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

PRESENTED TO
City of Saskatoon

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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 second sampling event conducted for garbage, recycling, and organics streams from the single family (SF) residential sector in December 2023 (Winter 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 Winter 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 70% for all three streams.

- On average, the total amount of materials disposed from all three streams on a bi-weekly basis was approximately 26 kg/household.

- On average, carts that were set out were 58% full.

- The garbage stream was primarily composed of food waste (31%), household hygiene, including diapers and pet waste (18%), plastics (12%), paper (9%), and construction and demolition wastes (9%).

- The diversion potential for the garbage stream based on existing programs and services is 57%.

- The recycling stream was primarily composed of paper packaging, including corrugated cardboard and boxboard (50%), paper (26%), and plastics (11%).

- The contamination in the recycling stream was 15%.

- The organics stream was primarily composed of food waste (53%) and yard waste (34%).

- The contamination in the organics stream was 9%.

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

Section 5.0 includes initial comments and preliminary recommendations based on the findings from the second 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. Only 1% of carts were overfilled; however, approximately 30% of carts were only filled to half capacity or below.

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- Additional education and communication on the new green cart program may be beneficial to:

  - Reduce the amount of food waste in the garbage stream, which was comprised of 31% food waste.

  - Remind residents that only biodegradable products institute (BPI) certified compostable bags are permitted in the green cart program. The total number of plastic bags was greater than the total number of BPI-certified bags.

  - Increase resident participation or set-out rates. On average, only 44% of residents set-out their green cart for collection; however, this is likely due to a low volume of yard waste being generated at this time of year.

- Additional education and communication on the recycling program may be beneficial to 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. Approximately 9% of material in the garbage stream was construction and demolition waste.

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
BPI	Biodegradable Products Institute
City	City of Saskatoon
HDPE	High-density Polyethylene
LDPE	Low-density Polyethylene
SARCAN	Saskatchewan Association of Rehabilitation Centres
SF	Single Family
Tetra Tech	Tetra Tech Canada Inc.
WEEE	Waste Electrical and Electronic Equipment

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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.

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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. The purpose of this study is to identify trends and changes in the City of Saskatoon's waste profile and provide benchmarks as new programs are introduced. The following programs implemented in the City include:

- In 2023, the City launched a mandatory curbside organics (green) cart program and a mandatory organics diversion program for the industrial, commercial, and institutional sector.

- In 2024, the City plans to implement a variable rate fee structure for curbside garbage (black) carts.

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. The first waste sort was conducted in October 2023 (Fall 2023). This seasonal report summarizes the second sampling event conducted for the single family (SF) residential sector in December 2023 (Winter 2023).

1.1   Scope of Work

This study characterized the composition of solid waste in the garbage, recycling, and organics streams from SF 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 the 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.

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This is the second sorting event that was undertaken from December 4 to December 15, 2023, inclusive. A sampling plan was prepared in conjunction with City staff. A total of 106 households were selected from ten neighbourhoods for the Winter 2023 sorting event and included the same households that were selected 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 Homes	Set Out Location	Description
Eastview	1	EAS	10	Back Lane	10 homes in a row
Parkridge	2	PAR	11	Front Street	11 homes in a row
Rosewood	3	ROS	10	Front Street	10 homes in a row
Mount Royal	4	MOU	14	Front Street	14 homes in a row
Holliston	5	HOL	11	Back Lane	11 homes in a row
City Park	6	CIT	10	Back Lane	10 homes in a row
Nutana	7	NUT	10	Back Lane	10 homes in a row
Silverwood Heights	8	SIL	10	Front Street	10 homes in a row
Willowgrove	9	WIL	10	Front Street	10 homes in a row within a cul-de-sac and adjacent road
Dundonald	10	DUN	10	Front Street	10 homes 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 Behavior:** A few residents approached the collection crew and asked questions about the project or they may have recognized the collection crew from the previous sorting event. 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.

- **Set-Out Rates:** The noted set-out rates for carts in back lane collection locations could potentially be skewed higher. Carts at these locations are usually not returned to the resident's yard or property and are all placed on one side of the alley, increasing the potential of an extra collected cart if they were not labelled correctly.

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▪ **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.

▪ **Low Organics Set-Out Rates:** The organic set out rate for eight of the ten neighborhoods was low may not be representative of the neighbourhood.

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 that was undertaken to conduct this study. Appendix B includes photos that highlight some of the 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. The Health and Safety Plan was reviewed and updated to account for seasonal changes (e.g., winter driving conditions, cold working temperatures) as well as inputs and lesson learned from the fall sorting event. 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.

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Prior to commencing work at the Saskatoon Regional Waste Management Centre (Landfill), 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 Winter 2023 sorting event. The Winter 2023 experienced higher-than-average temperatures and minimal snow prior to and during the waste characterization study. At the time of the Winter 2023 sorting event, there was no snow cover on the ground. 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 – Winter 2023

Date	Temperature (°C)[1]			Precipitation (mm)[1]	Max Wind Speed (km/hr)[1]
	Average	Min	Max		
December 4, 2023	-7.0	-14.7	0.7	0.0	Not reported
December 5, 2023	-3.1	-8.7	2.5	0.0	37
December 6, 2023	-1.6	-6.6	3.4	0.1	Not reported
December 7, 2023	1.1	-1.3	3.5	3.4	48
December 8, 2023	-5.0	-9.5	-0.5	0.0	Not reported
December 11, 2023	-8.4	-14.6	-2.2	0.0	66
December 12, 2023	-7.5	-13.6	-1.4	0.0	Not reported
December 13, 2023	-0.6	-6.5	5.3	0.0	40
December 14, 2023	0.	-6.0	6.0	0.0	34
December 15 2023	0.0	-4.4	4.4	0.0	49

Notes:
[1] Obtained from Government of Canada Climate for the City of Saskatoon.

2.3   Sampling Plan – Selected Homes

Tetra Tech worked with City staff to select households for the study. During the Winter 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 Winter 2023 sorting event. It should be noted that garbage, recycling, and organics were each collected every other week.

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[1] Government of Canada. (2023, November 7). Daily Data Report for December 2023.
  Daily Data Report for December 2023 - Climate - Environment and Climate Change Canada (weather.gc.ca).

