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Municipal Guidelines Committee 2016

Addressing the Challenges of Curbside Recycling

In this document we look to address the major challenges the recycling industry has been and continues to face due in large part to the failed practices associated with curbside recycling programs. The individuals responsible for the compilation of this document have over 100 years of combined experience in the recycling industry. However, our research is based not only on our own diverse personal experiences, but also from the feedback of many others within our industry that have made private and/or public commentary in regard to this topic.

From this document we hope to further ignite the much needed discussions around developing a more sustainable plan for curbside recycling. It is critical for our industry that we get this right. Big changes are needed and everyone involved in the process must understand their role and do their part for curbside recycling to work sustainably.

Municipal Guidelines Committee

Opening Statement

As members, not just of the recycling industry, but of society it is our desire to see recycling grow and continue to be a major contributor to the sustainability initiative of the world. However, the industry today is facing massive challenges that are ultimately blocking that growth from happening. While some of these challenges can be viewed as cyclical, others are undoubtedly systemic. If these challenges are not addressed in a broad based, meaningful way you will begin to see many “Material Recovery Facilities” (MRFs) close their doors and/or go out of business. You will see many remaining companies divest due to lack of profitability. This will cause recycling rates to decrease, which in effect will cause more tons to end up in the landfill. This is not a sustainable path for the future. Therefore, the industry must take steps to evolve from where it is today.

While we all agree that recycling is the right thing to do, it cannot continue through private and/or public companies if it cannot generate a reasonable profit for those handling, processing, buying and/or selling “recyclable commodities.” As a country built on capitalism generating a profit is necessary for a business to exist. Profit leads to investment and investment leads to innovation, which paves the way for better and more efficient ways of recycling. The CEO of Waste Management had this to say in reference to recycling, “And we all know what happens when it becomes unprofitable: people don't invest.” “And, you know, we generally invest \$100,000,000 to \$200,000,000 a year in recycling assets. The last two years we haven't invested **any**.” When the largest recycling company in the world doesn't think it's prudent to continue to invest in this business segment people better take notice and ask themselves, why? We have been and continue to be in an environment where most companies in this industry, public and private, large and small will tell you the same exact thing.

Again, the purpose of this document is to unveil the major challenges we have been facing and continue to face with curbside recycling, so that we can start and in many cases continue to have the necessary discussions with our state's municipalities around determining a better, more sustainable path forward. It must be an industry wide effort and we must get it right. Failure to do so puts the whole industry at significant risk. It is critical that we partner together in this effort.

I. Challenges

As previously stated, there are many significant challenges we are facing in our industry. Inbound curbside materials are more contaminated than ever, consumer preferences are driving light-weighting and new packaging demands, labor/handling/processing costs have increased dramatically, commodity prices have decreased over an extended period of time and end-user's quality requirements have increased substantially since 2013. One of these challenges alone makes things difficult, but when you combine all of them together (a perfect storm) it simply creates a largely unprofitable business model. It is critical that we continue to recycle, but private and public companies must also be able to generate a profit in order to do so. While recycling is critical for the environment, it cannot be viewed as a "free" or "charity" service. We must always remember that recycling is a business service that requires a tremendous amount of capital, technology and man power to be done right.

It is our collective opinion that the curbside recycling process is largely broken. It is futile to point the finger in any one direction. That is not our intention. There is enough blame to go around to everyone who is involved in the process. More importantly, it is critical we all become aware of the flaws and look to develop new solutions and enforce necessary changes in our curbside recycling programs, so that it is more sustainable. Let's take a look at each major component and the negative effect it is having, so we can all become more aware, start/continue to have serious discussions and create a more sustainable path forward together.

Contamination

Single-Stream is a recycling process that has been around since the 1980's. While it is a great concept in theory, the realities of it can be far different. For those that may not know, one of the major thoughts behind single-stream is to place all of your recyclable materials into one bin at the curb making it easier for residents to recycle and thus increasing recycling rates. What we have been and continue to see happening is that many people are placing anything and everything in their recycling bins, seemingly to not care or perhaps confusing their recycling bins with their garbage bins. Many people are just simply "hoping" that an item will be recyclable, so in the bin it goes. Additionally, many municipal partners have abandoned sound educational practices in favor of blindly expanding the scope of "acceptable" recyclables to divert more tons from landfills.

