

**APPENDIX C**  
**AUDIT PROCEDURE**

# AUDIT PROCEDURE

The purpose of the Audit Procedure is to:

- a) Outline proper auditing techniques that the City shall use that is intended to produce results that accurately reflect the composition of the Recyclables.
- b) To use the results from the material audits to produce the Composition Certificate.

The Audit procedures use ASTM D5231-92 as a guideline.

## **RESPONSIBILITIES**

The Contractor is responsible for providing staff and equipment to:

- 1) obtain the Source Sample
  - the Contractor, under the direction of the City, shall do all necessary steps in retrieving a Source Sample for the purposes of acquiring an Audit Sample. This includes the Contractor supplying dedicated, solid-walled containers that are compatible with their moving equipment and maintaining the condition of said containers, so as to prevent any material from escaping from the Audit Sample. (These containers are for the sole purpose of the Auditing Procedures and must be available at all times when not in use during the Auditing process).
- 2) deliver the Source Sample/Audit Sample to the Audit Area
  - the Contractor shall deliver the Source Sample/Audit Sample to the Audit Area using any necessary equipment without disturbing, removing or losing material from the sample.
- 3) deposit Audit Sample after Audit is complete
  - the Contractor, upon direction from the City, shall remove the audited material from the Audit Area and deposit the Audited Material into the appropriate area of the MRF.

The City is responsible for providing staff and equipment to:

- 1) Supervise the acquisition of the Audit Sample
  - the City shall oversee the Audit Sample acquisition from the initial unloading of the Source Collection Vehicle in the designated tipping floor area to the sample's transfer to the Audit Area. The City is to provide the Contractor with the Auditing schedule, 10 days prior to the scheduled day of the Audit.
- 2) Perform the Audit
  - the City shall sort the Audit Sample into the appropriate categories as per Appendix A, and weigh each category.
- 3) Compile the Audit results
  - the City shall compile the results of the Audit on specified worksheets and determine the composition of the Recyclable Material.
  - the Audit results shall be reported to the Contractor via the Composition Certificate.

## **SOURCE SAMPLE SELECTION**

An Audit shall be performed on Recyclables on a scheduled basis, with a minimum of 16 samples per month. Each Audit Sample is to be approximately 100 kilograms in weight.

The City is to provide the Contractor with the list of intended route/Collection Vehicle numbers for each Collection Day to be audited. Every effort shall be made to sample each route at least, once per year.

The frequency of sampling by Source is to duplicate the same proportion of the contributing weight of material from each Source. As an example – if in the previous calendar year, 92% of the total program tonnage is derived from Residential Dwelling Units, 6% of the tonnage is derived from the Multi-Family Buildings and 2% from the Community Recycling Depots, then in the subsequent calendar year:

- 92% of the Audit Samples shall be taken from material collected from Residential Dwelling Units.
- 6% of the Audit Samples shall be taken from material collected from Multi-Family Buildings.
- 2% of the Audit Samples shall be taken from material collected from Community Recycling Depots.

Should circumstances exist beyond the Contractor's control that prevents the selection of a specific sample that is requested by the City; a substitute sample may be allowed. Any substitutions must be approved by the City.

## **PREPARATION OF TIPPING FLOOR AND AUDIT AREA**

The Contractor shall ensure that the Tipping Floor area where the Source Collection Vehicle shall be emptied and the Source Sample obtained, be cleared (by either mechanical or manual means) and completely free of all material, liquid or snow.

The Audit Area must be kept clean of any material/debris that could contaminate the sample to be Audited including, any material from previous audits or residual from facility operations.

## **OBTAINING AUDIT SAMPLES**

As one of the required Source Collection Vehicles arrives at the Tipping Floor, the Contractor shall complete the following steps, to acquire a sample for Auditing:

- prepare the pre-determined Tipping Floor area by removing existing material to ensure a clean, dry floor.
- select the appropriate Collection Vehicle and record time, name of company, truck number, and scale ticket specifics.
- direct the Collection Vehicle operator to deposit the entire load on the pre-determined area.
- using a front-end loader (or similar equipment), the MRF equipment operator shall:
  - mix the entire load together and, in an effort to obtain a representative cross-section of the material, divide the load in half, longitudinally;
  - mix and quarter the remaining material, and select one quarter to be the Source Sample, using a random method of selection for the purpose of minimizing biasing of the sample;
  - place the entire Source Sample into a container, supplied by the Contractor.
- transport the container with the Source Sample to the Audit Area, and empty the container into an area designated by the City.
- with the Source Sample on the floor of the Audit Area, divide the pile down the center, complete to the floor. The City shall choose one-half the Source Sample (known as the Audit Sample) and the Contractor shall load the Audit Sample into a designated container.

