APPENDICES A-F

The Current State of End Markets Report

A Plastic Pollution Prevention and Packaging Producer Responsibility Act Needs Assessment Report

February 2026

Data and information used in this report provided as part of contract number DRR24043.

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Appendix A: Methods

End Market Identification

Initial End Market List

The first step in the research process was to identify end markets that manage covered material. To do this, the contractor reviewed online databases of end markets, such as the Association of Plastic Recyclers (APR) Buyers and Sellers Directory,[1] the Glass Recycling Coalition's Glass Recycling Map,[2] and the U.S.EPA's Recycling Infrastructure and Market Opportunities Map.[3] These databases were aggregated into a list of potential end markets. Any facility based in California, and facilities located outside California but suspected of managing covered material, were added to the list.

The team further refined the list by reviewing company websites and news articles with the intention of confirming that the facility manages covered materials. For example, facilities that manage primarily scrap metal or electronic plastic rather than covered material were removed from the list.

Contact Identification

Next, introductory emails were sent, or calls were placed, to each end market facility identified. These were predominantly facilities located in California but also included a number of facilities outside California managing covered materials that were identified through discussions. At this stage, the contractor had already received relevant contact information from secondary research and through previous connections in the industry. If the team did not have direct contact with the organizations, emails were sent to general "info" addresses and calls were placed directly to facilities to obtain a relevant contact. The purpose of these initial emails and calls was to set up a short introductory call to inform the organizations that the contract team planned to send out a survey and to identify the correct contact within the organizations capable of completing the survey.

End Market Confirmation

After the list of end market facilities and contacts was complete, meetings were scheduled with relevant industry associations that have a comprehensive understanding of end market facilities in the U.S., including those from the plastic, paper, glass, and metal industries. These associations confirmed the list of relevant end market facilities and provided additional plants and contacts.

Then the contractor compared the list of end market facilities against data in the Recycling and Disposal Reporting System (RDRS), which details reported waste flows between processors and end markets. The comparison confirmed that the contract team's list included all the end market facilities that receive material that is reported in RDRS. RDRS data are not exhaustive; it typically does not give the name of the facility when material is sent out of state, so this method was mainly used to confirm in-state end markets.

Each material section in this report presents more information on the number of end market facilities identified.

Challenges For End Market Identification

End Market Facility List*:* There is no single source of all California end market facilities accepting California covered material, so multiple sources were used to develop a thorough list.

RDRS was one source used. End market facilities that manage waste and recyclable materials are required to register in RDRS, but the RDRS registration categories do not align with the requirements of this report. For example, many brokers and end market facilities that manage industrial material only are categorized as a “recycler/composter” in RDRS. The database also includes many closed facilities. Brokers and closed end market facilities would not be considered an end market facility for this report; therefore, the RDRS list of “recycler/composter” cannot be used without qualifying each entry.

Industry associations were an additional data source. In general, their lists have better data for their members than for nonmembers.

Survey Development and Implementation

Survey Development

The second step in the research process was to develop an end market facility survey. The goal of the survey was to collect quantitative data on the amount of materials recycled at end market facilities. It also collected quantitative and qualitative data on material flow and material recovery, contamination, markets and costs, and environmental and public health impact.

A unique survey was developed for each major material class (plastics, paper and fiber, metal, glass, ceramics, and wood).

Each survey contained seven sections collecting the following information:

- **Contact and General Information:** This section captured respondent contact information and general facility information, such as address and year the facility was built.
- **Quantity of Material Managed:** The weight and composition of inbound material by ISRI grade specifications. It also captured data on the geographic origin of the material and type of facility it came from (e.g., recycling processing facility, Bulk and Bale, or CRV Redemption Center).
- **Contamination:** The types and quantity of contamination encountered at the facility and systems for managing the contamination.
- **Recovery and Technology:** The technologies utilized at the facility, the types of recycled products produced, and the approximate recycling conversion rate.
- **Markets and Costs:** The cost of implementing the processes described and the overall market dynamics for their business.

- **Future Capacities:** Opportunities for expansion and the requirements necessary to expand.
- **Environment and Public Health:** The strategies implemented to ensure the health and safety of employees and the environment.

The survey questions were reviewed by the CalRecycle technical team and were discussed and approved before being issued. In addition to approving the survey, CalRecycle provided a letter addressed to facilities, outlining the objectives of the report and encouraging participation.

The approved survey questions were issued using SurveyMonkey, which allowed for advanced logic to ensure that respondents were only asked questions relevant to their facility. For example, if a facility only managed PET Grade A, they were only asked questions related to that material.

Survey Implementation

The surveys were sent to the end market facilities identified via email in late May 2025. The contract team who had initially contacted plants and conducted introductory calls sent the surveys to ensure that most end market facilities received a survey from a recognizable email. The emails outlined the goal of the study, encouraged participation, and included the letter from CalRecycle which provided additional context and information. Respondents were informed that individual responses would not be shared with CalRecycle or anyone outside the contractor's team, and all responses would be aggregated prior to sharing with CalRecycle so that no information would be directly attributed to any end market facility. Non-Disclosure Agreements (NDAs) were put in place for those end market facilities that requested it.

The requested completion date was early June 2025. A centralized email address was given to which respondents could direct questions. The email inbox was monitored by several staff members and questions were promptly addressed.

Follow-up emails were sent to end market facilities that had yet to respond a few days after the completion deadline. The contractor also offered to meet with respondents to go over any questions they had or conduct the survey as an interview.

To further encourage end market facilities that had not responded, an abbreviated list of priority questions was issued. These aimed to gather data on the types of materials managed and the quantity of both inbound and outbound material.

Following the receipt of data, surveys were reviewed and the contractor followed up with emails and calls where necessary to clarify responses.

Challenges For Survey Development and Implementation

The primary challenge was obtaining end market participation in the time available; there was no requirement for end markets to participate, and the timescale available for the outreach was short. Several end market facilities declined to participate. The reasons given were the lack of any legal requirement and general wariness about sharing detailed business information.

Furthermore, designing a survey that was simple enough to entice participation but could also gather data in sufficient granularity to map input grades to the CMCs was challenging. End markets work with grade descriptions and their own compositional categories. In some cases, CMC categories align reasonably with industry categories, but in other cases they do not and/or data were unavailable at this granular level.

Supplemental Data Collection

In addition to primary data, the contractor used the data sources described.

CalRecycle's RDRS Reported Data: One of the main additional data sources that provided information on the outflows from recycling processing facilities and some of the end market facilities receiving covered materials.[4]

World Institute for Strategic Economic Research (WISERTrade):[5] This provided data on international exports.

CalRecycle's SB 343 Report:[6] This presents data on the composition of outbound recycling processing facility grades.

Model Development

The data gathered were used to assess the quantity of CMCs. However, because end market facilities do not characterize their materials in terms of CMC, the contractor developed groups of CMCs that both simplified the list of CMCs and were designed to reflect a list that end market facilities were more likely to recognize and provide data for. CMC end market groups defined in this report are specific for end markets and differ from those defined in the Current State of Collection Report, and Current State of Processing Reports.

Table A-1 shows how each CMC is categorized into CMC end market groups. The CMC end market groups are how the detailed information is provided in this report.

Table A-1: CMC End Market Group Categorization

CMC Class	CMC End Market Group	CMC Code and Form
Glass	Mixed Glass Bottles and Jars – Non-CRV	24_G1N Bottles and Jars w/o plastic component
Glass	Mixed Glass Bottles and Jars – Non-CRV	24_G1P Bottle and Jars w/ plastic component
Glass	Other Forms of Glass	24_G2N Other Forms w/o plastic component
Glass	Other Forms of Glass	24_G2P Other Forms w/ plastic component
Glass	Small Format – Glass	24_G3N Small – Two or more sides measuring 2" or less w/o plastic component

CMC Class	CMC End Market Group	CMC Code and Form
Glass	Small Format – Glass	24_G3P Small – Two or more sides measuring 2” or less w/ plastic component
Ceramic	Ceramic	24_C1N All Forms w/o plastic component
Ceramic	Ceramic	24_C1P All Forms w/ plastic component
Ceramic	Small Format – Ceramics	24_C2N Small – Two or more sides measuring 2” or less w/o plastic component
Ceramic	Small Format – Ceramics	24_C2P Small – Two or more sides measuring 2” or less w/ plastic component
Metal	Aluminum Containers – Non-CRV	24_M1N Non-Aerosol Container w/o plastic component
Metal	Aluminum Containers – Non-CRV	24_M1P Non-Aerosol Container w/ plastic component
Metal	Other Aluminum	24_M2N Foil Sheets w/o a plastic component
Metal	Other Aluminum	24_M2P Foil Sheets w/ a plastic component
Metal	Other Aluminum	24_M3N Foil Molded Containers w/o plastic component
Metal	Other Aluminum	24_M3P Foil Molded Containers w/ plastic component
Metal	Other Aluminum	24_M5N Other Forms w/o plastic component
Metal	Other Aluminum	24_M5P Other Forms w/ plastic component
Metal	Aluminum Containers – Non-CRV	24_M4P Aerosol can w/ plastic component
Metal	Other Nonferrous	24_M9N All Forms w/o plastic component
Metal	Other Nonferrous	24_M9P All Forms w/ plastic component
Metal	Tin/Steel/Bimetal – Non-CRV	24_M6N Non-Aerosol Container w/o plastic component
Metal	Tin/Steel/Bimetal – Non-CRV	24_M6P Non-Aerosol Container w/ plastic component

CMC Class	CMC End Market Group	CMC Code and Form
Metal	Tin/Steel/Bimetal – Non-CRV	24_M7P Aerosol Can w/ plastic component
Metal	Tin/Steel/Bimetal – Non-CRV	24_M8N Other Forms w/o plastic component
Metal	Tin/Steel/Bimetal – Non-CRV	24_M8P Other Forms w/ plastic component
Metal	Other Ferrous	24_M10N All Forms w/o plastic component
Metal	Other Ferrous	24_M10P All Forms w/ plastic component
Metal	Small Format – Metal	24_M12N Small – Two or more sides measuring 2” or less w/o plastic component
Metal	Small Format – Metal	24_M12P Small – Two or more sides measuring 2” or less w/ plastic component
Paper and Fiber	Kraft Paper	24_PF1N All Forms w/o plastic component
Paper and Fiber	Kraft Paper	24_PF1P All Forms w/ plastic component
Paper and Fiber	Aseptic Cartons	24_PF15P Aseptic Cartons
Paper and Fiber	Gable-top Cartons	24_PF5P Gable-top Cartons
Paper and Fiber	Paperboard	24_PF10N All Forms w/o plastic component
Paper and Fiber	Paperboard	24_PF10P All Forms w/ plastic component
Paper and Fiber	Other Lined Paper	24_PF7P Other Forms w/ plastic component
Paper and Fiber	OCC	24_PF9N Cardboard w/o plastic component
Paper and Fiber	OCC	24_PF9P Cardboard w/ plastic component
Paper and Fiber	Waxed OCC	24_PF8N Waxed Cardboard w/o plastic component
Paper and Fiber	Waxed OCC	24_PF8P Waxed Cardboard w/ plastic component

CMC Class	CMC End Market Group	CMC Code and Form
Paper and Fiber	Mixed Paper	24_PF11N All Forms w/o plastic component
Paper and Fiber	Molded Pulp	24_PF14P All Forms w/ plastic component
Paper and Fiber	Molded Pulp	24_PF14N All Forms w/o plastic component
Paper and Fiber	Mixed Paper	24_PF12N All Forms w/o plastic component
Paper and Fiber	Mixed Paper	24_PF12P All Forms w/ plastic component
Paper and Fiber	Mixed Paper	24_PF11P All Forms w/ plastic component
Paper and Fiber	Small Format – Paper	24_PF16N Small – Two or more sides measuring 2” or less w/o plastic component
Paper and Fiber	Small Format – Paper	24_PF16P Small – Two or more sides measuring 2” or less w/ plastic component
Plastic	Plastic #1 – PET Clear Bottles, Jugs, Jars – Non-CRV	24_P1P Bottles, Jugs, and Jars (Clear/Natural)
Plastic	Plastic #1 – PET Pigmented Bottles, Jugs, Jars – Non-CRV	24_P2P Bottles, Jugs, and Jars (Pigmented/Color)
Plastic	Plastic #1 – Other PET Rigid	24_P38P Other Rigid Containers, Cups, Lids, Plates, Trays, Tubs
Plastic	Plastic #1 – Other PET Rigid	24_P39P Other Rigid Items
Plastic	Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	24_P6P Bottles, Jugs and Jars (Clear/Natural)
Plastic	Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	24_P7P Bottles, Jugs and Jars (Pigmented/Color)
Plastic	Plastic #2 – HDPE Pails and Buckets	24_P8P Pails & Buckets
Plastic	Plastic #2 – Other HDPE Rigid	24_P40P Other Rigid Items

