

# **Bergen County District Solid Waste Management Plan Plan Amendment**

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## **Solid Waste Management and Funding Strategy**

## **Introduction**

This Bergen County District Solid Waste Management Plan Amendment (“Plan Amendment”) shall serve to update the Bergen County District Solid Waste Management Plan (“Solid Waste Plan”) and set forth the solid waste disposal, recycling, and funding strategy for the Bergen County Solid Waste Management District (the “District”).

## **Solid Waste Composition and Generation**

During 2018 and 2019 the Bergen County Utilities Authority (“BCUA”) conducted a waste quantification and generation study to estimate the quantities of solid waste generated in Bergen County. The June 12, 2019 Bergen County Solid Waste Composition and Generation Study 2003 to 2029 is included in this Plan Amendment as Appendix A. In accordance with this study, the following tables detail the estimated Municipal Solid Waste (“MSW”) and Non-Municipal Solid Waste (“Non-MSW”) composition, generation, recycling and disposal for 2019 - 2029.

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Generation											
MSW Residential	663,722	663,126	662,768	662,644	662,753	663,091	663,656	664,445	665,457	666,690	668,141
MSW CII	468,552	472,020	475,626	479,373	483,263	487,301	491,488	495,827	500,323	504,978	509,796
MSW All (CII+Res)	1,132,274	1,135,146	1,138,394	1,142,017	1,146,016	1,150,392	1,155,143	1,160,273	1,165,780	1,171,668	1,177,937
Non MSW	979,108	987,002	995,219	1,003,767	1,012,650	1,021,876	1,031,451	1,041,383	1,051,677	1,062,342	1,073,385
All Solid Waste	2,111,382	2,122,148	2,133,613	2,145,784	2,158,667	2,172,268	2,186,595	2,201,655	2,217,457	2,234,010	2,251,322
Diversion											
MSW Residential	307,610	309,303	311,050	312,852	314,709	316,622	318,590	320,615	322,697	324,836	327,032
MSW CII	233,486	238,225	243,097	248,106	253,256	258,551	263,996	269,596	275,353	281,275	287,365
MSW All (CII+Res)	541,096	547,528	554,147	560,958	567,965	575,173	582,587	590,211	598,050	606,111	614,398
Non MSW	656,313	663,247	670,432	677,875	685,580	693,552	701,797	710,320	719,126	728,222	737,613
All Solid Waste	1,197,409	1,210,774	1,224,579	1,238,833	1,253,545	1,268,725	1,284,384	1,300,530	1,317,177	1,334,333	1,352,011
Disposal											
MSW Residential	356,112	353,823	351,718	349,792	348,044	346,469	345,066	343,830	342,761	341,854	341,108
MSW CII	235,066	233,795	232,529	231,267	230,007	228,749	227,491	226,232	224,969	223,703	222,431
MSW All (CII+Res)	591,178	587,618	584,247	581,059	578,051	575,219	572,557	570,062	567,730	565,557	563,539
Non MSW	329,481	330,689	331,973	333,334	334,775	336,296	337,899	339,586	341,357	343,216	345,163
All Solid Waste	920,659	918,307	916,219	914,393	912,826	911,515	910,456	909,647	909,087	908,772	908,702

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Material	2003					2019					2029				
	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate
<b>Total paper</b>	<b>33.8%</b>	<b>413,667</b>	<b>146,865</b>	<b>266,802</b>	<b>35.5%</b>	<b>30.6%</b>	<b>346,919</b>	<b>183,258</b>	<b>163,661</b>	<b>52.8%</b>	<b>28.9%</b>	<b>340,698</b>	<b>216,980</b>	<b>123,718</b>	<b>63.7%</b>
Corrugated	9.4%	115,306	64,200	51,106	55.7%	11.8%	133,816	96,916	36,900	72.4%	13.0%	152,559	130,601	21,959	85.6%
Mixed Office Paper	2.8%	33,643	15,605	18,037	46.4%	3.9%	44,239	35,288	8,951	79.8%	4.3%	50,685	40,848	9,837	80.6%
Newspaper	7.0%	85,475	49,401	36,075	57.8%	4.1%	46,492	32,822	13,670	70.6%	3.1%	36,379	28,165	8,214	77.4%
Magazines/glossy & other	14.7%	179,243	17,659	161,584	9.9%	10.8%	122,372	18,232	104,140	14.9%	8.6%	101,075	17,366	83,709	17.2%
<b>Total plastic</b>	<b>9.5%</b>	<b>116,597</b>	<b>4,615</b>	<b>111,982</b>	<b>4.0%</b>	<b>8.3%</b>	<b>94,502</b>	<b>7,618</b>	<b>86,884</b>	<b>8.1%</b>	<b>7.7%</b>	<b>90,285</b>	<b>7,886</b>	<b>82,399</b>	<b>8.7%</b>
Plastic Containers	1.3%	15,480	4,206	11,273	27.2%	2.1%	23,828	5,924	17,904	24.9%	2.4%	28,349	5,497	22,853	19.4%
Other Plastic	8.3%	101,117	409	100,708	0.4%	6.2%	70,673	1,694	68,979	2.4%	5.3%	61,936	2,390	59,546	3.9%
Textiles and fabrics	3.5%	42,617	1,281	41,336	3.0%	3.6%	40,869	4,061	36,808	9.9%	3.3%	39,261	5,285	33,976	13.5%
Yard Waste	22.2%	272,096	248,798	23,298	91.4%	25.4%	287,303	250,938	36,365	87.3%	28.3%	333,817	278,331	55,486	83.4%
Food Waste	11.8%	144,464	33,234	111,230	23.0%	14.1%	159,125	38,684	120,441	24.3%	15.0%	177,226	46,364	130,862	26.2%
Other - Misc. organic / animal products	4.2%	51,106	-	51,106	0.0%	1.6%	18,494	-	18,494	0.0%	1.1%	12,951	-	12,951	0.0%
Wood	2.3%	28,559	-	28,559	0.0%	1.1%	12,597	-	12,597	0.0%	0.7%	8,821	-	8,821	0.0%
<b>Total metal</b>	<b>3.8%</b>	<b>46,893</b>	<b>7,812</b>	<b>39,081</b>	<b>16.7%</b>	<b>3.4%</b>	<b>38,650</b>	<b>11,196</b>	<b>27,454</b>	<b>29.0%</b>	<b>3.8%</b>	<b>44,173</b>	<b>12,002</b>	<b>32,171</b>	<b>27.2%</b>
Aluminum - Containers	0.8%	9,462	4,202	5,261	44.4%	0.9%	10,706	4,620	6,087	43.1%	1.1%	12,526	5,344	7,183	42.7%
Steel/tin & mixed - Containers	0.5%	5,865	3,610	2,255	61.6%	1.8%	20,814	6,576	14,238	31.6%	2.3%	26,654	6,658	19,995	25.0%
Other metal	2.6%	31,565	-	31,565	0.0%	0.6%	7,130	-	7,130	0.0%	0.4%	4,993	-	4,993	0.0%
Glass	3.2%	39,122	23,340	15,783	59.7%	5.2%	58,771	31,916	26,855	54.3%	4.7%	55,242	30,717	24,525	55.6%
Consumer electronics	0.6%	6,764	-	6,764	0.0%	0.5%	5,667	3,336	2,332	58.9%	0.5%	6,454	4,705	1,748	72.9%
Household hazardous & batteries	0.7%	8,338	5,632	2,706	67.5%	1.1%	12,408	10,089	2,318	81.3%	1.2%	13,998	12,127	1,870	86.6%
Miscellaneous	4.3%	52,910	-	52,910	0.0%	5.0%	56,969	-	56,969	0.0%	4.7%	55,011	-	55,011	0.0%
<b>TOTAL MSW (10+23)</b>	<b>100.0%</b>	<b>1,223,132</b>	<b>471,577</b>	<b>751,555</b>	<b>38.6%</b>	<b>100.0%</b>	<b>1,132,274</b>	<b>541,096</b>	<b>591,178</b>	<b>47.8%</b>	<b>100.0%</b>	<b>1,177,937</b>	<b>614,398</b>	<b>563,539</b>	<b>52.2%</b>

Source: BCUA (2019) Table 2

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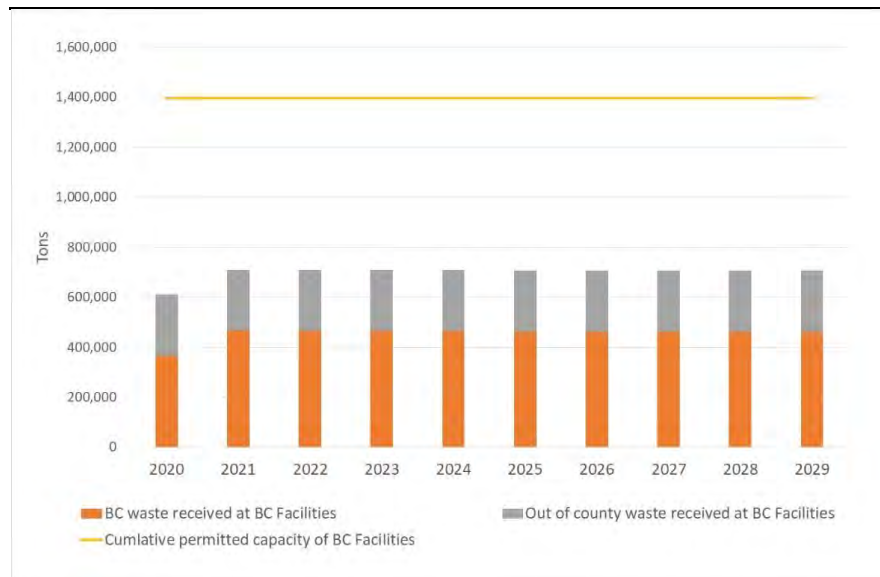
Material	2003					2019					2029				
	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate
Vegetative waste	10.0%	81,899	3,056	78,843	3.7%	2.8%	27,931	3,290	24,641	11.8%	2.4%	26,527	2,857	23,670	10.8%
White Goods & Appliances	4.1%	33,112	30,870	2,242	93.2%	4.1%	40,441	36,810	3,631	91.0%	5.3%	56,913	42,301	14,612	74.3%
Automobile Scrap, heavy iron & non-ferrous	16.8%	136,820	102,564	34,255	75.0%	7.1%	70,090	54,752	15,338	78.1%	7.5%	80,762	47,552	33,210	58.9%
Batteries (Automobile)	0.1%	645	645	-	100.0%	0.4%	3,539	3,373	166	95.3%	0.3%	3,411	2,505	907	73.4%
Furniture	3.3%	26,792	-	26,792	0.0%	0.8%	8,142	-	8,142	0.0%	0.7%	7,083	-	7,083	0.0%
Textiles, carpet and padding	3.8%	31,417	-	31,417	0.0%	0.9%	8,946	-	8,946	0.0%	0.6%	6,265	-	6,265	0.0%
Electronic	0.3%	2,452	-	2,452	0.0%	0.1%	777	-	777	0.0%	0.1%	777	-	777	0.0%
Tires	0.5%	3,844	1,843	2,002	47.9%	0.3%	3,142	2,595	547	82.6%	0.3%	3,139	3,069	70	97.8%
<b>TOTAL Bulky (Type 13)</b>	<b>38.8%</b>	<b>316,981</b>	<b>138,978</b>	<b>178,003</b>	<b>43.8%</b>	<b>16.5%</b>	<b>163,007</b>	<b>100,821</b>	<b>62,187</b>	<b>61.9%</b>	<b>17.1%</b>	<b>184,878</b>	<b>98,284</b>	<b>86,594</b>	<b>53.2%</b>
Wood	7.1%	57,814	9,353	48,461	16.2%	11.2%	110,498	9,196	101,301	8.3%	8.9%	95,985	10,021	85,963	10.4%
Concrete/Asphalt/Block/Brick	35.7%	291,806	287,056	4,751	98.4%	39.0%	384,651	365,336	19,315	95.0%	44.9%	485,968	463,370	22,598	95.3%
Roofing	2.6%	21,385	-	21,385	0.0%	4.8%	47,026	-	47,026	0.0%	4.4%	47,525	-	47,525	0.0%
Drywall	1.4%	11,164	-	11,164	0.0%	2.5%	24,550	-	24,550	0.0%	2.3%	24,811	-	24,811	0.0%
Soil & Gravel	10.4%	85,080	81,879	3,201	96.2%	18.4%	181,324	175,870	5,454	97.0%	15.3%	165,964	160,117	5,847	96.5%
Corrugated paper	0.5%	4,437	-	4,437	0.0%	1.0%	9,757	-	9,757	0.0%	0.9%	9,861	-	9,861	0.0%
Plastic	0.6%	4,786	-	4,786	0.0%	1.1%	10,524	-	10,524	0.0%	1.0%	10,636	-	10,636	0.0%
Metal	0.2%	1,358	-	1,358	0.0%	0.3%	2,985	-	2,985	0.0%	0.3%	3,017	-	3,017	0.0%
Glass	0.0%	98	-	98	0.0%	0.0%	215	-	215	0.0%	0.0%	217	-	217	0.0%
Other	2.5%	20,622	4,788	15,834	23.2%	3.8%	37,220	2,002	35,218	5.4%	3.6%	39,460	2,824	36,636	7.2%
<b>TOTAL C&amp;D (Type 13C)</b>	<b>61.1%</b>	<b>498,550</b>	<b>383,075</b>	<b>115,475</b>	<b>76.8%</b>	<b>82.0%</b>	<b>808,750</b>	<b>552,404</b>	<b>256,346</b>	<b>68.3%</b>	<b>81.6%</b>	<b>883,442</b>	<b>636,332</b>	<b>247,110</b>	<b>72.0%</b>
Type 25	0.0%	27	-	27	0.0%	0.0%	48	-	48	0.0%	0.0%	54	-	54	0.0%
Type 27	0.1%	923	-	923	0.0%	1.1%	10,413	-	10,413	0.0%	1.0%	10,714	-	10,714	0.0%
Type 27A	0.0%	26	26	-	100.0%	0.3%	3,429	3,088	340	90.1%	0.3%	3,531	2,998	533	84.9%
Type 27I	0.0%	-	-	-	-	0.0%	-	-	-	-	0.0%	-	-	-	-
Type 72	0.0%	-	-	-	-	0.0%	147	-	147	0.0%	0.0%	157	-	157	0.0%
<b>TOTAL Other</b>	<b>0.1%</b>	<b>976</b>	<b>26</b>	<b>951</b>	<b>2.6%</b>	<b>1.4%</b>	<b>14,037</b>	<b>3,088</b>	<b>10,949</b>	<b>22.0%</b>	<b>1.3%</b>	<b>14,456</b>	<b>2,998</b>	<b>11,459</b>	<b>20.7%</b>
<b>TOTAL Non-MSW</b>	<b>100.0%</b>	<b>816,507</b>	<b>522,078</b>	<b>294,429</b>	<b>63.9%</b>	<b>100.0%</b>	<b>985,794</b>	<b>656,313</b>	<b>329,481</b>	<b>66.6%</b>	<b>100.0%</b>	<b>1,082,776</b>	<b>737,613</b>	<b>345,163</b>	<b>68.1%</b>

Source: BCUA (2019) Table

### **10-Year Solid Waste Tonnage Forecast and Disposal Capacity Comparison**

During 2019, BCUA conducted a review of the current Solid Waste Plan. The August 16, 2019 Bergen County Solid Waste Management Plan Update Study Final Report (Report) is included in this Plan Amendment as Appendix B. As part of this Study, a solid waste capacity analysis for the District was conducted. Based on this study, it is likely that capacity will be available for the disposal of solid waste generated in Bergen County between 2019 and 2029. However, it should be noted that more than 75% of the total permitted capacity in Bergen County is handled by the Waste Management of New Jersey Fairview facility and the SAJO North Arlington facility. Should these facilities cease operations, then it will be necessary to utilize alternate capacity at new in-district or out-of-district facilities. Therefore, all non-operational, permitted in-county facilities should remain in the Solid Waste Plan, allowing them to remain available as a source of additional capacity within Bergen County. The following tables detail the ten-year projection of disposal and capacity for Bergen County.

Calendar Year	Total Bergen County Solid Waste Disposal <sup>1</sup> (Tons)	Bergen County Solid Waste Disposed at In-County TS <sup>2</sup> (Tons)	All Solid Waste Disposed at In-County TS <sup>3</sup> (Tons)	Unused Permitted Capacity at In-County TS <sup>4</sup> (Tons)
2020	918,307	367,323	612,323	<b>784,657</b>
2021	916,219	466,356	711,356	<b>685,624</b>
2022	914,393	465,426	710,426	<b>686,554</b>
2023	912,826	464,629	709,629	<b>687,351</b>
2024	911,515	463,961	708,961	<b>688,019</b>
2025	910,456	463,422	708,422	<b>688,558</b>
2026	909,647	463,011	708,011	<b>688,969</b>
2027	909,087	462,725	707,725	<b>689,255</b>
2028	908,772	462,565	707,565	<b>689,415</b>
2029	908,702	462,529	707,529	<b>689,451</b>



## **Solid Waste Disposal Strategy**

The District intends to implement a solid waste flow control system utilizing a competitive contracting process for the provision of disposal services as a concession as more fully set forth in the Solid Waste Division Funding System section of this Plan Amendment.

BCUA continues to believe that the marketing of a large volume of solid waste from more than one municipality provides for cost savings to those municipalities. In this regard, BCUA will continue the Solid Waste Cooperative Marketing Program as detailed in BCUA's August 20, 2002 Administrative Action that was certified by NJDEP on September 19, 2002.

## **Source Reduction and Recycling Initiatives and Programs**

In order to provide clarity and better align the list of designated mandatory recyclables currently certified by NJDEP for Bergen County as per the November 30, 2007 NJDEP Certification of the May 16, 2007 Bergen County District Solid Waste Management Plan Amendment with the categories used by NJDEP for recycling statistics, the Solid Waste Plan is amended to include the following definitions for designated mandatory recyclables:

<b>NJDEP ID and Material Recycling Category</b>	<b>NJDEP Definition of Recyclable Materials</b>
01 – Corrugated	Containers and similar paper items, usually used to transport supplies, equipment, parts, or other merchandise. Boxes and packaging generally made of wood pulp and consisting of two smooth sides with a corrugated inner layer. Brown paper grocery bags are included in this category.
02 – Mixed office paper	Items listed in computer printout/white ledger category when mixed with envelopes, manila folders and colored paper. Material is generated by commercial/institutional sources. Includes High Grade Office Paper** – White office printer paper. High grade office paper shall be kept separate from other paper products.
03 – Newspaper	All paper marketed as newsprint or newspaper and containing at least 70% newsprint or newspaper (American Paper Institute grades #6, #7 and #8 news).
04 – Other paper/ magazines/ junk mail	All magazine stock, white and colored paper and envelopes. Mixed Paper – Colored paper, telephone books, computer paper, office paper (when mixed with other paper), non-metallic wrapping paper, soft cover books, hard cover books with cover removed, magazines and flyers.
05 – Glass containers	All glass containers used for packaging food or beverages
06 – Aluminum Containers	Food and beverage containers made entirely of aluminum.
07 – Steel containers	Rigid containers made exclusively or primarily of steel, tin-plated steel, and composite steel and aluminum cans used to store food, beverages, paint, and a variety of other household and consumer products.
08 – Plastic containers	Containers such as polyethylene terephthalate (PETE - #1) soda bottles, high density polyethylene (HDPE - #2) milk, water or detergent bottles, low density polyethylene (LDPE - #4) containers, vinyl (V - #3) or polyvinyl chloride (PVC - #5) bottles and rigid and foam polystyrene (PS - #6).

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NJDEP ID and Material Recycling Category	NJDEP Definition of Recyclable Materials
09 – Heavy Iron	All structural steel or ferrous metal components. Includes non-auto ferrous scrap – All structural steel or ferrous metal, cast iron components. Products made from sheet iron such as shelving, file cabinets metal desks, steel drums, and other ferrous scrap.
10 – Non-Ferrous/ Aluminum Scrap	All non-container aluminum including auto parts, siding, aircraft parts, lawn chairs, window and door frames, pots and pans, foils and pie plates. Non-ferrous scrap consists primarily of copper and zinc. Copper generally takes the form of cable (utility wires), plumbing, wiring harnesses, motors, house wiring and bulky items. Metal or metal alloys which do not contain iron in appreciable amount. Products made of aluminum, copper, brass, zinc, lead, etc.
11 – White goods & light iron	All large appliances such as washers, dryers, refrigerators, etc., as well as products made from sheet iron, such as shelving, file cabinets, metal desks, recycled or reconditioned steel drums, stainless steel and other non-structural ferrous scrap. All CFCs in any white goods must be properly evacuated by licensed individuals and all CFCs recovered must be sent to an EPA approved reclaimer.
17 – Brush/Tree Parts	Vegetative waste or unfinished wood from land clearing projects or storm damage.
18 – Grass clippings	Cuttings from a mown lawn or pasture.
19 – Leaves	
22 – Concrete/ Asphalt/ Brick/ Block	Asphalt, concrete, brick, cinder block, "patio blocks," ceramic materials, stones and other masonry and paving materials. Note that the regulations at N.J.A.C. 7:26A allow for asphalt to be handled in two ways: incorporated into the asphalt production process (milled asphalt); or asphalt is taken to a Class B recycling center and used to produce construction aggregate. Either form of the material is acceptable for reporting purposes

In accordance with NJDEP ID and Material Recycling Category definitions, the following items remain designated mandatory recyclables for Bergen County:

Residential	Commercial, Institutional, and Industrial (CII)
03 – Newspaper	01 – Corrugated
05- Glass Containers	05 – Glass Containers
06 – Aluminum Containers	06 – Aluminum Containers
09- Heavy Iron	09 – Heavy Iron
19- Leaves	02 – Mixed Office Paper
11- White Goods and Light Iron	11- White Goods and Light Iron
07 – Steel Containers	04 – Other Paper/Magazines/Junk Mail
04 - Other Paper/Magazines/Junk Mail	22 – Concrete/Asphalt/Brick/Block
18 – Grass Clippings	08 – Plastic Containers (PETE #1 and HDPE #2 Only)
08 – Plastic Containers (PETE #1 and HDPE #2 Only)	
01 – Corrugated	
22 – Concrete/Asphalt/Brick/Block	

In addition, the Solid Waste Plan is proposed to be amended to include 07 – Steel Containers as a designated mandatory recyclable for the commercial, institutional, and industrial sectors.

## **Solid Waste Program Summary**

Over the past thirty years, Bergen County has established an aggressive, comprehensive, and successful recycling program. All seventy Bergen County municipalities provide curbside residential recycling programs. Recycling depots have been established in forty-nine municipalities and include the collection of materials ranging from traditional recyclables such as glass and paper to non-traditional recyclables such as oil filters and computers.

In addition to each municipality's individual recycling program, BCUA has implemented specific recycling, source reduction, and special waste programs to assist the District in maximizing its recycling potential, decreasing its waste generation, and ensuring the proper management of its solid waste stream.

BCUA provides technical and general assistance to Bergen County municipalities to ensure that the recycling and source reduction goals of the District are met. BCUA conducts the following recycling, source reduction, and special waste programs geared towards Bergen County residents, municipalities, schools, businesses, and civic groups.

### **Household Hazardous Waste Program**

BCUA operates a Household Hazardous Waste ("HHW") Management and Disposal Program for all Bergen County residents. These events provide a location for the proper disposal of household-generated hazardous waste. HHW is defined as any municipal solid waste generated by a private residence that is either a listed hazardous waste or exhibits certain hazardous characteristics. These characteristics are defined by state regulation and are based upon the ignitability, corrosivity, reactivity, and toxicity of the material. Various methods are used for managing the wastes that are received during the collections. Materials collected through this program are recycled, reused, incinerated, landfilled, or used as a fuel supplement.

Each Bergen County municipality has been afforded the option, free of charge, to dispose of illegally discarded hazardous waste left at their recycling centers or public works yards at the HHW events. During 2021, twenty-six Bergen County municipalities participated in BCUA HHW collection events.

Participation has been encouraged through an aggressive publicity and public education campaign.

BCUA has conducted one-day HHW collection events for residents since 1991. Since 2008, BCUA has hosted eight HHW collection events per year at three different locations throughout the county.

2022 marks the thirty-first year that BCUA has provided an HHW Management and Disposal Program for Bergen County residents. Since the program's inception, BCUA has hosted 183



one-day collection events and over 309,000 Bergen County residents have taken advantage of this program to dispose of over 24 million pounds of materials.

### **Computers and Electronics Recycling Program**

Most consumers are unaware that computer and electronic equipment contain toxic materials and heavy metals. These materials, if thrown in the trash, will end up in a landfill or incinerated, potentially creating an unsafe environment. To reduce the environmental impact caused by improper disposal, and at the same time increase recycling in Bergen County, BCUA introduced the Computer and Electronic Recycling Program in 2000 for Bergen County residents.

Due to the overwhelming response to the three collection days in 2000, BCUA decided to open a permanent computer and electronic recycling depot. On December 4, 2000, BCUA received approval from NJDEP to host a computer and electronic recycling depot. On March 1, 2001, BCUA opened a permanent Computer and Electronic Recycling Depot at its facility in Little Ferry, New Jersey. At the recycling depot BCUA accepts materials for recycling from residents, other government agencies, and private Bergen County businesses.

In addition to the permanent Computer and Electronics Recycling Depot, BCUA also hosts four one-day weekend collection events for residents at different sites throughout the county.

Since 2000, BCUA has collected over 7.7 million pounds, or an average of 354,000 pounds per year, of computer and electronic equipment for recycling.

### **School Environmental Awareness Challenge Grant Program**

The School Environmental Awareness Challenge Grant Program is intended to increase recycling and environmental awareness in Bergen County schools. This grant has been made available to all Bergen County public and private schools since 2007. Schools are able to apply for grants of up to \$1,000 to conduct activities related to the environment. All applicants must have a viable recycling program in their schools to be eligible to apply for funding for environmental projects or the grant funds must be spent on initiating a recycling program.

Since 2007, over \$1,000,000 has been awarded to 1,121 Bergen County schools.

### **Confidential Document Shredding Program**

In an effort to prevent identity theft, destroy confidential documents and increase recycling in Bergen County, during 2010 BCUA introduced a Mobile Paper Shredder Program for Bergen County residents. Each municipality is presented with the opportunity to host a collection event at a municipal site of their choice. BCUA also hosts four county-wide one-day collection events in conjunction with the computer and tire recycling events.

Since 2010, there were 570 municipal collection events and an additional 46 county-wide collection events. Since the program inception, over 4.2 million pounds of paper has been collected for destruction and recycling.

### **Tire Recycling Program**

In an effort to remove and recycle tires from Bergen County's MSW, BCUA initiated a tire-recycling program in 1995. BCUA offers four, one-day tire amnesty collection days to allow residents to drop-off tires at centrally located sites in Bergen County. In addition to the residential program, BCUA in conjunction with the Bergen County Parks Department and the Bergen County Mosquito Commission clean-up illegally dumped tires from sites throughout Bergen County and dispose of these tires at BCUA's one-day collection events.

Since 1995, BCUA has collected over 280,000 tires for recycling.

### **BCUA Backyard Composting Program**

In the spring 2002, BCUA expanded upon its yard waste management programs to include direct sales of composters to residents. BCUA makes backyard compost bins accessible and affordable to Bergen County residents. This program teaches and promotes the uses and benefits of composting. Among other things, the program informs residents that composting is an economical, practical, and convenient way to handle yard waste. Since 2002, over 3,400 composters have been sold to Bergen County residents.

### **Municipal Recycling Coordinator Workshops**

BCUA hosts municipal workshops each year that provide pertinent recycling and source reduction information to municipalities. Municipal representatives earn CEUs for Certified Recycling Professionals and Certified Public Works Managers for attendance at BCUA municipal workshops.

### **Certified Recycling Professional Tonnage Grant Assistance Program**

In accordance with the Recycling Enhancement Act, each New Jersey municipality is required to submit an Annual Recycling Tonnage Report to NJDEP signed by a Certified Recycling Professional ("CRP"). Failure to submit a Tonnage Report signed by a CRP jeopardizes a municipality's opportunity to receive the annual recycling tonnage grant. Since 2012, for those Bergen County municipalities that may not employ a CRP, BCUA provides the services of a CRP to sign and submit the Annual Recycling Tonnage Report to NJDEP at no cost to the municipality.

## **Public Education Programs**

BCUA provides at no charge a variety of education programs to Bergen County schools and civic groups. These programs include classroom recycling and waste reduction programs for all grade levels including pre-K. Civic group programs are generally geared towards senior citizen groups, women's clubs, libraries and environmental groups. Public education programs include the following:

### **Classroom Presentations**

Available for pre-K through college level students, each of the BCUA classroom programs has been developed for a specific age group or grade level. Information presented within that program is introduced so that specific educational objectives consistent with that particular age group are achieved.

Since January 2000, BCUA has conducted over 4,400 education programs to over 95,000 students in schools and pre-schools.

### **Assistance Publications:**

The following publications are developed, written, and published by BCUA on a regular basis.

*Recycling Update:* A monthly newsletter that provides technical and marketing information to the Bergen County municipalities.

*Trash Talk Newsletter:* This newsletter was developed for distribution to middle-elementary school students (grades 4-5-6). 2,000 copies are distributed throughout each school year.

*BCUA Recycling Markets Directory:* The purpose of this directory is to provide assistance and a reference guide of recycling companies available to Bergen County municipalities. The information collected in this directory has been gathered directly from the companies listed, either through a written or telephone survey.

*BCUA Commercial Recycling Handbook:* This handbook has been developed to assist businesses with initiating and/or expanding recycling programs.

*BCUA Recycling and Solid Waste Guide:* This web based newsletter was developed to provide Bergen County residents with information regarding BCUA sponsored environmental programs and other pertinent environmental information.

*"Be A Waste Watcher" Coloring Book:* Written and produced with young elementary students in mind, this 20-page coloring book gives students tips on reducing waste in an informative entertaining manner.

### **Environmental Programs Hotline**

The Environmental Programs Hotline provides residents with information regarding BCUA's HHW, computer and electronics, and tire recycling programs as well as general recycling information. BCUA averages 6,000 calls a year on the Environmental Programs Hotline. Over 1,500 hotline calls per year require a response from BCUA personnel. BCUA's Environmental Programs Hotline number is 201-807-5825.

### **BCUA Web Site**

BCUA has created and supports a web site that provides up-to-date information on all BCUA solid waste, recycling, special waste, and source reduction programs ([www.bcua.org](http://www.bcua.org)). The web site includes a calendar detailing BCUA's up-coming programs and events as well as a detailed list of BCUA recycling services and educational information regarding the proper management of solid waste. The website also provides links to the NJDEP web site recycling page and e-cycle page. The web site is an integral component of BCUA's public education program.

### **Municipal/School Supply Distribution**

BCUA distributes over 35,000 promotional materials such as pens and pencils made from recycled material, recycling stickers, and several other recycling and source reduction promotional material to Bergen County schools and municipalities each year.

### **BCUA Honors**

- USEPA Recognition

BCUA has been honored as one of two county agencies *nationwide* recognized for its achievement in the areas of recycling and solid waste reduction by the United States Environmental Protection Agency ("USEPA"). With the release of "Cutting the Waste Stream in Half: Community Record-Setters Show How," a manual detailing the two county and sixteen municipal programs, USEPA has recognized the efforts these communities have made in trying to combat one of our nation's most challenging environmental problems.

- 2002 – USEPA Environmental Quality Award for Computer and Electronics Recycling Program.
- 2005 – USEPA Environmental Quality Award for the BCUA Mercury Thermometer Swap Program.

NJDEP Outstanding Achievement in Recycling Awards:

- 2002 - Outstanding Achievement in Recycling Award for the BCUA Recycling Education Program.
- 2004 - Outstanding Achievement in Recycling Award for the BCUA's Mercury Thermometer Swap Program.
- 2009 - Outstanding Achievement in Recycling Award for the category of Outstanding Educator.
- 2012 - - Outstanding Achievement in Recycling Award for the BCUA Recycling Education Program.

Solid Waste Association of North America Silver Excellence Award:

- 2003 – BCUA received the Silver Excellence Award for its Special Waste Management Program.
- 2008 Silver Excellence Award for Special Waste Management for the BCUA's School Laboratory Hazardous Waste Removal and Grant Program.

Association of Environmental Authorities' WAVE Awards

- 1994 - Outstanding Public Education Summer Camp Program.
- 1997 - Outstanding Pre-School Recycling Program.
- 1998 - Outstanding Solid Waste Public Education Program.
- 1999 - Outstanding Household Hazardous Waste Collection Program.
- 2005 – Forward Thinking award for the Mercury Thermometer Swap Program.
- 2015 – Outstanding Public Education Program for the BCUA Recycling Curriculum Supplement and Discovery Box Program.
- 2018 – Outstanding Public Education Program for the BCUA Environmental Awareness Challenge Grant Program for schools.

## **Solid Waste Transfer Station Truck Route Ingress and Egress**

The August 16, 2019 Bergen County Solid Waste Management Plan Update Report included an analysis of the existing transfer stations' transfer trailer routes approved by the May 15, 2008 Administration Action Plan Amendment. Based on this analysis, the following amendment to traffic routes shall be incorporated into the Solid Waste Management Plan:

I.W.S. Transfer System of NJ, Inc., Transfer Station/Material Recovery Facility  
60 Railroad Ave, Closter, New Jersey 07624

The Primary Route for the Closter New Jersey, IWS Transfer System of NJ, Inc. are as follows:

### **Outbound Route**

<b>Follow...</b>	<b>Direction</b>	<b>To...</b>	<b>Continue...</b>
Railroad Ave.	North	Van Sciver St.	Left
Van Sciver St.	Northwest	West St.	Right
West St.	Northeast	Blanche Ave.	Right
Blanche Ave.	East	Herbert Ave.	Right
Herbert Ave.	South	Homans Ave.	Left
Homans Ave.	East	Piermont Road	Right
Piermont Road	South	Closter Dock Road	Left
Closter Dock Road	East	US 9W	South
US 9W	South	I80	West

### **Inbound Route**

<b>Follow...</b>	<b>Direction</b>	<b>To...</b>	<b>Continue...</b>
I-80	East	US 9W	North
US 9W	North	Closter Dock Road	Left
Closter Dock Road	West	Piermont Road	Right
Piermont Road	North	Homans Ave.	Left
Homans Ave.	West	Herbert Ave.	Right
Herbert Ave.	North	Blanche Ave.	Left
Blanche Ave.	West	West St.	Left
West St.	Southwest	Van Sciver St.	Left
Van Sciver St.	Southeast	Railroad Ave.	Right
Railroad Ave.	South	Facility	

I.W.S. Transfer System of NJ, Inc., Transfer Station/Material Recovery Facility  
 19-35 Atlantic Street, Garfield, New Jersey 07026

The revised routes for Garfield, New Jersey, IWS Transfer System of NJ, Inc. are as follows:

**Outbound Route**

Follow...	Direction	To...	Continue...
Commerce St.	East	Midland Ave.	Left
Midland Ave.	North	Monroe St.	Left
Monroe St.	West	Dayton Ave.	Right
Dayton Ave.	North	NJ Route 21	North
NJ Route 21	North	NJ Route 20	North
NJ Route 20	North	I-80	West

**Inbound Route**

Follow...	Direction	To...	Continue...
I-80	East	NJ Route 20	South
NJ Route 20	South	NJ Route 21	South
NJ Route 21	South	Dayton Ave. Exit	South
Dayton Ave.	South	Monroe St.	Left
Monroe St.	West	Midland Ave.	Right
Midland Ave.	South	Commerce St.	Right
Commerce St.	West	Facility	

**Secondary Route (Outbound Only)**

**Outbound Route**

Follow...	Direction	To...	Continue...
Commerce St.	East	Midland Ave.	Left
Midland Ave.	North	Monroe St.	Left
Monroe St.	West	River Dr.	Right
River Dr.	North	Outwater Ln.	Left
Outwater Ln.	West	Ackerman Ave.	Straight
Ackerman Ave.	West	NJ Route 21	Right
NJ Route 21	North	NJ Route 20	North
NJ Route 20	North	I-80	West

S&L Zeppetelli, Inc. Transfer Station  
131 Moonachie Road, Moonachie, New Jersey 07074

The revised routes for S&L Zeppetelli, Inc Transfer Station, Moonachie, New Jersey are as follows:

**Primary Route**

**Outbound Route**

Follow...	Direction	To...	Continue...
Moonachie Road	South	Washington Ave.	Straight
Washington Ave.	South	NJ Route 120	South
NJ Route 120	South	NJ Route 3	East
NJ Route 3	East	NJ Turnpike	South

**Inbound Route**

Follow...	Direction	To...	Continue...
NJ Turnpike	North	NJ Route 3	West
NJ Route 3	West	NJ Route 120	North
NJ Route 120	North	Washington Ave.	Straight
Washington Ave.	North	Moonachie Rd.	Straight
Moonachie Rd.	North	Facility	

**Secondary Route:**

**Outbound Route**

Follow...	Direction	To...	Continue...
Moonachie Rd.	South	Moonachie Ave.	Right
Moonachie Ave.	West	NJ Route 17	South
NJ Route 17	South	NJ Route 3	East
NJ Route 3	East	NJ Turnpike	South

**Inbound Route**

Follow...	Direction	To...	Continue...
NJ Turnpike	North	NJ Route 3	West
NJ Route 3	West	NJ Route 17	North
NJ Route 17	North	Moonachie Ave.	Right
Moonachie Av.	East	Moonachie Rd.	Left
Moonachie Rd.	North	Facility	



## **Solid Waste Division Funding**

As the result of the court decisions in Atlantic Coast Demolition & Recycling, Inc. v. Board of Chosen Freeholders<sup>1</sup> abrogating New Jersey’s prior waste flow rules, solid waste regulating authorities have a need to formulate and ensure economically sustainable and environmentally sound solid waste and recycling programs for the providing of these services pursuant to the New Jersey Solid Waste Management Act and implementing regulations promulgated thereunder by NJDEP. This Plan Amendment, providing for the adoption of the following solid waste management and disposal procedures, allows for the generation of sufficient funding necessary for the operation and maintenance of the District’s solid waste system, including the providing of needed recycling services, so that BCUA, as the implementing agency for the Solid Waste Plan, is able to continue to engage in environmentally sound practices and to continue to ensure efficient flow and disposal of solid waste generated within the District:

1. All solid waste generated within the District must be disposed of at designated Disposal Facilities. The Plan Amendment defines “Disposal Facility” to mean a permitted solid waste landfill, resource recovery facility, material recovery facility or solid waste transfer station.
2. BCUA intends to enter into agreements with Disposal Facilities for the acceptance of solid waste generated in the District. Following the Local Public Contracts Law competitive contracting process for the provision of a “concession”<sup>2</sup>, BCUA will adopt a Resolution to begin the process and will publish notice locally, state-wide, and nationally through various channels to request submissions.
3. All Disposal Facilities that respond to BCUA’s public notice will be scored on a pass/fail basis. Those that meet the following criteria will be included in the Solid Waste Plan as an authorized Disposal Facility and will be permitted to accept solid waste generated within the District:
  - a. The Disposal Facility affirmatively indicates through its response to the notice that it wishes to be included in the Solid Waste Plan as a permitted Disposal Facility.
  - b. The Disposal Facility is duly licensed to accept solid waste by the jurisdiction where it is located.

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<sup>1</sup> Atlantic Coast Demolition & Recycling, Inc. v. Board of Chosen Freeholders, 112 F.3d 652 (3rd Cir. 1997), cert. denied, 522 U.S. 966 (1997), amended by 135 F.3d 891 (3d Cir. 1998).

<sup>2</sup> “Concession” is defined as “the granting of a license or right to act for or on behalf of the contracting unit, or to provide a service requiring the approval or endorsement of the contracting unit, and which may or may not involve a payment or exchange, or provision of services by or to the contracting unit.” N.J.S.A. 40A:11-2(37).

