



California Department of
Resources Recycling and Recovery

$$n = \frac{(\sum N_i S_i)^2}{D + \sum N_i S_i^2}$$

Processing Fee and Handling Fee Cost Surveys

Handling Fee Final Report

$$PP_{\$/t} = (NHFR_{\$/t} + RR) - SV_{\$/t}$$

March 8, 2010

$$HF_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

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	NHFR	HFR
$\$/t$	10	N/A
$\$/c$	1	1



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March 8, 2010

Mr. Graham Johnson
California Department of Resources Recycling and Recovery
Division of Recycling
Financial Management Branch
801 K Street, 19th Floor
Sacramento, California 95814

Regarding: **Handling Fee Final Report**

Dear Mr. Johnson:

On behalf of all the team members who worked on the Processing Fee and Handling Fee Cost Surveys, NewPoint Group is pleased to submit this Handling Fee Final Report.

The Cost Survey was performed under contract by NewPoint Group for the California Department of Conservation. On January 1, 2010, the Department of Conservation, Division of Recycling, and the Integrated Waste Management Board, were merged into a single entity, the Department of Resources Recycling and Recovery.

This second-ever handling fee cost survey was a major primary–data, economic cost survey of California certified recycling centers. This survey was used to estimate California statewide, weighted–average, 2008 certified recycler costs per container for recyclers that do not receive handling fees (processing fee recyclers), and recyclers that do receive handling fees (handling fee recyclers). Recycler center costs were surveyed in 2009, using recycler center calendar year 2008 financial statements. Recycler center costs measured by this survey will be used for the handling fee calculation, effective July 1, 2010.

This Handling Fee Final Report describes the tasks conducted by NewPoint Group in completing the handling fee cost survey. The Final Report includes a description of the cost survey methodology, and cost per container calculations and results.

The NewPoint Group team appreciates the opportunity to conduct this major economic cost survey for the Department of Conservation. This new approach to formulating handling fees is a large cost–accounting and statistical challenge, rivaling the technical requirements of state–of–the–art, activity–based costing techniques and statistical survey methodologies, used by private industry.

A project of this magnitude requires a high degree of communication and collaboration by all involved. We wish to thank the Division of Recycling management, and staff, for their tremendous support and cooperation throughout this entire project. If you have any questions concerning this draft report, please feel free to contact either myself, or Ms. Wendy Pratt, at (916) 442-0189.

Very truly yours,

NewPoint Group®



James A. Gibson, Ph.D.
Director

$$n = \frac{(\sum N_i S_i)^2}{D + \sum N_i S_i^2}$$

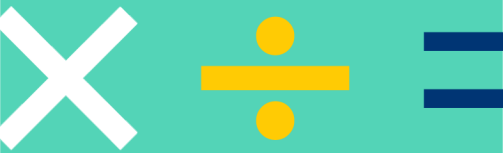


Executive Summary

$$PP_{\$/t} = (NHFR_{\$/t} + RR) - SV_{\$/t}$$

$$HF_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

	NHFR	HFR
$\$/t$	10	N/A
$\$/c$	1	1



Executive Summary

The processing fee and handling fee cost surveys were performed under contract by NewPoint Group Management Consultants, for the California Department of Conservation, Division of Recycling (DOR). This Handling Fee Final Report provides estimates of the statewide, weighted-average cost per beverage container to recycle for recycling centers that do not receive handling fees (processing fee recyclers), and recycling centers that do receive handling fees (handling fee recyclers). This report also summarizes the tasks NewPoint Group, and their subcontractors, conducted in order to obtain the final, statewide, weighted-average costs per container.

A. Handling Fee Cost Survey Background

Handling fees, paid to eligible supermarket, non-profit, and rural recyclers, have provided a mechanism to support convenient recycling opportunities within the Beverage Container Recycling Program (AB 2020). AB 3056, Statutes of 2006, implemented the most significant changes to the handling fee system since 1993. AB 3056 requires the Division of Recycling (DOR) to conduct a handling fee cost survey every two years, in conjunction with the processing fee cost survey.

The handling fee cost survey described in this report is the second of the every two year surveys to determine costs per container. Recycler center costs were surveyed in 2009 (April through October), using recycler center calendar year 2008 financial statements to determine a statewide, weighted-average cost to recycle beverage containers for processing fee recyclers, and for handling fee recyclers. The new handling fee per container payment, effective July 1, 2010, will be equal to the difference between the cost per container for handling fee recyclers, and the cost per container for processing fee recyclers.

Together, the processing fee and handling fee surveys performed in 2009 represented one of the largest cost survey efforts undertaken by the Department, to-date. In total, the NewPoint Group team completed 351 recycler cost surveys, comprised of 251 surveys of processing fee recyclers, and 100 surveys of handling fee recyclers. The combined processing fee and handling fee cost surveys were also among the most detailed and complex of any prior Department cost surveys in terms of quantitative information obtained.

B. Handling Fee Cost Survey Results

The statewide, weighted-average, recycler cost per container for handling fee recyclers and processing fee recyclers are presented in **Table ES-1**, on the next page. The statewide, weighted-average, cost to recycle for handling fee recyclers in 2008 was 2.196 cents per container, 64 percent higher than the statewide, weighted-average, cost to recycle for processing fee recyclers in 2008, at 1.337 cents per container.

$$n = \frac{(\sum N_i S_i)}{D + \sum N_i}$$

$$= \left(NHFR_{\$/t} + \right)$$

$$F_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

	NHFR	HFR
	10	N/A
	1	1

Table ES-1
Statewide Recycler Costs per Container
(2008)
Handling Fee Cost Survey

Recycler Type	2008 Statewide, Weighted-Average, Cost per Container	Percentage Change (HF increase over PF)	Error Rate at 90 % Confidence Interval
1. Handling Fee Recycler	2.196 Cents	+64%	5.17%
2. Processing Fee Recycler	1.337 Cents		7.10%
3. Handling Fee Recycler Cost per Container minus Processing Fee Recycler Cost per Container	0.859 Cents		

Table ES-1 includes the new handling fee payment calculation, 0.859 cents per recycled container, equal to the difference between the handling fee recycler statewide, weighted-average, cost per container to recycle, and the processing fee recycler statewide, weighted-average, cost per container to recycle, as specified in Section 14585 (f)(3), of the Beverage Container Recycling and Litter Reduction Act. The Department is scheduled to implement this new handling fee payment of just under one-cent per container starting July 1, 2010.

The sample sizes used to determine the costs per container were estimated to achieve a 90 percent confidence interval. This standard was higher than the statistical requirements in regulations for handling fee survey cost per container calculations, which specify an 85 percent confidence interval. The cost per container results for both handling fee recyclers and processing fee recyclers presented in this report exceeded this target, with low error rates at the 90 percent confidence level of 5.17 percent, and 7.10 percent, respectively.

C. Handling Fee Cost Survey Tasks

Below, we summarize eight of the major tasks that the NewPoint Group team conducted to complete this handling fee cost survey. The processing fee cost survey and handling fee cost survey were conducted in parallel. Several of these tasks were the same for

both surveys, for example updating the cost model, training, and quality control. The cost survey procedures, field methodology, and quality control steps were identical for both processing fee recyclers and handling fee recyclers.

1. Developed and documented a sample survey design framework, and selected recycling centers for the cost survey.

The requirement to calculate the statewide, weighted-average, cost to recycle beverage containers for both processing fee and handling fee recyclers necessitated evaluating and defining new survey sample strata based on the number of containers. Consistent with the 2006 handling fee cost survey, NewPoint Group utilized a strata definition that resulted in approximately the same total number of containers recycled within each strata population of handling fee recycling centers (just over 1.3 billion containers in each of the three survey strata). We selected a set of parallel strata definitions for processing fee recyclers, also resulting in approximately the same total number of containers recycled within each stratum’s population of processing fee recycling centers (approximately 3 billion containers in each of the three survey strata). Following the sample design and analyses, NewPoint Group identified and selected a stratified random sample of 85 processing fee recycling centers, and a stratified random sample of 100 handling fee recycling centers, to participate in the handling fee cost survey.