CMC Class	CMC End Market Group	CMC Code and Form
Plastic	Plastic #3 – PVC Rigid	24_P11P Rigid Items
Plastic	Plastic #4 – LDPE Bottles and Jugs	24_P13P Bottles, Jugs and Jars
Plastic	Plastic #4 – Other LDPE Rigid	24_P14P Other Rigid Items
Plastic	Plastic #5 – PP Rigid Items	24_P17P Bottles, Jugs and Jars
Plastic	Plastic #5 – PP Rigid Items	24_P41P Other Rigid Containers, Cups, Lids, Plates, Trays, Tubs
Plastic	Plastic #5 – PP Rigid Items	24_P20P Other Rigid Items
Plastic	Plastic #5 – Other PP	24_P19P Utensils
Plastic	Plastic #6 – Other PS	24_P27P Utensils
Plastic	Plastic #6 – PS Rigid Items	24_P43P Solid Hinged Containers, Plates, Cups, Tubs, Trays, and Other Solid Forms
Plastic	Plastics and Polymers Designed for Compostability – Rigid Items	24_P44P Rigid Items
Plastic	Plastic #7 – Other Rigid Plastics	24_P35P Rigid Items
Plastic	Multi-Material Laminate	24_P33P Other Forms
Plastic	Multi-Material Laminate	24_P46P Pouches and Envelopes
Plastic	Plastic-based Textiles	24_P34P Textiles
Plastic	Small Format – Plastics	24_P47P Small – Two or more sides measuring 2” or less
Plastic	Plastic #6 – EPS Rigid Items	24_P23P Expanded/Foamed Hinged Containers, Plates, Cups, Tubs, Trays, and Other Foamed Containers
Plastic	Plastic #6 – EPS Rigid Items	24_P42P Other Expanded/Foamed Forms
Plastic	Plastic #1 – PET Flexibles and Films	24_P5P Flexible and Film Items
Plastic	Plastic #3 – PVC Flexibles and Films	24_P12P Flexible and Film Items
Plastic*	PE Film	24_P15P Clear Non-Bag Film , 24_P16P Other Flexible, and Film Items and 24_P10P Flexible and Film Items

CMC Class	CMC End Market Group	CMC Code and Form
Plastic	Plastic #5 – Mono PP Flexibles and Films	24_P21P Clear Non-Bag Film and 24_P22P Other Flexible and Film Items
Plastic	Plastic #6 – PS Flexibles and Films	24_P29P Flexible and Film Items
Plastic	Plastics and Polymers Designed for Compostability – Flexibles and Films	24_P45P Flexible and Film Items
Plastic	Plastic – #7 Other Flexible and Films	24_P36P Flexible and Film Items
Wood and Other Organic Materials	Wood – Untreated	24_WO1N All Untreated Forms w/o plastic component
Wood and Other Organic Materials	Wood – Untreated	24_WO1P All Untreated Forms w/ plastic component
Wood and Other Organic Materials	Wood – Treated	24_WO2N All Treated or Painted Forms w/o plastic component
Wood and Other Organic Materials	Wood – Treated	24_WO2P All Treated or Painted Forms w/ plastic component
Wood and Other Organic Materials	All Other Textiles	24_WO3N Textiles w/o plastic component
Wood and Other Organic Materials	All Other Textiles	24_WO3P Textiles w/ plastic component
Wood and Other Organic Materials	All Other Wood and Organics	24_WO4N Other Forms w/o plastic component
Wood and Other Organic Materials	All Other Wood and Organics	24_WO4P Other Forms w/ plastic component
Wood and Other Organic Materials	Small Format – Wood and Organics	24_WO6N Small – Two or more sides measuring 2” or less w/o plastic component
Wood and Other Organic Materials	Small Format – Wood and Organics	24_WO6P Small – Two or more sides measuring 2” or less w/ plastic component

*LDPE and HDPE CMC groups were combined for this analysis. Data did not accurately differentiate these two groups therefore it was more appropriate to present them together

The contractor analyzed the data and estimated the quantities of:

1) CMC end market groups delivered to end market facilities in California.
2) CMC end market groups shipped from California to facilities in other U.S. states.
3) CMC end market groups exported to international end market facilities.

To estimate the quantity of CMC end market groups delivered to end markets in California, the contractor compiled data from individual facility survey responses. For each individual facility that reported receiving CMCs, tonnage data were classified by material grade. Tonnages for each grade type were then aggregated across the facility survey responses to calculate the total material grade quantity delivered to end market facilities in California. The survey data covered the 2024 calendar year.

For domestic shipments and international exports, the contractor did not have complete visibility of the specific end market facilities that receive the materials. As a result, this report uses RDRS data from calendar year 2024 for domestic exports, as it specifies the receiving state for the CMC material sent outside California. WISERTrade data were used for international exports, as it has data on tonnage of materials sent to other countries.

Each dataset reported input tonnage by a material category which was then matched to a material grade (e.g., 100 tons of PET Grade A). To break the grade data down into covered material categories, the contractor used a variety of sources for grade compositions, including:

- Survey data from end market facilities.
- CalRecycle's SB 343 Report, which uses data from 2023 and 2024.7 (SB 343)
- PET Recycling Corporation of California PET Bale Composition Analysis for 2024.8 (PRCC)

Table A-2 shows the type of composition data that were used for each CMC class/type. In most cases survey respondents did not provide composition data and therefore PRCC and SB 343 Report material compositions data were used. One HDPE end market facility and two glass end market facilities provide composition data which were used against the tonnages entering their end market facilities. The PRCC composition analysis was used for PET Grade A for material accepted in California end markets, domestic and international exports and SB 343 Report material grades were used for all other PET material grades accepted in California end markets and exported domestically and internationally. NA is indicated in the table for CMC classes in which no end markets were identified.

Table A-2: Compositions Data Used for each CMC Class/Type for CA, Domestic, and International Exports

CMC Class / Type	Composition Sources Used – California Material Grade	Composition Sources Used – Domestic and International Export Grades
Polyethylene terephthalate (PET #1) Rigid	PRCC and SB 343	PRCC and SB 343
High-density polyethylene (HDPE #2) Rigid	Survey Response and SB 343	SB 343
Polypropylene (PP #5) Rigid	SB 343	SB 343
PE Plastic Films	SB 343	SB 343
Other Plastic	SB 343	SB 343
Paper and Fiber	SB 343	SB 343
Metal	NA	SB 343
Glass	Survey Response and SB 343	SB 343
Ceramic	NA	NA
Wood and Other Organic Materials	NA	NA

The contractor prioritized survey data where it was available. The SB 343 Report data and the PET Recycling Corporation data were used to supplement the survey data.

For each CMC end market group, the contractor also calculated the outflow of recovered material from end market facilities using CMC conversion rate data from end market facilities that reported what percent of their inflow becomes a recovered material outflow. The contractor used both the tonnage feedstock and output of surveyed end market facilities, as well as the process loss rates reported by end market facilities in surveys, to estimate the CMC conversion rates.

The calculation method used for quantifying material that enters end markets in California and domestic and international exports is detailed in the following section.

California-based End Market Facilities

To measure the quantity of CMC end market groups entering California end markets, the contractor prioritized data received from survey respondents who indicated the quantity of material in grades their end market facility received in 2024. For each grade

type, the contractor summed the responses across end market facilities to produce a total amount of each grade handled by all survey respondents.

For end market facilities that did not respond to the survey, the contractor used RDRS data to fill the gaps. RDRS includes information on the tonnage that processing plants report sending to end market facilities in California. The database labels its outflow tonnage (for material leaving the plant) according to “material type,” which are organized into “material subcategories,” and “material categories.” The material types in RDRS are not as detailed as the grades in survey resources. For example, the RDRS data does not distinguish between “PET A” and “PET B” grade material. Therefore, facilities were researched to understand which grades they accepted and assigned each RDRS material type to a grade that aligned with the survey responses (Table A-3). The grades which were asked for in the survey were based on ISRI grade specifications, as these are widely known and were mentioned by end markets on the ground in California.

Finally, for end market facilities for which there was neither survey data nor RDRS data, the contractor used secondary research to estimate the quantity managed. This information came most often from end market facility websites or their profiles in news articles. Relevant sources are included in each material class section.

Domestic Export and International Exports

The flow of CMCs that are collected and sorted in California but sent to end markets outside of the state was also calculated. The contractor used two main data sources, one for exports to other states and one for international exports.

RDRS data were used to calculate domestic exports. In RDRS, exported material is listed as being sent for recycling to a specific state, or more generically “outside of California” but still domestic. As the material categories for this data are the same as those for California end market facilities, the contractor conducted the same material matching exercise to assign the RDRS data to bale categories. This mapping is outlined in Table A-3.

Table A-3: Full List of RDRS Material Categories and their Mapping to Survey Material Grades

RDRS – Material Category	RDRS – Material Subcategory	RDRS – Material Type	Matched Survey Grade/Material Grade
Glass	Mixed Glass	Mixed Glass	Material Recovery Facility-derived 3-Color Mixed Container Glass (Recycling Processing Facility Glass)
Glass	Glass Bottles and Containers	Brown/Amber	Redemption Center derived 3-Color Mixed Container Glass
Glass	Glass Bottles and Containers	Clear/Flint	Redemption Center derived 3-Color Mixed Container Glass
Glass	Glass Bottles and Containers	Glass Bottles and Containers	Material Recovery Facility-derived 3-Color Mixed Container Glass (Recycling Processing Facility Glass)
Glass	Glass	Glass	Redemption Center derived 3-Color Mixed Container Glass
Glass	Glass Cullet	Green/Emerald	Material Recovery Facility-derived 3-Color Mixed Container Glass Recycling Processing Facility Glass)
Glass	Glass Cullet	Glass Cullet – Mixed Colors	Material Recovery Facility-derived 3-Color Mixed Container Glass (Recycling Processing Facility Glass)

RDRS – Material Category	RDRS – Material Subcategory	RDRS – Material Type	Matched Survey Grade/Material Grade
Glass	Glass Bottles and Containers	Blue/Cobalt	Material Recovery Facility-derived 3-Color Mixed Container Glass (Recycling Processing Facility Glass)
Metal	Mixed Metal	Mixed Metal	Scrap Metal
Metal	Aluminum	Beverage Cans	Post-Consumer Aluminum Can Stock
Metal	Scrap Metal	Nonferrous Scrap – Red Metals	Scrap Metal
Metal	Scrap Metal	Scrap Metal	Scrap Metal
Metal	Scrap Metal	Ferrous Scrap	Scrap Metal
Metal	Scrap Metal	Scrap and/or Shredded Aluminum	Scrap Metal
Metal	Scrap Metal	Tin Scrap	Scrap Metal
Metal	Aluminum	Mixed Aluminum	Aluminum, tin, and steel product
Metal	Tin/Steel/Bimetal Containers, Cans, and Foil	Tin/Steel	Steel Can Bundles
Metal	Other Ferrous Scrap	Other Ferrous Metal	Scrap Metal
Metal	Scrap Metal	Mixed Nonferrous Scrap	Scrap Metal
Metal	Nonferrous Scrap	Cooper Scrap	Scrap Metal
Metal	Scrap Metal	Nonferrous Scrap – Other	Scrap Metal
Metal	Other Nonferrous Metals	Other Nonferrous Metal	Scrap Metal
Metal	Tin/Steel/Bimetal Containers, Cans, and Foil	Containers and Lids	Steel Can Bundles
Metal	Metal	Metal	Scrap Metal
Metal	Scrap Metal	Nonferrous Scrap – Nickel/Stainless/Hi Temp	Scrap Metal

RDRS – Material Category	RDRS – Material Subcategory	RDRS – Material Type	Matched Survey Grade/Material Grade
Metal	Scrap Metal	Lead Scrap	Scrap Metal
Metal	Scrap Metal	Zinc Scrap	Scrap Metal
Metal	Aluminum	Foil	Aluminum Foil
Metal	Scrap Metal	Unlisted Precious Metal Scrap	Scrap Metal
Metal	Nonferrous Scrap	Unlisted Nonferrous Metal Scrap	Scrap Metal
Metal	Other Ferrous Scrap	Stainless Steel Scrap	Scrap Metal
Metal	Other Ferrous Scrap	Iron, Steel, and/or other Ferrous Scrap, Excluding Stainless Steel	Scrap Metal
Paper	Layered Paper	Uncoated Corrugated Cardboard	OCC
Paper	Mixed Paper	Bale	Mixed Paper 2 – Lower Grade
Paper	Mixed Paper	Mixed Paper	Mixed Paper 2 – Lower Grade
Paper	Other Miscellaneous Paper	Other Miscellaneous Paper	Mixed Paper 2 – Lower Grade
Paper	Other Miscellaneous Paper	Other	Mixed Paper 2 – Lower Grade
Plastic	Polyethylene terephthalate (PET, #1)	Bottles	PET B
Plastic	Mixed Plastic	Mixed Plastic	Other #3-7
Plastic	Mixed Plastic	Rigids	Other #3-7
Plastic	Low-Density Polyethylene (LDPE, #4)	Mixed LDPE (#4)	Plastic PE Film
Plastic	High-Density Polyethylene (HDPE, #2)	Non-bottle Rigids	Other HDPE Packaging
Plastic	Plastic #7	Other (#7)	Other #3-7

RDRS – Material Category	RDRS – Material Subcategory	RDRS – Material Type	Matched Survey Grade/Material Grade
Plastic	High-Density Polyethylene (HDPE, #2)	Mixed HDPE (#2)	HDPE Colored
Plastic	Polypropylene (PP, #5)	Mixed PP (#5)	PP Rigids
Plastic	#3-7	Bottles and All Other Rigid Plastics	Other #3-7
Plastic	Polyethylene terephthalate (PET, #1)	Mixed PET (#1)	PET B with Thermoforms
Plastic	Polypropylene (PP, #5)	Rigids – All	PP Rigids
Plastic	Mixed Plastic	Film and Sheet – Mixed Retail	Plastic PE Film

WISERTrade data were used for international exports, which tracks the tonnage of seaborne exports as well as exports to Canada and Mexico. RDRS also tracks international exports of material; however, the WISERTrade data are more comprehensive. Both WISERTrade and RDRS data provided information on where exports from California were being shipped to; however, the data only provide the first country or state that takes possession of the material from California. Material could then be shipped to other countries or states, which is not accounted for in this analysis. It is also important to note that WISERTrade may include some material from other states that is shipped out of California ports.

