



NORTHEAST MRF GLASS SURVEY

REPORT

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INTRODUCTION & BACKGROUND

The [Northeast Recycling Council, Inc. \(NERC\)](#) is a multi-state non-profit organization that is committed to environmental and economic sustainability through responsible solid waste management. NERC conducts projects that influence policy and effect change through research, technical assistance, demonstration projects, and education.

The eleven Northeast states that NERC works with (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont) are interested in glass recycling and in supporting the highest value end markets for this material—glass container and fiberglass manufacturers. This interest led NERC to convene a Glass Committee in August 2017 with the goals of better understanding the recycled glass value chain and gaps in the Northeast, and to identify the role that NERC may be able to play in promoting greater diversion of glass containers to the greatest value end uses. The original Committee members were:

- Luke Truman, Allagash Brewing
- Peter Schirk, BHS-Sonthofen
- Sarah Reeves, Chittenden Solid Waste District, Vermont
- Michael Foote, City of Reading, Pennsylvania
- Ray Dube, Coca Cola Bottling of Northern New England
- Chris Nelson, Connecticut Department of Energy & Environmental Protection
- Susan Collins, Container Recycling Institute
- Natalie Starr, DSM Environmental
- Ted Siegler, DSM Environmental
- Megan Pryor, Maine Department of Environmental Protection (Committee Chair)
- Brooke Nash, Massachusetts Department of Environmental Protection
- Steve Changaris, National Waste & Recycling Association
- Chaz Miller, NERC Board Member
- Terry Laibach, New York State Department of Environmental Conservation
- Kayla Montanye, New York State Department of Environmental Conservation
- Curt Bucey, Strategic Materials
- Chuck Riegler, TOMRA
- Cathy Jamieson, Vermont Agency of Natural Resources
- Committee staffed by Mary Ann Remolador, NERC

Click [here](https://nerc.org/projects/current-projects/nercs-glass-committee) (<https://nerc.org/projects/current-projects/nercs-glass-committee>) for a current list of the Glass Committee members.

In 2017, there were six glass manufacturers—five glass container and one fiberglass—in the Northeast. There were also ten glass processing facilities in the region. In the New England states, there was one glass container manufacturer and one fiberglass manufacturer.¹

¹ Source: Glass Packaging Institute's Glass Resource Locator <http://www.gpi.org/glass-resource-locator>

Five of the region's states have bottle deposit laws that generate a significant amount of clean glass (higher value).² This source separated glass typically does not go to a Material Recovery Facilities (MRFs)³ and readily finds its way to manufacturers.

NERC's Glass Committee identified the primary problem with the region's glass is the material coming from MRFs.⁴ In 2017, the Committee was unclear about how glass flowed through the region's recycling systems. As a result, the Committee decided to survey MRFs throughout the region. NERC conducted the MRF survey from February 2017 – June 2018. Ninety-one MRFs were contacted and 45 completed the survey.

The survey results are a snapshot in time about Northeast MRF glass in an 11-state region.

KEY FINDINGS

Forty-nine percent (49%) of the MRFs in the NERC region responded to the survey, but not all MRFs answered all of the questions. These findings reflect the answers received from the participating MRFs, but may or may not be representative of the entire region.

- 54% of the reported glass tonnage from Northeast MRFs is sent to glass processors to be cleaned.
- 0.02% of the reported MRF glass tonnage is sent directly to a glass container manufacturer.
- 0% of MRF glass is sent to fiberglass manufacturers.
- 5% of MRF glass is used for aggregate, 2.70% as roadbase aggregate, and 0.01% for other beneficial use.
- 38.27% of MRF glass is used at landfills – for alternative daily cover (23.50%), trash (14.65%), and roadbase or fill (0.12%).
- 67% of the MRF respondents have not upgraded their facilities in the past three years.
- 65% of the MRFs do no additional cleaning of glass at their facilities.
- Only six of the respondent MRFs have a total percentage of Non-Glass Residuals & Fines of 10% or less. Five of these serve communities with either curbside separation of glass or dual stream recycling programs.
- From the perspective of the MRFs, the primary issues with recycled glass are wear and tear on equipment, lack of markets, contamination, and cost.

² According to the Container Recycling Institute, approximately 475,000 tons of glass are collected annually, through the container programs in Maine, New York, Connecticut, Massachusetts, and Vermont.

