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September 24, 2024

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

Dear Mr. Copp,

Re: August 2024 Performance Audit
Otter Lake Waste Processing & Disposal Facility

In August 2024, 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 Quarterly Performance Audit is 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 August 28, 2024.

SUMMARY

Based on 10 samples being collected during the August 2024 Performance Audit, the total compostable waste percentage per area ranged from a minimum of 1.79% to a maximum of 15.00%. The total weighted Compostable Waste Percentage for the August 2024 Audit is calculated to be 6.47%.

Using the combined data collected during the May 2024 and August 2024 Performance Audits, the total compostable waste percentage ranged from a minimum of 6.16% to a maximum of 43.25%. For the two quarterly audits completed to date, using the calculated 95% confidence interval, the percentage of Estimated Annual Compostable Waste is calculated to be between 6.49% and 15.63%, with a total weighted Compostable Waste Percentage value of 11.06%. 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. In September 2023, NSECC approved the following timeline for working towards this long-term Performance Target of maximum per cent compostable waste in the garbage stream:

- March 31, 2024 - 11.61% Compostable Waste
- March 31, 2025 - 10.81% Compostable Waste
- March 31, 2026 - 10.0% Compostable Waste

The Compliance Plan outlines how Quarterly Performance Audits will be completed as a means to quantify the presence of compostable waste being received in the residential waste stream 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.

METHODOLOGY

The methodology followed for the August 2024 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 will 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 2 and one sample from all other curbside collection areas (Areas 1, 3-8, and Condos), for a total of 10 samples, were assessed as part of the August 2024 Performance Audit. To avoid skewing the annual data, any duplicate samples are averaged to give a single value per area for each audit.

The selected loads were visually inspected at the tip face upon arrival and photographs were taken as shown in the attached photo log (Attachment 1). 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 1 (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 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 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

A baseline was developed through previous Performance Audits that were completed for the 2022/23 fiscal year 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 2022/23 quarterly Performance Audits, the total weighted Compostable Waste Percentage value of 12.41% was found.

Performance Audits for the 2023/24 fiscal year began in May 2023 (report dated June 26, 2023), with additional audits completed in August 2023 (report dated October 30, 2023), November 2023 (report dated January 9, 2024), and February 2024 (report dated March 18, 2024). Using the combined data collected during the 2023/24 quarterly Performance Audits, the total weighted Compostable Waste Percentage value of 11.64% was found.

Performance Audits for the 2024/25 fiscal year began in May 2024 (report dated June 18, 2024). During the May 2024 audit, the total compostable waste percentage ranged from a minimum of 6.51% to a maximum of 72.35%. Using the calculated 95% confidence interval, the percentage of Estimated Annual Compostable Waste was calculated to be between 7.41% and 23.87%, with a total weighted Compostable Waste Percentage value of 15.64% for the first quarter.

AUGUST 2024 PERFORMANCE AUDIT SUMMARY

A summary of the August 2024 Performance Audit completed at Otter Lake is provided below in Table C. The August 2024 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 2024 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	91.50%	0.00%	0.92%	1.96%	1.44%	3.92%	0.00%	7.32%
2A	92.99%	0.00%	0.64%	1.53%	2.42%	1.40%	0.00%	5.35%
2B	90.34%	0.00%	2.07%	1.38%	2.48%	2.62%	0.41%	6.90%
3	93.51%	0.32%	0.00%	1.41%	1.30%	3.14%	0.11%	5.95%
4	89.41%	0.00%	3.40%	1.05%	2.22%	3.66%	0.00%	6.93%
5	87.46%	0.00%	4.43%	0.97%	1.41%	5.19%	0.00%	7.57%
6	95.81%	0.00%	0.00%	1.36%	1.68%	1.26%	0.00%	4.29%
7	95.85%	0.00%	0.37%	1.29%	1.20%	0.83%	0.09%	3.41%
8	90.53%	0.00%	7.58%	0.32%	0.53%	0.95%	0.00%	1.79%
Condos	81.82%	0.23%	2.50%	6.14%	4.43%	4.43%	0.00%	15.00%

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 1.79% (Area 8) to a maximum of 15.00% (Condos), based on the 10 samples collected during the August 2024 Performance Audit.

Average Total Compostable Waste Percentage

A summary of the Total Compostable Waste percentage for the May 2024 and August 2024 Performance Audits 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

Waste Collection Area	Three Year Waste Average (Tonnes)	May 2024 Total Compostable Waste	August 2024 Total Compostable Waste	Average Total Compostable Waste Per Area
1	10014.25	18.71%*	7.32%	13.01%
2	6841.50	9.95%	6.12%**	8.04%
3	4433.34	18.36%	5.95%	12.15%
4	5334.37	6.51%	6.93%	6.72%
5	8637.86	11.78%	7.57%	9.67%
6	5150.89	11.26%	4.29%	7.78%
7	2930.93	8.91%	3.41%	6.16%
8	3298.51	11.76%	1.79%	6.78%
Condos	2351.13	72.35%	15.00%	43.68%

Notes:

1. Data used to calculate three-year average provided by Mirror and included tonnage from the fiscal years 2021/2022, 2022/2023, and 2023/2024.
2. *May 2024 Total Compostable Waste percentage for Area 1 is based on average of the two samples (1A and 1B) collected during the May 2024 waste audit.
3. ** August 2024 Total Compostable Waste percentage for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

Based on the data in Table D above, the average total compostable waste percentage ranges from a minimum of 6.16% (Area 7) to a maximum of 43.68% (Condos).