Further, some MRF operators in an effort to be more competitive have expanded their spectrum of “acceptable” items to include many non-recoverable items to make it simple for the consumer. As a result, it is all too common for MRFs to receive items like bowling balls, animal carcasses, concrete blocks, water hoses, chemicals and medical waste. Not only are these items not recyclable, but they destroy the processing equipment, they contaminate the good quality materials that MRFs have to market to customers and they put the people working in these facilities at a tremendous health & safety risk. Even with the latest technological equipment that costs each facility hundreds of thousands to multiple millions of dollars it is simply not enough to adequately handle all of these contaminating materials that continue to come in through the curbside programs. It is absolutely necessary to check with your local MRF on items in question and return to the mindset of “when in doubt, throw it out.”

To be clear, there are three separate issues pertaining to the wrong type of materials being put into the curbside bins. First, there are the “non-recyclable” (see pages 8 & 9) materials like concrete blocks, animal carcasses, bowling balls, stones and medical waste that belong in the garbage bin(s). Second, there are the “non-acceptable” (see pages 8 & 9) materials like electronics, food soiled boxes, wire hangers and wax paper that can technically be recycled, but should not be placed in your curbside bins (Programs vary. Check with your local recycler). Both of these types of materials are being placed in overwhelming amounts into the curbside recycling bins. This must stop. The third issue is that even when the right materials are being placed in the curbside bins they are often being left opened and exposed to the weather. Once these materials become wet (in some cases frozen) it becomes extremely difficult for MRFs to process (separate) these materials and therefore greatly affects the quality/value of the final product(s) being made to sell into the market place. This is not what these curbside systems are designed for and they simply cannot handle materials of this nature efficiently. If we continue to collect wet, non-acceptable and/or non-recyclable materials the system will continue to fail and be unprofitable for those handling/processing, buying and selling these commodities. We have reached a point where the costs to process are often higher than some of the materials are actually worth in the marketplace. When costs are higher than the value of your product(s) you no longer have the right to exist as a business in a free market capitalistic society.

With such enormous investments already made in single-stream recycling by companies in the State of New Jersey and around the country it hard to imagine it is going anywhere. The concept is not a bad one and it can work, but the practices, processes and commitments from those involved must change for it to work in a sustainable and profitable fashion. Recycling right needs to be enforced and it starts at the curb! What is recycling right? It is placing acceptable (check with local recycler) recyclable materials only, loose in bins, covered from the weather. For all other materials you should check with your local recycler before placing it in your curbside bin. Some materials may be required to be dropped off separately and others may be required to go to the landfill. This is what must begin to happen for this process to work effectively. Recycle right and enforce it. These two components must go hand-in-hand for recycling to work sustainably.

The Changing Stream: Light-Weighting and Changes in Preferences

MRF processors have been forced to deal with both light-weighting of materials in the curbside stream and the elimination of some grades. This is due largely to consumer preferences such as changes in packaging and shifting from paper to electronic technology. The sustainability movement is continuing to drive American brands to use innovative packaging that consumes fewer natural resources, commonly known as “light-weighting.” Since the beginning of curbside recycling a sheet of newsprint is now 15% lighter. Many container grades are lighter as well. For example, a PET water bottle is down 32%, aluminum cans (UBC) down 17% and HDPE milk jugs are 30% lighter. This means a processor has to touch 10,460 more PET bottles for every ton of PET and 12,100 more aluminum cans for every ton of UBC. This reduces the value of every ton of curbside recyclables. While light-weighting reduces the value it also increases costs because processors have to process more items to yield the same volumes.

Another packaging change that has negatively impacted processing is the use of “flexible packaging.” This is the fastest growing type of packaging in America. According to Natural Resources Defense Council, “virtually none of these flexible packaging materials are recyclable anywhere in the world.” Keep in mind, 1.5 lbs. of flexible plastic replaces 6 pounds of PET and 3 pounds of UBC. These changes are significant.

Another example of new packaging adversely impacting the MRF involves laundry detergent. Liquid laundry detergent was packaged in HDPE containers, which had a significant value.

