



**City of Camrose  
Waste Management Master Plan**

**Final**

Prepared for:

City of Camrose

Prepared by:

Stantec Consulting Ltd.

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## Sign-off Sheet



**Stantec**

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## 1.0 Introduction

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Stantec was retained by the City of Camrose to develop this Waste Management Master Plan (WMMP). This WMMP provides strategic direction for residential and Industrial, Commercial & Institutional (IC&I) waste management activities over the short term (years 1 to 5), mid term (years 6 to 10) and the long term (years 11 to 25) providing visionary direction for waste management over the next 25 years.

This WMMP was developed in four key phases. Phase 1 *City of Camrose – Waste Management Master Plan: Project Initiation Report*, July, 2012 (**Appendix A**) speaks to the strategy's vision and various goals and objectives to be achieved as part of the WMMP. The Phase 2 – *Part 1 - Current System Assessment and Long Term Waste Management Needs* report (**Appendix B**) provides a description of the City's current waste management system and documents projections for the amount of waste requiring management over the planning period. Based on the projections, the City's long term waste management needs were identified along with a set of reasonable and achievable waste diversion goals and specific program objectives.

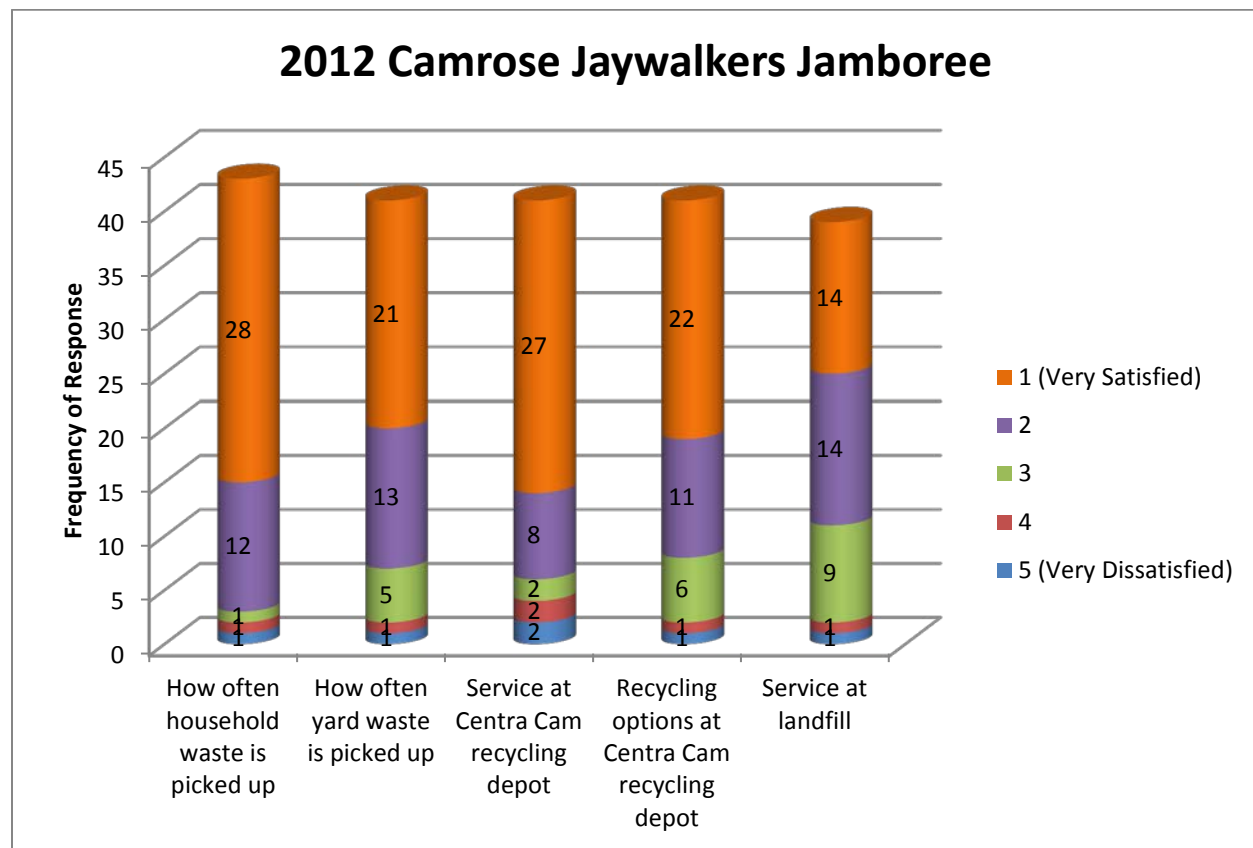
Also as part of Phase 2 of this WMMP, a *Part 2 – Best Practices Assessment Report* (August, 2012) was also developed (**Appendix C**). A range of appropriate best practices were identified and described in the form of a long list of waste management opportunities/options for review and discussion as it may relate to inclusion in the City's future solid waste management system. Based on those opportunities identified in Phase 2, the Phase 3 - *System Options Evaluation* report (**Appendix D**) then identified the characteristics of what might be a preferred waste management system; the short term (1-5 years), medium (5-10 years) and long term (10-25 years) waste management options that would likely be recommended to be implemented, associated waste diversion impacts, order or magnitude capital and operating costs, any system cost savings and revenues as well as an implementation timeline for the WMMP.

Consistent with the overarching waste planning principles for this WMMP, the Phase 3 report was structured in accordance with the Waste Hierarchy and focused first on waste reduction and reuse strategies for the City, then on various waste diversion initiatives for the residential single-family and multi-family sectors as well as strategies to divert waste in the IC&I sector. Strategies for management of the landfill were also discussed in the context of minimizing use, recognizing the landfill as a valuable resource and the benefits of prolonging landfill life.

The last phase in the process culminates in this final Waste Management Master Plan (WMMP) to guide the City in the development of what has been determined to be a preferred waste management system. The preferred system is described herein along with a recommended cost and financing strategy, WMMP implementation timelines and mechanisms for monitoring, reporting and plan review. Consultation associated with the development of the preferred long term waste management system is described below and a Consultation Record attached in **Appendix E**.

## 2.0 Consultation

This WMMP takes into consideration the results of public consultation events held as part of previous studies undertaken by the City, specifically the *Solid Waste Collection and Diversion Study*, KC Environmental Group Ltd., 2010 and *Review of the Industrial, Commercial and Institutional (IC&I) Waste Diversion Options Available Within the City of Camrose*, Hoffman Consulting (2011) as well as two events held during the course of its development. One event was held at the commencement of the work on the development of WMMP in conjunction with the annual Jaywalkers Jamboree on June 1-2, 2012. A promotional booth for the project was secured in a high traffic area of the Jamboree – a large community street party held in downtown Camrose – to solicit input on experiences with the current waste management system and preferences for growth options in the system in the future. Overall, more than 300 attendees were engaged and of these, 49 completed a short survey following a brief verbal outline of the project and its goals. The booth contained a multitude of existing information about the existing Camrose waste management system, as well as a description of the WMMP development project and its goals. A copy of the survey provided to the attendees has been included in **Appendix E**, along with a copy of the raw results including comments. The results of individual question follow in a series of graphs.



### Question 2 - Knowledge of 2015 Household Waste...



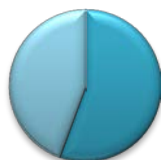
No  
Yes

### Question 3 - Current Usage of the Compostable...



Yes  
No

### Question 5 - Incorporation of Kitchen Organic Waste



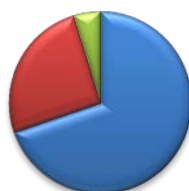
Yes  
No

### Question 7 - Potential for Change in Organic Waste Separation...



Yes  
No

### Question 8 - Acceptable Frequency for Curbside Recycling Pickup



Weekly  
Bi-weekly  
Other

The second event was a more formal Workshop held on January 24, 2013 coinciding with the end of Phase 3 of the WMMP. Notice of the Workshop was provided to the potential attendees approximately two weeks prior to the event in the form of direct communication. Stantec facilitated the Workshop for twelve (12) attendees including City staff, members of City Council, Camrose Energy, the Green Action Committee and Centra Cam. The purpose of the Workshop was two-fold: to gather feedback with respect to various programs and infrastructure development options presented in Phase 3 as part of a proposed preferred waste management system; and to generate discussion with respect to the degree of priority with which any preferred system component should be implemented (short, medium or longer term).

The details of these discussions are provided in **Appendix E** and the outcomes of the Workshop are factored into the recommended long term waste management system described herein.



### 3.0 Description of Preferred Waste Management System

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Detailed descriptions of the various system components discussed in this section are provided in both **Appendix C** and **Appendix D** of this WMMP. The discussion below provides basic descriptions of system programs and new infrastructure requirements but focus' more on the inter-linkages between major system components. These inter-linkages determine, along with the priorities identified in public consultation, program implementation timing (Section 5.0) as well as timing with respect to the need for any additional staff and budget resources as discussed in Section 4.0 below.

#### 3.1 PROGRAMMING FOR THE SHORT TERM (YEARS 1 TO 5)

##### 3.1.1 Promotion and Education Programs

The City has identified improved communication with the public as one of the five strategic priorities in the document entitled *“Going Forward: The Roadmap to 2015”* as part of their strategic plan. The plan includes the development of a comprehensive community engagement process that includes leveraging technology and social media to improve communication among some of the initiatives. Ongoing promotion and education (P&E) of waste management initiatives is critical to the success of those programs. One-time strategic and more involved campaigns are required to support major program shifts e.g. curbside recycling collection etc. The following are deemed to be important mechanisms to successful programming in the short term.

##### 3.1.2 Comprehensive Communication Plan

A Comprehensive Communication Plan will ensure a coordinated approach for the implementation of the reduction, diversion and disposal initiatives outlined in this WMMP. Without a communications plan, messages may be released to the public in a piecemeal fashion, which will not have as great of an effect as coordinated outreach. Effective communications plans contain four primary elements: design, funding, deployment, and monitoring and evaluation and will incorporate social media, incentives and social marketing as part of the entire strategy.



The City of Hamilton delivered 10,000 Gold Boxes to residents demonstrating successful diversion as an incentive.

The City currently has a website and uses social media sites such as Facebook, Twitter and RSS to inform and educate the public about waste management initiatives and updates. The audience for social media is limited to those residents with Facebook/Twitter accounts and an understanding of RSS feeds. While still a viable source of information, the City must be

cognizant of the demographics of the population; the last survey showed that at least half the population prefers non-electronic means of obtaining information.

Once a campaign is designed and funded, its deployment should be based on an implementation plan, which identifies the initiative, supporting tactics and timeframe for release to target audiences. Examples of successful communication tactics include the use a mix of media including strategies such as radio or TV, calendars, websites, public relations, social media, attendance at public events such as farmers markets etc. Sustained programs, with specific target messages and year-round exposure are identified as a best practice and are preferable to campaigns that are a one-time blitz (with the exception of promoting major program shifts).

The development of a Comprehensive Communication Plan is recommended in the short term to set the stage for the implementation of various P&E initiatives throughout the year and over the course of the WMMP planning period. In the short term, the City, as part of the communication program, should continue to use social media sites (Twitter, Facebook, RSS) to promote the City's ideas on waste management and support them through links on website (with appropriate legal disclaimers) which can be a mechanism to make waste management programs relatable to residents through real life experiences. Features of the waste management portion of the City's website should be optimized for mobile phones, tablets and other devices to provide residents with easy access to information online. This would be a low cost option as it would require minimal staff time, but does need support from Corporate Communication, IT and the Legal Department. This WMMP may present an ideal opportunity for City staff to collaborate on any improvements that might be made to the City's website as a whole.

The City should consider hiring a third party to assist with the development of a communications plan which would incorporate social media, marketing tools, incentives, a variety of media for promoting diversion programs. Adequate funding of P&E programs is crucial; the success of a program is dependent on the deployment of a successful P&E program to support and promote new programs to residents.

### **3.1.3 Solid Waste Bylaw Update**

Waste collection, removal and disposal of municipal solid waste are subject to the City's Solid Waste Bylaw #2670/11 which took effect on January 1, 2012. The bylaw stipulates the City is responsible for collection and disposal of municipal solid waste and gives the City the authority to limit the number of receptacles collected at each unit and schedule collection days and times as well as set out a number of parameters for collection and container set-out. In general terms the bylaw should be reviewed to incorporate any program changes that will occur since its last revision. Minor amendments like this can be accommodated with what should be a complete bylaw content review with implementation of each of the various options outlined in this report and that are approved by the City.

Various amendments may include but not be limited to:

- ✓ Acceptable blue box recycling containers, set out requirements, container size
- ✓ Acceptable blue box materials for set out
- ✓ Acceptable organics containers, set out requirements and container size
- ✓ Modified acceptable organics materials for set out
- ✓ Bulky item set out requirements, item limits, acceptable materials
- ✓ Changes in collection frequency e.g. bi-weekly garbage collection
- ✓ Modified/lower set out limits for garbage
- ✓ Multi-residential location collection provisions which may also include a save-harmless agreement for on-private property collection

Amendments should reflect any mandatory programs and required compliance as it relates to any future programming and any implications associated with non-compliance e.g. a list of infractions and possibly penalties for each infraction. The bylaw should continue to identify items that are non-collectable at the curb and that cannot be disposed of at landfill.

The bylaw also established charges for collection fees; the bylaw will need to be amended to reflect changes to fee structure based on program changes.

### **3.1.4 Enforcement**

Through the short term planning period, the City should identify and prioritize those waste management issues that are the most critical in regards to monitoring and enforcement. An update to the bylaw is recommended to support the implementation of all short term system components that require a change and to clearly identify certain actions/activities that require more stringent enforcement (e.g. fines for sharps or hazardous waste present in the waste stream at the curb). The methods of enforcement should be outlined and can include a range of approaches, from supported voluntary compliance (generally the ultimate objective of a Waste Management Department) to enforcement through refusal to collect materials to fines for repeated offences.

The City will need to carry out some form of enforcement to support program changes, whether through communications (like leaving stickers on bags/boxes identifying unacceptable materials) or home visits to more stringent approaches including issuance of fines. To most effectively achieve this, either waste management staff or bylaw officers are necessary to support these programs. Monitoring and enforcement will be necessary throughout the entire planning period.

### **3.1.5 Continued Waste Reduction Target Setting**

There are waste reduction and reuse initiatives that are recommended in the short term to support the City's short term planning goal of decrease residential waste entering the landfill by 50% and all waste (including commercial waste) by 36% from 2009 levels by 2015. These initiatives are "enhancements" to existing programs some of which only involve enhanced

communication to residents with respect to the minimization of waste (e.g. the website, tweets or Facebook updates) and don't involve the City taking on additional infrastructure to support these initiatives.

The City has already set the following waste reduction targets:

- Reduction of residential waste to 195 kg/capita by 2015
- Reduction of municipal solid waste (MSW) generation to 1000 kg/capita (including commercial waste) by 2015

In 2011, the generation rate for residential waste requiring disposal was 310 kg/capita. It is clear that additional waste reduction and diversion programs will need to be implemented in order to achieve the City's targets. It is important to have a target which can be monitored on a regular basis to determine if there is a decrease in waste generation rates within the City especially over the first few years of WMMP implementation. Based on the success of this initiative within the first few years, the per capita waste reduction target could be increased or a change in approach on promotion and education around this activity may be necessary.

### **3.1.6 Promoting Waste Reduction Tips**

One of the best mechanisms to achieve waste reduction targets is through various ongoing promotion and educational initiatives that includes specific ideas/instructions for residents, City staff and educational and commercial sectors to help them understand how to specifically reduce waste generation in their everyday activities. Examples of 'tips' for the residential sector:

- Use a refillable mug for coffee or other beverages on the go
- Remember your cloth bags when you head out to the grocery store
- Purchase items in bulk whenever possible... bring your own containers to the bulk store if possible
- Re-upholster worn out furniture instead of buying new – often the frame will far outlast the upholstery
- When faced with two similar products of different brands, choose the product with the least amount of packaging
- Avoid buying single serving or over-packaged foods – there is always an alternative with less packaging (and likely more nutritious)

This information can be made available by a website link or in concert with other hard copy promotional activities; calendars, brochures etc. and could be done in the short term. Various tips can also be provided for schools and businesses as well.

### **3.1.7 Waste or Goods Exchange Events**

A very user-friendly re-use program implemented in other municipalities is *waste exchange events*. This is recommended as a very low cost program and simply needs adequate advertising prior to the intended event/weekend. With waste exchange events, residents may leave items like furniture and any other reusable items at the curb (e.g., BBQs, tools, strollers, clothing, etc.) labeled “free” for anyone to pick up during selected times (events) of the year. Although these types of programs do not typically increase diversion rates significantly, they net some degree of environmental, social and potential economic benefit. This kind of program also provides a level of convenience to those without their own vehicles or means to bring larger items to a central facility. It is the responsibility of the resident to bring any items back in or take them for disposal as appropriate if the items remain at the curb once the event is over.

### **3.1.8 Non-Reusable Bulky Materials Collection & Management**

The City does not collect bulky materials at the curb; residents must bring these items to the landfill where they are subject to tipping fees. The City should consider alternative management options – depot collection, curbside call-in service, vouchers and pick up options (described in detail in **Appendix D**).

Cost implications range significantly from a separate bulky waste collection program (assuming not a user-pay program) to the use of a depot or CRC to manage these materials to no program at all. The City should seek pricing for separate bulky waste collection as part of the next RFP for curbside collection services to evaluate the cost-benefit of providing this level of service to residents. More often this program is managed on a cost-recovery basis if a curbside program is elected, that is, on a cost per item basis. Materials including recyclable and non-recyclable items could be collected and then directed appropriately for disposal, recycling or reuse as appropriate and in concert with appropriate receiving, handling and storage areas either at the landfill or at a re-purposed Centre Cam Depot (or both).

### **3.1.9 Blue Box Materials Collection & Processing Program**

The current depot based collection system relies on City residents to take the initiative to bring blue box recyclable materials to the depot. This is not as convenient as curbside collection for residents and may act as a deterrent to recycling which affects participation of residents in the program and so the amount of material that is captured and diverted from landfill. It was estimated in Phase 2 of this WMMP that this initiative alone could get the City to its 50% diversion target and previous consultation with the public indicates support for this program.

While this program is recommended as described herein, the fundamental factor with respect to the decision to implement this program is its cost. The City, given sheer tonnage generated, would not be able to support its own Materials Recovery Facility (MRF) and as such would be reliant on others to meet their processing capacity. As a first step in the implementation of this program the City should let a Request for Expression of Interest (REOI) to determine what capacity is available and within a reasonable haul distance of Camrose.

Preliminary discussion with the City of Edmonton indicates that they have capacity to accommodate Camrose tonnage over the longer term and are interested in further discussion in that regard. The City of Edmonton operates a blue bag program and currently accepts: all types of paper, cardboard, juice boxes, milk cartons, boxboard, metal cans, aluminum, glass bottles and jars, and plastics (#1,2,4,5). Discussions with Waste Management (WM) indicate there is also capacity at their recently upgraded Red Deer MRF. This facility receives similar materials with the exception of milk cartons and plastics other than #2.

Edmonton operates a single-stream processing program as does WM which would enable Camrose to place all recyclable materials in a single bag (Edmonton) or container at the curb. This program is also most efficient from a collection standpoint where a single compartment side or rear load truck may be utilized (or in concert with the co-collection of waste).

Depending on the results of the REOI process the City could let a Request for Proposal (RFP) for the long term processing of its blue box materials.

With respect to the collection of recyclable materials at the curb, the City can elect to make use of large blue boxes, recycling carts (in an automated system) and if the program includes processing at the City of Edmonton MRF (and perhaps elsewhere) could elect to use blue transparent bags for collection. The least cost option is obviously bags purchased by the householder and the most expensive option would be the larger recycling carts (discussed in Section 5.0 below).

In some municipalities it is the responsibility of the homeowner to purchase their own blue boxes. This has long been identified as not 'best practice'. The program needs to be as convenient as possible and these municipalities do not typically reflect high diversion rates with this approach. Further the smaller blue boxes are not recommended as the sheer volume of recyclables is greater than their capacity to hold materials and in some homes several are required to accommodate all recyclable materials. The City could adopt the approach of providing one large blue box and have more available at cost to residents.

From a collection standpoint, and based on other municipal experience blue box collection costs could range from \$100-\$150/household/year for weekly collection (and should occur as frequently as garbage collection). Having said that, a bi-weekly blue box collection program could be implemented if full-scale programming occurs for organic waste (as discussed above) as in that scenario the City could also adopt a bi-weekly collection cycle for garbage. This lets the City effectively 'trade one service for the other' to keep costs as low as possible. If the City determines that alternating bi-weekly collection of recyclables with garbage is preferred then it may be prudent to time the implementation of the blue box collection program after successful implementation of an enhanced organics collection program. Not only does this present the most cost-effective way to implement the program but it also allows the staging of these major initiatives from both a staff and budget resource management standpoint.

Again, the decision with respect to the use of bags or boxes and the appropriate collection configuration will fall out of the determination of a preferred processor for recyclables and other



decisions with respect to the system. Once a preferred processor is determined consideration will also have to be given to the need to bulk blue box materials for transfer (e.g. possibly located at the landfill) or whether a direct haul from the curb would be more cost-effective and practical. This is of course dependent on the distance (and time) to the receiving MRF. Edmonton is approximately one hour and fifteen minutes from Camrose and Red Deer is one hour and forty-five minutes. Other operators in other locations may also respond to an REOI process.

If a transfer station is necessary it isn't likely that the City would construct a conventional transfer building because of the volume of blue box material to be moved. Many smaller municipalities across Canada are constructing smaller and proprietary Transtor Transfer Stations to accommodate smaller tonnages.



### **3.1.10 Co-Collection of Materials at the Curb**

There may be opportunities for cost savings associated with the co-collection of materials depending on the preferred system configuration with respect to both preferred collection cycles (weekly, bi-weekly) and the location of facilities.

Organics could be co-collected with garbage on garbage collection days and organics could be co-collected with recycling on recycling collection days if all receiving facilities are at the landfill site (landfill, improved organic waste processing area and a transfer station if necessary to the shipment of recyclable materials to a more distant MRF for processing) and if the City implements an alternating bi-weekly garbage and recycling collection program. It may however also be possible to direct haul from the curb to a MRF (e.g. Edmonton) especially with a single-stream collection and processing program. Again preferred collection cycles and other factors play a large role in determining the feasibility of these options.

It is recommended that the City consider these opportunities once the preferred system configuration is adopted and appropriate to the timing of new collection contracts during the long term implementation of the WMMP.

### **3.1.11 Set-Out Limits**

The City has already identified a series of reductions in set-outs; in 2012, the City introduced a graduated bag limit of three containers; early this year (2013) the limit was reduced to two containers. As the decrease in the bag limit continues however, (e.g. ultimately to a one bag limit) the City should consider the timing relative to various program enhancements recommended in the WMMP (particularly with respect to curbside blue box and enhanced organics collection programs). Should the City implement these programs the sheer volume of garbage requiring disposal will decrease enough the support these lower bag limits. While bag limits are intended to drive diversion, there needs to be a reasonable and convenient alternative to disposal for those participating in curbside collection programs.

### **3.1.12 Hazardous Waste Management**

Currently, residents have a few options for disposing of household hazardous waste; the City offers two two-day Round It Up events per year in June and October at their public works yard, the Centra Cam depot accepts limited HHW materials from residents including paint, fluorescent tubes, and non-rechargeable batteries, 24 hours a day, 7 days a week, and the landfill accepts limited types of HHW. At the last Round It Up event however it was estimated that only 1% of the population participated, based on the tally sheets provided by the City.

In the short term, the City should establish partnerships with private retailers in the City wherever possible to provide alternative collection points for specific HHW materials like batteries. Partnership locations can be advertised to residents on the City's website and social media sites and included in future P&E materials. Larger retailers such as Canadian Tire, Walmart or Home Hardware may offer recycling programs for plastic film, batteries, CFL bulbs, paint, tires similar to those offered in their stores in other areas.

As there is a lengthy wait period between Round It Up dates, it would be beneficial to either increase the frequency of the delivery of this program or to expand acceptable materials at Centra Cam and/or at a new Community Recycling Centre (CRC) at the landfill site and in concert with the concept of 're-purposing' the landfill as discussed in Section 3.1.15. More than one more permanent depots for HHW would likely increase participation in this program along with the acceptance of more materials. Some municipalities also have 'paint re-use' programs where they make unused products; paint, thinners and other products, available to residents.

### **3.1.13 Industrial, Commercial & Institutional (IC&I) Waste Diversion Programs**

Since a large portion of the waste managed by the City consists of IC&I and Construction & Demolition (C&D) waste, any efforts to increase diversion in this sector will go a long way to extend the life of the landfill.

In the short term, those programs which should have the highest priority are those that will assist the City with understanding the quantity and composition of IC&I waste requiring management as well as identifying the issues the IC&I sector faces on a regular basis with



respect to waste diversion efforts. This will assist the City in deciding what diversion initiatives should be prioritized and also if and when to implement any mandatory diversion programs in the long term. On an ongoing basis, the City should also provide P&E material specifically targeted to this sector about current City diversion programs. The City should encourage regular communication with key stakeholders targeting employees, businesses, educational institutions, and business associations. This was confirmed in the survey conducted as part of the 2011 *Review of the IC&I Waste Diversion Options* by Hoffman Consulting, as the most common idea put forward by the IC&I sector was that the City should provide more awareness and P&E of waste diversion programs.

Further data collection is necessary as a first step in understanding the nature and quantities of material requiring management in this sector and that could reasonably be diverted. In the short term, the City should implement some tracking measures at the recycling depot and landfill in order to determine the source and type of waste being disposed of at these facilities. Both of these facilities are unattended at certain times which makes it difficult to track the source of waste. Much of the recycling at the depot is untracked unless it can be attributed to a specific generator or type of waste (e.g. cardboard). Tracking at the landfill does not adequately distinguish those mixed loads containing material that may be diverted not only from IC&I sources but MSW collected from trailer parks, condominium complexes and multi-residential facilities are also classified as commercial waste since it is collected by private haulers.

The City would likely benefit from routine visual waste inspections by staff or summer students to determine some order of magnitude understanding of wastes, and waste sources that may be targeted for diversion e.g. cardboard, construction waste, food waste etc.

The statistics and data generated from these audits/studies can assist in creating the framework for more stringent source separation requirements the City may determine over the long term e.g. material bans like cardboard. Based on preliminary estimates undertaken to support this WMMP it is estimated that about 30% of the tonnage from commercial sources and entering the landfill is organic waste and another and approximate 30% is paper and paper products. Data collection would confirm these as potential target materials (and sources) for diversion along with other material types and help to determine the degree of effort needed for separation of these materials for recovery.

### **3.1.14 Recycling Depot Enhancements**

Currently, the recycling depot consists of a facility owned by the City and operated by Centra Cam to process the recyclables delivered by residents to the depot. The depot is operating at capacity under the current system (no curbside collection of recyclables). Until the City implements a curbside blue box program (or not), there are some short term modifications to the recycling depot that could be implemented.

One of the modifications for consideration in the immediate short term is the adjustment of operating hours. Although the recycling depot is open 24 hours, 7 days a week for the disposal of most items, there are several items which are only accepted on weekdays from 8:00 a.m. to

4:00 p.m. The City and Centra Cam could consider evaluating traffic volumes to determine days and times which may be more appropriate for operating hours. It may be more convenient for residents to have options to recycle or dispose of items on Saturdays or after business hours some days in the week and perhaps the most cost effective way would be to close the depot on a day during the week where there may be less traffic. This may drive participation up for various recycling programs offered at the depot.

In the short term, and with the decision to implement a blue box curbside collection program, the City should consider means by which the existing depot may be re-purposed. It is likely, notwithstanding a curbside program, that small commercial, County and multi-family generators will still use the depot for blue box recycling purposes and so an area dedicated for that will still be necessary albeit not as much space and materials recovered (e.g. single stream) would be shipped either to a transfer station for shipping or shipped direct to MRF. Unused areas of the site could be repurposed for the collection of additional recyclable materials e.g. appliances, wood, small generation of construction and demolition material from home renovations and the like, potentially mattresses, carpeting, an enhanced HHW program and possibly a re-use centre (this may require use of the adjacent property), tires, continued electronics recycling etc.

If a curbside blue box program is not implemented then the City should continue to operate the depot (and possibly still expand to adjacent property) but also and entertain a new Community Resource Recovery Centre (CRRC) at the landfill (discussed in Section 3.2.7) to accommodate various diversion initiatives.

### **3.1.15 Rebranding/Repurposing of the Landfill**

The sanitary landfill is a vital part of the City's waste management program and every opportunity should be explored to extend the life of this resource. The concept of rebranding and repurposing the landfill is as described above, that is, the site would be re-designed as an integrated 'resource recovery' site that through proper signage and direction to visitors/users and appropriately constructed roadways to access a series of diversion facilities prior to disposal as the last (and least convenient) option for the user.

With rebranding usually comes a facility name that reflects the site's 'new purpose' and uses references to that such as 'resource recovery' or similar. The previous *Solid Waste Collection and Diversion Study* made note of the City's "paint your world green" theme developed for the City and that this theme could be carried through all waste diversion programs, including the recycling depot and the landfill in order to reflect an integrated approach and recognizable theme for all facilities. This could somehow be incorporated into the rebranding of the landfill site or otherwise the City could hire a marketing firm to develop a new image for all waste management programs and the new landfill site waste reduction and diversion infrastructure to support those programs.

As the City works toward making the landfill less 'disposal focused' and more 'diversion focused' both residential and IC&I sectors will come to view the facility in a different light. This will take time and will need to be supported by many of the mechanisms described in this section.

### **3.1.16 IC&I and C&D Materials Depot**

The City already has a diversion area for concrete and asphalt and should consider expansion of that area (if physically possible) to divert additional IC&I and C&D sector materials. The depot could take the form of a re-use area (specifically for C&D materials) and a recycling station for divertible materials. The City could choose to develop a facility itself or in partnership with a private entity interested in participating in the effort.

There are several advantages to such a program, including:

- Furthering the site as having focus on waste reuse and recycling as opposed to disposal
- Could divert significant quantities of waste
- Could divert specific harder to manage materials at the landfill tipping face
- Could lower disposal costs for these sectors

It is recommended that the City consider the merits of a depot in the context of the delivery of other program changes, timing, budget, the desire to re-purpose the landfill and in consultation with the IC&I and C&D sectors possibly as part of this WMMP process but certainly in roundtable discussions as described in Section 3.3.5. Consultation with respect to the types of materials that should be separated and the number of anticipated users should occur to determine facility footprint and configuration and so overall capital and operating cost implications for the City in the long term. Targeted materials will be supported by data collection activities also discussed in Section 3.1.13 above.

### **3.1.17 Differential Tipping Fees and Surcharges for Designated Materials**

The City's current tipping fee schedule (2012) does reflect some level of differential tipping in that some materials are received for free to encourage diversion including but not limited to batteries, pesticide containers and grass and tree clippings. Wood and metal are also received at a lower price than the disposal fee but the difference between these fees is not necessarily substantial enough to promote separation of these materials by most facility users.

Many municipalities across Canada use differential tipping fees to promote source separation of materials for diversion and to reduce disposal capacity use. The City should consider raising its disposal fee in the short term to mid term with sufficient notice to facility users. The fee shouldn't be so high as to force generators to go elsewhere but high enough to have greater separation of fees for disposal compared to lower fees for wood, metal, organics and other targeted materials.

The City could also consider applying a surcharge to mixed loads containing target materials including recyclables like cardboard, C&D materials, possibly organics in the longer term (see also Disposal Bans in Section 3.3.4). This acts as a financial incentive for businesses to source

separate material. The environmental benefit comes through increased diversion and reduction in the use of non-renewable resources (e.g., metals, etc.).

The City would have to ensure that the appropriate diversion infrastructure is in place for the materials that would be designated as being recyclable. For example, markets are currently available for old corrugated cardboard (OCC) and scrap metal. Markets would need to be available for other materials prior to those materials either being targeted with a differential tipping fee or a surcharge.

## **3.2 MEDIUM TERM PROGRAMMING (YEARS 6 TO 10)**

### **3.2.1 Enhanced Organic Waste Collection & Processing**

The City currently offers a limited organics collection program, accepting vegetative waste only (i.e. no meat or dairy products). An enhanced organics collection program, accepting a wider variety of materials, would contribute significantly to the amount of waste diverted from landfill. Estimates developed for *the Part 1: Current System Assessment and Long Term Waste Management Needs* report indicate that the amount of organics potentially diverted could almost triple in quantity with an enhanced program.

Implementation of an enhanced City-wide source separated organics (SSO) Green Bin collection and processing program in Camrose would result in the most significant change to the City's waste management system. A City-wide SSO program would:

- Shift a significant quantity of waste from the curbside waste stream to a Green Bin. In the order of 3,200 tonnes (2012 estimate) and up to just under 6,000 tonnes at the end of the planning period (noting these estimates are for single-family sector only and that multi-family sector organics separation and diversion would see more significant impacts);
- Decrease the consumption of disposal capacity at the Landfill;
- Reduce the potential environmental effects of the landfill by reducing odour, leachate and methane generation.

In regards to organics collection and processing on a preliminary basis and in general:

- Collection of organics should likely be on a weekly basis year round if the City decides to move to a bi-weekly garbage collection cycle (further discussed in Section 3.1.9). This encourages the highest participation rates because the program is more convenient than the garbage collection cycle, and it also reduces issues related to odours and vermin for residents.
- Green bins should be sized to allow for ease of use and to accommodate household organic (food waste, compostable fibres, leaf and yard waste), generally accommodated through the

use of smaller sized carts (e.g. 80 litre carts) and some allowance for leaf and yard waste in paper bags outside the cart.

- The program design should allow for the use of compostable liners (compostable film or paper) as this has been shown to increase householder participation. Current program experience indicates that a broad range of composting technologies can handle these materials.
- The City determines the feasibility of providing the program to multi-family dwellings once successfully applied in the single-family sector, based not only of the outcomes of the City's experience but on the outcome of studies currently being undertaken in other jurisdictions.
- The City should further extend the SSO program to the commercial sector once a broader spectrum of materials is accepted in the program.

From a Green Bin procurement standpoint, it is standard to provide not only a Green Bin but also a Kitchen Catcher (a smaller bin to collect organic waste to be deposited when full into the larger Green Bin).



The addition of substantial volumes of household organic waste to the existing, predominantly leaf and yard waste, composition will require more robust site and operations to ensure proper aeration, moisture control, C:N ratio, temperature control, other variables to ensure the proper composting of materials through high-rate, low-rate and curing phases and to ensure no off-site odour impacts during the processing of a more volatile blend of materials.

The City has operated an outdoor windrow composting program to date. With an enhanced program the site would generally need to consist of an indoor pre-processing area for receiving of fresh organic waste, blending bulking agent (e.g. wood) when necessary, indoor screening (if necessary depending on permitting requirements and the site's buffer zone (nearest sensitive receptors like homes)).



Given the buffers around the site and the volume of organic waste to be managed (including potential future commercial tonnage) the technology category most likely applicable to the City is a covered aerated windrow system. As an example (and in no way an endorsement) the GORE® system is used by many municipalities across Canada and is modular in nature so that the facility can be expanded as waste volumes increase. The City of Abbotsford, B.C. is currently constructing a small GORE® composting facility, owned and operated by Net Zero Waste and the town of Sechelt, B.C. is also in the midst of the design stage for a composting facility as well.



**Gore Cover Composting Operation**

Should the City roll-out an enhanced organic waste collection and processing program on a City-wide basis, the City, as a first step should let a formal Request for Proposal (RFP) process for either a 'wide open technology' vendor submission, meaning a bid process open to any technology type, or a more specific covered windrow application. Upon award and more detailed site design, the City would then require permitting from Alberta Environment and Sustainable Resource Development (AESRD) for full-scale construction and program implementation. The City would also require an operating contract.

### **3.2.2 Changes in Collection Frequency**

Best practices indicate that recyclable and organic materials should be collected at least as frequently (or more frequently) than the garbage stream. This encourages waste diversion by providing the same level of convenience for waste diversion programs as for garbage collection.

The City already collects organic waste at the curb between May and October on a weekly basis. There may not be a need to increase this level of service to year round service with a new Green Bin and enhanced organic collection program but that should in part be determined with other initiatives being considered such as co-collection or automated collection and in concert with considerations with respect to recycling collection. The introduction of a fully enhanced Green Bin program (with weekly collection year round) however, would allow the City

to reduce garbage collection frequency to a bi-weekly collection cycle. This is not only 'best practice' because putrescible waste, more prone to odour and vector attraction, is collected in the Green Bin program but also the sheer volume of garbage remaining with a well-run Green Bin and curbside recycling program no longer justifies such a high level of garbage collection service (weekly).

Bi-weekly collection of garbage would also enable the City to collect blue box recyclable materials on a bi-weekly basis (e.g. alternating with garbage) which results in the provision of both services on an 'as convenient' basis but likely presents the most cost-effective method for the City to enhance overall curbside collection services. This would suggest (as discussed previously) the City should implement a City-wide enhanced organic waste collection program prior to implementing a blue box collection program at the curb. Once the full scale organic waste program is implemented and residents are accustomed to the service then the City could scale back garbage collection to a bi-weekly basis while simultaneously introducing blue box collection.

It should be noted that for a bi-weekly recyclable materials collection program the City would want to ensure sufficient storage capacity to its residents e.g. larger blue boxes, blue bags (the endless container) or carts (in concert with automated collection).

### **3.2.3 Develop Partnership Agreements**

This program involves the identification of specific community stakeholders, potential partnerships, tools (e.g. web based waste exchange site(s) and links) and re-use program initiatives that may be specifically suited to the City based on their own community resource dynamics. By partnering with existing organizations, and acting as a facilitator between generators and collection providers, the City will be able to use established programs and infrastructure to support diversion initiatives. Mechanisms to achieving this include the formalization of relationships with partnering organizations and support of their services on the City's dedicated waste management webpages.

The focus of the re-use program will be on the effective use of existing community resources. The program would involve:

- Identification of specific community stakeholders that are currently involved in the re-use of various items within the community.
- Enhancement of the current "Re-use Guide" to link households to the most appropriate locations/options for donations-based re-use. The guide would provide information regarding the companies/organizations that accept donated materials for re-use or recycling. An on-line guide would likely be the most effective; however, it is recommended that the City dialogue with the charitable sector and other community organizations along with the public to determine the best vehicle for the guide.



### **3.2.4 Waste Re-Use Centre**

Re-use centres are a common way that communities can reduce waste production and extend landfill life. These come in the many forms from a 'housing' standpoint, from constructed buildings to trailers to smaller sheds. A centre could be developed in concert with



enhancements at the existing Centra Cam depot as well as in a CRC configuration at the landfill. A centre could be developed to simultaneously manage a re-use program as well as HHW drop-off.

Potential items that could be targeted for re-use include furniture (e.g. couches, chairs, and tables), housewares (e.g. dishes, utensils, pots, pans), clothing, books, CDs, DVDs, toys and various construction and renovation items, novelty items, etc.

The City should further investigate this option in the mid term as an evolution of the partnership agreement consideration outlined above. In many cases, municipalities partner with non-profit operations to run their re-use facilities.

### **3.2.5 Multi-Family Sector Waste Diversion Programs**

The City currently does not collect any solid waste from the multi-family sector. The City should consider greater control over this sector through the provision of collection services (for blue box recycling and organic waste) and supporting promotional and educational activities.

There have been significant challenges for municipalities in the delivery of waste diversion services in the multi-family sector. While these challenges are shared by most municipalities, the approaches to capturing recyclable and compostable material from this sector vary greatly within Canada and across North America. More generally however it is known that some degree of municipal ownership of a program is required to increase and maintain diversion in this sector. This can be achieved through regulatory and reporting requirements, but is more typically associated with financial incentives or disincentives to drive programs. This could be accommodated through differential tipping fees (e.g. higher disposal fees for garbage than processing fees for recycling) discussed in Section 3.1.17. It is particularly challenging to implement waste diversion programs in multi-family buildings for various reasons including various site and building designs and associated space limitations, tenant turnover rates and ownership/interest and related program control issues.

Notwithstanding these challenges, the City recognizes that this sector is key to achieving waste diversion targets and minimizing waste to landfill and that typically this sector wants the ability to participate in municipal waste diversion programs. Usually this is translated to a desire by this

sector for the municipality to provide the same level of service or uniform service across both single and multi-family sectors.

An effective collection program for the multi-family sector requires considerable and ongoing staff time with dedicated staff to properly administer the program, conduct site visits to support program set-up, assist with development and/or distribution of promotional and educational materials, monitor success of the program and attend to collection issues. The program can further be supported by database management (tracking locations participating in the program) and addressing new development in the City through construction permitting requirements associated



**Edmonton Multi-Family Recycling Collection Container**

with the requirement for necessary space/infrastructure to properly support waste diversion initiatives. Details with respect to database management, promotion and education and collection for this sector are discussed in **Appendix D**.



It is recommended that the City implement programming in the multi-family sector but only after full-scale implementation of blue box recycling and/or enhanced organic material collection in its single-family sector. Based on the proposed implementation timeline this initiative would not likely be undertaken until 2018. Several factors need to be considered before implementation in this sector but the largest issue is to determine the method of processing and so collection that will be employed for blue box recycling in the single-family sector. That determination, along with the characteristics of the multi-family sector (e.g. many high rise buildings versus low-rise townhomes, condominium units and smaller complexes (assuming some combination) will help to dictate the most practical method of collection in the multi-family sector. If the single-family sector is collected using blue bags or blue boxes for example then the multi-family sector could be included in routing using carts but would require the ability of the collection vehicles to add a cart lifter/be configured to handle both manual loading of bags/boxes and carts. This is not an issue other than the provision would need to be included in a future collection contract.

If the City moves to a cart-based program for the single-family sector for collection of blue box material and organics the shift to multi-family collection is straightforward and they are simply added to the routes although usually larger bins are provided for organics collection in that sector, and again, collection contracts need to be structured so that collection vehicles can add larger cart lifters for this program.

By delaying implementation in this sector it allows the City to determine the best mechanism for materials collection in the single-family sector and then expand that program beyond that sector, permits the City to spread budget resources over a longer period of time (e.g. the acquisition of

containers if determined) and to realistically allocate staff time to initiatives over the life of the WMMP.

### **3.2.6 Automated Collection**

The City should also continue to consider and seek pricing for the provision of an automated collection service to residents (e.g. with the next collection services procurement process). Automated collection can be provided for all waste streams (organics, garbage and recyclables) and carts would have to be provided to residents to support that collection program. Automated waste collection is considered to be a “best practice” in waste management where efficiencies can be gained in collection of any waste stream.

Automated collection provides better working conditions for vehicle operators and can also be far more efficient than manual collection. In 2009 the City of Toronto for example reported that in one area of the city they will reduce from 22 recycle/organics trucks and 17 garbage trucks to 18 trucks for all three waste streams. Automated collection facilitates the collection of a much larger route than manual collection in the same amount of time e.g. 1000 to 1200 stops compared to around 700 stops with manual collection.

The contract cost of more efficient automated collection should be weighed against the cost of carts as described in the sections above. The provision of carts presents a high initial one-time cost to the City depending on how many streams the City determines should be collected by this method. Sufficient time is also necessary prior to commencement of automated collection to procure carts and distribute them on a city-wide basis. Carts for garbage collection only are estimated at \$226,000 (240 L).

### **3.2.7 Support and/or Expand School Recycling and Curriculum**

In the mid term, the City should consider supporting in-school recycling programs and could consider the provision of both blue box and organics collection in partnership and possibly with a ‘consortium style’ contracted collection arrangement. The City should also continue to cooperate with Boards of Education to continue to develop appropriate curriculum for students as it relates to waste management. School-based programs can also be used as a conduit for broader community education programs on diversion.

### **3.2.8 Community Resource Recovery Centre (CRRC)**

The City currently provides several areas for the diversion of various recyclable materials including leaf and yard waste, scrap metal, asphalt, concrete, automotive batteries, tires, propane tanks and appliances at the landfill. Some of these recycling programs may be better served through a centralized receiving facility in the form of a CRRC strategically located before access to the landfill tipping face. Further it may be beneficial to use bins for convenient (e.g. better road conditions) disposal of garbage by residents as well (as opposed to allowing access to the tipping face). This may allow for improved management of the landfill working face for

operators. If this is a preferred option for the City then disposal bins should be located the furthest (and past) access to bins used for diversion purposes.

A CRRC concept could include bins, or if more appropriate, pads, for some of the materials already managed like leaf and yard waste and scrap metal. Additional bins could be provided for additional recyclable materials similar to those identified in Section 3.1.14 as it relates to a re-purposed depot (if a curbside recycling program is put into place). A CRRC could serve in lieu of a curbside collection program to provide convenient recycling services to the south end of the City and to manage additional tonnage with population growth and it can be used to expand the City's residential recycling programs.

The following materials could be separated:

- Blue box recyclables (serving multi-family sector in the short term, County and small commercial sector in short and long term);
- Old Corrugated Cardboard (OCC);
- Brush (gravel pad at grade, access required to grind and move materials);
- Leaf and yard waste (paper bags only, or debagged) (gravel pad at grade, access required to grind and move materials if not ground at the composting pad);
- Clean wood waste (40 yard bin);
- Drywall (40 yard bin);
- Asphalt shingles (40 yard bin);
- Used Tires (40 yard bin); scrap metal and white goods (gravel pad at grade);
- Space for a household hazardous waste depot and/or electronics collection and or appliance collection and storage;
- Dirty wood waste (gravel pad at grade);
- Furniture/mattresses (40 yard bin);
- Non-divertible Construction and Demolition Waste (40 yard bin(s));
- Mixed garbage (40 yard bin(s)).

One design concept that the City could employ and shown below is a modular design (by way of example only) that can be constructed as a smaller facility to start and expanded to accommodate additional material separation needs over time (pictured below).



It is recommended that the City consider the merits of a CRRC in the context of the delivery of other program changes, timing, budget, the desire to re-purpose the landfill and in consultation with the public as part of this WMMP process. Consultation with respect to the types of materials that should be separated and the number of anticipated users should occur to determine facility footprint and configuration and so more

accurate overall capital and operating cost implications for the City in the long term.

### **3.2.9 Waste Diversion Certification and Awards Program**

The City should consider a voluntary certification program for businesses that meet specific waste reduction and diversion standards set by the City. For example, businesses that are able to meet a certain level of diversion (e.g. 70%) could be allowed to use recognizable logos and signs to recognize their achievement. The certification would act as a positive public relations tool for businesses and would act as an incentive for businesses to participate in waste reduction/diversion initiatives.

### **3.2.10 Green Procurement Guide**

In the medium term, the City should develop a Green Procurement Guide specific to the IC&I and C&D sectors. The guide would educate IC&I and C&D generators about Green Procurement and would provide resources to these sectors on selecting products that are environmentally preferable. Although this initiative would not contribute significantly to increasing the City's waste diversion rate, it would show that the City is willing to take on a leadership role in environmental stewardship. The guide could be available on the City's webpage and promoted through advertising.

For the IC&I sector, green procurement options could include encouraging the purchase of paper products that are made of post-consumer recycled fibres and using cleaning products that contain less hazardous ingredients. For the C&D sector, options could include encouraging the purchase of building materials made of recyclables material or materials that are less hazardous in nature (e.g., low VOC paint).

Over the long term and once other key programs are in place, the City could also provide technical assistance services to companies that implement waste reduction programs; for example, the City could train companies in how to properly complete waste audits and develop waste reduction work plans. This type of program would not be mandatory; it would be a voluntary initiative that IC&I or C&D entities could participate in if interested.



### 3.3 LONG TERM PROGRAMMING (YEARS 11 TO 25)

#### 3.3.1 Mandatory Diversion Bylaw

Over the course of the planning period, the City can from time to time assess whether or not participation in diversion programs for residential sector and/or the multi-family sector will be made mandatory. Many municipalities have taken this approach as it supports other initiatives such as differential tipping fees, (further discussed in Section 3.1.17) landfill bans, and the ultimate goals of waste reduction and diversion from final disposal. A diversion bylaw can address the diversion of the organics stream or the blue box recycling stream, or a combination of both once adequate diversion programs have been implemented with time to adjust to new service levels and to compliance. This would not likely be considered until at least 2022 and as discussed above would require staff dedication to enforcement.

#### 3.3.2 Public Open Space Recycling

Public space recycling programs seek to capture additional recyclable materials from residential sources that are typically lost to disposal. Stantec has identified various best practices that could help overcome these obstacles including the use of clear and consistent signage, proper bin design and placement and good communications between collectors and facility managers.<sup>1</sup> The *Open Space Recycling Better Practices Review* also noted the importance of placing recycling containers and garbage containers side-by-side.

Portage la Prairie was recently (October 2010) selected to become the model community for Recycle Everywhere, a program which encourages recycling in Portage la Prairie's public spaces.<sup>2</sup> This program was implemented in conjunction with the Canadian Beverage Container Recycling Association and Multi-Material Stewardship Manitoba and required an investment of \$150,000 for over 200 bins, advertising and Recycle Everywhere decals. The recycling bins were placed throughout Portage la Prairie's parks, public buildings, shopping centres, community facilities and other public spaces. Camrose should carefully monitor the results of Portage la Prairie's program and select the most successful aspects of the program to implement in Camrose' public spaces.

This is recommended in the long term once a curbside collection program is established as this program can be collected as an add-on and enhancement to that program.

#### 3.3.3 Special Event Recycling

This type of program targets vendors or organizations, typically using municipal facilities like parks, arenas for festivals or special localized events. This program complements a public open space recycling program. In many municipalities, event organizers are required to get a permit for these events and this provides an opportunity to ensure that event organizers approach

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<sup>1</sup> Stantec, Open Space Recycling Better Practices Review, 2009.

<sup>2</sup> [http://cbcra-acrcb.org/RecycleEverywhere/pdf/recycle\\_everywhere\\_pr\\_oct22\\_2010.pdf](http://cbcra-acrcb.org/RecycleEverywhere/pdf/recycle_everywhere_pr_oct22_2010.pdf)



waste management in a fashion consistent with the municipal waste management program. Permitting could require that recycling is mandated but should be supported with promotional and educational materials designed for event planners and facility users. Various mechanisms for collection could be explored and employed but in all cases weights of material diverted should be recorded.

Special events recycling is generally only feasible if there is a high involvement of volunteers, attending diversion stations, informing attendees of the correct sorting methods and removing and often sorting materials to remove any contaminants.

This, like open space recycling, is recommended in the long term as a means to fine tune the City's recycling programs.

### **3.3.4 Disposal Ban**

A disposal 'ban' consists of prohibiting the disposal of designated materials at the point of disposal (i.e., at the Landfill) by the residential and IC&I sectors that haul materials directly to the landfill. Loads of material would be inspected before being dropped off at the landfill and loads exceeding permitted levels of banned material would be rejected or subject to a surcharge. The surcharge should be a prohibitive fee for loads with greater than a certain determined but practical percentage of a banned material. Potential mandatory materials for recycling applicable in Camrose could include concrete, drywall, shingles, organics, wood, cardboard, and other materials. Disposal bans would be put in effect for materials for which mature diversion options are in place.

There are a number of advantages associated with establishing a 'ban', including:

- Many waste materials have a good potential to be diverted from landfill disposal and the ban would help promote diversion.
- The operating life for existing landfill capacity would be extended.
- Natural resource consumption would be reduced through the reuse and recycling of a greater portion of the waste stream.

However, there are also several disadvantages which must also be taken into account:

- A ban would require the development of practical and cost-effective means for generators to divert the targeted materials as well as policies for managing non-compliance.
- Enforcing a mandatory ban could be somewhat controversial, can be staff intensive in order to police and it also potentially creates conflict between the City and facility users.

To some extent this can be managed with mechanisms like exemptions for small loads, a grace period and other options such as staging from a differential tipping fee approach to a full ban but

in the use of material bans is not recommended for the City in the short to mid term. It should only be evaluated in the long term once waste diversion programs and associated infrastructure is in place.

### **3.3.5 IC&I Sector Roundtable & Partnerships**

One method of engaging the IC&I sector would be through regular round-table discussions facilitated by the City with sector-specific representatives to discuss/resolve common waste challenges and identify areas for improvement/expansion. The City could obtain information on those issues which prevent or hinder this sector from fully participating in waste diversion programs (time, cost, contamination, lack of markets, lack of convenience, lack of information etc.). A P&E program should be developed to cater to both the residential and the IC&I sector and as part of a broader comprehensive communication plan discussed in Section 3.1.2.

The City should facilitate regular round-table discussions amongst specific sector representatives to discuss/resolve common waste reduction challenges (e.g. school boards, government, retailers, hospitals, waste haulers, and recyclers). Such discussions would promote the exchange of successful waste diversion ideas, processing options, and lessons learned.

These discussions could lead to the identification of new diversion and market development opportunities and best practices which would further encourage waste reduction and diversion within the IC&I sector. Sharing best practices between industry group members is expected to lead to some additional diversion. Members of this round-table could also get involved with the Recycling Council of Alberta's Industrial, Commercial and Institutional Committee<sup>3</sup> whose mandate is to "encourage and assist the IC&I and C&D sectors to responsibly manage their waste stream, assume stewardship, increase recycled content and conserve resources." This would also provide opportunities for the City to continue to advocate for and promote stewardship programs.

Various partnerships could evolve from these roundtable discussions with strategic sector groups toward the establishment of end markets, supporting infrastructure requirements, P&E initiatives and others. Research partnerships could also evolve with some including the University of Alberta (Augustana College), NorQuest, and perhaps the City of Edmonton to investigate different methods to re-use different materials, find new diversion opportunities and establish end markets for harder to recycle materials.

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<sup>3</sup> <http://www.recycle.ab.ca/IC&I>

## 4.0 Cost & Financing Strategy

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The City's current operating and capital budgets with respect to various waste collection and processing programs are detailed in **Appendix B**. The focus of this section is the impact to those existing operating and capital budgets as a function of implementing the preferred waste management system described in Section 3.0. A brief description of the City's existing financing strategy is discussed below. Not all programs described above are discussed specifically in this section in that a number of them are a function of increased staffing and promotional and educational activity. Those costs are captured here. Order of magnitude operating and capital costs associated with major components of the preferred system are discussed along with major assumptions associated with those estimates. The impact of new system components on the existing system is discussed in Section 4.3.

There are three fundamental issues that affect the City's ability to implement the preferred system; the 'willingness to pay' for the system and perhaps 'willingness to pay' for only some components of the system by City residents; 'how' the system gets paid for (to whatever extent it is implemented) that is, what combination of mechanisms are employed; and 'who' pays for what components of the system. These matters are discussed herein.

### 4.1 CURRENT COSTS AND FINANCING STRATEGY FOR WASTE MANAGEMENT SYSTEM

The current waste management system is treated as a utility and funded by user fees charged on utility bills. No tax revenue subsidizes these programs. Other sources of revenue are tipping fees at the Regional Sanitary Landfill, very minor revenue from the bag-tag program and revenue from the sale of recyclable material (The City receives 85% of the revenue as part of a revenue sharing agreement with Centra Cam).

The recycling depot provides service to City and non-city residents; however, all operating funding is collected from City residents as a part of the monthly utility charge. The City is in ongoing discussions with the County regarding the possible co-funding of this facility through a formal agreement, although to-date, the County has only participated in funding this facility on a year-to-year<sup>4</sup> basis (approximately 15% of depot users do not reside in the City). Based on budget information provided by the City, the County contributed \$44,000 in 2010 and 2011.

All operating and capital costs for the landfill are recovered through tipping fees. Each year, funds are reserved for future costs associated with the closure of the current landfill site. These rehabilitation costs are reviewed on a regular basis to ensure reserves are adequately funded<sup>5</sup>.

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<sup>4</sup> City of Camrose Preliminary Operating Budget, page 94

<sup>5</sup> City of Camrose Preliminary Operating Budget, page 91

All residential properties receiving waste collection services are charged four fixed monthly fees. The fees are charged each month, whether or not the service is used in any particular month. These include:

- Residential Waste Collection Fee - the contract fee charged by the current service provider. The City periodically tenders this service in order to receive the best service is provided for the most economical price. The 2011 fee was \$5.84/month.
- Residential Waste Disposal Fee - covers the cost of disposing the waste in the Camrose Regional Sanitary Landfill. The 2011 fee was \$3.42/month.
- Compostable Materials Collection Fee - covers residential collection of compostable materials for single family, duplex, and fourplex dwellings that already use City waste collection services. The 2011 fee was \$3.66/month.
- Recycling Fee - used to operate the recycling depot and other recycling programs such as glass, plastic and e-waste recycling, and the Back Yard Composter education program. The 2011 fee was \$4.25/month.

The combined total for these programs in 2011 was \$17.17/month. Residents are also able to purchase tags for additional bags of garbage for curbside collection beyond the three bag limit. A solid waste collection tag costs \$5.00/tag.

## **4.2 COSTS AND FINANCING STRATEGY TO IMPLEMENT PREFERRED WASTE MANAGEMENT SYSTEM**

In order to determine the potential operating and capital costs associated with the preferred waste management system Stantec used a range of cost information derived from existing sources including current equipment manufacturers for some facilities, recent procurement processes either where Stantec was engaged or with recently published results, costs developed for other projects by Stantec team members and/or studies undertaken by others. These costs were, where appropriate, adjusted to reflect the size and scale of any new infrastructure for the preferred waste management system.

The system cost analysis is presented in **Table 4.1** on an annual cash flow basis for the first 10 years of the planning period, reflecting annual capital and operating budget requirements and revenues. The cost analysis in **Table 4.1** reflects various cost recovery mechanisms that incorporate existing recovery mechanisms in the form of tipping fees and monthly utility rate charges. It also includes revenues through the sale of recyclable commodities and incentives/disincentives in the form of differential tipping fees mechanisms. It does not account for increased revenue from decreased bag limits at the curb as it is not deemed significant given previous revenue generation from this program. Others as described are deemed appropriate given the existing system and the outcomes of consultation with respect to the preferred system configuration. **Table 4.1** reflects a continued 'flat rate' utility based system.

While some portion of the preferred system could be funded through a levy/tax-based program no consideration has been given to this as the current system works well for the City.

It is important to point out that **Table 4.1** reflects the impact to the existing system from an 'additive' standpoint, that is additional cost and additional revenue, it does not incorporate existing system costs just 'changes' to existing system costs. In most cases, costs increase but in some cases they decrease as shown. Combined existing with preferred system characteristics are discussed in Section 4.3.

The following discusses the logic for determination of various and estimated capital and operating costs and assumptions associated with major program changes in the system. None of the costs indicated have been escalated for 'cost of living' increases but only escalated to reflect changes in population growth and the amount of waste estimated to require management in the various programs over the planning period as applicable.

#### **4.2.1 Administration**

This element of the preferred system is necessary to support successful implementation of the remainder of the system. While staffing requirements are ultimately dependent on the extent to which the City implements the various programs identified the current staffing complement for waste management services is likely insufficient. Staff will be required to coordinate not only ongoing promotion and educational (P&E) activities but various one-time larger scale campaigns that come with some of the major program changes identified. The development of various procurement documents will also be necessary along with related and ongoing contract oversight. Sufficient staffing is necessary for other administrative aspects (e.g. program monitoring and reporting) as well. As such two full-time staff are identified to undertake these activities and identified in **Table 4.1**. While salaries would be fine-tuned in accordance with City hiring policy these costs reflect a reasonable order-of-magnitude starting cost including a benefits ratio of 35%. Costs for other administrative aspects associated with successful long term strategy implementation are also provided and based on known typical costs and industry best-practices.

#### **4.2.2 Resource Recovery Programs**

The operating and capital cost estimates provided are based on reasonable facility life expectancy, reasonable estimated per tonne operating costs for these facilities based on known costs in other jurisdictions and based on typical materials managed. In the case of the CRRC, the costs are based on a composition of materials to include blue box recyclables, brush/wood, leaf and yard waste, drywall, shingles and other construction and demolition waste, tires, scrap metal, furniture, mattresses and other bulky items, textiles and carpeting (a robust program) and garbage. Costs and revenues are further developed to accommodate anticipated tonnage increases (or decreases as appropriate) over time and with program evolution.

\$20,000 was allocated (but would need to be fine-tuned based on site specifics at the landfill) for new signage and any necessary road upgrades to improve access for residents at the site.

This is specifically in concert with a landfill 'rebranding effort'. Costs for operation of a new CRRC were estimated to be in the order of \$100.00/tonne based on other known programs and diversion was estimated to increase in the order of 5% per year with increasing program awareness. The CRRC design is based on a basic modular eight bin configuration plus an estimated 1,000 m<sup>2</sup> pad area, gravel only (no road which would need to be costed separately depending on location on site) and based on a 20 year amortization period at 6%. Revenues were assumed at \$7.00/tonne for material received at the CRRC, again based on other municipal experience for the full 'basket of materials' received as described above. The CRRC was assumed to be unmanned.

A new IC&I/C&D recycling separation area was estimated assuming a 2,000 m<sup>2</sup> receiving and storage area cleared, graded, gravel pad with bunker/retaining walls for segregation of some materials again amortized over 20 years at 6%. Again it was assumed that operating costs would be in the order of \$100/tonne with 1,000 tonnes assumed to be received from those sectors in year one (based on a current and available 16,000 TPY available in the system). A 5% increase in diversion was again estimated based on increased program awareness over time.

Other costs included in resource recovery programs are a reuse centre and based on other municipal experience and a 20 year amortization at 6% for capital costs. No operating budget was developed for this as it may be operated in concert with non-profit organizations and/or at Centra Cam depot as part of a re-purposed depot program in concert with a curbside recycling program. Further the re-purposed depot was included as a line item but not populated as the impact is unknown as it relates to a curbside recycling program and the business case that would be developed by Centra Cam at this time. Further to this, an additional Hazardous Waste Round Up Event was added to the overall system and based on current one-time event costs.

The financing strategy also includes an increase in disposal to landfill costs by a very small \$5/tonne fee in order to create a greater differential between disposal and diversion. This needs further exploration but is based on the fact that the nearest landfill alternative is only 30 minutes away from Camrose. A \$25/tonne differential was assumed necessary to drive greater diversion efforts for IC&I and C&D sectors to a new separation area and those revenues are identified accordingly. Tipping fees for disposal in the area are generally low compared to any other jurisdiction in Canada. This makes it more difficult (than for others) to create a differential in tipping fees for the purpose of driving greater diversion. Notwithstanding diversion increases in this sector the funding strategy shows increased tipping fees over time for disposal because of anticipated growth.



TABLE 4.1  
SUMMARY OF OPERATING COSTS

| Summary of Operating Cost Projections - Recommended Waste Management System              |                 |                   |                    |                    |                    |                    |                    |                    |                    |                    |
|------------------------------------------------------------------------------------------|-----------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| all estimates in 2012 Dollars                                                            | Year 1          | Year 2            | Year 3             | Year 4             | Year 5             | Year 6             | Year 7             | Year 8             | Year 9             | Year 10            |
| <u>Program Component</u>                                                                 | 2013            | 2014              | 2015               | 2016               | 2017               | 2018               | 2019               | 2020               | 2021               | 2022               |
| <b>Administrative and Operational Support</b>                                            |                 |                   |                    |                    |                    |                    |                    |                    |                    |                    |
| New Staffing Support - Promotion & Education/Waste Reduction Initiatives                 | \$67,500        | \$67,500          | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           |
| New Staffing Support - Contract Oversight                                                |                 | \$67,500          | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           | \$67,500           |
| Direct Promotion & Education Program Costs (assume \$1.00 per HHLD up from 2011 of 0.38) | \$10,754        | \$10,754          | \$10,754           | \$10,754           | \$10,754           | \$10,754           | \$10,754           | \$10,754           | \$10,754           | \$10,754           |
| Comprehensive Communications Plan                                                        |                 | \$25,000          |                    |                    |                    |                    |                    |                    |                    |                    |
| Waste Management Master Plan Updates                                                     |                 |                   |                    |                    | \$75,000           |                    |                    |                    |                    | \$75,000           |
| Waste Audits                                                                             |                 |                   |                    | \$30,000           |                    |                    |                    |                    | \$30,000           |                    |
| <i>sub-total</i>                                                                         | <b>\$78,254</b> | <b>\$170,754</b>  | <b>\$145,754</b>   | <b>\$175,754</b>   | <b>\$220,754</b>   | <b>\$145,754</b>   | <b>\$145,754</b>   | <b>\$145,754</b>   | <b>\$175,754</b>   | <b>\$220,754</b>   |
| <b>Resource Recovery</b>                                                                 |                 |                   |                    |                    |                    |                    |                    |                    |                    |                    |
| Landfill Repurposing/Rebranding                                                          |                 | \$20,000          |                    |                    |                    |                    |                    |                    |                    |                    |
| CRRC Operations                                                                          |                 |                   |                    | \$27,200           | \$28,560           | \$29,920           | \$31,280           | \$32,640           | \$34,000           | \$35,360           |
| Enhanced Depot Operations (Centra Cam)                                                   |                 |                   |                    |                    |                    |                    |                    |                    |                    |                    |
| Enhanced IC&I/C&D Recycling Facilities Operation                                         |                 |                   |                    | \$100,000          | \$105,000          | \$110,250          | \$115,763          | \$121,551          | \$127,628          | \$134,010          |
| Amortized Capital Cost for CRRCs                                                         |                 |                   |                    | \$47,570           | \$47,570           | \$47,570           | \$47,570           | \$47,570           | \$47,570           | \$47,570           |
| Amortized Capital Costs for IC&I/C&D                                                     |                 |                   | \$14,000           | \$14,000           | \$14,000           | \$14,000           | \$14,000           | \$14,000           | \$14,000           | \$14,000           |
| Hazardous Waste Round Up Additional Annual Event                                         |                 | \$13,188          | \$13,188           | \$13,188           | \$13,188           | \$13,188           | \$13,188           | \$13,188           | \$13,188           | \$13,188           |
| Reuse Centre                                                                             |                 |                   | \$10,462           | \$10,462           | \$10,462           | \$10,462           | \$10,462           | \$10,462           | \$10,462           | \$10,462           |
| Differential Tipping Fees                                                                |                 | (\$80,000)        | (\$82,496)         | (\$85,070)         | (\$87,724)         | (\$90,461)         | (\$93,283)         | (\$96,194)         | (\$99,195)         | (\$102,290)        |
| Charge for IC&I Recycling Facilities                                                     |                 |                   |                    | (15,000)           | (15,750)           | (16,538)           | (17,364)           | (18,233)           | (19,144)           | (20,101)           |
| Revenues from Sale of Materials from Depots/CRRC                                         |                 |                   |                    | (\$1,904.00)       | (\$1,999.20)       | (\$2,094.40)       | (\$2,189.60)       | (\$2,284.80)       | (\$2,380.00)       | (\$2,475.20)       |
| <i>sub-total</i>                                                                         | <b>\$0</b>      | <b>(\$66,812)</b> | <b>(\$44,846)</b>  | <b>\$127,350</b>   | <b>\$131,056</b>   | <b>\$134,929</b>   | <b>\$138,979</b>   | <b>\$143,217</b>   | <b>\$147,653</b>   | <b>\$152,300</b>   |
| <b>Recycling Single Family</b>                                                           |                 |                   |                    |                    |                    |                    |                    |                    |                    |                    |
| Blue Box Collection (weekly single family homes)                                         |                 |                   | \$721,250          | \$739,281.25       | \$757,763.28       | \$776,707.36       | \$796,125.05       | \$816,028.17       | \$836,428.88       | \$857,339.60       |
| Annual Cost for Large Blue Boxes (1 per household)                                       |                 |                   | \$46,160           | \$1,154            | \$1,154            | \$1,154            | \$1,154            | \$1,154            | \$1,154            | \$1,154            |
| Processing Costs at MRF                                                                  |                 |                   | \$250,000          | \$256,250          | \$262,656          | \$269,223          | \$275,953          | \$282,852          | \$289,923          | \$297,171          |
| Revenues (sale of recyclables, at conservative \$80.00 per tonne basket of goods)        |                 |                   | (\$96,000)         | (\$98,400)         | (\$100,860)        | (\$103,382)        | (\$105,966)        | (\$108,615)        | (\$111,331)        | (\$114,114)        |
| Direct Haul to Processor (1.5 hours one way @ \$125/hour at 4.5 tonne per load)          |                 |                   | \$208,333          | \$213,541.67       | \$218,880.21       | \$224,352.21       | \$229,961.02       | \$235,710.04       | \$241,602.80       | \$247,642.87       |
| <i>sub-total</i>                                                                         |                 |                   | <b>\$1,129,743</b> | <b>\$1,111,827</b> | <b>\$1,139,594</b> | <b>\$1,168,055</b> | <b>\$1,197,227</b> | <b>\$1,227,129</b> | <b>\$1,257,778</b> | <b>\$1,289,194</b> |
| <b>Recycling Multi Family</b>                                                            |                 |                   |                    |                    |                    |                    |                    |                    |                    |                    |
| Blue Cart Collection (weekly)                                                            |                 |                   |                    |                    |                    | \$227,897          | \$233,594          | \$239,434          | \$245,420          | \$251,556          |
| Annual Cost for Blue Carts (assume 360L at \$60/cart)                                    |                 |                   |                    |                    |                    | \$14,100           | \$353              | \$353              | \$353              | \$353              |
| Processing Costs at MRF                                                                  |                 |                   |                    |                    |                    | \$53,845           | \$55,191           | \$56,570           | \$57,985           | \$59,434           |
| Revenues (sale of recyclables, at conservative \$80.00 per tonne basket of goods)        |                 |                   |                    |                    |                    | (\$43,076)         | (\$44,153)         | (\$45,257)         | (\$46,388)         | (\$47,548)         |
| Direct Haul to Processor (1.5 hours one way @ \$125/hour at 4.5 tonne per load)          |                 |                   |                    |                    |                    | \$44,870           | \$45,992           | \$47,142           | \$48,321           | \$49,529           |
| <i>sub-total</i>                                                                         | <b>\$0</b>      | <b>\$0</b>        | <b>\$0</b>         | <b>\$0</b>         | <b>\$0</b>         | <b>\$297,636</b>   | <b>\$290,977</b>   | <b>\$298,243</b>   | <b>\$305,690</b>   | <b>\$313,324</b>   |
| <b>Enhanced Organics Diversion Single Family</b>                                         |                 |                   |                    |                    |                    |                    |                    |                    |                    |                    |
| SSO Processing Operations                                                                |                 |                   |                    |                    | \$187,500          | \$192,187.50       | \$196,992.19       | \$201,916.99       | \$206,964.92       | \$212,139.04       |
| SSO Collection (to all year round)                                                       |                 |                   |                    |                    | \$48,000           | \$48,000           | \$48,000           | \$48,000           | \$48,000           | \$48,000           |
| Annual Cost for Green Bin Containers                                                     |                 |                   |                    |                    | \$128,373.44       | \$3,209.34         | \$3,209.34         | \$3,209.34         | \$3,209.34         | \$3,209.34         |
| Amortized cost of upgraded composting facility                                           |                 |                   |                    |                    | \$61,700           | \$61,700           | \$61,700           | \$61,700           | \$61,700           | \$61,700           |
| <i>sub-total</i>                                                                         | <b>\$0</b>      | <b>\$0</b>        | <b>\$0</b>         | <b>\$0</b>         | <b>\$425,573</b>   | <b>\$305,097</b>   | <b>\$309,902</b>   | <b>\$314,826</b>   | <b>\$319,874</b>   | <b>\$325,048</b>   |

TABLE 4.1  
SUMMARY OF OPERATING COSTS

|                                                                          |             |             |             |             |             |             |             |             |             |             |
|--------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Enhanced Organics Diversion Multi-Family                                 |             |             |             |             |             |             |             |             |             |             |
| SSO Processing Operations                                                |             |             |             |             |             |             | \$30,000    | \$30,750.00 | \$31,518.75 | \$32,306.72 |
| SSO Collection Year Round (weekly)                                       |             |             |             |             |             |             | \$85,830    | \$85,830    | \$85,830    | \$85,830    |
| Annual Cost for Green Carts (240L)                                       |             |             |             |             |             |             | \$11,800    | \$295.00    | \$295       | \$295       |
| sub-total                                                                | \$0         | \$0         | \$0         | \$0         | \$0         | \$0         | \$127,630   | \$116,875   | \$117,644   | \$118,432   |
| Garbage Collection                                                       |             |             |             |             |             |             |             |             |             |             |
| Collection (transition to bi-weekly garbage collection compared to 2011) |             |             |             |             | (\$200,000) | (\$200,000) | (\$200,000) | (\$200,000) | (\$200,000) | (\$200,000) |
| sub-total                                                                | \$0         | \$0         | \$0         | \$0         | (\$200,000) | (\$200,000) | (\$200,000) | (\$200,000) | (\$200,000) | (\$200,000) |
|                                                                          |             |             |             |             |             |             |             |             |             |             |
| Total Net Change in Program Costs                                        | \$78,254    | \$103,942   | \$1,230,651 | \$1,414,931 | \$1,716,977 | \$1,851,470 | \$2,010,469 | \$2,046,044 | \$2,124,394 | \$2,219,051 |
| Total Change per Single Family HHLD                                      | \$13.57     | \$17.58     | \$203.11    | \$227.83    | \$269.72    | \$283.76    | \$300.61    | \$298.47    | \$302.34    | \$308.11    |
| Total Change per Residential HHLD (single and multi-family)              | \$9.98      | \$13.26     | \$153.19    | \$171.83    | \$203.43    | \$214.01    | \$226.72    | \$225.11    | \$228.02    | \$232.38    |
| Proposed Flat Rate per SFD Per Month                                     | \$20        | \$21        | \$22        | \$24        | \$25        | \$26        | \$26        | \$26        | \$26        | \$26        |
| Annual Revenues                                                          | \$1,384,080 | \$1,489,616 | \$1,599,564 | \$1,788,603 | \$1,909,707 | \$2,035,747 | \$2,086,641 | \$2,138,807 | \$2,192,277 | \$2,247,084 |
| Surplus over Requirements (Contributions to Reserves)                    | \$1,306,000 | \$1,386,000 | \$369,000   | \$374,000   | \$193,000   | \$184,000   | \$76,000    | \$93,000    | \$68,000    | \$28,000    |
| Reserve fund Income (assumes 1% interest on balance)                     | \$0         | \$13,000    | \$27,000    | \$31,000    | \$35,000    | \$37,000    | \$40,000    | \$41,000    | \$42,000    | \$43,000    |
| Reserve Fund Balance at Year-end                                         | \$1,306,000 | \$2,705,000 | \$3,101,000 | \$3,506,000 | \$3,734,000 | \$3,955,000 | \$4,071,000 | \$4,205,000 | \$4,315,000 | \$4,386,000 |
| Proposed Flat Rate per All Residential Units Per Month                   | \$14        | \$15        | \$16        | \$17        | \$20        | \$20        | \$20        | \$20        | \$20        | \$20        |
| Annual Revenues                                                          | \$1,253,280 | \$1,376,370 | \$1,504,831 | \$1,638,855 | \$1,976,267 | \$2,025,673 | \$2,076,315 | \$2,128,223 | \$2,181,429 | \$2,235,964 |
| Surplus over Requirements (Contributions to Reserves)                    | \$1,175,000 | \$1,272,000 | \$274,000   | \$224,000   | \$259,000   | \$174,000   | \$66,000    | \$82,000    | \$57,000    | \$17,000    |
| Reserve fund Income (assumes 1% interest on balance)                     | \$0         | \$12,000    | \$25,000    | \$28,000    | \$30,000    | \$33,000    | \$35,000    | \$36,000    | \$37,000    | \$38,000    |
| Reserve Fund Balance at Year-end                                         | \$1,175,000 | \$2,459,000 | \$2,758,000 | \$3,010,000 | \$3,299,000 | \$3,506,000 | \$3,607,000 | \$3,725,000 | \$3,819,000 | \$3,874,000 |

Savings from closure of residential tipping face not yet included

HHLD - household

SSO - source separated organics

#### 4.2.3 Curbside Recycling in the Single-Family Sector

Cost estimates were developed for the City to undertake a curbside recyclables collection and processing program. The cost of collection was estimated based on the number of households to be collected and using a cost of \$125 per HHLD based on the real costs for other municipal blue box collection programs across Canada. Costs were escalated with anticipated housing growth over the ten (10) year operating period. It was assumed that the City would provide one large blue box per household (average cost of \$8 per box) to support a single-stream recycling program and boxes would continue to be provided to new homes throughout the planning period. Processing costs were determined based on predicted tonnes to be managed over time and based on a processing fee of \$100/tonne. That fee was estimated based on other municipal processing costs across Canada but also based on discussion with operators at both Edmonton and Red Deer processing facilities who have capacity to take the City's recyclable materials.

