



#210 - 211 Horseshoe Lake Drive
Halifax, NS B3S 0B9

T: 902.835.5560 (24/7)

3-A Vincent's Way
Antigonish, NS B2G 2X3

T: 902.863.1465 (24/7)

#E120 - 120 Torbay Road
St. John's, NL A1A 2G8

T: 709.738.8478 (24/7)

June 26, 2023

Mr. Steve Copp
Mirror Nova Scotia Limited

600 Otter Lake Drive
Lakeside, NS B3T 2E2

Dear Mr. Copp,

Re: May 2023 Performance Audit
Otter Lake Waste Processing & Disposal Facility

In May 2023, 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. The audit also captures the incoming percentage of white goods and household hazardous waste (HHW). This letter report provides a summary of the Performance Audit completed on May 17, 2023.

Summary

Based on 10 samples being collected during the May 2023 Performance Audit, the total compostable waste percentage per area ranged from a minimum of 5.00% to a maximum of 39.25%. The total weighted Compostable Waste Percentage for the May 2023 Audit is calculated to be 12.46%.

Using the calculated 95% confidence interval, the percentage of Estimated Annual Compostable Waste is calculated to be between 6.38% and 18.53%. The long-term cumulative goal (i.e., Performance Target) for Otter Lake includes compostable waste not exceeding 10% of the total amount of municipal solid waste landfilled, by mass.

As additional sampling will be completed during future quarterly audits, it is expected that the statistical data will vary as more audit data becomes available.

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) a long term goal of compostable waste not exceeding 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 included 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. White goods and HHW were added to the audits based on comments received from NSECC after their review of the draft Compliance Plan.

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

Methodology

The methodology followed for the May 2023 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; Fall 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.

The Alberta Provincial Waste Characterization Framework (2005) was reviewed and used to guide the number and weight of the samples to be collected. A minimum annual sample number of 40 samples is recommended, and as such, two samples from collection area 1 (Area 1) and one sample from all other

curbside collection areas (Areas 2-8 and Condos), for a total of 10 samples, were assessed as part of the May 2023 Performance Audit.

The selected loads were visually inspected at the tip face 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 6 (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 (Putrescible)	Whole vegetables, fruit, meat, fish, leftover food waste, eggshells, peels, oils, bones, fat, packaged food if most of 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 one of the following:

- Other garbage
- HHW including lead-acid (automotive) batteries, post-consumer paint products, ethylene glycol, used oil, used glycol, used oil filters, glycol containers, and oil containers.
- White goods (items such as toasters, microwaves, and coffee makers that would be mostly composed of metal materials that can be disposed of in garbage bags). It should be noted that the majority of white goods are not marketable from a recycling perspective.

Sorting Procedure

The sorting team consisted of several Mirror staff. All staff were briefed on the sorting protocols, including familiarity with example materials for each sorting category. Strum staff were designated as “Lead” and 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 weighed 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

Previous Performance Audits were completed in May 2022 (report dated June 22, 2022), August 2022 (report dated November 4, 2022), November 2022 (report dated February 2, 2023), and February 2023 (report dated April 6, 2023). Using the combined data collected during the May 2022, August 2022, November 2022, and February 2023 Performance Audits, the total compostable waste percentage ranged from a minimum of 8.90% to a maximum of 15.15%. Using the calculated 95% confidence interval, the percentage of Estimated Annual Compostable Waste was calculated to be between 9.31% and 14.72%, with a total weighted Compostable Waste Percentage value of 12.41%

Further details of the May 2022, August 2022, November 2022, and February 2023 Performance Audits are provided in the above-noted reports.

May 2023 Performance Audit Summary

A summary of the May 2023 Performance Audit completed at Otter Lake is provided below in Table C. As previously mentioned, the May 2023 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: May 2023 Performance Audit Results