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

Collection Day	Neighbourhood	Waste Stream	Issues
Monday, December 4	Eastview	Organics	Not enough set outs, went back a second time for collection.
	Rosewood	Recycling	
	Parkridge	Garbage	
Tuesday, December 5	Mount Royal	Garbage	
	City Park	Recycling	
	Eastview	Recycling	
	Holliston	Recycling	
	Rosewood	Organics	
Wednesday, December 6	Dundonald	Recycling	
	City Park	Garbage	
	Holliston	Organics	
Thursday, December 7	Silverwood Heights	Garbage	
	Nutana	Organics	
Friday, December 8	Dundonald	Garbage	
	Silverwood Heights	Recycling	
	Willowgrove	Organics	Not enough set outs, went back a second time for collection.
Monday, December 11	Willowgrove	Recycling	
	Eastview	Garbage	
	Parkridge	Organics	Not enough set outs, went back a second time for collection.
Tuesday, December 12	Mount Royal	Organics	Not enough set outs, went back a second time for collection. Only partially collected due to it already being collected by the recycling contractor before a second round of collection.
	Nutana	Recycling	
	Rosewood	Garbage	
Wednesday, December 13	Mount Royal	Recycling	Not enough set outs, went back a second time for collection.
	City Park	Organics	Not enough set outs, went back a second time for collection.
	Holliston	Garbage	
Thursday, December 14	Silverwood Heights	Organics	Not enough set outs, went back a second time for collection.
	Nutana	Garbage	
Friday, December 15	Dundonald	Organics	Not enough set outs, went back a second time for collection.
	Parkridge	Recycling	Not enough set outs, went back a second time for collection.
	Willowgrove	Garbage	

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2.4   Sample Collection Methodology

Each day, Tetra Tech arrived at the first collection location no earlier than 7:30 a.m. (note that carts are required to be placed out at the curb for collection by 7:00 a.m. as per the Waste Bylaw). 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. If there was a low number of carts set out (e.g., less than 50%), staff recorded this and returned at a later time that morning to collect materials from any additional carts set out. 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 Winter 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. Materials collected from carts in each neighbourhood were mixed and represented a single sample. Tetra Tech labelled material while collecting to make sure samples were not mixed or co-mingled. 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 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 for hand sorting, 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 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.

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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.

- Bi-weekly generation rates.

- Composition of materials by material type and weight.

- Diversion potential or contamination rate of materials.

- Capture rates of recyclable and organic materials.

- Counts of plastic film bags (non-packaging) and compostable/biodegradable bags.

- 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 location for diversion (e.g., the Recycling Division of Saskatchewan Association of Rehabilitation Centres [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 with future diversion programs.

- **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.

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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 Winter 2023 sorting event. The average total percentage of carts set-out was 70% for all three streams and the average set-out rates in the garbage, recycling, and organics stream was 84%, 83%, and 44%, respectively. The range of set-out rates for all routes was between 43% to 93%.

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

Route	Set Out Location	Garbage (%)	Recycling (%)	Organics (%)	Average (%)
Eastview	Back Lane	90%	80%	50%	**73%**
Parkridge	Front Street	64%	73%	18%	**52%**
Rosewood	Front Street	70%	80%	50%	**67%**
Mount Royal	Front Street	71%	43%	14%	**43%**
Holliston	Back Lane	91%	91%	64%	**82%**
City Park	Back Lane	80%	90%	30%	**67%**
Nutana	Back Lane	90%	90%	100%	**93%**
Silverwood Heights	Front Street	90%	90%	10%	**63%**
Willowgrove	Front Street	100%	90%	20%	**70%**
Dundonald	Front Street	90%	100%	80%	**90%**
Average		**84%**	**83%**	**44%**	**70%**

3.1.2   Material Collected

Table 3-2 summarizes the amount of material collected from each stream in SF residential carts during the Winter 2023 sorting event. The average total amount of materials collected was 273.88 kg from all three streams and the average amount of materials collected in the garbage, recycling, and organics stream was 169.22 kg, 57.08 kg, and 47.58 kg, respectively. The range for all three streams for a given route was 192.55 kg to 393.65 kg.

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

Route	Garbage (kg)	Recycling (kg)	Organics (kg)	Total (kg)
Eastview	129.25	48.95	42.60	**220.80**
Parkridge	89.05	60.15	43.35	**192.55**
Rosewood	129.80	50.75	41.35	**221.90**
Mount Royal	239.52	44.80	22.30	**306.62**
Holliston	179.25	69.10	41.05	**289.40**
City Park	161.80	61.80	35.40	**259.00**
Nutana	95.05	58.40	84.30	**237.75**
Silverwood Heights	174.35	57.10	5.90	**237.35**
Willowgrove	223.95	54.45	101.35	**379.75**
Dundonald	270.20	65.25	58.20	**393.65**
Average	**169.22**	**57.08**	**47.58**	**273.88**

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3.1.3 Waste Collected Per Household

Table 3-3 summarizes the amount of material collected per household from each stream in SF residential carts during the Winter 2023 sorting event. The average total amount of materials per household was 26.07 kg/household from all three streams and the average amount of materials collected per household in the garbage, recycling, and organics stream was 15.99 kg/household, 5.46 kg/household, and 4.62 kg/household, respectively. The generation rate range was between 17.50 kg/household and 39.37 kg/household per two-week period.

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

Route	Garbage (kg/household)	Recycling (kg/household)	Organics (kg/household)	Total (kg/household)*
Eastview	12.93	4.90	4.26	**22.08**
Parkridge	8.10	5.47	3.94	**17.50**
Rosewood	12.98	5.08	4.14	**22.19**
Mount Royal	17.11	3.20	1.59	**21.90**
Holliston	16.30	6.28	3.73	**26.31**
City Park	16.18	6.18	3.54	**25.90**
Nutana	9.51	5.84	8.43	**23.78**
Silverwood Heights	17.44	5.71	0.59	**23.74**
Willowgrove	22.40	5.45	10.14	**37.98**
Dundonald	27.02	6.53	5.82	**39.37**
Average	**15.99**	**5.46**	**4.62**	**26.07**

Note:

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

3.1.4 Cart Fullness

Table 3-4 summarizes the average cart fullness from each stream in SF residential carts during the Winter 2023 sorting event. The average fullness of carts was 58% for all three streams and the average fullness in the garbage, recycling, and organics streams were 65%, 75%, and 34%, respectively. The range of average fullness for all routes was between 47% and 71%.