Revenues were estimated at a conservative \$80/tonne basket value for all commodities and based on estimated tonnes to be processed (**Appendix B**) above what is currently received at Centra Cam (to reflect a difference in revenue from the current program). Centra Cam will continue to receive these materials from the County, small business and multi-family sources so that was accounted for in the calculations (e.g. 1,000 tonnes per year of cardboard revenue was assumed to remain with Centra Cam from commercial and other sources).

As it is unknown where the City's recyclable materials might ultimately be processed it is not clear whether the City might have to bear the cost of a new transfer facility. It may be feasible (in the cases where processing occurs in either Red Deer or Edmonton) that single-stream recyclables could be delivered directly from the curb. It is probable that the City's materials would be processed at one of these facilities given Stantec's preliminary discussion with the operators. As such, a transfer system has not been included in the financial analysis however the cost of direct haul (assuming use of dedicated trucks not co-collection vehicles) has been included based on estimated number of tonnes and loads per year. The calculations assume 4.5 tonnes per load, a three hour turnaround time and \$125/hour hauling fee.

#### 4.2.4 Curbside Recycling in the Multi-Family Sector

Cost estimates for this program were based on the same baseline costs and principles as used to calculate costs for single-family recycling. Exceptions include the costing for larger carts assumed for collection (e.g. in some cases centralized storage of carts) and the capture rates for recycling were assumed to be lower on a per household basis than for the single-family sector as this is typically the case for municipal recycling programs (e.g. per household generation rates are predicted to be in the order of 435 kg/HHLD/year for the single family sector by the time the program starts but a more conservative 295/kg/HHLD/year was used for the multi-family sector).

#### **4.2.5 Enhanced Organics Diversion in the Single-Family Sector**

An enhanced organics program requiring improved composting infrastructure with added material types (e.g. meat, dairy etc.) was estimated based on the use of a GORE® cover system and estimated by the manufacturer plus added costs associated with a pad area in the order of \$600,000 and amortized over fifteen years at 6%. This system was estimated to accommodate approximately 5,000 TPY and could receive organics from single-family, multi-family and portions of the IC&I sector. The added cost to collect organics on a weekly basis was determined by pro-rating existing collection costs over additional weeks throughout the winter months. This would permit maximum capture rates. A number of operating costs were reviewed for other municipalities for a range of material types (leaf and yard waste to a full suite of organic wastes), a range of tonnages and a range of more to less complex technology applications. It was determined that \$75.00/tonne for processing was likely order of magnitude of what it would cost to operate a GORE® cover system. Green bin costs were taken from other known municipal costs as well as recent manufacturer's quotations.

#### **4.2.6 Enhanced Organics Diversion in the Multi-Family Sector**

No cost was allocated to the multi-family sector for the already built enhanced composting facility but other assumptions used to calculate single-family sector costs were the same for this sector. In this case, organic material capture rates were assumed to be the same for the single-family sector as for some municipalities' organics generation rates are actually higher in the multi-residential sector depending on demographics. 240 L carts were assumed and priced based on manufacturer's quotations and the unit cost for collection (per stop) was assessed at the same for the single-family sector.

#### **4.2.7 Garbage Collection**

If a full scale organics and curbside recycling collection program is implemented the City can reasonably reduce the garbage collection cycle by half. While not exactly one-half the cost that was assumed for the purpose of assessment here and based on existing garbage collection costs.

### 4.3 CURRENT SYSTEM VERSUS PREFERRED SYSTEM COSTS AND FINANCING

Table 4.2 generally discusses impacts to existing system costs with implementation of the preferred waste management system.

**Table 4.2**  
**General Potential Impacts to Current Program Costs**

| <b>Current Program</b>                      | <b>Current Cost/Month (2011)</b> | <b>Potential Impact</b>                                                                                        |
|---------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>Residential Waste Collection Fee</b>     | \$5.84                           | May be reduced by approximately one-half with bi-weekly collection                                             |
| <b>Residential Waste Disposal Fee</b>       | \$3.42                           | Fee required to support landfill operations                                                                    |
| <b>Compostable Materials Collection Fee</b> | \$3.66                           | May be increased with weekly winter collection                                                                 |
| <b>Recycling Fee</b>                        | \$4.25                           | Base service may remain unchanged with new services at Centra Cam (additional recyclable materials management) |
| <b>Total</b>                                | <b>\$17.17</b>                   |                                                                                                                |

In order for the City to gain an order of magnitude understanding of the costs association with system change, the following Table 4.3 provides various broad system implementation scenarios. These are to be considered in the range of +/- 20% accuracy in most cases but are useful to put various program changes in context for any future community consultation efforts. Costs are discussed in the context of flat rate/utility based cost impacts on a per household basis and the difference between allocating costs over the single-family versus both the single and multi-family sectors are shown. These costs as shown may enable the City to better understand the 'willingness to pay' for the whole system as recommended versus system components.

**Table 4.3**  
**Program Scenarios and Associated Flat Rate Cost Impacts**

| <b>Program Scenario</b>                                                                           | <b>Discussion</b>                                                                                                                                                                                                                                                                                      | <b>Potential Impact</b>                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Entire Waste Management Master Plan Implementation</b>                                         | Implement all programs with identified phasing.                                                                                                                                                                                                                                                        | Flat Rate Single Family Only = <b>\$19/month Year 1 and \$26/month Year 10</b><br>Flat Rate Single and Multi- Family Units = <b>\$14/month Year 1 and \$20/month Year 10</b>            |
| <b>Curbside Blue Box Collection and Processing Only – No Other Programs and Revenues</b>          | Implement a blue box collection and processing program for both single family and multi-family sectors as well as increased promotional and educational activity only – <u><b>maintain same level of service for garbage collection</b></u>                                                            | Flat Rate Single Family Only = <b>\$14/month Year 1 and \$19/month Year 10</b><br>Flat Rate Single and Multi- Family Units = <b>\$11/month Year 1 and \$15/month Year 10</b>            |
| <b>Curbside Blue Box Collection and Processing Only – No Other Programs and Revenues</b>          | Implement a blue box collection and processing program for both single family and multi-family sectors as well as increased promotional and educational activity only – <u><b>reduce level of service for garbage collection to bi-weekly</b></u>                                                      | Flat Rate Single Family Only = <b>\$12.50/month Year 1 and \$17.50/month Year 10</b><br>Flat Rate Single and Multi- Family Units = <b>\$9.50/month Year 1 and \$13.50/month Year 10</b> |
| <b>Enhanced Organic Waste Infrastructure and Collection Only – No Other Programs and Revenues</b> | Implement improved organic waste infrastructure and the landfill with increased collection to support added organic materials capture and commercial source materials as well as increased promotional and educational activity - <u><b>maintain same level of service for garbage collection.</b></u> | Flat Rate Single Family Only = <b>\$3.20/month Year 1 and \$6.00/month Year 10</b><br>Flat Rate Single and Multi- Family Units = <b>\$2.50/month Year 1 and \$5.00/month Year 10</b>    |

Other order of magnitude costs for other system components e.g. administration and various other resource recovery options can be interpreted from Table 4.1 as can the impact of reduced revenue from those projected sources (tipping fees, sale of commodities).



## 5.0 Implementation Timeline & Contingencies

---

The schedule shown in Figure 5.1 provides a summary of all programs described and recommended in Section 3.0. From an implementation timing standpoint, these various programs are shown in each of the short, mid and longer term and that reflect priorities determined through consultation but also 'staged' implementation of programs so that they may be reasonably implemented given required staff and budget resources. A number of these programs are inter-connected and so appropriate 'staging' is also shown (e.g. bi-weekly collection of garbage only after the implementation of an enhanced organic waste collection and processing system). There are also a number of initiatives shown repeatedly throughout the planning period as appropriate (e.g. WMMP review).

There are no major potential risks to the City with respect to implementation of the preferred waste management system that were identified during the course of development of this WMMP. Potential risks that are sometimes identified in these planning processes may include delays in siting and/or approvals processes with respect to new waste management infrastructure, and sometimes predicted poor outcomes (e.g. lack of bidders, out-of-range pricing) from certain procurement processes. The City has existing Centra Cam depot recycling infrastructure that can reasonably continue operation until such time as the City may elect to implement a curbside collection program and haul materials to a more distant Materials Recovery Facility (MRF). The City also has several years of remaining landfill capacity and/or can construct new capacity to address its disposal needs. Notwithstanding the City's goal of preserving landfill capacity, a lack of existing disposal capacity is not a driver for the City to force implementation of various programs e.g. on a 'sooner than later' basis. The City can further extend/alter its current collection contract to address both its short term and longer term implementation needs.

It is further unlikely that the City will not be able to solicit competitive bids for any competitive process it seeks to undertake (collections, recyclable materials processing, construction of new diversion facilities, enhanced composting facilities, etc.). The City also owns its landfill site which is large enough to accommodate much of the infrastructure recommended in this WMMP so siting is not a significant issue. It is also very unlikely that the City would require any contingency capacity (e.g. a backup MRF for recyclable materials) as those MRF's that are geographically proximal have remaining capacity and are committed to continued operations for the processing of recyclables for other major municipalities. All of these factors suggest the City, can in effect, move at its own pace with respect to implementation of the various recommendations in this WMMP.

### Figure 5.1: Implementation Schedule

[illegible]

### Figure 5.1: Implementation Schedule

[illegible]

## 6.0 Monitoring, Reporting & Plan Review

The monitoring of system performance is an important aspect of ensuring the proper functioning of the overall waste management system and ensuring WMMP goals are achieved. There are a number of indicators that can be measured and tracked over the short, mid and long term as presented below.

**Table 6.1**  
**Monitoring Indicators**

| Broad Program Area                                        | Measurable Indicators                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RESIDENTIAL PROGRAMS</b>                               |                                                                                                                                                                                                                                                                                |
| Promotion and Education and Social Marketing              | <ul style="list-style-type: none"> <li>Spending per household on P&amp;E related activities.</li> </ul>                                                                                                                                                                        |
| Re-use Initiatives                                        | <ul style="list-style-type: none"> <li>Number of visitors to website.</li> <li>Number of Giveaway Weekends and approximate number of participants.</li> <li>Donations (number, type, approximate value, etc.) of reusable materials at the CRCs.</li> </ul>                    |
| Establish a per Capita Residential Waste Reduction Target | <ul style="list-style-type: none"> <li>Per capita waste generation based on annual tonnes and estimated population</li> <li>Per capita waste generation based on annual audits and waste generation rates</li> </ul>                                                           |
| Recycling Depot                                           | <ul style="list-style-type: none"> <li>Quantity and type of materials received and managed at the Recycling Depot.</li> </ul>                                                                                                                                                  |
| Private Sector Initiatives                                | <ul style="list-style-type: none"> <li>Number of companies with diversion initiatives and approximately quantity of waste diverted.</li> </ul>                                                                                                                                 |
| Curbside Recycling Collection                             | <ul style="list-style-type: none"> <li>Capture rate for recyclables before and after change to curbside collection. Best measured through curbside waste audit. Can also be estimated based on reported tonnage received for processing.</li> <li>Marketing Revenue</li> </ul> |
| Leaf and Yard Waste Composting                            | <ul style="list-style-type: none"> <li>Number of residential collections per year.</li> <li>Quantity of leaf and yard waste collected and processed.</li> </ul>                                                                                                                |
| Consistent Level of Bulky Waste Collection                | <ul style="list-style-type: none"> <li>Number of items &amp; fees collected.</li> </ul>                                                                                                                                                                                        |
| HHW Management                                            | <ul style="list-style-type: none"> <li>Quantity of HHW collected.</li> </ul>                                                                                                                                                                                                   |
| Disposal Options (Landfill)                               | <ul style="list-style-type: none"> <li>Quantity of residential waste disposed.</li> <li>Quantity of IC&amp;I waste disposed.</li> </ul>                                                                                                                                        |
| Durable (Bulky) Goods Processing                          | <ul style="list-style-type: none"> <li>Increase in diversion of bulky goods.</li> </ul>                                                                                                                                                                                        |
| Recycling in Public Spaces                                | <ul style="list-style-type: none"> <li>Number of public spaces with recycling containers.</li> </ul>                                                                                                                                                                           |
| Special Events Recycling Program                          | <ul style="list-style-type: none"> <li>Number of special events with diversion services.</li> </ul>                                                                                                                                                                            |
| SSO Program / Commercial Food Waste                       | <ul style="list-style-type: none"> <li>Quantity of SSO diverted.</li> <li>Increase in diversion rate.</li> <li>Capture rate for SSO. Best determined through curbside audits.</li> </ul>                                                                                       |

**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN**

Monitoring, Reporting &amp; Plan Review

June 2013

| Broad Program Area                       | Measurable Indicators                                                                                                                                                                                 |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collection System Efficiencies           | <ul style="list-style-type: none"> <li>Collection system statistics (e.g. average collection route size, operating hours per day)</li> <li>Time and motion statistics (e.g. time per stop)</li> </ul> |
| Garbage Restrictions                     | <ul style="list-style-type: none"> <li>Increase in diversion rate.</li> <li>Capture rates for divertible materials. Best determined through curbside audits.</li> </ul>                               |
| Disposal Bans                            | <ul style="list-style-type: none"> <li>Increase in diversion rate for banned materials.</li> </ul>                                                                                                    |
| <b>IC&amp;I AND C&amp;D PROGRAMS</b>     |                                                                                                                                                                                                       |
| Mandatory C&D Diversion                  | <ul style="list-style-type: none"> <li>Increase in diversion rate.</li> </ul>                                                                                                                         |
| IC&I and C&D Materials Depot at Landfill | <ul style="list-style-type: none"> <li>Increase in diversion rate.</li> </ul>                                                                                                                         |
| Differential Tipping Fees                | <ul style="list-style-type: none"> <li>Revenues from tipping fees.</li> <li>Increase in diversion rate.</li> </ul>                                                                                    |
| IC&I Diversion Regulations/Policies      | <ul style="list-style-type: none"> <li>Number of events (meetings, workshops, etc.) staff attended regarding 3Rs regulations.</li> </ul>                                                              |
| Mandatory Diversion Bylaw                | <ul style="list-style-type: none"> <li>Increase in diversion rate.</li> </ul>                                                                                                                         |

Proper monitoring and measuring of waste management system performance serves a number of functions, including the ability to:

- Adhere to currently accepted best practices;
- Identify issues with the system and effectively mitigate these issues;
- Adjust implementation schedules if issues arise;
- Assist in the selection and development of appropriate promotion and education initiatives; and,
- Identify opportunities for cost savings and increased effectiveness of the system.

The monitoring of system performance also helps with several other reporting exercises including:

- Creating a consistent reporting structure which is applicable to the City operations (landfill), the Centra Cam facility and to contract service providers.
- Reporting internally for departments and Council
- Sharing of key performance indicators with stakeholders and the public; and
- Completing Statistics Canada biennial survey(s) or meeting provincial reporting needs/surveys if applicable.

### **6.1.1 Waste Audits**

The City currently has no background audit information, or baseline from which improvements to diversion, capture and participation rates can be measured. Pre-program and post-program change audits allow for the monitoring of program success as well as the identification of various challenges with program implementation. Ideally, a full, four season curbside audit would be conducted prior to the implementation of major program changes and then a year afterward with routine audits occurring over the long term but at less frequent intervals (e.g. at most every five years afterward) but prior to future WMMP updates.

Routine waste audits are a necessary mechanism to gathering key program information:

- Participation and set-out data that can be used to support program decisions;
- Generation rates and capture rates used for planning purposes;
- Information which may be used to target specific education campaigns; and,
- Baseline data to monitor pilot programs and other system changes.

It should be noted that audits are necessary on a more frequent basis where there may be provisions in a blue box processing contract that are performance based, that is, if there is a revenue share for commodities back to the City that requires monitoring. These audits are commonly conducted at the receiving Materials Recovery Facility (MRF) as more frequent and cost-effective audits can be undertaken to verify material composition (and so appropriate apportionment of revenue if applicable).

It is likely the City would require the use of external resources to conduct audits as the City most likely will not have a) staff available, and b) staff trained to conduct waste audits.

### **6.1.2 Reporting**

It is recommended that the results of monitoring initiatives be reported on a regular basis internally within the City and externally to outside stakeholders. Primarily, this would take the form of an annual report on the WMMP. This annual report should provide an overview of the applicable objectives for that year and documentation on how the City reached these goals. It should also include a list of issues that arose during the year and how these issues were mitigated. Finally, the report should include a section regarding the planned WMMP implementation activities for the following year.

In addition to an annual report, the City should also ensure that all waste management related reports produced for Committee and Council, include a section on how the report contents relate to the implementation of the WMMP. This should apply to reports that relate directly and those that relate indirectly to the WMMP. This will assist City staff in adhering to the vision of



the WMMP and also guarantee that all interested parties understand how each waste management activity relates back to the strategic vision for waste management in the City.

This will be particularly critical when key decisions will be required during WMMP implementation. When recommendations are brought back to Council it will be essential to make the connection between the need and the WMMP as it would be previously adopted by Council.

### **6.1.3 Opportunities for Stakeholder Involvement during WMMP Implementation**

Reasonable options to provide opportunities for ongoing citizen feedback regarding the WMMP would include but not be limited to:

- Ensuring that the Annual Report provides a visually interesting and useful overview of the status of the WMMP including progress in achieving diversion targets. The report and key findings should be posted prominently on the City's website, and mechanisms for on-line comment and suggestions can be provided;
- Providing a brief summary of the Annual Report at public venues and sessions that will be taking place in overall support of the WMMP;
- Using various media to highlight the most important achievements in each year; and,
- Identifying key issues that arise, seeking comments and suggestions through personal contact and electronic media.

### **6.1.4 WMMP Review and Update**

It is recommended that City conduct periodic reviews and updates to the WMMP at various times throughout the planning period (2013-2038).

It is recommended that in 2017 or 2018, (around year five of the WMMP and ideally after the curbside audit) and every five years thereafter that the City complete a comprehensive review and update to the recommended WMMP. This review should outline the goals and objectives met in the previous years and also outline issues that arose over that period that may have hindered the implementation of the WMMP. The WMMP document should then be updated to reflect the review completed and provide a detailed implementation timeline for the next five years of the planning period.

As part of the WMMP review, some the key targets that could be adjusted would be:

- a) Per capita waste reduction targets to reflect the trends in waste generation observed through both annual tonnage records and curbside waste audits. They could also be adjusted to reflect Provincial/National trends, new initiatives planned to assist City residents

with waste reduction and reuse, and any reasonably understood trends in packaging such as shifts away from certain packaging approaches.

- b) Waste diversion targets based on program performance in the preceding years and planned diversion initiatives at the City and Provincial levels. Diversion targets will also have to be adjusted to reflect overall trends in material generation, such as a shift away from various types of recyclable packaging materials.

Periodic review of the WMMP will ensure the WMMP stays relevant, is reflective of any changes in provincial or federal regulatory and stewardship initiatives and will guide more specific actions, undertakings for the next five (5) year period and based on previous WMMP successes and challenges.

**APPENDIX A**  
**PHASE 1 CITY OF CAMROSE – WASTE**  
**MANAGEMENT MASTER PLAN: PROJECT**  
**INITIATION REPORT (JULY, 2012)**



**CITY OF CAMROSE**

**WASTE MANAGEMENT MASTER PLAN  
PROJECT INITIATION REPORT**

*Prepared for:*

**City of Camrose**

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July 2012

Project No. 110218706

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## **1.0 Introduction**

---

Stantec was retained by the City of Camrose to develop a Waste Management Master Plan (WMMP). The WMMP will provide strategic direction for residential and industrial, commercial and institutional (IC&I) waste management activities over the next ten (10) years while also providing visionary direction for waste management over the next twenty-five (25) years. The WMMP will focus on waste reduction, reuse and diversion initiatives and will support the City's short-term planning goal of decreasing residential waste entering the landfill by 50% and all waste (including commercial waste) by 36% from 2009 levels by 2015.

As a first step in development of the WMMP Stantec staff met with City of Camrose staff on May 8, 2012 to confirm scope of work/study expectations, to gather details and background information concerning the City's waste management system and to initiate discussion regarding the City's goals and objectives to be achieved as outcomes of the WMMP. Discussion was held with respect to appropriate study areas (e.g. single family, multi-family, commercial sector), appropriate methods for public engagement, potential partnership arrangements (e.g. other municipalities, private sector) as well as various planning issues, drivers, opportunities and constraints specific to the City. This report serves to document the outcome of those discussions and to specifically identify planning parameters and the overarching framework for development of the WMMP.

This framework includes broader waste management planning principles, planning principles that are unique to Camrose, and recognition of key current system constraints, specific key issues and opportunities that require consideration during the course of the planning process. Based on these planning elements and discussion with City staff, a general Vision Statement as well as draft goals and objectives for the plan are identified in this report for review and discussion. This framework is not intended to be static, but rather is expected to evolve over the course of WMMP development to reflect input from staff, City Council, other stakeholders and the public through the public consultation process discussed in Section 12 below.

Further, and based on initial discussions with City staff, review of documentation provided by the City, and Stantec's understanding of provincial policy initiatives and industry recognized best practices in planning, this report also provides a series of evaluation criteria (Section 11) proposed to be utilized to evaluate the City's waste management programming options and to ultimately determine the City's preferred waste management system. As with the rest of the information in this report, these criteria are provided for discussion purposes and may need to be fine-tuned, but inevitably will need to be confirmed to support the next phases of the WMMP.

## **2.0 Overarching Waste Planning Principles**

---

There are a number of overarching planning principles common to many municipal waste management master planning processes that can be set as the foundation for development of the planning document:

### **2.1 PROVINCIAL POLICY**

Alberta's waste strategy is outlined in a document called *Too Good to Waste* issued in October 2007. The strategy indicated a goal to decrease the amount of material sent to landfills from 806 to 500 kg/capita by the year 2010. Three main objectives identified to help achieve this goal were:

1. Albertans take responsibility for resource conservation and waste minimization.
2. Waste management systems are integrated to provide the capacity for processing and/or recovery of materials that would otherwise be disposed of as wastes.
3. Facilities and practices to manage secondary materials and wastes are protective of air, land, water and human health.

The first action in *Too Good To Waste* is a new paint stewardship program that will enable Albertans to recycle used or leftover paint. Other actions include a construction and demolition program and a paper and packaging program, both aimed at significantly reducing the amount of waste sent to municipal landfills.

Information posted on the Alberta Environment and Sustainable Resources Development (AESRD) website in February 2011 indicates that waste diversion rates closely reflect attitudes to waste and recycling. Rates are also related to current economic activity and to available facilities and programs for recycling and recovery. A higher waste diversion rate signals that Albertans want to reduce the impact of waste on the environment. Waste diversion rates are tapering off in Alberta. The Alberta residential sector currently has a waste diversion rate of 29%. This is the fifth highest rate in Canada.

The City has already adopted the objectives of the provincial waste strategy as a planning principle and with the intent to achieve the provincial waste reduction target of 500 kg/capita by 2010.

## 2.2 SUSTAINABILITY

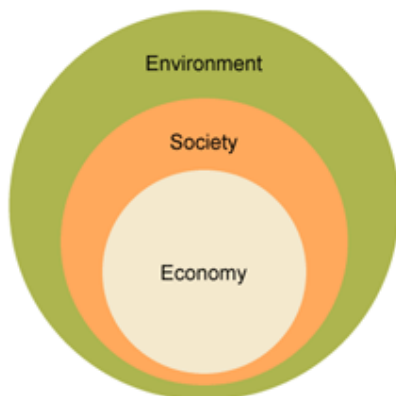
The principle of sustainability, or more appropriately 'sustainable development' is often integrated in some fashion into the general principles applied to waste management planning. The definition of sustainable development that is most commonly used is based on that adopted by the World Commission on Environment and Development (WCED) in 1987, commonly referred to as the Brundtland definition:

*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

Sustainable development generally means ensuring that well-being is at least maintained over time. The principle of fairness within and between present and future generations should be taken into account in the use of environmental, economic, and social resources. Putting these needs into practice requires living within the limits of the natural environment.

There is a strong relationship between meeting human needs now and into the future, and living within the limits of the environment. Figure 2-1 represents society and economic activity, which are constructs of people, at the centre of concern for sustainable development. Both are constrained by the natural systems of the Earth.

**Figure 2-1: The Relationship between the Environment, Society and the Economy**



The generation of waste is generally counterintuitive to the concept of environmental responsibility, which acknowledges the importance of living within the limits of Earth's resources.

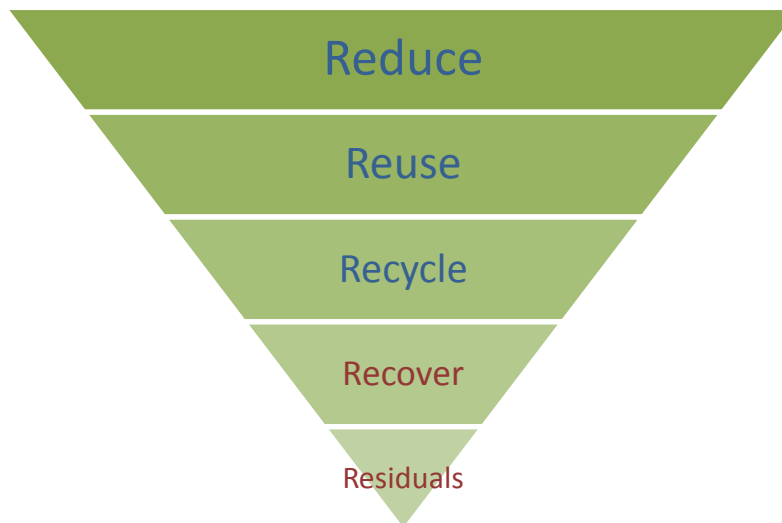
By taking into account the various environmental, economic and social impacts associated with various waste management options, the WMMP can generally address the principle of Sustainable Development.

## **2.3 THE WASTE HIERARCHY**

The 'waste hierarchy' or 'value' chain places priority on preventing waste generation, maximizing diversion of the waste that is generated and minimizing disposal with preference to disposal methods that allow for recovery of energy.

There are many versions of the waste hierarchy in general circulation as set out in governmental and non-governmental policy statements developed for jurisdictions world-wide. Generally, each version presents certain nuances that reflect certain regional or national differences. Put simply, the hierarchy generally appears as set out in Figure 2-2.

**Figure 2-2: The Waste Hierarchy**



The WMMP can be developed in a way that places first priority on preventing the generation of waste and then maximizing waste reduction and diversion efforts to achieve the goal of minimal disposal of remaining residue. City Council has already adopted specific waste reduction targets in support of this premise.

The 'waste hierarchy' concept is also discussed further in Section 5.1 as it relates to the provincial shift toward a focus on waste reduction.

## **2.4 ZERO WASTE**

Just as with sustainability and the waste hierarchy, there are variations in the description as to what zero waste is. Some descriptions of zero waste clearly incorporate the principles of sustainability and the waste hierarchy as described above, and others are primarily focused on the concept of extended producer responsibility and waste avoidance.

The Zero Waste International Alliance defines zero waste as:

*“A goal that is both pragmatic and visionary, to guide people to emulate sustainable natural cycles, where all discarded materials are resources for others to use. Zero waste means designing and managing products and processes to reduce the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing zero waste will eliminate all discharges to land, water and air that may be a threat to planetary, human, animal or plant health.”*

The Federation of Canadian Municipalities defines ‘Zero Waste Communities’ as:

*A community that “has made a long-term commitment to reducing waste through measures such as extended producer responsibility programs, economic instruments to encourage waste reduction, green procurement and product design that includes end-of-life management.”*

Municipalities that have adopted zero waste, such as many communities in British Columbia, have defined the specific behavior shifts that are required for zero waste. For example, the Regional District of Kootenay Boundary has defined the necessary shifts in behavior as follows:

1. It asks consumers, taxpayers and local governments to stop thinking of resources as garbage for which they have to pay to landfill, but to maximize reuse, repair, recycling and composting instead.
2. It asks business to seek out materials efficiencies; redesign products and packaging the community cannot reuse, repair, recycle or compost so that they can be handled that way; and extend their responsibility for the product and its packaging by establishing take-back, reuse and remanufacturing systems.
3. It asks senior levels of government to shift economic incentives for the use of virgin resources to renewable and secondary resources and to facilitate the growth of zero waste initiatives.”

The Alberta Urban Municipalities Association (AUMA) has adopted zero waste as the end goal and philosophy of solid waste management and has based their approach on the definition used by the Zero Waste International Alliance noted above: *Zero waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them.*

All descriptions of the philosophy of zero waste, generally have the following in common:

- a) Recognition of the need to shift to Extended Producer Responsibility (EPR) where the manufacturers of products and packaging become responsible for the full life-cycle of their products.

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- b) Recognition that municipal governments have a role to play, but cannot be wholly responsible for achieving zero waste, given that EPR is largely in the hands of the producers of materials and Federal and/or Provincial regulators.
- c) That the ultimate goal of a zero waste approach is to reduce and eventually eliminate the need for waste disposal. The long-term objective of a zero waste approach is to eliminate reusable materials from the waste stream.
- d) Recognition that both landfills and Waste To Energy (WTE) facilities will continue to play a role in residuals management while zero waste practices work towards decreasing the amount of residuals requiring disposal.

Many zero waste policy documents, take the approach that zero waste is a path or a road, along which society can progress towards a goal of minimizing the waste requiring disposal. Actual progress made along this path by communities that have adopted zero waste has varied, and in many cases the means used to measure progress have also varied.

Numerous jurisdictions have adopted the principle or philosophy of zero waste including but not limited to Edmonton, Calgary, Okotoks, Greater Vancouver, Regional District of Nanaimo, Toronto, the Province of Nova Scotia, Halifax, Seattle, Capital Regional District (Victoria) and Portland, Oregon. Most identify this as a long term objective and some have set specific targets by certain dates that are in the order of 50-60% in the short-term and ranging from 75 to 100% diversion in the longer term. While some municipalities have set a zero waste target there is no specific plan to achieve those targets in some cases.

The City's WMMP process could incorporate the principles of zero waste, as well as the other overarching waste management planning principles discussed above.

### **3.0 Project Specific Planning Principles**

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The following principles will be utilized throughout the planning process:

**Corporate Sustainability Initiatives.** The WMMP will be developed in accordance with the City's goals outlined in the Sustainability Plan to increase recycling education, procurement of recycled/recyclable items and waste diversion in order to ensure that Camrose has accessible and comprehensive recycling options in the long-term. These goals dovetail with the City's strategic priority of being actively green, which will be evidenced by an increase in diversion from landfill and an increase in recycling volumes.

**Corporate Mandate.** The WMMP will be developed in accordance with the City's mandate to provide collection and disposal of solid wastes in an environmentally responsible manner and meet the needs of the citizens in a cost effective manner, with an emphasis on recycling and reuse where feasible.

**Partnership Potential.** To potentially off-set the costs of waste processing and disposal investigation of partnership opportunities with the public and/or private sectors to identify the most cost effective, efficient and environmentally sound scenarios should be considered. This should include the role, if any, that a partnership with another municipality(s) and/or the private sector and various community groups could play in the development of future waste management programs and facilities.

**Financing & Funding.** As a result of budgetary pressures it is imperative that the WMMP identify sustainable long-term options; that is, tipping fees, rates and financing models which will allow the City to maintain a waste management operating budget, not only sufficient enough to provide the level of service demanded by the citizens, but to achieve various waste management objectives and ensure adequate resources e.g. staffing, that will enable the City to meet those demands and targets. Further, it is also ideal to be neutral (or better) from a system capital cost perspective and a review of all available forms of provincial and federal funding for both infrastructure and programming will be identified.

**Project Integration.** Due to the interactive nature of waste management systems, looking at one component in isolation of the others can be counter-productive in that changing one component can affect the efficiency and effectiveness of other parts of the system. These impacts could be in the form of either added opportunities or added constraints (or both) to other parts of that system. This 'bigger picture' approach will enable the City to identify potential program improvements while ensuring that any changes recommended take into account the impacts to the waste management system as a whole. Any potential component that could be included in the short-term or the long-term must be considered from an integrated waste management perspective to ensure that one system or program will not negatively impact another.



**Implementation and Contingency Plan.** In undertaking the study and preparing the Final Waste Management Master Plan (WMMP), it will be necessary to identify implementation challenges and to develop an implementation strategy / budget that will allow the City to overcome any such challenges. The implementation plan will not only identify key timeframes but also contingencies with the identification of potential risks to the implementation plan.

**Monitoring, Reporting & Plan Review.** Previous waste management master planning processes undertaken 10 to 20 years ago often resulted in the development of planning documents that were rarely referred to and that often became obsolete rather quickly within their planning timeframe. Good monitoring and reporting measures are key to ensuring that the WMMP remains relevant to the City. In order to accomplish this, a dedicated review process is required to ensure progress in implementing the WMMP is tracked and success in meeting the goals and objectives is measured. A monitoring and reporting program will be developed as part of the WMMP document.

Fundamentally the WMMP will provide clear mechanisms for the implementation of programs to 2023 as well as a long-term vision to guide the City until 2038. The WMMP will necessarily provide specific waste reduction and diversion targets as well as landfill management strategies directly tied to associated achievable implementation timelines.

## **4.0 Study Area**

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The WMMP as a whole will primarily focus on waste management and diversion for the City of Camrose. It is recognized however that residents within the County of Camrose also use the waste management facilities such as the landfill and recycle depot directly, and because of this various options and opportunities for collaboration between the City and County will be explored. Opportunities for waste reduction and diversion in the IC&I and C&D sectors – two of the largest contributors generally to landfill tonnage - will be also be specifically considered.

Therefore, the area that the plan will cover can be summarized as follows:

- The Study Area for the WMMP will be the City of Camrose. The WMMP will address the waste management requirements of the City, considering the waste generated over which the City has jurisdiction;
- The WMMP will further consider options for those sectors for which the City currently has less control; namely the multi-family and commercial sectors;
- The WMMP will take into consideration options that could be pursued in partnership and/or under agreement with other municipal jurisdictions (e.g. the County) or private sector companies.

## **5.0 Overarching System Constraints And Challenges**

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Preliminary review of system performance indicates the following key areas that reflect the 'problems' associated with the current solid waste management system - in other words the factors that are driving the need to review the County's waste management programs:

- No specific focus on, or broad programming for waste reduction and reuse
- Need to develop additional strategies beyond current programming to increase diversion over the longer term and the need for a feasible and detailed implementation plan to achieve those strategies
- Desire to maximize the use and public regard for existing approved disposal capacity in the regional landfill; this capacity needs to be recognized as a finite resource that has value to the broader community, which is not generally appreciated by local residents

The following sections briefly discuss each of the above noted 'problems' culminating in the development of a 'Problem Statement' that describes the problem that will be addressed through the development and implementation of a preferred WMMP.

### **5.1 FOCUS ON WASTE REDUCTION AND REUSE**

The evolution of waste management regulations and the nature of those regulations have historically focused on the importance of waste diversion (as opposed to waste reduction). Consequently, and with no regulatory or policy directives guiding them, very few municipalities have comprehensive, effective waste reduction practices in place. The Government of Alberta's document "*Too Good To Waste*" now provides a framework for resource conservation and environmental protection, recognizing that a shift must occur away from disposal towards waste reduction and reuse. The government has developed a number of strategies to accomplish the province's 20 year strategic plan. Waste reduction approaches have historically been largely voluntary; however, the provincial government is now considering the following actions to reduce municipal solid waste (MSW) in Alberta:

- Continue provincial public awareness and education on resource conservation and waste reduction
- Develop economic instruments to discourage waste generation and disposal
- Develop disposal bans where necessary to encourage waste reduction initiatives
- Incorporate full cost accounting into waste management policies to ensure that waste generators pay the full cost of waste disposal

These measures, in addition to initiatives such as new and improved Stewardship Programs, policy development, setting recovery targets for specific materials, development of sustainable resource recovery infrastructure, and the revision of existing legislation concerning waste management to focus on achieving outcomes for waste recovery and waste management will all contribute to meeting the goals of the waste strategy.

These initiatives and strategies will ultimately affect the City and its waste management practices. The WMMP will identify various waste reuse and reduction initiatives for consideration so that the City can proactively incorporate such strategies into their waste management system.

## **5.2 ADDITIONAL WASTE DIVERSION STRATEGIES**

The City desires to reduce residential waste by 45% from 2009 levels by 2015 with a target of 195 kg/capita by 2015 through the use of various waste reduction and diversion initiatives. For the purpose of the WMMP, the diversion 'rate' is defined as the proportion of waste managed by the City that is diverted from disposal as compared to the total amount of waste generated in and managed by the City. This diversion includes virtually all residential materials, but only a small portion of wastes generated by the commercial sector that are largely managed by the private sector. Detailed review of the waste system will occur in Phase 2 of the WMMP to confirm the proportion and composition of materials managed by the City and to assess potential waste diversion rates both incrementally (with program implementation) and as a whole (year by year target).

From a waste diversion target setting standpoint many municipalities have set and achieved a diversion target in the order of 50% and this target can be reasonable, in fact *zero waste* communities such as the Regional District of Nanaimo (RDN) have been reported to achieve in the order of 64% diversion (2006)<sup>1</sup>, accounting for both residential and IC&I wastes managed by the RDN. In the European Union, the most progressive jurisdictions have reached and remained at 60 to 65% diversion<sup>2</sup> for the past few years. At the same time, and it should be noted that population increases and increases in consumption have resulted in an overall increase in the amount of waste actually generated on a per capita basis in some cases.

In part, this should be expected as technology and new programs can only go so far in achieving increased diversion. There is a human element that needs to be taken into account. The following figure (Figure 5-1) provides an example of how human behavior, can influence the diversion rate of materials that can be relatively easy to divert. As noted, if 90% of the people in a community participate in a program and these individuals do the right thing (i.e. recycle) 90% of the time, only 81% of the target material will be diverted. This kind of participation and

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<sup>1</sup> FCM, Getting to 50% and Beyond, Success Stories from Canadian Municipalities, 2009

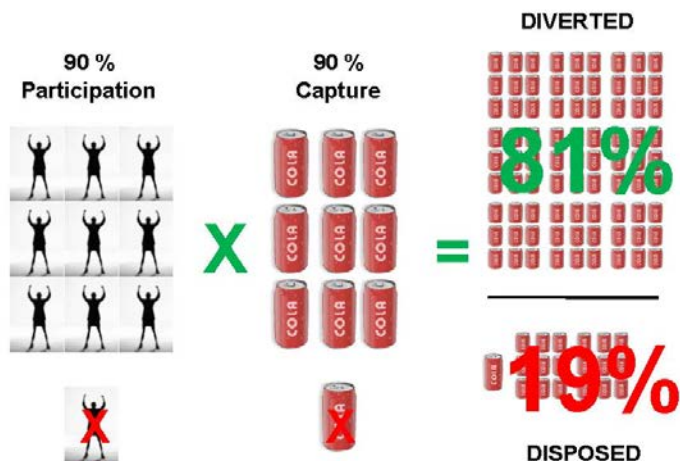
<sup>2</sup> Dr. Ella Stengler, CEWEP, based on data from EUROSTAT for 2007 (Treatment of municipal solid waste)

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capture rate is relatively common for easy to manage materials, but is not so common for materials that may be difficult to handle like various plastics and household organics.

**Figure 5-1: Participation, Capture and Diversion**



In order to make progress beyond 50% diversion, options for both bigger as well as smaller incremental improvements to diversion performance need to be examined. This may include adjustments to current programs in order to improve public participation, new programs that are designed to target key material streams, new material marketing opportunities, and new infrastructure.

In order to continue to make progress in reducing the overall tonnes of waste sent to disposal, incremental increases in diversion will also be needed just to offset increased population growth in the City which is expected to increase from 17,286<sup>3</sup> (2011) to 33,670 by 2038.<sup>4</sup> Should economic growth and other factors result in increases in overall waste generation per capita, additional growth in diversion rates will be needed to offset these changes as well. According to Statistics Canada, per capita waste disposal (kg of waste per person that was disposed) increased by 0.5% in Alberta from 2006-2008 with the highest amount of non-residential per capita waste disposal of 855 kg. With respect to waste diversion (kg of waste per person that was diverted), all provinces experienced an increase in total materials diverted, and Alberta's per capita waste diversion increased by 6.3% from 2006 – 2008 with an overall diversion rate of 15.3% (Statistics Canada, 2011).

While there are various mechanisms (options) available to the City to achieve waste diversion targets, some of which have been identified in previous strategic planning processes by the

<sup>3</sup> Statistics Canada. 2012. *Camrose, Alberta (Code 4810011) and Division No. 10, Alberta (Code 4810) (table)*

<sup>4</sup> Based on Growth Rates from City of Camrose Growth Study Update, 2006

City, it is critical to have these preferred options mapped out in a detailed and achievable implementation plan with specific annual objectives, associated budget requirements (capital and operating) and other necessary resources as well as clearly identified 'critical path' components of the plan.

### **5.3 MAXIMIZE USE AND REGARD FOR EXISTING DISPOSAL CAPACITY**

Notwithstanding the fact that the implementation of a clear waste reduction and reuse strategy along with additional waste diversion programs will lead to less waste received at the City's landfill, the initiatives developed for reduction and reuse should be coupled with the adoption of a management approach that considers the landfill itself in the context of all overarching waste management principles discussed in Section 2. The concept of sustainability in particular addresses the principle of fairness within and between present and future generations in the use of environmental, economic, and social resources. The landfill should be promoted as a valuable long-term resource for the City and one that can be utilized in that regard for current and future generations.

Solid waste (i.e. garbage) generated by City of Camrose citizens is disposed in the Camrose Regional Sanitary Landfill which is currently fully funded by tipping fees (i.e. no City tax revenue is used to fund landfill operations). The Landfill is operated under an Alberta Environment Approval which outlines the requirements with respect to protection of the environment. Regulatory requirements in regards to landfill construction, expansion and approvals and environmental protection are becoming more stringent all the time and requesting an approval for construction of a new landfill disposal cell is a timely and costly endeavor. Extending the life of the current and future disposal cells can be achieved through waste diversion, recovery and minimization initiatives.

Regardless of the ability to expand (the availability of physical space), the existing landfill should be operated to manage the use of existing air space in the most efficient way possible in order to preserve it, not only through reduction of waste to the landfill but through proper operating methods (use of equipment, compaction, use of cover/cover type, densification of waste etc.). This not only extends landfill life to be used by future generations it acts as the most cost effective way to manage in the long term.

From an environmental and life cycle analysis perspective the reduction of waste to landfill will have significant positive environmental impacts including reduction in greenhouse gas emissions, acid gas emissions, smog precursors, and toxic emissions to air and water, all of which should be considered in the evaluation of various program options (see draft Evaluation Criteria in Section 11 below).

To support promotion of the landfill as a 'resource' as opposed to a 'dump' the WMMP will consider mechanisms to change that perception in the Camrose community. This perception is common throughout North America and many communities have attempted to address the issue

through 'rebranding' their landfills (and waste transfer stations if appropriate) through the adoption of new facility names (e.g. recovery centre, resource recovery facility etc.) and strategically changing the focus through various site management/operational set up practices. These practices have included but have not necessarily been limited to, construction of reuse centres (often in partnership with community groups like Habitat for Humanity), strategic placement of recycling infrastructure (bins, bunkers, proper signage) or Community Recycling Centres (CRCs) such that residents must pass them first before they have access to disposal facilities, and other practices that will be explored in the development of the WMMP.

#### **5.4 ADDRESSING IC&I WASTE GENERATION**

66%-75% of the waste currently entering the landfill is generated by the Industrial, Commercial Institutional (IC&I) sector and construction and demolition (C&D) wastes. As discussed in Section 5.3 above there is the desire by the City to see a fundamental shift in the perception of the landfill as a resource to be preserved by the City for use over as long a term as possible. Mechanisms to accomplish this and that can be applied to the IC&I and C&D sectors include but are not limited to the application of differential tipping fees (a relatively significant gap between the cost to receive materials that can be diverted compared to what would be a higher cost to dispose of waste) and material bans (cardboard, organic waste, construction and demolition waste etc.). These both inspire source segregation of materials and the reduction of inbound materials for disposal at landfill.

These and other mechanisms form an important part of any long term plan and will be considered as a priority of the WMMP process. Strategies will be developed to address the need to balance revenue generation to support landfill operations with the City's sustainability and waste diversion objectives as well as the needs of the City's IC&I and C&D sectors and the private sector waste management industry.



## **6.0 Project Specific Key Issues**

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The following key issues and any others identified throughout the planning process and stakeholder consultation will need to be addressed:

**Willingness to Spend** - What are Camrose citizens willing to spend to achieve an increased waste diversion target? Achievement of any diversion rate beyond 40 percent generally requires significantly increased expenditures and effort in the areas of enhanced recycling and organics management programs as well as supporting community outreach initiatives. Previous consultation indicated that the majority of residents were willing to pay more to divert more waste from landfill.

**Feedback** - Every single-family home in the City was surveyed (survey sent out with utility bills and posted on website.). About 480 responses were received from 5000 households. This is good background data that will be used but confirmed in the WMMP development. However, no feedback was received from the commercial sector or the University which would be helpful in the development of the WMMP.

**Implementation** - The WMMP must generate an implementable specific system description based on the evaluation of the many 'best practice' options that are fine-tuned based on the agreed upon criteria. The City needs a clear implementation plan to execute.

**Reasonable Timelines** - The Community and Council are committed to moving forward in respect of waste management initiatives, but a solid, feasible, and realistic implementation plan needs to be developed and put into motion.

**Organics** – Currently organics diversion consists of about 75% residential drop off; only about 25% is picked up by the compostable materials collection truck, indicating that there is not substantial buy-in from the public. Year round bi-weekly pickup is not cost effective all year.

**IC&I Waste** - Commercial and institutional wastes (grocery stores, schools, hospitals etc.) account for a large proportion of the organic materials entering the landfill despite an incentive (no charge tipping) currently in place. The City's waste management system could use commercial and institutional organics collection as the base for expansion of composting facility; option to be evaluated – will need to address issue of contamination, companies (such as grocery stores) are slow to change practices.

25 to 33% of waste is residential, the remainder is IC&I waste. This needs to be addressed in the WMMP. All waste streams need to be considered. Wastes from the industrial park, downtown (Main Street), and commercial developments to be considered.

**Communications** - Communicate potential impacts to the environment over the long term – such as generation of leachate and landfill gas.

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**Perception-** Need to change the general public attitude that the landfill is a “dump” – currently it is not perceived as a resource recovery facility; value of landfill as a ‘resource’ that needs to be preserved over a long term, the value on having a landfill facility close to town, and future reclamation options (such as a dog off-leash park, other community uses).

**Landfill Regulations** – Current/future regulatory requirements could make expansion costly if necessary.

**Taking Care of Business** - There are small businesses currently engaged in recycling activity that need to be considered as it relates to continued business opportunities in the context of the WMMP.

**Education** - Minimal issues with illegal dumping/recycling have been encountered. 8 to 10% of residents “cheat” by putting waste in recycling/compost. Policing and education is required.

**Space** - In some cases for businesses there is not adequate space for an extra dumpster (for cardboard, etc.) on a property.

**Data** - No detailed waste audits have been done to date.

**Staffing** - A general issue especially in relation to communication with companies and local stakeholders relating to promotion and education. Until last year the City had a ½ to full time staff position for approximately a decade tasked to address education in schools, update brochures, etc. The WMMP will need to consider how to tie in the “waste in our world” modules in Grades 4 through 6 in schools to Camrose specific programs/goals - Need to address staffing requirements necessary to implement the WMMP and make related staffing recommendations.

## **7.0 Problem Statement**

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From the initial assessment of program performance we have gained insight into the 'problems' faced by the City as discussed above. The following problem statement has been formulated in order to encapsulate the waste management issues that the WMMP will need to address:

***While having achieved some progress in achieving waste diversion targets through recent implementation of specific initiatives, the City of Camrose needs specific and achievable waste reuse, reduction and recycling targets that can be reached through implementation of various programs and initiatives in a reasonable timeframe. The City needs a long term planning framework that is supported by the community and that positively affects community perception of the need for and the value of waste management infrastructure.***

## 8.0 Opportunities

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**Feedback.** Every single-family home in the City was surveyed (survey sent out with utility bills and posted on website.) About 480 responses were received from 5000 households. This is good background data and that will be used but confirmed in the WMMP

### **Adoption of Initiatives.**

- Council adopted the reduction of residential waste to 195 kg/capita by 2015
- Council adopted the reduction of municipal solid waste generation to 1000/kg/capita (including commercial waste) by 2015
- Curbside bag limit was imposed – the three bag limit is not an issue for most residents
- Compost program – mostly yard waste, kitchen scraps of fruit/vegetable scraps (no proteins) – windrowing at the landfill; feedback was that not enough notice was given to residents

**Council's Vision** – buying into the municipal Sustainability Plan. The Strategic Plan addresses some short term goals.

**Commitment.** The local Green Action Committee is very engaged, knowledgeable and innovative.

## **9.0 Vision Statement**

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The Vision for the long-term waste management master plan would arise from implementing the recommended WMMP is a system where:

- a. the City is a leader in waste reduction, reuse and diversion;
- b. *increases in the City's diversion rate keep pace with growth and are equal to or better than provincial policy objectives;*
- c. *the City has secure, cost effective, long-term capacity to process the diverted materials for which it is responsible and reduced reliance on disposal capacity;*
- d. *the City makes best use of and has high regard for its available, fully permitted landfill capacity as a valuable resource;*
- e. *the City has sufficient cost-effective, long-term capacity to process and/or dispose of the residual wastes left after diversion, for which it is responsible; and*
- f. *The system has the necessary flexibility to align with potential changes in provincial policy.*

## 10.0 Draft Goals And Objectives

Draft goals and objectives have been developed as the result of initial discussions with the City and are presented here for discussion. These are preliminary in many respects, as development of the WMMP has only just begun, and actual performance of the current system in the City is currently being studied. At this time, we have not yet defined current capture rates for the various materials managed by the City and cannot yet identify the actual areas in which the greatest improvements in diversion rates could be achieved.

As the study proceeds and further information is brought forward regarding current system performance and that which may be achieved by the options under consideration, it may be necessary to revisit/refine these goals and objectives for presentation in the final WMMP. The following draft goals and objectives (Table 10-1) are provided for consideration and in no particular order of priority:

**Table 10-1: Draft WMMP Goals and Objectives**

|   | GOAL                                                                                                                                                                                                  | OBJECTIVES                                                                                                                                                                                                                                                                                                                                                                                                     |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | The WMMP will:<br><b><i>Build on programs already in place;<br/>identify refinements to existing programs<br/>and any new recommended programs for<br/>implementation based on best practices</i></b> | <ul style="list-style-type: none"> <li>The WMMP will not be focused on 'reinventing the wheel' but on complimenting existing programs that are already working well</li> <li>Existing programs will be considered in the context of any impact to them as the result of other system changes</li> </ul>                                                                                                        |
| 2 | <b><i>Incorporate IC&amp;I waste management options and make strong recommendations in that regard</i></b>                                                                                            | <ul style="list-style-type: none"> <li>To reduce the high volumes of waste being landfilled by this sector (in the order of 75% of the annual total)</li> </ul>                                                                                                                                                                                                                                                |
| 3 | <b><i>Improve the City's waste diversion performance</i></b>                                                                                                                                          | <ul style="list-style-type: none"> <li>Increase diversion by.....(to be refined following the outcome of review of current system performance and diversion options)</li> <li>Achieve incremental diversion sufficient to keep pace with population growth in the City over the planning period (to be refined following the outcome of review of current system performance and diversion options)</li> </ul> |
| 4 | <b><i>Reduce the amount of waste generated</i></b>                                                                                                                                                    | <ul style="list-style-type: none"> <li>To achieve the City's existing waste reduction targets of residential waste by 45% and all waste (including commercial waste) by 36% from 2009 levels by 2015</li> </ul>                                                                                                                                                                                                |
| 5 | <b><i>Result in better management of existing approved and permitted disposal capacity in the City</i></b>                                                                                            | <ul style="list-style-type: none"> <li>Ensure that existing approved landfill capacity in the City is available for at least the next ...years (to be refined)</li> </ul>                                                                                                                                                                                                                                      |

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|    | GOAL                                                                                                                                                    | OBJECTIVES                                                                                                                                                                                                                                                                                                                              |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6  | <i>Reduce the environmental effects of managing waste generated in the City</i>                                                                         | <ul style="list-style-type: none"> <li>• Reduce the consumption of landfill airspace over the planning period and reduce potential air and water emission impacts.</li> <li>• Increase waste reduction and diversion activity to increase virgin material replacement credits</li> </ul>                                                |
| 7  | <i>Incorporate all aspects of public engagement</i>                                                                                                     | <ul style="list-style-type: none"> <li>• Achieve 'buy in' by the community for various waste management initiatives to achieve highest possible levels of participation in programming</li> </ul>                                                                                                                                       |
| 8  | <i>Consider all elements in respect of each other; impacts of changing one system component on all the others and a timeline/sequencing of elements</i> | <ul style="list-style-type: none"> <li>• Ensure that no one system change has a negative impact on other elements of the system</li> <li>• Ensure that programs that have 'critical path' elements, that is, those that must necessarily come before or after another, are identified and sequenced properly within the plan</li> </ul> |
| 9  | <i>Align with the Provincial Waste Strategy</i>                                                                                                         | <ul style="list-style-type: none"> <li>• Ensure that the City's plan is developed to, at minimum, achieve provincial waste reduction targets</li> </ul>                                                                                                                                                                                 |
| 10 | <i>Provide reporting that is readily accessible to the public in regards to initiatives, plans, and timelines (5 yr, 10, 20 yr plans)</i>               | <ul style="list-style-type: none"> <li>• Successful plan implementation is completely dependent on public acceptability/participation, this is dependent on clear understanding the expectations of the plan, the outcomes associated with participating – this needs to be conveyed correctly in the plan</li> </ul>                   |



## **11.0 Evaluation Of Opportunities & Constraints To Achieve The Vision & Strategy Goals & Objectives**

In order to assess the relative merits of various program options available to the City a number of factors or 'criteria' can be applied to each option. These factors are reflective of overarching planning principles (discussed in Section 2) as well as the City's specific goals and objectives for the WMMP. While there may be other factors to consider for the City the factors listed in Table 11-1 below are proposed for the City's consideration in assessing and understanding the impact of implementing various programming options. The criteria will be used to determine reasonable future programming options and appropriate timelines for implementation of those options in the context of a preferred waste management system.

**Table 11-1: Program Option & Opportunities Assessment Factors**

| <b>Consideration</b>            | <b>Application to Options</b>                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Economic</b>                 |                                                                                                                                                                                                                                                                                                                                               |
| Potential Cost Implications     | <ul style="list-style-type: none"> <li>• Potential cost implications for the options, including annual amortized capital and operating costs and potential revenues.</li> <li>• Potential costs should be within reasonable range of the current budget unless outside funding sources are available as they may be in some cases.</li> </ul> |
| Capital Assets / Infrastructure | <ul style="list-style-type: none"> <li>• Potential for investment in infrastructure by the City, based on decisions to construct new assets e.g. CRCs, etc.</li> </ul>                                                                                                                                                                        |
| Funding                         | <ul style="list-style-type: none"> <li>• Potential to be eligible for funding from external sources</li> </ul>                                                                                                                                                                                                                                |
| <b>Environmental</b>            |                                                                                                                                                                                                                                                                                                                                               |
| Potential for waste reduction   | <ul style="list-style-type: none"> <li>• Potential to reduce the amount of waste for disposal that the options present, encourages residents and businesses to generate less waste.</li> </ul>                                                                                                                                                |
| Potential Change in Diversion   | <ul style="list-style-type: none"> <li>• Potential changes in diversion rates that could directly or indirectly result from implementing any of the options are identified if possible.</li> </ul>                                                                                                                                            |
| Emissions to Air and Water      | <ul style="list-style-type: none"> <li>• Potential to reduce overall direct and indirect emissions of GHGs and other air parameters, as well as emissions to water, reduction in consumption of natural resources.</li> </ul>                                                                                                                 |
| Land Requirements               | <ul style="list-style-type: none"> <li>• Additional land requirements may have an impact on the environment.</li> <li>• Site size is often related to potential for community concern and potential for land use conflicts.</li> <li>• Potential land requirements required for additional infrastructure.</li> </ul>                         |

**CITY OF CAMROSE  
WASTE MANAGEMENT MASTER PLAN  
PROJECT INITIATION REPORT**

Evaluation Of Opportunities & Constraints To Achieve The Vision & Strategy Goals & Objectives  
July 2012

| Consideration                                                          | Application to Options                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Technical</b>                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Ease of Implementation/Timing of Implementation                        | <ul style="list-style-type: none"> <li>• Examples of implementation requirements may include: <ul style="list-style-type: none"> <li>▪ Facility siting for any new facilities.</li> <li>▪ Procurement processes such as RFPs for development of new facilities and/or new contracts for collection, transfer, processing.</li> </ul> </li> <li>• Implementation requirements/timelines for some system components affect others, for example, changes to collection programs e.g. procurement of collection vehicles if necessary etc.</li> <li>• Some options may be easier to implement than others given staff resources, budget resources etc.</li> </ul> |
| Staffing implications                                                  | <ul style="list-style-type: none"> <li>• The appropriate staffing balance has to be met in order to facilitate implementation of the new waste management system over the short and long term. Potential need for additional staffing to support initiative, expressed as full-time equivalents.</li> </ul>                                                                                                                                                                                                                                                                                                                                                   |
| Interaction with other System Components                               | <ul style="list-style-type: none"> <li>• Significance of interactions of options with other potential system components.</li> <li>• Options should not negatively interact with other components.</li> <li>• Some options will be contingent upon the viability of implementing another system component, i.e., single stream recycling requires access to a single stream processing facility.</li> </ul>                                                                                                                                                                                                                                                    |
| Short-term or Long-term Option                                         | <ul style="list-style-type: none"> <li>• Short-term options would include those that can easily be implemented within the first few years (e.g. within the first five years) and/or those options that would only be reasonably available in the short-term.</li> <li>• Long-term options would include those that require more time to implement (i.e. more than five years) and/or are more difficult to implement and/or are not economically feasible in the short term.</li> </ul>                                                                                                                                                                       |
| Potential for system efficiencies and improvements in level of service | <ul style="list-style-type: none"> <li>• Preferred if options increase efficiency and/or cost effectiveness of the waste system.</li> <li>• Diversion and collection options should have potential to enhance/improve levels of service.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           |
| Potential processing or disposal capacity requirements                 | <ul style="list-style-type: none"> <li>• Diversion processing options and waste disposal options must be able to provide sufficient capacity for a reasonable length of time.</li> <li>• Potential decreases in required landfill capacity for diversion options, would reflect both increased diversion and changes in composition and density of waste requiring landfill disposal.</li> </ul>                                                                                                                                                                                                                                                              |
| Ability to Adjust Option to Changes to in Provincial Policy            | <ul style="list-style-type: none"> <li>• Options need to have flexibility to adapt to changes that could occur based on changes in Provincial regulatory requirements/policy e.g. changing diversion targets, targeted recycling streams.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                          |
| Policy/By-Law Amendment                                                | <ul style="list-style-type: none"> <li>• Options/systems may require amendments to municipal policy or by-laws in order to provide regulatory environment for enforcement.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Approvals requirements                                                 | <ul style="list-style-type: none"> <li>• Nature and type of approvals required which may affect implementation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Partnership Opportunities                                              | <ul style="list-style-type: none"> <li>• Ability to partner with others to realize synergies, economies of scale, cost saving opportunities.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**CITY OF CAMROSE  
WASTE MANAGEMENT MASTER PLAN  
PROJECT INITIATION REPORT**

Evaluation Of Opportunities & Constraints To Achieve The Vision & Strategy Goals & Objectives  
July 2012

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| Consideration                     | Application to Options                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Social</b>                     |                                                                                                                                                                                                                                                                                                                                                            |
| Community Acceptance              | <ul style="list-style-type: none"><li>• Some options may be more widely accepted than other options</li><li>• The best options are more akin to community wants, needs and desire to modify behavior e.g. curbside set-out practices.</li></ul>                                                                                                            |
| Employment / Economic Development | <ul style="list-style-type: none"><li>• Employment during the construction and operation of waste management facilities, new collection programs etc. are of direct economic benefit to the community.</li><li>• System may support economic development through development of new markets and construction of new waste management facilities.</li></ul> |

## 12.0 Public Consultation

---

Public and stakeholder engagement is an essential component of any successful waste management master planning process and is usually a key factor in community acceptance of the recommended municipal waste management system. Accordingly, the engagement of key stakeholders and the public throughout the project via an effective awareness and communications plan will allow for informed input, as appropriate, into the Master Plan, especially during the development/confirmation of the Vision for the WMMP.

The engagement process will consist of three main Phases, which can be broken down into the following areas of focus. We present the following approach for confirmation by the City:

- **Phase 1 – Awareness:** During this Phase, the public and key internal and external stakeholders will be provided the initial invitation to participate in the development process. However, as most will not have had much if any exposure to the actual workings and components of a waste management system before, a certain level of project education is required to increase the level of informed discussion. As part of this Phase of engagement, project team members will provide information and answer questions about the existing waste management system, the waste management master plan project itself, and the need for engagement to develop a long term community vision for waste management, first to City Council and administration, followed by key stakeholders and the public. Because of the project timing during the summer months, engagement activities will focus on providing information and input opportunities at existing events such as the annual Jay Walkers Jamboree, farmer's markets, etc. as well as through the City of Camrose municipal website. Initial input will be gathered through a project initiation survey that asks general questions about user experiences and resident desires for the waste management system. This input will be used to develop the draft vision for the WMMP. Input received through this initial Phase will be posted to the City website along with any relevant project information created to date.
- **Phase 2 – Input:** Once the draft project vision has been created and previous data has been analyzed by the project team, further engagement can be started to confirm prior survey results and to discuss the priorities and vision for the WMMP that has been generated by the project team. Prior to engaging the public and stakeholders, a terms of reference will be developed to clearly outline the goals and expectations of participants in this Phase. Before going to the public and stakeholders, however, it would be advantageous to hold two short workshop-style meetings with the City's Council and administration respectively to discuss project objectives. It is essential that the administration meeting include engineering services area staff to receive a broad spectrum of input on current issues, benefits and opportunities within the existing waste management system. Once these meetings have been completed, direct engagement with the public and key stakeholders can begin in earnest. This will likely consist of the generation and posting

on the City website of a few draft vision statements based on the input received to date. Respondents as well as those who have provided input previously will be asked to volunteer to participate in a series of project focus groups that will be held throughout the project. The focus groups will be held at key stages of WMMP development to ensure that the overall interests of the community are being reflected in the draft plan components. Focus group membership will be limited to approximately 15 individuals, who collectively will represent but are not limited to:

- City Council
  - Green Action Committee
  - Camrose Regional Solid Waste Authority
  - Centra Cam Vocational Training Association)
  - Volunteer members of the public (identified through Phase 1 engagement, limited to three persons)
  - Camrose Construction Association
  - Canadian Home Builders Association
- **Phase 3 – Feedback:** The second focus group would be held at the end of Phase 3 to present the outcome of the system options review phase of the project and to generate open discussion and feedback with respect to the various system options developed.
- **Phase 4 – Preferred Option Selection:** The third focus group would be held at the end of Phase 4 to present the outcome of the evaluation of the systems and identification of the recommended preferred system. This will provide an opportunity to obtain feedback with respect to the recommended preferred system prior to the completion of the draft WMMP.

## **PUBLIC OPEN HOUSE**

A public open house will be held near the end of Phase 3 for the presentation of the interim WMMP in order to specifically engage the general public. The format of this session will be similar to the opening engagement events with project team members available to answer questions from attendees and information panels and/or handouts for review which will outline the system options that have been investigated. Should it be necessary, break-out discussions may be held on key topics to address specific public concerns. Written comments will be welcome during and following the sessions with a reasonable commenting timeline (generally 14 days).