Waste Collection Area	Category Percentage (%)							
	Garbage/Residue	HHW	White Goods	Fibre - Newsprint/Paper	Fibre - Corrugated Cardboard	Organics - Food/Putrescible Waste	Organics - Yard Waste	Total Compostable Waste
1-3	88.83%	0.20%	1.32%	3.35%	2.44%	2.94%	0.00%	8.73%
1	85.34%	0.00%	0.21%	3.67%	3.87%	6.18%	0.00%	13.72%
2	86.70%	0.00%	2.66%	5.21%	1.17%	3.72%	0.00%	10.10%
3	80.51%	0.21%	2.26%	2.36%	2.97%	10.56%	0.00%	15.89%
4	73.16%	0.00%	0.00%	1.37%	0.95%	12.42%	11.79%	26.53%
5	92.38%	0.00%	0.18%	2.78%	1.44%	1.97%	0.09%	6.28%
6	91.03%	0.77%	1.20%	1.20%	0.51%	5.04%	0.00%	6.75%
7	93.75%	0.98%	0.00%	1.43%	1.16%	2.41%	0.00%	5.00%
8	88.81%	0.00%	5.08%	2.09%	1.49%	1.79%	0.00%	5.37%
Condos	59.75%	0.00%	0.63%	2.77%	3.40%	32.20%	0.88%	39.25%

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 5.00% (Area 7) to a maximum of 39.25% (Condos), based on the 10 samples collected during the May 2023 Performance Audit.

Overall Compostable Waste

As shown in Table D below, given the May 2023 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 (6194.97 tonnes) and the three-year waste average total (49733.08 tonnes), the weighted Compostable Waste Percentage is calculated to be 12.46%. Supporting data is provided as Table 1 (Attachment 4).

Table D: Estimated Annual Compostable Waste based on May 2023 Data

Waste Collection Area	Three Year Waste Average (Tonnes)	May 2023 Total Compostable Waste	Estimated Annual Compostable Waste (Tonnes)
1	10130.91	11.23%*	1137.70
2	6958.87	10.10%	702.85
3	4479.73	15.89%	711.83
4	5415.09	26.53%	1436.62
5	8615.57	6.28%	541.06
6	5242.25	6.75%	353.85
7	2989.28	5.00%	149.46
8	3408.18	5.37%	183.02
Condos	2493.20	39.25%	978.58
TOTAL	49733.08	N/A	6194.97
Weighted Compostable Waste Percentage = (6194.97/49733.08) X 100 = 12.46%			

Notes:

1. Data used to calculate three year average provided by Mirror and included tonnage from the fiscal years 2020/2021, 2021/2022, and 2022/2023.
2. * May 2023 Total Compostable Waste percentage for Area 1 is based on average of the two samples (1-3 and 1) collected during the May 2023 waste audit.

Based on the data in Table D above, the Estimated Annual Compostable Waste per area ranges from a minimum of 149.46 tonnes (Area 7) to a maximum of 1436.62 tonnes (Area 4), with a mean of 688.33 tonnes.

Descriptive Statistics

A descriptive statistical analysis was completed on the Estimated Annual Compostable Waste tonnage and the Estimated Annual Food/Putrescible Waste calculated per area from the May 2023 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 1 – 4 (Attachment 4).

Compostable Waste

At 95% confidence interval, the Estimated Average Annual Compostable Waste tonnage per area is calculated to be between 352.60 tonnes (lower bound) and 1024.06 tonnes (upper bound). The confidence interval was calculated by subtracting/adding the calculated 95% confidence level (335.73) from the mean (688.33 tonnes).

By multiplying the lower bound (352.60 tonnes) and the upper bound (1024.06) of the 95% confidence interval by nine (for each area), the Total Estimated Annual Compostable Waste would have a calculated range from 3173.40 tonnes to 9216.54 tonnes. By dividing the lower and upper range of the Total Estimated Annual Compostable Waste by the three-year waste average total (49733.08 tonnes), and multiplying the values by 100%, the percentage of Estimated Annual Compostable Waste is calculated to be between 6.38% and 18.53%.

Food/Putrescible Waste

At 95% confidence interval, the Estimated Average Annual Food/Putrescible Waste tonnage per area is calculated to be between 158.98 tonnes (lower bound) and 560.19 tonnes (upper bound). The confidence interval was calculated by subtracting/adding the calculated 95% confidence level (200.61) from the mean (359.58 tonnes).

By multiplying the lower bound (158.98 tonnes) and the upper bound (560.19 tonnes) of the 95% confidence interval by nine (for each area), the Total Estimated Annual Food/Putrescible Waste would have a calculated range from 1430.82 tonnes to 5041.71 tonnes. By dividing the lower and upper range of the Total Estimated Annual Food/Putrescible Waste by the three-year waste average total (49733.08 tonnes), and multiplying the values by 100%, the percentage of Estimated Annual Food/Putrescible Waste is calculated to be between 2.88% and 10.14%. The estimated annual Food Waste percentage is calculated to be 6.51%.