Table 3-4: Cart Fullness – Winter 2023

Route	Set Out Location	Garbage (%)	Recycling (%)	Organics (%)	Average (%)
Eastview	Back Lane	54%	76%	46%	**58%**
Parkridge	Front Street	51%	59%	50%	**53%**
Rosewood	Front Street	73%	89%	18%	**60%**
Mount Royal	Front Street	62%	75%	40%	**59%**
Holliston	Back Lane	67%	79%	29%	**58%**
City Park	Back Lane	75%	64%	38%	**59%**
Nutana	Back Lane	52%	67%	24%	**47%**
Silverwood Heights	Front Street	61%	75%	10%	**49%**
Willowgrove	Front Street	80%	79%	55%	**71%**
Dundonald	Front Street	78%	84%	33%	**65%**
	Average	**65%**	**75%**	**34%**	**58%**

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3.2   Single Family Garbage

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

3.2.1 SF Garbage Waste Composition Results

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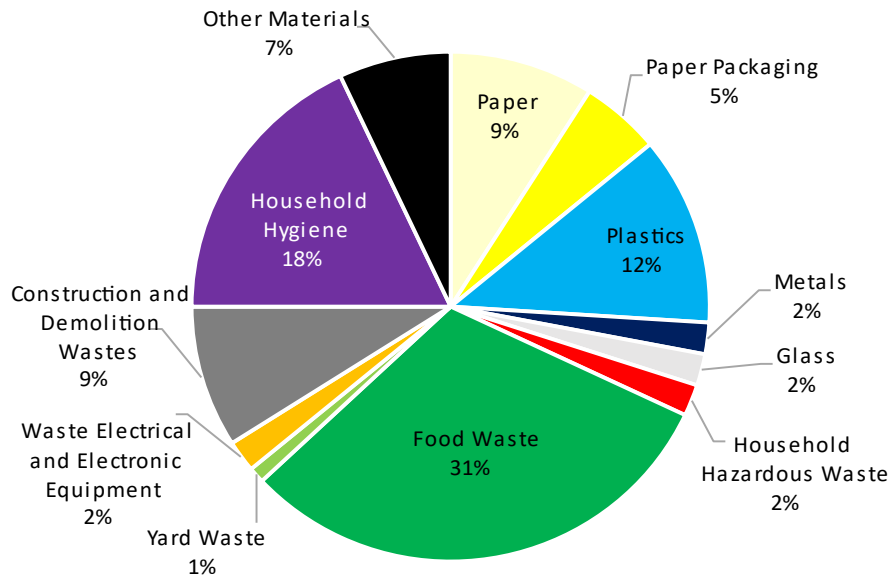

Figure 3-1: Overall SF Garbage Composition

The overall SF garbage stream was primarily composed of food waste (31%), household hygiene (18%), plastics (12%), paper (9%), and construction and demolition wastes (9%). The remainder was comprised of other materials (7%), paper packaging (5%), metal (2%), glass (2%), household hazardous waste (2%), electronics (2%), and yard waste (1%).

The most prominent five primary categories represent 79% of the SF garbage stream and are broken down as follows:

▪ Food waste, composed of avoidable food waste (22.3%) and unavoidable food waste (8.6%). 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 pet waste (10.3%) and diapers (6.4%).

▪ Plastics, including plastic laminates and other film packaging (3.6%), durable plastic products (1.9%), low-density polyethylene/high-density polyethylene (LDPE/HDPE) film – products (non-packaging) (1.6%), and #5 polypropylene (1.0%).

▪ Paper, primarily composed of tissue/toweling (5.1%), mixed paper (1.4%), and shredded paper (1.3%).

▪ Construction and demolition waste, primarily composed of asphalt roofing shingles (3.1%) and composite wood (2.9%).

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 65% and consisted of 38% organic materials, 12% recyclable materials, 8% no program materials, and 7% depot materials. The diversion potential for the SF garbage stream based on existing programs and services is 57%.
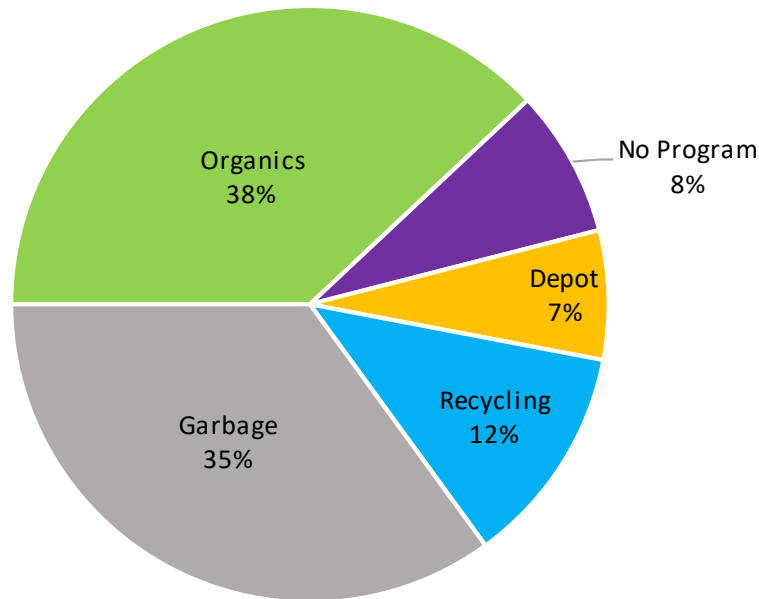

Figure 3-2: Overall SF Garbage Diversion Potential

The diversion potential may be broken down as follows:

- Organic materials, primarily composed of avoidable food waste (22.3%), unavoidable food waste (8.6%), and tissue/toweling (5.1%).

- Recyclable materials, which included boxboard/cores (1.5%), mixed paper (1.4%), shredded paper (1.3%), glass – non-beverage (1.3%), corrugated cardboard (1.0%), and #5 polypropylene (1.0%).

- No Program materials, which included asphalt roofing shingles (3.1%) and composite wood (2.9%).

- Depot materials, primarily composed of textiles (2.3%) and electronics (2.0%).

