

City of Saskatoon 2023 to 2025 City-Wide Waste Characterization Study Fall 2023



PRESENTED TO
City of Saskatoon

FEBRUARY 29, 2024
ISSUED FOR USE
FILE: 704-SWM.PLAN03291-01

This page intentionally left blank.

EXECUTIVE SUMMARY

Tetra Tech Canada Inc. (Tetra Tech) was retained by the City of Saskatoon (City) to conduct a multi-season City-Wide Waste Characterization Study. The scope of the study consists of nine seasonal waste sorting events over a three-year period from 2023 to 2025. This seasonal report summarizes the first sampling event conducted for garbage, recycling, and organics streams from the single family (SF) residential sector in October 2023 (Fall 2023).

Section 1.0 of the report identifies the scope of work, project limitations, and an overview of waste collection services in the City.

Section 2.0 identifies the methodology that was undertaken for the Fall Study, including waste collection, sorting, and data analysis. A detailed description of material categories is included in Appendix C.

Section 3.0 includes an overview of set-out rates, types and amounts of materials collected, and an estimate of cart fullness. Waste composition results for garbage, recycling, and organics are also presented in Section 3.0 along with diversion potential, contamination rates, capture rates, and a bag count for the organics stream. A detailed breakdown of waste composition results by stream is included in Appendix D.

- The average percentage of carts set-out for bi-weekly collection was 81% for all three streams.
- On average, the total amount of materials disposed from all three streams on a bi-weekly basis was approximately 41 kg/household.
- On average, carts that were set out were 69% full.
- The garbage stream was primarily composed of food waste (28%), household hygiene, including diapers and pet waste (14%), plastics (13%), paper (10%), and yard waste (9%).
- The diversion potential for the garbage stream based on existing programs and services is 63%.
- The recycling stream was primarily composed of paper packaging, including corrugated cardboard and boxboard (47%), paper (27%), and plastics (13%).
- The contamination in the recycling stream was 15%.
- The organics stream was primarily composed of yard waste (81%) and food waste (14%).
- The contamination in the organics stream was 3%.

Section 4.0 summarizes the interesting finds in the Fall Study and Appendix B includes selected photographs for reference.

Section 5.0 includes initial comments and preliminary recommendations based on the findings from the first sampling event:

- The bi-weekly collection frequency appears to be effective for resident's needs.
- The 360 L cart size worked well for most households, however, approximately 6% of carts were overfilled and approximately 24% of carts were filled to half capacity or below.
- The garbage stream was comprised of 37% organic materials. Increased education on the new green cart program may reduce the amount of food and yard waste in the garbage stream.

- Approximately 14% of material in the recycling carts consisted of garbage and organic material. Increased education on acceptable recyclable materials may reduce the amount of contamination in the recycling stream.
- Additional diversion programs are recommended for materials that can be diverted from the landfill, including construction and demolition waste.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1.0 INTRODUCTION.....	1
1.1 Scope of Work	1
1.2 Project Limitations	2
1.3 Overview of Garbage, Recycling, and Organics Collection.....	2
2.0 METHODOLOGY	3
2.1 Health and Safety	3
2.2 Seasonal Weather Conditions	3
2.3 Sampling Plan – Selected Households	4
2.4 Sample Collection Methodology	5
2.5 Hand Sorting.....	6
2.6 Data Analysis.....	6
3.0 RESULTS.....	7
3.1 Overview.....	7
3.1.1 Set-Out Rates	7
3.1.2 Material Collected	8
3.1.3 Waste Collected Per Household.....	8
3.1.4 Cart Fullness.....	9
3.2 Single Family Garbage	10
3.2.1 Garbage Waste Composition Results	10
3.2.2 Diversion Potential.....	11
3.3 Single Family Recycling.....	11
3.3.1 Recycling Waste Composition Results	12
3.3.2 Contamination Rate	13
3.3.3 Capture Rate	13
3.4 Single Family Organics.....	14
3.4.1 Organics Waste Composition Results	14
3.4.2 Contamination Rate	15
3.4.3 Capture Rate	15
3.4.4 Bag Count.....	16
4.0 INTERESTING FINDS.....	17
5.0 RECOMMENDATIONS	18
6.0 CLOSURE.....	19

LIST OF TABLES IN TEXT

Table 1-1: Single Family Households Characterized.....	2
Table 2-1: Weather Conditions – Fall 2023	4
Table 2-2: Collection Days and Waste Streams Sampled – Fall 2023	4
Table 3-1: Cart Set-Out Rates – Fall 2023	8
Table 3-2: Amount of Materials Collected by Waste Stream – Fall 2023	8
Table 3-3: Amount of Waste Materials Disposed per Household per Two Week Period – Fall 2023.....	9
Table 3-4: Cart Fullness – Fall 2023.....	9
Table 3-5: Recyclable Material in All Streams – Fall 2023	14
Table 3-6: Recyclable Material Capture Rate – Fall 2023	14
Table 3-7: Organic Material in All Streams – Fall 2023	16
Table 3-8: Organic Material Capture Rate – Fall 2023	16
Table 3-9: Number of Bags in SF Organics Samples – Fall 2023	16
Table 4-1: Notable Materials – Fall 2023	17

LIST OF FIGURES IN TEXT

Figure 3-1: Overall SF Garbage Composition.....	10
Figure 3-2: Overall SF Garbage Diversion Potential.....	11
Figure 3-3: Overall SF Recycling Composition	12
Figure 3-4: Overall SF Recycling Diversion Potential	13
Figure 3-5: Overall SF Organics Composition	14
Figure 3-6: Overall SF Organics Diversion Potential	15

APPENDIX SECTIONS

Appendix A	Tetra Tech’s Limitations on the Use of this Document
Appendix B	Selected Photographs
Appendix C	Material Categories
Appendix D	Waste Composition Results
Appendix E	Sectors and Naming Conventions

ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
City	City of Saskatoon
HDPE	High-density polyethylene
LDPE	Low-density polyethylene
SF	Single Family
Tetra Tech	Tetra Tech Canada Inc.

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the City of Saskatoon and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the City of Saskatoon, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

NOTE TO THE READER

The samples collected and characterized for this study are “snapshots” in time, meaning the reported quantities are estimates and only represent the conditions for the period in which they were collected. Annual variability, weather, and other factors can affect the amount and composition of waste and recyclables generated by the various sectors at any given time. Even with combined educational, regulatory, and financial initiatives the reader should not assume that it is necessarily easy, practical, or economical to recover a substantial portion of a disposed material from a mixed waste stream or at its source.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by the City of Saskatoon (City) to conduct a multi-season City-Wide Waste Characterization Study from 2023 to 2025. In 2023, the City launched a mandatory curbside organics (green) cart program and a mandatory organics diversion program for businesses. In 2024, the City plans to implement a variable rate fee structure for curbside garbage (black) carts. The study is ultimately anticipated to identify trends and changes in the City of Saskatoon's waste profile and provide benchmarks as new programs are introduced. It is understood that results from the study are intended to improve understanding of program use, identify changes over time, identify areas for program improvement, and to inform public communication campaigns.

The scope of the study consists of nine seasonal waste sorting events over a three-year period. This seasonal report summarizes the first sampling event conducted for the single family (SF) residential sector in the fall of 2023 (Fall 2023).

1.1 Scope of Work

This study characterized the composition of solid waste in the garbage, recycling, and organics streams from SF residential households that receive curbside collection. The fieldwork involved the following:

- Collected garbage, recycling, and organics from select households;
- Documented waste stream set-outs and fullness of the materials in the carts collected;
- Transported collected materials to a designated sorting area; and
- Sorted and weighed the collected waste streams.

The objectives of this study include the following:

- Document amount and types of materials discarded in the recycling, organics, and garbage waste streams to establish a baseline for the SF residential sector.
- Determine the amount of contamination found in the recycling and organic streams, and the amount of divertible materials in the garbage.
- Determine the capture rates for recyclables and organic materials relative to the generation rate.
- Document the estimated cart fullness prior to collection.
- Estimate waste generation rates for the three waste streams.
- Estimate diversion potential for other waste streams (such as those that have diversion programs) that could be diverted through depots such as household hazardous waste, construction waste, and textiles.
- Assess service level suitability (i.e., collection frequency and cart size) for SF residents.

This is the first sorting event that was undertaken from October 16 to October 27, 2023, inclusive. A sampling plan was prepared in conjunction with City staff. A total of 106 households were selected from 10 different neighbourhoods for the Fall 2023 sorting event. Table 1-1 summarizes the selected neighbourhoods, collection route number and code, number of households selected, cart set out location and description.