-
- 2. Monitored site completion characteristics to sample design for both handling fee recyclers and processing fee recyclers.** Each of the 251 processing fee surveys, and 100 handling fee surveys, were utilized to calculate recycler costs for specific components of the processing fee and handling fee cost surveys. Of the 251 surveys of processing fee recyclers, a total of 198 surveys were completed as part of the processing fee cost survey, cost per ton calculations, which were used to determine processing fees and processing payments, effective January 1, 2008. Of the 251 surveys of processing fee recyclers, a total of 85 surveys were completed as part of the handling fee survey, for the processing fee recycler cost per container calculation. These 85 processing fee recyclers surveyed for the cost per container calculation were comprised of 53 (251 minus 198) processing fee recyclers surveyed specifically for the cost per container calculation, plus 32 $[(198+85)-251=32]$ processing fee recyclers surveyed for both the cost per ton calculation (within the 198 processing fee surveys) and cost per container calculation (within the 85 handling fee surveys). These 32 processing fee recyclers were part of both surveys as a consequence of our random selection of recycling centers. All of the 100 surveys of handling fee recyclers were completed for the handling fee recycler cost per container calculation described in this report.
 - 3. Updated and calibrated the Labor Allocation Cost Survey Model.** The cost survey model was an 18-worksheet, *Excel*-based computer spreadsheet that was used to allocate recycling center costs to beverage container material types based on labor allocations. NewPoint Group updated the cost model to reflect 2008 container per pound and CRV payment information, as well as other required procedural changes to the cost survey. In addition, we calibrated the Indirect Cost Allocation Sub-Models for Aluminum/Bi-Metal and All-Plastics with 2008 survey information. These sub-models, now incorporated into the Labor Allocation Cost Survey Model, ensured proper allocation of costs and labor to plastic resins HDPE #2, PVC #3, LDPE #4, PP #5, PS #6, Other #7, and bi-metal (collectively referred to as the minority materials).
 - 4. Updated the Cost Survey Training Manual.** The *Training Manual* (approximately seven hundred (700) pages of reference material) consisted of sixteen (16) modules, each with detailed descriptions of cost survey background information, procedures, practice exercises, and case studies. We updated the *Training Manual* to reflect our practical experience in conducting the 2006 cost survey, as well as procedural changes that have occurred since the *Training Manual* was updated at the beginning of the 2002 cost survey.
 - 5. Conducted a 64-hour training session for fourteen (14) new members of the cost survey team and four (4) veteran members of the team; and a 24-hour refresher training for five (5) returning members of the cost survey team.** The training, primarily conducted in Division of Recycling and Perry-Smith LLP training rooms, included lectures, background reading materials, sample exercises, practical problem-solving, and a final exam. For the first time, the training session also included two field trips to a recycling center. Division of Recycling staff also participated in the training sessions.
 - 6. Scheduled, conducted, and completed 85 processing fee recycler site visits and 100 handling fee recycler site visits.** The site visits occurred during the seven months, between April 2009 and October 2009, using the statistical sample frame developed by NewPoint Group. Throughout the scheduling and site visits, the NewPoint Group team built on the on-site working relationships established in 2007 with the program's recyclers. These working relationships were important to

the success of this cost survey, and should carry over into future cost surveys. All of the cost surveys were conducted by a team of two auditors, including either an accountant or recycling expert. It typically took between one to four hours to complete each on-site survey. In addition to the on-site time, usually up to eight hours of additional time was required after the site visits to analyze data, and to follow-up with each recycler to obtain complete financial and labor information.

7. Developed and implemented an intensive quality control procedure.

The quality control procedure included thirteen (13) hours and five (5) different levels of review (site team review, independent manager review, CPA partner review, business analyst review, and project director review) for each site file. This review took place before the site files were released for data processing. These quality assurance steps ensured that each site file was complete and accurate, and that all

results from the labor allocation model and the indirect cost allocation sub-models were accurate. In total, over 30 hours were usually spent for each completed processing fee site, and over 25 hours were usually spent for each completed handling fee site, for the site team and quality control efforts.

8. Determined the final cost per container for processing fee and handling fee recyclers.

Using an automated process, NewPoint Group extracted results from each of the 185 (85 plus 100) completed cost models. NewPoint Group developed two *Excel* workbooks, one for handling fee recyclers, and one for processing fee recyclers, to calculate costs per container. We based the calculations for the processing fee recycler and handling fee recycler cost per container on a weighted-average by strata approach. Using defined and documented statistical procedures, NewPoint Group calculated error rates at a 90 percent confidence interval for these two cost per container calculations.

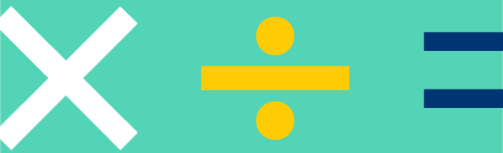


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$$= \left(NHFR_{\$/t} + \right)$$

$$F_{\$/c} = HFR_{\$/c} - NH$$

	NHFR	HFR
	10	N/A
	1	1

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Section 1 Introduction

$$PP_{\$/t} = \left(NHFR_{\$/t} + RR \right) - SV_{\$/t}$$

$$HF_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

	NHFR	HFR
$\$/t$	10	N/A
$\$/c$	1	1

1. Introduction

This *Handling Fee Final Report* presents results of a major primary data, economic cost survey of California certified recycling centers (cost survey). The cost survey was used to estimate California statewide, weighted-average 2008 certified recycler costs per container to recycler for recycling centers that do not receive handling fees (processing fee recyclers), and recycling centers that do receive handling fees (handling fee recyclers). The cost survey was performed under contract by NewPoint Group Management Consultants (NPG), for the California Department of Conservation (Department), Division of Recycling (DOR).

This report summarizes the methodologies used for the handling fee cost survey and presents results of the cost survey calculations.

This introductory section is organized as follows:

- A. *Convenience Zone and Handling Fee Cost Survey Background*
- B. *Handling Fee Cost Survey Objectives*
- C. *Handling Fee Cost Survey Tasks.*

A. Convenience Zone and Handling Fee Cost Survey Background

In 1986, the California State Legislature enacted the California Beverage Container Recycling and Litter Reduction Act (AB 2020). This “bottle bill” program is the only one of its kind in the nation in terms of its unique program structure.

A major subprogram within AB 2020 is the convenience zone system. AB 2020 established specific goals for convenient recycling in order to allow consumers to redeem their containers and receive back their refund value. A traditional deposit system requires beverage retailers (dealers) to accept and sort returned empty containers. However, part of the compromise behind AB 2020 was to develop a mechanism to avoid, or minimize, dealer take-back requirements, which were viewed as costly and unwieldy. While California had about 500 pre-existing recycling centers, these were not deemed adequate to ensure convenient recycling opportunities, as many of these sites did not accept all materials, and/or were in industrial locations.

Rather than requiring all dealers to accept empty containers, AB 2020 established redemption centers close to where people shopped. Thus was born the “convenience zone”, defined as the area within a one-half mile circular radius surrounding each supermarket in California with annual sales exceeding \$2 million.¹ Each convenience zone (CZ) was to contain at least one recycling center that redeemed all types of beverage containers, and

¹ This definition is still in place today.

was to be open at least 30 hours per week, including at least 5 off-business hours. If a recycling center was not established within a zone, then all dealers within the zone would be required to take back containers. Through this mechanism, the law created incentives for dealers to ensure that a recycling center was located in their zone.

The intent of AB 2020 was to balance equity, efficiency, and effectiveness in providing recycling opportunities. The convenience zone mandate was established to be equitable, i.e. providing consumers with an easy mechanism to return their redemption value. At the same time, this mechanism was intended to be more efficient and effective than a traditional deposit system.

The CZ system has proven to be equitable, and it is significantly more efficient and cost effective than in-store dealer take-back. However, conventional wisdom is that recycling in convenience zones on average costs more than recycling at pre-existing recycling centers.

A major issue that has surrounded convenience zones over the program's twenty years is based around the question: *How much should the State pay for convenience?* As a result, the issue of subsidizing recycling centers in convenience zones has led to frequent legislative adjustments over the history of the program, and continuing most recently with AB 3056, signed into law in September, 2006.