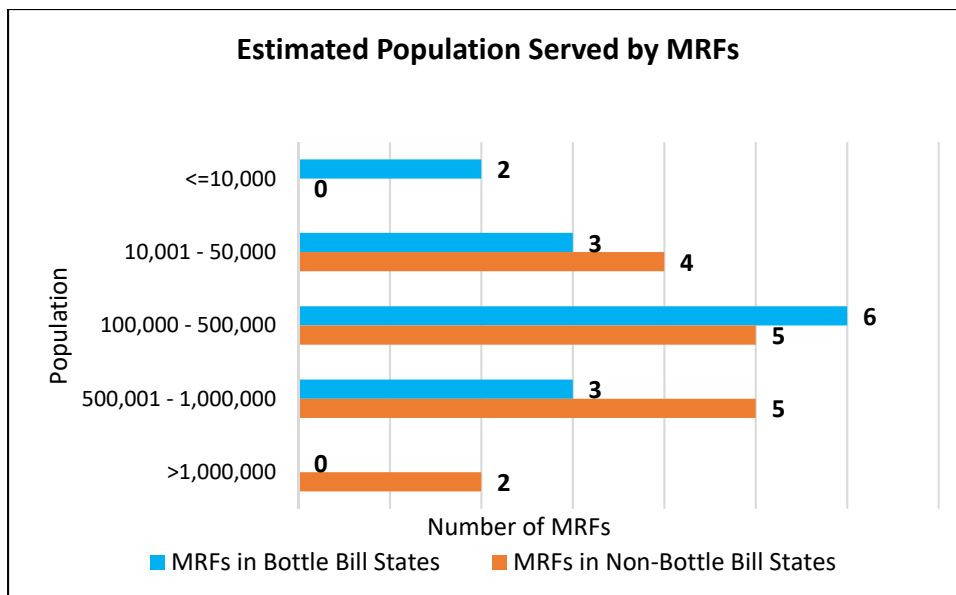
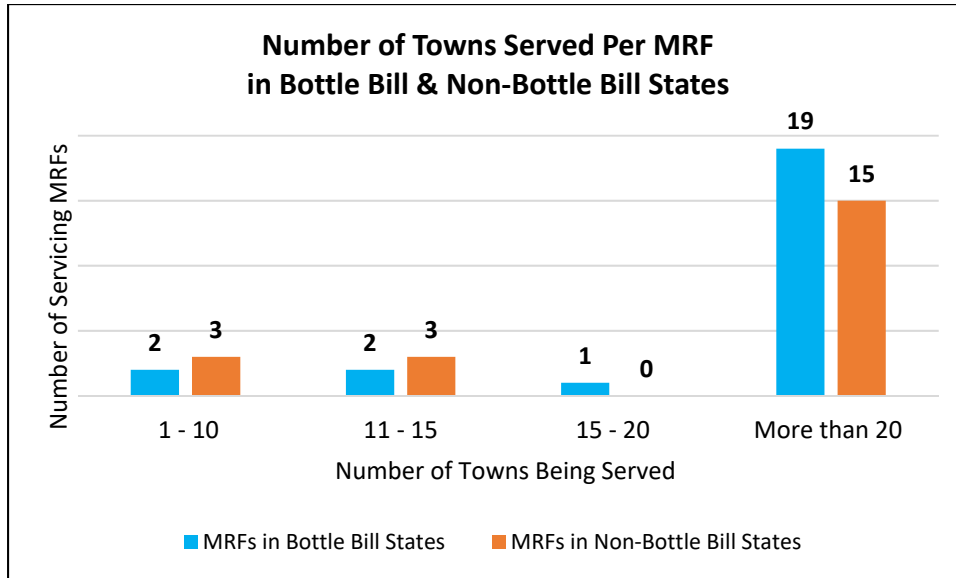
³ Definition of a Materials Recovery Facility (MRF) - is a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers.

⁴ MRF glass typically has high levels of contaminants and fines making it a low value material. Typically, this glass is unsuitable for the container and fiberglass manufacturers without first going to a processor for cleaning.

