

# Initial Evaluation of Regional Recyclables Processing Options

**PREPARED FOR:** Foothills Regional Services Commission

**PREPARED BY:** CH2M HILL

**DATE:** November 10, 2014

**VERSION:** FINAL

**PROJECT NUMBER:** 494520

## 1 Introduction

CH2M HILL was retained by the Foothills Regional Services Commission (FRSC) to complete an initial assessment of options for locating and developing a centralized facility for processing recyclables collected in Turner Valley, Black Diamond, Okotoks, High River and Nanton. Specifically, the scope of work for this assignment included:

- reviewing existing collection and processing facilities in each municipality;
- reviewing historical quantities of recyclable materials diverted through each municipal program;
- development of scenarios that involve either (i) consolidation of materials collected in the region for forwarding to an existing processing facility, or (ii) construction of a new processing facility to service the region; and
- completing a 15 year cash-flow analysis of each scenario that considered both capital and operating costs, as well as any upgrades to municipal programs or facilities that are required to participate in the program represented by each scenario.

This technical memorandum outlines the processing scenarios that were developed jointly by FRSC personnel and CH2M HILL, and the underlying assumptions related to each including material quantities, equipment requirements and estimated costs of each program. The results of the cash-flow analysis are also presented.

## 2 Summary of Existing Municipal Programs

A summary of the residential recycling programs in each municipalities that is included in this evaluation is provided in Exhibit 1.

EXHIBIT 1  
SUMMARY OF EXISTING RECYCLING PROGRAMS

	Program Type	Materials	Local Sorting/Baling	Commodity Marketing
Black Diamond	Drop-off Depot at Turner Valley	OCC, ONP, office paper, tin cans mixed plastics, glass	Yes (by Turner Valley)	Direct (by Turner Valley)
High River	Drop-off Depot	OCC, ONP, mixed paper, tin cans mixed plastics, telephone books	No	By 3rd Party
Nanton	Drop-off Depot	OCC, ONP, mixed paper, tin cans rigid plastic containers, telephone books	No	By 3rd Party
Okotoks	Drop-off Depot and Curbside pickup by subscription	OCC, ONP, office paper, tin cans mixed plastics, glass	Yes	Direct
Turner Valley	Drop-off Depot	OCC, ONP, office paper, mixed paper, tin cans mixed plastics, glass	Yes	Direct

Notes:

OCC = corrugated cardboard

ONP = newsprint and inserts

### 3 Estimated Quantities of Recyclable Materials

As part of the analysis of options, it was necessary to estimate the future quantities of materials that would be recovered from each municipality. This was done by using historical data to calculate per capita or per household diversion rates, and combining these rates with population projections for each community. The population growth for all areas except Okotoks was assumed to be 2% per year. The growth rate in Okotoks was assumed to be 3.8% per year. Population projections are provided in the attachments.

Data on historical quantities of materials diverted through recycling programs were provided by Turner Valley, Okotoks, and High River. The data reported by Turner Valley included the materials diverted from Black Diamond.

No historical data was received from the Town of Nanton. However, the nature of the town and its recycling program were considered similar enough to High River that per capita diversion rates calculated for High River could be used for estimating purposes. Similarly, the quantities of metals diverted from High River were not available, and the per capita diversion rate was estimated from the Turner Valley data.

Discussions with the Town of Okotoks during the course of this project indicated that the Town's recycling programs are in a state of transition. Currently the Town provides two drop-off recycling depot locations, and offers a curbside service on a subscription basis. However, as part of updates to the Town's Resource Recovery Plan, consideration is being given to replacing the subscription service with a Town-wide program for all single-family residents, and phasing

out or re-tasking the drop-off depot service. These changes are being evaluated as part of updates to the Town's Resource Recovery Plan.

A summary of the historical data and the calculated diversion rates are provided in Exhibit 2.

EXHIBIT 2  
HISTORICAL MATERIAL QUANTITIES (2013 TONNES)

	Turner Valley & Black Diamond	High River	Nanton (1)	Okotoks Depot (2)	Okotoks Curbside (3)
Newspaper	50.1	42.1	---	190.5	
Cardboard	68.2	234.1	---	865.5	
White Ledger/Office	2.3	N/A	---	7.4	
Mixed Paper	39.6	168.8	---	505.6	
Plastics (Hard and soft)	26.3	40.8	---	140.0	
Glass (clear and coloured)	12.2	N/A	---	72.8	
Metals	10.7	N/A (1)	---	53.3	
Commingled	---	---	---	---	440.4
<b>Total</b>	<b>209.4</b>	<b>485.8</b>	<b>---</b>	<b>1835.0</b>	<b>440.4</b>
2013 Population	4,540	12,920	2,132	26,319	
Diversion Rate (kg/per capita)	46.1	37.6	N/A	69.7	

Notes:

1. Data not available
2. Includes material collected through curbside collection program from January through June, 2013.
3. Includes only material collected through curbside collection program from July through December, 2013.

## 4 Processing Options Considered

In consultation with FRSC personnel, CH2M HILL developed six scenarios that include handling materials at the Foothills Landfill, the MD of Foothill's Public Works Yard in Aldersyde, or at a facility developed on newly purchased industrial land in the Abild's Industrial Park in Aldersyde. Scenarios 1, 2A and 2B represent using a regional transfer station at these locations to stage and then transfer material to an existing Material Recovery Facility (MRF) in Calgary. Scenario 3, 4A and 4B represent constructing new MRFs at these locations and processing materials locally. A summary of each scenario is provided in Exhibit 3.

Two additional scenarios, involving re-development of the Town of Okotoks' existing recycling facility to host the regional materials recovery facility (MRF) or transfer station, were initially considered. However, these were removed from consideration when it became apparent that this site could not support the necessary redevelopment in light of the Town's plans to reconstruct and expand its Operations Center.

