



Nov. 12, 2025

Submitted electronically to wastechar@calrecycle.ca.gov

Dan Brown, Acting Policy Director
Department of Resources Recycling and Recovery (CalRecycle)
Policy Development and Analysis Office
1001 "I" Street, MS-24B
Sacramento, CA 95814

RE: Comments on SB 54 Material Characterization Study Revised Preliminary Findings Report

Dear Mr. Brown,

Thank you for the opportunity to review and comment on the revised draft report released on Sept. 30, 2025. We appreciate the extensive effort behind this statewide waste composition study—the field sampling, the categorization work, the compilation of hundreds of sample datasets, and the responsiveness to feedback throughout this process.

Our comments below reflect a desire to support developing the most robust and reliable disposal estimates possible, given the important role these numbers will play in establishing baseline recycling rates to be used in implementing the Plastic Pollution Prevention and Packaging Producer Responsibility Act, as codified in the California Public Resources Code at Sections 42040–42084 (Senate Bill 54). We offer these observations in the spirit of collaboration and with the goal of helping ensure the final methodology is transparent, statistically sound, and operationally durable. We offer these observations in the spirit of collaboration and with the goal of helping ensure the final methodology is transparent, statistically sound, and operationally durable.

Observations on the Revised Analytical Approach

We noticed that the September draft introduces a new analytical method (Dirichlet distribution) for handling compositional data and addressing the large number of zeros present across categories. This appears to be a significant departure from the approach used in the June 2025 draft and in past CalRecycle studies.

We recognize that zero-heavy datasets can be challenging and that compositional data requires thoughtful handling. At the same time, the shift to a methodology that replaces all zero values and generates 1,000 synthetic datasets raised a few concerns for us regarding interpretability, sample independence, and the potential effects on categories observed infrequently in the field.

We would appreciate any additional detail CalRecycle can share about:

- The rationale for selecting this approach over other compositional data methods
- Any references, guidance, or statistical literature that informed the decision



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- Whether CalRecycle has evaluated how this method performs relative to more traditional ASTM-consistent techniques
- Applying this method to previous characterizations to determine the differences and changes between the most current report and previous ones

The analytical reasoning will help us better understand and support the implementation of SB 54 and accurately communicate the methodology to our participant producers.

Effects of Zero Handling and Randomization on Disposal Estimates

The replacement of zeros through sample averaging appears to have had a notable impact on disposal estimates, particularly for lower-prevalence packaging categories and plastics. For some covered material categories (CMCs), estimated disposal increased by more than 100%—and in a few cases by more than 1,000%—between the June and September drafts.

We understand that estimates can shift as methods refine, and we appreciate the challenge posed by categories that are rarely observed in the waste stream. At the same time, these large variations prompted us to seek clarity on how the new approach treats sparse data and whether alternative techniques might limit such inflation while still addressing zero-value constraints.

If possible, we would welcome:

- Any sensitivity analysis comparing June (ASTM-aligned) and September (Dirichlet-based) outputs
- Additional insight into how CalRecycle assessed the potential magnitude of methodological impacts on low-volume material categories
- Information on whether CalRecycle explored zero-aware modeling approaches that preserve sample independence

Consistency With Historical Trends

In reviewing the September estimates alongside past CalRecycle waste characterization studies, we observed that overall total disposed CMC tons along with several material disposal tonnages—particularly for plastics—are substantially higher than previously reported values. For example, HDPE container disposal would reach the highest level seen in any CalRecycle dataset.

We recognize that differences across studies can reflect genuine changes in disposal behavior, methodological updates, or improved categorization. We would appreciate any clarification CalRecycle can provide on how it interprets these differences and whether CalRecycle believes the higher disposal values reflect real statewide conditions or methodological effects from the new approach.



Consolidation of Plastic vs. Non-Plastic Categories

We also noticed that while the contractor collected field data distinguishing plastic from non-plastic forms of similar items, the September draft presents disposal results at a consolidated level. We understand this may be due to sparsity issues or broader reporting considerations.