MRF SURVEY RESULTS

Survey Demographics

MRF Glass Survey Response Rate	
Total MRFs Contacted	91
Total Survey Responses (49%)	45
Survey Responses Received from MRFs in Bottle Bill States	24
Survey Responses Received from MRFs in Non-Bottle Bill States	21

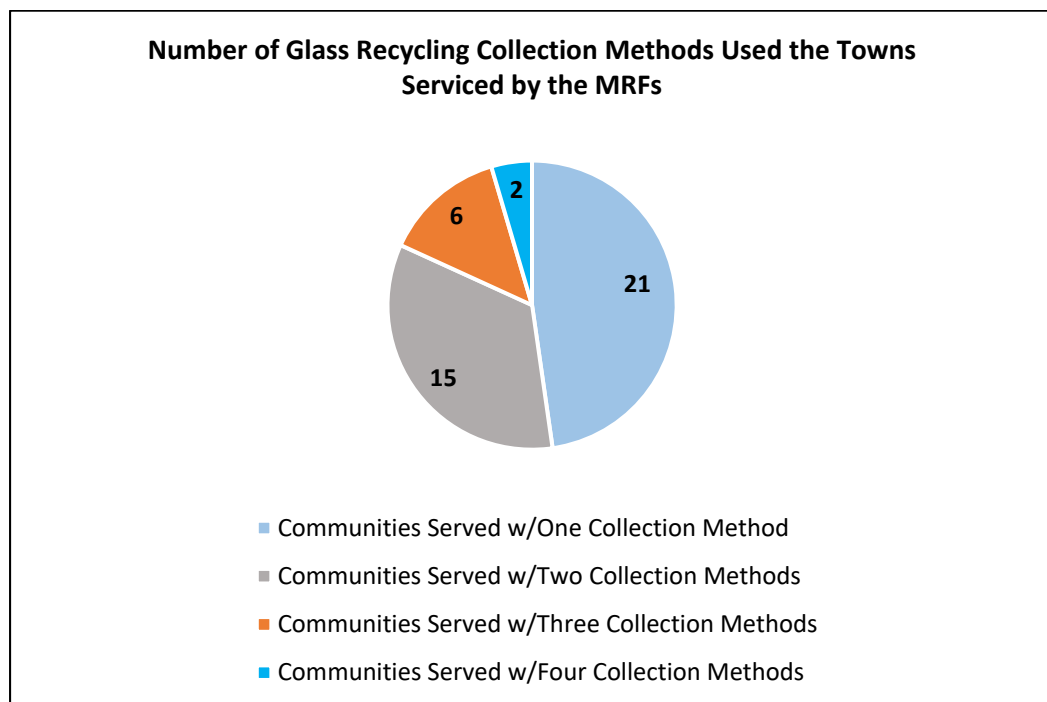


*Of the 42 responses received, 12 MRFs (29%) reported that they did not know the total population they serve.

Recycling Collection Methods in Served Communities

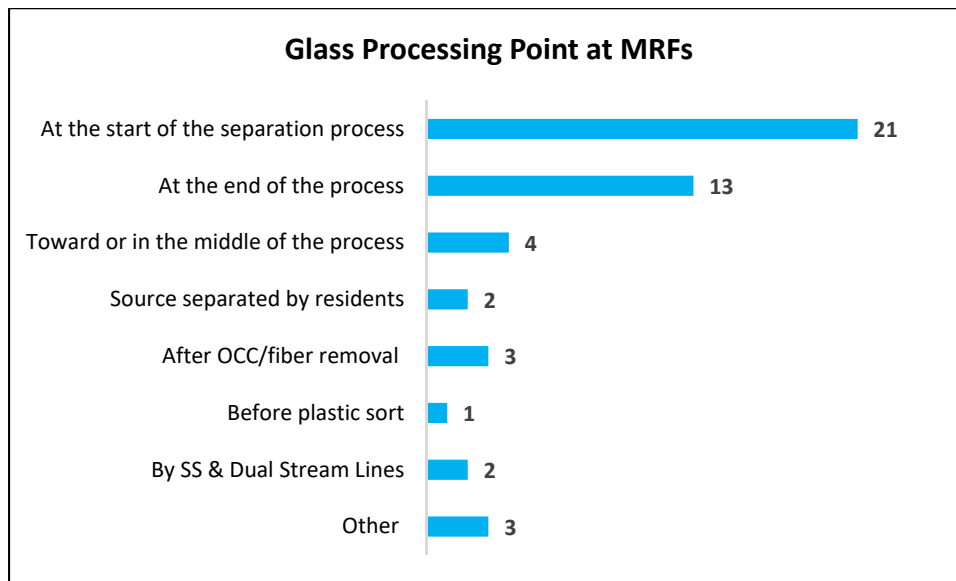
Summary of Glass Recycling Collection Methods in the Communities Served by the MRFs	# of Responses	% of Total Responses
Single Stream	33	73%
Dual Stream	18	40%
Single Stream & Dual Stream	14	31%
Source Separated at Facility ⁵	12	27%
Specific Drop Off Locations	11	24%
Source Separated Curbside ⁶	3	7%

