November 4, 2022

Mr. Steve Copp
Mirror Nova Scotia Limited
600 Otter Lake Drive
Lakeside, NS   B3T 2E2

Dear Mr. Copp,

Re: August 2022 Performance Audit
        Otter Lake Waste Processing & Disposal Facility

In August 2022, Strum Consulting was retained by Mirror Nova Scotia Limited (Mirror) to oversee a Performance Audit at the Otter Lake Waste Processing & Disposal Facility (Otter Lake) located at 600 Otter Lake Drive in Lakeside, NS.

The purpose of the Performance Audit was to characterize the incoming residential waste stream and assess the percentage of compostable waste in this stream by mass. This letter report provides a summary of the Performance Audit completed on August 30, 2022 and includes a statistical analysis of the performance audit data collected to date.

Background
In March 2022, Nova Scotia Environment & Climate Change (NSECC) issued an updated Municipal Approval for Otter Lake, allowing the Front End Processor and Waste Stabilization Facility (FEP/WSF) to be deactivated upon the submission and acceptance of a Compliance Plan in accordance with the Approval requirements.

As per the Approval, the Performance Targets for Otter Lake include (but are not limited to) compostable waste not exceeding ten percent (10%) of the total amount of municipal solid waste landfilled, by mass. Prior to the deactivation of the FEP and WSF, the submitted Compliance Plan must include details of how Performance Targets will be achieved. The Compliance Plan also outlines how Performance Audits will be completed as a means to quantify the presence of compostable waste being received at Otter Lake.

Given the above, quarterly Performance Audits will be completed to characterize the composition of compostable waste in the incoming residential waste stream and to assess compliance with Performance Targets.

Engineering • Surveying • Environmental

Methodology

The methodology followed for the August 2022 Performance Audit reflects best practices identified in the Divert NS Waste Audit Manual and Field Procedures Guide (2017), as well as site specific processes established by Halifax Regional Municipality (HRM), and is summarized below.

Sample Load Identification

Residential curbside collection is divided into eight collection areas in HRM and condominium properties which are also considered to be residential. The geographic descriptions of the various areas are described in Table A, below.

Table A: Collection Area Descriptions

Waste Collection Area	Area Description
1	Halifax (former city limits); Spryfield
2	Dartmouth (former city limits)
3	Bedford; Hammonds Plains; Pockwock
4	Beechville-Timberlea; Herring Cove; Prospect; Peggy's Cove; St. Margaret's Bay to Hubbards
5	Sackville; Beaver Bank; Rall River; Waverley, Wellington; Dutch Settlement
6	Cole Harbour; Westphal; Cherry Brook; Eastern Passage; Cow Bay
7	Porters Lake; Lawrencetown; Chezzetcook; Lake Echo; Preston
8	Middle Musquodoboit; Musquodoboit Harbour; Elderbank; Sheet Harbour; Eastern Shore
Condos	Multi-residential style properties located in various communities

Based on residential curbside collection schedules for each specific collection area and the scheduled audit date and time, sample loads are selected ahead of time by HRM staff. A random number generator is used to choose which vehicle would be sampled. One sample from each of the eight curbside collection areas and one sample from condos were assessed as part of the August 2022 Performance Audit.

The selected loads were visually inspected on the tip floor upon arrival and photographs were taken as shown in the attached photo log. The following information was recorded for each load:

- Collection vehicle and route numbers
- Date/Time of arrival
- Date/Time sample taken
- Gross and tare weight of truck
- Weight of sample
- Number/type of bulky items observed
- Names of persons taking the sample
- Date/Time of sorting

Sample Size

Photographs of the auditing process are provided as Attachment 1. Once emptied from the vehicle, multiple sections of the load were selected in order to draw a sample that was representative of the load. Each sample was to contain a mix of clear and black bags. Containers shown in Photo 2 (Attachment 1) were used to collect a sample between 90 and 135 kg.

Records documenting the identifying information of each vehicle sampled (scale tickets - Attachment 2) and the Performance Audit Record field data sheets (Attachment 3) are also attached to this report.

Material Categories

The categories that were used to define the different types of compostable waste are consistent with the Approval and are outlined below in Table B.

Table B: Compostable Waste Sorting Categories

Category	Sub-Category	Examples
Fibre	Newsprint/Paper	The Chronicle Herald, The Coast, Masthead News, The Cobequid/Dartmouth/Cole Harbour Wire, flyers
	Corrugated Cardboard/Boxboard	Consumer boxes (e.g., from appliances, storage, filing, and shipping)
Organics	Food Waste	Whole vegetables, fruit, meat, fish, leftover food waste, egg shells, peels, oils, bones, fat, packaged food if most of if it consists of food
	Yard Waste	Grass, leaves, brush, branches, wood chips, soil

Materials which did not fall into one of the above noted categories were counted, weighed, and categorized as other garbage.

Sorting Procedure

The sorting team consisted of several Mirror staff. All staff was briefed on the sorting protocols, including familiarity with example materials for each sorting category. Strum staff was designated as "Lead" and was responsible for quality control and data collection.