Because SB 54 requires material-specific recycling rates—particularly for plastics—we would appreciate insight into:

- The rationale for combining these two categories
- Whether CalRecycle intends to publish plastic and non-plastic forms separately in the final report
- Whether additional disaggregated results will be available
- Whether any data limitations or confidence interval concerns influenced the consolidation
- Access to more data granularity, if available, which would be very helpful for producer planning and internal modeling

Misalignment Between the CMC Definitions in the CalRecycle CMC Guidance Document and Study Material Sorting List – Appendix 1: Potential Impact on Recycling Rate Determinations

When the RFP titled “SB 54 Disposal Facility-based Material Characterization Study DRR24008” was issued in May 2024, CAA was keenly interested in **Appendix A, Table 3: Material Sorting List and Definitions by Category**, as this was the first time CalRecycle had provided indicative definitions of individual CMCs. More specifically, CAA responded to **Addendum 3 of DRR24008** with specific questions that aimed to clarify how plastic-coated fiber substrates would be represented in the various fiber sort categories/CMCs to be used for the Material Characterization Study (MCS). This included but was not limited to **Kraft Paper (24_PFI1N/P)**, **Molded Fiber (24_PFI214N/P)**, **Paperboard (24_PFI10N/P)**, **White Paper (24_PFI11N/P)**, **Other/Mixed Paper (24_PFI12N/P)** and **Multi-Material Laminates (24_PFI7P)**.

Responses from CalRecycle clearly indicated that if a paper format had a plastic coating (either single-sided or double-sided), it would be characterized to the applicable fiber sort category that best represents that format. For example, a single-sided or double-sided polycoated paperboard cup would be sorted to the sort category “**Paperboard (24_PFI10N/P)**.” Similarly, a molded fiber food service ware container with plastic coating would be reported to the sort category “**Molded Fiber (24_PFI214N/P)**.” With respect to plastic-coated paper substrates, the sort category “**Other/Mixed Paper (24_PFI12N/P)**” would be limited to fiber formats that do not fall under any of the other fiber/paper sort categories listed above it on sort category list.



When the draft CalRecycle CMC Reporting Guidance Document was released in early June 2025, CAA was surprised to see that the definitions of the various fiber/paper CMCs had changed with respect to the classification of paper substrates with plastic coatings as compared to the answers CAA received to our questions on fiber sort categories used in the MCS. Based on conversations with CalRecycle, it is our understanding that just prior to the start of the field work, changes were made to how plastic-coated paper substrates were to be classified during the material characterization study. Accordingly, any plastic-coated paper substrate would no longer be sorted to the applicable paper format that best matched its form, but would instead be reported to the sort category **“Multi-Material Laminates (24_PF7P).”**

Although CAA was concerned about changes to how plastic-coated paper substrates are characterized, we were at least pleased that the changes brought CalRecycle’s CMC Reporting Guidance into alignment with the MCS of covered materials disposed at landfills. In fact, given that all plastic-coated paper substrates were to be reported to the CMC **“25_PF7P – Paper/Fiber – Multi-Material Laminate,”** CAA proposed creating a new CMC for any plastic-coated paperboard. Our intention was to isolate this material from other plastic-coated paper/fiber substrates as new and emerging end markets for polycoated paperboard show promising developments. CalRecycle accepted our proposal and created a new CMC called **“25_PF17P – Paper/Fiber – Multi-Material Laminate – Paperboard with a Plastic Coating/Lining”** bringing the total number of CMCs to 95. Our intention was to isolate this material from other plastic-coated paper/fiber substrates as new and emerging end markets for polycoated paperboard show promising developments. CalRecycle accepted our proposal and created a new CMC called **“25_PF17P – Paper/Fiber – Multi-Material Laminate – Paperboard with a Plastic Coating/Lining,”** bringing the total number of CMCs to 95.