Table 1-1: Single Family Households Characterized

Neighbourhood	Collection Route	Route Code	Number of Households	Set Out Location	Description
Eastview	1	EAS	10	Back Lane	10 households in a row
Parkridge	2	PAR	11	Front Street	11 households in a row
Rosewood	3	ROS	10	Front Street	10 households in a row
Mount Royal	4	MOU	14	Front Street	14 households in a row
Holliston	5	HOL	11	Back Lane	11 households in a row
City Park	6	CIT	10	Back Lane	10 households in a row
Nutana	7	NUT	10	Back Lane	10 households in a row
Silverwood Heights	8	SIL	10	Front Street	10 households in a row
Willowgrove	9	WIL	10	Front Street	10 households in a row within a cul-de-sac and adjacent road
Dundonald	10	DUN	10	Front Street	10 households in a row with one set-out around the corner
Total			106		

1.2 Project Limitations

The findings of this study may be limited by the following factors:

- **Sampling Methodology:** Results from this sampling methodology are directly correlated to the 10 to 14 households that were selected for collection in each neighbourhood. It was assumed that these households would be representative of the entire neighbourhood.
- **Residential Behaviour:** A few residents approached the collection crew and asked questions about the project. This may have affected resident's behaviour patterns with respect to waste disposal practices for other waste streams and future sorting events due to their awareness of the waste characterization study.
- **Diversion Potential:** The diversion potential is calculated based on an ideal scenario where residents are correctly utilizing all waste diversion options that were available at the time of the study. Diversion potential is considered a theoretical maximum and represents the upper boundary of what could be possible given the current waste composition and waste diversion programs.
- **Waste Produced Per Household Estimation:** The amount of waste produced every two weeks per household is calculated by dividing the total weight collected by the total number of households not accounting for the set-out rate.

1.3 Overview of Garbage, Recycling, and Organics Collection

The following section provides an overview of the City's services for garbage, recycling, and organics collection for SF households.

Garbage (black cart) is collected on a bi-weekly basis year-round. The default cart size is 360 L however, households have the option to request a smaller 240 L cart size. Collection operations are conducted by the City.

In 2023, garbage collection was funded through property taxes, however, in 2024, the City will be implementing a utility fee and variable cart sizes for garbage collection.

Recycling (blue cart) is collected on a bi-weekly basis year-round. The default cart size is 360 L. Collection operations are conducted under contract with a third-party service provider. Recycling collection is funded through a recycling utility fee and residents have the option to pay for an additional cart, if desired.

Organics (green cart) is collected on a bi-weekly basis year-round and includes yard and food waste. The default cart size is 360 L and collection operations are conducted by the City. Prior to 2023, the green cart program was a voluntary, subscription-based program, however, in the spring of 2023, the green cart program was expanded to a City-wide program for all SF households receiving cart collections. In 2023, organics collection was funded through property taxes, however, in 2024, the City will be implementing a utility fee for organics collection.

All three waste streams are collected on different days of the week (e.g., no more than one cart is placed out for collection on any given day). Set-out locations for carts vary depending on the location in the City but include both front street and back lane. Front street collections occur on both sides of the street; however, back lane collections occur on only one side of the lane. Overfilled carts and/or materials placed outside the carts are not collected.

2.0 METHODOLOGY

The following section describes the methodology used to conduct this study. Appendix B includes photos that highlights some of the waste sampling and characterization activities.

2.1 Health and Safety

A Health and Safety Plan was developed for this project to identify potential hazards in advance of the waste composition study. Tetra Tech staff conducting field work for this study were required to have up-to-date safety certifications and training for waste sorting activities. Personal protective equipment, including face masks, safety goggles, gloves, steel toe boots, coveralls, and hi-vis vests, was worn by all field staff according to Tetra Tech's Health and Safety Plan.

Prior to commencing work on site, Tetra Tech staff conducted a landfill safety orientation with City staff to identify site-specific hazards, controls, and expectations. A safe working location was selected and clearly demarcated. Safety meetings were conducted by Tetra Tech at the beginning of each day to review and identify key concerns and hazard mitigation strategies, including how to handle material hazards such as sharps or hazardous materials, safe lifting of heavy material, working around and driving vehicles.

2.2 Seasonal Weather Conditions

Table 2-1 documents an overview of the weather conditions in Saskatoon during the Fall 2023 sorting event. The Fall 2023 experienced higher-than-average temperatures and minimal snow prior to and during the waste characterization study. This may have influenced the amount and types of waste in the carts (e.g., higher volumes of leaf and yard waste from an extended growing season and later in the season yard cleanups).

Table 2-1: Weather Conditions – Fall 2023

Date	Temperature (°C)			Precipitation (mm)	Max Wind Speed (km/hr)
	Average	Min.	Max.		
October 16, 2023	8.0	-1.6	17.5	0.0	Not reported
October 17, 2023	12.7	8.2	17.2	0.4	48
October 18, 2023	8.5	1.0	16.0	0.0	38
October 19, 2023	11.1	0.9	21.3	0.0	36
October 20, 2023	9.2	2.5	16.0	0.0	53
October 23, 2023	-1.1	-3.5	1.4	0.0	35
October 24, 2023	-8.0	-12.9	-3.2	1.0	38
October 25, 2023	-10.1	-15.9	-4.3	0.0	Not reported
October 26, 2023	-7.7	-14.6	-0.8	0.0	31
October 27, 2023	-4.0	-7.0	-1.0	1.2	32

Note:

¹ Obtained from Government of Canada Climate for the City of Saskatoon.

2.3 Sampling Plan – Selected Households

Tetra Tech worked with City staff to select households for the study. During the Fall 2023 event, a total of 106 households were selected from ten neighbourhoods with different collection routes in the City. Table 2-2 summarizes the collection days, routes, waste streams, and notes from the Fall 2023 sorting event. It should be noted that garbage, recycling, and organics were each collected every other week.

Table 2-2: Collection Days and Waste Streams Sampled – Fall 2023

Collection Day	Collection Route	Waste Stream	Sample Issues
Monday, October 16	Willowgrove	Recycling	
	Eastview	Garbage	
	Parkridge	Organics	
Tuesday, October 17	Mount Royal	Organics	
	Nutana	Recycling	
	Rosewood	Garbage	
Wednesday, October 18	Mount Royal	Recycling	Only partially characterized since some bags were removed from the sorting area after collection.
	City Park	Organics	

¹ Government of Canada. (2023, November 7). Daily Data Report for October 2023.

https://climate.weather.gc.ca/climate_data/daily_data_e.html?hlyRange=2008-12-02%7C2024-01-03&dlyRange=2008-12-02%7C2024-01-03&mlyRange=%7C&StationID=47707&Prov=SK&urlExtension=_e.html&searchType=stnProx&optLimit=yearRange&Month=10&Day=3&StartYear=1840&EndYear=2024&Year=2023&selRowPerPage=25&Line=11&txtRadius=25&optProxType=city&selCity=52%7C9%7C106%7C39%7CSaskatoon&selPark=&txtCentralLatDeg=&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongDeg=&txtCentralLongMin=0&txtCentralLongSec=0&txtLatDecDeg=&txtLongDecDeg=&timeframe=2

Collection Day	Collection Route	Waste Stream	Sample Issues
Thursday, October 19	Holliston	Garbage	
	Silverwood Heights	Organics	
	Nutana	Garbage	
Friday, October 20	Dundonald	Organics	
	Parkridge	Recycling	
	Willowgrove	Garbage	
Monday, October 23	Eastview	Organics	
	Rosewood	Recycling	
	Parkridge	Garbage	
Tuesday, October 24	Mount Royal	Garbage	
	City Park	Recycling	Not collected by Tetra Tech due to carts already being collected by the recycling contractor. Data was not available.
	Eastview	Recycling	
	Holliston	Recycling	
	Rosewood	Organics	
Wednesday, October 25	Dundonald	Recycling	
	City Park	Garbage	
	Holliston	Organics	
Thursday, October 26	Silverwood Heights	Garbage	
	Nutana	Organics	
Friday, October 27	Dundonald	Garbage	
	Silverwood Heights	Recycling	
	Willowgrove	Organics	

2.4 Sample Collection Methodology

Prior to material collection, Tetra Tech field staff recorded the number of garbage, organics, or recycling carts that were set-out from the selected households as well as the estimated percent cart fullness. During collection, staff also recorded general observations and resident encounters. Recorded observations would include any additional materials placed outside of the garbage cart or if there was a large amount of contamination (e.g., building materials) in or around the cart. All carts recorded during the Fall 2023 sampling event were noted to be the default 360 L size (e.g., no smaller cart sizes were noted).

Tetra Tech field staff collected contents from each household's carts. Only materials that were placed inside the carts were collected and characterized. All home addresses were confidential and were only provided to the field supervisor for coordination purposes. Measures were taken to ensure all data collected remained anonymous and results were aggregated.

Once the samples were collected, Tetra Tech staff transported the materials to the designated sorting area at the Landfill. Samples were then unloaded, and the sorting team organized the materials to confirm all samples were accounted for, labelled properly, and secured to make sure samples were not mixed or co-mingled.