Overall Compostable Waste

August 2024

As shown in Table E below, given the August 2024 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 (3171.64 tonnes) and the three-year waste average total (48,992.77 tonnes), the weighted Compostable Waste Percentage is calculated to be 6.47%. Supporting data is provided as Table 1 (Attachment 4).

Table E: Estimated Annual Compostable Waste based on August 2024 Data

Waste Collection Area	Three Year Waste Average (Tonnes)	August 2024 Total Compostable Waste	Estimated Annual Compostable Waste (Tonnes)
1	10014.25	7.32%	733.07
2	6841.50	6.12%*	418.93
3	4433.34	5.95%	263.60
4	5334.37	6.93%	369.57
5	8637.86	7.57%	653.68
6	5150.89	4.29%	221.14
7	2930.93	3.41%	99.95
8	3298.51	1.79%	59.03
Condos	2351.13	15.00%	352.67
TOTAL	**48992.77**	**N/A**	**3171.64**
Weighted Compostable Waste Percentage = (3171.64/48992.77) X 100 = 6.47%			

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. *August 2024 Total Compostable Waste percentage for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

Based on the data in Table E above, the Estimated Annual Compostable Waste per area ranges from a minimum of 59.03 tonnes (Area 8) to a maximum of 733.07 tonnes (Area 1), with a mean of 352.40 tonnes.

May 2024, and August 2024

As shown in Table F below, given the average (May 2024 and August 2024) 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 (5417.38 tonnes) and the three-year waste average total (48,992.77 tonnes), the weighted Compostable Waste Percentage is calculated to be 11.06%. Supporting data is provided as Table 2 (Attachment 4).

Table F: Estimated Annual Compostable Waste – May 2024 and August 2024

Waste Collection Area	Three Year Waste Average (Tonnes)	Three Year Waste Average (% Total)	Average Total Compostable % Per Area	Estimated Annual Compostable Waste (Tonnes)
1	10014.25	20.44%	13.01%	1303.31
2	6841.50	13.96%	8.04%	549.97
3	4433.34	9.05%	12.15%	538.80
4	5334.37	10.89%	6.72%	358.34
5	8637.86	17.63%	9.67%	835.46
6	5150.89	10.51%	7.78%	400.50
7	2930.93	5.98%	6.16%	180.58
8	3298.51	6.73%	6.78%	223.54
Condos	2351.13	4.80%	47.21%	1026.89
TOTAL	**48992.77**	**100.00%**	**N/A**	**5417.38**
Compostable Waste Percentage = (5417.38/48992.77) X 100 = 11.06%				

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.

Based on the data in Table F above, the Estimated Annual Compostable Waste per area ranges from a minimum of 180.58 tonnes (Area 7) to a maximum of 1303.31 tonnes (Area 1), with a mean of 611.15 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 August 2024 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 353.23 tonnes (lower bound) and 850.63 tonnes (upper bound). The confidence interval was calculated by subtracting/adding the calculated 95% confidence level (248.70) from the mean (601.93 tonnes).

By multiplying the lower bound (353.23 tonnes) and the upper bound (850.63 tonnes) of the 95% confidence interval by nine (for each area), the Total Estimated Annual Compostable Waste would have a calculated range of 3179.10 tonnes to 7655.67 tonnes. By dividing the lower and upper range of the Total Estimated Annual Compostable Waste by the three-year waste average total (48,992.77 tonnes), and multiplying the values by 100%, the percentage of Estimated Annual Compostable Waste is calculated to be between 6.49% and 15.63%.

Food/Putrescible Waste

At 95% confidence interval, the Estimated Average Annual Food/Putrescible Waste tonnage per area is calculated to be between 155.46 tonnes (lower bound) and 492.71 tonnes (upper bound). The confidence interval was calculated by subtracting/adding the calculated 95% confidence level (168.63) from the mean (324.08 tonnes).

By multiplying the lower bound (155.46 tonnes) and the upper bound (492.71 tonnes) of the 95% confidence interval by nine (for each area), the Total Estimated Annual Food/Putrescible Waste would have a calculated range from 1399.13 tonnes to 4434.40 tonnes. By dividing the lower and upper range of the Total Estimated Annual Food/Putrescible Waste by the three-year waste average total (48,992.77 tonnes), and multiplying the values by 100%, the percentage of Estimated Annual Food/Putrescible Waste is calculated to be between 2.86% and 9.05%. The estimated annual Food Waste percentage is calculated to be 5.95%. Supporting data is provided as Table 6 (Attachment 4).