- c. The Disposal Facility consents to enter into an Agreement with BCUA to accept solid waste generated within the District. The Agreement, which will be made available as part of the request for submissions, will contain the following terms:
  - i. The Disposal Facility may charge any solid waste disposal fees in accordance with any and all applicable federal, state or local statutes and regulations governing the disposal fees.
  - ii. BCUA will not regulate the Disposal Facility's fee (tipping fee).
  - iii. The Disposal Facility collecting solid waste generated within the District will be required to provide to BCUA a written report each calendar month identifying the origin and tonnage of solid waste being accepted for disposal by the Disposal Facility, including a detailed breakdown of solid waste disposed of at the Disposal Facility by each municipality and/or each individual hauler. The monthly written report must consist of hauler and/or generator summaries based upon certified weights and is to be submitted to BCUA on or before the 15<sup>th</sup> of the calendar month immediately following the reporting calendar month. This obligation can be satisfied by submission of the written report generated by the Disposal Facility pursuant to and as required by N.J.A.C. 7:26-2.13(e), or by any other similar submission.
  - iv. The Disposal Facility agrees to remit to BCUA a flat per-ton Service Fee, which shall be calculated by the BCUA, in accordance with the Municipal and County Utilities Authorities Law, N.J.S.A. 40:14B-1 et seq., by dividing the annual cost associated with the Bergen County-wide solid waste and recycling programs by the estimated total tonnage of all solid waste anticipated to be generated within the District.
  - v. The Disposal Facility consents to the jurisdiction of the courts of the State of New Jersey by entering into the Agreement.
4. Any solid waste hauler engaged in the transport of solid waste generated within the District must engage the services of a Disposal Facility that is part of the Solid Waste Plan. Any in-state Disposal Facility that is not part of the Solid Waste Plan but accepts solid waste generated within the District, or any solid waste hauler who transports solid waste generated within the District and fails to transport that waste to a Disposal Facility that is part of the Solid Waste Plan will be subject to enforcement action as detailed in Section 7. This means that any solid waste hauler who transports solid waste generated within the District to a Disposal Facility not part of the Solid Waste Plan will be subject to enforcement action.
5. All Disposal Facilities who respond to the public notice and agree to each of the above requirements will be selected by Resolution of BCUA for the maximum period of five (5) years.
6. BCUA shall assess a per ton Solid Waste Management Service Fee ("Service Fee"). The Service Fee shall be calculated by BCUA, in accordance with N.J.S.A. 40:14B-

1 et seq., on a per ton basis by dividing the annual cost associated with the Bergen County-wide solid waste and recycling programs as set forth in this Section 6 of this Plan Amendment by the estimated total of all solid waste anticipated to be generated within the District. The Service Fee shall be assessed against the Disposal Facility and the Service Fee assessed shall be payable by the Disposal Facility in accordance with the Service Agreement with BCUA and any and all funds received by the BCUA from the payment of Service Fees shall be utilized for the funding of county-wide programs undertaken by (1) the Bergen County Office of Environmental Health (“BCOEH”) related to enforcement pursuant to the County Environmental Health Act, N.J.S.A. 26:3A2-21 et seq. and the rules promulgated by NJDEP pursuant thereto, N.J.A.C. 7:1H-1.1 et seq.; (2) BCUA’s own programs and services related to solid waste planning, public outreach/education and community projects; (3) BCUA’s own programs and services related to recycling and associated activities; and (4) BCUA-provided services related to solid waste tracking/reporting, program activities and recordkeeping.

7. Any in-state Disposal Facility accepting solid waste generated within the District that has not been designated as a Disposal Facility as detailed in Section 3 and has failed to enter into and Agreement with BCUA as detailed in Section 3 shall be subject to prosecution of an enforcement action by the BCOEH, the agency charged with and responsible for enforcement of this provision pursuant to the County Environmental Health Act, and the rules promulgated by the NJDEP pursuant thereto. In addition, any solid waste hauler engaged in the transporting of solid waste generated within the District must dispose of such solid waste at a designated Disposal Facility as detailed in Section 3. Failure of the solid waste hauler to dispose of solid waste at a designated Disposal Facility as detailed in Section 3 shall result in the solid waste hauler being subject to prosecution of an enforcement action by the BCOEH, the agency charged with and responsible for enforcement of this provision pursuant to the County Environmental Health Act, and the rules promulgated by NJDEP pursuant thereto

The imposition and collection of the Service Fee shall commence upon Certification of this Amendment by the NJDEP

BCOEH Enforcement Protocol - Any violation of any rule(s) and/or regulation(s) governing solid waste generated and/or otherwise existing within the District, including, but not limited to, the transportation and/or disposal thereof, falling under the authority of BCOEH is subject to prosecution in the Superior Court of New Jersey, Bergen County Vicinage (the “Superior Court”).

Any violator, upon a finding of guilt by the Superior Court, shall be liable to pay any associated monetary judgment entered by the Superior Court to the BCOEH.



## **Appendix A**

### **June 12, 2019 Bergen County Solid Waste Composition and Generation Study 2003 to 2029 Report (Final)**

A large, solid blue geometric shape that resembles a stylized arrow or a large 'L' rotated 90 degrees counter-clockwise. It starts from the left edge of the page and extends towards the right, with its top edge sloping downwards from left to right. It frames the title and subtitle text on the right side.

# **Bergen County Solid Waste Composition and Generation Study 2003 to 2029**

Report (Final)

June 12, 2019



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# **Bergen County Solid Waste Composition and Generation Study 2003 to 2029**

Report (Final)

June 12, 2019





# Issue and revision record

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# Executive Summary

## Study Overview

Bergen County Utilities Authority (BCUA) commissioned Mott MacDonald LLC to undertake a study to estimate current and future solid waste composition and generation quantities in Bergen County. This study has used available secondary sources to update existing data on current Bergen County solid waste composition and quantities by material, generated, disposed and recycled from 2003 to 2016, and provide projections to 2029. The following main sources of data have been used:

1. BCUA (March 2005) Bergen County Solid Waste Composition Study – Final Report
2. BCUA (August 2006) Bergen County Current and Projected Solid Waste Quantities Study
3. New Jersey Department of Environmental Protection (NJ DEP) Solid Waste Disposal and Recycling Statistics 2003 to 2016
4. US EPA (2018) Advancing Sustainable Materials Management: Facts and Figures Report 2015
5. US Environmental Protection Agency (EPA) (July 2013) – MSW Residential/Commercial Percentage Allocation – Data Availability U.S. EPA Office of Resource Conservation and Recovery
6. New York City Sanitation Department (2018) NYC Residential, School, and NYC Housing Authority Waste Characterization Study

The study includes MSW - Types 10 (from Residential and Commercial Industrial and Institutional (CII) Sources) and 23; and Non-MSW - Types 13, 13C, 25, 27 and 72.

The objective is to provide updated information on waste composition and quantities to inform BCUA's long-term strategic planning for solid waste management and recycling in Bergen County.

## Scope of services

The scope of services for this project as set out in the BCUA Request for Proposals is as follows:

- *“Estimate the composition of solid waste generated in Bergen County utilizing the March 2005 Solid Waste Composition – Final Report as well as population growth, economic development initiatives, land use planning, other New Jersey county composition studies and any other factors or reports that may be useful in estimating solid waste composition.”*
- *“Project the Bergen County solid waste stream generation for the next ten (10) years using information such as current waste generation rates, population growth, economic development initiatives, land use planning, and any other factors that may be useful in developing solid waste projections.”*
- *“Produce a comprehensive report providing data and narrative detailing the solid waste generation and composition methodology. The report shall include detailed projections for solid waste generation and composition.”*

## Methodology

To address the scope, two main tasks and associated sub-tasks were identified. Numbered bullets under each sub-task describe the methodological steps undertaken.

### Task 1 – Update waste characterization and quantities between 2003 to 2016

Task 1.1. Estimate proportion (%) of MSW materials disposed of in Bergen County by materials:

1. Categories of materials were assigned to closely match those used for solid waste in the BCUA 2005 report, tailored to also align with the categories used in NJ DEP recycling statistics.
2. The proportions (%) of MSW recycled and disposed of by material from residential and CII sources in 2003 were then assigned to these categories from the BCUA 2005 Report.
3. The percentage breakdown for residential MSW in Bergen County in the year 2017 was estimated by benchmarking the findings of the New York Sanitation Department (NYSD) (2018) waste characterization study. This was found to be the most relevant available study, as no recent NJ studies in similar areas were identified.
4. The CII fraction of MSW in 2017 was estimated using the residential/commercial split for New York in the EPA 2013 study (and BCUA (2005)). As the total quantities were known from the NJDEP statistics, the total CII was identified by subtracting the residential waste tonnage from the total.
5. The average annual percentage of waste disposed of between 2003 (BCUA 2005) and 2017 (NYSD 2018) for each material category were used to estimate the solid waste disposal characterization between 2004 and 2016 by linear interpolation.

Task 1.2. Estimate proportion (%) of Non-MSW disposed of by material between 2003 and 2016

1. Materials categories were assigned based on those used in the BCUA 2005 Report and NJ DEP statistics.
2. The average annual material proportions for Non-MSW in 2003 were obtained from the BCUA 2003 study for all years between 2003 and 2016.

Task 1.3. Calculate proportion (%) of materials diverted/recycled in Bergen County by material between 2003 and 2016:

1. Average annual percentages of each material diverted were taken from the quantities recorded in the NJ DEP recycling statistics.
2. The breakdown between residential and CII categories were derived based on the estimated proportional residential/commercial split for New York City presented in the EPA 2003 Study.

Task 1.4. Estimate quantities of MSW and non-MSW materials disposed, recycled and generated between 2003 and 2016:

1. Annual quantities of solid waste disposed (by type) and materials diverted (by material and source) were obtained directly from the NJ DEP recycling statistics.
2. Quantities of solid waste by material were derived by multiplying the total annual quantities by the average annual proportions (%) established in Task 1.1 and 1.2.
3. Materials generation quantities and proportions were derived by adding together the quantities of waste discarded and materials diverted.



## Task 2 – Project annual material disposal, diversion and generation from 2017 to 2029

Task 2.1. Model forecast based on continuation of derived annual solid waste and recycling trends (estimated in Task 1):

1. Average percentage values for disposal and recycling between 2014 and 2016 were used to set values for the base year of the projection (2017).
2. The baseline projection from 2017 to 2029 was then developed using average annual growth/fall in generation and diversion quantities by material between 2003 and 2016 which were derived in Task 1. The range of years for each material was selected to remove years with high variance from the mean. Growth rates were also capped in some years to reflect diminishing rates of return.
3. An exponential smoothing factor of (Alpha = 0.3) was added to the linear extrapolations of recycling and generation trends to account for diminishing rates of return.

Task 2.2. Update forecasted disposal and recycling projection based on anticipated changes in future recycling trends:

1. Percentage reductions in recycled quantities for 2018 were included in the baseline projections (developed in task 2.1) for selected materials, namely magazines, glossy and other paper, plastic containers and other plastic (40% reduction); and mixed office paper and newspaper (10% reduction).<sup>1</sup>
2. The baseline projected growth rates are then applied, to reflect a recovery in recycling rates for these materials.

## Results

The estimated composition of solid waste and quantities from 2003 to 2029 have been provided to BCUA in a MS Excel spreadsheet and are summarized in this report.

Table 1 below shows the total estimated annual quantities of waste generated, diverted and disposed of in Bergen County by source. Chart 1 and Chart 2 illustrate the disposal and diversion trends for MSW and Non-MSW over the same period. MSW from both residential and CII sources requiring disposal is projected to continue to reduce, and recycling to increase steadily between 2019 and 2029. The quantity of waste generated will continue to increase over this period, principally due to projected population growth, although the total MSW generation rate per capita is expected to fall from 6.44 to 6.26 lb/person/day.

Table 2 and Table 3 provide data for 2003 (baseline), 2019 (projected current) and 2029 (projected +10 years) for MSW and Non-MSW respectively in relation to materials composition, quantities of waste generated, recycled and disposed, and annual recycling rate. Based on the results of the study it is expected that the MSW recycling rate in 2019 will be around 47.8%, and this is projected to increase to 52.2% by 2029 despite setbacks in the short-term due to recent and ongoing changes in markets for some recyclables (e.g. scrap paper and plastics). The recycling rate for Non-MSW is projected to increase slightly from 66.6% to around 68.1%. C&D waste, mainly concrete, asphalt, block and brick, and soil and gravel make up around 60% of all Non-MSW recycled, and therefore have a disproportional effect on recycling rates for this category.

The results of the study are summarized in full in the main body of this report and in the tables presented in Appendix D (Derived Bergen County Solid Waste Statistics 2003 to 2016). The

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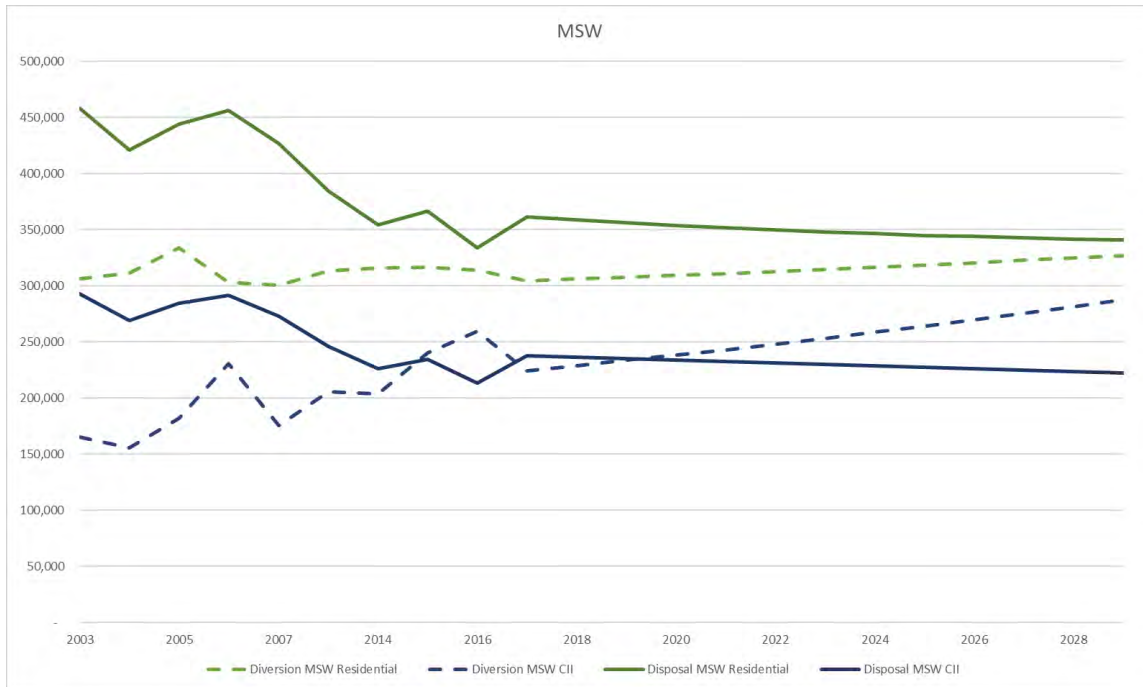
<sup>1</sup> C.f. "The Chinese import ban and its impact on global plastic waste trade" published in the journal Science Advances by Amy L. Brooks, Shunli Wang, and Jenna R. Jambeck.

Projections from 2017 to 2029 are shown in Section 4 (see Table 20 to Table 25 for Projection 1, and Table 27 to Table 30 for projection adjusted to reduce short-term recycling rate).

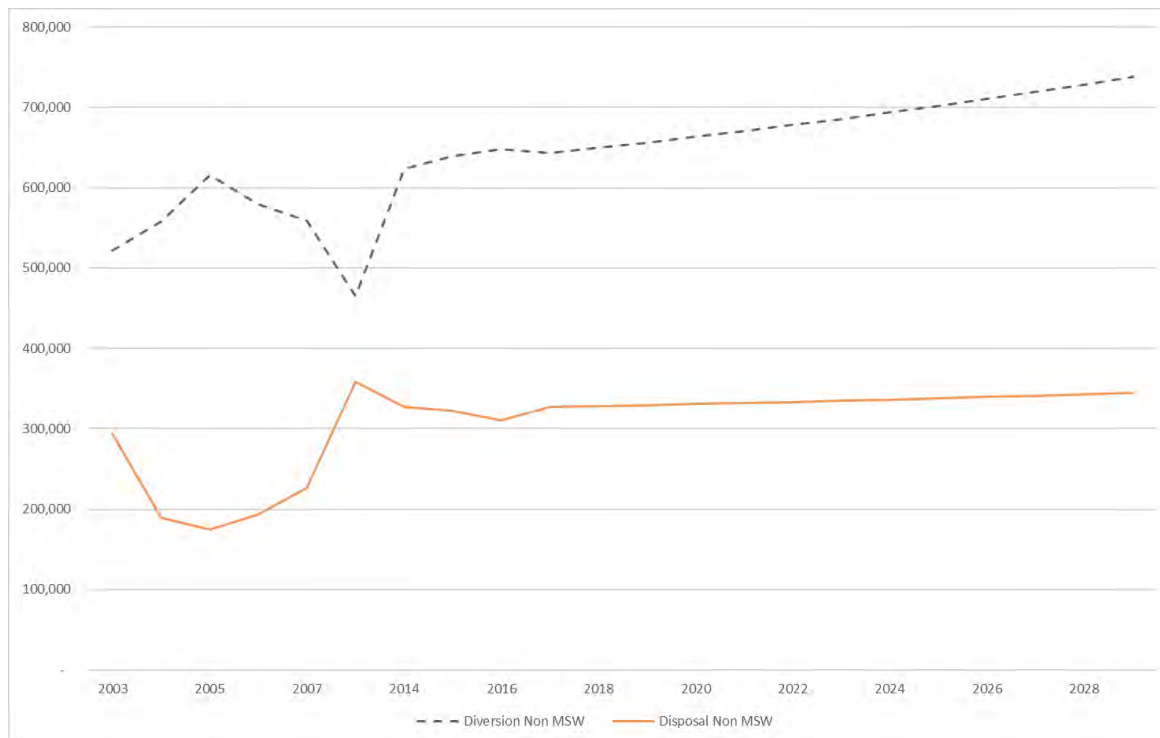
**Table 1: Total Estimated Annual Quantities of MSW and Non-MSW Generated, Diverted and Disposed by Source 2003 to 2029**

	2003	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Generation</b>															
MSW Residential	764,851	647,779	665,641	664,559	663,722	663,126	662,768	662,644	662,753	663,091	663,656	664,445	665,457	666,690	668,141
MSW CII	458,281	473,133	462,022	465,220	468,552	472,020	475,626	479,373	483,263	487,301	491,488	495,827	500,323	504,978	509,796
MSW All (CII+Res)	1,223,132	1,120,912	1,127,663	1,129,780	1,132,274	1,135,146	1,138,394	1,142,017	1,146,016	1,150,392	1,155,143	1,160,273	1,165,780	1,171,668	1,177,937
Non MSW	816,507	958,925	964,268	971,532	979,108	987,002	995,219	1,003,767	1,012,650	1,021,876	1,031,451	1,041,383	1,051,677	1,062,342	1,073,385
All Solid Waste	2,039,640	2,079,838	2,091,931	2,101,311	2,111,382	2,122,148	2,133,613	2,145,784	2,158,667	2,172,268	2,186,595	2,201,655	2,217,457	2,234,010	2,251,322
<b>Diversion</b>															
MSW Residential	306,403	313,709	304,387	305,972	307,610	309,303	311,050	312,852	314,709	316,622	318,590	320,615	322,697	324,836	327,032
MSW CII	165,175	259,547	224,391	228,876	233,486	238,225	243,097	248,106	253,256	258,551	263,996	269,596	275,353	281,275	287,365
MSW All (CII+Res)	471,577	573,256	528,779	534,848	541,096	547,528	554,147	560,958	567,965	575,173	582,587	590,211	598,050	606,111	614,398
Non MSW	522,078	648,283	643,183	649,627	656,313	663,247	670,432	677,875	685,580	693,552	701,797	710,320	719,126	728,222	737,613
All Solid Waste	993,656	1,221,540	1,171,962	1,184,474	1,197,409	1,210,774	1,224,579	1,238,833	1,253,545	1,268,725	1,284,384	1,300,530	1,317,177	1,334,333	1,352,011
<b>Disposal</b>															
MSW Residential	458,448	334,070	361,253	358,587	356,112	353,823	351,718	349,792	348,044	346,469	345,066	343,830	342,761	341,854	341,108
MSW CII	293,107	213,586	237,631	236,345	235,066	233,795	232,529	231,267	230,007	228,749	227,491	226,232	224,969	223,703	222,431
MSW All (CII+Res)	751,555	547,656	598,884	594,932	591,178	587,618	584,247	581,059	578,051	575,219	572,557	570,062	567,730	565,557	563,539
Non MSW	294,429	310,642	327,290	328,349	329,481	330,689	331,973	333,334	334,775	336,296	337,899	339,586	341,357	343,216	345,163
All Solid Waste	1,045,984	858,298	926,174	923,281	920,659	918,307	916,219	914,393	912,826	911,515	910,456	909,647	909,087	908,772	908,702

**Chart 1: MSW CII and Residential Disposal and Diversion Trends (2003 to 2029), Tons**



**Chart 2: Non-MSW Diversion and Disposal Trends (2003 to 2029), Tons**



**Table 2: Total MSW Composition (%), Generation, Recycling & Disposal Quantities (Tons), & Recycling Rate (%) 2003, 2019 & 2029**

Material	2003					2019					2029				
	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate
<b>Total paper</b>	<b>33.8%</b>	<b>413,667</b>	<b>146,865</b>	<b>266,802</b>	<b>35.5%</b>	<b>30.6%</b>	<b>346,919</b>	<b>183,258</b>	<b>163,661</b>	<b>52.8%</b>	<b>28.9%</b>	<b>340,698</b>	<b>216,980</b>	<b>123,718</b>	<b>63.7%</b>
Corrugated	9.4%	115,306	64,200	51,106	55.7%	11.8%	133,816	96,916	36,900	72.4%	13.0%	152,559	130,601	21,959	85.6%
Mixed Office Paper	2.8%	33,643	15,605	18,037	46.4%	3.9%	44,239	35,288	8,951	79.8%	4.3%	50,685	40,848	9,837	80.6%
Newspaper	7.0%	85,475	49,401	36,075	57.8%	4.1%	46,492	32,822	13,670	70.6%	3.1%	36,379	28,165	8,214	77.4%
Magazines/glossy & other	14.7%	179,243	17,659	161,584	9.9%	10.8%	122,372	18,232	104,140	14.9%	8.6%	101,075	17,366	83,709	17.2%
<b>Total plastic</b>	<b>9.5%</b>	<b>116,597</b>	<b>4,615</b>	<b>111,982</b>	<b>4.0%</b>	<b>8.3%</b>	<b>94,502</b>	<b>7,618</b>	<b>86,884</b>	<b>8.1%</b>	<b>7.7%</b>	<b>90,285</b>	<b>7,886</b>	<b>82,399</b>	<b>8.7%</b>
Plastic Containers	1.3%	15,480	4,206	11,273	27.2%	2.1%	23,828	5,924	17,904	24.9%	2.4%	28,349	5,497	22,853	19.4%
Other Plastic	8.3%	101,117	409	100,708	0.4%	6.2%	70,673	1,694	68,979	2.4%	5.3%	61,936	2,390	59,546	3.9%
Textiles and fabrics	3.5%	42,617	1,281	41,336	3.0%	3.6%	40,869	4,061	36,808	9.9%	3.3%	39,261	5,285	33,976	13.5%
Yard Waste	22.2%	272,096	248,798	23,298	91.4%	25.4%	287,303	250,938	36,365	87.3%	28.3%	333,817	278,331	55,486	83.4%
Food Waste	11.8%	144,464	33,234	111,230	23.0%	14.1%	159,125	38,684	120,441	24.3%	15.0%	177,226	46,364	130,862	26.2%
Other - Misc. organic / animal products	4.2%	51,106	-	51,106	0.0%	1.6%	18,494	-	18,494	0.0%	1.1%	12,951	-	12,951	0.0%
Wood	2.3%	28,559	-	28,559	0.0%	1.1%	12,597	-	12,597	0.0%	0.7%	8,821	-	8,821	0.0%
<b>Total metal</b>	<b>3.8%</b>	<b>46,893</b>	<b>7,812</b>	<b>39,081</b>	<b>16.7%</b>	<b>3.4%</b>	<b>38,650</b>	<b>11,196</b>	<b>27,454</b>	<b>29.0%</b>	<b>3.8%</b>	<b>44,173</b>	<b>12,002</b>	<b>32,171</b>	<b>27.2%</b>
Aluminum - Containers	0.8%	9,462	4,202	5,261	44.4%	0.9%	10,706	4,620	6,087	43.1%	1.1%	12,526	5,344	7,183	42.7%
Steel/tin & mixed - Containers	0.5%	5,865	3,610	2,255	61.6%	1.8%	20,814	6,576	14,238	31.6%	2.3%	26,654	6,658	19,995	25.0%
Other metal	2.6%	31,565	-	31,565	0.0%	0.6%	7,130	-	7,130	0.0%	0.4%	4,993	-	4,993	0.0%
Glass	3.2%	39,122	23,340	15,783	59.7%	5.2%	58,771	31,916	26,855	54.3%	4.7%	55,242	30,717	24,525	55.6%
Consumer electronics	0.6%	6,764	-	6,764	0.0%	0.5%	5,667	3,336	2,332	58.9%	0.5%	6,454	4,705	1,748	72.9%
Household hazardous & batteries	0.7%	8,338	5,632	2,706	67.5%	1.1%	12,408	10,089	2,318	81.3%	1.2%	13,998	12,127	1,870	86.6%
Miscellaneous	4.3%	52,910	-	52,910	0.0%	5.0%	56,969	-	56,969	0.0%	4.7%	55,011	-	55,011	0.0%
<b>TOTAL MSW (10+23)</b>	<b>100.0%</b>	<b>1,223,132</b>	<b>471,577</b>	<b>751,555</b>	<b>38.6%</b>	<b>100.0%</b>	<b>1,132,274</b>	<b>541,096</b>	<b>591,178</b>	<b>47.8%</b>	<b>100.0%</b>	<b>1,177,937</b>	<b>614,398</b>	<b>563,539</b>	<b>52.2%</b>

**Table 3: Total Non-MSW Composition (%), Generation, Recycling & Disposal Quantities (Tons), & Recycling Rate (%) 2003, 2019 & 2029**

Material	2003					2019					2029				
	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate
Vegetative waste	10.0%	81,899	3,056	78,843	3.7%	2.8%	27,931	3,290	24,641	11.8%	2.4%	26,527	2,857	23,670	10.8%
White Goods & Appliances	4.1%	33,112	30,870	2,242	93.2%	4.1%	40,441	36,810	3,631	91.0%	5.3%	56,913	42,301	14,612	74.3%
Automobile Scrap, heavy iron & non-ferrous	16.8%	136,820	102,564	34,255	75.0%	7.1%	70,090	54,752	15,338	78.1%	7.5%	80,762	47,552	33,210	58.9%
Batteries (Automobile)	0.1%	645	645	-	100.0%	0.4%	3,539	3,373	166	95.3%	0.3%	3,411	2,505	907	73.4%
Furniture	3.3%	26,792	-	26,792	0.0%	0.8%	8,142	-	8,142	0.0%	0.7%	7,083	-	7,083	0.0%
Textiles, carpet and padding	3.8%	31,417	-	31,417	0.0%	0.9%	8,946	-	8,946	0.0%	0.6%	6,265	-	6,265	0.0%
Electronic	0.3%	2,452	-	2,452	0.0%	0.1%	777	-	777	0.0%	0.1%	777	-	777	0.0%
Tires	0.5%	3,844	1,843	2,002	47.9%	0.3%	3,142	2,595	547	82.6%	0.3%	3,139	3,069	70	97.8%
<b>TOTAL Bulky (Type 13)</b>	<b>38.8%</b>	<b>316,981</b>	<b>138,978</b>	<b>178,003</b>	<b>43.8%</b>	<b>16.5%</b>	<b>163,007</b>	<b>100,821</b>	<b>62,187</b>	<b>61.9%</b>	<b>17.1%</b>	<b>184,878</b>	<b>98,284</b>	<b>86,594</b>	<b>53.2%</b>
Wood	7.1%	57,814	9,353	48,461	16.2%	11.2%	110,498	9,196	101,301	8.3%	8.9%	95,985	10,021	85,963	10.4%
Concrete/Asphalt/Block/Brick	35.7%	291,806	287,056	4,751	98.4%	39.0%	384,651	365,336	19,315	95.0%	44.9%	485,968	463,370	22,598	95.3%
Roofing	2.6%	21,385	-	21,385	0.0%	4.8%	47,026	-	47,026	0.0%	4.4%	47,525	-	47,525	0.0%
Drywall	1.4%	11,164	-	11,164	0.0%	2.5%	24,550	-	24,550	0.0%	2.3%	24,811	-	24,811	0.0%
Soil & Gravel	10.4%	85,080	81,879	3,201	96.2%	18.4%	181,324	175,870	5,454	97.0%	15.3%	165,964	160,117	5,847	96.5%
Corrugated paper	0.5%	4,437	-	4,437	0.0%	1.0%	9,757	-	9,757	0.0%	0.9%	9,861	-	9,861	0.0%
Plastic	0.6%	4,786	-	4,786	0.0%	1.1%	10,524	-	10,524	0.0%	1.0%	10,636	-	10,636	0.0%
Metal	0.2%	1,358	-	1,358	0.0%	0.3%	2,985	-	2,985	0.0%	0.3%	3,017	-	3,017	0.0%
Glass	0.0%	98	-	98	0.0%	0.0%	215	-	215	0.0%	0.0%	217	-	217	0.0%
Other	2.5%	20,622	4,788	15,834	23.2%	3.8%	37,220	2,002	35,218	5.4%	3.6%	39,460	2,824	36,636	7.2%
<b>TOTAL C&amp;D (Type 13C)</b>	<b>61.1%</b>	<b>498,550</b>	<b>383,075</b>	<b>115,475</b>	<b>76.8%</b>	<b>82.0%</b>	<b>808,750</b>	<b>552,404</b>	<b>256,346</b>	<b>68.3%</b>	<b>81.6%</b>	<b>883,442</b>	<b>636,332</b>	<b>247,110</b>	<b>72.0%</b>
Type 25	0.0%	27	-	27	0.0%	0.0%	48	-	48	0.0%	0.0%	54	-	54	0.0%
Type 27	0.1%	923	-	923	0.0%	1.1%	10,413	-	10,413	0.0%	1.0%	10,714	-	10,714	0.0%
Type 27A	0.0%	26	26	-	100.0%	0.3%	3,429	3,088	340	90.1%	0.3%	3,531	2,998	533	84.9%
Type 27I	0.0%	-	-	-	-	0.0%	-	-	-	-	0.0%	-	-	-	-
Type 72	0.0%	-	-	-	-	0.0%	147	-	147	0.0%	0.0%	157	-	157	0.0%
<b>TOTAL Other</b>	<b>0.1%</b>	<b>976</b>	<b>26</b>	<b>951</b>	<b>2.6%</b>	<b>1.4%</b>	<b>14,037</b>	<b>3,088</b>	<b>10,949</b>	<b>22.0%</b>	<b>1.3%</b>	<b>14,456</b>	<b>2,998</b>	<b>11,459</b>	<b>20.7%</b>
<b>TOTAL Non-MSW</b>	<b>100.0%</b>	<b>816,507</b>	<b>522,078</b>	<b>294,429</b>	<b>63.9%</b>	<b>100.0%</b>	<b>985,794</b>	<b>656,313</b>	<b>329,481</b>	<b>66.6%</b>	<b>100.0%</b>	<b>1,082,776</b>	<b>737,613</b>	<b>345,163</b>	<b>68.1%</b>

## Limitations of the study

Data used in this study is collected from existing/available secondary sources only. No field work (e.g. sampling and analysis of solid waste, or in-field composition evaluation) has been carried out as part of this study. While care has been taken to use official data and information where available, we cannot guarantee the reliability of data sources used.

The model and results stemming from this study include forecasts, projections and other predictive statements that represent our assumptions and expectations in light of the available information and reasonable professional judgment. The actual waste characteristics and quantities may differ from those projected in this Report. Consequently, no guarantee is presented or implied as to the accuracy of specific forecasts, projections or predictive statements contained herein.

# 1 Background and Scope

Bergen County Utilities Authority (BCUA) commissioned Mott MacDonald LLC to provide Engineering Services for a solid waste composition and generation study to determine the composition and future solid waste generation for Bergen County. The data obtained from the study will be used to develop a ten-year solid waste management plan for the Bergen County solid waste district.

## 1.1 Background

In 2003, BCUA appointed an engineering consultant to study the composition and quantities of solid waste (Types 10 and 13) from residential, and from commercial industrial and institutional (CII) sources, diverted for recycling and disposed of in Bergen County. The study involved seasonal waste characterization surveys at several county transfer stations, and analysis of available historic data on waste disposal and recycling.<sup>2</sup> The findings of the 2003 study are published in BCUA Solid Waste Composition – Final Report (March 2005).

The 2005 Report was followed by a desk-study undertaken to project solid waste quantities from 2003 to 2020 based on historic data and available statistical projections for demographic and economic indicators. The results are published in the BCUA Report entitled Current and Projected Solid Waste Quantities (August 2006).

The BCUA 2005 and 2006 Reports were included in the Updated Bergen County Solid Waste Management Plan (October 2006).

Using available data including the BCUA 2005 and 2006 Reports and other available BCUA, New Jersey Department of Environmental (NJ DEP) and industry data, Mott MacDonald has updated the data on current Bergen County MSW composition and quantities by material, generated, disposed and recycled to 2016, and provided projections from 2016 to 2029.<sup>3</sup> The purpose of the current study is to provide updated information on waste composition and quantities to inform BCUA's long-term strategic planning for solid waste recycling and management in Bergen County.

## 1.2 Scope of Services

The scope of services for this project as set out in the BCUA Request for Proposals (RFP) Engineering Services for Solid Waste Composition and Generation Study (Undated) includes the following items:

- *“Estimate the composition of solid waste generated in Bergen County utilizing the March 2005 Solid Waste Composition – Final Report as well as population growth, economic development initiatives, land use planning, other New Jersey county composition studies and any other factors or reports that may be useful in estimating solid waste composition.”*
- *“Project the Bergen County solid waste stream generation for the next ten (10) years using information such as current waste generation rates, population growth, economic development initiatives, land use planning, and any other factors that may be useful in developing solid waste projections.”*

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<sup>2</sup> The 2005 study was influenced by a similar study on solid waste composition in Bergen County that was undertaken for BCUA in 1992/3.

<sup>3</sup> It is assumed that the BCUA updated solid waste management plan will be published in 2019. Therefore, projections have been provided from 2017 to 2029 to cover a ten-year plan period.



- *“Produce a comprehensive report providing data and narrative detailing the solid waste generation and composition methodology. The report shall include detailed projections for solid waste generation and composition.”*

The solid waste composition study and projections include analysis of generation, disposal, and diversion of NJ DEP Waste Types 10, 13 and 13C. Type 10 is characterized by 1) Residential, and 2) Commercial Industrial and Institutional (CII) Sources.

Collection and analysis of data is required from existing/available secondary sources only. No field work (e.g. sampling and analysis of solid waste, or in-field composition evaluation) has been carried out in this study.

### **1.3 Structure of this Report**

Section 2 of this report provides an overview of the methods adopted to address the objectives of this study, including the main tasks and sub-tasks.

Section 3 presents estimated quantities and characteristics of solid waste generated, diverted for recycling and disposed of between 2003 and 2016. Full results for 2003 to 2016 are presented in Appendix C. A description tasks and inputs are also provided in Section 3, and input data is provided in Appendix A and B.

Projections of solid waste generation, diversion and disposal from 2017 to 2029 are presented in Section 4. Two scenarios are presented: 1) a baseline projection (business as usual), and 2) an adjusted projection accounting for current and anticipated changes in recycling markets, affecting short-term recycling rates for certain materials.

A summary of modelled solid waste generation, diversion and disposal data between 2003 and 2029 is presented in Section 5.

### **1.4 Limitations of the study**

Data used in this study is collected from existing/available secondary sources only. No field work (e.g. sampling and analysis of solid waste, or in-field composition evaluation) has been carried out as part of this study. While care has been taken to use official data and information where available, we cannot guarantee the reliability of data sources used.

The model and results stemming from this study include forecasts, projections and other predictive statements that represent our assumptions and expectations in light of the available information and reasonable professional judgment. The actual waste characteristics and quantities may differ from those projected in this Report. Consequently, no guarantee is presented or implied as to the accuracy of specific forecasts, projections or predictive statements contained herein.

## 2 Methodology

This Section provides an outline of the methodology adopted for the study, principal sources of data used, and the waste and recycling categories adopted. The section also discusses limitations of the study.

### 2.1 Sources of Data

The main sources of data used for this study include the following:

1. **BCUA Solid Waste Composition Study – Final Report (March 2005)** – This report documents the methods and findings of a solid waste characterization study undertaken at waste transfer stations in Bergen County over 4 seasons in 2003 (it is referred to in this Report as the “BCUA (2003) Study” and the results are documented in the “BCUA (2005) Report”. The study covers Waste Type 10 MSW from Commercial, Industrial and Institutional (CII) Sources and Type 13 Bulky waste, and 13C Construction and Demolition (C&D) waste.
2. **BCUA Current and Projected Solid Waste Quantities Study (August 2006)** – This study builds on the BCUA 2003 characterization study (see 1 above) to provide projections of solid waste generation, diversion and disposal from 2004 to 2020.
3. **NJ DEP Solid Waste Disposal and Recycling Statistics** – NJ DEP provided data (Microsoft Excel spreadsheet) on solid waste disposal quantities by type between 2003 and 2017. Note: only partial data is available for 2017.
4. **US EPA (2018) Advancing Sustainable Materials Management: Facts and Figures Report 2015** - Estimates MSW generation, recycling and disposal by materials and products in the US using a material flow methodology.<sup>4</sup>
5. **US EPA (July 2013) – MSW Residential/Commercial Percentage Allocation – Data Availability U.S. Environmental Protection Agency Office of Resource Conservation and Recovery** - Report classifies MSW materials into residential and commercial fractions based on available data and ‘best judgement’.<sup>5</sup>
6. **New York City Sanitation Department (2018) NYC Residential, School, and NYC Housing Authority Waste Characterization Study** – 2017 composition study including residential MSW discarded in the five boroughs of New York City. This study has been used as a benchmark to estimate the quantity of MSW materials arising in Bergen County in 2017.
7. **US Census Bureau** – Bergen County population data taken from the National Population Projection Tables (2017).<sup>6</sup> The data is from the 2010 Census and subsequent years are Census Bureau estimates.

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<sup>4</sup> EPA ASMM Facts and Figures: Available at: <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/advancing-sustainable-materials-management>

<sup>5</sup> EPA (2013) Report available at: [https://www.epa.gov/sites/production/files/2016-01/documents/rev\\_10-24-14\\_msw\\_residential\\_commercial\\_memorandum\\_7-30-13\\_508\\_fnl.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/rev_10-24-14_msw_residential_commercial_memorandum_7-30-13_508_fnl.pdf)

<sup>6</sup> US Census Bureau – Bergen County Quick facts. Available at: <https://www.census.gov/quickfacts/bergencountynewjersey>

## 2.2 Categories of Waste and Materials

### 2.2.1 Waste Types

NJ DEP characterizes solid wastes according to their source and characteristics into the following 'Types':

- Type 10: Municipal Solid Waste (Residential, and Commercial Industrial and Institutional (CII) Sources)
- Type 13 – Bulky waste
- Type 13C – Construction and Demolition (C&D) waste
- Type 23 – Vegetative waste
- Type 27 – Dry industrial waste
- Type 27A – Waste containing asbestos
- Type 27I - Waste containing incinerator ash

A description of the categories is provided in Appendix A.1.

The RFP (BCUA undated) states that “*the solid waste composition study and projections include analysis of generation disposal, and diversion of NJ DEP Waste Types 10, 13 and 13C*”. However, this study has been expanded to include Type 23 vegetative waste to align with the NJ DEP statistics definition of MSW as Type 10 + Type 23.

It should be noted that the Bergen County solid waste characterization study undertaken in 2003, and the associated Final Report (BCUA 2005) and Current and Projected Waste Quantities Report (BCUA 2006) used broad definitions of “Type 10” and “Type 13”. In the BCUA 2005 Report solid waste reported as Type 10 also included yard waste such as leaves and grass clippings, which are typically defined as Type 23 – Vegetative waste. Additionally, “Type 13” waste included both NJ DEP Type13 and Type 13C waste as an undifferentiated category.

### 2.2.2 MSW and Non-MSW

In annual solid waste and recycling statistics in New Jersey municipalities and boroughs published by NJ DEP, MSW is the sum of annual quantities of Type 10 and Type 23 wastes, and the remaining solid waste types are Non-MSW. NJ DEP also attributes diverted materials to MSW and Non-MSW categories within their statistics on recycling.

In this study, Non-MSW refers to Types 13, 13C and Other Non-MSW types including Types 25, 27, 27A, 27I and 72.

### 2.2.3 Waste and Recycling Materials Categories

Waste and recycling materials categories have been selected based on those used by NJ DEP in their waste and recycling statistics, as shown in Table 4.

The Non-MSW waste materials used in the present study have been adapted from the BCUA 2005 Report as shown in Table 5. NJ DEP recycling materials categories have also been assigned to determine statistics on total generation.