The above noted statistical analyses are based on a total of 10 samples collected during the May 2023 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.

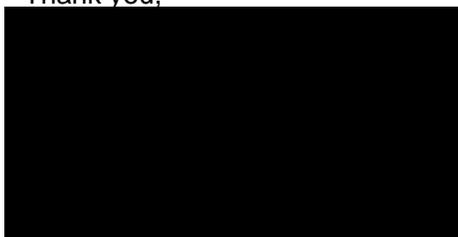
Closure

This report was prepared by [REDACTED], Senior Environmental Geoscientist. 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,



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

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental, or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

The Report is to be treated as confidential and may not be used or relied upon by third parties, except:

- as agreed in writing by Consultant and Client
- as required by law
- for use by governmental reviewing agencies

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss, or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained 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 1-3. Photo taken on May 1, 2023.



Photo 2: Waste audit sample collected from HRM collection Area 1-3. Photo taken on May 17, 2023 during waste audit.



Photo 3: Sorting process and fiber OCC bin of HRM collection Area 1-3. Photo taken May 17, 2023 during waste audit.



Photo 4: Food waste bin sorted from HRM collection Area 1-3. Photo taken May 17, 2023 during waste audit.



Photo 5: Waste collection vehicle unloading waste collected from HRM collection Area 1. Photo taken on May 2, 2023.



Photo 6: Waste audit sample collected from HRM collection Area 1. Photo taken on May 17, 2023 during waste audit.



Photo 7: Sorting process and fiber OCC bin of HRM collection Area 1. Photo taken May 17, 2023 during waste audit.



Photo 8: Newsprint/ paper bin sorted from HRM collection Area 1. Photo taken May 17, 2023 during waste audit.



Photo 9: Waste pile from HRM collections Area 2.
Photo collected May 10, 2023.



Photo 10: Waste audit sample from HRM collection Area 2.
Photo collected May 17, 2023.



Photo 11: Yard waste bin sorted from HRM collection Area 2.
Photo taken on May 17, 2023 during waste audit.



Photo 12: Food waste bin sorted from HRM collection Area 2.
Photo taken May 17, 2023 during waste audit.



Photo 13: Waste collection vehicle unloading waste collected from HRM collection Area 3. Photo taken on May 9, 2023.



Photo 14: Waste audit sample from HRM collection Area 3. Photo collected May 17, 2023 during waste audit.



Photo 15: Paper waste sorted from HRM collection Area 3. Photo collected May 17, 2023 during waste audit.



Photo 16: Food waste sorted from HRM collection Area 3. Photo taken May 17, 2023 during waste audit.



Photo 17: Waste collection vehicle unloading waste collected from HRM collection Area 4. Photo taken on May 9, 2023.



Photo 18: Waste audit sample from HRM collection Area 4. Photo collected May 17, 2023 during waste audit.



Photo 19: Paper waste bin sorted from HRM collection Area 4. Photo taken May 17, 2023 during waste audit.



Photo 20: Food waste bin sorted from HRM collection Area 4. Photo taken May 17, 2023 during waste audit.



Photo 21: Waste collection vehicle unloading waste collected from HRM collection Area 5. Photo taken on May 1, 2023.



Photo 22: Waste audit sample from HRM collection Area 5. Photo collected May 17, 2023.



Photo 23: White goods waste sample from HRM collection Area 5 following sorting. Photo taken May 17, 2023 during waste audit.



Photo 24: Waste sample from HRM collection Area 5 following sorting. Photo taken May 17, 2023 during waste audit.



Photo 25: Waste collection vehicle unloading waste collected from HRM collection Area 6. Photo taken on May 4, 2023.



Photo 26: Waste audit sample collected from HRM collection Area 6. Photo collected May 17, 2023.



Photo 27: Food waste bin separated from HRM collection Area 6. Photo taken May 17, 2023 during waste audit.



Photo 28: Fiber OCC bin separated from HRM collection Area 6. Photo taken May 17, 2023 during waste audit.



Photo 29: Waste collection vehicle unloading waste collected from HRM collection Area 7. Photo taken on May 12, 2023.