2.5 Hand Sorting

For all three waste streams, staff weighed each sample to determine the pre-weight. For the garbage stream, the field team took a subsample that was approximately 100 kg, collecting material from each collection bag to minimize potential bias. For the recycling and organics streams, the entire samples were sorted. Each sample was then hand sorted into its respective material categories.

All samples were hand sorted as per the categories agreed upon with the City. Each categorized item was placed into respective bins. The contents of each bin were then weighed and recorded to determine the weight for each secondary category. Details of the sorting categories are included in Appendix C, along with their description, and preferred diversion/disposal method.

The waste streams were characterized into 13 primary categories which were then further divided into 67 secondary categories. Primary categories include the following:

- Paper.
- Metals.
- Food waste.
- Yard waste.
- Bulky waste.
- Paper packaging.
- Glass.
- Construction and demolition waste.
- Household hygiene.
- Plastics.
- Household hazardous waste.
- Waste Electrical and Electronic Equipment (WEEE).
- Other materials.

Note that the term “household hazardous waste” is an industry term that refers to household products that may be flammable, corrosive, or toxic under certain conditions, but are generally safe to handle under normal conditions.

The “household hygiene” category includes materials such as diapers, sanitary products, and pet waste.

The “other materials” primary category includes materials such as textiles, tires and other rubber, other waste, and wooden utensils.

2.6 Data Analysis

Data analysis was performed using Tetra Tech’s spreadsheet analysis tool. Data was compiled into primary and secondary categories by weight. The composition for each stream was calculated as weighted averages.

The types of data analysis undertaken by Tetra Tech include the following:

- Set-out rates and fullness of curbside carts.
- Biweekly generation rates.
- Composition of materials by material type and weight.
- Diversion potential or contamination rate of materials.
- Capture rates of recyclable and organic materials.
- Notable items.

3.0 RESULTS

The following summarizes the waste composition results for the various streams investigated. Results are presented by primary category. Primary category percentages were calculated by aggregating all sample data for each stream. An average percentage by weight was determined for each stream. Waste composition results for all samples by material categories are presented in Appendix D. Selected photographs of samples are shown in Appendix B.

Following the waste composition results, the proportion of materials that could be diverted from disposal was estimated and presented as the diversion potential or contamination rate. Classifications for the diversion potential of each secondary category can be found in Appendix C. The materials were categorized as follows:

- **Organics:** materials accepted by the City's composting program (e.g., yard waste, food scraps, and food soiled paper).
- **Recycling:** materials accepted by the City's curbside collection services or at recycling depots.
- **Depot:** materials accepted for drop-off at a depot or other drop-off locations for diversion (e.g., SARCAN, Material Recovery Centre).
- **No Program:** materials that do not currently have a diversion program in the City but could theoretically be diverted from landfill.
- **Garbage:** materials that do not fall within the above diversion options and would be landfilled.

The diversion potential is calculated based on an ideal scenario where residents are correctly utilizing all waste diversion options that were available at the time of the study. This is the theoretical maximum and represents the upper boundary of what is possible given the current waste composition and waste diversion programs.

3.1 Overview

3.1.1 Set-Out Rates

Table 3-1 summarizes the set-out rates from each stream in SF residential carts during the Fall 2023 sorting event. The average total percentage of carts set-out was 81% for all three streams and the average set-out rates in the garbage, recycling, and organics streams were 88%, 80%, and 75%, respectively. The range of set-out rates for all routes was between 67% to 100%. Cart set-out rate was higher than 100% in Nutana as an extra recycling cart and an extra organics cart were set out on their collection days.

Table 3-1: Cart Set-Out Rates – Fall 2023

Neighbourhood	Set Out Location	Garbage (%)	Recycling (%)	Organics (%)	Average (%)
Eastview	Back Lane	100%	70%	80%	83%
Parkridge	Front Street	73%	73%	73%	73%
Rosewood	Front Street	80%	70%	60%	70%
Mount Royal	Front Street	86%	57%	57%	67%
Holliston	Back Lane	100%	82%	73%	85%
City Park	Back Lane	70%	Not collected	70%	70%
Nutana	Back Lane	100%	100%	100%	100%
Silverwood Heights	Front Street	100%	100%	90%	97%
Willowgrove	Front Street	80%	80%	50%	70%
Dundonald	Front Street	90%	80%	90%	87%
Average		88%	80%	75%	81%

3.1.2 Material Collected

Table 3-2 summarizes the amount of material collected from each stream in SF residential carts during the Fall 2023 sorting event. The average total amount of materials collected was 424.35 kg from all three streams and the average amount of materials collected in the garbage, recycling, and organics stream was 215.95 kg, 50.24 kg, and 163.19 kg, respectively. The range for all three streams for a given route was 322.35 kg to 602.50 kg.

Table 3-2: Amount of Materials Collected by Waste Stream – Fall 2023

Neighbourhood	Garbage (kg)	Recycling (kg)	Organics (kg)	Total (kg)
Eastview	192.02	48.35	235.98	476.35
Parkridge	182.60	48.90	200.05	431.55
Rosewood	239.00	33.30	74.35	346.65
Mount Royal	212.50	35.73	153.55	401.78
Holliston	209.80	50.70	90.65	351.15
City Park	167.30	Not collected*	155.05	322.35
Nutana	179.80	48.05	186.88	414.73
Silverwood Heights	290.55	78.25	233.70	602.50
Willowgrove	279.80	55.00	145.90	480.70
Dundonald	206.15	53.85	155.79	415.79
Average	215.95	50.24	163.19	424.35

*Note: the City Park recycling sample information being unavailable reduced the total weight for this neighborhood and the total average weight.

3.1.3 Waste Collected Per Household

Table 3-3 summarizes the average amount of material collected per household from each stream in SF residential carts during the Fall 2023 sorting event. The average total amount of materials per household was 41.06 kg/household from all three streams and the average amount of materials per household in the garbage,

recycling, and organics stream was 20.63 kg/household, 4.81 kg/household, and 15.62 kg/household, respectively. The generation rate range was between 28.70 kg/household and 60.25 kg/household per two-week period.

Table 3-3: Amount of Waste Materials Disposed per Household per Two Week Period – Fall 2023

Neighbourhood	Garbage (kg/household)	Recycling (kg/household)	Organics (kg/household)	Total (kg/household)*
Eastview	19.20	4.84	23.60	47.64
Parkridge	16.60	4.45	18.19	39.23
Rosewood	23.90	3.33	7.44	34.67
Mount Royal	15.18	2.55	10.97	28.70
Holliston	19.07	4.61	8.24	31.92
City Park	16.73	Not collected**	15.51	32.24
Nutana	17.98	4.81	18.69	41.47
Silverwood Heights	29.06	7.83	23.37	60.25
Willowgrove	27.98	5.50	14.59	48.07
Dundonald	20.62	5.39	15.58	41.58
Average	20.63	4.81	15.62	41.06

*Note: Total kilograms (kg) collected divided by total number of houses per route (regardless of the number of carts set out).

**Note: The City Park sample information being unavailable reduced the total weight per household for route City Park and the total average weight per household.

3.1.4 Cart Fullness

Table 3-4 summarizes the average cart fullness from each stream in SF residential carts during the Fall 2023 sorting event. The average fullness of carts was 69% for all three streams and the average fullness in the garbage, recycling, and organics streams were 73%, 73%, and 63%, respectively. The range of average fullness for all routes was between 58% and 81%.

Table 3-4: Cart Fullness – Fall 2023

Neighbourhood	Set Out Location	Garbage (%)	Recycling (%)	Organics (%)	Average (%)
Eastview	Back Lane	76%	69%	98%	81%
Parkridge	Front Street	58%	54%	63%	58%
Rosewood	Front Street	86%	74%	20%	60%
Mount Royal	Front Street	64%	61%	64%	63%
Holliston	Back Lane	63%	83%	66%	71%
City Park	Back Lane	68%	Not collected	63%	65%
Nutana	Back Lane	63%	60%	69%	64%
Silverwood Heights	Front Street	79%	82%	62%	74%
Willowgrove	Front Street	92%	79%	58%	76%
Dundonald	Front Street	81%	92%	67%	80%
	Average	73%	73%	63%	69%

3.2 Single Family Garbage

The following summarizes the waste composition results and diversion potential for SF garbage in the City.

3.2.1 Garbage Waste Composition Results

Figure 3-1 illustrates the average waste composition of the garbage stream from the SF sector in Fall 2023. This is a snapshot of the types and relative quantities of materials that were discarded by residents at this time of the year.