Packaging in this area has been shifting to laundry detergent pods. These pods are premeasured resulting in no wasted product and generally come packaged in a flexible pouch, which is not recyclable. This one change today has a financial impact of about \$500-\$600 per ton given the lost value of HDPE pigment containers and the increased landfill disposal cost.

Lastly, it is no secret that the American consumer is rapidly moving from traditional sources of news consumption (newspapers and magazines) to on-line digital mediums. While the changes listed here are culturally positive, stakeholders in the recycling value chain need to recognize the higher cost in processing recyclable materials, such that, the cost to process may continue to exceed the available value even when markets recover.

Rising Labor/Handling/Processing Costs

The equipment that is used to handle/process acceptable curbside materials is extremely expensive. It is quite common for MRFs to spend hundreds of thousands to multiple millions of dollars to have the right equipment in their facilities and on the road to quickly and efficiently handle/process curbside materials. However, it is important to keep in mind that the equipment was not designed to handle many of the non-acceptable and/or non-recyclable materials that are coming in through the curbside recycling programs. When you start placing these materials through curbside recycling systems it ultimately causes three major problems.

First, it causes the equipment to slow-down, breakdown and/or malfunction much more frequently than it otherwise would. This has increased processing costs significantly. Fixing a piece of equipment on a multi-million dollar system is not like changing a flat tire on your bike. It takes time, it takes expertise and it takes a lot of money. While equipment is all but guaranteed to break down at some point, it occurs much more frequently than it should due to the contaminating materials being put through the system. Secondly, when these overwhelming amounts of contaminating materials go through the system it's important to acknowledge that some of it (in some cases a lot of it) will make it all the way through into the final product(s) that the MRF's have to sell in order to make money. When these finished products are contaminated it decreases the associated value significantly. If the quality is very bad the bale must be broken open and put back through the system, which again increases the costs. Lastly, these contaminating materials coming in can be very dangerous to handle. There are men and women working on and around these

sorting lines for hours every day. They are constantly being exposed to harmful materials like chemicals, medical waste and food waste. People are being exposed to extremely harmful materials and we really need to acknowledge the health and safety risks these contaminating materials can and do cause.

Who is responsible for these costs due to contaminated curbside materials? Is it the MRF? The Municipality? The Residents? Should these costs be shared? The fact of the matter is that it costs a tremendous amount of money to sort, separate and dispose of all of the contaminating materials coming in through the curbside programs. For it to be done safely and sustainably everyone must accept these realities, do their part and share in the true the cost of it.

Commodity Prices

Commodity prices have been and continue to be low. Many will look to point out that commodity prices are cyclical and go up and down over time. While we can all agree that commodity prices are indeed cyclical there is nothing that says these cycles can't stay low for months or years. Are the MRFs and the municipalities they partner with on the same page and prepared for that? Today, when you look around you will see the smallest to the largest companies in survival mode refusing to invest another penny and cutting all available costs. It is still not enough. The reality is that the economics of single-stream recycling (the way it is today) cannot withstand low prices over long periods of time. The costs are too great and the margins too small. MRFs cannot be the only ones to bear the weight of lower commodity prices and increased costs. Municipalities need to understand this and take on their part. There needs to be a greater shift towards agreements that allow processors to be compensated fairly for their services regardless of market conditions and allow each party to share the benefits of higher prices. The markets are changing all the time, the waste stream is changing and the values of recycled commodities are changing. Greater flexibility, transparency and understanding need to be built into our partnerships for recycling programs to be sustainable.

Certain aspects of prices are out of all of our control as markets are largely based on supply and demand. However, the aspect of pricing we do have control over involves producing a consistently high quality product. If MRFs are able to produce a high quality product than they will receive the top market dollar. If the quality of the product is low, not only will the MRF receive the

lowest value, but there will even be times when no end-users will take it at all. If there's no market for the material than its value is zero and it must be either placed in a warehouse (hoping the price will go up) or sent to the landfill at a cost. Producing good quality materials ensures you will just about always have a market and at the best price available at that time.