**CITY COUNCIL PRESENTATION**

Members of City Council already sit on the Green Action Committee and would also be invited to participate in the focus groups as described above. Once the interim and final WMMP have been completed, members of the Project Team will make a formal presentation to Council to outline the project progress and findings to date. If possible, at least a portion of these presentations should be held *in camera* in order to have frank discussions about project components without the possibility of premature public disclosure.

**PUBLIC CONSULTATION RECORD**

All feedback gathered from this consultation process will be documented in a Record of Consultation (RoC) Section/Appendix of the WMMP. The RoC will include meeting minutes/notes/key points of discussion, event sign-in sheets, copies of display and presentation materials, advertisements, and any feedback received from the open houses and focus groups. A comment-response table will be included which will feature each comment received from consultation events and responses that address how the feedback was incorporated into the WMMP.

## 13.0 Next Steps

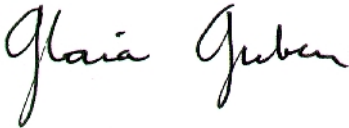
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Stantec has commenced with Phase 2 of the WMMP and can proceed with options evaluation upon confirmation of the evaluation criteria identified in this report. The vision, goals and objectives of the WMMP identified in this report are draft only for review and comment and it is expected that they will be fine-tuned for the final WMMP based on the outcomes of the public consultation process.

Respectfully,



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**APPENDIX B**  
**PHASE 2 – PART 1 - CURRENT SYSTEM**  
**ASSESSMENT AND LONG TERM WASTE**  
**MANAGEMENT NEEDS REPORT**  
**(AUGUST, 2012)**



**Stantec**

**City of Camrose Waste  
Management Master Plan Phase 2 -  
Part 1: Current System Assessment  
& Long Term Waste Management  
Needs**

Phase 2 - Part 1: Current System  
Assessment, Long Term Waste  
Management Needs

Prepared for:

The City of Camrose

Prepared by:

Stantec Consulting Ltd.

August 2012  
1102-18706

# CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN PHASE 2 - PART 1: CURRENT SYSTEM ASSESSMENT & LONG TERM WASTE MANAGEMENT NEEDS

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**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN PHASE 2 - PART 1:  
CURRENT SYSTEM ASSESSMENT & LONG TERM WASTE MANAGEMENT NEEDS**

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## **1.0 Planning Horizon & Performance Objectives**

---

Stantec was retained by the City of Camrose to develop a Waste Management Master Plan (WMMP). The WMMP will provide strategic direction for residential and IC&I waste management activities over the next five to ten years while also providing visionary direction for waste management over the next 25 years. The WMMP will focus on waste reduction, reuse and diversion initiatives and will support the City's short-term planning goal of decrease residential waste entering the landfill by 50% and all waste (including commercial waste) by 36% from 2009 levels by 2015.

In 2010 the City completed a Solid Waste Collection and Diversion Study, (KC Environmental Group) and the outcome of that study also included per capital waste reduction targets to be addressed as part of this WMMP:

- *Reduction of residential waste to 195 kg/capita by 2015 (was 360 kg/capita in 2010, not including residential drop off at the landfill)*
- *Reduction of municipal solid waste (MSW) generation to 1000kg/capita (including commercial waste) by 2015 (was 1560 kg/capita in 2010)*

This report follows the Phase 1 *City of Camrose – Waste Management Master Plan: Project Initiation Report*, June, 2012 that speaks to the strategy's vision and various goals and objectives to be achieved as part of the WMMP. This Phase 2 – Part 1 Report provides a description of The City's current waste management system to determine the elements of the City's 'status quo' system from a programming and infrastructure standpoint. This report also documents projections for the amount of waste requiring management over the planning period. Based on these projections, the City's Long Term waste management needs were identified to support the development of a Long Term vision for the system and for setting reasonable and achievable waste diversion goals and specific program objectives.

Also as Phase 2 of the WMMP a Part 2 – *Best Practices Assessment* (August, 2012) was undertaken (under separate cover). A range of appropriate best practices were identified and described in the form of a long list of waste management opportunities/options for review and discussion as it may relate to inclusion in the City's future solid waste management system. Once the City has reviewed this and the Best Practices Assessment, the list of opportunities/ options will be further evaluated and refined to support Phase 3 of the WMMP that focuses on implementation of the plan.

Plan implementation will be guided by opportunities that will be identified as short term (1-5 years), midterm (5-10 years) and long term (10-25) options and by providing clear mechanisms for the implementation of programs designed to meet the goals and objectives of the WMMP.

## **2.0 Current System Assessment**

---

This section provides a description of the City's community characteristics including both the residential and Industrial, Institutional and Commercial (IC&I) sectors recognizing all sectors as having a significant impact on the City's waste management system. Current City programs and operations are described, as well as the current amount and type of materials managed by the City, and current waste management system costs.

### **2.1 COMMUNITY CHARACTERISTICS**

The following sections provide an overview of the current and projected population and related demographics, in addition to information on the IC&I sector.

#### **2.1.1 Population**

The population of Camrose was 17,286 in 2011. The annual population growth projected from 2006 – 2011 was 3.5% annually. The results of the 2011 census showed a larger than expected increase in population with a growth rate of 10.6% from 2006<sup>1</sup>.

Based on the City's Transportation Master Plan (June 2006) the City's population is expected to grow to<sup>2</sup>:

- 35,230 by 2036 (30 year growth)
- 45,098 by 2046 (40 year growth)
- 57,729 by 2056 (50 year growth)

Although the City had a higher than expected rate of growth from 2006 to 2011, it is unlikely that this rate of growth will be sustained. As such, and for planning purposes, a more realistic growth rate of 2.5% has been used to estimate population growth over the planning period. A 2.5% growth rate is more consistent with the City's Transportation Master Plan projections as well as newer 2011 Census projections for the City.

---

<sup>1</sup> Statistics Canada. 2012. Camrose, Alberta (Code 4810011) and Division No. 10, Alberta (Code 4810) (table). Census Profile. 2011 Census. Statistics Canada Catalogue no. 98-316-XWE. Ottawa. Released February 8, 2012. <http://www12.statcan.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E> (accessed May 28, 2012).

<sup>2</sup> City of Camrose Growth Study Update (2006-2056)



### **2.1.2 Demographics**

According to the 2006 Census<sup>3</sup> 19% of the City's population is over the age of 65, compared to the provincial average of 11%. The City further had a lower population in the 30 to 49 age group (25%) when compared to the provincial average (31%). The 2006 Census indicated that the median income of Camrose residents is \$48,000 compared to the provincial median of \$64,000 and this may be simply indicative of the older population (retired) within the City.

Approximately half of the population has lived at the same address for at least five years, however with Augustana College becoming a University of Alberta campus, the student population is expected to increase. The average household size is 2.2 persons and the population is predominantly English speaking<sup>1</sup>.

Approximately half of the population aged 15 or over reported no post-secondary certificate, diploma or degree. Approximately 67% of population is in the labour force – the top three employment sectors are sales and service, trades/transport and equipment operators, business/finance and administration<sup>1</sup>.

#### **2.1.2.1 Single/Multifamily Residences**

Based on 2011 Census Canada results, there are approximately 7,460 total private dwellings with an annual growth of 160 units per year or average annual growth rate of 2.1%. Multi-family residences account for an estimated 22.7% of total households within the City for an approximate split of 1,693 multi-family units and 5,767 single family residences.<sup>4</sup>

#### **2.1.2.2 IC&I Sector**

There are 1,240 registered businesses in the City with the major sectors consisting of oil & gas, healthcare, agriculture, education, retail services, tourism<sup>5</sup>. According to Statistics Canada (2006), the top industry categories are other services, retail trade, health care and social services with growth in service like the development of major big box stores like Wal-Mart and Superstore. This sector is expected to continue to grow. Discussion on the City's IC&I sector as it relates to waste composition and waste generation is provided in Section 3.2.1.

---

<sup>3</sup> The 2011 Census data were not available at the time of this report.

<sup>4</sup> 2011 Census Canada. <http://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-cma-eng.cfm?LANG=Eng&GK=CMA&GC=833>

<sup>5</sup> City of Camrose, Municipal Sustainability Plan, 2010

## **2.2 REVIEW OF CURRENT PROGRAMS & DEPOT OPERATIONS**

### **2.2.1 Waste Collection and Disposal Bylaw**

The City of Camrose has a Waste Collection and Disposal Bylaw (#2670/11) which provides the guidelines for the set-out and collection of solid waste, as well as prohibitions, offences and penalties. The bylaw defines a receptacle as a container having a capacity of between 60 and 100 L with a maximum weight of 20 kg.

The bylaw deals primarily with the residential waste collection fee, general waste collection requirements for single family residences, location of receptacles and containers, and preparation of waste for collection. The bylaw does not address multi-family waste, but does specify how waste must be set out for commercial collection where applicable.

### **2.2.2 Promotion & Education/Communication Tactics**

This section documents the current level of promotion and education (P&E) carried out by the City.

#### **2.2.2.1 Communication with the Public**

On the City's website, there is an area called "Camrose Listens" where residents can fill out an action form to ask questions or provide input on concerns.

The City recently (2011) completed a Citizen Satisfaction Survey, using Ipsos Reid to conduct 300 telephone interviews with randomly selected residents on community issues, quality of life, satisfaction with municipal services, communication and information needs, perceptions of staff and council, citizen priorities and expectations, and infrastructure.

Of note was the fact that when residents were given a list of six priorities the City may address over the coming year (roads & infrastructure, snow removal, curbside recycling, expanded aquatic center, performing arts center, new trails), curbside recycling ranked third on the list.

Another interesting fact was that of the respondents, only 50% had visited the City's website in the last 12 months, in fact, the newspaper was by far the preferred method by which residents preferred to receive information at 48% of the mentions of preferred methods of communicating information. Internet and email received only 15% and 12% respectively of the mentions.

**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN PHASE 2 - PART 1:  
CURRENT SYSTEM ASSESSMENT & LONG TERM WASTE MANAGEMENT NEEDS**

Current System Assessment

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As part of the City's 2010 *Solid Waste Collection and Diversion Study*, a solid waste management survey was conducted. A survey was mailed out to 5,000 households and 487 responses were received (just under a 10% response rate). Some highlights of the survey were as follows:

- 58% of respondents indicated the City should increase the current service level for the collection of household hazardous waste (HHW) to either monthly collection or a permanent depot
- The majority of respondents indicated that information should be sent through utility bills and articles in local newspapers
- The top three priorities for program enhancements are:
  - Curbside collection of recyclables
  - Spring and fall curbside collection of leaf and yard waste (LYW)
  - More education
- 53% of respondents indicated the City should consider implementing a bag or cart limit
- Depot enhancement was also mentioned by respondents as a way to help residents recycle more.

**2.2.2.2 Promotion and Education Initiatives**

The City maintains an area on their website that pertains to solid waste management<sup>6</sup>, providing information on recycling, HHW, composting, the landfill, and commercial/multi-family waste collection. Residents have the ability to sign up for email notifications for council matters, job postings, news flashes and city/community events.

Additionally, the City uses some social media such as Facebook and Twitter, to provide information about solid waste management and City news in general.

Communication initiatives include:

- Recycle with Centra Cam Brochure
- Grass Cycling in Camrose Brochure
- Residential Compostable Materials Collection Program - Yard Waste & Limited Kitchen Organics Brochure
- Guide to Recycling in Camrose Brochure

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<sup>6</sup> <http://www.camrose.ca/index.aspx?nid=108>

- Collection Schedule/Recycling Guide
- City Watch Articles
- “City” page in both the Camrose Booster and the Camrose Canadian

The Centra Cam staff also conducts public education programs in schools and school tours of depot.

Camrose has also struck a Green Action Committee, composed of five to eight members at large, two Council members, and the University of Alberta Sustainability Coordinator. The purpose of the committee is to act as a think tank aimed at improving Camrose as a green community.

### **2.2.3 Garbage Collection**

Currently, residents may put out up to three cans/bags of garbage at the curb per week; additional cans/bags must have a bag tag at a rate of \$5 per tag. In 2012 the City introduced a graduated bag limit on single family, duplex and fourplex dwellings set at three containers per collection day (any combination of cans, boxes or bags). This limit is set to be reduced to a two-container limit by 2013. Materials need to be placed out at the curb by 7:45 am.

### **2.2.4 Organics and Yard Waste**

The City implemented a residential curbside yard waste and limited kitchen organics collection program for single family, duplex and fourplex dwellings in April 2011. Multi-family locations (including those over four units) and IC&I locations are not eligible to participate in the program.

Between May and October, organics are collected weekly, on the same day as garbage and with a separate vehicle. Between November and April, the collection frequency changes to bi-weekly, however the material is still collected on the same weekday as garbage, in separate vehicles.

Material must be set out in a compostable yard waste bag, a durable waste container clearly labeled “yard waste” or bundled and tied and kept a metre apart from garbage. The City will supply up to three “yard waste” labels for use on containers. Unlimited amounts of organic material may be set out; however, containers/bundles must weigh less than 20 kg (44 lbs.).

Acceptable materials include:

- Small Shrubbery
- Hedge Prunings
  - Grass Clippings and Leaves
  - Sawdust
  - Fruits, Vegetables, Peelings
  - Coffee Grounds, Filters, Tea bags
  - Food-soiled Paper and Cardboard (e.g. pizza boxes)

Non-acceptable materials include;

- Meat, Fish, Bones
- Dairy Products
- Animal Waste
- Sanitary Products (e.g. diapers)
- Plastic Liner Bags

### **2.2.5 Collection Contract Details**

The City issued a “Tender for Residential Solid Waste Collection Contract 2010-2014” which was awarded to BFI Canada Inc. for the curbside collection of residential garbage, limited organics and yard waste.

For residential waste collection, BFI is paid on a per unit basis, as well as \$1.50 per additional bag collected paid quarterly (based on an assumed volume of 50 tags/month or 600 per year).

The contract with BFI commenced on October 1, 2010, ending on March 31, 2014<sup>7</sup>.

### **2.2.6 Household Hazardous Waste**

In coordination with Alberta Recycling Management Authority, the City offers HHW Roundups in June and October at the Public Works Yard usually over the course of two days for each event. A total of 227 users from the City and 63 users from the County participate in the June event and 227 users from the City and 66 users from the County participated in the October event. The total number of residents from the City that participated in the event equated to just over 1% of the total population in 2011.

The Centra Cam Depot accepts limited types of HHW including paint, batteries and fluorescent bulbs between 8:00 am and 4:00 pm on weekdays.

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<sup>7</sup> Information provided by the City of Camrose (specifically found on Contract Surety Bond Request Form)

The landfill also accepts limited types of HHW including waste oil and filters, herbicide/pesticide/waste oil containers, propane cylinders and batteries during regular operating hours.

### **2.2.7 Electronics**

The Centra Cam Depot currently accepts electronic waste (e-waste) from residents between 8:00 am and 4:00 pm on weekdays. Materials accepted include televisions, desktop computers, monitors and printers. Items such as VCRs and small household appliances are not accepted at the depot.

### **2.2.8 Commercial Solid Waste Management Programs**

The City does not provide collection of solid waste from the IC&I or multi-family sector; they are responsible for contracting with the private sector for waste collection and disposal or bringing waste to the landfill themselves. A full discussion on IC&I waste is presented in Section 3.2.

### **2.2.9 Waste Collection from Municipal Facilities**

The City has a contract with Trisura from Oct. 1, 2010 to Sept. 20, 2013 for the collection of waste from Municipal Facilities. There are two bins located at the bottle depot and public works yard, one bin located at each of the Food Bank, Golf Course and arena.

#### **2.2.10 Waste Collection from Downtown Garbage Bins**

Waste collection from garbage receptacles in the downtown area is carried out by Waste Management and OPT Waste Removal.

#### **2.2.11 Waste Collection from Business Revitalization Zone (BRZ)**

Waste collection from the BRZ is carried out by Waste Management and OPT Waste Removal. Joint bins for old corrugated cardboard (OCC) are collected by Waste Management for a fee; this is arranged by the business owner. As described in the KC Waste Collection and Diversion Study, Section 2.4.5, joint bins for OCC are collected by Waste Management for a fee, and collection is arranged by business owners.

#### **2.2.12 Waste Collection from IC&I Sector**

TK Environmental, a private company, collects recyclables twice a week from both commercial and residential sectors at \$5/month for residences and \$3/month for apartments. OPT Waste removal provides bin services to the IC&I sector and is estimated to collect over 800 bins from this sector in the City.

### **2.2.13 Deposit Return Program**

In Alberta, the Beverage Container Management Board is responsible for the collection and recycling of beverage containers. In coordination with the BCMB, the Universal Bottle Depot in the City provides \$0.10 refunds to residents for each container less than 1 L in size and \$0.25 for containers greater than 1 L in size. The depot accepts beverage containers from residents Tuesday through Friday, 9:00 am and 5:00 pm and Saturday 9:00 am to 4:00 pm.

### **2.2.14 Depot Recycling Program**

The City does not offer curbside collection of recyclables; instead, the city offers collection of divertible materials through a depot recycling program. Material is accepted from residential and commercial sectors.

The Centra Cam depot was established in 1996 and expanded to its current size in 2008, which essentially doubled its size. The facility is located at 4402-51 Ave., and is open for most drop-offs 24 hours per day 7 days per week. The depot is open Monday to Saturday 8am – 4 pm during which times staff are available for assistance.

Operation of the depot is contracted to Centra Cam Vocation Training Association. The partnership arrangement is mutually beneficial providing services to the City at a lower cost and jobs for Centra Cam clients. The City owns all equipment, buildings and land. Centra Cam owns two vertical balers, tools, a forklift and drop-off bins. The City owns some equipment on site including a large baler for cardboard.

The recycling depot land is leased to Centra Cam under a five year contract which was set to expire July 1, 2011; however, in April 2011 an agreement was signed to extend the contract for an additional five years. Under the recycling contract, 85% of the revenue from recyclables goes back to the City. In 2011, the City reported paper commodity revenue of \$156,803.

The majority of material accepted at the depot is generated by City residents, with a small portion from the County. According to the Solid Waste Collection and Diversion Study (SWCADS), the depot also receives commercial OCC from Waste Management, OPT Waste Removal and McDonalds. It is estimated that 15% of the users of the facility are not City residents<sup>8</sup>.

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<sup>8</sup> Preliminary Operating Budget, Page 94



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The Depot has a number of designated collection areas within the facility. The facility accepts the following:

**Table 2-1: Recyclable Materials Accepted at Centra Cam**

| <b>Location</b>                                | <b>Materials Accepted</b>                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Main Facility</b>                           | <ul style="list-style-type: none"> <li>• Florescent tubes (4' and 8')</li> <li>• Car and household batteries</li> <li>• Paint (latex and oil)</li> <li>• Telephone books</li> <li>• Hard and soft cover books</li> </ul>                                                                                                                            |
| <b>Marked Windows on West Side of Building</b> | <ul style="list-style-type: none"> <li>• Paper products</li> </ul>                                                                                                                                                                                                                                                                                  |
| <b>Marked Bins</b>                             | <ul style="list-style-type: none"> <li>• Shredded paper</li> <li>• Cardboard</li> <li>• Clear glass</li> <li>• Tin cans</li> <li>• Plastic grocery/store bags</li> <li>• Milk jugs/cartons</li> <li>• #1, 2, 3, 5 &amp; 7 plastics</li> </ul>                                                                                                       |
| <b>Marked Cages</b>                            | <ul style="list-style-type: none"> <li>• Televisions</li> <li>• Printers</li> <li>• Computers</li> <li>• Monitors</li> <li>• Computer peripherals</li> </ul>                                                                                                                                                                                        |
| <b>Compost Bunker</b>                          | <ul style="list-style-type: none"> <li>• Leaf and yard waste</li> <li>• Limited kitchen organic waste</li> <li>• Pumpkins (November)</li> <li>• Christmas Trees (January and February) - Residents must drop off trees prior to March 1st, approximately 50-100 trees are collected and shredded for use directly in City planting beds.</li> </ul> |

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Products/Materials not accepted include:

|                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• #6 Plastics</li> <li>• Coloured Glass</li> <li>• Stereos, radios, clocks etc.</li> <li>• Small and large appliances (microwaves, dishwashers, stoves, fridges, water coolers, coffee makers, etc.)</li> <li>• CFL bulbs</li> <li>• Branches</li> </ul> | <ul style="list-style-type: none"> <li>• Garbage</li> <li>• Bottled gas containers</li> <li>• Toxic waste (other than latex and oil paint)</li> <li>• Rechargeable batteries</li> <li>• Printer or toner cartridges</li> <li>• Paint brushes, rollers or trays</li> <li>• Wood, metal, or concrete products</li> <li>• Furniture</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The Centra Cam Recycling Depot currently ships various material types to market. The following table indicates the quantities and destination for each marketable material shipped in 2011.

**Table 2-2: Materials Shipped to Market from Centra Cam Depot (2011)**

| Material                        | Destination/Market                 | Tonnes Shipped (2011)             |
|---------------------------------|------------------------------------|-----------------------------------|
| OCC                             | Allied Paper Savers                | 1104.00                           |
| ONP                             | Allied Paper Savers & KT Brokerage | 372.80                            |
| E-Waste                         | Recycle Logic                      | 146.55                            |
| Tin                             | Gen. Alta                          | 33.48                             |
| Glossy Paper                    | Capital Paper Recycling            | 144.26                            |
| Office Waste Paper              | Capital Paper Recycling            | 103.41                            |
| Mixed Paper                     | Capital Paper Recycling            | 346.19                            |
| Phone Books                     | Dice-a-bed                         | 10.39                             |
| Soft and Hard Cover Books       | Capital Paper Recycling            | 27.67                             |
| Coloured Plastic                | X-poly                             | 0.03                              |
| Film Plastic                    | Capital Paper Recycling            | 9.65                              |
| Glass                           | Potters Industries                 | 82.14                             |
| <b>Total Diverted</b>           |                                    | <b>2,380.55</b>                   |
| <b>Other Materials Diverted</b> |                                    |                                   |
| Paint                           | Recycle Solutions Co. Ltd.         | 121 partially filled aerosol cans |
| Fluorescent Tubing              |                                    | 7,856 linear feet                 |
| Cans                            |                                    | 33,480 cans                       |

Information provided by the City, Recycling Ship Report, 2011

## **2.3 REVIEW OF LANDFILL OPERATIONS**

The Camrose Regional Sanitary Landfill is managed by the Camrose Regional Landfill Authority which is a partnership between the City of Camrose, Camrose County, and the Village of Bittern Lake. The Class II landfill is located on Township Road 463, approximately 800 m west of 50 Street on land which is owned by the Province of Alberta and leased to the Camrose Regional Solid Waste Authority<sup>9</sup>.

The landfill is operated by Maplethorpe Contractors Ltd., under contract. Maplethorpe Contractors Ltd. has been operating the landfill since 1988 under contracts lasting three to five years. The contract was recently extended from May 1, 2012 to April 30, 2016.

The landfill is open from Monday to Saturday from 9:00 am - 4:30 pm; the hours are extended on Wednesdays until 8:00 pm from May 9 through to September 26, 2012.

The total capacity of the landfill including air space is approximately 2,000,000 m<sup>3</sup> with the life expected to be 35 plus years<sup>10</sup>.

In 2011, the landfill served a total residential population of 24,620 including the Village of Bittern Lake, Camrose County and the City of Camrose. In addition to receiving residential waste, the landfill also accepts commercial waste. Most commercial waste is counted as City waste unless the driver indicates another source; this may include waste from "out of region". The City's *Solid Waste Collection and Diversion Study* (SWCDS), 2010 reported that 78% of the City's MSW sent to landfill was IC&I and C&D waste.

The landfill accepts waste and provides diversion opportunities for waste oil, batteries, scrap metal, tires, herbicide/pesticide containers, wood, compostable material, wire and cable and CFC units. The cost of landfill operations is currently offset by revenue from tipping fees.

### **2.3.1 Permits**

The landfill is operated under an Alberta Environment Approval, which requires strict adherence to regulations to protect air, land, and water. The City received a new Alberta Environmental Approval to operate the landfill in September 2007. The new approval increased requirements for groundwater monitoring, surface runoff control, waste cell lining and leachate monitoring and collection and treatment; as well as requirements for reporting and timelines for implementation.

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<sup>9</sup> Preliminary Operating Budget, page 91

<sup>10</sup> Information supplied by the City of Camrose

### **2.3.2 Facilities and Staffing**

The facilities at the landfill include a scale, scale office, and a scale equipment building. In addition, there is Recycling Compound "A" for waste oil and batteries, Recycling Compound "B" for scrap metal and tires, and an herbicide/pesticide container storage compound. Portions of the landfill site are devoted to the recycling program, composting program, burn pit program and an asphalt/concrete recycling program. Staffing at the landfill consists of a scale operator and two equipment operators.

### **2.3.3 Landfill Burn Program**

The City operates a burn pit program for untreated wood and excess wood from its Parks and Recreation department. Ashes are subsequently landfilled.

### **2.3.4 Waste Diversion Programs**

The following materials are recycled:

|                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Herbicide/Pesticide Containers</li> <li>• Batteries</li> <li>• Waste oil, oil filters, plastic oil containers</li> <li>• Tires – tires are recycled through local companies. Only old tires are received which are used as part of an engineered leachate collection system.</li> <li>• Scrap metal</li> </ul> | <ul style="list-style-type: none"> <li>• Wire and cable (barbed wire, fencing wire, winch cables etc.)</li> <li>• Propane bottles</li> <li>• (Leachate Water)</li> <li>• CFC (Freon-containing appliances e.g. fridges, freezers, air conditioners)</li> <li>• Asphalt</li> <li>• Concrete</li> <li>• Composting of grass, leaves, yard waste</li> </ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### **2.3.5 Concrete Recycling**

The City provides a fee-based disposal area for non-contaminated waste concrete. When old sidewalks, driveways, or roadway curbs become broken and unusable, they may be disposed at the concrete recycling site.

A private contractor crushes the concrete into a usable gravel material that is stockpiled and charged out to projects as it is used.

All costs related to the site including operation, maintenance, crushing, reclamation, and overhead are recovered by the disposal charges as well as sale of usable product.

- End dump - \$150
- Tandem - \$75
- Single axle - \$40

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- Small single axle - \$25
- Half ton - \$10

**2.3.6 Tipping Fees**

The following table presents the current tipping fee schedule effective January 1, 2012. Routine household waste generated by residents of the County will have tipping fees paid by the County at a rate of \$35.00/tonne or a minimum fee of \$5.00 per vehicle.

**Table 2-3: Tipping Fee Schedule 2012**

| Tipping Fee Schedule                                                                                              |                                                                  |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Camrose Regional Sanitary Landfill Site                                                                           |                                                                  |
| Waste Disposed during Normal Hours                                                                                |                                                                  |
| Refuse                                                                                                            |                                                                  |
| Commercial                                                                                                        | Min. \$35.00 per tonne                                           |
| Demolition                                                                                                        |                                                                  |
| Industrial (inert, single commodity)                                                                              |                                                                  |
| Animals                                                                                                           |                                                                  |
| Clean Fill Soil                                                                                                   | No charge if free of debris and placed in                        |
| Grass & Tree Clippings                                                                                            | compost compound                                                 |
| Outside region additional surcharge accepted only with prior approval from Camrose Regional Solid Waste Authority | Double Applicable Rate                                           |
| Special Waste (Environmental) Upon Analysis                                                                       |                                                                  |
| Hydrocarbon Soils - Max 10,000 ppm                                                                                | \$16.00 - \$18.00 per tonne                                      |
| Asbestos                                                                                                          | \$40.00/tonne Plus \$100.00 Hr.<br>1Hr. Minimum equipment charge |
| Used Oil                                                                                                          | Free                                                             |
| Appliances (White goods)                                                                                          | \$5.00 each                                                      |
| Appliances (Freon)                                                                                                | \$25.00 each                                                     |
| Batteries                                                                                                         | Free                                                             |
| Pesticide Containers                                                                                              | Free                                                             |
| Wood and Metals                                                                                                   | Based on separation<br>\$17.50 to \$35.00 tonne                  |
| Tires                                                                                                             | Based on separation/stacking/sorting<br>Free to \$40.00 tonne    |

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| Tipping Fee Schedule                                                             |
|----------------------------------------------------------------------------------|
| <b>Waste Disposed Outside Normal Hours - Combination Below as Required</b>       |
| scale house @ 30.00/hr.<br>equipment @ 100.00/hr.<br>disposal @ applicable rates |

## 2.4 CURRENT SYSTEM PERFORMANCE – TONNES DIVERTED AND DISPOSED

### 2.4.1 Tonnes Received at the Landfill Site

Table 2-4 below shows the origin or type of waste received at the landfill in 2011, their respective tonnages and each as a percentage of total waste received. Wastes originating from the City of Camrose in this table include waste from all sectors (single family residential, multi-family residential and IC&I) and accounts for both curbside collection as well as drop off at the landfill.

**Table 2-4: Incoming Material by Origin (2011)**

| Origin of Waste <sup>11</sup> | Tonnes | % of Total |
|-------------------------------|--------|------------|
| Clean Fill Soil               | 21,615 | 35%        |
| City of Camrose               | 21,444 | 35%        |
| Impacted Soil                 | 13,831 | 22%        |
| County of Camrose             | 2,977  | 5%         |
| Compost                       | 1,739  | 3%         |
| Town or Village               | 147    | 0.2%       |
| Total                         | 61,753 | 100%       |

Table 2-5 shows total tonnage received at the landfill for the years 2007 to 2011 and shows fairly consistent tonnage received over that period as well as the number of vehicles entering the site. Tonnage data is inclusive of all waste received from residential and commercial sectors and that from the City of Camrose, the County of Camrose and neighbouring towns and villages.

**Table 2-5: Landfill Quantities and Vehicle Counts (2007-2011)**

| Landfill Quantities | 2007   | 2008   | 2009   | 2010   | 2011   |
|---------------------|--------|--------|--------|--------|--------|
| Total Tonnage       | 66,668 | 65,743 | 61,314 | 67,677 | 61,778 |
| Vehicle Counts      | 25,070 | 26,955 | 26,509 | 24,211 | 25,848 |

<sup>11</sup> Camrose Regional Solid Waste Authority, Sanitary Landfill Operator's Report Period 2011-4

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Table 2-6 shows the quantity of waste received at the landfill (2009 to 2011) from each of the City's residential, IC&I and other sectors. The amount of waste received from the residential sector includes waste collected at the curb as well as residential drop off material. The decrease in the amount of residential waste disposed over this time period is most likely attributed to the City's introduction of limited kitchen waste in the organics program as well as the implementation of bag limits.

**Table 2-6: City Waste Tonnage Summary by Type (2009-2011)**

| Type of Waste  | 2009   | 2010   | 2011   |
|----------------|--------|--------|--------|
| Total          | 22,198 | 20,779 | 21,444 |
| Residential    | 6201   | 5714   | 5360   |
| IC&I and Other | 15,997 | 15065  | 16,084 |

Table 2-7 shows the amount of special waste that was managed between 2009 and 2011. Batteries, oil containers and pesticide containers were added to other Household Hazardous Waste (HHW) tonnage to calculate the total amount of HHW managed by the City in 2011. This is summarized in Table 2-8. These totals reflect the quantity of materials collected during the two day June and October HHW Round Up events as well as through the Centra Cam Depot and through diversion at the landfill. All quantities and volumes have been converted to kg (based on their respective physical and chemical properties) to determine an accurate diversion rate for the City.

**Table 2-7: Special Waste Tonnage (2009-2011)**

| Type of Waste        | 2009          | 2010          | 2011          |
|----------------------|---------------|---------------|---------------|
| <b>Total</b>         | <b>787.54</b> | <b>707.82</b> | <b>473.25</b> |
| Batteries            | 17.53         | 8.81          | 7.52          |
| Metals               | 590.18        | 485.53        | 256.58        |
| Oil containers       | 0.44          | 0.91          | 0.93          |
| Pesticide Containers | 5.74          | 12.5          | 7.14          |
| Sorted Tires         | 109.95        | 19.4          | 19.19         |
| Leachate Water       | 55.28         | 185.57        | 178.76        |

**Table 2-8: 2011 HHW Waste Diverted Totals**

|                   | Waste Paint Materials (Litres) | Waste Aerosols (Litres) | Propane (Kilograms) | Latex Paint (Litres) | Helium      | Waste Oil (Kilograms) | Batteries (Kilograms) | Fluor. Tubes (lin. ft.) |
|-------------------|--------------------------------|-------------------------|---------------------|----------------------|-------------|-----------------------|-----------------------|-------------------------|
| <b>June</b>       | 10,000                         | 2,240                   | 100                 |                      |             |                       |                       |                         |
| <b>October</b>    | 7,000                          | 2,255                   |                     | 4,000                | 5           |                       |                       |                         |
| <b>Annually</b>   | 40,100                         |                         |                     |                      |             | 3.36                  | 8.93                  | 7,950                   |
| <b>Total (kg)</b> | <b>83,937</b>                  | <b>2043</b>             | <b>100</b>          | <b>5,580</b>         | <b>45.4</b> | <b>3.36</b>           | <b>8.93</b>           | <b>451.7</b>            |



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## 2.4.2 Centra Cam Recycling Depot Tonnages

Table 2-9 shows recyclable material tonnage received by material type at the Centra Cam Recycle Depot from 2009 to 2011. It is estimated that 15% of the people using the Centra Cam Depot are not residents of the City. It is reasonable to assume that a significant portion of Old Corrugated Cardboard (OCC) being received is from the commercial sector as opposed to the residential sector.

**Table 2-9: Centra Cam Recycling Tonnages (2009-2011)**

|                    | 2009            | 2010 <sup>12</sup> | 2011 <sup>13</sup> |
|--------------------|-----------------|--------------------|--------------------|
| Cardboard          | 993.20          | 1,076.81           | 1,094.00           |
| Newspaper          | 380.55          | 378.01             | 401.35             |
| Paper              | 267.26          | 284.72             |                    |
| Glossy Paper       |                 |                    | 109.47             |
| Office Waste Paper |                 |                    | 119.47             |
| Mixed Paper        |                 |                    | 34.66              |
| Tin                | 30.42           | 42.50              | 30.68              |
| Glass              | 35.00           | 45.13              | 82.67              |
| Plastic            | 11.53           | 12.93              |                    |
| Film Plastic       |                 | 16.93              | 16.65              |
| Plastic Tarps      |                 |                    | 14.70              |
| E-Waste            | 118.46          | 119.82             | 150.93             |
| Telephone Books    |                 | 11.72              | 10.77              |
| Dry Cell Batteries |                 | 0.06               | 1.41               |
| <b>Total</b>       | <b>1,836.42</b> | <b>1,988.63</b>    | <b>2,066.75</b>    |
| Paint              |                 | 53,930 L           | 40,100 L           |
| Fluorescent Tubes  |                 | 2,980 lin. ft.     | 7,950 lin. ft.     |

## 2.4.3 Estimated Waste Diversion Rates

Table 2-10 summarizes the waste generation and diversion statistics from 2009 to 2011 and accounts for quantities of residential waste generated both at curbside and quantities dropped off at the landfill. The recyclable materials included in the table reflect the quantity of materials diverted through the residential sector at the Centra Cam Depot (assuming 85% of those dropping off at the depot are City residents and that 60% of the cardboard received at the depot is from the ICI sector). It is assumed that since the multi-family sector is not included in the curbside collection program, that a majority of the waste produced can be attributed to the single family sector. The HHW totals include materials collected at the Centra Cam Depot,

<sup>12</sup> Information for 2009 and 2010 provided by the City in the form of an email from Centra Cam 2009-2010 Recycled Quantities

<sup>13</sup> Camrose Booster, 2011

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landfill and Round Up events. For a summary of projections based on the current system please refer to section 3.1.2.

**Table 2-10: Summary of Residential Waste Collection and Diversion (2009-2011) (tonnes)**

|      | Waste Generated | SSO/<br>Yard Waste | Yard Waste Only | Recyclable Materials | HHW    | Total Generated | Total Diverted | Curbside & Depot Diversion Rate |
|------|-----------------|--------------------|-----------------|----------------------|--------|-----------------|----------------|---------------------------------|
| 2009 | 6201            | N/A                | 310.05          | 1240.5               | 62.22  | 7813.77         | 1612.77        | 20.6%                           |
| 2010 | 5714            | N/A                | 510.75          | 1557.9               | 137.72 | 7920.39         | 2206.39        | 27.9%                           |
| 2011 | 5360            | 1089.99            | N/A             | 1629.2               | 92.17  | 8171.32         | 2811.32        | 34.4%                           |

The amount of residential waste produced (including divertible items) in 2011 was 611 kg/capita (based on single family households).

## 2.5 CURRENT PROGRAM COSTS AND REVENUES

This section presents the information supplied by the City with respect to expenditures and revenues for existing waste management programs.

### 2.5.1 Current Capital Budget Projections

The City's Preliminary Capital Budget (2012-2016) allocated the following amounts:

- \$20,000 for the recycling depot to construct an enclosed shelter around the paper drop-off area on the west side of the depot structure which will allow use of the facility with less exposure to the elements and improve customer satisfaction.
- \$63,000 to expand the existing concrete dump site and improve the grade on site to permit use of the site during inclement weather in 2012 and total expenditure for program over five years expected to total \$83,000.
- No other budget has been allocated to recycling for 2013 to 2016.
- \$400,000 has been allocated in 2012 for cell development at the landfill which increases by \$50,000 per year from 2013 to 2016 for a total of \$2,500,000 over five years.

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**2.5.2 Current Operating Budget Projections**

The City's Preliminary Operating Budget (2012-2014) allocated the following amounts for 2012:

- Waste Collection: \$892,410
- Regional Landfill: \$881,655
- Recycling Program: \$482,511
- Recycling Concrete: \$50,000

The following table presents the waste collection operating budget for 2010 to 2014.

**Table 2-11: Waste Collection Operating Budget – 2010-2014**

|                      | 2010 Actual | 2011 Budget | 2012 Budget | 2013 Forecast | 2014 Forecast |
|----------------------|-------------|-------------|-------------|---------------|---------------|
| Financing            |             |             |             |               |               |
| Sales & User Charges | 597,383     | 856,100     | 892,410     | 910,259       | 928,464       |
| Expenditures         |             |             |             |               |               |
| Salaries & Benefits  | 10,230      | 33,000      | 36,309      | 36,686        | 36,872        |
| Contracted Services  | 379,446     | 580,900     | 615,909     | 628,227       | 640,792       |
| Materials & Supplies | 112,653     | 143,200     | 130,892     | 133,860       | 137,084       |
| Assets<10,000        | 9,635       | 35,000      | 35,000      | 35,700        | 36,414        |
| Equipment Charges    | 579         | --          | 500         | 510           | 520           |
| Transfer to Reserves | 84,840      | 64,000      | 73,800      | 75,276        | 76,782        |
|                      | 597,383     | 856,100     | 892,410     | 910,259       | 928,464       |

Table 2-12 presents the operating budget for the landfill which was approved by the Camrose Regional Solid Waste Authority.

**Table 2-12: Landfill Operating Budget – 2010-2014**

|                        | 2010 Actual | 2011 Budget | 2012 Budget | 2013 Forecast | 2014 Forecast |
|------------------------|-------------|-------------|-------------|---------------|---------------|
| Financing              |             |             |             |               |               |
| Sales & User Charges   | 752,764     | 637,500     | 880,255     | 897,860       | 915,817       |
| Transfer from Capital  | 540,427     |             |             |               |               |
| Investment Return Bank | 18,397      |             |             |               |               |
| Rentals                | 1,165       | 1,500       | 1,400       | 1,428         | 1,457         |
| Total                  | 1,312,753   | 639,000     | 881,655     | 899,288       | 917,274       |
| Expenditures           |             |             |             |               |               |
| Salaries & Benefits    | 66,768      | 38,900      | 38,500      | 38,768        | 39,014        |
| Contracted Services    | 322,982     | 345,500     | 355,000     | 362,100       | 369,342       |
| Insurance              | 6,054       | 5,000       | 6,535       | 6,666         | 6,799         |
| Materials & Supplies   | 26,181      | 36,200      | 45,820      | 46,768        | 47,735        |
| Equipment Charges      | 516,204     | 2,900       | 2,900       | 2,958         | 3,017         |
| Heat, Light & Water    | 5,873       | 5,700       | 6,300       | 6,615         | 6,946         |
| Assets<10,000          | 1,600       | 1,600       | 26,600      | 1,600         | 1,600         |
| Transfer to Reserves   | 367,091     | 203,200     | 400,000     | 433,813       | 442,821       |
|                        | 1,312,753   | 639,000     | 881,655     | 899,288       | 917,274       |

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Table 2-13 presents the recycling program operating budget for 2010 to 2014. The majority of the increase in sales and user fees is related to reduced commodity pricing and increased Centra Cam contract costs. The Administration does not anticipate an increase to the recycling fee in 2012. The debenture principal and interest relate to the semi-annual debenture repayments for the funding of the recycling facility expansion which started in 2008 and will continue until 2017.

**Table 2-13: Recycling Program Operating Budget – 2010-2014**

|                      | 2010 Actual | 2011 Budget | 2012 Budget | 2013 Forecast | 2014 Forecast |
|----------------------|-------------|-------------|-------------|---------------|---------------|
| <b>Financing</b>     |             |             |             |               |               |
| Sales & User Charges | 541,368     | 459,200     | 482,511     | 492,162       | 502,006       |
| <b>Expenditures</b>  |             |             |             |               |               |
| Salaries & Benefits  | 23,620      | 17,500      | 25,031      | 25,519        | 25,816        |
| Contracted Services  | 344,699     | 350,400     | 368,721     | 365,895       | 373,213       |
| Materials & Supplies | 11,422      | 18,800      | 20,800      | 21,216        | 21,641        |
| Equipment Charges    | 9,300       | 5,400       | 6,500       | 6,630         | 6,763         |
| Debenture Principal  | 33,976      | 35,500      | 37,100      | 38,700        | 40,400        |
| Debenture Interest   | 14,558      | 13,000      | 11,500      | 9,900         | 8,200         |
| Transfer to Reserves | 103,973     | 18,600      | 12,859      | 24,302        | 25,973        |
|                      | 541,368     | 459,200     | 482,511     | 492,162       | 502,006       |

Table 2-14 presents the operating budget for the concrete recycling facility located at the landfill. The concrete stockpile was crushed in 2009. Due to increased amounts of concrete material entering the storage facility, the City plans to expand the existing site in 2012. Crushing of the existing material is not anticipated in 2012 but will be required within a few years. Transfers to reserves include transfers to fund future crushing costs and reserves for future closure costs.

**Table 2-14: Concrete Recycling – Operating Budget – 2010-2014**

|                                | 2010 Actual | 2011 Budget | 2012 Budget | 2013 Forecast | 2014 Forecast |
|--------------------------------|-------------|-------------|-------------|---------------|---------------|
| <b>Financing</b>               |             |             |             |               |               |
| Sales & User Charges           | 77,153      | 50,000      | 50,000      | 51,000        | 52,020        |
| <b>Expenditures</b>            |             |             |             |               |               |
| Salaries & Benefits            | 7,905       | 8,500       | 8,500       | 8,670         | 8,843         |
| Contracted Services            | 180,197     |             |             |               |               |
| Materials & Supplies           | 50,382      | 4,300       | 4,300       | 4,386         | 4,474         |
| Equipment Charges              | 5,850       | 4,500       | 4,500       | 4,590         | 4,682         |
| Transfer to Inventory Concrete | (205,235)   |             |             |               |               |
| Transfer to Reserves           | 37,604      | 32,700      | 32,700      | 33,354        | 34,021        |
|                                | 77,153      | 50,000      | 50,000      | 51,000        | 52,020        |

### 2.5.3 Promotion and Education Costs

In the budget information provided by the City, expenditures were recorded for Recycling (advertising), Green Bin Program (materials) and Composting Program (materials). These costs have been assumed to be associated with educational programming and have been summarized in Table 2-15 below.

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**Table 2-15: Promotion and Education Costs (2010-2011)**

| Expenditure                    | 2010       | 2011       |
|--------------------------------|------------|------------|
| Recycling – Advertising        | \$8,338.91 | \$700.92   |
| Green Bin Program – Materials  | \$4,549.34 | \$5,889.11 |
| Composting Program - Materials | \$286.79   | \$2.10     |
| Per capita expenditure         | \$0.76     | \$0.38     |

A detailed list of all expenditures and revenues from 2009 to 2011 is presented in **Appendix A** for reference.

## 2.5.4 Collection Funding Rationale

In Camrose, waste collection and disposal is treated as a utility, and is completely funded by user fees charged on utility bills. No tax revenue subsidizes these programs. Similarly, the Camrose Regional Sanitary Landfill is fully funded by tipping fees, so no City or County tax revenue is used to fund landfill operations.

All residential properties receiving waste collection services are charged four fixed monthly fees. The fees are charged each month, whether or not the service is used in any particular month. These include:

- Residential Waste Collection Fee - the contract fee charged by the current service provider. The City periodically tenders this service in order to receive the best service is provided for the most economical price. The current fee is \$5.84/month.
- Residential Waste Disposal Fee - covers the cost of disposing the waste in the Camrose Regional Sanitary Landfill. The current fee is \$3.42/month.
- Compostable Materials Collection Fee - covers residential collection of compostable materials for single family, duplex, and fourplex dwellings that already use City waste collection services. The current fee is \$3.66/month.
- Recycling Fee - used to operate the recycling depot and other recycling programs such as glass, plastic and e-waste recycling, and the Back Yard Composter education program. The current fee is \$4.25/month.

Residents are also able to purchase tags for additional bags of garbage for curbside collection beyond the three bag limit. A solid waste collection tag costs \$5.00/tag.

Revenue is received for recyclables marketed by Centra Cam; the City receives 85% of the revenue as part of the revenue sharing agreement.

The recycling depot provides service to City and non-city residents; however, all operating funding is collected from City residents as a part of the monthly utility charge. The City is in

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ongoing discussions with the County regarding the possible co-funding of this facility through a formal agreement, although to-date, the County has only participated in funding this facility on a year-to-year<sup>14</sup> basis (approximately 15% of depot users do not reside in the City). From budget information provided by the City, the County contributed \$44,000 in 2010 and 2011.

All operating and capital costs for the landfill are recovered through tipping fees. Each year, funds are reserved for future costs associated with the closure of the current landfill site. These rehabilitation costs are reviewed on a regular basis to ensure reserves are adequately funded<sup>15</sup>.

In 2011 revenue from recycling consisted of:

- Recycling charges: \$420,420
- Paper Commodity Revenue: \$156,803
- County Cost Sharing for Recycling Program: \$44,000

Similarly, revenue from waste collection was derived from the following sources;

- Waste collection charge: \$404,812
- Compostable Material Collection Fee: \$192,286
- Bag Tag: \$433

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<sup>14</sup> Preliminary Operating Budget, page 94

<sup>15</sup> Preliminary Operating Budget, page 91

### **3.0 Long Term Waste Management Needs**

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This section focuses on the determination of the City's long term waste management needs as it relates to the management of increasing volumes of waste associated with population and commercial growth and in the context of achieving various objectives with respect to both residential and IC&I waste streams.

The City has already undertaken initiatives toward reducing the amount of waste requiring disposal and achieving waste diversion targets. Bigger initiatives include progressively increasing bag limits and the inclusion of limited kitchen waste in the curbside organics program.

Key objectives for the WMMP and discussed in the Phase 1 *City of Camrose – Waste Management Master Plan: Project Initiation Report*, June, 2012 include, among other things the desire to build on existing programs, to support diversion in the IC&I sector and to address multi-family location collection programs. A key outcome of the community survey undertaken as part of the City's *Solid Waste Collection and Diversion Study* in 2010 was the identification of curbside collection of recyclables as a top priority.

This section focuses on the anticipated amounts of waste the City will be required to manage over the 25 year planning horizon for the WMMP. It further projects the impact of increased waste diversion activity for key components of the waste management system (recycling and organics) to project what various tonnage volumes might look like in concert with population growth over time. Not only does this help to determine what long term infrastructure requirements the City may have but it also sets the stage for setting specific waste diversion targets over time.

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## 3.1 LONG TERM RESIDENTIAL WASTE MANAGEMENT NEEDS

### 3.1.1 Population Projections

Population projections for the City and using a modest estimate of 2.5% growth annually (calculated based on 2006 and 2011 Census data) are provided in

Table 3-1 for the planning period (25 years) and form the basis for estimating the amount of waste requiring management over that time period.

**Table 3-1: Population Projections**

| Year | Population |
|------|------------|
| 2112 | 17,718     |
| 2017 | 20,046     |
| 2022 | 22,681     |
| 2027 | 25,661     |
| 2032 | 29,033     |
| 2037 | 32,848     |

### 3.1.2 Residential Tonnage Projections – Current Programming

In order to estimate the projected amount of waste (defined as the total amount of garbage, recycling, organics, HHW, and electronic waste combined) requiring management, an average of the annual quantity of residential waste generated per capita for 2011 was calculated using information from a variety of sources including the 2010 SWCDS, BFI's curbside collection tonnage information, and 2011 Census Canada statistics.

As these figures do not include waste generated from the IC&I or multi-family sector, the reported amounts of waste generated can most reasonably be attributed to the single family sector and accurately represent current City service levels or 'status quo'. This gives a reasonably accurate picture of the amount of residential waste the City will be required to manage in the long term should they not implement any additional waste diversion initiatives over the planning period.

It is important to note that because the City's current program is more wholly focused on the single-family sector that waste generation rates discussed in this section only pertain to that sector. They do not account for all City waste generation (the entire population including multi-family residents). As such the waste generation rates presented herein will not be consistent with previous calculations determined in previous studies undertaken by the City.

To generate an accurate estimate of the amount of waste produced per capita in the single family sector, the waste generation rate was calculated using the estimated single family



population of Camrose and all available diversion and disposal options to residents (including residential drop off and curbside collection), resulting in an average residential waste generation rate for 2011 of **611 kg/capita/year**. This value was used in the calculations of the estimates of waste requiring management over the planning period.

The amount of material diverted through residential deposit return and residential on-property diversion was not included (e.g. backyard composting); although material is diverted it is not part of the City's waste handling system. Note that the diversion rates for the 'status quo' only include the programs run by the Centra Cam depot, HHW Round Up days, curbside collection programs, and HHW diverted at the landfill.

In order to estimate the amounts of waste requiring management in the long term, Stantec has employed its in-house waste projection model. This model can be used to assess, not only projected waste requiring handling for each waste stream (e.g. recycling, garbage), but can also assess various scenarios associated with changes in waste composition and changes in program participation rates as a function of various program changes (e.g. curbside recycling). Those aspects of the model are described further in Section 3.1.3 below.

In order to employ the model and to assess future diversion potential for the City it was necessary to estimate the City's waste composition by specific material type. In the absence of detailed, current waste audit data from the City, Stantec used waste composition data from other sources that either closely reflected the same type of programming as the City (combined leaf, yard waste and organics program) and/or reflected both similar programming but also similar demographics. Since the City of Hamilton in Ontario has a Source Separated Organics (SSO) program that combines leaf, yard waste and organics in its curbside collection program, their waste audit data was used in calculations pertaining to organics relative to overall waste composition. The data was adjusted to account for Camrose's limited organics collection program, lower overall participation rates and lower overall waste (of all types) generated. The Town of High River<sup>16</sup> has a similar depot-based recycling program to the City of Camrose, deposit return beverage container program, as well as a similar population. Based on the information in High River's Solid Waste Diversion Study report, we were able to calculate reasonably accurate participation, capture rates, and diversion totals for the City of Camrose. In determining the capture rates and participation rates for beverage containers, the provincial deposit return program was considered for estimating the tonnages of materials to be managed. It was assumed that the majority of accepted beverage containers would be recycled through the deposit return program.

### **3.1.3 Application of Waste Generation Rates to Projected Population**

The average generation rate for 2011 was applied to the entire projected population to estimate the total amount of waste requiring management. It was assumed that the amount of waste would increase according to the rate of growth of the population.

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<sup>16</sup> Town of High River Solid Waste Diversion Study. Sonnevera International Corp. 2010

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The total amount of waste generated was then apportioned according to the percentage of the total amounts of recyclables, organics, HHW and garbage calculated in the projection model.

For example, for the Status Quo scenario in 2012

2012 Population x Waste Diversion Rate  
(611 kg/capita/year) x % recyclables = Amount of recyclables requiring management in 2012.

2012 Population x Waste Diversion Rate  
(611 kg/capita /year) x % organics = Amount of organics requiring management in 2012.

Table 3-2 provides estimates of the amount of waste requiring management based on the status quo program and no additional activities aimed at increasing diversion (e.g. no curbside recycling program etc.). The estimates are based on the current diversion rate of 34.4% and a waste generation rate of 611 kg/capita/year.

**Table 3-2: Status Quo Scenario – Waste Requiring Management (2012-2037)**

| Year | Single Family Population | Waste Generated (tonnes) | Recyclables | Organics | HHW | Disposal |
|------|--------------------------|--------------------------|-------------|----------|-----|----------|
| 2012 | 13,694                   | 8,372                    | 1,674       | 1,112    | 93  | 5,493    |
| 2017 | 15,494                   | 9,472                    | 1,894       | 1,258    | 105 | 6,215    |
| 2022 | 17,529                   | 10,717                   | 2,143       | 1,423    | 119 | 7,031    |
| 2027 | 19,833                   | 12,125                   | 2,424       | 1,610    | 135 | 7,955    |
| 2032 | 22,439                   | 13,718                   | 2,743       | 1,822    | 152 | 9,001    |
| 2037 | 25,388                   | 15,521                   | 3,104       | 2,061    | 172 | 10,184   |

## 3.1.4 Residential Tonnage Projections with Increased Waste Diversion

In order for the City to be able to preliminarily assess the impacts of various new waste diversion initiatives (discussed in detail in *the Phase 2: Part 2 – Best Practices Assessment Report* under separate cover) and to determine reasonable short term and longer term waste diversion targets Stantec modeled two realistic programming scenarios. These scenarios were selected because they represent programming options that would yield the highest waste diversion results for the single-family residential sector:

- Introduction of a curbside recycling program
- Enhanced curbside organics collection program

As described briefly above Stantec uses an in-house waste projection model that can assess waste diversion impacts associated with various collection scenarios and various program implementation options. The model is often used to determine the maximum practical diversion rate that can be achieved for a waste stream given the composition of waste (type and amount) (e.g. food, paper, steel cans, etc.) based on reasonable capture rates (material set out per household) and participation rates (the number of households participating). This model effectively determines the range of tonnages requiring collection for each of garbage, organics and recycling based on implementation of various waste diversion programming options.

For both scenarios described below it was assumed that both would be supported by increased promotion and educational activity. These projections only concern themselves with waste currently managed by the City, that is, the multi-family sector is not considered. Should added programming for this sector be determined as a strategic part of the WMMP, the impacts of that programming/tonnage projections can also be determined. While implementation of recycling programs in the multi-family sector has been historically challenging for most municipalities, and the same level of participation has not been achieved as for the single-family sector, there would still be a positive waste diversion impact.

#### **3.1.4.1 Curbside Recycling Program Scenario**

One of the City's goals is to reduce the amount of residential waste being disposed and there is support in principle by the community for curbside collection of recyclables. This program would significantly increase participation in the City's recycling program and significantly increase the amount of recyclable materials captured and diverted. A number of assumptions were made in order to model this program for the City:

- A full spectrum of recyclable materials accepted in program
- Residents are returning a majority of beverage containers to the Universal Bottle Depot (deposit program)
- Overall participation rates will increase with the launch of the program and substantial P&E
- The introduction of a curbside recycling program will likely also increase participation and capture rates in current LYW/limited kitchen waste program as residents become re-invigorated
- The Centra Cam Depot will continue to accept recyclable materials

In order to model the amount of waste requiring management with a curbside recycling program, the following assumptions were made with respect to the estimates:

- Waste generation rates will remain constant (611 kg/capita/year)

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- Waste generation increases consistently with the growth in population (2.5%/year)
- Composition of waste remains consistent over the 25 year planning period

**The estimated diversion rate for this scenario is 50%.** This diversion rate does not reflect the tonnages of beverage containers being diverted through the deposit return program.

Table 3-3 provides estimates of the quantities of waste requiring management based on a curbside recycling program, continued use of the Centra Cam Depot, increased promotional activity and a status quo organics collection program.

**Table 3-3: Curbside Recycling Program Scenario – Waste Requiring Management (2012-2037)**

| Year | Single Family Population | Waste Generated (tonnes,) | Recyclables | Organics | HHW | Disposal |
|------|--------------------------|---------------------------|-------------|----------|-----|----------|
| 2012 | 13,694                   | 8372                      | 2,448       | 1,614    | 93  | 4,217    |
| 2017 | 15,494                   | 9,472                     | 2,770       | 1,826    | 105 | 4,771    |
| 2022 | 17,529                   | 10,717                    | 3,134       | 2,066    | 119 | 5,398    |
| 2027 | 19,833                   | 12,125                    | 3,546       | 2,337    | 134 | 6,107    |
| 2032 | 22,439                   | 13,718                    | 4,012       | 2,645    | 151 | 6,910    |
| 2037 | 25,388                   | 15,521                    | 4,539       | 2,992    | 171 | 7,818    |

## 3.1.4.2 Curbside Recycling Program with an Enhanced Curbside Organics Program Scenario

To further increase waste diversion and reduce the amount of waste requiring disposal, the City could implement an enhanced organic waste collection program. The scenario modeled and discussed here is based on the introduction of a curbside recycling program in addition to an enhanced curbside organics program that sees the addition of the full spectrum of organic materials to the program. This is discussed in much more detail in the *Phase 2: Part 2 – Best Practices Assessment Report*. Table 3-4 provides the estimates of the tonnages of material in this scenario that would require management over the next 25 years. Model assumptions include:

- A full spectrum of recyclable materials accepted in program
- Other compostable materials such as paper towels, paper plates, tissues, meat and dairy etc. are included in the program, with the exception of diapers and sanitary waste
- Residents are returning a majority of beverage containers to the Universal Bottle Depot (deposit program)

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- Overall participation and capture rates will increase with the launch of the program and substantial P&E
- Organics will be collected on a weekly basis
- The amount of organics requiring management will include yard waste
- The Centra Cam Depot would continue to accept recyclable materials
- Green Bins and Kitchen Catchers are provided to residents
- Compostable Bags are accepted in the enhanced organics program

In order to model the amount of waste requiring management with an expanded program, the following assumptions were made with respect to the estimates:

- Waste generation rates will remain constant (611 kg/capita/year)
- Waste generation increases consistently with the growth in population (2.5%/year)
- Composition of waste remains consistent over 25 year duration

**The estimated diversion rate for this program is 67%.** This diversion rate does not reflect the tonnages of beverage containers being diverted through the deposit return program.

**Table 3-4: Curbside Recycling with Enhanced Organics Program Scenario – Waste Requiring Management (2012-2037)**

| Year | Population | Waste Generated (tonnes) | Recyclables | Organics | HHW | Disposal |
|------|------------|--------------------------|-------------|----------|-----|----------|
| 2012 | 17,718     | 8,372                    | 2,339       | 3,202    | 91  | 2,738    |
| 2017 | 20,047     | 9,472                    | 2,646       | 3,623    | 105 | 3,098    |
| 2022 | 22,681     | 10,717                   | 2,994       | 4,099    | 119 | 3,505    |
| 2027 | 25,661     | 12,125                   | 3,387       | 4,638    | 135 | 3,965    |
| 2032 | 29,033     | 13,718                   | 3,832       | 5,247    | 152 | 4,486    |
| 2037 | 32,848     | 15,521                   | 4,336       | 5,937    | 172 | 5,076    |

These diversion targets do not represent materials managed through other programs that are described in detail in the *Phase 2: Part 2 – Best Practices Assessment Report* and as such residential waste diversion targets could ultimately be much higher for the City over the long term. The Phase 2 Report discusses the full range of options for residential waste programming for the City and their various implications.

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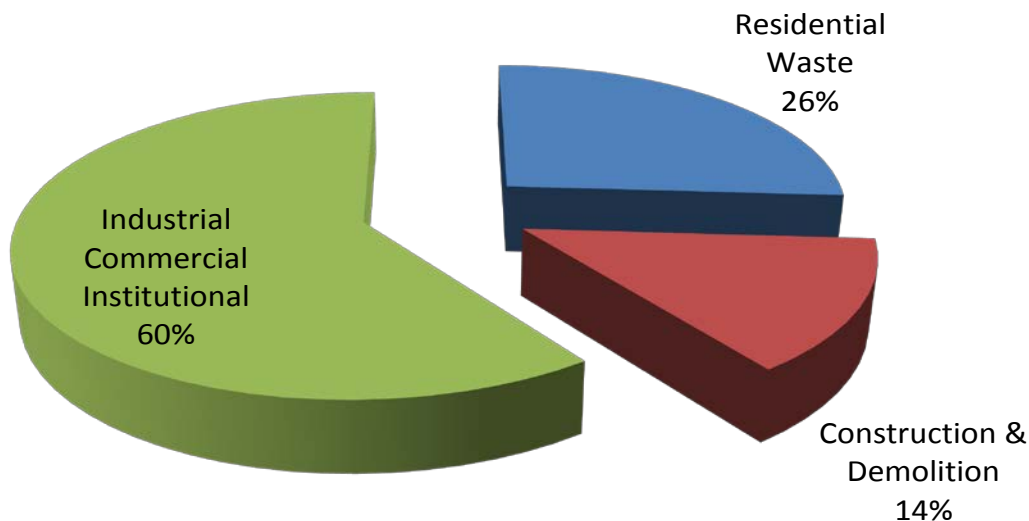
**3.2 LONG TERM INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL (IC&I)  
WASTE MANAGEMENT NEEDS**

The City currently handles a significant amount of waste, primarily through disposal from its' IC&I sector, Construction & Demolition (C&D) sector, and waste generated by City Operations. Commercial businesses located within the City are responsible for providing their own collection of waste materials. The IC&I sector largely receives waste management services from private contractors operating within the City.

The following figure illustrates the composition of Camrose MSW; IC&I waste comprises approximately 60% of the total waste stream and that with C&D wastes represents in the order of 74% of the total amount of waste that needs to be managed in one form or another. This information is based on a previous study conducted for the City which reviewed a series of IC&I waste diversion options<sup>17</sup>.

**Figure 3-1: Composition of Camrose MSW (2008)**

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**Composition of Camrose (MSW) Municipal Solid Waste (2008)**

<sup>17</sup> Review of the IC&I Waste Diversion Options Available Within the City of Camrose, Hoffman Consulting, May 2011

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**3.2.1 IC&I Waste Composition by Industry Sector in the City**

It is a useful exercise to estimate the total amount of waste produced by the IC&I sector by sector category to assess the amount and types of waste that may be able to be targeted for diversion purposes and to potentially project reduced volumes of waste to landfill. Should the City elect to implement one or more of the various waste management options identified in the *Phase 2: Part 2 – Best Practices Assessment Report* some order of magnitude impact could be reasonably determined (e.g. reduced disposal requirements, reduced revenue from tipping fees).

In order to estimate the actual amount of waste produced by the IC&I sector the following methodology was used.

- The City of Camrose community profile on the Statistics Canada website was consulted to determine the estimated number of employees working in various industry sectors.<sup>18</sup> The most recent data available was for 2006; the population in 2006 was 15,620 and in 2011 rose to 17,286 representing a 10.6% increase in population. This increase in population was applied as a percentage to the number of employees to estimate the number of employees for 2011 and then associated waste generation.
- Due to the scarcity of data available on estimates of IC&I waste by industry sector in Canada in general and including Alberta; the only available information came from two reports from Ontario which discussed IC&I sector waste management in Ontario municipalities.<sup>19</sup> These reports provided estimates of the amount of waste generated per employee by industry sector. C&D material quantities are difficult to estimate as they are often generated periodically based on construction starts and as much of this material is not tracked.
- By multiplying the number of employees per industry sector by the waste produced per employee per industry sector, it was estimated that the City's IC&I sector produces approximately 9,984 tonnes of IC&I waste in 2011. It should be noted that this total tonnage does not include the construction industry sector as neither of the studies which we reviewed were able to present reasonable waste generation values for the construction industry. In other words, there is additional IC&I waste not being accounted for using our method of estimation, as we do not consider the construction sector in our calculations and nor do we consider any IC&I waste generated outside the City limits. The total amount of IC&I waste including construction waste and waste from outside sources was estimated at 16,084 tonnes for 2011 based on data provided by the City.

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<sup>18</sup> Statistics Canada. 2007. *Camrose, Alberta (Code4810011) (table). 2006 Community Profiles*. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007.  
<http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E>  
(accessed July 26, 2012).

<sup>19</sup> "IC&I Waste Characterization Report IC&I 3Rs Strategy Project", June 5, 2007, City of Ottawa, Genivar and Jacques Whitford and "Analysis of City of Owen Sound Waste Audit/Recycling Plan for IC&I Premises", City of Owen Sound, Kelleher Environmental, MOE, OWMA, November 24, 2008



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- presents the estimated IC&I waste generated per industry sector in the City based on the labour force aged 15 and over.
- The “Other services” category includes many types of services and the proportion of employees in these services can be unique to the municipality (Statistics Canada does not provide a further breakdown). The estimated waste generated per employee in this category varies widely by municipality so while “Other services” is still be calculated in the projections, it is necessary to note that these projections are provided with the caution that they may not be wholly accurate.

Table 3.5 provides a summary of waste generation estimates by employee.

**Table 3-5: Waste Generation Estimates per Employee**

| Industry                                         | Number of Employees (2006) | Number of Employees (2011) | % of Employees in Each Industry | Estimates of Waste Generated in Camrose (tonnes per year) (2011) |
|--------------------------------------------------|----------------------------|----------------------------|---------------------------------|------------------------------------------------------------------|
| Agriculture and other resource-based industries  | 670                        | 741                        | 8%                              | 437                                                              |
| Construction                                     | 595                        | 658                        | 7%                              | --                                                               |
| Manufacturing                                    | 575                        | 636                        | 7%                              | 630                                                              |
| Wholesale trade                                  | 260                        | 288                        | 3%                              | 397                                                              |
| Retail trade                                     | 1,460                      | 1,615                      | 17%                             | 3,875                                                            |
| Finance and real estate                          | 395                        | 437                        | 5%                              | 197                                                              |
| Health and social services                       | 1,255                      | 1,388                      | 15%                             | 1,152                                                            |
| Educational services                             | 555                        | 614                        | 7%                              | 387                                                              |
| Business services                                | 950                        | 1,051                      | 11%                             | 578                                                              |
| Other services                                   | 1,660                      | 1,836                      | 20%                             | 2,332                                                            |
| Total Experienced Labour Force 15 Years and Over | 8,375                      | 9,263                      | 100%                            | 9,984                                                            |

The information presented above provides the City with information on sectors which can be targeted for various waste reduction and diversion efforts. For instance, a considerable portion of waste is generated by the retail trade, health and social services. In the retail trade, much of the waste generated is relatively easy to manage, with larger volumes of fibre based waste (e.g. cardboard and paper). For others (grocery stores, food manufacturers, etc.) the organic portion of their waste streams may be the ideal target if future options for organics management are practical and economical. Numerous mechanisms to encourage diversion from these sectors are discussed in the *Phase 2: Part 2 – Best Practices Assessment Report*.



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## 3.2.2 IC&I and C&D Waste Composition Estimates for the Landfill

The following Table 3-6 provides a breakdown of broad categories of waste brought to the Landfill in 2011 according to the City's Landfill Operator's Report<sup>20</sup>. The tonnage information taken from the report and provided in Table 3-6 is not focused on material source and only on waste types received that may provide opportunities for waste diversion.

**Table 3-6: Landfill Quantities (2011) Tonnes of IC&I Waste by Material Type Managed by the City (2009)**

| Type of Waste    | 2011<br>(tonnes) |
|------------------|------------------|
| Commercial Waste | 14,024           |
| Refuse           | 5,979            |
| C&D              | 2,040            |
| Untreated Wood   | 1,102            |
| Total            | 23,145           |

The composition of IC&I garbage brought to the landfill based on these broad categories and tonnages was considered to determine how much potentially divertible material is currently being disposed. The estimated composition of IC&I waste was determined by referencing a discussion paper on Sustainable Waste Management by the City of Edmonton<sup>21</sup>. This report provided estimates for ICI and C&D Waste Composition in the Province of Alberta in 2002. Based on this information, and information provided in the Landfill Operator's Report, the general composition of waste currently managed at the landfill was determined.

Table 3-7 provides that composition, and as it illustrates, much of the IC&I material currently being landfilled is potentially divertible.

**Table 3-7: Estimated Composition of IC&I Waste Brought to the Landfill**

| IC&I Waste Composition | Percent Composition | Tonnes |
|------------------------|---------------------|--------|
| Hazardous Waste        | 1.7                 | 238    |
| Textile & Rubber       | 4.1                 | 575    |
| Renovation             | 3.1                 | 435    |
| Wood                   | 6.4                 | 898    |
| Organics               | 30                  | 4,207  |
| Plastics               | 10.4                | 1,458  |
| Non-Ferrous            | 0.6                 | 84     |
| Ferrous                | 4.1                 | 575    |
| Glass                  | 1.9                 | 266    |

<sup>20</sup> 2011 Camrose Regional Solid Waste Authority Sanitary Landfill Operator's Report

<sup>21</sup> Sustainable Waste Management, City of Edmonton, Waste Management Branch, May 2010

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| IC&I Waste Composition | Percent Composition | Tonnes |
|------------------------|---------------------|--------|
| Paper                  | 29.7                | 4,165  |
| Other                  | 8.1                 | 1,136  |
| Total:                 | 100                 | 14,038 |

Table 3-8 provides a breakdown of estimated composition of C&D waste brought to the landfill.

**Table 3-8: Estimated Composition of C&D Waste Brought to the Landfill**

| C&D Waste Composition | Percent Composition | Tonnes |
|-----------------------|---------------------|--------|
| Brick-Stone           | 3                   | 61     |
| Roofing               | 11.5                | 235    |
| Drywall               | 9.5                 | 194    |
| Asphalt               | 4.5                 | 92     |
| Concrete              | 9                   | 184    |
| Wood                  | 26.5                | 541    |
| Non-Ferrous           | 6.9                 | 141    |
| Ferrous               | 2.1                 | 43     |
| Paper                 | 14                  | 286    |
| Other                 | 13                  | 265    |
| Total:                | 100                 | 2,040  |

### 3.2.3 IC&I and C&D Future Waste Projections

Due to the uncertainty surrounding the amount of IC&I waste that the City may ultimately manage in the future based on economic growth or decline, it is somewhat difficult to accurately the amount of material that will require management over the 25 year planning period.