The audit space consisted of an open area set up with tables for sorting waste materials, containers clearly labeled for each of the waste categories, and digital scales for weighing the waste materials. The containers used for sorting were weighted prior to commencing the audit and recorded on the data sheets to allow for net sample weights to be determined.

To maintain consistency, the Lead was responsible for weighing and recording the data on dedicated data sheets for each area, each time a container was filled. The process continued for each respective area until the full sample was properly sorted and weighed.

Previous Assessments

To establish a baseline for future Performance Audits, an Initial Performance Audit was completed in May 2022 as detailed in the Initial Performance Audit report (dated June 22, 2022). Using the data collected during the May 2022 Performance Audit, the total compostable waste percentage ranged from a minimum of 3.27% to a maximum of 15.4%, with a mean of 7.12%.

Further details of the May 2022 Performance Audit are provided in the above-noted report.

August 2022 Performance Audit Summary

A summary of the August 2022 Performance Audit completed at Otter Lake is provided below in Table C. As previously mentioned, the August 2022 Performance Audit field data sheets containing the data collected respective to each waste collection area during the audit are attached to this report as Attachment 3.

Table C: August 2022 Performance Audit Results

Waste Collection Area	Category Percentage (%)					
	Garbage/ Residue	Fibre - Newsprint/ Paper	Fibre - Corrugated Cardboard	Organics - Food/Putrescible Waste	Organics - Yard Waste	Total Compostable Waste
1	86.51%	5.14%	3.97%	3.84%	0.14%	13.09%
2	79.26%	5.04%	5.26%	8.81%	1.41%	20.52%
3	80.68%	1.55%	5.15%	11.07%	1.55%	19.32%
4	87.31%	0.54%	1.62%	7.77%	2.46%	12.39%
5	87.65%	5.26%	2.55%	2.15%	2.07%	12.03%
6	93.75%	1.25%	2.32%	2.41%	0.00%	5.98%
7	92.20%	1.63%	2.37%	3.73%	0.07%	7.80%
8	83.14%	1.18%	2.04%	4.47%	8.71%	16.40%
Condos	87.50%	4.70%	3.10%	5.40%	0.00%	13.20%

Notes: 1. Total compostable waste percentage based on aggregate of four compostable waste category percentages.

Using the data in Table C above, the total compostable waste percentage ranged from a minimum of 5.98% (Area 6) to a maximum of 20.52% (Area 2), with a mean of 13.41% based on only nine (9) samples being collected during the August 2022 Performance Audit.

Average Total Compostable Waste Percentage

A summary of the Total Compostable Waste percentage for the May 2022 and August 2022 Performance Audit completed at Otter Lake is provided below in Table D. Using this data, the Average Total Compostable Waste percentage was calculated for each area.

Table D: Average Total Compostable Waste Percentage

Waste Collection Area	May 2022 Total Compostable Waste	August 2022 Total Compostable Waste	Average Total Compostable Waste Per Area
1	15.40%	13.09%	14.25%
2	10.44%	20.52%	15.48%
3	3.87%	19.32%	11.60%
4	3.27%	12.39%	7.83%
5	6.34%	12.03%	9.19%
6	3.39%	5.98%	4.69%
7	3.96%	7.80%	5.88%
8	6.90%	16.40%	11.65%
Condos	10.54%	13.20%	11.87%

Notes: 1. Average total compostable waste percentage per area based on May 2022 and August 2022 Waste Audit Total Compostable Waste percentages.

Using the data in Table D above, the average total compostable waste percentage ranged from a minimum of 4.69% (Area 6) to a maximum of 15.48% (Area 2), with a mean of 10.27% based on a total of 18 samples being collected during the May 2022 Performance Audit and the August 2022 Performance Audit.

Overall Compostable Waste

August 2022

As shown in Table E below, given the August 2022 total compostable waste percentage per area and the three year average of waste tonnage per area, the estimated compostable waste tonnage per year has been calculated. Using the total of the Estimated Annual Compostable Waste (6653.31 tonnes) and the three year waste average total (48,923.20 tonnes), the Compostable Waste Percentage is calculated to be 13.60%. Supporting data is provided as Table 1 (Attachment 4).

Table E: Estimated Annual Compostable Waste based on August 2022 Data

Waste Collection Area	Three Year Waste Average (Tonnes)	August 2022 Total Compostable Waste	Estimated Annual Compostable Waste (Tonnes)
1	9918.30	13.09%	1298.31
2	6866.42	20.52%	1408.99
3	4358.45	19.32%	842.05
4	5304.70	12.39%	657.25
5	8372.02	12.03%	1007.15
6	5130.17	5.98%	306.78
7	2962.13	7.80%	231.05
8	3383.67	16.40%	554.92
Condos	2627.33	13.20%	346.81
TOTAL	**48923.20**	**N/A**	**6653.31**
Compostable Waste Percentage = (6653.31/48923.20) X 100 = 13.60%			

Notes: 1. Data used to calculate three year average provided by Mirror and included tonnage from the fiscal years 2019/2020, 2020/2021, and 2021/2022.