Initially, AB 2020 included a "safety net," Convenience Incentive Payments (CIPs), to help pay the cost of recycling centers located in CZs. CIPs were paid from unredeemed funds. Only sites that were the sole redemption location in a zone, and that realized a net average monthly financial loss, were eligible. However, in the early program years, up to two-thirds of new CZ redemption centers received CIPs. Realizing that CIPs were becoming the norm, rather than the exception, the legislature adopted restrictions on CIP amounts and how they were allocated. The biggest concern with

the CIP system was that it was "needs based", and discouraged improvements in operating efficiency.

In 1992, AB 87 enacted a number of major changes to the still-young AB 2020 program. One of the most significant changes was the elimination of the CIP, and the establishment of a "performance-based" 1.7-cent per container handling fee to pay for the cost of convenience at CZ sites. AB 87 provided for handling fee payments of up to \$2,300 per month, per site, with priority going to those sites with the highest eligible monthly volume. To be eligible, sites had to be the only recycling center in a convenience zone; be located at, or in, the parking lot of the supermarket; and meet specified total monthly redemption volumes, initially 45,000 containers per month, increasing to 60,000 containers per month in January, 1994. Further, to ensure that sites receiving handling fees were recycling adequate glass and plastic, AB 87 required that glass and plastic must be at least 30 percent of a site's eligible volume. The total amount allocated for handling fees was set at \$18.5 million per year.

With the exception of changes to the amount of total funding, this basic handling fee system was in place between 1993 and 2008, as a means to help pay for the cost of convenient recycling, with only relatively modest modifications. Until July 1, 2008, handling fee eligibility requirements were as follows:

- Eligible sites included: recycling centers at supermarket sites, non-profit convenience zone recyclers, or rural regional recyclers²

² These categories of recycler are defined in statute: a supermarket site means any certified recycling center which redeems all types of beverage containers in accordance with Section 14572, and which is located within, or outside and immediately adjacent to the entrance of, or at, or within a parking lot or loading area surrounding, a supermarket which is the focal point of a convenience zone, or a dealer that is located within that zone, and which is accessible to motor traffic (Section 14526.5). A nonprofit convenience zone recycler means a recycling center that is operated by an organization established as a 501(c) or 501(d) entity in U.S. Code, is certified by the Department, and is located within a convenience zone, but is not necessarily a supermarket site

- Recycling centers must recycle at least 60,000 containers in the calendar month for which they were paid, or at least an average of 60,000 containers per month during the previous 12 months (a container 24 ounces, or more, counted as two containers)
- The number of containers eligible for handling fees was determined by dividing the site's monthly volume of glass and plastic containers by the monthly volume of all containers. If this quotient was at least equal to 10 percent, the total monthly volume of the site was eligible for handling fees. If the quotient was less than ten percent, then the maximum eligible volume was determined by dividing the volume of glass and plastic containers by 10 percent. (Note: given high volumes of plastic recycling, essentially all recyclers met this eligibility requirement)
- The per container handling fee was 1.8 cents, and the monthly handling fee payment per site did not exceed \$2,300
- If there were not adequate total monthly funds allocated to pay all eligible handling fee sites, then sites with higher monthly eligible volumes receive priority for payments
- Handling fee payments were made to only one certified recycling center in a convenience zone. If a dealer was in two zones, only one payment would be made to a recycler located at that dealer. If another recycler was operating in a zone without receiving handling fee payments, the Division did not pay handling fees to a convenience zone recycler in that zone, and neither did the other recycler receive handling fees
- There were separate eligibility criteria for rural region recyclers, related to hours of operation, operation in more than one zone, and location of other recyclers

(Section 14514.7). A rural regional recycler means an operator that is certified by the Department as being in a nonurban area identified using Farmers Home Loan Administration criteria, or is within an area designated by the Department as a rural region with a population of between 10,000 and 50,000 persons (Sections 14525.5.1 and 14571).

- Total annual handling fee payments in fiscal year 2006/2007 were capped at \$33 million, and for fiscal year 2007/2008, were capped at \$35 million.

AB 3056, Statutes of 2006, implemented the most significant changes to the handling fee system since 1993. These changes started with the 2006 handling fee cost survey, and the new approach to handling fee calculations and payments, as of July 1, 2008. On July 1, 2008, provision for the maximum annual funding cap were removed (constrained only by available unredeemed funds); the 60,000 minimum containers per month was removed; the \$2,300 maximum per month was removed; the 1.8 cents per container was removed; and counting containers 24 ounces and above as two containers was removed.

AB 3056 requires the Division of Recycling (DOR) to conduct a handling fee cost survey every two years, in conjunction with the processing fee cost survey. Section 14585, subdivision (f) was added to the Beverage Container Recycling and Litter Reduction Act on September 30, 2006, as follows:

“(f)(1) On or before January 1, 2008, and every two years thereafter, the department shall conduct a survey of a statistically significant sample of certified recycling centers that receive handling fee payments to determine the actual cost incurred for the redemption of empty beverage containers by those certified recycling centers. The department shall conduct these cost surveys in conjunction with the cost surveys performed by the department pursuant to subdivision (b) of Section 14575 to determine processing payments and processing fees. The department shall include, in determining the actual costs, only those allowable costs contained in regulations adopted pursuant to this division that are used by the department to conduct cost surveys pursuant to subdivision (b) of Section 14575.

(2) Using the information obtained pursuant to paragraph (1), the department shall then determine the statewide weighted-average cost incurred for the redemption of empty beverage

containers, per empty beverage container, at recycling centers that receive handling fees.

(3) On and after July 1, 2008, the department shall determine the amount of the handling fee to be paid for each empty beverage container by subtracting the amount of the statewide weighted-average cost per container to redeem empty beverage containers by recycling centers that do not receive handling fees from the amount of the statewide weighted-average cost per container determined pursuant to paragraph (2).

(4) The department shall adjust the statewide average cost determined pursuant to paragraph (2) for each beverage container annually to reflect changes in the cost of living, as measured by the Bureau of Labor Statistics of the United States Department of Labor or a successor agency of the United States government.

(5) The cost information collected pursuant to this section at recycling centers that receive handling fees shall not be used in the calculation of the processing payments determined pursuant to Section 14575.”

The handling fee cost survey described in this report is the second of the every two year surveys to determine costs per container. This handling fee cost survey was conducted in parallel with the processing fee cost survey, which was used to determine costs per ton for each of the ten beverage container material types. Results of the processing fee cost survey are described in a separate report.

Together, the processing fee and handling fee cost surveys performed in 2009 represented one of the largest cost survey efforts undertaken by the DOR, to-date (only the cost survey performed in 2007 was larger). In total, the NewPoint Group team completed 351 recycler cost surveys, comprised of 251 surveys of processing fee recyclers, and 100 surveys of handling fee recyclers. The combined processing fee and handling fee cost surveys were also among the most detailed and complex of any prior DOR cost surveys in terms of quantitative information obtained.

B. Handling Fee Cost Survey Objectives

The objective of the handling fee cost survey was to estimate the California statewide, weighted-average, 2008 certified recycler cost per container to recycle for handling fee recyclers and processing fee recyclers.

Recycler center costs were surveyed in 2009, using recycler center calendar year 2008 financial statements. Beginning July 1, 2010, the per container handling fee payment for eligible supermarket sites, non-profit convenience zone recyclers, and rural recyclers, will be based on the calculated measured difference between the cost per container for these two populations (i.e. handling fee recycler cost per container, minus processing fee recycler cost per container).

The recycler costs per container presented in this report culminate ten intensive months (March through December, 2009) of research, development, and implementation effort on a primary data economic cost survey of California certified recycling centers. The actual cost survey field work was performed over the seven month time period, from April through October, 2009.

C. Handling Fee Cost Survey Tasks

Below, we summarize eight of the major tasks that the NewPoint Group team conducted to complete this handling fee cost survey. The processing fee cost survey and handling fee cost survey were conducted in parallel. Several of these tasks were the same for both surveys, for example updating the cost model, training, and quality control. The cost survey procedures, field methodology, and quality control steps were identical for both processing fee recyclers and handling fee recyclers.