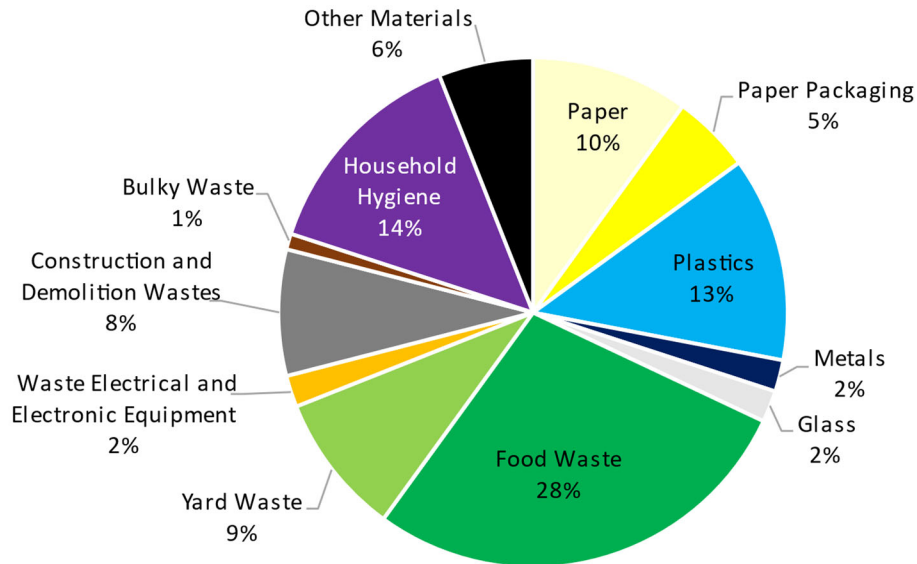


Figure 3-1: Overall SF Garbage Composition

The SF garbage stream was primarily composed of food waste (28%), household hygiene (14%), plastics (13%), paper (10%), and yard waste (9%). The remainder was comprised of construction and demolition wastes (8%), other materials (6%), paper packaging (5%), metals (2%), glass (2%), electronics (2%), and bulky waste (1%).

The most prominent five primary categories represent 74% of the SF garbage stream and are broken down as follows:

- Food waste, composed of avoidable food waste (20.6%) and unavoidable food waste (7.6%). Avoidable food waste included edible food (e.g., whole fruits and vegetables, prepared meals, meat, and bread) and unavoidable food waste included inedible food (e.g., peels, bones, solidified fats, and coffee grounds).
- Household hygiene, which mainly included diapers (7.6%) and pet waste (5.9%).
- Plastics, including plastic laminates and other film packaging (3.0%), low-density polyethylene/high-density polyethylene (LDPE/HDPE) film – products (non-packaging) (1.9%), durable plastic products (1.8%), #5 polypropylene (1.3%), and plastic film (1.1%).
- Paper, primarily composed of tissue/toweling (7.4%), mixed paper (1.4%), and food soiled paper (1.0%). Mixed paper included fine paper, flyers, magazines, and newsprint.

Yard waste, composed of yard and garden debris (7.7%) and brush and branches (1.2%).

3.2.2 Diversion Potential

Figure 3-2 summarizes the diversion potential of the SF garbage stream. The diversion potential represents the percentage of materials that could be diverted from the garbage stream through the City's organics, recycling, and depot programs. The 'No Program' category represents the theoretical diversion potential of materials from the garbage stream, but no corresponding program or service is currently offered (e.g., construction and demolition wastes). The total diversion potential for the SF garbage stream was calculated to be 72% and consisted of 46% organic materials, 11% recyclable materials, 9% no program materials, and 6% depot materials. The diversion potential for the SF garbage stream based on existing programs and services is 63%.

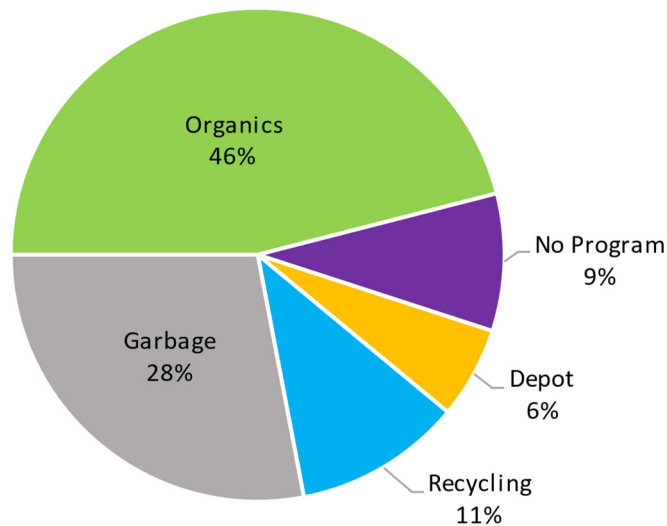


Figure 3-2: Overall SF Garbage Diversion Potential

The diversion potential is broken down as follows:

- Organic materials, primarily composed of avoidable food waste (20.6%), yard and garden debris (7.7%), unavoidable food waste (7.6%), and tissue/toweling (7.4%).
- Recyclable materials, which included boxboard/cores (1.5%), mixed paper (1.4%), #5 polypropylene (1.3%), and corrugated cardboard (1.2%).
- No program materials, which included dimensional lumber – treated (3.0%), ceramics/porcelain (1.5%), and carpeting (1.4%).
- Depot materials, primarily composed of textiles (3.1%) and electronics (2.0%).

3.3 Single Family Recycling

The following summarizes the waste composition results and contamination rate for SF recycling.

3.3.1 Recycling Waste Composition Results

Figure 3-3 illustrates the average waste composition of the recycling stream from the SF sector in Fall 2023. This is a snapshot of the types and relative quantities of materials that were discarded by residents at this time of the year.

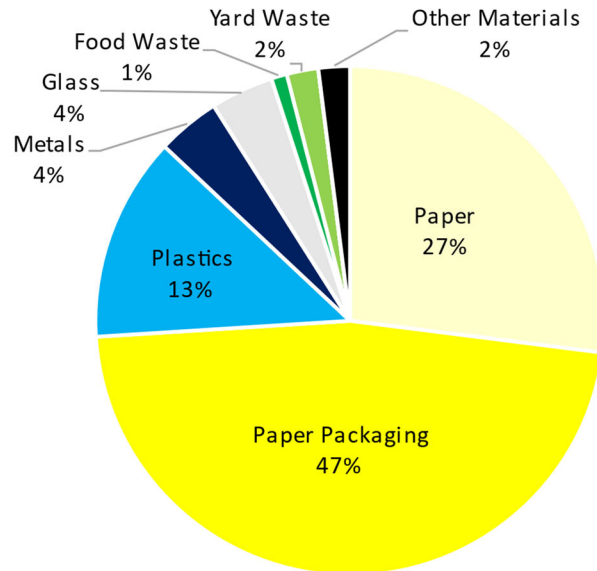


Figure 3-3: Overall SF Recycling Composition

The SF recycling stream was primarily composed of paper packaging (47%), paper (27%), and plastics (13%). These three primary categories represent 87% of the SF recycling stream.

The primary categories in SF recycling are broken down as follows:

- Paper packaging, mainly including corrugated cardboard (26.8%) and boxboard/cores (16.9%).
- Paper, primarily composed of mixed paper (22.7%) and other paper – non-obligated (3.0%). Other paper – non-obligated includes soft and hard cover books and photographs.
- Plastics, including #2 HDPE non-beverage containers (2.2%), durable plastic products (1.9%), #1 polyethylene terephthalate thermoform (1.7%), #5 polypropylene (1.4%), and #1 polyethylene terephthalate bottles, jugs, and jars – non-beverage (1.2%).

3.3.2 Contamination Rate

Figure 3-4 summarizes the percent contamination of the SF recycling stream. The percent contamination represents the percentage of materials that are considered garbage, organic, or depot materials. The total percent contamination for the SF recycling stream was 15%, including garbage materials (10%), organic materials (4%), and depot materials (1%). The recycling stream contained 5% cross contamination and 10% contamination.

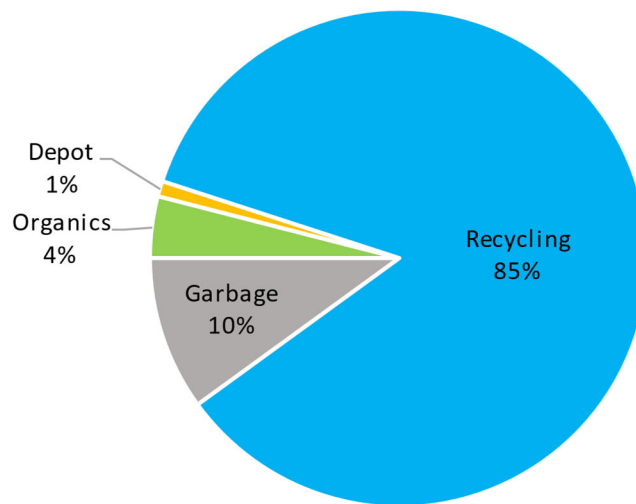


Figure 3-4: Overall SF Recycling Diversion Potential

The contamination is broken down as follows:

- Garbage materials, including other paper – non-obligated (3.0%), durable plastic products (1.9%), and other waste (1.0%). Garbage materials also included plastic film (0.7%), LDPE/HDPE film – products (non-packaging) (0.7%), plastic laminates and other film packaging (0.7%), other glass (0.6%), sanitary products (0.5%), other rigid plastic packaging (0.4%), Polycoat beverage cups (0.2%), laminated paper packaging (0.2%), spiral wound containers (0.2%), ice cream containers and other bleached long Polycoat fibre (0.1%), and #6 polystyrene – expanded (0.1%).
- Organic materials, primarily composed of yard and garden debris (2.0%) and avoidable food waste (1.2%).
- Depot materials, primarily composed of textiles (0.7%).