With the publication of the final CalRecycle CMC Reporting Guidance document on Sept. 2, 2025, and further updates on Sept. 8, there are notable changes to some of the fiber/paper categories that will create a misalignment between the results in the Material Characterization Study and the CMC Reporting Guidance, which will impact which CMCs producers would report under. In the updated CMC Reporting Guidance document, only double-sided plastic-coated fiber would be reported to either **“25_PF7P – Paper/Fiber – Multi-Material Laminate,”** or **“25_PF17P – Paper/Fiber – Multi-Material Laminate – Paperboard with a Plastic Coating/Lining.”** Paper substrates that are coated with plastic on only one side would be reported to the applicable fiber CMC with a plastic component. For example, paperboard with a plastic coating on a single-side of the covered material would be reported to the CMC **“25_PF10P – Paper/Fiber – Paperboard – All Forms w/ plastic component.”** The same would apply to other paper material types and forms including Kraft Paper, Molded Fiber, White Paper and Other Mixed Paper substrates that have a plastic coating on one side being reported to the “with plastic component” variant of those CMCs.

This misalignment of producer reporting categories with MCS categories has potential implications for the comparability of recycling rates that CalRecycle is mandated by statute to publish by Jan. 1, 2026, pursuant to PRC 42061(b). While disposal of CMCs in



California landfills forms only part of the data inputs into the denominator of the recycling rate calculation, it is important that both the numerator and the denominator are aligned, and that the recycling rates that are calculated reflect the actual materials that producers report to these CMCs. CAA is open to supporting CalRecycle, where appropriate, to ensure that this is achieved.

Treatment of an Evolving Scope of Exclusions in SB 54 Draft Regulations

Given the significance of the study results as an input into the recycling rate calculations for each CMC, the determination of which packaging and food service ware items are considered covered materials under SB 54 is critical to developing accurate disposal quantities. Given that there have been changes to the scope of exclusions as presented in the various iterations of the draft regulations during the study period, it is not clear how this changing scope has been reflected in the study results. More importantly, it is critical that CalRecycle be able to adjust the study results to reflect the actual scope of exclusions once these are finalized. CalRecycle indicated during the public meeting that it had designed the study to be able to account for this issue, which is very positive. CAA looks forward to discussing with CalRecycle how such changes to the scope of covered materials in the final regulations will be accounted for when or if using the results of this study in developing the recycling rates pursuant to PRC 42061(b).

Opportunities for Continued Collaboration

We greatly appreciate CalRecycle's openness in releasing data and methodology summaries to interest holders. We believe the following steps could support mutual alignment as the final report is prepared:

- Sharing additional technical documentation on the September analytical approach, if available
- Clarifying the statistical assumptions behind the zero-replacement method and confidence interval calculations
- Discussing the potential for supplemental sensitivity analyses comparing outputs across multiple methods
- Continuing to explore ways to incorporate additional mixed-load data in future years, given that transfer trailers represent a large share of statewide disposal and the current revised report sample reflects an overall proportion of less than 9% of mixed-load data
- Ensuring the alignment of sorting categories with CMC reporting definitions and examples so that recycling rates calculated for CMCs accurately reflect the covered materials reported to them
- Clarifying how changes to the scope of covered materials in the final regulations will be accounted for when using the results of this study in developing the recycling rates pursuant to PRC 42061(b)



We offer these suggestions respectfully and with the understanding that CalRecycle must balance methodological rigor with tight statutory timelines.

We value the significant resources CalRecycle has invested in developing these statewide disposal estimates, and we appreciate the opportunity to offer feedback. Our goal is to support the development of a durable, transparent, and statistically sound foundation for SB 54 recycling rate calculations.

We look forward to continued dialogue and are happy to collaborate further, provide additional detail on the observations above, or participate in any technical discussions if helpful.

Thank you again for your time, effort, and partnership.

Sincerely,



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