EXHIBIT 3  
SUMMARY OF SCENARIOS CONSIDERED

	<b>Regional Facility Location</b>	<b>Regional Facility Type</b>	<b>Commodity Marketing</b>
Scenario 1	Foothills Landfill	Regional Transfer Station	Via Contracted Processor
Scenario 2A	Aldersyde MD Yard	Regional Transfer Station	Via Contracted Processor
Scenario 2B	New Aldersyde Property	Regional Transfer Station	Via Contracted Processor
Scenario 3	Foothills Landfill	Regional MRF	Direct to Market
Scenario 4A	Aldersyde MD Yard	Regional MRF	Direct to Market
Scenario 4B	New Aldersyde Property	Regional MRF	Direct to Market

All of the scenarios are predicated on the drop-off recycling programs in High River, Nanton, and Turner Valley being converted to single-stream collection programs. This would not require any change in collection bins/trucks in High River or Nanton; residents would be re-educated to place commingled (i.e. unsorted) recyclables in any of the existing drop-off depot containers rather than separating their materials into designated containers. In Turner Valley, it is assumed that new roll-off containers would be installed for collection of commingled materials, and the existing depot building and baling equipment would become surplus to the Town's program.

The existing curbside recycling program in Okotoks is based on single-stream collection model. The only change would involve routing the trucks to the new destination facility. As previously outlined, existing drop-off depots may be retasked or phased out in the coming years as part of proposed changes to residential waste management programs. For the purpose of this analysis, it has been assumed that only a single-stream residential curbside collection program is in place within Okotoks.

It is further assumed that all recycling programs would harmonize the materials they accept and educational materials to optimize processing and marketing. For the evaluation, it is assumed the following materials would be collected:

- Cardboard
- Newsprint and inserts
- Mixed paper
- glass
- Metal food cans/lids and aluminum foil
- mixed plastics
- telephone books

#### 4.1 Scenarios 1, 2A and 2B

These scenarios involve the development of a transfer station or "reload" facility within the region. Conceptually, each municipality would deliver commingled materials from its recycling program to this facility. The materials would be consolidated and shipped in larger quantities to an existing MRF in the region for processing.

Three host locations were considered for the reload facility: the Foothills Landfill (Scenario 1), the MD of Foothill's Public Works Yard in Aldersyde (Scenario 2A), and a new property in the Abild's Industrial Park purchased by FRSC to host the facility (Scenario 2B). Conceptually, the reload facility at all locations would consist of an unheated 18 m by 30 m (60 ft by 100 ft) steel frame/fabric cover building with concrete foundations and floors and overhead doors on three sides. The building could be configured so that multiple collection trucks could deliver recyclables to the building at once by dumping through the overhead doors on the side of the building. Alternatively, the building would allow one truck at a time to drive completely inside the building and unload during windy conditions.

Material delivered by each municipality would be stored indoors until it is loaded into a larger truck for delivery to the MRF. Trucking of recyclable materials to the existing MRF would utilize 15 m (50 ft) walking floor-style trailers to optimize transfer costs. It is assumed that these trailers would have a payload capacity of 16 tonnes of commingled recyclables.

To reduce building heights and concrete costs, a flat floor inside the building has been assumed. This necessitates the use of a telehandler (e.g. JCB 506-36) or similar equipment to load the transfer trailer rather than a skid steer or front-end loader.

For the purposes of the evaluation, it was assumed that materials would be transferred to an existing MRF in Calgary owned and operated by BFI <sup>1</sup>.

## 4.2 Scenarios 3, 4A and 4B

These scenarios involve the construction of a new MRF at Foothills Landfill (Scenario 3), the MD of Foothill's Public Works Yard in Aldersyde (Scenario 4A), or a new property in the Abild's Industrial Park purchased by FRSC (Scenario 4B). Conceptually, the MRF at each location would be similar to a facility recently constructed in Canmore, Alberta, but without the waste transfer station component.

As in the previous scenarios, each municipality would deliver commingled materials from its recycling program to this new regional facility. However, rather than being shipped to a larger facility for sorting, the commingled materials would be sorted into constituent streams (e.g. cardboard, newsprint, plastics) at the regional MRF, and each constituent would be forwarded directly to end-markets from the facility.

## 5 Cost Estimates

Rough order-of-magnitude (ROM) construction and operating costs for the new facilities and associated equipment were estimated for each option described in the previous section.

ROM costs for construction of each facility were based on the costs of reference facilities identified by CH2M HILL and the client. In the case of the reload facility, the reference facility was an identically-sized equipment structure recently built at the Foothills Landfill. The reference facility for the regional MRF was an identically-sized facility recently constructed for the Town of Canmore. For this analysis, tender costs for the Canmore facility were adjusted to

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<sup>1</sup> Other large MRFs with the capacity to accept and handle the material from the study area exist in the region, and these should be investigated prior to entering into any processing contracts.

remove the cost of the transfer station building and associated equipment, and the cost of the extensive network of foundation piles that were necessary at the Canmore site.

The capital costs for Scenarios 2B and 4B also include the cost of land which is estimated to be in the order of \$415,000 for a 0.6 hectare (1.5 acre) parcel. An allowance of \$25,000 to construct civil infrastructure and utility connections which already exist at the other two locations is also included in the capital costs for these scenarios.

Operating cost estimates for the reload facility and the regional MRF were obtained from cost estimates and cost curves contained in a recent study of regional recyclables processing opportunities in Ontario <sup>2</sup>. In both cases, the costs were calculated on a \$ per tonne basis.

The operating costs for the regional MRF represent the full cost of processing (i.e. they do not contain any offsets from sale of recyclables). A budgetary cost was obtained from BFI for processing materials at their Calgary MRF. For consistency, the quote from BFI was also based on the full cost of processing with no offsets from revenues from the sale of recyclables.

## 6 Evaluation of Scenarios

The capital and operating cost estimates for the various aspects of each scenario were inputted into a standardized cash-flow model that allowed for the calculation of the system's net-present value (NPV). The cash-flow model was based on a 17-year time period: a 2-year period commencing in 2015 for facility design and construction, and a 15 year operating period commencing in 2017. To allow for calculation of annual operating costs, the cash flow model was also populated with the projected annual quantities of recyclable materials diverted from each municipality.

The NPV of construction and operating costs for each scenario are summarized in Exhibit 4. And graphically in Exhibit 5. Detailed NPV calculations for each option are provided in the attachments.