**Table 4: Waste and Recycling Materials Categories [MSW]**

MATERIAL (2018) [This Study]	BCUA 2003 Sorting Categories (Table 3-9)	NJ DEP Recycling Materials	
<b>Total Paper</b>			
Corrugated	Corrugated cardboard & craft paper	1	Corrugated
Mixed Office Paper	Office Paper	2	Mixed Office Paper
Newspaper	Newsprint	3	Newspaper
Other Paper/Mag/Junk Mail	Magazines and other paper	4	Other Paper/Mag/Junk Mail
<b>Total Plastic</b>			
Plastic Containers	HDPE and PETE bottles and jars	8	Plastic Containers
Other Plastic	Other plastic	26	Other Plastic
<b>Total Textiles, rubber and leather</b>			
Textiles	Textiles	29	Textiles
Rubber and leather	Rubber and leather (no tires)	---	---
Yard waste	Other yard waste	17	Brush/Tree Parts
	Grass Clippings	18	Grass Clippings
	Leaves	19	Leaves
Food Waste	Food Waste - residential	23	Food Waste
	Food Waste - commercial		
Wood	Wood	---	---
Other organics/combustibles	Other organics/combustibles	---	---
<b>Total Metal</b>			
Aluminum Containers	Aluminum food & beverage containers	6	Aluminum Containers
Steel and mixed metal Containers	Steel & bi-metal food & beverage containers	7	Steel Containers
Other metal	Other metal	---	---
	Other recyclable metal		
	Nonrecyclable metal		
Glass	Glass containers	5	Glass Containers
		25	Other Glass
Consumer electronics	Electronics	21	Consumer Electronics
Household hazardous & batteries	Household hazardous & special waste	12	Anti-freeze
		16	Used Motor Oil
	Batteries	24	Batteries (Dry Cell)
Miscellaneous	Other inorganics/noncombustibles	---	---
	Unclassifiable fines		
	Disposable diapers/sanitary products		

Source: BCUA (2005) Table 3-9 & NJ DEP New Jersey Materials and Recycling Statistics

**Table 5: Waste and Recycling Materials Categories [Non-MSW]**

MATERIAL (2018) [This Study]	BCUA 2003 Sorting Categories (Table 4-3)	NJ DEP Recycling Materials
<b>Type 13 – Bulky Waste</b>		
Vegetative waste	Vegetative materials	Stumps
	Other organics combustibles	
White Goods & Appliances	Appliances	White Goods & Light Iron
Automobile Scrap, heavy iron & non-ferrous	Metal	Automobile Scrap
		Batteries (Automobile)
		Heavy Iron
		Non-Ferrous/Aluminium Scrap
Furniture	Wood furniture	---
	Stuffed goods and furniture	
Textiles, carpet and padding	Textiles, carpet and padding	---
Electronic	Electronic devices	---
Tires	Tires	Tires
<b>Type 13C – Construction and Demolition</b>		
Wood	Lumber	Wood Scraps
Concrete/Asphalt/Block/Brick	Concrete	Concrete / Asphalt / Brick / Block
	Asphalt pavement	
	Blocks and bricks	
Roofing	Roofing materials	---
Drywall	Gypsum board and plaster	---
Soil & Gravel	Soil sand grit and dust	Oil Contaminated Soil
Corrugated paper	Corrugated cardboard & kraft paper	---
	Other paper	
Plastic	Plastic	---
Metal	Other inorganics / non-combustibles	---
Glass	Glass	---
Other	Other rubber	Other Material Not Listed
	Insulation	Fluorescent Lights
	Bagged and miscellaneous	Paints and Stain

Source: BCUA (2005) Table 4-3, and NJ DEP Waste and Recycling Statistics

## 2.3 Study Methodology

To address the scope, two main tasks and associated sub-tasks were identified. Numbered bullets under each sub-task describe the methodological steps undertaken.

### 2.3.1 Task 1 – Update waste characterization and quantities between 2003 to 2016

Task 1.1. Estimate proportion (%) of MSW materials disposed of in Bergen County by materials:

1. Categories of materials were assigned to closely match those used for solid waste in the BCUA 2005 report, tailored to also align with the categories used in NJ DEP recycling statistics.
2. The proportions (%) of MSW recycled and disposed of by material from residential and CII sources in 2003 were then assigned to these categories from the BCUA 2005 Report.
3. The percentage breakdown for residential MSW in Bergen County in the year 2017 was estimated by benchmarking the findings of the New York Sanitation Department (NYSD) (2018) waste characterization study. This was found to be the most relevant available study, as no recent NJ studies in similar areas were identified.
4. The CII fraction of MSW in 2017 was estimated using the residential/commercial split for New York in the EPA 2013 study (and BCUA (2005)). As the total quantities were known from the NJDEP statistics, the total CII was identified by subtracting the residential waste tonnage from the total.
5. The average annual percentage of waste disposed of between 2003 (BCUA 2005) and 2017 (NYSD 2018) for each material category were used to estimate the solid waste disposal characterization between 2004 to 2016 by linear interpolation.

Task 1.2. Estimate proportion (%) of Non-MSW disposed of by material between 2003 and 2016

1. Materials categories were assigned based on those used in the BCUA 2005 Report and NJ DEP statistics.
2. The average annual material proportions for Non-MSW in 2003 were obtained from the BCUA 2003 study for all years between 2003 and 2016.

Task 1.3. Calculate proportion (%) of materials diverted/recycled in Bergen County by material between 2003 and 2016:

1. Average annual percentages of each material diverted were taken from the quantities recorded in the NJ DEP recycling statistics.
2. The breakdown between residential and CII categories were derived based on the estimated proportional residential/commercial split for New York City presented in the EPA 2003 Study.

Task 1.4. Estimate quantities of MSW and non-MSW materials disposed, recycled and generated between 2003 and 2016:

1. Annual quantities of solid waste disposed (by type) and materials diverted (by material and source) were obtained directly from the NJ DEP recycling statistics.
2. Quantities of solid waste by material were derived by multiplying the total annual quantities by the average annual proportions (%) established in Task 1.1 and 1.2.
3. Materials generation quantities and proportions were derived by adding together the quantities of waste discarded and materials diverted.

### 2.3.2 Task 2 – Project annual material disposal, diversion and generation from 2017 to 2029

Task 2.1. Model forecast based on continuation of derived annual solid waste and recycling trends (estimated in Task 1):

1. Average percentage values for disposal and recycling between 2014 and 2016 were used to set values for the base year of the projection (2017).
2. The baseline projection from 2017 to 2029 was then developed using average annual growth/fall in generation and diversion quantities by material between 2003 and 2016 which were derived in Task 1. The range of years for each material was selected to remove years with high variance from the mean. Growth rates were also capped in some years to reflect diminishing rates of return. Disposal was calculated by subtracting diversion values from generation values.
3. An exponential smoothing factor of (Alpha = 0.3) was added to the linear extrapolation to account for diminishing rates of return on recycling and generation trends.

Task 2.2. Update forecasted disposal and recycling projection based on anticipated changes in future recycling trends:

1. Percentage reductions in recycled quantities for 2018 were included in the baseline projections (developed in task 2.1) for selected materials, namely magazines, glossy and other paper, plastic containers and other plastic (40% reduction); and mixed office paper and newspaper (10% reduction).<sup>7</sup>
2. The baseline projected growth rates were then applied to reflect expected recovery in recycling markets and associated rates for these materials.

More detailed descriptions of the methodology outlined above and assumptions are presented in Section 3 and Section 4 alongside the results of tasks 1 and 2.

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<sup>7</sup> C.f. "The Chinese import ban and its impact on global plastic waste trade" published in the journal Science Advances by Amy L. Brooks, Shunli Wang, and Jenna R. Jambeck.

## 3 Baseline Solid Waste Characterization and Quantities (2003 to 2016)

This Section reports the findings of the baseline characterization and quantification of solid waste and recyclables generated, diverted for recycling (including composting), and disposed of from 2003 to 2016 in Bergen County. Results for MSW (Types 10 and 23) from Residential, CII and All (Residential + CII) sources, and Non-MSW (predominantly Type 13, 13C) from all sources, are provided.

### 3.1 Solid Waste Disposal - Composition and Quantities

#### 3.1.1 Total Quantities of Solid Waste Disposed

Reported total annual quantities of solid waste disposed of in Bergen County have been provided between 2003 and 2016 by NJ DEP as shown in Table 6.<sup>8</sup> The data is reported by municipalities in accordance with prescribed standards and guidelines, and is aggregated for Bergen County by NJ DEP. MSW quantities are derived from the sum of quantities for Type 10 and 23, while Non-MSW is the sum of the remaining types 13, 13C, 25, and 27. Type 72 (Bulk Liquids and Semi-Liquids) is not solid waste and is shown for information only.

**Table 6: Bergen County Annual Solid Waste Disposal Quantities (Tons), by Type (2003 to 2016) – All Sources**

Type	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
10	749,799	689,522	728,138	747,341	699,326	673,541	681,143	610,261	629,845	593,904	629,529	577,951	600,845	547,040
13	178,003	131,372	107,409	90,075	75,122	60,063	60,284	58,862	63,301	74,891	63,409	75,599	53,270	40,342
13C	115,475	57,140	66,443	101,804	145,246	138,872	221,227	235,786	259,199	222,786	272,005	236,151	262,057	261,160
23	1,755	553	483	498	602	495	647	1,074	16,725	18,796	908	2,613	543	616
25	27	32	9	1	37	192	47	21	65	18	24	24	23	94
27	923	597	772	1,085	4,862	2,159	6,685	6,779	15,679	16,321	23,280	15,658	6,918	8,397
27A	0	0	0	2	1,119	571	475	15	24	28	36	196	451	229
27I	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	5	0	0	5	0	0	0	11	419
<b>Total</b>	1,045,984	879,216	903,253	940,805	926,314	875,898	970,508	912,797	984,844	926,744	989,191	908,192	924,118	858,298
<b>MSW</b>	751,555	690,075	728,621	747,839	699,928	674,036	681,790	611,335	646,570	612,700	630,436	580,564	601,388	547,656
<b>Non-MSW</b>	294,429	189,141	174,632	192,966	226,386	201,862	288,718	301,462	338,273	314,044	358,754	327,628	322,730	310,642

Source: NJ DEP (2018)

<sup>8</sup> MSW quantities are the sum of quantities for Type 10 and Type 23 waste from all sources.



### 3.1.2 Composition and Quantities of MSW Disposed

#### 3.1.2.1 MSW Disposed from Residential Sources

##### **Method for Estimating Residential Composition and Quantities**

Data on the composition of solid waste disposed from residential sources in the BCUA (2005) Report - *Table 3.7* from 2003 has been adopted for the base year (2003) in this study, as this is the best available data. No primary data on the composition and character of solid waste disposed of from Bergen County from either commercial or residential sources was identified between 2004 and the present. Therefore, to estimate the average residential solid waste composition for the County during this period, a benchmarking approach has been adopted in this study, as follows:

1. Data on the composition of solid waste from residential sources in New York City (NYC) from a characterization study carried out by New York City Department of Sanitation (DSNY) in 2017 (DSNY 2018) has been used to estimate the composition of waste disposed in Bergen County in the same year.<sup>9</sup>
2. Categories of waste materials used in the DSNY 2017 study were modified for use in this study to align with the categories used in the BCUA 2005 Report and NJ DEP waste and recycling statistics (i.e. material categories were combined/split or matched-up with similar categories).
3. Data on percentages of materials disposed of between 2004 and 2016 were derived by simple linear interpolation of the data from 2003 in the BCUA (2005) Report and 2017 in the DSNY (2018) Report.

The breakdown of MSW from residential sources in NYC in 2017, by material, is shown in Table 7, alongside the BCUA data for 2003, and the percentage change by material over the period 2003 to 2017. The material categories for both studies have been adjusted to align with the categories adopted for this study.

The NYC Study was selected as the best and most relevant available data, as both Bergen County and NYC share similarities in land-use, socio-economic characteristics and population density, and are in close geographic proximity. In addition, the NYC study is recent, detailed, and contains relevant waste types and sources.

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<sup>9</sup> New York City Department of Sanitation (2018) NYC Residential, School, and NYC Housing Authority Waste Characterization Study

**Table 7: NYC 2017 Residential Solid Waste Disposal – Composition**

<b>MATERIAL</b>	<b>BCUA 2003</b>	<b>NYC 2017</b>	<b>Total Change</b>	<b>Annual av. Change</b>
<b>Paper</b>	<b>33.6%</b>	<b>26.0%</b>	<b>-7.60%</b>	<b>-0.54%</b>
<i>Corrugated</i>	4.5%	5.7%	1.20%	0.09%
<i>Mixed Office Paper</i>	1.3%	0.7%	-0.60%	0.04%
<i>Newspaper</i>	5.3%	1.9%	-3.40%	-0.24%
<i>Magazines/glossy &amp; other</i>	22.5%	17.7%	-4.80%	-0.34%
<b>Plastic</b>	<b>14.4%</b>	<b>14.9%</b>	<b>0.50%</b>	<b>0.04%</b>
<i>Plastic Containers</i>	1.4%	2.4%	1.00%	0.07%
<i>Other Plastic</i>	13.0%	12.5%	-0.50%	0.04%
<b>Textiles and fabrics</b>	<b>5.9%</b>	<b>6.3%</b>	<b>0.40%</b>	<b>0.03%</b>
<i>Textiles</i>	4.6%	5.2%	0.60%	0.04%
<i>Rubber and leather</i>	1.3%	1.1%	-0.20%	0.01%
Yard Waste	3.7%	6.6%	2.90%	0.21%
Food Waste	15.2%	20.7%	5.50%	0.39%
Wood	6.1%	2.8%	-3.30%	-0.24%
Other - Misc. organic / animal products	3.0%	2.2%	-0.80%	-0.06%
<b>Metal</b>	<b>5.3%</b>	<b>4.7%</b>	<b>-0.60%</b>	<b>0.04%</b>
Aluminum - Containers	0.8%	1.1%	0.30%	0.02%
Steel/tin & mixed - Containers	0.3%	2.7%	2.40%	0.17%
Other metal	4.2%	0.9%	-3.30%	-0.24%
Glass	2.1%	4.5%	2.40%	0.17%
Consumer electronics	1.2%	0.3%	-0.90%	-0.96%
Household hazardous & batteries	0.3%	0.4%	0.10%	0.01%
Miscellaneous	9.2%	10.6%	1.40%	0.10%

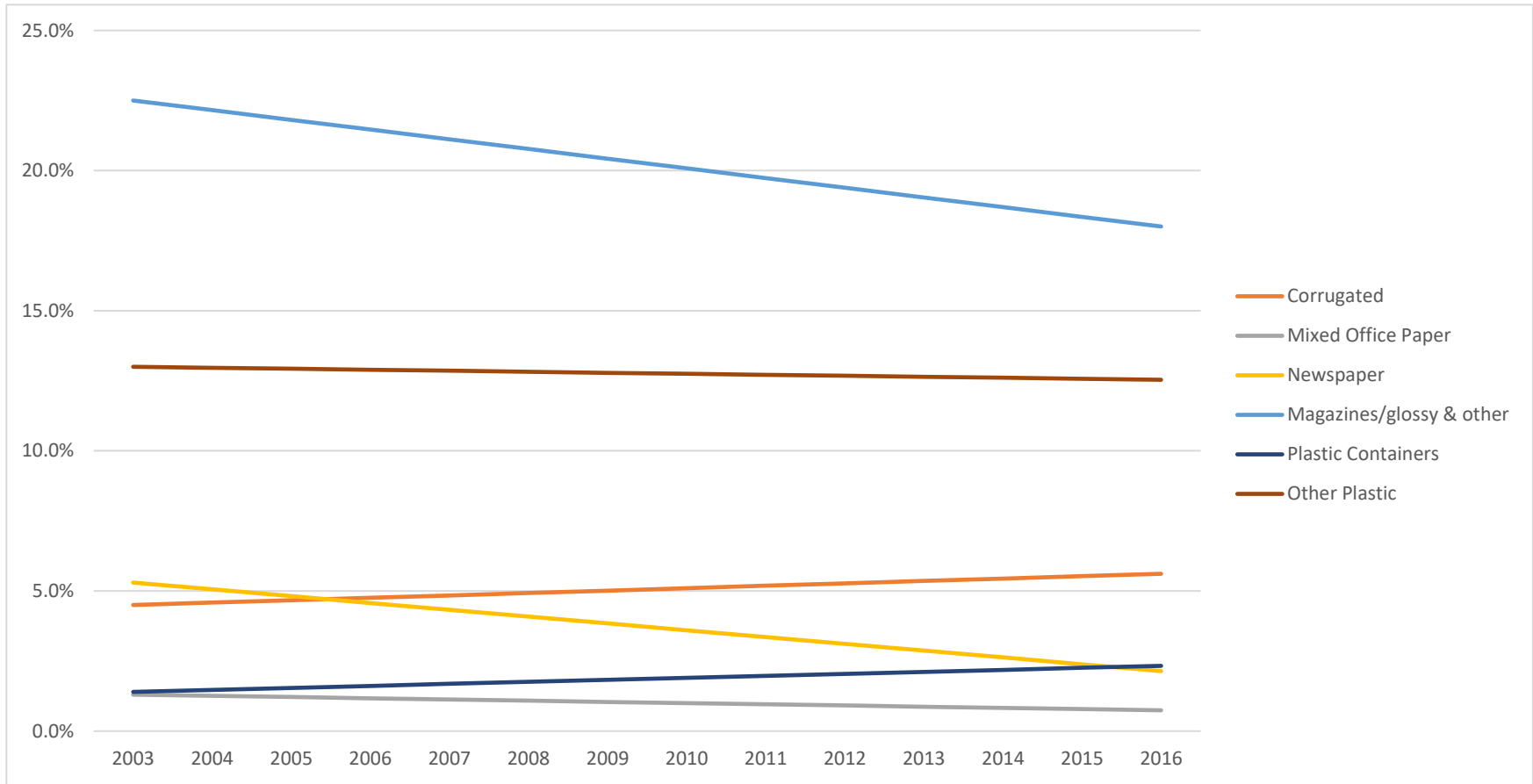
Source: BCUA (2005) and NYDS (2018)

Note: Percentages are by weight.

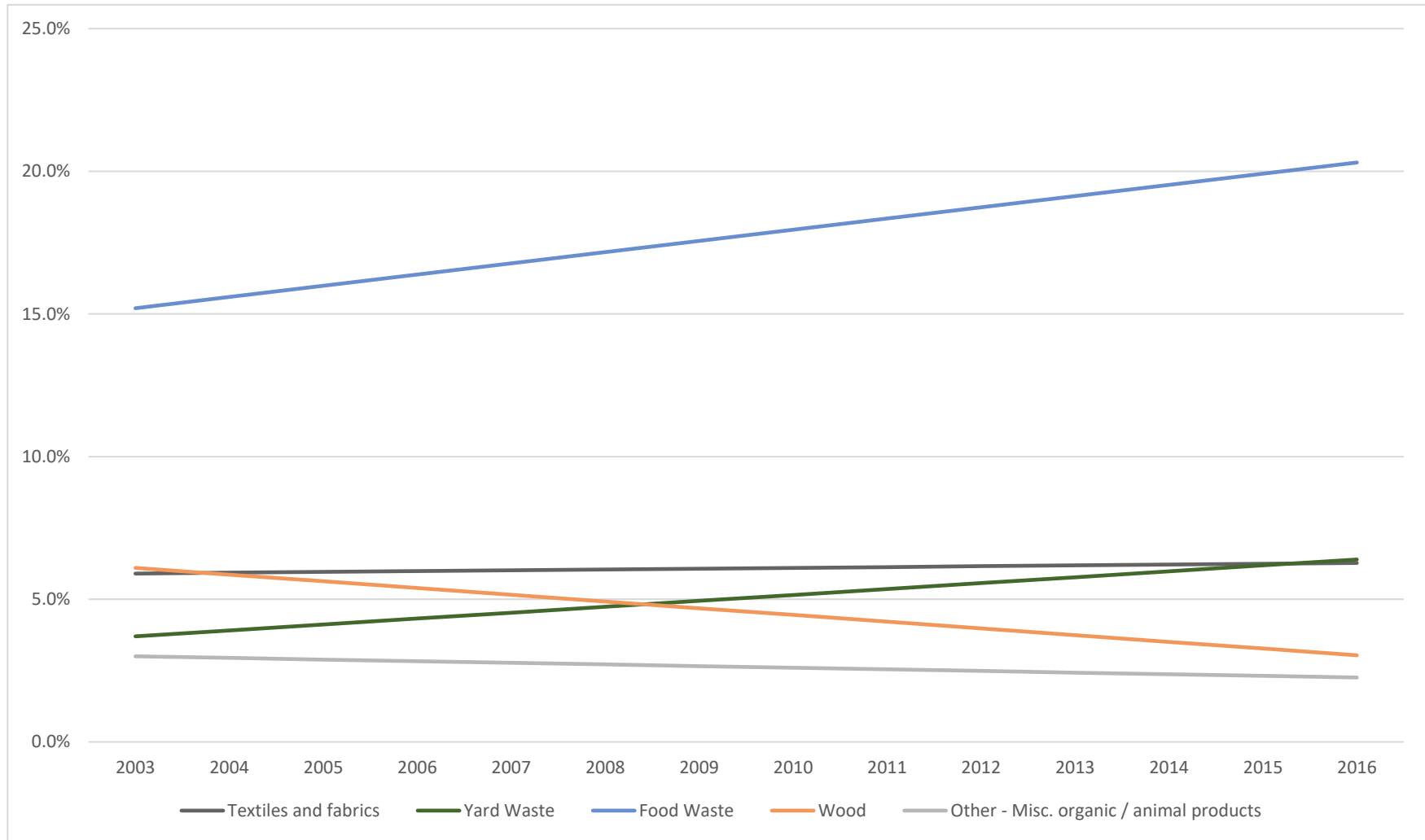
### Annual Average Composition of MSW from Residential Sources (2003 to 2017)

The estimated annual composition of MSW from residential sources in Bergen County which was disposed of between 2003 and 2017 is presented in Table 44 - Appendix D.1, and associated trends are illustrated in Chart 3 to Chart 5.

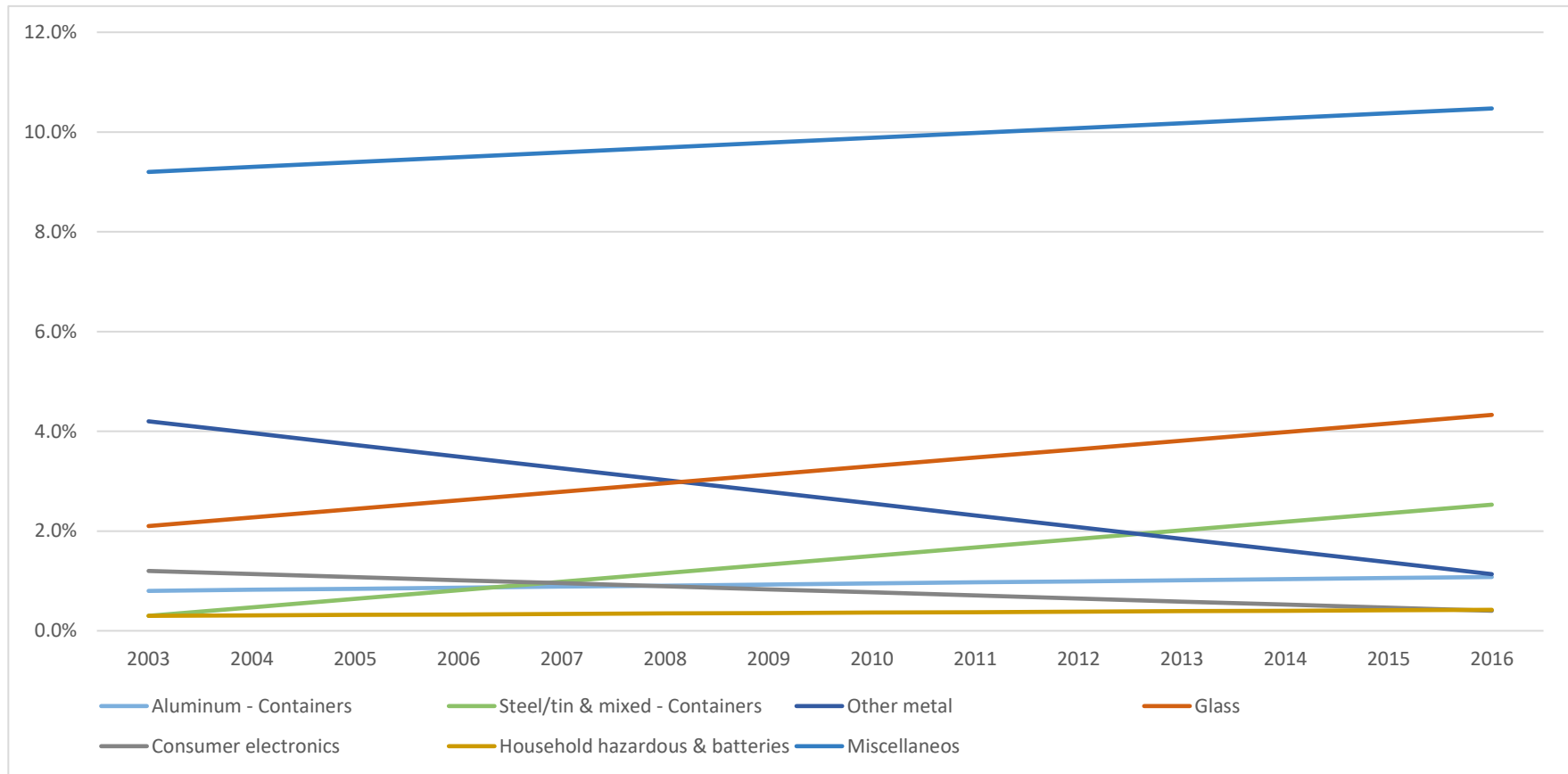
**Chart 3: Baseline Residential MSW Disposal Composition Trends 2003 to 2016 (Paper and Plastic)**



**Chart 4: Baseline Residential MSW Disposal Composition Trends 2003 to 2016 (Organics and textiles)**



**Chart 5: Baseline Residential MSW Disposal Composition Trends 2003 to 2016 (Metal, glass and other categories)**



### Annual Quantities of MSW Materials from Residential Sources (2003 to 2016)

Total MSW (Type 10 + 23) disposal quantities reported for Bergen County between 2003 and 2016 provided by NJ DEP (Table 35 – Appendix C.2) were allocated to residential and CII categories using a ratio of 61% to 39% respectively, in line with the split used in the BCUA 2003 characterization study, as shown in Table 8.

**Table 8: Total Annual MSW Quantities (Tons) Discarded, by Source (Residential – CII) (2003 to 2016)**

Source	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Residential	458,448	420,946	444,459	456,182	426,956	411,162	415,892	372,914	394,408	373,747	384,566	354,144	366,847	334,070
CII	293,107	269,129	284,162	291,657	272,972	262,874	265,898	238,421	252,162	238,953	245,870	226,420	234,541	213,586
All MSW	751,555	690,075	728,621	747,839	699,928	674,036	681,790	611,335	646,570	612,700	630,436	580,564	601,388	547,656

Notes: Total MS Quantities derived from NJ DEP data (Type 10+23). Residential - Commercial Split derived from Ratio 61:39 used in BCUA (2005)

Quantities of individual MSW material categories discarded from residential sources have been estimated using the residential quantities shown in Table 8, and the composition percentages for MSW disposed of from residential sources presented in Table 44 - Appendix D.1. Estimated quantities of residential MSW discarded are provided in Table 45 - Appendix D.1.

#### 3.1.2.2 MSW Disposed from CII Sources

##### Method for Estimating CII Composition and Quantities

Data on MSW composition from CII sources from the BCUA 2005 Report has been used as the best available data for 2003. However, no data on the composition of MSW arising in Bergen County from CII sources is available from 2004 to 2017; and no recent studies of waste composition from CII sources in other areas (counties, boroughs or states) with similar socio-economic characteristics have been identified for use in this study. Therefore, the following approach has been adopted to estimate MSW composition from CII in 2017:

1. Total MSW (Type 10 + 23) disposal quantities for Bergen County between 2003 and 2016 provided by NJ DEP (Appendix D.1) were allocated to residential and CII categories using a ratio of 61% to 39% respectively, taken from the BCUA 2005 study.<sup>10</sup>
2. The total quantities of residential MSW were then distributed across the materials categories using the percentages derived from the BCUA (2005) and NYC (2018) studies, to give annual residential disposal quantities by material.
3. Ratios of residential to CII waste disposed provided in a US EPA (2013) Report (based on historic averages) were used as the basis on which to calculate the split between CII and residential disposal tonnages by material.<sup>11</sup> The rates in the study were adjusted so that the total quantities provided by NJDEP were maintained. The amended ratios are provided in Table 9.
4. Waste composition percentage by materials were applied to the calculated tonnages for CII.

<sup>10</sup> The BCUA (2005) study applied the ratio 61% residential 39% commercial uniformly across all materials categories.

<sup>11</sup> US EPA (2013) "MSW Residential/Commercial Percentage Allocation – Data Availability" - Table 5. MSW Residential/Commercial Generation Allocation, by Product.

**Table 9: Ratio of Residential to Commercial Breakdown, EPA and Amended Ratios**

NJDEP Category	EPA (2013) Category	EPA Discarded Ratios		Adjusted Ratios (Adopted)	
		Residential	Commercial	Residential	Commercial
<b>Paper</b>					
<i>Corrugated</i>	<i>Corrugated boxes</i>	39%	61%	39%	61%
<i>Mixed Office Paper</i>	<i>Office-type papers</i>	30%	70%	30%	70%
<i>Newspaper</i>	<i>Newspapers/Mechanical Papers</i>	75%	25%	75%	25%
<i>Magazines/glossy &amp; other</i>	<i>Magazines</i>	68%	32%	68%	32%
<b>Plastic</b>					
<i>Plastic Containers</i>	<i>HDPE Natural Bottles</i>	66%	34%	66%	34%
<i>Other Plastic</i>	<i>Other plastics packaging</i>	53%	47%	64%	36%
<b>Textiles and fabrics</b>					
<i>Textiles</i>	<i>Textiles*</i>	40%	60%	50%	50%
<i>Rubber and leather</i>	<i>Rubber and leather**</i>	57%	43%	64%	36%
Yard Waste	Yard Wastes	77%	23%	71%	29%
Food Waste	Food Wastes	46%	54%	58%	42%
Wood	Wood Packaging	46%	54%	53%	47%
<b>Other - Misc. organic / animal products</b>		-	-	61%	39%
<b>Metal</b>					
<i>Aluminium - Containers</i>	<i>Aluminium packaging</i>	66%	34%	64%	36%
<i>Steel/tin &amp; mixed - Containers</i>	<i>Steel packaging</i>	80%	20%	67%	33%
<i>Other metal</i>				61%	39%
Glass	Glass packaging	56%	44%	61%	39%
Consumer electronics	Selected Consumer Electronics	53%	47%	60%	40%
Household hazardous & batteries		-	-	61%	39%
Miscellaneous	Miscellaneous Inorganic Wastes			61%	39%

Source: EPA (2013) MSW Residential/Commercial Percentage Allocation – Data Availability

Notes: The material categories in the US EPA Report were matched with the NJ DEP categories used in this study. However, the categories do not match exactly. Additionally, the ratios from the EPA study were modified (max +13%). Where no data is available a 39:61 ratio has been adopted.

**Annual Average Composition of MSW from CII Sources (2003 to 2017)**

The estimated annual composition of MSW from CII sources in Bergen County disposed of between 2003 and 2017 is presented in Table 46 - Appendix D.1.

**Annual Quantities of MSW Materials from CII Sources (2003 to 2017)**

By applying the annual quantities of MSW disposed from CII sources (Table 8) to the composition ratios for MSW disposed from CII sources (Table 46 - Appendix D.1), quantities of MSW from CII sources in Bergen County disposed of between 2003 and 2017 have been derived by material. These quantities are presented in Table 47 - Appendix D.1.

### 3.1.2.3 MSW Disposed from All Sources

#### **Composition and Quantities of MSW Disposed of from All Sources**

Annual quantities and composition ratios of MSW disposed of from all sources in Bergen County between 2003 and 2017 have been derived using the product of individual material quantities from residential and CII sources. Estimated historic quantities of MSW from all sources by material are presented in Table 48 - Appendix D.1.

#### **Comparison of Bergen County and National Trends in MSW Composition**

The US EPA releases the Advancing Sustainable Materials Management (ASMM): Facts and Figures Report annually. The report includes estimates of MSW generation, diversion and disposal, by material to characterize MSW in the US at the national level.<sup>12</sup> The data is developed using a materials flow methodology, which relies on a mass balance approach, using data gathered from industry associations and businesses, supported by government data from sources including the Department of Commerce and the US Census Bureau, and other sources, such as waste characterizations and surveys performed by governments, industry, or the press. The latest EPA data is for 2015.

National data from the EPA ASMM Report has been reviewed against the baseline estimates in this study to check for anomalies.

Table 10 discusses the estimated changes in residential waste composition in Bergen County against the trends identified in the EPA ASMM Report between 2005 and 2015 to identify similarities and differences in materials disposal trends.

Based on the comparison of data between the present study and EPA ASMM between 2005 and 2015, the data presented in Table 48 - Appendix D.1 is found to be generally consistent with national trends. The two most significant changes during the period between 2003 and 2016 are the decline in paper waste and increase in food waste.

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<sup>12</sup> EPA Facts and Figures Web Homepage: <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling>



**Table 10: Comparison of Waste Disposal Composition Trends, by Material between Bergen County and EPA (2005 to 2015)**

Material	2005	2015	Diff.	Discussion
<u>Paper</u>				
BC All	34.1%	27.3%	-6.8%	According to the EPA, generation of newspapers has been declining since 2000, and this trend is expected to continue, partly due to decreased page size, but mainly due to the increased digitization of news. The generation of office-type (high grade) papers also has been in decline, due at least partially to the increased use of the electronic transmission of reports, etc. This trend is corroborated by the present study, which estimates a 6.8% fall, compared to 11.8% in the EPA data.  While there has been a recent increase in generation of corrugated card due to growth in online retail, this has been offset by an increase in the rate of recycling during the period.
EPA	25.1%	13.3%	-11.8%	
<u>Food waste</u>				
BC All	15.7%	20.4%	+4.7%	EPA estimates that only 5% of food waste is composted nationally. In Bergen County the reported rate is 12%. During the period 2005 to 2015, generation of food waste in Bergen County grew by close to 15%, which is close to the 20% increase shown in the EPA Report. Recycling also increased significantly during this time (from almost zero). Overall both studies found a similar increase in disposal of food waste (4.7% vs 3%). However, the slightly higher proportion in the BC All data is expected as commercial establishments in NYC (within 100 miles of a composting facility) are legally obliged to recycle food waste.
EPA	18.9%	21.9%	+3%	
<u>Yard waste</u>				
BC All	3.5%	5.5%	+2%	Yard waste is composed of leaves, grass clippings and woody wastes. These materials are not differentiated in the NYC study; therefore, the categories from the BCUA study have been combined. Generation of these materials is highly seasonal, with leaves highest in autumn, and grass clippings high in summer.  The total tonnage of yard waste generated declined only slightly from 272 thousand tons in 2003 to 271 thousand tons in 2016. However, the recycling rate declined slightly from 91.4% to 88.5%, which is likely to account for the higher proportion of yard waste in this study compared to the EPA data.  Leaves constitute the largest fraction of yard waste generated on average. According to the New Jersey Statewide Mandatory Source Separation and Recycling Act (P.L. 1987, c.102, or NJSA 13:1E-99.11 et seq.), leaves must be source separated and recycled (composted), and area not permitted in NJ landfills. Therefore, compliance is the main factor driving the proportion of leaves disposed.
EPA	7.1%	7.8%	+0.7%	
<u>Metal</u>				
BC All	5.1%	4.6%	-0.5%	The proportion of metals (ferrous, non-ferrous and mixed containers, and 'other metals') in the waste stream which were discarded fell very slightly from 5.1-4.6% between 2013 and 2016. The EPA data, which shows a 0.4% increase, a difference of only 0.9%.
EPA	7.6%	8%	+0.4%	
<u>Wood</u>				
BC All	6.3%	3.6%	-2.3%	This category of materials includes relates to wood pallets, wood debris, firewood and other miscellaneous wooden items. For 2005, wood waste accounted for around 6.3% of the waste stream in Bergen County compared to 9% in the EPA data. In 2015 the difference between the proportion present study and the EPA estimates has increased. The reduction in wood waste from 6.3% to 3.6% could be largely accounted for by the significant increase in recycling of wood waste reported in Bergen County from 16% in 2005 (in line with the EPA data) to 29% in 2015.
EPA	9%	9.7%	+0.7%	
<u>Glass</u>				
BC All	2.4%	4.2%	+2.2%	The proportion of glass in the waste stream did not change significantly between 2005 and 2015 according to both studies. This difference is within a typical margin of error for a characterization study.
EPA	5.8%	4.9%	-0.9%	
<u>Plastic</u>				
BC All	14.8%	14.5%	-0.3%	Estimates from the present study show a high proportion of plastic in the waste stream compared to the EPA data in both 2005 and 2015. However, data on proportion of plastic in the waste streams from the Bergen County (2005) and NYC (2018) studies report similar data, and the trend is also in-line with the EPA data, which shows a 0.1% difference in disposal composition after 10 years.
EPA	2.2%	2.3%	+0.1%	
<u>Textiles</u>				
BC All	5.7%	6.7%	+1%	The proportion of textiles in the residential waste stream increased very slightly. For all waste (residential +CII) the increase is roughly in line with the EPA study estimates. It is well documented that waste textiles (mainly from clothing) are increasing. However, the disposal rate is moderated somewhat by increased recycling.
EPA	5.7%	7.9%	+2.2%	
<u>Electronics</u>				
BC All	0.8%	0.4%	-0.4%	Consumer electronics represents a very small fraction of the residential waste stream – just 0.3% in 2016 according to the estimates in the present study. While generation of consumer electronics has grown significantly between 2005 to 2015, disposal has fallen because of higher recycling rates. This trend is in line with expectations.  The EPA study does not include standalone statistics for e-waste.
EPA	-	-	-	

Source: EPA Advancing Materials Management 2018

### 3.1.3 Non-MSW Waste Disposal Composition and Quantities

For statistical purposes NJ DEP defines MSW as Type 10 and Type 23 wastes. Non-MSW consists of the remaining solid waste types (13, 13C, 25, 27 and 72). Data on annual Non-MSW waste disposal quantities for Bergen County provided by NJ DEP are shown in Table 11. Type 13 – Bulky waste and Type 13C – Construction and Demolition Waste (C&D) together constitute by far the largest quantity disposed (~95-99% by weight).

**Table 11: Bergen County Non-MSW Solid Waste Disposal Quantities (Tons) 2003 to 2016**

Type	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
13	178,003	131,372	107,409	90,075	75,122	60,063	60,284	58,862	63,301	74,891	63,409	75,599	53,270	40,342
13C	115,475	57,140	66,443	101,804	145,246	138,872	221,227	235,786	259,199	222,786	272,005	236,151	262,057	261,160
25	27	32	9	1	37	192	47	21	65	18	24	24	23	94
27	923	597	772	1,085	4,862	2,159	6,685	6,779	15,679	16,321	23,280	15,658	6,918	8,397
27A	0	0	0	2	1,119	571	475	15	24	28	36	196	451	229
271	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	5	0	0	5	0	0	0	11	419
<b>Total</b>	<b>294,429</b>	<b>189,141</b>	<b>174,632</b>	<b>192,966</b>	<b>226,386</b>	<b>201,862</b>	<b>288,718</b>	<b>301,462</b>	<b>338,273</b>	<b>314,044</b>	<b>358,754</b>	<b>327,628</b>	<b>322,730</b>	<b>310,642</b>

Source: NJ DEP (2018)

The BCUA 2005 Report does not differentiate between Type 13 and 13C wastes. However, materials have been assigned to these categories in the present study to align with NJ DEP statistics. It should be noted that there may be some overlap between the categories (e.g. some vegetative waste disposed of will be from C&D sources).

The material composition and quantities of Non-MSW (i.e. Type 13 and 13C) disposed of in 2003 estimated in the BCUA 2005 report are presented in Table 12 alongside adjusted quantities adopted for the current study. The adjusted Non-MSW disposal quantities have been created by applying ratios of materials from the BCUA 2005 Report (grouped by Type) to total quantities for Type 13 and 13C provided by NJ DEP (see Table 11).

The BCUA 2005 Report, and NJ DEP statistics, do not differentiate between the sources of Non-MSW waste. Therefore, the source of Non-MSW waste has not been characterized as 'residential' or 'CII' in the current study.

No recent study has been identified which provides relevant and reliable data on composition of Type 13 and 13C waste disposed in Bergen County between 2004 to present. While some relatively recent studies on C&D waste management have been carried out in the North-eastern US, their findings are not consistent and data availability is variable. Therefore, the breakdown observed during the BCUA 2003 study as reported in *Table 4-3* of the BCUA 2005 Final Report, provided in Table 12 has been used to estimate the average composition for all years.

Estimated quantities of Non-MSW from Bergen County disposed of between 2003 to 2016 are provided in Table 50 in Appendix D.1.