Photo 30: Waste from HRM collection Area 7. Photo collected May 17, 2023.



Photo 31: Food waste bin separated from HRM collection Area 7. Photo taken May 17, 2023 during waste audit.



Photo 32: Paper waste sample from HRM collection Area 7 following sorting. Photo taken May 17, 2023 during waste audit.



Photo 33: Waste collection vehicle unloading waste collected from HRM collection Area 8. Photo taken on May 11, 2023.



Photo 34: Waste audit sample from HRM collection Area 8. Photo collected May 17, 2023.



Photo 35: Food waste bin separated from HRM collection Area 8. Photo taken May 17, 2023 during waste audit.



Photo 36: Waste sample from HRM collection Area 8 following sorting. Photo taken May 17, 2023 during waste audit.



Photo 37: Waste collection vehicle unloading waste collected from HRM collection Area 9 (Condos). Photo taken on May 5, 2023.



Photo 38: Waste audit sample from HRM collection Area 9 (Condos). Photo collected May 17, 2023.



Photo 39: Food waste sample from HRM collection Area 9 (Condos) following sorting. Photo taken May 17, 2023 during waste audit.



Photo 40: Food waste sample from HRM collection Area 9 (Condos) following sorting. Photo taken May 17, 2023 during waste audit.

ATTACHMENT 2
SCALE TICKETS

Halifax Regional Municipality

Vehicle ID: RE1032
License Plate: 56-927-D
Waste Type: residential
Origin: 1 HALIFAX

Invoice: 0400927
Royal Environmental Group

Scale Slip: 085459
05/02/2023 12:04:23
Clerk: DMS

Gross Weight: 24,990 (kg)
Tare Weight: 16,600 (kg)
Net Weight: 8,390 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE2099
License Plate: PR41538
Waste Type: residential
Origin: 1 HALIFAX
Invoice: 0400927
Royal Environmental Group

Scale Slip: 085440
05/01/2023 15:29:27
Clerk: DMS

Gross Weight: 22,700 (kg)
Tare Weight: 16,250 (kg)
Net Weight: 6,450 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE2106
License Plate: 44-063-D
Waste Type: residential
Origin: 2 DARTMOUTH
Invoice: 0400927
Royal Environmental Group

Scale Slip: 085663
05/10/2023 12:21:24
DMS

Gross Weight: 24,680 (kg)
Tare Weight: 16,020 (kg)
Net Weight: 8,660 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

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

Scale Slip: 085640
05/09/2023 13:22:57
Clerk: DMS

Gross Weight: 26,650 (kg)
Tare Weight: 16,510 (kg)
Net Weight: 10,140 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: GFL014
License Plate: 45360D
Waste Type: residential
Origin: 4 WESTERN COUNTY
Invoice: 0402150
GFL Environmental Inc

Scale Slip: 085639
05/09/2023 13:21:00
Clerk: DMS

Gross Weight: 25,260 (kg)
Tare Weight: 16,660 (kg)
Net Weight: 8,600 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE2105
License Plate: 44-096-D
Waste Type: residential
Origin: 5 SACKVILLE/FALL RIVER
Invoice: 0400927
Royal Environmental Group

Scale Slip: 085437
05/01/2023 14:25:25
Clerk: DMS

Gross Weight: 19,750 (kg)
Tare Weight: 16,160 (kg)
Net Weight: 3,590 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE2104
License Plate: 44-091-D
Waste Type: residential
Origin: 6 COLE HARBOUR/EASTERN PASSAGE
Invoice: 0400927
Royal Environmental Group

Scale Slip: 085541
05/04/2023 13:04:00
Clerk: Shelley

Gross Weight: 25,430 (kg)
Tare Weight: 15,990 (kg)
Net Weight: 9,440 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: MW9519
License Plate: 56245D
Waste Type: residential
Origin: PRESTON/LAWRENCETOWN/LAKE ECHO
Voice: 0188466
MILLER WASTE SYSTEMS

Scale Slip: 085736
05/12/2023 14:21:34
Clerk: Shelley

Gross Weight: 28,490 (kg)
Tare Weight: 17,270 (kg)
Net Weight: 11,220 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: ES4038
License Plate: 48770D
Waste Type: residential
Origin: 8 EASTERN COUNTY
Invoice: 0028092
EASTERN SHORE CARTAGE