The above noted statistical analyses are based on a total of 20 samples collected during the May 2024 and August 2024 Performance Audits. 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], and was reviewed by [redacted]. 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,

[redacted]

[redacted]

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.

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

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ATTACHMENT 1
PHOTOGRAPH LOG

Photo 1: Waste audit sample collected from HRM collection Area 1.
Photo taken on August 23, 2024.

Photo 2: Food waste sample collected from HRM collection Area 1.
Photo taken on August 28, 2024, during waste audit.

Photo 3: Newsprint/paper waste bin of HRM collection Area 1.
Photo taken on August 28, 2024, during waste audit.

Photo 4: OCC waste bin sorted from HRM collection Area 1.
Photo taken on August 28, 2024, during waste audit.

Photo 5: Waste collection vehicle unloading waste collected from HRM Area 2A. Photo taken on August 12, 2024.

Photo 6: Waste audit sample from HRM collection Area 2A (extra load). Photo taken on May 15, 2024, during waste audit.

Photo 7: Newsprint/paper collected from HRM collection Area 2A (extra load). Photo taken on August 28, 2024, during waste audit.

Photo 8: Newsprint/paper collected from HRM collection Area 2A (extra load). Photo taken on August 28, 2024, during waste audit.

Photo 9: Waste collection pile from HRM collection Area 2B.
Photo taken on August 15, 2024.

Photo 10: Waste audit sample collected from HRM collection Area 2B (extra load).
Photo taken on August 28, 2024, during waste audit.

Photo 11: Cardboard waste bin of HRM collection Area 2B (extra load).
Photo taken on August 28, 2024, during waste audit.

Photo 12: White goods waste bin sorted from HRM collection Area 2B (extra load).
Photo taken on August 28, 2024, during waste audit.

Photo 13: Waste collection vehicle unloading waste collected from HRM Area 3. Photo collected August 13, 2024.

Photo 14: Yard waste sample from HRM collection Area 3. Photo taken on August 28, 2024, during waste audit.

Photo 15: OCC waste bin sorted from HRM collection Area 3. Photo taken on August 28, 2024, during waste audit.

Photo 16: Food waste bin sorted from HRM collection Area 3. Photo taken on August 28, 2024, during waste audit.

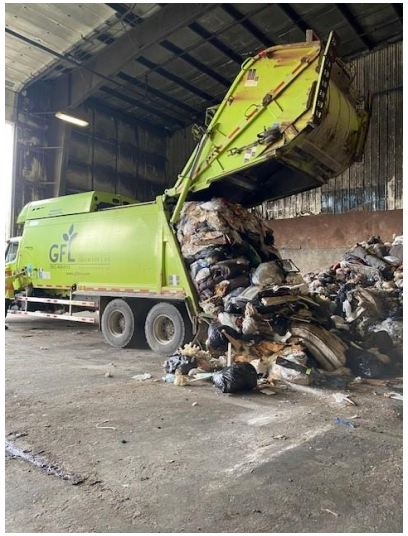

Photo 17: Waste collection vehicle unloading waste collected from HRM Area 4.
Photo taken on August 14, 2024.

Photo 18: Waste audit sample from HRM collection Area 4.
Photo taken on August 28, 2024, during waste audit.

Photo 19: Food waste sorted from HRM collection Area 4.
Photo taken on August 28, 2024, during waste audit.

Photo 20: White goods waste sorted from HRM collection Area 4.
Photo taken on August 28, 2024, during waste audit.

Photo 21: Waste pile HRM collection Area 5.
Photo taken on August 22, 2024.

Photo 22: Waste audit sample from HRM collection Area 5.
Photo taken on August 28, 2024, during waste audit.

Photo 23: White goods waste bin sorted from HRM collection Area 5.
Photo taken on August 28, 2024, during waste audit.

Photo 24: Food waste bin sorted from HRM collection Area 5.
Photo taken on August 28, 2024, during waste audit.

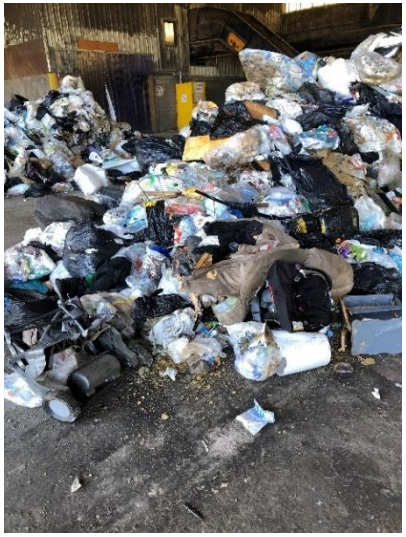

Photo 25: Waste collection pile from HRM Area 6.
Photo taken on August 23, 2024.

Photo 26: Food waste bin separated from HRM collection Area 6.
Photo taken on August 28, 2024, during waste audit.

Photo 27: HHW waste bin separated from HRM collection Area 6.
Photo taken on August 28, 2024, during waste audit.

Photo 28: Newsprint/paper waste bin separated from HRM collection Area 6.
Photo taken on August 28, 2024, during waste audit.