Specifically for plastic, the material categories in the WISERTrade data are organized at a less granular level than both the RDRS data and the survey results. WISERTrade data only has two categories for plastics: plastics #1-2 and mixed plastic (#3-7). To break down the material categories to a similar level as the survey, the contractor used the material category splits of the exports from the more detailed RDRS data and applied them to the WISERTrade data. The contractor could then use its matched RDRS-Survey categories to estimate CMC tonnage. An example of this calculation is shown in Table A-4, where the WISERTrade data provide a total international export figure for “mixed plastic (#3-7)”, while the RDRS data indicates there is #3-7 rigid plastic exported as both PP rigids and other mixed rigid plastics (#3-7) separately. Table A-5 shows the categories to which this calculation example was applied.

Table A-4: WISERTrade Data Decomposition using RDRS Data – Example

CMC End Market Group	WISERTrade Data for Mixed Plastic (#3-7)(tons)	RDRS Data – Split of Exported #3-7 Rigids (%)	Estimated Tonnage – Applying RDRS Splits to WISERTrade Data (tons)
PP Rigids		9%	1,710
Other Mixed Rigid Plastics (#3-7)		91%	17,290
Total #3-7 Rigids	**19,000**	**100%**	**19,000**

Table A-5: Categories to which a WISERTrade Data Calculation was Applied

WISERTrade Data Category	RDRS Categories Which Fall within the WISERTrade Data Categories
Plastic #1-2	PET bottles, PET B With Thermoforms, HDPE Bottles, Other HDPE Packaging
Mixed Plastic (#3-7)	PP Rigids, Other Mixed Rigid Plastics (#3-7)

Composition of Grades and Calculating CMC Tonnage

After all the data for each material grade were standardized and aggregated using survey, RDRS, or WISERTrade data, the contractor applied a composition to the data to calculate the tonnage of CMC end market group within each bale type, again using a tiered data approach. The four survey respondents who provided the composition of their inputs had those compositions applied to them: two glass facilities and two plastic facilities. One glass facility provided the percentage of their input – glass material versus non-glass residue – but no other composition data.

For all survey respondents who did not provide composition data, the contractor used composition data from the SB 343 Report and PRCC. Each material category in the characterization studies was matched or aggregated to one of the following types of study groups: (1) a CMC end market group; (2) a category containing CRV material which is not covered under the Act; or (3) a catchall category for “noncovered material” other than CRV. These matchings are shown in Table A-6 and Table A-7. The contractor assumed that the proportions reported in the characterization studies matched the proportions in material that was sent to end markets. It should be noted that ceramics are not included in this table as they were not included in the SB 343 Report material categories.

These compositions were then multiplied by each respective grade tonnage for material accepted by or sent to end market facilities in California, domestic exports, and international exports.

Table A-6: SB 343 Material Category Mapping to Study Groups (CMC End Market Groups & Noncovered Material)

SB 343 Material Category	Study Groups, including CMC End Market Groups
Other Mixed Paper	Mixed Papers
Uncoated Corrugated Cardboard/ Old Corrugated Containers (OCC)	OCC
Newspapers/ Newspaper Inserts	Mixed Papers
Magazines and Catalogs	Mixed Papers
White Office-Type Paper and Mail	Mixed Papers
Folded Paper Containers and Other Paperboard Packaging	Paperboard
Paper Bags and Kraft Paper	Kraft Paper
Mixed Material Single-Use	Noncovered Material
Remainder/ Composite Mixed Material Multi-Use	Noncovered Material
Uncoated Fiber-Based Food Service Ware	Paperboard
Composite Food Service Paper & Packaging	Kraft Paper
Films - Plastic Bags - Designed for Disposal	Plastic - #7 Other Flexible and Films
Remainder/ Composite Fiber	Small Format - Paper
Fines and Residuals	Noncovered Material
PP Multi-Use	Noncovered Material
Other (rare items <1% each)	Noncovered Material
Glass Beverage Containers - Brown/Amber - CRV	Mixed Glass Bottles and Jars - CRV
Glass Beverage Containers - Brown/Amber - Non-CRV	Mixed Glass Bottles and Jars - Non-CRV
Glass Containers - Clear/ Flint – Non-CRV	Mixed Glass Bottles and Jars - Non-CRV
Remainder/ Composite Glass	Small Format - Glass
PP Pigmented Single-Use Rigids	Plastic #5 - PP Rigid Items

SB 343 Material Category	Study Groups, including CMC End Market Groups
Remainder/ Composite Plastic	Small Format - Plastics
Other (rare items < 1% each)	Noncovered Material
Glass Beverage Containers - Clear/Flint - CRV	Mixed Glass Bottles and Jars - CRV
Glass Containers - Green/ Emerald - Non-CRV	Mixed Glass Bottles and Jars - Non-CRV
Tin/Steel Cans, Lids - Non-CRV	Tin/Steel/Bimetal - Non-CRV
PET Clear Beverage Bottles - CRV	Noncovered Material
Films - Plastic Non-Bags - Other Film	Plastic - #7 Other Flexible and Films
Glass Beverage Containers - Green/Emerald - CRV	Mixed Glass Bottles and Jars - CRV
Green Material, Clean Wood, and Food Scraps	All Other Wood and Organics
Glass Containers - Other Colors – Non-CRV	Mixed Glass Bottles and Jars - Non-CRV
Aluminum Beverage Cans - CRV	Aluminum Beverage Cans - CRV
PS Thermoformed Clamshells and Containers	Plastic #6 - PS Rigid Items
Aluminum Foil (>3 mm), Molded Containers	Other Aluminum
Aluminum Cans and Lids - Non-CRV	Aluminum Containers - Non-CRV
Tin/Steel or Aluminum Aerosol Containers	Tin/Steel/Bimetal - Non-CRV
Aluminum Foil (<3 MM), Sheets	Other Aluminum
Other Nonferrous Metal	Other Nonferrous
Aluminum Bottles - Non-CRV	Aluminum Containers - Non-CRV
Aluminum Bottles for Beverages - CRV	Aluminum Beverage Cans - CRV
Other Ferrous Metal	Other Ferrous
Remainder/ Composite Metal	Small Format - Metal
Tin/Steel Paint Cans	Tin/Steel/Bimetal - Non-CRV
Household Hazardous Waste	Noncovered Material
PS Expanded - Packaging	Plastic #6 - PS Rigid Items

SB 343 Material Category	Study Groups, including CMC End Market Groups
HDPE Pigmented Single-Use Rigids	Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV
HDPE Clear Beverage Bottles – Non-CRV	Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV
HDPE Buckets: Non-Food	Plastic #2 - HDPE Pails and Buckets
PP Clear Single-Use Rigids	Plastic #5 - PP Rigid Items
Other HDPE Clear Single-Use Rigids	Plastic #2 - Other HDPE Rigid
HDPE Clear Beverage Bottles - CRV	Noncovered Material
Other HDPE Multi-Use Rigids	Plastic #2 - Other HDPE Rigid
Mixed Plastic Multi-Use	Noncovered Material
HDPE Buckets: Food	Plastic #2 - Other HDPE Rigid
Unknown Plastic Type or Mixture of Multiple Plastic Resins (Single-Use)	Small Format – Plastics
PET Clear Bottles - Non-CRV	Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV
Other PET Clear Single-Use Rigids	Plastic #1 - Other PET Rigid
PET Thermoformed Clamshells and Containers	Plastic #1 - Other PET Rigid
PET Pigmented Beverage Bottles - CRV	Noncovered Material
PET Pigmented Bottles – Non-CRV	Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV
Other (7) Single-Use Rigids	Plastic #7 - Other Rigid Plastics
Films - Plastic Non-Bags - Agricultural and Commercial	Plastic #4 - Mono LDPE Flexibles and Films
Gable-top Cartons - Non-CRV	Aseptic Cartons
Aseptic Containers - Non-CRV	Gable-Top Cartons
White Office-Type Paper and Mail	Other Lined Paper
Other PET Pigmented Single-Use Rigids	Plastic #1 - Other PET Rigid
PS Densified: Single-Use Food Service Ware	Plastic #6 - Other PS
Tin/Steel Aerosol Containers	Tin/Steel/Bimetal - Non-CRV
Tin/Steel Beverage Containers - CRV	Noncovered Material
Textiles and Clothing	Noncovered Material
Uncoated Soiled Fiber Products	Mixed Papers

SB 343 Material Category	Study Groups, including CMC End Market Groups
HDPE Clear Beverage Bottles - Non-CRV	Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV
PS Expanded - Food Service Ware	Plastic #6 - EPS Rigid Items
Metal Hazardous Waste: Used Oil Filters, Gas Cylinders	Noncovered Material
Other Multi Material Laminate Single-Use	Multi-Material Laminate
Films - Plastic Bags - Designed for Reuse	Noncovered Material
Treated Wood	Wood – Treated
PET Multi Use Rigids	Noncovered Material
Clean Molded Paper Fiber	Molded Pulp
LDPE Pigmented Single-Use Rigids	Plastic #4 - LDPE Bottles and Jugs
LDPE Clear Single-Use Rigids	Plastic #4 - Other LDPE Rigid
Mailing Pouches & Shipping Envelopes	Noncovered Material
PVC Multi-Use	Noncovered Material
PS Densified: Multi-Use	Noncovered Material
Plastic Wine Bladders	Noncovered Material
Plant Material Food Service Ware	All Other Wood and Organics
Films - Plastic Bags - Compostable	Plastics and Polymers Designed for Compostability - Flexibles and Films
PVC Single-Use Rigids	Plastic #3 - PVC Rigid
Gable-top Cartons/ Aseptics - CRV	Noncovered Material
LDPE Multi-Use	Noncovered Material
Bulky Items	Noncovered Material
LDPE Clear Beverage Bottles	Plastic #4 - LDPE Bottles and Jugs

Table A-7: PET Recycling Corporation of California Material Category Mapping to Study Groups (CMC End Market Groups & Noncovered Material)

PET Recycling Corporation of California Material Category	Study Group, including CMC End Market Groups
Small Format - Metal	Small Format - Metal
PET Clear Beverage Bottles - CRV	Noncovered Material
PET Pigmented Beverage Bottles - CRV	Noncovered Material
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV
Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV	Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV
Plastic #1 - Other PET Rigid	Plastic #1 - Other PET Rigid
Small Format - Plastics	Small Format - Plastics

Recovered Material Output Calculation

Recovered material outputs from end market facilities were calculated by multiplying the total tonnage of each CMC end market group entering end market facilities, excluding tons identified as contamination, by CMC conversion rates. CMC conversion rates estimated through data provided by survey respondents were used where possible and for CMC end market groups where no conversion rates were provided, rates were gathered through secondary research. This was the case for aluminum and steel CMC end market groups, however; survey responses were used for all other CMC end market groups. CMC conversion rates calculated for California end markets were applied to domestic and international end markets.

The approach outlined is shown in Figure A-1 and Figure A-2.

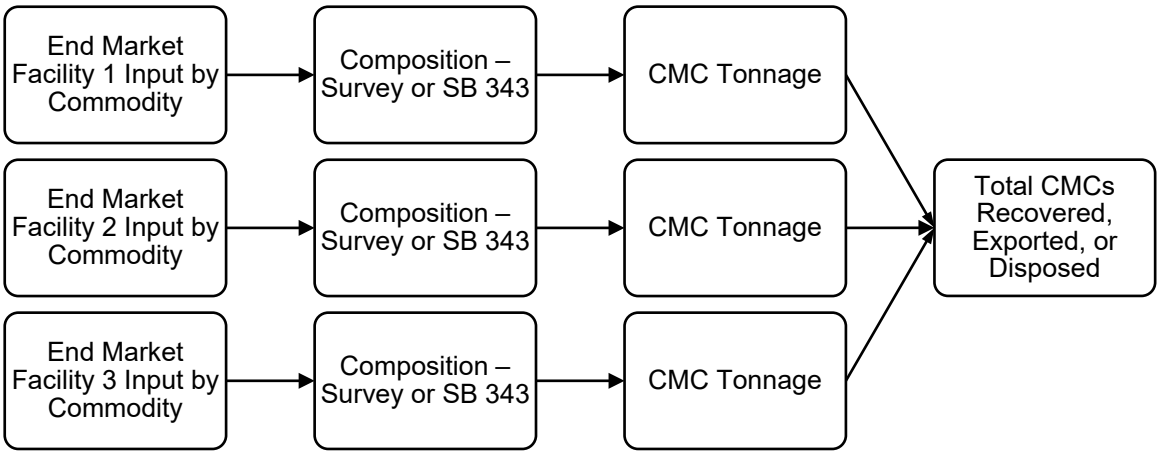

Figure A-1: CMC Tonnage Calculation for Survey Respondents

Figure A-2: CMC Tonnage Calculation for RDRS Data

Table A-8 shows the extent to which each data source was relied upon for the calculation of tons accepted by end markets in California. The contractor aggregated all of the tons accepted by end market facilities in California to estimate the total tonnage of material entering California end markets in 2024. Table A-8 shows the percentage of each total quantity of material accepted by end markets that was estimated from survey results, RDRS data, or secondary sources. The table shows that in total, 84% of the estimated tons of material grades accepted by end markets in California was sourced from the survey data, while 14% came from RDRS data, and 2% was estimated from secondary data. The table includes material entering end markets in California only; it excludes metal materials, as the contractor did not find identify any metal end market facilities in California.

Table A-8: Contribution of CMC Tonnage by Data Source for CMCs Accepted by End Markets in California

Data Source	Plastic	Glass	Paper	Total
Percent of CMC Tonnage Data that is from Survey Results	51%	100%	100%	**84%**
Percent of CMC Tonnage Data that is from RDRS Data	43%	0%	0%	**14%**
Percent of CMC Tonnage Data that is from Secondary Sources	6%	0%	0%	**2%**
Totals	**100%**	**100%**	**100%**	**100%**

Additional Challenges and Limitations

Additional challenges and limitations for different material classes and the steps taken to resolve these challenges are described in this section.