Scale Slip: 085695
05/11/2023 13:30:38
Clerk: Shelley

Gross Weight: 20,060 (kg)
Tare Weight: 15,630 (kg)
Net Weight: 4,430 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: MW4105
License Plate: 59-703-D
Waste Type: residential
Origin: BEDFORD SACKVILLE CONDOS
Invoice: 0188466
MILLER WASTE SYSTEMS

Scale Slip: 085564
05/05/2023 12:00:00
Clerk: Shelley

Gross Weight: 20,060 (kg)
Tare Weight: 17,460 (kg)
Net Weight: 2,600 (kg)

Total: \$0.00
\$0.00

ATTACHMENT 3
FIELD DATA SHEETS

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Patrick Avery, Callum Drever

Area Area 1 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	RE1032	
Collection Area	Halifax	
Date	02-May-23	
Ticket Time	12:04	
Gross Weight	24,990	KG
Tare Weight	16,600	KG
Net Weight	8390	KG

Weight of Gross Sample 146 **KG**

Weight of Tote Bin 50.5 **KG** **Date of Audit of Sample** 17-May-23

Net Sample of Trash 95.5 **KG** **Sample Audit Time Started** 9:35am

Number of Bulkies Observed - **Sample Audit Time Completed** 10:00am

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.50	132.00	-	81.50
Fibre - Newsprint/Paper	2.20	3.30	2.40	3.50
Fibre - OCC	2.20	3.00	2.90	3.70
Food/Putrescible Waste	1.10	7.00	-	5.90
Yard Waste	0.00	-	-	0.00
HSW	0.00	-	-	0.00
White Goods	1.10	1.30	-	0.20

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	132.00	50.50	81.50	85.340
Fibre - Newsprint/Paper	5.70	2.20	3.50	3.665
Fibre - OCC	5.90	2.20	3.70	3.874
Food/Putrescible Waste	7.00	1.10	5.90	6.178
Yard Waste	0.00	0.00	0.00	0.000
HHW	0.00	0.00	0.00	0.000
White Goods	1.30	1.10	0.20	0.209
Lost or Gained Mass	Combined Weight Following Sorting			-0.342
	145.50			

Notes:

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Callum Drever

Area Area 2 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	RE2106
Collection Area	Dartmouth
Date	10-May-23
Ticket Time	12:21
Gross Weight	24,680
Tare Weight	16,020
Net Weight	8660

KG
KG
KG

Weight of Gross Sample 145 KG
Weight of Tote Bin 51 KG **Date of Audit of Sample** 17-May-23
Net Sample of Trash 94 KG **Sample Audit Time Started** 10:25am
Number of Bulkies Observed - **Sample Audit Time Completed** 11:00am

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	51.00	132.50	-	81.50
Fibre - Newsprint/Paper	2.20	3.10	4.00	4.90
Fibre - OCC	2.20	1.40	1.90	1.10
Food/Putrescible Waste	1.10	4.60	-	3.50
Yard Waste	0.00	-	-	0.00
HSW	0.00	-	-	0.00
White Goods	1.10	3.60	-	2.50

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	132.50	51.00	81.50	86.702
Fibre - Newsprint/Paper	7.10	2.20	4.90	5.213
Fibre - OCC	3.30	2.20	1.10	1.170
Food/Putrescible Waste	4.60	1.10	3.50	3.723
Yard Waste	0.00	0.00	0.00	0.000
HHW	0.00	0.00	0.00	0.000
White Goods	3.60	1.10	2.50	2.660
Lost or Gained Mass	Combined Weight Following Sorting			-0.34
	144.50			

Notes:

Performance Audit Record

Date May 17, 2023

Name of Supervisor Callum Drever

Area Area 3

Number of Sorters 6

Weighscale Ticket Information

Truck Number/ID	RE1031	
Collection Area	Bedford / Hammonds Plains	
Date	09-May-23	
Ticket Time	13:22	
Gross Weight	26,650	KG
Tare Weight	16,510	KG
Net Weight	10140	KG