Photo 29: Waste collection vehicle unloading waste collected from HRM Area 7.
Photo taken on August 13, 2024.

Photo 30: Waste audit sample from HRM collection Area 7.
Photo taken on August 28, 2024, during waste audit.

Photo 31: Food waste bin separated from HRM collection Area 7.
Photo taken on August 28, 2024, during waste audit.

Photo 32: White goods waste bin sample from HRM collection Area 7.
Photo taken on August 28, 2024, during waste audit.

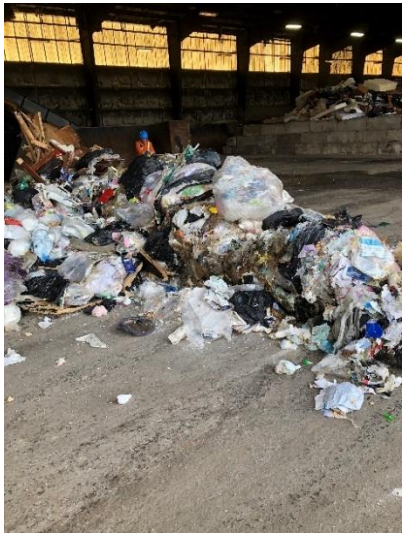

Photo 33: Waste audit sample from HRM collection Area 8.
Photo taken on August 15, 2024.

Photo 34: OCC waste sample from HRM collection Area 8 following sorting.
Photo taken on August 28, 2024, during waste audit.

Photo 35: Food waste bin separated from HRM collection Area 8.
Photo taken on August 28, 2024, during waste audit.

Photo 36: White goods waste sample from HRM collection Area 8 following sorting.
Photo taken on August 28, 2024, during waste audit.

Photo 37: Waste audit sample from HRM collection Area 9 (Condos). Photo taken on August 16, 2024.

Photo 38: HHW sample from HRM collection Area 9 (Condos) following sorting. Photo taken on August 28, 2024, during waste audit.

Photo 39: White goods sample from HRM collection Area 9 (Condos) following sorting. Photo taken on August 28, 2024, during waste audit.

Photo 40: OCC waste sample from HRM collection Area 9 (Condos) following sorting. Photo taken on August 28, 2024, during waste audit.

ATTACHMENT 2
SCALE TICKETS

Halifax Regional Municipality

Scale Slip: 096835
08/23/2024 11:34:20
Clerk: DMS

Vehicle ID: RE1044
License Plate: 57-424-D
Waste Type: residential
Origin: 1 HALIFAX
Invoice: 0400927
Royal Environmental Group

Gross Weight: 22,960 (kg)
Tare Weight: 16,600 (kg)
Net Weight: 6,360 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip: 096633
08/15/2024 12:19:11
Clerk: DMS

Vehicle ID: RE2080
License Plate: 44-073-D
Waste Type: residential
Origin: 2 DARTMOUTH
Invoice: 0400927
Royal Environmental Group

Gross Weight: 22,640 (kg)
Tare Weight: 16,110 (kg)
Net Weight: 6,530 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip: 096546
08/12/2024 12:16:42
Clerk: Shelley

Vehicle ID: RE3012
License Plate: 62794D
Waste Type: residential
Origin: 2 DARTMOUTH
Invoice: 0400927
Royal Environmental Group

Gross Weight: 25,050 (kg)
Tare Weight: 16,780 (kg)
Net Weight: 8,270 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip: 096576
08/13/2024 12:47:11
Clerk: Shelley

Vehicle ID: RE1035
License Plate: 55-579-D
Waste Type: residential
Origin: 3 BEDFORD/HAMMONDS PLAINS
Invoice: 0400927
Royal Environmental Group

Gross Weight: 26,340 (kg)
Tare Weight: 16,620 (kg)
Net Weight: 9,720 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip:	096626
	08/14/2024 17:22:02
Clerk:	Shelley

Vehicle ID:	GFL010
License Plate:	45366D
Waste Type:	residential
Origin:	4 WESTERN COUNTY
Invoice:	0402150
	GFL Environmental Inc

Gross Weight:	26,870 (kg)
Tare Weight:	16,820 (kg)
Net Weight:	10,050 (kg)

	$0.00
Total:	$0.00

Halifax Regional Municipality

Scale Slip: 096800
08/22/2024 11:18:53
Clerk: DMS

Vehicle ID: RE1041
License Plate: 57-421-D
Waste Type: residential
Origin: 5 SACKVILLE/FALL RIVER
Invoice: 0400927
Royal Environmental Group

Gross Weight: 24,460 (kg)
Tare Weight: 16,460 (kg)
Net Weight: 8,000 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip: 096838
08/23/2024 12:05:42
Clerk: DMS

Vehicle ID: RE3011
License Plate: 62544D
Waste Type: residential
Origin: 6 COLE HARBOUR/EASTERN PASSAGE
Invoice: 0400927
Royal Environmental Group