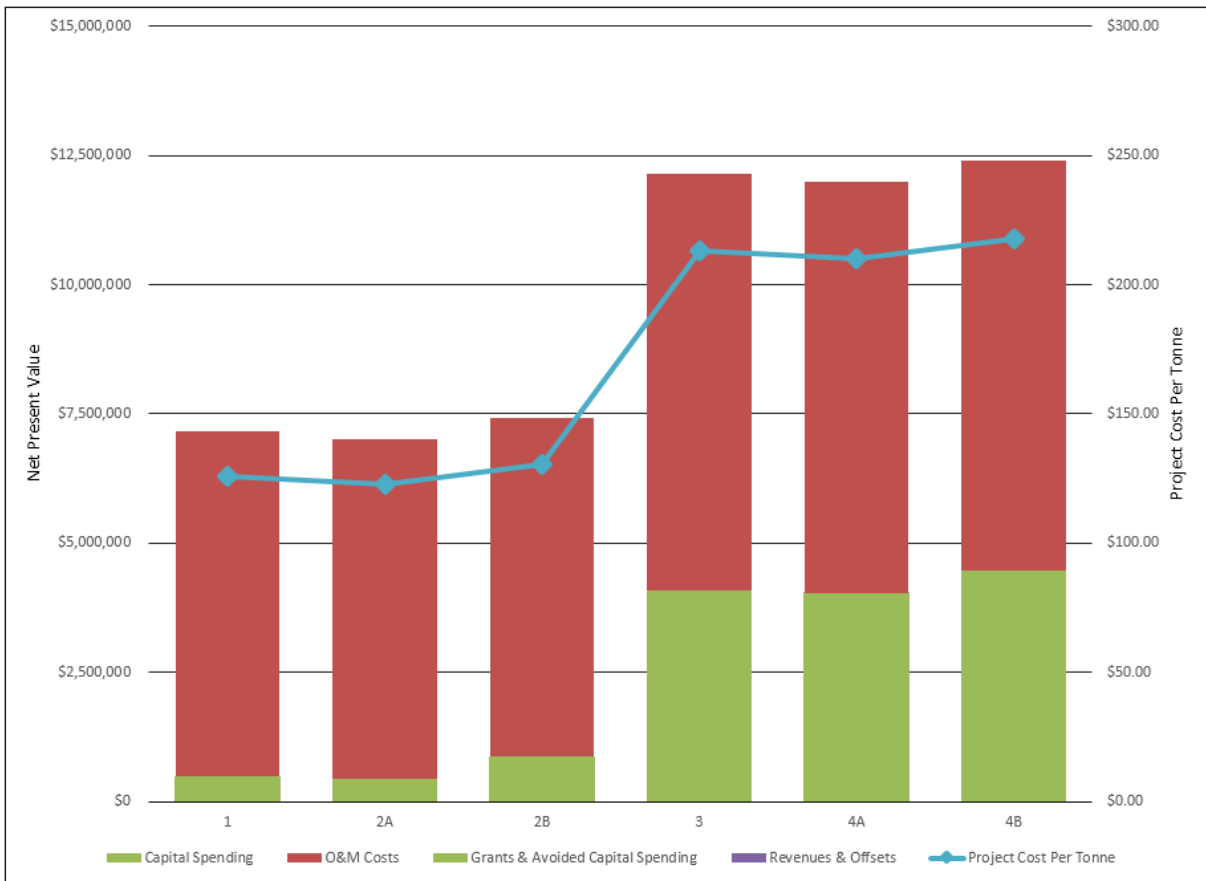
Net revenues from the transport and sale of recyclable products to end markets was assumed to be the same in all scenarios. For this reason they were not included in the NPV calculations.

EXHIBIT 4  
SUMMARY OF FINANCIAL EVALUATION OF SCENARIOS

	Facility Location & Type	17-Year Net Present Value		
		Capital	Operating	Total
Scenario 1	Reload @ Foothills LF	\$494,398	\$6,675,354	\$7,169,752
Scenario 2A	MRF @ MD Yard	\$446,321	\$6,559,938	\$7,006,259
Scenario 2B	MRF @ Abild's Ind. Park	\$869,398	\$6,559,938	\$7,429,336
Scenario 3	MRF @ Foothills LF	\$4,085,032	\$8,057,299	\$12,142,331
Scenario 4A	MRF @ MD Yard	\$4,036,955	\$7,941,884	\$11,978,839
Scenario 4B	MRF @ Abild's Ind. Park	\$4,460,032	\$7,941,884	\$12,401,915

<sup>2</sup> Resource Recycling Systems, "A Study of the Optimization of the Blue Box Material Processing System in Ontario (Volume 3)", June, 2012.

**EXHIBIT 5**  
**GRAPHICAL COMPARISON OF FINANCIAL EVALUATION RESULTS**



## 7 Conclusions

The results of the financial evaluation show that, with respect to the same type of facility, there is little difference in the cost between siting the facility at the Foothills landfill or the MD's yard in Aldersyde. Not surprisingly, there would be a higher cost associated with siting facilities on new land in Aldersyde in the event that there is insufficient space available at the MD yard.

There is a significant difference between the two types of facility (i.e. reload vs. local MRF). The difference is primarily due to the significantly higher capital cost associated with the construction of a new MRF within the FRSC boundaries.