Weight of Gross Sample 148.5 KG

Weight of Tote Bin 51 KG

Date of Audit of Sample 17-May-23

Net Sample of Trash 97.5 KG

Sample Audit Time Started 11:00am

Number of Bulkies Observed -

Sample Audit Time Completed 11:30am

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1 (Black)	2 (Clear)	
Garbage/Residue	51.00	68.00	61.50	78.50
Fibre - Newsprint/Paper	3.30	1.30	1.50 2.80	2.30
Fibre - OCC	2.20	-	3.50 1.60	2.90
Food/Putrescible Waste	3.30	1.20	7.70 4.70	10.30
Yard Waste	0.00	-	-	0.00
HSW	1.10	-	1.30	0.20
White Goods	1.10	-	3.30	2.20

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	129.50	51.00	78.50	80.513
Fibre - Newsprint/Paper	5.60	3.30	2.30	2.359
Fibre - OCC	3.50	2.20	2.90	2.974
Food/Putrescible Waste	13.60	3.30	10.30	10.564
Yard Waste	0.00	0.00	0.00	0.000
HHW	1.30	1.10	0.20	0.205
White Goods	3.30	1.10	2.20	2.256
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	148.50			

Notes: Columns added for extra sorted bins due to this sample being split in to Black and clear for the monthly Waste audit.

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Callum Drever

Area Area 4 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	GFL014	
Collection Area	Western County	
Date	09-May-23	
Ticket Time	13:21	
Gross Weight	25,260	KG
Tare Weight	16,660	KG
Net Weight	8600	KG

Weight of Gross Sample 146 KG

Weight of Tote Bin 51 KG **Date of Audit of Sample** 17-May-23

Net Sample of Trash 95 KG **Sample Audit Time Started** 11:30am

Number of Bulkies Observed - **Sample Audit Time Completed** 12:00pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	51.00	120.50	-	69.50
Fibre - Newsprint/Paper	2.20	3.50	-	1.30
Fibre - OCC	2.20	1.80	1.30	0.90
Food/Putrescible Waste	1.10	12.90	-	11.80
Yard Waste	5.60	16.80	-	11.20
HSW	0.00	-	-	0.00
White Goods	0.00	-	-	0.00

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	120.50	51.00	69.50	73.158
Fibre - Newsprint/Paper	3.50	2.20	1.30	1.368
Fibre - OCC	3.10	2.20	0.90	0.947
Food/Putrescible Waste	0.00	0.00	11.80	12.421
Yard Waste	0.00	0.00	11.20	11.789
HHW	0.00	0.00	0.00	0.000
White Goods	0.00	0.00	0.00	0.000
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	146.00			

Notes: Yard waste weighed on empty black tote (5.6 kg).

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Callum Drever

Area Area 5 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	RE2105
Collection Area	Sackville / Fall River
Date	01-May-23
Ticket Time	14:25
Gross Weight	19,750 KG
Tare Weight	16,160 KG
Net Weight	3590 KG

Weight of Gross Sample 161.5 KG

Weight of Tote Bin 50 KG **Date of Audit of Sample** 17-May-23

Net Sample of Trash 111.5 KG **Sample Audit Time Started** 12:30pm

Number of Bulkies Observed - **Sample Audit Time Completed** 12:55pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.00	153.00	-	103.00
Fibre - Newsprint/Paper	2.20	5.30	-	3.10
Fibre - OCC	2.20	3.80	-	1.60
Food/Putrescible Waste	1.10	3.30	-	2.20
Yard Waste	1.10	1.20	-	0.10
HSW	0.00	-	-	0.00
White Goods	1.10	1.30	-	0.20

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	153.00	50.00	103.00	92.377
Fibre - Newsprint/Paper	5.30	2.20	3.10	2.780
Fibre - OCC	3.80	2.20	1.60	1.435
Food/Putrescible Waste	0.00	0.00	2.20	1.973
Yard Waste	1.30	1.10	0.10	0.090
HHW	0.00	0.00	0.00	0.000
White Goods	1.30	1.10	0.20	0.179
Lost or Gained Mass	Combined Weight Following Sorting			-0.310
	161.00			

Notes: Small rat ran out of gross pile after being weighed.

Both fibre samples weighed with two blue totes (1.1kg) stacked on top of eachother.