3.3.3 Capture Rate

Table 3-5 summarizes the amount of recyclable material found in the garbage, recycling, and organics streams; these values represent the average from the 10 neighborhoods. The total amount of recyclable materials in the garbage, recycling, and organics streams was 23.40 kg, 42.53 kg, and 2.01 kg, respectively. Table 3-6 summarizes the capture rate of the recycling stream. The total amount of recyclables that could be diverted was 67.94 kg and the total amount of recyclable captured in the recycling stream was 42.53 kg. Therefore, the capture rate for recyclables was determined to be 62.6%.

Table 3-5: Recyclable Material in All Streams – Fall 2023

	Garbage	Recycling	Organics
Total waste generated (kg)	215.95	50.24	163.19
Percent Composition of Recyclable Material	10.8%	84.7%	1.2%
Recyclable Material (kg)	23.40	42.53	2.01

Table 3-6: Recyclable Material Capture Rate – Fall 2023

	Value
Total Recyclables in Garbage, Recycling, and Organics Streams (kg)	67.94
Total Recyclables Captured in the Recycling Stream (kg)	42.53
Capture Rate	62.6%

3.4 Single Family Organics

The following summarizes the waste composition results and contamination rate for SF organics.

3.4.1 Organics Waste Composition Results

Figure 3-5 illustrates the average waste composition of the organics stream from the SF sector in Fall 2023. This is a snapshot of the types and relative quantities of materials that were discarded by residents at this time of the year.

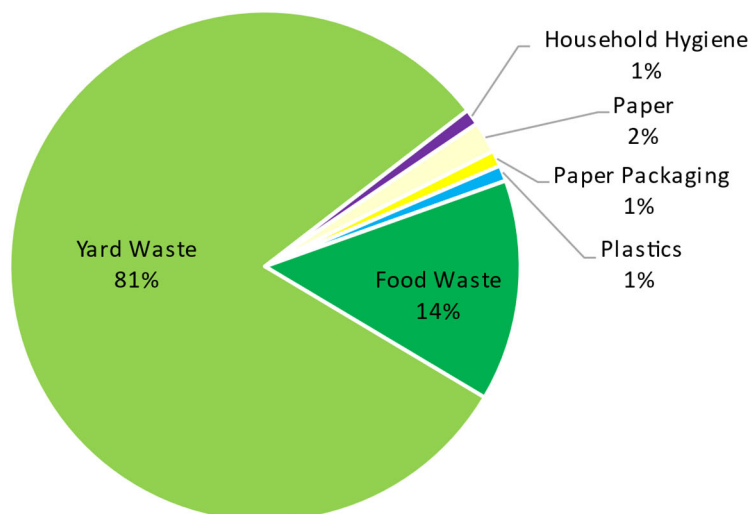


Figure 3-5: Overall SF Organics Composition

The SF organics stream was primarily composed of yard waste (81%) and food waste (14%). These two primary categories represent 95% of the SF organics stream.

The primary categories in SF organics is broken down as follows:

- Yard waste, including yard and garden debris (77.1%) and brush and branches (4.0%).
- Food waste, composed of avoidable food waste (9.9%) and unavoidable food waste (4.4%).

3.4.2 Contamination Rate

Figure 3-6 summarizes the percent contamination of the SF organics stream. The percent contamination represents the percentage of materials that are considered garbage or recyclable materials. The total contamination for the SF organics stream was 3%, including garbage materials (2%) and recyclable materials (1%). The organics stream contained 2% contamination and 1% cross contamination.

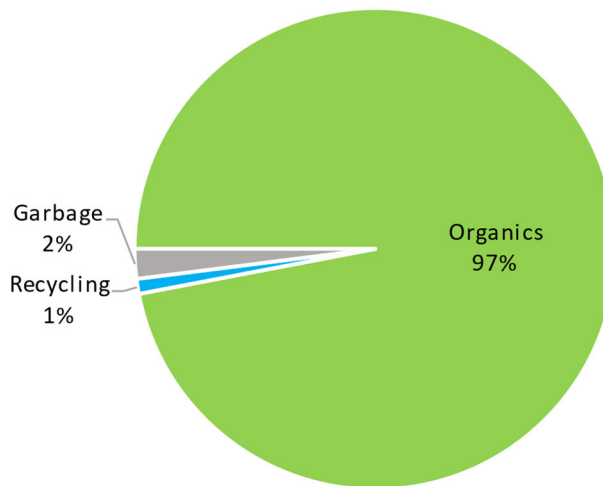


Figure 3-6: Overall SF Organics Diversion Potential

The contamination is broken down as follows:

- Garbage materials, including diapers (0.4%), sanitary products (0.2%), #7 biodegradable/compostable plastics (0.2%), and other paper – non-obligated (0.2%).
- Recyclable materials, primarily composed of corrugated cardboard (0.6%).

3.4.3 Capture Rate

Table 3-7 summarizes the amount of organic material found in the garbage, recycling, and organics streams; these values represent the average from the 10 neighborhoods. The total amount of organic materials in the garbage, recycling, and organics streams was 98.28 kg, 1.95 kg, and 158.38 kg, respectively. Table 3-8 summarizes the capture rate of the organics stream. The total amount of organics that could be diverted was 258.60 kg and the total amount of organic captured in the organics stream was 158.38 kg. Therefore, the capture rate for organics was determined to be 61.2%.

Table 3-7: Organic Material in All Streams – Fall 2023

	Garbage	Recycling	Organics
Total waste generated (kg)	215.95	50.24	163.19
Percent Composition of Organic Material	45.5%	3.9%	97.1%
Organic Material (kg)	98.28	1.95	158.38

Table 3-8: Organic Material Capture Rate – Fall 2023

	Value
Total Organics in Garbage, Recycling, and Organics Streams (kg)	258.60
Total Organics Captured in the Organic Stream (kg)	158.38
Capture Rate	61.2%

3.4.4 Bag Count

Table 3-9 summarizes the number of bags found in the SF organics stream during the Fall 2023 sorting event. The average number of #7 biodegradable/compostable bags per kg of organics was 0.05 bags/kg. The range was between 0.01 and 0.12 bags/kg. The average number of LDPE/HDPE non-packaging bags per kg of organics was 0.01 bags/kg ranging between 0.00 and 0.07 bags/kg. LDPE non-packaging included purchased film bags (e.g., garbage bags, kitchen catchers, sandwich and freezer bags, etc.).

Table 3-9: Number of Bags in SF Organics Samples – Fall 2023

Route	Weight of Organics (kg)	#7 Biodegradable/Compostable (bags)	LDPE/HDPE Non-Packaging (bags)	#7 Biodegradable/Compostable (bags/kg)	LDPE/HDPE Non-Packaging (bags/kg)
Eastview	235.98	4	0	0.02	0.00
Parkridge	200.05	2	1	0.01	<0.01
Rosewood	74.35	6	5	0.08	0.07
Mount Royal	153.55	3	0	0.02	0.00
Holliston	90.65	10	2	0.11	0.02
City Park	155.05	9	0	0.06	0.00
Nutana	186.88	10	0	0.05	0.00
Silverwood Heights	233.70	2	0	0.01	0.00
Willowgrove	145.90	10	1	0.07	0.01
Dundonald	155.79	18	1	0.12	0.01
Average	163.19	7	1	0.05	0.01

4.0 INTERESTING FINDS

Table 4-1 lists some of the notable, unexpected, or unusual materials found during the waste composition study. These materials will not necessarily skew the results as it is not atypical to have these types of materials present in the waste stream.

