# Workshop to Present Proposed Methodology for the 2014 Commingled Rate Survey

Department of Resources Recycling and Recovery
(Cal Recycle)

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# Introduction

- Darald Walther
  - Recycling Specialist II
  - Lead Person for Commingled Rate Study (CMRS)

## Workshop Agenda

- Purpose of workshop
- Commingled Rate Study (CMRS)
  - Purpose
  - Rates definitions (CPP, RVSP, RVCP)
  - Methodology
    - Study Periods, Sampling, Scheduling
    - Sample Size Calculation
    - Site & Sample Selection & Analysis
- Rates Calculations
- Study Year Calendar

## Purpose of Workshop

PRC Div 12.1, Sec 14549.5 requires DOR to consult with the public & program operators regarding the statewide commingled rate study methodology

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## Purpose of Commingled Rate Study

- CMRS estimates the Statewide Average:
  - Containers per Pound (CPP)
  - Refund Value per Segregated Pound (RVSP)
  - Refund Value per Commingled Pound (RVCP)

  For each material and program type

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## Containers per Pound (CPP)

- Estimates the statewide average number of CRV containers per pound
- Specific to each Material Type used in:
  - Recycling & Redemption Rate calculations
  - Processing Fees and Payments calculations

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## Refund Value per Segregated Pound (RVSP)

- Estimates statewide average value of CRV in a pound of segregated material
- Specific to each Material Type
- Calculated for each program type but applicable to RCs only
- Allows redemption of 100% CRV loads by weight at RCs

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## Refund Value per Commingled Pound (RVCP)

- Estimates statewide value of CRV weight to Total weight in commingled loads
- Allows redemption of mixed loads by weight
- Specific to each Program Type
- Specific to each Material Type

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## Methodology of Commingled Rate Study

- Study Periods, Sampling, and Scheduling
- Sample Size Calculation
- Site Selection
- Materials and Sample Selection & Analysis
- Calculations
- Stratified Random Sampling with Proportional Allocation

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## CMRS Study Periods

12-month study, two 6-month periods to reflect seasonality, same sites studied in each 6-month period

- Study Period 1

  Oct. 1, 2012 – March 31, 2013

- Study Period 2

  April 1, 2013 – Sept. 30, 2013

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## Sampling & Scheduling

- Same # of containers studied each program/material type combination
- Each 6-month period, total # of containers required will be sampled
- Studies scheduled virtually every week to account for seasonality
- Sample distributed evenly over time to account for seasonality

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## Sample Size Calculation

- Binomial Sampling Procedure
- Mathematically adjusted to account for weight
- Variable data based on the results of previous studies
- Maintains 95% Confidence Level
- Error Rates at or below 0.05

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## Sample Size

- Aluminum
  - Minimum of 50 containers @ each CP and CS site
  - Minimum of 100 containers @ each RC and RV site
  - Minimum of 150 containers @ each SP site
  - (Thousands of Containers Total)
- Glass
  - Minimum of 100 containers @ each CP and CS site
  - Minimum of 200 containers @ each RC, RV, and SP site
  - (Thousands of containers Total)

## Sample Size

- PET Plastic #1
  - Minimum of 60 containers @ each CP, CS, RC, and SP site
  - Minimum of 200 containers @ each RV site
  - (Thousands of containers Total)
- HDPE Plastic #2
  - Minimum of 60 containers @ each CP, CS, RC, and SP site
  - Minimum of 200 containers @ each RV site
  - (Thousands of containers Total)

## Sample Size

- Bimetal
  - 40 CRV containers where available (800 – 1,000 Total)
- #3 through #7 Plastics
  - 30 CRV containers where available (600 - 700 Total)
- each 6-month period
- CPP and RVSP only, No RVCP

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## Number of Sites Selected

- 150 sites minimum to be studied
  - 53 Recycling Centers
  - 18 Reverse Vending Machines
  - 29 Collection Programs
  - 14 Community Service Programs
  - 36 Curbside Programs

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## Site Selection

- Population Determination
  - Currently operational programs
  - Certified at least 8 months during prior fiscal year
  - Reported volume to DORiiS during prior fiscal year
  - Not receiving an Individual Commingled Rate

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## Site Selection

- Grouped by Region
  - South (VEN, SBA, LAX, ORA, SDG, RIV, SBD, IMP counties)
  - North (The rest of the counties)
- Stratified by Received PET Volume

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## Site Selection

- Sites placed in Volume Strata for each region
- Proportional # sites selected from each Volume Stratum
- Selected using Random Number Generator

Stratified Random Sampling with Proportional Allocation

Sampling Techniques, 3rd Edition

William Cochran, Professor of Statistics, Emeritus, Harvard University

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## Site Selection - an example

53 RCs to be studied. 36% RC volumes North, 36% of 53 = 19 sites North.

| Stratum | PET Volume | # Sites |
|---|---|---|
| 1 | 50% | 10 |
| 2 | 25% | 5 |
| 3 | 25% | 4 |
| Total | 100% | 19 |

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## Site Selection - an example

53 RCs to be studied. 66% RC volumes South, 66% of 53 = 34 sites South.

| Stratum | PET Volume | # Sites |
|---|---|---|
| 1 | 50% | 17 |
| 2 | 25% | 9 |
| 3 | 25% | 8 |
| Total | 100% | 34 |

(19 North + 34 South = 53 Total)

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## Materials to Sample

- AL, GL, PL #1, & PL #2 at all sites
  - Bimetal & PL #3 through #7 where available
- Materials from correct program
- No line breakage, rejected, or out-of-state containers
- Plastics must be labeled with resin number

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## Sample Selection

- RC: from whole loads, after transaction complete
- CS: from collection truck or sort line (Material must be from selected CS.)
- CP & SP: from bins
- Whole Containers

Piles/bins Grids – Random Selection

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## Sample Analysis

- Containers of single material type are counted and weighed in batches
  - RC, RV as purchased (debris & residual product removed)
  - CP, CS, & SP in market ready condition
- Container batches further sorted, counted and weighed
  - CRV less than 24 oz. ($0.05)
  - CRV greater than/equal to 24 oz. ($0.10)
  - Non – CRV
  - Contaminants

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## Calculating the CPP

Containers per Pound

$$= \frac{\text{Total \# of CRV Containers}}{\text{Total Weight of CRV Containers}}$$

## Calculating the RVSP

Refund Value per Segregated Pound

$$= \frac{\text{Refund Value CRV Containers Sampled}}{\text{Total Weight CRV Containers Sampled}}$$

$$= \frac{[\,(\text{\# CRV Containers} \geq 24\text{ oz.}) \times (\$0.10) + (\text{\# CRV Containers} < 24\text{ oz.}) \times (\$0.05)\,]}{\text{Total Weight CRV Containers Sampled}}$$

## Calculating the RVCP

Refund Value per Commingled Pound

$$= \frac{\text{Refund Value CRV Containers Sampled}}{\text{Total Weight of All Containers}}$$

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## Calendar for 2014 CMRS

| | |
|---|---|
| • Public Workshop | Aug. 17, 2012 |
| • First Study | Oct. 2012 – Mar. 2013 |
| • Second Study | Apr. 2013 – Sep. 2013 |
| • Public Hearing to Propose 2014 Rates | October 2013 |
| • Notice 2014 Rates | Dec. 1, 2013 |
| • 2014 Rates Effective | Jan. 1, 2014 |

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Comments ?

Questions ?

Thank You for Attending

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Documents relating to this workshop can be located and downloaded from our website **CALRECYCLE.ca.gov**

For additional assistance obtaining these documents, please contact:
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