Strum
C O N S U L T I N G

Based on the data in Table E above, the Estimated Annual Compostable Waste per area ranges from a minimum of 231.05 tonnes (Area 7) to a maximum of 1408.99 tonnes (Area 2), with a mean of 739.26 tonnes.

May and August 2022

As shown in Table F below, given the average (May and August 2022) total compostable waste percentage per area and the three year average of waste tonnage per area, the estimated compostable waste tonnage per year has been calculated. Using the totals of the Estimated Annual Compostable Waste (5,287.45 tonnes) and the three year waste average total (48,923.20 tonnes), the Compostable Waste Percentage is calculated to be 10.81%. Supporting data is provided as Table 2 (Attachment 4).

Table F: Estimated Annual Compostable Waste based on May and August 2022 Data

Waste Collection Area	Three Year Waste Average (Tonnes)	Three Year Waste Average (% Total)	Average Total Compostable Waste % Per Area	Estimated Annual Compostable Waste (Tonnes)
1	9918.30	20.27%	14.25%	1413.36
2	6866.42	14.04%	15.48%	1062.92
3	4358.45	8.91%	11.60%	505.58
4	5304.70	10.84%	7.83%	415.36
5	8372.02	17.11%	9.19%	769.39
6	5130.17	10.49%	4.69%	240.60
7	2962.13	6.05%	5.88%	174.17
8	3383.67	6.92%	11.65%	394.20
Condos	2627.33	5.37%	11.87%	311.86
TOTAL	**48923.20**	**100.00%**	**N/A**	**5287.45**
Compostable Waste Percentage = (5287.45/48923.20) X 100 = 10.81%				

Notes: 1. Data used to calculate three year average provided by Mirror and included tonnage from the fiscal years 2019/2020, 2020/2021, and 2021/2022.

Based on the data in Table F above, the Estimated Annual Compostable Waste per area ranges from a minimum of 174.17 tonnes (Area 7) to a maximum of 1413.36 tonnes (Area 1), with a mean of 587.34 tonnes.

Descriptive Statistics

A descriptive statistical analysis was completed on the Estimated Annual Compostable Waste tonnage calculated per area from the May 2022 Performance Audit and the August 2022 Performance Audit. The statistical analysis was completed using the Microsoft Excel Analysis ToolPak Descriptive Statistics analysis tool. Supporting data for the statistical analysis is provided as Tables 3 and 4 (Attachment 4).

At 95% confidence interval, the Estimated Average Annual Compostable Waste tonnage per area is calculated to be between 359.94 tonnes (lower bound) and 814.74 tonnes (upper bound). The confidence interval was calculated by subtracting/adding the calculated 95% confidence level (227.40) from the mean (587.34 tonnes).

By dividing the lower bound (359.94 tonnes) and upper bound (814.74 tonnes) of the 95% confidence interval by the Total Estimated Annual Compostable Waste (5,287.45 tonnes), and multiplying the values by 100%, the percentage of Estimated Annual Compostable Waste is calculated to be between 6.81% and 15.41%.

The above noted statistical analysis is based on a total of 18 samples collected during the May 2022 Performance Audit and August 2022 Performance Audit. As additional sampling will be completed during future audits, it is expected that the statistical data will vary as more data becomes available.

Closure

This report was prepared by J██████████████████Project Manager. Should additional information become available, Strum requests that this information be brought to our attention immediately so that we can re-assess the conclusions presented in this report.

This Report and any use of the Report is subject to the terms herein (see attached Statement of Qualifications and Limitations).

If you have any questions, please contact us.

Thank you,

August 2022 Performance Audit, Otter Lake Waste Processing & Disposal Facility   *November 4, 2022*
Mr. Steve Copp
Mirror Nova Scotia Limited   *Project # 22-8641*

Statement of Qualifications and Limitations

This Report (the "Report") has been prepared by Strum Consulting ("Consultant") for the benefit of Mirror Nova Scotia Limited ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations, and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations")
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports
- may be based on information provided to Consultant which has not been independently verified
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued
- must be read as a whole and sections thereof should not be read out of such context
- was prepared for the specific purposes described in the Report and the Agreement
- in the case of subsurface, environmental, or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time

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the prior written consent of Consultant to use and rely upon the Report and the Information. Any damages arising from improper use of the Report or parts thereof shall be borne by the party making such use.

ATTACHMENT 1
PHOTOGRAPH LOG

Photo 1: Waste collection vehicle unloading waste collected from HRM collection Area 1. Photo taken on August 23, 2022.

Photo 2: Waste audit sample collected from HRM collection Area 1. Photo taken on August 30, 2022 during waste audit.

Photo 3: Sorting process of HRM collection Area 1. Photo taken August 30, 2022 during waste audit.