**Table 12: Non-MSW (Type 13 and 13C) Composition by Material**

Material	Type	BCUA (2005) Composition 2003			Current Study Composition 2003	
		% by type	Tons	%	Tons	%
Vegetative waste (stumps and brush/trees)	13	44.3 %	20,641	8.4%	78,843	26.8%
White Goods & Appliances	13	1.3%	587	0.2%	2,242	0.8%
Automobile Scrap, heavy iron & non-ferrous	13	19.2%	8,968	3.6%	34,255	11.6%
Furniture	13	15.1%	7,014	2.8%	26,792	9.1%
Textiles, carpet and padding	13	17.7%	8,225	3.3%	31,417	10.7%
Electronic	13	1.4%	642	0.3%	2,452	0.8%
Tires	13	1.1%	524	0.2%	2,002	0.7%
<b>TOTAL 13 - Bulky Waste*</b>		<b>100.00%</b>	<b>46,601</b>	<b>18.9%</b>	<b>178,003</b>	<b>60.5%</b>
Wood	13C	42.0%	83,922	34.0%	48,461	16.5%
Concrete/Asphalt/Block/Brick	13C	4.1%	8,227	3.3%	4,751	1.6%
Roofing	13C	18.5%	37,034	15.0%	21,385	7.3%
Drywall	13C	9.7%	19,334	7.8%	11,164	3.8%
Soil & Gravel	13C	2.8%	5,544	2.3%	3,201	1.1%
Corrugated paper	13C	3.8%	7,684	3.1%	4,437	1.5%
Plastic	13C	4.1%	8,288	3.4%	4,786	1.6%
Metal	13C	1.2%	2,351	1.0%	1,358	0.5%
Glass	13C	0.1%	169	0.1%	98	0.03%
Other	13C	13.7%	27,420	11.1%	15,834	5.4%
<b>TOTAL 13C - C&amp;D Waste*</b>		<b>100.0%</b>	<b>199,973</b>	<b>81.1%</b>	<b>115,475</b>	<b>39.2%</b>
<b>Other Non-MSW</b>		<b>0%</b>	<b>-</b>	<b>0%</b>	<b>951</b>	<b>0.3%</b>
<b>Total Non-MSW</b>		<b>100%</b>	<b>246,574</b>	<b>100%</b>	<b>294,429</b>	<b>100%</b>

Source: BCUA (2005), \* NJ DEP waste and recycling statistics

### 3.2 Material Diversion Composition and Quantities

The annual quantities of individual materials diverted by municipalities in Bergen County between 2003 and 2017 categorized by source (residential and CII) were provided by NJ DEP. NJ DEP has allocated materials to “MSW”, “Non-MSW” and “Add-on” categories, as described in Appendix B. The Add-on category is described in Appendix A.2.

#### 3.2.1 “MSW” Materials Diverted

Annual average composition rates and total quantities of “MSW” materials diverted for recycling in Bergen County from Residential, CII and All Sources are provided in Table 36 to Table 37 in Appendix C.3.1.

#### 3.2.2 “Non-MSW” Materials Diverted

Annual average composition and total quantities of “Non-MSW” materials diverted for recycling in Bergen County from All Sources are provided in Table 42 and Table 43 in Appendix C.3.2.

### 3.3 Solid Waste Generation Quantities and Composition

Estimated annual quantities of MSW and Non-MSW generated in Bergen County between 2003 and 2017 have been calculated by adding the quantities of waste diverted for recycling by material to quantities of waste disposed of by material. Categories of MSW and Non-MSW are reported.

#### 3.3.1 Generation

Estimates of annual average composition and total quantities of “MSW” Materials generated in Bergen County from 2003 to 2017 are provided in Table 51 and Table 52 respectively (Appendix D.2).

#### 3.3.2 “Non-MSW” Materials Generation

Estimates of annual average composition and total quantities of “Non-MSW” materials generated in Bergen County from 2003 to 2017 are provided in Table 53 and Table 54 respectively (Appendix D.2).

### 3.4 Material Diversion Rates

Diversion rates are presented for “MSW” Materials in Table 55 and “Non-MSW” Materials in Table 56 (Appendix D.3), in accordance with the classifications set by NJ DEP (see Appendix B).

Diversion rates have been derived by dividing annual diversion quantities by material for MSW (Table 34) and Non-MSW (Table 43), respectively into annual quantities generated for MSW (Table 52) and Non-MSW (Table 54) by material (Appendix D.3).

## 4 Solid Waste Projections 2017 to 2029

This section builds on the solid waste characterization and quantities from 2003 to 2016 from the previous chapters to project solid waste generation, diversion and disposal quantities in Bergen County to 2029. The section covers the waste quantities and recycling rates associated with two projection scenarios from 2017 to 2029.

### 4.1 Overview

Two projections of solid waste generation, diversion (for recycling) and disposal from 2017 to 2019 have been modelled by extrapolation of the resulting trends from Task 1 (see Section 3).

Projection 1 uses linear extrapolation of recent MSW and Non-MSW generation and diversion trends generated in Task 1 by material. The disposal forecast is generated by subtracting the forecasted generation from the forecasted diversion for each year/material. Projection 1 is intended to represent a continuation of current waste generation trends, and disposal and recycling practices (i.e. the Business as Usual scenario).

Projection 2 provides an adjusted forecast of MSW generation, diversion and disposal based on Projection 1 but assuming short-term reductions in recycling due to current and anticipated changes in markets for some recyclables. Projection 2 is the preferred scenario for MSW adopted for this study. This projection does not include Non-MSW, as the impact of recycling market changes is expected to significantly influence the recycling of the main materials included in this category (e.g. construction materials, contaminated soils, and heavy metal goods).

The approach to Projections 1 and 2 and associated results are presented in the below sub-sections.

### 4.2 Projection 1 - Business as Usual

Projection 1 is built up from individual generation and diversion forecasts for residential and CII MSW, and Non-MSW. Disposal is forecast by subtracting forecasted diversion from forecasted generation.

#### 4.2.1 Waste and Materials Generation Projection 1

Projection 1 estimates annual waste and materials generation quantities arising in Bergen County from 2017 to 2029. Generation includes waste disposed and materials diverted for recycling.

Material generation quantities were estimated by extrapolating the growth rates for total waste generation between 2011 and 2016. To minimize the impact of variability in the known data the periods used for some of the growth rates calculation were varied to best fit historic trends and remove outliers.

Growth or decline has been limited to a maximum change in tonnage of +/-5% or +/-2% per year (depending on materials and volumes) to avoid rates of change that are unsustainable over the forecasted period. An exponential smoothing factor of (Alpha = 0.3) was also added to the linear extrapolations of recycling and generation trends to account for diminishing rates of return.

Table 13 presents the average growth percentage, the data period selected to calculate the growth percentage, and notes on the selection of average growth value for each material category for MSW from residential and CII sources.

**Table 13: Historic MSW Generation Growth Rate Calculations**

Waste Category	Period used	Net Difference	Average growth / year over period	Notes
<b>RESIDENTIAL</b>				
Corrugated	2010-2016	24.1%	3.7%	2011-2015 growth flat
Mixed Office Paper	2008-2016	20.9%	2.4%	2011-2014 low quantities generated
Newspaper	2011-2016	-22.7%	-5.0%	
Magazines/glossy & other	2011-2016	-18.6%	-4.0%	
Plastic Containers	2010-2016	7.5%	1.2%	2011 high quantity
Other Plastic	2010-2016	-11.8%	-2.1%	2011 high quantity
Textiles and fabrics	2011-2016	-12.7%	-2.7%	
Yard Waste	2010-2016	8.9%	1.4%	2011-12 very high quantities
Food Waste	2010-2016	7.6%	2.5%	
Wood	2011-2016	-39.0%	-5.0%	Growth capped at -5%
Other - Misc. organic / animal products	2011-2016	-24.8%	-5.0%	Growth capped at -5%
Aluminum - Containers	2011-2016	0.2%	0.0%	
Steel/tin & mixed - Containers	2011-2016	13.1%	2.5%	
Other metal	2011-2016	-58.4%	-5.0%	Growth capped at -5%
Glass	2011-2016	-8.7%	-1.8%	
Consumer electronics	2011-2015	6.5%	2.1%	
Household hazardous & batteries	2011-2016	3.4%	0.7%	
Miscellaneous	2011-2016	-11.1%	-2.3%	
<b>CII</b>				
Corrugated	2010-2016	6.8%	1.1%	2011 low quantity
Mixed Office Paper	2008-2016	15.4%	1.8%	2011-2014 low quantities generated
Newspaper	2011-2016	28.2%	0.0%	0% used. No long-term growth expected.
Magazines/glossy & other	2011-2016	-5.7%	-1.2%	
Plastic Containers	2012-2016	18.5%	4.3%	2011 high quantity
Other Plastic	2012-2016	-6.2%	-1.6%	2011 high quantity
Textiles and fabrics	2011-2016	8.0%	1.5%	
Yard Waste	2011-2016	47.2%	5.0%	Growth capped at 5%
Food Waste	2011-2016	2.3%	0.5%	
Wood	2011-2016	-41.0%	-5.0%	Growth capped at -5%
Other - Misc. organic / animal products	2011-2016	85.4%	-5.0%	Growth capped at -5%
Aluminum - Containers	2011-2016	67.1%	5.0%	Growth capped at 5%
Steel/tin & mixed - Containers	2011-2016	-58.4%	5.0%	Growth capped at 5%
Other metal	2011-2016	3.1%	-5.0%	Growth capped at -5%
Glass	2013-2016	5.0%	0.6%	2011-12 low quantities
Consumer electronics	2011-2015	10.0%	1.0%	
Household hazardous & batteries	2011-2016	12.0%	2.0%	Capped at 2%
Miscellaneous	2011-2016	85.4%	2.0%	Capped at 2%

The same exercise was carried out to project generation quantities for Non-MSW streams. The average growth percentage used, the data period selected, and notes are presented in Table 14.

**Table 14: Bergen County Non-MSW Generation Growth Rate Calculations**

Waste Category	Period used	Net Difference	Average growth / year over period	Notes
Vegetative waste	2010-2015	-3.6%	-0.7%	2011 high quantity / 2016 low
White Goods & Appliances	2011-2016	796.5%	5.0%	Capped at 5%
Automobile Scrap, heavy iron & non-ferrous	2011-2016	-319.6%	2.0%	No trend available. Nominal 2% used
Batteries (Automobile)	2010-2016	-3.6%	-0.6%	2011 high quantity
Furniture	2011-2015	-9.5%	-2.0%	
Textiles, carpet and padding	2011-2016	-39.0%	-5.0%	Capped at -5%
Electronic	2011-2016	-39.0%	0.0%	0% used. No decline anticipated
Tires	2011-2016	-0.3%	-0.1%	
Wood	2011-2016	-17.0%	-2.0%	
Concrete/Asphalt/Block/Brick	2010-2016	22.1%	3.4%	2011-12 low quantity
Roofing	2011-2016	0.8%	0.2%	
Drywall	2011-2016	0.8%	0.2%	
Soil & Gravel	2011-2016	-6.1%	-1.3%	
Corrugated paper	2011-2016	0.8%	0.2%	
Plastic	2011-2016	0.8%	0.2%	
Metal	2011-2016	0.8%	0.2%	
Glass	2011-2016	0.8%	0.2%	
Other	2011-2016	4.2%	0.8%	
Type 25	2010-2015	8.5%	1.6%	2011 high quantity
Type 27	2010-2015	2.1%	0.4%	2011 high quantity
Type 27A	2011-2016	2.1%	0.4%	
Type 27I	2011-2016	0.0%	0.0%	No data
Type 72	2011-2016	0.0%	0.1%	No trend. Nominal 1% used

The first year of projection for the model (the base year) is 2017. Data for 2017 has been calculated based on the average of the 3 years 2014 to 2016 plus the selected growth rate. This starting figure serves as a recent average tonnage for each of the material categories to reduce likelihood that data anomalies in the base year are projected over the entire period.

The baseline projection of solid waste and materials generation are presented in Table 15 to Table 17.

**Table 15: MSW Residential Generation – Baseline Projection 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>155,466</b>	<b>153,270</b>	<b>151,203</b>	<b>149,263</b>	<b>147,447</b>	<b>145,754</b>	<b>144,180</b>	<b>142,724</b>	<b>141,384</b>	<b>140,159</b>	<b>139,045</b>	<b>138,042</b>	<b>137,148</b>
Corrugated	36,561	37,499	38,461	39,448	40,460	41,498	42,563	43,655	44,774	45,923	47,101	48,310	49,549
Mixed Office Paper	10,525	10,702	10,882	11,065	11,251	11,440	11,633	11,828	12,028	12,230	12,436	12,645	12,858
Newspaper	36,181	34,912	33,688	32,506	31,366	30,266	29,205	28,181	27,193	26,239	25,319	24,431	23,574
Magazines/glossy & other	72,200	70,157	68,173	66,244	64,370	62,549	60,780	59,060	57,390	55,766	54,189	52,656	51,166
<b>Total plastic</b>	<b>57,882</b>	<b>57,370</b>	<b>56,869</b>	<b>56,378</b>	<b>55,897</b>	<b>55,425</b>	<b>54,964</b>	<b>54,511</b>	<b>54,069</b>	<b>53,635</b>	<b>53,211</b>	<b>52,796</b>	<b>52,390</b>
Plastic Containers	14,272	14,393	14,514	14,637	14,760	14,885	15,011	15,138	15,265	15,394	15,524	15,655	15,788
Other Plastic	43,610	42,978	42,355	41,741	41,136	40,540	39,953	39,374	38,803	38,241	37,687	37,141	36,603
Textiles and fabrics	22,707	22,283	21,866	21,457	21,056	20,662	20,276	19,896	19,524	19,159	18,801	18,449	18,104
Yard Waste	228,782	231,065	233,372	235,701	238,054	240,430	242,830	245,254	247,702	250,174	252,671	255,194	257,741
Food Waste	77,628	79,013	80,423	81,858	83,318	84,804	86,317	87,857	89,425	91,020	92,644	94,297	95,979
Other - Misc. organic / animal products	11,118	10,729	10,353	9,991	9,641	9,304	8,978	8,664	8,361	8,068	7,786	7,513	7,250
Wood	7,858	7,583	7,317	7,061	6,814	6,576	6,346	6,123	5,909	5,702	5,503	5,310	5,124
<b>Total metal</b>	<b>22,809</b>	<b>22,855</b>	<b>22,910</b>	<b>22,973</b>	<b>23,047</b>	<b>23,128</b>	<b>23,219</b>	<b>23,319</b>	<b>23,427</b>	<b>23,544</b>	<b>23,669</b>	<b>23,803</b>	<b>23,944</b>
Aluminum - Containers	6,317	6,319	6,321	6,323	6,325	6,327	6,328	6,330	6,332	6,334	6,336	6,338	6,340
Steel/tin & mixed - Containers	11,823	12,030	12,240	12,455	12,673	12,894	13,120	13,350	13,583	13,821	14,063	14,309	14,559
Other metal	4,670	4,506	4,348	4,196	4,049	3,908	3,771	3,639	3,512	3,389	3,270	3,156	3,045
Glass	38,729	38,242	37,761	37,286	36,817	36,354	35,897	35,446	35,000	34,560	34,125	33,696	33,272
Consumer electronics	4,239	4,302	4,365	4,430	4,496	4,563	4,631	4,700	4,769	4,840	4,912	4,985	5,059
Household hazardous & batteries	2,541	2,553	2,565	2,577	2,589	2,601	2,613	2,626	2,638	2,650	2,662	2,675	2,687
Miscellaneous	35,882	35,295	34,718	34,150	33,592	33,043	32,502	31,971	31,448	30,934	30,428	29,930	29,441
<b>TOTAL</b>	<b>665,641</b>	<b>664,559</b>	<b>663,722</b>	<b>663,126</b>	<b>662,768</b>	<b>662,644</b>	<b>662,753</b>	<b>663,091</b>	<b>663,656</b>	<b>664,445</b>	<b>665,457</b>	<b>666,690</b>	<b>668,141</b>



**Table 16: MSW CII – Baseline Projection 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>194,327</b>	<b>195,014</b>	<b>195,716</b>	<b>196,432</b>	<b>197,163</b>	<b>197,909</b>	<b>198,669</b>	<b>199,445</b>	<b>200,235</b>	<b>201,041</b>	<b>201,862</b>	<b>202,699</b>	<b>203,550</b>
Corrugated	93,893	94,621	95,354	96,094	96,839	97,589	98,346	99,108	99,877	100,651	101,431	102,218	103,010
Mixed Office Paper	32,529	32,941	33,357	33,779	34,207	34,640	35,078	35,522	35,971	36,426	36,887	37,354	37,827
Newspaper	12,805	12,805	12,805	12,805	12,805	12,805	12,805	12,805	12,805	12,805	12,805	12,805	12,805
Magazines/glossy & other	55,101	54,648	54,200	53,754	53,313	52,875	52,441	52,010	51,583	51,159	50,739	50,322	49,909
<b>Total plastic</b>	<b>37,730</b>	<b>37,675</b>	<b>37,632</b>	<b>37,602</b>	<b>37,583</b>	<b>37,576</b>	<b>37,582</b>	<b>37,601</b>	<b>37,633</b>	<b>37,678</b>	<b>37,736</b>	<b>37,808</b>	<b>37,895</b>
Plastic Containers	8,773	9,040	9,314	9,597	9,888	10,189	10,498	10,817	11,145	11,483	11,832	12,191	12,562
Other Plastic	28,956	28,636	28,318	28,005	27,694	27,388	27,084	26,784	26,488	26,194	25,904	25,617	25,333
Textiles and fabrics	18,599	18,800	19,003	19,208	19,416	19,625	19,837	20,051	20,268	20,486	20,707	20,931	21,157
Yard Waste	50,346	52,108	53,932	55,820	57,773	59,795	61,888	64,054	66,296	68,616	71,018	73,504	76,076
Food Waste	78,203	78,452	78,702	78,953	79,204	79,457	79,710	79,964	80,219	80,475	80,731	80,989	81,247
Other - Misc. organic / animal products	8,742	8,436	8,141	7,856	7,581	7,315	7,059	6,812	6,574	6,344	6,122	5,907	5,701
Wood	5,669	5,471	5,279	5,095	4,916	4,744	4,578	4,418	4,263	4,114	3,970	3,831	3,697
<b>Total metal</b>	<b>15,085</b>	<b>15,403</b>	<b>15,741</b>	<b>16,097</b>	<b>16,473</b>	<b>16,868</b>	<b>17,283</b>	<b>17,719</b>	<b>18,176</b>	<b>18,655</b>	<b>19,157</b>	<b>19,681</b>	<b>20,228</b>
Aluminum - Containers	4,094	4,237	4,386	4,539	4,698	4,862	5,033	5,209	5,391	5,580	5,775	5,977	6,186
Steel/tin & mixed - Containers	8,004	8,284	8,574	8,874	9,184	9,506	9,839	10,183	10,539	10,908	11,290	11,685	12,094
Other metal	2,987	2,882	2,782	2,684	2,590	2,500	2,412	2,328	2,246	2,168	2,092	2,018	1,948
Glass	20,824	20,917	21,011	21,105	21,199	21,294	21,389	21,485	21,581	21,678	21,775	21,872	21,970
Consumer electronics	1,284	1,293	1,302	1,311	1,320	1,329	1,338	1,348	1,357	1,366	1,376	1,385	1,395
Household hazardous & batteries	9,573	9,707	9,842	9,980	10,120	10,262	10,405	10,551	10,699	10,848	11,000	11,154	11,310
Miscellaneous	21,641	21,944	22,251	22,563	22,878	23,199	23,523	23,853	24,187	24,525	24,869	25,217	25,570
<b>TOTAL</b>	<b>462,022</b>	<b>465,220</b>	<b>468,552</b>	<b>472,020</b>	<b>475,626</b>	<b>479,373</b>	<b>483,263</b>	<b>487,301</b>	<b>491,488</b>	<b>495,827</b>	<b>500,323</b>	<b>504,978</b>	<b>509,796</b>

**Table 17: Non-MSW Generation – Baseline Projection 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
White Goods & Appliances	28,268	28,122	27,977	27,833	27,690	27,547	27,405	27,264	27,123	26,983	26,844	26,706	26,568
Automobile Scrap, heavy iron & non-ferrous	37,277	38,582	39,932	41,330	42,777	44,274	45,823	47,427	49,087	50,805	52,583	54,424	56,329
Batteries (Automobile)	68,924	69,889	70,867	71,859	72,865	73,885	74,920	75,969	77,032	78,111	79,204	80,313	81,437
Furniture	3,673	3,657	3,641	3,625	3,610	3,594	3,579	3,563	3,548	3,533	3,517	3,502	3,487
Textiles, carpet and padding	8,372	8,256	8,142	8,029	7,918	7,809	7,701	7,594	7,489	7,385	7,283	7,182	7,083
Electronic	9,607	9,271	8,946	8,633	8,331	8,039	7,758	7,486	7,224	6,971	6,727	6,492	6,265
Tires	777	777	777	777	777	777	777	777	777	777	777	777	777
Vegetative waste	3,101	3,100	3,099	3,098	3,097	3,096	3,095	3,094	3,093	3,091	3,090	3,089	3,088
<b>Total type 13</b>	<b>159,999</b>	<b>161,654</b>	<b>163,382</b>	<b>165,185</b>	<b>167,064</b>	<b>169,021</b>	<b>171,057</b>	<b>173,174</b>	<b>175,373</b>	<b>177,657</b>	<b>180,027</b>	<b>182,485</b>	<b>185,034</b>
Wood	113,577	111,987	110,419	108,873	107,349	105,846	104,364	102,903	101,463	100,042	98,641	97,260	95,899
Concrete/Asphalt/Block/Brick	358,894	367,381	376,069	384,962	394,065	403,383	412,922	422,686	432,682	442,913	453,387	464,108	475,083
Roofing	46,927	46,976	47,026	47,075	47,125	47,175	47,225	47,275	47,324	47,374	47,424	47,475	47,525
Drywall	24,499	24,524	24,550	24,576	24,602	24,628	24,654	24,680	24,706	24,732	24,758	24,785	24,811
Soil & Gravel	186,252	184,610	182,982	181,369	179,770	178,185	176,614	175,056	173,513	171,983	170,467	168,964	167,474
Corrugated paper	9,737	9,747	9,757	9,767	9,778	9,788	9,798	9,809	9,819	9,829	9,840	9,850	9,861
Plastic	10,502	10,513	10,524	10,535	10,546	10,557	10,569	10,580	10,591	10,602	10,613	10,625	10,636
Metal	2,979	2,982	2,985	2,988	2,992	2,995	2,998	3,001	3,004	3,007	3,011	3,014	3,017
Glass	214	214	215	215	215	215	216	216	216	216	216	217	217
Other	36,725	36,938	37,152	37,368	37,585	37,803	38,022	38,242	38,464	38,687	38,912	39,137	39,364
<b>Total type 13C</b>	<b>790,306</b>	<b>795,873</b>	<b>801,680</b>	<b>807,729</b>	<b>814,026</b>	<b>820,575</b>	<b>827,381</b>	<b>834,449</b>	<b>841,782</b>	<b>849,388</b>	<b>857,270</b>	<b>865,434</b>	<b>873,886</b>
Type 25	47	48	48	49	50	50	51	51	52	53	53	54	54
Type 27	10,354	10,384	10,413	10,443	10,473	10,503	10,532	10,563	10,593	10,623	10,653	10,684	10,714
Type 27A	3,418	3,428	3,438	3,448	3,458	3,468	3,478	3,488	3,498	3,509	3,519	3,529	3,540
Type 72	145	146	147	148	149	150	151	152	153	154	155	156	157
<b>Total Other</b>	<b>13,964</b>	<b>14,005</b>	<b>14,046</b>	<b>14,087</b>	<b>14,129</b>	<b>14,170</b>	<b>14,212</b>	<b>14,254</b>	<b>14,296</b>	<b>14,338</b>	<b>14,380</b>	<b>14,423</b>	<b>14,465</b>
<b>TOTAL</b>	<b>964,268</b>	<b>971,532</b>	<b>979,108</b>	<b>987,002</b>	<b>995,219</b>	<b>1,003,767</b>	<b>1,012,650</b>	<b>1,021,876</b>	<b>1,031,451</b>	<b>1,041,383</b>	<b>1,051,677</b>	<b>1,062,342</b>	<b>1,073,385</b>

#### 4.2.2 Materials Diversion Projection 1

As with generation projection 1, quantities of materials diverted between 2017 and 2029 were projected by linear extrapolation of recent recycling trends estimated in Task 1.

Material diversion quantities were estimated by extrapolating the growth rates for materials diverted between 2011 and 2016. To minimize the impact of variability in the known data the periods used for some of the growth rates calculation were varied to best fit historic trends and remove outliers. Growth or decline has been limited to a maximum change in tonnage of +/-5% or +/-2% per year (depending on materials and volumes) to avoid rates of change that are unsustainable over the forecasted period. An exponential smoothing factor of (Alpha = 0.3) was also added to the linear extrapolations of recycling and generation trends to account for diminishing rates of return.

Table 18 presents the average growth percentage, the data period selected to calculate the growth percentage, and notes on the selection of average growth value for each material category for MSW from residential and CII sources.

**Table 18: Historic MSW Material Diversion Growth Rate Calculations**

Waste Category	Period used	Net Difference	Average growth / year over period	Notes
<b>RESIDENTIAL</b>				
Corrugated	2011-2015	31.8%	0.5%	2016 high quantity
Mixed Office Paper	2010-2015	13.2%	2.5%	2016 high quantity
Newspaper	2011-2016	-14.0%	-3.0%	
Magazines/glossy & other	2012-2016	-13.2%	-3.5%	2011 high quantity
Plastic Containers	2010-2016	4.4%	0.7%	2011 high quantity
Other Plastic	2011-2016	296.1%	5.0%	Capped at 5%
Textiles and fabrics	2011-2016	5.2%	1.0%	
Yard Waste	2010-2016	8.6%	1.4%	
Food Waste	2011-2016	19.0%	5.0%	Capped at 5%
Wood				No recycling
Other - Misc. organic / animal products				No recycling
Aluminum - Containers	2011-2016	11.3%	2.2%	
Steel/tin & mixed - Containers	2011-2016	-16.7%	-2.0%	Capped at -2%
Other metal				No recycling
Glass	2011-2016	-16.7%	-2.0%	Capped at -2%
Consumer electronics	2011-2016	35.2%	5.0%	Capped at 5%
Household hazardous & batteries	2011-2016	19.3%	3.6%	
Miscellaneous				No recycling
<b>CII</b>				
Corrugated	2011-2016	44.2%	5.0%	Capped at 5%
Mixed Office Paper	2011-2016	55.7%	2.0%	Capped at 2%
Newspaper	2011-2016	18.4%	0.0%	0% used. No long-term growth expected
Magazines/glossy & other	2013-2016	1.1%	0.4%	2011-12 low quantities
Plastic Containers	2011-2016	-22.0%	-4.9%	
Other Plastic	2011-2016	98.8%	5.0%	Capped at 5%
Textiles and fabrics	2011-2016	110.2%	5.0%	Capped at 5%
Yard Waste	2011-2016	40.8%	2.0%	Capped at 2%
Food Waste	2011-2016	10.6%	2.0%	
Wood				No recycling
Other - Misc. organic / animal products				No recycling
Aluminum - Containers	2011-2016	148.4%	2.0%	Capped at 2%
Steel/tin & mixed - Containers	2011-2016	53.5%	2.0%	Capped at 2%
Other metal				No recycling
Glass	2011-2016	166.3%	2.0%	Capped at 2%
Consumer electronics	2011-2016	63.1%	5.0%	Capped at 5%
Household hazardous & batteries	2011-2016	13.3%	2.5%	
Miscellaneous				No recycling

The same exercise was carried out to estimate growth rates for non-MSW streams, as presented in Table 19.

The number of Non-MSW categories in which no recycling is reported is higher than for MSW due to the way data is collected and reported. In total, 12 categories in the table have no recycling projection. In addition, the category “batteries (automobiles)” is derived exclusively from material diversion data and therefore has a 100% recycling rate.

**Table 19: Bergen County Non-MSW Generation Growth Rate Calculations**

Waste Category	Period used	Net Difference	Average growth / year over period	Notes
Vegetative waste	2011-2016	-23.3%	-2.0%	Capped at -2%
White Goods & Appliances	2011-2016	97.9%	2.0%	Capped at 2%
Automobile Scrap, heavy iron & non-ferrous	2011-2016	-49.7%	-2.0%	Capped at -2%
Batteries (Automobile)	2011-2016	-19.3%	-4.2%	
Furniture				No recycling
Textiles, carpet and padding				No recycling
Electronic				No recycling
Tires	2011-2016	12.7%	2.4%	
Wood	2012-2016	5.0%	1.2%	
Concrete/Asphalt/Block/Brick	2011-2016	22.5%	3.4%	2011 high quantity
Roofing				No recycling
Drywall				No recycling
Soil & Gravel	2011-2016	-6.5%	-1.3%	
Corrugated paper				No recycling
Plastic				No recycling
Metal				No recycling
Glass				No recycling
Other	2011-2016	129.6%	5.0%	Capped at 5%
Type 25	2011-2016			
Type 27		-2.1%	-0.4%	No recycling
Type 27A				
Type 72	2011-2016			No recycling

The base year for the projection of materials diversion was also calculated in the same way as the total waste generation baseline to minimize the effect of a data anomaly on the projection. I.e. the average recycling percentage of each material from 2014 to 2016 was used for the initial year.

The results of material diversion projection 1 for MSW from residential and CII sources and Non-MSW are provided in Table 20, Table 21, and Table 22 respectively.

**Table 20: MSW Residential Diversion Projection 1, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>61,973</b>	<b>61,346</b>	<b>60,739</b>	<b>60,153</b>	<b>59,586</b>	<b>59,039</b>	<b>58,512</b>	<b>58,003</b>	<b>57,512</b>	<b>57,040</b>	<b>56,586</b>	<b>56,150</b>	<b>55,731</b>
Corrugated	16,269	16,330	16,391	16,452	16,513	16,575	16,637	16,699	16,761	16,824	16,886	16,949	17,012
Mixed Office Paper	7,718	7,853	7,991	8,132	8,275	8,420	8,568	8,719	8,872	9,028	9,187	9,348	9,513
Newspaper	28,484	27,892	27,313	26,745	26,189	25,645	25,112	24,590	24,079	23,578	23,088	22,609	22,139
Magazines/glossy & other	9,502	9,270	9,044	8,824	8,609	8,399	8,195	7,995	7,800	7,610	7,425	7,244	7,067
<b>Total plastic</b>	<b>6,289</b>	<b>6,322</b>	<b>6,355</b>	<b>6,388</b>	<b>6,422</b>	<b>6,456</b>	<b>6,490</b>	<b>6,525</b>	<b>6,559</b>	<b>6,594</b>	<b>6,629</b>	<b>6,665</b>	<b>6,700</b>
Plastic Containers	6,251	6,283	6,315	6,347	6,379	6,412	6,444	6,477	6,510	6,543	6,576	6,610	6,643
Other Plastic	38	39	40	42	43	45	46	48	49	51	53	55	57
Textiles and fabrics	1,296	1,306	1,315	1,324	1,334	1,343	1,353	1,362	1,372	1,382	1,392	1,402	1,412
Yard Waste	206,770	208,780	210,808	212,857	214,926	217,014	219,123	221,253	223,403	225,574	227,766	229,980	232,215
Food Waste	6,477	6,704	6,938	7,181	7,433	7,693	7,962	8,241	8,529	8,828	9,137	9,456	9,787
Other - Misc. organic / animal products													
Wood													
<b>Total metal</b>	<b>5,932</b>	<b>5,926</b>	<b>5,921</b>	<b>5,918</b>	<b>5,915</b>	<b>5,914</b>	<b>5,914</b>	<b>5,915</b>	<b>5,918</b>	<b>5,922</b>	<b>5,927</b>	<b>5,933</b>	<b>5,940</b>
Aluminum - Containers	2,638	2,678	2,718	2,760	2,801	2,844	2,887	2,930	2,975	3,020	3,065	3,112	3,159
Steel/tin & mixed - Containers	3,294	3,248	3,203	3,158	3,114	3,070	3,027	2,985	2,943	2,902	2,861	2,821	2,782
Other metal													
Glass	24,269	23,929	23,594	23,264	22,938	22,617	22,300	21,988	21,680	21,377	21,077	20,782	20,491
Consumer electronics	2,634	2,726	2,821	2,920	3,022	3,128	3,238	3,351	3,468	3,589	3,715	3,845	3,980
Household hazardous & batteries	1,111	1,139	1,167	1,197	1,227	1,258	1,289	1,322	1,355	1,389	1,424	1,460	1,497
Miscellaneous													
<b>TOTAL</b>	<b>316,751</b>	<b>318,176</b>	<b>319,660</b>	<b>321,202</b>	<b>322,803</b>	<b>324,462</b>	<b>326,181</b>	<b>327,959</b>	<b>329,797</b>	<b>331,695</b>	<b>333,654</b>	<b>335,673</b>	<b>337,754</b>

**Table 21: MSW CII Diversion Projection 1, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	134,328	137,414	140,598	143,883	147,273	150,771	154,380	158,106	161,950	165,918	170,014	174,242	178,606
Corrugated	75,171	77,802	80,525	83,343	86,260	89,279	92,404	95,638	98,985	102,450	106,036	109,747	113,588
Mixed Office Paper	28,764	29,166	29,575	29,989	30,409	30,834	31,266	31,704	32,148	32,598	33,054	33,517	33,986
Newspaper	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156
Magazines/glossy & other	21,238	21,290	21,343	21,396	21,448	21,501	21,555	21,608	21,661	21,715	21,768	21,822	21,876
<b>Total plastic</b>	6,412	6,373	6,342	6,318	6,302	6,293	6,292	6,299	6,313	6,334	6,363	6,400	6,444
Plastic Containers	3,814	3,683	3,558	3,437	3,320	3,208	3,099	2,994	2,891	2,793	2,698	2,606	2,517
Other Plastic	2,598	2,689	2,783	2,881	2,981	3,086	3,194	3,306	3,421	3,541	3,665	3,793	3,926
Textiles and fabrics	2,564	2,653	2,746	2,842	2,942	3,045	3,151	3,262	3,376	3,494	3,616	3,743	3,874
Yard Waste	39,030	39,576	40,130	40,692	41,261	41,839	42,425	43,019	43,621	44,232	44,851	45,479	46,116
Food Waste	30,858	31,299	31,745	32,198	32,658	33,124	33,596	34,076	34,562	35,055	35,555	36,062	36,577
Other - Misc. organic / animal products													
Wood													
<b>Total metal</b>	5,130	5,202	5,275	5,349	5,424	5,500	5,577	5,655	5,734	5,814	5,895	5,978	6,062
Aluminum - Containers	1,849	1,875	1,901	1,928	1,955	1,982	2,010	2,038	2,067	2,096	2,125	2,155	2,185
Steel/tin & mixed - Containers	3,281	3,327	3,374	3,421	3,469	3,517	3,566	3,616	3,667	3,718	3,770	3,823	3,877
Other metal													
Glass	11,543	11,704	11,868	12,034	12,203	12,374	12,547	12,723	12,901	13,081	13,264	13,450	13,638
Consumer electronics	480	497	514	532	551	570	590	611	632	654	677	701	726
Household hazardous & batteries	8,615	8,767	8,922	9,080	9,240	9,403	9,569	9,739	9,911	10,086	10,264	10,446	10,630
Miscellaneous	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	238,959	243,485	248,141	252,929	257,853	262,919	268,128	273,487	278,999	284,669	290,501	296,500	302,672

**Table 22: Non-MSW Diversion Projection 1, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
White Goods & Appliances	3,384	3,336	3,290	3,244	3,198	3,153	3,109	3,066	3,023	2,980	2,939	2,898	2,857
Automobile Scrap, heavy iron & non-ferrous	35,801	36,302	36,810	37,325	37,848	38,378	38,915	39,460	40,012	40,573	41,141	41,716	42,301
Batteries (Automobile)	56,318	55,529	54,752	53,985	53,230	52,484	51,750	51,025	50,311	49,606	48,912	48,227	47,552
Furniture	3,580	3,475	3,373	3,274	3,178	3,085	2,995	2,907	2,822	2,739	2,659	2,581	2,505
Textiles, carpet and padding	-	-	-	-	-	-	-	-	-	-	-	-	-
Electronic	-	-	-	-	-	-	-	-	-	-	-	-	-
Tires	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetative waste	2,510	2,552	2,595	2,639	2,684	2,729	2,775	2,822	2,870	2,919	2,968	3,018	3,069
<b>Total type 13</b>	<b>101,592</b>	<b>101,195</b>	<b>100,821</b>	<b>100,468</b>	<b>100,138</b>	<b>99,830</b>	<b>99,544</b>	<b>99,280</b>	<b>99,038</b>	<b>98,817</b>	<b>98,618</b>	<b>98,440</b>	<b>98,284</b>
Wood	9,040	9,118	9,196	9,276	9,356	9,436	9,518	9,600	9,683	9,766	9,850	9,935	10,021
Concrete/Asphalt/Block/Brick	348,374	356,754	365,336	374,124	383,124	392,340	401,778	411,443	421,341	431,476	441,856	452,485	463,370
Roofing	-	-	-	-	-	-	-	-	-	-	-	-	-
Drywall	-	-	-	-	-	-	-	-	-	-	-	-	-
Soil & Gravel	179,202	177,528	175,870	174,228	172,600	170,988	169,391	167,809	166,242	164,689	163,151	161,627	160,117
Corrugated paper	-	-	-	-	-	-	-	-	-	-	-	-	-
Plastic	-	-	-	-	-	-	-	-	-	-	-	-	-
Metal	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	1,869	1,934	2,002	2,072	2,144	2,219	2,297	2,378	2,461	2,547	2,636	2,728	2,824
<b>Total type 13C</b>	<b>538,484</b>	<b>545,334</b>	<b>552,404</b>	<b>559,699</b>	<b>567,224</b>	<b>574,984</b>	<b>582,984</b>	<b>591,230</b>	<b>599,726</b>	<b>608,478</b>	<b>617,493</b>	<b>626,775</b>	<b>636,332</b>
Type 25	-	-	-	-	-	-	-	-	-	-	-	-	-
Type 27	-	-	-	-	-	-	-	-	-	-	-	-	-
Type 27A	3,107	3,097	3,088	3,079	3,070	3,061	3,052	3,043	3,033	3,024	3,015	3,007	2,998
Type 72	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Other</b>	<b>3,107</b>	<b>3,097</b>	<b>3,088</b>	<b>3,079</b>	<b>3,070</b>	<b>3,061</b>	<b>3,052</b>	<b>3,043</b>	<b>3,033</b>	<b>3,024</b>	<b>3,015</b>	<b>3,007</b>	<b>2,998</b>
<b>TOTAL</b>	<b>643,183</b>	<b>649,627</b>	<b>656,313</b>	<b>663,247</b>	<b>670,432</b>	<b>677,875</b>	<b>685,580</b>	<b>693,552</b>	<b>701,797</b>	<b>710,320</b>	<b>719,126</b>	<b>728,222</b>	<b>737,613</b>

### 4.2.3 Waste Disposal Projection 1

Disposal Projection 1 has been derived by subtracting the diversion and generation forecasts in Projection 1. Waste disposal projections for MSW from residential and CII sources, and Non-MSW are presented in Table 23, Table 24 and Table 25 respectively.