In order to develop projections for the planning period, it was however assumed that economic conditions would remain steady and the amount of IC&I waste disposed by the City would increase steadily with increases in population and related commercial growth over the planning period.

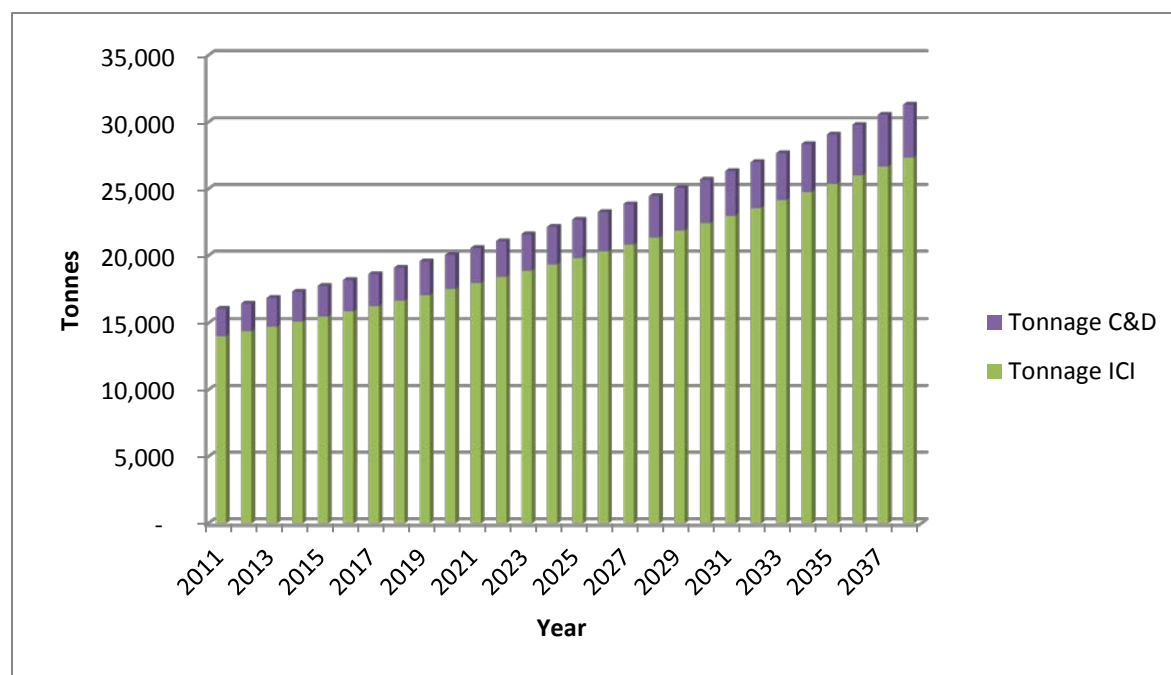
**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN PHASE 2 - PART 1:  
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Figure 3-2 presents the estimated quantities of IC&I waste that may be disposed over the 25 year planning period using 2011 quantities as the baseline.

**Figure 3-2 Estimated Total Amount of IC&I and C&D Waste Disposed at Camrose Landfill (2011-2037)**



These estimates suggest the amount of combined IC&I and C&D materials could effectively double over the WMMP planning period.

## **4.0 Next Steps**

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The second part of Phase 2, *Part 2 - Best Practices Assessment* is provided under separate cover and provides a long list of waste reduction and diversion programming options for the City's consideration. The Part 2 report discusses numerous mechanisms that may be employed independently or in combination to achieve the City's waste reduction and diversion targets. Stantec will meet the City to discuss the findings in this report as well as the findings of the Phase 2, Part 2 report. Based on discussions with the City, Stantec will commence work on *Phase 3 – System Options*.

## **5.0 Stantec Quality Management Program**

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This report, entitled “**City of Camrose Waste Management Master Plan Phase 2 - Part 1: Best Practices Assessment; Prepared for: City of Camrose.; Prepared by: Stantec Consulting Ltd.; August 2012**” was produced by:



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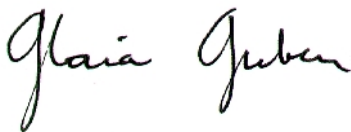
Leslie Greener, H.B.A  
Waste Management Planner



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Cathy Smith, H.B.A, M.A.  
Senior Consultant

This report has been reviewed and approved for transmittal by:



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Gloria Gerber, M.Eng., P.Eng  
Senior Associate, Waste Management Engineer

# **APPENDIX A**

## **BUDGET INFORMATION**

## Appendix A: Budget Information – 2009 -2011

|                                         | 2009                  | 2010                    | 2011                    |
|-----------------------------------------|-----------------------|-------------------------|-------------------------|
| <b>Regional Landfill</b>                |                       |                         |                         |
| <b>Financing - Regional Landfill</b>    |                       |                         |                         |
| Disposal Tipping Fees                   | \$(933,250.21)        | \$(752,764.22)          | \$(1,089,404.12)        |
| Property Lease – Landfill               | \$(1,266.70)          | \$(1,164.84)            | \$(1,068.17)            |
| Interest Income                         |                       | \$(18,396.55)           | \$(23,518.64)           |
| TRF From Capital Fund                   |                       | \$(540,426.60)          |                         |
| <b>Total</b>                            | <b>\$(934,516.91)</b> | <b>\$(1,312,752.21)</b> | <b>\$(1,113,990.93)</b> |
| <b>Expenditures - Regional Landfill</b> |                       |                         |                         |
| Salaries and Wages                      | \$53.47               | \$-                     | \$-                     |
| PW Wages                                | \$1,865.24            | \$9,102.52              | \$15,943.85             |
| Salary-Fin Services                     | \$2,543.90            | \$2,637.67              | \$2,762.09              |
| Salary-Engineering                      | \$18,025.46           | \$23,771.97             | \$30,036.71             |
| General Contract                        | \$254,377.84          | \$253,271.24            | \$259,388.68            |
| Closure Costs – Annual                  |                       |                         | \$40,364.00             |
| Groundwater Monitoring                  |                       | \$378.00                | \$2,482.35              |
| Special Waste                           | \$85,691.25           | \$41,056.51             | \$81,836.03             |
| Consulting Fees                         | \$58,771.64           | \$21,389.22             | \$15,739.93             |
| Insurance                               | \$4,954.00            | \$6,054.00              | \$6,535.00              |
| Leachate Remove/Disp                    | \$6,145.00            | \$4,082.00              | \$3,135.00              |
| VISA/MC/DD                              | \$2,380.00            | \$1,972.92              | \$3,688.45              |
| Materials                               | \$8,424.39            | \$13,951.64             | \$41,508.98             |
| Electricity                             | \$1,847.44            | \$1,866.01              | \$3,225.68              |
| Natural Gas                             | \$4,275.76            | \$4,007.16              | \$4,438.94              |
| Phone, Cell, Net                        | \$804.24              | \$831.70                | \$863.77                |
| Equipment CHGS                          | \$1,226.07            | \$5,609.00              | \$13,644.52             |
| Computer Replacement                    | \$1,600.00            | \$1,600.00              | \$1,600.00              |
| TRF To Reserves-Landfill                | \$-                   |                         | \$-                     |
| TRF To Capital-Landfill                 | \$468,828.04          | \$367,091.02            | \$29,001.49             |
| <b>Total</b>                            | <b>\$921,814.40</b>   | <b>\$758,672.58</b>     | <b>\$556,195.47</b>     |
| <b>Expenditures - Hazardous Waste</b>   |                       |                         |                         |
| Hazardous Waste Roundup – Wages         | \$1,521.98            | \$1,359.69              | \$1,699.21              |
| Hazardous Waste Roundup Prog.           | \$10,965.90           | \$12,229.34             | \$11,407.18             |
| Hazardous Waste Roundup- Equip Chgs     | \$214.63              | \$64.00                 | \$81.26                 |
| <b>Total</b>                            | <b>\$12,702.51</b>    | <b>\$13,653.03</b>      | <b>\$13,187.65</b>      |
| <b>Expenditures - Landfill Projects</b> |                       |                         |                         |
| Projects - Exempt Salaries              |                       | \$29,895.65             | \$7,063.23              |
| Projects -4055 Materials                |                       |                         | \$545,603.67            |
| Projects - Equip CHGS                   |                       | \$1,746.50              | \$1,329.25              |
| Project - 4530 Materials                |                       | \$508,784.45            | \$(9,388.34)            |
| <b>Total</b>                            |                       | <b>\$540,426.60</b>     | <b>\$544,607.81</b>     |
| <b>Net Regional Landfill</b>            | <b>\$0.00</b>         | <b>\$0.00</b>           | <b>\$0.00</b>           |
| <b>Waste Collection</b>                 |                       |                         |                         |
| <b>Financing - Waste Collection</b>     |                       |                         |                         |
| Waste Collection Charge                 | \$(369,101.95)        | \$(377,155.04)          | \$(404,812.65)          |
| Compostable Material Coll. Fee          |                       |                         | \$(192,286.67)          |
| Waste Additional Tag Charge             |                       |                         | \$(433.81)              |
| Waste Disposal Charge                   | \$(204,353.75)        | \$(210,592.79)          | \$(233,261.41)          |
| TRF From Reserve – Operating            |                       | \$(9,635.00)            | \$(19,165.37)           |
| <b>Total</b>                            | <b>\$(573,455.70)</b> | <b>\$(597,382.83)</b>   | <b>\$(849,959.91)</b>   |
| <b>Expenditures - Waste Collection</b>  |                       |                         |                         |
| Waste Collection- Salaries              | \$1,494.87            | \$1,658.83              | \$1,461.44              |
| Waste Collection- Sal.Eng.Admin         | \$9,336.26            | \$8,570.86              | \$31,630.51             |
| Waste Collection- Contract              | \$357,717.00          | \$379,446.19            | \$586,195.75            |
| Waste Collection- Disposal Chg          | \$133,996.73          | \$110,543.33            | \$108,847.01            |
| Waste Collection- Materials/R&M         | \$355.98              | \$2,109.65              | \$24,463.00             |
| Waste Collection-Equip Chgs             | \$344.83              | \$578.72                | \$1,764.54              |
| Waste Collection- Reduction Review      | \$21,184.66           | \$9,635.00              | \$33,353.20             |
| TRF to operating- Waste Coll'n          | \$20,225.00           | \$50,000.00             | \$62,244.46             |
| TRF to reserve- Waste Coll'n            | \$28,800.37           | \$34,840.25             |                         |
| <b>Total</b>                            | <b>\$573,455.70</b>   | <b>\$597,382.83</b>     | <b>\$849,959.91</b>     |
| <b>Net Waste Collection</b>             | <b>\$0.00</b>         | <b>\$0.00</b>           | <b>\$0.00</b>           |
| <b>Recycling</b>                        |                       |                         |                         |
| <b>Financing – Recycling</b>            |                       |                         |                         |

|                                 | 2009           | 2010           | 2011           |
|---------------------------------|----------------|----------------|----------------|
| Recycling Charges               | \$(312,939.56) | \$(408,145.52) | \$(420,420.14) |
| Paper Commodity Revenue         | \$(24,303.60)  | \$(89,222.24)  | \$(156,803.48) |
| Recycling - County Cost Sharing |                | \$(44,000.00)  | \$(44,000.00)  |
| TRF From Capital- Recycling     | \$(58,354.64)  |                |                |
| Total                           | \$(395,597.80) | \$(541,367.76) | \$(621,223.62) |
| Expenditures – Recycling        |                |                |                |
| Composting Program- Wages       | \$4,228.29     | \$3,182.87     | \$494.92       |
| Composting Program- PW Wages    | \$3,629.92     | \$6,998.43     | \$11,682.54    |
| Recycling- Interdept Wages- CS  | \$492.54       | \$48.92        | \$-            |
| Recycling - Salary- ENG.Admin   | \$16,532.46    | \$13,389.37    | \$14,023.39    |
| Recycling- Contractor           | \$188,241.80   | \$230,905.13   | \$234,554.03   |
| Recycling – Advertising         | \$8,429.88     | \$8,338.91     | \$700.92       |
| Recycling - R&M                 | \$8,105.04     | \$6,586.03     | \$13,005.19    |
| Recycling – Insurance           | \$1,098.00     | \$3,080.00     | \$3,912.00     |
| Recycling – Grant               | \$105,625.00   | \$102,375.00   | \$104,400.00   |
| Recycling - Debenture Interest  | \$16,002.95    | \$14,557.82    | \$13,048.61    |
| Recycling - Debenture Principle | \$32,533.49    | \$33,976.02    | \$35,482.51    |
| Green Bin Program – Materials   | \$4,361.27     | \$4,549.34     | \$5,889.11     |
| Composting Program – Materials  | \$59.84        | \$286.79       | \$2.10         |
| Recycling - Equipment CHGS      | \$680.30       | \$4,366.59     | \$10,830.84    |
| Composting Program - Equip CHGS | \$5,577.02     | \$4,933.89     | \$615.00       |
| TRF to Capital – Recycling      | \$-            | \$103,792.65   | \$172,582.46   |
| Total                           | \$395,597.80   | \$541,367.76   | \$621,223.62   |
| Net Recycling                   | \$0.00         | \$0.00         | \$0.00         |

Information provided by the City of Camrose – Budget Reports (2009-2011)



**APPENDIX C**  
**PART 2 – BEST PRACTICES**  
**ASSESSMENT REPORT (AUGUST, 2012)**



**City of Camrose Waste Management  
Master Plan Phase 2 - Part 2: Best  
Practices Assessment**

Phase 2 - Part 2: Best Practices Assessment

Prepared for:

The City of Camrose

Prepared by:

Stantec Consulting Ltd.

August 2012  
1102-18706

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**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN PHASE 2 - PART 2: BEST PRACTICE ASSESSMENT**

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## **1.0 Introduction**

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The City of Camrose has already implemented some best practices into their waste management system including limited collection of kitchen organics, leaf and yard waste collection, the provision of a recycling depot for a variety of materials, a garbage bag limit to promote diversion of organics and recycling and various communication initiatives. The City also engages in strong public consultation processes when undertaking both corporate and waste management strategic planning exercises. The options presented in the following sections do not address these already implemented best practices and only represent best or 'better' practices that have not been implemented and that may serve to improve waste management system performance. 'Alternative' best practices are also discussed as appropriate; for example, the City could, as an alternative to or in conjunction with the current user-pay/bag-tag program, implement clear bag programs should it be determined that the switch would net better blue box capture results.

A range of appropriate best practices discussed below as 'opportunities' are included in this section to ultimately determine suitable modifications to existing programs and/or additional waste reduction, reuse, recycling and landfill disposal/operations initiatives that could be implemented in order to meet the City's goals toward achieving higher diversion targets and reduced disposal of waste at landfill. The following sections provide a compendium of waste management approaches that could be included in the WMMP over the short (1 to 5 years) term, mid (5 to 10 years) term, and long (10 to 25 years) term.

Based on the experience of the Project Team and the experience of other jurisdictions across Canada a full range of opportunities have been identified for consideration as part of the City's future solid waste management system. Particular emphasis has been placed on addressing 'gaps' identified in the 'status quo' system.

The opportunities described herein take into consideration the potential for partnerships or other arrangements that could provide for cost effective system improvements. These arrangements could include the singular or combination usage of options such as regional approaches with other municipalities, the potential for private partnerships and alternative contractual arrangements with the private sector. This best practices assessment also focuses on various program strategies the City could implement that might optimize external funding and/or reduce costs.

Although the primary focus of the waste management master plan (WMMP) is the residential waste management system, which accounts for the majority of waste material directly managed by the City and within the City's control, waste generated by the Industrial, Commercial, and Institutional (IC&I) sector is also discussed in detail with respect to various options to encourage diversion of those waste materials from the City's landfill. While the City has no flow control of waste from those sectors they are positioned to implement various incentives and penalties, regulatory mechanisms to support that sector in achieving higher waste diversion objectives.

Once this 'menu' of options is considered by the City the merits of individual options relative to each other will be assessed in order to assist in determining a conceptual waste management system consistent with the City's overarching goals, objectives and planning principles for development of the WMMP. Specific attention will be given to the various criteria that will be considered in the detailed assessment of preferred options as determined by the City. These criteria are described in Section 11 of the *City of Camrose – Waste Management Master Plan: Project Initiation Report*, June, 2012 and include but are not limited to considerations with respect to community acceptability, impact to diversion, impact to landfill, funding eligibility, cost, infrastructure requirements, staffing implications, ease of implementation and the like.

The sections presented below are organized such that broader administrative requirements associated with successful implementation of the preferred waste management system options are addressed first and foremost and then associated options are discussed in a way consistent with the 'waste hierarchy'. This means that the initial focus is on waste reduction and reuse, then potential improved or new waste diversion initiatives and lastly with discussion on managing disposal at the City's landfill.

Table 1-1 below summarizes the broad 'menu' of options identified in this report and for the City's consideration. While discussion of each of the options is provided in detail in this report the summary in Table 1-1 provides the City with a concise list of options that can (or not) be considered further as it relates to WMMP implementation. It also provides a mechanism for the City to refer to specific sections of the report that are of particular interest and that the City may identify as requiring further information or further focus in the implementation phase.

**Table 1-1: Summary of Waste Reduction & Reuse Options**

| Category and Option                   |                                      | Description                                                                                                                                                                 |
|---------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Program Administration Options</b> |                                      |                                                                                                                                                                             |
|                                       | Staffing Requirements                | Adequate staffing levels are required for strategy implementation, promotional & educational efforts and coordinating all aspects of the preferred management options.      |
| Monitoring & Reporting                | Waste Audits                         | Conduct regular waste auditing to determine participation, generation and capture rates as a means to monitor system performance and support planning and policy decisions. |
|                                       | Key Performance Indicators (KPIs)    | Monitor and/or measure KPIs to measure and evaluate system performance.                                                                                                     |
|                                       | Produce an Annual Report on the WMMP | An annual report can communicate an overview of the City's success in reaching goals and outline future plans for the WMMP to Council, residents and stakeholders.          |
|                                       | Plan Review                          | Implement a process which results in an annual review and updating of the Waste Management Communication Strategy                                                           |

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| <b>Waste Reduction &amp; Reuse Options</b> |                                                                             |                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | Take it Back Programs                                                       | Establish a voluntary program where the retailer is responsible for managing a product or material.                                                                                                                                                                                                         |
|                                            | Establish a Per Capita Waste Reduction Target                               | A measurable waste reduction target would be set, monitored and appropriately supported.                                                                                                                                                                                                                    |
|                                            | Develop Reuse Centres, Program and Partnering Initiatives                   | Involves the identification of specific community stakeholders (e.g. charitable organizations), potential partnerships, tools (e.g. web based waste exchange sites) and re-use program initiatives (e.g. curbside waste exchange events).                                                                   |
|                                            | Adopt Green Purchasing Policies                                             | Green Purchasing or Green Procurement Policies focus on the use of recycled materials to encourage product producers to use alternative sources of raw materials and to consider the products life cycle.                                                                                                   |
|                                            | Opt out of 'junk' mail delivery                                             | Support paper waste avoidance by providing residents with information on how to eliminate unnecessary mail.                                                                                                                                                                                                 |
|                                            | Diaper Waste Minimizations                                                  | Provide information as part of ongoing promotional and educational (P&E) initiatives on diaper waste minimization and promote the use of cloth diapers.                                                                                                                                                     |
|                                            | Endorse Extended Producer Responsibility and Waste Minimization Legislation | Support for provincial efforts to implement/enhance Extended Producer Responsibility programs in the Province.                                                                                                                                                                                              |
| <b>Promotion and Education Options</b>     |                                                                             |                                                                                                                                                                                                                                                                                                             |
|                                            | Comprehensive Communication Plan                                            | Develop a plan to communicate information supporting the objectives set out in the WMMP to the public including the design of promotional campaigns.                                                                                                                                                        |
|                                            | Continued Market Research                                                   | Implement on-going market research to determine the effectiveness of P&E initiatives, using the results to improve communication in areas that are identified as lacking by the community. Allows for the targeting of specific waste streams, programs or communities that require additional information. |
|                                            | Incentives and Social Marketing                                             | Community-based social marketing emphasizes direct, personal contact among community members and the removal of barriers to more sustainable actions and behaviours.                                                                                                                                        |
|                                            | Use Social Media                                                            | Embrace social media as a means to communicate diversion initiatives and new programs to the community at large, but on a more personalized level, by engaging individuals and groups alike through mediums such as Twitter, Facebook and blogs.                                                            |



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| <b>Recycling Materials Management Options</b>       |                                              |                                                                                                                                                                                                                                                   |
|-----------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                     | Recycling Depot Enhancements                 | Enhance the Centra Cam Depot to incorporate the changes associated with the WMMP such as an expansion to the facility (if curbside recycling is not implemented) or modification to the role of the depot (if curbside recycling is implemented). |
|                                                     | Blue Box Materials Processing                | Evaluate and compare the merits of single, two, and mixed stream handling and processing technologies including associated collection, transportation and processing costs.                                                                       |
|                                                     | Public Open Space Recycling                  | Open space recycling programs seek to capture additional recyclable materials from residential sources that are typically lost to disposal.                                                                                                       |
|                                                     | Special Event Recycling                      | Special events recycling programs target vendors or organizations and checks that appropriate recycling initiatives are in place.                                                                                                                 |
| <b>Organics Management Options</b>                  |                                              |                                                                                                                                                                                                                                                   |
|                                                     | Enhanced Organics Collection Program         | Enhance the current organics collection program through the expansion of compostable materials permitted in the program. A pilot study and comprehensive P&E program are recommended to assist in implementation this program.                    |
|                                                     | Alternative Organics Processing Technologies | Evaluate the merits of alternative organics processing technologies in addition to an expansion of current operations for long term management of organics.                                                                                       |
| <b>Residential Curbside Collection Options</b>      |                                              |                                                                                                                                                                                                                                                   |
|                                                     | Set-Out Limits                               | Examine potential for further restrictions on garbage to encourage participation in diversion programs.                                                                                                                                           |
|                                                     | Recyclable Materials Collection              | Evaluate the benefits of single, two, and multi-stream collection options and the associated efficiencies and costs of implementing each system.                                                                                                  |
|                                                     | Collection Frequency                         | Collection frequency is to be established dependent on the level of curbside service provided by the City and should include organics and recycling to be collected as frequently or more frequently than garbage.                                |
|                                                     | Co-Collection of Waste Streams at the Curb   | Co-collection of waste streams improve efficiencies and reduce costs and can be adapted to reflect the level of curbside service the City provides.                                                                                               |
|                                                     | Automated Collection                         | Automated collection involves the provision of carts to residents and is considered to be far more efficient than manual collection.                                                                                                              |
|                                                     | Provision of Collection Containers           | Evaluate options for increasing ability to capture additional material at the curb including use of larger blue boxes or collection in transparent bags.                                                                                          |
|                                                     | Bulky Materials Management                   | Evaluate the current disposal methods and consider alternative management options - depot, call-in service, 'trash & treasure days', vouchers and pick up.                                                                                        |
| <b>Multi-Family Sector Waste Management Options</b> |                                              |                                                                                                                                                                                                                                                   |
|                                                     | Provision of Additional Collection Services  | Provide the multi-family sector with diversion opportunities such as organics and recycling collection. This program would involve database management, monitoring and extensive P&E.                                                             |
|                                                     | Promotion and Education                      | Develop an outreach strategy, collaborate with building groups and involve building management in the implementation and management of this program.                                                                                              |

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| <b>Hazardous Waste Management Options</b> |                                                           |                                                                                                                                                                                                          |
|-------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | Management Options                                        | Evaluate current management practices, expansion of services through either expansion of current program and/or establishment of depots, consider establishing partnerships with EPR stewards to manage. |
| <b>Regulatory Mechanism Options</b>       |                                                           |                                                                                                                                                                                                          |
|                                           | Solid Waste Bylaw Update                                  | Review and identify areas for improvement to provide regulatory strength and enforcement capabilities. Many options noted above or below would require bylaw amendment as part of implementation plan.   |
|                                           | Enforcement                                               | Establish frame-work to support enforcement (including staffing) of diversion programs for residential sector.                                                                                           |
|                                           | Mandatory Diversion Bylaws - Residential and IC&I sectors | Mandate the diversion of recyclables and organics in both the residential and IC&I sector. Extensive auditing and surveying are key components to ensuring success of a mandatory diversion bylaw.       |
|                                           | Construction and Demolitions Waste Diversion Plans        | Mandate the diversion of construction and demolition wastes from the IC&I sector through implementation of a 'permitting' based system.                                                                  |
| <b>City Operations Diversion Programs</b> |                                                           |                                                                                                                                                                                                          |
|                                           | Lead By Example                                           | Provide diversion opportunities in municipal buildings, on municipal property and during City C&D projects to create resident 'buy in' to diversion programs.                                            |
| <b>IC&amp;I Waste Management Options</b>  |                                                           |                                                                                                                                                                                                          |
|                                           | Provide Promotion & Education Information to IC&I Sector  | Provide the IC&I sector with information regarding diversion programs and potentially partnership with the private sector to facilitate information sharing and promote waste reduction.                 |
|                                           | Data Collection                                           | Develop voluntary measure for haulers and private sector operators to collect and report data to monitor system performance.                                                                             |
|                                           | IC&I Sector Roundtable                                    | Organize a group (roundtable) including sector-specific representatives and the City to target waste related challenges of the IC&I sector.                                                              |
|                                           | Waste Diversion Certification and Awards Program          | Develop a program to identify and promote successful diversion programs within the IC&I community through a certificate or award to leader in waste reduction/diversion.                                 |
|                                           | Develop End-Markets                                       | Work with haulers, suppliers and producers to expand the types of materials collected and develop end-markets for recyclable materials.                                                                  |
|                                           | Green Building Incentives                                 | Provide training and incentives to the construction sector to build green in order to encourage more sustainable construction and/or mandate use of recycled materials in City projects.                 |

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| Facilitate Diversion             |                                                                   |                                                                                                                                                                                                                                               |
|----------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | IC&I Collection Program                                           | Examine the potential to provide collection of all waste streams from the IC&I sector located in the downtown core.                                                                                                                           |
|                                  | School Waste Diversion Program                                    | Examine potential partnerships with local school boards and other educational institutions to promote City programs and establish mutual goals for waste reduction and diversion.                                                             |
|                                  | Green Procurement Policies                                        | Implement Green Procurement Policies and develop a Green Procurement Guide specific to the IC&I and C&D sectors operating in the City.                                                                                                        |
|                                  | Strategic Partnerships                                            | Evaluate the merits of private/public partnerships to support diversion through the establishment of end-market, supporting infrastructure requirements, and P&E initiatives.                                                                 |
| Landfill Site Management Options |                                                                   |                                                                                                                                                                                                                                               |
|                                  | Rebranding/Repurposing of the Landfill                            | Rebrand the landfill to reflect both the current and future opportunities for diversion.                                                                                                                                                      |
|                                  | Community Resource Recovery Centre (CRRRC)                        | Community Recycling Centres (CRC) established in accessible locations within the City. This would facilitate diversion as residents would have 'local' access. Could be co-sited with transfer facility(s) to more efficiently use resources. |
|                                  | Differential Tipping Fees and Surcharges for Designated Materials | Implementation of differential tipping fees for mixed loads received at the landfill to encourage separation and diversion of materials. Tipping fees would increase for loads containing specified divertible materials.                     |
|                                  | Ban Designated Materials from Landfill                            | A disposal ban prohibiting the disposal of designated materials at the landfill.                                                                                                                                                              |
|                                  | Operational or Engineering Improvements                           | Examine potential operating/engineering improvements (e.g. landfill gas management, fill plan etc.)                                                                                                                                           |
|                                  | Provide Supporting Infrastructure for IC&I Waste Diversion        | Develop a re-use area for C&D materials and a recycling station for divertible materials for the IC&I sector.                                                                                                                                 |

## 2.0 Program Administration Options

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### 2.1 STAFFING REQUIREMENTS

Many municipalities have staff allocated specifically to waste reduction, diversion and enforcement programs. Sufficient staff resources will be necessary for communicate strategy implementation, from the development and distribution of promotional and educational materials to coordinating all aspects of the preferred management options ultimately identified in this WMMP.

Sufficient staff resources will be necessary to coordinate all aspects of the preferred management options ultimately identified in this WMMP.

Each program and combinations of programming will require varying levels of staff support but adequate staffing levels as ultimately recommended will confirm that programs are implemented in accordance with approved budgets and schedule. Once a set of options for the preferred waste management system has been determined and the system has been designed from an implementation standpoint (e.g. years 1 through 5, 5 to 10 years, 10-25 years), an associated staffing compliment will be accordingly recommended for consideration in the City's future annual operating budgets.

It is already evident that additional staff resources are necessary to support and coordinate promotional and educational (P&E) initiatives for recently initiated programs like the kitchen organics collection program. Very preliminary consultation (at the Jaywalkers Jamboree) suggests that many residents may not even be aware of the program. The addition of this staff resource could be considered in the very short term planning period and, like with many other municipalities, could be a 'shared' position with other divisions with a similar 'sustainability' focus like water conservation as one example.

While the impacts of successful P&E programming are discussed in Section 3.8 it has been demonstrated in other municipal jurisdictions that adequate allocation of staff resources is essential for the successful implementation of P&E activities and the associated success of waste management programs. In the past, the City had a part time educational promotions coordinator, a position that is under review at the moment and has an unknown future. At times the City may also require additional staff support for these initiatives, this could be summer or co-op students or other temporary help depending on specific campaigns that are being developed and implemented. A majority of the options presented in this report have a prominent P&E component that would require the deployment of P&E tactics and materials in coordination with the launch of new initiatives.

## **2.2 MONITORING AND REPORTING**

Monitoring and reporting are important aspects of system maintenance that can provide the City with useful information regarding landfill operations, waste diversion, curbside collection programs, capture rates, and participation rates. The information acquired during a monitoring activity such as waste auditing can be used for planning and policy decisions, and can provide required information to receive external program funding. Proper monitoring and measuring of waste management system performance serves a number of functions, including the ability to:

- Adhere to currently accepted best practices
- Identify issues within the system and effectively mitigate these issues
- Adjust implementation schedules if issues arise
- Assist in the selection and development of appropriate promotion and education (P&E) initiatives and
- Identify opportunities for cost savings and increased effectiveness of the system

The monitoring of system performance is an important aspect of confirming the proper functioning of the City's waste management system and ensuring goals as set out through the WMMP planning process are achieved. Effective monitoring also helps with several other reporting exercises including:

- Creating a consistent reporting structure applicable to existing City operations (landfill, the Centra Cam facility) for contract service providers and for new programs as they are implemented
- Reporting internally for departments and Council and
- Completing Statistics Canada biennial survey(s) if applicable

In coordination with the landfill, Centra Cam and other City operations could provide a report indicating monthly and annual tonnages of each material stream (garbage, recyclables, organics, C&D etc.) and other key data using a consistent format and reporting structure to confirm that all information is comparable from month to month, year to year.

Annual monitoring of waste tonnages would determine if there is a decrease in waste generation rates within the City over the WMMP implementation period. Based on the success of the WMMP the per capita waste reduction target could be increased or additional efforts/a change in approach may be identified as necessary.

### 2.2.1 Waste Audits

The City currently does not have a regular waste auditing program in place. Regular auditing of waste program performance, through observations of curbside behaviour (e.g. set-out and participation) and the collection and sorting of a representative sample of waste material, serve as the primary means of hard data gathering on program implementation.

Industry best practices recommend that a full audit should consist of four separate audits conducted over the course of a year on a predetermined and specific set of households. The areas chosen for an audit should reflect a variety of types of neighbourhoods and areas (e.g. detached single-family households, rural areas, and town homes), socioeconomic areas, and waste generation characteristics. Audits should be conducted during every season (winter, spring, summer, and fall) to confirm that accurate and representative information is collected. Seasonal audits account for differences and fluctuations in waste generation and composition associated with changes in consumption patterns (e.g. typically more single-serving beverage containers, fresh vegetable matter in summer months, more steel food and other packaging in winter). Garbage, recycling (if and when appropriate), and organics streams would be collected, sorted and weighed to confirm that all waste streams are considered.

Annual monitoring of waste tonnages would determine if there is a decrease in waste generation rates within the City over the WMMP implementation period.

This waste auditing practice provides the following key information:

- Participation and set-out data that can be used to support program decisions
- Generation rates and capture rates used for planning purposes
- Information which may be used to target specific education campaigns and,
- Baseline data to monitor pilot programs and other system changes

The information acquired during a waste audit is essential to support many of the planning and policy decisions that would be required during implementation of the WMMP and can provide information and data to support applications for various funding opportunities or grants.

### 2.2.2 Key Performance Indicators

A number of key system performance indicators should be monitored and/or measured on a regular basis to track system performance and the effectiveness of the recommended initiatives. Key performance indicators that should be tracked

Indicators can assist in establishing a need for increased promotion and education for a certain program, or highlighting problem areas where inefficiencies may need to be addressed.

include:

- Costs – gross and net cost/tonne for each waste stream managed
- Recovery rates versus residue rates – recycling (obtain from processor)
- Participation rates – in waste diversion programs (via waste audits)
- Promotion and education costs – cost/household per year
- Tonnes of material marketed – kilograms/household/year by material type (e.g. fibres, containers – obtain from processor)
- Tonnes of material collected – garbage, recycling, and other wastes
- Marketing revenues – for recycling (obtain from processor).

Key performance indicators are an excellent tool in measuring performance within a system, and to evaluate the performance of every program. These indicators can assist in establishing a need for increased promotion and education for a certain program, or highlighting problem areas where inefficiencies may need to be addressed. Prior to the implementation of the program, a system or database should be created to continuously monitor and track performance indicators.

### **2.2.3 Reporting**

It is ideal for the results of monitoring initiatives described above be reported on a regular basis internally and externally to all stakeholders.

This can take the form of an annual report on the WMMP. An annual report can provide an overview of the applicable objectives for that year and documentation on how goals were actually achieved. It could also include a list of issues that arose during the year and how these issues were mitigated. Finally, the report could include a section on future plans related to WMMP implementation for the following year.

An annual report, if implemented, creates an opportunity to communicate the success of WMMP implementation not just with Council, but also directly with interested residents and other stakeholders. The annual report should be in a succinct form that clearly identifies successes over the previous year, general performance and also areas where collectively the municipality and residents may need to improve performance.

An annual report, if implemented, creates an opportunity to communicate the success of WMMP implementation not just with Council, but also directly with interested residents and other stakeholders.



In addition to an annual report, the City could also confirm that all waste management related reports produced for Committee and Council include a section on how the report contents relate to the implementation of the WMMP. This would assist staff in adhering to the vision of the WMMP and also guarantee that all interested parties understand how each waste management activity relates back to the vision for waste management within the City.

## **2.3 PLAN REVIEW**

It is recommended that the City conduct periodic reviews and updates to the WMMP at various times throughout the planning period. It is recommended that in 2017, (year five of the WMMP) that the City completes a comprehensive review and update to the WMMP. This review should outline the goals and objectives met in previous years and also outline issues that arose over that period that may have hindered the implementation plan. This document should then be updated to reflect the review completed and provide a detailed implementation plan for the next five years of the planning period.

A five year review of the plan will better enable the City to adapt to any changes in the future including, but not limited to legislative, demographic, population changes and economic factors.

A five year review of the plan will better enable the City to adapt to any changes in the future including, but not limited to legislative, demographic, population changes and economic factors. As such, the review should consider the adjustment of key goals such as overall waste diversion targets and per capita waste reduction targets that may be necessitated as the result of such changes and to reflect changes in overall trends associated with the waste management system (e.g. consumer behavior, changes in packaging etc.).

Long term strategic planning processes require mandated review periods, however, updates should also occur with more significant or potentially unforeseen events. Examples of these changes include major facility events (e.g. opening and closing of landfills or transfer stations, facility modifications), major changes in economic conditions affecting population growth or industrial development, substantial changes in provincial or federal regulations or policy and any other major development that could significantly affect/alter the plan.



### 3.0 Waste Reduction & Reuse Options

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Options to reduce and reuse waste are essential for “re-thinking” wasteful behaviour. Reduction and reuse options tend to be very cost effective, with some budget requirements for staff time and promotion and education initiatives, but very modest capital or on-going operating costs.



Reduction initiatives that have been undertaken by other municipalities across North America can be drawn upon to guide the City in implementation of an expanded waste reduction program. Further to that, this strategic planning process offers the opportunity to assess existing City programs that may be enhanced to achieve their waste reduction goals.

The following sections outline a list of new and existing waste reduction and reuse program options for further assessment.

#### 3.1 TAKE IT BACK PROGRAMS

In order to decrease the amount of waste requiring management by the City, a “Take it Back” program could be established, outside of the program mandated by the Province, where the retailer is responsible for managing a product or material.

Some cities in North America have established voluntary “Take it Back” programs, whereby a retailer offers a voluntary recycling program; materials are either recycled or disposed of properly (e.g. Rona’s paint program) or the ENVIRx program for pharmaceuticals (discussed in Section 8.0).

Partnerships are developed with local businesses and charitable organizations to accept back specific used items from their customers or clients and therefore take over the responsibility of reusing, recycling or properly disposing of the materials.

The following are some examples of Canadian municipalities that have developed ‘take-it-back’ programs

- The City of Calgary has published a very comprehensive guide<sup>1</sup> to recycling and reuse in Calgary which provides information on locations which accept materials for recycling or reuse. The City of Calgary also maintains an electronic “Green Workplace Directory<sup>2</sup>” which provides information on recycling and reuse of material commonly used commercially.

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<sup>1</sup> [www.greencalgary.org/images/uploads/File/Reuse\\_Recycle\\_GC.pdf](http://www.greencalgary.org/images/uploads/File/Reuse_Recycle_GC.pdf)

<sup>2</sup> [www.greencalgary.org/green-workplaces/category/recycling/](http://www.greencalgary.org/green-workplaces/category/recycling/)

- The Recycling Council of British Columbia has established a retailer take back program for batteries, cell phones, eye glasses, plastic bags, electronics, medications, tires, CFLs, small appliances, packaging and used oil/filters/containers; some of these materials are part of the provincial stewardship program.
- The City of Edmonton maintains a reuse and recycling directory where residents can find out which charity, business or City service will reuse, recycle or dispose of unwanted household items.
- The City of Ottawa established a Take it Back! Program, in 1997, as a return-to-vendor program to provide residents with a convenient and safe way of reusing, recycling and/or safely disposing of household products. The program has grown to 800 retailer locations and charitable organizations accepting back over 150 different household products from City residents.

Participation in a program like this is voluntary; partnerships are developed with local businesses and charitable organizations to accept back specific used items from their customers or clients and therefore take over the responsibility of reusing, recycling or properly disposing of the materials. Typically, these guides are available online, in print and sometimes as an application for mobile phones. The partners in such a program benefit from the free promotional materials supplied by the City, a free web listing, increased customer flow and the ability to market themselves as an “environmental partner”.

Since the City does not maintain an extensive list of retailers that accept materials for take-back, the City might want to develop a formal agreement process with new and currently participating partners which includes commitments to reuse and divert materials where appropriate, proper disposal of remaining materials, definitions of acceptable materials, as well as monitoring and reporting requirements.

Partners will need to be consulted through the planning stage to develop appropriate P&E materials for use in-store. A continuous feedback mechanism should be developed and may include a standing committee, regular roundtable events and possibly a quarterly or bi-annual newsletter.

P&E tactics best suited to communicating this program and target audiences should be identified and incorporated into the annual communication plan, discussed further in Section 3.8.1. This should also include a re-design of the waste management portion of the City's website so that residents can easily find information on the Take It Back program and its partners.

To establish an accurate reporting structure, a full third-party audit could be undertaken on an on-going basis of all participating business to determine an accurate tonnage of the amount of material diverted through this program. This information can be used as a baseline

measurement, which then can be used to gauge the success of the program moving forward by comparing annual diversion tonnage data.

### **3.2 ESTABLISH A PER CAPITA WASTE REDUCTION TARGET**

Most municipalities measure the success of their waste management system based on the waste diversion rate it achieves; they do not measure waste reduction or set waste reduction goals. The City has recognized the importance of setting a waste reduction goal of 50% by 2015 which illustrates the City's shift in thinking towards adopting the principles of the "Waste Value Chain" in that a specific, measurable waste reduction target was set. This goal serves as a means to locally offset the trend of increased per capita waste generation that has been observed across the Province and the Country. The City has set the following waste reduction targets:

- Reduction of residential waste to 195 kg/capita by 2015 (was 360 kg/capita in 2010)
- Reduction of municipal solid waste (MSW) generation to 1000 kg/capita (including commercial waste) by 2015 (was 1560 kg/capita in 2010)

**Goal:** Reduce residential waste to 195 kg/capita and MSW to 1000 kg/capita by 2015.

To support achievement of these goals in the short term, the City needs to provide direction on how residents can achieve this goal by providing support through P&E initiatives and highlighting local reduction initiatives already underway. Generally, P&E information and materials should target single-use materials. Examples include plastic bags and the promotion of the use of cloth bags, single use beverage containers replaced by refillable containers, disposable diapers replaced by cloth diapers and the like (further discussion on diaper waste minimization is presented in Section 3.6).

Mechanisms to support this target could include initiatives such as providing tips for waste reduction online, such as information about the benefits of cloth diapers, promoting "litter-less" lunch programs and the use of a social media campaign to encourage residents to actively participate in policy making, for example, an online pledge to reduce waste. Specific waste reduction 'tips' can be developed for various sectors e.g. residential, schools, business.

These initiatives could be supported by a ban pertaining to a target waste stream, which would be in name only unless the necessary infrastructure is in place (i.e. a ban on water bottles requires an adequate provision of water fountains accessible to the public).

The City should also support National and International events such as Waste Reduction Week, the development of Extended Producer Responsibility (EPR) and partnerships with the IC&I sector (see Section 11.7.5) to reduce overall waste, specifically in packaging.

This option can be monitored through the evaluation of per capita waste generation over time as a measurement of the success of the reduction target.

### 3.3 DEVELOP REUSE CENTRES, PROGRAMS AND PARTNERING INITIATIVES

The re-direction of materials through an established charity or depot program and/or a city-run or controlled re-use facility could see increased diversion although somewhat less significant when compared to other programs (e.g. curbside recyclables collection). There is greater benefit from a social perspective for some communities in the context of supporting their lower income residents (and these facilities are sometimes very popular with college students). These types of facilities may be welcomed by some as they typically sell commonly needed household items like children's clothing, toys, small appliances and other needed items. Not only is there this obvious social benefit but the effect that most people 'just want to do the right thing' and would simply support these programs based on principle.

Some short term options available to the City include:

- Stronger promotion of reuse options which already exist in the City that may include organizations like Habitat for Humanity, Re-Store, Salvation Army, and others. These organizations divert materials from landfill through donation and re-sale.
- Many jurisdictions in North America promote a one-day waste exchange event at strategic times during the year (e.g. spring cleaning, return of students in the fall) where residents can place reusable items at the curb to be taken for free and used by others. One issue that can arise is that residents don't retrieve items not taken (e.g. back into the house or taken to the landfill if necessary) and so the program requires clear direction to residents as to the expectations of the program.
- The promotion and direction of reusable items through a newly constructed re-use centre/facility now often constructed in concert with a Community Resource Recovery Centre (CRRRC). A re-use centre/CRRRC could be accommodated with an expansion of the existing Centra Cam site and/or at the landfill (this is discussed further in Section 12.2). Many municipalities partner with charities (Salvation Army, Goodwill, Habitat for Humanity) to operate reuse centres at CRRCs.
- The City of Edmonton operates a dedicated reuse centre for "eco-art materials", as well as reuse centres at some of their eco-stations.

There is greater benefit from a social perspective for some communities.

The City can coordinate and promote a variety of partnerships for a variety of re-use and diversion initiatives within the City and by making use of already established organizations and supporting infrastructure.

Short term development of this option would involve the identification of specific community stakeholders, potential partnerships, tools (e.g. web based waste exchange site(s) and links) and re-use program initiatives that may be specifically suited to the City based on their own community dynamics. This option could be considered as a natural extension of a "Take It Back" Program and the formal agreements developed for that initiative. The City can coordinate

and promote a variety of partnerships for a suite of re-use and diversion initiatives within the City and by making use of already established organizations and supporting infrastructure. Mechanisms to achieving this in the short term include the formalization of relationships with partnering organizations and support of their services on the City's dedicated waste management webpages.

In the medium to longer-term consideration could be given to a reuse centre/CRRC concept. Various partnership scenarios have been implemented by other municipalities that could be assessed in more detail to identify that which might also be best suited to the City. The City already partners with Centra Cam Vocational Training Association, a non-profit agency, to operate the recycling depot and process recyclables; the City could consider an extension of this partnership for operation of other diversion programs.

As part of a more formal partnership agreement with various agencies the City could also create an incentive for those that support reuse and diversion initiatives by reducing disposal tipping fees for those partnering organizations. They would have to demonstrate through a reporting mechanism that the materials they collect are reused and/or recycled in a responsible manner (such as the service provided by Centra Cam).

Formal partnership agreements could outline acceptable practices, target materials, reporting requirements and incentives to partner so that potential partnership organization are provided with clear and concise goals and objectives and the mechanisms to provide ongoing reporting on program barriers and successes. These documents would also outline the City's contribution to programming which could include reduced tipping fees as discussed but at minimum supporting P&E programming and tactics to promote the mutually beneficial partnership (e.g. recycling directories, webpages, references in recycling guide and the like).

### **3.4 ADOPT GREEN PURCHASING POLICIES**

Green Procurement Policies (or Green Purchasing Policies) consider the broader environmental, economic, and social impacts of products in addition to price and quality (which are the focus of more typical procurement strategies). Green Procurement Policies typically focus on buying products that:

- Are made of sustainable or recycled materials
- Have a lesser amount of packaging
- Contain less toxic materials and
- Are produced as locally as possible

Green Procurement Policies encourage product producers to use alternative sources of raw materials and to consider the downstream effects of a product's life cycle.

Green Procurement Policies encourage product producers to use alternative sources of raw materials and to consider the downstream effects of a product's life cycle. Environmental benefits of implementing a Green Purchasing Policy include:

- Reducing greenhouse gas emissions
- Improving energy efficiency
- Reducing the release of ozone depleting substances
- Increasing reuse and recycling and
- Reducing the production of hazardous waste

With the increased availability of information online there is an opportunity for residents to further decrease the amount of paper waste generated within their household through such initiatives as stopping the delivery of unaddressed and addressed advertising mail.

The City has the opportunity to drive the implementation of a robust Corporate Green Purchasing Policy which will govern the procurement of all goods and services by the City. The implementation of a Corporate Green Purchasing Policy will demonstrate environmental leadership. This initiative was discussed as a short term goal for ecological sustainability in the Municipal Sustainability Plan.

The City should be the leaders in the development of corporate performance measurements to evaluate the economic, social and environmental impacts of the policy through the direct use of green procurement statements in the sourcing of goods and services.

Green procurement standards should:

- Include proximity to product clauses to reduce transportation impacts;
- Include a buy local food component when applicable;
- Include a public awareness campaign to demonstrate commitment to environmental sustainability;
- Include a measurement system that balances quality, price and environmental impacts with inputs from the business community.

The development of a robust green purchasing policy will continue to support green industry within the City boundaries and showcase the City as a leader in procurement policy development.



### **3.5 PAPER WASTE AVOIDANCE**

Waste minimization is at the top of the waste hierarchy, and contrary to popular perception, reducing the amount of waste that is produced can be achieved relatively simply by rethinking purchasing and consumer habits and being aware of avoidable sources of waste.

With the increased availability of information online there is an opportunity for residents to further decrease the amount of paper waste generated within their household through such initiatives as stopping the delivery of unaddressed and addressed advertising mail. In the short term, the City can support paper waste avoidance by providing information on how residents can use existing resources to stop the delivery of unaddressed and addressed advertising mail and soft cover phone books.

As a natural extension of a “Take it Back” Program, information on paper waste avoidance can be posted on the City’s website and incorporated into any potential web-based application. A supporting P&E program would be aimed at modifying consumer attitudes and behaviour.

Mid-term consideration should be given to engaging local media outlets that produce newspapers to develop partnerships to support print run reductions based on residents opting out of delivery. The City can support this through the promotion of online versions of local papers and flyers that are traditionally distributed directly to households.

This option can be monitored through the evaluation of per capita waste generation rate over time and supports the waste reduction target identified by the City and discussed in Section 3.2

### **3.6 DIAPER WASTE MINIMIZATION**

Diapers, both disposable and cloth, have an impact on the environment and any significant environmental advantage of one over the other hinges on the types and amounts of resources, water, and energy used to manufacture and/or care for the diapers. A review of several municipal waste audits undertaken by Stantec indicates that diaper waste can represent in the range of 3% to 4.5% of the municipal waste stream; which is not insignificant.

Consideration could be given to how to promote diaper waste minimization where appropriate, in support of the overall waste reduction target. In the short term, the opportunity exists to develop P&E materials to help residents manage diaper waste, including information on how to handle solids to decrease odour issues in the presentation of alternatives to disposable diapers such as cloth diapers and cloth diaper services.

A review of several municipal waste audits undertaken by Stantec indicates that diaper waste can represent in the range of 3% to 4.5% of the municipal waste stream.

Communities that have moved to bi-weekly garbage collection have provided their residents with information on using cloth diapers and cloth diaper services that are available in their

community as well as programs for the management of sanitary waste due to medical conditions and/or home daycare services. By making residents aware of available options, it provides a mechanism to encourage local solutions for managing this waste stream.

Further consideration could be given to engaging the community and social service sector to determine if subsidies to support the use of cloth diapers are appropriate and how such a program could be best managed to support reduction initiatives in all sectors of the community. Depending on the outcome of these studies, long term planning could include the development of a cloth diaper subsidy that would support the residential sector in the minimization of diaper waste.

### **3.7 ENDORSE EXTENDED PRODUCER RESPONSIBILITY AND WASTE MINIMIZATION LEGISLATION**

Beyond programs identified in this section that the City could have direct control of, further efforts to prevent and minimize waste can be directed at waste minimization legislation and programs at federal and provincial levels.

The City has the ability to play an increasing role in endorsing, encouraging and advocating that the provincial and federal governments become more active in developing and enforcing a regulatory environment that increases extended producer responsibility (EPR) requirements for brand-owners, manufacturers and importers of the goods that potentially wind up in the municipal waste stream.

EPR is an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle<sup>3</sup>. EPR puts the onus for managing waste back into the producer's hands so that municipalities do not have to deal with all of the environmental, social, and economic impacts of waste management. The Province has made progress on EPR such as the paint, electronics and tire stewardship programs, but there are other material streams (e.g. construction and demolition waste) for which EPR programs have yet to be developed.

EPR puts the onus for managing waste back into the producer's hands so that municipalities do not have to deal with all of the environmental, social, and economic impacts of waste management.

The province had proposed a C&D waste reduction program to increase the current 10% recycling rate of C&D materials by providing incentives to reduce, reuse and recycle more C&D materials. Progress was made with consultation and a Memorandum of Understanding (MOU) between Alberta Environment and Sustainable Resource Development (AESRD), the Alberta Construction Association and the Canadian Home Builders' Association. Industry stakeholders

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<sup>3</sup> [http://www.ccme.ca/ourwork/waste.html?category\\_id=128](http://www.ccme.ca/ourwork/waste.html?category_id=128)



showed support for a deposit-refund based program, however, to-date no further progress has been made on this initiative<sup>4</sup>.

The City should continue to lobby the provincial and federal governments for more regulations (and more enforcement) concerning EPR and stewardship programs. The Canadian Home Builder's Association produced a report entitled "Waste Management and 'Extended Producer Responsibility' Regulations in the Residential Construction Industry<sup>5</sup>" which documents a number of issues relating to application of EPR to IC&I and C&D waste as well as the status of EPR in Canadian provinces. The information in this report would be useful to the City when deciding on the issues requiring greater lobbying and/or changes to regulations.

### **3.8 PROMOTION & EDUCATION OPTIONS**

The City has identified improved communication with the public as one of the five strategic priorities in the document entitled "*Going Forward: The Roadmap to 2015*" as part of their strategic plan. The plan includes the development of a comprehensive community engagement process that includes leveraging technology and social media to improve communication among some of the initiatives. The following sections provide an overview of components of an enhanced communication program with residents that could be used to provide information on waste management programs.

#### **3.8.1 Comprehensive Communication Plan**

A comprehensive Communication Plan will confirm that a coordinated approach for the implementation of the waste reduction, reuse, diversion and disposal initiatives outlined in the WMMP. Without a communications plan, messages may be released to the public in a piecemeal fashion, which will not have as great of an effect as coordinated outreach. Effective communications plans contain four primary elements: design, funding, deployment, and monitoring and evaluation<sup>6</sup>, which are discussed in more detail below.

The design of any promotional campaign should be based on the overall Communication Plan. Goals and objectives should be identified to confirm that the approach taken is in concordance with the WMMP. Since each audience may have different requirements, it is important to identify and consider the needs of the target audiences. Also, tactics, timing and plans for monitoring and evaluating the success of the promotional campaign should also be considered during the design phase.

Funding is a necessary component of any promotional campaign; however the effective use of a budget is even more critical. In numerous studies undertaken in Ontario a

Without a communications plan, messages may be released to the public in a piecemeal fashion, which will not have as great of an effect as coordinated outreach.

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<sup>4</sup> Presentation at SWANA, March 2012, C&D Waste Sorting Facility, EWMC, City of Edmonton.

<sup>5</sup> <http://www.chba.ca/uploads/policy%20archive/2010/epr&wastemanagementscoping-mar15-10.pdf>

<sup>6</sup> KPMG, R.W. Beck. 2007. Blue Box Program Enhancement and Best Practices Assessment Project – Volume 1.

correlation between an increase in spending and an increased level of recovery for recycling programs has been found. Annually, through the Waste Diversion Ontario (WDO) datacall, information is gathered on P&E spending in correlation to tonnes of recyclables recovered. The table below illustrates the relationship between diversion rate and P&E costs. Those municipalities shown below who spend more on P&E have higher diversion rates. It should be noted that all of these municipalities have well established source separated organic waste programs contributing to their diversion rates and that these diversion rates are a function of all diversion programs not just curbside blue box recycling programs that these municipalities have in place.

**Table 3-1: Municipal P&E Expenditure vs. Diversion Rate**

| Municipality | Residential P&E costs per tonne of recyclable materials (WDO 2010 datacall) | WDO GAP Diversion Rate (2010) |
|--------------|-----------------------------------------------------------------------------|-------------------------------|
| Hamilton     | \$5.31                                                                      | 47.70%                        |
| Durham       | \$3.56                                                                      | 51.59%                        |
| Peel         | \$3.37                                                                      | 43.38%                        |
| Halton       | \$2.24                                                                      | 53.53%                        |
| Ottawa       | \$0.19                                                                      | 38.80%                        |

Once a campaign is designed and funded, its deployment should be based on a plan that identifies the specific initiative or initiatives, supporting tactics and a timeframe for release to target audiences. Examples of successful communication tactics include the use a mix of media including strategies such as radio or TV, calendars, websites, public relations, and social media. Sustained programs, with specific target messages and year-round exposure are identified as a best practice and are preferable to campaigns that are a one-time blitz.

Many municipalities employ annual feedback mechanisms to continue to monitor the success of their P&E programs and use the results for the development of their annual communication plans.

As part of the WMMP, a Communication Plan will be developed to reflect programs selected for the preferred system. This will set the stage for the implementation of various P&E initiatives to be undertaken at key points in short term WMMP implementation and that can be used as a framework for communications planning over the long term.

As is the case with the WMMP, the Communications Plan will require routine updating; the plan should be reviewed annually as it relates to communicating both existing and any new initiatives that may be undertaken and to set annual operating budgets accordingly. Monitoring and evaluation is also essential to gauging the usefulness and acceptance of different P&E tactics. Assessing the success or failure of a campaign can lead to improvements in the next campaign and elimination of those elements that were deemed unsuccessful or having limited impact. The simplest form of evaluation is the use of surveys to determine if the tactic has reached and had an impact on its target audience, although this method does require additional budget consideration, on an annual basis this could be coordinated with general satisfaction surveys

conducted by the City as a whole. The idea of continued market research is discussed further in Section 3.8.2.

### **3.8.2 Continued Market Research**

Continued market research has been identified as a mechanism that is essential to the continued development of various P&E materials and tactics that more effectively communicate the intent and requirements of program changes and to be able to gauge the impacts that those materials and tactics have on their target audiences. Many municipalities employ annual feedback mechanisms to continue to monitor the success of their P&E programs and use the results for the development of their annual communication plans. The use of focus groups is a tool that can be used to engage specific sectors including single family households, the multi-family and the IC&I sectors.

In 2011, the City contracted Ispos Reid to conduct a telephone survey of approximately 300 residents to gauge the level of satisfaction with City services. Of note was the mention of the need for additional information on garbage and recycling programs, as well as the fact that curbside recycling was ranked as third most important priority for the City at 54% of respondents, behind roads and infrastructure renewal (72%) and snow removal (61%).

Residents need to have feedback and reporting on how well they are doing and have the acknowledgement that their actions are making a difference.

The City of Edmonton routinely conducts public, online and phone surveys, with the latest survey held in 2011. Overall 84% were satisfied with waste management services. Similarly, Calgary also conducts similar citizen satisfaction surveys. The 2011 results indicated that waste management was the fifth most mentioned item as a priority for the City. Residents cited improvements in recycling/garbage services as a reason for improved quality of life.

The City can incorporate ongoing market research endeavours into its communication planning exercises and work between City departments to use research findings in a communication activity. By gathering continued feedback from all sectors that it serves, the City will be able to tailor P&E tactics and materials to address any identified gaps in communication.

### **3.8.3 Incentives and Social Marketing**

Social marketing is the systematic application of marketing, along with other concepts and techniques, to achieve specific behavioral goals for a social good. Community-based social marketing emphasizes direct, personal contact among community members and the removal of barriers and "roadblocks" to more sustainable actions and behaviours.

Community-based social marketing involves:

- Identifying the barriers to a behaviour;

- Developing and piloting a program to overcome these barriers;
- Implementing the program across a community; and
- Evaluating the effectiveness of the program.<sup>7</sup>

There are several behaviour change tools that can be employed through community-based social marketing including:

- Appealing to norms
- Prompts
- Commitments and
- Maintaining behavior change.

“Appealing to norms” attempts to encourage residents to behave similarly to others in their neighbourhood based on what is perceived to be normal behaviour. There are two types of norms, descriptive norms and injunctive norms.

Descriptive norms provide examples of what is commonly done. Descriptive norms reinforce that waste diversion through recycling and organic programs is normal and if a resident is not diverting waste, then he/she is not normal. Injunctive norms focus on what should, or should not be done and do not specifically target behaviours. For example, injunctive messages would focus on the benefits of recycling and environmental awareness. The City could appeal to these norms by targeting specific material types that are not achieving a high level of diversion. In this way, if a resident is not targeting that material, then they would not be considered “normal”. While appealing to the norms, prompts and commitments are useful to enacting a change, and are crucial to maintaining the change in behaviour. Residents need to have feedback and reporting on how well they are doing and have the acknowledgement that their actions are making a difference. Information on performance should be shared with residents and celebrated. Media events, notices on the front page of the municipal website, regular reporting through graphics on the waste management webpage would all be useful means of providing this feedback.

- Prompts remind individuals to recycle and place divertible materials in the proper container. Reminders can be stickers, magnets or even the recycling or organics bin itself. Other prompts can direct residents as to which materials belong in the proper receptacle. For example, the City of Hamilton promotes recycling and provides a visual prompt to its residents through the Gold Box



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<sup>7</sup> [http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/what\\_you\\_can\\_do/socialmarketing.cfm?attr=28](http://oee.nrcan.gc.ca/communities-government/transportation/municipal-communities/what_you_can_do/socialmarketing.cfm?attr=28)

Program. Through the Gold Box Program, residents who achieve a high level of diversion (determined through a waste audit of their waste set-out), receive a gold box for their recyclables. The gold box provides a visual cue to other residents that they too can receive a gold box if they divert their waste properly.

- Commitments include pledges that residents can take to agree to take action towards waste diversion and reduction. By making a public statement about his/her intentions, the person taking the pledge is more likely to follow through with their commitment. Residents could contribute to a waste reduction pledge posted on the City's website. Those taking the "Pledge" could be sent a special package of "tools" including prompts to help them modify their behaviour at home and at work.

Several social marketing tools have been developed to assist communities in developing community-based social marketing material.

- Tools for Change (<http://www.toolsofchange.com>) is a website developed through a partnership between Environment Canada and several supporting sponsors to provide communities with resources regarding community-based social marketing. The website offers tools and case studies in areas such as the environment (including waste management), health promotion, and safety.
- RecycleBank ([www.recyclebank.com](http://www.recyclebank.com)) is a program currently available in the US and UK in which the company will partner with a municipality to help promote waste management programs through incentives and rewards. Registered participants can track their contribution to diversion programs and earn incentive points, which can be redeemed with everyday rewards that are redeemable at national and local shops and businesses.
- Reverse vending machines are also available in the marketplace. They pay participants for depositing recyclable materials into their collection bins.

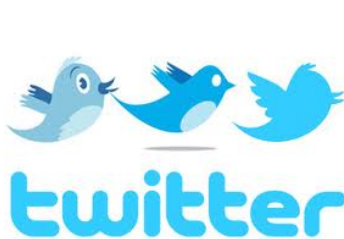
Only 50% of Camrose residents use the website as a source of information; it is unlikely that social media will be used by the majority of residents. In essence, the City will have to use a variety of media.

Should the City implement a curbside recycling program (discussed in Section 4.2) the City could implement a program like the "Gold Box" reward program to provide residents with direct positive feedback for their participation in the City's waste management programs. A program like this would generate positive PR which can be used to promote waste minimization and reduction initiatives and other diversion programs. RecycleBank and other potential rewards programs should continue to be evaluated and implemented when reasonable and feasible to support the goals and objectives of the WMMP.

### 3.9 USE SOCIAL MEDIA

An important aspect of any waste management program includes the development of directed information for a particular audience in a targeted approach. Social media is increasingly becoming an important method to connect with new audiences and is worthwhile for sharing information on specific programs and provides a means to reach out to residents, businesses and visitors.

The term "Social Media" refers to the use of web-based and mobile technologies which turns communications into interactive dialogues. It is a form of electronic communication through which users create online communities to share information, ideas, personal messages, and other content such as photos and videos<sup>8</sup>.



Most social media sites (Facebook, Twitter, LinkedIn, YouTube, etc.) provide easy

and free ways for organizations, agencies and governments to interact directly with individuals in a two-way form of communication. Because of the increase in mobile internet and smart phone usage, social media involvement has become a necessity for those organizations and agencies wishing to fully connect with their audience.

Many municipalities are embracing the use of Social Media to connect with residents to promote and communicate municipal programs available to them. The internet provides many tools and guides on how governments can best use Social Media, which could be referenced during development of this option within the larger communication strategy: a good example is the State of Connecticut, Department of Energy and Environmental Protection guide to Using Social Media to Promote

As an example, the Region of Halton's Waste Management Division in Ontario is utilizing both Twitter and a community blog ([Haltonrecycles.ca](http://Haltonrecycles.ca)) to provide its residents with an ongoing dialogue on waste management programs, initiatives and information.

To support the use of Social Media, the Region identified staff within the Waste Management Division from communications, planning, collection operations and landfill operations, a total of 10 staff, who would be willing and able to dedicated the equivalent of one half-day per week to contribute to and monitor the waste management social media accounts, specifically Twitter.

The Region conducted internal training on Social Media 101, best practices for Twitter, and blogging and external training on "what makes news, storytelling and clear writing, and photography and video best practices. Training was completed to confirm staff were prepared and able to represent the Region in the appropriate fashion online.

<sup>8</sup> State of Connecticut, Department of Energy & Environmental Protection. Using Social Media to Promote Recycling. 2011.



Recycling<sup>9</sup>. Also, the Continuous Improvement Fund of Ontario has developed a Social Media Guide<sup>10</sup>, which is helpful with initial development and planning a social media program. These resources could be used for research purposes, and supported with corporate training services.

The City should be cognizant of the preferred communication methods of its citizens as expressed during the last survey. Only 50% of Camrose residents use the website as a source of information; it is unlikely that social media will be used by the majority of residents. In essence, the City will have to use a variety of media.

The City, as part of the communication program, could continue to use social media sites (Twitter, Facebook, RSS) to promote the City's ideas on waste management and support them through links on website (with appropriate legal disclaimers) which can be a mechanism to make waste management programs relatable to residents through real life experiences. This would be a low cost option as it would require minimal staff time, but does need support from Corporate Communication, IT and the Legal Department.

The identification of potential staff resources from throughout the City could be completed, which has the potential to provide multiple views to be communicated through social media on how to participate in waste management programs. Features of the waste management portion of the City's website should be optimized for mobile phones, tablets and other devices to provide residents with easy access to information online.

Consideration can be given to the idea of hiring a third party to maintain social media sites or to train City Staff to maintain the social media sites. Consideration could be given to utilizing resources at educational institutions, through co-op placements, summer students or contests to develop apps or other aspects of social media. Coordination with other departments is recommended to confirm that the Social Media program is in line with any other Social Media efforts and that a consistent approach to online interactions is maintained.

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<sup>9</sup> Using Social Media to Promote Recycling. [http://www.ct.gov/dep/cwp/view.asp?a=2714&q=487970&depNav\\_GID=1645](http://www.ct.gov/dep/cwp/view.asp?a=2714&q=487970&depNav_GID=1645)

<sup>10</sup> CIF. Relationships Matter: Social Media and Internet Marketing for Blue Box P&E Programs. <http://www.wdo.ca/cif/pdf/CIF-Social-Media-Guide.pdf>

## 4.0 Recyclable Materials Management Options

### 4.1 RECYCLING DEPOT ENHANCEMENTS

Currently, the City has a partnership with Centra Cam to process the recyclables delivered by residents to the depot. The depot is operating at full capacity and has limited additional storage however the City owns the adjacent property upon which additional capacity for receiving, storage and handling may be able to be created.

The depot will likely continue to play a role in the City's diversion efforts, regardless of whether or not curbside recycling is implemented. Most likely, only the scale and nature of the depot's contribution to programming would change.

Since the completion of the Solid Waste Collection and Diversion Study, additional materials (especially plastics) have been accepted at the depot, which was one of the recommendations of the study. Another of the recommendations was to modify the operating hours of the depot; possibly closing on one of the days with lower traffic volumes (e.g. Sundays).

A brief internet search revealed that there are a variety of practices with respect to operating hours for Recycling Depots across the Country (Table 4-1). Recycling Depots are now more commonly referred to as Community Recycling Centres (CRCs) or Community Resource Recovery Centres (CRRCs) and this concept is discussed further in Section 12.2 and in the context of constructing a new CRRC at the City's landfill.

**Table 4-1: Operational Hours of Community Recycling Centres**

| Facility(ies)                | Operating Hours                                                                                                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Edmonton Eco-stations</b> | Summer Hours: mid-March – mid November<br>Monday - Saturday 9 am-6:30 pm<br>Sunday & Holidays Closed<br>Winter Hours:<br>Tuesday - Saturday 9 am - 4:30 pm<br>Sunday, Monday & Holidays Closed                                  |
| <b>Hamilton CRCs</b>         | Monday – Saturday – 8 to 6 pm                                                                                                                                                                                                   |
| <b>Peel Region CRCs</b>      | Operating hours vary depending on facility; for example, Tues. to Sat., 8:30 am - 4:30 pm or Mon. to Sun., 8:30 am - 4:30 pm<br><br>Some locations have extended evening hours every Thursday until 8 pm from May to September. |



**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN PHASE 2 - PART 2: BEST PRACTICE ASSESSMENT**

3BRecyclable Materials Management Options

August 2012

| Facility(ies)                     | Operating Hours                                                                                                                                                                                           |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>York Region CECs</b>           | Operating hours vary depending on facility; for example, Daily 8:30 to 4:30 except Tuesday and Wednesday or Monday to Saturday from 8:00 am to 5:00 pm or Open 9:30 to 4:30 except Tuesday and Wednesday. |
| <b>Spruce Grove Eco-Centre</b>    | Mon, Tues, Fri, Sat: 10 am – 6 pm<br>Wednesday: Closed<br>Thursday: Noon – 8 pm.<br>Sunday: Closed                                                                                                        |
| <b>St. Albert Recycling Depot</b> | Sun, Mon: Closed<br>Tues, Wed, Fri: 10 am to 6 pm<br>Thurs: 12 pm to 8 pm<br>Saturday: 9 am to 5 pm                                                                                                       |
| <b>Okotoks Recycling Centre</b>   | Mon, Tues, Wed, Fri: 9:00 am – 5:00 pm<br>Thurs: 12:00 pm – 8:00 pm<br>Sat: 9:00 am – 5:00 pm<br>Sun: 12:00 pm - 5:00 pm                                                                                  |

In the short term, the City and Centra Cam could evaluate traffic volumes to determine days and times most appropriate to adjusting operating hours.

If the City implements curbside recycling, the depot may play a modified role as the same quantities of blue box type materials will not likely be received. Instead, the depot could continue to receive other materials and start accepting other reusable or recyclable materials e.g. textiles, metals, reusable goods like clothing, furniture, mattresses, box springs for reuse or recycling, carpeting, household demolition materials like drywall, household hazardous waste (HHW), e-waste (electronic waste), etc. The depot would need to be reconfigured to accommodate different materials.

If the City does not implement curbside recycling and chooses to implement other programs to increase diversion (e.g. increased multi-residential sector promotion, expanded organics program with biweekly garbage collection, further reduced bag limits, material bans at landfill etc.), there will very likely be a significant increase in volumes of material to the depot. The impact of these programs will need further consideration in the next phase of the WMMP with respect to the existing depot configuration, space and current handling practices.