*44 MRFs responded. More than one response was allowable for this multiple-choice question.



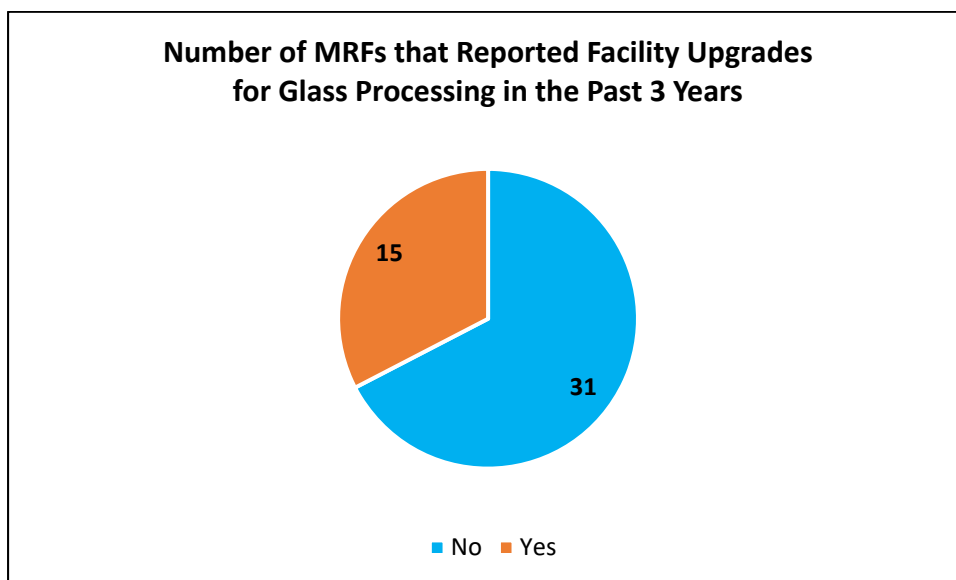
⁵ Source separated at the facility refers to MRFs that receive glass that has been collected separately from other recyclables and processes them separately.

⁶ Source separated curbside refers to a recycling program that requires residents to separate their recyclables and keep them separated when setting them out at the curb.



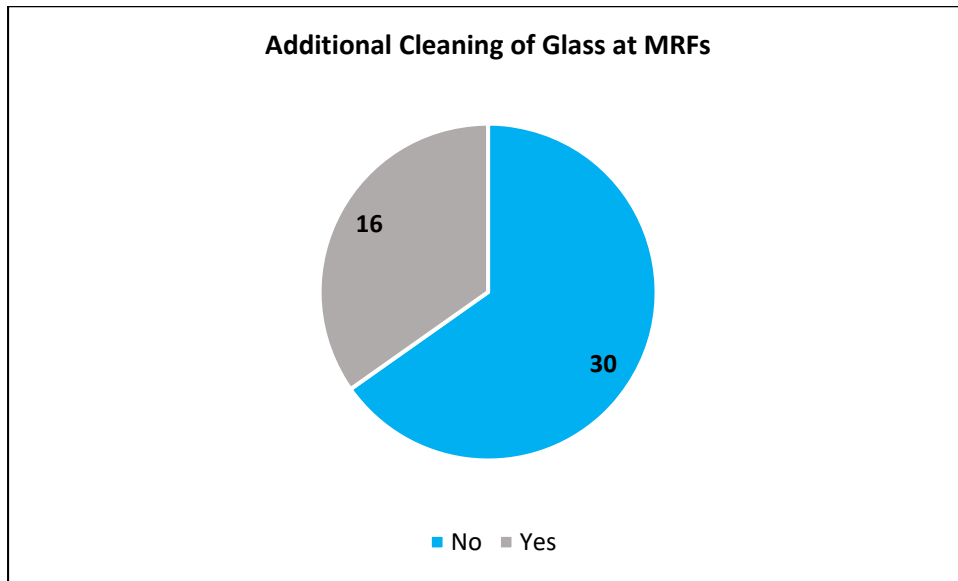
* 41 MRFs responded. More than one response was allowable for this multiple-choice question.