Table 4-1: Notable Materials – Fall 2023

Waste Stream	Sample ID	Description	Photo
Garbage	FA23-EAS-G	Parts of a chair	
Garbage	FA23-EAS-G	Sink	
Recycling	FA23-EAS-R	Beverage containers (unopened)	
Garbage	FA23-MOU-G	Standing fan	
Garbage	FA23-NUT-G	Fluorescent lightbulbs	
Garbage	FA23-NUT-G	Part of light fixture with ballast	

Waste Stream	Sample ID	Description	Photo
Garbage	FA23-ROS-G	Gaming console	
Garbage	FA23-SIL-G	Bicycle tires	
Garbage	FA23-DUN-G	Two inflatable dinosaur costumes	
Organics	FA23-DUN-O	Sanitary products	

5.0 RECOMMENDATIONS

The following are some initial comments and recommendations based on the findings from the Fall 2023 study:

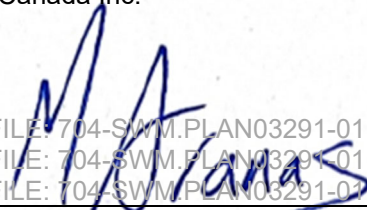
- The bi-weekly collection frequency appears to be effective for resident's needs. On average, carts that were set out were 69% full. The range for all three streams for a given route was 58% to 81%.
- The 360 L cart worked well for most households however:
 - There were 18 carts out of 306 total possible carts that were overfilled (e.g., the lid did not fully close). This included 11 garbage, 5 recycling, and 2 organics carts.
 - There were 73 carts out of 306 total possible carts that were filled to half capacity or below. This included 23 garbage, 18 recycling, and 32 organics carts.
- The garbage stream was comprised of 37% organic materials, including 28% food waste and 9% yard waste. Increased education on the new green cart program may reduce the amount of food and yard waste in the garbage stream.

- Approximately 10% of material in the recycling carts was garbage, mainly composed of non-obligated paper and durable plastic products. The recycling stream also contained 4% organic material, containing yard and garden debris and avoidable food waste. Increased education on acceptable recyclable materials may reduce the amount of contamination in the recycling stream.
- Additional diversion programs are recommended for materials that can be diverted from the landfill, including construction and demolition waste (e.g., treated wood, ceramics, and carpeting).

6.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.



FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01

Prepared by:
Mackenzie Aranas, B.Sc.
Environmental Technician
Solid Waste Management Practice
Direct Line: 306.659.6101
Mackenzie.Aranas@tetrattech.com



FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01

Reviewed by:
Kentson Yan, M.Sc., P.Eng.
Project Engineer
Solid Waste Management Practice
Direct Line: 403.723.1556
Kentson.Yan@tetrattech.com



FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01

Prepared by:
Michelle Jelinski, P.Eng.
Project Engineer – Team Lead
Solid Waste Management Practice
Direct Line: 587.460.3449
Michelle.Jelinski@tetrattech.com



FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01
FILE: 704-SWM.PLAN03291-01

Reviewed by:
Wilbert Yang, P.Eng.
Senior Planning Engineer
Solid Waste Management Practice
Direct Line: 604.608.8648
Wilbert.Yang@tetrattech.com

/lm

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner

consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

SELECTED PHOTOGRAPHS



Photo 1: Field Staff Collecting Materials



Photo 2: Field Staff Loading a Sample to Transport to the Sorting Area



Photo 3: Residential Bins Set Out for Curbside Collection



Photo 4: Example of a 100 kg Garbage Sample for Hand Sorting



Photo 5: Example of a Recycling Sample for Hand Sorting



Photo 6: Example of an Organics Sample for Hand Sorting



Photo 7: Example of the Mixed Paper Category



Photo 8: Example of the Tissue/Toweling Category



Photo 9: Example of the Polycoat Beverage Cups Category



Photo 10: Example of the Aseptic Containers - Beverage Category



Photo 11: Example of the #1 Polyethylene Terephthalate (PET) Thermoform Category



Photo 12: Example of the #2 High-Density Polyethylene (HDPE) Non-Beverage Category



Photo 13: Example of the #5 Polypropylene (PP) Category



Photo 14: Example of the #6 Polystyrene (PS) - Expanded Category



Photo 15: Example of the #7 Biodegradable/Compostable Plastics Category



Photo 16: Example of the Plastic Film Category



Photo 17: Example of the Plastic Laminates and Other Film Packaging Category

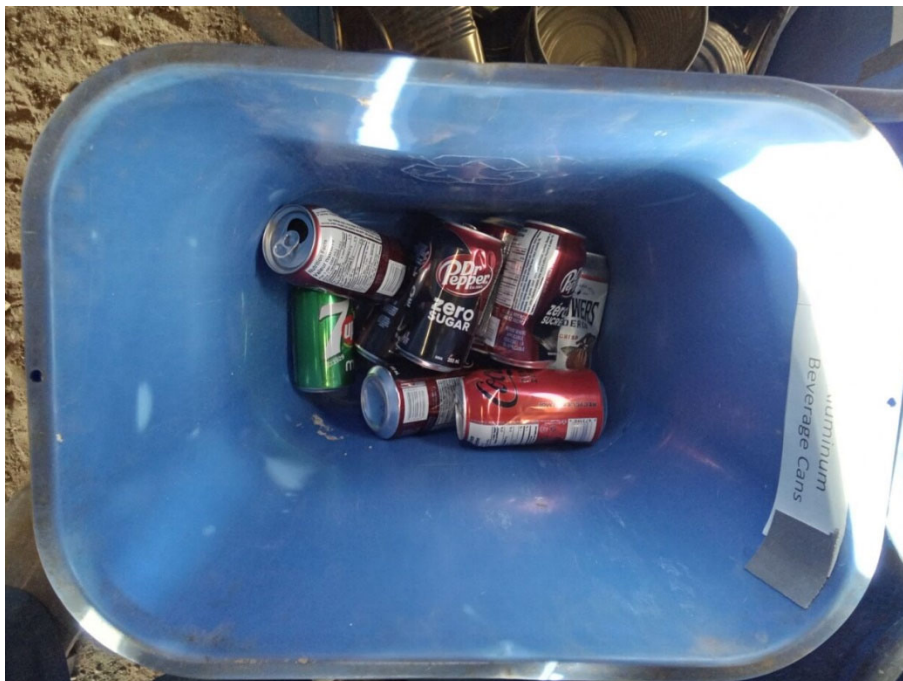


Photo 18: Example of the Aluminum Beverage Cans Category



Photo 19: Example of the Aluminum Non-Beverage Category



Photo 20: Example of the Steel Food Cans Category



Photo 21: Example of the Glass Beverage Containers Category



Photo 22: Example of the Glass Non-Beverage Category



Photo 23: Example of the Household Hazardous Waste Category



Photo 24: Example of the Avoidable Food Waste Category



Photo 25: Example of the Unavoidable Food Waste Category



Photo 26: Example of the Yard and Garden Debris Category



Photo 27: Example of the Diapers Category



Photo 28: Example of the Textiles Category



Photo 29: Example of the Other Waste Category

APPENDIX C

MATERIAL CATEGORIES

Table C-1: Material Category Descriptions

	Category	Description and/or Examples	Diversion Potential
01 Paper			
1	Mixed Paper	<ul style="list-style-type: none"> Fine household papers, writing paper, office paper, copy paper, bills and statements, ad mail, etc. Includes glossy flyers and advertising that are not distributed with newspapers. Includes gift wrap, construction paper, puzzle books, e.g., sudoku or colouring books Glossy magazines, catalogues, calendars, annual reports (must be bound, i.e., stapled or glued) Telephone books and other directories such as the Yellow Pages Non Newspapers(e.g., TV guides, Auto Trader, Real Estate News) plus inserts and flyers from newspapers made of newsprint. Daily and weekly newspapers 	Recycling
2	Tissue/Toweling	<ul style="list-style-type: none"> Paper napkins, towel, tissues 	Organics
3	Food Soiled Paper	<ul style="list-style-type: none"> Plates, cups, muffin wrappers, coffee filters, teabags, bags, food packaging 	Organics
4	Shredded Paper	<ul style="list-style-type: none"> Paper that has been shredded mechanically into thin strips 	Recycling
5	Other Paper – Non-Obligated	<ul style="list-style-type: none"> Soft or hard covered literary books, academic journals, textbooks, photographs 	Garbage
02 Paper Packaging			
6	Corrugated Cardboard	<ul style="list-style-type: none"> Includes micro-flute corrugated containers, pizza boxes, waxed corrugated containers, electronic product boxes such as television and computer boxes, boxes used to direct mail for residential consumers 	Recycling
7	Boxboard/Cores	<ul style="list-style-type: none"> Boxboard, paperboard, cereal box, shoe box, frozen food box, cores from toilet paper/toweling/gift wrap, etc. Includes wet-strength boxboard, fast food cartons such as fry/onion ring boxes and paper plates 	Recycling
8	Kraft Paper	<ul style="list-style-type: none"> Kraft paper bags and wrap, grocery or retail bags, potato bags, some pet food bags, etc. Includes brown, white, and coloured kraft paper and bags. No bags with bonded plastic or foil liners/layers/coatings. Includes bags with a light grease coating 	Recycling
9	Molded Pulp	<ul style="list-style-type: none"> Egg cartons, drink trays, other trays, molded pulp flower pots/trays, etc. 	Recycling
10	Polycoat Beverage Cups	<ul style="list-style-type: none"> Hot beverage/food containers, with polycoat on inside only, including coffee cups, soup cups/bowls, chili cups etc. Cold beverage/food containers with polycoat on both sides including fountain drinks, take-out ice cream cups 	Garbage
11	Ice Cream Containers and Other Bleached Long Polycoat Fibre	<ul style="list-style-type: none"> Polycoated paper ice cream containers, typically with a lid, excluding boxboard folded ice cream boxes. Food containers with white fibre and a rolled or folded rim, includes Michelina's frozen food, KFC tubs 	Garbage
12	Laminated Paper Packaging	<ul style="list-style-type: none"> Paper based packaging (at least 85% paper) with foil or plastic liners/layers/coatings, pouches, cookie bags, microwave popcorn bags, fast food sandwich wraps, gift bags, paper based trays, etc. 	Garbage
13	Spiral Wound Containers	<ul style="list-style-type: none"> Spiral wound cans with paper walls and plastic or metal tops or bottoms; frozen juice, Pringles, raisins, etc. 	Garbage