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3.3   Single Family Recycling

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

3.3.1 SF Recycling Waste Composition Results

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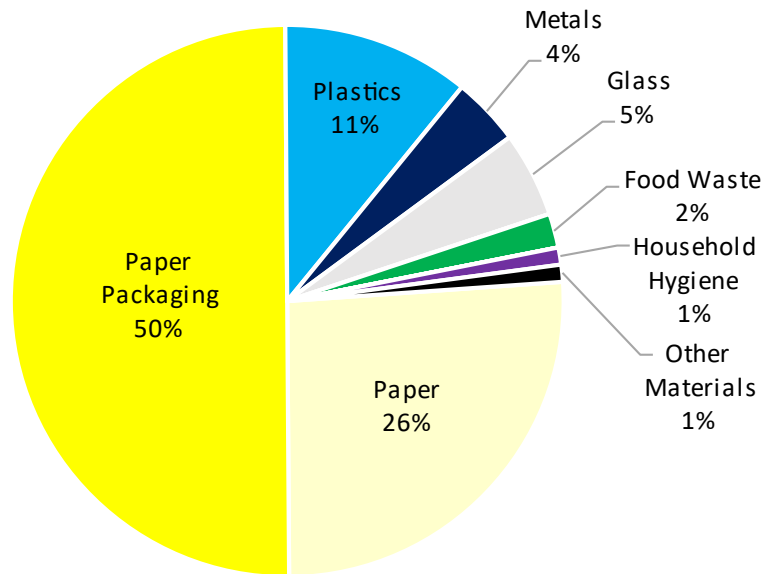

Figure 3-3: Overall SF Recycling Composition

The SF recycling stream was primarily composed of paper packaging (50%), paper (26%), and plastics (11%). 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 (29.2%) and boxboard/cores (15.1%).

▪ Paper, primarily composed of mixed paper (20.9%) and other paper – non-obligated (3.2%). Other paper – non-obligated includes soft and hard cover books and photographs.

▪ Plastics, including #1 polyethylene terephthalate thermoform (1.9%), #2 HDPE non-beverage (1.9%), #5 polypropylene (1.7%), and #1 polyethylene terephthalate bottles, jugs, and jars – non-beverage (1.3%).

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.
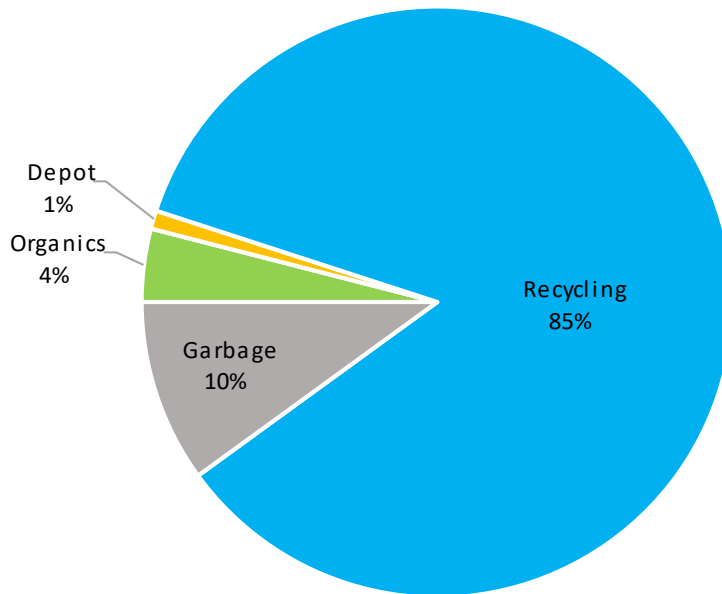

Figure 3-4: Overall SF Recycling Contamination

The contamination is broken down as follows:

- Garbage materials, including other paper – non-obligated (3.2%), laminated paper packaging (1.0%), plastic laminates and other film packaging (0.8%), and other rigid plastic packaging (0.8%). Garbage materials also included durable plastic products (6%), other waste (0.6%), diapers (0.5%), plastic film (0.5%), spiral wound containers (0.5%), ice cream containers and other bleached long Polycoat fibre (0.3%), LDPE/HDPE film – products (non-packaging) (0.2%), aerosol containers (0.2%), other glass (0.2%), sanitary products (0.2%), Polycoat beverage cups (0.1%), and #6 polystyrene – expanded (0.1%).

- Organic materials, primarily composed of avoidable food waste (1.9%) and tissues/toweling (0.8%).

- Depot materials, primarily composed of electronics (0.4%).

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 ten neighborhoods. The total amount of recyclable materials in the garbage, recycling, and organics streams was 19.80 kg, 48.69 kg, and 2.50 kg, respectively. Table 3-6 summarizes the capture rate of the recycling stream. The total amount of recyclables that could be diverted was 70.99 kg and the total amount of recyclable captured in the recycling stream was 48.69 kg. Therefore, the capture rate for recyclables was determined to be 68.6%.

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

	Garbage	Recycling	Organics
Total Waste Generated (kg)	169.22	57.08	47.58
Percent Composition of Recyclable Material	11.7%	85.3%	5.3%
Recyclable Material (kg)	19.80	48.69	2.50

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

	Value
Total Recyclables in Garbage, Recycling, and Organics Streams (kg)	70.99
Total Recyclables Captured in the Recycling Stream (kg)	48.69
Capture Rate	68.6%

3.4   Single Family Organics

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

3.4.1   SF Organics Waste Composition Results

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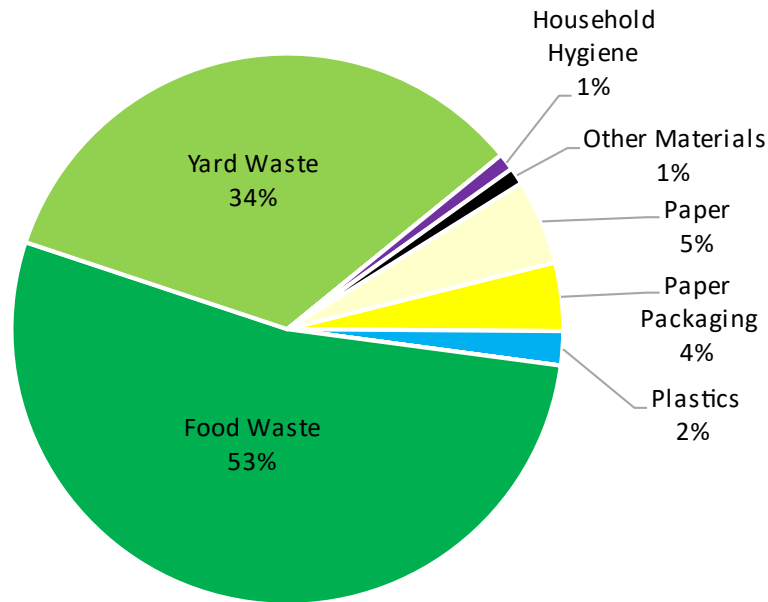

Figure 3-5: Overall SF Organics Composition

The majority of the SF organics stream was composed of food waste (53%) and yard waste (34%). These two primary categories represent 87% of the SF organics stream.

