Best Management Practices: Commingled Residential Recycling

Due to recent changes in recycling markets, curbside commingled recycling programs may need to be updated to ensure the best use of recyclable materials collected at the curb.

This guide provides best management practices (BMPs) on what recyclables to include in curbside programs and why. These BMPs were developed based on research and input from stakeholders throughout the recycling process – local governments, collectors, material recovery facilities, and end-users. This document is intended for use by local governments and recycling collection companies who design and provide recycling services to residents and businesses.

Commingled curbside recycling

Commingled recycling – also known as mixed or single-stream recycling – require that residents place all recyclables into one bin at the curb. The materials in the bin are picked up by a recycling company and brought to a material recovery facility (MRF). The MRF sorts the material into individual commodity streams such as glass, paper, plastics, and metals.

Commingled recycling has increased in popularity because it is easy for residential customers to put all their recyclables in one cart, costs cities less money, and increases recycling collection rates.

However, due to confusion about what is recyclable and what is not, residents often contaminate recyclable material by placing garbage and other non-recyclable items in the commingled bin. In some cases, accepted materials can even cross-contaminate other recyclables in the bin.

Ecology has been working with stakeholders to track contamination issues for many years, and has published two studies:

- Optimizing the Commingled Recycling Systems in Northwest Washington
- Beyond the Curb - Tracking the Commingled Residential Recyclables from Southwest WA

High levels of contamination in commingled recycling programs have led to challenges in finding end markets for collected materials.

Recent changes in recycling regulations

Beginning in July 2017, the Chinese government imposed a new regulation – known as "National Sword 2017" and "Blue Sky 2018." These regulations restrict the import of low-grade and contaminated recyclables.

China accepted more than 50 percent of the worlds exported recyclables for almost two decades. While recyclable material fuels China's industries, contamination in the imported material has caused high levels of waste and environmental pollution.

China's new regulation started with restrictions on the importation of 24 materials including low-grade post-consumer plastics (codes 3-7) and unsorted paper (mixed waste paper). The list of restricted materials may increase in 2018 and 2019. The policy includes a strict 0.5 percent limit on the amount of contamination allowed for other imported recyclables. In addition, China severely limited the number of import licenses issued for recyclable materials.

The new restrictions have caused worldwide impacts in recycling markets. The west coast and Washington state are particularly impacted due to the reliance on Chinese markets because of the close proximity, relatively low cost, and ease of shipping recyclable materials to China.

Reconsidering curbside recycling programs

In response to the dramatic shift in markets, local municipalities should reconsider what is accepted in commingled curbside recycling programs. Focus should be placed on collecting high quality materials instead of large quantities of marginal materials.

Deciding your acceptance list

When deciding on your acceptance list, work closely with your MRF to get answers to these questions:

- What material grade and specifications does it meet? Are there markets for these specifications?
- Will this material be sorted at the MRF from other materials so it is "mill ready" and doesn't require further sorting to remove contaminants?
- Where is this material going after it leaves the MRF? Are there viable end markets for this material?
- Is this material really getting recycled – meaning, is it manufactured into new products? Can you get documentation that the materials are really getting recycled?
- How does the material impact other material streams? If it is mixed into other streams, is it a contaminant that needs to be thrown away (an out-throw)? Is it forbidden in the material stream because it causes problems in processing (prohibitive)?

If your answers to these questions suggest the materials are not readily recycled or negatively impact the quality of other materials in the recycling system, do not add them to your materials acceptance list.

Yes ✓ Include in your commingled cart

Paper (including office and notebook paper, newspaper, phone directories, mail, catalogues, magazines, and cereal or cracker boxes)

Why? Paper is compatible with commingled collection and processing systems. Local and export end-use markets use recycled paper to create mixed or corrugated paper grades.

BMP: Paper should be clean and dry. No shredded paper.

Corrugated cardboard

Why? Cardboard is compatible with commingled collection and processing systems. There are strong local and export end-use markets for these materials.

BMP: Cardboard boxes should be clean, dry, and flattened. Discourage setting cardboard outside of the bin where it is exposed to rain and moisture.

Plastic bottles and jugs (clear, colored, and natural)

Why? Bottles and jugs (usually PET (#1) and HDPE (#2)) are compatible with commingled collection and processing systems. There are strong local and export end-use markets for these materials.

BMP: Refer to the shape of the bottle or jug to determine if the item is recyclable, instead of relying on the resin number.

Steel and aluminum cans

Why? Cans are compatible with commingled collection and processing systems. Local end-use markets recycle cans into scrap steel or used beverage container grades.

BMP: Do not crush cans. Lids from steel cans should remain attached or securely placed within the can and squeezed to keep them from falling out. Loose metal lids should be thrown away, as they are commonly missorted into paper bales and cause safety hazards for employees.

No! Do not include in your commingled cart

Plastic bags and film

Why? Plastic bags and film wrap around MRF machinery. This costs MRFs time and labor to cut plastic film off equipment and causes safety hazards for employees. Plastic bags and film are one of the biggest problem at MRFs.

BMP: Return plastic bags to participating retail stores. Consider implementing Wrap Recycling Action Program (WRAP), a national public awareness and outreach initiative by the American Chemistry County, for plastic wraps, bags, and flexible packaging recycling.

Shredded paper

Why? Shredded paper falls through the processing system at the MRF and ends up as garbage. Shredded paper contaminates other recyclable materials.