Either way, with or without curbside collection of recyclable materials, other program changes resulting from the WMMP will affect the current depot program. In either case the City may have to further investigate the adjacent property for additional depot operations that may include programming described here as well as those described in other sections like the reuse centre discussed in Section 12.2. The existing operating model appears to work well and the City

could continue to partner with Centra Cam as well as one or more non-profit agencies (e.g. Habitat for Humanity, Salvation Army etc.) as many other municipalities have done.

## **4.2 BLUE BOX MATERIALS PROCESSING OPTIONS**

There are a number of processing options that have to be evaluated to move from the current depot based recycling collection program to an enhanced program that offers a higher level of service through curbside collection to the City's residents. Detailed discussion on the collection of recyclables and impacts associated with the various processing options described here is provided in Section 6.2.

The processing of recyclables is a straightforward concept; taking collected recycled materials, sorting through them to remove unwanted items and other materials as appropriate and producing a clean commodity that can be sold to buyer/market for conversion back to another product.

The processing of recyclables is a straightforward concept; taking collected recycled materials, sorting through them to remove unwanted items and other materials as appropriate and producing a clean commodity that can be sold to buyer/market for conversion back to another product. The current depot collection program in the City is set up so that the resident acts as the primary processor, by putting the proper materials in the designated areas, so that the collected material are somewhat clean and can be shipped directly to market. This system is functional when dealing with a limited amount of materials, but can become less efficient as the either the amount of collected materials increases or the number of materials accepted increases or some combination of both.

The City can increase its capture of recyclable materials by providing the convenience of a curbside collection program which would enable three basic ways that recyclable materials could be processed on the City's behalf. There is no discussion on the feasibility of the City constructing its own Materials Recovery Facility (MRF) because of the relatively low volume of recyclable materials that would be captured in a curbside collection program.

### **Multi-Stream Handling and Processing**

A multi-stream processing facility is very similar to the current system in use at the City recycling depot. This type of facility has a low capital cost (compared to other programs discussed below), as there is very little equipment required for the operation. Generally, all that is needed is sufficiently sized building that can accommodate a number of storage bays (which correspond to the streams being collected) for the incoming material. A small baler would still be needed and the facility could also have a conveyance system with a magnet for metal separation to separate steel from aluminum cans. A conveyor could also be used to run plastic or paper materials (e.g. to sort cardboard from paper or certain plastics) using manual sorting. There would be very little sorting in general with this system as described. Sorting would also include a quality check for the removal of some obvious "contamination" prior to shipment to various brokers or end-markets.

## **Two Stream Handling and Processing**

A two stream processing facility is set up to receive collected recycling in two streams, a mixed fibre stream and a mixed containers stream. The streams are kept separate and are processed utilizing various mechanical (different types of equipment) and manual (people) means. For example, with fibres, cardboard is removed mechanically and newspaper can also be removed mechanically from other paper items, limiting the manual sorting that needs to be done. The same can be done with the containers – steel, aluminum and glass containers can be removed by mechanical methods so there is limited amount of manual is required, generally confined to the removal of contaminants/quality control. The sorted materials are baled and transported to market or shipped loose as appropriate e.g. glass. Advantages associated with this program are that processing costs are generally lower than for single stream recycling (but collection costs can be higher), it usually permits a very broad range of materials to be recycled and it provides the flexibility to adjust to market conditions by modifying sorting (e.g. separating newspaper from a mixed fibre stream when markets permit) to generate higher revenues for that material. While there is more opportunity for contamination of materials with a two stream program than with a multi-stream program (e.g. cross-contamination of containers in the fibre stream and vice-versa), it has less potential for this problem than single stream processing systems do.

## **Single Stream Handling and Processing**

A single stream processing facility can receive fully commingled fibres and containers and is very similar to a two stream processing facility, with the exception that much more equipment is needed at the front-end and usually in the form of a series of disc screens to separate fibres from containers.

Materials are then managed much the same as in a two stream facility but more diligence is required to confirm that there is no cross-contamination of materials as discussed above. The major advantage to a single stream program is that the costs for collection can be substantially lower (especially when compared to a multi-stream collection system) and in the case of the City these materials would also require transfer to a distant MRF and those handling and transportation costs would be lower as well (than for a two stream system). Disadvantages include the fact that processing costs are generally higher and there is some potential for cross-contamination of materials sent to markets which could yield lower revenue from the same materials.

The major advantage to a single-stream program is that the costs for collection can be substantially lower (especially when compared to a multi-stream collection system) and in the case of the City these materials would also require transfer to a distant MRF and those handling and transportation costs would be lower as well (than for a two-stream system).

It would likely be in the best interest of the City as a first step (prior to any consideration to a curbside collection program and its configuration) to undertake a formal Request for Expression of Interest (REI) process. This would enable the City to better determine its various processing options with respect to the long term management of its recyclable materials and to assess

those options relative to the supporting infrastructure that would be required e.g. additional sorting equipment at the existing depot or a transfer station for more distant processing of materials.

This process would also enable the City to determine the full range of materials that could be collected as part of the program and assist in determining more definitively what those collection costs may be as well as appropriate collection containers. Some MRFs, for example, are capable of receiving materials in blue transparent bags and some are not. The processing options available to the City will strongly dictate the characteristics of the rest of the system.

### **4.3 PUBLIC OPEN SPACE RECYCLING**

Open space recycling programs seek to capture additional recyclable materials from residential sources that are typically lost to disposal in areas such as parks and the downtown business core. These programs have their challenges but a series of best practices have/are being developed for program implementation. Stantec conducted a review of open space recycling programs across Canada (*Open Space Recycling Better Practices Review*) and identified program inhibitors to be cost and contamination of the recycling stream but also various best practices that could help overcome these obstacles including the use of clear and consistent signage, proper bin design and placement and good communications between collectors and facility managers.

The overall feasibility and success of such a program would be more likely if the system includes the capability of the City to collect either dual stream or single stream recyclables.

The *Open Space Recycling Better Practices Review* also noted the importance of placing recycling containers and garbage containers side-by-side. Therefore, for a successful open space recycling program, the City could consider implementing and/or improving its open space recycling programs. For example, if a garbage container is not placed beside a recycling container, individuals may simply throw all their waste (i.e., both garbage and recycling) into the recycling container, resulting in a very high contamination rate. Implementing both open space recycling and garbage programs simultaneously should achieve lower contamination rates and higher diversion rates.

The overall feasibility and success of such a program would be more likely if the system includes the capability of the City to collect either dual stream or single stream recyclables (discussed in Section 4.2 above), that is, more of a 'mixed' recycling stream allowing for the collection of commingled containers (aluminum, plastics, glass) which would allow for increased capture of these materials in open spaces with simple collection container set up. Materials collected in open spaces also tend to be more contaminated (with non-recyclable materials) and Materials Recovery Facilities (MRFs) capable of processing these more mixed recycling streams are also capable of handling reasonable degrees of contamination.

Another option for the management of beverage containers in public spaces is the use of reverse vending machines for collection of metal, glass and plastics containers. These machines have been used in communities to capture this recyclable stream in high traffic areas, parks and on university campuses. These machines provide a means for source separation of materials, with a decrease in the incidence of litter and increase of diversion of this material from landfill, all while positively promoting recycling programs through cash incentives. The City could use such a program in its downtown core and high traffic tourist areas. This needs to be considered carefully in the context of desired reduction of these target materials (e.g. single serve beverage containers).



Tomra T-710 RVM  
[www.tomra.com](http://www.tomra.com)

The City could consider the implementation of a pilot program once the determination is made with respect to the various recyclable materials processing options discussed above and that program is implemented. These programs serve to bring awareness to the waste diversion efforts associated with the WMMP and provide constant messaging (consistent with residential recycling program) to the public.

Over the mid-term and based on the results of the pilot program, staff could develop and implement a comprehensive open space recycling program across the City and, in concert with whatever processing system is adopted for the long term. By making an effort to collect recyclables in public spaces, the City will demonstrate to residents and visitors that waste management programs are a priority within the City of Camrose and that recycling is just as important where we 'live' as where we 'play' and as discussed in Section 10.0, also where we 'work'.

#### **4.4 SPECIAL EVENT RECYCLING**

Special events recycling programs send the same message as open space recycling programs with respect to the importance of recycling and providing consistent messages to the public wherever they may be. This type of program targets vendors or organizations, typically using municipal facilities like parks, arenas for festivals or special localized events. This program complements an open space recycling program. In many municipalities event organizers are required to get a permit for these events and this provides an opportunity to confirm that event organizers approach waste management in a fashion consistent with the municipal waste management program. Permitting could require that recycling and organics diversion are mandated but should be supported with promotional and educational materials designed for event planners and facility users.

In many municipalities event organizers are required to get a permit for these events and this provides an opportunity to ensure that event organizers approach waste management in a fashion consistent with the municipal waste management program.

Some municipalities have Special Events collection programs where some or all of the following are collected: recyclable materials, flattened/bundled cardboard, organics and garbage.

Two examples of well-established special event recycling programs are described below.



- The City of Hamilton in Ontario funds waste collection from Community festivals and special events held on City property. All eligible events meeting the criteria for provision of waste management services are required to actively participate in Hamilton's waste diversion programs (recycling and organics diversion) and Hamilton covers the cost for collection and disposal of all streams including garbage. In 2009, 40 events were identified as eligible for this collection service and a budget of \$70,000 was earmarked to cover the cost of collection and processing services. Hamilton's Waste Management Division provides the following services:

- supply, delivery and removal of garbage, recycling and organics bins
- cleaning of containers for use at other events
- supply of community outreach signage to promote diversion capture of acceptable materials
- collection, processing and disposal of all materials collected

Non-community events held at Hamilton facilities are also required to participate in the City's waste diversion programs and the Waste Management Division provides access to recycling and organics collection while the costs of collection and processing are paid for by the event organizers.

- The Region of Halton has developed guidelines which define eligible events and terms of service for special event collection. They also developed a self-assessment guide to help organization manage and minimize waste generated through their activities and events. The Region requires participating organizations who wish to use their collection bins and P&E materials set up and attend a training workshop lead by the Region. The Region will supply carts and P&E materials to eligible organization for events on a first come first serve basis, hinging on their compliance with the following requirements:

- Submitting Request Form at least six weeks in advance of event
- Submitting a waste diversion plan with Request Form
- Recognizing Halton's in-kind sponsorship with logo placement on website and in printed materials



Halton's program consists of a hybrid costing structure, where the Region will collect acceptable recycling and organics at no cost during normal operating hours, but collection services required on weekends and statutory holidays need to be contracted through a private hauler.

The City holds a major annual festival, the Big Valley Jamboree, which draws over 80,000 attendees. It is understood that a private company is responsible for waste handling at the event and may provide opportunities for waste diversion however there may be opportunities for improvements to this program as well as opportunities at other annual or even less frequent events in the City. This year (2012), the City is sponsoring a meal at a kick-off party<sup>11</sup>; this is an example of an event where the City could have some control over waste diversion practices, (e.g. recycling).

As illustrated above, there are many different approaches to providing a Special Event Recycling program and the City should, over the short term, identify opportunities for implementing waste diversion opportunities in the City at selected special events. The development of the program should include identification of eligibility criteria, collection services to be provided, type and number of collection containers, and supporting P&E materials, including guidelines, training and signage.

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<sup>11</sup> <http://www.camrosebooster.com/node/1426>

## 5.0 Organics Management Options

Organic materials such as yard waste and limited food waste make up approximately 50% of the residential waste stream. The City is diverting an estimated 13% of its waste with the current program. Municipalities are generally motivated to develop enhanced organics programs as a means of removing the organic fraction of waste from the garbage stream which reduces methane gas production, saves landfill capacity and reduces the costs and risks associated with siting a new landfill/landfill expansion. This section discusses the option of an enhanced organic waste source separation program and various options with respect to organic waste processing for the City to consider with an enhanced program. Improved processing infrastructure could also facilitate composting of the large amount of organic waste generated by the IC&I sector

Organic materials such as yard waste and limited food waste make up approximately 50% of the residential waste stream. The City is diverting an estimated an approximate 13% of its waste with the current program.

### 5.1 ENHANCED ORGANICS COLLECTION PROGRAM

The City could elect the option of enhancing its organic waste collection program through the expansion of the list of compostable materials permitted in the program. The current yard waste and limited food waste program allows for diversion of the following materials:

#### Acceptable Yard Waste and Limited Organic Food Waste

- Small Shrubbery
- Hedge Prunings
- Grass Clippings and Leaves
- Sawdust
- Fruits, Vegetables, Peelings
- Coffee Grounds, Filters, Tea bags
- Food-soiled Paper and Cardboard (e.g. pizza boxes)

An enhanced organics collection program could allow for capture and diversion of the following materials:

#### Enhanced Organics Program List of Acceptable Materials

- |                                                            |                                                                                              |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| • Bread, toast cereal, baked goods & pizza                 | • Shredded paper                                                                             |
| • Fruits and vegetables                                    | • Soiled paper food packaging, cardboard egg cartons, pizza liners                           |
| • Cake, cookies, pies, muffins & candies                   | • Soiled paper towels, paper napkins, facial tissues, paper towel rolls & toilet paper rolls |
| • Coffee grounds & filters, tea bags                       |                                                                                              |
| • Eggs & egg shells                                        |                                                                                              |
| • Pasta, rice, couscous, potatoes, oatmeal, flour & grains |                                                                                              |



### Enhanced Organics Program List of Acceptable Materials

- |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Nuts &amp; nut shells, peanut butter</li> <li>• Jams and jelly</li> <li>• Sauces, salad dressing, syrups</li> <li>• Dairy products, cheese and yogurt</li> <li>• Meat, fish &amp; shellfish</li> <li>• Fats &amp; oils, lard, gravy, butter &amp; margarine</li> <li>• Small Shrubbery</li> <li>• Hedge Prunings</li> <li>• Grass Clippings and Leaves</li> <li>• Sawdust</li> </ul> | <ul style="list-style-type: none"> <li>• Paper plates, paper take-out food trays &amp; containers, paper cups</li> <li>• Parchment paper, tissue paper, meat/fish paper</li> <li>• Houseplants</li> <li>• Hair, pet hair, feathers, nail clippings, dryer lint</li> <li>• Popsicle sticks, wood tooth picks, chopsticks</li> <li>• Pet waste and kitty litter</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

As a first step, and in concert with the provision of Green Bins and Kitchen Catchers, (discussed in Section 6.6 below) the City could undertake a pilot study in selected areas of the City. This would enable the City to gauge what the future success of a City wide program might be and to gather 'lessons-learned' with respect to implementation and the use of various promotion and educational techniques that may be employed.

A pilot study area should be reflective of a broad cross-section of demographics and could include multi-residential dwellings. The duration of the pilot program should be approximately six months which is an adequate amount of time to gauge the effectiveness of P&E materials, willingness of residents to participate; logistical issues with collection, etc. The City should undertake pre- and post-pilot surveys to examine successes and failures of the pilot so issues can be identified and resolved before implementation of a City wide program. A waste audit should also be undertaken to assess participation, capture rates and contamination levels and general understanding of the program by those participating in the pilot study. Funding opportunities for this type of pilot program are available, such as the Green Municipal Enabling Fund (up to \$350,000).

A comprehensive P&E program will be required to assist in increasing resident support and participation. The P&E component can consist of activities such as provision of free samples (presented as a 'kit' including new collection bin(s) and compostable bag samples). In the long term residents would need to be provided with an up-to-date list of acceptable manufacturers and compostable bag brands including picture and logo identification. Retailers in the City would need to be engaged in providing opportunities to residents to purchase compostable bags in order to confirm that success of the program if implemented on a City wide basis.

An enhanced program may also encourage the IC&I sector to participate in an organics diversion program because of the increased list of acceptable materials. Sources of large amounts of organic waste include schools, hospitals and long term care facilities, grocery stores, restaurants and food manufacturers. The addition of a broader range of organic materials to the program makes source separation more economically viable and generally more efficient for many of these locations. Grocery stores, for example, sometimes have fairly

limited space for compactors and bins but typically already use self-contained (leak-proof) bins because of the nature of the waste they generate. With added materials these bins could be repurposed for organic waste collection with smaller, front-end or other roll-off bins dedicated to the remainder of the waste stream (and ideally cardboard). The expanded program would enable sufficient volumes of waste to be collected on a frequency that would reduce potential issues with odour but that would confirm that the bins are full when collected. These programs need to be cost-efficient in this way to enable participation from this sector.

## **5.2 ORGANICS WASTE PROCESSING OPTIONS**

The City can continue to use the existing composting site at the landfill for processing of organic materials but composting, particularly in the context of an expanded program and potential for impacts like odour, should be undertaken in accordance with best practices. Properly managed organic waste can be composted into a marketable final product that in some municipalities has been provided back to the community for their personal use, used at City parks and other facilities and also to community groups (such as Boy Scouts, etc.) for fundraising purposes.

Recommendations from the KC Environmental report include the continued operating of the current composting system at the landfill, that it be expanded and that the City engage a composting expert. They further suggest that operations be contracted out to reduce risk of odours and associated costs. Composting operations are best suited to sites and design considerations that prevent or control off-site environmental impacts, especially water contamination, odours, dust, noise, vermin and vectors. Site considerations should include adequate separation between the facility and adjacent land uses, especially sensitive land uses (residential, schools etc.), and sensitive environmental features. The site should be of sufficient size and convenient to transportation routes which the landfill site appears to be.

Site size and design for an expanded operation should take into consideration operations as they relate to pre-processing, processing, curing and finishing in capacity calculation and relative to composting pad size, working surfaces and other site considerations.

The City currently employs an outdoor windrow method of composting and this may or may not continue to serve the City's needs in the long term, either in the interest of expanding the City's program as described above and/or in the context of providing capacity to the City's Industrial, Commercial & Institutional (IC&I) sector.

Composting operations are best suited to sites and design considerations that among other things prevent or control off-site environmental impacts, especially water contamination, odours, dust, noise, vermin and vectors.

There is greater process control with aerated static pile systems than open windrow systems as well as automated environmental monitoring.

As such this section describes various composting methods and technology types that the City may reasonably employ and that they may consider further in the context of the long term management of organic waste. There are four general categories of aerobic composting processes or technologies that can be considered further and the relative merits of each are discussed: Continued Outdoor Windrow Composting, Aerated Static Pile Composting, Enclosed Agitated Bed Composting and In-vessel Composting. Anaerobic digestion (AD) processes are not discussed here as the City does not produce enough organic waste for energy production and the associated offsetting revenue. As such the net cost to construct and operate an AD facility would be significantly higher than a much less complex aerobic composting system.

#### Continued Outdoor Windrow Composting

An open windrow process places feedstock in long “windrows” or linear triangular piles. Windrows are usually placed on a firm (e.g. concrete/asphalt) surface or pad. The windrows or piles are periodically turned with the frequency being determined by the stage of composting. Frequency of turning can range from several times per day to once per month depending on a wide range of factors. Turning the windrows speeds the composting process through aeration and confirms that uniform pathogen reduction and product quality.

The advantages of open windrows are their relatively low capital and operating costs, simple low technology requirements, and flexibility in management of material. Disadvantages associated with turned windrow methods can include difficulty maintaining moisture in dry periods and managing leachate in wet periods as well as potential for significant odour and vector attraction. While open windrow composting is suitable for many feedstocks, it is most commonly used for processing yard wastes as it is often difficult to properly manage household or kitchen organics through this type of process. A properly managed windrow composting facility will not necessarily produce a greater negative impact (e.g. offsite odours) than facilities that are fully enclosed but the potential is much higher. Composting is both an art and a science and, in order to achieve this level of performance, on-site staff must be well-trained in the biochemistry of composting and trouble-shooting solutions when problems arise.



#### Aerated Static Pile Composting Technology

Aerated static pile composting involves forming large piles of feedstock and introducing air to the composting mass either through positive or negative aeration. This type of composting appears to be similar in nature to open windrow composting but the key difference is that the windrows are not turned and remain stationary during most of the process. Air is supplied by industrial grade fans and conveyed to the composting mass via pipes embedded underneath

the compost pile. Airflow is controlled through timers or temperature probes that trigger aeration for cooling when the piles approach the maximum threshold temperatures for efficient composting.

Most large aerated static pile systems contain similar elements. These include an impermeable foundation or base with embedded aeration pipes, industrial blowers and aeration controls.



Recent developments in technology have resulted in aerated static pile systems being combined with a laminated membrane cover (such as the Gore cover shown). The addition of a cover to a static pile encloses the composting process and provides many of the same benefits of an in-vessel system, without the expense or technical complexity of such systems. These static pile cover systems help to manage moisture, reduce odour and vector issues.

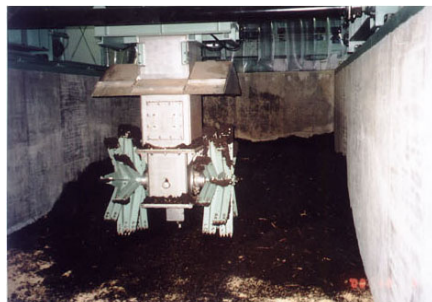
Some advantages of aerated static piles are effective air management and process control, and relatively low overall technology and staffing requirements. Disadvantages of aerated static pile systems include higher capital costs than for windrow systems, some potential odour management and vector problems, and potential for preferential air channels that lead to an inconsistent end product.

There is greater process control with aerated static pile systems than open windrow systems as well as automated environmental monitoring. This system does not require as much operator experience as an open windrow system but does require a fundamental understanding of how composting works (the balance of art and science).

#### Enclosed Agitated Bed Composting Technology

An enclosed agitated bed composter typically features an enclosed building with either an open floor for windrows or constructed concrete channels. The enclosure protects the composting process from precipitation as well as containing odours and providing a concrete working surface. An enclosed composting building usually includes an air circulation system that creates a negative air pressure within the enclosure. The air is then exhausted through a biofilter to reduce potential odour outside of the building.

The type of equipment involved in the automated turning process is dependent on whether composting occurs in windrows or in channels. Equipment can include a typical windrow turner, or turners on rails that traverse the concrete channels or a large “eggbeater” agitator that is moved across the floor by a bridge crane. With each turning, the machine aerates the material and gradually moves it further along the length of the composter. The turning process is timed so that when the organic material





reaches the end of the compost channel, the primary compost process is essentially completed. Additional aeration may be provided from below using a forced air supply, which delivers air through small orifices in the floor or channel bottom.

The advantages of an enclosed agitated bed composter include a higher degree of process control than open windrowing and the ability to control off-site odours through biofilters. The main disadvantages are potentially higher capital costs; potentially high levels of odour within the facility during turning; need for biofilters and the requirement for careful management of the curing process to minimize odours. Some of these facilities have also experienced problems with structural corrosion from corrosive gases given off in the composting process.

Enclosed agitated bed composters are often used to compost household organic or food wastes, biosolids or mixed solid waste feedstocks.

### In-vessel Composting Technology

#### *In-vessel Channels/Drums/Chambers*

In-vessel composters are completely enclosed composting units with some capable of capturing methane ("biogas") for energy production. The organic feedstock is composted under controlled air, moisture and temperature conditions. In vessel technologies are best suited to situations where a high degree of process control is desirable or the threshold of tolerance for odours is very low. In-vessel technologies are highly automated and come in two categories: batch or



continuous feed processes. Batch processes often use modular containers that are loaded with a prepared feedstock and then not disturbed again until after the composting process is complete. Continuous feed systems use a rotating drum or tunnel technology with new material introduced to one end of the system and product removed from the other end on a regular basis.

The advantages of in-vessel composters are: the high degree of process control achievable, the ability to completely control odours during initial composting and the modular nature of most in-vessel systems allowing capacity to be extended or added to. Higher potential capital costs and mechanical complexity have been cited as disadvantages of fully enclosed vessels. Many systems require continued composting/curing after the initial in-vessel residence time is complete. This can be a source of odours, since the partially composted and odorous material must be further cured in windrows or static piles. In-vessel technologies require the least amount of land per volume of material processed depending on on-site curing requirements and the presence of vectors is very low.

Capital and operating costs for in-vessel technologies are the highest for any class of aerobic composting technology. Consequently, in-vessel composters are often used for the composting of specialty feedstocks such as food wastes, fish waste, biosolids and mushroom substrates.

### *In-Vessel Container Composting*

Container composting is a modular in-vessel composting system. Premixed organic material is sealed in containers for 10 to 18 days of intensive composting under computer controlled forced aeration. Exhaust air is typically treated by bio-filtration. The initial intensive phase of composting within the containerized systems may reduce the odour output of the processed material.

Containers are fully enclosed coated or stainless steel construction with a perforated plate plenum for floor air delivery with hydraulic top load. Controls are automated and depending on the system, containers may be suitable for 200 to 10,000 tonnes per year.

These in-vessel systems offer an enclosed system intended to minimize odour, provide a high level of process control and minimize the operator's need to rely on the 'art' as opposed to the 'science' of composting. They are modular and can accommodate varying/increased tonnage. The advantages of in-vessel container composters include a higher degree of process control than open windrowing and the ability to control off-site odours through biofilters. The main disadvantages are higher capital costs; need for biofilters and potential problems with corrosion and performance of the units. A secondary processing area is also needed for the low-rate composting phase as the in-vessel units do not generate a finished compost product.

Recently, the University of Alberta (Augustana Campus) purchased an in-vessel composting system which uses a 1.2 m x 9.1 m (4 ft x 30 ft) steel drum to



process organics into a marketable product (compost). Of the 50 to 70 tonnes of organic materials input to the system annually, 20 tonnes of compost are produced.

The following table provides an overview comparison of the above technologies.

**Table 5-1: Comparison of Technologies**

| Factor                                          | Open Windrow                                                               | Aerated Static Pile | Enclosed Agitated Bed | In-Vessel     |
|-------------------------------------------------|----------------------------------------------------------------------------|---------------------|-----------------------|---------------|
| <b>Minimum Tonnage Required</b>                 | No                                                                         | Yes/no              | Yes                   | No            |
| <b>Relative Costs (operating &amp; capital)</b> | Low                                                                        | Medium              | High                  | High          |
| <b>Relative Site Size Requirements</b>          | High                                                                       | Medium              | Medium                | Medium        |
| <b>Relative Odour Potential</b>                 | High                                                                       | Medium              | Low                   | Low           |
| <b>Complexity of Technology</b>                 | Low                                                                        | Low                 | Medium                | High          |
| <b>Relative Vector Attraction</b>               | High                                                                       | Medium              | Low                   | Low           |
| <b>Feedstock Requirements</b>                   | Sometimes difficult to manage food waste – very common to blend yard waste | Any feedstock       | Any feedstock         | Any feedstock |

All of these methods are employed by other municipalities. Smaller municipalities do employ outdoor windrow composting for their programs but also tend to restrict feedstocks to those that the City currently receives. Others take on the full range of compostable materials described above but typically use the more sophisticated processes and technologies described above.

Should the City decide to further explore these options they will be assessed in detail with respect to capital and operating costs over the life cycle of an improved windrow facility or a new facility in Phase 3 of the WMMP process.

## 6.0 Residential Curbside Collection Options

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Encouraging increased participation and capture of curb side recyclables and organic material requires continuous effort by municipalities. There are many different approaches that have been used successfully by other municipalities of similar size including “set out” limits, bag tags, the use of clear bags for garbage collection, or any combination of the above. Each approach can provide different results including a focus on minimized waste generation, increased diversion, and/or cost efficiencies. There has also been a movement by some municipalities to a cart based system with volume based collection rates. Incentives for increased participation in diversion programs need to be tailored to an individual municipality and must be promoted and communicated effectively and consistently to check acceptance of the program changes by residents.

### 6.1 “SET OUT” LIMITS

In 2013, the bag limit in the City will be reduced from the current limit per residential unit of three bags per week to two bags per week. Any additional bags will require the resident to purchase bag tags at a price of \$5 each. In the short term, the bag tag cost can aid in providing incentive for residents to divert waste. This is a relatively low cost option that can provide increased revenue, and is fairly easily incorporated in the initial stages of a WMMP. As the decrease in the bag limit continues however, (e.g. ultimately to a one bag limit) the City’s approach to increase diversion needs to be supported by providing residents with a convenient way to divert additional material. Appropriate diversion programs such as curbside recycling collection and/or an enhanced organics program should be in place to confirm that residents are able to dispose of all of their waste without consistently having the need to purchase additional bag tags or find an alternative means of disposal (e.g. pay for private collection or take the material to the landfill).

As the decrease in the bag limit continues however, (e.g. ultimately to a one bag limit) the City’s approach to increase diversion needs to be supported by providing residents with a convenient way to divert additional material.

Longer term consideration could also be given to the implementation of a full user pay system in which residents are required to pay for collection based on the quantity of waste produced at their unit of residence. The user pay system is generally only applied to waste only, not to divertible materials and while it has been considered by a number of municipalities it has not typically been implemented as it is sometimes not perceived that well. That is, while residents recognize there should be incentives in place to divert waste there is only so much waste that has a beneficial end use and charging for all waste set out can sometimes be seen simply as a revenue generating mechanism for the City as opposed to a waste diversion incentive. As such, a full user pay program can sometimes be difficult to introduce to residents and not unlike



a bag limit program there needs to be a complimentary and convenient waste diversion program including programs like curbside recyclable materials collection in most cases.

## **6.2 CONSIDERATIONS WITH RESPECT TO RECYCLABLE MATERIALS COLLECTION**

The current depot based collection system relies on City residents to take the initiative and take their materials to the depot to be recycled. This is somewhat inconvenient for the residents and does act as a deterrent to recycling in both the amount of material that is captured and the participation of the residents in the program. Enhancing the collection program to a curbside service, would make the program more convenient, will increase the participation and result in more material being diverted. Surveys conducted by the City indicated that residents have a strong desire for curbside collection of recyclables, selecting it as the first preference for options the City should consider implementing. The collection system would reflect the processing option that the City chooses (as discussed in Section 4.2 above) and the impacts to collection are generally discussed below.



A multi-stream collection is the most expensive collection system of the three options: multi-stream, two stream and single stream. Collection vehicles need to have a number of separate compartments that the collector would sort material into. A configuration could include a paper and cardboard compartment, metal containers compartment, plastic bottles compartment, mixed plastics compartment and a glass compartment. Multiple compartments means that there is limited volume for the different materials in the truck, and also the potential to 'cube out', when one compartment fills up and requires emptying but there is still space in the other compartments. This results in a loss of efficiency. Another factor that lowers efficiency for collection is not only the need to take time sorting at the curb by the collector but that a multi-stream truck takes more time (than a two or single stream truck) to dump the collected materials, as each stream has to be dumped in separate areas or storage bays at the receiving facility.

Enhancing the collection program to a curbside service, would make the program more convenient, will increase the participation and result in more material being diverted.

The more material sorts required at the curb the more time it takes the collector at each stop and the fewer stops that can be serviced by a collector in a given day.

The more material sorts required at the curb the more time it takes the collector at each stop and the fewer stops that can be serviced by a collector in a given day. This means more staff and equipment (trucks) are needed and at a higher cost than for single or I collection.

Single and two stream collection programs are more efficient. The two stream system does require a small amount of extra effort and time for the collector when compared to single stream, which usually means a slightly higher collection cost. But each of them have the efficiency advantage of being able to use some compaction (which is not possible in multi-stream collection) on the collection vehicle, which means that the space on the truck is maximized, more material is on the truck and the collector can service more stops. The one advantage single stream has over two stream collection is that with two stream collection, there is also the chance that one side of the collection vehicle can 'cube out' before the other and the operator would have to empty the truck before it is completely full. This can be effectively managed with proper routing and truck configuration (relative size of the compartments) but with single stream this is not a concern as there is only one compartment.



Best practices indicate that recyclable and organic materials should be collected at least as frequently or more frequently than the waste stream to encourage waste diversion by providing the same level of convenience for waste diversion programs as for garbage collection.

### 6.3 COLLECTION FREQUENCY

Determining appropriate collection frequency is dependent on the range of collection services provided. If the City elects to provide a curbside recycling collection program and/or an enhanced organics program, the collection frequency for all waste streams should be assessed accordingly.

Best practices indicate that recyclable and organic materials should be collected at least as frequently or more frequently than the waste stream to encourage waste diversion by providing the same level of convenience for waste diversion programs as for garbage collection. In most municipalities organic waste is collected on a weekly basis using Green Bins. As frequent collection of organics encourages participation in this program because of the 'yuck' factor; residents are more likely to default their organics to the garbage stream if it is collected on a more frequent basis. Notwithstanding colder weather in the winter organic waste can still generate odours as it will still start to decompose.

The City can elect for year-round weekly collection of organics to encourage participation in the program as well as weekly collection of recyclable materials. Alternatively the City could elect to collect organics weekly and collect recyclable materials and garbage on an alternating bi-weekly cycle. This still provides 'as frequent collection' for garbage and recycling but at a lower cost to the City. Bi-weekly collection of garbage is acceptable in programs that support organics collection because the sheer volume of garbage remaining to be collected is substantially reduced and proper separation of organic waste out of the garbage stream allows it to be stored for longer periods of time.

The City could also consider continued collection of leaf and yard waste (LYW) with its organics program or provide seasonal leaf and yard waste collection only during high volume times such as spring and fall. For example, LYW collection could be provided on a bi-weekly or weekly basis from April to June and from September to November. Some municipalities provide leaf and yard waste over the summer months e.g. May to October and then use the same truck for collection of bulky item waste over the remaining six months of the year.

#### **6.4 CO-COLLECTION OF WASTE STREAMS AT THE CURB**

Co-collection is an option that would enable the City to collect two or more streams at one time, Most municipal systems opt for a two stream collection system however multi-stream recycling programs are still in place for some. This is discussed further in Section 4.2 as it relates to recyclable materials processing. The City's current collection contract will expire in March 2014 which will enable the City to solicit bids for various co-collection options. This could include co-collection of organics and garbage to be taken to the landfill site and multi-stream recycling collection with a separate truck. It could also be co-collection of single stream recyclables and organics one week and co-collection of garbage and organics the next but these options are contingent on the recycling program as well as the City's desired frequency of collection. In any case pricing for a number of options can be solicited from prospective collection service providers. Co-collection of wastes is most practical when materials will be dropped off at the same site. By way of example, if the City selected a single stream recycling program with processing at a distant MRF (e.g. Edmonton) then a transfer facility for those materials would be ideally located at the City's landfill site.

#### **6.5 AUTOMATED COLLECTION**

The City could also consider and seek pricing for the provision of an automated collection service to residents. Automated collection can be provided for all waste streams (organics, garbage and recyclables) and carts would be provided to residents to support that

Automated collection provides better working conditions for vehicle operators and can also be far more efficient than manual collection.

collection program. Automated waste collection is considered to be a "best practice" in waste management where efficiencies can be gained in collection of any waste stream. Automated collection provides better working conditions for vehicle operators and can also be far more efficient than manual collection. In 2009 the City of Toronto for example reported that in one area of the City they will reduce from 22 recycle/organics trucks and 17 garbage trucks to 18 trucks for all three waste streams. Automated collection facilitates the collection of a much larger route than manual collection in the same amount of time e.g. 1000 to 1200 stops compared to around 700 stops with manual collection. There a significant ergonomic and health and safety benefits associated with automated collection including injury prevention (slip and fall), and injury from lifting (e.g. back injury). This combined with the sheer efficiency of automated collection makes it industry best practice.

The contract cost of more efficient automated collection should be weighed against the cost of carts. The estimated cost of implementing an automated cart system is approximately \$30/cart for 80 L organic carts, \$45/cart for 240 L waste carts and \$45/cart for 360 L recycling bins. The provision of carts presents a high initial one-time cost to the City depending on how many streams the City determines should be collected by this method. Winnipeg is currently in the process of implementing an automated cart system City wide, after experiencing great success in their pilot program which provided residents in the northwest area garbage collection using this system since February 2010.

## 6.6 PROVISION OF COLLECTION CONTAINERS

### Organic Waste Collection Containers

Currently, the City does not provide any containers for curbside collection of yard waste and limited kitchen organics to residents. Best practice is to provide residents with the means to contain organics both in the home and curbside, through the provision of both large and small collection bins.

Convenience, increased diversion, participation, and capture rates are some of the benefits associated with the provision of containers for collection of

organic materials. A program that uses both small and large containers is advantageous in that it promotes frequent diversion of materials at the source (e.g. kitchen, bathroom) and minimizes unappealing aspects and common deterrents in participation of the organics programs such as odour and the inconvenience of having to supply collection containers.

A program that utilizes both Kitchen Catchers and Green Bins promotes frequent diversion of materials and minimizes common deterrents such as odour and the inconvenience of having to supply collection containers.

As the City does not currently provide collection containers, the provision of containers on a City wide basis would represent a one-time capital cost (as well as the ongoing cost of replacement of broken containers and new containers for new residents). The following table provides an estimate of the anticipated costs for procurement of both small and large collection carts. These costs do not include costs associated with the delivery of carts to participating single family residential locations only and to give the City an idea of the order of magnitude cost for this program.

**Table 6-1: Organic Collection Cart Costs**

| Cart                                                           | Cost of Cart   | Single Family Residents | Estimated Capital Cost |
|----------------------------------------------------------------|----------------|-------------------------|------------------------|
| <b>Small kitchen collection bin (7 litre capacity)</b>         | \$5-\$10 each  | 5,800                   | \$29,000 to \$58,000   |
| <b>Curbside collection container (45 litre/20 kg capacity)</b> | \$15-\$20 each | 5,800                   | \$87,000 to \$116,000  |

The cost of supplying carts could be offset by various funding and grant opportunities such as the Alberta Environmentally Sustainable Agriculture Processing Based Program (up to \$20,000).

The inclusion of compostable plastic bags in Green Bin programs has been a demonstrated success in many municipalities. Compostable plastic is defined by the Canadian Plastic Industry Association as “materials that undergo degradation by biological processes during composting to yield carbon dioxide, water, inorganic compounds and biomass at a rate consistent with other compostable materials in commercial/industrial conditions”. Municipalities who have excluded the use of compostable bags to line their Green Bins tend to experience a lower capture rate than that of municipalities that permit the use of compostable bags. This goes a long way in managing the ‘yuck’ factor associated with the source separation of organic waste.

### **Recyclable Materials Collection Containers**

If the City elects to provide residents with curbside recycling in the future, best practices also recommend providing residents with means to contain recyclable materials in their home as well as at the curb, through provision of recycling bins at no cost to residents. Provision of recycling bins can greatly increase the participation, capture rates and overall success of a curbside recycling program by increasing the

The use of transparent blue bags is in essence an endless container for capture of recyclable materials at the curb and provides a smooth transition for any future additions to the recycling program.

convenience to residents. Depending on whether recycling is collected at the curb as a single stream or dual stream, recycling containers can reflect the needs of the program. For example, if the program is single stream, a single, larger blue box could be provided, whereas in a dual stream program, two regular sized bins (e.g. one for containers and one for fibres) could be provided to promote proper sorting techniques to residents. Larger blue box containers for recyclables are recognized as an effective method in increasing diversion as the increased capacity reduces the amount of recyclables that overflow the container and end up being placed in the garbage stream. A larger blue box also provides opportunities for improvements to the recyclables program and materials that may be included as the program matures.

The provision of containers could present a high initial one-time cost. As containers require routine replacement due to loss or damage, it is likely that each home may require more than one container over the course of the program. Also, if the City elects to adopt a recycling program involving a dual stream system and provides residents with two bins each, the cost would be substantially higher than that associated with a single stream system. Provision of an additional container to residents will also accommodate full capture of recyclable materials in the waste stream and any potential future changes to the program (e. g. new markets for recyclable material). Table 6-2 provides an estimate of the costs for the provision of bins in each scenario. These costs can increase or decrease based on the quantity of bins ordered

and specifications and do not include costs associated with the delivery of carts to participating residential locations.

**Table 6-2: Recycling Bin Collection Costs**

| Bin                                         | Cost of Cart | Single Family Residents | Estimated Capital Cost |
|---------------------------------------------|--------------|-------------------------|------------------------|
| 1 Medium Recycling Bin (59L)                | \$6-\$7 each | 5,800                   | \$34,800 to \$40,600   |
| 2 Medium Recycling Bins (59L)<br>(2 Stream) | \$6-\$7 each | 5,800                   | \$69,600 to \$81,200   |
| Large Recycling Bin (87L)                   | \$7-\$8 each | 5,800                   | \$40,600 to \$46,400   |

Various provincial and federal grant opportunities such as the Alberta Environmentally Sustainable Agriculture Processing Based Program (up to \$20,000) may again provide opportunities to assist in funding for the provision of recycling bins.

Alternatively, the City could consider a transparent blue bag program for the collection of recyclable materials if the City is entertaining a two stream or a single stream system. The use of transparent blue bags is in essence an endless container for capture of recyclable materials at the curb, providing a smoother transition for future additions to the recycling program. Blue bags have been successfully used in other municipalities for many years and are available at similar cost to regular green or black garbage bags which in many cases residents already purchase. There are numerous benefits to implementing a bag based recycling program including low cost to the City, reduced litter at curbside and protection of recyclable material from the elements, resulting in less water content sent to the MRF. It is ergonomically preferable for both residents and collection staff, there are less storage issues when compared to blue bins. The transparency of the bags allows for differentiation between container and paper streams (if a two stream system is chosen) and quick inspection for contamination by collection staff.

## 6.7 BULKY MATERIALS MANAGEMENT

The City currently directs residents to dispose of white goods at the Regional Landfill. The City of Camrose, like most municipalities does charge a fee for disposal of white goods at \$5.00/piece and \$25.00/piece for CFC-bearing appliances, to cover the cost of Freon removal.

While white goods are managed well by the City, the management of other large non-recyclable (but potentially re-usable) items may deserve further consideration. Bulky material management can be managed in a variety of ways, including provision of a call in service, community yard sale 'trash & treasure days', provision of regular curbside collection, diversion through a CRRC, or provision of vouchers.



A “call in” service to residents can either be provided as an unlimited service, or limited and seasonally or year-round. When a resident requires collection, they call in to request a pick up. A dedicated collection vehicle goes to the specified address, collects the bulky waste, and delivers it to the landfill for proper diversion and/or disposal. This service could be provided free of charge or on a “per stop” or per item basis. This option can provide residents who do not own vehicles large enough to transport these items the option to properly dispose of bulky materials without having the need to rent a vehicle.

A community yard sale ‘trash & treasure days’ provides residents with a day where they can place their bulky items at the curbside to be taken by others free of charge. This option promotes the re-use approach of waste management and is relatively low in cost (often only an ad is placed on City website or in the newspaper), however leaves residents responsible for removing the left over items.

Some municipalities have provided bulky item pick up (for non-recyclable bulky items) with their regular curbside garbage collection program but have then moved to less frequent separate collection systems as the result of cost and the recognition that this is an unnecessarily high level of service and doesn’t promote waste reduction and reuse. It further leads to unsightly set outs at the curb. It is also difficult to anticipate the amount of bulky waste that will be generated making it more difficult to assess collection requirements.

Providing residents with the option to divert bulky waste through a CRRC can be accomplished at a relatively low cost (compared to collection) and promotes a re-use approach. See Section 12.2 for more discussion on CRRCs and bulky item materials management. Bulky items that are collected or placed at a CRRC that are in poor repair and not appropriate for re-use could be processed to remove any re-usable or recyclable portion of the item. An example of durable goods processing is mattress recycling. Mattress recycling provides an opportunity for the City to divert bulky items from the landfill and increase their diversion tonnages considerably. To implement this program, the City could establish a disassembly facility or locate a private company interested in processing durable goods, or an existing mattress recycler.

Vouchers are coupons that allow residents to dispose of bulky items at the landfill free of charge. Coupons can easily be mailed to residents or picked up by residents and can specify to residents what they can and can’t include in their load. The disadvantage to this program is that it encourages disposal, as some residents may try to use their voucher up to its full value whether really needed or not.



## **7.0 Multi-Family Sector Waste Diversion Programs**

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The multi-family sector represents approximately 23% of all dwellings in the City of Camrose. While Camrose provides the same level of recycling service for this sector as the single-family sector through the existing recycling depot, consideration will have to be given with respect to increasing service to this sector if the City elects to implement a curbside recyclable materials collection program. The City currently provides organic waste collection to the single family sector and to the multi-family sector under five units in size.

While municipalities see this sector as the 'next frontier' in waste diversion there have been significant challenges for municipalities in the delivery of waste diversion services. While these challenges are shared by most municipalities, the approaches to capturing recyclable and compostable material from this sector vary greatly within Canada and across North America. More generally however it is known that some degree of municipal ownership of a program is required to increase and maintain diversion in this sector. This can be achieved through regulatory and reporting requirements, but is more typically associated with financial incentives or disincentives to drive programs. It is particularly challenging to implement waste diversion programs in multi-family buildings with differences in site and building design, age and income of residents, tenant turnover rates, physical limitations of residents and ownership issues. Each building comes with a unique set of characteristics that must be taken into account in order to design an effective waste diversion program. There is no 'one-size-fits-all' solution for waste diversion in multi-family buildings; however, there are a number of best practices that can be incorporated into any multi-family building's waste diversion program.

Multi-family buildings generally use a chute system or common collection area for waste collection. Unfortunately, both of these systems make it difficult to promote diversion programs in the multi-residential sector. Diversion programs compete with garbage chutes, and, the setup of the chute system guarantees anonymity for residents regarding the waste they dispose. Common collection points (such as the provision of a garbage bin) also do not promote 'ownership of waste.' That is, residents are less inclined to participate in diversion programs, as they are able to produce unlimited amounts of garbage, without any monitoring. An overview of a number of best practices identified through research conducted by municipalities who have implemented multi-family diversion programs is presented herein.

Many municipalities across the country have made efforts to identify and implement innovative methods to increase the convenience of waste diversion programs for multi-family buildings. Generally best practices for the multi-family sector stipulate that successful programs should consist of the following:

- Create and maintain a database of multi-family properties
- Establish benchmark performance measures and methods for monitoring of the program on a regular basis
- Provide adequate collection capacity for all waste streams, specifically recyclables
- Provide P&E materials, tools and program support – engage in outreach activities including training for stakeholders<sup>12</sup>

As such, the City could consider the following if it decides to proceed with the provision of additional collection services (e.g. recyclable materials) for the multi-family sector in order to drive increased diversion of waste from that sector.

### **Database Management**

The City could develop and maintain a comprehensive database of eligible locations for service, which includes information on the characteristics and infrastructure of the building, the services provided, and contact information for building management. As well, the City could directly assist with the identification of barriers to participation, specific to building and building location (space issues, inability to retrofit the facility, lack of support from building management, etc.) and make recommendations to managers, building owners etc. This would entail site visits and time and would require additional staff resources.

The City could undertake the development of a comprehensive multi-family waste diversion program plan over the short to mid-term planning period. This plan would identify participation and diversion requirements for existing and new buildings, any applicable green building requirements for new facilities in concert with other City initiatives including construction permits/bylaws in the case of new facilities to require the addition of infrastructure to support a comprehensive diversion program, general collection service requirements, rates and fees if any that are applicable. These programs are most often complimented by various bylaw provisions and mechanisms like a Save-Harmless Agreement that allows the City/its Contractor to enter onto private property for collection in cases where it is safe to do so.

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<sup>12</sup> Continuous Improvement Fund. Guidelines for Implementing Best Practices in Municipal Multi-residential Recycling Programs. November 2009.

The plan could also outline the P&E program tools that will be made available to this sector, monitoring and reporting requirements and feedback mechanisms. It is essential to develop a program that will carry diversion initiatives forward in this sector that align with the overall goals and objectives of the WMMP. Implementation of the plan could either commence with the start-up of a new recyclable materials collection service if implemented or could be phased in after establishing such a program in the single-family sector.

In many cases the costs associated with these programs are levied to all tax payers regardless of their participation in the program and waste diversion services (recycling and organics collection) are provided 'free of charge'. In other cases but not as common is a volume-based rate system for collection. The fee is based on how much garbage the building generates (number of front end bins) during the billing period and the number of units in the building. In this type of rate system there would be no fee for recycling or organics collection but the City also collects garbage. If the City considers implementation of a volume-based rate system, the City would almost certainly need to engage various stakeholders on the matter. Other funding models will be discussed in the next phase of the WMMP should the City decide to pursue this option further.

### **Monitoring**

Performance benchmarking is also a key step in implementing program enhancements so that targets can be set and program improvements are measured. Performance indicators such as container fullness and contamination can be monitored during site visits. Site visits provide the opportunity to monitor building performance and enable flagging of low performing buildings which may benefit from follow-up strategies and top performers which may serve as model buildings.

Periodic waste composition audits should be conducted to assist with planning, determining generation rates and capture rates which can be used to compare performance over a period of time.

Periodic waste composition audits should be conducted to assist with planning, determining generation rates and capture rates which can be used to compare performance over a period of time.

Collection service providers play an important role in the program; they should be adequately trained and understand their role in the program. Collection crews can provide useful information about any issues with a site which may require follow-up, such as contamination, bins not in the proper position or out for collection, bins needing repair, not meeting minimum quantities of recycling etc. These issues can be relayed to building staff, municipal staff or to the collection service provider. One of the biggest issues with diversion programs in multi-family buildings is contamination. There is no direct feedback for residents about putting the wrong materials in bins, whether through lack of knowledge, or indifference leaving the superintendent to deal with the contaminated bins. Often this material will not be collected, or additional levies

will be charged. The collection crew can be a valuable source of information regarding problematic materials at certain buildings.

As an additional measure, some buildings have installed security cameras to try to identify repeat offenders and remove the anonymity associated with waste disposal in multi-family buildings.

If diversion opportunities are provided to residents, the WMMP will include a monitoring program to establish benchmark performance measures and monitor the progress and performance of the program on a frequent and ongoing basis.

Successful communication initiatives include an outreach strategy that balances the production of printed material with in-person outreach to building tenants and outreach to management/superintendents/owners.

### **Promotion and Education**

In order to support a strong program the City would need to develop a P&E program specific to the multi-family sector with appropriate tactics and approaches to engage this sector in waste diversion programs.

Successful communication initiatives include an outreach strategy that balances the production of printed material with in-person outreach to building tenants and outreach to management/superintendents/owners. The City could collaborate with any tenant associations and designated community services groups within the City. Building management and/or superintendents need to be key drivers/motivators in these programs. Consideration could also be given to recruiting building representatives to support building specific outreach programs, with the City providing training to these “ambassadors”.

Print material that could be considered for development include a guide for building managers/superintendents on the specifics of the recycling programs, orientation guides for new tenants/unit owners as well as the provision of reusable bags and/or containers that can be used to separate and carry materials to the larger collection bins.



Umbra Recycling Bag

Specific promotion and educational materials need to be developed to support continued effort for source separation of recyclables (and organics) within these facilities.

### **Collection**

As part of program development, the City would need to evaluate collection options and container types with consideration given to a particular building type and the waste streams being collected (recyclables, organics), predicted volumes, frequency of collection and the ability for collection vehicles to empty the bins. Organics collection can sometimes be problematic due to the weight of the material and freezing issues that can occur during colder

months and it is important to provide both a sufficient number of bins but also to collect this material frequently. Frequency is also important in summer months to abate odour issues that can arise with more rapid decomposition. Discussions with service providers and building management should be undertaken to identify the most suitable means for collection.

While smaller buildings and townhouse style condominium unit collection can be fairly straightforward, larger multi-level apartment buildings can present more of a challenge. Municipalities have taken many different approaches to increasing in-building participation in diversion programs including initiatives such as chute closure programs, designated chute times for specific waste streams, and establishing central storage areas for in-unit recycling container storage.

A garbage chute closure program entails the permanent closure of the garbage chutes within a building, forcing tenants to take all waste streams to the central collection area. With supporting P&E initiatives, chute closures have shown to increase participation in recycling and organics programs. Full support of the building management is required to effectively implement this type of program.

Another approach to increasing in-building participation includes the designation of specific days for using the chutes to dispose of specific waste streams (garbage, recycling, organics). This approach designates specific days of the week where residents can dispose of one waste stream via the existing chute system. For example, Mondays would be designated for recyclable fibers, Tuesdays for recyclable containers, Wednesdays for organics and Thursdays for residual garbage, etc. Like the chute closure program, supporting P&E initiatives and buy-in from building management is required. The key is ensuring that the appropriate collection bins are in place at the bottom of the chutes on the appropriate days.

Building management can also set up a designated common space where residents can temporarily store their in-unit collection bins/bags, therefore eliminating the need for them to return directly to their unit once they empty their bins. This allows residents to bring down materials on their way out and pick up their collection bins when they return. This approach makes it easier for residents to participate as they do not need to make multiple trips to and from their unit to participate in diversion programs.

It is strongly urged that the City engage multi-family sector stakeholders during any program development phase to confirm buy-in and the development of a program that is specific to the needs of this sector within the City of Camrose.

## 8.0 Hazardous Waste Management Options

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The City currently offers two Round It Up events per year in June and October at their public works yard, with each event taking place over a two day period. The household hazardous waste (HHW) program is funded through the provincial program and managed through the Alberta Recycling Management Authority (ARMA), a not-for-profit association responsible for managing Alberta's tire, e-waste and paint recycling programs. The ARMA hosts a website that provides information to residents including acceptable materials, as well as Round It Up dates and locations.

As residents are currently provided with limited options for HHW disposal, they are required to store varying quantities of HHW for extended periods of time, which can lead to improper disposal.

Currently, the Centra Cam depot accepts limited HHW materials from residents including paint, fluorescent tubes, and non-rechargeable batteries 24 hours a day, 7 days a week. As residents are currently provided with limited options for HHW disposal, they are required to store varying quantities of HHW for extended periods of time, which can lead to improper disposal. The City could examine the possibility of hosting a permanent HHW depot at either the Centra Cam facility or the existing landfill as part of a CRRC, depending on funding opportunities available. Residents will be more likely to dispose of HHW properly if they are provided with a disposal location that is in close proximity and is able to accept HHW on a regular basis. As with all other waste diversion programs convenience is key to success.

Other program options include a Paint Re-Use Program that allows residents to drop off paint for others to reuse. This reduces disposal costs for the City and although colour choices may be limited at times, it provides an opportunity for reuse and a cost effective way for residents to "beautify their surroundings". This program can also be extended to include varnishes, paint thinners and other products.

Alberta also offers pharmaceutical recycling free of charge under the Pharmaceutical Stewardship Program. The ENVIRx program is administered by Alberta Pharmacists' Association. Membership in the association and pharmaceuticals/consumer health products industries provides financial contributions to the program. Consumers can drop-off expired and unused medications at any of the participating community pharmacies across Alberta for safe disposal. These medications are then collected by pharmacies and incinerated in an environmentally friendly manner. The City could establish a partnership with local pharmacies such as Shoppers Drug Mart, Safeway Pharmacy, and the Drugstore Pharmacy, all of which participate in the ENVIRx program to enhance the level of service currently provided for HHW disposal. The services that are provided as part of the program could then be communicated to the residents as part of the P&E program for the City.

The City could consider establishing a partnership with other private retailers in the City as a short term option to provide alternative collection points for specific HHW materials like batteries. Partnership locations can be advertised to residents on the City's website and included in future P&E materials. For example, the Canadian Tire in Camrose will collect residential quantities of tires and car batteries free of charge. As there is a lengthy wait period in between Round It Up dates, it may be beneficial to advertise this type of service to provide residents alternative but more frequent HHW disposal and recycling options.



## **9.0 Regulatory Mechanism Options**

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### **9.1 SOLID WASTE BYLAW UPDATE**

On January 1, 2012, Bylaw #2670/11 took effects to regulate, control, and maintain a system for the collection, removal and disposal of solid waste within the City. The City should consider revising the current bylaw to incorporate a much stricter approach to the management of waste in the City.

Revisions to the Bylaw should prohibit disposal of biological hazards, HHW, and e-waste, and instruct residents to bring them to the Centra Cam depot, HHW Round-Up events or participating pharmacies instead for proper disposal. Multiple sections pertaining to resident provision of collection containers and the requirements of such containers should also be updated. Currently, residents are to provide their own compostable containers for collection of kitchen organics. As discussed in Section 6.6, it would be beneficial to both the City and its residents to provide reusable organics collection containers to residents. The following sections will provide options to the City to enhance the current waste management bylaw.

### **9.2 ENFORCEMENT**

At present, enforcement of the bylaw is very limited, in part due to the lack of resources available (i.e. no dedicated waste bylaw officers). Bylaw enforcement is an important aspect of the system that can provide educational opportunities to the public. Residential compliance with the bylaw will dwindle if there are little to no enforcement opportunities.

Bylaw enforcement is an important aspect of the system that can provide educational opportunities to the public. Residential compliance with the bylaw will dwindle if there are little to no enforcement.

Through the short term planning period, the City should identify and prioritize those waste management issues that are the most critical in regards to monitoring and enforcement. An update to the bylaw is recommended to support the implementation of all short term system components that require a change and to clearly identify certain actions/activities that require more stringent enforcement (e.g. fines for sharps or hazardous waste present in the waste stream at the curb). The methods of enforcement should be outlined and can include a range of approaches, from supported voluntary compliance (generally the ultimate objective of a Waste Management Department) to enforcement through refusal to collect materials to fines for repeated offences or health and safety violations. The City will need to carry out enforcement to support program changes, whether through communications or home visits to more stringent approaches including issuance of fines. To most effectively achieve this, dedicated solid waste management bylaw officers will be required, along with compliance from the collection contractor and waste management operations staff.

### 9.3 MANDATORY DIVERSION BYLAWS

The first phase of a mandatory diversion bylaw would involve implementation of mandatory diversion for specific material types with largely voluntary compliance, with increased enforcement in the next phase resulting in significant diversion impacts. We recommend that a survey be conducted on each sector (single family, multi-residential and IC&I) to determine what materials have the highest level of public support for the mandatory recycling. The secondary phase could consider the inclusion of less popular materials (as a result of the survey), dependent on current market processing capacities and availability.

#### Residential Sector

The City, through the update exercise can also decide if participation in diversion programs for residential sector and/or the multi-family sector will be made mandatory. Many municipalities have taken this approach as it supports other initiatives such as differential tipping fees, (further discussed in Section 12.3) landfill bans and the ultimate goals of waste reduction and diversion from final disposal. A diversion bylaw can address the diversion of the organics stream or recycling stream, or a combination of both, and significantly improve current diversion rates.

The most successful (and stringent) mandatory diversion bylaws encompass both streams, and generally require that residents use clear bags for garbage to provide collection contractors with the ability to quickly observe contamination levels at curbside.

The most successful (and stringent) mandatory diversion bylaws encompass both streams, and generally require that residents use clear bags for garbage to provide collection contractors with the ability to quickly observe contamination levels at curbside.

Should the City elect to make diversion mandatory, consideration should be given to implementing mandatory bylaws only after a diversion programs such as an enhanced organics program and/or curbside recycling have been implemented. Residents will need to be provided with adequate diversion programs and time to adjust to the new service levels to confirm the success and compliance with a new diversion bylaw.

#### IC&I Sector

As outlined in the 2009-2010 Solid Waste Collection and Diversion Study, over 75% of Camrose's MSW is comprised of commercial waste. As the commercial sector generates the largest quantity of waste, it also provides the greatest opportunity to improve the overall diversion rate for the City. The City could revise the Solid Waste Management bylaw to require diversion by IC&I waste generators, including development of waste reduction work plans.

An increase in tipping fees will assist in the transition period and gradually adjust the public to prepare for the mid or long term implementation of the bylaw.

The City could mandate the diversion of recyclables and organics in the IC&I sector to address the large quantities of divertible materials that are currently being sent to the landfill. The waste management bylaw could address the lack of adequate diversion in this sector by requiring IC&I locations to create waste reduction work plans and to divert organics and recyclable materials. These work plans generally involve an audit or series of audits which assist in identification of current waste diversion and generation statistics. The statistics and data generated from these studies can assist in creating the framework for a waste reduction work plan to be developed to address the more stringent requirements of the updated bylaw. Consideration should be given to adjusting the bylaw, post-implementation of either a curbside recycling program or an enhanced organics program, to confirm fair diversion opportunities are provided to IC&I locations. The mandatory diversion bylaw would go further and check that certain materials are diverted from all IC&I and C&D related streams, as this type of waste is what is predominantly managed at the landfill. This option would present a great opportunity to increase waste diversion rates in both sectors; however, it would require a significant amount of effort to enforce (i.e., landfill staff, Centra Cam staff/bylaw officers dedicated to enforcing the bylaw).

To support the introduction of a new waste diversion bylaw, an increase in tipping fees for 'mixed waste' (e.g. charging double the regular 'garbage' rate if a customer decides to not sort their waste) in the short term could be implemented at the landfill, although careful consideration will have to be given to the rate at which the tipping fee is increased as the current cost recovery mechanism at the landfill is the tipping fees charged to the IC&I sector. An increase in tipping fees will assist in the transition period and gradually adjust the public to prepare for the mid or long term implementation of the bylaw.

In the mid to long term, the City could consider implementing a mandatory diversion bylaw for IC&I generators that use the City's system for disposal.

Before implementing a mandatory diversion bylaw the City must confirm that the appropriate infrastructure to handle the influx of diverted materials is in place. It may be best for the City to use a phased-in approach to developing the program to confirm that the markets can handle the additional material.

One source of waste from the IC&I sector is C&D waste. Examples of common C&D materials include wood, drywall, shingles, metal, and clean or contaminated soil. The City could focus on implementing a program that requires proper disposal and diversion of these materials. Revisions to the current bylaws could be implemented to require the development and approval of a waste diversion plan for C&D projects, such as requiring builders to acquire various permits prior to commencement of a construction project.

In the mid-term, prior to the implementation of a mandatory waste diversion bylaw for the IC&I sector, a 'permitting' based system could help to phase in this approach. This option would involve the City implementing a program that would require the C&D sector to source separate specific recyclable materials from the waste stream or prohibit them from discarding the specified materials in the garbage. Implementation of such a program would be contingent

upon the City having such authority to implement this type of program under current legislation. Should it have the power to do so, the City could require that C&D generators develop a “diversion plan” for each project prior to granting site plan or other approvals for the project to go ahead. For example, the City could require that C&D projects demonstrate how they will divert 50% of the waste produced over the life cycle of the project. The City could also enforce this program through fines for non-compliance in addition to the increased tipping fees discussed in the preceding section.

The existing concrete and scrap metal diversion programs at the landfill provides excellent diversion opportunity for C&D projects; however, the lack of other end markets for materials such as drywall, wood, and shingles may or may not be issue for this option. Diversion opportunities must be available with the implementation of a waste diversion bylaw.

## 10.0 City Operations Diversion Programs

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The City already has a sound waste management policy and program to manage waste generated by City operations through an in-house diversion strategy and this provides the opportunity for the City to lead by example and to provide support to the IC&I sector.

Leading by example is important to maintain a good public image, particularly when introducing new programs such as curbside recycling collection or an enhanced organics program. A good opportunity to create resident 'buy in' to changes in a program is to show that the City staff fully support the recommendations of the new WMMP, and can include initiatives supporting increased internal City waste diversion efforts such as continuing to provide and possibly enhancing sorting stations in municipal buildings and on municipal property.

Leading by example is important to maintain a good public image, particularly when introducing new programs such as curbside recycling collection or an enhanced SSO program.

A waste audit could be conducted in City building office space to provide data on what the current system's opportunities are for diversion and respective diversion rates, what the potential diversion rate could be with the introduction of any program changes, and what the respective short and long term goals are for the program. Following the initial audit, the results of the study should be shared with the staff, to promote office space diversion. In order to have an effective waste diversion program, the following is ideal to have in place:

- A consolidated plan with goals and objectives
- An internal leader to drive the plan
- Detailed audit information for pre- and post-implementation of a waste diversion program
- Definition of responsibilities for management and operation of plan and;
- Monitoring and reporting strategies

The City should also be the one to take the lead in establishing waste diversion initiatives at City parks, other outdoor facilities, and high traffic areas (such as the downtown core) and demonstrate how businesses can implement similar programs at their workplaces (discussed in Section 4.3).

Other cities have undertaken similar initiatives: the City of Calgary began developing a corporate waste strategy in 2010, addressing office waste, C&D waste, hazardous waste, recyclables and yard waste. Calgary also introduced a Green Office Program to minimize waste generation and increase waste diversion in the City's offices and facilities. Their goals are 80%

diversion of waste from landfill by 2020, 30% reduction in paper consumption by 2013 and 50% post-consumer recycled content (in paper) by 2013.

The City has an opportunity to lead by example, to demonstrate innovation in building design and waste reduction whether it is in the construction of new buildings, renovation or deconstruction of old buildings. There are a variety of mechanisms the City could consider for mandating C&D material diversion which could include specific language in tender documents, hold-back requirements, and the requirements of the waste diversion bylaw. As municipal projects can be a major source of revenue for many contracts, companies will usually adapt their common practices to meet the requirements of City projects, provided the infrastructure is in place for them to do so.

For example, the City of Lethbridge has put on a focus on “deconstruction” instead of demolition for city projects, with Facility Services determining the estimated diversion rate for a project with the aid of a waste streaming specialist. This has enabled the City to reach rates of 93% diversion of C&D material for some projects.

Acquiring Leadership in Energy & Environmental Design (LEED®) designation is considered by many municipalities in the planning and design phase of C&D projects (discussed further in Section 0). Many provinces and municipalities in Canada have mandated specific LEED requirements for their construction projects, e.g. LEED Silver requirements must be met for commercial and institutional projects that are funded by the Government of Manitoba and all buildings constructed over 500m<sup>2</sup> in Vancouver must meet LEED Gold Standards.

## 11.0 IC&I Waste Management Options

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The City does not provide waste collection to the IC&I sector; as such little information is available on the amount of IC&I waste generated since collection and disposal is managed by the private sector. Statistics Canada reported a diversion rate of IC&I waste across Canada of 12.7% in 2008. The SWCDS reported that 78% of the City's MSW sent to landfill was IC&I and C&D waste; 12% higher than the provincial average of 66%<sup>13</sup>.

In 2008, the MSW waste generation rate was reported to be 1,560 kg/capita/year compared to a provincial average of 1,130 kg/capita/year and Alberta Environment's goal of 500 kg/capita.

In 2008, the MSW waste generation rate for the City was reported to be 1,560 kg/capita/year compared to a provincial average of 1,130 kg/capita/year and Alberta Environment's goal of 500 kg/capita.

In 2011, a review of IC&I waste diversion options was conducted by Hoffman Consulting. This report<sup>14</sup> made a number of recommendations, based on interviews conducted with municipalities, waste commissions, non-profit organizations, and a recycling business, most of which are addressed in the sections below.

One of the most common suggestions found during the surveys to divert more waste was for the City to provide more promotion and education to the IC&I sector. The following sections provide an overview of the options for the City's consideration which would contribute to increased waste diversion from this sector.

### 11.1 PROVIDE PROMOTION & EDUCATION INFORMATION TO IC&I SECTOR

As part of the City's P&E program options already discussed, the City could provide information about current City diversion programs, potentially through a partnership with the IC&I sector and waste management service providers to facilitate information sharing and to promote waste reduction.

The City should encourage waste reduction and diversion through regular communication with key stakeholders targeting employees, businesses, business associations and cultural groups.

Discussion with the IC&I sector has consistently identified the importance of P&E as critical to the success of the implementation of any minimization or diversion strategy. The City should encourage waste reduction and diversion through regular communication with key stakeholders targeting employees, businesses, business associations and cultural groups. For example, the City could facilitate regular discussion amongst specific sector representatives to discuss/ resolve common waste reduction challenges. This would provide an opportunity for promotion of the City's

<sup>13</sup> Solid Waste Collection and Diversion Study, Section 5: Action Plan/Implementation Plan, Page 1

<sup>14</sup> Review of the ICI Waste Diversion Options Available within the City of Camrose, Hoffman Consulting, 2011



programs. Contact on a regular basis is required as employee turnover is often frequent in the IC&I Sector.

Halifax recently (2011) undertook a major P&E program in advance of amending a bylaw to reduce garbage bag limits from six to four bags/containers and the use of clear bags for garbage for residential and IC&I sectors. The intent of the communication plan was to promote engagement in the program and help the public understand the issues around increasing diversion through more effective source separation. They currently have four waste resource education officers whose focus is to promote municipal waste/resource diversion programs. They work with a variety of sectors including schools, institutions, food service, multi-family residences and other commercial businesses. The waste resource education officers conduct customized education sessions at various businesses within the IC&I sector, presentations at schools, tours of waste facilities and other events and sessions. Halifax is also working on a new communication program called "What Goes Where" which focuses on educating the public about recent program changes to recycle all plastics (#1 through #7, except Styrofoam). The program includes advertising on radio, television, metro buses, local papers and websites.

Metro Vancouver has put together a comprehensive demolition, land clearing and construction waste management toolkit<sup>15</sup>, which is available online and provides a variety of tools and disposal options aimed at the building construction industry.

## 11.2 DATA COLLECTION

The City could develop voluntary measures for haulers and private sector operators to collect and report data so the performance of the current system can be understood, communicated and promoted.

It may be difficult to obtain information from the private sector due to competitive concerns. It has been suggested to instead use information from StatsCan's biannual waste management industry survey. In 2009, a survey was sent out to 1,422 businesses and had a 93% response rate. This data, however, is not broken down by city, merely by province and would only serve to provide general information to the City.

The current data tracking system at the landfill and the recycling depot does not differentiate those materials which are attributed to the IC&I sector, nor those materials which may be diverted instead of disposed.

The current data tracking system at the landfill and the recycling depot does not differentiate those materials which are attributed to the IC&I sector, nor those materials which may be diverted instead of disposed. For instance, mixed loads which contain material that are diverted to the appropriate recycling area at the landfill are still classified as "refuse", charged to "landfilling" although a portion may be recycled. MSW collected from trailer parks, condominium complexes and multi-residential facilities is classified as commercial waste since it is collected by private haulers; the Hoffman Report estimates approximately 10% of the IC&I waste that was

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<sup>15</sup> <http://www.metrovancouver.org/about/publications/Publications/dlctoolkit08web1.pdf>

landfilled could be considered as “residential waste”. Lastly, IC&I waste diversion through the recycling depot is only based on old corrugated cardboard (OCC), diversion of other materials such as paper, e-waste, plastic and compostables is not recorded.

It may be possible to work in partnership with an agency like Green Calgary, described below, to obtain data on the small business sector. Some sectors, such as educational institutions, may have audit data that would provide information on waste generation and diversion rates.