Overall

- There is no single source of all California end markets or end markets accepting covered material, so multiple sources were used to develop a thorough list of domestic end markets.
- WISERTrade data only includes the tonnage of material exported from California but does not consider if the material originated in California or was sent from other states. Additionally, the data does not confirm that the material was received by an international end market but indicates the country of import.

- Due to the short timeline of the project, there was a limited response period for survey respondents. The contractor provided a letter from CalRecycle to encourage participation in the survey but there was no requirement to participate.
- Material reporting by processors and recycling facilities in the RDRS has limited applicability due to several considerations, including misalignment of reportable materials compared to CMCs, lack of inflow reporting on recyclable materials, and the lack of reporting on the specific end markets material is sent to.
- Survey respondents could not provide detailed data by CMC end market group; therefore, the contractor needed to design a methodology for converting the data provided to required report outputs. Survey data were provided by material grade and then converted to CMC end market groups based on material characterization studies.

Glass

Outside of the overall challenges, end markets' ability to differentiate between different covered materials received at their facilities presented a challenge in developing results related to glass. As glass material that end markets receive is broken into fragments, survey respondents were unable to identify which covered material group the material they received belonged to. As a result, all glass covered material groups were grouped together for this report.

Ceramics

Ceramic quantities presented challenges as available composition data which included ceramic quantities was not split by covered and noncovered ceramic material categories. There was limited secondary research available on this and also limited secondary research available on ceramic material recycling in general.

Metals

Outside of the overall challenges, both aluminum and steel presented challenges in developing results related to Metal. Data used to calculate metal quantities were based on RDRS and WISERTrade data and composition data used on these quantities showed low quantities of covered metal materials. However, due to the coarseness of material type information in RDRS, there were challenges in identifying RDRS materials that counted as covered material. There is also limited secondary research available on covered metal material exports from California.

Paper and Fiber

Outside of overall challenges, paper and fiber presented challenges related to data. RDRS data cannot easily be matched with grades of exported paper and fiber. Categories of Mixed Paper and OCC were identified, but it is unclear whether grades such as Aseptic Cartons were exported but included in categories such as Mixed Paper or not exported at all.

Secondly, there are significant limitations in using WISERTrade for export statistics. This is because the tonnages reflect point of exit shipments for seaborne exports, which

will include any tonnage shipped from other states for onward transport from California ports and therefore is likely an overestimate.

Furthermore, of the three identified paper and fiber end markets, only two responded to the survey. Another end market facility that recycles cartons in California was identified. However, it was not operational during the course of this study.

Plastic

Outside of the overall challenges, PE film presented the largest challenge in developing results related to Plastic. The contractor only received one full response from a PE film end market and one short email response. Neither of these responses provided significant detail on the composition of the material they collect or the source of material as they noted most of the materials come from brokers. There is also limited secondary research available on PE recycling processing facility film composition, Therefore, detailed composition estimates for PE film could not be provided similar to other material grades.

Wood and Other Organic Material

Outside of the overall challenges, wood and other organic materials presented challenges in data availability for both primary and secondary data. In particular, the contractor outreach to individual potential wood end markets yielded no responses and outreach through industry associations yielded only two partial survey responses.[*] While the contractor reported the data received from the two partial survey responses and domestic exports data from RDRS, there are limitations to this data, and the absence of international export data further compounds the issue of data availability. Furthermore, it is likely that a relatively high proportion of wood packaging material (e.g., pallets and crates) are reused. Due to the high degree of informality of the reuse and subsequent recovery processes, it is not possible within the scope of this study to determine whether these items should be treated as covered materials. Therefore, for the purposes of this report, the criteria for whether wood packaging is considered single-use or reusable are not considered and the estimate for wood packaging entering the recycling stream as CMCs includes wood packaging broadly.

Community-Based Organizations and Tribal Community Selection and Survey Methodology

The contractor administered a survey of interested parties representing priority populations (CBOs, EJ groups, and Tribes) to collect data on community recycling and composting practices, such as levels of access, materials collected, and infrastructure capacity. This survey, known as the Community Recycling and Composting Survey, was developed for CBOs, EJ groups, and Tribes and contained questions surrounding community perspectives of past, current, and future recycling collection services and

[*] In total, four survey responses were received from wood end markets; however, two of these respondents were screened out because they indicated that they did not meet the definition of a wood end market.

processing infrastructure. This information is intended to fill knowledge gaps to support current and needed state reports.

The survey was distributed to selected participants, who were each also asked to participate in a virtual introduction meeting and listening sessions. Participants included individuals representing the CBOs, EJ groups, and Tribes, as well as interested individuals among those communities. Selected CBOs, EJ groups, and Tribes were located throughout California; the selection process is provided in the following section.

CBO and Tribe Selection

The contractor selected CBOs and EJ groups to engage with from each region of California based on information about overall population, population density, access to education information for recycling, availability of recycling options, and the interested parties' focus on environmental or waste issues. All groups were obtained from the 2020 California Census Statewide Partners list and the use of CalEnviroScreen 4.0 data. The contractor contacted a total of 43 CBOs and EJ groups to participate in the study. A total of 324 surveys were received from CBOs and EJ groups and, and 14 CBOs and EJ groups participated in introductory meetings and listening sessions.

The contractor selected Tribes for participation in the study with assistance from CalRecycle based on several factors, including Tribal demographics, proximity to major urban centers, the presence of an internal Tribal environmental program, and demonstrated efforts to promote recycling within Tribal operations. The goal of identifying Tribes for participation with assistance from CalRecycle was to ensure diverse geographic and cultural representation, as well as inclusion of Tribes with varying levels of existing engagement in recycling and environmental sustainability programs. The contractor attempted to identify a primary contact person within each Tribe who could complete the survey and participate in project-related engagement activities. If the team could not identify a contact person, assistance was provided by CalRecycle.

The contractor's Tribal liaison identified 20 Tribes to contact for their expertise related to the study in collaboration with CalRecycle.[†] These Tribes were contacted through a combination of emails and phone calls to encourage participation, answer questions, and provide additional information about the study's purpose and expected outcomes. Three Tribes participated in engagement activities, resulting in eight completed surveys and participation from six individuals from all three Tribes at various introductory meetings and listening sessions.

[†] CalRecycle acknowledges that the land of the state of California has been inhabited since time immemorial and recognizes California Native American tribes as the original stewards of California, whose leadership and partnership can guide us toward a waste-free future.

Survey Development

The Community Recycling and Composting Survey was developed to gather information and expertise from CBOs representing priority populations, EJ groups, and Tribes. In addition to being available in English, the Community Recycling and Composting Survey was translated into Spanish and simplified Chinese. Tribes received an adapted version of the Community Recycling and Composting Survey with three questions removed and a modification to the introduction, all noted in Appendix F of the Current State of Processing Report. The survey included questions about barriers to access recycling and composting systems, the environmental and community impacts of those systems, and related education and outreach materials respondents may have received in the past.

Table A-9. Community Recycling and Composting Survey Metrics

Survey	Total Number of Surveys Completed	Number of Surveys Completed in Spanish	Number of Surveys Completed in Chinese	Regions Represented
CBO Survey	324	0	0	Valley (87) Coastal (46) Southern (108) Mountain (80) Bay Area (3)
Tribal Communities Survey[1]	8	N/A	N/A	Mountain (5) Southern (3)

[1] The tribal survey was not translated into any other language(s)

Engagement Meetings

The contractor conducted four introductory meetings and ten listening sessions to provide an overview of the Act, explain why CBO, EJ group, and Tribal involvement matters, present a call to action, identify barriers to participation, discuss community and environmental impacts, and respond to questions. Listening sessions were designed to provide a forum to hear directly from these community members on their experiences and provide more narrative discussion of information captured in the survey. Each CBO, EJ group, and Tribe who attended the introductory meeting were encouraged to attend the listening sessions. Feedback from these listening sessions, as appropriate, is in the Current State of Processing Report, as well as in Appendix G of this report.

CBO and Tribal Participation

The participation rates for the CBOs, EJ groups, and Tribal virtual introductory meetings and listening sessions as well as a discussion on which communities were not well represented in this study can be found in the Current State of Processing Report,

Appendix G. Participation information includes the CBO and Tribe name and area of representation to provide an understanding of the overall response area.

CBO, EJ Groups and Tribal Engagement Limitations

Data Collection Limitations

- Timeline of Survey Data Collection: The community recycling and composting survey had a brief turnaround time, which may have hindered community members from participating or submitting complete surveys.
- Meetings Required Before Survey Distribution: The survey was finalized in late June; however, introductory meetings had to be held prior to distributing the survey. Most CBOs, EJ groups, and Tribes require at least one month to schedule a meeting and two months to engage with their community. With the tight time frame, the turnaround time required of the CBOs, EJ groups, and Tribes was shorter than optimal.
- Barriers to Access Online Engagement Activities: Many of the CBOs and EJ groups who participated in the study had members of their communities who were hard to reach via phone or email. While partnering with CBOs and EJ groups allowed the project the opportunity to connect with those individuals, there was still a significant barrier in collecting data from individuals with no stable primary residence or reliable access to a computer or internet.

Analysis Limitations

- GIS Mapping: Availability of priority population data were limited and in some instances surrogate data were required.
    - GIS information for rural areas as defined in 50101 of the Health and Safety Code was unavailable. As such, census data were used to identify communities with a population less than 10,000. The definition under section 50101 includes communities with a "population not exceeding 20,000 and is contained within a nonmetropolitan area;" these data were not readily available. Sensitivity analysis showed that using a definition of 10,000 or 20,000 population had insignificant impacts on maps or findings.
    - GIS shapefiles and spatial data for Tribes located in California who are on the contact list maintained by the Native American Heritage Commission was unavailable. Analysis was conducted using federally recognized Tribes.
- Facilitated Questions: The listening sessions did not ask direct questions regarding environmental or health impacts on end market facilities. The contractor relied on answers from the survey.

Appendix B: Plastic

Plastic end markets identified are summarized in Table B-1. Two additional end market facilities were included in a preliminary list of end market facilities; these are not included here as, during the survey outreach, they identified themselves as brokers and therefore were excluded from further analysis. This is not an exhaustive list of end market facilities, as there are others outside the U.S. which manage covered material, but the contractor was unable to verify the exact locations or number of facilities that take California material.

Table B-1: End market facilities that Manage Plastic Covered Material

Primary Material Managed	End market facilities Identified in CA	End market facilities Identified Outside CA But in U.S.
PET	6	1
HDPE and PP	4	1
PE Film	3	2
Total	**13**	**4**

Table B-2 summarizes the response rates from plastic end market facilities. Of the 17 end market facilities identified, the contractor received data from eight. This was supplemented with data gathered through interviews with three end market facilities, and secondary research.

Table B-2: Plastic End Market Survey Responses

Primary Material Managed	Full Survey Response	Partial Survey Response	Short Email Response	Declined to Participate	No Response
PET	2	0	1	2	2
HDPE and PP	2	1	0	0	2
PE Film	1	0	1	1	2
Total	**5**	**1**	**2**	**3**	**6**

As described in the methods section, a model was developed to estimate the weight of material recycled. For each plant, the model estimated the feedstock to each end market facility and the recovered material outputs. The source of model inputs for plastic is summarized in Table B-3. Of the 17 plastic end market facilities, 15 were operational in 2024. For the 15 end market facilities that were operational in 2024, seven provided input and output data in the surveys, six were identified in RDRS data,

and two end market facilities' input and output tonnages were estimated through secondary research. Export data from WISERTrade were also used to understand international exports.

Table B-3: Source of Model Inputs and Recycled Material Outputs of Plants

Primary Material Managed	Survey Data	RDRS Data	Secondary Research Data	Not Operational in 2024
PET	3	4	0	0
HDPE and PP	2	0	1	2
PE Film	2	2	1	0
Total	**7**	**6**	**2**	**2**

The following tables provide more detail on the composition of different plastic material grades.

PET Grade A

Table B-4 shows the composition of PET Grade A. Since PET Grade A is sourced from recycling centers that manage CRV material, this grade is predominantly beverage containers which are not covered under the Act. Some missorted non-beverage PET bottles end up in Grade A, and overall Grade A PET contains approximately 2% covered materials. The non-beverage PET bottles are recycled with beverage containers as they have many of the same recycling properties, while the other materials (such as small plastics) are either sorted and sent to other end markets for recycling or disposed of. At least one HDPE and PP end market responded that they accept caps that are sorted at PET plants as inputs.

Table B-4: Estimated Composition of PET Grade A Accepted by or Sent to PET End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of Grade A	Acceptability
Plastic #1 - PET Clear Beverage Bottles - CRV	180,900	92.15%	Target
Plastic #1 - PET Pigmented Beverage Bottles - CRV	6,090	3.10%	Target
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	3,100	1.58%	Target
Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV	240	<1%	Target
Other Contaminants (noncovered material)	5,970	3.04%	Nontarget
Total	**196,300**	**100.00%**	
Total Target Material	**190,330**	**96.96%**	
Total CMC Target Material	**3,340**	**1.70%**	

Table B-5 shows the composition of PET Grade B. Grade B material is primarily handled by recycling processing facility systems. About 60% of it comprises CRV beverage containers, which are not covered under the Act. Thirty three percent (33%) of Grade B comprises covered material – mainly non-beverage PET bottles. CRV beverage containers have similar recycling properties to non-beverage PET bottles, and they are often recycled together. Inclusions of small format plastics and contaminants, such as caps, make up about 3% of Grade B; these are sent to disposal.