	Category	Description and/or Examples	Diversion Potential
14	Gable Top Containers – Beverage	<ul style="list-style-type: none"> ▪ Polycoat containers with a gable shaped top, milk and milk substitutes like soy, almond and rice milk, and juices 	Recycling
15	Gable-Top Containers – Non-Beverage	<ul style="list-style-type: none"> ▪ Polycoat containers with a gable shaped top that previously contained some foods or other products, e.g., sugar, molasses etc. 	Recycling
16	Aseptic Containers – Beverage	<ul style="list-style-type: none"> ▪ Polycoat fibre and foil containers (e.g., Tetra Pak) for beverage e.g., soy, almond and rice milk, juice boxes 	Recycling
17	Aseptic Containers – Non-Beverage	<ul style="list-style-type: none"> ▪ Polycoat fibre and foil containers (e.g., Tetra Pak) for soup, sauces etc. 	Recycling
03 Plastics			
18	#1 Polyethylene Terephthalate Bottles – Beverage	<ul style="list-style-type: none"> ▪ Soft drink/water bottles 	Recycling
19	#1 Polyethylene Terephthalate Bottles, Jugs and Jars – Non-Beverage	<ul style="list-style-type: none"> ▪ Salad dressing bottles, peanut butter jars 	Recycling
20	#1 Polyethylene Terephthalate Thermoform	<ul style="list-style-type: none"> ▪ #1 clamshells, #1 egg cartons, #1 trays, #1 blister packaging, #1 drink cups, etc. 	Recycling
21	#2 High-Density Polyethylene Beverage	<ul style="list-style-type: none"> ▪ Milk jugs, juice containers and drinkable yogurt bottles 	Recycling
22	#2 High-Density Polyethylene Non-Beverage	<ul style="list-style-type: none"> ▪ Laundry detergent, bleach, vinegar, personal care products such as shampoos, conditioners and body wash, windshield washing fluid containers, cleaning supplies. Other #2 containers such as margarine and yogurt containers and lids made from high-density polyethylene 	Recycling
23	#3 Polyvinyl Chloride	<ul style="list-style-type: none"> ▪ Tubs, condiment containers 	Recycling
24	#5 Polypropylene	<ul style="list-style-type: none"> ▪ #5 bottles and containers. plastic bottles includes nutritional supplement drinks, shampoos, etc. ▪ #5 containers such as margarine and yogurt containers and other containers made from polypropylene, including tubs and lids with resin codes #5 polypropylene 	Recycling
25	#6 Polystyrene – Expanded	<ul style="list-style-type: none"> ▪ Foam take-out containers such as drink cups, large, white packaging foam, meat trays, coloured foam insulation 	Garbage
26	#6 Polystyrene – Non-Expanded	<ul style="list-style-type: none"> ▪ Polystyrene clear clamshell containers such as berry and muffin containers, rigid polystyrene cups, plates, and bottles 	Recycling
27	#7 Biodegradable/Compostable Plastics	<ul style="list-style-type: none"> ▪ Might not have #7 label; include BPI certification 	Garbage
28	Plastic Film	<ul style="list-style-type: none"> ▪ High-density polyethylene and low-density polyethylene film, dry cleaning bags, bread bags, milk bags, toilet paper and paper towel over-wrap, lawn seed bags 	Garbage
29	Low-Density Polyethylene and High-Density Polyethylene Film – Products (Non-Packaging)	<ul style="list-style-type: none"> ▪ Non-packaging low-density polyethylene and high-density polyethylene film (e.g., kitchen catchers, sandwich and freezer bags, etc.) 	Garbage
30	Plastic Laminates and Other Film Packaging	<ul style="list-style-type: none"> ▪ Laminated plastic film and bags that are at least 85% plastic (by weight). Includes chip bags, vacuum sealed bags, cereal liners, candy wraps, pasta bags, boil in a bag, plastic based food pouches, etc. 	Garbage

	Category	Description and/or Examples	Diversion Potential
31	Other Rigid Plastic Packaging	<ul style="list-style-type: none"> Other rigid containers (#4 and #7), non-polyethylene Terephthalate blister packaging, unmarked/coded packaging, plant pots and trays, pails etc. 	Garbage
32	Durable Plastic Products	<ul style="list-style-type: none"> Non-packaging such as videocassette recorder tapes, compact discs, toys, games, tupperware, etc. Include multi-material items that are mainly plastic – e.g., a plastic toy truck with metal axles 	Garbage
04 Metals			
33	Aluminum Beverage Cans	<ul style="list-style-type: none"> Aluminum soft drinks, soda, juice, alcoholic beverages, beer cans 	Recycling
34	Aluminum Non-Beverage	<ul style="list-style-type: none"> Food containers, aluminum foil wrap, pie plates, baking trays, etc. 	Recycling
35	Aerosol Containers	<ul style="list-style-type: none"> Mousse spray cans, air freshener spray cans, deodorant spray cans, hairspray cans, food spray cans for cheese or whipped cream, empty spray cans, cooking oil, etc. 	Garbage
36	Other Aluminum	<ul style="list-style-type: none"> Aluminum siding, baking trays etc. 	Garbage
37	Steel Beverage Cans	<ul style="list-style-type: none"> Steel apple juice, alcoholic beverages, beer cans, Sapporo, etc. 	Recycling
38	Steel Food Cans	<ul style="list-style-type: none"> Soup, beans, peaches, etc. No alcohol containers 	Recycling
39	Other Metal	<ul style="list-style-type: none"> Wire, hardware, copper 	Depot
05 Glass			
40	Glass Beverage Containers	<ul style="list-style-type: none"> Juice, beer, and wine bottles 	Recycling
41	Glass Non-Beverage	<ul style="list-style-type: none"> Food containers 	Recycling
42	Other Glass	<ul style="list-style-type: none"> Window glass, plates, and glasses, light bulbs (fluorescent tubes and compact fluorescents go in Household Hazardous Waste) 	Garbage
06 Household Hazardous Waste			
43	Household Hazardous Waste	<ul style="list-style-type: none"> Labelled CAUTION, WARNING, CORROSIVE, EXPLOSIVE, FLAMMABLE, POISONOUS or TOXIC Acid, adhesives, automotive, batteries, cleaners, cylinders, coorsives, fuels, light bulbs, mercury, oxidizing chemicals, paint, pesticides and fertilizers, pharmaceuticals, solvents 	Depot
07 Food Waste			
44	Avoidable Food Waste	<ul style="list-style-type: none"> Whole fruits and vegetables, meat, bread, prepared meals, fruits and vegetables trimmings 	Organics
45	Unavoidable Food Waste	<ul style="list-style-type: none"> Inedible food, such as peelings, bones, solidified fats, cooking oils, and food grease 	Organics
08 Yard Waste			
46	Yard and Garden Debris	<ul style="list-style-type: none"> Grass clippings, leaves, weeds, plant parts, pumpkins, topsoil, and sod 	Organics
47	Brush and Branches	<ul style="list-style-type: none"> Small twigs and tree trimmings that are no more than 60 centimetres in length and 2 centimetres in diameter, conifer cones and needles, wood chips and bark mulch 	Organics