**Table 23: Bergen County MSW Residential Disposal Projection 1, by Material, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>93,493</b>	<b>91,924</b>	<b>90,464</b>	<b>89,110</b>	<b>87,861</b>	<b>86,715</b>	<b>85,669</b>	<b>84,722</b>	<b>83,872</b>	<b>83,118</b>	<b>82,459</b>	<b>81,892</b>	<b>81,417</b>
Corrugated	20,292	21,169	22,070	22,996	23,946	24,923	25,926	26,956	28,013	29,100	30,215	31,361	32,537
Mixed Office Paper	2,807	2,848	2,890	2,933	2,976	3,020	3,065	3,110	3,155	3,202	3,249	3,297	3,345
Newspaper	7,696	7,019	6,375	5,761	5,177	4,622	4,093	3,591	3,114	2,661	2,231	1,823	1,436
Magazines/glossy & other	62,698	60,887	59,128	57,420	55,761	54,150	52,585	51,065	49,590	48,156	46,764	45,412	44,099
<b>Total plastic</b>	<b>51,593</b>	<b>51,049</b>	<b>50,514</b>	<b>49,989</b>	<b>49,475</b>	<b>48,969</b>	<b>48,473</b>	<b>47,987</b>	<b>47,509</b>	<b>47,041</b>	<b>46,582</b>	<b>46,132</b>	<b>45,690</b>
Plastic Containers	8,021	8,110	8,199	8,290	8,381	8,473	8,567	8,661	8,755	8,851	8,948	9,046	9,144
Other Plastic	43,572	42,939	42,315	41,700	41,093	40,496	39,907	39,326	38,754	38,190	37,634	37,086	36,546
Textiles and fabrics	21,411	20,977	20,551	20,133	19,722	19,319	18,923	18,534	18,152	17,777	17,409	17,048	16,693
Yard Waste	22,011	22,286	22,563	22,844	23,128	23,415	23,706	24,001	24,299	24,600	24,905	25,214	25,526
Food Waste	71,151	72,309	73,484	74,676	75,885	77,112	78,355	79,617	80,896	82,193	83,507	84,841	86,192
Other - Misc. organic / animal products	11,118	10,729	10,353	9,991	9,641	9,304	8,978	8,664	8,361	8,068	7,786	7,513	7,250
Wood	7,858	7,583	7,317	7,061	6,814	6,576	6,346	6,123	5,909	5,702	5,503	5,310	5,124
<b>Total metal</b>	<b>16,877</b>	<b>16,929</b>	<b>16,988</b>	<b>17,056</b>	<b>17,131</b>	<b>17,215</b>	<b>17,305</b>	<b>17,404</b>	<b>17,509</b>	<b>17,622</b>	<b>17,742</b>	<b>17,870</b>	<b>18,004</b>
Aluminum - Containers	3,679	3,641	3,602	3,563	3,523	3,483	3,442	3,400	3,358	3,315	3,271	3,226	3,181
Steel/tin & mixed - Containers	8,528	8,781	9,037	9,297	9,559	9,824	10,093	10,365	10,640	10,919	11,202	11,488	11,778
Other metal	4,670	4,506	4,348	4,196	4,049	3,908	3,771	3,639	3,512	3,389	3,270	3,156	3,045
Glass	14,460	14,313	14,167	14,022	13,879	13,737	13,597	13,458	13,320	13,183	13,048	12,914	12,781
Consumer electronics	1,605	1,576	1,544	1,510	1,474	1,435	1,393	1,349	1,301	1,251	1,197	1,140	1,079
Household hazardous & batteries	1,431	1,415	1,398	1,380	1,362	1,343	1,324	1,304	1,282	1,261	1,238	1,214	1,190
Miscellaneous	35,882	35,295	34,718	34,150	33,592	33,043	32,502	31,971	31,448	30,934	30,428	29,930	29,441
<b>TOTAL</b>	<b>348,890</b>	<b>346,383</b>	<b>344,063</b>	<b>341,924</b>	<b>339,965</b>	<b>338,182</b>	<b>336,572</b>	<b>335,132</b>	<b>333,859</b>	<b>332,750</b>	<b>331,804</b>	<b>331,017</b>	<b>330,387</b>



**Table 24: Bergen County MSW CII Disposal Projection 1, by Material, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>59,999</b>	<b>57,600</b>	<b>55,118</b>	<b>52,549</b>	<b>49,890</b>	<b>47,138</b>	<b>44,289</b>	<b>41,339</b>	<b>38,285</b>	<b>35,123</b>	<b>31,848</b>	<b>28,457</b>	<b>24,944</b>
Corrugated	18,722	16,819	14,830	12,751	10,579	8,310	5,942	3,470	891	(1,799)	(4,604)	(7,529)	(10,578)
Mixed Office Paper	3,765	3,774	3,783	3,791	3,798	3,805	3,812	3,818	3,824	3,829	3,833	3,837	3,841
Newspaper	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649
Magazines/glossy & other	33,863	33,358	32,857	32,359	31,865	31,374	30,886	30,402	29,922	29,445	28,971	28,500	28,033
<b>Total plastic</b>	<b>31,318</b>	<b>31,302</b>	<b>31,291</b>	<b>31,283</b>	<b>31,281</b>	<b>31,283</b>	<b>31,290</b>	<b>31,302</b>	<b>31,320</b>	<b>31,344</b>	<b>31,373</b>	<b>31,409</b>	<b>31,451</b>
Plastic Containers	4,960	5,356	5,755	6,159	6,568	6,981	7,399	7,823	8,254	8,690	9,134	9,585	10,044
Other Plastic	26,358	25,947	25,535	25,124	24,713	24,302	23,891	23,479	23,066	22,653	22,239	21,824	21,407
Textiles and fabrics	16,036	16,147	16,257	16,366	16,474	16,580	16,686	16,789	16,892	16,992	17,091	17,188	17,283
Yard Waste	11,316	12,532	13,802	15,128	16,512	17,956	19,463	21,035	22,675	24,385	26,167	28,025	29,961
Food Waste	47,344	47,153	46,957	46,755	46,547	46,333	46,114	45,889	45,657	45,420	45,176	44,926	44,670
Other - Misc. organic / animal products	8,742	8,436	8,141	7,856	7,581	7,315	7,059	6,812	6,574	6,344	6,122	5,907	5,701
Wood	5,669	5,471	5,279	5,095	4,916	4,744	4,578	4,418	4,263	4,114	3,970	3,831	3,697
<b>Total metal</b>	<b>9,954</b>	<b>10,201</b>	<b>10,466</b>	<b>10,748</b>	<b>11,049</b>	<b>11,368</b>	<b>11,707</b>	<b>12,065</b>	<b>12,443</b>	<b>12,841</b>	<b>13,261</b>	<b>13,703</b>	<b>14,167</b>
Aluminum - Containers	2,245	2,362	2,484	2,611	2,743	2,880	3,022	3,170	3,324	3,484	3,650	3,822	4,001
Steel/tin & mixed - Containers	4,723	4,957	5,200	5,453	5,716	5,989	6,272	6,567	6,872	7,190	7,520	7,862	8,217
Other metal	2,987	2,882	2,782	2,684	2,590	2,500	2,412	2,328	2,246	2,168	2,092	2,018	1,948
Glass	9,281	9,213	9,142	9,070	8,996	8,920	8,842	8,762	8,680	8,596	8,510	8,422	8,331
Consumer electronics	804	796	787	778	769	759	748	737	725	712	698	684	669
Household hazardous & batteries	958	940	921	901	880	858	836	812	788	763	736	709	680
Miscellaneous	21,641	21,944	22,251	22,563	22,878	23,199	23,523	23,853	24,187	24,525	24,869	25,217	25,570
<b>TOTAL</b>	<b>223,063</b>	<b>221,735</b>	<b>220,411</b>	<b>219,091</b>	<b>217,772</b>	<b>216,454</b>	<b>215,135</b>	<b>213,814</b>	<b>212,489</b>	<b>211,158</b>	<b>209,822</b>	<b>208,478</b>	<b>207,124</b>

**Table 25: Bergen County Non-MSW Disposal Projection 1, by Material, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
White Goods & Appliances	24,836	24,739	24,641	24,544	24,446	24,349	24,252	24,154	24,057	23,960	23,864	23,767	23,670
Automobile Scrap, heavy iron & non-ferrous	1,971	2,781	3,631	4,520	5,451	6,426	7,446	8,512	9,627	10,793	12,011	13,283	14,612
Batteries (Automobile)	11,806	13,571	15,338	17,107	18,880	20,656	22,435	24,219	26,007	27,800	29,598	31,401	33,210
Furniture	(16)	76	166	252	335	416	493	569	641	711	778	844	907
Textiles, carpet and padding	8,372	8,256	8,142	8,029	7,918	7,809	7,701	7,594	7,489	7,385	7,283	7,182	7,083
Electronic	9,607	9,271	8,946	8,633	8,331	8,039	7,758	7,486	7,224	6,971	6,727	6,492	6,265
Tires	777	777	777	777	777	777	777	777	777	777	777	777	777
Vegetative waste	633	590	547	503	458	412	365	318	270	221	172	121	70
<b>Total type 13</b>	<b>57,987</b>	<b>60,061</b>	<b>62,187</b>	<b>64,364</b>	<b>66,596</b>	<b>68,883</b>	<b>71,227</b>	<b>73,629</b>	<b>76,093</b>	<b>78,619</b>	<b>81,210</b>	<b>83,868</b>	<b>86,594</b>
Wood	104,615	102,947	101,301	99,677	98,073	96,490	94,928	93,385	91,863	90,359	88,875	87,410	85,963
Concrete/Asphalt/Block/Brick	18,704	19,008	19,315	19,626	19,941	20,259	20,582	20,908	21,238	21,572	21,910	22,252	22,598
Roofing	46,927	46,976	47,026	47,075	47,125	47,175	47,225	47,275	47,324	47,374	47,424	47,475	47,525
Drywall	24,499	24,524	24,550	24,576	24,602	24,628	24,654	24,680	24,706	24,732	24,758	24,785	24,811
Soil & Gravel	5,361	5,408	5,454	5,499	5,542	5,585	5,626	5,665	5,704	5,741	5,778	5,813	5,847
Corrugated paper	9,737	9,747	9,757	9,767	9,778	9,788	9,798	9,809	9,819	9,829	9,840	9,850	9,861
Plastic	10,502	10,513	10,524	10,535	10,546	10,557	10,569	10,580	10,591	10,602	10,613	10,625	10,636
Metal	2,979	2,982	2,985	2,988	2,992	2,995	2,998	3,001	3,004	3,007	3,011	3,014	3,017
Glass	214	214	215	215	215	215	216	216	216	216	216	217	217
Other	34,920	35,069	35,218	35,366	35,513	35,658	35,802	35,945	36,087	36,227	36,365	36,501	36,636
<b>Total type 13C</b>	<b>258,456</b>	<b>257,389</b>	<b>256,346</b>	<b>255,325</b>	<b>254,327</b>	<b>253,351</b>	<b>252,397</b>	<b>251,464</b>	<b>250,553</b>	<b>249,662</b>	<b>248,792</b>	<b>247,941</b>	<b>247,110</b>
Type 25	47	48	48	49	50	50	51	51	52	53	53	54	54
Type 27	10,354	10,384	10,413	10,443	10,473	10,503	10,532	10,563	10,593	10,623	10,653	10,684	10,714
Type 27A	302	321	340	360	379	398	417	437	456	475	494	514	533
Type 72	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Other</b>	<b>145</b>	<b>146</b>	<b>147</b>	<b>148</b>	<b>149</b>	<b>150</b>	<b>151</b>	<b>152</b>	<b>153</b>	<b>154</b>	<b>155</b>	<b>156</b>	<b>157</b>
<b>TOTAL</b>	<b>10,848</b>	<b>10,898</b>	<b>10,949</b>	<b>10,999</b>	<b>11,050</b>	<b>11,101</b>	<b>11,151</b>	<b>11,202</b>	<b>11,253</b>	<b>11,304</b>	<b>11,356</b>	<b>11,407</b>	<b>11,459</b>

### 4.3 Projection 2 – Reduced Diversion Scenario

Projection 2 is derived from Projection 1, applying initial reductions in paper and plastic diversion rates. In the Projection 1, MSW paper and plastic categories have increasing recycling rates, meaning that divergence in those streams is growing. Projection 2 assumes that recycling is likely to reduce in the short-term from 2018 onwards due to changes in US-international trade in recyclables affecting the availability of markets for materials diverted from residential and CII sources (e.g. China’s changing policies on recyclables imports).<sup>13</sup>

Reduced diversion growth rates were introduced into the model in 2017 by applying a ‘market correction’ value. The remaining years in the projection are calculated in the same way as in Projection 1. This is due to the expectation that recycling recovers as markets correct themselves. The correction values factors are provided in Table 26.

**Table 26: MSW Recycling Rate Correction Values**

MATERIAL	2017 Reduction (%)
Mixed office paper	10.0%
Newspaper	10.0%
Magazines/glossy & other	40.0%
Plastic containers	40.0%
Other plastic	40.0%
Glass	10.0%

Note: The “2017 Reduction (%)” is a percentage of the recycling fraction. E.g. newspaper is recycled at 77%, a 10% reduction produces the figure 70% recycling.

The reduced rates of 40% and 10% are based primarily on the research article “The Chinese import ban and its impact on global plastic waste trade” published in the journal Science Advances by Amy L. Brooks, Shunli Wang, and Jenna R. Jambeck.<sup>14</sup> Other articles, such as “U.S. Plastic Recycling Rate Projected to Drop to 4.4% in 2018”, from the website plasticpollutioncoalition.org have also been used as references.<sup>15</sup>

The three material streams that are expected to see significant changes in recyclability based on global policy are:

- Magazines / glossy, and other (paper);
- Plastic containers; and
- Other plastic.

Additionally, the material streams “mixed office paper” and “newspaper” may see minor setbacks in recycling fraction due to increased standards on paper waste import quality. The market for “glass” is also expected to reduce slightly in the short-term.

MSW (Residential and CII) diversion, and disposal forecasts under Projection 2 are shown in Table 27 to Table 30.

<sup>13</sup> See <https://www.wastedive.com/news/china-us-recycling-scrap-import-ban-trade-anniversary-2018/528050/>

<sup>14</sup> <http://advances.sciencemag.org/content/4/6/eaat0131>

<sup>15</sup> <https://www.plasticpollutioncoalition.org/pft/2018/10/4/us-plastic-recycling-rate-projected-to-drop-to-44-in-2018>

**Table 27: Bergen County MSW Residential Diversion Projection 2, by Material, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>54,552</b>	<b>54,063</b>	<b>53,591</b>	<b>53,136</b>	<b>52,696</b>	<b>52,273</b>	<b>51,866</b>	<b>51,474</b>	<b>51,097</b>	<b>50,736</b>	<b>50,389</b>	<b>50,057</b>	<b>49,739</b>
Corrugated	16,269	16,330	16,391	16,452	16,513	16,575	16,637	16,699	16,761	16,824	16,886	16,949	17,012
Mixed Office Paper	6,946	7,068	7,192	7,319	7,447	7,578	7,711	7,847	7,985	8,125	8,268	8,413	8,561
Newspaper	25,636	25,103	24,581	24,070	23,570	23,080	22,601	22,131	21,671	21,221	20,780	20,348	19,925
Magazines/glossy & other	5,701	5,562	5,427	5,294	5,165	5,040	4,917	4,797	4,680	4,566	4,455	4,346	4,240
<b>Total plastic</b>	<b>3,773</b>	<b>3,793</b>	<b>3,813</b>	<b>3,833</b>	<b>3,853</b>	<b>3,874</b>	<b>3,894</b>	<b>3,915</b>	<b>3,936</b>	<b>3,957</b>	<b>3,978</b>	<b>3,999</b>	<b>4,020</b>
Plastic Containers	3,751	3,770	3,789	3,808	3,827	3,847	3,867	3,886	3,906	3,926	3,946	3,966	3,986
Other Plastic	23	23	24	25	26	27	28	29	30	31	32	33	34
Textiles and fabrics	1,296	1,306	1,315	1,324	1,334	1,343	1,353	1,362	1,372	1,382	1,392	1,402	1,412
Yard Waste	206,770	208,780	210,808	212,857	214,926	217,014	219,123	221,253	223,403	225,574	227,766	229,980	232,215
Food Waste	6,477	6,704	6,938	7,181	7,433	7,693	7,962	8,241	8,529	8,828	9,137	9,456	9,787
Other - Misc. organic / animal products	-	-	-	-	-	-	-	-	-	-	-	-	-
Wood	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total metal</b>	<b>5,932</b>	<b>5,926</b>	<b>5,921</b>	<b>5,918</b>	<b>5,915</b>	<b>5,914</b>	<b>5,914</b>	<b>5,915</b>	<b>5,918</b>	<b>5,922</b>	<b>5,927</b>	<b>5,933</b>	<b>5,940</b>
Aluminum - Containers	2,638	2,678	2,718	2,760	2,801	2,844	2,887	2,930	2,975	3,020	3,065	3,112	3,159
Steel/tin & mixed - Containers	3,294	3,248	3,203	3,158	3,114	3,070	3,027	2,985	2,943	2,902	2,861	2,821	2,782
Other metal	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass	21,842	21,536	21,235	20,937	20,644	20,355	20,070	19,789	19,512	19,239	18,970	18,704	18,442
Consumer electronics	2,634	2,726	2,821	2,920	3,022	3,128	3,238	3,351	3,468	3,589	3,715	3,845	3,980
Household hazardous & batteries	1,111	1,139	1,167	1,197	1,227	1,258	1,289	1,322	1,355	1,389	1,424	1,460	1,497
Miscellaneous	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>304,387</b>	<b>305,972</b>	<b>307,610</b>	<b>309,303</b>	<b>311,050</b>	<b>312,852</b>	<b>314,709</b>	<b>316,622</b>	<b>318,590</b>	<b>320,615</b>	<b>322,697</b>	<b>324,836</b>	<b>327,032</b>

**Table 28: Bergen County MSW CII Diversion Projection 2, by Material, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>123,479</b>	<b>126,524</b>	<b>129,667</b>	<b>132,910</b>	<b>136,258</b>	<b>139,713</b>	<b>143,280</b>	<b>146,962</b>	<b>150,763</b>	<b>154,687</b>	<b>158,738</b>	<b>162,921</b>	<b>167,241</b>
Corrugated	75,171	77,802	80,525	83,343	86,260	89,279	92,404	95,638	98,985	102,450	106,036	109,747	113,588
Mixed Office Paper	27,325	27,708	28,096	28,489	28,888	29,293	29,703	30,119	30,540	30,968	31,401	31,841	32,287
Newspaper	8,240	8,240	8,240	8,240	8,240	8,240	8,240	8,240	8,240	8,240	8,240	8,240	8,240
Magazines/glossy & other	12,743	12,774	12,806	12,837	12,869	12,901	12,933	12,965	12,997	13,029	13,061	13,093	13,126
<b>Total plastic</b>	<b>3,847</b>	<b>3,824</b>	<b>3,805</b>	<b>3,791</b>	<b>3,781</b>	<b>3,776</b>	<b>3,775</b>	<b>3,779</b>	<b>3,788</b>	<b>3,800</b>	<b>3,818</b>	<b>3,840</b>	<b>3,866</b>
Plastic Containers	2,288	2,210	2,135	2,063	1,992	1,925	1,859	1,796	1,735	1,676	1,619	1,564	1,511
Other Plastic	1,559	1,613	1,670	1,728	1,789	1,851	1,916	1,983	2,053	2,125	2,199	2,276	2,356
Textiles and fabrics	2,564	2,653	2,746	2,842	2,942	3,045	3,151	3,262	3,376	3,494	3,616	3,743	3,874
Yard Waste	39,030	39,576	40,130	40,692	41,261	41,839	42,425	43,019	43,621	44,232	44,851	45,479	46,116
Food Waste	30,858	31,299	31,745	32,198	32,658	33,124	33,596	34,076	34,562	35,055	35,555	36,062	36,577
Other - Misc. organic / animal products	-	-	-	-	-	-	-	-	-	-	-	-	-
Wood	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total metal</b>	<b>5,130</b>	<b>5,202</b>	<b>5,275</b>	<b>5,349</b>	<b>5,424</b>	<b>5,500</b>	<b>5,577</b>	<b>5,655</b>	<b>5,734</b>	<b>5,814</b>	<b>5,895</b>	<b>5,978</b>	<b>6,062</b>
Aluminum - Containers	1,849	1,875	1,901	1,928	1,955	1,982	2,010	2,038	2,067	2,096	2,125	2,155	2,185
Steel/tin & mixed - Containers	3,281	3,327	3,374	3,421	3,469	3,517	3,566	3,616	3,667	3,718	3,770	3,823	3,877
Other metal	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass	10,388	10,534	10,681	10,831	10,983	11,136	11,292	11,450	11,611	11,773	11,938	12,105	12,275
Consumer electronics	480	497	514	532	551	570	590	611	632	654	677	701	726
Household hazardous & batteries	8,615	8,767	8,922	9,080	9,240	9,403	9,569	9,739	9,911	10,086	10,264	10,446	10,630
Miscellaneous	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>224,391</b>	<b>228,876</b>	<b>233,486</b>	<b>238,225</b>	<b>243,097</b>	<b>248,106</b>	<b>253,256</b>	<b>258,551</b>	<b>263,996</b>	<b>269,596</b>	<b>275,353</b>	<b>281,275</b>	<b>287,365</b>

**Table 29: Bergen County MSW Residential Disposal Projection 2, by Material, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>100,914</b>	<b>99,207</b>	<b>97,612</b>	<b>96,127</b>	<b>94,751</b>	<b>93,481</b>	<b>92,315</b>	<b>91,251</b>	<b>90,287</b>	<b>89,423</b>	<b>88,656</b>	<b>87,985</b>	<b>87,409</b>
Corrugated	20,292	21,169	22,070	22,996	23,946	24,923	25,926	26,956	28,013	29,100	30,215	31,361	32,537
Mixed Office Paper	3,579	3,634	3,690	3,746	3,804	3,862	3,921	3,982	4,043	4,105	4,168	4,232	4,296
Newspaper	10,545	9,809	9,106	8,436	7,796	7,186	6,604	6,050	5,522	5,019	4,539	4,083	3,650
Magazines/glossy & other	66,499	64,595	62,746	60,950	59,205	57,510	55,863	54,263	52,710	51,200	49,734	48,309	46,926
<b>Total plastic</b>	<b>54,109</b>	<b>53,577</b>	<b>53,056</b>	<b>52,545</b>	<b>52,043</b>	<b>51,552</b>	<b>51,069</b>	<b>50,597</b>	<b>50,133</b>	<b>49,679</b>	<b>49,234</b>	<b>48,798</b>	<b>48,370</b>
Plastic Containers	10,522	10,623	10,725	10,829	10,933	11,038	11,144	11,251	11,359	11,468	11,578	11,690	11,802
Other Plastic	43,587	42,954	42,331	41,716	41,110	40,514	39,925	39,345	38,774	38,210	37,655	37,108	36,569
Textiles and fabrics	21,411	20,977	20,551	20,133	19,722	19,319	18,923	18,534	18,152	17,777	17,409	17,048	16,693
Yard Waste	22,011	22,286	22,563	22,844	23,128	23,415	23,706	24,001	24,299	24,600	24,905	25,214	25,526
Food Waste	71,151	72,309	73,484	74,676	75,885	77,112	78,355	79,617	80,896	82,193	83,507	84,841	86,192
Other - Misc. organic / animal products	11,118	10,729	10,353	9,991	9,641	9,304	8,978	8,664	8,361	8,068	7,786	7,513	7,250
Wood	7,858	7,583	7,317	7,061	6,814	6,576	6,346	6,123	5,909	5,702	5,503	5,310	5,124
<b>Total metal</b>	<b>16,877</b>	<b>16,929</b>	<b>16,988</b>	<b>17,056</b>	<b>17,131</b>	<b>17,215</b>	<b>17,305</b>	<b>17,404</b>	<b>17,509</b>	<b>17,622</b>	<b>17,742</b>	<b>17,870</b>	<b>18,004</b>
Aluminum - Containers	3,679	3,641	3,602	3,563	3,523	3,483	3,442	3,400	3,358	3,315	3,271	3,226	3,181
Steel/tin & mixed - Containers	8,528	8,781	9,037	9,297	9,559	9,824	10,093	10,365	10,640	10,919	11,202	11,488	11,778
Other metal	4,670	4,506	4,348	4,196	4,049	3,908	3,771	3,639	3,512	3,389	3,270	3,156	3,045
Glass	16,887	16,706	16,526	16,349	16,173	15,999	15,827	15,656	15,488	15,321	15,156	14,992	14,830
Consumer electronics	1,605	1,576	1,544	1,510	1,474	1,435	1,393	1,349	1,301	1,251	1,197	1,140	1,079
Household hazardous & batteries	1,431	1,415	1,398	1,380	1,362	1,343	1,324	1,304	1,282	1,261	1,238	1,214	1,190
Miscellaneous	35,882	35,295	34,718	34,150	33,592	33,043	32,502	31,971	31,448	30,934	30,428	29,930	29,441
<b>TOTAL</b>	<b>361,253</b>	<b>358,587</b>	<b>356,112</b>	<b>353,823</b>	<b>351,718</b>	<b>349,792</b>	<b>348,044</b>	<b>346,469</b>	<b>345,066</b>	<b>343,830</b>	<b>342,761</b>	<b>341,854</b>	<b>341,108</b>

**Table 30: Bergen County MSW CII Disposal Projection 2, by Material, 2017-2029 (Tons)**

Waste Stream	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Total paper</b>	<b>70,848</b>	<b>68,490</b>	<b>66,049</b>	<b>63,522</b>	<b>60,905</b>	<b>58,196</b>	<b>55,389</b>	<b>52,483</b>	<b>49,473</b>	<b>46,354</b>	<b>43,124</b>	<b>39,777</b>	<b>36,310</b>
Corrugated	18,722	16,819	14,830	12,751	10,579	8,310	5,942	3,470	891	(1,799)	(4,604)	(7,529)	(10,578)
Mixed Office Paper	5,203	5,232	5,261	5,290	5,319	5,347	5,375	5,403	5,431	5,459	5,486	5,513	5,540
Newspaper	4,564	4,564	4,564	4,564	4,564	4,564	4,564	4,564	4,564	4,564	4,564	4,564	4,564
Magazines/glossy & other	42,358	41,874	41,394	40,917	40,444	39,974	39,508	39,045	38,586	38,130	37,678	37,229	36,783
<b>Total plastic</b>	<b>33,883</b>	<b>33,851</b>	<b>33,827</b>	<b>33,811</b>	<b>33,801</b>	<b>33,800</b>	<b>33,807</b>	<b>33,822</b>	<b>33,845</b>	<b>33,877</b>	<b>33,918</b>	<b>33,969</b>	<b>34,029</b>
Plastic Containers	6,485	6,829	7,179	7,534	7,896	8,264	8,639	9,021	9,410	9,808	10,213	10,628	11,051
Other Plastic	27,397	27,022	26,648	26,276	25,906	25,536	25,168	24,801	24,435	24,070	23,705	23,341	22,978
Textiles and fabrics	16,036	16,147	16,257	16,366	16,474	16,580	16,686	16,789	16,892	16,992	17,091	17,188	17,283
Yard Waste	11,316	12,532	13,802	15,128	16,512	17,956	19,463	21,035	22,675	24,385	26,167	28,025	29,961
Food Waste	47,344	47,153	46,957	46,755	46,547	46,333	46,114	45,889	45,657	45,420	45,176	44,926	44,670
Other - Misc. organic / animal products	8,742	8,436	8,141	7,856	7,581	7,315	7,059	6,812	6,574	6,344	6,122	5,907	5,701
Wood	5,669	5,471	5,279	5,095	4,916	4,744	4,578	4,418	4,263	4,114	3,970	3,831	3,697
<b>Total metal</b>	<b>9,954</b>	<b>10,201</b>	<b>10,466</b>	<b>10,748</b>	<b>11,049</b>	<b>11,368</b>	<b>11,707</b>	<b>12,065</b>	<b>12,443</b>	<b>12,841</b>	<b>13,261</b>	<b>13,703</b>	<b>14,167</b>
Aluminum - Containers	2,245	2,362	2,484	2,611	2,743	2,880	3,022	3,170	3,324	3,484	3,650	3,822	4,001
Steel/tin & mixed - Containers	4,723	4,957	5,200	5,453	5,716	5,989	6,272	6,567	6,872	7,190	7,520	7,862	8,217
Other metal	2,987	2,882	2,782	2,684	2,590	2,500	2,412	2,328	2,246	2,168	2,092	2,018	1,948
Glass	10,435	10,383	10,329	10,274	10,216	10,158	10,097	10,035	9,970	9,904	9,837	9,767	9,695
Consumer electronics	804	796	787	778	769	759	748	737	725	712	698	684	669
Household hazardous & batteries	958	940	921	901	880	858	836	812	788	763	736	709	680
Miscellaneous	21,641	21,944	22,251	22,563	22,878	23,199	23,523	23,853	24,187	24,525	24,869	25,217	25,570
<b>TOTAL</b>	<b>237,631</b>	<b>236,345</b>	<b>235,066</b>	<b>233,795</b>	<b>232,529</b>	<b>231,267</b>	<b>230,007</b>	<b>228,749</b>	<b>227,491</b>	<b>226,232</b>	<b>224,969</b>	<b>223,703</b>	<b>222,431</b>





## 5 Summary of Results

This Section provides a summary of the results of this Study. It includes data derived from existing composition studies and NJDEP data between 2003 and 2016, and projections by extrapolation based on the derived data from 2017 to 2029. Projection 2, which assumes an initial reduction in diversion rates from 2017 has been used as the preferred projection scenario for MSW. Projection 1 is used for Non-MSW.

### 5.1 Overview

To estimate MSW disposal composition by material from 2003 to 2017, data from BCUA (2005) and DSNY (2018) residential composition studies were used for 2003 and 2017 respectively. Quantities were derived from NJDEP statistics, and the CII: Residential ratio was derived from EPA (2012) data. Non-MSW disposal composition by materials was derived from BCUA (2005) and NJDEP statistics. Data on diversion by material (MSW and Non-MSW) between 2003 and 2016 was provided by NJ DEP as recorded by municipalities and boroughs (See Appendix C). Generation quantities and composition were derived by adding disposal and diversion quantities. Detailed methodology and results for 2003 to 2016 are presented in Section 3 and Appendix D.

To forecast solid waste generation, diversion and disposal from 2017 to 2029 a two-step approach was adopted. First, Projection 1 extrapolated recent trends identified in the historic analysis set out in Section 3. To do this the annual growth rate for individual materials generated and diverted over selected periods were identified and added to the previous year. A default period of 2001 to 2016 was used, but this was modified where necessary to remove anomalies. A cap of between 2 and 5% per annum was also applied to avoid unsustainable rates of growth. In some cases, 0% or nominal growth rates were used based on professional judgement. The average quantities between 2014 to 2016 were used to define the base year for 2017.

Projection 2 assumes that recycling is likely to reduce in the short-term from 2018 onwards due to changes in US-international trade in recyclables affecting the availability of markets for materials diverted from residential and CII sources (e.g. China's changing policies on recyclables imports).<sup>16</sup> Reduced diversion growth rates were introduced into the model in 2017 by applying a 'market correction' value. The remaining years in the projection are calculated in the same way as in Projection 1. This is due to the expectation that recycling rates are likely to recover as markets correct themselves.

### 5.2 Results

Table 31 shows the total estimated annual quantities of waste generation, diversion and disposal of in Bergen County by source between 2003 and 2029. Chart 6 and Chart 7 below illustrate the disposal and diversion trends for MSW and Non-MSW over the same period. MSW from both residential and CII sources is projected to continue to reduce, and recycling to increase steadily between 2019 and 2029. The quantity of waste generated will continue to increase over this period, principally due to projected population growth, although the total MSW generation rate per capita is expected to fall from 6.44 to 6.26 lb/person/day.

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<sup>16</sup> See <https://www.wastedive.com/news/china-us-recycling-scrap-import-ban-trade-anniversary-2018/528050/>  
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Table 32 and Table 33 provide data for 2003 (baseline), 2019 (projected current) and 2029 (projected +10 years) for MSW and Non-MSW respectively in relation to materials composition, quantities of waste generated, recycled and disposed, and annual recycling rate. Based on the results of the study it is expected that the MSW recycling rate in 2019 will be around 47.8%, and this is projected to increase to 52.2% by 2029 despite setbacks in the short-term due to recent and ongoing changes in markets for some recyclables (e.g. scrap paper and plastics). The recycling rate for Non-MSW is projected to increase slightly from 66.6% to around 68.1%. C&D waste, mainly concrete, asphalt, block and brick, and soil and gravel make up around 60% of all Non-MSW recycled, and therefore have a disproportional effect on recycling rates for this category.

**Table 31: Total Estimated Annual Quantities of MSW and Non-MSW Generated, Diverted and Disposed by Source 2003 to 2029**

	2003	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Generation</b>															
MSW Residential	764,851	647,779	665,641	664,559	663,722	663,126	662,768	662,644	662,753	663,091	663,656	664,445	665,457	666,690	668,141
MSW CII	458,281	473,133	462,022	465,220	468,552	472,020	475,626	479,373	483,263	487,301	491,488	495,827	500,323	504,978	509,796
MSW All (CII+Res)	1,223,132	1,120,912	1,127,663	1,129,780	1,132,274	1,135,146	1,138,394	1,142,017	1,146,016	1,150,392	1,155,143	1,160,273	1,165,780	1,171,668	1,177,937
Non MSW	816,507	958,925	964,268	971,532	979,108	987,002	995,219	1,003,767	1,012,650	1,021,876	1,031,451	1,041,383	1,051,677	1,062,342	1,073,385
All Solid Waste	2,039,640	2,079,838	2,091,931	2,101,311	2,111,382	2,122,148	2,133,613	2,145,784	2,158,667	2,172,268	2,186,595	2,201,655	2,217,457	2,234,010	2,251,322
<b>Diversion</b>															
MSW Residential	306,403	313,709	304,387	305,972	307,610	309,303	311,050	312,852	314,709	316,622	318,590	320,615	322,697	324,836	327,032
MSW CII	165,175	259,547	224,391	228,876	233,486	238,225	243,097	248,106	253,256	258,551	263,996	269,596	275,353	281,275	287,365
MSW All (CII+Res)	471,577	573,256	528,779	534,848	541,096	547,528	554,147	560,958	567,965	575,173	582,587	590,211	598,050	606,111	614,398
Non MSW	522,078	648,283	643,183	649,627	656,313	663,247	670,432	677,875	685,580	693,552	701,797	710,320	719,126	728,222	737,613
All Solid Waste	993,656	1,221,540	1,171,962	1,184,474	1,197,409	1,210,774	1,224,579	1,238,833	1,253,545	1,268,725	1,284,384	1,300,530	1,317,177	1,334,333	1,352,011
<b>Disposal</b>															
MSW Residential	458,448	334,070	361,253	358,587	356,112	353,823	351,718	349,792	348,044	346,469	345,066	343,830	342,761	341,854	341,108
MSW CII	293,107	213,586	237,631	236,345	235,066	233,795	232,529	231,267	230,007	228,749	227,491	226,232	224,969	223,703	222,431
MSW All (CII+Res)	751,555	547,656	598,884	594,932	591,178	587,618	584,247	581,059	578,051	575,219	572,557	570,062	567,730	565,557	563,539
Non MSW	294,429	310,642	327,290	328,349	329,481	330,689	331,973	333,334	334,775	336,296	337,899	339,586	341,357	343,216	345,163
All Solid Waste	1,045,984	858,298	926,174	923,281	920,659	918,307	916,219	914,393	912,826	911,515	910,456	909,647	909,087	908,772	908,702

**Table 32: Total MSW Composition (%), Generation, Recycling & Disposal Quantities (Tons), & Recycling Rate (%) 2003, 2019 & 2029**

Material	2003					2019					2029				
	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate
<b>Total paper</b>	<b>33.8%</b>	<b>413,667</b>	<b>146,865</b>	<b>266,802</b>	<b>35.5%</b>	<b>30.6%</b>	<b>346,919</b>	<b>183,258</b>	<b>163,661</b>	<b>52.8%</b>	<b>28.9%</b>	<b>340,698</b>	<b>216,980</b>	<b>123,718</b>	<b>63.7%</b>
Corrugated	9.4%	115,306	64,200	51,106	55.7%	11.8%	133,816	96,916	36,900	72.4%	13.0%	152,559	130,601	21,959	85.6%
Mixed Office Paper	2.8%	33,643	15,605	18,037	46.4%	3.9%	44,239	35,288	8,951	79.8%	4.3%	50,685	40,848	9,837	80.6%
Newspaper	7.0%	85,475	49,401	36,075	57.8%	4.1%	46,492	32,822	13,670	70.6%	3.1%	36,379	28,165	8,214	77.4%
Magazines/glossy & other	14.7%	179,243	17,659	161,584	9.9%	10.8%	122,372	18,232	104,140	14.9%	8.6%	101,075	17,366	83,709	17.2%
<b>Total plastic</b>	<b>9.5%</b>	<b>116,597</b>	<b>4,615</b>	<b>111,982</b>	<b>4.0%</b>	<b>8.3%</b>	<b>94,502</b>	<b>7,618</b>	<b>86,884</b>	<b>8.1%</b>	<b>7.7%</b>	<b>90,285</b>	<b>7,886</b>	<b>82,399</b>	<b>8.7%</b>
Plastic Containers	1.3%	15,480	4,206	11,273	27.2%	2.1%	23,828	5,924	17,904	24.9%	2.4%	28,349	5,497	22,853	19.4%
Other Plastic	8.3%	101,117	409	100,708	0.4%	6.2%	70,673	1,694	68,979	2.4%	5.3%	61,936	2,390	59,546	3.9%
Textiles and fabrics	3.5%	42,617	1,281	41,336	3.0%	3.6%	40,869	4,061	36,808	9.9%	3.3%	39,261	5,285	33,976	13.5%
Yard Waste	22.2%	272,096	248,798	23,298	91.4%	25.4%	287,303	250,938	36,365	87.3%	28.3%	333,817	278,331	55,486	83.4%
Food Waste	11.8%	144,464	33,234	111,230	23.0%	14.1%	159,125	38,684	120,441	24.3%	15.0%	177,226	46,364	130,862	26.2%
Other - Misc. organic / animal products	4.2%	51,106	-	51,106	0.0%	1.6%	18,494	-	18,494	0.0%	1.1%	12,951	-	12,951	0.0%
Wood	2.3%	28,559	-	28,559	0.0%	1.1%	12,597	-	12,597	0.0%	0.7%	8,821	-	8,821	0.0%
<b>Total metal</b>	<b>3.8%</b>	<b>46,893</b>	<b>7,812</b>	<b>39,081</b>	<b>16.7%</b>	<b>3.4%</b>	<b>38,650</b>	<b>11,196</b>	<b>27,454</b>	<b>29.0%</b>	<b>3.8%</b>	<b>44,173</b>	<b>12,002</b>	<b>32,171</b>	<b>27.2%</b>
Aluminum - Containers	0.8%	9,462	4,202	5,261	44.4%	0.9%	10,706	4,620	6,087	43.1%	1.1%	12,526	5,344	7,183	42.7%
Steel/tin & mixed - Containers	0.5%	5,865	3,610	2,255	61.6%	1.8%	20,814	6,576	14,238	31.6%	2.3%	26,654	6,658	19,995	25.0%
Other metal	2.6%	31,565	-	31,565	0.0%	0.6%	7,130	-	7,130	0.0%	0.4%	4,993	-	4,993	0.0%
Glass	3.2%	39,122	23,340	15,783	59.7%	5.2%	58,771	31,916	26,855	54.3%	4.7%	55,242	30,717	24,525	55.6%
Consumer electronics	0.6%	6,764	-	6,764	0.0%	0.5%	5,667	3,336	2,332	58.9%	0.5%	6,454	4,705	1,748	72.9%
Household hazardous & batteries	0.7%	8,338	5,632	2,706	67.5%	1.1%	12,408	10,089	2,318	81.3%	1.2%	13,998	12,127	1,870	86.6%
Miscellaneous	4.3%	52,910	-	52,910	0.0%	5.0%	56,969	-	56,969	0.0%	4.7%	55,011	-	55,011	0.0%
<b>TOTAL MSW (10+23)</b>	<b>100.0%</b>	<b>1,223,132</b>	<b>471,577</b>	<b>751,555</b>	<b>38.6%</b>	<b>100.0%</b>	<b>1,132,274</b>	<b>541,096</b>	<b>591,178</b>	<b>47.8%</b>	<b>100.0%</b>	<b>1,177,937</b>	<b>614,398</b>	<b>563,539</b>	<b>52.2%</b>

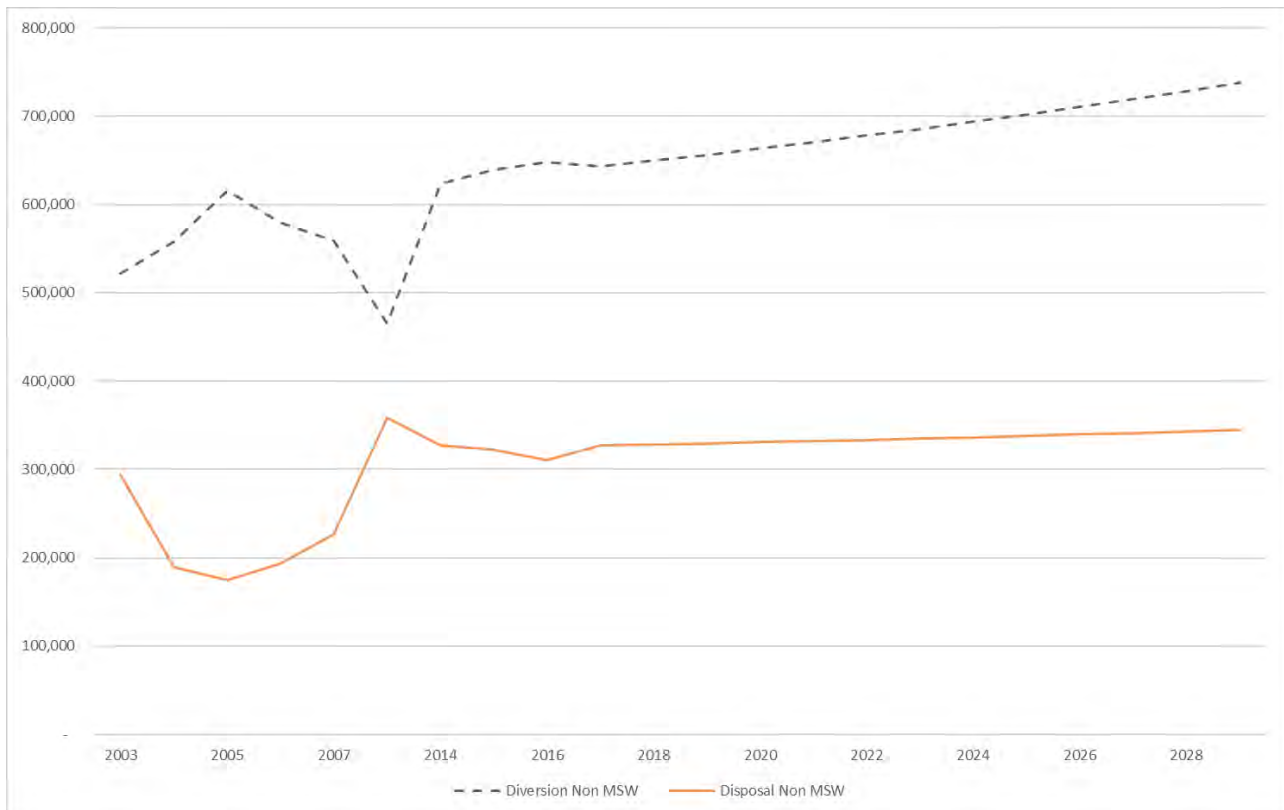
**Table 33: Total Non-MSW Composition (%), Generation, Recycling & Disposal Quantities (Tons), & Recycling Rate (%) 2003, 2019 & 2029**