Photo 4: Food waste bin sorted from HRM collection Area 1. Photo taken August 30, 2022 during waste audit.

Photo 5: Waste pile from HRM collections Area 2.
Photo collected August 18, 2022

Photo 6: Waste audit sample from HRM collection Area 2.
Photo collected August 18, 2022.

Photo 7: Waste sample collected from HRM collection Area 2 following sorting.
Photo taken on August 30, 2022 during waste audit.

Photo 8: Newsprint/ paper bin sorted from HRM collection Area 2.
Photo taken August 30, 2022 during waste audit.

Photo 9: Waste collection vehicle unloading waste collected from HRM collection Area 3. Photo taken on August 19, 2022.

Photo 10: Waste audit sample from HRM collection Area 3. Photo collected August 30, 2022 during waste audit.

Photo 11: Waste audit sample from HRM collection Area 3 following sorting. Photo collected August 30, 2022 during waste audit.

Photo 12: Fiber OCC sorted from HRM collection Area 3. Photo taken August 30, 2022 during waste audit.

Photo 13: Waste collection vehicle unloading waste collected from HRM collection Area 4. Photo taken on August 18, 2022.

Photo 14: Waste audit sample from HRM collection Area 4. Photo collected August 30, 2022 during waste audit.

Photo 15: Food waste bin sorted from HRM collection Area 4. Photo taken August 30, 2022 during waste audit.

Photo 16: Yard waste bin sorted from HRM collection Area 4. Photo taken August 30, 2022 during waste audit.

Photo 17: Waste collection vehicle unloading waste collected from HRM collection Area 5. Photo taken on August 22, 2022.

Photo 18: Waste audit sample from HRM collection Area 5. Photo collected August 22, 2022.

Photo 19: Fiber OCC waste bin separated from HRM collection Area 5. Photo taken August 30, 2022 during waste audit.

Photo 20: Waste sample from HRM collection Area 5 following sorting. Photo taken August 30, 2022 during waste audit.

Photo 21: Waste collection vehicle unloading waste collected from HRM collection Area 6. Photo taken on August 23, 2022.

Photo 22: Waste pile from HRM collection Area 6. Photo collected August 23, 2022.

Photo 23: Food waste bin separated from HRM collection Area 6. Photo taken August 30, 2022 during waste audit.

Photo 24: Waste sample from HRM collection Area 6 following sorting. Photo taken August 30, 2022 during waste audit.
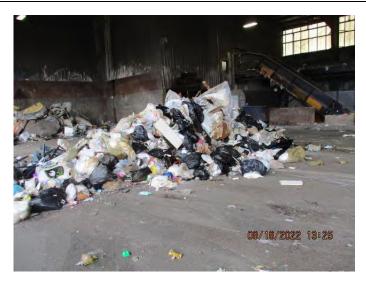
Photo 25: Waste collection vehicle unloading waste collected from HRM collection Area 7. Photo taken on August 19, 2022.

Photo 26: Waste audit sample from HRM collection Area 7. Photo collected August 19, 2022.

Photo 27: Fiber OCC bin separated from HRM collection Area 7. Photo taken August 30, 2022 during waste audit.

Photo 28: Waste sample from HRM collection Area 7 following sorting. Photo taken August 30, 2022 during waste audit.

Photo 29: Waste collection vehicle unloading waste collected from HRM collection Area 8. Photo taken on August 28, 2022.

Photo 30: Waste audit sample from HRM collection Area 8. Photo collected August 18, 2022.

Photo 31: Yard waste bin separated from HRM collection Area 8. Photo taken August 30, 2022 during waste audit.

Photo 32: Waste sample from HRM collection Area 8 following sorting. Photo taken August 30, 2022 during waste audit.

Photo 33: Waste collection vehicle unloading waste collected from HRM collection Area 9 (Condos). Photo taken on August 22, 2022.

Photo 34: Waste audit sample from HRM collection Area 9 (Condos). Photo collected August 22, 2022.

Photo 35: Food waste bin separated from HRM collection Area 9 (Condos). Photo taken August 30, 2022 during waste audit.

Photo 36: Waste sample from HRM collection Area 9 (Condos) following sorting. Photo taken August 30, 2022 during waste audit.

ATTACHMENT 2
SCALE TICKETS

Halifax Regional Municipality

Scale Slip: 078967
08/23/2022 14:19:57
Clerk: Shelley

Gross Weight: 25,510 (kg)
Tare Weight: 16,520 (kg)
Net Weight: 8,990 (kg)

Total: $0.00
$0.00

Vehicle ID: RE1037
License Plate: 56-926-D
Waste Type: residential
Origin: 1 HALIFAX

Invoice: 0400927
Royal Environmental Group

Halifax Regional Municipality

Scale Slip: 078842
                  08/18/2022 13:30:02
Clerk: JDT

Gross Weight: 22,800 (kg)
Tare Weight: 16,210 (kg)
Net Weight: 6,590 (kg)