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Callum Drever

Area 6 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	RE2104
Collection Area	Cole Harbour / Eastern Passage
Date	04-May-23
Ticket Time	13:04
Gross Weight	25,430 KG
Tare Weight	15,990 KG
Net Weight	9440 KG

Weight of Gross Sample 166.5 KG

Weight of Tote Bin 49.5 KG **Date of Audit of Sample** 17-May-23

Net Sample of Trash 117 KG **Sample Audit Time Started** 12:55pm

Number of Bulkies Observed - **Sample Audit Time Completed** 1:20pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	49.50	156.00	-	106.50
Fibre - Newsprint/Paper	1.10	2.50	-	1.40
Fibre - OCC	1.10	1.70	-	0.60
Food/Putrescible Waste	1.10	7.00	-	5.90
Yard Waste	0.00	-	-	0.00
HSW	1.10	2.00	-	0.90
White Goods	1.10	2.50	-	1.40

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	156.00	49.50	106.50	91.026
Fibre - Newsprint/Paper	2.50	1.10	1.40	1.197
Fibre - OCC	1.70	1.10	0.60	0.513
Food/Putrescible Waste	7.00	1.10	5.90	5.043
Yard Waste	0.00	0.00	0.00	0.000
HHW	2.00	1.10	0.90	0.769
White Goods	2.50	1.10	1.40	1.197
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	166.50			

Notes:

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Callum Drever

Area Area 7 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	MW9519
Collection Area	Preston/Lawrencetown/ Lake Echo
Date	12-May-23
Ticket Time	14:21
Gross Weight	28,490 KG
Tare Weight	17,270 KG
Net Weight	11220 KG

Weight of Gross Sample 162 KG

Weight of Tote Bin 50 KG **Date of Audit of Sample** 17-May-23

Net Sample of Trash 112 KG **Sample Audit Time Started** 1:20pm

Number of Bulkies Observed - **Sample Audit Time Completed** 1:45pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.00	155.00	-	105.00
Fibre - Newsprint/Paper	1.10	2.70	-	1.60
Fibre - OCC	1.10	2.40	-	1.30
Food/Putrescible Waste	1.10	3.80	-	2.70
Yard Waste	0.00	-	-	0.00
HSW	1.10	2.20	-	1.10
White Goods	0.00	-	-	0.00

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	155.00	50.00	105.00	93.750
Fibre - Newsprint/Paper	2.70	1.10	1.60	1.429
Fibre - OCC	2.40	1.10	1.30	1.161
Food/Putrescible Waste	3.80	1.10	2.70	2.411
Yard Waste	0.00	0.00	0.00	0.000
HHW	2.20	1.10	1.10	0.982
White Goods	0.00	0.00	0.00	0.000
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	162.00			

Notes:

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Callum Drever

Area Area 8 **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	ES4038
Collection Area	Eastern County
Date	11-May-23
Ticket Time	13:30
Gross Weight	20,060
Tare Weight	15,630
Net Weight	4430

KG
KG
KG

Weight of Gross Sample 117 KG
Weight of Tote Bin 50 KG **Date of Audit of Sample** 17-May-23
Net Sample of Trash 67 KG **Sample Audit Time Started** 1:45pm
Number of Bulkies Observed - **Sample Audit Time Completed** 2:10pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.00	109.50	-	59.50
Fibre - Newsprint/Paper	2.20	3.60	-	1.40
Fibre - OCC	1.10	2.10	-	1.00
Food/Putrescible Waste	1.10	2.30	-	1.20
Yard Waste	0.00	-	-	0.00
HSW	0.00	-	-	0.00
White Goods	1.10	4.50	-	3.40

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	109.50	50.00	59.50	88.806
Fibre - Newsprint/Paper	3.60	2.20	1.40	2.090
Fibre - OCC	2.10	1.10	1.00	1.493
Food/Putrescible Waste	2.30	1.10	1.20	1.791
Yard Waste	0.00	0.00	0.00	0.000
HHW	0.00	0.00	0.00	0.000
White Goods	4.50	1.10	3.40	5.075
Lost or Gained Mass	Combined Weight Following Sorting			-0.427
	116.50			

Notes:

Performance Audit Record

Date May 17, 2023 **Name of Supervisor** Callum Drever

Area Area 9 (Condos) **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	MW4105
Collection Area	Bedford Sackville Condos
Date	05-May-23
Ticket Time	12:00
Gross Weight	20,060
Tare Weight	17,460
Net Weight	2600