## **Attachments**

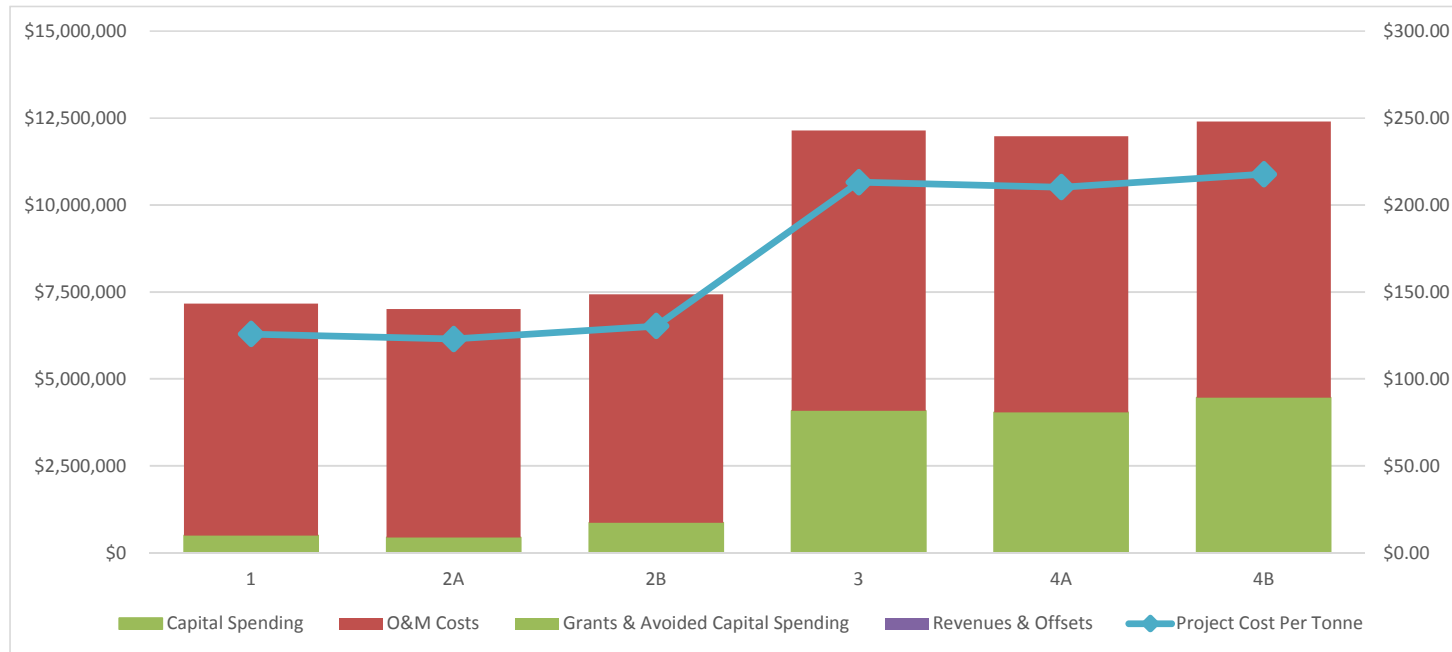
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Client: Foothills Regional Services Commission  
 Project: MRF Assessment  
 Date: November 10, 2014

Summary of Lifecycle Project Costs

Options	Capital Spending	Grants & Avoided Capital Spending	O&M Costs	Revenues & Offsets	Total Project NPV	Feedstock Diverted	Project Cost Per Tonne
						(tonnes)	(NPV\$/tonne)
1 Reload Facility at Foothills Landfill	\$494,398	\$0	\$6,675,354	\$0	\$7,169,752	56,970	\$125.85
2A Reload Facility at Aldersyde MD Yard	\$446,321	\$0	\$6,559,938	\$0	\$7,006,259	56,970	\$122.98
2B Reload Facility at New Aldersyde Site	\$869,398	\$0	\$6,559,938	\$0	\$7,429,336	56,970	\$130.41
3 MRF at Foothills Landfill	\$4,085,032	\$0	\$8,057,299	\$0	\$12,142,331	56,970	\$213.13
4A MRF at Aldersyde MD Yard	\$4,036,955	\$0	\$7,941,884	\$0	\$11,978,839	56,970	\$210.26
4B MRF at New Aldersyde Site	\$4,460,032	\$0	\$7,941,884	\$0	\$12,401,915	56,970	\$217.69



Client: Foothills Regional Services Commission

Project: MRF Assessment

Date: November 10, 2014

Parameter	Variable Name	Value	Units
Real Discount Rate	RDR	4%	
Roll-off Truck Rate	RO_Rate	\$ 150.00	per hour
Roll-off Container Payload	RO_Capacity	1.7	tonnes
Transfer Trailer Capacity	TT_Capacity	16	tonnes
Cost of Transfer to 3rd Party MRF	MRF_Transfer	\$ 300.00	per load
3rd Party MRF Tipping Fee	MRF_Fee	\$ 100.00	per tonne
Reload Facility O&M	Reload_OM	\$ 25.00	per tonne
MRF O&M	MRF_OM	\$ 180.00	per tonne

#### Population Growth Rates

Black Diamond	2.0%	per year
High River	2.0%	per year
Nanton	2.0%	per year
Okotoks	3.8%	per year
Turner Valley	2.0%	per year

#### Product Revenues

Commingled	\$0	per tonne
Newspaper	\$0	per tonne
Cardboard	\$0	per tonne
White Ledger/Office	\$0	per tonne
Mixed Paper	\$0	per tonne
Plastics (Hard and soft)	\$0	per tonne
Glass (clear and coloured)	\$0	per tonne
Metals	\$0	per tonne

Start Location	Foothills LF			Aldersyde		
	km <sup>1</sup>	min <sup>1</sup>	Avg Speed	km <sup>1</sup>	min <sup>1</sup>	Avg Speed
Black Diamond						
High River	13.4	14	57	10.6	9	71
Nanton	45.3	37	73	44.6	29	92
Okotoks	9.6	11	52	8.2	8	62
Turner Valley	29.8	27	66	31.5	27	70
BFI MRF (Calgary)	45.6	37	74	44.7	29	92

#### Notes:

1. Distances and travel times are one-way as per Google Maps.





**Client: Foothills Regional Services Commission**

**Project: MRF Assessment**

**Date: November 10, 2014**

Load Time @ Source	10 min
Unload Time @ MRF	20 min
Unload Time @ Source	10 min
Total Load/Unload	40 min
Hourly Trucking Rate	\$ 150.00 per hour
Roll-off Container Payload	1.7 tonnes

**Foothills LF Location**

<b>Start Location</b>	<b>Travel Time (min)</b>	<b>Load/Unload (min)</b>	<b>Total Time (min)</b>	<b>Cost/Load (\$)</b>	<b>Cost/Tonne (\$)</b>
High River	28	40	68	\$ 170.00	\$ 100.00
Nanton	74	40	114	\$ 285.00	\$ 168.00
Okotoks	22	40	62	\$ 155.00	\$ 92.00
Turner Valley/ Black Diamond	54	40	94	\$ 235.00	\$ 139.00

**Aldersyde Location**

<b>Start Location</b>	<b>Travel Time (min)</b>	<b>Load/Unload (min)</b>	<b>Total Time (min)</b>	<b>Cost/Load (\$)</b>	<b>Cost/Tonne (\$)</b>
High River	18	40	58	\$ 145.00	\$ 86.00
Nanton	58	40	98	\$ 245.00	\$ 145.00
Okotoks	16	40	56	\$ 140.00	\$ 83.00
Turner Valley/ Black Diamond	54	40	94	\$ 235.00	\$ 139.00