1. Developed and documented a sample survey design framework, and selected recycling centers for the cost survey.

The new requirement to calculate the statewide, weighted-average, cost to recycle beverage containers for both processing fee and handling fee recyclers necessitated evaluating and defining survey sample strata based on the number of containers. NewPoint Group evaluated different container strata configurations based on the number of containers recycled at each site. The handling fee container strata definitions resulted in approximately the same total number of containers recycled within each strata population of handling fee recycling centers (just over 1.3 billion containers in each of the three survey strata). We selected a set of parallel strata definitions for processing fee recyclers. The processing fee recycler container strata definitions also resulted in approximately the same total number of containers recycled within each stratum's population of processing fee recycling centers (approximately 3 billion containers in each of the three survey strata). Following the sample design and analyses, NewPoint Group identified and selected a stratified random sample of 85 processing fee recycling centers, and a stratified random sample of 100 handling fee recycling centers, to participate in the handling fee cost survey.

2. Monitored site completion characteristics to sample design for both handling fee recyclers and processing fee recyclers.

Each of the 251 processing fee surveys, and 100 handling fee surveys, were utilized to calculate recycler costs for specific components of the processing fee and handling fee cost surveys. Of the 251 surveys of processing fee recyclers, a total of 198 surveys were completed as part of the processing fee cost survey, cost per ton calculations, which were used to determine processing fees and processing payments, effective January 1, 2010. Of the 251 surveys of processing fee recyclers, a total of 85 surveys were completed as part of the handling fee survey, for the processing fee recycler cost per container calculation. These

85 processing fee recyclers surveyed for the cost per container calculation were comprised of 53 (251 minus 198) processing fee recyclers surveyed specifically for the cost per container calculation, plus 32 [(198+85)-251=32] processing fee recyclers surveyed for both the cost per ton calculation (within the 198 processing fee surveys) and cost per container calculation (within the 85 handling fee surveys). These 32 processing fee recyclers were part of both surveys as a consequence of our random selection of recycling centers. All of the 100 surveys of handling fee recyclers were completed for the handling fee recycler cost per container calculation described in this report.

3. Updated and calibrated the Labor Allocation Cost Survey Model.

The cost survey model was an 18-worksheet, *Excel*-based computer model that was used to allocate recycling center costs to beverage container material types based on labor allocations. NewPoint Group updated the cost model to reflect 2008 container per pound and CRV payment information, as well as other required procedural changes to the cost survey. In addition, we calibrated the Indirect Cost Allocation Sub-Models for Aluminum/ Bi-Metal and All-Plastics with 2008 survey information. These sub-models, now incorporated into the Labor Allocation Cost Survey Model, ensured proper allocation of costs and labor to plastic resins HDPE #2, PVC #3, LDPE #4, PP #5, PS #6, Other #7; and bi-metal (collectively referred to as the minority materials).

4. Updated the Cost Survey *Training Manual*.

The *Training Manual* (approximately seven hundred (700) pages of reference material) consisted of sixteen (16) modules, each with detailed descriptions of cost survey background information, procedures, practice exercises, and case studies. We updated the *Training Manual* to reflect our practical experience in conducting the 2006 cost survey, as well as procedural changes that have occurred since the *Training Manual* was updated at the beginning of the 2002 cost survey.

- 5. Conducted (1) a 64-hour training session for fourteen (14) new members of the cost survey team and four (4) veteran member of the team; and (2) a 24-hour refresher training for five (5) highly experienced returning members of the cost survey team.**

The training, conducted in a Division of Recycling and Perry-Smith LLP training rooms, included lectures, background reading materials, sample exercises, practical problem-solving, and a final exam. Division of Recycling staff also participated in the training sessions.

- 6. Scheduled, conducted, and completed 85 processing fee recycler site visits and 100 handling fee recycler site visits.**

The site visits occurred during the seven months, between April 2009 and October 2009, using the statistical sample frame developed by NewPoint Group. Throughout the scheduling and site visits, the NewPoint Group team built on the working relationships established in 2007 with the program's recyclers. These on-site working relationships were important to the success of this cost survey, and should carry over into future cost surveys. All of the cost surveys were conducted by a team of two auditors, including either an accountant or recycling expert. It typically took between one to four hours to complete each on-site survey. In addition to the on-site time, usually up to eight hours of additional time was required after the site visits to analyze data, and to follow-up with each recycler to obtain complete financial and labor information.

- 7. Developed and implemented an intensive quality control procedure.**

The quality control procedure included thirteen (13) hours and five (5) different levels of review (site team review, independent manager review, CPA partner review, business analyst review, and project director review) for each site file. This review took place before the site files were released for data processing. These quality assurance steps ensured that each site file was complete and accurate, and that all results from the labor allocation model and the indirect cost allocation sub-models were accurate. In total, over 30 hours were usually spent for each completed processing fee site, and over 25 hours were usually spent for each completed handling fee site, for the site team and quality control efforts.

- 8. Determined the final cost per container for processing fee and handling fee recyclers.**

Using an automated process, NewPoint Group extracted results from each of the 185 (85 plus 100) completed cost models. NewPoint Group developed two Excel workbooks, one for handling fee recyclers, and one for processing fee recyclers, to calculate costs per container. We based the calculations for the processing fee recycler and handling fee recycler cost per container on a weighted-average by strata approach. Using defined and documented statistical procedures, NewPoint Group calculated error rates at a 90 percent confidence interval for these two cost per container calculations.

$$n = \frac{(\sum N_i S_i)^2}{D + \sum N_i S_i^2}$$



Section 2 Handling Fee Cost Survey Methodologies

$$PP_{\$/t} = \left(NHFR_{\$/t} + RR \right) - SV_{\$/t}$$

$$HF_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

	NHFR	HFR
$\$/t$	10	N/A
$\$/c$	1	1

2. Handling Fee Cost Survey Methodologies

This section describes the cost survey methodologies, from establishing the survey sample frame, to the quality control procedures, and all the supporting tasks in between. Several of these tasks were conducted jointly for the processing fee survey and the handling fee survey. There are nine key tasks described in this section:

- A. Survey Design
- B. Survey Scheduling, Logistics, and Confidentiality
- C. Training Manual Updates
- D. Surveyor Training
- E. Cost Model Updates
- F. Calibration of the Indirect Cost Allocation Sub-Models
- G. Site and Survey Tracking
- H. Cost Survey Procedures
- I. Quality Control and Confidentiality Procedures.

A. Survey Design

This 2008 survey was the second time that the DOR conducted a handling fee survey to determine the cost per container of recycling beverage containers. NewPoint Group developed the survey design for the first handling fee cost survey, and three most recent processing fee cost surveys. We utilized the same handling fee cost survey design methodology that we developed for the previous handling fee cost survey.

The purpose of the survey design was to identify the specific recycling centers surveyed during 2009, to estimate California statewide, weighted-average, 2008 certified recycler center cost per container to recycle for handling fee recyclers, and processing fee recyclers. Recycler center costs were surveyed in 2009, using recycler center calendar year 2008 financial statements. Recycler center costs measured by the cost survey will be used for the handling fee payment calculation, effective July 1, 2010.

The population of processing fee recycling centers eligible for the handling fee cost survey was the same as the population of processing fee recycling centers eligible for the processing fee cost survey, defined as all recycling centers: (1) not receiving handling fees between January 2008 and December 2008, and (2) certified and operational on or before March 1, 2008. There were 729 recycling centers in this total processing fee recycling center population.

The population of handling fee recycling centers eligible for the handling fee cost survey was defined as all recyclers: (1) receiving at least one handling fee payment for any of the months between January 2008 and December 2008, and (2) certified and

$$n = \frac{(\sum N_i S_i)}{D + \sum N_i}$$

$$= \left(NHFR_{\$/t} + \right)$$

$$F_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

	NHFR	HFR
	10	N/A
	1	1

Table 2-1
Handling Fee Recycler
Container Stratum Definitions
(2008)
Handling Fee Cost Survey

Stratum	2008 Number of Containers Recycled
1	Greater than, or equal to, 6.3 million containers
2	Greater than, or equal to, 3.5 million containers, up to less than 6.3 million containers
3	Less than 3.5 million containers

Table 2-2
Processing Fee Recycler
Container Stratum Definitions
(2008)
Handling Fee Cost Survey

Stratum	2008 Number of Containers Recycled
1	Greater than, or equal to, 31 million containers
2	Greater than, or equal to, 15 million containers, up to less than 31 million containers
3	Less than 15 million containers

operational on or before March 1, 2008. There were 1,077 recycling centers in this total handling fee recycling center population.