Glass Processing Point - Other Responses
Arrives color-sorted from communities.
Last on the Single Stream line, and first on the Dual Stream line.
In the middle for the Single Stream Line, and at the beginning for Dual Stream.

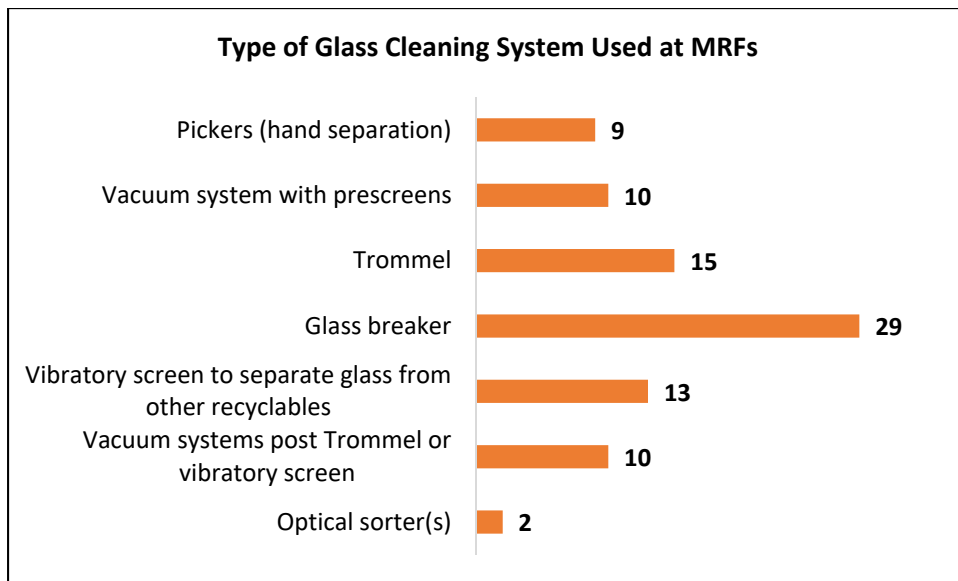


*46 MRFs responded.

Glass Cleaning at MRFs

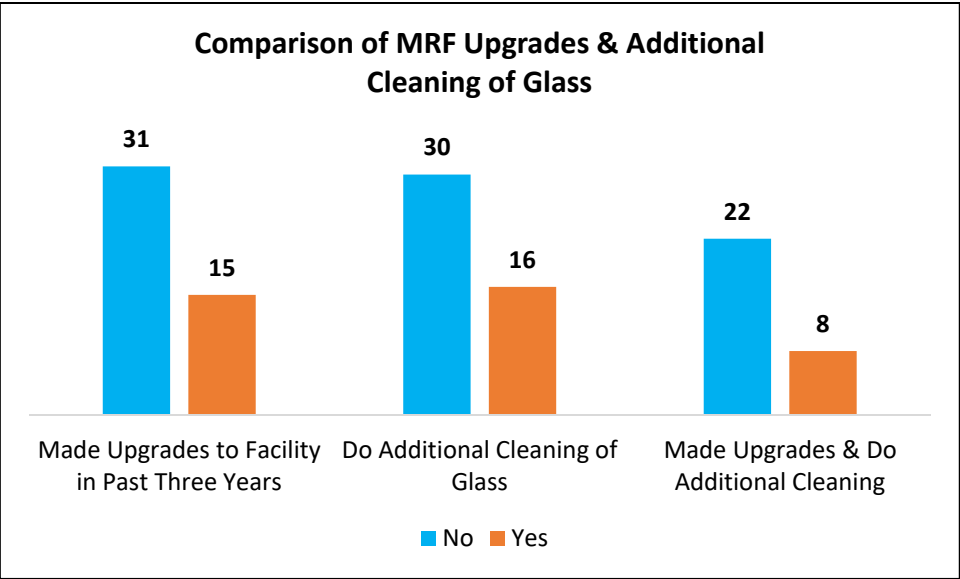


*46 MRFs responded.