Client: Foothills Regional Services Commission  
 Project: MRF Assessment  
 Date: November 10, 2014  
 Option: 1 (Foothills Reload)

	Development Stage		Operational Stage														Remaining Useful Life	Comments/Assumptions
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
<b>GRANTS AND AVOIDED SPENDING</b>																		
<b>Grants</b>																		
Misc 1																		
<b>Avoided Capital Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Avoided O&amp;M Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>REVENUES</b>																		
<b>Tipping Fees</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Product Revenues</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>ANNUAL NET COST</b>	\$50,000	\$380,000	\$532,908	\$549,080	\$565,758	\$582,971	\$600,763	\$749,194	\$638,146	\$657,766	\$678,061	\$699,066	\$720,738	\$743,135	\$766,278	\$790,242	\$814,856	\$0
<b>CUMMULATIVE SPENDING</b>	\$50,000	\$430,000	\$962,908	\$1,511,987	\$2,077,745	\$2,660,716	\$3,261,479	\$4,010,673	\$4,648,819	\$5,306,585	\$5,984,647	\$6,683,712	\$7,404,450	\$8,147,585	\$8,913,863	\$9,704,105	\$10,518,961	\$10,518,961

15 Year Project Life	
Capital Spending (NPV)	\$494,398
Total Operating and Maintenance Spending (NPV)	\$6,675,354
Total Grants and Avoided Spending (NPV)	\$0
Total Revenue (NPV)	\$0
<b>Project Total (NPV)</b>	<b>\$7,169,752</b>
Real Discount Rate	4.0%
Tonnes Managed Through Scenario	56,970





Client: Foothills Regional Services Commission  
 Project: MRF Assessment  
 Date: November 10, 2014  
 Option: 2A (Aldersyde MD Yard Reload)

	Development Stage		2017	2018	2019	2020	2021	Operational Stage		2024	2025	2026	2027	2028	2029	2030	2031	Remaining Useful Life	Comments/Assumptions
	2015	2016						2022	2023										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
<b>GRANTS AND AVOIDED SPENDING</b>																			
<b>Grants</b>																			
Misc 1																			
<b>Avoided Capital Costs</b>																			
Black Diamond																			
High River																			
Nanton																			
Okotoks																			
Turner Valley																			
<b>Avoided O&amp;M Costs</b>																			
Black Diamond																			
High River																			
Nanton																			
Okotoks																			
Turner Valley																			
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>REVENUES</b>																			
<b>Tipping Fees</b>																			
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Product Revenues</b>																			
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Subtotal</b>		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>ANNUAL NET COST</b>	\$0	\$380,000	\$523,027	\$539,003	\$555,476	\$572,487	\$590,070	\$738,283	\$627,021	\$646,417	\$666,485	\$687,259	\$708,692	\$730,851	\$753,744	\$777,458	\$801,821	\$0	
<b>CUMMULATIVE SPENDING</b>	\$0	\$380,000	\$903,027	\$1,442,030	\$1,997,506	\$2,569,992	\$3,160,062	\$3,898,345	\$4,525,366	\$5,171,783	\$5,838,268	\$6,525,527	\$7,234,219	\$7,965,070	\$8,718,815	\$9,496,272	\$10,298,094	\$10,298,094	

<b>15 Year Project Life</b>	
Capital Spending (NPV)	\$446,321
Total Operating and Maintenance Spending (NPV)	\$6,559,938
Total Grants and Avoided Spending (NPV)	\$0
Total Revenue (NPV)	\$0
<b>Project Total (NPV)</b>	<b>\$7,006,259</b>
Real Discount Rate	4.0%
Tonnes Managed Through Scenario	56,970



Client: Foothills Regional Services Commission  
 Project: MRF Assessment  
 Date: November 10, 2014  
 Option: 2B (Reload in Abild's Industrial Park)

	Development Stage		2017	2018	2019	2020	2021	Operational Stage		2024	2025	2026	2027	2028	2029	2030	2031	Remaining Useful Life	Comments/Assumptions
	2015	2016						2022	2023										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
<b>GRANTS AND AVOIDED SPENDING</b>																			
<b>Grants</b>																			
Misc 1																			
<b>Avoided Capital Costs</b>																			
Black Diamond																			
High River																			
Nanton																			
Okotoks																			
Turner Valley																			
<b>Avoided O&amp;M Costs</b>																			
Black Diamond																			
High River																			
Nanton																			
Okotoks																			
Turner Valley																			
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>REVENUES</b>																			
<b>Tipping Fees</b>																			
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Product Revenues</b>																			
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Subtotal</b>			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>ANNUAL NET COST</b>	\$440,000	\$380,000	\$523,027	\$539,003	\$555,476	\$572,487	\$590,070	\$738,283	\$627,021	\$646,417	\$666,485	\$687,259	\$708,692	\$730,851	\$753,744	\$777,458	\$801,821	\$0	
<b>CUMMULATIVE SPENDING</b>	\$440,000	\$820,000	\$1,343,027	\$1,882,030	\$2,437,506	\$3,009,992	\$3,600,062	\$4,338,345	\$4,965,366	\$5,611,783	\$6,278,268	\$6,965,527	\$7,674,219	\$8,405,070	\$9,158,815	\$9,936,272	\$10,738,094	\$10,738,094	

<b>15 Year Project Life</b>	
Capital Spending (NPV)	\$869,398
Total Operating and Maintenance Spending (NPV)	\$6,559,938
Total Grants and Avoided Spending (NPV)	\$0
Total Revenue (NPV)	\$0
<b>Project Total (NPV)</b>	<b>\$7,429,336</b>
Real Discount Rate	4.0%
Tonnes Managed Through Scenario	56,970