Gross Weight: 24,010 (kg)
Tare Weight: 16,850 (kg)
Net Weight: 7,160 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip: 096588
08/13/2024 15:35:01
Clerk: Shelley

Vehicle ID: MW9524
License Plate: 56246D
Waste Type: residential
Origin: 7 PRESTON/LAWRENCETOWN/LK ECHO
Invoice: 0188466
MILLER WASTE SYSTEMS

Gross Weight: 30,840 (kg)
Tare Weight: 17,110 (kg)
Net Weight: 13,730 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip: 096650
08/15/2024 15:54:59
Clerk: DMS

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

Gross Weight: 23,060 (kg)
Tare Weight: 18,640 (kg)
Net Weight: 4,420 (kg)

$0.00

Total: $0.00

Halifax Regional Municipality

Scale Slip: 096681
08/16/2024 15:14:24
Clerk: DMS

Vehicle ID: RE1057
License Plate: 43-745-D
Waste Type: residential
Origin: DARTMOUTH CONDOS
Invoice: 0400927
Royal Environmental Group

Gross Weight: 21,400 (kg)
Tare Weight: 17,950 (kg)
Net Weight: 3,450 (kg)

$0.00

Total: $0.00

ATTACHMENT 3
FIELD DATA SHEETS

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 1

Number of Sorters 4

Weighscale Ticket Information

Truck Number/ID	RE1044	
Collection Area	Halifax	
Date	23-Aug-24	
Ticket Time	11:34:20	
Gross Weight	22,960	KG
Tare Weight	16,600	KG
Net Weight	6,360	KG

Weigth of Gross Sample 126.0 KG

Weight of Tote Bin 50.0 KG

Date of Audit of Sample 28-Aug-24

Net Sample of Trash 76.5 KG

Sample Audit Time Started 8:40am

Number of Bulkies Observed 0

Sample Audit Time Completed 9:15am

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	50.0	120.0	-	70.0	91.50%
Fibre - Newsprint/Paper	1.1	2.6	-	1.5	1.96%
Fibre - OCC	1.1	2.2	-	1.1	1.44%
Food/Putrescible Waste	1.1	4.1	-	3.0	3.92%
Yard Waste	-	-	-	-	-
HHW	-	-	-	-	-
White Goods	2.2	1.7	1.2	0.7	0.92%
Lost or Gained Mass	**Combined Weight Following Sorting**			0.00	
	126.0				

Notes:

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 2A

Number of Sorters 5

Weighscale Ticket Information

Truck Number/ID	RE3012	
Collection Area	Dartmouth	
Date	12-Aug-24	
Ticket Time	12:16:42	
Gross Weight	25,050	KG
Tare Weight	16,780	KG
Net Weight	8,270	KG

Weigth of Gross Sample 129.5 KG

Weight of Tote Bin 51.0 KG

Date of Audit of Sample 28-Aug-24

Net Sample of Trash 78.5 KG

Sample Audit Time Started 9:15am

Number of Bulkies Observed 0

Sample Audit Time Completed 9:40am

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	51.0	124.0	-	73.0	92.99%
Fibre - Newsprint/Paper	2.2	1.4	2.0	1.2	1.53%
Fibre - OCC	1.1	3.0	-	1.9	2.42%
Food/Putrescible Waste	1.1	2.2	-	1.1	1.40%
Yard Waste	-	-	-	-	-
HHW	-	-	-	-	-
White Goods	1.1	1.6	-	0.5	0.64%
Lost or Gained Mass	**Combined Weight Following Sorting**			-0.39	
	129.0				

Notes:

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 2B

Number of Sorters 5

Weighscale Ticket Information

Truck Number/ID	RE2080	
Collection Area	Dartmouth	
Date	15-Aug-24	
Ticket Time	12:19:11	
Gross Weight	22,640	KG
Tare Weight	16,110	KG
Net Weight	6,530	KG

Weigth of Gross Sample 122.5 KG

Weight of Tote Bin 50.0 KG

Date of Audit of Sample 28-Aug-24

Net Sample of Trash 72.5 KG

Sample Audit Time Started 9:40am

Number of Bulkies Observed 0

Sample Audit Time Completed 10:30 AM

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	50.0	115.5	-	65.5	90.34%
Fibre - Newsprint/Paper	1.1	2.1	-	1.0	1.38%
Fibre - OCC	1.1	2.9	-	1.8	2.48%
Food/Putrescible Waste	1.1	3.0	-	1.9	2.62%
Yard Waste	1.1	1.4	-	0.3	0.41%
HHW	-	-	-	-	-
White Goods	1.1	2.6	-	1.5	2.07%
Lost or Gained Mass	**Combined Weight Following Sorting**			-0.41	
	122.0				

Notes:

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 4

Number of Sorters 4

Weighscale Ticket Information

Truck Number/ID	GFL010	
Collection Area	Western County	
Date	14-Aug-24	
Ticket Time	17:22:02	
Gross Weight	26,870	KG
Tare Weight	16,820	KG
Net Weight	10,050	KG