The top primary categories in SF garbage may be broken down as follows:

▪ Food waste, composed of avoidable food waste (38.4%) and unavoidable food waste (14.6%).

▪ Yard waste, including yard and garden debris (31.6%) and brush and branches (2.2%).

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 9%, including recyclable materials (5%), garbage materials (3%), and depot materials (1%). The organics stream contained 6% cross contamination and 3% contamination.
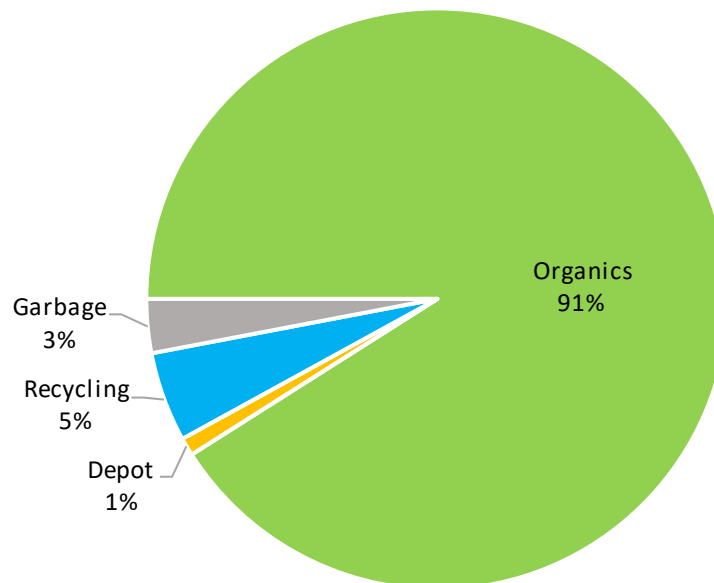

Figure 3-6: Overall SF Organics Contamination

The contamination may be broken down as follows:

▪ Recyclable materials, primarily composed of corrugated cardboard (2.5%) and mixed paper (0.7%), although it is noted that the City's website advertises that residents can line their green carts with newspaper, paper bags, or soiled pizza boxes to help prevent materials from becoming stuck or frozen in the carts.

▪ Garbage materials, including plastic laminates and other film packaging (0.6%) and #7 biodegradable /compostable plastics (0.4%).

▪ Depot materials, composed of textiles (0.6%).

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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 ten neighborhoods. The total amount of organic materials in the garbage, recycling, and organics streams was 64.38 kg, 2.00 kg, and 43.50 kg, respectively. Table 3-8 summarizes the capture rate of the organics stream. The total amount of organics that could be diverted was 109.88 kg and the total amount of organics captured in the organics stream was 43.50 kg. Therefore, the capture rate for recyclables was determined to be 39.6%.

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

	Garbage	Recycling	Organics
Total Waste Generated (kg)	169.22	57.08	47.58
Percent Composition of Organic Material	38.0%	3.5%	91.4%
Organic Material (kg)	64.38	2.00	43.50

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

	Value
Total Organics in Garbage, Recycling, and Organics Streams (kg)	109.88
Total Organics Captured in the Organic Stream (kg)	43.50
Capture Rate	39.6%

3.4.4   Bag Count

Table 3-9 summarizes the number of bags found in the SF organics stream during the Winter 2023 sorting event. The average number of #7 biodegradable/compostable bags per kg of organics was 0.17 bags/kg. The range was between 0.00 and 4.75 bags/kg. The average number of LDPE/HDPE non-packaging bags per kg of organics was 0.21 bags/kg ranging between 0.00 and 0.56 bags/kg. LDPE/HDPE 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 – Winter 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	42.60	2	0	0.05	0.00
Parkridge	43.35	22	2	0.51	0.05
Rosewood	41.35	0	0	0.00	0.00
Mount Royal	22.30	15	12	0.67	0.54
Holliston	41.05	1	23	0.02	0.56
City Park	35.40	11	0	0.31	0.00
Nutana	84.30	1	6	0.01	0.07
Silverwood Heights	5.90	28	3	4.75	0.51
Willowgrove	101.35	3	0	0.03	0.00
Dundonald	58.20	0	11	0.00	0.19
Average	**47.58**	**8**	**10**	**0.17**	**0.21**

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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 – Winter 2023

Waste Stream	Sample ID	Description	Photo
Garbage	WI23-DUN-G	Composite wood	
Garbage	WI23-MOU-G	Three lead-acid batteries	
Garbage	WI23-MOU-G	Car tire	
Garbage	WI23-PAR-G	Jig saw	
Garbage	FA23-NUT-G	Carpet	

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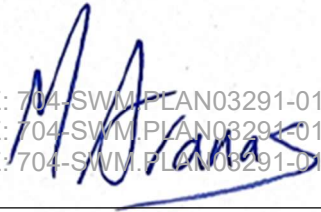| Waste Stream	Sample ID	Description	Photo
Organics	WI23-MOU-O	Insulin needles	
Organics	WI23-MOU-O	Plastic food packaging	
Organics	WI23-HOL-O	Plastic laminates and other film	
Organics	WI23-MOU-O	Jacket	
Recycling	WI23-PAR-R	Avoidable food waste	
Recycling	WI23-MOU-R	Toaster	

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5.0 RECOMMENDATIONS

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

- The bi-weekly collection frequency appears to be sufficient for garbage and recycling. On average, garbage and recycling carts were 65% and 75% full, respectively.