*39 MRFs responded. More than one answer was allowable for this multiple-choice question.

Comparison of MRF Line Speeds	
	# of MRF Responses
Design & Actual Line Speeds Are Equal	11
Design Speed is Greater Than Actual Line Speed	14
Actual Line Speed is Greater Than Design Speed	5
Unknown	4
Variable	1
Incomplete Response	1
NA	4
Total MRF responses to question	40

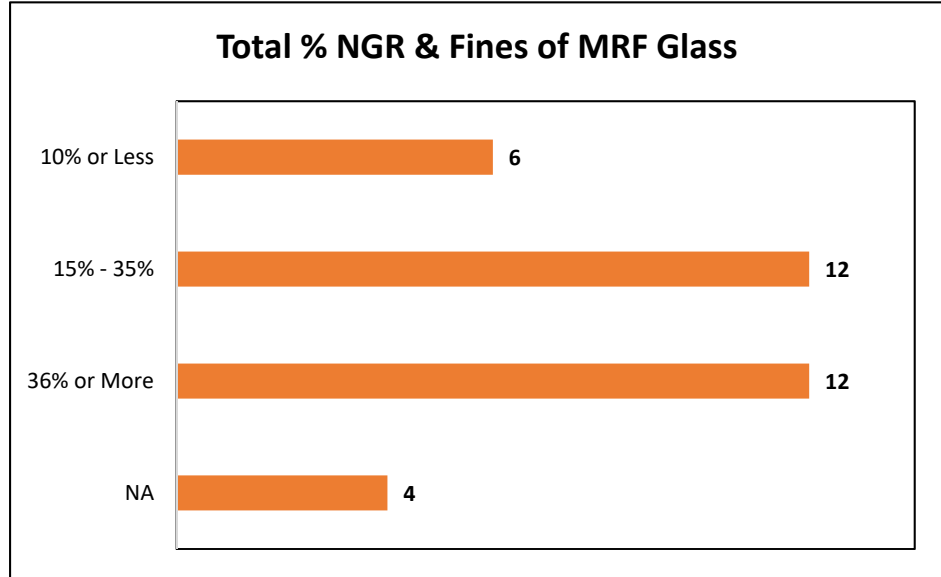


Quality of Processed MRF Glass

% of Non-Glass Residue (NGR) & Fines In the Recycled Glass	
% of NGR	% of Fines
0	0
0	0
1	50
2	1
5	5
5	
5	5
7	90
8	7
8	43
12	12
13	13
14	22
15	15
15	10
17	40
19	21
20	23
21	18
24	21
25	5
27	8
33	
35	
35	
50	30
50	2
75	25
NA	NA
NA	NA
NA	NA
NA	NA
	100
	75

*34 MRFs responded.

**Blank cells indicate no response provided.



*34 MRFs responded.

Comparison of Six MRFs with Lowest % of NGR & Fines			
0% - 10% Total NGR & Fines	Type of Recycling Collection Program	Cleaning System(s)	Upgrades Made in Past Three Years
0	Source Separated at Curbside & Facility & Drop Off Locations	Pickers	No
0	Source Separated at Curbside & Facility	No response given to the question.	No
3	Dual Stream	Pickers, Glass Breaker, & Vibratory Screen	Yes
5	Dual Stream & Source Separated at Facility	Vibratory Screen & Optical Sorter	Yes
10	Single Stream	Glass Breaker, Vibratory Screen, & Vacuum System Post Vibratory Screen	Yes
10	Single Stream & Dual Stream	Trommel & Glass Breaker	Yes

Quantity of Recycled MRF Glass & End Markets

Tons Per Year (TPY) & End Destinations for MRF Glass in 2017			
	Total TPY Reported	% of Total TPY	Number of MRF Responses
Sent to Glass Processor	222,200	54.00%	26
Sent to Glass Container Manufacturers	100	0.02%	1
Tonnage Sent to Fiberglass Manufacturer	0	0.00%	44
Used as Aggregate	20,510	5.00%	11
Used as Roadbase Aggregate	11,087	2.70%	2
Used as Other Beneficial Use	55	0.01%	2
Used as Alternative Daily Cover	96,600	23.50%	12
Landfilled as Trash	60,255	14.65%	10
Used as Roadbase Aggregate or Fill at Landfill	500	0.12%	1
Total	411,307		

*45 MRFs responded. More than one answer was allowable for this multiple-choice question.