Material	2003					2019					2029				
	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate
Vegetative waste	10.0%	81,899	3,056	78,843	3.7%	2.8%	27,931	3,290	24,641	11.8%	2.4%	26,527	2,857	23,670	10.8%
White Goods & Appliances	4.1%	33,112	30,870	2,242	93.2%	4.1%	40,441	36,810	3,631	91.0%	5.3%	56,913	42,301	14,612	74.3%
Automobile Scrap, heavy iron & non-ferrous	16.8%	136,820	102,564	34,255	75.0%	7.1%	70,090	54,752	15,338	78.1%	7.5%	80,762	47,552	33,210	58.9%
Batteries (Automobile)	0.1%	645	645	-	100.0%	0.4%	3,539	3,373	166	95.3%	0.3%	3,411	2,505	907	73.4%
Furniture	3.3%	26,792	-	26,792	0.0%	0.8%	8,142	-	8,142	0.0%	0.7%	7,083	-	7,083	0.0%
Textiles, carpet and padding	3.8%	31,417	-	31,417	0.0%	0.9%	8,946	-	8,946	0.0%	0.6%	6,265	-	6,265	0.0%
Electronic	0.3%	2,452	-	2,452	0.0%	0.1%	777	-	777	0.0%	0.1%	777	-	777	0.0%
Tires	0.5%	3,844	1,843	2,002	47.9%	0.3%	3,142	2,595	547	82.6%	0.3%	3,139	3,069	70	97.8%
<b>TOTAL Bulky (Type 13)</b>	<b>38.8%</b>	<b>316,981</b>	<b>138,978</b>	<b>178,003</b>	<b>43.8%</b>	<b>16.5%</b>	<b>163,007</b>	<b>100,821</b>	<b>62,187</b>	<b>61.9%</b>	<b>17.1%</b>	<b>184,878</b>	<b>98,284</b>	<b>86,594</b>	<b>53.2%</b>
Wood	7.1%	57,814	9,353	48,461	16.2%	11.2%	110,498	9,196	101,301	8.3%	8.9%	95,985	10,021	85,963	10.4%
Concrete/Asphalt/Block/Brick	35.7%	291,806	287,056	4,751	98.4%	39.0%	384,651	365,336	19,315	95.0%	44.9%	485,968	463,370	22,598	95.3%
Roofing	2.6%	21,385	-	21,385	0.0%	4.8%	47,026	-	47,026	0.0%	4.4%	47,525	-	47,525	0.0%
Drywall	1.4%	11,164	-	11,164	0.0%	2.5%	24,550	-	24,550	0.0%	2.3%	24,811	-	24,811	0.0%
Soil & Gravel	10.4%	85,080	81,879	3,201	96.2%	18.4%	181,324	175,870	5,454	97.0%	15.3%	165,964	160,117	5,847	96.5%
Corrugated paper	0.5%	4,437	-	4,437	0.0%	1.0%	9,757	-	9,757	0.0%	0.9%	9,861	-	9,861	0.0%
Plastic	0.6%	4,786	-	4,786	0.0%	1.1%	10,524	-	10,524	0.0%	1.0%	10,636	-	10,636	0.0%
Metal	0.2%	1,358	-	1,358	0.0%	0.3%	2,985	-	2,985	0.0%	0.3%	3,017	-	3,017	0.0%
Glass	0.0%	98	-	98	0.0%	0.0%	215	-	215	0.0%	0.0%	217	-	217	0.0%
Other	2.5%	20,622	4,788	15,834	23.2%	3.8%	37,220	2,002	35,218	5.4%	3.6%	39,460	2,824	36,636	7.2%
<b>TOTAL C&amp;D (Type 13C)</b>	<b>61.1%</b>	<b>498,550</b>	<b>383,075</b>	<b>115,475</b>	<b>76.8%</b>	<b>82.0%</b>	<b>808,750</b>	<b>552,404</b>	<b>256,346</b>	<b>68.3%</b>	<b>81.6%</b>	<b>883,442</b>	<b>636,332</b>	<b>247,110</b>	<b>72.0%</b>
Type 25	0.0%	27	-	27	0.0%	0.0%	48	-	48	0.0%	0.0%	54	-	54	0.0%
Type 27	0.1%	923	-	923	0.0%	1.1%	10,413	-	10,413	0.0%	1.0%	10,714	-	10,714	0.0%
Type 27A	0.0%	26	26	-	100.0%	0.3%	3,429	3,088	340	90.1%	0.3%	3,531	2,998	533	84.9%
Type 27I	0.0%	-	-	-	-	0.0%	-	-	-	-	0.0%	-	-	-	-
Type 72	0.0%	-	-	-	-	0.0%	147	-	147	0.0%	0.0%	157	-	157	0.0%
<b>TOTAL Other</b>	<b>0.1%</b>	<b>976</b>	<b>26</b>	<b>951</b>	<b>2.6%</b>	<b>1.4%</b>	<b>14,037</b>	<b>3,088</b>	<b>10,949</b>	<b>22.0%</b>	<b>1.3%</b>	<b>14,456</b>	<b>2,998</b>	<b>11,459</b>	<b>20.7%</b>
<b>TOTAL Non-MSW</b>	<b>100.0%</b>	<b>816,507</b>	<b>522,078</b>	<b>294,429</b>	<b>63.9%</b>	<b>100.0%</b>	<b>985,794</b>	<b>656,313</b>	<b>329,481</b>	<b>66.6%</b>	<b>100.0%</b>	<b>1,082,776</b>	<b>737,613</b>	<b>345,163</b>	<b>68.1%</b>

**Chart 6: MSW CII and Residential Disposal and Diversion Trends (2003 to 2029), Tons**



**Chart 7: Non-MSW Diversion and Disposal Trends (2003 to 2029), Tons**



# Appendices

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# A. Waste Types and Recycling Classes

## A.1 NJ DEP Waste Types

In accordance with the brief, the following solid waste types are included in the study:

- **Type 10 - Municipal (household, commercial and institutional):** Waste originating in the community consisting of household waste from private residences, commercial waste which originates in wholesale, retail or service establishments, such as, restaurants, stores, markets, theaters, hotels and warehouses, and institutional waste material originated in schools, hospitals, research institutions and public buildings.
- **Type 13 - Bulky waste:** Large items of waste material, such as appliances and furniture. Discarded automobiles, trucks and trailers and large vehicle parts, and tires are included under this category.
- **Type 13C - Construction and Demolition waste:** Waste building material and rubble resulting from construction, remodeling, repair, and demolition operations on houses, commercial buildings, pavements and other structures. The following materials may be found in construction and demolition waste: treated and un-treated wood scrap; tree parts, tree stumps and brush; concrete, asphalt, bricks, blocks and other masonry; plaster and wallboard; roofing materials; corrugated cardboard and miscellaneous paper; ferrous and non-ferrous metal; non-asbestos building insulation; plastic scrap; dirt; carpets and padding; glass (window and door); and other miscellaneous materials; but shall not include other solid waste types.

The following additional types have been included in the study as significant amounts are recorded in New Jersey Department of Environmental Protection (NJ DEP) statistics:

- **Type 23 – Vegetative waste:** Waste materials from farms, plant nurseries and greenhouses that are produced from the raising of plants. This waste includes such crop residues as plant stalks, hulls, leaves and tree wastes processed through a wood chipper. Also included are non-crop residues such as leaves, grass clippings, tree parts, shrubbery and garden wastes.
- **Type 25 - Animal and food processing wastes:** Processing waste materials generated in canneries, slaughter-houses, packing plants or similar industries, including animal manure when intended for disposal and not reuse. Also included are dead animals. Animal manure, when intended for reuse or composting, is to be managed in accordance with the criteria and standards developed by the Department of Agriculture as set forth at N.J.S.A. 4:9-38.
- **Type 27 - Dry industrial waste:** Waste materials resulting from manufacturing, industrial and research and development processes and operations, and which are not hazardous in accordance with the standards and procedures set forth at N.J.A.C. 7:26G. Also included are nonhazardous oil spill cleanup waste, dry nonhazardous pesticides, dry nonhazardous chemical waste, and residue from the operations of a scrap metal shredding facility.
- **Type 27A** Waste material consisting of asbestos or asbestos containing waste.
- **Type 27I** Waste material consisting of incinerator ash or ash containing waste.

NJ DEP waste and recycling statistics include data on Municipal Solid Waste (MSW), which they define as Type 10 + 23.



## A.2 NJ DEP Recycling Classes

"Class A recyclable material" means a source separated non-putrescible recyclable material specifically excluded from Department approval prior to receipt, storage, processing or transfer at a recycling center in accordance with N.J.S.A. 13:1E-99.34b, which material currently includes source separated non-putrescible metal, glass, paper, plastic containers, and corrugated and other cardboard.

"Class B recyclable material" means a source separated recyclable material which is subject to Department approval prior to receipt, storage, processing or transfer at a recycling center in accordance with N.J.S.A. 13:1E-99.34b, and which includes, but is not limited to, the following:

- Source separated, non-putrescible, waste concrete, asphalt, brick, block, asphalt-based roofing scrap and wood waste;
- Source separated, non-putrescible, waste materials other than metal, glass, paper, plastic containers, corrugated and other cardboard resulting from construction, remodeling, repair and demolition operations on houses, commercial buildings, pavements and other structures;
- Source separated whole trees, tree trunks, tree parts, tree stumps, brush and leaves provided that they are not composted;
- Source separated scrap tires; and
- Source separated petroleum contaminated soil.

"Class C recyclable material" means a source separated compostable material which is subject to Department approval prior to the receipt, storage, processing or transfer at a recycling center in accordance with N.J.S.A. 13:1E-99.34b, and which includes, but is not limited to, organic materials such as:

- Source separated food waste;
- Source separated vegetative food waste; and
- Source separated yard trimmings.

"Class D recyclable material" means, but is not limited to, the following:

- Used oil, as defined in this section, which is subject to Department approval prior to the receipt, storage or processing at a Class D recycling center in accordance with N.J.S.A. 13:1E-99.34b, and which includes, but is not limited to, the following:
  - a. Used lubricant oil;
  - b. Used coolant oil (non-contact heat transfer fluids);
  - c. Used emulsion oil; and
  - d. Any other synthetic oil or oil refined from crude oil, which has been used, and as a result of such use is contaminated by physical or chemical impurities;
- Batteries as defined in this section;
- Pesticides as defined in this section;
- Thermostats as defined in this section;
- Latex paint;
- Oil base paints from household or small quantity generators; and
- Antifreeze.

### A.3 Add-Ons

The Solid and Hazardous Waste Management Program apportions the tonnage amount reported by the Institute of Scrap Recycling Industries and the Auto and Metals Recyclers Association (ISRI/AMRA) to the municipalities. The Solid and Hazardous Waste Management Program tallies the metals, which were marketed through an ISRI or AMRA facility as reported by municipalities. This total figure is subtracted from the statewide figure, submitted by ISRI/AMRA. The balance of tonnages is distributed to municipalities based on population size.

## B. NJ DEP Materials Classifications

DEP ID	MATERIAL	MSW / Non-MSW	RECYCLING CLASS
01	Corrugated	MSW	A
02	Mixed Office Paper	MSW	A
03	Newspaper	MSW	A
04	Other Paper/Mag/Junk Mail	MSW	A
05	Glass Containers	MSW	A
06	Aluminum Containers	MSW	A
07	Steel Containers	MSW	A
08	Plastic Containers	MSW	A
09	Heavy Iron	non-MSW	A
10	Non-Ferrous/Aluminum Scrap	non-MSW	A
11	White Goods & Light Iron	non-MSW	A
12	Anti-freeze	MSW	D
13	Batteries (Automobile)	non-MSW	D
14	Automobile Scrap	non-MSW	A
15	Tires	non-MSW	B
16	Used Motor Oil	MSW	D
17	Brush/Tree Parts	MSW	C
18	Grass Clippings	MSW	C
19	Leaves	MSW	C
20	Stumps	non-MSW	C
21	Consumer Electronics	MSW	D
22	Concrete / Asphalt / Brick / Block	non-MSW	B
23	Food Waste	MSW	C
24	Other Material Not Listed	non-MSW	
24	Fluorescent Lights	non-MSW	D
24	Batteries (Dry Cell)	MSW	D
25	Other Glass	MSW	B
26	Other Plastic	MSW	B
27	Oil Contaminated Soil	non-MSW	B
28	Process Residue	non-MSW	
29	Textiles	MSW	A
30	Wood Scraps	non-MSW	B

# C. Existing Bergen County Solid Waste Statistics

## C.1 2003 MSW Composition (BCUA 2005)

The BCUA (2005) report provides data on the composition of MSW disposed from residential and CII sources in Bergen County. The results of the study, percentage of total sample by material, averaged over the year are reproduced in in Table 34. Material categories have been adjusted from the BCUA 2005 study to align with categories used in NJDEP waste and recycling statistics.

**Table 34: Solid Waste Disposal 2003: Composition by Source (BCUA 2005)**

Material Category	Type	Residential	CII	All
<b>Paper</b>	<b>Type 10</b>	<b>33.6%</b>	<b>38.5%</b>	<b>35.5%</b>
<i>Corrugated</i>	<i>Type 10</i>	<i>4.5%</i>	<i>10.3%</i>	<i>6.8%</i>
<i>Mixed Office Paper</i>	<i>Type 10</i>	<i>1.3%</i>	<i>4.2%</i>	<i>2.4%</i>
<i>Newspaper</i>	<i>Type 10</i>	<i>5.3%</i>	<i>4.1%</i>	<i>4.8%</i>
<i>Magazines/glossy &amp; other</i>	<i>Type 10</i>	<i>22.5%</i>	<i>19.9%</i>	<i>21.5%</i>
<b>Plastic</b>	<b>Type 10</b>	<b>14.4%</b>	<b>15.2%</b>	<b>14.9%</b>
<i>Plastic Containers</i>	<i>Type 10</i>	<i>1.4%</i>	<i>1.2%</i>	<i>1.5%</i>
<i>Other Plastic</i>	<i>Type 10</i>	<i>13.0%</i>	<i>14.0%</i>	<i>13.4%</i>
<b>Textiles and fabrics</b>	<b>Type 10</b>	<b>5.9%</b>	<b>4.7%</b>	<b>5.5%</b>
<i>Textiles</i>	<i>Type 10</i>	<i>4.6%</i>	<i>3.4%</i>	<i>4.2%</i>
<i>Rubber and leather</i>	<i>Type 10</i>	<i>1.3%</i>	<i>1.3%</i>	<i>1.3%</i>
<b>Yard Waste</b>	<b>Type 23</b>	<b>3.7%</b>	<b>2.1%</b>	<b>3.1%</b>
<b>Food Waste</b>	<b>Type 23</b>	<b>15.2%</b>	<b>14.2%</b>	<b>14.8%</b>
<b>Wood</b>	<b>Type 23</b>	<b>6.1%</b>	<b>7.8%</b>	<b>6.8%</b>
<b>Other - Misc. organic / animal products</b>	<b>Type 23</b>	<b>3.0%</b>	<b>4.9%</b>	<b>3.8%</b>
<b>Metal</b>	<b>Type 10</b>	<b>5.3%</b>	<b>5.2%</b>	<b>5.2%</b>
<i>Aluminum - Containers</i>	<i>Type 10</i>	<i>0.8%</i>	<i>0.6%</i>	<i>0.7%</i>
<i>Steel/tin &amp; mixed - Containers</i>	<i>Type 10</i>	<i>0.3%</i>	<i>0.3%</i>	<i>0.3%</i>
<i>Other metal</i>	<i>Type 10</i>	<i>4.2%</i>	<i>4.3%</i>	<i>4.2%</i>
<b>Glass</b>	<b>Type 10</b>	<b>2.1%</b>	<b>4.8%</b>	<b>2.1%</b>
<b>Consumer electronics</b>	<b>Type 10</b>	<b>1.2%</b>	<b>0.4%</b>	<b>0.9%</b>
<b>Household hazardous &amp; batteries</b>		<b>0.3%</b>	<b>0.3%</b>	<b>0.4%</b>
<b>Miscellaneous</b>	<b>Type 10</b>	<b>9.2%</b>	<b>1.9%</b>	<b>7.0%</b>

Source: BCUA Bergen County Solid Waste Composition – Final Report (March 2005).

Note: Categories adjusted.

The BCUA (2005) study defines all waste arising from residential and CII sources as Type 10. However, NJ DEP statistics on MSW are composed of the sum of data for both Type 10 and Type 23. Therefore, this study has assigned these two NJ DEP waste types to the materials in Table 34.

## C.2 Annual Solid Waste Quantities by Type

Table 35 shows annual quantities of solid waste arising in Bergen County by Type (see Appendix A1 for definitions). The data was provided by NJ DEP in excel spreadsheet format in September 2018. The data is generated at the borough/municipality level and aggregated by NJ DEP.

**Table 35: Bergen County Annual Solid Waste Disposal Quantities (Tons) (2003 to 2017)**

Waste Type	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
10	749,799	689,522	728,138	747,341	699,326	673,541	681,143	610,261	629,845	593,904	629,529	577,951	600,845	547,040
13	178,003	131,372	107,409	90,075	75,122	60,063	60,284	58,862	63,301	74,891	63,409	75,599	53,270	40,342
13C	115,475	57,140	66,443	101,804	145,246	138,872	221,227	235,786	259,199	222,786	272,005	236,151	262,057	261,160
23	1,755	553	483	498	602	495	647	1,074	16,725	18,796	908	2,613	543	616
25	27	32	9	1	37	192	47	21	65	18	24	24	23	94
27	923	597	772	1,085	4,862	2,159	6,685	6,779	15,679	16,321	23,280	15,658	6,918	8,397
27A	0	0	0	2	1,119	571	475	15	24	28	36	196	451	229
27I	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	5	0	0	5	0	0	0	11	419
<b>Total Tons</b>	<b>1,045,984</b>	<b>879,216</b>	<b>903,253</b>	<b>940,805</b>	<b>926,314</b>	<b>875,898</b>	<b>970,508</b>	<b>912,797</b>	<b>984,844</b>	<b>926,744</b>	<b>989,191</b>	<b>908,192</b>	<b>924,118</b>	<b>858,298</b>
<b>MSW</b>	<b>751,555</b>	<b>690,075</b>	<b>728,621</b>	<b>747,839</b>	<b>699,928</b>	<b>674,036</b>	<b>681,790</b>	<b>611,335</b>	<b>646,570</b>	<b>612,700</b>	<b>630,436</b>	<b>580,564</b>	<b>601,388</b>	<b>547,656</b>
<b>Non-MSW</b>	<b>294,429</b>	<b>189,141</b>	<b>174,632</b>	<b>192,966</b>	<b>226,386</b>	<b>201,862</b>	<b>288,718</b>	<b>301,462</b>	<b>338,273</b>	<b>314,044</b>	<b>358,754</b>	<b>327,628</b>	<b>322,730</b>	<b>310,642</b>

Source: NJ DEP (2018)

## C.3 Annual Material Diversion Quantities, by Material, Type and Class

Table 36 to Table 43 show annual material diversion statistics from Residential sources, CII sources, and All Sources (Residential and CII combined) for Bergen County between 2003 and 2016. The data was provided by NJ DEP in excel spreadsheet format in September 2018. The data is generated at the borough/municipality level and aggregated by NJ DEP.<sup>17</sup>

<sup>17</sup> Data from 2017 was also provided by NJ DEP. However, as statistics from the Institute of Scrap Recycling Industries and the Auto and Metals Recyclers Association (ISRI/AMRA) (referred to as 'add-ons') are not included, this data is partial and has therefore not been included in the current study.

### C.3.1 “MSW” Materials

**Table 36: Bergen County “MSW” Material Diversion Composition – Residential Sources (2003 to 2016)**

Recycling Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Paper</b>	<b>18.6%</b>	<b>21.8%</b>	<b>22.5%</b>	<b>21.0%</b>	<b>21.3%</b>	<b>21.6%</b>	<b>20.0%</b>	<b>21.2%</b>	<b>16.9%</b>	<b>16.8%</b>	<b>18.9%</b>	<b>18.8%</b>	<b>19.3%</b>	<b>21.5%</b>
<i>Corrugated</i>	3.1%	3.1%	2.9%	3.1%	4.1%	3.4%	3.8%	3.9%	3.9%	4.2%	4.8%	4.9%	4.6%	5.9%
<i>Mixed Office Paper</i>	0.9%	1.8%	2.0%	1.0%	1.2%	1.8%	1.6%	2.2%	1.4%	1.2%	1.3%	1.8%	2.3%	3.1%
<i>Newspaper</i>	12.1%	13.7%	15.5%	14.7%	13.4%	13.6%	12.5%	12.4%	9.8%	8.8%	9.5%	9.0%	8.9%	9.7%
<i>Other Paper/Mag/Junk Mail</i>	2.4%	3.2%	2.0%	2.2%	2.6%	2.8%	2.1%	2.6%	1.8%	2.6%	3.2%	3.1%	3.5%	2.7%
<b>Plastic</b>	<b>0.9%</b>	<b>1.1%</b>	<b>1.3%</b>	<b>1.3%</b>	<b>1.7%</b>	<b>1.6%</b>	<b>2.0%</b>	<b>1.9%</b>	<b>1.9%</b>	<b>1.9%</b>	<b>2.0%</b>	<b>2.1%</b>	<b>2.0%</b>	<b>1.8%</b>
<i>Plastic Containers</i>	0.9%	1.1%	1.3%	1.3%	1.6%	1.6%	2.0%	1.9%	1.9%	1.9%	2.0%	2.1%	2.0%	1.8%
<i>Other Plastic</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Textiles	<b>0.2%</b>	<b>0.3%</b>	<b>0.4%</b>	<b>0.9%</b>	<b>0.3%</b>	<b>0.3%</b>	<b>0.3%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.7%</b>	<b>0.3%</b>
Leaves, Brush/Tree Parts, Grass Clippings	73.5%	68.4%	67.4%	67.3%	66.9%	67.4%	62.5%	65.3%	72.1%	71.7%	67.5%	66.8%	63.9%	64.1%
Food Waste	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.1%	2.7%	3.2%
<b>Metal</b>	<b>1.4%</b>	<b>1.6%</b>	<b>1.7%</b>	<b>1.4%</b>	<b>1.9%</b>	<b>1.7%</b>	<b>1.8%</b>	<b>2.0%</b>	<b>1.5%</b>	<b>1.4%</b>	<b>1.7%</b>	<b>1.9%</b>	<b>2.1%</b>	<b>1.6%</b>
<i>Aluminum Containers</i>	0.6%	0.6%	0.7%	0.5%	0.7%	0.7%	0.6%	0.8%	0.6%	0.5%	0.7%	0.8%	0.9%	0.8%
<i>Steel Containers</i>	0.7%	1.0%	1.0%	0.8%	1.2%	1.0%	1.2%	1.2%	0.9%	0.9%	1.0%	1.2%	1.1%	0.9%
Glass Containers, Other Glass	5.3%	6.6%	6.4%	6.7%	7.3%	7.0%	8.1%	8.3%	6.7%	7.0%	8.1%	8.6%	8.3%	6.5%
Consumer electronics	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.3%	0.5%	0.4%	0.5%	0.7%	0.9%	0.9%	0.6%
Used Motor Oil, Batteries (Dry Cell), Anti-freeze	0.1%	0.2%	0.3%	1.3%	0.5%	0.2%	5.0%	0.4%	0.2%	0.2%	0.6%	0.5%	0.2%	0.3%

**Table 37: Bergen County “MSW” Material Diversion Quantities (Tons) – Residential Sources (2003 to 2016)**

Recycling Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Paper</b>	<b>56,839</b>	<b>68,034</b>	<b>75,014</b>	<b>63,623</b>	<b>64,136</b>	<b>69,065</b>	<b>58,082</b>	<b>60,203</b>	<b>61,057</b>	<b>61,643</b>	<b>59,375</b>	<b>59,544</b>	<b>60,993</b>	<b>67,326</b>
<i>Corrugated</i>	9,373	9,521	9,613	9,372	12,292	10,948	11,063	11,098	14,124	15,298	15,171	15,579	14,427	18,622
<i>Mixed Office Paper</i>	2,816	5,697	6,643	3,072	3,756	5,697	4,759	6,375	5,058	4,334	4,197	5,730	7,217	9,805
<i>Newspaper</i>	37,218	42,721	51,924	44,503	40,280	43,560	36,133	35,272	35,539	32,411	29,825	28,549	28,150	30,567
<i>Other Paper/Mag/Junk Mail</i>	7,433	10,094	6,835	6,676	7,808	8,861	6,128	7,457	6,337	9,600	10,183	9,687	11,199	8,332
<b>Plastic</b>	<b>2,637</b>	<b>3,549</b>	<b>4,341</b>	<b>4,048</b>	<b>4,963</b>	<b>5,000</b>	<b>5,871</b>	<b>5,467</b>	<b>6,742</b>	<b>6,935</b>	<b>6,410</b>	<b>6,622</b>	<b>6,375</b>	<b>5,770</b>
<i>Plastic Containers</i>	2,631	3,548	4,340	4,042	4,954	4,991	5,870	5,467	6,727	6,913	6,395	6,605	6,344	5,709
<i>Other Plastic</i>	6	0	1	5	9	8	0	0	15	22	15	17	31	61
Textiles	<b>677</b>	<b>905</b>	<b>1,222</b>	<b>2,646</b>	<b>942</b>	<b>895</b>	<b>807</b>	<b>918</b>	<b>878</b>	<b>875</b>	<b>1,039</b>	<b>755</b>	<b>2,184</b>	<b>924</b>
Leaves, Brush/Tree Parts, Grass Clippings	225,210	212,914	224,985	204,113	200,992	215,667	181,033	185,257	260,455	263,073	211,544	211,108	201,997	201,234
Food Waste	260	1	1	14	-	10	9	79	98	882	32	186	8,488	10,100
<b>Metal</b>	<b>4,147</b>	<b>4,883</b>	<b>5,713</b>	<b>4,179</b>	<b>5,766</b>	<b>5,494</b>	<b>5,301</b>	<b>5,607</b>	<b>5,449</b>	<b>5,244</b>	<b>5,326</b>	<b>6,162</b>	<b>6,521</b>	<b>5,137</b>
<i>Aluminum Containers</i>	1,865	1,770	2,468	1,660	2,044	2,218	1,863	2,193	2,137	1,993	2,052	2,503	2,914	2,378
<i>Steel Containers</i>	2,282	3,114	3,245	2,520	3,722	3,276	3,438	3,414	3,312	3,251	3,274	3,659	3,607	2,758
Glass Containers, Other Glass	16,267	20,465	21,481	20,439	21,922	22,468	23,423	23,420	24,347	25,870	25,390	27,329	26,228	20,282
Consumer electronics	-	-	258	193	477	740	866	1,537	1,506	1,758	2,216	2,716	2,882	2,036
Used Motor Oil, Batteries (Dry Cell), Anti-freeze	365	635	927	3,869	1,441	703	14,429	1,114	755	827	2,013	1,682	667	901
	<b>306,403</b>	<b>311,386</b>	<b>333,941</b>	<b>303,125</b>	<b>300,638</b>	<b>320,042</b>	<b>289,820</b>	<b>283,602</b>	<b>361,288</b>	<b>367,107</b>	<b>313,344</b>	<b>316,105</b>	<b>316,336</b>	<b>313,709</b>

**Table 38: Bergen County “MSW” Material Diversion Composition – CII Sources (2003 to 2016)**

Recycling Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Paper</b>	<b>54.5%</b>	<b>70.3%</b>	<b>74.6%</b>	<b>67.9%</b>	<b>65.9%</b>	<b>66.5%</b>	<b>65.0%</b>	<b>54.0%</b>	<b>55.1%</b>	<b>53.2%</b>	<b>57.5%</b>	<b>59.1%</b>	<b>50.6%</b>	<b>58.6%</b>
<i>Corrugated</i>	33.2%	51.8%	52.0%	50.2%	43.3%	43.1%	44.5%	37.4%	35.5%	32.5%	33.6%	33.4%	27.0%	32.7%
<i>Mixed Office Paper</i>	7.7%	8.7%	16.1%	9.3%	6.8%	14.7%	10.9%	9.3%	8.6%	8.8%	10.1%	10.1%	11.9%	13.8%
<i>Newspaper</i>	7.4%	3.7%	1.1%	3.8%	3.4%	1.1%	2.4%	2.1%	2.1%	4.2%	3.3%	3.8%	4.4%	3.6%
<i>Other Paper/Mag/Junk Mail</i>	6.2%	6.1%	5.3%	4.5%	12.3%	7.6%	7.2%	5.2%	8.9%	7.7%	10.6%	11.8%	7.3%	8.5%
<b>Plastic</b>	<b>1.2%</b>	<b>0.9%</b>	<b>0.8%</b>	<b>1.0%</b>	<b>1.4%</b>	<b>1.2%</b>	<b>1.6%</b>	<b>6.3%</b>	<b>5.1%</b>	<b>2.2%</b>	<b>3.4%</b>	<b>2.5%</b>	<b>2.3%</b>	<b>3.3%</b>
<i>Plastic Containers</i>	1.0%	0.5%	0.5%	0.6%	0.9%	0.7%	0.7%	5.4%	4.0%	1.9%	2.2%	1.4%	1.6%	2.0%
<i>Other Plastic</i>	0.2%	0.4%	0.3%	0.4%	0.4%	0.5%	0.9%	0.9%	1.0%	0.3%	1.2%	1.1%	0.8%	1.3%
Textiles	0.4%	0.7%	0.4%	0.4%	0.5%	0.2%	0.3%	0.7%	0.9%	0.8%	4.0%	1.2%	0.8%	1.2%
Leaves, Brush/Tree Parts, Grass Clippings	14.3%	18.1%	11.7%	18.6%	14.9%	15.1%	13.4%	13.7%	14.0%	15.0%	11.7%	11.7%	22.4%	14.6%
Food Waste	20.0%	5.2%	6.1%	5.7%	10.5%	9.1%	10.8%	9.4%	15.6%	18.3%	11.4%	14.0%	14.3%	11.0%
<b>Metal</b>	<b>2.2%</b>	<b>0.4%</b>	<b>0.7%</b>	<b>0.9%</b>	<b>0.6%</b>	<b>0.7%</b>	<b>1.0%</b>	<b>1.9%</b>	<b>0.9%</b>	<b>1.5%</b>	<b>2.4%</b>	<b>2.4%</b>	<b>1.9%</b>	<b>2.2%</b>
<i>Aluminum Containers</i>	1.4%	0.2%	0.4%	0.4%	0.2%	0.3%	0.4%	0.6%	0.2%	0.3%	0.6%	0.6%	0.7%	0.9%
<i>Steel Containers</i>	0.8%	0.3%	0.3%	0.5%	0.4%	0.4%	0.5%	1.3%	0.6%	1.1%	1.8%	1.8%	1.2%	1.2%
Glass Containers, Other Glass	4.3%	2.3%	2.5%	3.4%	3.0%	2.9%	2.9%	9.4%	2.9%	4.5%	6.0%	4.9%	4.7%	4.9%
Consumer electronics	0.0%	0.0%	0.0%	0.0%	0.5%	1.2%	0.2%	1.6%	0.3%	1.1%	0.3%	0.1%	0.2%	0.3%
Used Motor Oil, Batteries (Dry Cell), Anti-freeze	3.2%	2.1%	3.2%	2.1%	2.9%	3.1%	4.7%	3.1%	5.4%	3.4%	3.4%	4.1%	2.9%	3.9%

**Table 39: Bergen County “MSW” Material Diversion Quantities (Tons) – CII Sources (2003 to 2016)**

Recycling Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Paper</b>	<b>90,026</b>	<b>109,226</b>	<b>135,756</b>	<b>156,609</b>	<b>115,498</b>	<b>115,625</b>	<b>102,018</b>	<b>107,370</b>	<b>91,266</b>	<b>99,121</b>	<b>118,332</b>	<b>120,311</b>	<b>121,672</b>	<b>152,026</b>
<i>Corrugated</i>	54,828	80,534	94,663	115,899	76,010	74,879	69,853	74,468	58,850	60,582	69,056	68,045	64,964	84,877
<i>Mixed Office Paper</i>	12,789	13,547	29,321	21,510	11,871	25,600	17,162	18,418	14,212	16,338	20,695	20,606	28,673	35,821
<i>Newspaper</i>	12,183	5,732	2,040	8,825	6,040	1,928	3,748	4,150	3,451	7,785	6,702	7,678	10,573	9,217
<i>Other Paper/Mag/Junk Mail</i>	10,226	9,413	9,732	10,376	21,576	13,219	11,256	10,335	14,752	14,416	21,879	23,982	17,462	22,112
<b>Plastic</b>	<b>1,978</b>	<b>1,370</b>	<b>1,448</b>	<b>2,307</b>	<b>2,376</b>	<b>2,040</b>	<b>2,492</b>	<b>12,531</b>	<b>8,381</b>	<b>4,099</b>	<b>7,066</b>	<b>5,180</b>	<b>5,582</b>	<b>8,613</b>
<i>Plastic Containers</i>	1,575	717	874	1,478	1,619	1,188	1,122	10,712	6,661	3,469	4,575	2,903	3,748	5,192
<i>Other Plastic</i>	403	653	575	829	756	852	1,369	1,819	1,721	630	2,492	2,276	1,834	3,420
Textiles	604	1,129	657	913	819	352	455	1,390	1,502	1,469	8,198	2,412	1,862	3,157
Leaves, Brush/Tree Parts, Grass Clippings	23,589	28,077	21,259	42,885	26,067	26,276	21,095	27,213	23,137	28,013	24,015	23,872	53,746	37,854
Food Waste	32,974	8,142	11,053	13,230	18,466	15,879	16,983	18,679	25,785	34,140	23,439	28,443	34,307	28,522
<b>Metal</b>	<b>3,665</b>	<b>674</b>	<b>1,301</b>	<b>2,147</b>	<b>1,047</b>	<b>1,161</b>	<b>1,494</b>	<b>3,718</b>	<b>1,433</b>	<b>2,707</b>	<b>4,972</b>	<b>4,899</b>	<b>4,642</b>	<b>5,637</b>
<i>Aluminum Containers</i>	2,337	280	692	914	332	502	672	1,147	389	617	1,192	1,319	1,724	2,427
<i>Steel Containers</i>	1,328	394	609	1,233	714	658	822	2,571	1,044	2,091	3,780	3,580	2,917	3,210
Glass Containers, Other Glass	7,073	3,548	4,556	7,779	5,246	5,050	4,566	18,737	4,819	8,441	12,284	9,944	11,372	12,834
Consumer electronics	-	-	85	90	828	2,111	316	3,108	446	1,996	557	244	420	728
Used Motor Oil, Batteries (Dry Cell), Anti-freeze	5,267	3,298	5,889	4,846	5,032	5,438	7,427	6,145	8,984	6,270	6,935	8,358	6,861	10,176
	<b>165,175</b>	<b>155,464</b>	<b>182,005</b>	<b>230,806</b>	<b>175,378</b>	<b>173,933</b>	<b>156,847</b>	<b>198,889</b>	<b>165,753</b>	<b>186,256</b>	<b>205,799</b>	<b>203,662</b>	<b>240,465</b>	<b>259,547</b>

**Table 40: Bergen County “MSW” Material Diversion Composition – All Sources (2003 to 2016)**

Recycling Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Paper</b>	31.1%	38.0%	40.9%	41.2%	37.7%	37.4%	35.8%	34.7%	28.9%	29.1%	34.2%	34.6%	32.8%	38.3%
<i>Corrugated</i>	13.6%	19.3%	20.2%	23.5%	18.6%	17.4%	18.1%	17.7%	13.8%	13.7%	16.2%	16.1%	14.3%	18.1%
<i>Mixed Office Paper</i>	3.3%	4.1%	7.0%	4.6%	3.3%	6.3%	4.9%	5.1%	3.7%	3.7%	4.8%	5.1%	6.4%	8.0%
<i>Newspaper</i>	10.5%	10.4%	10.5%	10.0%	9.7%	9.2%	8.9%	8.2%	7.4%	7.3%	7.0%	7.0%	7.0%	6.9%
<i>Other Paper/Mag/Junk Mail</i>	3.7%	4.2%	3.2%	3.2%	6.2%	4.5%	3.9%	3.7%	4.0%	4.3%	6.2%	6.5%	5.1%	5.3%
<b>Plastic</b>	1.0%	1.1%	1.1%	1.2%	1.5%	1.4%	1.9%	3.7%	2.9%	2.0%	2.6%	2.3%	2.1%	2.5%
<i>Plastic Containers</i>	0.9%	0.9%	1.0%	1.0%	1.4%	1.3%	1.6%	3.4%	2.5%	1.9%	2.1%	1.8%	1.8%	1.9%
<i>Other Plastic</i>	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.4%	0.3%	0.1%	0.5%	0.4%	0.3%	0.6%
Textiles	0.3%	0.4%	0.4%	0.7%	0.4%	0.3%	0.3%	0.5%	0.5%	0.4%	1.8%	0.6%	0.7%	0.7%
Leaves, Brush/Tree Parts, Grass Clippings	52.8%	51.6%	47.7%	46.3%	47.7%	49.0%	45.3%	44.0%	53.8%	52.6%	45.4%	45.2%	45.9%	41.7%
Food Waste	7.0%	1.7%	2.1%	2.5%	3.9%	3.2%	3.8%	3.9%	4.9%	6.3%	4.5%	5.5%	7.7%	6.7%
<b>Metal</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<i>Aluminum Containers</i>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<i>Steel Containers</i>	1.7%	1.2%	1.4%	1.2%	1.4%	1.3%	1.5%	1.9%	1.3%	1.4%	2.0%	2.1%	2.0%	1.9%
Glass Containers, Other Glass	0.9%	0.4%	0.6%	0.5%	0.5%	0.6%	0.6%	0.7%	0.5%	0.5%	0.6%	0.7%	0.8%	0.8%
Consumer electronics	0.8%	0.8%	0.7%	0.7%	0.9%	0.8%	1.0%	1.2%	0.8%	1.0%	1.4%	1.4%	1.2%	1.0%
Used Motor Oil, Batteries (Dry Cell), Anti-freeze	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**Table 41: Bergen County “MSW” Material Diversion Quantities (Tons) – All Sources (2003 to 2016)**