- The bi-weekly collection frequency and/or large cart size appears to be a higher level of service than what is required for the organics stream during the winter season. On average, organics carts were only 34% full with a 44% set out rate.

- The 360 L cart worked well for most households, however:

  - There were three carts out of 306 total possible carts (e.g., 1%) that were overfilled (e.g., the lid did not fully close). This included two garbage and one organics cart.

  - There were 91 carts out of 306 total possible carts (or approximately 30% of carts) that were filled to half capacity or below. This included 39 garbage, 19 recycling, and 33 organics carts.

- Additional education and communication on the new green cart program may be beneficial to:

  - Reduce the amount of food waste in the garbage stream. In the Winter 2023 study, the garbage stream was comprised of 31% food waste.

  - Remind residents that only biodegradable products institute (BPI) certified compostable bags are permitted in the green cart program. The total number of plastic bags (10) was greater than the total number of BPI-certified bags (8) in the Winter 2023 study.

  - Increase resident participation or set-out rates. On average, only 44% of residents set-out their green cart for the Winter 2023 study; however, this is likely due to a low volume of yard waste being generated at this time of year. In addition, some residents may intentionally choose to not set their carts out when only a minimal amount of material is in the cart. During the colder winter months, materials remain frozen and odours tend to be reduced, resulting in less of a need to have the cart collected every two weeks. This recommendation will be revisited after future sorting events in the spring and summer seasons to better determine if the set-out trend is low overall or is dependent on seasonal considerations.

- Additional education and communication on the recycling program may be beneficial to:

  - Reduce the amount of contamination in the recycling stream. Approximately 10% of material in the recycling carts was garbage, mainly composed of non-obligated paper, laminated paper packaging, other rigid plastic packaging, plastic laminates, and other film packaging. The recycling stream also contained 4% organic material, mostly containing avoidable food waste and tissue/toweling.

- Additional diversion programs are recommended for materials that can be diverted from landfill, including construction and demolition waste (e.g., asphalt roofing shingles, composite wood). Approximately 9% of material in the garbage stream in the Winter 2023 study was construction and demolition waste.

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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.

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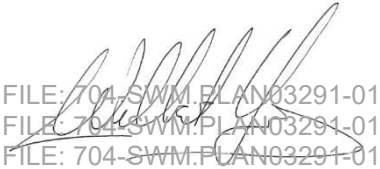Direct Line: 306.659.6101
Mackenzie.Aranas@tetratech.com

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

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

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

/as

APPENDIX A

TETRA TECH'S LIMITATIONS ON USE OF THIS DOCUMENT

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LIMITATIONS ON USE OF THIS DOCUMENT

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APPENDIX B

SELECTED PHOTOGRAPHS

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Photo 1: Field Staff Collecting Materials

Photo 2: Field Staff Loading Material from Collections

Photo 3: Field Staff Hand Sorting a Sample

Photo 4: Field Staff Inputting Data

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Photo 5: Field Staff Disposing of a Sample

Photo 6: Example of a 100 kg Garbage Sample for Hand Sorting

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Photo 7: Example of a Recycling Sample for Hand Sorting

Photo 8: Example of an Organics Sample for Hand Sorting

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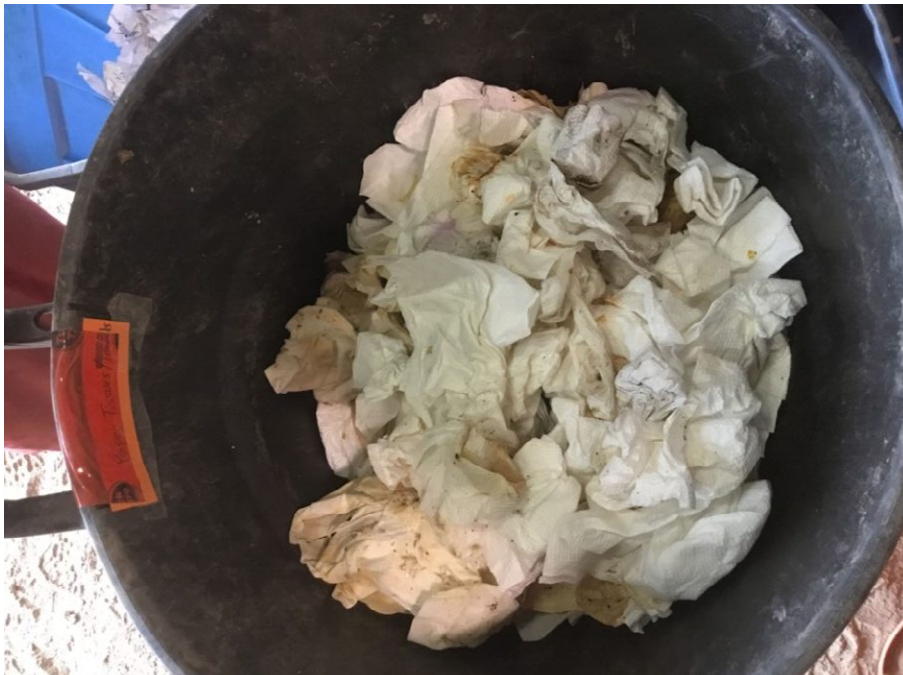**Photo 9: Example of the Mixed Paper Category**

Photo 10: Example of the Tissue/Toweling Category

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Photo 11: Example of the Corrugated Cardboard Category

Photo 12: Example of the Boxboard/Cores Category

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Photo 13: Example of the #1 Polyethylene Terephthalate Bottles – Beverage Category

Photo 14: Example of the #2 High-Density Polyethylene Non-Beverage Category

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Photo 15: Example of the #5 Polypropylene Category

Photo 16: Example of the Low-Density Polyethylene/High-Density Polyethylene Film – Products (Non-Packaging) Category

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Photo 17: Example of the Durable Plastic Products Category

Photo 18: Example of the Aluminum Non-Beverage Category

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Photo 19: Example of the Steel Food Cans Category

Photo 20: Example of the Glass Beverage Containers Category

Photo 21: Example of the Household Hazardous Waste Category

Photo 22: Example of the Avoidable Food Waste Category

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Photo 23: Example of the Unavoidable Food Waste Category

Photo 24: Example of the Brush and Branches Category

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Photo 25: Example of the Diapers Category

Photo 26: Example of the Textiles Category

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Photo 27: Example of the Other Waste Category