Therefore, in order create top quality recyclable commodities people need to be continually educated about recycling, material must come in cleaner from the curb, it must be enforced and the MRFs must process it in whatever way necessary to remove the vast majority of any non-acceptable and non-recyclable materials that remain. This includes having the necessary technology and man power throughout the system. Top quality equals top value. As countries around the world grow and their collection systems become more sophisticated MRFs in the USA are facing increased competition from around the world. If they don't produce top quality products then customers will look to other countries for what they need. It's that simple.

End-User's Quality Requirements

Starting in 2013, China (the world's largest consumer of wastepaper) implemented a quality initiative called, "The Green Fence." This initiative quite literally turned the industry upside down overnight. Up until that point MRFs were able to get away with shipping lower quality products largely produced from dirty single-stream/curbside materials to end-users without a lot of repercussions. This Green Fence initiative involved a very strict quality standard that had to be met in order to get your cargo cleared through Chinese Customs. Failure to meet the quality standards resulted in severe downgrades and/or outright rejections of cargo resulting in massive financial losses felt around the industry. For example, if a supplier shipped one bad container of material out of a total order of ten, then customs had the ability to reject the entire shipment even if the other nine containers contained good materials. The cost of shipping containers half way around the world only to have to be returned to the United States is enormous. In fact, it led to many companies going out of business.

While this initiative hurt many businesses, it also forced many to try to produce better quality products. Many thought this initiative would be short-lived, but it still remains today and will most likely only become more stringent. Not only is China enforcing stricter quality standards, but all other countries are as well. In an increasingly competitive global market place it is essential we

produce high quality products that our domestic and overseas customers want and need. The reality of the material we are producing today from the single-stream is that it is quite often not up to the specifications that the mills require. This results in a great deal of lost revenue and customers looking elsewhere for their needs. Again, it is an enormous problem with huge financial implications for all parties involved. These problems can range from a few thousand dollars to millions of dollars when the problem exists with large shipments to overseas customers. Quality is no longer an option, but mandatory to be in and stay in the game.

Greater education is needed in order to promote cleaner recycling at the curb. This is where the crux of the problem lies. Early in recycling’s evolution education was a primary concern. Dual stream markets had no tolerance for contamination. The same is now true today for single-stream collection. We must go back to intense education on what is acceptable in our curbside programs to maintain a sustainable industry. Education is the first and most important step for the process to work. Only acceptable recyclable materials, loose in covered bins should be collected as part of any curbside recycling program. At that point, it is on each individual MRF to produce high quality products.

II. Acceptable/Non Acceptable Materials in Curbside Recycling

- a. List may vary at each Material Recovery Facility.
- b. All materials should be loose in bins. No materials should be in bags.
- c. Other materials may be recyclable, but should not be put in your curbside bin.
- d. Bins should be covered from the weather.
- e. When in doubt, check with local recycler.

Paper Acceptable	Paper Non Acceptable (Some Examples)
<ul style="list-style-type: none"> • All full-sheet office paper, white paper • Colored paper • Newspaper (plastic bags and strings removed) • Magazines (all types), catalogs (all types) • Phonebooks (all types) • Junk mail • Paperboard • Tissue boxes • Heavy weight folders • Paper towel and toilet paper rolls 	<ul style="list-style-type: none"> • Shredded Paper (Single-Stream) • Napkins • Tissue paper • Wall paper • Paper towels • Wax paper • Wrapping paper • Any paper which has the potential to be contaminated with bodily fluid

Cardboard Acceptable	Cardboard Non Acceptable (Some Examples)
<ul style="list-style-type: none"> • Corrugated cardboard • Brown paper bags • Boxboard (i.e. shoeboxes, gift boxes, cereal boxes) 	<ul style="list-style-type: none"> • Cardboard lined with plastic (i.e. bubble wrap boxes) • Waxed/waterproof cardboard • Food soiled boxes (i.e. pizza boxes)
Plastics Acceptable	Plastics Non-Acceptable (Some Examples)
<ul style="list-style-type: none"> • Only bottles, jugs and jars (materials must be rinsed) i.e. soda bottles, laundry detergent jugs, water bottles, milk jugs etc.... 	<ul style="list-style-type: none"> • Plastic “baggies” • Plastic tableware • Styrofoam containers • Shopping, Grocery, Retail bags • Clam-Shells (take-out containers)
Metals Acceptable	Metals Non Acceptable (Some Examples)
<ul style="list-style-type: none"> • Aluminum and tin beverage containers (materials must be rinsed) • Metal and tin food containers (materials must be rinsed) 	<ul style="list-style-type: none"> • Metal and cardboard containers • Paint cans • Aerosol cans
Glass Acceptable	Glass Non Acceptable (Some Examples)
<ul style="list-style-type: none"> • Bottles and Jars only (rinsed) 	<ul style="list-style-type: none"> • Everything else