	Development Stage		Operational Stage														Remaining Useful Life	Comments/Assumptions	
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030			2031
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			17
<b>Baseline Assumptions</b>																			
<b>Total Material Quantities - By Source (tonnes)</b>																			
Black Diamond			118.0	120.5	122.8	125.4	127.8	130.2	132.9	135.6	138.3	141.1	143.8	146.8	149.7	152.8	155.7		
High River			555.3	566.3	577.7	589.2	601.0	613.1	625.3	637.8	650.6	663.6	676.9	690.3	704.2	718.3	732.6		
Nanton			91.6	93.4	95.4	97.2	99.1	101.2	103.1	105.2	107.3	109.4	111.7	113.9	116.3	118.6	120.8		
Turner Valley			107.9	110.1	112.2	114.4	116.8	119.2	121.5	123.8	126.3	129.0	131.6	134.3	136.8	139.6	142.4		
Okotoks (Curbside)			2,122.6	2,203.3	2,287.0	2,373.9	2,464.1	2,557.8	2,655.0	2,755.9	2,860.6	2,969.3	3,082.1	3,199.2	3,320.8	3,447.0	3,578.0		
Okotoks (Depot)			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Okotoks (Curbside + Depot)			2,122.6	2,203.3	2,287.0	2,373.9	2,464.1	2,557.8	2,655.0	2,755.9	2,860.6	2,969.3	3,082.1	3,199.2	3,320.8	3,447.0	3,578.0		
<b>Total</b>			<b>2,995.4</b>	<b>3,093.6</b>	<b>3,195.1</b>	<b>3,300.1</b>	<b>3,408.8</b>	<b>3,521.5</b>	<b>3,637.8</b>	<b>3,758.3</b>	<b>3,883.1</b>	<b>4,012.4</b>	<b>4,146.1</b>	<b>4,284.5</b>	<b>4,427.8</b>	<b>4,576.3</b>	<b>4,729.5</b>		
<b>Total Material Quantities - All Sources (tonnes)</b>																			
Unclassified			2,122.6	2,203.3	2,287.0	2,373.9	2,464.1	2,557.8	2,655.0	2,755.9	2,860.6	2,969.3	3,082.1	3,199.2	3,320.8	3,447.0	3,578.0		
Newspaper			107.8	110.0	112.1	114.5	116.6	119.1	121.5	123.7	126.3	128.8	131.5	134.1	136.7	139.5	142.2		
Cardboard			368.6	376.0	383.6	391.0	399.0	407.0	415.1	423.4	431.8	440.5	449.3	458.3	467.4	476.8	486.3		
White Ledger/Office			2.5	2.5	2.5	2.6	2.7	2.7	2.7	2.8	2.9	2.9	3.0	3.1	3.1	3.2	3.2		
Mixed Paper			256.1	261.3	266.5	271.9	277.3	282.8	288.4	294.2	300.2	306.2	312.3	318.6	324.9	331.4	338.0		
Plastics (Hard and soft)			80.7	82.2	84.0	85.5	87.2	89.0	90.8	92.6	94.4	96.4	98.3	100.2	102.4	104.4	106.4		
Glass (clear and coloured)			13.2	13.6	13.8	14.1	14.4	14.6	14.9	15.3	15.5	15.9	16.1	16.5	16.8	17.2	17.5		
Metals			43.9	44.7	45.6	46.6	47.5	48.5	49.4	50.4	51.4	52.4	53.5	54.5	55.7	56.8	57.9		
<b>Total</b>			<b>2,995.4</b>	<b>3,093.6</b>	<b>3,195.1</b>	<b>3,300.1</b>	<b>3,408.8</b>	<b>3,521.5</b>	<b>3,637.8</b>	<b>3,758.3</b>	<b>3,883.1</b>	<b>4,012.4</b>	<b>4,146.1</b>	<b>4,284.5</b>	<b>4,427.8</b>	<b>4,576.3</b>	<b>4,729.5</b>		
CHECK			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
<b>CAPITAL COSTS</b>																			
<b>Upgrades to Collection Programs</b>																			
Black Diamond	\$ -	\$ -																	
High River	\$ -	\$ -																	
Nanton	\$ -	\$ -																	
Okotoks (Curbside)	\$ -	\$ -																	
Okotoks (Depot)	\$ -	\$ -																	
Turner Valley	\$ -	\$ -																	
<b>Processing Facilities</b>																			
Reload Facility		\$4,250,000																	
Regional Material Recovery Facility (MRF)	\$50,000																		
Utility Servicing (3-Phase Power, Sanitary, Potable)		\$65,000																	
Mobile Equipment																			
Transfer Trucks																			
Land Purchase	\$0																		
<b>Equipment Replacement/Retrofit</b>																			
Buildings								\$65,000											
Processing Equipment																			
Mobile Equipment																			
Transfer Trucks																			
<b>Subtotal</b>	\$50,000	\$4,315,000	\$0	\$0	\$0	\$0	\$0	\$65,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
<b>OPERATION AND MAINTENANCE COSTS</b>																			
<b>Incremental Cost to Municipal Collection Programs</b>																			
Black Diamond																			
High River																			
Nanton																			
Okotoks (Curbside)																			
Okotoks (Depot)																			
Turner Valley																			
<b>Trucking from Depots to Regional Site</b>																			
Black Diamond	\$139 /tonne		\$16,402	\$16,750	\$17,069	\$17,431	\$17,764	\$18,098	\$18,473	\$18,848	\$19,224	\$19,613	\$19,988	\$20,405	\$20,808	\$21,239	\$21,642		
High River	\$100 /tonne		\$55,530	\$56,630	\$57,770	\$58,920	\$60,100	\$61,310	\$62,530	\$63,780	\$65,060	\$66,360	\$67,690	\$69,030	\$70,420	\$71,830	\$73,260		
Nanton	\$168 /tonne		\$15,389	\$15,691	\$16,027	\$16,330	\$16,649	\$17,002	\$17,321	\$17,674	\$18,026	\$18,379	\$18,766	\$19,135	\$19,538	\$19,925	\$20,294		
Turner Valley	\$139 /tonne		\$14,998	\$15,304	\$15,596	\$15,902	\$16,235	\$16,569	\$16,889	\$17,208	\$17,556	\$17,931	\$18,292	\$18,668	\$19,015	\$19,404	\$19,794		
Okotoks (Depot)	\$92 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
<b>Reload Facility O&amp;M</b>																			
Facility operation and maintenance			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Transfer to 3rd Party Processing Facility			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Processing Fee by 3rd Party MRF			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
<b>Regional MRF O&amp;M</b>																			
Commingled	\$180.00 /tonne		\$539,172	\$556,848	\$575,118	\$594,018	\$613,584	\$633,870	\$654,804	\$676,494	\$698,958	\$722,232	\$746,298	\$771,210	\$797,004	\$823,734	\$851,310		
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
<b>Other System O&amp;M</b>																			
Misc 1																			
Misc 2																			
Misc 3																			
<b>Subtotal</b>	\$0	\$0	\$641,491	\$661,223	\$681,580	\$702,600	\$724,332	\$746,848	\$770,016	\$794,004	\$818,824	\$844,515	\$871,034	\$898,448	\$926,786	\$956,132	\$986,300		