Total: $0.00
                  $0.00

Vehicle ID: RE2082
License Plate: 44-088-D
Waste Type: residential
Origin: 2 DARTMOUTH
Invoice: 0400927
                  Royal Environmental Group

Halifax Regional Municipality

Scale Slip: 078883
                  08/19/2022 12:57:49
Clerk: Shelley

Gross Weight: 25,050 (kg)
Tare Weight: 16,460 (kg)
Net Weight: 8,590 (kg)

Vehicle ID: RE1031
License Plate: 55-319-D
Waste Type: residential
Origin: 3 BEDFORD/HAMMONDS PLAINS
Invoice: 0400927
                  Royal Environmental Group

Total: $0.00
                  $0.00

Halifax Regional Municipality

Scale Slip:	078852
	08/18/2022 15:56:44
Clerk:	JDT

Gross Weight:	24,260 (kg)
Tare Weight:	16,800 (kg)
Net Weight:	7,460 (kg)

Vehicle ID:	GFL011
License Plate:	45355D
Waste Type:	residential
Origin:	4 WESTERN COUNTY
Invoice:	0402150
	GFL Environmental Inc

Total:	$0.00
	$0.00

Halifax Regional Municipality

Scale Slip:	078936
	08/22/2022 14:46:13
Clerk:	Shelley

Gross Weight:	22,360 (kg)
Tare Weight:	15,890 (kg)
Net Weight:	6,470 (kg)

Total:	$0.00
	$0.00

ehicle ID:	RE2083
cense Plate:	44-075-D
/aste Type:	residential
rigin:	5 SACKVILLE/FALL RIVER
voice:	0400927
	Royal Environmental Group

Halifax Regional Municipality

Scale Slip:	078980
	08/23/2022 17:34:13
Clerk:	Shelley

Gross Weight:	22,380 (kg)
Tare Weight:	16,450 (kg)
Net Weight:	5,930 (kg)

Vehicle ID: RE1041
License Plate: 57-421-D
Waste Type: residential
Origin: 6 COLE HARBOUR/EASTERN PASSAGE

Invoice: 0400927
Royal Environmental Group

	$0.00
Total:	$0.00

Halifax Regional Municipality

Scale Slip:	078898
	08/19/2022 15:51:09
Clerk:	Shelley
Gross Weight:	27,860 (kg)
Tare Weight:	17,030 (kg)
Net Weight:	10,830 (kg)

Vehicle ID:	MW9524
License Plate:	56246D
Waste Type:	residential
Origin:	PRESTON/LAWRENCETOWN/LAKE ECHO
Invoice:	0188466
	MILLER WASTE SYSTEMS

Total:	$0.00
	$0.00

Halifax Regional Municipality

Vehicle ID: ES8183
License Plate: 51811D
Waste Type: residential
Origin: 8 EASTERN COUNTY

Invoice: 0028092
                EASTERN SHORE CARTAGE

Scale Slip: 078839
                08/18/2022 13:11:24
Clerk: JDT

Gross Weight: 22,810 (kg)
Tare Weight: 16,690 (kg)
Net Weight: 6,120 (kg)

Total: $0.00
                $0.00

Halifax Regional Municipality

Scale Slip: 078927
                  08/22/2022 13:08:15
Clerk: Shelley

Gross Weight: 14,250 (kg)
Tare Weight: 13,870 (kg)
Net Weight: 380 (kg)

Vehicle ID: MW2422
License Plate: 43-098-D
Waste Type: residential
Origin: BEDFORD SACKVILLE CONDOS

Invoice: 0188466
MILLER WASTE SYSTEMS

Total: $0.00
                  $0.00

ATTACHMENT 3
FIELD DATA SHEETS

Performance Audit Record

Date	August 30, 2022		Name of Supervisor	Patrick Avery

Area	1		# of Sorters	8

Weighscale Ticket Information

Truck Number/ID	RE1037	
Collection Area	1	
Date	23-Aug-22	
Ticket Time	14:19	
Gross Weight	25,510	KG
Tare Weight	16,520	KG
Net Weight	8990	KG

Weigth of Gross Sample	196.5	KG		
Weight of Tote Bin	50.5	KG	Date of Audit of Sample	Aug 30. 2022
Net Sample of Trash	146	KG	Sample Audit Time Started	9am
Number of Bulkies Observed	-		Sample Audit Time Completed	9:35am

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	**2**	
Garbage/Residue	50.50	176.80	-	126.30
Fibre - Newsprint/Paper	4.00	2.00	2.40	7.50
		2.80	4.30	
Fibre - OCC	2.00	3.40	4.40	5.80
Food/Putrescible Waste	2.00	2.60	5.00	5.60
Yard Waste	1.00	1.20	-	0.20

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	176.80	50.50	126.30	86.51
Fibre - Newsprint/Paper	11.50	4.00	7.50	5.14
Fibre - OCC	7.80	2.00	5.80	3.97
Food/Putrescible Waste	7.60	2.00	5.60	3.84
Yard Waste	1.20	1.00	0.20	0.14
Lost or Gained Mass	-	-	145.40	0.41