Table B-5: Estimated Composition of PET Grade B Accepted by or Sent to PET End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Mixed Papers	390	<1%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	24,870	57.30%	Target
Plastic #1 - PET Pigmented Beverage Bottles - CRV	1,170	2.70%	Target
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	9,180	21.15%	Target
Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV	390	<1%	Target
Plastic #1 - Other PET Rigid	4,810	11.08%	Target
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	130	<1%	Nontarget
Plastic #2 - Other HDPE Rigid	130	<1%	Nontarget
Plastic #5 - PP Rigid Items	650	1.50%	Nontarget
Plastic #6 - PS Rigid Items	130	<1%	Nontarget
Plastic #7 - Other Flexible and Films	130	<1%	Nontarget
Small Format - Plastics	780	1.80%	Nontarget
All Other Wood and Organics	130	<1%	Nontarget
Other Contaminants (noncovered material)	510	1.18%	Nontarget
Total	**43,400**	**100.00%**	
Total Target Material	**40,420**	**93.13%**	
Total CMC Target Material	**14,380**	**33.13%**	

Table B-6 shows the composition of PET Grade B with Thermoforms. This grade comprises 52% PET CRV beverage containers. PET Grade B with Thermoforms contain approximately 21% Plastic #1 – Other PET Rigid, which are mostly PET Thermoforms. The Plastic Recycling Corporation of California states that PET Grade B with Thermoforms must include no more than 30% thermoforms. Exceeding this percentage means it should be reclassified under a different material grade.

Table B-6: Estimated Composition of PET Grade B with Thermoforms Accepted by or Sent to PET End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Plastic #1 - PET Clear Beverage Bottles - CRV	12,810	45.27%	Target
Plastic #1 - PET Pigmented Beverage Bottles - CRV	910	3.22%	Target
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	5,210	18.41%	Target
Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV	1550	5.48%	Target
Plastic #1 - Other PET Rigid	5,790	20.46%	Target
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	230	<1%	Nontarget
Plastic #5 - PP Rigid Items	230	<1%	Nontarget
Small Format - Plastics	1,130	3.99%	Target
Other Contaminants (noncovered material)	440	1.55%	Nontarget
Total	**28,300**	**100.00%**	
Total Target Material	**27,400**	**96.82%**	
Total CMC Target Material	**13,680**	**48.34%**	

Table B-7 shows the composition of PET Thermoform Only grade. The Thermoform Only grade contains 90% plastic #1 – other PET rigid and small amounts of other small format plastics.

Table B-7: Estimated Composition of PET Thermoforms Accepted by or Sent to PET End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Plastic #1 - Other PET Rigid	990	90.0%	Target
Plastic #5 – PP Rigid Items	10	<1%	Nontarget
Small Format - Plastics	90	8.18%	Target
Other Contaminants (noncovered material)	10	<1%	Nontarget
Total	**1,100**	**100.00%**	
Total Target Material	**1,080**	**98.18%**	
Total CMC Target Material	**1,080**	**98.18%**	

Table B-8 shows the composition of the HDPE Natural grade. The two largest categories of material in the HDPE natural grade are CRV HDPE beverage bottles (42%), which are not covered by the Act, and HDPE bottles that are covered by the Act (46%). A large proportion of HDPE bottles covered by the Act are milk jugs, which are beverages but exempt from the CRV. Although approximately 88% of this grade is considered target material, only 46% is both a target material and covered by the Act.

Table B-8: Estimated Composition of HDPE Natural Accepted by or Sent to HDPE and PP End Markets in CA, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Aluminum Beverage Cans - CRV	130	<1%	Nontarget
Other Nonferrous Metals	10	<1%	Nontarget
Kraft Paper	30	<1%	Nontarget
Aseptic Cartons	20	<1%	Nontarget
Paperboard	10	<1%	Nontarget
OCC	30	<1%	Nontarget
Mixed Papers	30	<1%	Nontarget
Small Format – Paper	10	<1%	Nontarget

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Plastic #1 - PET Clear Beverage Bottles - CRV	280	1.79%	Nontarget
Plastic #1 – PET Clear Bottles, Jugs, Jars – Non -RV	40	<1%	Nontarget
Plastic #1 – PET Pigmented Bottles, Jugs, Jars – Non-CRV	30	<1%	Nontarget
Plastic #2 - HDPE Clear Beverage Bottles - CRV	6,640	42.22%	Target
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	7,160	45.60%	Target
Plastic #2 - Other HDPE Rigid	440	2.80%	Nontarget
Plastic #2 – HDPE Flexibles and Films	30	<1%	Nontarget
Plastic #4 – LDPE Bottles and Jugs	30	<1%	Nontarget
Plastic #5 - PP Rigid Items	80	<1%	Nontarget
Plastic #7 – Other Flexible and Films	10	<1%	Nontarget
Small Format – Plastics	10	<1%	Target
All Other Wood and Organics	50	<1%	Nontarget
Other Contaminants (noncovered material)	630	4.02%	Nontarget
Total	**15,700**	**100.00%**	
Total Target Material	**13,810**	**87.96%**	
Total CMC Target Material	**7,170**	**45.67%**	

Table B-9 shows the composition of the HDPE Colored grade. The largest category of HDPE Colored grade material is covered HDPE bottles. (80%). Most HDPE beverage containers are not colored (juice jugs, for example), so unlike HDPE Natural grade material, bottles covered by the BCRP only make up a small amount of the HDPE Colored grade (<1%). Approximately 82% of this grade is considered target material and 81% is both a target material and covered by the Act.

Table B-9: Estimated Composition of HDPE Colored Accepted by or Sent to HDPE and PP End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Aluminum Beverage Cans - CRV	50	<1%	Nontarget
Tin/Steel/Bimetal – Non-CRV	30	<1%	Nontarget
Aseptic Cartons	30	<1%	Nontarget
Gable-Top Cartons	30	<1%	Nontarget
Kraft Paper	30	<1%	Nontarget
Paperboard	50	<1%	Nontarget
OCC	50	<1%	Nontarget
Mixed Papers	80	<1%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	130	<1%	Nontarget
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	50	<1%	Nontarget
Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV	210	<1%	Nontarget
Plastic #1 - Other PET Rigid	270	<1%	Nontarget
Plastic #2 - HDPE Clear Beverage Bottles - CRV	170	<1%	Target
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	25,790	78.87%	Target
Plastic #2 – HDPE Pails and Buckets	30	<1%	Nontarget
Plastic #2 - Other HDPE Rigid	3,760	11.50%	Nontarget
Plastic #4 – LDPE Bottles and Jugs	30	<1%	Nontarget
Plastic #4 - Other LDPE Rigid	50	<1%	Nontarget
Plastic #5 - PP Rigid Items	300	<1%	Nontarget
Plastic #6 – PS Rigid Items	30	<1%	Nontarget
Plastic #7 - Other Rigid Plastics	110	<1%	Nontarget
Small Format - Plastics	240	<1%	Target
Plastic #7 - Other Flexible and Films	110	<1%	Nontarget
All Other Wood and Organics	80	<1%	Nontarget
Other contaminants (noncovered material)	990	3.04%	Nontarget
Total	**32,700**	**100.00%**	
Total Target Material	**26,200**	**80.12%**	
Total CMC Target Material	**26,030**	**79.60%**	

Table B-10 shows the composition of the HDPE Other Rigid grade. HDPE Other Rigid packaging also contains HDPE bottles (90%).

Table B-10: Estimated Composition of HDPE Other Rigid Accepted by or Sent to HDPE and PP End Markets in California, Domestically, and Internationally

CMC	Tons per year	% of grade	Acceptability
Aluminum Beverage Cans - CRV	90	<1%	Nontarget
Tin/Steel/Bimetal - Non-CRV	10	<1%	Nontarget
Kraft Paper	10	<1%	Nontarget
Aseptic Cartons	10	<1%	Nontarget
Gable-Top Cartons	10	<1%	Nontarget
Paperboard	20	<1%	Nontarget
OCC	20	<1%	Nontarget
Mixed Papers	40	<1%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	10	<1%	Nontarget
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	20	<1%	Nontarget
Plastic #1 - Other PET Rigid	150	1.53%	Nontarget
Plastic #2 – HDPE Clear Beverage Bottles - CRV	10	<1%	Nontarget
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	8,780	89.59%	Target
Plastic #4 – Other LDPE Rigid	10	<1%	Nontarget
Plastic #5 - PP Rigid Items	230	2.35%	Nontarget
Plastic #7 – Other Flexibles and Films	40	<1%	Nontarget
Small Format – Plastics	10	<1%	Target
All Other Wood and Organics	40	<1%	Nontarget
Plastic #2 - HDPE Pails and Buckets	190	1.94%	Target
Other Contaminants (noncovered material)	100	1.02%	Nontarget
Total	**9,800**	**100.00%**	
Total Target Material	**8,970**	**91.53%**	
Total CMC Target Material	**8,970**	**91.53%**	

Table B-11 shows the composition of the PP Rigid grade. The PP Rigid grade contains approximately 51% PP rigid items. Other plastics mixed in with this grade include PET and HDPE, which make up a few percent each. More than 40% of the PP Rigid grade is either contamination, such as moisture and dirt, or nontarget material such as paper or other plastics, all of which is disposed of.

Table B-11: Estimated Composition of PP Rigid Accepted by or Sent to HDPE and PP End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Kraft Paper	80	1.78%	Nontarget
OCC	80	1.78%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	260	5.78%	Nontarget
Plastic #1 - Other PET Rigid	80	1.78%	Nontarget
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	80	1.78%	Target
Plastic #2 - Other HDPE Rigid	80	1.78%	Target
Plastic #5 - PP Rigid Items	2,110	46.89%	Target
Plastic #7 - Other Rigid Plastics	150	3.33%	Nontarget
Small Format - Plastics	240	5.33%	Target
Multi-Use Containers (noncovered material)	790	17.56%	Nontarget
Other Contaminants (noncovered material)	550	12.22%	Nontarget
Total	**4,500**	**100.00%**	
Total Target Material	**2,510**	**55.78%**	
Total CMC Target Material	**2,510**	**55.78%**	

Table B-12 shows the composition of the Plastic #3-7 grade. Plastics #3-7 comprise many different material types. PP rigid items make up the largest share of the grade at 61%, with the next largest share being nonpackaging contamination at 9%. The remaining material includes other packaging materials of different material types. Only a small share of this material is sent to end markets in California; the data show that nearly all this material is exported to end markets overseas. This makes evaluating what in this grade is target and nontarget material more challenging. Since PP makes up the largest share of the grade, this analysis assumes that PP is the targeted material.

Table B-12: Estimated Composition of Plastic #3-7 Accepted by or Sent to HDPE and PP End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
All CMC Glass	30	<1%	Nontarget
Aluminum Beverage Cans - CRV	230	<1%	Nontarget
Other Aluminum	90	<1%	Nontarget
Aluminum Containers – Non-CRV	50	<1%	Nontarget
Tin/Steel/Bimetal - Non-CRV	130	<1%	Nontarget
Other Ferrous	80	<1%	Nontarget
Kraft Paper	250	1.03%	Nontarget
Aseptic Cartons	180	<1%	Nontarget
Gable-Top Cartons	80	<1%	Nontarget
Paperboard	270	1.11%	Nontarget
OCC	110	<1%	Nontarget
Mixed Papers	740	3.05%	Nontarget
Small Format - Paper	120	<1%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	280	1.15%	Nontarget
Plastic #1 – PET Pigmented Beverage Bottles – CRV	20	<1%	Nontarget
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	170	<1%	Nontarget
Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV	80	<1%	Nontarget
Plastic #1 - Other PET Rigid	830	3.42%	Nontarget
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	630	2.59%	Nontarget
Plastic #2 - Other HDPE Rigid	900	3.70%	Nontarget
Plastic #3 – PVC Rigid	10	<1%	Nontarget
Plastic #4 – LDPE Bottles and Jugs	30	<1%	Nontarget
Plastic #4 - Other LDPE Rigid	100	<1%	Nontarget
Plastic #5 - PP Rigid Items	14,900	61.32%	Target
Plastic #6 - Other PS	70	<1%	Nontarget
Plastic #6 - PS Rigid Items	340	1.40%	Nontarget
Plastic #6 – EPS Rigid Items	40	<1%	Nontarget

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Plastic #7 - Other Rigid Plastics	430	1.77%	Nontarget
Plastic #7 - Other Flexible and Films	450	1.85%	Nontarget
Small Format - Plastics	300	1.23%	Nontarget
All Other Wood and Organics	320	1.32%	Nontarget
Other Contaminants (noncovered material)	2,040	8.40%	Nontarget
Total	**24,300**	**100.00%**	
Total Target Material	**14,900**	**61.32%**	
Total CMC Target Material	**14,900**	**61.32%**	

Table B-13 shows the annual exports of plastics to international end markets based on WISERTrade data.