Changes in Recycling Markets & Effect on Glass Recycling

Several recycling market changes significantly affected glass markets during the survey period—the closure of the MA-based glass container manufacturer that used a significant amount of recycled glass (March 2018), the subsequent closure of a MA-based glass processing facility (June 2018), and the closure of another glass processing facility in Rhode Island (Spring 2018). The closure of these facilities left New England without nearby glass processing and container end markets for MRF glass.

Also in March 2018, China instituted bans on two globally traded recyclables—mixed paper and mixed plastics. As a result, the overall value of and revenues generated by these materials dropped. Commonly, MRFs depend on recycling revenues to subsidize the cost of less valuable recycled materials such as domestically traded glass.

Due to the timing of the market changes with the survey, NERC contacted the respondent MRFs with additional questions. The following charts summarize the responses received from 14 MRFs regarding the first six months in 2018:

Have the Towns Serviced by MRFs Stopped Collecting Glass in 2018?	
No	14
Yes	0

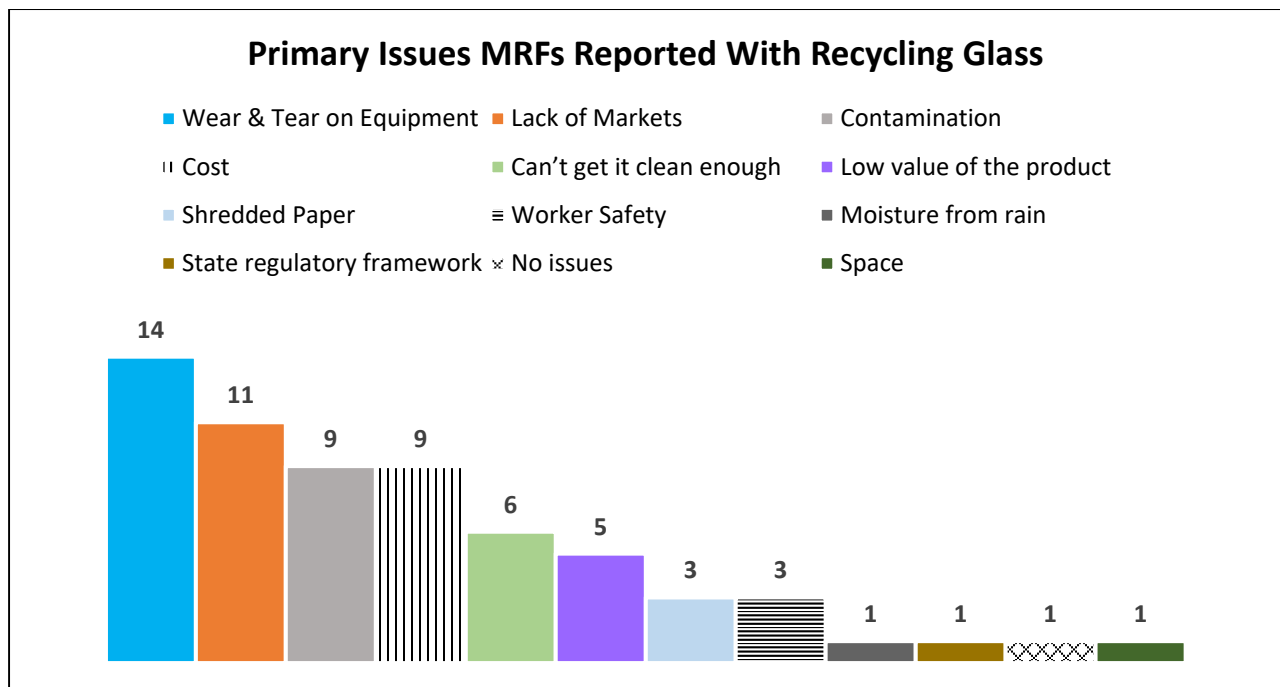
* 14 MRFs responded.