KG
KG
KG

Weight of Gross Sample 130 KG

Weight of Tote Bin 50.5 KG **Date of Audit of Sample** 17-May-23

Net Sample of Trash 79.5 KG **Sample Audit Time Started** 2:10pm

Number of Bulkies Observed - **Sample Audit Time Completed** 2:30pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)			Net Sample (KG)
		1	2	3	
Garbage/Residue	50.50	98.00	-	-	47.50
Fibre - Newsprint/Paper	2.20	1.80	2.60	-	2.20
Fibre - OCC	2.20	2.20	2.70	-	2.70
Food/Putrescible Waste	3.30	13.40	7.40	8.10	25.60
Yard Waste	1.10	1.80	-	-	0.70
HSW	0.00	-	-	-	0.00
White Goods	1.10	1.60	-	-	0.50

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	98.00	50.50	47.50	59.748
Fibre - Newsprint/Paper	4.40	2.20	2.20	2.767
Fibre - OCC	4.90	2.20	2.70	3.396
Food/Putrescible Waste	20.80	3.30	25.60	32.201
Yard Waste	1.80	1.10	0.70	0.881
HHW	0.00	0.00	0.00	0.000
White Goods	1.60	1.10	0.50	0.629
Lost or Gained Mass	Combined Weight Following Sorting			-0.385
	129.50			

Notes:

ATTACHMENT 4
SUPPORTING DATA

Table 1: Total Compostable Waste Percentage Per Area (May 2023)

Project # 22-8641

Waste Collection Area	% Organics From May 17, 2023 Waste Audit	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
1	11.23%	10130.91	1137.70
2	10.10%	6958.87	702.85
3	15.89%	4479.73	711.83
4	26.53%	5415.09	1436.62
5	6.28%	8615.57	541.06
6	6.75%	5242.25	353.85
7	5.00%	2989.28	149.46
8	5.37%	3408.18	183.02
Condos	39.25%	2493.20	978.58
TOTAL		49733.08	6194.97

Mean	14.04%	-	688.33
Min	5.00%	-	149.46
Max	39.25%	-	1436.62

Compostable Waste Percentage	$(6194.97/49733.08)*100\% = 12.46\%$
-------------------------------------	--------------------------------------

Notes: % Organic for Area 1 based on average of the two samples (1-3 and 1) collected during the May 2023 waste audit.

Table 2: Compostable Waste Descriptive Statistics

Project 22-8641

Mean	688.330386
Standard Error	145.5910478
Median	702.84587
Mode	#N/A
Standard Deviation	436.7731434
Sample Variance	190770.7788
Kurtosis	-0.715405452
Skewness	0.401379144
Range	1287.159377
Minimum	149.464
Maximum	1436.623377
Sum	6194.973474
Count	9
Confidence Level(95.0%)	335.7335583
Upper CI	1024.063944
Lower CI	352.5968277

Table 3: Total Food Waste Percentage Per Area (May 2023)

Project # 22-8641

Waste Collection Area	% Food Waste From May 17, 2023 Waste Audit	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Food Waste (Tonnes)
1	4.56%	10130.91	461.97
2	3.72%	6958.87	258.87
3	10.56%	4479.73	473.06
4	12.42%	5415.09	672.55
5	1.97%	8615.57	169.73
6	5.04%	5242.25	264.21
7	2.41%	2989.28	72.04
8	1.79%	3408.18	61.01
Condos	32.20%	2493.20	802.81
TOTAL		49733.08	3236.25

Mean	8.30%	-	359.58
Min	1.79%	-	61.01
Max	32.20%	-	802.81

Food Waste Percentage	$(3236.25/49733.08) * 100\% = 6.51\%$
------------------------------	---------------------------------------

Notes: % Food Waste for Area 1 is based on average of the two samples (1-3 and 1) collected during the May 2023 waste audit.

Table 4: Food Waste Descriptive Statistics

Project 22-8641

Mean		359.5830806
Standard Error		86.99249961
Median		264.2094
Mode	#N/A	
Standard Deviation		260.9774988
Sample Variance		68109.25489
Kurtosis		-0.833730952
Skewness		0.552790329
Range		741.803978
Minimum		61.006422
Maximum		802.8104
Sum		3236.247725
Count		9
Confidence Level(95.0%)		200.6050638
Upper CI		560.1881444
Lower CI		158.9780167