The processing fee recycler cost per ton calculations for aluminum, glass, PET #1, and HDPE #2, were based on a stratified random sample design. The three processing fee cost survey strata were defined by volume (tons) of glass redeemed. Glass ton strata definitions for processing fee recyclers have provided a proven valid mechanism to minimize the sample size necessary, but still obtain a statistically valid cost per ton result for the four major material types: aluminum, glass, PET #1, and HDPE #2.

The new requirement to calculate statewide, weighted-average costs to recycle beverage containers for processing fee, and handling fee, recyclers necessitated evaluating and defining new strata based on number of containers.

The strata definition for handling fee sites that resulted in an efficient sample size is shown in **Table 2-1**, left. The strata definition for processing fee sites that resulted in an efficient sample size is shown in **Table 2-2**, left.

To measure calendar year 2008 costs, the survey design consisted of two components:

- A statistically defensible, stratified random sample of 85 sites, drawn from the 729 qualifying processing fee recycling centers. Three strata were defined by the total annual containers handled by a site. This stratified random sample was used to measure the costs of recycling CRV containers for processing fee recycling centers
- A statistically defensible, stratified random sample of 100 sites, drawn from the 1,077 qualifying handling fee recycling centers. Three strata were defined by the total annual containers handled by a site. This stratified random sample was used to measure the costs of recycling CRV containers for handling fee recycling centers.

The above two survey components were treated equivalently in terms of scheduling, site visits, and quality control. It was only in the final calculations that a distinction was made between the two groups.

Because of these parallel strata definitions for handling fee and processing fee recyclers, we were able to directly compare cost per container results for the two populations. Furthermore, as a result of this survey design, the cost survey conducted for 2008 costs per container treated the two recycler populations with equal statistical rigor.

DOR regulations require that the cost per container be estimated at an 85 percent confidence interval, and Division of Recycling policy further specifies a 10 percent error rate. Similar to the processing fee cost survey, the sampling plan (for the two stratified random samples) was based on a more accurate and statistically conventional and accepted, 90 percent confidence interval.

Table 2-3
Handling Fee (HF) Recycler Site Visits
(2008)
Handling Fee Cost Survey

Handling Fee Recycler Site Category	Number of HF Site Visits
HF Container Stratum 1	25
HF Container Stratum 2	20
HF Container Stratum 3	55
Total HF Completed Sites	100

Sample Design

Table 2-3, above, provides a summary of the completed handling fee recycler survey sites. NewPoint Group scheduled, conducted, and completed 100 handling fee recycler site visits and cost analyses for the handling fee cost survey.

Table 2-4, on the next page, provides a summary of the completed processing fee recycler survey sites. NewPoint Group scheduled, conducted, and completed 85 processing fee recycler site visits and cost analyses for the handling fee cost survey. A total of 32 sites in Table 2-4 had multiple designations. These 32 sites were surveyed for both the handling fee and processing fee cost surveys.

Together, the processing fee and handling fee cost surveys performed in 2009 represented one of the largest cost survey efforts undertaken by the DOR, to-date. In total, the NewPoint Group team completed 351 recycler cost surveys, comprised of 251 surveys of processing fee recyclers, and 100 surveys of handling fee recyclers.

Table 2-5, on the next page, provides a comparison of the error rates, population size, sample size, and sample method for the two recycler populations in the handling fee cost survey. With error rates of just over 5 and 7 percent, this handling fee cost survey exceeded the conventional statistical accuracy of 10 percent at the 90 percent confidence level for both handling fee and processing fee recyclers.

B. Survey Scheduling, Logistics, and Confidentiality

A significant component of the cost survey involved scheduling site visits and the communication interface with recyclers chosen from the sample frame. Two staff-people at NewPoint Group were employed part-time during the start-up and survey months (March through October 2009) to coordinate scheduling, and communicate with recyclers.

Because conducting a cost survey fundamentally entails the collection of proprietary financial information, sensitivity to stakeholder relations is highly important. Without willing and active cooperation from the selected recycling center operators, determining the real costs of beverage container recycling would be exceptionally difficult, and the results would be hard to support.

Our approach was to communicate with the site operators and managers from the start of the process to help them understand what the cost survey entailed, what information we were seeking to obtain, and, perhaps most importantly, to correct misunderstandings about the purpose of the cost survey.

The first stage of recycler communication was a letter, on Department letterhead, informing the recycler that they were selected to participate in the handling fee cost survey. The letter also identified expectations of the recycler, and introduced NewPoint Group as the DOR contractor. Introduction letters were sent to all selected recyclers starting in early April, 2009.

In the second stage of communication, the NewPoint Group scheduling coordinators made telephone contact with recyclers. Sites were initially prioritized based on location and complexity of sites. In the first month, sites in Northern California were scheduled to accommodate traveling schedules and arrangements.

2. Handling Fee Cost Survey Methodologies

Table 2-4
Processing Fee (PF) Recycler Site Visits
(2008)
Handling Fee Cost Survey

Processing Fee Recycler Site Category	Total Number of PF Site Visits for HF Survey	Number Visited for HF Survey Only ^a	Number Visited for Both PF and HF Surveys ^b
PF Container Stratum 1	21	9	12
PF Container Stratum 2	23	10	13
PF Container Stratum 3	41	34	7
Total PF completed sites	85	53	32

^a These 53 of 85 sites were only selected for the cost per container calculation for processing fee sites.

^b These 32 of 85 sites were selected for the cost per container calculation for the handling fee cost survey, and the cost per ton calculation for the processing fee cost survey.

Table 2-5
Error Rates, Population Sizes, Sample Sizes and Method by Recycler Type
(2008)
Handling Fee Cost Survey

Recycler Type	Error Rate (90% CI)	Population Size	Sample Size	Sample Method
1. Handling Fee Recyclers	5.17%	1,077	100	Container Stratified Random Sample
2. Processing Fee Recyclers	7.10%	729	85	Container Stratified Random Sample

Site visit appointments were usually scheduled for first thing in the morning, or first thing in the afternoon. The survey team also contacted the recycler directly, one or two days, before the site visit, for final visit confirmation. Site visits were conducted by a team of two surveyors, including an accountant or a recycling expert. Survey teams made their own travel arrangements.

There were two handling fee recycler operators that owned a significant number of sites selected for the survey. For these organizations, the scheduling coordinators set up an initial meeting between the survey team and corporate officers, prior to scheduling individual site visits. A NewPoint Group business analyst also attended these meetings.

The coordinators conducted many behind the scenes tasks to ensure overall success of the project. For example, to reduce travel expenses, the coordinators utilized specialized mapping

software to schedule consecutive site visits first within regions, and then within nearby locations. In addition, the coordinators were tasked to optimize site visit efficiency, matching (1) the varying schedules of more than twenty site survey team personnel, (2) diverse geographic locations, and (3) availability of the recycling centers. During any given week, up to six different survey teams were in the field.

The coordinators maintained a secure File Transfer Protocol (FTP) server as a single point of distribution for confidential cost model templates, scheduling information, and cost model forms. To ensure confidentiality of recyclers' proprietary information, every NewPoint Group employee and subcontractor employee that worked on the handling fee cost survey contract signed individual Confidentiality Agreements warranting that they would not disclose any information made available by each certified recycler. Also, each company

contractor – NewPoint Group, Inc. (Prime Contractor), Perry-Smith, LLP (Subcontractor), Geiss Consulting (Subcontractor), and Leon E. Tuttle, CPA (Disabled Veteran Business Enterprise Subcontractor) - also signed company Confidentiality Agreements.