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APPENDIX C

MATERIAL CATEGORIES

Table C-1: Material Category Descriptions

Category		Description and/or Examples	Diversion Potential
01	**Paper**		
1	Mixed Paper	▪ 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., sudoko 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	▪ Paper napkins, towel, tissues	Organics
3	Food Soiled Paper	▪ Plates, cups, muffin wrappers, coffee filters, teabags, bags, food packaging	Organcis
4	Shredded Paper	▪ Paper that has been shredded mechanically into thin strips	Recycling
5	Other Paper – Non-Obligated	▪ Soft or hard covered literary books, academic journals, textbooks, photographs	Garbage
02	**Paper Packaging**		
6	Corrugated Cardboard	▪ 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	▪ 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	▪ 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	▪ Egg cartons, drink trays, other trays, molded pulp flower pots/trays, etc.	Recycling
10	Polycoat Beverage Cups	▪ 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	▪ 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	▪ 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	▪ Spiral wound cans with paper walls and plastic or metal tops or bottoms; frozen juice, Pringles, raisins, etc.	Garbage

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	Category	Description and/or Examples	Diversion Potential
14	Gable Top Containers – Beverage	• 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	• 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	• 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	• Polycoat fibre and foil containers (e.g., Tetra Pak) for soup, sauces etc.	Recycling
03	**Plastics**		
18	#1 Polyethylene Terephthalate Bottles – Beverage	• Soft drink/water bottles	Recycling
19	#1 Polyethylene Terephthalate Bottles, Jugs and Jars – Non-Beverage	• Salad dressing bottles, peanut butter jars	Recycling
20	#1 Polyethylene Terephthalate Thermoform	• #1 clamshells, #1 egg cartons, #1 trays, #1 blister packaging, #1 drink cups, etc.	Recycling
21	#2 High-Density Polyethylene Beverage	• Milk jugs, juice containers and drinakble yogurt bottles	Recycling
22	#2 High-Density Polyethylene Non-Beverage	• Laundry detergent, bleach, vinegar, personal care products such as shampoos, conditioners, and body wash, winshield 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	• Tubs, condiment containers	Recycling
24	#5 Polypropylene	• #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	• Foam take-out containers such as drink cups, large, white packaging foam, meat trays, coloured foam insulation	Garbage
26	#6 Polystyrene – Non-Expanded	• Polystyrene clear clamshell containers such as berry and muffin containers, rigid polystyrene cups, plates, and bottles	Recycling
27	#7 Biodegradable/Compostable Plastics	• Might not have #7 label; include Biodegradable Products Institute (BPI) certification	Garbage
28	Plastic Film	• 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)	• 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	• 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

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	Category	Description and/or Examples	Diversion Potential
31	Other Rigid Plastic Packaging	▪ 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	▪ 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	▪ Aluminum soft drinks, soda, juice, alcoholic beverages, beer cans	Recycling
34	Aluminum Non-Beverage	▪ Food containers, aluminum foil wrap, pie plates, baking trays, etc.	Recycling
35	Aerosol Containers	▪ 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	▪ Aluminum siding, baking trays etc.	Garbage
37	Steel Beverage Cans	▪ Steel apple juice, alcoholic beverages, beer cans, Sapporo, etc.	Recycling
38	Steel Food Cans	▪ Soup, beans, peaches, etc. ▪ No alcohol containers	Recycling
39	Other Metal	▪ Wire, hardware, copper	Depot
05	**Glass**		
40	Glass Beverage Containers	▪ Juice, beer, and wine bottles	Recycling
41	Glass Non-Beverage	▪ Food containers	Recycling
42	Other Glass	▪ 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	▪ 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	▪ Whole fruits and vegetables, meat, bread, prepared meals, fruits and vegetables trimmings	Organics
45	Unavoidable Food Waste	▪ Inedible food, such as peelings, bones, solidified fats, cooking oils, and food grease	Organics
08	**Yard Waste**		
46	Yard and Garden Debris	▪ Grass clippings, leaves, weeds, plant parts, pumpkins, topsoil, and sod	Organics
47	Brush and Branches	▪ Small twigs and tree trimmings that are no more than 60 cm in length and 2 cm in diameter, conifer cones and needles, wood chips and bark mulch	Organics

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	Category	Description and/or Examples	Diversion Potential
08	**Yard Waste**		
48	Electronics	▪ 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	▪ Unpainted or unstained lumber and pallets	No program
50	Dimensional Lumber – Treated	▪ Painted, stained, or treated lumber	No program
51	Composite Wood	▪ Plywood, oriented strand board, medium-density fibreboard, particle board	No program
52	Gysum Wallboard	▪ Drywall	No program
53	Asphalt Roofing Shingles	▪ Asphalt shingles and tarpaper	No program
54	Mixed Metals	▪ Ferrous, non-ferrous, aluminum	No program
55	Concrete, Bricks	▪ Concrete, paving stones, cement bricks	No program
56	Ceramics, Porcelain	▪ Tiles, toilets, sinks	No program
57	Carpeting	▪ Carpeting, underlay, mats	No program
58	Other Construction and Demolition Wastes	▪ Vinyl siding, misc. conduits, ceiling tiles, plumbing pipes, insulation	No program
11	**Bulky Waste**		
59	Furniture or Fixtures	▪ Chairs, sofas, cabinets, tables, garden furniture, etc.	No program
60	Other Large Bulky Items	▪ Other large items not classified elsewhere	No program
12	**Household Hygiene**		
61	Diapers	▪ Diapers	Garbage
62	Sanitary Products	▪ Sanitary napkins, hygiene products, etc.	Garbage
63	Pet Waste	▪ Animal feces, bedding, kitty litter	Garbage
13	**Other Materials**		
64	Textiles	▪ Clothing, shoes, mats, drapes, sheets, etc. Plastic rice sacks go in Other Rigid Plastic Packaging	Depot
65	Tires and Other Rubber	▪ Rubber tires and tubes, other rubber items such as hoses	Garbage
66	Other Waste	▪ Materials not classified elsewhere, wooden fruit basket, vacuum bags, wax candles, furnace filters, etc.	Garbage
67	Wood Utensils	▪ Chopsticks, wooden forks, toothpicks, etc.	Organics