Weigth of Gross Sample 127.5 KG

Weight of Tote Bin 51.0 KG

Date of Audit of Sample 28-Aug-24

Net Sample of Trash 76.5 KG

Sample Audit Time Started 11:00 AM

Number of Bulkies Observed 0

Sample Audit Time Completed 11:30 AM

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	51.0	119.4	-	68.4	89.41%
Fibre - Newsprint/Paper	1.1	1.9	-	0.8	1.05%
Fibre - OCC	1.1	2.8	-	1.7	2.22%
Food/Putrescible Waste	1.1	3.9	-	2.8	3.66%
Yard Waste	-	-	-	-	-
HHW	-	-	-	-	-
White Goods	1.1	3.7	-	2.6	3.40%
Lost or Gained Mass	**Combined Weight Following Sorting**			0.00	
	127.5				

Notes: A couple glass Jars full of food were weighed as part of the food category.

Performance Audit Record

Date	August 28, 2024	**Name of Supervisor**	**Patrick Avery**
Area	Area 5	**Number of Sorters**	4

Weighscale Ticket Information

Truck Number/ID	RE1041	
Collection Area	Sackville/ Fall Rive	
Date	22-Aug-24	
Ticket Time	11:18:53	
Gross Weight	24,460	KG
Tare Weight	16,460	KG
Net Weight	8,000	KG

Weigth of Gross Sample	142.0	KG		
Weight of Tote Bin	49.5	KG	**Date of Audit of Sample**	28-Aug-24
Net Sample of Trash	92.5	KG	**Sample Audit Time Started**	11:30 AM
Number of Bulkies Observed	0		**Sample Audit Time Completed**	12:30 PM

Material	**Empty Bin Weight (KG)**	**Total Separated Sample Weights (KG)**		**Net Sample (KG)**	**Compostables (%)**
		1	**2**		
Garbage/Residue	49.5	130.4	-	80.9	87.46%
Fibre - Newsprint/Paper	1.1	2.0	-	0.9	0.97%
Fibre - OCC	1.1	2.4	-	1.3	1.41%
Food/Putrescible Waste	1.1	5.9	-	4.8	5.19%
Yard Waste	-	-	-	-	-
HHW	-	-	-	-	-
White Goods	1.1	5.2	-	4.1	4.43%
Lost or Gained Mass	**Combined Weight Following Sorting**			-0.35	
	141.5				

Notes:

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 6

Number of Sorters 5

Weighscale Ticket Information

Truck Number/ID	RE3011	
Collection Area	Cole Harbour/ Eastern Passage	
Date	23-Aug-24	
Ticket Time	12:05:42	
Gross Weight	24,010	KG
Tare Weight	16,850	KG
Net Weight	7,160	KG

Weigth of Gross Sample 145.5 KG

Weight of Tote Bin 50.0 KG

Date of Audit of Sample 28-Aug-24

Net Sample of Trash 95.5 KG

Sample Audit Time Started 12:30 PM

Number of Bulkies Observed 0

Sample Audit Time Completed 1:00 PM

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	50.0	141.5	-	91.5	95.81%
Fibre - Newsprint/Paper	1.1	2.4	-	1.3	1.36%
Fibre - OCC	1.1	2.7	-	1.6	1.68%
Food/Putrescible Waste	1.1	2.3	-	1.2	1.26%
Yard Waste	-	-	-	-	-
HHW	-	-	-	-	-
White Goods	-	-	-	-	-
Lost or Gained Mass	**Combined Weight Following Sorting**			0.00	
	145.5				

Notes:

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 7

Number of Sorters 5

Weighscale Ticket Information

Truck Number/ID	MW9524	
Collection Area	Preston/ Lawrencetown/Lake Echo	
Date	13-Aug-24	
Ticket Time	15:35:01	
Gross Weight	30,840	KG
Tare Weight	17,110	KG
Net Weight	13,730	KG

Weigth of Gross Sample 158.5 KG

Weight of Tote Bin 50.0 KG

Date of Audit of Sample 28-Aug-24

Net Sample of Trash 108.5 KG

Sample Audit Time Started 1:00 PM

Number of Bulkies Observed 0

Sample Audit Time Completed 1:20 PM

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	50.0	154.0	-	104.0	95.85%
Fibre - Newsprint/Paper	1.1	2.5	-	1.4	1.29%
Fibre - OCC	1.1	2.4	-	1.3	1.20%
Food/Putrescible Waste	1.1	2.0	-	0.9	0.83%
Yard Waste	1.1	1.2	-	0.1	0.09%
HHW	-	-	-	-	-
White Goods	1.1	1.5	-	0.4	0.37%
Lost or Gained Mass	**Combined Weight Following Sorting**			-0.32	
	158.0				

Notes:

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 8

Number of Sorters 5

Weighscale Ticket Information

Truck Number/ID	ES4038	
Collection Area	Eastern County	
Date	15-Aug-24	
Ticket Time	15:54:59	
Gross Weight	23,060	KG
Tare Weight	18,640	KG
Net Weight	4,420	KG