C. Training Manual Updates

The first *Processing Fee Cost Survey Training Participant Manual* was prepared by NewPoint Group in 1995 to support the processing fee cost survey training provided to DOR staff at that time. This manual contained hundreds of example case studies, problem sets, quizzes, sample financial documents, handouts, reading assignments, and procedures to develop skills needed to conduct successful processing fee cost surveys.

Because the training manual was originally prepared in 1995, it required extensive revisions and adjustments, which were made prior to the 2002 cost survey. For the current processing fee and handling fee cost surveys, NewPoint Group reviewed the training modules, and when appropriate, revised work assignments needed to support the in-classroom and self-study training modules.

For the first handling fee cost survey in 2006, NewPoint Group updated relevant aspects of the training manual to include background information on convenience zones and handling fees, and specific costing information for handling fee recyclers, such as non-allowable incentive payments to supermarkets. Since the cost survey procedures were identical for the processing fee and handling fee surveys, these revisions to the training manual were relatively minor.

The updated training manual consisted of three volumes:

- *Training Manual, Volume 1* (the primary training manual, approximately 700 pages in length)

- *Supplemental Materials, Volume 2* (background reading and support materials)
- *Field Manual, Volume 3* (a summary version of the site visit procedures).

D. Surveyor Training

Successfully completing the processing fee cost survey site visits required knowledge of recycling, recycling practices, the beverage container recycling program, the specific procedures of site visits, auditing, and financial cost-accounting. The NewPoint Group trained surveyor team consisted primarily of accountants and recycling experts.

Nine of the twenty-three individuals who conducted site visits for this survey had previous experience in the 2002, 2004, and/or 2006 processing fee cost surveys, had completed the full 64-hour training session, and in some cases also completed a 24-hour refresher training in prior years. These surveyors already had extensive experience in auditing and financial accounting procedures, as well as practical site-visit and recycling program experience. Five of these nine returning team members still completed another 24-hour refresher course in 2009. The remaining four of the nine returning survey team members, and fourteen new, survey team members completed the full 64-hour training program in 2009.

Classroom training consisted of 56 hours of in-class lectures, reading materials, study exercises, and problem solving. In 2009, for the first time, we included an additional eight hours of field training, as part of the 64 total hours of training. The classroom training was held at the DOR and Perry-Smith offices, and all training was conducted over a three-week period, during April 2009.

The field training consisted of two field trips, first a four hour field trip to a Sacramento-area recycling center to tour the site. NewPoint Group scheduled the initial field trip in the first

week of training to provide new team members with a first-hand view of recycling site operations. The second field trip was held on the last day of training, and consisted of the actual site-visit component of a cost survey, at the same recycling center. An experienced NewPoint Group team member conducted the cost survey, with the training class observing, and asking questions. This field training, for the first time, provided new team members with valuable on-site experience prior to their first site visits.

E. Cost Model Updates

The labor allocation cost model (cost model) is an *Excel* workbook consisting of 18 worksheets. The model was first developed by NewPoint Group to improve the methodology of the 1995 cost surveys. Since that time it has been updated and revised to accommodate legislative and regulatory changes, as well as upgrades of *Excel*. In 2000, NewPoint Group and the DOR conducted a significant revision to add plastic resins #2 to #7 to the model, and to upgrade to *Excel 1997*, which replaced old *Excel* macros with *Visual Basic* programming.

The current version of the cost model represents several legacy generations (and layers) of modifications and updates, including a significant number of improvements that were made immediately following the 2002, 2004, and 2006 cost surveys. To update the model for the 2006 handling fee survey, we added a cost per container calculation to the Recycler Cost Summary worksheet. Prior to conducting the current cost survey, NewPoint Group reviewed and updated the model to reflect 2008 container per pound and CRV payment information, as well as procedural changes to the cost survey. NewPoint Group used the same cost model for both the handling fee and processing fee cost surveys.

F. Calibration of the Indirect Cost Allocation Sub-Models

The cost model includes two indirect cost allocation sub-models, to calculate the costs per ton of bi-metal, and plastic resins #2 to #7. For this 2008 cost survey, we applied this same indirect cost allocation sub-model procedure to determine costs per ton for the minority material types that was developed in 2002, and used again in 2004 and 2006. While the sub-models were not used specifically for the cost per container calculations, the sub-models are an integral part of the cost model, and thus are integral to the cost surveys.

The purpose of the two sub-models, the Indirect Cost Allocation Sub-Model for All Plastics, and the Indirect Cost Allocation Sub-Model for Aluminum/Bi-Metal, was to separate the individual majority and minority material costs from the larger indirect cost categories, all plastics and aluminum/bi-metal. Using operational and material handling factors, the sub-models provide a consistent, site-specific, and sub-material specific approach, for determining the costs per ton for both the high-volume majority materials, and low-volume minority materials.

Four operational/material handling factors (weight, number of containers, volume (size) of containers, and commingled rate), along with a weighting allocation across these factors, formed the basis of the indirect cost allocation sub-models for the two majority, and seven minority, materials (glass does not require a sub-model). The sub-models were integrated into the Labor Allocation Cost Model for each site.

G. Site and Survey Tracking

For this cost survey, NewPoint Group developed and utilized a *Google Documents* Site Status Reporting System. This secure reporting system was password protected, and utilized by only four project team members (the two

scheduling coordinators, a Perry-Smith partner, and a NewPoint Group business analyst) to monitor and track sites.

The reporting system included a row of descriptive information on each of the 351 surveyed, and twelve dropped, processing fee and handling fee recycling sites. Information in the reporting system included: RC and PR numbers; recycler name; county; recycler type; recycler sample(s) and strata; site survey team members; and entry dates and initials for each of nine stages of the survey process, from mailing the initial letter, to scheduling, to final review approval.

H. Cost Survey Procedures

There were three phases of an individual cost survey:

- Pre-site visit – model population, data review, and travel logistics
- On-site visit – site tour, cost survey, and labor interviews
- Post-site visit - data entry, analysis, and follow-up.

Pre-Site Visit

Before conducting the on-site cost survey, the survey team obtained all available information about that site. NewPoint Group entered recycling volumes for 2008 into the cost model *Excel* file for each site. The survey team evaluated the volume information to identify the approximate size and scope of the survey. Much of the pre-site visit time was spent on travel logistics and mapping.

On-Site Visit

For the two handling fee operators with a large number of sites in the sample, a NewPoint Group business analyst, and the survey team, met first at operation headquarters to discuss

financial and labor information, and then at each individual survey site. The actual site visits for these sites were typically less than two hours, because the financial and labor information had already been obtained and discussed at the initial headquarters meeting.

With the exception of the large handling fee operators, the primary data-gathering effort took place during the site visit. Each site visit typically lasted about two hours, depending on the size and complexity of the site. Survey teams carefully followed procedures outlined in the *Training Manual, Volume 1*. The survey team first toured the site with site management to view and inquire about the site's operations, including materials handled, equipment, recycling procedures, material shipping, etc.

Another key task was reviewing the financial information with site management, or a financial officer, to identify and categorize allowable and non-allowable costs for calculating processing fees, direct and indirect costs, and beverage container indirect (BCI) and all materials indirect (AMI) costs.

These cost categories were identical to those used for the processing fee cost survey. However, there were operational differences between the two populations. For example, some handling fee recycling centers located in supermarket parking lots pay the supermarket specifically for the privilege of locating at that store. These “incentive” or “exclusivity” payments were paid in addition to rent, and were not allowable costs. Processing fee recyclers did not have this type of payment.

The next key task was conducting structured labor allocation interviews to determine allocation of each employee's time first to recycler, or other business, then to direct yard labor or all other labor, and finally by CRV material type or other non-CRV material type. The cost model used this labor allocation information to allocate indirect costs and wages.

Post-Site Visit

After the site visit, the survey team spent from four, to ten or more, hours further compiling the site data, entering information into the cost model, completing the site memorandum and site file, and reviewing the site file. In many cases, site managers did not have all the necessary information available at the site visit, and the survey team had to telephone to request additional information, or to ask specific questions about the data.

Following the site visit, the team entered the labor information for each employee, as well as the cost summary and direct cost information into the cost model. Once the data were entered into the cost model, the model calculated recycling costs per CRV container. Finally, the survey team compiled and checked all workpapers, and conducted a reasonableness check of survey results before passing the site file on to a manager for the first of several independent office review steps.