Notes: 0.3 kg added to garbage waste (bag of dog poop) was in yard waste

Several concrete bags with some residue influencing higher Fibre- Newsprint/paper mass

Performance Audit Record

Date   August 30, 2022   **Name of Supervisor**   Patrick Avery

Area   2   **# of Sorters**   7

Weighscale Ticket Information

Truck Number/ID	RE2082
Collection Area	2
Date	18-Aug-22
Ticket Time	13:30
Gross Weight	22800 KG
Tare Weight	16210 KG
Net Weight	6590 KG

Weigth of Gross Sample   186   KG

Weight of Tote Bin   51   KG   **Date of Audit of Sample**   30-Aug

Net Sample of Trash   135   KG   **Sample Audit Time Started**   9:38am

Number of Bulkies Observed   -   **Sample Audit Time Completed**   10:30am

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG) 1	2	Net Sample (KG)
Garbage/Residue	51.00	158.00	-	107
Fibre - Newsprint/Paper	3.00	3.00	4.20	6.80
		2.60	-	
Fibre - OCC	3.00	2.40	1.80	7.10
		5.90	-	
Food/Putrescible Waste	1.00	12.90	-	11.9
Yard Waste	1.00	2.90	-	1.9

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	158.00	51.00	107.00	79.26
Fibre - Newsprint/Paper	9.80	3.00	6.80	5.04
Fibre - OCC	10.10	3.00	7.10	5.26
Food/Putrescible Waste	12.90	1.00	11.90	8.81
Yard Waste	2.90	1.00	1.90	1.41
Lost or Gained Mass	-	-	134.70	0.22

Notes:

Performance Audit Record

Date　　　　　　　　　August 30, 2022　　　　　**Name of Supervisor**　**Patrick Avery**

Area　　　　　　　　　3　　　　　　　　　　　**# of Sorters**　　　8

Weighscale Ticket Information

Truck Number/ID	RE1031	
Collection Area	3	
Date	19-Aug-22	
Ticket Time	12:57	
Gross Weight	25050	KG
Tare Weight	16460	KG
Net Weight	8590	KG

Weigth of Gross Sample　　　154　　　KG

Weight of Tote Bin　　　　51　　　KG　　**Date of Audit of Sample**　　30-Aug

Net Sample of Trash　　　103　　　KG　　**Sample Audit Time Started**　　10:30am

Number of Bulkies Observed　　-　　　　　**Sample Audit Time Completed**　10:55am

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	51.00	134.10	-	83.10
Fibre - Newsprint/Paper	1.00	2.60	-	1.60
Fibre - OCC	3.00	2.00	2.90	5.30
		3.40	-	
Food/Putrescible Waste	2.00	11.00	2.40	11.40
Yard Waste	1.00	2.60	-	1.60

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	134.10	51.00	83.10	80.68
Fibre - Newsprint/Paper	2.60	1.00	1.60	1.55
Fibre - OCC	8.30	3.00	5.30	5.15
Food/Putrescible Waste	13.40	2.00	11.40	11.07
Yard Waste	2.60	1.00	1.60	1.55
Lost or Gained Mass	-	-	103.00	0.00

Notes:　0.1kg subtracted from yard waste - added to garbage (dog poop)

　- Addressed sorters on animal waste proper sorting.

Performance Audit Record

Date	August 30, 2022	Name of Supervisor	Patrick Avery

Area	4	# of Sorters	8

Weighscale Ticket Information

Truck Number/ID	GFL011	
Collection Area	4	
Date	18-Aug-22	
Ticket Time	15:56	
Gross Weight	24260	KG
Tare Weight	16800	KG
Net Weight	7460	KG

Weigth of Gross Sample	181	KG		
Weight of Tote Bin	51	KG	Date of Audit of Sample	30-Aug
Net Sample of Trash	130	KG	Sample Audit Time Started	10:55am
Number of Bulkies Observed	-		Sample Audit Time Completed	11:25am

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	51.00	164.50	-	113.5
Fibre - Newsprint/Paper	1.00	1.70	-	0.7
Fibre - OCC	2.00	1.80	2.30	2.10
Food/Putrescible Waste	2.00	10.00	2.10	10.1
Yard Waste	2.00	2.40	2.80	3.2

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	164.50	51.00	113.50	87.31
Fibre - Newsprint/Paper	1.70	1.00	0.70	0.54
Fibre - OCC	4.10	2.00	2.10	1.62
Food/Putrescible Waste	12.10	2.00	10.10	7.77
Yard Waste	5.20	2.00	3.20	2.46
Lost or Gained Mass	-	-	129.60	0.31

Notes:

Performance Audit Record

Date   August 30, 2022   **Name of Supervisor**   Patrick Avery

Area   5   **# of Sorters**   7

Weighscale Ticket Information

Truck Number/ID	RE2083	
Collection Area	5	
Date	22-Aug-22	
Ticket Time	14:46	
Gross Weight	22360	KG
Tare Weight	15890	KG
Net Weight	6470	KG