Other Prohibitive Materials

- Electronics – Cell Phones, Ipad, IPods, Laptops, Desk Tops etc...
- Radioactive Materials
- Hazardous Materials – Oil, Paint, Antifreeze
- Corrosives – Batteries (not contained in e-scrap)
- Non-Electronics – Tires, fiberglass, wood, asbestos, appliances, roofing, solid waste, furniture, ceramics
- Compressed Gas Cylinders
- Flammable Materials
- Other Hazardous Wastes – Pesticides, oil filters, mercury switches, biohazards, fluorescents, lights, air bags, lead, tube tvs
- Refrigerants – Freon/Puron/Substitutes, compressors, air conditioners
- PCBs – Capacitors, transformers, ballast
- Explosives – Fire arms, ammunition, shells
- Medical Waste – Needles, Syringes etc...

III. Educational Guidelines

Throughout this document we have been hammering on the point of education. It is absolutely critical to recognize that educating people on the requirements of recycling properly is paramount. Make no mistake; this is where the crux of the problem lies. Unless it is addressed at the source there is not a whole lot that will change and we will continue to produce inferior products that are increasingly difficult to market at top value, which ultimately costs everyone money. Remember, we are in competition with the rest of the world. If we don't produce what customers want and need, they will look elsewhere for other alternatives.

In more recent years the education piece of the recycling process has mostly been done in a way that shows a lack of priority and commitment. Greater awareness must be achieved and more dollars must be spent to educate the public. Everyone knows at this point that recycling is important and most people want to recycle. However, most people do not know what should and should not be in their curbside recycling bins. This is a major problem for all of the reasons previously stated.

The men and women that are picking up curbside recyclables should be trained to not unload bins with trash in it or other non-acceptable items. If not, MRFs should begin to enforce downgrades on site or even outright rejections of inbound contaminated material redirecting it to the landfill. Every town should commit to a program of continued education to keep the inbound stream clean. If the town wants the MRFs support with education then it has to come with a fee for that service. The greater the awareness the greater the result will be and the more dollars will be saved in the long run for everyone involved. Recycling is a critical component of the sustainability initiative of the world, we must start investing in it accordingly and that starts with making education a top priority and a commitment to consistent enforcement.

IV. Financial Impact

It is important to understand the following financial impacts resulting from having a contaminated inbound waste stream. We will not get into great detail here, but hit on the major point:

- a. When the value of the total inbound mix, including the residue and glass expense, is less than the cost to process there will be a charge for processing recyclable materials.

- b. There will be rejections or chargebacks for moisture and contamination.
- c. There will be adjustments allowing processors to pass through any wage or tax increases caused by a change in law.

V. Global Market Place

Our industry is part of the global economy. Much of the recyclable materials we produce here in the United States are purchased by end-users overseas that use these materials to make new products. As the demands of the customers change overseas, so must the products we produce in order to obtain maximum value and reduce waste. As with any commodities prices will go up and down over time, but maximum value will always be achieved with a consistently high quality product that customers want and need.

Nonetheless, the global impacts and the uncertainty of the commodity markets are unpredictable. Therefore, processors should not be required to bear the risk of an unpredictable market when such risk has the ability to force a business to close its doors. Also, it's important to acknowledge that the composition of recyclable materials is changing. As companies around the country and world continue to innovate and find more cost effective ways of creating their products, so does the value of these recyclable materials. Municipalities and MRFs must work closely together to understand the ever changing dynamics of the recycling markets, so that we can continually move forward in a sustainable fashion.

As members of this industry and of the global market place we must constantly re-evaluate the commitments, protocols and processes we have in place for our curbside recycling programs. Changes must be made to create a more sustainable and profitable path forward, so that the necessary investments can start being made again leading to better, more efficient ways of recycling. The time to act is now. Please join us in this fight.