Table B-13: Annual International Plastic Exports from California 2014-2024 (tons)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Mexico (PET)	129	236	719	801	1,302	3,595	11,400	26,006	32,115	23,242	35,725
Mexico (HDPE)	1,545	1,087	682	1,043	2,325	2,494	3,669	5,530	5,647	3,868	5,637
Vietnam (PET and HDPE)	12,212	10,902	9,022	31,732	18,193	6,548	14,737	7,956	2,589	5,378	9,269
Malaysia (PET and HDPE)	9,944	9,839	11,252	25,766	38,614	9,565	30,875	25,512	8,285	8,020	6,833
El Salvador (PET and HDPE)	1,837	3,297	2,716	3,188	4,916	5,728	5,822	12,370	8,715	4,057	2,821
Honduras (PET and HDPE)	0	0	0	114	565	44	151	3,338	262	132	887
Taiwan (PET and HDPE)	13,213	22,496	16,526	19,634	22,235	20,278	11,735	6,949	1,710	782	705
Thailand (PET and HDPE)	4,177	581	718	6,704	27,227	6,547	4,449	1,362	415	235	556
Belgium (PET and HDPE)	17	0	37	0	125	235	0	0	0	0	441
India (PET and HDPE)	1,490	795	539	2,064	4,139	3,303	497	1,425	399	430	406
Guatemala (PET and HDPE)	0	22	66	14	36	22	0	66	198	22	199
Indonesia (PET and HDPE)	21,275	14,461	10,903	10,322	9,854	6,456	5,175	5,445	1,992	0	184
Netherlands (PET and HDPE)	0	0	0	230	326	0	59	23	185	17	151

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
China (PET and HDPE)	409,255	276,359	251,676	182,253	17,529	10,953	1,611	102	23	190	93
Mexico (3-7)	6,063	3,804	12,289	24,519	25,913	20,392	19,574	11,799	10,601	16,164	15,541
Malaysia (3-7)	13,773	15,181	11,283	40,501	82,254	18,543	23,094	9,424	2,054	1,360	1,174
Canada (3-7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,589	1,781	2,026
Honduras (3-7)	575	95	0	22	357	0	933	17	0	0	769
Taiwan (3-7)	10,066	19,276	7,419	6,540	7,861	4,451	4,610	1,349	468	608	409
Vietnam (3-7)	8,656	7,456	16,830	31,973	19,319	5,676	6,456	487	145	127	260
Germany (3-7)	13	0	0	0	110	312	332	990	2,000	46	258
Netherlands (3-7)	0	0	0	0	0	0	142	37	747	211	243
Indonesia (3-7)	36,102	18,270	11,594	9,323	3,539	1,144	1,443	151	0	0	188
Israel (3-7)	37	0	0	0	0	0	0	0	0	0	162
Belgium (3-7)	0	0	182	390	109	275	0	0	0	198	144
India (3-7)	135	795	396	923	1,248	820	289	884	60	153	128
Thailand (3-7)	6,518	3,823	2,354	10,035	29,405	2,959	384	307	219	57	66

Appendix C: Paper and Fiber

As specified in Section 4.2 in the main body of this report, with input from the American Forest & Paper Association (AF&PA), the list of paper and fiber end markets was reviewed and finalized to three paper and fiber end market facilities. The table summarizes the responses received from two confirmed end markets facilities, as the other confirmed end market facility declined to participate.

Table C-1: Paper and Fiber End Market Survey Responses

Primary Material Managed	Full Survey Response	Partial Survey Response	Short Email Response	Declined to Participate	No Response
Mixed Paper and OCC	2	0	0	0	0
OCC*	0	0	0	1	0
Total	**2**	**0**	**0**	**1**	**0**

*It is unclear if other materials (e.g., paperboard) were also managed as a primary material by the paper and fiber end market facility that declined to participate.

As described in the Model Development section of Appendix A, a model was developed to estimate the weight of recovered material. For each end market facility, the model estimated the feedstock entering each end market facility and the recovered material outputs. These feedstock and output amounts were estimated based on survey responses, RDRS data, and secondary research. The source of model inputs for paper and fiber is summarized in the table.

Table C-2: Source of Model Inputs and Recycled Material Outputs of Plants

Primary Material Managed	Survey Data	Survey and RDRS Data	RDRS Data Only
Mixed Paper and OCC	2	0	0
OCC*	0	0	1
Total	**2**	**0**	**1**

* It is unclear if other materials (e.g., paperboard) were also managed as a primary material by the paper and fiber end market facility that declined to participate.

Table C-3 provides additional information on the composition of OCC grades from California entering domestic and international end markets. Overall, the OCC grade is predominantly (over 90%) OCC and contains a smaller proportion of kraft paper, paperboard, and mixed papers, which altogether make up less than 6% of the grade.

This composition is based off SB 343 Report material compositions data, and the composition of domestic and international exports of OCC is assumed to be the same as OCC accepted by end markets in California.

Table C-3: Estimated Composition of OCC grades Accepted by or Sent to End Markets in California, Domestic Exports, and International Exports

CMC End Market Group	Tons per year	% of grade	Acceptability
Mixed Glass Bottles and Jars - CRV	1,740	<1%	Nontarget
All CMC Glass	620	<1%	Nontarget
Aluminum Beverage Cans - CRV	610	<1%	Nontarget
Aluminum Containers - Non-CRV	310	<1%	Nontarget
Other Aluminum	200	<1%	Nontarget
Other Nonferrous	10,010	<1%	Nontarget
Tin/Steel/Bimetal - Non-CRV	1,530	<1%	Nontarget
Other Ferrous	1,230	<1%	Nontarget
Small Format – Metal	200	<1%	Nontarget
Kraft Paper	68,520	1.40%	Target
Gable-Top Cartons	1,530	<1%	Nontarget
Paperboard	123,230	2.51%	Target
OCC	4,452,560	90.84%	Target
Mixed Papers	89,840	1.83%	Nontarget
Molded Pulp	6,540	<1%	Nontarget
Small Format - Paper	28,900	<1%	Nontarget
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	820	<1%	Nontarget
Plastic #1 - PET Pigmented Bottles, Jugs, Jars – Non-CRV	310	<1%	Nontarget
Plastic #1 - Other PET Rigid	3,270	<1%	Nontarget
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	7,550	<1%	Nontarget
Plastic #2 - Other HDPE Rigid	3,980	<1%	Nontarget
Plastic #4 - Other LDPE Rigid	200	<1%	Nontarget
Plastic #4 - Mono LDPE Flexibles and Films	5,310	<1%	Nontarget

CMC End Market Group	Tons per year	% of grade	Acceptability
Plastic #5 - PP Rigid Items	3,980	<1%	Nontarget
Plastic #6 - PS Rigid Items	2,450	<1%	Nontarget
Plastic #7 - Other Rigid Plastics	100	<1%	Nontarget
Plastic #7 - Other Flexible and Films	15,310	<1%	Nontarget
Multi-Material Laminate	200	<1%	Nontarget
Small Format - Plastics	7,960	<1%	Nontarget
Wood - Treated	3,980	<1%	Nontarget
All Other Wood and Organics	2,040	<1%	Nontarget
Other contaminants (noncovered material)	56,770	1.16%	Nontarget
Total	**4,901,800**	**100.00%**	
Total Target Material	**4,644,210**	**94.74%**	
Total CMC Target Material	**4,644,210**	**94.74%**	

Table C-4 provides additional information on the composition of mixed paper grades in California entering domestic and international end markets. Overall, the mixed paper grade is made up of approximately 43% mixed papers, 29% OCC, 10% paperboard, 7% kraft paper, and 2% small format paper. The composition of mixed papers is assumed to be the same for all U.S. end markets as those found from the surveys of California end markets.

Table C-4: Estimated Composition of Mixed Paper Accepted by or Sent to End Markets in California, Domestic Exports, and International Exports

CMC End Market Group	Tons per year	% of grade	Acceptability
All CMC Glass	430	<1%	Nontarget
Aluminum Beverage Cans - CRV	1,720	<1%	Nontarget
Other Aluminum	430	<1%	Nontarget
Other Nonferrous	430	<1%	Nontarget
Tin/Steel/Bimetal - Non-CRV	860	<1%	Nontarget
Other Ferrous	430	<1%	Nontarget
Small Format - Metal	860	<1%	Nontarget
Kraft Paper	60,410	6.80%	Target
Aseptic Cartons	3,110	<1%	Nontarget
Gable-Top Cartons	960	<1%	Nontarget
Paperboard	90,220	10.15%	Target
OCC	258,060	29.03%	Target
Mixed Papers	376,070	42.30%	Target
Molded Pulp	3,440	<1%	Target

CMC End Market Group	Tons per year	% of grade	Acceptability
Small Format - Paper	19,350	2.18%	Target
PET Clear Beverage Bottles - CRV	1,720	<1%	Nontarget
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	430	<1%	Nontarget
Plastic #1 - Other PET Rigid	5,160	<1%	Nontarget
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars – Non-CRV	1,720	<1%	Nontarget
Plastic #2 - Other HDPE Rigid	430	<1%	Nontarget
Plastic #4 - Mono LDPE Flexibles and Films	430	<1%	Nontarget
Plastic #5 - PP Rigid Items	3,010	<1%	Nontarget
Plastic #6 - Other PS	430	<1%	Nontarget
Plastic #6 - PS Rigid Items	2,150	<1%	Nontarget
Plastic #6 - EPS Rigid Items	430	<1%	Nontarget
Plastic #7 - Other Flexible and Films	11,180	1.26%	Nontarget
Plastic #7 - Other Rigid Plastics	430	<1%	Nontarget
Multi-Material Laminate	430	<1%	Nontarget
Small Format – Plastics	3,440	<1%	Nontarget
Wood - Treated	1,300	<1%	Nontarget
All Other Wood and Organics	3,010	<1%	Nontarget
Other contaminants (noncovered material)	36,520	4.11%	Nontarget
Total	**889,000**	**100.00%**	
Total Target Material	**809,860**	**91.10%**	
Total CMC Target Material	**809,860**	**91.10%**	

Table C-5 shows the annual exports of paper and fiber to international end markets from 2014 to 2024 based on WISERTrade.

Table C-5: Annual International Paper and Fiber Exports from California 2014 – 2024 (tons)

Country	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Thailand	19,423	51,398	68,176	43,006	127,925	150,208	169,891	1,107,199	1,335,306	1,426,242	1,097,803
Vietnam	36,308	62,619	54,969	163,661	371,991	659,724	684,659	1,388,080	1,255,454	796,707	925,491
Malaysia	11,187	7,244	2,908	6,312	22,641	42,033	228,175	547,684	868,949	888,391	881,170
Taiwan	66,248	59,658	147,649	145,323	315,741	447,735	481,511	954,991	812,085	583,408	388,836
Korea, Republic Of	238,465	296,635	201,362	142,173	309,314	358,144	357,429	449,741	441,862	326,720	350,376
China	4,486,509	4,818,621	4,469,992	3,736,835	4,276,757	3,206,058	2,663,201	337,434	261,941	329,834	278,052
Indonesia	38,392	12,015	11,392	17,583	107,955	167,107	124,692	296,846	216,213	150,978	96,975
Mexico	7,424	2,009	180	465	3,817	516	1,027	28,515	15,901	6,139	16,766
India	4,979	4,072	9,173	23,084	64,893	48,440	35,386	50,505	17,039	9,880	14,412
Mexico	8,098	2,016	23	427	3,779	134	667	22,864	910	6,437	13,201
Laos	0	0	0	0	0	4,643	20,910	32,888	47,301	14,121	5,038
El Salvador	4,376	8,425	1,042	260	0	152	6,666	8,872	1,351	873	4,895
Peru	619	1,672	993	2,723	0	609	891	5,441	1,208	22	4,344
Germany	0	0	24	0	34	176	97	0	152	16	3,954
Chile	111	0	2,068	87	1,809	1,074	386	7,790	30	149	3,929
Japan	13,126	48,469	44,337	37,548	35,410	30,318	19,837	9,810	5,435	2,086	2,539
Colombia	0	0	0	0	207	1,536	1,291	7,379	3,560	885	1,660
Ecuador	2,097	828	0	6,414	66	211	1,209	15,481	49,608	471	1,501
Singapore	0	0	0	118	6,468	2,056	107,983	157,333	28,719	423	1,451
Guatemala	0	93	0	0	214	32,192	810	2,096	414	2,713	754
Argentina	0	0	0	0	0	443	0	0	0	0	538
Pakistan	1,015	244	21	22	74	349	1,843	3,459	160	54	167
Hong Kong	1,881	4,449	3,935	1,801	5,840	1,776	7,997	934	1,918	171	89
Turkey	66	88	0	0	347	36	0	0	0	418	0
Bangladesh	0	61	0	0	0	178	173	1,420	1,908	47	0
Spain	0	0	0	0	0	0	0	0	0	24	0

Country	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Nicaragua	0	0	0	0	0	0	0	0	0	16	0
Philippines	5,205	4,252	7,167	11,073	18,044	6,501	1,931	6,295	1,408	0	0
Italy	0	0	0	2,117	1,640	4,039	0	306	603	0	0
Saudi Arabia	0	0	0	3,055	842	44	0	0	269	0	0
Sri Lanka	0	0	0	0	0	0	0	0	55	0	0
Brazil	0	0	0	0	0	0	0	453	47	0	0
Australia	24	537	250	0	0	281	89	306	0	0	0
Venezuela	968	446	0	0	0	0	0	0	0	0	0
Dominican Republic	22	173	129	0	0	237	0	94	0	0	0
Serbia	0	122	0	0	0	0	0	0	0	0	0
Costa Rica	222	21	0	0	0	0	0	0	0	0	0
Sudan (Starting 2011)	0	0	0	0	265	0	0	0	0	0	0
Panama	117	0	0	0	0	0	0	0	0	0	0
Trinidad And Tobago	0	0	0	0	0	494	0	562	0	0	0
United Kingdom	0	0	0	94	0	240	0	0	0	0	0
Ireland	0	0	0	0	0	0	83	0	0	0	0
Netherlands	0	0	0	162	764	70	178	0	0	0	0
France	0	0	0	0	0	0	0	0	0	0	0
United Arab Emirates	0	0	0	0	3,452	11,994	0	0	0	0	0
Burma (Myanmar)	0	0	0	0	255	76,591	57,873	222	0	0	0
Egypt	0	0	0	0	162	0	0	0	0	0	0

Country	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Central African Republic	231	0	0	0	0	0	0	0	0	0	0
Chad	256	0	0	0	0	0	0	0	0	0	0
Djibouti	0	0	0	0	0	0	108	0	0	0	0
Kenya	0	0	0	0	0	120	0	0	0	0	0

Appendix D: Metal

This section provides additional information on the survey responses received from metal end market facilities and additional strategies used to produce report outputs.

No end market facilities were identified in California that manage metal covered material. Seven end market facilities that manage covered metal material were identified throughout the U.S. These are summarized in Table D-1. This study analyzed the flow of materials outside the U.S. based on export data from RDRS, WISERTrade and secondary research.