Client: Foothills Regional Services Commission  
 Project: MRF Assessment  
 Date: November 10, 2014  
 Option: 3 (Foothills MRF)

	Development Stage		Operational Stage														Remaining Useful Life	Comments/Assumptions
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
<b>GRANTS AND AVOIDED SPENDING</b>																		
<b>Grants</b>																		
Misc 1																		
<b>Avoided Capital Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Avoided O&amp;M Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>REVENUES</b>																		
<b>Tipping Fees</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Product Revenues</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>ANNUAL NET COST</b>	\$50,000	\$4,315,000	\$641,491	\$661,223	\$681,580	\$702,600	\$724,332	\$811,848	\$770,016	\$794,004	\$818,824	\$844,515	\$871,034	\$898,448	\$926,786	\$956,132	\$986,300	\$0
<b>CUMMULATIVE SPENDING</b>	\$50,000	\$4,365,000	\$5,006,491	\$5,667,714	\$6,349,294	\$7,051,894	\$7,776,226	\$8,588,074	\$9,358,090	\$10,152,095	\$10,970,918	\$11,815,433	\$12,686,468	\$13,584,916	\$14,511,702	\$15,467,834	\$16,454,134	\$16,454,134

15 Year Project Life	
Capital Spending (NPV)	\$4,085,032
Total Operating and Maintenance Spending (NPV)	\$8,057,299
Total Grants and Avoided Spending (NPV)	\$0
Total Revenue (NPV)	\$0
<b>Project Total (NPV)</b>	<b>\$12,142,331</b>
Real Discount Rate	4.0%
Tonnes Managed Through Scenario	56,970

	Development Stage		Operational Stage														Remaining Useful Life	Comments/Assumptions	
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030			2031
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			17
<b>Baseline Assumptions</b>																			
<b>Total Material Quantities - By Source (tonnes)</b>																			
Black Diamond			118.0	120.5	122.8	125.4	127.8	130.2	132.9	135.6	138.3	141.1	143.8	146.8	149.7	152.8	155.7		
High River			555.3	566.3	577.7	589.2	601.0	613.1	625.3	637.8	650.6	663.6	676.9	690.3	704.2	718.3	732.6		
Nanton			91.6	93.4	95.4	97.2	99.1	101.2	103.1	105.2	107.3	109.4	111.7	113.9	116.3	118.6	120.8		
Turner Valley			107.9	110.1	112.2	114.4	116.8	119.2	121.5	123.8	126.3	129.0	131.6	134.3	136.8	139.6	142.4		
Okotoks (Curbside)			2,122.6	2,203.3	2,287.0	2,373.9	2,464.1	2,557.8	2,655.0	2,755.9	2,860.6	2,969.3	3,082.1	3,199.2	3,320.8	3,447.0	3,578.0		
Okotoks (Depot)			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Okotoks (Curbside + Depot)			2,122.6	2,203.3	2,287.0	2,373.9	2,464.1	2,557.8	2,655.0	2,755.9	2,860.6	2,969.3	3,082.1	3,199.2	3,320.8	3,447.0	3,578.0		
<b>Total</b>			<b>2,995.4</b>	<b>3,093.6</b>	<b>3,195.1</b>	<b>3,300.1</b>	<b>3,408.8</b>	<b>3,521.5</b>	<b>3,637.8</b>	<b>3,758.3</b>	<b>3,883.1</b>	<b>4,012.4</b>	<b>4,146.1</b>	<b>4,284.5</b>	<b>4,427.8</b>	<b>4,576.3</b>	<b>4,729.5</b>		
<b>Total Material Quantities - All Sources (tonnes)</b>																			
Unclassified			2,122.6	2,203.3	2,287.0	2,373.9	2,464.1	2,557.8	2,655.0	2,755.9	2,860.6	2,969.3	3,082.1	3,199.2	3,320.8	3,447.0	3,578.0		
Newspaper			107.8	110.0	112.1	114.5	116.6	119.1	121.5	123.7	126.3	128.8	131.5	134.1	136.7	139.5	142.2		
Cardboard			368.6	376.0	383.6	391.0	399.0	407.0	415.1	423.4	431.8	440.5	449.3	458.3	467.4	476.8	486.3		
White Ledger/Office			2.5	2.5	2.5	2.6	2.7	2.7	2.7	2.8	2.9	2.9	3.0	3.1	3.1	3.2	3.2		
Mixed Paper			256.1	261.3	266.5	271.9	277.3	282.8	288.4	294.2	300.2	306.2	312.3	318.6	324.9	331.4	338.0		
Plastics (Hard and soft)			80.7	82.2	84.0	85.5	87.2	89.0	90.8	92.6	94.4	96.4	98.3	100.2	102.4	104.4	106.4		
Glass (clear and coloured)			13.2	13.6	13.8	14.1	14.4	14.6	14.9	15.3	15.5	15.9	16.1	16.5	16.8	17.2	17.5		
Metals			43.9	44.7	45.6	46.6	47.5	48.5	49.4	50.4	51.4	52.4	53.5	54.5	55.7	56.8	57.9		
<b>Total</b>			<b>2,995.4</b>	<b>3,093.6</b>	<b>3,195.1</b>	<b>3,300.1</b>	<b>3,408.8</b>	<b>3,521.5</b>	<b>3,637.8</b>	<b>3,758.3</b>	<b>3,883.1</b>	<b>4,012.4</b>	<b>4,146.1</b>	<b>4,284.5</b>	<b>4,427.8</b>	<b>4,576.3</b>	<b>4,729.5</b>		
CHECK			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
<b>CAPITAL COSTS</b>																			
<b>Upgrades to Collection Programs</b>																			
Black Diamond	\$	-	\$	-															
High River	\$	-	\$	-															
Nanton	\$	-	\$	-															
Okotoks (Curbside)	\$	-	\$	-															
Okotoks (Depot)	\$	-	\$	-															
Turner Valley	\$	-	\$	-															
<b>Processing Facilities</b>																			
Reload Facility																			
Regional Material Recovery Facility (MRF)		\$4,250,000																	
Utility Servicing (3-Phase Power, Sanitary, Potable)																			
Mobile Equipment			\$65,000																
Transfer Trucks																			
Land Purchase		\$0																	
<b>Equipment Replacement/Retrofit</b>																			
Buildings																			
Processing Equipment																			
Mobile Equipment								\$65,000											
Transfer Trucks																			
<b>Subtotal</b>	\$0	\$4,315,000	\$0	\$0	\$0	\$0	\$0	\$65,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>OPERATION AND MAINTENANCE COSTS</b>																			
<b>Incremental Cost to Municipal Collection Programs</b>																			
Black Diamond																			
High River																			
Nanton																			
Okotoks (Curbside)																			
Okotoks (Depot)																			
Turner Valley																			
<b>Trucking from Depots to Regional Site</b>																			
Black Diamond	\$139 /tonne		\$16,402	\$16,750	\$17,069	\$17,431	\$17,764	\$18,098	\$18,473	\$18,848	\$19,224	\$19,613	\$19,988	\$20,405	\$20,808	\$21,239	\$21,642		
High River	\$86 /tonne		\$47,756	\$48,702	\$49,682	\$50,671	\$51,686	\$52,727	\$53,776	\$54,851	\$55,952	\$57,070	\$58,213	\$59,366	\$60,561	\$61,774	\$63,004		
Nanton	\$145 /tonne		\$13,282	\$13,543	\$13,833	\$14,094	\$14,370	\$14,674	\$14,950	\$15,254	\$15,559	\$15,863	\$16,197	\$16,516	\$16,864	\$17,197	\$17,516		
Turner Valley	\$139 /tonne		\$14,998	\$15,304	\$15,596	\$15,902	\$16,235	\$16,569	\$16,889	\$17,208	\$17,556	\$17,931	\$18,292	\$18,668	\$19,015	\$19,404	\$19,794		
Okotoks (Depot)	\$83 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
<b>Reload Facility O&amp;M</b>																			
Facility operation and maintenance			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Transfer to 3rd Party Processing Facility			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
Processing Fee by 3rd Party MRF			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>Regional MRF O&amp;M</b>																			
Commingled	\$180.00 /tonne		\$539,172	\$556,848	\$575,118	\$594,018	\$613,584	\$633,870	\$654,804	\$676,494	\$698,958	\$722,232	\$746,298	\$771,210	\$797,004	\$823,734	\$851,310		
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
<b>Other System O&amp;M</b>																			
Misc 1																			
Misc 2																			
Misc 3																			
<b>Subtotal</b>	\$0	\$0	\$631,610	\$651,146	\$671,298	\$692,115	\$713,639	\$735,937	\$758,891	\$782,655	\$807,248	\$832,709	\$858,989	\$886,164	\$914,252	\$943,348	\$973,266	\$0	