Weigth of Gross Sample   175   KG

Weight of Tote Bin   49.5   KG   **Date of Audit of Sample**   30-Aug

Net Sample of Trash   125.5   KG   **Sample Audit Time Started**   11:25qm

Number of Bulkies Observed   -   **Sample Audit Time Completed**   12pm

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	49.50	159.50	-	110
Fibre - Newsprint/Paper	2.00	7.30	1.30	6.6
Fibre - OCC	2.00	2.30	2.90	3.2
Food/Putrescible Waste	1.00	3.70	-	2.7
Yard Waste	1.00	3.60	-	2.6

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	159.50	49.50	110.00	87.65
Fibre - Newsprint/Paper	8.60	2.00	6.60	5.26
Fibre - OCC	5.20	2.00	3.20	2.55
Food/Putrescible Waste	3.70	1.00	2.70	2.15
Yard Waste	3.60	1.00	2.60	2.07
Lost or Gained Mass	-	-	125.10	0.32

Notes:

Performance Audit Record

Date	August 30, 2022		**Name of Supervisor**	Patrick Avery
Area	6		**# of Sorters**	5

Weighscale Ticket Information

Truck Number/ID	RE1041	
Collection Area	6	
Date	23-Aug-22	
Ticket Time	17:34	
Gross Weight	22380	KG
Tare Weight	16450	KG
Net Weight	5930	KG

Weigth of Gross Sample	161.5	KG		
Weight of Tote Bin	49.5	KG	**Date of Audit of Sample**	30-Aug
Net Sample of Trash	112	KG	**Sample Audit Time Started**	12:30pm
Number of Bulkies Observed	-		**Sample Audit Time Completed**	12:50pm

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	49.50	154.50	-	105
Fibre - Newsprint/Paper	1.00	2.40	-	1.4
Fibre - OCC	2.00	2.10	2.50	2.6
Food/Putrescible Waste	1.00	3.70	-	2.7
Yard Waste	0.00	0.00	-	0

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	154.50	49.50	105.00	93.75
Fibre - Newsprint/Paper	2.40	1.00	1.40	1.25
Fibre - OCC	4.60	2.00	2.60	2.32
Food/Putrescible Waste	3.70	1.00	2.70	2.41
Yard Waste	0.00	0.00	0.00	0.00
Lost or Gained Mass	-	-	111.70	0.27

Notes:

Performance Audit Record

Date	August 30, 2022	**Name of Supervisor**	Patrick Avery
Area	7	**# of Sorters**	5

Weighscale Ticket Information

Truck Number/ID	MW9524	
Collection Area	7	
Date	19-Aug-22	
Ticket Time	15:51	
Gross Weight	27860	KG
Tare Weight	17030	KG
Net Weight	10830	KG

Weigth of Gross Sample	197.5	KG	
Weight of Tote Bin	50	KG	**Date of Audit of Sample** 30-Aug
Net Sample of Trash	147.5	KG	**Sample Audit Time Started** 12:50pm
Number of Bulkies Observed	-		**Sample Audit Time Completed** 1:10pm

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	**2**	
Garbage/Residue	50.00	186.00	-	136
Fibre - Newsprint/Paper	2.00	1.80	2.60	2.4
Fibre - OCC	2.00	2.20	3.30	3.5
Food/Putrescible Waste	2.00	4.20	3.30	5.5
Yard Waste	1.00	1.10	-	0.1

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	186.00	50.00	136.00	92.20
Fibre - Newsprint/Paper	4.40	2.00	2.40	1.63
Fibre - OCC	5.50	2.00	3.50	2.37
Food/Putrescible Waste	7.50	2.00	5.50	3.73
Yard Waste	1.10	1.00	0.10	0.07
Lost or Gained Mass	-	-	147.50	0.00

Notes:

Performance Audit Record

Date	August 30, 2022		Name of Supervisor	Patrick Avery
Area	8		# of Sorters	7

Weighscale Ticket Information

Truck Number/ID	ES8183	
Collection Area	8	
Date	18-Aug-22	
Ticket Time	13:11	
Gross Weight	22810	KG
Tare Weight	16690	KG
Net Weight	6120	KG

Weigth of Gross Sample	177	KG		
Weight of Tote Bin	50.5	KG	Date of Audit of Sample	30-Aug
Net Sample of Trash	127.5	KG	Sample Audit Time Started	1:10pm
Number of Bulkies Observed	-		Sample Audit Time Completed	1:40pm

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG) 1	2	Net Sample (KG)
Garbage/Residue	50.50	156.50	-	106
Fibre - Newsprint/Paper	2.00	1.70	1.80	1.5
Fibre - OCC	2.00	2.20	2.40	2.6
Food/Putrescible Waste	1.00	6.70	-	5.7
Yard Waste	2.00	7.30	5.80	11.1