The City of Calgary is a major funder of a non-profit agency, Green Calgary<sup>16</sup>, which provides information to residents, businesses and schools through workshops, a website, an eco-store and presentations. Green Calgary also provides a number of services targeted at businesses, providing waste assessments and action plans, green workplace presentations, reports and one-on-one consultation through their Commercial Environmental Services program which is entirely funded by the City. The City of Calgary is able to access information about the IC&I sector through Green Calgary.

### **11.3 IC&I SECTOR ROUNDTABLE**

As part of the ongoing process of providing information discussed above, the City could facilitate regular roundtable discussions amongst specific sector representatives to discuss/resolve common waste reduction challenges (e.g. school boards, government, retailers, hospitals, waste haulers, and recyclers). Such discussions would promote the exchange of successful waste diversion ideas, processing options, and lessons learned.

These discussions could lead to the identification of new diversion and market development opportunities and best practices which would further encourage waste reduction and diversion within the IC&I sector. The main issue with this type of program would be that only a limited number of businesses could participate in discussions at any one time.

Sharing best practices between industry group members is expected to lead to some additional diversion, assuming most are already implementing reasonably successful programs.

The Recycling Council of Alberta<sup>17</sup> has an Industrial, Commercial and Institutional Committee whose mandate is to “encourage and assist the IC&I and C&D sectors to responsibly manage their waste stream, assume stewardship, increase recycled content and conserve resources.” The City should use any resources available through the Recycling Council of Alberta.

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<sup>16</sup> [www.greencalgary.org](http://www.greencalgary.org)

<sup>17</sup> <http://www.recycle.ab.ca/ici>

## **11.4 WASTE DIVERSION CERTIFICATION AND AWARDS PROGRAM**

The City could develop a program to identify and promote successful diversion programs within the IC&I community through a certificate or award to those businesses who are leaders in waste reduction and diversion.

Certification would act as a positive public relations tool for businesses and would act as an incentive for businesses to participate in waste reduction/diversion initiatives.

A voluntary certification program could be established for businesses that meet specific waste reduction and diversion standards set by the City. For example businesses that are able to meet a certain level of diversion (e.g. 70%) could be allowed to use recognizable logos and signs to recognize their achievement. The certification would act as a positive public relations tool for businesses and would act as an incentive for businesses to participate in waste reduction/diversion initiatives. This could also be coupled with a Take it Back program in order to recognize those businesses who make a significant contribution to waste diversion through their participation in the program.

The Recycling Council of Ontario (RCO) has initiated a waste diversion certification program called 3RCertified<sup>18</sup> which is intended to recognize the businesses and institutions that take proactive steps to manage their solid waste responsibly and effectively. The core of the 3RCertified program is a set of policy-based and performance-based waste diversion and reduction criteria. Participating organizations must undergo a rigorous onsite evaluation before being accredited to the 3RCertified standard. While interesting, the level of rigor applied to the certification process is likely outside the available resources that the City could commit.

Waste Check<sup>19</sup>, an organization based in Nova Scotia, has a Business Rewards Program which acknowledges local businesses for the Business of the Month award. The purpose of this award is to acknowledge and reward businesses in the IC&I sector for their efforts in the area of solid waste reduction and management through positive reinforcement and recognition. This contributes to healthy competition amongst local businesses to reduce and divert as much waste as possible, and to implement more environmentally friendly business practices. The "Business of the Month Award" winners are presented with a framed certificate and are advertised in the most popular newspapers and radio stations, including French publications, as well as on Waste Check's website.

## **11.5 DEVELOP END MARKETS**

The City could work with haulers, suppliers and producers to expand the types of materials collected and develop end-markets for recyclable materials including C&D, textiles, carpet, treated wood etc.

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<sup>18</sup> [https://www.rco.on.ca/3r\\_certified](https://www.rco.on.ca/3r_certified)

<sup>19</sup> [www.wastecheck.com](http://www.wastecheck.com)

The City is located geographically close enough to take advantage of potential end-markets in Edmonton or Calgary. Where markets are technically feasible but don't exist for marketing reasons, time should be allowed to develop markets before implementing restrictions on disposal of materials, allowing the recycling industry to provide a program development period for material diversion which contributes to market security.

Some of the barriers to implementing this option include low landfill tipping fees which allow for cheap disposal, lack of education about available markets and lack of opportunities to recycle, cost of time and labour needed to sort, and lack of commitment to source separation on the job site.

Potential end-markets and alternative uses for materials include:

- Asphalt and concrete – crushed material can be used in place of new aggregate in asphalt pavement, new concrete production, road base and backfill
- OCC – fibre recycling, feedstock for roofing materials, cardboard shred for compost amendments, external markets
- Wood – fuel source, landscape mulch, erosion control on construction sites, compost amendment, livestock bedding, fibre stock for production of roofing materials, framing wood, and flooring and cabinets can be recovered for resale
- Textiles – can be collected for distribution and resold to merchants in third world countries. Damaged or unusable textiles can be recycled through high-tech machinery that produces automobile insulation, blankets and underlay for carpets
- Carpet – carpet and waste flooring materials can be converted into sheared carpet fibers (which can be made into nylon carpet fiber, nylon pellets and plastic components and carpet padding)
- Drywall – can be used as a soil or compost amendment.

## **11.6 GREEN BUILDING INCENTIVES**

The City could provide training and incentives to building designers, builders and developers to build green in order to encourage more sustainable construction, both in City and private construction projects.

LEED® is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

LEED® certification has several waste diversion benefits as it encourages the development of waste recycling programs for tenants of buildings. LEED® certification extends best building practices which will help reduce waste as points are received for implementing diversion programs. The City could require new facilities built within its boundaries over a certain size (say over 500 m<sup>2</sup>) to achieve LEED® certification. Within this program they could include specific targets for waste minimization and diversion.

Within LEED, there is also a program for Existing Building Operations & Maintenance (EBOM) which is an existing building rating system administered by the Canada Green Building Council. It helps building owners and operators optimize building performance. It is optimally used for large to medium buildings with LEED certification.

BOMA BEST is a national environmental recognition and certification program for existing commercial buildings. This program helps assess how well a building is performing and includes suggestions on ways to improve environmental practices. It is most suitable for commercial office buildings, and retail (malls).

In City projects, the City could consider mandated performance, that is, a certain percentage of a designated material must be comprised of recycled material.

Both LEED EBOM and BOMA BEST offer four levels of certification and have a waste reduction focus. The City could also encourage existing buildings to obtain certification in either of these programs.<sup>20</sup> Beyond certification in either of the above-mentioned programs, the City could provide incentives such as free consultations and fee discounts and grants for builders and developers to build “green” buildings.

Research indicates there are a number of projects proposed for LEED certification (e.g. Camrose Performing Arts Centre, City Hall, WWTP), however, the status of these projects and the level and status of certification is unknown at this time.

In City projects, the City could consider mandated performance; that is, a certain percentage of a designated material must be comprised of recycled material. Alternatively, there could be

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<sup>20</sup> Stantec Sustainable Solutions - <http://www.aeea.ca/pdf/bomavsleed.pdf>

preferential pricing, for materials with a minimum recycled content allowed a percentage increase in product price in competitive tendering evaluation.

Examples of initiatives by various government sectors for LEED certification in government buildings include:

- Since 2005, all new federal government office buildings in Canada have been required to meet Canada Green Building Council's LEED Gold level.
- In 2007, Public Works and Government Services Canada implemented BOMA Canada Go Green Plus environmental assessment program.
- In 2006, the Government of Alberta made a commitment that new capital projects will achieve a LEED Canada Silver certification rating.

This increase in level of service would allow the City to track the diversion efforts of these businesses and also get a handle on participation rates in diversion initiatives in the small commercial IC&I sector.

In Vancouver, all new municipal facilities over 500 m<sup>2</sup> are required to meet LEED Gold Standards.

## **11.7 FACILITATE DIVERSION**

Although, as previously identified, the City does not manage any portion of the waste generated by the IC&I sector, it is known that this sector produces significantly more waste than the residential sector. The options for diversion of IC&I materials considered for the WMMP must acknowledge that the majority of these materials are managed outside the City's system. The City can encourage and support diversion but is not in the position to control the level of diversion by these sectors at this time.

### **11.7.1 IC&I Collection Program**

The City should examine the potential to provide collection of garbage, recycling and organics from the IC&I sector located in the downtown core.

Over the short term, the City could consider expanding curbside collection to all small businesses within the City. This increase in level of service would allow the City to track the diversion efforts of these businesses and also get a handle on participation rates in diversion initiatives in the small commercial IC&I sector. With this initiative, the City could also consider establishing garbage disincentives (e.g., commercial bag limits of garbage volume limits) to promote increased capture of recyclable and organic material.

If the City goes ahead with implementing a curbside IC&I program, a full P&E program will need to be developed to support this initiative. Like with the single family and multi-family sector, clear and concise educational materials are required to increase acceptance and participation in this type of program.

### **11.7.2 Retirement Facilities Diversion**

The City could consider a stronger focus on waste diversion initiatives in retirement and long term care facilities.

A somewhat significant portion of the institutional sector in the City can likely be attributed to retirement and long term care facilities as 19% of the population is over 65 years of age and some reasonable percentage of that population would reside in these facilities. The City could consider a specific P&E program aimed at these facilities to increase participation and diversion rates in this part of the institutional sector.

The benefit to establishing partnership with schools is that a student population that is well informed on waste management programs and policies can assist with raising the overall diversion rate through program awareness and encourage participation at home.

As these facilities generally have fairly active 'internal communities' or 'social groups' amongst them, the introduction of incentive programs could greatly increase the success of a new program. Providing residents with social activities and emphasizing the 'group' or 'community' aspect of diversion is an aspect of social marketing (discussed further in section 3.8.3) and could not only facilitate increased participation in waste diversion activities but create a sense of even greater 'environmental contribution' by community members.

### **11.7.3 School Waste Diversion Program**

The City should examine potential partnerships with local school boards and other educational institutions to identify opportunities for promotion of City programs, and to establish mutual goals for waste reduction and diversion initiatives and reporting mechanisms to track quantities of waste generated. Depending on a facility sustainability program, schools and institutions may have waste audit information they can share which would be of use to the City to identify areas for waste reduction or diversion.

The benefit to establishing partnerships with schools and institutions is that a student population that is well informed on waste management programs and policies can assist with raising the overall diversion rate through program awareness, which in turn will increase the participation rate and decrease contamination.



The City could piggyback on initiatives that many school boards have implemented. The Recycling Council of Alberta supports the Triple StaRs Grade 4 Waste Reduction Challenge annually. Triple StaRs is a five-day waste audit that takes place during Waste Reduction Week. The week's finale involves the participating classes developing a Pledge of Action to reduce waste in the classroom for the rest of the year<sup>21</sup>. Also, many schools across the Province participate in a waste-free lunch contest during this week<sup>22</sup>. Funding opportunities are available to schools through the Alberta Emerald Foundation which through the Youth Environmental Engagement Grant Program supports grassroots examples of environmental excellence in waste minimization and recycling, conservation of energy and natural resources and other similar topics<sup>23</sup>. Information from these events could provide the City with data about waste quantities and help identify P&E opportunities.

#### **11.7.4 Green Procurement Policies**

This option involves the implementation of Green Procurement Policies to support green industry by including specifications for recycled content, reusability and life cycle management through the development of a Green Procurement Guide specific to the IC&I and C&D sectors operating in the City. The guide would educate IC&I and C&D generators about Green Procurement and would provide resources to these sectors on selecting products that are environmentally preferable. This initiative would show that the City is willing to take on a leadership role in environmental stewardship.

For the IC&I sector, green procurement options could include encouraging the purchase of paper products that are made of post-consumer recycled fibres and using cleaning products that contain less hazardous ingredients. For the C&D sector, options could include encouraging the purchase of building materials made of recyclable material or materials that are less hazardous in nature (e.g., low VOC paint).



The City could also institute a policy to mandate minimum recycled content standards for all purchases.

The following are examples of green procurement policies:

- Rona Inc. developed a Wood Products Procurement Policy which gives preference to suppliers that offer sustainably sourced lumber. At the end of 2010, all softwood lumber offered by Rona was from certified forests. They also created an online eco-responsible

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<sup>21</sup> Recycling Council of Alberta. Waste Reduction Week. Triple StaRs Grand 4 Waste Reduction Challenge. <http://www.recycle.ab.ca/rrr>. Accessed June 27, 2012.

<sup>22</sup> Recycling Council of Alberta Newsletter Connector. Fall 2011. Waste Reduction Week 2011.

<sup>23</sup> Alberta Emerald Foundation. Youth Environmental Engagement Grant Program. <http://emerald.foundation.ca/programs/youth-engagement-program>. Accessed June 27, 2012.

renovation guide that identifies a range of building materials, products and processes, and accompanying environmental life cycle analysis<sup>24</sup>.

- New York City<sup>25</sup> enacted a series of environmentally preferable purchasing laws which apply to products purchased or leased directly by the City, building construction and renovation for spaces over 15,000 sq. ft., leased space, or any other contracts at the discretion of the Director of City wide Environmental Purchasing.
- The Clean Air Partnership is a registered charity that works in partnership with municipalities and organizations to improve local air quality and reduce greenhouse gases and conducts research on municipal policies for a number of networks and organizations. Recently, they authored a report<sup>26</sup> on Green Procurement Policies and Actions for the Clean Air Council which documents Green/Sustainable Procurement policies, procedures and actions by a number of municipalities in Ontario. The report provides a description of initiatives undertaken in Canada and the U.S. at the municipal, provincial and federal level, many of which may be of interest to the City.

### **11.7.5 Strategic Partnerships**

The City could evaluate the merits of private/public partnerships to support diversion through the establishment of end markets, supporting infrastructure requirements, and P&E initiatives. This would involve participating in, facilitating or developing research partnerships to examine reuse of materials and establishment of end markets for recyclable and reusable goods.

This option would see the City providing assistance to and support for entrepreneurs by providing a location for developing new diversion facilities (e.g. "Green Park") and promoting the use of existing and new facilities to divert IC&I and C&D materials. This option would include promotion of existing diversion opportunities for concrete, asphalt, scrap metal, as well as blue box materials.

Over the short term, the City could provide assistance to and support for entrepreneurs for developing new diversion initiatives and promoting the use of existing facilities to divert IC&I and C&D materials. The concept should be discussed with targeted businesses to determine if there is sufficient interest to pursue development.

The City could consider forming research partnerships with post-secondary institutions such as the University of Alberta Augustana Campus. Research could focus on investigating different methods to re-use different materials and establish end markets for hard-to-recycle materials.

Other communities have had success in forming partnerships. The City of Calgary developed its Biocell project with support from the University of Calgary. The Biocell promotes sustainable

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<sup>24</sup> Top 50 Socially Responsible Corporations - <http://www2.macleans.ca/2011/06/09/better-business/>

<sup>25</sup> [http://www.nyc.gov/html/nycwasteless/html/wasteless/atwork\\_greenpurchasing\\_agencies.shtml#construction](http://www.nyc.gov/html/nycwasteless/html/wasteless/atwork_greenpurchasing_agencies.shtml#construction)

<sup>26</sup> <http://www.cleanairpartnership.org/files/Green%20Procurement%20Scan%20October%202011%20Draft.pdf>

solid waste management and extends the landfill bioreactor concept to include principles of sustainable development. The Biocell project has the potential to greatly decrease the environmental impact of operating a solid waste landfill.

The Edmonton Waste Management Centre of Excellence (EWMCE) is a not-for-profit corporation established to meet solid waste and waste water challenges worldwide featuring innovative research, technology development and training. Members consist of the City of Edmonton, University of Alberta, Alberta Research Council, AMEC, NAIT, and EPCOR.<sup>27</sup>

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<sup>27</sup> [http://www.edmonton.ca/for\\_residents/garbage\\_recycling/edmonton-waste-management-centre.aspx](http://www.edmonton.ca/for_residents/garbage_recycling/edmonton-waste-management-centre.aspx)

## 12.0 Landfill Site Management Options

The City currently has areas at the landfill for disposal of waste oil and batteries, scrap metal, tires, herbicide/pesticide containers, wood, compostable material, wire and cable, CFC units (fridges, freezers) which offers some opportunity to segregate materials. However, the landfill is principally used for disposal of waste by residents and small commercial generators arriving in smaller vehicles. This keeps small vehicle traffic from the landfill tipping face for safety reasons and allows for operation of a smaller tipping face for large waste hauling trucks.

There are a number of options for consideration by the City that would increase the amount of material diverted from the landfill while simultaneously extending the life of the landfill as well. These include the “re-purposing” of the landfill site potentially including construction of a community recycling centre, differential tipping fees, landfill bans, improvements to the landfill infrastructure, transfer stations, and diversion of construction and demolition (C&D) materials. Further discussion on each of these topics is included below.

### 12.1 REBRANDING/REPURPOSING OF THE LANDFILL

Communities across Canada are becoming more cognizant of the need to move towards a more sustainable approach of managing waste. In keeping with that philosophy, there has been a move towards rebranding waste disposal facilities. Once known as “dumps”, landfills have become “waste management facilities” which shifts the focus from disposal to sustainability and waste diversion program development. There have been a number of facilities who have repurposed their facilities, for example, the **Bow Valley Waste Management Commission operates the “Francis Cooke Regional Landfill and Resource Recovery Centre”**, highlighting the fact that there are a number of diversion options at this facility.

Regardless of the number and timing of additional diversion waste diversion programs implemented at the landfill, the City could consider ‘re-purposing’ the landfill e.g. like a Resource Recovery Centre to reflect the City’s mandate of sustainability.

Similarly, the Leduc & District Regional Landfill changed its name to the **“Leduc & District Regional Waste Management Facility”**.



The Beaver Regional Waste Management Services Commission changed its operating name to “Beaver Municipal Solutions” with a new logo and slogan “Innovative Solutions for a Changing World”. The change in operating name offered an opportunity for promotion and education; their website was relaunched with a new look in order to be able to provide more information on services and initiatives offered by the new entity.

Regardless of the number and timing of additional diversion options at the existing landfill, the City should consider renaming their landfill to reflect the both the current and future opportunities for diversion. This could form part of a larger re-launch of the City's program, with a cohesive P&E program and branding for all waste management facilities, including the recycling depot so the public can identify components of a comprehensive suite of waste management initiatives. This would also be part of a re-launch of the City's website to improve the information offered to visitors to the site.

## **12.2 COMMUNITY RESOURCE RECOVERY CENTRE (CRRC)**

Many large municipalities in Canada have or are developing what they refer to as Community Recycling Centres (CRCs), Community Resource Recovery Centres (CRRCs), Community Environmental Centres (CECs), Eco Stations or other, and that are fundamentally designed for the purposes of receiving source-separated materials bound for beneficial end-markets. While operating under the same principle as the City's existing recycling depot, these facilities are typically designed to focus on the principles of the 3Rs where waste reduction and reuse are paramount (e.g. with a reuse centre of some description) followed by a focus on diversion of as many materials as practically possible with the last element of facility management lending itself to disposal (e.g. 40 cubic yard bins in a designated area past the points of recovery).

CRRCs can also provide residents with convenient points of access to drop off materials that are not so easily managed at the curb, e.g. blue box recycling from certain multi-residential or commercial locations, building materials, organics, electronics, bulky items like appliances, shredded paper, etc. CRRCs can also be used to assist residents with managing waste materials that exceed their curbside pick-up limits that may apply. The CRRCs can also feature education areas where residents can learn more about environmental issues.

The City of Edmonton has three Eco Stations in addition to drop off facilities at its Edmonton Waste Management Centre. Edmonton Eco Stations accept HHW, e-waste, bulky items, blue box recyclables, mattress or box springs, white goods and large appliances and tires.

The Leduc & District Regional Waste Management Facility accepts recyclables, HHW and also houses a "Take it Leave it" program where residents can drop off or take items that can be reused thus keeping them out of the landfill.

Some municipalities have also partnered with the private sector to operate depot systems on their behalf. Halton Region currently partners with two private sector operators in the Region to receive residential drop-off materials at their two waste transfer stations but is currently evaluating a more formal CRRC network within the Region. Private sector partnerships may be a viable way for the City to integrate additional locations within a CRRC network and/or the City could further investigate the merits of two CRRC locations within the City (one at the existing depot location and one at the landfill). Notwithstanding that given the size of the City this would be more convenient for all residents, this addition may benefit the City in both maximizing the existing depot in terms of materials diverted and potential waste reduction initiatives, and may

also assist in re-purposing the landfill site as discussed above. Further, and given the space limitations at the existing depot location, the landfill site may be better suited to the construction of a transfer station should the City require the transfer of recyclable materials outside their jurisdiction.

Ideally a new CRRC would be located in concert with any new transfer stations the City elects to construct to optimize their current residential waste collection programs. This not only facilitates transfer of curbside collected materials if necessary but also provides opportunities to bulk and ship other materials in the future, e.g. storage and bulk transfer of materials from the transfer station to end-markets or materials processors, e.g. metals, wood, etc.

In terms of capital and operating costs, the range of costs for a CRRC vary greatly and are based on a number of factors like site size requirements, number and type of materials being handled, haul distances to processors or other material handlers, scalehouse requirements if any, staffing/site attendance, ownership of equipment e.g. bins, and other variables.

### 12.3 DIFFERENTIAL TIPPING FEES

The majority of residential garbage is disposed of at the Regional Sanitary Landfill. As seen in Table 12-1, there is currently no differential tipping fee for mixed loads.

**Table 12-1: Camrose Regional Sanitary Landfill Site Tipping Fees**

| Tipping Fee Schedule                                                                                              |                                                                 |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>Waste Disposed during Normal Hours</b>                                                                         |                                                                 |
| Refuse<br>Commercial<br>Demolition<br>Industrial (inert, single commodity)<br>Animals                             | Min. \$35.00 per tonne                                          |
| Clean Fill Soil<br>Grass & Tree Clippings                                                                         | No charge if free of debris and placed in compost compound      |
| Outside region additional surcharge Accepted only with prior approval from Camrose Regional Solid Waste Authority | Double Applicable Rate                                          |
| <b>Special Waste (Environmental) Upon Analysis</b>                                                                |                                                                 |
| Hydrocarbon Soils - Max 10,000 ppm                                                                                | \$16.00 - \$18.00 per tonne                                     |
| Asbestos                                                                                                          | \$40.00/tonne plus \$100.00/hr. – 1 hr minimum equipment charge |
| Appliances (White goods)                                                                                          | \$5.00 each                                                     |
| Appliances (Freon)                                                                                                | \$25.00 each                                                    |
| Batteries<br>Pesticide Containers<br>Used Oil                                                                     | Free                                                            |
| Wood and Metals                                                                                                   | Based on separation - \$17.50 to \$35.00/ tonne                 |

## CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN PHASE 2 - PART 2: BEST PRACTICE ASSESSMENT

11B Landfill Site Management Options

August 2012

| Tipping Fee Schedule                                                       |                                                              |
|----------------------------------------------------------------------------|--------------------------------------------------------------|
| Tires                                                                      | Based on separation/stacking/sorting - Free to \$40.00/tonne |
| <b>Waste Disposed Outside Normal Hours - Combination below as required</b> |                                                              |
| scalehouse @ 30.00 / hr                                                    |                                                              |
| equipment @ 100.00 / hr                                                    |                                                              |
| disposal @ applicable rates                                                |                                                              |

Municipalities have implemented differential tipping fees to support diversion programs by encouraging source separation of materials brought to the landfill site through the use of financial incentives along with providing appropriate access to infrastructure to allow for source separation. By increasing the costs to dispose mixed loads and providing infrastructure for the collection of source separated materials, the City can directly influence the actions of residents who self-haul waste to landfill and private haulers who bring materials to the landfill for disposal. The rate for mixed loads needs to be set at a rate that discourages the practice and is generally set at a value up to five times the rate for residual garbage. Currently, soil, grass and tree clippings, tires, used oil, batteries and pesticide containers are accepted free of charge if these materials are clean and source separated so there is already some precedent for differential tipping fees in existence. However, the differential on some materials may not provide enough of an incentive to separate materials. Other material streams such as old corrugated cardboard (OCC) could also be accepted either free of charge or at reduced tipping rates, should there be a ready and reasonable market for diversion of these material streams.

By increasing the costs to dispose of mixed loads and providing infrastructure for the collection of source separated materials the City can directly influence the actions of residents who self-haul waste to landfill as well as private waste haulers.

At the Leduc & District Regional Waste Management Facility, a tipping fee of \$50.00/tonne applies to residential waste, commercial waste, C&D waste, concrete, and scrap metal/appliances. Regular commercial and residential waste from out-of-boundary customers is charged at \$54.00/tonne. Variable rates apply to compostable materials; \$28/tonne for LYW, \$49/tonne for organics from member municipalities and \$69/tonne for organics from commercial customers. The tipping fee for mixed loads will be charged at the rate of the highest fee for any one of the materials contained in the load.

The Bow Valley Waste Management Commission charges differential tipping fees at their Francis Cooke Landfill. As an example, the tipping fee for unsorted asphalt shingles is \$250/tonne compared to \$50/tonne for "clean" asphalt shingles. The same charges apply to unsorted and clean drywall/gypsum. The charge for acceptable waste (recycling sorted) is \$100/tonne compared to recycling "unsorted" at \$190/tonne.

Consideration could focus on increasing the tipping fee for mixed loads of materials at the landfill to encourage source separation of materials and increased diversion, along with



development of additional infrastructure as discussed further in Section 12.7. The rate should be developed based on availability of end markets and take into consideration the need to prevent the re-direction of waste to private landfills which may have lower tipping fees.

## 12.4 SURCHARGES FOR DESIGNATED MATERIALS

The City could consider adjusting/expanding the surcharge applied to mixed loads containing target materials, including recyclables, C&D materials and possibly organics. Tipping fees could be decreased to support source separation.

The City could charge variable tipping fees on incoming IC&I and C&D loads depending upon the type of acceptable recyclable material in the load and whether materials are separated into individual material streams or arrive as mixed loads. Most communities charge in the order of five times the tipping fee for mixed loads containing divertible material. This acts as a financial incentive for businesses to source separate material. The environmental benefit comes through increased diversion and reduction in the use of non-renewable resources (e.g., metals, etc.). The table below presents, by way of example only, the variable tipping fees levied by the Regional District of Nanaimo for different types of waste.

Many municipalities charge in the order of five times the tipping fee for mixed loads containing divertible material.

**Table 12-2: Regional District of Nanaimo Landfill Tipping Fees**

| Regional District of Nanaimo                                                         |             |
|--------------------------------------------------------------------------------------|-------------|
| Type of Waste                                                                        | Tipping Fee |
| Regular waste                                                                        | \$115/tonne |
| Loads of MSW containing gypsum, recyclable cardboard, paper, metal or tires          | \$230/tonne |
| C&D waste containing gypsum, recyclable cardboard, paper, metal, wood waste or tires | \$340/tonne |
| Loads of garden waste, scrap metal or corrugated cardboard                           | \$55/tonne  |
| Commercial loads of organic waste                                                    | \$100/tonne |

The City would have to confirm that the appropriate diversion infrastructure is in place for the materials designated as recyclable and that markets are available and suitable for the City.

## **12.5 BAN DESIGNATED MATERIALS FROM LANDFILL**

A disposal ban consists of prohibiting the disposal of designated materials at the point of disposal (i.e., at the landfill). Loads of material would be inspected before being dropped off at the landfill and loads exceeding permitted levels of banned material would be rejected or subject to a surcharge. The surcharge should be a prohibitive fee (e.g., 10 times the normal cost for disposal) for loads with greater than 5% of a banned material. Potential mandatory materials for recycling that could be banned from landfill disposal could include concrete, drywall, shingles, organics, wood, cardboard, recyclable paper and other materials.

As described above, the City could simply place a higher tipping fee on any incoming loads in which designated materials are mixed with other wastes for disposal. The City would gain revenue from the fines and avoid the cost and effort required to dispose of illegally dumped waste.

There are a number of advantages associated with establishing a ban, including:

- Many waste materials have a good potential to be diverted from landfill disposal and the ban would help promote diversion
- The operating life for existing landfill capacity would be extended
- Natural resource consumption would be reduced through the reuse and recycling of a greater portion of the waste stream

There are also several disadvantages which must also be taken into account:

- A ban would require the development of programs for diverting waste materials, amendments to the City's Waste Management bylaw, and policies for non-compliance.
- The effectiveness of the program will depend on defining a use or market for the waste materials that are diverted from the landfill. Some options for use of materials exist at the landfill itself; others may require identification of markets within the municipality or cities within a reasonable haul distance.
- Enforcing a mandatory ban could be somewhat controversial. Less overall flexibility is provided in such a system for waste generators. However, exemptions for small loads, a grace period and other options such as staging from a differential tipping fee approach to a full ban, could be considered to ease the transition to the new policy.
- The City would incur some capital cost to set up designated diversion areas at the landfill, and operating costs for staffing these diversion areas as well as grinding certain materials if necessary.

There are a number of municipalities that have implemented landfill bans, examples of programs in British Columbia are described below.

- The Hartland Landfill in the Capital Regional District of B.C. has a ban on aggregate, asphalt, clean soil, concrete, OCC, drywall, rubble, scrap metal, cardboard, large appliances, tires, yard waste and product stewardship materials. A future ban on wood waste and kitchen scraps from businesses is being considered<sup>28</sup>, further to additional consultation with stakeholders and to evaluate the impact of proposed provincial legislation to expand EPR across the province.
- The Regional District of Nanaimo (RDN) increased the tipping fee for clean wood waste at RDN solid waste facilities in order to create incentives to divert this material to licensed recycling facilities, and implemented a ban on clean wood waste at the Regional Landfill and roll-off containers of wood waste at RDN solid waste facilities. Third party wood waste recycling facilities are contracted to manage the wood waste received at the landfill and transfer station from small self-haulers. The following materials are prohibited for disposal at the landfill; gypsum, wood waste, recyclable cardboard, paper, metal, household plastic containers, tires and organic waste from commercial sources. They also have differential tipping fees (See Section 12.3 for more details on the fees)<sup>29</sup>.
- Metro Vancouver has a landfill ban on OCC, recyclable paper, green waste, containers made of glass, metal or banned recycled plastic and beverage containers and prohibits clean or treated wood > 2.5 m, gypsum, inert fill materials, electronics and asbestos (just an example of some of the prohibited materials<sup>30</sup>). Loads containing prohibited materials are assessed a \$50 minimum surcharge, plus the cost of removal, clean-up or remediation. Loads containing banned materials are assessed at 50% tipping fee surcharge.

## **12.6 OPERATIONAL OR ENGINEERING LANDFILL IMPROVEMENTS**

The City could consider the following improvements to the landfill:

- Developing a fill plan to more effectively use the capacity at the site
- Investing in a GPS system to improve compaction and optimize airspace use at the landfill
- Directing residential landfill traffic to a depot area, reducing the open working tipping face at the landfill and allowing for optimal tipping face operation
- Landfill gas management and energy recovery system

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<sup>28</sup> <http://www.crd.bc.ca/waste/hartland/prohibited.htm>

<sup>29</sup> <http://www.rdn.bc.ca/cms.asp?wpID=1508>

<sup>30</sup> <http://www.metrovancouver.org/services/solidwaste/disposal/Pages/bannedmaterials.aspx>

- Development of a soils management plan or other similar initiatives to confirm that effective management of inert materials and that could facilitate management of materials from other City operations. Such a plan would include an update to the soils and materials balances developed for the landfill, in regards to the demand for daily, interim and final cover. The plan could include formalized measures to use the weight and volume of stockpiled cover materials, to increase the in-place density of the waste stream
- Review and update of approaches for daily cover including the potential for expanded use of tarp, spray and other alternative cover approaches to optimize landfill airspace
- Development of an expanded residential CRRC at the landfill, allowing for an increase in the source separation and diversion of difficult to compact but recyclable or reusable bulky materials and designated areas for recyclable C&D wastes and grinding/size reduction of non-recyclable or reusable wastes prior to disposal
- Improved signage for all areas of the landfill for existing and new designated recovery and disposal areas

The City may have already undertaken some of these practices but others may reflect options undertaken by other municipalities that the City may not have considered/implemented.

Further review is needed to scope the potential for improvements to the landfill operations. The above should be considered only as a preliminary overview, to be expanded upon in the detailed implementation plan.

The need for infrastructure development for the diversion of C&D waste is becoming more important as diversion in public and private construction is encouraged or mandated through ordinances or regulations.

## **12.7 SUPPORTING INFRASTRUCTURE FOR IC&I WASTE DIVERSION**

This option involves the identification of the potential infrastructure needed to support IC&I and C&D diversion programs and the determination of options for the City to participate in or to facilitate infrastructure development.

The City could consider developing an area for the diversion of IC&I and C&D materials at the landfill. This could take the form of a re-use area (specifically for C&D materials) and a recycling station for divertible materials. The City could choose to develop a facility itself or in partnership with a private entity interested in participating in the effort.

There are several advantages to such a program, including:

- Promoting the reuse and recycling of waste as opposed to disposal.
- Lowers disposal costs for contractors.

- The opportunity to recycle difficult-to-divert waste streams such as shingles and drywall, etc.

The capital costs to develop an IC&I and C&D materials recovery depot can vary significantly based on:

- The existing infrastructure at the site (e.g. scales, access roads).
- The amount of grading and material required to develop the appropriate facility configuration.
- The type and potential quantity of materials that would be managed, which will determine the facility footprint and resources required for construction.

The operating costs to run such a depot can also vary significantly based on:

- The types and quantities of material managed. Some materials such as wood waste may have a net cost to divert from landfill, for example if diversion of these materials involved shredding/chipping of wood wastes once or more a year. Other materials such as scrap metals may generate net revenues from the sale of these commodities.
- The method used to manage the materials. If materials are placed in 40 yard roll-off bins and hauled a distance for recycling and/or recovery, then there would be a cost associated with removing these bins and hauling them to the location where the material would be used.
- The staffing and monitoring of the depot. Generally, facilities with more successful diversion rates would have at least one dedicated staff on-site at any one time, to direct customers to the appropriate areas and to confirm that customers are source separating their materials at the facility.

Cost recovery mechanisms also have to be investigated. The City will need to confirm that there are end markets available for IC&I and C&D materials collected through these depots prior to developing them.

Examples of options for C&D materials are presented below:

- Alberta Waste and Recycling Ltd. is setting up resource recovery depots throughout Alberta to accept and recycle C&D waste materials. They presently have four transfer sites in and around Calgary, charging \$65/tonne for sorted loads of wood, drywall, asphalt shingles and brush. Asphalt and concrete are accepted at \$49/tonne. They also operate a mobile residential recycling service and a special events recycling trailer. They also operate a transfer site for the City of Airdrie on a pilot basis, accepting tires, concrete, asphalt, drywall, garbage, propane, OCC, wood, automotive batteries, shingles and scrap metal. Asphalt

and concrete are accepted at \$9/tonne, wood, shrubs, brush, drywall and shingles are accepted at \$65/tonne<sup>31</sup>.

- The City of Calgary has implemented a C&D waste diversion pilot at one landfill to accept wood, drywall, asphalt shingles and cardboard at \$65.00/tonne. This material is also accepted at the other two landfills at \$140.00/tonne for commercial customers only.
- The City of Red Deer is diverting asphalt shingles and gypsum drywall for recycling which are diverted to an assigned diversion area at the landfill.
- The Bow Valley Waste Management Commission operates a resource recovery area at the Francis Cooke Landfill where the following materials can be diverted: asphalt, asphalt shingles, concrete, drywall, kiln-dried wood and OSB (oriented strand board). There is also a C&D "take it or leave it" area where items for re-use can be placed or picked up.
- The City could consider a number of options for handling divertible materials. One option is the construction of diversion areas at the landfill where clean loads of designated materials could be dropped off. Supporting infrastructure has been discussed above.

The City could also develop partnerships with the private sector to collect and process materials such as wood waste, for instance, working with retail centres or a larger service provider to process mixed and segregated materials. Finally, the City could partner with the private sector for collection and processing of C&D waste, similar to the following examples of what other jurisdictions are doing.

- The City of Airdrie has partnered with Alberta Waste and Recycling Ltd. to operate a Resource Recovery Depot at their transfer site to supplement the recycling depot in order to handle larger item recyclables and construction material.
- In Los Angeles, all haulers and contractors responsible for handling C&D waste must obtain a permit prior to collecting, hauling and transporting C&D waste which must be taken to City certified C&D waste processors. C&D rebates will be phased out; compliance will be through the requirement of obtaining a permit which results in less paperwork and administration for both contractors and the City. Non-compliance penalties of up to \$5,000 will be assessed for every load of C&D waste not taken to City-certified processors.<sup>32</sup>

The need for infrastructure development for the diversion of C&D waste is becoming more important as diversion in public and private construction is encouraged or mandated through ordinances or regulations. The greatest uncertainty for the construction industry is the availability of salvage and recycling services and outlets and any costs associated with handling C&D materials.

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<sup>31</sup> [http://www.airdrie.ca/recycling\\_waste/transfer\\_site.cfm](http://www.airdrie.ca/recycling_waste/transfer_site.cfm)

<sup>32</sup> [http://san.lacity.org/solid\\_resources/recycling/c&d.htm](http://san.lacity.org/solid_resources/recycling/c&d.htm)

## 13.0 Next Steps

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The next step in developing the City's WMMP is to discuss the options as presented in this report with the City, to provide clarification with respect to the information provided herein. Based on discussions with the City and the results of Phases 1 and 2, Stantec will commence work on *Phase 3 – System Options Evaluation* to identify a preferred waste management system; the short, medium and long term waste management options that are recommended to be implemented and the associated waste diversion impacts and associated capital and operating costs, system cost savings and revenues.

Once this set of potential options for the enhanced waste management system have been approved by the City, further engagement with the residents and stakeholders can be initiated. This will entail a series of focus group sessions that will be used to discuss the waste management options available to the City and the prioritization of changes to the existing system. Focus group attendees will be drawn initially from established local waste management stakeholders (City Council, Green Action Committee, Camrose Regional Solid Waste Authority, Centra Cam Vocational Training Association, etc.) as well as any members of the public identified by the project team. Other groups who may be interested in participating include Camrose Construction Association and the Canadian Home Builders Association.

The first focus group session will focus on the City's existing waste management system and the stakeholder perspective on various opportunities for improvement. Participants will be presented with updates on the project history and progress and then asked to help define the goals and objectives of the WMMP, as well as prioritizing the suite of options contained in this report. The second focus group would be held at the end of Phase 3 to present the outcome of the system options review phase of the project and to generate open discussion and feedback with respect to the various system options developed. The third and final focus group would be held at the end of Phase 4 to present the outcome of the evaluation of the systems and identification of the recommended preferred system. This will provide an opportunity to obtain feedback with respect to the recommended preferred system prior to the completion of the draft WMMP.

Once the draft WMMP has been approved for release, an open house style event will be held to receive public comment. The release of the draft WMMP on the City website should occur at least three weeks prior to the event in conjunction with an invitation and advertisement for the open house on the City's website and the local newspaper, as well as the posting of notices at the main waste management facilities in the area (recycling depot and landfill). Public comment will be open for approximately two weeks after the open house event, at which time the draft WMMP will be finalized based on the commentary provided by the public and the stakeholder focus group.



## **14.0 Stantec Quality Management Program**

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This report, entitled “**City of Camrose Waste Management Master Plan Phase 2 - Part 2: Best Practices Assessment; Prepared for: City of Camrose.; Prepared by: Stantec Consulting Ltd.; August 2012**” was produced by:



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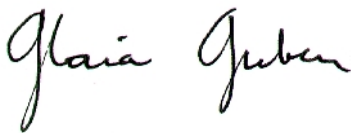
Leslie Greener, H.B.A  
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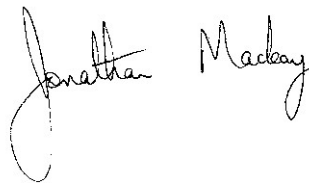
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Senior Consultant

This report has been reviewed and approved for transmittal by:



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Engineer



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Jonathan Mackay, B.Sc.  
Associate

**APPENDIX D**  
**PHASE 3 - SYSTEM OPTIONS**  
**EVALUATION REPORT**



**City of Camrose Waste  
Management Master Plan**

**Phase 3 – System Options  
Evaluation**

Prepared for:

The City of Camrose

Prepared by:

Stantec Consulting Ltd.

August 2012  
1102-18706

## Sign-off Sheet



**Stantec**

This document entitled City of Camrose Waste Management Master Plan was prepared by Stantec Consulting Ltd. for the account of the City of Camrose. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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Senior Consultant**

Reviewed by \_\_\_\_\_  
(signature)

**Gloria Gerber, M.Eng., P.Eng.  
Senior Associate, Waste Management Engineer**

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## 1.0 Introduction

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Stantec was retained by the City of Camrose to develop a Waste Management Master Plan (WMMP). The WMMP will provide strategic direction for residential and Industrial, Commercial & Institutional (IC&I) waste management activities over the short term (2013 – 2018), mid-term (2019 – 2023) and the long term (2024 – 2038) while also providing visionary direction for waste management over the next 25 years.

This report follows the Phase 1 *City of Camrose – Waste Management Master Plan: Project Initiation Report*, June, 2012 that speaks to the strategy's vision and various goals and objectives to be achieved as part of the WMMP. It also follows a *Phase 2 – Part 1 - Current System Assessment and Long Term Waste Management Needs* report which provides a description of the City's current waste management system to determine the elements of the City's 'status quo' system from a programming and infrastructure standpoint. That report also documents projections for the amount of waste requiring management over the planning period. Based on the projections, the City's long term waste management needs were identified to support the development of a long term vision for the system and for setting reasonable and achievable waste diversion goals and specific program objectives.

Also as part of Phase 2 of the WMMP, a *Part 2 – Best Practices Assessment Report* (August, 2012) was undertaken (under separate cover). A range of appropriate best practices were identified and described in the form of a long list of waste management opportunities/options for review and discussion as it may relate to inclusion in the City's future solid waste management system.

Based on the findings of the Phase 2 work and based on discussions with and feedback from City staff, this *Phase 3 - System Options Evaluation* report identifies the characteristics of a preferred waste management system; the short, medium and long term waste management options that are recommended to be implemented, associated waste diversion impacts, order or magnitude capital and operating costs, any system cost savings and revenues as well as an implementation timeline for the WMMP.

This report outlines recommended programming and infrastructure development in the short (1 to 5 years), mid (5 to 10 years) and long term (10 to 25) with clear actions to be undertaken and the mechanisms to be employed to meet the goals and objectives of the WMMP. This report first discusses those mechanisms to be employed throughout the life of the WMMP and those that are necessary to any waste management system. Specific programming and infrastructure development necessary in each of the short, mid and then long term are then discussed along with critical path for certain actions/undertakings if applicable.

All programs that must be supported by any significant change to other system components e.g. promotional and educational undertakings, collection programming, those that impact operating



and capital budgets, may require additional staffing, may require approvals, have outside funding opportunities, and/or require significant community support are discussed in detail. Consistent with the overarching waste planning principles for this WMMP, this report is structured in accordance with the Waste Hierarchy and focuses first on waste reduction and reuse strategies for the City, then on various waste diversion initiatives for the residential single-family and multi-family sectors as well as strategies to divert waste in the IC&I sector. Strategies for management of the landfill are also discussed in the context of minimizing use, recognizing the landfill as a valuable resource and the benefits of prolonging landfill life.

## 2.0 Programs for the Duration of WMMP (2013-2038)

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These programs are deemed to be required over the life of the WMMP and with any waste management system configuration, that is, any preferred system that results from the WMMP planning and public consultation process. These programs specifically address various administrative, promotion and educational and regulatory requirements.

### 2.1 PROGRAM ADMINISTRATION

#### 2.1.1 Staffing Requirements

Staffing requirements are ultimately dependent on the extent to which the City implements the various programs identified in the WMMP. Staffing is discussed throughout this report and will be considered in more detail with respect to associated cost-benefit in Phase 4. The current staffing complement for waste management services is likely insufficient to effectively implement this WMMP. Staff will be required to coordinate not only ongoing promotion and educational (P&E) activities but various one-time larger scale campaigns that come with some of the major program changes identified in this report. The development of various procurement documents will also be necessary along with ongoing contract oversight and sufficient staffing to manage the administrative aspects (e.g. program monitoring and reporting) of the various programs identified herein.

At minimum, one extra staff person (FTE) should likely be hired to assist with planning, program implementation and delivery of programs associated with this WMMP. The City could supplement staffing through summer student/co-op student hiring to assist with some aspects of programming. In some cases volunteers have been engaged by other municipalities (e.g. Boy Scouts), to assist with tasks like the distribution of blue boxes. Similar opportunities might exist for the City for various programs discussed in this report.

In the mid-term, staffing requirements will need to be re-evaluated after various programs have been implemented. As additional diversion programs are implemented, such as those targeted towards multi-family and IC&I sectors, there may additional staffing requirements.

#### ***Recommendation***

**2013 - One Full Time FTE**

**2014 onward – ongoing evaluation/addition of staffing with program implementation**

**Preliminary Budget Implication: TBD**

### **2.1.2 Waste Audits**

The City currently has no background audit information, or baseline from which improvements to diversion, capture and participation rates can be measured. Pre-program and post-program change audits allow for the monitoring of program success as well as the identification of various challenges with program implementation. Ideally, a full, four season curbside audit would be conducted prior to the implementation of major program changes and then a year afterward with routine audits occurring over the long term but at less frequent intervals (e.g. at most every five years afterward) but prior to future WMMP updates.

Routine waste audits are a necessary mechanism to gathering key program information:

- Participation and set-out data that can be used to support program decisions;
- Generation rates and capture rates used for planning purposes;
- Information which may be used to target specific education campaigns; and,
- Baseline data to monitor pilot programs and other system changes.

It should be noted that audits are necessary on a more frequent basis where there may be provisions in a blue box processing contract that are performance based, that is, if there is a revenue share for commodities back to the City that requires monitoring. These audits are commonly conducted at the receiving Materials Recovery Facility (MRF) as more frequent and cost-effective audits can be undertaken to verify material composition (and so appropriate apportionment of revenue if applicable).

It is likely the City would require the use of external resources to conduct audits as the City most likely will not have a) staff available, and b) staff trained to conduct waste audits.

#### ***Recommendation***

**2013 – 2014 Four Season Curbside Audit**

**2018 – Post Implementation Audit (Enhanced Organics and Curbside Blue Box Programs)**

**2021 onward – every five years (year prior to WMMP update) or as necessary**

**Preliminary Budget Implication: 2013-2014 - \$85,000**

**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN**

1BPrograms for the Duration of WMMP (2013-2038)

August 2012

**2.1.3 Monitoring & Reporting**

The monitoring of system performance is an important aspect of ensuring the proper functioning of the overall waste management system and ensuring WMMP goals are achieved. There are a number of indicators that can be measured and tracked over the short, mid and long term as presented below.

**Table 2-1: Monitoring Indicators**

| <b>Program</b>                                                  | <b>Measurable Indicators</b>                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RESIDENTIAL PROGRAMS</b>                                     |                                                                                                                                                                                                                                                                                |
| Promotion and Education and Social Marketing                    | <ul style="list-style-type: none"> <li>Spending per household on P&amp;E related activities.</li> </ul>                                                                                                                                                                        |
| Re-use Initiatives                                              | <ul style="list-style-type: none"> <li>Number of visitors to website.</li> <li>Number of Giveaway Weekends and approximate number of participants.</li> <li>Donations (number, type, approximate value, etc.) of reusable materials at the CRCs.</li> </ul>                    |
| Establish a per Capita Residential Waste Reduction Target       | <ul style="list-style-type: none"> <li>Per capita waste generation based on annual tonnes and estimated population</li> <li>Per capita waste generation based on annual audits and waste generation rates</li> </ul>                                                           |
| Recycling Depot                                                 | <ul style="list-style-type: none"> <li>Quantity and type of materials received and managed at the Recycling Depot.</li> </ul>                                                                                                                                                  |
| Private Sector Initiatives                                      | <ul style="list-style-type: none"> <li>Number of companies with diversion initiatives and approximately quantity of waste diverted.</li> </ul>                                                                                                                                 |
| Curbside Recycling Collection                                   | <ul style="list-style-type: none"> <li>Capture rate for recyclables before and after change to curbside collection. Best measured through curbside waste audit. Can also be estimated based on reported tonnage received for processing.</li> <li>Marketing Revenue</li> </ul> |
| Leaf and Yard Waste Composting                                  | <ul style="list-style-type: none"> <li>Number of residential collections per year.</li> <li>Quantity of leaf and yard waste collected and processed.</li> </ul>                                                                                                                |
| Consistent Level of Bulky Waste Collection                      | <ul style="list-style-type: none"> <li>Number of items &amp; fees collected.</li> </ul>                                                                                                                                                                                        |
| HHW Management                                                  | <ul style="list-style-type: none"> <li>Quantity of HHW collected.</li> </ul>                                                                                                                                                                                                   |
| Disposal Options (Landfill)                                     | <ul style="list-style-type: none"> <li>Quantity of residential waste disposed.</li> <li>Quantity of IC&amp;I waste disposed.</li> </ul>                                                                                                                                        |
| Durable (Bulky) Goods Processing                                | <ul style="list-style-type: none"> <li>Increase in diversion of bulky goods.</li> </ul>                                                                                                                                                                                        |
| Recycling in Public Spaces                                      | <ul style="list-style-type: none"> <li>Number of public spaces with recycling containers.</li> </ul>                                                                                                                                                                           |
| Special Events Recycling Program                                | <ul style="list-style-type: none"> <li>Number of special events with diversion services.</li> </ul>                                                                                                                                                                            |
| Source Separated Organics (SSO) Program / Commercial Food Waste | <ul style="list-style-type: none"> <li>Quantity of SSO diverted.</li> <li>Increase in diversion rate.</li> <li>Capture rate for SSO. Best determined through curbside audits.</li> </ul>                                                                                       |
| Collection System Efficiencies                                  | <ul style="list-style-type: none"> <li>Collection system statistics (e.g. average collection route size, operating hours per day)</li> <li>Time and motion statistics (e.g. time per stop)</li> </ul>                                                                          |

**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN**

1BPrograms for the Duration of WMMP (2013-2038)

August 2012

| Program                                  | Measurable Indicators                                                                                                                                                       |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Garbage Restrictions                     | <ul style="list-style-type: none"> <li>▪ Increase in diversion rate.</li> <li>▪ Capture rates for divertible materials. Best determined through curbside audits.</li> </ul> |
| Disposal Bans                            | <ul style="list-style-type: none"> <li>▪ Increase in diversion rate for banned materials.</li> </ul>                                                                        |
| <b>IC&amp;I AND C&amp;D PROGRAMS</b>     |                                                                                                                                                                             |
| Mandatory C&D Diversion                  | <ul style="list-style-type: none"> <li>▪ Increase in diversion rate.</li> </ul>                                                                                             |
| IC&I and C&D Materials Depot at Landfill | <ul style="list-style-type: none"> <li>▪ Increase in diversion rate.</li> </ul>                                                                                             |
| Differential Tipping Fees                | <ul style="list-style-type: none"> <li>▪ Revenues from tipping fees.</li> <li>▪ Increase in diversion rate.</li> </ul>                                                      |
| IC&I Diversion Regulations/Policies      | <ul style="list-style-type: none"> <li>▪ Number of events (meetings, workshops, etc.) staff attended regarding 3Rs regulations.</li> </ul>                                  |
| Mandatory Diversion Bylaw                | <ul style="list-style-type: none"> <li>▪ Increase in diversion rate.</li> </ul>                                                                                             |

Proper monitoring and measuring of waste management system performance serves a number of functions, including the ability to:

- Adhere to currently accepted best practices;
- Identify issues with the system and effectively mitigate these issues;
- Adjust implementation schedules if issues arise;
- Assist in the selection and development of appropriate promotion and education initiatives; and,
- Identify opportunities for cost savings and increased effectiveness of the system.

The monitoring of system performance also helps with several other reporting exercises including:

- Creating a consistent reporting structure which is applicable to the City operations (landfill), the Centra Cam facility and to contract service providers.
- Reporting internally for departments and Council
- Sharing of key performance indicators with stakeholders and the public; and
- Completing Statistics Canada biennial survey(s) if applicable.

It is recommended that the results of monitoring initiatives be reported on a regular basis internally within the City and externally to outside stakeholders. Primarily, this would take the form of an annual report on the WMMP. This annual report should provide an overview of the applicable objectives for that year and documentation on how the City reached these goals. It

should also include a list of issues that arose during the year and how these issues were mitigated. Finally, the report should include a section regarding the planned WMMP implementation activities for the following year.

In addition to an annual report, the City should also ensure that all waste management related reports produced for Committee and Council, include a section on how the report contents relate to the implementation of the WMMP. This should apply to reports that relate directly and those that relate indirectly to the WMMP. This will assist City staff in adhering to the vision of the WMMP and also guarantee that all interested parties understand how each waste management activity relates back to the strategic vision for waste management in the City.

This will be particularly critical when key decisions will be required during WMMP implementation. When recommendations are brought back to Council it will be essential to make the connection between the need and the WMMP adopted by Council.

***Recommendation*****2014-onward – Annual Report on Previous Year Activities****Preliminary Budget Implication: Staff Time/Production and Distribution of Annual Report****2.1.4 WMMP Review and Update**

It is recommended that City conduct periodic reviews and updates to the WMMP at various times throughout the planning period (2013-2038).

It is recommended that in 2018, (year five of the WMMP and ideally after the curbside audit) and every five years thereafter that the City complete a comprehensive review and update to the recommended WMMP. This review should outline the goals and objectives met in the previous years and also outline issues that arose over that period that may have hindered the implementation of the WMMP. The WMMP document should then be updated to reflect the review completed and provide a detailed implementation timeline for the next five years of the planning period.

As part of the WMMP review, some the key targets that could be adjusted would be:

- a) Per capita waste reduction targets to reflect the trends in waste generation observed through both annual tonnage records and curbside waste audits. They could also be adjusted to reflect provincial/national trends, new initiatives planned to assist City residents with waste reduction and reuse, and any reasonably understood trends in packaging such as shifts away from certain packaging approaches.

- b) Waste diversion targets based on program performance in the preceding years and planned diversion initiatives at the City and Provincial levels. Diversion targets will also have to be adjusted to reflect overall trends in material generation, such as a shift away from various types of recyclable packaging materials.

Periodic review of the WMMP will ensure the WMMP stays relevant, is reflective of any changes in provincial or federal regulatory and stewardship initiatives and will guide more specific actions, undertakings for the next five (5) year period and based on previous WMMP successes and challenges.

***Recommendation*****2018, 2023, 2028, 2033, 2038 WMMP Review****Preliminary Budget Implication: \$75,000 to \$100,000 per update**

## **2.2 PROMOTION AND EDUCATION PROGRAMS**

The City has identified improved communication with the public as one of the five strategic priorities in the document entitled “*Going Forward: The Roadmap to 2015*” as part of their strategic plan. The plan includes the development of a comprehensive community engagement process that includes leveraging technology and social media to improve communication among some of the initiatives. Ongoing promotion and education (P&E) of waste management initiatives is critical to the success of those programs. One-time strategic and more involved campaigns are required to support major program shifts e.g. curbside recycling, green bin collection etc. The following are deemed to be important mechanisms to successful programming.

### **2.2.1 Comprehensive Communication Plan**

A Comprehensive Communication Plan will ensure a coordinated approach for the implementation of the reduction, diversion and disposal initiatives outlined in the WMMP. Without a communications plan, messages may be released to the public in a piecemeal fashion, which will not have as great of an effect as coordinated outreach. Effective communications plans contain four primary elements: design, funding, deployment, and monitoring and evaluation and will incorporate social media, incentives and social marketing as part of the entire strategy.



The City currently has a website and uses social media sites such as Facebook, Twitter and RSS to inform and educate the public about waste management initiatives and updates. The audience for social media is limited to those residents with Facebook/Twitter accounts and an understanding of RSS feeds. While still a viable source of information, the City must be cognizant of the demographics of the population; the last survey showed that at least half the population prefers non-electronic means of obtaining information.

Once a campaign is designed and funded, its deployment should be based on an implementation plan, which identifies the initiative, supporting tactics and timeframe for release to target audiences. Examples of successful communication tactics include the use a mix of media including strategies such as radio or TV, calendars, websites, public relations, social media, attendance at public events such as farmers markets etc. Sustained programs, with specific target messages and year-round exposure are identified as a best practice and are preferable to campaigns that are a one-time blitz (with the exception of promoting major program shifts).

Over the short term planning period, the City should develop a Comprehensive Communication Plan and supporting procedures and policies, the timing of which would coincide with budget development. These documents would set the stage for the implementation of various P&E initiatives throughout the year and over the course of the WMMP planning period.

The City should consider hiring a third party to assist with the development of a communications plan which would incorporate social media, marketing tools, incentives, a variety of media for promoting diversion programs. Adequate funding of P&E programs is crucial; the success of a program is dependent on the deployment of a successful P&E program to support and promote new programs to residents.

### **2.2.2 Social Media Sites**

In the short term, the City, as part of the communication program, should continue to use social media sites (Twitter, Facebook, RSS) to promote the City's ideas on waste management and support them through links on website (with appropriate legal disclaimers) which can be a mechanism to make waste management programs relatable to residents through real life experiences. Features of the waste management portion of the City's website should be optimized for mobile phones, tablets and other devices to provide residents with easy access to information online. This would be a low cost option as it would require minimal staff time, but does need support from Corporate Communication, IT and the Legal Department. This WMMP may present an ideal opportunity for City staff to collaborate on any improvements that might be made to the City's website as a whole.



The City of Hamilton delivered 10,000 Gold Boxes to residents demonstrating successful diversion as an incentive.

Short to mid-term consideration can be given to the idea of hiring a third party to maintain social media sites or to train City Staff to maintain the social media sites. Consideration could be given to utilizing resources at educational institutions, through co-op placements, summer students or contests to develop apps or other aspects of social media. Coordination with other departments is recommended to ensure that the Social Media program is in line with any other Social Media efforts and that a consistent approach to online interactions is maintained.

### **2.2.3 Continued Market Research**

Continued market research is an important component of the communications plan and is essential to the continued development of P&E materials. It is important to understand the impacts of P&E materials on their target audiences and identify any gaps in communication.

The City has used third party firms to conduct market research, most recently in 2011. The City should consider continued use of these types of firms to conduct telephone surveys, focus groups, website surveys, written surveys etc. The City should continue to evaluate the success of P&E materials and continue to monitor their effectiveness. It is anticipated that social media will have evolved significantly at this point; alternate media/programs/sites for social media may be better used (i.e. Facebook might be replaced by an alternate social media platform) which may need to be incorporated into the City's website or P&E strategy.

#### ***Recommendation***

**2013 - 2014 – Develop Comprehensive Communication Plan**

**2013 - 2014 - Evaluate Existing Website/Social Media Sites**

**Ongoing – Continued Market Research**

**Preliminary Budget Implication:**

**Staff Time to Coordinate All Initiatives**

**Communication Plan \$25,000 (outside marketing firm)**

**Sustained budget of \$1.00/Household Baseline Initiatives = approximate \$7,500.00/Year\***

**Major Program Shifts \$2.00-\$4.00/Household (Initiative Dependent) = \$15,000 +\***

**Website Updates/Social Media = internal staff resources**

**\*based on best practices research: Blue Box Program Enhancement and Best Practices Assessment Project, KPMG LLP, R.W. Beck Inc., Entec Consulting, 2006**

## **2.3 REGULATORY MECHANISMS**

There are a number of regulatory mechanisms that can be implemented over the life of the WMMP to support various waste management initiatives.

### **2.3.1 Solid Waste Bylaw Update**

Waste collection, removal and disposal of municipal solid waste are subject to the City's Solid Waste Bylaw #2670/11 which took effect on January 1, 2012. The bylaw stipulates the City is responsible for collection and disposal of municipal solid waste and gives the City the authority to limit the number of receptacles collected at each unit and schedule collection days and times as well as set out a number of parameters for collection and container set-out. In general terms the bylaw should be reviewed to incorporate any program changes that will occur since its last revision. Minor amendments like this can be accommodated with what should be a complete bylaw content review with implementation of each of the various options outlined in this report and that are approved by the City. Various amendments may include but not be limited to:

- ✓ Acceptable blue box recycling containers, set out requirements, container size
- ✓ Acceptable blue box materials for set out
- ✓ Acceptable organics containers, set out requirements and container size
- ✓ Modified acceptable organics materials for set out
- ✓ Bulky item set out requirements, item limits, acceptable materials
- ✓ Changes in collection frequency e.g. bi-weekly garbage collection
- ✓ Modified/lower set out limits for garbage
- ✓ Multi-residential location collection provisions which may also include a save-harmless agreement for on-private property collection

Amendments should reflect any mandatory programs and required compliance as it relates to any future programming and any implications associated with non-compliance e.g. a list of infractions and possibly penalties for each infraction. The bylaw should continue to identify items that are non-collectable at the curb and that cannot be disposed of at landfill.

The bylaw also established charges for collection fees; the bylaw will need to be amended to reflect changes to fee structure based on program changes.

### **2.3.2 Enforcement**

Through the short term planning period, the City should identify and prioritize those waste management issues that are the most critical in regards to monitoring and enforcement. An update to the bylaw is recommended to support the implementation of all short term system components that require a change and to clearly identify certain actions/activities that require more stringent enforcement (e.g. fines for sharps or hazardous waste present in the waste stream at the curb). The methods of enforcement should be outlined and can include a range of approaches, from supported voluntary compliance (generally the ultimate objective of a Waste

Management Department) to enforcement through refusal to collect materials to fines for repeated offences.

The City will need to carry out some form of enforcement to support program changes, whether through communications (like leaving stickers on bags/boxes identifying unacceptable materials) or home visits to more stringent approaches including issuance of fines. To most effectively achieve this, either waste management staff or bylaw officers are necessary to support these programs. Monitoring and enforcement will be necessary throughout the entire planning period.

### **2.3.3 Mandatory Diversion Bylaw**

Over the course of the planning period the City can from time to time assess whether or not participation in diversion programs for residential sector and/or the multi-family sector will be made mandatory. Many municipalities have taken this approach as it supports other initiatives such as differential tipping fees, (further discussed in Section 5.4) landfill bans if implemented and the ultimate goals of waste reduction and diversion from final disposal. A diversion bylaw can address the diversion of the organics stream or the blue box recycling stream, or a combination of both once adequate diversion programs have been implemented with time to adjust to new service levels and to compliance. This would not likely be considered until at least 2019 and, as discussed above, would require staff dedication to enforcement.

#### ***Recommendation***

**Update Solid Waste Bylaw on an as-needed basis**

**Evaluate communications/enforcement opportunities with new programs**

**Evaluate mandatory diversion bylaw (not likely before 2019)**

#### **Preliminary Budget Implication:**

**Staff Time to update bylaw**

**Staff time to for enforcement of programs**

**Staff time for enforcement of mandatory diversion programs**

### 3.0 Waste Reduction and Reuse Programs

---

There are waste reduction and reuse initiatives that are recommended in the short term to support the City's short term planning goal of decrease residential waste entering the landfill by 50% and all waste (including commercial waste) by 36% from 2009 levels by 2015. These initiatives are "enhancements" to existing programs some of which only involve enhanced communication to residents with respect to the minimization of waste (e.g. the website, tweets or Facebook updates) and don't involve the City taking on additional infrastructure to support these initiatives.

#### 3.1 CONTINUED WASTE REDUCTION TARGET SETTING

The City has already set the following waste reduction targets:

- Reduction of residential waste to 195 kg/capita by 2015
- Reduction of municipal solid waste (MSW) generation to 1000 kg/capita (including commercial waste) by 2015

In 2011, the generation rate for residential waste requiring disposal was 310 kg/capita. It is clear that additional waste reduction and diversion programs will need to be implemented in order to achieve the City's targets. It is important to have a target which can be monitored on a regular basis to determine if there is a decrease in waste generation rates within the City especially over the first few years of WMMP implementation. Based on the success of this initiative within the first few years, the per capita waste reduction target could be increased or a change in approach on promotion and education around this activity may be necessary.

#### 3.2 PROMOTING WASTE REDUCTION TIPS

One of the best mechanisms to achieve waste reduction targets is through various ongoing promotion and educational initiatives that includes specific ideas/instructions for residents, City staff and educational and commercial sectors to help them understand how to specifically reduce waste generation in their everyday activities. Examples of 'tips' for the residential sector:

- Use a refillable mug for coffee or other beverages on the go
- Don't forget your cloth bags when you head out to the grocery store
- Purchase items in bulk whenever possible... bring your own containers to the bulk store if possible
- Instead of buying new toys or tools, try sharing with friends

- Re-upholster worn out furniture instead of buying new – often the frame will far outlast the upholstery
- When faced with two similar products of different brands, choose the product with the least amount of packaging
- Avoid buying single serving or over-packaged foods – there is always an alternative with less packaging (and likely more nutritious)

This information can be made available by a website link or in concert with other hard copy promotional activities; calendars, brochures etc. and could be done in the short term. Various tips can also be provided for schools and businesses as well.

### **3.3 DEVELOP PARTNERSHIP AGREEMENTS**

This program in the short to mid-term involves the identification of specific community stakeholders, potential partnerships, tools (e.g. web based waste exchange site(s) and links and re-use program initiatives that may be specifically suited to the City based on their own community resource dynamics. By partnering with existing organizations, and acting as a facilitator between generators and collection providers, the City will be able to use established programs and infrastructure to support diversion initiatives. Mechanisms to achieving this include the formalization of relationships with partnering organizations and support of their services on the City's dedicated waste management webpages.

The focus of the re-use program will be on the effective use of existing community resources. The program would involve:

- Identification of specific community stakeholders that are currently involved in the re-use of various items within the community.
- Enhancement of the current "Re-use Guide" to link households to the most appropriate locations/options for donations-based re-use. The guide would provide information regarding the companies / organizations that accept donated materials for re-use or recycling. An on-line guide would likely be the most effective; however, it is recommended that the City dialogue with the charitable sector and other community organizations along with the public to determine the best vehicle for the guide.

### **3.4 WASTE OR GOODS EXCHANGE EVENTS**

A very user-friendly re-use program implemented in other municipalities is *waste exchange events*. This is recommended as a very low cost program and simply needs adequate advertising prior to the intended event/weekend. With waste exchange events, residents may leave items like furniture and any other reusable items at the curb (e.g., BBQs, tools, strollers, clothing, etc.) labeled "free" for anyone to pick up during selected times (events) of the year. Although these types of programs do not typically increase diversion rates significantly, they net



some degree of environmental, social and potential economic benefit. This kind of program also provides a level of convenience to those without their own vehicles or means to bring larger items to a central facility. It is the responsibility of the resident to bring any items back in or take them for disposal as appropriate if the items remain at the curb once the event is over. The City should pilot this event in the short term and monitor any issues and opportunities arising.

### **3.5 WASTE RE-USE CENTRE**

Re-use centres are a common way that communities can reduce waste production and extend landfill life. These come in the many forms from a 'housing' standpoint, from constructed buildings to trailers to smaller sheds. A centre could be developed in concert with



enhancements at the existing Centra Cam depot as well as in a Community Recycling Centre (CRC) configuration at the landfill. A centre could be developed to simultaneously manage a re-use program as well as HHW drop-off.

Potential items that could be targeted for re-use include furniture (e.g. couches, chairs, and tables), housewares (e.g. dishes, utensils, pots, pans), clothing, books, CDs, DVDs, toys and various construction and renovation items, novelty items.

The City should further investigate this option in the mid-term as an evolution of the partnership agreement consideration outlined above. In many cases municipalities partner with non-profit operations to run their re-use facilities.

### **3.6 ENDORSE EXTENDED PRODUCER RESPONSIBILITY AND WASTE MINIMIZATION LEGISLATION**

The City's sustainability initiatives, corporate mandates and waste diversion goals are the driving factors of this WMMP. The majority of recommendations in this WMMP relate to how waste management issues can be addressed in a municipal context but consideration needs to be given to how broader federal and provincial regulatory and policy initiatives affect municipal waste management. Further, it is important that these broader regulatory and policy changes are enacted in a way that doesn't contradict the objectives of the City itself. To this end the City should consider engaging in stronger advocacy in the long term to support the concepts of Extended Producer Responsibility (EPR) and other initiatives that fundamentally affect waste reduction, diversion and disposal programming for the City.

The City, in the long term, should consider involvement, feedback to various provincial and federal initiatives e.g. Government of Alberta, Canadian Council of Ministers of the Environment (CCME).



The City should also continue to support various *Take it Back Programs* that may evolve either as federal or provincial initiatives and/or through manufacturing or retail initiatives.

Table 3-1 details recommendations, costs, impacts and timelines associated with all waste reduction and re-use options recommended for implementation or for more detailed consideration by the City and with respect to achieving various goals and objectives of the WMMP.