	Category	Description and/or Examples	Diversion Potential
08 Yard Waste			
48	Electronics	<ul style="list-style-type: none"> Laptop computers, notebooks, tablet PCs, TVs and Computer Monitors, printers, fax machines, photocopiers and scanners, personal, portable, or home DVD, Blu Ray, CD, MP3, record players; film or digital cameras/video recorders; digital picture frames; audio and video baby monitors; cable/satellite TV receivers; amps, receivers; speakers, headphones, microphones, coaxial, telephone, speaker wires, coffee makers, mixers, bread makers, toaster ovens, waffle, makers, crock pots, saw , drill, etc. 	Depot
10 Construction And Demolition Wastes			
49	Dimensional Lumber – Untreated	<ul style="list-style-type: none"> Unpainted or unstained lumber and pallets 	No program
50	Dimensional Lumber – Treated	<ul style="list-style-type: none"> Painted, stained, or treated lumber 	No program
51	Composite Wood	<ul style="list-style-type: none"> Plywood, oriented strand board, medium-density fibreboard, particle board 	No program
52	Gypsum Wallboard	<ul style="list-style-type: none"> Drywall 	No program
53	Asphalt Roofing Shingles	<ul style="list-style-type: none"> Asphalt shingles and tarpaper 	No program
54	Mixed Metals	<ul style="list-style-type: none"> Ferrous, non-ferrous, aluminum 	No program
55	Concrete, Bricks	<ul style="list-style-type: none"> Concrete, paving stones, cement bricks 	No program
56	Ceramics, Porcelain	<ul style="list-style-type: none"> Tiles, toilets, sinks 	No program
57	Carpeting	<ul style="list-style-type: none"> Carpeting, underlay, mats 	No program
58	Other Construction and Demolition Wastes	<ul style="list-style-type: none"> Vinyl siding, misc. conduits, ceiling tiles, plumbing pipes, insulation 	No program
11 Bulky Waste			
59	Furniture or Fixtures	<ul style="list-style-type: none"> Chairs, sofas, cabinets, tables, garden furniture, etc. 	No program
60	Other Large Bulky Items	<ul style="list-style-type: none"> Other large items not classified elsewhere 	No program
12 Household Hygiene			
61	Diapers	<ul style="list-style-type: none"> Diapers 	Garbage
62	Sanitary Products	<ul style="list-style-type: none"> Sanitary napkins, hygiene products, etc. 	Garbage
63	Pet Waste	<ul style="list-style-type: none"> Animal feces, bedding, kitty litter 	Garbage
13 Other Materials			
64	Textiles	<ul style="list-style-type: none"> Clothing, shoes, mats, drapes, sheets, etc. Plastic rice sacks go in Other Rigid Plastic Packaging 	Depot
65	Tires and Other Rubber	<ul style="list-style-type: none"> Rubber tires and tubes, other rubber items such as hoses 	Garbage
66	Other Waste	<ul style="list-style-type: none"> Materials not classified elsewhere, wooden fruit basket, vacuum bags, wax candles, furnace filters, etc. 	Garbage
67	Wood Utensils	<ul style="list-style-type: none"> Chopsticks, wooden forks, toothpicks, etc. 	Organics

APPENDIX D

WASTE COMPOSITION RESULTS

Table D-1: Fall 2023 Waste Composition Results – By Stream

Category	Garbage	Recycling	Organics
01 Paper	10.3%	26.6%	1.9%
01. Mixed Paper	1.4%	22.7%	0.1%
02. Tissue/Toweling	7.4%	0.3%	1.5%
03. Food Soiled Paper	1.0%	0.3%	0.2%
04. Shredded Paper	0.0%	0.3%	0.0%
05. Other Paper – Non-Obligated	0.6%	3.0%	0.2%
02 Paper Packaging	4.6%	47.2%	0.9%
06. Corrugated Cardboard	1.2%	26.8%	0.6%
07. Boxboard / Cores	1.5%	16.9%	0.1%
08. Kraft Paper	0.5%	1.1%	0.1%
09. Molded Pulp	0.1%	1.3%	0.1%
10. Polycoat Beverage Cups	0.4%	0.2%	<0.1%
11. Ice Cream Containers and Other Bleached Long Polycoat Fiber	0.1%	0.1%	0.0%
12. Laminated Paper Packaging	0.5%	0.2%	<0.1%
13. Spiral Wound Containers	<0.1%	0.2%	0.0%
14. Gable Top Containers – Beverage	0.1%	0.2%	0.0%
15. Gable-top Containers – Non-Beverage	<0.1%	0.1%	0.0%
16. Aseptic Containers – Beverage	0.1%	0.1%	<0.1%
17. Aseptic Containers – Non-Beverage	0.0%	0.1%	0.0%
03 Plastics	12.6%	12.5%	0.8%
18. #1 Polyethylene Terephthalate Bottles – Beverage	0.1%	0.5%	0.0%
19. #1 Polyethylene Terephthalate Bottles, Jugs, and Jars – Non-Beverage	0.5%	1.2%	<0.1%
20. #1 Polyethylene Terephthalate Thermoform	0.6%	1.7%	<0.1%
21. #2 High-Density Polyethylene Beverage	0.1%	0.3%	0.0%
22. #2 High-Density Polyethylene Non-Beverage	0.9%	2.2%	<0.1%
23. #3 Polyvinyl Chloride	0.1%	0.2%	0.0%
24. #5 Polypropylene	1.3%	1.4%	<0.1%
25. #6 Polystyrene – Expanded	0.5%	0.1%	<0.1%
26. #6 Polystyrene – Non-Expanded	0.2%	0.6%	<0.1%
27. #7 Biodegradable/Compostable Plastics	0.1%	<0.1%	0.2%
28. Plastic Film	1.1%	0.7%	0.1%
29. Low-Density Polyethylene and High-Density Polyethylene Film – Products (Non-Packaging)	1.9%	0.7%	0.1%
30. Plastic Laminates and Other Film Packaging	3.0%	0.7%	0.1%
31. Other Rigid Plastic Packaging	0.5%	0.4%	<0.1%
32. Durable Plastic Products	1.8%	1.9%	<0.1%

Category	Garbage	Recycling	Organics
04 Metals	2.1%	3.7%	0.1%
33. Aluminum Beverage Cans	<0.1%	0.1%	<0.1%
34. Aluminum Non-Beverage	0.9%	1.9%	0.1%
35. Aerosol Containers	0.1%	0.0%	0.0%
36. Other Aluminum	<0.1%	<0.1%	<0.1%
37. Steel Beverage Cans	0.0%	0.0%	0.0%
38. Steel Food Cans	0.3%	1.4%	0.0%
39. Other Metal	0.7%	0.3%	<0.1%
05 Glass	1.6%	4.2%	<0.1%
40. Glass Beverage Containers	0.1%	1.3%	0.0%
41. Glass Non-Beverage	0.9%	2.3%	<0.1%
42. Other Glass	0.7%	0.6%	<0.1%
06 Household Hazardous Waste	0.6%	<0.1%	<0.1%
43. Household Hazardous Waste	0.6%	<0.1%	<0.1%
07 Food Waste	28.2%	1.3%	14.3%
44. Avoidable Food Waste	20.6%	1.2%	9.9%
45. Unavoidable Food Waste	7.6%	<0.1%	4.4%
08 Yard Waste	8.9%	2.1%	81.1%
46. Yard and Garden Debris	7.7%	2.0%	77.1%
47. Brush and Branches	1.2%	<0.1%	4.0%
09 Waste Electrical and Electronic Equipment	2.0%	<0.1%	<0.1%
48. Electronics	2.0%	<0.1%	<0.1%
10 Construction and Demolition Wastes	8.5%	0.1%	0.2%
49. Dimensional Lumber – Untreated	0.2%	0.0%	0.0%
50. Dimensional Lumber – Treated	3.0%	<0.1%	0.2%
51. Composite Wood	1.1%	<0.1%	0.0%
52. Gypsum Wallboard	0.4%	0.0%	0.0%
53. Asphalt Roofing Shingles	0.0%	0.0%	0.0%
54. Mixed Metals	0.9%	0.1%	0.0%
55. Concrete, Bricks	0.0%	0.0%	0.0%
56. Ceramics, Porcelain	1.5%	0.0%	0.0%
57. Carpeting	1.4%	0.0%	0.0%
58. Other Construction and Demolition Wastes	<0.1%	0.0%	<0.1%
11 Bulky Waste	0.6%	0.0%	0.0%
59. Furniture or Fixtures	0.5%	0.0%	0.0%
60. Other Large Bulky Items	0.1%	0.0%	0.0%
12 Household Hygiene	14.3%	0.5%	0.5%
61. Diapers	7.6%	0.0%	0.4%
62. Sanitary Products	0.8%	0.5%	0.2%
63. Pet Waste	5.9%	0.0%	0.0%

Category	Garbage	Recycling	Organics
13 Other Materials	5.7%	1.8%	0.1%
64. Textiles	3.1%	0.7%	<0.1%
65. Tires and Other Rubber	0.1%	0.0%	0.0%
66. Other Waste	2.4%	1.0%	0.1%
67. Wood Utensils	<0.1%	0.1%	<0.1%
	100.0%	100.0%	100.0%

APPENDIX E

SECTORS AND NAMING CONVENTIONS

Sectors & Naming Convention

The naming convention for samples should be as follows:

Example: **FA23 - EAS - G**

Season and Year Route # Stream

Options:

Fall = FA23 Winter = WI23 Spring = SP24 Summer = SU24	See Table	Garbage = G Recycling = R Organics = O
--	-----------	--

Route	Collection Route	Community
EAS	01	Eastview
PAR	02	Parkridge
ROS	03	Rosewood
MOU	04	Mount Royal
HOL	05	Holliston
CIT	06	City Park
NUT	07	Nutana
SIL	08	Silverwood Heights
WIL	09	Willowgrove
DUN	10	Dundonald