Weigth of Gross Sample 145.0 KG

Weight of Tote Bin 50.0 KG

Date of Audit of Sample 24-Aug-24

Net Sample of Trash 95.0 KG

Sample Audit Time Started 1:20 PM

Number of Bulkies Observed 0

Sample Audit Time Completed 1:40 PM

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	50.0	136.0	-	86.0	90.53%
Fibre - Newsprint/Paper	1.1	1.4	-	0.3	0.32%
Fibre - OCC	1.1	1.6	-	0.5	0.53%
Food/Putrescible Waste	1.1	2.0	-	0.9	0.95%
Yard Waste	-	-	-	-	-
HHW	-	-	-	-	-
White Goods	1.1	8.3	-	7.2	7.58%
Lost or Gained Mass	**Combined Weight Following Sorting**			0.00	
	145.0				

Notes:

Performance Audit Record

Date August 28, 2024

Name of Supervisor **Patrick Avery**

Area Area 9

Number of Sorters 5

Weighscale Ticket Information

Truck Number/ID	RE1057	
Collection Area	Bedford/ Sackville Condos	
Date	16-Aug-24	
Ticket Time	15:14:24	
Gross Weight	21,400	KG
Tare Weight	17,950	KG
Net Weight	3,450	KG

Weigth of Gross Sample 138.5 KG

Weight of Tote Bin 50.5 KG

Date of Audit of Sample 28-Aug-24

Net Sample of Trash 88.0 KG

Sample Audit Time Started 1:40 PM

Number of Bulkies Observed 0

Sample Audit Time Completed 2:15 PM

Material	Empty Bin Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)	Compostables (%)
		1	2		
Garbage/Residue	50.5	122.5	-	72.0	81.82%
Fibre - Newsprint/Paper	1.1	6.5	-	5.4	6.14%
Fibre - OCC	2.2	1.8	4.3	3.9	4.43%
Food/Putrescible Waste	1.1	5.0	-	3.9	4.43%
Yard Waste	-	-	-	-	-
HHW	1.1	1.3	-	0.2	0.23%
White Goods	1.1	3.3	-	2.2	2.50%
Lost or Gained Mass	**Combined Weight Following Sorting**			0.00	
	138.5				

Notes:

ATTACHMENT 4
SUPPORTING DATA

Table 1: Total Compostable Waste Percentage Per Area (August 2024) *Project # 22-8641*

Waste Collection Area	% Organics From August 28, 2024 Waste Audit	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
1	7.32%	10014.25	733.07
2	6.12%	6841.50	418.93
3	5.95%	4433.34	263.60
4	6.93%	5334.37	369.57
5	7.57%	8637.86	653.68
6	4.29%	5150.89	221.14
7	3.41%	2930.93	99.95
8	1.79%	3298.51	59.03
Condos	15.00%	2351.13	352.67
	TOTAL	48992.77	3171.64

Mean	6.49%	-	352.40
Min	1.79%	-	59.03
Max	15.00%	-	733.07

Compostable Waste Percentage	(3171.64/48992.77)*100% = 6.47%

Notes: % Organic for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

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CONSULTING

Table 2: Average Total Compostable Waste Percentage Per Area (August 2024) *Project # 22-8641*

Waste Collection Area	% Organics From May 15, 2024 Waste Audit	% Organics From August 28, 2024 Waste Audit	% Organics Average	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
1	18.71%	7.32%	13.01%	10014.25	1303.31
2	9.95%	6.12%	8.04%	6841.50	549.97
3	18.36%	5.95%	12.15%	4433.34	538.80
4	6.51%	6.93%	6.72%	5334.37	358.34
5	11.78%	7.57%	9.67%	8637.86	835.46
6	11.26%	4.29%	7.78%	5150.89	400.50
7	8.91%	3.41%	6.16%	2930.93	180.58
8	11.76%	1.79%	6.78%	3298.51	223.54
Condos	72.35%	15.00%	43.68%	2351.13	1026.89
			TOTAL	48992.77	5417.38

Mean	12.67%	-	601.93
Min	6.16%	-	180.58
Max	43.68%	-	1303.31

Compostable Waste Percentage	(5417.38/48992.77)*100% = 11.06%

Notes:

1. % Organic for Area 1 based on average of the two samples (1A and 1B) collected during the May 2024 waste audit.
2. % Organic for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

Table 3: Estimated Annual Compostable Waste Per Area *Project # 22-8641*

Audit	Waste Collection Area	% Organics	Average Waste Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
May 2024 Performance Audit	1	18.71%	10014.25	1873.54
	2	9.95%	6841.50	681.00
	3	18.36%	4433.34	813.99
	4	6.51%	5334.37	347.12
	5	11.78%	8637.86	1017.25
	6	11.26%	5150.89	579.86
	7	8.91%	2930.93	261.20
	8	11.76%	3298.51	388.06
	Condos	72.35%	2351.13	1701.11
August 2024 Performance Audit	1	7.32%	10014.25	733.07
	2	6.12%	6841.50	418.93
	3	5.95%	4433.34	263.60
	4	6.93%	5334.37	369.57
	5	7.57%	8637.86	653.68
	6	4.29%	5150.89	221.14
	7	3.41%	2930.93	99.95
	8	1.79%	3298.51	59.03
	Condos	15.00%	2351.13	352.67
	Mean	12.67%	-	601.93
	Min	1.79%	-	59.03
	Max	72.35%	-	1873.54