Table D-1: End market facilities that Manage Covered Metal Material

Primary Material Managed	End market facilities Identified in CA	End market facilities Identified Outside CA but in U.S.
Aluminum	0	5
Steel	0	2
Total	**0**	**7**

For the seven facilities identified, seven contacts were verified, including facility managers, senior executives, and vice presidents. Table D-2 summarizes the response rates from metal end market facilities. The contractor received data from four of the seven end market facilities, all of which only manage aluminum. These responses were supplemented with four interviews and secondary data. No responses were received from steel end markets.

Table D-2: Metal End market facilities Survey Responses

Primary Material Managed	Full Survey Response	Partial Survey Response	Short Email Response	Declined to Participate	No Response
Aluminum	0	2	2	0	1
Steel	0	0	0	0	2
Total	**0**	**2**	**2**	**0**	**3**

Table D-3 shows the composition of Post-Consumer Aluminum Can Stock material grades in California entering domestic and international end markets. Since Post-Consumer Aluminum Can Stock grades are sourced from recycling centers that manage California BCRP material, they are predominantly beverage containers (approximately 94%), which are not covered under the Act; however, they make up a significant portion of the aluminum packaging quantities in California and have therefore been included in this report. Overall, Post-Consumer Aluminum Can Stock material

grades contain approximately 6% covered materials with less than 1% being covered aluminum materials which are not target material at end markets purchasing Post-Consumer Aluminum Can Stock material grades.

Table D-3: Estimated Composition of Post-Consumer Aluminum Can Stock in California Entering Domestic and International End Markets

CMC End Market Group or CRV Material	Tons per year	% of grade	Acceptability
Aluminum Beverage Cans - CRV	185,160	94.71%	Target
Tin/Steel/Bimetal - Non-CRV	780	<1%	Nontarget
Other Aluminum	390	<1%	Nontarget
Other Ferrous	400	<1%	Nontarget
Mixed Papers	600	<1%	Nontarget
Kraft Paper	160	<1%	Nontarget
Plastic #1 - PET Clear Bottles, Jugs, Jars – Non-CRV	160	<1%	Nontarget
Plastic #1 - Other PET Rigid	200	<1%	Nontarget
Plastic #5 - PP Rigid Items	230	<1%	Nontarget
Plastic #6 - PS Rigid Items	6,700	3.43%	Nontarget
Plastic #7 - Other Flexible and Films	100	<1%	Nontarget
Small Format - Plastics	390	<1%	Nontarget
All Other Wood and Organics	230	<1%	Nontarget
Total	**195,500**	**100.00%**	
Total Target Material	**185,160**	**94.71%**	
Total CMC Target	**0**	**0%**	

Table D-4 shows the composition of Steel Can Bundle material grades in California entering domestic and international end markets. Steel Can Bundles are predominantly composed of non-CRV tin/steel/bimetal, which makes up approximately 71% of the average material grade composition. The CMC categories other ferrous metals and small format – metals make up approximately 14% and 5% of these material grades respectively, and missorted non-steel materials make up the remaining 10%. Over 85% of the feedstock within these material grades is target material for steel end markets, with almost all the material covered under the Act.

Table D-4: Estimated Composition of Steel Can Bundles in California, Domestically, and Internationally

CMC End Market Group and CRV Material	Tons per year	% of grade	Acceptability
Aluminum Containers - Non-CRV	130	<1%	Nontarget
Aluminum Beverage Cans - CRV	40	<1%	Nontarget
Tin/Steel/Bimetal - Non-CRV	11,290	71.01%	Target
Other Aluminum	40	<1%	Nontarget
Other Nonferrous	180	1.13%	Nontarget
Other Ferrous	2,280	14.34%	Target
Small Format - Metal	730	4.59%	Nontarget
OCC	30	<1%	Nontarget
Paperboard	20	<1%	Nontarget
Kraft Paper	10	<1%	Nontarget
Mixed Papers	30	<1%	Nontarget
Small Format - Paper	40	<1%	Nontarget
Plastic #1 - PET Clear Bottles, Jugs, Jars - Non CRV	10	<1%	Nontarget
Plastic #1 - Other PET Rigid	10	<1%	Nontarget
Plastic #2 – HDPE (pigmented and natural) Bottles, Jugs, Jars - Non CRV	20	<1%	Nontarget
Plastic #7 - Other Flexible and Films	20	<1%	Nontarget
Small Format - Plastics	40	<1%	Nontarget
All Other Wood and Organics	180	1.13%	Nontarget
Other contaminants	800	5.03	Nontarget
Total	**15,900**	**100.00%**	
Total Target Material	**13,570**	**85.35%**	
Total CMC Target Material	**13,570**	**85.35%**	

Table D-5 shows the domestic exports of aluminum and steel material grades from California in 2024 according to RDRS.

Table D-5: Domestic Exports from California in 2024 (tons)

State	Post Consumer Aluminum Can Stock	Aluminum, tin, and steel product	Aluminum Foil	Steel Can Bundles
Pennsylvania	57,405	290	0	0
Alabama	398	232	83	0
Illinois	1,662	198	0	151
Kentucky	0	177	0	0
Michigan	3,668	131	0	0
Florida	119	89	0	0
Oregon	520	85	0	8,406
Washington	31,831	42	0	0
Out of California	1,609	20	0	717
Indiana	624	14	0	342
South Carolina	1,807	0	0	0
New York	932	0	0	477
Georgia	444	0	0	0
Texas	203	0	0	0
Arizona	63	0	0	550
Missouri	23	0	0	0
Montana	0	0	0	48
Nevada	0	0	0	780

Table D-6 shows the annual exports of aluminum cans to international end markets from 2014-2024 based on WISERTrade.

Table D-6: Annual Aluminum Can International Exports by Country (2014-2024)

Country	2014	2016	2016	2017	2018	2019	2020	2021	2022	2023	2024
Thailand	0	85	0	0	0	264	1,773	2,727	3,987	16,828	28,874
Indonesia	0	915	0	0	0	441	6,106	7,760	4,831	11,599	14,474
India	0	21	102	19	747	2,606	6,654	1,600	6,510	7,975	9,963
Hong Kong	0	183	7	0	0	119	1,136	12,338	7,386	12,014	9,462
China	207	1,849	525	489	596	110	2,445	5,711	7,337	3,228	8,820
Korea, Republic Of	626	9,071	370	301	194	1,171	3,756	3,846	14,091	8,927	8,579
Taiwan	21	477	0	0	356	155	526	1,631	4,090	3,648	3,949
Vietnam	0	59	0	0	0	129	531	1,603	2,047	1,091	3,863
Japan	0	231	645	318	235	185	1,301	2,004	2,236	1,592	3,139
Malaysia	0	0	0	0	0	1,426	9,603	2,566	11,694	6,621	1,660
Pakistan	0	0	0	0	0	95	45	326	416	231	477
Belgium	0	0	0	0	112	0	0	0	92	21	237
Spain	0	0	0	0	0	0	0	25	98	83	162
Greece	0	0	0	0	0	20	71	381	463	177	115
United Kingdom	0	0	0	0	0	0	0	0	0	0	104
United Arab Emirates	0	0	0	0	0	33	101	22	470	156	87

Country	2014	2016	2016	2017	2018	2019	2020	2021	2022	2023	2024
Philippines	0	118	0	0	0	34	17	31	778	43	69
Brazil	0	0	0	0	5	0	43	208	136	305	50
Germany	0	0	0	0	46	0	0	0	275	0	43
Italy	0	0	0	0	0	0	0	124	713	176	22
Turkey	0	0	0	0	0	0	66	503	725	67	21
Albania	0	0	0	0	0	0	0	0	0	158	0
Mexico	0	0	0	0	0	0	0	72	506	44	0
Saudi Arabia	0	0	0	0	22	0	267	0	0	21	0
Banglades h	0	0	0	0	0	0	0	0	0	6	0
Russia	0	0	0	0	0	955	3,741	4,163	223	0	0
Bahrain	0	0	0	0	0	0	0	0	88	0	0
Egypt	0	0	0	0	0	0	4	0	25	0	0
Ecuador	0	0	0	0	0	0	0	0	22	0	0
Netherland s	0	0	0	0	12	165	44	0	20	0	0
Oman	0	0	0	0	0	0	0	0	6	0	0
Western Samoa	0	24	0	0	0	0	0	0	0	0	0
Dominican Republic	0	0	0	0	0	0	20	0	0	0	0
France	0	0	0	0	13	0	0	22	0	0	0
Poland	0	0	0	22	0	0	0	0	0	0	0
Cambodia	0	0	0	0	0	0	22	0	0	0	0

Country	2014	2016	2016	2017	2018	2019	2020	2021	2022	2023	2024
Singapore	0	0	0	0	0	44	261	129	0	0	0
Ghana	0	0	0	0	0	82	0	0	0	0	0

Appendix E: Glass

Seven end market facilities in California were identified that manage glass covered material, summarized in Table E-1. The table is not an exhaustive list, as there are end market facilities outside the U.S. that manage covered material. This study analyzed the flow of material outside the U.S. based on export data, but since outreach was not conducted to end market facilities outside the U.S., specific end market facilities outside the U.S. were not identified.

Table E-1: End market facilities that Manage Glass Covered Material

Primary Material Managed	End market facilities Identified in CA	End market facilities Identified Outside CA in U.S.
Glass	7	0

Of the seven glass end market facilities identified, seven contacts were verified. A full survey response was received from one end market facility, partial survey responses and shortened email responses were received from five end market facilities, which included qualitative and quantitative information and details on the capacity, but no feedstock composition details or facility output details. Table E-2 details the survey response rates from glass end market facilities.

Table E-2: Glass End market facility Survey Response Rate

Primary Material Managed	Full Survey Response	Partial Survey Response	Short Email Response	Declined to Participate	No Response
Glass	1	5	1	0	0

As described in the Model Development section of Appendix A, a model was developed to estimate the weight of recovered material. For each facility, the model estimated the feedstock entering each end market facility and the recovered material outputs. These feedstock and output amounts were estimated based on survey responses, RDRS data, and secondary research. The source of model inputs (i.e., the number of end market facilities for which model inputs were derived from each listed resource) for glass is summarized in Table E-3. For the seven end market facilities that were operational in 2024, seven provided data on both feedstock entering their end market facility and output recovered product in their survey responses. The contractor identified these same seven end market facilities in the RDRS data. Export data from WISERTrade were also used to estimate the quantity of glass material being exported internationally. There was no information on ceramic material in the RDRS data or the WISERTrade export data.

Table E-3: Source of Model Inputs and Recycled Material Outputs of End market facilities

Primary Material Managed	Survey Data	Survey and RDRS Data	RDRS Data Only
Glass	1	6	0

Tables E-4 through E-8 provide more detail on the composition of glass material grades.

Recycling Processing Facility Glass

Table E-4 shows the composition of glass from recycling processing facilities. Glass material grades contain approximately 34% covered glass materials. Approximately 11% of the total glass accepted by end markets is CRV mixed glass bottles and jars, which are not covered under the Act. The composition shows that glass is highly contaminated, with approximately 56% being nontarget material for glass end market facilities. Approximately 27% of glass is made up of other contaminants or noncovered materials and approximately 74% of these other contaminants are typically fines and residuals. The glass composition was estimated using the average of two end market facility survey responses regarding the composition of recycling processing facility glass they received in 2024 and SB 343 Report material compositions.

Table E-4: Estimated Composition of Recycling Processing Facility Glass Accepted by or Sent to Glass End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Mixed Glass Bottles and Jars - CRV	50,640	11.08%	Target
All CMC Glass	157,670	34.49%	Target
Ceramic	19,390	4.24%	Nontarget
Aluminum Beverage Cans - CRV	700	<1%	Nontarget
Aluminum Containers - Non-CRV	500	<1%	Nontarget
Other Aluminum	300	<1%	Nontarget
Other Nonferrous	400	<1%	Nontarget
Small Format - Metal	400	<1%	Nontarget
Kraft Paper	2,810	<1%	Nontarget
Gable-Top Cartons	100	<1%	Nontarget
Aseptic Cartons	100	<1%	Nontarget

CMC End Market Group and CRV	Tons per year	% of grade	Acceptability
Paperboard	2,810	<1%	Nontarget
OCC	3,110	<1%	Nontarget
Mixed Papers	29,740	6.51%	Nontarget
Molded Pulp	400	<1%	Nontarget
Small Format - Paper	29,140	6.37%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	400	<1%	Nontarget
Plastic #1 - PET Pigmented Beverage Bottles - CRV	200	<1%	Nontarget
Plastic #1 - Other PET Rigid	200	<1%	Nontarget
Plastic #2 - Other HDPE Rigid	600	<1%	Nontarget
Plastic #5 - PP Rigid Items	1,110	<1%	Nontarget
Plastic #6 - Other PS	100	<1%	Nontarget
Plastic #6 - PS Rigid Items	1,000	<1%	Nontarget
Plastic #6 - EPS Rigid Items	300	<1%	Nontarget
Plastic #7 - Other Flexible and Films	1,310	<1%	Nontarget
Plastic #7 - Other Rigid Plastics	200	<1%	Nontarget
Small Format - Plastics	8,140	1.78%	Nontarget
Wood - Treated	900	<1%	Nontarget
All Other Wood and Organics	21,000	4.59%	Nontarget
Other Contaminants (noncovered material)	123,480	27.01%	Nontarget
Total	**457,150**	**100.0%**	
Total Target Material	**208,310**	**45.57%**	
Total CMC Target Material	**157,670**	**34.49%**	

Redemption Center Glass

Since Redemption Center Glass material grades are sourced from recycling centers that manage CRV material, these grades are predominantly beverage containers (approximately 95%), which are not covered under the Act. Some missorted non-beverage container glass and ceramic materials end up in these material grades. Approximately 2% of material in Redemption Center Glass consists of covered glass materials and ceramic materials with approximately 1% being covered glass materials and 1% being ceramic materials. Non-beverage mixed glass bottles and jars are considered a target material in end markets in California and are accepted for recovery; however, ceramic is not a target material for glass end markets and is considered a contaminant. This means that approximately 96% of California Redemption Center Glass material is accepted by end markets in California, with nontarget covered material and other contaminants making up the remaining 4%.