**Table 3-1: Waste Reduction and Re-use Recommendations**

| Waste Reduction and Re-use Recommendations |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                   |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | Short – Mid Term Options                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                            | Mid-Long Term Options                                                                                                                                                                                                                             |
| Consideration                              | Establish a Per Capita Waste Reduction Target                                                                                                                                                                                                                                                                                                                                                                               | Develop Reuse Centres, Programs and Partnering Initiatives                                                                                                                                                                                                                                                                                 | Enhancements to waste reduction and reuse options.                                                                                                                                                                                                |
| Recommendation                             | Target a decrease in residential waste generation and re-evaluate as initiatives are implemented.                                                                                                                                                                                                                                                                                                                           | Identify specific community stakeholders, potential partnerships, tools and re-use program initiatives.                                                                                                                                                                                                                                    | Develop programs to enhance waste reduction and reuse initiatives, including: <ul style="list-style-type: none"> <li>Endorsement of Extended Producer Responsibility and Waste Minimization Legislation</li> <li>Take-it-Back Programs</li> </ul> |
| Implementation Timeline                    | 2013 - develop and implement a campaign in the immediate short term as ongoing initiative throughout the entire planning period, targeting different materials/behaviors each year to encourage waste reduction.<br>2014 - re-evaluate progress towards achieving waste reduction goal<br>2015 - set new goal if original goal not achieved.<br><br>2014 - 2017 - Monitor progress through waste audits on a regular basis. | 2013 - 2018 - continue to promote waste reduction, identify specific community stakeholders currently involved in re-use of various items in the community, enhance current “Re-use Guide”, develop partnership agreements, waste exchange events.<br><br>2019 - develop expanded re-use centre as an evolution of partnership agreements. | 2019 - ongoing - implement enhancements to the program                                                                                                                                                                                            |
| Sector Served                              | Residential and IC&I sectors.                                                                                                                                                                                                                                                                                                                                                                                               | Residential and IC&I sectors.                                                                                                                                                                                                                                                                                                              | Primarily Residential Sector.                                                                                                                                                                                                                     |
| Economic                                   |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                   |
| Operating Costs                            | Minimal operating costs. Primary cost is associated with P&E requirements to target and educate the public on how to avoid generating specific waste streams.                                                                                                                                                                                                                                                               | Cost implications range from small operational budget increases for P&E initiatives to larger capital and/or operating costs (development of Re-use Centre).                                                                                                                                                                               | Minimal – primarily staff time. A budget allocation in the order of \$5,000 to \$10,000 may be necessary for staff/council/representation at provincial and/or federal workshops, conferences etc.                                                |
| Capital Assets / Infrastructure            | None                                                                                                                                                                                                                                                                                                                                                                                                                        | Potential for some minor asset and investment in infrastructure by the City, based on the decision to move forward with the construction of a re-use centre. However, largely this option would be built upon existing reuse infrastructure in the community.                                                                              | None                                                                                                                                                                                                                                              |
| Funding Potential                          | N/A                                                                                                                                                                                                                                                                                                                                                                                                                         | Investigate opportunities through Alberta Eco-trust.                                                                                                                                                                                                                                                                                       | N/A                                                                                                                                                                                                                                               |
| Environmental and Social Benefits          |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                   |
| Potential for waste reduction/diversion    | In accordance with City's goal to reduce waste, would contribute to goal of reducing residential waste by 50% from 2009 levels by 2015 and should result in increase in diversion from landfill.                                                                                                                                                                                                                            | Direct diversion impact can be minimal (less than 1% addition to current diversion rates), but supports waste reduction goals, community partnerships and/or charities.                                                                                                                                                                    | Impact low to high depending on programs - supports concept of sustainability, waste reduction and diversion goals.                                                                                                                               |
| Community Acceptance                       | Likely high public acceptance. Can be coupled with communications on the financial savings also associated with waste avoidance.                                                                                                                                                                                                                                                                                            | Public will be accepting of this program. Builds strong community relationships. Potential for building sustainable public/private partnerships at the grass-roots level with non-profit agencies.                                                                                                                                         | Opportunity for the City to demonstrate environmental leadership to the private sector and City residents. Likely high public acceptance of low-cost initiatives to help increase diversion.                                                      |
| Employment / Economic Development          | No direct employment or economic development potential.                                                                                                                                                                                                                                                                                                                                                                     | No direct employment or economic development potential. However, could result in increase in business for service providers based on increase visits to their location.                                                                                                                                                                    | No direct employment or economic development potential. However, could result in some increase in business for some service providers (diaper services etc.).                                                                                     |

| Waste Reduction and Re-use Recommendations |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                              |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | Short – Mid Term Options                                                                                                                                                                                                                      |                                                                                                                                                                                                                                          | Mid-Long Term Options                                                                                                                                                                                                                        |
| Consideration                              | Establish a Per Capita Waste Reduction Target                                                                                                                                                                                                 | Develop Reuse Centres, Programs and Partnering Initiatives                                                                                                                                                                               | Enhancements to waste reduction and reuse options.                                                                                                                                                                                           |
| Technical                                  |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                              |
| Constraints                                | <p>Focus on targeting materials stream that are relatively easy to avoid, e.g. disposable coffee cups, disposable cleaning items, etc.</p> <p>Primary barrier is the identification of materials streams for which avoidance is possible.</p> | <p>Primary barriers are the identification of participating private sector partners and maintain an accessible database for residents.</p> <p>Provincial and Municipal approvals required if construction of a re-use centre occurs.</p> | <p>Identification of materials streams for which avoidance is possible.</p> <p>Providing mechanisms for diaper waste avoidance that can be used by all sectors of the Community, including those that are demographically disadvantaged.</p> |
| Staffing implications                      | Some support also required by existing administration support for waste auditing function, and to identify target materials and behaviours.                                                                                                   | Short term staff requirements to identify specific community stakeholders, potential partnerships, tools, and re-use program initiatives that may be specifically suited to the City based on community resource dynamics.               | Senior staff resources required to support provincial and federal dialogue, as part of working groups and key committees. Staffing addressed through FTE needed for P&E.                                                                     |
| Impact to Other System Components          | Decreased waste generation should extend life of landfill.                                                                                                                                                                                    | <p>An organized effort for reuse would greatly assist residents in finding and accessing reuse opportunities in a more efficient fashion.</p> <p>Some potential for landfill disposal capacity savings.</p>                              | Decreased waste generation should extend life of landfill.                                                                                                                                                                                   |
| Partnership Opportunities                  | N/A                                                                                                                                                                                                                                           | Many opportunities for partnerships with charitable organizations, non-profit organizations.                                                                                                                                             | Partnerships with retailers for take it back program                                                                                                                                                                                         |

## 4.0 Waste Diversion Programs

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Although the City has implemented diversion programs, additional measures will be required in order to drive waste reduction and diversion in order to meet the City's targets. Programs which will significantly increase waste diversion include expanded organic waste collection, and curbside recycling collection. These options have been presented in the following sections as well as a number of refinements to these programs for consideration in the mid to long term which will enhance diversion such as multi-family diversion programs, IC&I waste diversion programs, and initiatives such as public open space and special event recycling to capture those additional recyclable materials.

### 4.1 ORGANIC WASTE COLLECTION & PROCESSING PROGRAM

The City currently offers a limited organics collection program, accepting vegetative waste only (i.e. no meat or dairy products). An enhanced organics collection program, accepting a wider variety of materials, would contribute significantly to the amount of waste diverted from landfill. Estimates developed for *the Part 1: Current System Assessment and Long Term Waste Management Needs* indicate that the amount of organics potentially diverted could almost triple in quantity with an enhanced program.

Implementation of an enhanced City-wide source separated organics (SSO) Green Bin collection and processing program in Camrose would result in the most significant change to the City's waste management system. A City-wide SSO program would:

- Shift a significant quantity of waste from the curbside waste stream to a Green Bin. In the order of 3,200 tonnes (2012 estimate) and up to just under 6,000 tonnes at the end of the planning period (noting these estimates are for single-family sector only and that multi-family sector organics separation and diversion would see more significant impacts);
- Decrease the consumption of disposal capacity at the Landfill;
- Reduce the potential environmental effects of the landfill by reducing odour, leachate and methane generation.

Notwithstanding there is an existing collection program in place it is recommended that the City undertake a Green Bin/Expanded Program collection program pilot study in the short term. This will determine how to best implement the program on a City-wide basis. Based on the pilot, the appropriate type and size of container, the use of biodegradable bags, collection scheduling, residential interest and anticipated participation in the program, successes and challenges associated with a full-scale program would be assessed.

The study area selected for the pilot study should be reflective of a broad cross-section of demographics and would ideally include some multi-family dwellings. One hundred (100) homes across the City would be representative. The duration of the pilot program should be approximately six months which is an adequate amount of time to gauge the effectiveness of P&E materials, willingness of residents to participate; logistical issues with collection, etc. The City should undertake pre- and post-pilot survey to examine successes and failures of the pilot so issues can be identified and resolved before a City-wide program is implemented. A waste audit should also be undertaken to assess participation, capture rates and contamination levels and general understanding of the program by those participating in the pilot study.

During the pilot study, it should be possible to process the relatively small amounts of the enhanced organic waste stream at the current composting pad at the landfill but this is subject to Alberta Environment and Sustainable Resources Development (AESRD) approvals which should be secured as the first order of business. Currently the composting operation, which accepts left and yard waste, falls under a “notice” activity. If the facility is to take food waste, it would fall under a registration, and would need to meet, at a minimum, the requirements outlined in the Code of Practice for Compost Facilities.

In regards to organics collection and processing on a preliminary basis and in general:

- Collection of organics should likely be on a weekly basis all year round if the City decides to move to a bi-weekly garbage collection cycle (further discussion in both Sections 4.2 and 4.4). This encourages the highest participation rates because the program is more convenient than the garbage collection cycle, and it also reduces issues related to odours and vermin for residents;
- Green bins should be sized to allow for ease of use and to accommodate household organic (food waste, compostable fibres, leaf and yard waste), generally accommodated through the use of smaller sized carts (e.g. 80 litre carts) and some allowance for leaf and yard waste in paper bags outside the cart;
- The program design should allow for the use of biodegradable liners (biodegradable film or paper) as this has been shown to increase householder participation. Current program experience indicates that a broad range of composting technologies can handle these materials.
- The City determines the feasibility of providing the program to multi-family dwellings once successfully applied in the single-family sector, based not only on the outcomes of the City's experience but on the outcome of studies currently being undertaken in other jurisdictions.



- The City should further extend the SSO program to the commercial sector once a broader spectrum of materials is accepted in the program.

From a Green Bin procurement standpoint, it is standard to provide not only a Green Bin but also a Kitchen Catcher (a smaller bin to collect organic waste to be deposited when full into the larger Green Bin). The cost for these on a City-wide basis (single family) is provided below. With respect to provision for a pilot study the cost would be in the order of \$1,750 for the Green Bins and \$650 for the Kitchen Catchers, promotional materials would need to be developed and six (6) months store of biodegradable bags would need to be provided. Other costs include pre and post-survey development and collection of data as well as pre and post audits. Overall costs for a pilot study are likely in the order of about \$15,000. As the City is already on a collection cycle for organics this material could be collected (with the exception of the material to be collected for auditing) on the same scheduled collection cycle already underway and the costs should be negligible if any for the contractor and hence the City.

| Recyclables Collection Container | Cost to the City                                                           |
|----------------------------------|----------------------------------------------------------------------------|
| Green Bin                        | \$15 to \$20 per bin = \$85,000 for one bin to all single family homes     |
| Kitchen Catcher                  | \$6 to \$7 per bin = \$31,300 for one container to all single family homes |

Upon successful completion of the pilot study and if the City decides to enhance the organics program the City would need to make improvements to its existing composting pad and operation. The addition of substantial volumes of household organic waste to the existing, predominantly leaf and yard waste, composition will require more robust site and operations to ensure proper aeration, moisture control, Carbon:Nitrogen (C:N) ratio, temperature control, other variables to ensure the proper composting of materials through high-rate, low-rate and curing phases and to ensure no off-site odour impacts during the processing of a more volatile blend of materials.

The City has operated an outdoor windrow composting program to date. With an enhanced program the site would generally need to consist of an indoor pre-processing area for receiving fresh organic waste, blending bulking agent (e.g. wood) when necessary, indoor screening (if necessary depending on permitting requirements and the site's buffer zone (nearest sensitive receptors like homes)). This could likely take the form of a Cover-All style building.

Given the buffers around the site and the volume organic waste to be managed (including potential future commercial tonnage) the technology category most likely applicable to the City is a



Coverall Style Building

One Team. Infinite Solutions.



covered aerated windrow system. As an example (and in no way an endorsement), Stantec obtained estimates from Gore & Associates for the infrastructure required to handle the quantity of organic waste predicted to be generated. The GORE® system is used by many municipalities across Canada and is modular in nature so that the facility can be expanded as waste volumes increase. The City of Abbotsford, B.C. is currently constructing a small GORE® composting facility, owned and operated by Net Zero Waste and the town of Sechelt, B.C. is also in the midst of the design stage for a composting facility as well.

There are two options with GORE® for consideration:

- a) an above ground aeration batch operation (with manual handling of covers). Based on handling 5,000 tonnes per year, it is estimated that four covers will be required for a cost of \$275,000 (considering commercial and multi-family sector participation).
- b) an in-ground continuous solution with (with manual handling of covers). Based on handling 5,000 tonnes per year, it is estimated that four covers will be required for a cost of \$350,000.

A portable winder (as opposed to manual handling of the cover) is in the order of an additional \$85,000. Additional cost variables include site costs/improvements/construction, equipment i.e. shredders, loaders, turning unit etc. (which may be available at the landfill site), design (traditional heap versus bunker walls for winter conditions), energy, water and operations etc.

#### Gore Cover Composting Operation



This information is meant to provide the City with some basic understanding of the capital costs associated with an appropriate technology to be used for this composting operation. Further cost refinements will be developed in Phase 4.



If the results of the pilot study indicate that the City should roll-out an enhanced organic waste collection and processing program on a city-wide basis, the City, as a first step (2014) should let a formal Request for Proposal (RFP) process for either a 'wide open technology' vendor submission, meaning a bid process open to any technology type, or a more specific covered windrow application. Upon award and more detailed site design the City would then require permitting from AESRD for full-scale construction and program implementation. The City would also require an operating contract. It is estimated that full-scale city-wide implementation could occur by 2016.

Table 4-1 details recommendations, costs, impacts and timelines associated with organics management options recommended for implementation or for more detailed consideration by the City and with respect to achieving various goals and objectives of the WMMP.

**Table 4-1: Organics Management Recommendations**

| Organics Management Recommendations     |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                             |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Short to Mid Term Options                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                             |
| Consideration                           | Enhanced Organics Collection Program                                                                                                                                                                                                                                                                                                                                                                                                   | Organic Waste Processing                                                                                                                                                                                                                    |
| Recommendation                          | Enhance the current organics collection program through the expansion of materials permitted in the program. A pilot study and comprehensive P&E program are recommended to assist in the implementation of this program.                                                                                                                                                                                                              | The existing composting operation should be upgraded to manage a broader range of organic waste materials and from all available sources (including appropriate commercial generators).                                                     |
| Implementation Timeline                 | 2013 - Pilot Study<br>2013 - include provision for weekly year round collection in new collection contract<br>2015 - RFP/order green bins and kitchen catchers<br>2016 - program roll-out City-wide single family<br>2018 - program roll-out multi-family, commercial                                                                                                                                                                  | 2014 - let an RFP for SSO processing technology<br>2014 - RFP award and permitting process<br>2015 - Construction and RFP for operating contract, commissioning with existing materials                                                     |
| Sector Served                           | Single-family residential sector<br>Multi-family residential sector, commercial sector                                                                                                                                                                                                                                                                                                                                                 | Single-family residential sector<br>Multi-family residential sector, commercial sector                                                                                                                                                      |
| Economic                                |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                             |
| Operating Costs                         | <p>With a year-round weekly enhanced organics collection service, the collection costs of the program annually would increase to approximately \$300,000. (extrapolated from current program costs and level of service).</p> <p>An initial pilot study would include costs associated with provision of bins, P&amp;E materials, collection services, audits and staff to support the study (estimated in the order of \$15,000).</p> | <p>Contracted operating costs = TBD</p> <p>May be some minor revenues generated from useable end-product compost.</p>                                                                                                                       |
| Capital Assets / Infrastructure         | \$116,300 initial cost of bins and catchers, replacement and new carts longer term                                                                                                                                                                                                                                                                                                                                                     | \$275,000 to \$350,000 GORE/equivalent style systems Portable Winder = \$85,000<br>Turning Unit = TBD<br>Grinder/Shredder/Mixing Unit = TBD<br>Screener = TBD<br>coverall/equivalent style building = TBD<br>site and servicing works = TBD |
| Funding Potential                       | Green Municipal Fund                                                                                                                                                                                                                                                                                                                                                                                                                   | Funds may be available through the Building Canada Fund – Communities Component, Green Infrastructure Fund, Green Municipal Fund                                                                                                            |
| Environmental and Social Benefits       |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                             |
| Potential for waste reduction/diversion | <p>Diversion rate with blue box collection program combined = 67%.</p> <p>The City currently manages in the order if 1,100 tpy of organics. With an enhanced organics program the amount would increase to about 3,300 tpy with program start up (not including commercial or multi-family tonnages) and just under 6,000 tonnes by the end of the planning period.</p>                                                                | High - supports enhanced organics program for all sectors                                                                                                                                                                                   |
| Community Acceptance                    | Likely to be well received by community                                                                                                                                                                                                                                                                                                                                                                                                | Required in order to have enhanced organics collection program.                                                                                                                                                                             |
| Employment / Economic Development       | No significant direct employment or economic development potential.                                                                                                                                                                                                                                                                                                                                                                    | Will be some employment during construction of processing facility. Will be ongoing operation of facility required.                                                                                                                         |

| Organics Management Recommendations |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                          |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|                                     | Short to Mid Term Options                                                                                                                                                                                                                                                                                                          |                                                                                                                          |
| Consideration                       | Enhanced Organics Collection Program                                                                                                                                                                                                                                                                                               | Organic Waste Processing                                                                                                 |
| Technical                           |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                          |
| Constraints                         | Residents may be deterred by “yuck” factor due to inclusion of potentially more odourous materials in this stream. Will require increased P&E efforts and on an on-going basis.                                                                                                                                                    | Nature and length of time required for Approvals/permitting for site.                                                    |
| Staffing implications               | Oversight of pilot study, P&E program development, oversight of organics collection contract, initial bin procurement and ongoing bin replacement management                                                                                                                                                                       | Staff oversight of contractors required to manage SSO processing facility.                                               |
| Impact to Other System Components   | Increased amount of organic materials collected results in significant increases to processing costs.<br>Costs to residents for compostable bags if used.<br>Comprehensive P&E program required.<br>Potential for significant reduction in waste to landfill and positive impacts with respect to leachate and methane production. | Decrease in revenues from landfill tipping fees.<br>External revenue from tipping fees if receiving commercial organics. |
| Partnership Opportunities           | No current opportunities identified                                                                                                                                                                                                                                                                                                |                                                                                                                          |

## **4.2 BLUE BOX MATERIALS COLLECTION & PROCESSING PROGRAM**

The current depot based collection system relies on City residents to take the initiative to bring blue box recyclable materials to the depot. This is not as convenient as curbside collection for residents and may act as a deterrent to recycling which affects participation of residents in the program and so the amount of material that is captured and diverted from landfill. It was estimated in Phase 2 of the WMMP that this initiative alone could get the City to its 50% diversion target and previous consultation with the public indicates support for this program.

While this program is recommended as described herein, the fundamental factor with respect to the decision to implement this program is its cost. The City, given sheer tonnage generated, would not be able to support its own Materials Recovery Facility (MRF) and as such would be reliant on others to meet their processing capacity. As a first step in the implementation of this program the City should let a Request for Expression of Interest (REOI) to determine what capacity is available and within a reasonable haul distance of Camrose. This should be undertaken in the short term (e.g. 2013-2014).

Preliminary discussion with the City of Edmonton indicates that they have capacity to accommodate Camrose tonnage over the longer term and are interested in further discussion in that regard. The City of Edmonton operates a blue bag program and currently accepts: all types of paper, cardboard, juice boxes, milk cartons, boxboard, metal cans, aluminum, glass bottles and jars, and plastics (#1,2,4,5). Discussions with Waste Management (WM) indicate there is also capacity at their recently upgraded Red Deer MRF. This facility receives similar materials with the exception of milk cartons and plastics other than #2.

While Edmonton currently pays a higher tipping fee for its blue bag materials processing they are negotiating what is likely to be a lower fee, more in the order of \$95-\$100/tonne which is in line with other industry material processing costs across Canada. The Red Deer facility would likely charge a similar fee. At the time of this report it was to be confirmed that revenue from the sale of recyclable materials would come back to the City but this is probable. The average 'basket value' for recyclable commodities for 2012 to date is \$124.00/tonne for Ontario. (The same composite index is not calculated elsewhere in Canada and so this is by way of example only and noting that Ontario does not have the same deposit return program as Alberta). Edmonton operates a single-stream processing program as does WM which would enable Camrose to place all recyclable materials in a single bag (Edmonton) or container at the curb. This program is also most efficient from a collection standpoint where a single compartment side or rear load truck may be used.

Depending on the results of the REOI process the City could let a Request for Proposal (RFP) for the long term processing of its blue box materials.

With respect to the collection of recyclable materials at the curb the City can elect to make use of large blue boxes, recycling carts (in an automated system discussed in Section 4.4.3 below) and if the program includes processing at the City of Edmonton MRF (and perhaps elsewhere)

could elect to use blue transparent bags for collection. The least cost option is obviously bags purchased by the householder and the most expensive option would be the larger recycling carts as an initial capital cost as follows:

| Recyclables Collection Container | Cost to the City                                                                                                                                                                                   |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Small Blue Boxes                 | \$6 to \$8/box = average \$36,100 for one box per single family home*                                                                                                                              |
| Large Blue Boxes                 | \$7 to \$9 per box = average \$38,500 for one box per single family home*                                                                                                                          |
| Blue Bags                        | No cost to City; residents responsible for purchase, same order of cost as a conventional black garbage bag.                                                                                       |
| Carts                            | 360 L cart = \$59.00 (freight included) = \$284,100 for one cart for all single family homes*<br><br>240 L cart = \$47.00 (freight included) = \$226,300 for one cart for all single family homes* |

*\*this does not include the cost for City-wide distribution*

In some municipalities it is the responsibility of the homeowner to purchase their own blue boxes. This has long been identified as not 'best practice'. The program needs to be as convenient as possible and these municipalities do not typically reflect high diversion rates with this approach. Further the smaller blue boxes are not recommended as the sheer volume of recyclables is greater than their capacity to hold materials and in some homes several are required to accommodate all recyclable materials. The City could adopt the approach of providing one large blue box and have more available at cost to residents.

There is no one approach used for recycling collection that is preferable across municipalities. A variety of approaches are used in various and random municipal jurisdictions across Canada, as noted below.

### Recycling Containers Used in Communities Across Canada

| Container Type             | Municipal Program                              |
|----------------------------|------------------------------------------------|
| Blue Bag only              | Edmonton, Charlottetown, Halifax, St. John's   |
| Blue Bag, Blue Box or Both | Peel, Niagara, Muskoka, London, Halton, Guelph |
| Blue Box Only              | Most Municipalities                            |
| Automated Cart Only        | Calgary, Toronto, Kelowna, Winnipeg            |

From a collection standpoint, and based on other municipal experience blue box collection costs could range from \$100-\$150/household/year for weekly collection (and should occur as frequently as garbage collection). Having said that, a bi-weekly blue box collection program could be implemented if full-scale programming occurs for organic waste (as discussed above) as in that scenario the City could also adopt a bi-weekly collection cycle for garbage. This lets the City effectively 'trade one service for the other' to keep costs as low as possible. If the City determines that alternating bi-weekly collection of recyclables with garbage is preferred then it may be prudent to time the implementation of the blue box collection program after successful implementation of an enhanced organics collection program. Not only does this present the most cost-effective way to implement the program but it also allows the staging of these major initiatives from both a staff and budget resource management standpoint. It also allows residents to adapt to the changes.

Again, the decision with respect to the use of bags or boxes and the appropriate collection configuration will fall out of the determination of a preferred processor for recyclables and other decisions with respect to the system. Once a preferred processor is determined consideration will also have to be given to the need for bulk blue box materials for transfer (e.g. possibly located at the landfill) or whether a direct haul from the curb would be more cost-effective and practical. This is of course dependent on the distance (and time) to the receiving MRF. Edmonton is approximately one hour and fifteen minutes from Camrose and Red Deer is an hour and forty-five. Other operators in other locations may also respond to an REOI process.

If a transfer station is necessary it isn't likely that the City would construct a conventional transfer building because of the volume of blue box material to be moved. Many smaller municipalities across Canada are constructing smaller and proprietary Transtor Transfer Stations to accommodate smaller tonnages. Transtor units can be used with or without compaction as is appropriate.

Transtor costs are in the order of \$175,000 installed with footings poured. Two Transtor units are recommended and with two compaction trailers at \$200,000 each. Site development (binwalls, servicing etc.) is usually in the order of \$200,000-\$400,000 (site dependent). While Stantec is not endorsing this technology; it is presented as a viable option for the City.



Table 4-2 details recommendations, costs, impacts and timelines associated with implementing a blue box curbside collection and processing program and with respect to achieving various goals and objectives of the WMMP.



**Table 4-2: Residential Curbside Collection Recommendations**

| Residential Curbside Collection Recommendations |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short to Mid Term Options                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Consideration                                   | Curbside Recyclable Materials Collection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Provision of Collection Containers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Recommendation                                  | Provide curbside recycling service to residents if an acceptable processing arrangement can be identified.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Determine the type and size of container as the result of determining a processor and determining the cost for collection of carts versus continued manual collection.                                                                                                                                                                                                                                                                                                                                               |
| Implementation Timeline                         | <p>2013 - re-tender collection contract - determine costs for collection based on each of bi-weekly and weekly collection cycles, automated versus manual collection (depending on collection contract term - recommend seven (7) years) if new trucks required.</p> <p>2015 - Issue REOI for recyclable material processing to ensure capacity available/interest by processors.</p> <p>2016 - Issue RFP for processing.</p> <p>2017 - Roll out curbside recycling program based on provisions in existing/new collection contract.</p> <p>2018 - program roll out multi-residential in concert with organics roll-out</p> | <p>2013 - Determine container type and size from re-issuance of collection tender for March 31, 2014 termination date of current contract. (depending on collection contract term – recommend seven (7) years) if new trucks required.</p> <p>2016 - Approximately six (6) months for container procurement, tender, fabrication and distribution for blue boxes or carts if applicable OR notification to manufacturers and retailers if blue bag program.</p> <p>2017 - Distribute carts, boxes if applicable.</p> |
| Sector Served                                   | Single-family and Multi-family residential sectors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Single-family and Multi-family residential sectors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Economic                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operating Costs                                 | <p>Weekly collection costs for recycling estimated at \$100 to \$150 per household per year based on other municipal experience.</p> <p>Processing costs in the order of \$95.00/tonne - revenue to be determined but will likely offset the cost of processing most years.</p> <p>If transfer station necessary approximately \$8,000 per year for operation/maintenance of the site and the cost of haulage.</p>                                                                                                                                                                                                          | Costs for warehousing and providing replacement boxes/carts after the initial provision of boxes and new ones to new homeowners.                                                                                                                                                                                                                                                                                                                                                                                     |
| Capital Assets / Infrastructure                 | May necessitate construction of a transfer facility - in the order of \$1,000,000. As tonnage grows may necessitate additional trailers/Transtor unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>\$38,400 to \$284,000 (or nothing if bags are used)</p> <p>Ongoing maintenance and replacement of containers.</p>                                                                                                                                                                                                                                                                                                                                                                                                 |
| Funding Potential                               | Green Municipal Fund                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Environmental and Social Benefits               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Potential for waste reduction/diversion         | <p>High - Provision of curbside recycling collection will increase the diversion rate to over 50%.</p> <p>The projected amount of recyclables managed will increase from 1,633 tpy (under the current system) to approximately 2,500 tpy (2012) and 4,500 tpy by the end of the planning period.</p>                                                                                                                                                                                                                                                                                                                        | Effects diversion based on container provision - larger containers or bags provide more recycling capacity and less likelihood of defaulting into the garbage.                                                                                                                                                                                                                                                                                                                                                       |
| Community Acceptance                            | Community acceptance likely to be very high as they have indicated a desire for this program.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Likely high community satisfaction with any type of curbside collection container.                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Residential Curbside Collection Recommendations |                                                                                                                                                                                                                       |                                                                                                                                                 |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Short to Mid Term Options                       |                                                                                                                                                                                                                       |                                                                                                                                                 |
| Consideration                                   | Curbside Recyclable Materials Collection                                                                                                                                                                              | Provision of Collection Containers                                                                                                              |
| Employment / Economic Development               | Local employment through the provision of collection service. May affect existing private sector operators. May affect existing depot operators if depot not re-purposed.                                             | No local employment or economic development potential.                                                                                          |
| Technical                                       |                                                                                                                                                                                                                       |                                                                                                                                                 |
| Constraints                                     | Development of appropriate P&E materials and messaging is critical to participation in this program.                                                                                                                  | Barriers to carts sometimes for residents who have storage and handling issues.                                                                 |
| Staffing implications                           | Staff time to execute the process; REOI, RFP, transfer station if necessary.<br>Staff time for administration of collection and processing contract.                                                                  | One time coordination of large scale distribution with program implementation.<br><br>Ongoing replacement and new containers for new residents. |
| Impact to Other System Components               | Impact to existing depot operations - provides opportunity to re-purpose the depot to support other diversion programs.<br>Decreased waste to landfill for disposal, decreased tipping fees, increased landfill life. |                                                                                                                                                 |
| Partnership Opportunities                       |                                                                                                                                                                                                                       |                                                                                                                                                 |

### **4.3 MULTI-FAMILY SECTOR WASTE DIVERSION PROGRAMS**

The City currently does not collect any solid waste from the multi-family sector. The City should consider greater control over this sector through the provision of collection services (for blue box recycling and organic waste) and supporting promotional and educational activities.

There have been significant challenges for municipalities in the delivery of waste diversion services in the multi-family sector. While these challenges are shared by most municipalities, the approaches to capturing recyclable and compostable material from this sector vary greatly within Canada and across North America. More generally however it is known that some degree of municipal ownership of a program is required to increase and maintain diversion in this sector. This can be achieved through regulatory and reporting requirements, but is more typically associated with financial incentives or disincentives to drive programs. This could be accommodated through differential tipping fees (e.g. higher disposal fees for garbage than processing fees for recycling) discussed in Section 5.4. It is particularly challenging to implement waste diversion programs in multi-family buildings for various reasons including various site and building designs and associated space limitations, tenant turnover rates and ownership/interest and related program control issues.

Notwithstanding these challenges the City recognizes that this sector is key to achieving waste diversion targets and minimizing waste to landfill and that typically this sector wants the ability to participate in municipal waste diversion programs. Usually this is translated to a desire by this sector for the municipality to provide the same level of service or uniform service across both single and multi-family sectors.

An effective collection program for the multi-family sector requires considerable and ongoing staff time with dedicated staff to properly administer the program, conduct site visits to support program set-up, assist with development and/or distribution of promotional and educational materials, monitor success of the program and attend to collection issues. The program can further be supported by database management (tracking locations participating in the program) and addressing new development in the City through construction permitting requirements associated with the requirement for necessary space/infrastructure to properly support waste diversion initiatives.

#### **4.3.1 Database Management**

A comprehensive database of eligible locations for service should be compiled and maintained, which includes information on the characteristics and infrastructure of the building, services provided, and contact information for building management. As well, the City could directly assist with the identification of barriers to participation, specific to building and building location (space issues, inability to retrofit the facility, lack of support from building management, etc.) and make recommendations to managers, building owners, etc. Follow up should also occur to monitor contamination rates that can be higher in this sector with feedback mechanisms to

those locations to reduce contamination rates (and mechanisms in the bylaw to remove them from routes if the problem is great enough to affect the City's processing contracts).

This sector should also be monitored as part of the City's routine curbside auditing program as discussed in Section 2.1.2.

#### **4.3.2 Promotion and Education**

Specific promotion and educational materials need to be developed to support continued effort for source separation of recyclables (and organics) within these facilities specific to the multi-family sector. This could be a part of a larger communication strategy for the City. Successful communication initiatives include an outreach strategy that balances the production of printed material with in-person outreach to building tenants and outreach to management/superintendents/owners.

Print material that could be considered for development include a guide for building managers/superintendents on the specifics of the recycling programs, orientation guides for new tenants/unit owners as well as the provision of reusable bags and/or containers that can be used to separate and carry materials to the larger collection bins. Often promotional and educational materials can be created cost-effectively where they may be downloaded from the City's website. By way of example visit [www.toronto.ca](http://www.toronto.ca), as Toronto faces tremendous challenge with diversion programs in the multi-family sector (including language barriers) they have developed numerous on-line promotional tools to support their programs that the City may be able to draw from.



#### **4.3.3 Collection**

The City will need to evaluate collection options and container types with consideration given to particular building types and the waste streams being collected (recyclables, organics), predicted volumes, frequency of collection and the ability for collection vehicles to empty the bins. Organics collection can sometimes be problematic due to the weight of the material and freezing issues that can occur during colder months and it is important to provide both a sufficient number of bins but also to collect this material frequently. As with the single-family sector, frequency is also important in summer months to abate odour issues that can arise with more rapid decomposition of the organics stream.

While collection from smaller buildings and townhouse style condominium unit can be fairly straightforward, larger multi-level apartment buildings can present more of a challenge.



The City of Edmonton uses Blue Front End Bins for Single Stream Recyclables Collection at Apartment Buildings

**One Team. Infinite Solutions.**

For a target of 70% diversion, it is recommended that each residential unit be provided with the equivalent of 50 L of storage capacity, approximately the size of a standard 14 gallon blue box. This works out to one 95 L cart for every seven units, or one 4 yd<sup>3</sup> for every 60 units<sup>1</sup>. The type of collection bins used will be dependent on the design and type of multi-family buildings. Smaller complexes may only require blue boxes or blue bags, however, carts may be more efficiently collected in many cases. Larger 340 – 360 L blue carts can be used in those complexes with a common collection point. The rule of thumb is that for multi-family buildings between 30 and 100 units either carts or front-end bins can be used, those buildings over 100 units are better served with front end bins.<sup>2</sup> The latter however, is not likely necessary or practical for the City given the small number of buildings that would likely have over 100 units.

It is recommended that the City implement programming in the multi-family sector but only after full-scale implementation of blue box recycling and/or enhanced organic material collection in its single-family sector. Based on the proposed implementation timeline this initiative would not likely be undertaken until 2018. Several factors need to be considered before implementation in this sector but the largest issue is to determine the method of processing and collection that will be employed for blue box recycling in the single-family sector. That determination, along with the characteristics of the multi-family sector (e.g. many high rise buildings versus low-rise townhomes, condominium units and smaller complexes (assuming some combination) will help to dictate the most practical method of collection in the multi-family sector. If the single-family sector is collected using blue bags or blue boxes for example then the multi-family sector could be included in routing using carts but would require the ability of the collection vehicles to add a cart lifter/be configured to handle both manual loading of bags/boxes and carts. This is not an issue other than the provision would need to be included in a future collection contract.

If the City moves to a cart-based program for the single-family sector for collection of blue box material and organics, the shift to multi-family collection is straightforward and they are simply added to the routes although usually larger bins are provided for organics collection in that sector, and again, collection contracts need to be structured so that collection vehicles can add larger cart lifters for this program.

By delaying implementation in this sector it allows the City to determine the best mechanism for materials collection in the single-family sector and then expand that program beyond that sector, permits the City to spread budget resources over a longer period of time (e.g. the acquisition of containers if determined) and to realistically allocate staff time to initiatives over the life of the WMMP.

Table 4-2 details recommendations, costs, impacts and timelines associated with implementing blue box and organics curbside collection programs for the multi-residential sector and with respect to achieving various goals and objectives of the WMMP.

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<sup>1</sup> CIF Guidelines for Implementing Best Practices in Municipal Multi-Residential Recycling Programs, 2009

<sup>2</sup> KPMG, Blue Box Program Enhancement and Best Practices Assessment Project, 2006

**Table 4-3: Multi-family Program Recommendations**

| Multi-family Program Recommendations    |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Mid Term Options                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                       |
| Consideration                           | Provision of Additional Collection Services                                                                                                                                                                                                                                                                                                                                                                                                      | Promotion and Education                                                                                                                                                                                                                                                                                                               |
| Recommendation                          | Provide the multi-family sector with diversion opportunities such as organics and recycling collection.                                                                                                                                                                                                                                                                                                                                          | Develop an outreach strategy, collaborate with building groups and involve building management in the implementation and management of this program.                                                                                                                                                                                  |
| Implementation Timeline                 | 2018 - Implement collection service in this sector.                                                                                                                                                                                                                                                                                                                                                                                              | 2016 - Develop strategy for and implement consultation with this sector.<br>2017 - Procure appropriate bins/carts for each of recycling and organics.                                                                                                                                                                                 |
| Sector Served                           | Multi-family                                                                                                                                                                                                                                                                                                                                                                                                                                     | Multi-family                                                                                                                                                                                                                                                                                                                          |
| Economic                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |
| Operating Costs                         | Administrative cost to maintain program (promotion, customer service and monitoring).<br>2013 - Additional cost of collection for this sector to be developed with collection tender.                                                                                                                                                                                                                                                            | Best practices recommend expenditures of at least \$1 per capita on P&E.<br><br>Minimum annual costs estimated at \$20,000 (for entire City) when multi-residential sector included.<br>Required to be built into and be maintained in the annual operating budget.<br>Additional budget required to support new program initiatives. |
| Capital Assets / Infrastructure         | Based on 2011 census data (now available) = 2475 multi-family units of which 1455 are apartments but under five storeys. Carts would be provided to most of the apartment buildings but smaller boxes or bags could likely be used by the balance for recycling. Bins and carts for organics also required. True costs would need to be assessed based on the number of buildings (as opposed to units discussed above) and their configuration. |                                                                                                                                                                                                                                                                                                                                       |
| Funding Potential                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |
| Environmental and Social Benefits       |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |
| Potential for waste reduction/diversion | High - providing collection services will promote waste diversion in a sector that historically underuses waste diversion opportunities.                                                                                                                                                                                                                                                                                                         | Essential component to the success of newly implemented programs (i.e. curbside recycling and enhanced organics programs)                                                                                                                                                                                                             |
| Community Acceptance                    | Residents generally accepting of increased availability to diversion programs. A robust P&E campaign required to get “buy-in” of all stakeholders in the multi-residential sector.                                                                                                                                                                                                                                                               | Enhanced P&E program with provision of in-unit collection containers (bags, kitchen catchers) and ongoing educational information will increase participation and acceptance of program.                                                                                                                                              |
| Employment / Economic Development       | Increased collection requirements, business for bag/container manufactures.                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                       |
| Technical                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |
| Constraints                             | Barriers include inability to retrofit specific buildings, space issues for collection, resistance to participation, contamination of recyclables and organics.                                                                                                                                                                                                                                                                                  | Development of appropriate P&E materials. Engaging appropriate stakeholders.<br>Requires ongoing P&E support for all facilities – not a one-time campaign.                                                                                                                                                                            |
| Staffing implications                   | Staff time to implement and maintain program, collection contract oversight.                                                                                                                                                                                                                                                                                                                                                                     | Staff time to develop and possibly distribute, P&E materials.                                                                                                                                                                                                                                                                         |
| Impact to Other System Components       | Increased processing fees associated with increased tonnages of recyclables, but potential for increased revenue from markets as well.<br><br>Increase in organic materials to be managed and associated processing costs.<br><br>Extensive P&E campaign required to support the program.<br><br>Significant decrease in the amount of garbage to be landfilled – decreased disposal fees.                                                       | Increase in recyclable materials to be managed resulting in increased processing costs and revenues from markets.                                                                                                                                                                                                                     |
| Partnership Opportunities               |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                       |



## **4.4 REFINEMENTS TO THE CURBSIDE COLLECTION PROGRAM**

There will be opportunities to modify or enhance curbside collection programs to improve overall efficiency and to potentially realize savings throughout the course of WMMP implementation. This section discusses those options.

### **4.4.1 Set-out Limits**

The City has already identified a series of reductions in set-outs; in 2012, the City introduced a graduated bag limit of three containers; in 2013 the limit will be reduced to two containers. As the decrease in the bag limit continues however, (e.g. ultimately to a one bag limit) the City should consider the timing of that relative to various program enhancements recommended in the WMMP (particularly with respect to curbside blue box and enhanced organics collection programs). Should the City implement these programs the sheer volume of garbage requiring disposal will decrease enough to support these lower bag limits. While bag limits are intended to drive diversion there needs to be a reasonable and convenient alternative to disposal for those participating in curbside collection programs.

#### **4.4.1.1 Collection Frequency**

Best practices indicate that recyclable and organic materials should be collected at least as frequently (or more frequently) than the garbage stream. This encourages waste diversion by providing the same level of convenience for waste diversion programs as for garbage collection.

The City already collects organic waste at the curb between May and October on a weekly basis. There may not be a need to increase this level of service to year round service with a new Green Bin and enhanced organic collection program but that should in part be determined with the outcome of the pilot study discussed in Section 4.1. The introduction of a fully enhanced Green Bin program (with weekly collection year round) however, would allow the City to reduce garbage collection frequency to a bi-weekly collection cycle. This is not only 'best practice' because putrescible waste, more prone to odour and vector attraction, is collected in the Green Bin program but also the sheer volume of garbage remaining with a well-run Green Bin and curbside recycling program no longer justifies such a high level of garbage collection service (weekly).

Bi-weekly collection of garbage would also enable the City to collect blue box recyclable materials on a bi-weekly basis (e.g. alternating with garbage) which results in the provision of both services on an 'as convenient' basis but likely presents the most cost-effective method for the City to enhance overall curbside collection services. This would suggest (as discussed previously) that the City should implement a City-wide enhanced organic waste collection program prior to implementing a blue box collection program at the curb. Once the full scale organic waste program is implemented and residents are accustomed to the service then the City could scale back garbage collection to a bi-weekly basis while simultaneously introducing blue box collection.



It should be noted that for a bi-weekly recyclable materials collection program the City would want to ensure sufficient storage capacity to its residents e.g. larger blue boxes, blue bags (the endless container) or carts (in concert with automated collection described below).

#### **4.4.2 Co-Collection of Materials at the Curb**

There may be opportunities for cost savings associated with the co-collection of materials depending on the preferred system configuration with respect to both preferred collection cycles (weekly, bi-weekly) and the location of facilities.

Organics could be co-collected with garbage on garbage collection days and organics could be co-collected with recycling on recycling collection days if all receiving facilities are at the landfill site (landfill, improved organic waste processing area and a transfer station if necessary to the shipment of recyclable materials to a more distant MRF for processing) and if the City implements an alternating bi-weekly garbage and recycling collection program. It may however also be possible to direct haul from the curb to a MRF (e.g. Edmonton) especially with a single-stream collection and processing program. Again preferred collection cycles and other factors play a large role in determining the feasibility of these options.

It is recommended that the City consider these opportunities once the preferred system configuration is adopted and appropriate to the timing of new collection contracts during the long term implementation of the WMMP.

#### **4.4.3 Automated Collection**

The City should also continue to consider and seek pricing for the provision of an automated collection service to residents (e.g. with the next collection services procurement process). Automated collection can be provided for all waste streams (organics, garbage and recyclables) and carts would have to be provided to residents to support that collection program. Automated waste collection is considered to be a “best practice” in waste management where efficiencies can be gained in collection of any waste stream.

Automated collection provides better working conditions for vehicle operators and can also be far more efficient than manual collection. For example, in 2009 the City of Toronto reported that in one area of the City they will reduce from 22 recycle/organics trucks and 17 garbage trucks to 18 trucks for all three waste streams. Automated collection facilitates the collection of a much larger route than manual collection in the same amount of time e.g. 1,000 to 1,200 stops compared to around 700 stops with manual collection.

The contract cost of more efficient automated collection should be weighed against the cost of carts as described in the sections above. The provision of carts presents a high initial one-time cost to the City depending on how many streams the City determines should be collected by this method. Sufficient time is also necessary prior to commencement of automated collection to procure carts and distribute them on a city-wide basis. Carts for garbage collection only are estimated at \$226,000 (240 L).

#### **4.4.4 Bulky Materials Collection & Management**

The City does not collect bulky materials at the curb; residents must bring these items to the landfill where they are subject to tipping fees. The City should consider alternative management options – depot collection, curbside call-in service, 'goods exchange days' (previously discussed in Section 3.4), vouchers and pick up options.

Cost implications range significantly from a separate bulky waste collection program (assuming not a user-pay program) to the use of a depot or CRC to manage these materials to no program at all. The City should seek pricing for separate bulky waste collection as part of the next RFP for curbside collection services to evaluate the cost-benefit of providing this level of service to residents. More often this program is managed on a cost-recovery basis if a curbside program is elected, that is, on a cost per item basis. Materials including recyclable and non-recyclable items could be collected and then directed appropriately for disposal, recycling or reuse as appropriate and in concert with appropriate receiving, handling and storage areas either at the landfill or at a re-purposed Centre Cam Depot (or both).

Table 4-4 below, presents a number of options used by municipalities across Canada; many of who have moved away from unlimited bulk waste collection and instead, either place limits on the amount collected or collect fees for disposal of these items. Full or partial pricing for waste collection sends a message to residents that a reasonable, not unlimited, level of service will be provided that encourages waste reduction and re-use. This encourages residents to think of more creative ways to dispose of unwanted items and divert material from the landfill.

**Table 4-4: Bulky Items Management Options**

| Options                                                          | Program Description                                                                                                                                                                                                                                                                     | Advantages                                                                                                                                                                                                                                                         | Disadvantages                                                                                                                                                                                  | Cost                                                                                            |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Call In                                                          | Residents call in when they have a bulky item that they need picked up. City sends someone out to pick it up. Program options can include: pick up within a couple days, on a designated day, only run program over a few weeks during the year, pick up for free or pick up for a fee. | Can specify what residents can and can't include.<br><br>Helps to avoid lineups public drop off facilities. Convenient for residents.                                                                                                                              | Can be expensive if no fee charged.<br><br>Can spend a lot of time traveling versus picking up material (avoidable by setting designated day for pick up).<br><br>Commitment to response time. | Relatively high compared to other options if no fee charged. (can be on a cost-recovery basis). |
| Amnesty Days                                                     | Residents drop off their bulky items at the landfill on designated days for a predetermined fee (i.e. free, \$5 per item, \$7 per item etc.)                                                                                                                                            | Controlled handling on designated days only.<br><br>No collection costs incurred by City.                                                                                                                                                                          | Potential of requiring an additional part-time landfill attendant to assist with drop off during peak periods.                                                                                 | Low cost to crush the bulky items, higher cost to tub grind if either of these are elected.     |
| Goods Exchange Days                                              | Residents place items at curbside to be taken by others for free.<br><br>Residents are responsible for removing leftovers.                                                                                                                                                              | Annual/semi-annual etc. event same times each year therefore minimal advertisement.<br><br>Reduces total volume of material for disposal.                                                                                                                          |                                                                                                                                                                                                | Low – often only an ad is placed on city website/in the newspaper.                              |
| Regular Curbside Collection for Tagged items (Seasonal, monthly) | Residents permitted to place bulky items at the curb for collection with a user fee tag. Tags are purchased from municipal offices.                                                                                                                                                     | Municipality can cover cost of collection with user fee tags and does not spend time advertising program as it is part of weekly service.                                                                                                                          | Additional municipal staff and truck, or a contractor is required for this collection.                                                                                                         | Low (user pay)                                                                                  |
| Regular Curbside Collection (Seasonal, monthly)                  | Residents permitted to place bulky items at the curb for collection.                                                                                                                                                                                                                    | Easy for residents to dispose of waste.                                                                                                                                                                                                                            | Additional municipal staff and truck, or a contractor is required for this collection.                                                                                                         | High – difficult to anticipate how much bulk waste set out for collection.                      |
| Voucher                                                          | Coupons for free dumping/disposal of items directly at landfill (of a certain size e.g. ½ tonne/year) for each residential household.                                                                                                                                                   | Can easily mail coupons to residents or attach them to Collections Calendar, or residents can pick them up.<br><br>Can specify what residents can and can't include in their load.<br><br>Avoids line ups at the public drop off/landfill as with designated days. | This still encourages disposal.                                                                                                                                                                | Low to Moderate                                                                                 |
| Drop off at Landfill Site or Transfer Station                    | Residents drop their bulky item off at a designated spot at the landfill site.                                                                                                                                                                                                          | On-site treatment option to grind/crush materials.<br><br>No collection costs borne by the City.                                                                                                                                                                   | Potential of requiring an additional part-time landfill attendant to assist with drop off during peak periods.                                                                                 | Low cost to crush the bulky items, higher cost to tub grind them if this option elected.        |

Table 4-5 details recommendations, costs, impacts and timelines associated with refining the City's residential curbside collection program and with respect to achieving various goals and objectives of the WMMP.

**Table 4-5: Curbside Collection Program Recommendations**

| Curbside Collection Program Recommendations |                                                                                                                                                                                      |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                     |                                                                                                                                                          |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short to Mid Term Options                   |                                                                                                                                                                                      |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                     |                                                                                                                                                          |
| Consideration                               | Set-out Limits                                                                                                                                                                       | Bulky Materials Management                                                                                                                                                                         | Collection Frequency                                                                                                                                                                                                                                                                                                    | Co-Collection of Materials                                                                                                                                                          | Automated Collection                                                                                                                                     |
| Recommendation                              | Continue to reduce bag limits in concert with providing opportunities for greater waste diversion. Evaluate bag limit for collection if implementing a bi-weekly collection program. | Evaluate the current disposal methods and consider alternative management options - depot, call-in service, 'goods exchange days', vouchers and pick up.                                           | Collection frequency is to be established dependent on the level of curbside service provided by the City and should include organics and recycling to be collected as frequently or more frequently than garbage.                                                                                                      | Opportunities for co-collection of waste streams to improve efficiencies and reduce costs should be explored with new collection tendering processes.                               | Automated collection of waste streams to improve efficiencies and reduce costs should be explored with new collection tendering processes.               |
| Implementation Timeline                     | 2016 - reduce to two bag limit with introduction of Green Bin program<br>2017- reduce to one bag limit with introduction of blue box program.                                        | 2013 - Determine costs for a bulky-item collection program with new collection tender.                                                                                                             | 2013 - Costs to be determined through next collection tender (depending on contract duration).<br>2016 - Implement weekly year round organics collection if feasible.<br>2017 - Implement bi-weekly recycling and garbage collection (if feasible).                                                                     | 2013 - to be determined through procurement process for collection.                                                                                                                 | For the next contract for collection of recyclables, the City should seek pricing for collection using Automated Carts.                                  |
| Sector Served                               | Single-family residential sector.                                                                                                                                                    | Single and Multi-family sectors                                                                                                                                                                    | Single-family residential sector.                                                                                                                                                                                                                                                                                       | Single-family residential sector, multi-family sector.                                                                                                                              | Single-family residential sector, multi-family sector.                                                                                                   |
| Economic                                    |                                                                                                                                                                                      |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                     |                                                                                                                                                          |
| Operating Costs                             | Administrative costs associated with retailers/bag tag program.<br><br>Revenue generated from sale of bag tags.                                                                      | Cost implications range significantly from a separate bulky waste collection program to use of a depot/CRC to manage these materials to no program.<br><br>Could be user fee based for collection. | Costs should be requested in conjunction with the letting of a new collection tender for year round weekly collection of organics, weekly and bi-weekly collection of each of recycling and organics.<br><br>Decrease in garbage collection costs due to reduction in collection frequency to bi-weekly if implemented. | Costs dependent on number of waste streams to be managed at the curb, receiving location(s) for materials to be collected.<br><br>Very suitable for single-stream recycling system. | Automated collection operational costs can provide cost savings when compared to regular collection due to increased efficiency in automated collection. |
| Capital Assets / Infrastructure             | None                                                                                                                                                                                 | None                                                                                                                                                                                               | None                                                                                                                                                                                                                                                                                                                    | None                                                                                                                                                                                | Carts for collection as previously discussed.                                                                                                            |
| Funding Potential                           | N/A                                                                                                                                                                                  |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                     |                                                                                                                                                          |

Curbside Collection Program Recommendations

Short to Mid Term Options

| Consideration                           | Set-out Limits                                                                                                                                                                                                | Bulky Materials Management                                                                                                                                                                                                                                                                                  | Collection Frequency                                                                                                                                                                                                                                                                                                                                                                                                                 | Co-Collection of Materials                                                                              | Automated Collection                                                                                                                                                                                           |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental and Social Benefits       |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                         |                                                                                                                                                                                                                |
| Potential for waste reduction/diversion | <p>High - reducing garbage results in increase of capture of materials in other waste streams (recycling, organics).</p> <p>A one bag limit could increase diversion by up to 5%.</p>                         | <p>Low but supports sustainability concept and community partnering/charities, in some cases low income residents, students may reuse materials</p> <p>A CRC diverts bulky materials from the landfill as well as what could be numerous other materials and supports the overall waste reduction goal.</p> | <p>High - with increased service levels for the recycling and organics program there is increased diversion.</p> <p>Adjusting to bi-weekly garbage collection with weekly organics and curbside recycling collection could further increase the diversion rate by an additional 3 to 4% based on other municipal experience.</p>                                                                                                     | No diversion impacts. Focus is on operational cost savings.                                             | Some diversion impact because the size of the carts accommodate sufficient storage of recyclable and organic materials (e.g. less likely to default to a garbage cart when recycling or organics bin is full). |
| Community Acceptance                    | Will require extensive P&E campaign so residents do not view this as a reduction in the level of service.                                                                                                     | High community acceptance.                                                                                                                                                                                                                                                                                  | Community more accepting of changes to level of service with provision of additional services.                                                                                                                                                                                                                                                                                                                                       | Co-collection promoted through P&E program so residents know material is kept separate.                 | Community acceptance of cart-based program likely high – some however complain about storage and handling.                                                                                                     |
| Employment / Economic Development       | No direct employment or economic development potential.                                                                                                                                                       | New collection requirements if implemented.                                                                                                                                                                                                                                                                 | New collection requirements if implemented.                                                                                                                                                                                                                                                                                                                                                                                          | None                                                                                                    | None                                                                                                                                                                                                           |
| Technical                               |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                         |                                                                                                                                                                                                                |
| Constraints                             | Sufficient diversion programs must be in place before reducing limits.                                                                                                                                        |                                                                                                                                                                                                                                                                                                             | Changes to biweekly garbage collection require extensive P&E campaign to promote awareness to residents.                                                                                                                                                                                                                                                                                                                             | Depends on location of processing facilities. Lack of transfer capability limits co-collection options. | Cost of carts.                                                                                                                                                                                                 |
| Staffing implications                   | Administration of bag-tag program. Enforcement of limits.                                                                                                                                                     | Collection likely contracted out. Staff time for administration of contract.                                                                                                                                                                                                                                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                  | Staff time for administration of contract.                                                              | Staff time for administration of contract and cart distribution, etc.                                                                                                                                          |
| Impact to Other System Components       | <p>Increased recyclable and organics processing fees with increased tonnages.</p> <p>Increased revenue from sale of recyclable materials to market.</p> <p>Decreased waste to landfill and disposal fees.</p> | <p>Decreased revenues from landfill tipping fees.</p> <p>Associated P&amp;E costs to support the program.</p> <p>Reduce hard to compact waste to be landfilled – better operating.</p>                                                                                                                      | <p>Associated substantial P&amp;E campaign to support set-out schedule and times.</p> <p>Reduction in frequency of garbage collection may result in potential increased diversion of recyclable and organics and increased processing fees (assuming enhanced organics and recycling program is implemented).</p> <p>Potential for increased revenue from sale of recyclables.</p> <p>Reduced disposal tipping fees and revenue.</p> | Provides system efficiencies.                                                                           | Additional diversion will reduce consumption of landfill capacity, extending its operating life.                                                                                                               |
| Partnership Opportunities               | Not applicable                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                         |                                                                                                                                                                                                                |

## 4.5 HAZARDOUS WASTE MANAGEMENT

Currently, residents have a few options for disposing of household hazardous waste; the City offers two two-day Round It Up events per year in June and October at their public works yard, the Centra Cam depot accepts limited HHW materials from residents including paint, fluorescent tubes, and non-rechargeable batteries 24 hours a day, 7 days a week, and the landfill accepts limited types of HHW. At the last Round It Up event however it was estimated that only 1% of the population participated in that program, based on the tally sheets provided by the City.

In the short term, the City should establish partnerships with private retailers in the City wherever possible to provide alternative collection points for specific HHW materials like batteries. Partnership locations can be advertised to residents on the City's website and social media sites and included in future P&E materials. Larger retailers such as Canadian Tire, Walmart or Home Hardware may offer recycling programs for plastic film, batteries, CFL bulbs, paint, tires similar to those offered in their stores in other areas.

As there is a lengthy wait period between Round It Up dates, it would be beneficial to either increase the frequency of the delivery of this program or to expand acceptable materials at Centra Cam and/or at a new Community Recycling Centre (CRC) at the landfill site and in concert with the concept of 're-purposing' the landfill as discussed in Section 5.1. More than one more permanent depots for HHW would likely increase participation in this program along with the acceptance of more materials. Some municipalities also have 'paint re-use' programs where they make unused products (such as paint, thinners and other products) available to residents.

The following graphic shows a list of commonly received materials at HHW depots. Table 4.6 details recommendations, impacts and timelines associated with refining the City's HHW program and with respect to achieving various goals and objectives of the WMMP.



**Household**

- Aerosol Cans
- Batteries (disposable and rechargeable)
- Nail Polish and remover
- Cooking Oil
- Fire Extinguishers
- Metal, Floor, Furniture Polish
- Fluorescent Bulbs and tubes
- Needles and syringes
- Thermometers/ Thermostats
- Perfume
- Helium Tanks

**Automotive Garage**

- Motor Oil and Filters
- Car Batteries
- Sealants, Adhesives
- Fuel
- Brake Fluid
- Car Care Products
- Paint, Stain, Varnish
- Paint Thinner
- Windshield Wiper Fluid
- Antifreeze

**Outdoor Use**

- Pool/ Hot Tub Chemicals
- Propane Tanks and Cylinders
- Fertilizers
- Herbicides
- Insecticides
- Pesticides

**Table 4-6: Hazardous Waste Management Recommendations**

| <b>Hazardous Waste Management Recommendations</b> |                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Short to Mid Term Option</b>                   |                                                                                                                                                                                                                                                                                                                              |
| Consideration                                     | Management of Hazardous Waste                                                                                                                                                                                                                                                                                                |
| Recommendation                                    | Evaluate current management practices, expansion of services through either expansion of current Round It Up program and/or establishment of expanded material depots, partnerships with retailers.                                                                                                                          |
| Implementation Timeline                           | 2013 - Investigate retailers who will accept and manage HHW and build promotional campaign/web site link if appropriate.<br>2014 - Investigate opportunity and cost of expanding list of acceptable materials at the recycling depot and at the landfill (e.g. at a CRC) versus additional Round It Up events and locations. |
| Sector Served                                     | Single and Multi-family Residential Sector                                                                                                                                                                                                                                                                                   |
| Economic                                          |                                                                                                                                                                                                                                                                                                                              |
| Operating Costs                                   | Establishment of expanded depot collection/enhancement of current program - Disposal costs are significant for hazardous waste, increased capture of materials will increase disposal cost.                                                                                                                                  |
| Capital Assets / Infrastructure                   | Additional containment and storage requirement if expanded depot operations.                                                                                                                                                                                                                                                 |
| Funding Potential                                 |                                                                                                                                                                                                                                                                                                                              |
| Environmental and Social Benefits                 |                                                                                                                                                                                                                                                                                                                              |
| Potential for waste reduction/diversion           | Low – hazardous waste is a small volume of material in waste stream, approximately 1%. Diverting hazardous materials from landfill provided for a significant environmental benefit.                                                                                                                                         |
| Community Acceptance                              | High acceptance of additional locations and materials to dispose of HHW safely.                                                                                                                                                                                                                                              |
| Employment / Economic Development                 | No employment or economic potential.                                                                                                                                                                                                                                                                                         |
| Technical                                         |                                                                                                                                                                                                                                                                                                                              |
| Constraints                                       | Establishment of take-back programs with retailers, cost to develop depots at existing recycling depot or CRC.                                                                                                                                                                                                               |
| Staffing implications                             | Requires staff time to investigate retail opportunities, establish promotional materials/web site, coordinate additional round up days and/or management of additional depot materials.                                                                                                                                      |
| Impact to Other System Components                 | Reduction of volatile waste being landfilled.                                                                                                                                                                                                                                                                                |
| Partnership Opportunities                         | As described.                                                                                                                                                                                                                                                                                                                |

## **4.6 IC&I WASTE DIVERSION PROGRAMS**

Since a large portion of the waste managed by the City consists of IC&I and C&D waste, any efforts to increase diversion in this sector will go a long way to extend the life of the landfill.

In the short term, those programs which should have the highest priority are those that will assist the City with understanding the quantity and composition of IC&I waste requiring management as well as identifying the issues the IC&I sector faces on a regular basis with respect to waste diversion efforts. This will assist the City in deciding what diversion initiatives should be prioritized and also if and when to ever implement any mandatory diversion programs in the long term. On an on-going basis, the City should also provide P&E material specifically targeted to this sector about current City diversion programs. The City should encourage regular communication with key stakeholders targeting employees, businesses, educational institutions, and business associations. This was confirmed in the survey conducted as part of the 2011 *Review of the IC&I Waste Diversion Options* by Hoffman Consulting, as the most common idea put forward by the IC&I sector was that the City should provide more awareness and P&E of waste diversion programs.

### **4.6.1 Data Collection**

Further data collection is necessary as a first step in understanding the nature and quantities of material requiring management in this sector and that could reasonably be diverted. In the short term, the City should implement some tracking measures at the recycling depot and landfill in order to determine the source and type of waste being disposed at these facilities. Both of these facilities are unattended at certain times which makes it difficult to track the source of waste. Much of the recycling at the depot is untracked unless it can be attributed to a specific generator or type of waste (e.g. cardboard). Tracking at the landfill does not adequately distinguish those mixed loads containing material that may be diverted not only from IC&I sources but MSW collected from trailer parks, condominium complexes and multi-residential facilities are also classified as commercial waste since it is collected by private haulers.

The City has attempted to develop voluntary measures for haulers and private sector operators to collect and report data although this has proven understandably difficult. The City would likely benefit from routine visual waste inspections by staff or summer students to determine some order of magnitude understanding of wastes, and waste sources that may be targeted for diversion e.g. cardboard, construction waste, food waste, etc.

The statistics and data generated from these audits/studies can assist in creating the framework for more stringent source separation requirements the City may impose over the long term e.g. material bans like cardboard. Based on preliminary estimates undertaken to support this WMMP it is estimated that about 30% of the tonnage from commercial sources and entering the landfill is organic waste and approximate 30% is paper and paper products. Data collection would confirm these as potential target materials (and sources) for diversion along with other material types and help to determine the degree of effort needed for separation of these materials for recovery.

#### **4.6.2 IC&I Sector Roundtable & Partnerships**

One method of engaging the IC&I sector would be through regular round table discussions facilitated by the City with sector-specific representatives to discuss/resolve common waste challenges and identify areas for improvement/expansion. The City could obtain information on those issues which prevent or hinder this sector from fully participating in waste diversion programs (time, cost, contamination, lack of markets, lack of convenience, lack of information etc.). A P&E program should be developed to cater to both the residential and the IC&I sector and as part of a broader comprehensive communication plan discussed in Section 2.2.1.

The City should facilitate regular round table discussions amongst specific sector representatives to discuss/resolve common waste reduction challenges (e.g. school boards, government, retailers, hospitals, waste haulers, and recyclers). Such discussions would promote the exchange of successful waste diversion ideas, processing options, and lessons learned.

These discussions could lead to the identification of new diversion and market development opportunities and best practices which would further encourage waste reduction and diversion within the IC&I sector. Sharing best practices between industry group members is expected to lead to some additional diversion. Members of this roundtable could also get involved with the Recycling Council of Alberta's Industrial, Commercial and Institutional Committee<sup>3</sup> whose mandate is to "encourage and assist the IC&I and C&D sectors to responsibly manage their waste stream, assume stewardship, increase recycled content and conserve resources." This would also provide opportunities for the City to continue to advocate for and promote stewardship programs.

Various partnerships could evolve from these roundtable discussions with strategic sector groups toward the establishment of end markets, supporting infrastructure requirements, P&E initiatives and others. Research partnerships could also evolve with some including the University of Alberta (Augustana College), NorQuest, and perhaps the City of Edmonton to investigate different methods to re-use different materials, find new diversion opportunities and establish end markets for harder to recycle materials.

#### **4.6.3 Waste Diversion Certification and Awards Program**

Over the long term the City should consider a voluntary certification program for businesses that meet specific waste reduction and diversion standards set by the City. For example businesses that are able to meet a certain level of diversion (e.g. 70%) could be allowed to use recognizable logos and signs to recognize their achievement. The certification would act as a positive public relations tool for businesses and would act as an incentive for businesses to participate in waste reduction/diversion initiatives.

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<sup>3</sup> <http://www.recycle.ab.ca/IC&I>

#### **4.6.4 Support and/or Expand School Recycling and Curriculum**

In the mid-term the City should consider supporting in-school recycling programs and could consider the provision of both blue box and organics collection in partnership and possibly with a 'consortium style' contracted collection arrangement. The City should also continue to cooperate with Boards of Education to continue to develop appropriate curriculum for students as it relates to waste management. School-based programs can also be used as a conduit for broader community education programs on diversion.

#### **4.6.5 Green Procurement Guide**

In the mid to long term the City could develop a Green Procurement Guide specific to the IC&I and C&D sectors. The guide would educate IC&I and C&D generators about Green Procurement and would provide resources to these sectors on selecting products that are environmentally preferable. Although this initiative would not contribute significantly to increasing the City's waste diversion rate, it would show that the City is willing to take on a leadership role in environmental stewardship. The guide could be available on the City's webpage and promoted through advertising.

For the IC&I sector, green procurement options could include encouraging the purchase of paper products that are made of post-consumer recycled fibres and using cleaning products that contain less hazardous ingredients. For the C&D sector, options could include encouraging the purchase of building materials made of recyclables material or materials that are less hazardous in nature (e.g., low VOC paint).

Over the long term and once other key programs are in place, the City could also provide technical assistance services to companies that implement waste reduction programs; for example, the City could train companies in how to properly complete waste audits and develop waste reduction work plans. This type of program would be a voluntary initiative that IC&I or C&D entities could participate in if interested.

#### **4.6.6 Encourage Green Building Standards (e.g. LEED®)**

Leadership in Energy & Environmental Design (LEED®) is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

LEED® certification has several waste diversion benefits as it encourages the development of waste recycling programs for tenants of buildings. LEED® certification extends best building practices which will help reduce waste as points are received for implementing diversion programs. Over the long term the City could encourage new facilities built within its boundaries over a certain size (say over 500 m<sup>2</sup>) to achieve LEED® certification. Within this program they could include specific targets for waste minimization and diversion.

The City could provide incentives such as free consultations and fee discounts and grants for builders and developers to build “green” buildings.

These programs support increased waste diversion in the IC&I sector and while they support the goals and objectives of the WMMP they are largely a function of staff time with no significant cost to implement. Various recommendations with respect to IC&I waste diversion and the required supporting infrastructure and programs are discussed in Section 5.0 below and as it relates to ‘re-purposing’ the City’s landfill. Recommendations, impacts, costs and timelines associated with refined programming for the IC&I sector and with respect to achieving various goals and objectives of the WMMP are provided in Table 5-1 in Section 5.0.

#### **4.7 RECYCLING DEPOT ENHANCEMENTS**

Currently, the recycling depot consists of a facility owned by the City and operated by Centra Cam to process the recyclables delivered by residents to the depot. The depot is operating at capacity under the current system (no curbside collection of recyclables). Until the City implements a curbside blue box program (or not) there are some short term modifications to the recycling depot that could be implemented.

One of the modifications for consideration in the immediate short term is the adjustment of operating hours. Although the recycling depot is open 24 hours, 7 days a week for the disposal of most items, there are several items which are only accepted on weekdays from 8:00 a.m. to 4:00 p.m. The City and Centra Cam could consider evaluating traffic volumes to determine days and times which may be more appropriate for operating hours. It may be more convenient for residents to have options to recycle or dispose of items on Saturdays or after business hours some days in the week and perhaps the most cost effective way would be to close the depot on a day during the week where there may be less traffic. This may drive participation up for various recycling programs offered at the depot.

In the short term and with the decision to implement a blue box curbside collection program the City should consider means by which the existing depot may be re-purposed. It is likely that notwithstanding having a curbside program that small commercial, county and multi-family generators will still use the depot for blue box recycling purposes and so an area dedicated for that will still be necessary albeit not as much space and materials recovered (e.g. single stream) would be shipped either to a transfer station for shipping or shipped direct to MRF. Unused areas of the site could be repurposed for the collection of additional recyclable materials e.g. appliances, wood, small generation of construction and demolition material from home renovations and the like, potentially mattresses, carpeting, an enhanced HHW program and possibly a re-use centre (this may require use of the adjacent property), tires, continued electronics recycling etc.

If a curbside blue box program is not implemented then the City should continue to operate the depot (and possibly still expand to adjacent property) but also consider a new CRC at the landfill (discussed in Section 5.0) to accommodate diversion of the materials and programs identified

above and to ensure sufficient supplemental space to accommodate population growth and associated additional blue box tonnage.

#### **4.8 PUBLIC OPEN SPACE RECYCLING**

Public space recycling programs seek to capture additional recyclable materials from residential sources that are typically lost to disposal. Stantec has identified various best practices that could help overcome these obstacles including the use of clear and consistent signage, proper bin design and placement and good communications between collectors and facility managers.<sup>4</sup> The *Open Space Recycling Better Practices Review* also noted the importance of placing recycling containers and garbage containers side-by-side.

Portage la Prairie was recently (October 2010) selected to become the model community for Recycle Everywhere, a program which encourages recycling in Portage la Prairie's public spaces.<sup>5</sup> This program was implemented in conjunction with the Canadian Beverage Container Recycling Association and Multi-Material Stewardship Manitoba and required an investment of \$150,000 for over 200 bins, advertising and Recycle Everywhere decals. The recycling bins were placed throughout Portage la Prairie's parks, public buildings, shopping centres, community facilities and other public spaces. Camrose should carefully monitor the results of Portage la Prairie's program and select the most successful aspects of the program to implement in Camrose' public spaces.

This is recommended in the mid to long term once a curbside collection program is established as this program can be collected as an add-on and enhancement to that program.

#### **4.9 SPECIAL EVENT RECYCLING**

This type of program targets vendors or organizations, typically using municipal facilities like parks, arenas for festivals or special localized events. This program complements a public open space recycling program. In many municipalities event organizers are required to get a permit for these events and this provides an opportunity to ensure that event organizers approach waste management in a fashion consistent with the municipal waste management program. Permitting could require that recycling is mandated but should be supported with promotional and educational materials designed for event planners and facility users. Various mechanisms for collection could be explored and employed but in all cases weights of material diverted should be recorded.

Special events recycling is generally only feasible if there is a high involvement of volunteers, attending diversion stations, informing attendees of the correct sorting methods and removing and often sorting materials to remove any contaminants.

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<sup>4</sup> Stantec, Open Space Recycling Better Practices Review, 2009.