BMP: Take shredded paper to shred events in your community or throw in the garbage. Limit shredding paper – only shred paper with sensitive information instead of whole documents.

Food-soiled or greasy paper

Why? Greasy or food soiled paper is considered a contaminant in paper markets. Items contaminated with food can mold and attract vectors such as rats.

BMP: Put greasy and food-soiled paper in the garbage.

Pizza boxes

Why? Pizza boxes are typically contaminated with food and grease. Items contaminated with food can mold and attract vectors such as rats.

BMP: Put pizza boxes in the garbage.

Wet cardboard and paper

Why? Wet cardboard and paper can mold or dry into hard, unrecyclable blocks of fiber. Water and moisture is considered a contaminant.

BMP: Keep cardboard and paper dry. Put wet cardboard and paper in the garbage.

Plastic cups, trays, and clamshells

Why? Plastic drinking cups, trays, and clamshells are easily flattened in the collection and processing system, ending up mixed in with paper and not recycled. They often are contaminated with food. Different plastic grades melt at different temperatures. In addition, they often have added stickers that are difficult to remove and incompatible with the recycling process.

BMP: Put plastic cups, trays, and clamshells in the garbage.

Scrap metal and pots and pans

Why? Metal pots and pans can cause damage to MRF equipment. Scrap metal can cause safety hazards in collection and processing systems.

BMP: Take scrap metal to metal recycling locations.

Aluminum foil and trays

Why? Aluminum trays and foil burn up during processing because they melt at lower temperatures than aluminum cans. They have no value in the recycling system. This material also ends up contaminating paper bales, as it is easily flattened and can move through the processing system like paper. Aluminum is usually contaminated with food as well.

BMP: Throw aluminum foil and trays in garbage.

Textiles

Why? Clothing and textiles can wrap around MRF machinery and contaminate material streams.

BMP: Donate to charity organizations. Some charities participate in local programs such as Threadcycle where old and worn out clothing and textiles are reused or recycled.

Use caution before including in your commingled cart

Talk with your hauler, MRF, and end-users to decide if the following materials should be included in your commingled recycling cart.

Glass

Why? Glass breaks in curbside bins and at MRFs. Domestic paper mills cannot use paper from commingled recycling programs because it is contaminated with broken glass. Broken glass causes damage to paper processing machinery and degrades the value of paper fiber. In addition, glass is heavy and expensive to transport for processing. Glass collected in commingled systems has limited uses and often ends up as road fill and alternative daily cover in landfills.

BMP: Collect glass separately from other materials. This prevents broken glass from contaminating paper fiber. Send glass to a secondary processor, when possible.

Paper cups, cartons, and aseptic containers (unless separated by MRF for specific markets)

Why? Paper products that hold liquids (polycoated paper cups, cartons, and aseptic containers) do not break down in water and contaminate paper at kraft paper mills. Cartons are prohibited in mixed paper bales by Chinese import regulations. These products are usually contaminated with food and liquids as well.

BMP: Sort cups, cartons, and aseptic containers into separate bales, if specialized end markets are available. Require MRFs to provide documentation regarding end-market availability.

Frozen and refrigerated food boxes (wet-strength paperboard)

Why? Paper products intended to be frozen or refrigerated (wet-strength) do not break down in water and contaminate paper at kraft paper mills.

BMP: Collect only if end markets are available. Rinse and sort with cartons and aseptic containers.

Paper egg and berry cartons

Why? Due to possible food contamination, paper egg and berry cartons in paper bales are prohibited by Chinese customs. They are also made from low quality paper fiber and have limited end-markets.

BMP: Collect only if end markets are available.

Plastic caps and lids

Why? Most – but not all – MRFs can process plastic bottles with caps left on allowing them to "follow the bottle" through the MRF. Check with your MRF before promoting "caps on." If the caps and lids are not attached to the bottle, they contaminate paper or end up as garbage. Lids from dairy tubs should be discarded.

BMP: If your MRF approves, keep plastic caps on empty bottles. Put all other lids in the garbage.

Other plastics

Why? Optical sorters commonly sort plastic containers incorrectly (i.e. PS or PVC plastic containers are sorted as PET). MRFs that use hand sorters instead of, or in addition to optical sorters may be able to process PS or PVC containers. Larger plastics such as lawn furniture and kids toys are difficult to collect at the curb and may be too big for some MRF conveyor belts. Conversely, small items such as bottles smaller than 8oz can fall through the processing system, can contaminate other sorted materials, and may not be recovered. These plastics do not have reliable end-markets.

BMP: Check if your MRF can handle these materials. Require that plastics are sorted by resin type into market-ready bales. Instead of a mixed plastic (#3-7 bale), sort plastics into separate market-ready bales, including low-density polyethylene (#4 LDPE), polypropylene (PP, #5) and polystyrene (PS, #6 not expanded). Require documentation from MRFs that plastics will be sorted by specific resin types into "mill ready" bales. Require documentation that the plastics were sold and delivered to viable end-markets.

Metal aerosol cans

Why? Since aerosol cans are pressurized, they can threaten the safety of MRF facility staff. Full or partly full cans contain hazardous chemicals, so it is important they be disposed of properly.

BMP: Take full or partly full aerosol cans to county household hazardous waste facilities. Check if your MRF can handle empty aerosol cans.

Following these best management practices and focusing on collecting high quality materials should lead to less contamination and more real recycling, where materials are clean, marketable and can be used as feedstocks to create new products.

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