Table E-5: Estimated Composition of Redemption Center Glass Accepted by or Sent to Glass End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per annum	% of grade	Acceptability
Mixed Glass Bottles and Jars - CRV	124,100	94.73%	Target
All CMC Glass	1,500	1.15%	Target
Ceramic	1,500	1.15%	Nontarget
Tin/Steel Beverage Containers - CRV	100	<1%	Nontarget
Tin/Steel/Bimetal - Non-CRV	200	<1%	Nontarget
Kraft Paper	100	<1%	Nontarget
Mixed Papers	400	<1%	Nontarget
Small Format - Paper	500	<1%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	400	<1%	Nontarget
Plastic #2 - HDPE Clear Beverage Bottles - CRV	200	<1%	Nontarget
Plastic #5 - PP Rigid Items	100	<1%	Nontarget
Plastic #7 - Other Flexible and Films	500	<1%	Nontarget
Small Format - Plastics	200	<1%	Nontarget
All Other Wood and Organics	300	<1%	Nontarget
Other Contaminants (noncovered material)	900	<1%	Nontarget
Total	**131,000**	**100.00%**	
Total Target Material	**125,600**	**95.88%**	
Total CMC Target Material	**1,500**	**1.15%**	

Table E-6, Table E-7, and Table E-8 show the composition of Green, Amber and Clear/Flint Unprocessed Container Glass entering end markets in California. Approximately 76% of Green, 27% of Amber, and 22% of Clear/Flint Unprocessed Container Glass entering end markets are covered materials.

Table E-6: Estimated Composition of Unprocessed Green Container Glass Accepted by or Sent to Glass End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per annum	% of grade	Acceptability
Mixed Glass Bottles and Jars – CRV	9,400	21.82%	Target
All CMC Glass	32,970	76.53%	Target
Tin/Steel/Bimetal - Non-CRV	140	<1%	Nontarget
Small Format - Paper	230	<1%	Nontarget
Plastic #7 - Other Flexible and Films	340	<1%	Nontarget
Total	**43,080**	**100.00%**	
Total Target Material	**42,370**	**98.35%**	
Total CMC Target Material	**32,970**	**76.53%**	

Table E-7: Estimated Composition of Unprocessed Amber Container Glass Accepted by or Sent to Glass End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per annum	% of grade	Acceptability
Mixed Glass Bottles and Jars – CRV	28,100	64.16%	Target
All CMC Glass	12,000	27.4%	Target
Ceramic	200	<1%	Nontarget
Ton/Steel/Bimetal – Non-CRV	400	<1%	Nontarget
Mixed Papers	400	<1%	Nontarget
Small Format - Paper	400	<1%	Nontarget
Plastic #5 - PP Rigid Items	600	1.37%	Nontarget
Plastic #7 - Other Flexible and Films	900	2.05%	Nontarget

CMC End Market Group and CRV	Tons per annum	% of grade	Acceptability
Small Format - Plastics	400	<1%	Nontarget
Other Contaminants (noncovered material)	400	<1%	Nontarget
Total	**43,800**	**100.00%**	
Total Target Material	**40,100**	**91.55%**	
Total CMC Target Material	**12,000**	**27.4%**	

Table E-8: Estimated Composition of Unprocessed Clear/Flint Container Glass Accepted by or Sent to Glass End Markets in California, Domestically, and Internationally

CMC End Market Group and CRV	Tons per annum	% of grade	Acceptability
Mixed Glass Bottles and Jars – CRV	59,100	67.85%	Target
All CMC Glass	19,200	22.04%	Target
Ceramic	200	<1%	Nontarget
Tin/Steel Beverage Containers - CRV	100	0.11%	Nontarget
Tin/Steel/Bimetal - Non-CRV	1,500	1.73%	Nontarget
Kraft Paper	700	<1%	Nontarget
Plastic #1 - PET Clear Beverage Bottles - CRV	100	<1%	Nontarget
Plastic #2 - HDPE Clear Beverage Bottles - CRV	100	<1%	Nontarget
Plastic #7 - Other Flexible and Films	2,500	2.87%	Nontarget
All Other Wood and Organics	500	<1%	Nontarget
Other contaminants	3,100	3.56%	
Total	**87,100**	**100.00%**	
Total Target Material	**78,300**	**89.90%**	
Total CMC Target Material	**19,200**	**22.04%**	

Table E-9 shows the annual exports of glass to international end markets from 2014 to 2024.[9]

Table E-9: Annual International Glass Exports from California 2014-2024 (tons)

Country	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Mexico	3	0	0	0	0	20	0	2,166	0	6,957	777
Korea, Republic Of	13	2	58	2,191	1,231	1,870	1,318	1,130	1,127	159	438
Japan	49	18	29	31	32	463	151	113	145	410	423
China	0	0	5	0	20	285	313	365	232	2,134	338
Australia	43	6	0	0	3	0	0	0	0	62	210
Indonesia	0	0	0	0	0	0	0	0	0	0	89
Taiwan	0	0	0	63	237	68	34	25	60	90	77
French Polynesia	0	0	0	0	0	0	0	0	0	0	1
United Kingdom	16	0	0	2	5	3	3	3	0	0	1
Germany	0	1	0	0	0	0	0	1	1	0	0
New Zealand	19	24	6	0	0	3	14	0	0	0	0
Singapore	0	15	0	10	0	0	0	0	0	0	0
Hong Kong	14	8	3	44	41	0	0	0	0	0	0
Canada	0	0	0	0	0	0	0	0	0	0	0
Mexico	0	0	0	0	0	0	0	0	0	0	0
Guatemala	9	0	0	0	0	0	0	0	0	0	0
Colombia	0	0	2	0	0	0	0	0	0	0	0
Peru	0	0	0	21	0	0	0	0	0	0	0
Sweden	0	0	0	0	0	0	0	0	0	0	0
Finland	0	0	0	0	0	0	0	0	0	0	0
Denmark	0	0	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0	0	0	0	0	0	0	0	0	0
France	0	0	0	0	0	0	0	0	0	0	0
Austria	0	0	0	0	0	0	0	0	0	0	0
Czech Republic	0	0	0	0	0	0	0	0	0	0	0
Slovakia	0	0	0	0	0	0	0	0	0	0	0
Switzerland	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0

Country	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Russia	0	0	0	0	0	0	0	0	0	0	0
Belarus	0	0	0	0	0	0	0	0	0	0	0
Georgia	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0	0	0	0	0
Italy	0	0	0	0	0	0	0	0	0	0	0
Greece	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0
Israel	0	0	0	0	0	0	0	0	0	0	0
Saudi Arabia	0	0	0	0	0	0	0	0	0	0	0
Qatar	0	0	0	0	0	0	0	0	0	0	0
United Arab Emirates	0	0	0	0	0	0	0	0	0	0	0
India	1,760	0	0	0	0	0	0	0	0	0	0
Nepal	0	0	0	0	0	0	0	0	0	0	0
Thailand	0	0	0	0	0	4	0	0	0	0	0
Vietnam	0	0	0	0	0	0	0	0	0	0	0
Malaysia	0	0	0	0	0	0	4	0	0	0	0
Philippines	0	0	8	0	0	0	0	0	0	0	0
Papua New Guinea	0	0	0	0	0	0	0	0	0	0	0
New Caledonia	0	0	0	0	0	0	0	0	0	0	0
South Africa	0	0	0	0	0	0	0	0	0	0	0

Appendix F: Wood and Other Organic Material

Table F-1 outlines the 19 potential end market facilities in California that were contacted to verify if they meet the definition of an end market. This table is not a comprehensive list of all wood end market facilities in California. When individual outreach did not produce any responses, the contractor engaged two wood industry associations (NWPCA and WPA) to help reach out to potential end market facilities. The table shows the initial list of wood end market facilities that were contacted but does not include the facilities that the industry associations represented and contacted since the associations declined to share their specific members.

Table F-1: End market facilities Contacted

End Market Contacted	Number of End market facilities Contacted
Packaging Specialists, Inc. (PSI)	1
Kamps Pallets, Inc.	3
SFV Pallet	2
Green Solutions and More, Inc.	1
Agri-Chip	1
Oakland Pallet	2
RWP Landscape Materials	1
Bedford Enterprises, Inc.	1
Wastemetrics	1
U.S. Wood & Service, Inc.	1
Pallet One	2
A&I Pallets	1
Oxnard Pallet	1
Bay Area Scavenger and Recycling	1
Total number of potential wood end market facilities contacted (initial outreach)	**19**

Out of the two partial survey responses received, one survey response provided estimated composition of its inbound wooden pallet and crate tonnages. This information is presented in Table F-2 and Table F-3 to provide an illustrative indication of potential inbound composition for wooden pallets and crates. The tonnages shown in these tables assume that all treated or painted wood pallets and crates do not meet the criteria for reuse and therefore are considered to be covered materials. A similar assumption is made for untreated wood given that the research team is unable to verify if any untreated pallets and crates meet the criteria for reuse. It should be noted that given the limited survey responses and insufficient RDRS‡ and secondary research data to supplement the inbound tonnages of wood covered materials, the following tables are not representative of the wood material grades in California.

Table F-2: Estimated Composition of Wooden Pallet Grades (As Reported by One End Market)

CMC End Market Group	Tons per year	% of Grade	Acceptability
Untreated Wood	52,460	78.99%	Target
Treated or Painted Wood	13,950	21.01%	Nontarget
Total	**66,410**	**100.00%**	
Total Target Material	**52,460**	**78.99%**	
Total CMC Target Material	**52,460**	**78.99%**	

Table F-3 shows the estimated composition of wooden crate grades as reported by the survey respondent. It should be noted that the respondent provided grade composition estimates only for the “untreated wood” and “treated or painted wood” CMC end market groups, which summed to only 32%. Since the contractor could not estimate compositions from other sources (e.g., RDRS), the remaining percentage in the grade (68%) was assumed to be unknown. The contractor likewise back-calculated the tons associated with this “unknown” group (i.e., if 80 tons represented 32%, then 68% would represent 170 tons). As shown in Table F-5, the remaining 68% of the grade includes other wood packaging and non-wood contamination; however, the respondent specified that the proportion of each was unknown.

‡ The RDRS dataset includes pallets under the category of construction/demolition/inert (CDI) debris; however, the research team was unable to confirm if the receiving plants met the criteria of wood end market facilities as defined in this report. Therefore, the tonnages of pallets found in RDRS dataset were not included in the tables in this appendix.

Table F-3: Estimated Composition of Wooden Crate Grades (As Reported by One End Market)

CMC End Market Group	Tons per year	% of Grade	Acceptability
Untreated Wood	48	21.00%	Target
Treated or Painted Wood	25	11.00%	Nontarget
Unknown	155	68.00%	Nontarget
Total	**228**	**100.00%**	
Total Target Material	**48**	**21.00%**	
Total CMC Target Material	**48**	**21.00%**	

Table F-4 and Table F-5 show the details of the estimated composition of wooden pallet and crate grades as reported by one end market facility.

Table F-4: Composition of Inbound Wooden Pallets (As Reported by One End Market)

Covered Material Category	Estimated % of grade	Is this category considered unwanted / a contaminant in the grade?	Max % tolerance for this material category
Untreated wood without plastic component	64%	No	90%
Untreated wood with plastic component	15%	No	47%
Treated or painted wood without plastic component	21%	Yes	50%
Treated or painted wood with plastic component	0%	No	No response
Any other wood packaging	0%	No	No response
Non-wood (contamination)	0%	No	No response

Table F-5: Composition of Inbound Wooden Crates (As Reported by One End Market)

Covered Material Category	Estimated % of grade	Is this category considered unwanted / a contaminant in the grade?	Max % tolerance for this material category
Untreated wood without plastic component	11 – 20%	No	N/A
Untreated wood with plastic component	1 – 10%	Yes	1 – 10%
Treated or painted wood without plastic component	1 – 10%	Yes	1 – 10%
Treated or painted wood with plastic component	1 – 10%	Yes	1 – 10%
Any other wood packaging	% of material not known	Yes	0%
Non-wood (contamination)	% of material not known	Yes	0%

Source Reference Notes

[1] Association of Plastic Recyclers (APR). Buyers & Sellers Directory. Accessed August, 2025. https://plasticsrecycling.org/tools-and-resources/buyers-sellers-directory/.

[2] Glass Recycling Foundation. Interactive Glass Recycling Map. Accessed August, 2025. https://www.glassrecycles.org/industry-tools-1/glass-map.

[3] Environmental Protection Agency (EPA). Recycling Infrastructure and Market Opportunities Map. Accessed August, 2025. https://www.epa.gov/circulareconomy/recycling-infrastructure-and-market-opportunities-map.

[4] CalRecycle, Recycling and Disposal Reporting System (RDRS).

[5] WISERTrade. (n.d.). Online international trade data and statistics database. Retrieved 8/7/2025, from https://www.wisertrade.org/home/portal/index.jsp

[6] CalRecycle, Publication Summary SB 343 Final Findings Report (DRRR-202501750), 2025.

[7] Ibid

[8] PRCC, California PET Bale Composition Analysis: 2024 Update.

[9] WISERTrade. (n.d.). Online international trade data and statistics database. Retrieved 8/7/2025, from https://www.wisertrade.org/home/portal/index.jsp