Client: Foothills Regional Services Commission  
 Project: MRF Assessment  
 Date: November 10, 2014  
 Option: 4A (Aldersyde MD Yard MRF)

	Development Stage		Operational Stage														Remaining Useful Life	Comments/Assumptions
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
<b>GRANTS AND AVOIDED SPENDING</b>																		
<b>Grants</b>																		
Misc 1																		
<b>Avoided Capital Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Avoided O&amp;M Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>REVENUES</b>																		
<b>Tipping Fees</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Product Revenues</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>ANNUAL NET COST</b>	\$0	\$4,315,000	\$631,610	\$651,146	\$671,298	\$692,115	\$713,639	\$800,937	\$758,891	\$782,655	\$807,248	\$832,709	\$858,989	\$886,164	\$914,252	\$943,348	\$973,266	\$0
<b>CUMMULATIVE SPENDING</b>	\$0	\$4,315,000	\$4,946,610	\$5,597,756	\$6,269,054	\$6,961,170	\$7,674,809	\$8,475,746	\$9,234,637	\$10,017,292	\$10,824,540	\$11,657,248	\$12,516,237	\$13,402,401	\$14,316,653	\$15,260,001	\$16,233,267	\$16,233,267

15 Year Project Life	
Capital Spending (NPV)	\$4,036,955
Total Operating and Maintenance Spending (NPV)	\$7,941,884
Total Grants and Avoided Spending (NPV)	\$0
Total Revenue (NPV)	\$0
<b>Project Total (NPV)</b>	<b>\$11,978,839</b>
Real Discount Rate	4.0%
Tonnes Managed Through Scenario	56,970





Client: Foothills Regional Services Commission  
 Project: MRF Assessment  
 Date: November 10, 2014  
 Option: 4B (MRF in Abild's Industrial Park)

	Development Stage		Operational Stage														Remaining Useful Life	Comments/Assumptions
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
<b>GRANTS AND AVOIDED SPENDING</b>																		
<b>Grants</b>																		
Misc 1																		
<b>Avoided Capital Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Avoided O&amp;M Costs</b>																		
Black Diamond																		
High River																		
Nanton																		
Okotoks																		
Turner Valley																		
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>REVENUES</b>																		
<b>Tipping Fees</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Product Revenues</b>																		
Commingled	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Newspaper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cardboard	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
White Ledger/Office	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Mixed Paper	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plastics (Hard and soft)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Glass (clear and coloured)	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Metals	\$0.00 /tonne		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>ANNUAL NET COST</b>	\$440,000	\$4,315,000	\$631,610	\$651,146	\$671,298	\$692,115	\$713,639	\$800,937	\$758,891	\$782,655	\$807,248	\$832,709	\$858,989	\$886,164	\$914,252	\$943,348	\$973,266	\$0
<b>CUMMULATIVE SPENDING</b>	\$440,000	\$4,755,000	\$5,386,610	\$6,037,756	\$6,709,054	\$7,401,170	\$8,114,809	\$8,915,746	\$9,674,637	\$10,457,292	\$11,264,540	\$12,097,248	\$12,956,237	\$13,842,401	\$14,756,653	\$15,700,001	\$16,673,267	\$16,673,267

15 Year Project Life	
Capital Spending (NPV)	\$4,460,032
Total Operating and Maintenance Spending (NPV)	\$7,941,884
Total Grants and Avoided Spending (NPV)	\$0
Total Revenue (NPV)	\$0
<b>Project Total (NPV)</b>	<b>\$12,401,915</b>
Real Discount Rate	4.0%
Tonnes Managed Through Scenario	56,970