I. Quality Control and Confidentiality Procedures

Data quality control (QC) was a primary focus of the cost survey project. Quality control procedures included five separate levels of review and totaled on-average 13 hours per site. These data QC procedures were essential to ensure

that the cost survey results were fair, equitable, accurate, reasonable, justifiable, and defensible.

This extensive quality control process, with five different individuals or teams, ensured that each site file was complete and accurate. Files that did not meet all the quality control criteria were returned to the original survey team for corrections, if appropriate. NewPoint Group approved site file data for the final cost per container calculations described in Section 3, after this extensive series of quality control reviews was complete.

Confidentiality was important for the cost survey. The data from each recycling site were not to be disclosed, as release of the data could potentially be compromising to a recycling business. As a result, NewPoint Group developed formal policies regarding confidentiality. Each project team member signed an Employee Confidentiality statement, and in addition, each project team firm signed a similar statement. Records from each site were maintained securely at the NewPoint Group offices after they were completed, and printouts and drafts with site-specific information were shredded. The final site files were delivered to the DOR for their secure record retention. Computers were protected against unauthorized access through use of project passwords. All electronic files related to site visits were stored on a secure server, accessible by password only, to survey team members.



$$n = \frac{(\sum N_i S_i)^2}{D + \sum N_i S_i^2}$$

Section 3 Handling Fee Cost Calculations and Results

$$PP_{\$/t} = (NHFR_{\$/t} + RR) - SV_{\$/t}$$

$$HF_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

	NHFR	HFR
$\$/t$	10	N/A
$\$/c$	1	1

3. Handling Fee Cost Calculations and Results

This section describes the calculations used, and the final results for, the statewide, weighted-average cost per container to recycle for processing fee recyclers, and handling fee recyclers. This section is organized as follows:

- A. Cost Calculations
- B. Cost Results.
- C. Comparison of Cost Results.

A. Cost Calculations

This handling fee cost survey was the second time that the DOR calculated cost per container at the statewide level. This section discusses various methodological issues related to this calculation.

The statewide statistical methodology (stratified weighted-average cost, simple weighted-average cost, or population weighted-average cost) used for either cost per ton calculations, or cost per container calculations, were pre-determined by sample design.¹ We utilized a stratified random sample for the handling fee cost survey.

For our stratified random sample, we used a weighted-average by strata calculation to determine cost per ton, or cost per container. This weighted-average by strata calculation is similar to the approach for aluminum, glass, PET #1, and HDPE #2 cost per ton for the processing fee cost survey. **Figure 3-1**, on the next page, illustrates the weighted-average by strata calculation approach for calculating cost per container.

The handling fee cost survey consisted of two stratified random samples, one for handling fee recyclers, and one for processing fee recyclers. Within each population, recyclers were divided into three strata, based on the annual number of containers recycled. While the specific definitions between handling fee and processing fee container strata were different, the overall structures of the two sets of strata were similar. That is, both the handling fee and processing fee container strata were constructed so that the recyclers within each stratum handled approximately one-third of the total number of population containers recycled. This was important, because it allowed us to directly compare results of the two cost per container calculations.

The first step in calculating cost per container was to aggregate the individual material cost results from the completed labor allocation cost model for each site. For each recycling site, we calculated total CRV costs by summing CRV costs for each

¹ The Beverage Container Recycling Act specifies that cost per ton and cost per container calculations be based on a statewide weighted-average. This eliminated a fourth option for the calculation, a simple average (taking the average of each site, and dividing by the total number of sites).

$$n = \frac{(\sum N_i S_i)}{D + \sum N_i}$$

$$= (NHFR_{\$/t} +$$

$$F_{\$/c} = HFR_{\$/c} - NH$$

	NHFR	HFR
	10	N/A
	1	1

3. Handling Fee Cost Calculations and Results

Figure 3-1
Cost per Container Calculation
(2008)
Handling Fee Cost Survey

<u>Container Stratum 1 Sample Costs</u>	X	Container Stratum 1 Population Containers	=	Container Stratum 1 Total Population Costs
				+
<u>Container Stratum 2 Sample Costs</u>	X	Container Stratum 2 Population Containers	=	Container Stratum 2 Total Population Costs
				+
<u>Container Stratum 3 Sample Costs</u>	X	Container Stratum 3 Population Containers	=	Container Stratum 3 Total Population Costs
				<hr style="width: 20%; margin: 0 auto;"/>
				Total Population Containers
			=	Statewide Stratified Weighted-Average Cost Per Container

of the ten material types, as determined by the labor allocation cost model and sub-models. Next, we converted tons of each CRV material to number of containers. The number of CRV containers for a given material type was equal to: tons x 2,000 x CPP, where CPP was the 2008 statewide average containers per pound for each material type, as determined by DOR. We determined the total CRV containers by calculating the number of CRV containers for each material type, and summing across all ten material types. For a recycler with 100 tons of aluminum redeemed, the number of aluminum containers was equal to:

$$\begin{aligned}
 &(100 \text{ tons}) \times (2,000 \text{ pounds/ton}) \\
 &\quad \times (29.45 \text{ containers/pound}) \\
 &= 5,890,000 \text{ containers.}
 \end{aligned}$$

Once we had determined individual site CRV costs and CRV containers, we were able to determine statewide weighted-average costs per container. For the weighted-average by strata

calculation for cost per container, we first determined an average cost per container for each stratum by dividing total CRV costs for the stratum by total CRV containers in the stratum. We then multiplied that stratum average cost per container by total containers in the stratum population. We then summed total CRV costs for the three strata, and divided by total containers in the population. This calculation is illustrated in Figure 3.1, above.

B. Cost Results

The statewide, weighted-average, recycler cost per container for handling fee recyclers and processing fee recyclers are presented in **Figure 3-2**, on the next page. The statewide, weighted-average, cost to recycle for handling fee recyclers in 2008 was 2.196 cents per container, 64 percent higher than the statewide, weighted-average, cost to recycle for processing fee recyclers in 2008, at 1.337 cents per container.

Figure 3-2
Handling Fee and Processing Fee Recycler Cost per Container
(2008)
Handling Fee Cost Survey

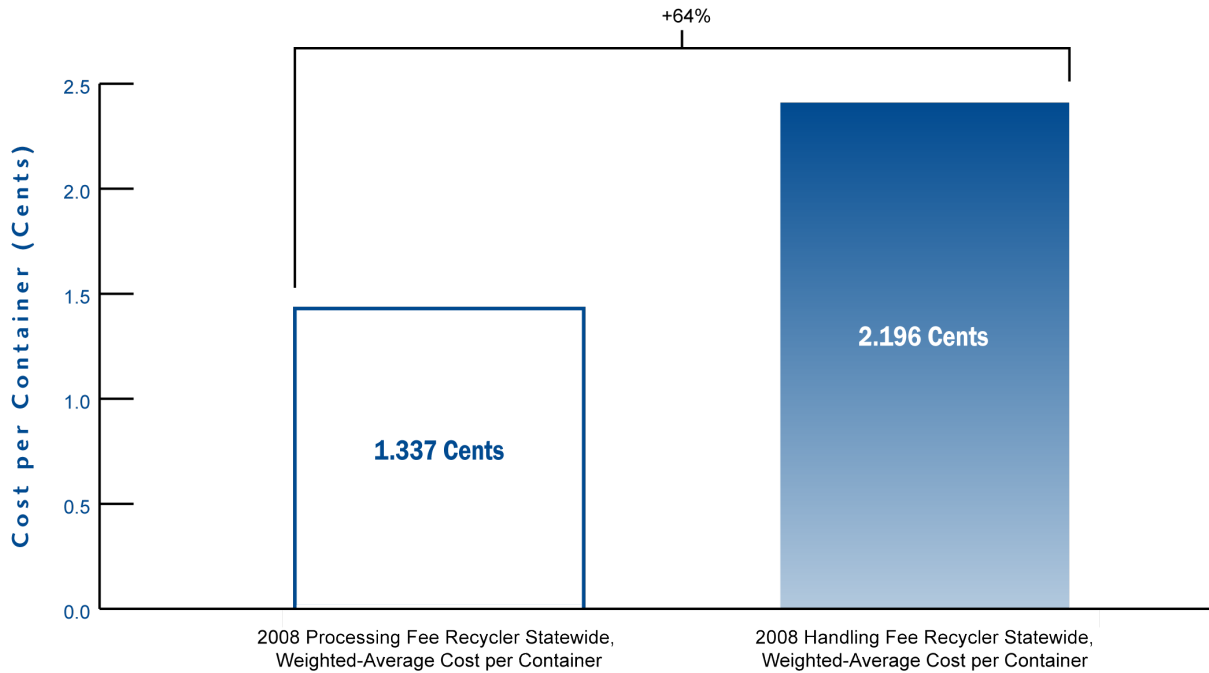


Table 3-1, on the next page, includes the new handling fee payment calculation, 0.859 cents per recycled container, equal to the difference between the handling fee recycler statewide, weighted-average, cost per container to recycle, and the processing fee recycler statewide, weighted-average, cost per container to recycle, as specified in Section 14585 (f)(3). The Department is scheduled to implement this new handling fee payment starting July 1, 2010.