Recycling Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Paper</b>	<b>146,865</b>	<b>177,260</b>	<b>210,770</b>	<b>220,233</b>	<b>179,634</b>	<b>184,691</b>	<b>160,100</b>	<b>167,573</b>	<b>152,324</b>	<b>160,763</b>	<b>177,707</b>	<b>179,856</b>	<b>182,665</b>	<b>219,352</b>
<i>Corrugated</i>	64,200	90,055	104,275	125,271	88,302	85,827	80,916	85,566	72,974	75,880	84,227	83,624	79,391	103,499
<i>Mixed Office Paper</i>	15,605	19,245	35,964	24,582	15,627	31,296	21,920	24,793	19,270	20,672	24,892	26,336	35,890	45,626
<i>Newspaper</i>	49,401	48,454	53,964	53,328	46,320	45,488	39,880	39,422	38,990	40,195	36,527	36,227	38,724	39,784
<i>Other Paper/Mag/Junk Mail</i>	17,659	19,507	16,567	17,052	29,384	22,080	17,384	17,792	21,090	24,016	32,062	33,669	28,661	30,444
<b>Plastic</b>	<b>4,615</b>	<b>4,919</b>	<b>5,789</b>	<b>6,355</b>	<b>7,339</b>	<b>7,040</b>	<b>8,362</b>	<b>17,997</b>	<b>15,124</b>	<b>11,034</b>	<b>13,476</b>	<b>11,802</b>	<b>11,957</b>	<b>14,383</b>
<i>Plastic Containers</i>	4,206	4,265	5,214	5,520	6,573	6,179	6,993	16,179	13,388	10,382	10,970	9,508	10,092	10,902
<i>Other Plastic</i>	409	654	576	835	765	861	1,370	1,819	1,736	652	2,507	2,294	1,865	3,481
Textiles	1,281	2,034	1,879	3,560	1,761	1,247	1,262	2,308	2,380	2,343	9,238	3,166	4,046	4,080
Leaves, Brush/Tree Parts, Grass Clippings	248,798	240,991	246,244	246,997	227,058	241,943	202,128	212,470	283,593	291,086	235,559	234,980	255,744	239,088
Food Waste	33,234	8,143	11,054	13,244	18,466	15,889	16,992	18,757	25,883	35,022	23,471	28,629	42,795	38,622
<b>Metal</b>	<b>7,812</b>	<b>5,558</b>	<b>7,014</b>	<b>6,326</b>	<b>6,813</b>	<b>6,655</b>	<b>6,795</b>	<b>9,325</b>	<b>6,882</b>	<b>7,951</b>	<b>10,298</b>	<b>11,061</b>	<b>11,163</b>	<b>10,774</b>
<i>Aluminum Containers</i>	4,202	2,050	3,160	2,573	2,376	2,720	2,534	3,340	2,526	2,610	3,244	3,823	4,639	4,806
<i>Steel Containers</i>	3,610	3,508	3,854	3,753	4,436	3,934	4,261	5,985	4,355	5,341	7,054	7,238	6,524	5,968
Glass Containers, Other Glass	23,340	24,012	26,037	28,218	27,168	27,518	27,990	42,157	29,166	34,311	37,674	37,273	37,600	33,116
Consumer electronics	-	-	342	283	1,305	2,851	1,182	4,645	1,952	3,754	2,774	2,960	3,302	2,764
Used Motor Oil, Batteries (Dry Cell), Anti-freeze	5,632	3,933	6,816	8,714	6,472	6,141	21,856	7,259	9,738	7,097	8,947	10,040	7,528	11,077
	<b>471,577</b>	<b>466,850</b>	<b>515,946</b>	<b>533,931</b>	<b>476,016</b>	<b>493,974</b>	<b>446,667</b>	<b>482,491</b>	<b>527,041</b>	<b>553,362</b>	<b>519,144</b>	<b>519,767</b>	<b>556,801</b>	<b>573,256</b>



### C.3.2 “Non-MSW” Materials

**Table 42: Bergen County “Non-MSW” Material Diversion Composition – All Sources (2003 to 2016)**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Automobile Scrap	6.0%	8.0%	5.8%	3.8%	4.2%	4.9%	0.7%	3.5%	4.9%	0.0%	2.0%	0.7%	1.0%	3.5%
Batteries (Automobile)	0.1%	0.1%	0.2%	0.1%	0.3%	0.1%	0.1%	0.1%	0.1%	0.4%	1.2%	0.8%	0.8%	0.1%
Concrete / Asphalt / Brick / Block	55.0%	48.3%	61.7%	46.3%	46.8%	46.7%	49.6%	33.2%	34.9%	51.3%	63.1%	55.1%	55.2%	50.0%
Florescent Lights	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.0%
Heavy Iron	12.5%	16.8%	11.1%	10.9%	11.5%	18.8%	16.0%	20.9%	19.4%	5.5%	3.4%	3.7%	2.4%	13.5%
Non-Ferrous/Aluminum Scrap	1.2%	2.4%	1.2%	12.4%	1.7%	2.1%	10.2%	11.2%	10.8%	0.7%	0.6%	1.0%	0.5%	0.4%
Oil Contaminated Soil	15.7%	9.1%	7.5%	16.4%	20.0%	10.1%	14.4%	23.9%	22.0%	27.8%	19.8%	32.4%	32.9%	20.2%
Other Material Not Listed	0.9%	1.4%	0.7%	1.1%	0.9%	0.3%	1.1%	0.0%	0.1%	0.3%	0.0%	0.1%	0.2%	0.3%
Paints and Stain	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Process Residue	0.0%	0.1%	0.1%	0.5%	0.0%	0.0%	0.2%	0.2%	0.8%	1.1%	0.0%	0.0%	0.7%	0.7%
Street sweepings	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stumps	0.6%	0.5%	0.8%	0.9%	0.6%	0.6%	0.4%	0.4%	0.6%	1.5%	0.8%	0.5%	0.7%	0.5%
Tires	0.4%	0.3%	0.3%	0.2%	0.3%	0.2%	0.3%	0.2%	0.3%	0.6%	0.5%	0.3%	0.5%	0.3%
White Goods & Light Iron	5.9%	11.5%	9.9%	6.4%	12.6%	14.4%	4.3%	4.6%	0.9%	8.8%	6.5%	4.0%	3.2%	9.3%
Wood Scraps	1.8%	1.4%	0.7%	1.0%	1.0%	1.8%	2.7%	1.8%	5.1%	2.1%	2.1%	1.4%	1.6%	1.2%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Table 43: Bergen County “Non-MSW” Material Diversion Quantities (Tons) – All Sources (2003 to 2016)**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Automobile Scrap	31,283	44,841	35,544	22,237	23,446	31,519	4,442	27,944	31,515	125	9,090	4,575	6,448	22,743
Batteries (Automobile)	645	685	1,047	350	1,723	635	663	738	881	1,250	5,541	4,987	5,367	711
Concrete / Asphalt / Brick / Block	287,056	269,126	379,905	268,547	261,855	300,925	329,878	264,665	222,253	178,546	293,869	343,501	352,925	324,145
Florescent Lights								113	366	57	31	15	1,161	44
Heavy Iron	65,079	93,852	68,443	63,358	64,402	121,238	106,376	166,516	123,308	18,995	15,691	23,310	15,179	87,263
Non-Ferrous/Aluminum Scrap	6,203	13,594	7,601	71,628	9,315	13,420	68,107	89,095	68,691	2,605	2,946	6,063	3,350	2,421
Oil Contaminated Soil	81,879	50,957	46,371	95,054	111,952	65,161	95,660	190,908	139,806	96,508	92,321	201,770	210,181	130,724
Other Material Not Listed	4,788	8,070	4,480	6,435	5,124	2,089	7,380	202	614	920	209	520	1,473	2,205
Paints and Stain														
Process Residue	26	407	364.2	2,956	26	310	1,456	1,504	4,858	3,756	66	136	4,456	4,756
Street sweepings								1,078	-	-	-	-	-	-
Stumps	3,056	2,681	5,100	5,184	3,623	3,547	2,441	2,963	3,966	5,148	3,746	2,867	4,387	3,042
Tires	1,843	1,642	1,654	1,312	1,584	1,513	1,917	1,875	1,984	2,016	2,134	1,856	3,313	2,235
White Goods & Light Iron	30,870	64,027	60,956	36,879	70,470	92,705	28,832	36,519	5,986	30,470	30,162	25,160	20,456	60,303
Wood Scraps	9,353	7,737	4,322	6,009	5,675	11,470	17,975	14,184	32,597	7,322	9,558	8,703	10,494	7,690
<b>TOTAL</b>	<b>522,078</b>	<b>557,618</b>	<b>615,786</b>	<b>579,950</b>	<b>559,196</b>	<b>644,532</b>	<b>665,128</b>	<b>798,303</b>	<b>636,824</b>	<b>347,717</b>	<b>465,364</b>	<b>623,462</b>	<b>639,188</b>	<b>648,283</b>

## **D. Derived Bergen County Solid Waste Statistics 2003 to 2016**

### **D.1 Solid Waste Disposal Composition and Quantities**

Estimated solid waste disposal quantities and composition between 2003 and 2016 are shown for MSW from residential and CII sources, and Non-MSW from all sources in Table 44 to Table 50 below.

**Table 44: Bergen County MSW Disposal Composition – Residential Sources (2003 to 2017)**

NJ DEP MATERIAL	Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Paper	Type 10	33.6%	33.1%	32.5%	32.0%	31.4%	30.9%	30.3%	29.8%	29.2%	28.7%	28.1%	27.6%	27.1%	26.5%	26.0%
Corrugated	Type 10	4.5%	4.6%	4.7%	4.8%	4.8%	4.9%	5.0%	5.1%	5.2%	5.3%	5.4%	5.4%	5.5%	5.6%	5.7%
Mixed Office Paper	Type 10	1.3%	1.3%	1.2%	1.2%	1.1%	1.1%	1.0%	1.0%	1.0%	0.9%	0.9%	0.8%	0.8%	0.7%	0.7%
Newspaper	Type 10	5.3%	5.1%	4.8%	4.6%	4.3%	4.1%	3.8%	3.6%	3.4%	3.1%	2.9%	2.6%	2.4%	2.1%	1.9%
Magazines/glossy & other	Type 10	22.5%	22.2%	21.8%	21.5%	21.1%	20.8%	20.4%	20.1%	19.7%	19.4%	19.0%	18.7%	18.4%	18.0%	17.7%
Total Plastic	Type 10	14.4%	14.4%	14.5%	14.5%	14.5%	14.6%	14.6%	14.7%	14.7%	14.7%	14.8%	14.8%	14.8%	14.9%	14.9%
Plastic Containers	Type 10	1.4%	1.5%	1.5%	1.6%	1.7%	1.8%	1.8%	1.9%	2.0%	2.0%	2.1%	2.2%	2.3%	2.3%	2.4%
Other Plastic	Type 10	13.0%	13.0%	12.9%	12.9%	12.9%	12.8%	12.8%	12.8%	12.7%	12.7%	12.6%	12.6%	12.6%	12.5%	12.5%
Total Textiles and fabrics	Type 10	5.9%	5.9%	6.0%	6.0%	6.0%	6.0%	6.1%	6.1%	6.1%	6.2%	6.2%	6.2%	6.2%	6.3%	6.3%
Textiles	Type 10	4.6%	4.6%	4.7%	4.7%	4.8%	4.8%	4.9%	4.9%	4.9%	5.0%	5.0%	5.1%	5.1%	5.2%	5.2%
Rubber and leather	Type 10	1.3%	1.3%	1.3%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%
Yard Waste	Type 23	3.7%	3.9%	4.1%	4.3%	4.5%	4.7%	4.9%	5.2%	5.4%	5.6%	5.8%	6.0%	6.2%	6.4%	6.6%
Food Waste	Type 23	15.2%	15.6%	16.0%	16.4%	16.8%	17.2%	17.6%	18.0%	18.3%	18.7%	19.1%	19.5%	19.9%	20.3%	20.7%
Wood	Type 23	6.1%	5.9%	5.6%	5.4%	5.2%	4.9%	4.7%	4.5%	4.2%	4.0%	3.7%	3.5%	3.3%	3.0%	2.8%
Other - Misc. organic / animal products	Type 23	3.0%	2.9%	2.9%	2.8%	2.8%	2.7%	2.7%	2.6%	2.5%	2.5%	2.4%	2.4%	2.3%	2.3%	2.2%
Total Metal	Type 10	5.3%	5.3%	5.2%	5.2%	5.1%	5.1%	5.0%	5.0%	5.0%	4.9%	4.9%	4.8%	4.8%	4.7%	4.7%
Aluminum - Containers	Type 10	0.8%	0.8%	0.8%	0.9%	0.9%	0.9%	0.9%	0.9%	1.0%	1.0%	1.0%	1.0%	1.1%	1.1%	1.1%
Steel/tin & mixed - Containers	Type 10	0.3%	0.5%	0.6%	0.8%	1.0%	1.2%	1.3%	1.5%	1.7%	1.8%	2.0%	2.2%	2.4%	2.5%	2.7%
Other metal	Type 10	4.2%	4.0%	3.7%	3.5%	3.3%	3.0%	2.8%	2.6%	2.3%	2.1%	1.8%	1.6%	1.4%	1.1%	0.9%
Total Glass	Type 10	2.1%	2.3%	2.4%	2.6%	2.8%	3.0%	3.1%	3.3%	3.5%	3.6%	3.8%	4.0%	4.2%	4.3%	4.5%
Consumer electronics	Type 10	1.2%	1.1%	1.1%	1.0%	1.0%	0.9%	0.8%	0.8%	0.7%	0.6%	0.6%	0.5%	0.5%	0.4%	0.3%
Household hazardous & batteries		0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Miscellaneous	Type 10	9.2%	9.3%	9.4%	9.5%	9.6%	9.7%	9.8%	9.9%	10.0%	10.1%	10.2%	10.3%	10.4%	10.5%	10.6%
	<b>MSW</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

- Notes. 1) 2003 percentages are sourced from BCUA (March 2005) Solid Waste Composition Final Report - Table 3-7.  
 2) 2017 percentages are adapted from NYC Sanitation Department (2018) Solid Waste Composition Study.  
 3) 2004 to 2016 percentages between 2003 and 2017 are derived by interpolation.

**Table 45: Bergen County MSW Disposal Quantities (Tons) – Residential Sources (2003 to 2017)**

MATERIAL	TYPE	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Paper	Type 10	154,039	139,141	144,487	145,809	134,137	126,932	126,122	111,054	115,302	107,223	108,228	97,734	99,237	88,548	91,360
<i>Corrugated</i>	Type 10	20,630	19,303	20,763	21,701	20,677	20,264	20,854	19,019	20,453	19,702	20,602	19,276	20,281	18,756	12,800
<i>Mixed Office Paper</i>	Type 10	5,960	5,292	5,397	5,344	4,819	4,464	4,337	3,729	3,775	3,417	3,351	2,934	2,882	2,482	1,209
<i>Newspaper</i>	Type 10	24,298	21,288	21,398	20,854	18,481	16,799	15,982	13,425	13,241	11,640	11,043	9,309	8,752	7,159	8,205
<i>Magazines/glossy &amp; other</i>	Type 10	103,151	93,258	96,930	97,910	90,161	85,404	84,949	74,881	77,834	72,464	73,232	66,215	67,322	60,152	69,146
Total Plastic	Type 10	66,017	60,616	64,161	66,016	61,939	59,795	60,631	54,499	57,781	54,887	56,614	52,262	54,267	49,538	55,184
<i>Plastic Containers</i>	Type 10	6,418	6,194	6,857	7,364	7,197	7,225	7,605	7,085	7,775	7,635	8,131	7,741	8,280	7,779	9,121
<i>Other Plastic</i>	Type 10	59,598	54,573	57,462	58,815	54,894	52,717	53,175	47,547	50,146	47,386	48,620	44,647	46,118	41,878	46,063
Total Textiles and fabrics	Type 10	27,048	24,836	26,350	27,175	25,556	24,728	25,132	22,641	24,059	22,905	23,678	21,906	22,797	20,856	19,024
<i>Textiles</i>	Type 10	21,089	19,544	20,826	21,571	20,372	19,795	20,200	18,273	19,495	18,634	19,338	17,960	18,762	17,228	14,971
<i>Rubber and leather</i>	Type 10	5,960	5,412	5,651	5,735	5,306	5,051	5,050	4,475	4,677	4,378	4,450	4,047	4,140	3,722	4,054
Total Yard Waste	Type 23	16,963	16,447	18,286	19,714	19,335	19,471	20,557	19,205	21,129	20,796	22,195	21,173	22,692	21,357	26,982
Food Waste	Type 23	69,684	65,637	71,050	74,716	71,607	70,573	73,019	66,938	72,346	70,024	73,562	69,134	73,055	67,840	69,130
Wood	Type 23	27,965	24,685	25,017	24,601	22,019	20,235	19,487	16,595	16,621	14,870	14,394	12,420	12,001	10,141	8,545
Other -Misc. organic / animal products	Type 23	13,753	12,388	12,826	12,903	11,833	11,160	11,051	9,696	10,029	9,290	9,339	8,398	8,490	7,540	7,727
Total Metal	Type 10	24,298	22,310	23,366	23,787	22,080	21,087	21,151	18,806	19,720	18,527	18,899	17,252	17,713	15,988	17,631
<i>Aluminum - Containers</i>	Type 10	3,668	3,458	3,746	3,943	3,782	3,730	3,862	3,543	3,831	3,711	3,901	3,668	3,878	3,603	4,054
<i>Steel/tin &amp; mixed - Containers</i>	Type 10	1,375	1,984	2,857	3,715	4,209	4,758	5,525	5,594	6,592	6,888	7,746	7,741	8,647	8,447	10,416
<i>Other metal</i>	Type 10	19,255	16,687	16,572	15,934	13,907	12,423	11,586	9,509	9,128	7,769	7,087	5,692	5,031	3,794	3,161
Total Glass	Type 10	9,627	9,561	10,857	11,926	11,894	12,159	13,011	12,306	13,692	13,615	14,668	14,115	15,250	14,460	15,805
Consumer electronics	Type 10	5,501	4,793	4,787	4,634	4,074	3,671	3,458	2,871	2,795	2,419	2,252	1,857	1,698	1,341	1,175
Household hazardous & batteries		1,375	1,302	1,416	1,496	1,439	1,424	1,479	1,361	1,476	1,434	1,511	1,424	1,509	1,405	1,510
Miscellaneous	Type 10	42,177	39,139	41,760	43,308	40,951	39,839	40,704	36,863	39,373	37,676	39,143	36,393	38,058	34,984	37,361
<b>TOTAL TONS</b>	<b>MSW</b>	<b>458,448</b>	<b>420,946</b>	<b>444,459</b>	<b>456,182</b>	<b>426,956</b>	<b>411,162</b>	<b>415,892</b>	<b>372,914</b>	<b>394,408</b>	<b>373,747</b>	<b>384,566</b>	<b>354,144</b>	<b>366,847</b>	<b>334,070</b>	<b>351,433</b>

Notes. 1) Total Tonnage of MSW from residential sources is derived from NJ DEP data on MSW (Type 10+23) x 61% (residential / CII ratio from BCUA 2005 study).  
2) Tonnage of Materials is derived by multiplying total tons by percentages in Table 44.

**Table 46: Bergen County MSW Disposal Composition – CII Sources (2003 to 2017)**

MATERIAL	Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Paper	Type 10	38.5%	37.6%	36.7%	35.8%	34.9%	34.0%	33.1%	32.2%	31.3%	30.4%	29.5%	28.6%	27.7%	26.8%	25.9%
<i>Corrugated</i>	Type 10	10.4%	10.3%	10.2%	10.1%	10.0%	9.9%	9.8%	9.7%	9.6%	9.4%	9.3%	9.2%	9.1%	9.0%	8.9%
<i>Mixed Office Paper</i>	Type 10	4.1%	3.9%	3.7%	3.5%	3.3%	3.1%	2.9%	2.7%	2.5%	2.3%	2.1%	1.9%	1.7%	1.5%	1.3%
<i>Newspaper</i>	Type 10	4.0%	3.8%	3.6%	3.4%	3.2%	3.0%	2.8%	2.6%	2.4%	2.2%	2.0%	1.8%	1.6%	1.4%	1.2%
<i>Magazines/glossy &amp; other</i>	Type 10	19.9%	19.5%	19.2%	18.8%	18.4%	18.0%	17.6%	17.2%	16.8%	16.4%	16.1%	15.7%	15.3%	14.9%	14.5%
Total Plastic	Type 10	15.7%	15.5%	15.4%	15.2%	15.1%	15.0%	14.8%	14.7%	14.5%	14.4%	14.2%	14.1%	13.9%	13.8%	13.6%
<i>Plastic Containers</i>	Type 10	1.7%	1.7%	1.7%	1.8%	1.8%	1.8%	1.8%	1.9%	1.9%	1.9%	2.0%	2.0%	2.0%	2.1%	2.1%
<i>Other Plastic</i>	Type 10	14.0%	13.8%	13.7%	13.5%	13.3%	13.1%	13.0%	12.8%	12.6%	12.4%	12.3%	12.1%	11.9%	11.7%	11.5%
Total Textiles and fabrics	Type 10	4.9%	5.1%	5.3%	5.5%	5.7%	5.9%	6.1%	6.3%	6.5%	6.7%	6.9%	7.1%	7.3%	7.5%	7.7%
<i>Textiles</i>	Type 10	3.6%	3.8%	4.0%	4.2%	4.5%	4.7%	4.9%	5.1%	5.3%	5.6%	5.8%	6.0%	6.2%	6.5%	6.7%
<i>Rubber and leather</i>	Type 10	1.3%	1.3%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.0%	1.0%
Total Yard Waste	Type 23	2.2%	2.4%	2.6%	2.8%	2.9%	3.1%	3.3%	3.5%	3.7%	3.9%	4.1%	4.3%	4.5%	4.7%	4.9%
Food Waste	Type 23	14.2%	14.8%	15.3%	15.9%	16.5%	17.1%	17.7%	18.2%	18.8%	19.4%	20.0%	20.6%	21.1%	21.7%	22.3%
Wood	Type 23	7.9%	7.6%	7.2%	6.9%	6.6%	6.3%	6.0%	5.6%	5.3%	5.0%	4.7%	4.3%	4.0%	3.7%	3.4%
Other - Misc. organic / animal products	Type 23	5.1%	4.8%	4.6%	4.4%	4.2%	4.0%	3.8%	3.6%	3.4%	3.2%	3.0%	2.8%	2.6%	2.4%	2.2%
Total Metal	Type 10	5.0%	5.0%	4.9%	4.9%	4.8%	4.7%	4.7%	4.6%	4.6%	4.5%	4.4%	4.4%	4.3%	4.3%	4.2%
<i>Aluminum - Containers</i>	Type 10	0.5%	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%	0.8%	0.8%	0.8%	0.9%	0.9%	0.9%	1.0%	1.0%
<i>Steel/tin &amp; mixed - Containers</i>	Type 10	0.3%	0.4%	0.6%	0.7%	0.9%	1.0%	1.2%	1.3%	1.4%	1.6%	1.7%	1.9%	2.0%	2.1%	2.3%
<i>Other metal</i>	Type 10	4.2%	4.0%	3.7%	3.5%	3.3%	3.0%	2.8%	2.6%	2.3%	2.1%	1.8%	1.6%	1.4%	1.1%	0.9%
Total Glass	Type 10	2.1%	2.3%	2.4%	2.6%	2.8%	3.0%	3.1%	3.3%	3.5%	3.6%	3.8%	4.0%	4.2%	4.3%	4.5%
Consumer electronics	Type 10	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%
Household hazardous & batteries		0.5%	0.5%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Miscellaneous	Type 10	3.7%	4.1%	4.6%	5.1%	5.6%	6.1%	6.6%	7.1%	7.6%	8.0%	8.5%	9.0%	9.5%	10.0%	10.5%
		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Notes. 1) Percentages by material are derived from the tonnages provided in Table 47.

**Table 47: Bergen County MSW Disposal Quantities (Tons) – CII Sources (2003 to 2017)**

MATERIAL	Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paper	Type 10	112,763	101,123	104,220	104,351	95,215	89,332	87,973	76,742	78,901	72,622	72,517	64,748	64,965	57,243	58,116
Corrugated	Type 10	30,476	27,699	28,947	29,404	27,232	25,948	25,967	23,032	24,094	22,581	22,975	20,919	21,423	19,284	20,020
Mixed Office Paper	Type 10	12,077	10,539	10,547	10,228	9,015	8,144	7,694	6,411	6,265	5,448	5,103	4,236	3,909	3,123	2,821
Newspaper	Type 10	11,777	10,275	10,281	9,969	8,785	7,934	7,494	6,243	6,099	5,302	4,963	4,118	3,797	3,031	2,735
Magazines/glossy & other	Type 10	58,433	52,609	54,445	54,749	50,182	47,306	46,818	41,055	42,443	39,292	39,475	35,474	35,836	31,806	32,539
Plastic	Type 10	45,965	42,205	44,149	44,888	41,615	39,693	39,762	35,306	36,973	34,688	35,334	32,209	33,023	29,762	30,609
Plastic Containers	Type 10	4,855	4,542	4,885	5,105	4,863	4,765	4,903	4,471	4,808	4,631	4,841	4,529	4,765	4,406	4,698
Other Plastic	Type 10	41,110	37,271	38,850	39,359	36,354	34,544	34,471	30,487	31,798	29,710	30,135	27,350	27,917	25,044	25,911
Textiles and fabrics	Type 10	14,287	13,118	14,422	15,389	14,952	14,927	15,634	14,497	15,840	15,491	16,433	15,588	16,619	15,564	17,251
Textiles	Type 10	10,477	10,215	11,415	12,361	12,173	12,305	13,035	12,215	13,478	13,300	14,229	13,605	14,612	13,779	14,971
Rubber and leather	Type 10	3,810	3,444	3,579	3,614	3,327	3,151	3,133	2,761	2,869	2,671	2,698	2,439	2,479	2,214	2,280
Yard Waste	Type 23	6,336	6,346	7,259	8,023	8,046	8,264	8,882	8,432	9,414	9,390	10,145	9,787	10,599	10,072	11,021
Food Waste	Type 23	41,546	39,712	43,582	46,427	45,039	44,901	46,963	43,496	47,468	46,371	49,142	46,571	49,605	46,414	50,059
Wood	Type 23	23,140	20,379	20,600	20,203	18,027	16,512	15,844	13,438	13,399	11,926	11,477	9,839	9,435	7,903	7,577
Other - Misc. organic / animal products	Type 23	14,806	13,047	13,197	12,952	11,566	10,603	10,184	8,647	8,632	7,693	7,416	6,368	6,119	5,138	4,940
Metal	Type 10	14,783	13,574	14,161	14,360	13,276	12,628	12,613	11,167	11,659	10,905	11,073	10,061	10,282	9,235	9,431
Aluminum - Containers	Type 10	1,593	1,554	1,737	1,881	1,853	1,873	1,984	1,860	2,052	2,025	2,167	2,072	2,225	2,099	2,280
Steel/tin & mixed - Containers	Type 10	879	1,189	1,659	2,117	2,368	2,654	3,062	3,084	3,619	3,769	4,227	4,214	4,698	4,581	5,130
Other metal	Type 10	12,310	10,669	10,596	10,188	8,892	7,943	7,408	6,081	5,837	4,968	4,532	3,640	3,218	2,427	2,021
Glass	Type 10	6,155	6,114	6,943	7,627	7,607	7,777	8,323	7,873	8,759	8,711	9,385	9,032	9,758	9,253	10,105
Consumer electronics	Type 10	1,263	1,144	1,191	1,205	1,112	1,056	1,052	930	968	904	916	830	846	758	783
Household hazardous & batteries		1,330	1,217	1,280	1,309	1,221	1,171	1,180	1,054	1,111	1,048	1,075	986	1,017	923	966
Miscellaneous	Type 10	10,732	11,164	13,170	14,937	15,308	16,021	17,500	16,851	19,050	19,215	20,967	20,410	22,284	21,332	23,500
<b>TOTAL TONS</b>		<b>293,107</b>	<b>269,129</b>	<b>284,162</b>	<b>291,657</b>	<b>272,972</b>	<b>262,874</b>	<b>265,898</b>	<b>238,421</b>	<b>252,162</b>	<b>238,953</b>	<b>245,870</b>	<b>226,420</b>	<b>234,541</b>	<b>213,586</b>	<b>224,559</b>

Notes. 1) Total Tonnage of MSW from CII sources is derived from NJ DEP data on MSW (Type 10+23) x 39% (residential / CII ratio from BCUA 2005 study).  
2) Tonnage of Materials is derived from residential – commercial ratios set out in Table 9 (based on data for NYC in EPA 2013).

**Table 48: Bergen County MSW Disposal Quantities (Tons) – All Sources (2003 to 2017)**

MATERIAL	Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Paper	Type 10	266,802	240,263	248,707	250,159	229,352	216,264	214,095	187,795	194,203	179,845	180,745	162,482	164,202	145,791	149,476
Corrugated	Type 10	51,106	47,003	49,710	51,105	47,909	46,213	46,821	42,051	44,547	42,282	43,577	40,195	41,704	38,040	32,820
Mixed Office Paper	Type 10	18,037	15,831	15,944	15,572	13,833	12,608	12,031	10,140	10,040	8,865	8,454	7,171	6,791	5,604	4,031
Newspaper	Type 10	36,075	31,563	31,679	30,823	27,266	24,733	23,476	19,668	19,340	16,941	16,006	13,427	12,549	10,189	10,940
Magazines/glossy & other	Type 10	161,584	145,866	151,375	152,659	140,343	132,710	131,767	115,936	120,276	111,756	112,708	101,689	103,158	91,957	101,685
Plastic	Type 10	111,982	102,821	108,309	110,904	103,554	99,487	100,393	89,804	94,754	89,576	91,948	84,471	87,290	79,299	85,793
Plastic Containers	Type 10	11,273	10,736	11,742	12,469	12,060	11,990	12,508	11,556	12,583	12,266	12,972	12,270	13,045	12,185	13,819
Other Plastic	Type 10	100,708	91,844	96,312	98,174	91,249	87,261	87,646	78,034	81,945	77,096	78,755	71,998	74,034	66,922	71,974
Textiles and fabrics	Type 10	41,336	37,954	40,772	42,565	40,508	39,656	40,765	37,139	39,899	38,396	40,112	37,495	39,416	36,419	36,275
Textiles	Type 10	31,565	29,759	32,241	33,932	32,545	32,099	33,235	30,488	32,973	31,934	33,568	31,565	33,374	31,008	29,941
Rubber and leather	Type 10	9,770	8,856	9,230	9,349	8,634	8,202	8,183	7,236	7,546	7,049	7,148	6,486	6,619	5,936	6,334
Yard Waste	Type 23	23,298	22,793	25,545	27,737	27,381	27,736	29,439	27,638	30,543	30,187	32,340	30,960	33,291	31,428	38,002
Food Waste	Type 23	111,230	105,349	114,632	121,143	116,645	115,474	119,982	110,434	119,814	116,395	122,704	115,705	122,660	114,254	119,189
Wood	Type 23	51,106	45,064	45,617	44,804	40,046	36,747	35,332	30,032	30,020	26,795	25,871	22,259	21,436	18,044	16,122
Other - Misc. organic / animal products	Type 23	28,559	25,435	26,023	25,855	23,399	21,764	21,235	18,342	18,661	16,984	16,755	14,766	14,609	12,678	12,667
Metal	Type 10	39,081	35,884	37,527	38,147	35,356	33,714	33,764	29,972	31,380	29,432	29,972	27,313	27,995	25,223	27,062
Aluminum - Containers	Type 10	5,261	5,012	5,483	5,824	5,634	5,603	5,846	5,402	5,883	5,736	6,067	5,740	6,103	5,702	6,334
Steel/tin & mixed - Containers	Type 10	2,255	3,174	4,516	5,831	6,577	7,412	8,587	8,677	10,211	10,656	11,973	11,954	13,345	13,028	15,546
Other metal	Type 10	31,565	27,357	27,167	26,121	22,798	20,366	18,994	15,590	14,965	12,737	11,619	9,332	8,249	6,221	5,182
Glass	Type 10	15,783	15,675	17,801	19,553	19,501	19,936	21,335	20,179	22,451	22,326	24,054	23,147	25,009	23,714	25,911
Consumer electronics	Type 10	6,764	5,936	5,978	5,839	5,187	4,727	4,510	3,801	3,763	3,322	3,168	2,687	2,544	2,099	1,958
Household hazardous & batteries		2,706	2,519	2,696	2,805	2,660	2,595	2,659	2,415	2,587	2,482	2,585	2,410	2,527	2,328	2,476
Miscellaneous	Type 10	52,910	50,303	54,930	58,245	56,260	55,860	58,203	53,714	58,423	56,891	60,111	56,804	60,341	56,316	60,861
<b>TOTAL TONS</b>		<b>751,555</b>	<b>690,075</b>	<b>728,621</b>	<b>747,839</b>	<b>699,928</b>	<b>674,036</b>	<b>681,790</b>	<b>611,335</b>	<b>646,570</b>	<b>612,700</b>	<b>630,436</b>	<b>580,564</b>	<b>601,388</b>	<b>547,656</b>	<b>575,792</b>

Notes. 1) Total Tonnage is provided by NJ DEP  
2) Tonnages by materials are the sum of values from Table 45 and Table 47

**Table 49: Bergen County Non-MSW Waste Disposal Composition – All Sources 2003 to 2017**

MATERIAL	Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Vegetative waste	Type 13	26.8%	30.8%	27.2%	20.7%	14.7%	13.2%	9.2%	8.6%	8.3%	10.6%	7.8%	10.2%	7.3%	5.8%	5.7%
White Goods & Appliances	Type 13	0.8%	0.9%	0.8%	0.6%	0.4%	0.4%	0.3%	0.2%	0.2%	0.3%	0.2%	0.3%	0.2%	0.2%	0.2%
Automobile Scrap, heavy iron & non-ferrous	Type 13	11.6%	13.4%	11.8%	9.0%	6.4%	5.7%	4.0%	3.8%	3.6%	4.6%	3.4%	4.4%	3.2%	2.5%	2.5%
Furniture	Type 13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Textiles, carpet and padding	Type 13	9.1%	10.5%	9.3%	7.0%	5.0%	4.5%	3.1%	2.9%	2.8%	3.6%	2.7%	3.5%	2.5%	2.0%	1.9%
Electronic	Type 13	10.7%	12.3%	10.9%	8.2%	5.9%	5.3%	3.7%	3.4%	3.3%	4.2%	3.1%	4.1%	2.9%	2.3%	2.3%
Tires	Type 13	0.8%	1.0%	0.8%	0.6%	0.5%	0.4%	0.3%	0.3%	0.3%	0.3%	0.2%	0.3%	0.2%	0.2%	0.2%
<b>TOTAL Bulky</b>		<b>0.7%</b>	<b>0.8%</b>	<b>0.7%</b>	<b>0.5%</b>	<b>0.4%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.1%</b>	<b>0.1%</b>
Wood	Type 13C	60.5%	69.5%	61.5%	46.7%	33.2%	29.8%	20.9%	19.5%	18.7%	23.8%	17.7%	23.1%	16.5%	13.0%	12.9%
Concrete/Asphalt/Block/Brick	Type 13C	16.5%	12.7%	16.0%	22.1%	26.9%	28.9%	32.2%	32.8%	32.2%	29.8%	31.8%	30.2%	34.1%	35.3%	35.3%
Roofing	Type 13C	1.6%	1.2%	1.6%	2.2%	2.6%	2.8%	3.2%	3.2%	3.2%	2.9%	3.1%	3.0%	3.3%	3.5%	3.5%
Drywall	Type 13C	7.3%	5.6%	7.0%	9.8%	11.9%	12.7%	14.2%	14.5%	14.2%	13.1%	14.0%	13.3%	15.0%	15.6%	15.6%
Soil & Gravel	Type 13C	3.8%	2.9%	3.7%	5.1%	6.2%	6.7%	7.4%	7.6%	7.4%	6.9%	7.3%	7.0%	7.9%	8.1%	8.1%
Corrugated paper	Type 13C	1.1%	0.8%	1.1%	1.5%	1.8%	1.9%	2.1%	2.2%	2.1%	2.0%	2.1%	2.0%	2.3%	2.3%	2.3%
Plastic	Type 13C	1.5%	1.2%	1.5%	2.0%	2.5%	2.6%	2.9%	3.0%	2.9%	2.7%	2.9%	2.8%	3.1%	3.2%	3.2%
Metal	Type 13C	1.6%	1.3%	1.6%	2.2%	2.7%	2.9%	3.2%	3.2%	3.2%	2.9%	3.1%	3.0%	3.4%	3.5%	3.5%
Glass	Type 13C	0.5%	0.4%	0.4%	0.6%	0.8%	0.8%	0.9%	0.9%	0.9%	0.8%	0.9%	0.8%	1.0%	1.0%	1.0%
Other	Type 13C	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
<b>TOTAL C&amp;D</b>		<b>5.4%</b>	<b>4.1%</b>	<b>5.2%</b>	<b>7.2%</b>	<b>8.8%</b>	<b>9.4%</b>	<b>10.5%</b>	<b>10.7%</b>	<b>10.5%</b>	<b>9.7%</b>	<b>10.4%</b>	<b>9.9%</b>	<b>11.1%</b>	<b>11.5%</b>	<b>11.5%</b>
25 - Animal and food processing wastes	Type 25	39.2%	30.2%	38.0%	52.8%	64.2%	68.8%	76.6%	78.2%	76.6%	70.9%	75.8%	72.1%	81.2%	84.1%	84.0%
27 - Dry industrial waste	Type 27	0.01%	0.02%	0.00%	0.00%	0.02%	0.10%	0.02%	0.01%	0.02%	0.01%	0.01%	0.01%	0.01%	0.03%	0.00%
27A - Asbestos containing waste	Type 27A	0.31%	0.32%	0.44%	0.56%	2.15%	1.07%	2.32%	2.25%	4.64%	5.20%	6.49%	4.78%	2.14%	2.70%	2.87%
27I - Incinerator Ash	Type 27I	0.00%	0.00%	0.00%	0.00%	0.49%	0.28%	0.16%	0.00%	0.01%	0.01%	0.01%	0.06%	0.14%	0.07%	0.05%
72 - Bulk liquid and semi-liquids	Type 72	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>TOTAL OTHER TYPES</b>		<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.14%</b>	<b>0.22%</b>
<b>TOTAL NON-MSW TONS</b>		<b>0.3%</b>	<b>0.3%</b>	<b>0.4%</b>	<b>0.6%</b>	<b>2.7%</b>	<b>1.4%</b>	<b>2.5%</b>	<b>2.3%</b>	<b>4.7%</b>	<b>5.2%</b>	<b>6.5%</b>	<b>4.8%</b>	<b>2.3%</b>	<b>2.9%</b>	<b>3.1%</b>

Notes. 1) Percentages by materials for Type 13 and 13C are derived from 2003 values reported in the BCUA (2005) Final Report.  
2) Percentages for Type 25 and 27 are calculated from NJ DEP tonnages (Table 35).



**Table 50: Bergen County Non-MSW Waste Disposal Quantities – All Sources 2003 to 2017**

NJ DEP MATERIAL	Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Vegetative waste	Type 13	74,362	54,882	44,871	37,630	31,383	25,092	25,184	24,590	26,445	31,287	26,490	31,582	22,254	16,853	19,330
White Goods & Appliances	Type 13	2,256	1,665	1,361	1,141	952	761	764	746	802	949	804	958	675	511	586
Automobile Scrap, heavy iron & non-ferrous	Type 13	35,494	26,196	21,417	17,961	14,979	11,977	12,021	11,737	12,622	14,933	12,644	15,074	10,622	8,044	9,226
Furniture	Type 13	26,950	19,890	16,262	13,637	11,373	9,094	9,127	8,912	9,584	11,339	9,600	11,446	8,065	6,108	7,005
Textiles, carpet and padding	Type 13	34,461	25,433	20,794	17,438	14,543	11,628	11,671	11,395	12,255	14,499	12,276	14,636	10,313	7,810	8,958
Electronic	Type 13	2,467	1,821	1,489	1,248	1,041	832	835	816	877	1,038	879	1,048	738	559	641
Tires	Type 13	2,014	1,486	1,215	1,019	850	679	682	666	716	847	717	855	603	456	523
<b>TOTAL Bulky Waste</b>		<b>178,003</b>	<b>131,372</b>	<b>107,409</b>	<b>90,075</b>	<b>75,122</b>	<b>60,063</b>	<b>60,284</b>	<b>58,862</b>	<b>63,301</b>	<b>74,891</b>	<b>63,409</b>	<b>75,599</b>	<b>53,270</b>	<b>40,342</b>	<b>46,271</b>
Wood	Type 13C	46,548	23,033	26,783	41,037	58,549	55,979	89,176	95,045	104,483	89,805	109,645	95,193	105,635	105,274	121,886
Concrete/Asphalt/Block/Brick	Type 13C	4,561	2,257	2,624	4,021	5,737	5,485	8,738	9,314	10,238	8,800	10,744	9,328	10,351	10,316	11,944
Roofing	Type 13C	20,543	10,165	11,820	18,111	25,839	24,705	39,356	41,946	46,111	39,634	48,390	42,011	46,620	46,460	53,792
Drywall	Type 13C	10,728	5,308	6,173	9,458	13,493	12,901	20,552	21,905	24,080	20,697	25,269	21,938	24,345	24,262	28,090
Soil & Gravel	Type 13C	3,072	1,520	1,767	2,708	3,864	3,694	5,885	6,272	6,895	5,926	7,235	6,282	6,971	6,947	8,043
Corrugated paper	Type 13C	3,741	1,851	2,153	3,298	4,706	4,499	7,168	7,639	8,398	7,218	8,813	7,651	8,491	8,462	9,797
Plastic	Type 13C	4,596	2,274	2,644	4,052	5,781	5,527	8,805	9,384	10,316	8,867	10,826	9,399	10,430	10,394	12,034
Metal	Type 13C	4,411	2,183	2,538	3,889	5,548	5,305	8,451	9,007	9,901	8,510	10,391	9,021	10,011	9,976	11,551
Glass	Type 13C	92	46	53	81	116	111	177	189	207	178	218	189	210	209	242
Other	Type 13C	17,183	8,502	9,887	15,148	21,613	20,664	32,919	35,085	38,569	33,151	40,474	35,139	38,994	38,861	44,993
<b>TOTAL C&amp;D Waste</b>		<b>115,475</b>	<b>57,140</b>	<b>66,443</b>	<b>101,804</b>	<b>145,246</b>	<b>138,872</b>	<b>221,227</b>	<b>235,786</b>	<b>259,199</b>	<b>222,786</b>	<b>272,005</b>	<b>236,151</b>	<b>262,057</b>	<b>261,160</b>	<b>302,370</b>
25 - Animal and food processing wastes	Type 25	27	32	9	1	37	192	47	21	65	18	24	24	23	94	15
27 - Dry industrial waste	Type 27	923	597	772	1,085	4,862	2,159	6,685	6,779	15,679	16,321	23,280	15,658	6,918	8,397	10,322
27A - Asbestos containing waste	Type 27A	-	-	-	2	1,119	571	475	15	24	28	36	196	451	229	163
27I - Incinerator Ash	Type 27I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72 - Bulk liquid and semi-liquids	Type 72	-	-	-	-	-	5	-	-	5	-	-	-	11	419	775
<b>TOTAL OTHER TYPES</b>		<b>951</b>	<b>629</b>	<b>781</b>	<b>1,087</b>	<b>6,018</b>	<b>2,927</b>	<b>7,207</b>	<b>6,814</b>	<b>15,773</b>	<b>16,367</b>	<b>23,340</b>	<b>15,878</b>	<b>7,403</b>	<b>9,140</b>	<b>11,275</b>
<b>TOTAL NON-MSW TONS</b>		<b>294,429</b>	<b>189,141</b>	<b>174,632</b>	<b>192,966</b>	<b>226,386</b>	<b>201,862</b>	<b>288,718</b>	<b>301,462</b>	<b>338,273</b>	<b>314,044</b>	<b>358,754</b>	<b>327,628</b>	<b>322,730</b>	<b>310,642</b>	<b>359,916</b>

Notes. 1) Total Tonnage and Tonnages by Type provided by NJ DEP  
2) Tonnages by material are derived from the 2003 composition percentages reported in the BCUA (2005) Final Report.