## **AUDIT SAMPLE SORTING PROCEDURES**

The City shall weigh the Audit Sample to ensure a minimum weight of 100 kilograms. Should the Audit Sample be less than 100 kilograms, additional material from the bottom of the Source Sample shall be randomly added to the Audit Sample until the weight of the Audit Sample is equal to or greater than 100 kilograms.

The City shall separate the Audit Sample by placing individual items into their designated sort bin as per the categories in Appendix A. The following rules shall apply to the sorting process:

- transparent and semi-transparent bags containing Recyclables are to be emptied and the contents sorted into the appropriate categories in Appendix A.
- combined and nested material shall be separated and each Recyclable shall be sorted into the appropriate categories in Appendix A.

- PET #1 Bottles that have an over-wrapped label made from plastic other than the PET shall be considered PET #1 Bottles.
- free-flowing liquid in PET #1 Bottles is to be removed by emptying the liquid into a separate sort bin. The liquid shall be weighed to identify the weight of the liquid. The liquid is considered contamination. The empty PET #1 Bottle shall be considered a Commodity.
- PET #1 Bottles containing frozen liquid shall be considered Contamination.
- opaque bags containing Recyclables shall be considered Contamination.
- plastic containers containing excessive food residual shall be considered contamination.
- containers/fibre that have a surface area greater than approximately thirty (30) per cent covered with oil, dirt, or paint, shall be considered Contamination.
- containers that have contained medical waste and/or bio-hazardous waste shall be considered Contamination.
- excessive amounts of snow shall be considered Contamination.

The sorting process shall be deemed complete once all materials in the Audit Sample have been sorted, and the floor and auditing table have been swept clean of any remnants.

The Contract Administrator shall be the sole arbitrator of the Audit Procedures and any decision regarding the Audit Procedures and/or the classification of Recyclables made by the Contract Administrator will be considered final and the Contractor will comply with any decision made by the Contract Administrator.

**WEIGHING AND QUALITY ASSURANCE**

Once the sorting process is complete, the City shall weigh the contents of the sort bins. The weight of the contents of all sort bins shall be recorded and summed.

The sum of the sorted material shall be compared to the Audit Sample starting weight to ensure the quality of the Audit. If the variance in the weight between the sum of the sorted material and the Audit Sample starting weight is more than 2%, and the variance cannot be explained, the Audit Sample shall be considered invalid and not used in the composition calculations.

**DISPOSAL OF AUDITED MATERIAL**

Once weighing is complete, the Audited Materials can be deposited into their corresponding area of the MRF. The Contractor is to ensure all containers used, are free of any residual prior to returning them to the designated storage area.

**CALCULATIONS**

**COMPOSITION OF COMMODITY IN AUDIT SAMPLE**

The percent composition of the Commodity in the Audit Sample is determined by comparing the weight of the Commodity to the total weight of the Audit Sample.

$$\text{percent composition of Commodity} = \left( \frac{\text{weight of Commodity in Audit Sample}}{\text{total weight of Audit Sample}} \right) \times 100$$

e.g.	weight of ONP in Audit Sample	=	30.00 kgs
	weight of total Audit Sample	=	105.00 kgs

**percent composition of ONP in Audit Sample:  $(30/105) \times 100 = 28.57\%$**

## **AVERAGE COMPOSITION OF COMMODITY BY SOURCE**

The average composition by Source shall be derived from the sum of the individual values of the percent composition of Commodity in the Audit Sample obtained from a specific Source divided by the total number of Audit Samples taken by Source, for the designated period.

e.g. percent composition of ONP in Audit Sample from Residential Dwellings Units:

sample one: 28.57%

sample two: 25.23%

sample three: 27.50%

**average composition of ONP from Residential Dwellings Units:  $(28.57+25.23+27.50)/3 = 27.10\%$**

The above calculation shall be performed for the collected Recyclables from each Source.

## **COMPOSITION CERTIFICATE**

The Contract Administrator, on a monthly basis, shall provide to the Contractor, a summary of the weighted combined weighed average of the composition of Recyclables from the Sources that were audited. This summary shall be known as the Composition Certificate.