The sample sizes used to determine the cost per containers were estimated to achieve a 90 percent confidence interval. This standard was higher than the statistical requirements in regulations for handling fee survey cost per container calculations, which specify an 85 percent confidence interval. The 2008 cost per container results for both

handling fee recyclers and processing fee recyclers exceeded this target, with low error rates at the 90 percent confidence level of 5.17 percent, and 7.10 percent, respectively.

Table 3-2, on the next page, compares total number of containers recycled, population size, and sample size for handling fee and processing fee recyclers.

The new handling fee payment, as of July 1, 2010, will be paid on all eligible containers recycled by supermarket sites, nonprofit convenience zone recyclers, and rural region recyclers. The new, calculated, per container handling fee payment of 0.859 cents is less than the handling fee payment determined in the 2006 handling fee cost survey, of 0.980 cents per container.

3. Handling Fee Cost Calculations and Results

Table 3-1
Statewide Recycler Costs per Container
(2008)
Handling Fee Cost Survey

Recycler Type	Statewide, Weighted-Average, Cost per Container	Percentage Change (HF increase over PF)	Error Rate at 90 % Confidence Interval
1. Handling Fee Recycler	2.196 Cents	+64%	5.17%
2. Processing Fee Recycler	1.337 Cents		7.10%
3. Handling Fee Recycler Cost per Container minus Processing Fee Recycler Cost per Container	0.859 Cents		

Table 3-2
Handling Fee and Processing Fee Recyclers,
Number of Containers Recycled, Population Sizes, and Sample Sizes
(2008)
Handling Fee Cost Survey

Recycler Type	Total Number of Containers Recycled	Population Size (sites)	Sample Size (sites)
1. Handling Fee Recyclers	3.99 billion	1,077	100
2. Processing Fee Recyclers	8.97 billion	729	85

C. Comparison of Cost Results

Figure 3-3, on the next page, compares the statewide, weighted-average cost per container for processing fee and handling fee recyclers from the 2006 and 2008 handling fee cost surveys. Between 2006 and 2008, the processing fee recycler cost per container decreased 7 percent, while the handling fee recycler cost per container decreased 9 percent. These decreases are consistent with the processing fee cost survey cost per ton results, in which costs per ton decreased for all material types, except aluminum.

The decrease in cost per container between 2006 and 2008 is due in large part to increased volumes. Handling fee recycler volumes, in terms of containers recycled, increased 28 percent between 2006 and 2008. Similarly, processing fee recycler volumes, in terms of number of containers recycled, increased 30 percent over the two year period. The volume increases provided improved economies of scale, and thus led to reduced per container costs, for both types of recyclers. **Table 3-3**, on the next page, provides a comparison of the results for the 2008 and 2006 handling fee cost surveys.

Figure 3-3

Comparison of Processing Fee Recycler and Handling Fee Recycler
 Cost per Container (2006 and 2008)
 Handling Fee Cost Survey

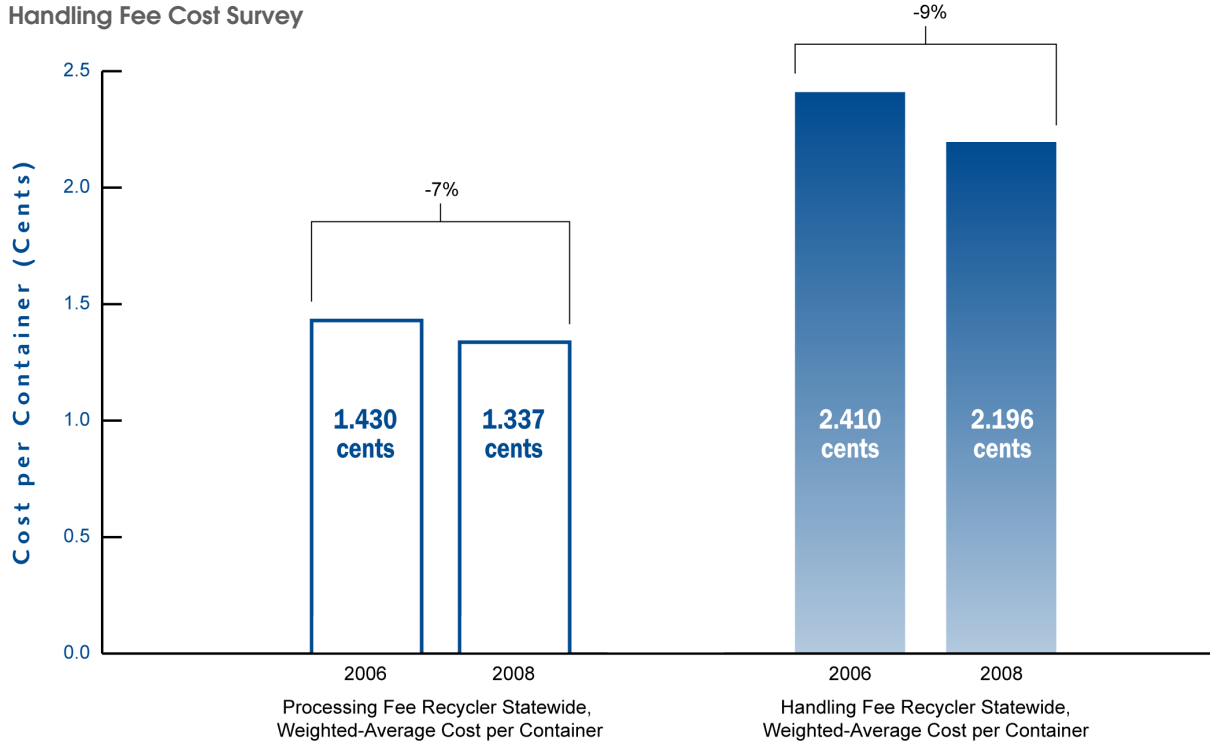


Table 3-3

Costs per Container and Error Rates (2008 and 2006)
 Handling Fee Cost Survey

Recycler Type	2008 Statewide, Weighted-Average, Cost per Container	2006 Statewide, Weighted-Average, Cost per Container	Percentage Change (2006 to 2008)	2008 Error Rate at 90% Confidence Interval	2006 Error Rate at 90% Confidence Interval
1. Handling Fee Recycler	2.196 Cents	2.410 Cents	-9%	5.17%	6.31%
2. Processing Fee Recycler	1.337 Cents	1.430 Cents	-7%	7.10%	6.16%
3. Handling Fee Recycler Cost per Container minus Processing Fee Recycler Cost per Container	0.859 Cents	0.980 Cents	-12%		

3. Handling Fee Cost Calculations and Results

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$$n = \frac{(\sum N_i S_i)^2}{D + \sum N_i S_i^2}$$

$$PP_{\$/t} = (NHFR_{\$/t} + RR) - SV_{\$/t}$$

$$HF_{\$/c} = HFR_{\$/c} - NHFR_{\$/c}$$

	NHFR	HFR
$\$/t$	10	N/A
$\$/c$	1	1