**One county MRF stopped collecting glass as part of their single stream collection due to the cost of recycling glass and the drop in recycling revenues. Drop off locations are still available.

Changes to End Destinations for MRF Glass In 2018		
	Tons	# of MRFs
Increased Tons Going to Glass Processor	9,600	1
Increased Tons Going to Roadbase Aggregate Instead of to Glass Processor	19,831	1
No changes in end destinations	0	12

*14 MRFs responded.

MRF Issues with Recycling Glass



*41 MRFs responded. More than one answer was allowable to this multiple-choice question.

CONCLUSIONS

- The MRFs with the lowest percentages of total NGR and fines were the facilities that took in source separated materials, dual stream materials, or had made recent investments in glass cleaning equipment.
- End markets for MRF glass are dependent upon the availability of local processors and manufacturers (500-mile radius).
- More glass processing capacity is needed in New England. (One example of an expanding glass processor in the region is Pace Recycling, which broke ground on their facility in New Jersey in the Summer 2018.)
- Existing and emerging alternative end markets are an option for MRF glass throughout the region (i.e., Pulverized Glass Aggregate, glass foam aggregate, pozzolanic cement or concrete).
- To increase the quality of the region's MRF glass, greater emphasis is needed for measuring and reducing contamination levels and for cleaning the glass at the MRFs.
- Although NERC's survey did not focus on best practices for managing glass at MRFs, lessons can be learned from the six MRFs that produce the highest quality glass and the communities they serve. Of these, five MRFs serve communities that offer source separation of glass curbside and/or dual stream recycling programs and two of the MRFs keep the glass separated at their facilities. In addition, four of the MRFs have made upgrades in the past three years and do additional cleaning of the glass with a variety of equipment.

APPENDIX – MRF GLASS SURVEY

The Northeast Recycling Council (NERC) (www.nerc.org) is a non-profit organization working with the eleven Northeast states on sustainable materials management issues. NERC's Glass Committee developed this survey to find out about the flow of glass through Material Recycling Facilities (MRFs) in the region.

Confidentiality - The individual responses to the survey will be kept confidential by NERC. A NERC staff member will be the only one to see the completed surveys and to compile the information into aggregate form. If you have any questions or concerns about the survey, contact Mary Ann Remolador, Assistant Director, NERC maryann@nerc.org, 802-254-3636.

1. Contact Information

Name

Company

Address

City/Town

State/Province

ZIP/Postal Code

Email Address

Phone Number

2. How many towns does your MRF serve?

1 - 10

11 - 15

15 - 20

More than 20

3. What is the total population that your facility serves?

4. How is glass recycled in the communities you serve? (Check all that apply)

Single Stream

Dual Stream

Source Separated at Facility

Specific Drop Off Locations

Other (please specify)

5. How is the glass processed through your facility? (Check all that apply.)

- At the start of the separation process
- At the end of the process
- Other (please specify)

6. Has your facility made upgrades for glass processing in the past three years?

- No
- Yes

7. What is your MRF's design line speed?

8. What is your MRF's actual line speed?

9. Does your facility do any additional cleaning of the recycled glass?

- Yes
- No

10. What type of glass clean up system do you have? (Check all that apply.)

- Pickers (hand separation)
- Vacuum system with prescreens
- Trommel
- Glass breaker
- Vibratory screen to separate glass from other recyclables
- Vacuum systems post Trommel or vibratory screen
- Optical sorter(s)

11. What % of non-glass residue and fines are in the recycled glass from your facility?

% of Non-Glass Residue

% of Fines

Don't Know

12. What is the annual tonnage of glass sent to glass processor, or glass container and fiberglass manufacturers?

Tonnage Sent to Glass Processor

Tonnage Sent to Glass Container Manufacturer(s)

Tonnage Sent to Fiberglass Manufacturer

What is the annual tonnage of glass sent to landfills, or used as aggregate, alternative daily cover, or other beneficial use?

13. What is the annual tonnage of glass sent to landfills, or used as aggregate, alternative daily cover, or other beneficial use?

Tonnage Sent to Landfill as Trash

Tonnage Used as Alternative Daily Cover

Tonnage Used as Aggregate

Tonnage Used for Other Beneficial Use – please describe

14. What are the primary issues your facility has with processing glass?

Thank you for taking time out of your day to complete this survey. We truly value your feedback, time, and effort.