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APPENDIX D

WASTE COMPOSITION RESULTS

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Table D-1: Winter 2023 Waste Composition Results – by Stream

Category	Garbage	Recycling	Organics
01 Paper	**1.0%**	**29.2%**	**2.5%**
01. Mixed Paper	1.5%	15.1%	0.5%
02. Tissue/Toweling	0.4%	2.1%	0.2%
03. Food Soiled Paper	0.1%	1.1%	0.3%
04. Shredded Paper	0.4%	0.1%	0.2%
05. Other Paper – Non-Obligated	0.4%	0.3%	0.1%
02 Paper Packaging	**1.2%**	**1.0%**	**0.3%**
06. Corrugated Cardboard	0.1%	0.5%	0.0%
07. Boxboard / Cores	0.1%	0.4%	0.0%
08. Kraft Paper	<0.1%	<0.1%	0.0%
09. Molded Pulp	0.1%	0.3%	0.1%
10. Polycoat Beverage Cups	<0.1%	0.1%	0.0%
11. Ice Cream Containers and Other Bleached Long Polycoat Fiber	12.2%	11.0%	2.1%
12. Laminated Paper Packaging	0.2%	0.5%	<0.1%
13. Spiral Wound Containers	0.4%	1.3%	0.1%
14. Gable Top Containers – Beverage	0.6%	1.9%	0.1%
15. Gable-top Containers – Non-Beverage	0.1%	0.4%	<0.1%
16. Aseptic Containers – Beverage	0.4%	1.9%	<0.1%
17. Aseptic Containers – Non-Beverage	<0.1%	0.0%	0.0%
03 Plastics	**1.0%**	**1.7%**	**0.3%**
18. #1 Polyethylene Terephthalate Bottles – Beverage	0.3%	0.1%	<0.1%
19. #1 Polyethylene Terephthalate Bottles, Jugs, and Jars – Non-Beverage	0.3%	0.1%	0.1%
20. #1 Polyethylene Terephthalate Thermoform	0.1%	<0.1%	0.4%
21. #2 High-Density Polyethylene Beverage	0.9%	0.5%	0.1%
22. #2 High-Density Polyethylene Non-Beverage	1.6%	0.2%	0.3%
23. #3 Polyvinyl Chloride	3.6%	0.8%	0.6%
24. #5 Polypropylene	0.8%	0.8%	0.1%
25. #6 Polystyrene – Expanded	1.9%	0.6%	0.1%
26. #6 Polystyrene – Non-Expanded	2.0%	3.8%	0.2%
27. #7 Biodegradable/Compostable Plastics	0.1%	0.4%	<0.1%
28. Plastic Film	0.7%	1.2%	0.2%
29. Low-Density Polyethylene and High-Density Polyethylene Film – Products (Non-Packaging)	0.1%	0.2%	0.0%
30. Plastic Laminates and Other Film Packaging	<0.1%	<0.1%	0.0%
31. Other Rigid Plastic Packaging	<0.1%	0.0%	0.0%
32. Durable Plastic Products	0.5%	1.9%	0.0%
04 Metals	**0.5%**	**0.1%**	**<0.1%**
33. Aluminum Beverage Cans	2.2%	4.5%	0.3%
34. Aluminum Non-Beverage	0.2%	1.6%	0.0%
35. Aerosol Containers	1.3%	2.7%	0.3%
36. Other Aluminum	0.8%	0.2%	<0.1%
37. Steel Beverage Cans	2.1%	0.1%	<0.1%

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Category	Garbage	Recycling	Organics
38. Steel Food Cans	2.1%	0.1%	<0.1%
39. Other Metal	30.8%	2.2%	53.0%
05 Glass	**22.3%**	**1.9%**	**38.4%**
40. Glass Beverage Containers	8.6%	0.3%	14.6%
41. Glass Non-Beverage	1.2%	0.2%	33.8%
42. Other Glass	0.8%	0.2%	31.6%
06 Household Hazardous Waste	**0.3%**	**0.0%**	**2.2%**
43. Household Hazardous Waste	2.0%	0.4%	0.0%
07 Food Waste	**2.0%**	**0.4%**	**0.0%**
44. Avoidable Food Waste	8.4%	0.4%	0.0%
45. Unavoidable Food Waste	0.3%	0.1%	<0.1%
08 Yard Waste	**0.6%**	**0.1%**	**0.0%**
46. Yard and Garden Debris	2.9%	0.1%	0.0%
47. Brush and Branches	0.5%	<0.1%	0.0%
09 Waste Electrical and Electronic Equipment	**3.1%**	**0.0%**	**0.0%**
48. Electronics	0.3%	0.1%	0.0%
10 Construction and Demolition Wastes	**0.0%**	**0.0%**	**0.0%**
49. Dimensional Lumber – Untreated	0.0%	0.0%	0.0%
50. Dimensional Lumber – Treated	0.3%	0.0%	0.0%
51. Composite Wood	0.4%	<0.1%	0.0%
52. Gypsum Wallboard	0.0%	0.0%	0.0%
53. Asphalt Roofing Shingles	0.0%	0.0%	0.0%
54. Mixed Metals	0.0%	0.0%	0.0%
55. Concrete, Bricks	18.2%	0.7%	0.4%
56. Ceramics, Porcelain	6.4%	0.5%	0.2%
57. Carpeting	1.5%	0.2%	0.2%
58. Other Construction and Demolition Wastes	10.3%	0.0%	<0.1%
11 Bulky Waste	**6.6%**	**0.9%**	**0.8%**
59. Furniture or Fixtures	2.3%	0.2%	0.6%
60. Other Large Bulky Items	1.1%	0.0%	<0.1%
12 Household Hygiene	**3.1%**	**0.6%**	**0.1%**
61. Diapers	0.1%	0.1%	0.1%
62. Sanitary Products	1.0%	29.2%	2.5%
63. Pet Waste	1.5%	15.1%	0.5%
13 Other Materials	**0.4%**	**2.1%**	**0.2%**
64. Textiles	0.1%	1.1%	0.3%
65. Tires and Other Rubber	0.4%	0.1%	0.2%
66. Other Waste	0.4%	0.3%	0.1%
67. Wood Utensils	1.2%	1.0%	0.3%
	100.0%	**100.0%**	**100.0%**

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APPENDIX E

SECTORS AND NAMING CONVENTIONS

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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

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