<sup>5</sup> [http://cbcra-acrcb.org/RecycleEverywhere/pdf/recycle\\_everywhere\\_pr\\_oct22\\_2010.pdf](http://cbcra-acrcb.org/RecycleEverywhere/pdf/recycle_everywhere_pr_oct22_2010.pdf)



This, like open space recycling is recommended in the mid to long term as a means to fine tune the City's recycling programs.

Table 4-7 details recommendations, impacts and timelines associated with additional management options for recyclable materials and with respect to achieving various goals and objectives of the WMMP.

Table 4-7: Recycling Management Options

| Recycling Management Recommendations |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                              |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | Short Term Options                                                                                                                                                                                                                                                                                                                                                                                                    | Mid to Long Term Options                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                              |
| Consideration                        | Recycling Depot Enhancements                                                                                                                                                                                                                                                                                                                                                                                          | Special Event Recycling                                                                                                                                                                                                                                                                                                                                                               | Public Open Space Recycling                                                                                                                                  |
| Recommendation                       | <p>Enhance the Recycling Depot to incorporate the changes associated with the WMMP such as an expansion to the facility (if curbside recycling is not implemented) or modification to the role of the depot (if curbside recycling is implemented).</p> <p>Adjust operating hours to enable residents to provide increased access to depot (weekends and evenings).</p>                                               | Identify opportunities for implementing waste diversion opportunities at selected special events. The development of the program should include identification of eligibility criteria, collection services to be provided, type and number of collection containers, and supporting P&E materials, including guidelines, training and signage.                                       | Implement a public open space recycling program.                                                                                                             |
| Implementation Timeline              | <p>2013 - 2014 evaluate modifications to depot to increase efficiency and convenience e.g. adjustment of operating hours.</p> <p>2016 - evaluate definitive costs of depot re-purposing and materials to be received, logistics etc. at same time as RFP let for blue box processing capacity</p> <p>2017 - construct/modify depot to accommodate re-purposing (2017 commencement of blue box collection program)</p> | 2020 - post established blue box collection program in both single family and multi-family sectors                                                                                                                                                                                                                                                                                    | 2020 - post established blue box collection program in both single family and multi-family sectors                                                           |
| Sector Served                        | Residential, multi-family, small commercial generators                                                                                                                                                                                                                                                                                                                                                                | Single-family residential sector, Multi-family residential sector                                                                                                                                                                                                                                                                                                                     | Single-family residential sector<br>Multi-family residential sector                                                                                          |
| Economic                             |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                              |
| Operating Costs                      | <p>Additional operating expenditures - highly dependent on additional programming, additional HHW materials significant cost per tonne.</p> <p>Additional materials captured might result in additional revenue from material sales - material dependent.</p> <p>Additional processing costs for various materials and material quantities.</p>                                                                       | <p>Small to medium operational expenditures associated with staff time for delivery and collection of containers, potential costs associated with collection services and staff time to provide training services to organizations. P&amp;E development cost included in communication budget.</p> <p>Minor increase in collection and processing costs for recyclable materials.</p> | Cost for full program implementation to be determined. Increased collection and processing costs for additional recyclable materials, container maintenance. |
| Capital Assets / Infrastructure      | May be some infrastructure modifications to existing depot.                                                                                                                                                                                                                                                                                                                                                           | Small capital expenditure associated with collection containers.                                                                                                                                                                                                                                                                                                                      | <p>Capital cost associated public space recycling bins, support P&amp;E materials.</p> <p>Minor additional revenues for increased recyclable materials.</p>  |
| Funding Potential                    | N/A                                                                                                                                                                                                                                                                                                                                                                                                                   | Potential from private sector e.g. sponsors                                                                                                                                                                                                                                                                                                                                           | Potential funding available from province or corporate sponsors.                                                                                             |

| Recycling Management Recommendations    |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Short Term Options                                                                                                                                                        | Mid to Long Term Options                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Consideration                           | Recycling Depot Enhancements                                                                                                                                              | Special Event Recycling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Public Open Space Recycling                                                                                                                                                                                                                                                                                                                                                                      |
| Environmental/Social Benefits           |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Potential for waste reduction/diversion | Program dependent - additional capacity and convenience at depot would be positive for users, could see significant diversion depending on types and number of materials. | Small potential to increase diversion from landfill. Depends on number and size of special events and degree of participation in program by attendees.<br>Depends on number and scale of events, and on key aspects of event design.                                                                                                                                                                                                                                                                                      | Low - public space recycling serves more of a promotional purpose - unifies recycling across the City.<br><br>Estimated at 2 kg/capita equates to 35 tonnes and a 0.2% increase in the diversion rate.                                                                                                                                                                                           |
| Community Acceptance                    | Increased availability and materials to be diverted likely to be well received by community.                                                                              | Promotes recycling and composting beyond the household and workplace. Should be accepted by the public and private sectors as a natural extension of their waste management programs, viewed as “greening” of the City.                                                                                                                                                                                                                                                                                                   | Promotes recycling beyond the household and workplace. Should be accepted by the public and private sectors as a natural extension of their recycling programs, viewed a “greening” of the City.                                                                                                                                                                                                 |
| Employment / Economic Development       | No direct employment or economic development potential.                                                                                                                   | No direct employment or economic development potential. However, could result in some increase in business for some collection service providers.                                                                                                                                                                                                                                                                                                                                                                         | No direct employment or economic development potential. However, could result in some increase in business for some service providers (recycling bin supplier).                                                                                                                                                                                                                                  |
| Technical                               |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                  |
| Constraints                             | Improvements dependent on decisions to provide curbside recycling collection and/or development of a CRC at landfill.                                                     | Include provision of containers and collection and processing arrangements (typically coordinated with a private sector hauler).<br>Barriers include ad-hoc requests to provide additional service to specific events outside of an organized system. Eligibility criteria and program guidelines need to be developed to provide governance to the program. Administrative barriers may include the issuance of permits or inclusion of provisions for this service in collection contracts.<br>Dependent on volunteers. | To implement an effective program, the City would need to first identify the target areas for improved open space recycling, identify the various approaches to be piloted and would then procure and install the containers. Barriers include the need to choose the most appropriate signage and container configuration to overcome the issue with garbage and recycling cross-contamination. |
| Staffing implications                   | Development of P&E materials included in P&E program budget. Additional staff time required for monitoring and evaluation of the changes.                                 | Would require staff time for administration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Would require coordination between City staff (waste and parks) and staff time for administration.                                                                                                                                                                                                                                                                                               |
| Impact to Other System Components       | Reduced waste to landfill and reduced disposal fees. Provides continued opportunity for multi-residential (especially in the short term) and small commercial recycling.  | Potential decrease in materials landfilled, and increase in quantity of materials requiring processing.                                                                                                                                                                                                                                                                                                                                                                                                                   | Minor reduction in disposal capacity requirements, and minor increase in recycling processing requirements.                                                                                                                                                                                                                                                                                      |
| Partnership Opportunities               | Enhancements made in partnership with Centra Cam and surrounding County.                                                                                                  | May be able to partner with local businesses for support of program.                                                                                                                                                                                                                                                                                                                                                                                                                                                      | May partner with provincial agencies or corporations for delivery of program.                                                                                                                                                                                                                                                                                                                    |

## 5.0 Camrose Waste Resource Recovery Centre (Regional Sanitary Landfill)

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The sanitary landfill is a vital part of the City's waste management program and every opportunity should be explored to extend the life of this resource. The options described previously will greatly enhance the lifespan of the landfill, avoiding the additional cost and effort required to expand or site a new landfill in the very long term.

The following sections describe recommendations as they relate to increasing waste diversion activities above current levels at the landfill and repurposing the site such that the focus is not on disposal but first on waste reduction, reuse and recycling practices. The Infrastructure required at the site and to support various programs described in this report is also discussed in this section.

### 5.1 REBRANDING/REPURPOSING OF THE LANDFILL

The concept of re-branding and re-purposing the landfill is as described above, that is, the site would be re-designed as an integrated 'resource recovery' site that through proper signage and direction to visitors/users and appropriately constructed roadways to access a series of diversion facilities prior to disposal as the last (and least convenient) option for the user.

With that usually comes a facility name that reflects the sites 'new purpose' and uses references to that such as 'resource recovery' or similar. The previous *Solid Waste Collection and Diversion Study* made note of the City's "paint your world green" theme developed for the City and that this theme could be carried through all waste diversion programs, including the recycling depot and the landfill in order to reflect an integrated approach and recognizable theme for all facilities. This could somehow be incorporated into the re-branding of the landfill site or otherwise the City could hire a marketing firm to develop a new image for all waste management programs and the new landfill site waste reduction and diversion infrastructure to support those programs.

As the City works toward making the landfill less 'disposal focused' and more 'diversion focused' both residential and IC&I sectors will come to view the facility in a different light. This will take time and will need to be supported by many of the mechanisms described in this section.

### 5.2 COMMUNITY RECYCLING CENTRE

The City currently provides several collection areas for the diversion of various recyclable materials including leaf & yard waste, scrap metal, asphalt, concrete, automotive batteries, tires, propane tanks and appliances at the landfill. Some of these recycling programs may be better served through a centralized receiving facility in the form of a Community Recycling Centre (CRC) strategically located before access to the landfill tipping face. Further it may be

beneficial to use bins for convenient (e.g. better road conditions) disposal of garbage by residents as well (as opposed to allowing access to the tipping face). This may or may not allow for improved management of the landfill working face for operators. If this is a preferred option for the City then disposal bins should be located the furthest (and past) access to bins used for diversion purposes.

A CRC concept could include bins, or if more appropriate, pads, for some of the materials already managed like leaf and yard waste, scrap metal and additional bins could be provided for additional recyclable materials similar to those identified in Section 4.7 as it relates to a re-purposed depot (if a curbside recycling program is put into place). A CRC could serve in lieu of a curbside collection program to provide convenient recycling services to the south end of the City and to manage additional tonnage with population growth and it can be used to expand the City's residential recycling programs; wood, small generation of construction and demolition material from home renovations and the like, potentially mattresses, carpeting, an enhanced HHW program and possibly a re-use centre, tires, electronics recycling etc.

The design concept for the CRC at the landfill would ideally be as follows:

- Access to the CRC through the existing landfill scales;
- Access roads to the CRC would be paved;
- The 'front-end' of the facility (i.e. that area accessed first by residents) would be dedicated to diversion of materials. For as many materials as possible, the tipping fee would be set at a minimal fee that is lower than the fee applied to regular garbage to encourage diversion (pending confirmation of management costs). The general principle for the fees is that diversion through the CRC should cost less than disposal.
- High volume materials (such as brush) would be managed on gravel pads, built at ground level, separated by concrete block barriers (for material separation purposes, not as push walls).
- Lower volume materials would be managed via 40 yard bins (or smaller if appropriate), placed below grade through a conventional 'saw tooth' design or a modular design, where the bins are set up below-grade and the public drops materials in from an above-grade off-loading area. This would include any materials that would be hauled off-site for management (e.g. shingles, drywall, scrap metal, etc.), garbage to be hauled up to the landfill tipping face., possibly leaf and yard waste to be hauled to the composting pad.
- Clear and appropriate signage would be placed throughout the site to direct facility users.

- At the 'front-end' of the facility, the following materials could be separated in the short term:
  - Blue box recyclables (serving multi-family sector in the short term, county and small commercial sector in short and long term);
  - Old Corrugated Cardboard;
  - Brush (gravel pad at grade, access required to grind and move materials);
  - Leaf & yard waste (paper bags only, or debugged) (gravel pad at grade, access required to grind and move materials if not ground at the composting pad);
  - Clean wood waste (40 yard bin);
  - Drywall (40 yard bin);
  - Asphalt shingles (40 yard bin);
  - Used Tires (40 yard bin); scrap metal and white goods (gravel pad at grade).
- Near the 'diversion' area, space could be provided for a household hazardous waste depot and/or electronics collection and/or appliance collection and storage.
- A separate 'zone' of the CRC could be used for separation of other material types that the City may want to manage separately and may include:
  - Dirty wood waste (gravel pad at grade);
  - Furniture/mattresses (40 yard bin);
  - Non-divertible Construction and Demolition Waste (40 yard bin(s));
  - Mixed garbage (40 yard bin(s)).
- Access to the 'disposal zone' should be only after visitors have had to enter and go through or past the 'diversion zone'. This would allow residents to split loads between divertible and disposable items, allowing them to 'save' on tipping fees as recyclable materials would be received at no or a lower charge than non-divertible waste.

Three design concepts for a CRC are pictured below. The first is a CRC developed and operated in the City of Hamilton in Ontario. The area to the right includes 12 bays where various material streams are separated for diversion. Residents pay no fee for materials dropped off in this area.



The area to the left includes four bays for garbage drop-off. Residents must pay a fee for dropping off material in this area. The total reported capital cost for this facility when constructed in 2006 was \$2.4 million.

The second design concept, shown below is a modular design (by way of example only) that can be constructed as a smaller facility to start and expanded to accommodate additional material separation needs over time. An eight bin design by this manufacturer was quoted in the order of \$320,000. Delivery costs and site preparation costs need to be confirmed.



City of Hamilton CRC



Modular CRC Design



The third design concept included the modification of an existing maintenance building, installation of baling and bagging equipment and storage facility, weigh scale and scalehouse facility, compost facility and resident drop-off area for waste and recycling.



The capital costs to develop such facilities can vary significantly based on:

- The existing infrastructure at the site. At the landfill there are already scales and an access road.
- The amount of grading and material required to develop the appropriate facility configuration.
- The type and potential quantity of materials that would be managed, which will determine the facility footprint and resources required for construction.
- The operating costs to run such facilities can also vary significantly based on:
  - The types and quantities of material managed. Some materials such as wood waste may have a net cost to divert from landfill, if diversion of these materials involved shredding/chipping of wood wastes once or more a year. Other materials such as scrap metals and blue box materials may generate net revenues from the sale of these commodities.
  - The method used to manage the materials. For materials which are placed in 40 yard roll-off bins there is a cost associated with removing these bins and hauling them to the location

where the material would be used. The City would require an operating contract to supply bins and haul materials as needed.

- The staffing and monitoring of the CRC. Generally, facilities with more successful diversion rates have dedicated staff on-site to direct residents to the appropriate areas and to check that residents are source separating their materials at the facility.

It is recommended that the City consider the merits of a CRC in the context of the delivery of other program changes, timing, budget, the desire to re-purpose the landfill and in consultation with the public as part of this WMMP process. Consultation with respect to the types of materials that should be separated and the sheer number of anticipated users should occur to determine the facility footprint and configuration, and the overall capital and operating cost implications for the City in the long term.

### **5.3 IC&I AND C&D MATERIALS DEPOT**

The City already has a diversion area for concrete and asphalt and should consider expansion of that area (if physically possible) to divert additional IC&I and C&D sector materials. The depot could take the form of a re-use area (specifically for C&D materials) and a recycling station for divertible materials. The City could choose to develop a facility itself or in partnership with a private entity interested in participating in the effort.

There are several advantages to such a program, including:

- Furthering the site as having focus on waste reuse and recycling as opposed to disposal.
- Could divert significant quantities of waste
- Could divert specific harder-to-manage materials at the landfill tipping face.
- Could lower disposal costs for these sectors.

Similar to the CRC discussed above, the capital costs to develop an IC&I and C&D materials recovery depot can vary significantly based on:

- The existing infrastructure at the site. At the landfill there are already scales and an access road.
- The amount of grading and material required to develop the appropriate facility configuration.
- The type and potential quantity of materials that would be managed, which will determine the facility footprint and resources required for construction. Materials could include continued asphalt and concrete recycling, large quantities of clean and dirty wood, drywall, shingles, metals, plastics, etc.

- The operating costs to run such a depot and like a CRC also vary significantly based on:
- The types and quantities of material managed. Some materials such as wood waste may have a net cost to divert from landfill, if diversion of these materials involved shredding/chipping of wood wastes once or more a year. Other materials such as scrap metals may generate net revenues from the sale of these commodities.
- The method used to manage the materials. If materials are placed in 40 yard roll-off bins and hauled a distance for recycling and/or recovery, then there would be a cost associated with removing these bins and hauling them to the location where the material would be used. It may be more practical to build a loading area/ramp to load tractor trailer quantities of materials depending on quantities and destination.
- The staffing and monitoring of the depot. Generally, facilities with more successful diversion rates would have at least one dedicated staff on-site at any one time, to direct residents to the appropriate areas and to ensure that residents are source separating their materials at the facility.

It is recommended that the City consider the merits of a depot in the context of the delivery of other program changes, timing, budget, the desire to re-purpose the landfill and in consultation with the IC&I and C&D sectors possibly as part of this WMMP process but certainly in roundtable discussions as described in Section 4.6.2 above. Consultation with respect to the types of materials that should be separated and the sheer number of anticipated users should occur to determine facility footprint and configuration and so overall capital and operating cost implications for the City in the long term. Targeted materials will be supported by data collection activities also discussed in Section 4.6.1.

#### **5.4 DIFFERENTIAL TIPPING FEES AND SURCHARGES FOR DESIGNATED MATERIALS**

The City's current tipping fee schedule (2012) does reflect some level of differential tipping in that some materials are received for free to encourage diversion including, but not limited to, batteries, pesticide containers, and grass and tree clippings. Wood and metal are also received at a lower price than the disposal fee but the difference between these fees is not necessarily substantial enough to promote separation of these materials by most facility users.

Many municipalities across Canada use differential tipping fees to promote source separation of materials for diversion and to reduce disposal capacity use. The City should consider raising its disposal fee in the short term to mid-term with sufficient notice to facility users. The fee shouldn't be so high as to force generators to go elsewhere but high enough to have greater separation of fees for disposal compared to lower fees for wood, metal, organics and other targeted materials.

In the long term, the City could also consider applying a surcharge to mixed loads containing target materials, including recyclables like cardboard, C&D materials and possibly organics.

This acts as a financial incentive for businesses to source separate material. The environmental benefit comes through increased diversion and reduction in the use of non-renewable resources (e.g., metals, etc.).

The City would have to ensure that the appropriate diversion infrastructure is in place for the materials that would be designated as being recyclable. For example, markets are currently available for OCC and scrap metal. Markets would need to be available for other materials prior to those materials either being targeted with a differential tipping fee or a surcharge.

## **5.5 DISPOSAL BAN**

A disposal 'ban' consists of prohibiting the disposal of designated materials at the point of disposal (i.e., at the Landfill) by the residential and IC&I sectors that haul materials directly to the landfill. Loads of material would be inspected before being dropped off at the landfill and loads exceeding permitted levels of banned material would be rejected or subject to a surcharge. The surcharge should be a prohibitive fee for loads with greater than a certain determined but practical percentage of a banned material. Potential mandatory materials for recycling applicable in Camrose could include concrete, drywall, shingles, organics, wood, cardboard, and other materials. Disposal bans would be put in effect for materials for which mature diversion options are in place.

There are a number of advantages associated with establishing a 'ban', including:

- Many waste materials have a good potential to be diverted from landfill disposal and the ban would help promote diversion.
- The operating life for existing landfill capacity would be extended.
- Natural resource consumption would be reduced through the reuse and recycling of a greater portion of the waste stream.

However, there are also several disadvantages which must also be taken into account:

- A ban would require the development of practical and cost-effective means for generators to divert the targeted materials as well as policies for managing non-compliance.
- Enforcing a mandatory ban could be somewhat controversial, can be staff intensive in order to police and it also potentially creates conflict between the City and facility users.

To some extent this can be managed with mechanisms like exemptions for small loads, a grace period and other options such as staging from a differential tipping fee approach to a full ban. The use of material bans is not recommended for the City in the short to mid-term. It should only be evaluated in the long term once waste diversion programs and associated infrastructure is in place.

## **5.6 OPERATIONAL OR ENGINEERING IMPROVEMENTS**

The City should from time to time retain a third party engineer to assess any operating improvements that could be made at the existing landfill. This could occur in year one of any new operating contract term. Assessment would focus on any operating improvements that may serve to further the life of the existing landfill and/or result in cost-savings. This may include but would not be limited to:

- Evaluate the use of a tarping system or spray for daily cover of waste as a mechanism to reduce landfill capacity requirements associated with conventional cover;
- Evaluate grinding of bulky wastes/hard to compact wastes as a means to reduce capacity requirements and improve daily operations;
- Ensure existing compaction equipment is adequate and that no additional compaction could be gained through alternative compaction equipment.

Table 5.1 details recommendations, impacts and timelines associated with the landfill management program and with respect to achieving various goals and objectives of the WMMP.

**Table 5-1: Landfill Management Program Recommendations**

| Landfill Management Program Recommendations |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                 |                                                                                                  |                                                                                                                                                                                              |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All Terms                                   |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                 |                                                                                                  |                                                                                                                                                                                              |
| Consideration                               | Community Recycling Centre                                                                                                                                                                                                                               | IC&I and C&D Depot                                                                                                                                                                                    | Adjust/Expand Tipping Fees for Designated Materials                                                                                                                                                                                                                             | Ban Designated Materials from Landfill                                                           | Operational or Engineering Landfill Improvements                                                                                                                                             |
| Recommendation                              | Further consideration, detailed cost-benefit to be determined with consultation and decisions with respect to curbside recycling program, re-purposing the existing depot.                                                                               | Further consideration, detailed cost-benefit to be determined after data collection and roundtable discussions to identify material types, users, facility footprint and configuration.               | Implement differential tipping fees for mixed loads of garbage received at the landfill to encourage separation and diversion of materials.<br><br>Consider surcharges for loads with target materials (OCC etc.) in the mid-term and once segregation facilities are in place. | Only recommended to be evaluated in the long term and once diversion infrastructure is in place. | Examine potential operating/engineering improvements from time to time.                                                                                                                      |
| Implementation Timeline                     | 2013-2015 - consultation and decisions with respect to existing programs.<br>Mid to long term - look at resource recovery for additional materials and CRC as an option (if not implemented in short term) at every five year review period of the WMMP. | 2013-2015 - data collection and roundtable discussions.<br><br>2015 - detailed cost-benefit assessment                                                                                                | 2013 - Notification of increase in tipping fee to generators and haulers<br><br>2014 - Increase tipping fee for disposal<br><br>Consider surcharges in the mid-term.                                                                                                            | Long term consideration.                                                                         | 2016 - 2017 - Year one of new operating contract term.                                                                                                                                       |
| Sector Served                               | Residential sector, County                                                                                                                                                                                                                               | IC&I, C&D                                                                                                                                                                                             | Residential, IC&I, C&D                                                                                                                                                                                                                                                          | Residential and IC&I Sector                                                                      |                                                                                                                                                                                              |
| Economic                                    |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                 |                                                                                                  |                                                                                                                                                                                              |
| Operating Costs                             | Operating costs all dependent on type and size of facility(s), materials managed etc. More detailed information and costing required after consultation.                                                                                                 | Potentially significant operating costs depending on the required infrastructure, materials managed and the potential for partnership with the private sector.<br><br>More detailed costing required. | Some cost recovery through surcharges if applied to non-separated loads (target materials). Increase in disposal tipping fee revenue for loads received/decreased tipping fee revenue from tonnes source separated.                                                             | Staff time -Enforcement staff required.<br><br>Cost recovery through fines/surcharges.           | Third party engineering review of the landfill.<br><br>Operational improvements may be identified with associated cost savings or the reverse (additional cost estimated at about \$20,000). |
| Capital Assets / Infrastructure             | More detailed costing required.                                                                                                                                                                                                                          | Potentially significant - more detailed costing required.                                                                                                                                             |                                                                                                                                                                                                                                                                                 |                                                                                                  | Potential capital requirements depending on nature of identified improvements.                                                                                                               |
| Funding Potential                           | Green Municipal Fund<br>Green Infrastructure Fund                                                                                                                                                                                                        | Investigate opportunities through Alberta Deal Generator, other for developing end-markets/innovative uses for materials.                                                                             |                                                                                                                                                                                                                                                                                 |                                                                                                  |                                                                                                                                                                                              |

| Landfill Management Program Recommendations |                                                                                                                                                                                                                                                                 |                                                                                                                                                                            |                                                                                                                                                                                   |                                                                                                                                                                    |                                                                                                                                                                                                     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All Terms                                   |                                                                                                                                                                                                                                                                 |                                                                                                                                                                            |                                                                                                                                                                                   |                                                                                                                                                                    |                                                                                                                                                                                                     |
| Consideration                               | Community Recycling Centre                                                                                                                                                                                                                                      | IC&I and C&D Depot                                                                                                                                                         | Adjust/Expand Tipping Fees for Designated Materials                                                                                                                               | Ban Designated Materials from Landfill                                                                                                                             | Operational or Engineering Landfill Improvements                                                                                                                                                    |
| Environmental and Social Benefits           |                                                                                                                                                                                                                                                                 |                                                                                                                                                                            |                                                                                                                                                                                   |                                                                                                                                                                    |                                                                                                                                                                                                     |
| Potential for waste reduction/diversion     | Increased waste reduction/reuse associated with management of some material streams, potentially in partnership with other charitable organizations.<br><br>Moderate to High depending on what materials can be diverted from disposal, and hours of operation. | Depending on nature of diversion program and the materials diverted, potential for waste reduction is significant.                                                         | Moderate to High diversion based on increase capture of designated materials.                                                                                                     | Large percentage increase in diversion from disposal of designated materials from landfill.                                                                        | No potential for additional waste diversion or reduction but improvements may result in increased disposal capacity at the landfill e.g. alternate daily cover could reduce air space requirements. |
| Community Acceptance                        | This program should be highly acceptable, as it would provide the public with year round access to proper disposal facilities for waste materials and access to waste diversion programs.                                                                       | High level of acceptance by public/private sector since option promotes reuse/recycling, lowers disposal costs and provides opportunity to recycle other material streams. | Increased tipping fees may not be acceptable to the private sector who may send more material to other facilities if possible to avoid the increased tipping fees.                | Could be contentious if diversion infrastructure is inadequate.                                                                                                    |                                                                                                                                                                                                     |
| Employment / Economic Development           | Could be direct employment through new staffing needs, hauling/transfer contracts, and other.                                                                                                                                                                   | Potential for some direct employment at the site and economic development potential with development of end markets or infrastructure.                                     | No direct employment or economic development potential.                                                                                                                           | None.                                                                                                                                                              |                                                                                                                                                                                                     |
| Technical                                   |                                                                                                                                                                                                                                                                 |                                                                                                                                                                            |                                                                                                                                                                                   |                                                                                                                                                                    |                                                                                                                                                                                                     |
| Constraints                                 | Implementation requires capital budget approvals, permitting, approvals, DB for design, build of site and facilities, determination of number of potential users, materials to handle, partnership arrangements; charitable and private sector, construction.   | Identification of partners, establishment of end-markets prior to implementation of collection of IC&I and C&D materials.                                                  | Establishment of appropriate diversion infrastructure for various materials at the landfill. Will require ongoing monitoring to ensure compliance if surcharges are ever applied. | Requires a phased-in approach – moving from voluntary compliance to increased enforcement. Before implementation, the appropriate infrastructure must be in place. | Dependent on any recommendations – may require capital budget approvals, design, retrofit of site and facilities, landfill gas, leachate etc.                                                       |



| Landfill Management Program Recommendations |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                    |                                                                                                               |                                                                                                                                                                                                       |                                                  |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| All Terms                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                    |                                                                                                               |                                                                                                                                                                                                       |                                                  |
| Consideration                               | Community Recycling Centre                                                                                                                                                                                                                                                                                                                                                                                                                                                                | IC&I and C&D Depot                                                                                                                                                 | Adjust/Expand Tipping Fees for Designated Materials                                                           | Ban Designated Materials from Landfill                                                                                                                                                                | Operational or Engineering Landfill Improvements |
| Staffing implications                       | <p>FTEs needed depending on whether operations are contracted, depending on HHW handling, degree of site supervision/monitoring, recordkeeping, scales etc.</p> <p>Mid to long term staffing requirements based on construction and operation of CRCs.</p>                                                                                                                                                                                                                                | <p>Dedicated staff-on site at depot.</p> <p>Dependent on whether the City manages the depot or if it is managed by the private sector.</p>                         | <p>Staff time if incoming loads monitored for surcharge application.</p>                                      | <p>Landfill attendant/bylaw enforcement.</p>                                                                                                                                                          |                                                  |
| Impact to Other System Components           | <p>Providing regular access to permanent depots will ensure that residents have appropriate access to manage all waste streams.</p> <p>Is a very efficient and convenient means for residents to properly dispose of wastes (e.g. HHW) and to increase diversion activity, positively affects other aspects of the system; reducing curbside collection volumes and directing materials away from landfill disposal.</p> <p>Potential decrease in waste disposal tipping fee revenue.</p> | <p>Associated P&amp;E costs.</p> <p>Decrease in waste disposal tipping fee revenue.</p> <p>Potentially significant decrease in use of waste disposal capacity.</p> | <p>Increased operating and processing costs due to an increase in materials to be segregated and managed.</p> | <p>May result in system efficiencies with less material requiring disposal at City facilities.</p> <p>Associated P&amp; E costs.</p> <p>Potential decrease in waste disposal tipping fee revenue.</p> |                                                  |
| Partnership Opportunities                   | <p>Charitable Organizations/Private Sector</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                    |                                                                                                               |                                                                                                                                                                                                       |                                                  |

## 6.0 Implementation Schedule

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An implementation schedule, based on the program recommendations discussed in the previous sections, is presented in Table 6-1.

Note that in the short term, the majority of the recommendations focus on waste diversion programs. Many of these programs (e.g. organics and curbside blue box collection programs) will be fairly capital intensive with the need to purchase collection containers and fund collection programs; however, it is these same programs which will drive increased diversion. It is likely that these programs will be widely accepted by residents and will provide the “most bang for the buck”.

Programs targeting the IC&I sector are more difficult to implement and are generally slated for implementation in the mid to long term planning period.

Many of the programs are interconnected, that is, the decision to implement one facet of a program will have an impact on another, for instance, should curbside blue-box recycling collection be offered, the operation of the recycling depot will be affected.

There are a number of recommendations which will be ongoing throughout the entire planning period which will require ongoing evaluation and adjustments, for example, staffing requirements, enforcement, bylaw updates, P&E programs as programs are implemented.

Table 6-1: Implementation Schedule

|                                                                    | Short Term              |                                      |                         |      |      |      | Mid-Term                    |                                   |      |      |      | Long-Term               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
|--------------------------------------------------------------------|-------------------------|--------------------------------------|-------------------------|------|------|------|-----------------------------|-----------------------------------|------|------|------|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
|                                                                    | 2013                    | 2014                                 | 2015                    | 2016 | 2017 | 2018 | 2019                        | 2020                              | 2021 | 2022 | 2023 | 2024                    | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 |  |  |
| Programs for the Duration of the WMMP                              |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Program Administration                                             |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Staffing Requirements                                              | 1 FTE                   | Ongoing evaluation of staffing needs |                         |      |      |      | →                           |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Monitoring & Reporting – Waste Audits                              | ★                       |                                      |                         |      |      | ★    |                             | ★                                 |      |      |      |                         |      | ★    |      |      |      | ★    |      |      |      |      |      | ★    |      |      |  |  |
| Annual Reports on the WMMP                                         |                         | 0                                    | first quarter each year |      |      |      | →                           |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| WMMP Review                                                        |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Promotion and Education Programs                                   |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Comprehensive Communication Plan                                   |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Evaluate Existing Website/Social Media Sites                       | ★                       |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Continued Market Research                                          | ongoing                 |                                      |                         |      |      |      | →                           |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Regulatory Mechanism Options                                       |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Update Solid Waste Bylaw Update on an as-needed basis              |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Evaluation of enforcement opportunities with new programs          |                         |                                      |                         |      |      |      |                             | may be necessary post WMMP review |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Evaluate Mandatory Diversion Bylaw(s)                              |                         |                                      |                         |      |      |      |                             | likely post programs              |      |      |      | likely with WMMP review |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Waste Reduction & Reuse Programs                                   |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Promote Waste Reduction                                            | ongoing                 |                                      |                         |      |      |      | →                           |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Continued Waste Reduction Target Setting                           | likely with WMMP review |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Develop Partnership Agreements                                     |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Waste or Goods Exchange Events                                     |                         |                                      |                         |      |      |      | could be few times per year |                                   |      |      |      | →                       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Waste Reuse Centre                                                 |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Endorse EPR and Waste Minimization Legislation                     |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Waste Diversion Programs                                           |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Organics Waste Collection & Processing Program                     |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Enhanced Organics Collection Program                               |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Pilot Study                                                        |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Include provision for weekly collection in new collection contract |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Procure collection containers                                      |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Roll out program to single family residences                       |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Roll out program to multi-family residences                        |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Organic Waste Processing                                           |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Let & award RFP for SSO processing technology & permitting         |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Construction, let RFP for operation of facility                    |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Blue Box Materials Collection & Processing Programs                |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Retender collection contract                                       |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Consider container type and size from tender results (e.g. carts)  |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Issue REOI for processing                                          |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Issue and award RFP for processing                                 |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Confirm use of containers or bags from RFP results and procure     |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Roll out program to single family residences                       |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Roll out program to multi-family residences                        |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| Multi-Family Sector Waste Diversion Programs                       |                         |                                      |                         |      |      |      |                             |                                   |      |      |      |                         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |

### Table 6-1: Implementation Schedule

[illegible]

## **7.0 Next Steps**

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The next phase of the project is to develop the planned waste management system (Phase 4). This will entail the following steps;

1. Description of the Preferred System
2. Cost and Financing Strategy
3. Implementation Timelines and Contingencies
4. Monitoring, Reporting and Plan Review.

In the meantime, the City will need to identify those recommendations that will form part of the preferred system based on budget, staffing and public acceptability and present those options to the public.

As outlined in our proposal, we recommend holding one or more focus groups with key stakeholders to present the outcome of this Phase 3 report and to generate open discussion and feedback with respect to the various system options developed.

The feedback received will be considered during the development of the Phase 4 Report. Following the completion of Phase 4, we recommend holding another focus group to present the outcome of the evaluation of the systems and identification of the preferred system prior to completing the draft WMMP.

# **APPENDIX E**

## **CONSULTATION RECORD**



## CAMROSE WASTE MANAGEMENT MASTER PLAN

The City of Camrose is in the process of developing an integrated solid Waste Management Master Plan (WMMP) – a way to plan strategically for waste management needs in Camrose for the next 25 years.

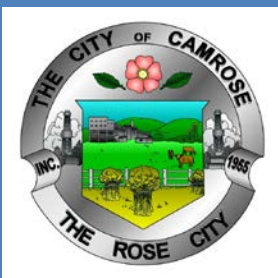
What can it mean to the residents of Camrose?

- More service efficiency – greater “bang for buck”
- More service options
- Better long term waste management service
- Better environmental protection

To help us in the development process, please answer the following questions about your waste management needs.

1. Help us understand your experience with the current waste management system. Please rate your level of agreement with the following statements, on a scale where **1** means **Very Satisfied** and **5** means **Very Dissatisfied**.

|                                                 | 1              | 2 | 3 | 4 | 5                 |
|-------------------------------------------------|----------------|---|---|---|-------------------|
|                                                 | Very Satisfied |   |   |   | Very Dissatisfied |
| How often household waste is picked up          |                |   |   |   |                   |
| How often yard waste is picked up               |                |   |   |   |                   |
| Service at Centra-Cam recycling depot           |                |   |   |   |                   |
| Recycling options at Centra-Cam recycling depot |                |   |   |   |                   |
| Service at landfill                             |                |   |   |   |                   |





2. Did you know about the goal to reduce the amount of household waste sent to the landfill to 50% of 2009 levels by 2015 in the City of Camrose?

- ☐ Yes  
☐ No

3. Do you currently use the compostable materials collection program?

- ☐ Yes  
☐ No

4. If not, why not? \_\_\_\_\_

5. If you do, do you add kitchen organic waste?

- ☐ Yes  
☐ No

6. If not, why not? \_\_\_\_\_

7. If the City provided you with dedicated bins for your kitchen and yard for organic wastes, do you think you would start separating kitchen waste if you don't already?

- ☐ Yes  
☐ No

8. What would be an acceptable frequency for curbside recycling pickup?

- ☐ Weekly  
☐ Bi-weekly (once every two weeks)  
☐ Other: please specify \_\_\_\_\_

9. Additional comments regarding the waste management system:

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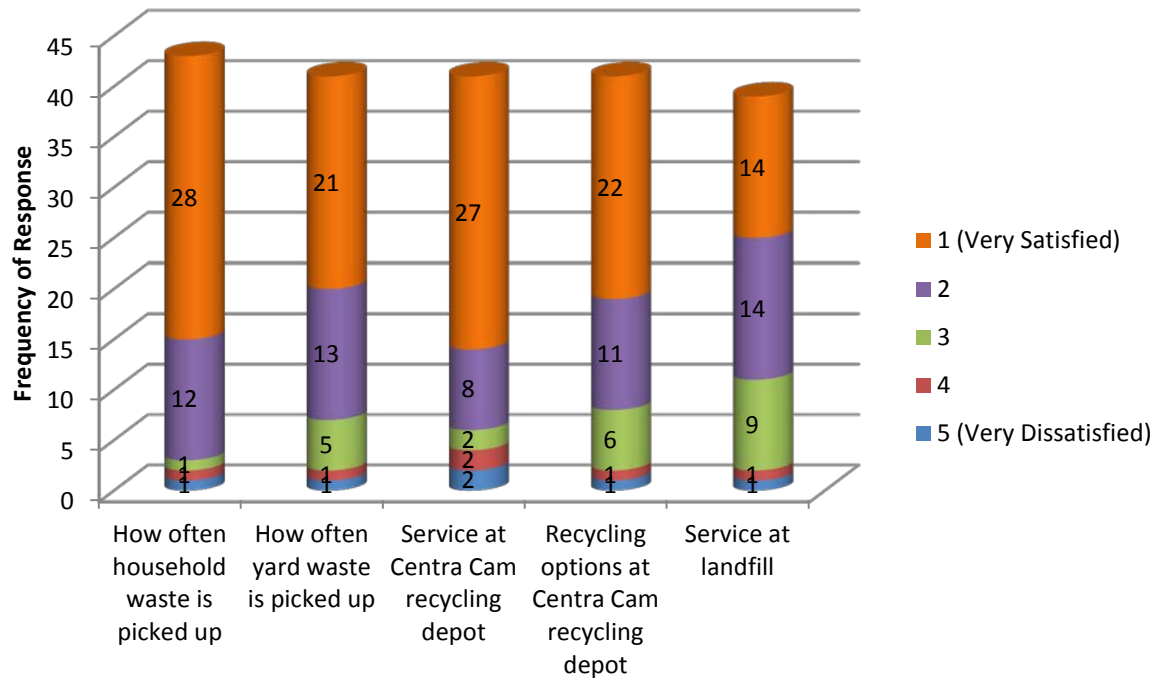
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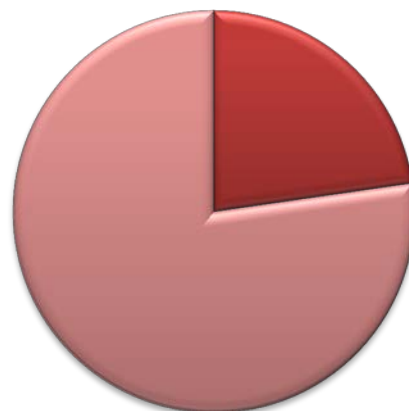


# Question 1

## 2012 Camrose Jaywalkers Jamboree

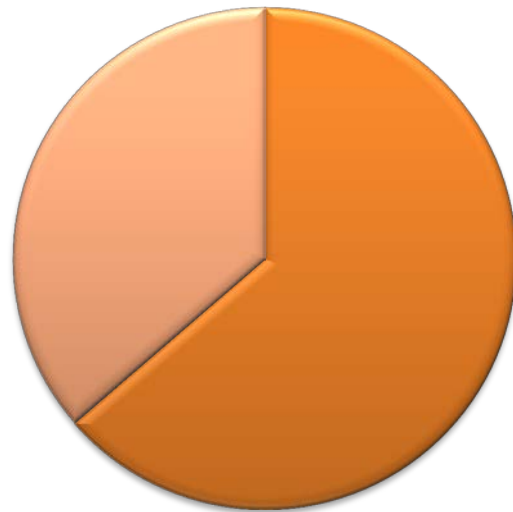


**Did you know about the new goal to reduce the amount of household waste sent to the landfill to 50% of 2009 levels by 2015 in the City of Camrose?**



■ No  
■ Yes

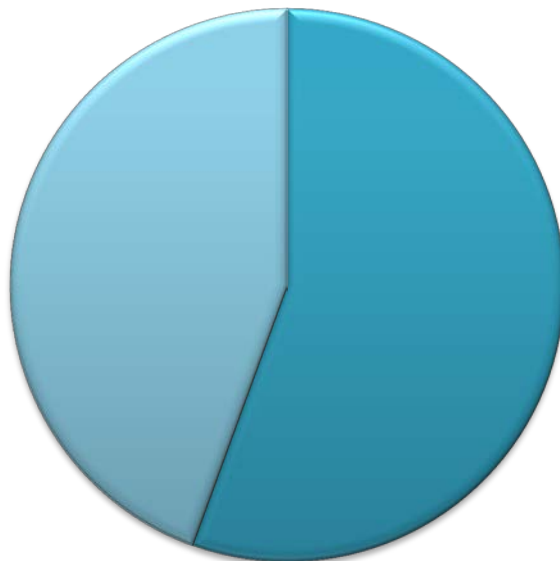
**Do you currently use the compostable materials collection program?**



■ Yes

■ No

**If you do, do you add kitchen organic waste?**



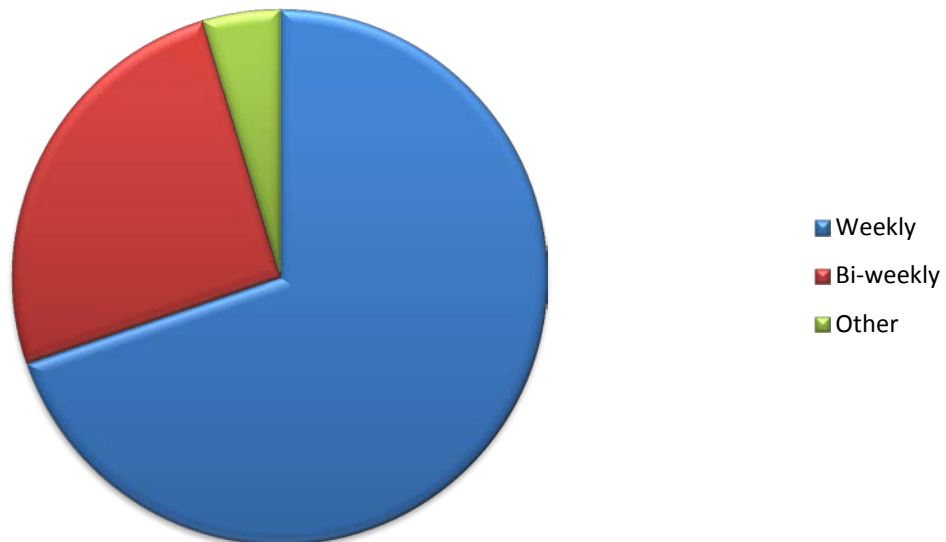
■ Yes

■ No

**If the City provided you with dedicated bins for your kitchen and yard for organic waste, do you think you would start separating kitchen waste if you don't already?**



**What would be an acceptable frequency for curbside recycling pickup?**



# City of Camrose Waste Management Master Plan Consultation Session

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The City of Camrose has retained Stantec Consulting Ltd. (Stantec) to develop a long term Waste Management Master Plan (WMMP). This document will provide strategic direction for City Council and Administration on residential and industrial/commercial/institutional (ICI) waste management activities over the next five to ten years with a progressive vision over the next 25 years.

The WMMP will support the City's goal of decreasing waste entering the landfill through a series of waste reduction, reuse and diversion initiatives.

Several phases of work on the WMMP have already been completed, including a review of the current waste management system, an evaluation of long term waste management needs, an assessment of best practices in waste management from other cities in Canada, and the creation of a menu of potential waste management options for the future.

Now we need your help! We need your input on how you want your waste management system to work in the future – which options the City should pursue in the short, medium and long term to make Camrose a model waste management community.

Please join us for an overview of the project and a discussion on the recommended options. Representatives from the City of Camrose and Stantec will be on hand to discuss the options and answer questions.

Location: City Council Chambers at City Hall, 5204 – 50 Avenue, Camrose  
Date and Time: January 24, 2013: 1:30 to 4:30 pm



## **Agenda**

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**Stantec**

### **Camrose Waste Management Master Plan – Consultation Workshop**

Location: City Council Chambers at City Hall: 5204 – 50 Avenue, Camrose

Date: January 24, 2013: 1:30 pm to 4:30 pm

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| <b>Time:</b> | <b>Item:</b>               | <b>Action:</b> |
|--------------|----------------------------|----------------|
| 1:30         | Introduction/Presentation  |                |
| 2:30         | Group Discussion/Exercises |                |
| 3:00         | Break                      |                |
| 3:15         | Group Discussion/Exercises |                |
| 4:00         | Wrap up                    |                |

# City of Camrose

## Waste Management Master Plan



One Team. Infinite Solutions





# About Stantec

- Founded in 1954 in Edmonton.
- We provide professional consulting services in
  - Planning
  - Engineering
  - Architecture
  - Environmental sciences
  - Public consultation
- Have strategic waste management planning experience with municipalities all across Canada.





# Some “W’s” about the project

## Why?

- Camrose wants to become a “greener” city through better waste management

## Who?

- Led by Infrastructure Services

## What?

- Develop a Waste Management Master Plan (WMMP)
- Will provide strategic direction for residential and IC&I waste management



# Some “W’s” about the project

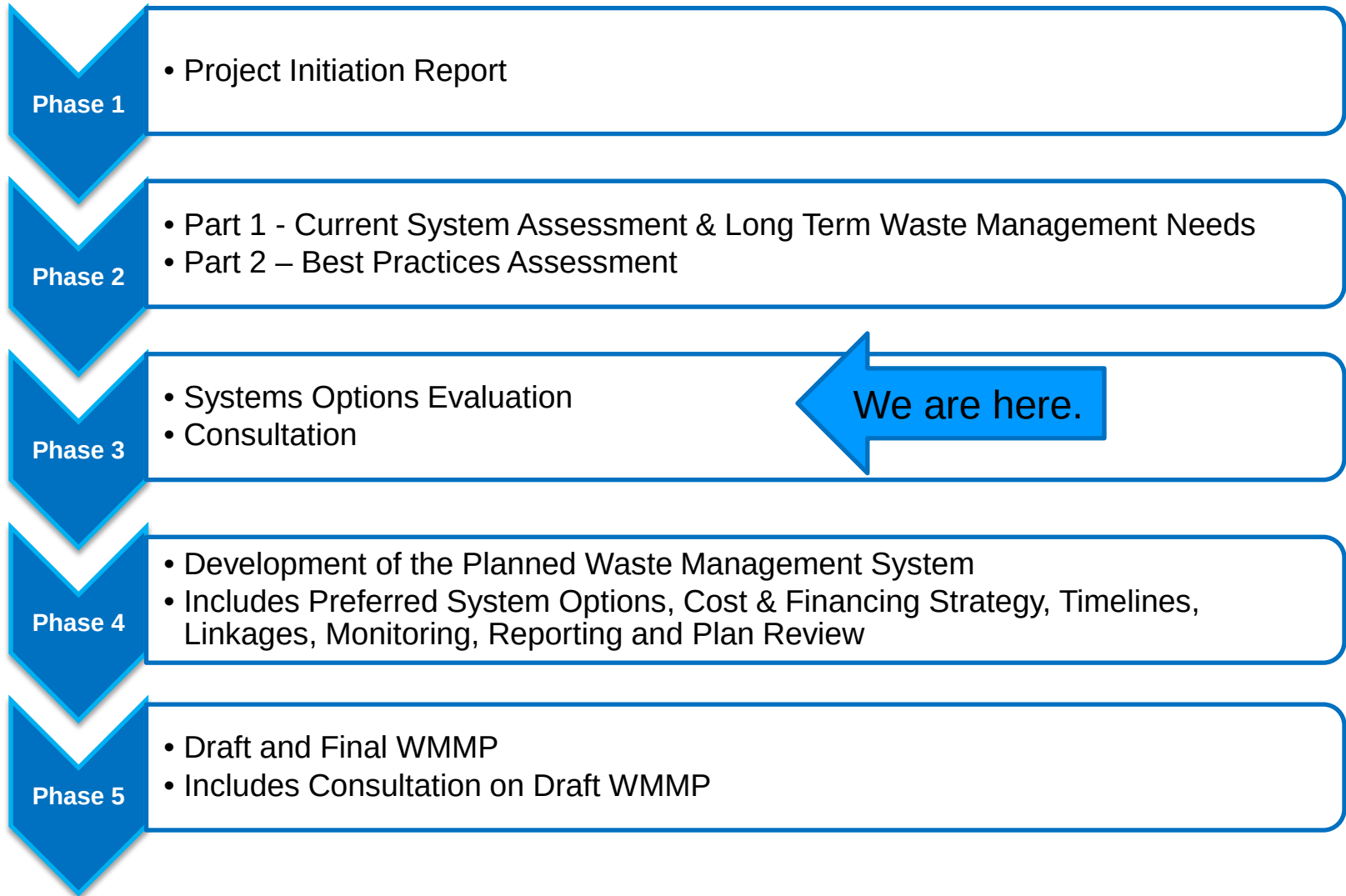
## When?

- Project – completed spring 2013
- WMMP – strategic guidance for next 5-10 years, visionary direction for waste management over the next 25 years.

## Where?

- WMMP will focus on waste management in the City, as well as activities at the landfill and Centra-Cam Recycling Depot

# At What Stage is the Project?



# Recommended Systems - Recycling

- Provide curbside recycling service to all single-family residents.
- Expand program to multi-family residences once fully implemented.
- Repurpose recycling depot.
- Construct community recycling centre at landfill.



# Recommended Systems - Organics

- Provide expanded organics collection service to all single-family residents.
- Expand program to multi-family residences once fully implemented.
- Expand composting facility at landfill to process organics.





# Recommended Systems - Waste

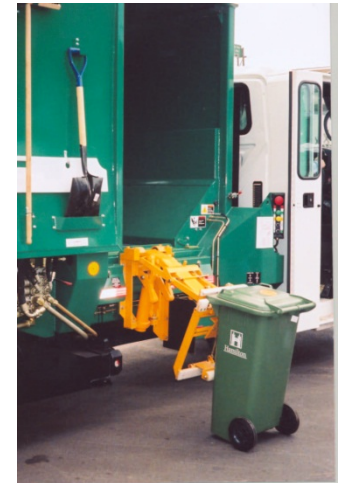
- Reduce bag limit to two (2) and then to one (1) per residence once all recycling and organics programs implemented.
- Biweekly waste collection once other diversion programs have been implemented.





# Enhancements to Collection Program

- Automated collection of waste streams
- Co-collection of waste streams (e.g. waste and organics collected by the same truck)
- Single Stream Recycling
- Provision of Containers (Blue boxes or carts, Green bins)
- Household Hazardous Waste
- Bulky Items



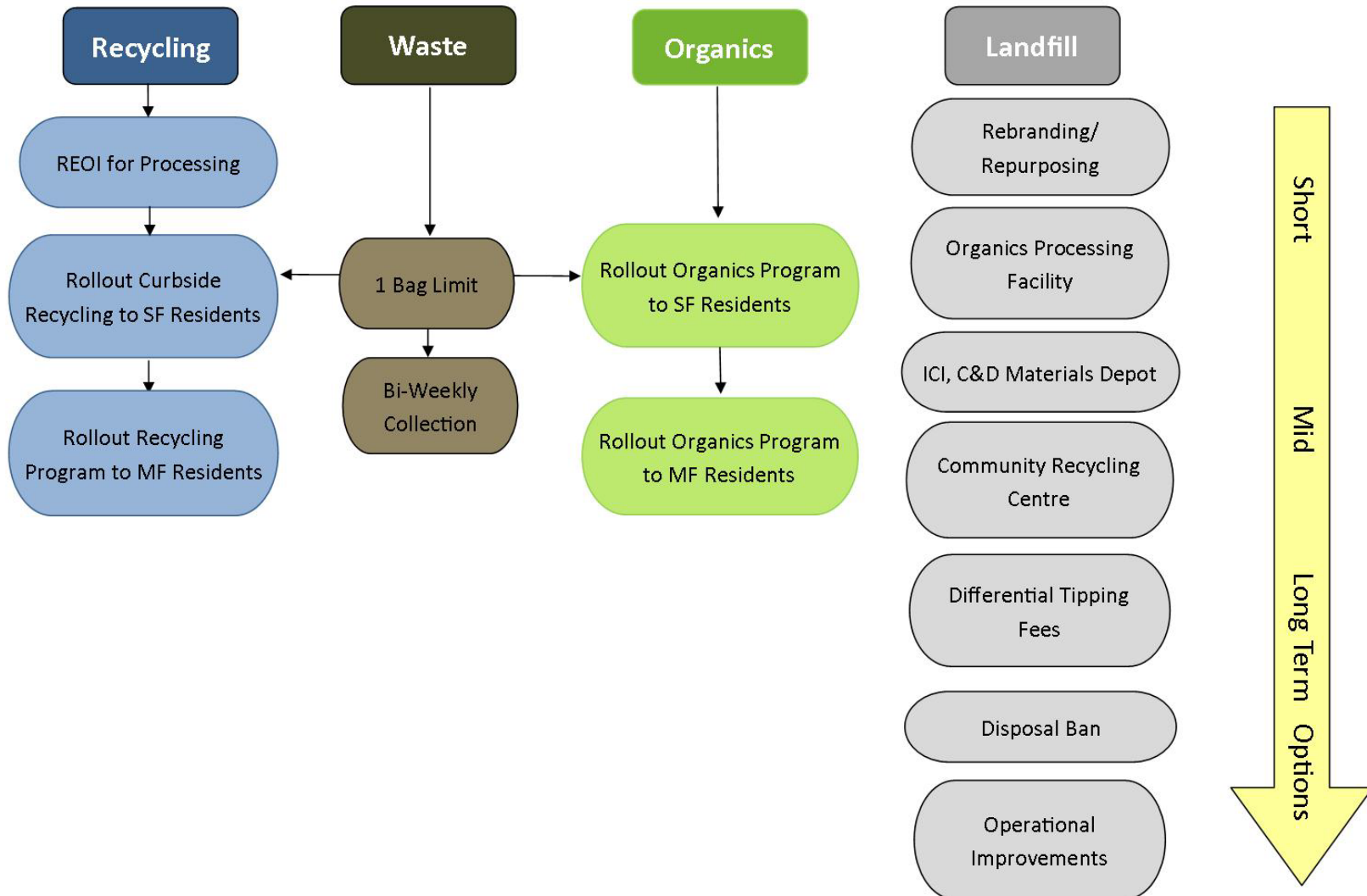
# Enhancements to Landfill

- Rebranding
- Differential Tipping Fees
- Depots for IC&I and Construction & Demolition Debris
- Organics Processing Facility
- Community Recycling Centre
- Transfer Station
- Operational Improvements
- Material Bans



# Overview of Options

**Status Quo:** Recycling Depot, Limited Organics Collection, 2 Bag Limit (2013)



# Questions?

Gloria Gerber  
Stantec Consulting Ltd.  
Ph: (780) 917-7251  
[gloria.gerber@stantec.com](mailto:gloria.gerber@stantec.com)

## Implementing the Options – For Discussion

| Option                                                            | Rating 1-10 (Degree of Importance – Option should be included in the WMMP)<br>1 – High<br>10 – Low | Is This a Short/Mid/Long Term Option | Comments |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------|----------|
| <b>Exercise #1 – Collection/Disposal</b>                          |                                                                                                    |                                      |          |
| <b>Residential Curbside Collection Options</b>                    |                                                                                                    |                                      |          |
| Set-out Limits                                                    |                                                                                                    |                                      |          |
| Recyclable Materials Collection                                   |                                                                                                    |                                      |          |
| Collection Frequency                                              |                                                                                                    |                                      |          |
| Co-Collection of Waste Streams at the Curb                        |                                                                                                    |                                      |          |
| Automated Collection                                              |                                                                                                    |                                      |          |
| Provision of Collection Containers                                |                                                                                                    |                                      |          |
| Bulky Materials Management                                        |                                                                                                    |                                      |          |
| <b>Organics Management Options</b>                                |                                                                                                    |                                      |          |
| Enhanced Organics Collection Program                              |                                                                                                    |                                      |          |
| <b>Landfill Site Management Options</b>                           |                                                                                                    |                                      |          |
| Rebranding/Repurposing of the Landfill                            |                                                                                                    |                                      |          |
| Community Recycling Centre (CRRC)                                 |                                                                                                    |                                      |          |
| Differential Tipping Fees and Surcharges for Designated Materials |                                                                                                    |                                      |          |
| Ban Designated Materials from Landfill                            |                                                                                                    |                                      |          |
| Operational or Engineering Improvements                           |                                                                                                    |                                      |          |
| Provide Supporting Infrastructure for IC&I Waste Diversion        |                                                                                                    |                                      |          |

**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN**

January 2013

| Option                                                    | Rating 1-10 (Degree of Importance – Option should be included in the WMMP)<br>1 – High<br>10 – Low | Is This a Short/Mid/Long Term Option | Comments |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------|----------|
| <b>Exercise #2 – Diversion/Policy</b>                     |                                                                                                    |                                      |          |
| <b>Multi-Family Sector Waste Management Options</b>       |                                                                                                    |                                      |          |
| Provision of Additional Collection Services               |                                                                                                    |                                      |          |
| Promotion and Education                                   |                                                                                                    |                                      |          |
| <b>IC&amp;I Waste Management Options</b>                  |                                                                                                    |                                      |          |
| Provide Promotion & Education Information to IC&I Sector  |                                                                                                    |                                      |          |
| Data Collection                                           |                                                                                                    |                                      |          |
| IC&I Sector Roundtable                                    |                                                                                                    |                                      |          |
| Develop End-Markets                                       |                                                                                                    |                                      |          |
| IC&I Collection Program                                   |                                                                                                    |                                      |          |
| School Waste Diversion Program                            |                                                                                                    |                                      |          |
| Green Procurement Policies                                |                                                                                                    |                                      |          |
| Strategic Partnerships                                    |                                                                                                    |                                      |          |
| <b>Recycling Materials Management Options</b>             |                                                                                                    |                                      |          |
| Recycling Depot Enhancements                              |                                                                                                    |                                      |          |
| Blue Box Materials Processing                             |                                                                                                    |                                      |          |
| Special Event Recycling                                   |                                                                                                    |                                      |          |
| <b>Waste Reduction &amp; Reuse Options</b>                |                                                                                                    |                                      |          |
| Establish a Per Capita Waste Reduction Target             |                                                                                                    |                                      |          |
| Develop Reuse Centres, Program and Partnering Initiatives |                                                                                                    |                                      |          |
| <b>Promotion and Education Options</b>                    |                                                                                                    |                                      |          |
| Comprehensive Communication Plan                          |                                                                                                    |                                      |          |
| Continued Market Research                                 |                                                                                                    |                                      |          |
| Incentives and Social Marketing                           |                                                                                                    |                                      |          |
| Use Social Media                                          |                                                                                                    |                                      |          |

**CITY OF CAMROSE WASTE MANAGEMENT MASTER PLAN**

January 2013

| Option                                                    | Rating 1-10 (Degree of Importance – Option should be included in the WMMP)<br>1 – High<br>10 – Low | Is This a Short/Mid/Long Term Option | Comments |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------|----------|
| <b>Regulatory Mechanism Options</b>                       |                                                                                                    |                                      |          |
| Solid Waste Bylaw Update                                  |                                                                                                    |                                      |          |
| Enforcement                                               |                                                                                                    |                                      |          |
| Mandatory Diversion Bylaws – Residential and IC&I sectors |                                                                                                    |                                      |          |
| Construction and Demolition Waste Diversion Plans         |                                                                                                    |                                      |          |



## Meeting Notes



**Stantec**

### Camrose WMMP Stakeholder Workshop

Date/Time: January 24, 2013 / 1:00 pm – 4:40 pm  
Place: Camrose City Hall  
Next Meeting:  
Attendees: Marshall Chalmers, Mayor  
Daryl Shillington, City Council  
Max Lindstrand, City Council  
Earle Berry, City Council  
Ray McIsaac, City Council  
Gerry Galenza, City Council  
Russell Hawkins, Camrose Energy  
Roxanna Skjonsberg, CentraCam  
Terry Vickers, Recycle with CentraCam  
Gordon Loughheed, Green Action Committee  
Jeremy Enarson, City of Camrose  
Mark Barrett, City of Camrose  
Cathy Smith, Stantec  
Jonathon Mackay, Stantec  
Gloria Gerber, Stantec  
Distribution: Attendees

| Option                                         | Rating 1-10 (Degree of Importance – Option should be included in the WMMP)<br>1 – High<br>10 – Low | Is This a Short/Mid/Long Term Option |
|------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------|
| <b>Exercise #1 – Collection/Disposal</b>       |                                                                                                    |                                      |
| <b>Residential Curbside Collection Options</b> |                                                                                                    |                                      |
| Set-out Limits                                 | 1-2                                                                                                | short - medium                       |
| Recyclable Materials Collection                | 2                                                                                                  | short                                |
| Collection Frequency                           | 6                                                                                                  | long                                 |
| Co-Collection of Waste Streams at the Curb     | 2                                                                                                  | short                                |
| Automated Collection                           | 4                                                                                                  | short - medium                       |
| Provision of Collection Containers             | 4                                                                                                  | short                                |
| Bulky Materials Management                     |                                                                                                    | short                                |
| <b>Organics Management Options</b>             |                                                                                                    |                                      |
| Enhanced Organics Collection Program           | 8                                                                                                  | short                                |
| <b>Landfill Site Management Options</b>        |                                                                                                    |                                      |
| Rebranding/Repurposing of the Landfill         | 3                                                                                                  | short                                |
| Community Recycling Centre (CRRC)              | 3                                                                                                  | short – medium                       |

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| Option                                                            | Rating 1-10 (Degree of Importance – Option should be included in the WMMP)<br>1 – High<br>10 – Low | Is This a Short/Mid/Long Term Option |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------|
| Differential Tipping Fees and Surcharges for Designated Materials | 1                                                                                                  | short - medium                       |
| Ban Designated Materials from Landfill                            | 7                                                                                                  | medium- long                         |
| Operational or Engineering Improvements                           | 8.5                                                                                                | continuous - long                    |
| Provide Supporting Infrastructure for IC&I Waste Diversion        |                                                                                                    | short                                |
| <b>Exercise #2 – Diversion/Policy</b>                             |                                                                                                    |                                      |
| <b>Multi-Family Sector Waste Management Options</b>               |                                                                                                    |                                      |
| Provision of Additional Collection Services                       | 2                                                                                                  | medium                               |
| Promotion and Education                                           | 1                                                                                                  | short - medium                       |
| <b>IC&amp;I Waste Management Options</b>                          |                                                                                                    |                                      |
| Provide Promotion & Education Information to IC&I Sector          | 1                                                                                                  | short                                |
| Data Collection                                                   | 1                                                                                                  | short                                |
| IC&I Sector Roundtable                                            | 1                                                                                                  | short                                |
| Develop End-Markets                                               | 3                                                                                                  | short                                |
| IC&I Collection Program                                           | 1                                                                                                  | short                                |
| School Waste Diversion Program                                    | 5                                                                                                  | medium                               |
| Green Procurement Policies                                        | 2.5                                                                                                | short                                |
| Strategic Partnerships                                            | 6                                                                                                  | long                                 |
| <b>Recycling Materials Management Options</b>                     |                                                                                                    |                                      |
| Recycling Depot Enhancements                                      | 1                                                                                                  | short                                |
| Blue Box Materials Processing                                     | 1                                                                                                  | short                                |
| Special Event Recycling                                           | 8                                                                                                  | long                                 |
| <b>Waste Reduction &amp; Reuse Options</b>                        |                                                                                                    |                                      |
| Establish a Per Capita Waste Reduction Target                     |                                                                                                    | short                                |
| Develop Reuse Centres, Program and Partnering Initiatives         | 5                                                                                                  | medium                               |
| <b>Promotion and Education Options</b>                            |                                                                                                    |                                      |
| Comprehensive Communication Plan                                  | 1                                                                                                  | short                                |
| Continued Market Research                                         | 7                                                                                                  |                                      |
| Incentives and Social Marketing                                   |                                                                                                    |                                      |
| Use Social Media                                                  | 1                                                                                                  | short                                |
| <b>Regulatory Mechanism Options</b>                               |                                                                                                    |                                      |
| Solid Waste Bylaw Update                                          | 1                                                                                                  | continuous - short                   |
| Enforcement                                                       | 1                                                                                                  | short                                |
| Mandatory Diversion Bylaws – Residential and IC&I sectors         | 7                                                                                                  | medium - long                        |

| Option                                            | Rating 1-10 (Degree of Importance – Option should be included in the WMMP)<br>1 – High<br>10 – Low | Is This a Short/Mid/Long Term Option |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------|
| Construction and Demolition Waste Diversion Plans | 5                                                                                                  | short - medium                       |

### Comments

### EXERCISE #1 – COLLECTION/DISPOSAL

#### RESIDENTIAL CURBSIDE COLLECTION OPTIONS

- Set-out Limits
  - two bags
  - culturally skeptical
  - styrofoam is an issue
  - families of 3+ have issues
  - need more recycling to drive this
  - more contamination already at Centra-Cam with two bag limit
  - need more education on recyclables
  - sending message about what should/shouldn't be recycled by system
- Recyclable Materials Collection
  - more numbers of plastic
  - anything perceived as recyclables is collected and then diverted to landfill or recycling
  - better education on potentials - batteries, etc.
  - more frequent/constant HHW collection
  - potential for smaller collection points at facilities or downtown
  - always need central depot for large volumes of cardboard, etc.
  - availability = uptake
- Collection Frequency
  - Waste - weekly now, bi-weekly as rest of program evolves - longer term
  - Recycling - weekly

- Organics - weekly in summer, monthly in winter, more composting in summer though, maybe bi-weekly in winter
- Co-Collection of Waste Streams at Curbside
  - most convenient but costly
  - need new trucks, etc.
  - bid out services separately - synergies
  - need to factor in existing business
- Automated Collection
  - front collection - aesthetically bad
  - expensive - new bins, new trucks, etc.
  - need bin sizes to fit resident needs
  - service providers need to provide flexibility
- Provision of Collection Containers
  - need to have clear plan to limit amount of bins bought becoming obsolete with new system
  - division between residential/commercial/small business/multi-family
  - competition with Clean It/Green It
- Bulky Materials Management
  - big bin event / hazardous waste
  - two current options in City
  - like Take It/Leave It concept
  - separate from large item collection
  - enforcement of leftover materials

## **ORGANICS MANAGEMENT OPTIONS**

- Enhanced Organics Collection Program

## **LANDFILL SITE MANAGEMENT OPTIONS**

- Rebranding/Repurposing of the Landfill
  - better connotation with WMC
- Community Recycling Centre (CRC)

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- expand to the east (Public Works yard)
  - more in city, better picture of other additions from County
- Differential Tipping Fees and Surcharges for Designated Materials
  - critical
  - need to factor in rates at Dried Meat - variable
  - need to tier/segregate to encourage separation
- Ban Designated Materials from Landfill
  - tough to impose total ban
- Operational or Engineering Improvements
  - currently doing a good job
- Provide Supporting Infrastructure for IC&I Waste Diversion
  - ongoing

## **EXERCISE #2 – DIVERSION/POLICY**

### **Multi-Family Sector Waste Management Options**

- Provision of Additional Collection Services
  - education is important
  - yes - already conditioned to carry to a bin, now just have to separate out streams
- Promotion and Education
  - education is important
  - need more, more frequent and more modes
  - tags on bags - very effective
  - need more - also four bag limit at Christmas, etc.

### **IC&I Waste Management Options**

- Provide Promotion & Education Information to IC&I Sector
  - infrastructure plus aggressive education/enforcement

- Data Collection
- IC&I Sector Roundtable
- Develop End-Markets
- IC&I Collection Program
- School Waste Diversion Program
  - mainly organics and recyclables
- Green Procurement Policies
- Strategic Partnerships

### **Recycling Materials Management Options**

- Recycling Depot Enhancements
  - close to capacity
- Blue Box Materials Processing
  - education key
- Special Event Recycling
  - already happening

### **Waste Reduction & Reuse Options**

- Establish a Per Capita Waste Reduction Target
  - it is established - residential only
- Develop Reuse Centres, Program and Partnering Initiatives

### **Promotion and Education Options**

- Comprehensive Communication Plan
  - Important/ impossible
- Continued Market Research
- Incentives and Social Marketing
- Use Social Media

## **Regulatory Mechanism Options**

- Solid Waste Bylaw Update
- Enforcement
  - struggling
- Mandatory Diversion Bylaws – Residential and IC&I sectors
- Construction and Demolition Waste Diversion Plans

**Action:**

## **GENERAL COMMENTS**

Overarching Theme – promotion and education are important

- Bulky Items
  - o important to provide bulky service spring/fall
  - o big bin event or goods exchange
  - o a few times a year.
  - o Maybe collect using City forces/less favored.
- Collection - don't like two truck pass – fuel consumption
- Earlier discussion - could put another depot "in the west".
- Important to
  - o Get more land, expand to adjacent yard, easy to solve
  - o Facility management with public works activities
  - o Is expanding east going to do it?
  - o Future infrastructure needs eg. Processing, blue box etc



- Likes second transfer site idea at landfill - transport recyclables back to Camrose
- Issue with siting a second depot Nimby
- Different tipping fees – critical - 80% of waste is commercial
- ICI diversion overall a high priority for the group
- Market research for eg shingles, drywall, etc. fairly high priority - need to determine where, how much
- Strong support (repeatedly) for differential tipping fees
- Continual reinforcement of "80%" is ICI
- CentreCam has confidential and paper pickup
- Shredding now at schools
- Green Procurement discussion around green energy, then to purchasing policies, LED's, etc., recycled paper purchase - admin could manage it
- P3 brought up re: partnerships
- ICI sector big focus
- Look at AD biofuel technology

The meeting adjourned at 4:40 PM

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

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