Notes:
1. % Organic for Area 1 based on average of the two samples (1A and 1B) collected during the May 2024 waste audit.
2. % Organic for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

Table 4: Compostable Waste Descriptive Statistics *Project 22-8641*

Mean	601.9315552
Standard Error	117.8767378
Median	403.4974061
Mode	#N/A
Standard Deviation	500.1086437
Sample Variance	250108.6555
Kurtosis	2.17463271
Skewness	1.580728085
Range	1814.517272
Minimum	59.02596842
Maximum	1873.54324
Sum	10834.76799
Count	18
Confidence Level(95.0%)	248.6981776
Upper Confidence Interval	850.6297328
Lower Confidence Interval	353.2333776

Table 5: Total Food Waste Percentage Per Area (August 2024) *Project # 22-8641*

Waste Collection Area	% Food Waste From August 28, 2024 Waste Audit	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Food Waste (Tonnes)
1	3.92%	10014.25	392.72
2	2.01%	6841.50	137.58
3	3.14%	4433.34	138.99
4	3.66%	5334.37	195.24
5	5.19%	8637.86	448.23
6	1.26%	5150.89	64.72
7	0.83%	2930.93	24.31
8	0.95%	3298.51	31.25
Condos	4.43%	2351.13	104.20
	TOTAL	48992.77	1537.25

Mean	2.82%	-	170.81
Min	0.83%	-	24.31
Max	5.19%	-	448.23

Food Waste Percentage	(1535.25/48992.77)*100% = 3.14%

Notes: % Food waste for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

Table 6: Average Total Food Waste Percentage Per Area (August 2024) *Project # 22-8641*

Waste Collection Area	% Food Waste From May 15, 2024 Waste Audit	% Food Waste From August 28, 2024 Waste Audit	% Food Waste Average	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Food Waste (Tonnes)
1	6.70%	3.92%	5.31%	10014.25	531.72
2	5.53%	2.01%	3.77%	6841.50	257.96
3	9.51%	3.14%	6.32%	4433.34	280.26
4	3.44%	3.66%	3.55%	5334.37	189.51
5	5.48%	5.19%	5.34%	8637.86	460.89
6	6.59%	1.26%	3.92%	5150.89	202.00
7	4.77%	0.83%	2.80%	2930.93	82.01
8	6.35%	0.95%	3.65%	3298.51	120.40
Condos	62.94%	4.43%	33.69%	2351.13	792.01
			TOTAL	48992.77	2916.76

Mean	7.59%	-	324.08
Min	2.80%	-	82.01
Max	33.69%	-	792.01

Compostable Waste Percentage	(2916.76/48992.77)*100% = 5.95%

Notes:

1. % Food waste for Area 1 based on average of the two samples (1A and 1B) collected during the May 2024 waste audit.
2. % Food waste for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

Table 7: Estimated Annual Food Waste Per Area *Project # 22-8641*

Audit	Waste Collection Area	% Food Waste	Average Waste Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
May 2023 Performance Audit	1	6.70%	10014.25	670.72
	2	5.53%	6841.50	378.33
	3	9.51%	4433.34	421.53
	4	3.44%	5334.37	183.77
	5	5.48%	8637.86	473.55
	6	6.59%	5150.89	339.28
	7	4.77%	2930.93	139.71
	8	6.35%	3298.51	209.55
	Condos	62.94%	2351.13	1479.83
August 2024 Performance Audit	1	3.92%	10014.25	392.72
	2	2.01%	6841.50	137.58
	3	3.14%	4433.34	138.99
	4	3.66%	5334.37	195.24
	5	5.19%	8637.86	448.23
	6	1.26%	5150.89	64.72
	7	0.83%	2930.93	24.31
	8	0.95%	3298.51	31.25
	Condos	4.43%	2351.13	104.20
	Mean	7.59%	-	162.04
	Min	0.83%	-	0.00
	Max	62.94%	-	1479.83

Notes:
1. % Food waste for Area 1 based on average of the two samples (1A and 1B) collected during the May 2024 waste audit.
2. % Food waste for Area 2 is based on average of the two samples (2A and 2B) collected during the August 2024 waste audit.

Table 8: Food Waste Descriptive Statistics *Project 22-8641*

Mean	324.0844966
Standard Error	79.92459335
Median	202.3985965
Mode	#N/A
Standard Deviation	339.0913317
Sample Variance	114982.9312
Kurtosis	7.965721794
Skewness	2.522949856
Range	1455.517048
Minimum	24.3118341
Maximum	1479.828882
Sum	5833.520939
Count	18
Confidence Level(95.0%)	168.6261521
Upper Confidence Interval	492.7106487
Lower Confidence Interval	155.4583445