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	156.50	50.50	106.00	83.14
Fibre - Newsprint/Paper	3.50	2.00	1.50	1.18
Fibre - OCC	4.60	2.00	2.60	2.04
Food/Putrescible Waste	6.70	1.00	5.70	4.47
Yard Waste	13.10	2.00	11.10	8.71
Lost or Gained Mass	-	-	126.90	0.47

Notes:

Performance Audit Record

Date   August 30, 2022   **Name of Supervisor**   Patrick Avery

Area   9   **# of Sorters**   8

Weighscale Ticket Information

Truck Number/ID	MW2422
Collection Area	9
Date	22-Aug-22
Ticket Time	13:08
Gross Weight	14250 KG
Tare Weight	13870 KG
Net Weight	380 KG

Weigth of Gross Sample   150.5   KG

Weight of Tote Bin   50.5   KG   **Date of Audit of Sample**   30-Aug

Net Sample of Trash   100   KG   **Sample Audit Time Started**   1:40pm

Number of Bulkies Observed   -   **Sample Audit Time Completed**   2:10pm

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG) 1	2	Net Sample (KG)
Garbage/Residue	50.50	138.00	-	87.5
Fibre - Newsprint/Paper	2.00	4.60	2.10	4.7
Fibre - OCC	2.00	2.80	2.30	3.1
Food/Putrescible Waste	1.00	6.40	-	5.4
Yard Waste	0.00	-	-	0

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	138.00	50.50	87.50	87.5
Fibre - Newsprint/Paper	6.70	2.00	4.70	4.7
Fibre - OCC	5.10	2.00	3.10	3.1
Food/Putrescible Waste	6.40	1.00	5.40	5.4
Yard Waste	0.00	0.00	0.00	0
Lost or Gained Mass	-	-	100.70	-0.7

Notes:

ATTACHMENT 4
SUPPORTING DATA

Waste Collection Area	% Organics From August 30, 2022 Waste Audit	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
1	13.09%	9918.30	1298.31
2	20.52%	6866.42	1408.99
3	19.32%	4358.45	842.05
4	12.39%	5304.70	657.25
5	12.03%	8372.02	1007.15
6	5.98%	5130.17	306.78
7	7.80%	2962.13	231.05
8	16.40%	3383.67	554.92
Condos	13.20%	2627.33	346.81
	TOTAL	48923.19	6653.31

Average	13.41%	-	739.26
Min	5.98%	-	231.05
Max	20.52%	-	1408.99

Compostable Waste Percentage	(6653.31/48923.19)*100% = 13.60%

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Waste Collection Area	% Organics From May 19, 2022 Baseline Audit	% Organics From August 30, 2022 Waste Audit	% Organics Average	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
1	15.40%	13.09%	14.25%	9918.30	1413.36
2	10.44%	20.52%	15.48%	6866.42	1062.92
3	3.87%	19.32%	11.60%	4358.45	505.58
4	3.27%	12.39%	7.83%	5304.70	415.36
5	6.34%	12.03%	9.19%	8372.02	769.39
6	3.39%	5.98%	4.69%	5130.17	240.60
7	3.96%	7.80%	5.88%	2962.13	174.17
8	6.90%	16.40%	11.65%	3383.67	394.20
Condos	10.54%	13.20%	11.87%	2627.33	311.86
			TOTAL	48923.19	5287.45

Average	10.27%	-	587.49
Min	4.69%	-	174.17
Max	15.48%	-	1413.36

Compostable Waste Percentage	(5287.45/48923.19)*100% = 10.81%

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Audit	Waste Collection Area	% Organics	Average Waste Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
May 2022 Initial Performance Audit	1	15.40%	9918.30	1527.42
	2	10.44%	6866.42	716.85
	3	3.87%	4358.45	168.67
	4	3.27%	5304.70	173.46
	5	6.34%	8372.02	530.79
	6	3.39%	5130.17	173.96
	7	3.96%	2962.13	117.30
	8	6.90%	3383.67	233.47
	Condos	10.54%	2627.33	276.92
August 2022 Performance Audit	1	13.09%	9918.30	1298.31
	2	20.52%	6866.42	1408.99
	3	19.32%	4358.45	842.05
	4	12.39%	5304.70	657.25
	5	12.03%	8372.02	1007.15
	6	5.98%	5130.17	306.78
	7	7.80%	2962.13	231.05
	8	16.40%	3383.67	554.92
	Condos	13.20%	2627.33	346.81

Average	10.27%	-	587.34
Min	3.27%	-	117.30
Max	20.52%	-	1527.42

Column1	
Mean	587.3426074
Standard Error	107.7828698
Median	438.797034
Mode	#N/A
Standard Deviation	457.283989
Sample Variance	209108.6466
Kurtosis	-0.321863367
Skewness	0.943581426
Range	1410.117207
Minimum	117.30048
Maximum	1527.417687
Sum	10572.16693
Count	18
Confidence Level(95.0%)	227.4019778
Upper CI	814.7445852
Lower CI	359.9406295

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