## D.2 Solid Waste Generation

Estimated solid waste generation composition and quantities between 2003 and 2016 are shown for Total MSW from all sources, and Non-MSW from all sources in Table 51 to Table 54.

**Table 51: Bergen County Composition of Total MSW Generated, by Material (2003-2016)**

MATERIAL	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Total Paper</b>	<b>33.8%</b>	<b>36.1%</b>	<b>36.9%</b>	<b>36.7%</b>	<b>34.8%</b>	<b>34.3%</b>	<b>33.2%</b>	<b>32.5%</b>	<b>29.5%</b>	<b>29.2%</b>	<b>31.2%</b>	<b>31.1%</b>	<b>29.9%</b>	<b>32.6%</b>
<i>Corrugated</i>	9.4%	11.8%	12.4%	13.8%	11.6%	11.3%	11.3%	11.7%	10.0%	10.1%	11.1%	11.3%	10.5%	12.6%
<i>Mixed Office Paper</i>	2.8%	3.0%	4.2%	3.1%	2.5%	3.8%	3.0%	3.2%	2.5%	2.5%	2.9%	3.0%	3.7%	4.6%
<i>Newspaper</i>	7.0%	6.9%	6.9%	6.6%	6.3%	6.0%	5.6%	5.4%	5.0%	4.9%	4.6%	4.5%	4.4%	4.5%
<i>Magazines/Glossy &amp; Other</i>	14.7%	14.3%	13.5%	13.2%	14.4%	13.3%	13.2%	12.2%	12.0%	11.6%	12.6%	12.3%	11.4%	10.9%
<b>Total Plastic</b>	<b>9.5%</b>	<b>9.3%</b>	<b>9.2%</b>	<b>9.1%</b>	<b>9.4%</b>	<b>9.1%</b>	<b>9.6%</b>	<b>9.9%</b>	<b>9.4%</b>	<b>8.6%</b>	<b>9.2%</b>	<b>8.7%</b>	<b>8.6%</b>	<b>8.4%</b>
<i>Plastic Containers</i>	1.3%	1.3%	1.4%	1.4%	1.6%	1.6%	1.7%	2.5%	2.2%	1.9%	2.1%	2.0%	2.0%	2.1%
<i>Other Plastic</i>	8.3%	8.0%	7.8%	7.7%	7.8%	7.5%	7.9%	7.3%	7.1%	6.7%	7.1%	6.8%	6.6%	6.3%
Total Textiles and Fabrics	3.5%	3.5%	3.4%	3.6%	3.6%	3.5%	3.7%	3.6%	3.6%	3.5%	4.3%	3.7%	3.8%	3.6%
Total Yard Waste	22.2%	22.8%	21.8%	21.4%	21.6%	23.1%	20.5%	22.0%	26.8%	27.6%	23.3%	24.2%	25.0%	24.1%
Food Waste	11.8%	9.8%	10.1%	10.5%	11.5%	11.2%	12.1%	11.8%	12.4%	13.0%	12.7%	13.1%	14.3%	13.6%
Wood	4.2%	3.9%	3.7%	3.5%	3.4%	3.1%	3.1%	2.7%	2.6%	2.3%	2.3%	2.0%	1.9%	1.6%
Other - Misc. Organic / Animal Products	2.3%	2.2%	2.1%	2.0%	2.0%	1.9%	1.9%	1.7%	1.6%	1.5%	1.5%	1.3%	1.3%	1.1%
<b>Total Metal</b>	<b>3.8%</b>	<b>3.6%</b>	<b>3.6%</b>	<b>3.5%</b>	<b>3.6%</b>	<b>3.5%</b>	<b>3.6%</b>	<b>3.6%</b>	<b>3.3%</b>	<b>3.2%</b>	<b>3.5%</b>	<b>3.5%</b>	<b>3.4%</b>	<b>3.2%</b>
<i>Aluminum - Containers</i>	0.8%	0.6%	0.7%	0.7%	0.7%	0.7%	0.7%	0.8%	0.7%	0.7%	0.8%	0.9%	0.9%	0.9%
<i>Steel/tin &amp; mixed - Containers</i>	0.5%	0.6%	0.7%	0.7%	0.9%	1.0%	1.1%	1.3%	1.2%	1.4%	1.7%	1.7%	1.7%	1.7%
<i>Other Metal</i>	2.6%	2.4%	2.2%	2.0%	1.9%	1.7%	1.7%	1.4%	1.3%	1.1%	1.0%	0.8%	0.7%	0.6%
Total Glass	3.2%	3.4%	3.5%	3.7%	4.0%	4.1%	4.4%	5.7%	4.4%	4.9%	5.4%	5.5%	5.4%	5.1%
Consumer Electronics	0.6%	0.5%	0.5%	0.5%	0.6%	0.6%	0.5%	0.8%	0.5%	0.6%	0.5%	0.5%	0.5%	0.4%
Household Hazardous & Batteries	0.7%	0.6%	0.8%	0.9%	0.8%	0.7%	2.2%	0.9%	1.1%	0.8%	1.0%	1.1%	0.9%	1.2%
Miscellaneous	4.3%	4.3%	4.4%	4.5%	4.8%	4.8%	5.2%	4.9%	5.0%	4.9%	5.2%	5.2%	5.2%	5.0%
	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Table 52: Bergen County MSW Generation Quantities (Tons), by Material (2003-2016)**

Waste Stream	Type	Class	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Total paper</b>	<b>10</b>		<b>413,667</b>	<b>417,523</b>	<b>459,477</b>	<b>470,392</b>	<b>408,986</b>	<b>400,955</b>	<b>374,195</b>	<b>355,368</b>	<b>346,527</b>	<b>340,609</b>	<b>358,453</b>	<b>342,337</b>	<b>346,867</b>	<b>365,142</b>
<i>Corrugated</i>	10	A	115,306	137,058	153,985	176,376	136,211	132,040	127,737	127,617	117,521	118,162	127,804	123,819	121,095	141,538
<i>Mixed Office Paper</i>	10	A	33,643	35,076	51,908	40,155	29,461	43,904	33,951	34,933	29,310	29,537	33,346	33,507	42,682	51,230
<i>Newspaper</i>	10	A	85,475	80,017	85,643	84,151	73,586	70,221	63,357	59,090	58,330	57,136	52,533	49,654	51,273	49,973
<i>Magazines/glossy &amp; other</i>	10	A	179,243	165,373	167,942	169,711	169,727	154,790	149,151	133,728	141,366	135,773	144,770	135,358	131,818	122,401
<b>Total plastic</b>	<b>10</b>		<b>116,597</b>	<b>107,740</b>	<b>114,099</b>	<b>117,259</b>	<b>110,893</b>	<b>106,527</b>	<b>108,755</b>	<b>107,802</b>	<b>109,878</b>	<b>100,610</b>	<b>105,424</b>	<b>96,273</b>	<b>99,247</b>	<b>93,682</b>
<i>Plastic Containers</i>	10	A	15,480	15,001	16,956	17,989	18,634	18,169	19,501	27,735	25,971	22,648	23,942	21,778	23,137	23,087
<i>Other Plastic</i>	10	B	101,117	92,497	96,888	99,008	92,014	88,122	89,016	79,852	83,681	77,748	81,262	74,292	75,899	70,403
Textiles and fabrics	10	A	42,617	39,988	42,651	46,124	42,269	40,903	42,028	39,446	42,278	40,739	49,349	40,661	43,462	40,500
Yard Waste	23	C	272,096	263,784	271,790	274,734	254,439	269,679	231,567	240,108	314,136	321,273	267,899	265,940	289,035	270,517
Food Waste	23	C	144,464	113,493	125,685	134,387	135,112	131,363	136,973	129,191	145,697	151,417	146,176	144,334	165,455	152,876
Other - Misc. organic / animal products	23		51,106	45,064	45,617	44,804	40,046	36,747	35,332	30,032	30,020	26,795	25,871	22,259	21,436	18,044
Wood	23		28,559	25,435	26,023	25,855	23,399	21,764	21,235	18,342	18,661	16,984	16,755	14,766	14,609	12,678
<b>Total metal</b>	<b>10</b>		<b>46,893</b>	<b>41,442</b>	<b>44,542</b>	<b>44,473</b>	<b>42,169</b>	<b>40,369</b>	<b>40,559</b>	<b>39,297</b>	<b>38,261</b>	<b>37,383</b>	<b>40,270</b>	<b>38,374</b>	<b>39,158</b>	<b>35,996</b>
<i>Aluminum - Containers</i>	10	A	9,462	7,061	8,643	8,397	8,011	8,323	8,380	8,742	8,410	8,346	9,311	9,562	10,742	10,507
<i>Steel/tin &amp; mixed containers</i>	10	A	5,865	6,682	8,371	9,584	11,013	11,346	12,848	14,662	14,567	15,998	19,027	19,193	19,869	18,996
<i>Other metal</i>	10		31,565	27,357	27,167	26,121	22,798	20,366	18,994	15,590	14,965	12,737	11,619	9,332	8,249	6,221
Glass	10	A	39,122	39,688	43,837	47,771	46,669	47,454	49,325	62,336	51,617	56,637	61,728	60,420	62,609	56,830
Consumer electronics	10	D	6,764	5,936	6,321	6,122	6,491	7,577	5,692	8,446	5,715	7,077	5,942	5,647	5,846	4,863
Household hazardous & batteries	10	D	8,338	6,452	9,512	11,519	9,132	8,736	24,515	9,674	12,325	9,579	11,533	12,450	10,055	13,406
Miscellaneous	10		52,910	50,303	54,930	58,245	56,260	55,860	58,203	53,714	58,423	56,891	60,111	56,804	60,341	56,316
<b>TOTAL TONS</b>	<b>MSW</b>		<b>1,223,132</b>	<b>1,156,925</b>	<b>1,244,566</b>	<b>1,281,770</b>	<b>1,175,944</b>	<b>1,168,011</b>	<b>1,128,457</b>	<b>1,093,826</b>	<b>1,173,611</b>	<b>1,166,062</b>	<b>1,149,580</b>	<b>1,100,331</b>	<b>1,158,189</b>	<b>1,120,912</b>

**Table 53: Bergen County Non-MSW Generation Composition, by Material (2003-2016)**

Waste Stream	Waste Type	Recycling category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Vegetative waste	13	Stumps	10.0%	8.2%	6.7%	5.8%	4.7%	3.6%	3.1%	2.6%	3.3%	5.8%	3.9%	3.8%	2.9%	2.2%
White Goods & Appliances	13	White Goods & Light Iron	4.1%	8.8%	7.9%	4.9%	9.1%	11.0%	3.1%	3.4%	0.7%	4.7%	3.8%	2.7%	2.2%	6.3%
Automobile Scrap, heavy iron & non-ferrous	13	Heavy Iron, Non-Ferrous/Aluminum Scrap, Automobile Scrap	16.8%	23.8%	16.7%	22.6%	14.2%	21.0%	20.0%	26.8%	24.2%	5.5%	4.8%	5.1%	3.7%	12.5%
Batteries (Automobile)	13	Batteries (Automobile)	0.1%	0.1%	0.1%	0.0%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.7%	0.5%	0.6%	0.1%
Furniture	13	No recycling	3.3%	2.6%	2.0%	1.8%	1.4%	1.1%	1.0%	0.8%	1.0%	1.7%	1.2%	1.2%	0.8%	0.6%
Textiles, carpet and padding	13	No recycling	3.8%	3.1%	2.4%	2.1%	1.7%	1.3%	1.1%	0.9%	1.1%	2.0%	1.4%	1.4%	1.0%	0.7%
Electronic	13	No recycling	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
Tires	13	Tires	0.5%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.2%	0.3%	0.4%	0.3%	0.3%	0.4%	0.3%
<b>Total type 13</b>			<b>38.8%</b>	<b>47.2%</b>	<b>36.4%</b>	<b>37.7%</b>	<b>31.8%</b>	<b>38.4%</b>	<b>28.6%</b>	<b>35.0%</b>	<b>30.7%</b>	<b>20.5%</b>	<b>16.1%</b>	<b>15.2%</b>	<b>11.6%</b>	<b>22.8%</b>
Wood	13C	Wood Scraps	7.1%	4.2%	4.1%	6.3%	8.5%	8.2%	11.6%	10.3%	14.5%	15.2%	15.0%	11.3%	12.5%	12.2%
Concrete/Asphalt/Block/Brick	13C	Concrete / Asphalt / Brick / Block	35.7%	36.4%	48.4%	35.3%	34.1%	36.2%	35.5%	24.9%	23.9%	28.4%	37.0%	37.1%	37.8%	34.9%
Roofing	13C	No recycling	2.6%	1.4%	1.6%	2.4%	3.4%	3.0%	4.3%	4.0%	4.9%	6.2%	6.1%	4.6%	5.0%	5.0%
Drywall	13C	No recycling	1.4%	0.7%	0.8%	1.3%	1.8%	1.6%	2.2%	2.1%	2.6%	3.3%	3.2%	2.4%	2.6%	2.6%
Soil & Gravel	13C	Oil Contaminated Soil	10.4%	7.0%	6.1%	12.7%	14.8%	8.2%	10.7%	18.0%	15.1%	15.5%	12.1%	21.9%	22.6%	14.4%
Corrugated paper	13C	No recycling	0.5%	0.3%	0.3%	0.5%	0.7%	0.6%	0.9%	0.8%	1.0%	1.3%	1.3%	1.0%	1.0%	1.0%
Plastic	13C	No recycling	0.6%	0.3%	0.3%	0.5%	0.8%	0.7%	1.0%	0.9%	1.1%	1.4%	1.4%	1.0%	1.1%	1.1%
Metal	13C	No recycling	0.2%	0.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.4%	0.4%	0.3%	0.3%	0.3%
Glass	13C	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other	13C	Street sweepings, fluorescent lights, paints and stain, other materials not listed	2.5%	2.1%	1.7%	2.6%	3.2%	2.5%	4.0%	3.1%	3.7%	4.8%	4.6%	3.5%	4.0%	4.0%
<b>Total type 13C</b>			<b>61.1%</b>	<b>52.6%</b>	<b>63.5%</b>	<b>61.8%</b>	<b>67.4%</b>	<b>61.3%</b>	<b>70.5%</b>	<b>64.3%</b>	<b>67.2%</b>	<b>76.5%</b>	<b>81.1%</b>	<b>83.1%</b>	<b>87.1%</b>	<b>75.7%</b>
Type 25	25	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Type 27	27	No recycling	0.1%	0.1%	0.1%	0.1%	0.6%	0.3%	0.7%	0.6%	1.6%	2.5%	2.8%	1.6%	0.7%	0.9%
Type 27A	27A	Process Residue	0.0%	0.1%	0.0%	0.4%	0.1%	0.1%	0.2%	0.1%	0.5%	0.6%	0.0%	0.0%	0.5%	0.5%
Type 27I	27I	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Type 72	72		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total Other Non-MSW</b>			<b>0.1%</b>	<b>0.1%</b>	<b>0.1%</b>	<b>0.5%</b>	<b>0.8%</b>	<b>0.4%</b>	<b>0.9%</b>	<b>0.8%</b>	<b>2.1%</b>	<b>3.0%</b>	<b>2.8%</b>	<b>1.7%</b>	<b>1.2%</b>	<b>1.4%</b>
<b>Sum Total</b>			<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Table 54: Bergen County Non-MSW Generation Quantities (Tons), by Material (2003-2016)**

Waste Stream	Type	Class	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Vegetative waste	13	C	81,899	60,870	52,674	45,081	36,897	30,151	29,142	29,035	32,004	38,319	31,832	36,352	27,981	20,911
White Goods & Appliances	13	A	33,112	65,681	62,308	38,013	71,416	93,462	29,592	37,260	6,783	31,413	30,961	26,112	21,127	60,811
Automobile Scrap, heavy iron & non-ferrous	13	A	136,820	177,568	132,258	174,557	111,620	177,736	190,526	294,883	235,696	36,137	39,930	48,497	35,228	120,191
Batteries (Automobile)	NA	D	645	685	1,047	350	1,723	635	663	738	881	1,250	5,541	4,987	5,367	711
Furniture	13	NA	26,792	19,773	16,166	13,557	11,307	9,040	9,073	8,859	9,528	11,272	9,544	11,379	8,018	6,072
Textiles, carpet and padding	13	NA	31,417	23,187	18,957	15,898	13,259	10,601	10,640	10,389	11,173	13,218	11,192	13,343	9,402	7,120
Electronic	13	NA	2,452	1,810	1,480	1,241	1,035	827	831	811	872	1,032	874	1,041	734	556
Tires	13	B	3,844	3,119	2,861	2,325	2,428	2,189	2,595	2,537	2,695	2,858	2,847	2,706	3,912	2,689
<b>Total type 13</b>			<b>316,981</b>	<b>352,693</b>	<b>287,752</b>	<b>291,024</b>	<b>249,686</b>	<b>324,641</b>	<b>273,062</b>	<b>384,512</b>	<b>299,632</b>	<b>135,499</b>	<b>132,719</b>	<b>144,418</b>	<b>111,769</b>	<b>219,061</b>
Wood	13C	B	57,814	31,716	32,206	48,732	66,630	69,750	110,817	113,135	141,374	100,818	123,709	107,808	120,471	117,290
Concrete/Asphalt/Block/Brick	13C	B	291,806	271,476	382,639	272,735	267,830	306,638	338,980	274,365	232,916	187,711	305,059	353,216	363,706	334,889
Roofing	13C	NA	21,385	10,582	12,305	18,854	26,899	25,718	40,970	43,666	48,002	41,259	50,374	43,734	48,532	48,365
Drywall	13C	NA	11,164	5,525	6,424	9,843	14,043	13,427	21,389	22,797	25,060	21,540	26,298	22,832	25,336	25,250
Soil & Gravel	13C	B	85,080	52,541	48,213	97,876	115,979	69,011	101,794	197,445	146,992	102,685	99,862	208,317	217,446	137,965
Corrugated paper	13C	NA	4,437	2,196	2,553	3,912	5,581	5,336	8,501	9,060	9,960	8,561	10,452	9,074	10,070	10,035
Plastic	13C	NA	4,786	2,368	2,754	4,219	6,020	5,756	9,169	9,772	10,743	9,233	11,273	9,787	10,861	10,824
Metal	13C	NA	1,358	672	781	1,197	1,708	1,633	2,601	2,772	3,047	2,619	3,198	2,776	3,081	3,070
Glass	13C	NA	98	48	56	86	123	117	187	199	219	188	230	200	221	221
Other	13C	NA	20,622	15,905	13,591	20,394	25,040	21,131	37,715	33,724	36,521	31,525	37,537	32,915	38,566	38,059
<b>Total type 13C</b>			<b>498,550</b>	<b>393,030</b>	<b>501,521</b>	<b>477,849</b>	<b>529,852</b>	<b>518,516</b>	<b>672,121</b>	<b>706,936</b>	<b>654,834</b>	<b>506,139</b>	<b>667,993</b>	<b>790,659</b>	<b>838,290</b>	<b>725,968</b>
Type 25	25	NA	27	32	9	1	37	192	47	21	65	18	24	24	23	94
Type 27	27	NA	923	597	772	1,085	4,862	2,159	6,685	6,779	15,679	16,321	23,280	15,658	6,918	8,397
Type 27A	27A	NA	26	407	364	2,958	1,146	881	1,931	1,519	4,882	3,784	103	331	4,907	4,985
Type 27I	27I	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Type 72	72	D	-	-	-	-	-	5	-	-	5	-	-	-	11	419
<b>Total Other Non-MSW</b>			<b>976</b>	<b>1,036</b>	<b>1,145</b>	<b>4,043</b>	<b>6,045</b>	<b>3,237</b>	<b>8,663</b>	<b>8,318</b>	<b>20,632</b>	<b>20,123</b>	<b>23,406</b>	<b>16,013</b>	<b>11,859</b>	<b>13,896</b>
<b>TOTAL Non-MSW</b>			<b>816,507</b>	<b>746,759</b>	<b>790,418</b>	<b>772,916</b>	<b>785,583</b>	<b>846,395</b>	<b>953,846</b>	<b>1,099,766</b>	<b>975,098</b>	<b>661,761</b>	<b>824,118</b>	<b>951,091</b>	<b>961,918</b>	<b>958,925</b>

### D.3 Materials Diversion (Recycling) Rates

Table 55 to Table 56 show the diversion rates for materials allocated to “MSW”, “Non-MSW” and Total Materials generated (i.e. the proportion of materials diverted from materials generated).

**Table 55: Bergen County “MSW” Material Diversion Rates (% of Generated) 2003 to 2016**

Waste Stream	Recycling category	Class	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Total paper</b>	<b>Paper</b>	<b>A</b>	35.5%	42.5%	45.9%	46.8%	43.9%	46.1%	42.8%	47.2%	44.0%	47.2%	49.6%	52.5%	52.7%	60.1%
<i>Corrugated</i>	<i>Corrugated</i>	A	55.7%	65.7%	67.7%	71.0%	64.8%	65.0%	63.3%	67.0%	62.1%	64.2%	65.9%	67.5%	65.6%	73.1%
<i>Mixed Office Paper</i>	<i>Mixed Office Paper</i>	A	46.4%	54.9%	69.3%	61.2%	53.0%	71.3%	64.6%	71.0%	65.7%	70.0%	74.6%	78.6%	84.1%	89.1%
<i>Newspaper</i>	<i>Newspaper</i>	A	57.8%	60.6%	63.0%	63.4%	62.9%	64.8%	62.9%	66.7%	66.8%	70.3%	69.5%	73.0%	75.5%	79.6%
<i>Magazines/glossy &amp; other</i>	<i>Other Paper/Mag/Junk Mail</i>	A	9.9%	11.8%	9.9%	10.0%	17.3%	14.3%	11.7%	13.3%	14.9%	17.7%	22.1%	24.9%	21.7%	24.9%
<b>Total plastic</b>	<b>Plastic</b>		4.0%	4.6%	5.1%	5.4%	6.6%	6.6%	7.7%	16.7%	13.8%	11.0%	12.8%	12.3%	12.0%	15.4%
<i>Plastic Containers</i>	<i>Plastic Containers</i>	A	27.2%	28.4%	30.7%	30.7%	35.3%	34.0%	35.9%	58.3%	51.5%	45.8%	45.8%	43.7%	43.6%	47.2%
<i>Other Plastic</i>	<i>Other Plastic</i>	B	0.4%	0.7%	0.6%	0.8%	0.8%	1.0%	1.5%	2.3%	2.1%	0.8%	3.1%	3.1%	2.5%	4.9%
Textiles and fabrics	Textiles	A	3.0%	5.1%	4.4%	7.7%	4.2%	3.0%	3.0%	5.9%	5.6%	5.8%	18.7%	7.8%	9.3%	10.1%
Yard Waste	Leaves, Brush/Tree Parts, Grass Clippings	C	91.4%	91.4%	90.6%	89.9%	89.2%	89.7%	87.3%	88.5%	90.3%	90.6%	87.9%	88.4%	88.5%	88.4%
Food Waste	Food Waste	C	23.0%	7.2%	8.8%	9.9%	13.7%	12.1%	12.4%	14.5%	17.8%	23.1%	16.1%	19.8%	25.9%	25.3%
Other - Misc. organic / animal products	No recycling		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Wood	No recycling		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total metal</b>	<b>Metal</b>		<b>16.7%</b>	<b>13.4%</b>	<b>15.7%</b>	<b>14.2%</b>	<b>16.2%</b>	<b>16.5%</b>	<b>16.8%</b>	<b>23.7%</b>	<b>18.0%</b>	<b>21.3%</b>	<b>25.6%</b>	<b>28.8%</b>	<b>28.5%</b>	<b>29.9%</b>
Aluminum - Containers	Aluminum Containers	A	44.4%	29.0%	36.6%	30.6%	29.7%	32.7%	30.2%	38.2%	30.0%	31.3%	34.8%	40.0%	43.2%	45.7%
Steel/tin & mixed - Containers	Steel Containers	A	61.6%	52.5%	46.0%	39.2%	40.3%	34.7%	33.2%	40.8%	29.9%	33.4%	37.1%	37.7%	32.8%	31.4%
Other metal	No recycling		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Glass	Glass Containers, Other Glass	A	59.7%	60.5%	59.4%	59.1%	58.2%	58.0%	56.7%	67.6%	56.5%	60.6%	61.0%	61.7%	60.1%	58.3%
Consumer electronics	Consumer electronics	D	0.0%	0.0%	5.4%	4.6%	20.1%	37.6%	20.8%	55.0%	34.2%	53.1%	46.7%	52.4%	56.5%	56.8%
Household hazardous & batteries	Used Motor Oil, Batteries (Dry Cell)	D	67.5%	61.0%	71.7%	75.7%	70.9%	70.3%	89.2%	75.0%	79.0%	74.1%	77.6%	80.6%	74.9%	82.6%
Miscellaneous	No recycling		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total 'MSW' Recycling Rate</b>			<b>38.6%</b>	<b>40.4%</b>	<b>41.5%</b>	<b>41.7%</b>	<b>40.5%</b>	<b>42.3%</b>	<b>39.6%</b>	<b>44.1%</b>	<b>44.9%</b>	<b>47.5%</b>	<b>45.2%</b>	<b>47.2%</b>	<b>48.1%</b>	<b>51.1%</b>

**Table 56: Bergen County “Non-MSW” Material Diversion Rates (% of Generated) 2003 to 2016**

Waste Stream	Recycling category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Vegetative waste	Stumps	3.7%	4.4%	9.7%	11.5%	9.8%	11.8%	8.4%	10.2%	12.4%	13.4%	11.8%	7.9%	15.7%	14.5%
White Goods & Appliances	White Goods & Light Iron	93.2%	97.5%	97.8%	97.0%	98.7%	99.2%	97.4%	98.0%	88.2%	97.0%	97.4%	96.4%	96.8%	99.2%
Automobile Scrap, heavy iron & non-ferrous	Heavy Iron, NonFerrous/Aluminum Scrap, Automobile Scrap	75.0%	85.8%	84.4%	90.1%	87.0%	93.5%	93.9%	96.2%	94.8%	60.1%	69.4%	70.0%	70.9%	93.5%
Batteries (Automobile)	Batteries (Automobile)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Furniture	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Textiles, carpet and padding	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Electronic	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vegetative waste	Stumps	47.9%	52.6%	57.8%	56.4%	65.2%	69.1%	73.9%	73.9%	73.6%	70.5%	75.0%	68.6%	84.7%	83.1%
<b>Total type 13</b>		<b>43.8%</b>	<b>62.8%</b>	<b>62.7%</b>	<b>69.0%</b>	<b>69.9%</b>	<b>81.5%</b>	<b>77.9%</b>	<b>84.7%</b>	<b>78.9%</b>	<b>44.7%</b>	<b>52.2%</b>	<b>47.7%</b>	<b>52.3%</b>	<b>81.6%</b>
Wood	Wood Scraps	16.2%	24.4%	13.4%	12.3%	8.5%	16.4%	16.2%	12.5%	23.1%	7.3%	7.7%	8.1%	8.7%	6.6%
Concrete/Asphalt/Block/Brick	Concrete / Asphalt / Brick / Block	98.4%	99.1%	99.3%	98.5%	97.8%	98.1%	97.3%	96.5%	95.4%	95.1%	96.3%	97.2%	97.0%	96.8%
Roofing	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Drywall	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Soil & Gravel	Oil Contaminated Soil	96.2%	97.0%	96.2%	97.1%	96.5%	94.4%	94.0%	96.7%	95.1%	94.0%	92.4%	96.9%	96.7%	94.8%
Corrugated paper	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Metal	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Glass	No recycling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other	Street sweepings, paints and strain, fluorescent lights, materials not listed	23.2%	50.7%	33.0%	31.6%	20.5%	9.9%	19.6%	4.1%	2.7%	3.1%	0.6%	1.6%	6.8%	5.9%
<b>Total type 13C</b>		<b>76.8%</b>	<b>85.5%</b>	<b>86.8%</b>	<b>78.7%</b>	<b>72.6%</b>	<b>73.2%</b>	<b>67.1%</b>	<b>66.6%</b>	<b>60.4%</b>	<b>56.0%</b>	<b>59.3%</b>	<b>70.1%</b>	<b>68.7%</b>	<b>64.0%</b>
Type 25	No recycling														
Type 27	No recycling														
Type 27A	Process Residue	100.0%	100.0%	100.0%	99.9%	2.3%	35.2%	75.4%	99.0%	99.5%	99.3%	64.7%	41.0%	90.8%	95.4%
Type 72	No recycling														
<b>Total Other Non-MSW</b>		<b>2.6%</b>	<b>39.3%</b>	<b>31.8%</b>	<b>73.1%</b>	<b>0.4%</b>	<b>9.6%</b>	<b>16.8%</b>	<b>18.1%</b>	<b>23.5%</b>	<b>18.7%</b>	<b>0.3%</b>	<b>0.8%</b>	<b>37.6%</b>	<b>34.2%</b>
<b>TOTAL</b>		<b>63.9%</b>	<b>74.7%</b>	<b>77.9%</b>	<b>75.0%</b>	<b>71.2%</b>	<b>76.2%</b>	<b>69.7%</b>	<b>72.6%</b>	<b>65.3%</b>	<b>52.5%</b>	<b>56.5%</b>	<b>65.6%</b>	<b>66.4%</b>	<b>67.6%</b>





## **Appendix B**

### **August 16, 2019 Bergen County Solid Waste Management Plan Update Study Final Report**

A large teal graphic element on the left side of the page, consisting of a vertical rectangle on the left and a triangle on the right that points towards the center. The teal color is a vibrant, medium-saturated shade.

# **Bergen County Solid Waste Management Plan Update Study**

Final Report

August 16, 2019



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# **Bergen County Solid Waste Management Plan Update Study**

Final Report

August 16, 2019



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# 1 Introduction

This Report has been prepared by Mott MacDonald for the Bergen County Utilities Authority (BCUA) to support in the preparation of the 2019 County Solid Waste Plan update.

## 1.1 Overview and Scope

BCUA has engaged Mott MacDonald to undertake solid waste advisory services to assist in the development of a ten-year Solid Waste Management Plan (SWMP) for the Bergen County solid waste district.

In 2018, BCUA commissioned a study to determine the composition and generation of solid waste for Bergen County. The methodology and results of the 2018 study are presented in the BCUA (2019) Bergen County Solid Waste Composition and Generation Study 2003 to 2029: Report (Final), June 12, 2019, prepared by Mott MacDonald.<sup>1</sup> A summary of key solid waste and recycling projections is provided in **Appendix A**. The study will be utilized to determine solid waste disposal and recycling needs for the next ten years.

Following on from the 2018 study, BCUA issued a Request for Proposal (RFP) on February 6, 2019 to undertake the following tasks:

1. *“Determine current disposal capacity available to Bergen County. Project ten-year disposal capacity available for Bergen County utilizing the January 31, 2019 Solid Waste Composition and Generation Study and solid waste trends throughout the region.*
2. *Review current County recycling strategy and recommend improvements, if needed, to conform to [New Jersey Department of Environmental Protection (NJDEP)] requirements.*
3. *Review and confirm current truck routes for ingress and egress to Bergen County solid waste transfer stations.”*

The purpose of this study is to inform and provide an evidence base for the preparation of a new long-term strategic plan for Bergen County solid waste management.

In addition, the RFP also requested the consultant to: *“Develop, in conjunction with and at the direction of BCUA and BCUA legal counsel, a long-term funding strategy for the BCUA solid waste services.”* As instructed by BCUA in meeting of May 17, 2019, this task has not been included in this revision of the report. The services will be undertaken at a later date to be advised by BCUA and will be included as an update to the Report.

Mott MacDonald set out its approach in more detail in our proposal dated February 15, 2019. The approach is summarized at the start of each section.

## 1.2 Structure of this Report

The remaining sections of this report are as follows:

- Section 2 – Waste Disposal Capacity Analysis
- Section 3 – Review of Bergen County Recycling Plan
- Section 4 – Review of Truck Route Ingress and Egress at Transfer Stations

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<sup>1</sup> At the time Mott MacDonald's *Bergen County Solid Waste Composition and Generation Study 2003 to 2029* was prepared, the 2018 tonnage figures (i.e. tonnage disposed from Bergen County as origin in 2018) were not yet available. As such, the 2018 disposal tonnage figures published in this document were estimated. This *BCUA Solid Waste Plan Update* includes the actual 2018 tonnage disposed from Bergen County as origin, which accounts for the minor difference in the 2018 disposal tonnage figures cited in these two Mott MacDonald documents.



## 2 Waste Disposal Capacity Analysis

### 2.1 Scope and Approach

This study estimates current disposal capacity, and projects the ten-year disposal capacity, available for Bergen County using data and projections from the BCUA (2019) Solid Waste Composition and Generation Study, information provided the solid waste management facilities in Bergen County, and publicly available data.

To create the waste-flow model presented in **Appendix C** and estimate Bergen County’s future waste disposal capacity needs, the waste tonnages received at the following facilities in 2018 were examined:

- In-county transfer stations
- Keegan Landfill (located in Hudson County)
- Out-of-county (in-state) transfer stations, landfills, and incinerators
- Out-of-state transfer stations, landfills, and incinerators

There are currently seven permitted transfer stations within Bergen County. Details of each facility (i.e. names, ID, permitted waste types, and physical addresses) are presented in Table 1.

**Table 1: In-County Operating Transfer Stations**

Facility Name	Facility ID#	Waste Type	Address
IWS Transfer Systems of NJ, Inc. (Former Owner: Miele Sanitation Co.)	131858	10,13,13C, 23	60 Railroad Avenue Closter Borough, NJ
Waste Management of NJ, Inc. (Fairview)	131871	10,13,13C,23,25,27	61 Broad Avenue Fairview Borough, NJ
IWS Transfer Systems of NJ, Inc.	131873	10,13,13C,23,27	19-35 Atlantic Street Garfield, NJ
National Transfer, Inc.	131883	10,13,13C,23,27	445 N Main Street Lodi Borough, NJ
S&L Zeppetelli, Inc.	131894	13,13C,27	191 Moonachie Road Moonachie Borough, NJ
NJS&EA (Owner) SAJO Transport (Operator)	203153	10,13,13C,23,25,27	100 Baler Boulevard N. Arlington, NJ
Waste Management of NJ, Inc. (Hillsdale)	133484	10,13,13C, 23,27	77 Brookside Place Hillsdale Borough, NJ

Source: NJDEP Bureau of Solid Waste Permitting

It should be noted that, effective June 1, 2019, Waste Management of NJ, Inc. has suspended operations of its transfer station located in the Borough of Hillsdale and, according to the owner, its permit will be kept current. All permitted facilities are to remain in the County Plan and keep the permitted capacity available. However, until further notice, this facility cannot be relied upon as a future source of disposal capacity for Bergen County waste and has not been included in the capacity projections.

Table 2 documents the destination of all waste generated and collected in Bergen County in 2018. As noted in Table 2, approximately 1.1 million tons of solid waste was generated in Bergen County in 2018. Around 40% of the waste was received at the in-county transfer stations, 11% at Keegan Landfill, 43% at other NJ transfer stations outside Bergen County, and the remaining 6% was taken out of the State.

**Table 2: 2018 Bergen County Solid Waste Disposal Locations**

Facility Name	2018 Tons Disposed	% of County Waste
IWS Transfer Systems of NJ, Inc. (Former Owner: Miele Sanitation Co.)	36,451	3.38%
Waste Management of NJ, Inc. (Fairview)	98,711	9.14%
IWS Transfer Systems of NJ, Inc.	107,082	9.92%
National Transfer, Inc.	79,518	7.37%
S&L Zeppetelli, Inc.	4,653	0.43%
NJS&EA (Owner) / SAJO Transport (Operator)	82,385	7.63%
Waste Management of NJ, Inc. (Hillsdale)	26,040	2.41%
Keegan Landfill	118,568	10.98%
Other In-state, out-of-county facilities (38 total)	461,447	42.74%
Out-of-state facilities (12 total)	64,731	6.00%
<b>Total</b>	<b>1,079,586</b>	<b>100%</b>

Source: NJDEP, Bureau of Solid Waste Planning and Licensing

In estimating future disposal capacity, tonnages of solid waste imported to the Bergen County transfer stations from outside the County were also analyzed to estimate the total tonnages received at the facilities in 2018, as shown in Table 3.

**Table 3: Imported Solid Waste Disposed at In-County Transfer Stations in 2018**

Facility Name	2018 Tons Disposed (from outside Bergen County)
IWS Transfer Systems of NJ, Inc. (Former Owner: Miele Sanitation Co.)	7,528
Waste Management of NJ, Inc. (Fairview)	83,293
IWS Transfer Systems of NJ, Inc.	59,943
National Transfer, Inc.	20,833
S&L Zeppetelli, Inc.	0
NJS&EA (Owner) SAJO Transport (Operator)	72,916
Waste Management of NJ, Inc. (Hillsdale)	406
<b>Total</b>	<b>244,921</b>

Source: NJDEP, Bureau of Solid Waste Planning and Licensing

A graphic showing the flow of solid waste in 2018 from within Bergen County to its point of transfer/disposal, as well as solid waste received at Bergen County transfer stations from out-of-county sources is presented in **Appendix C**.

## 2.2 Summary of Permitted Capacity

Table 4 presents a summary of permitted capacity at in-county transfer stations. As previously mentioned, the Waste Management of NJ, Inc. Hillsdale transfer station has suspended its operations and has not been included in the capacity analysis.

**Table 4: In-County Transfer Stations Permitted Disposal Capacities**

Facility Name	Weekly Waste Acceptance Schedule	Permitted Daily Tonnage Limit	Permitted Weekly Tonnage Limit
IWS Transfer Systems of NJ, Inc. (Former Owner: Miele Sanitation Co.)	Monday-Saturday 7:00AM-5:00PM	145	725*
Waste Management of NJ, Inc. (Fairview)	Monday-Saturday 24 hours/day	1,400	8,400
IWS Transfer Systems of NJ, Inc.	Monday-Friday 6:00AM-5:00PM Saturday 7:00AM-1:00PM	750	3,520
National Transfer, Inc.	Monday-Friday 6:30AM-2:30PM Saturday 6:30AM-1:00PM	350	2,100*
S&L Zeppetelli, Inc.	Monday-Friday 6:00AM-4:00PM Saturday 6:00AM-1:00PM	20	120*
NJS&EA (Owner) SAJO Transport (Operator)	Monday-Friday 6:00AM-4:30PM Saturday 6:00AM-3:30PM	2,750	12,000
<b>Total</b>		<b>5,415</b>	<b>26,865</b>

Notes: \*Not Specified in Permit

According to the data presented in Table 4, for the next 10 years, Bergen County should have an in-county disposal capacity of 1,396,980 tons per year (or an average daily capacity of 5,415 tons). Should the Waste Management Hillsdale transfer station restart operations, the in-county disposal capacity would increase by 900 tons per day (TPD) to a total of 6,315 TPD. However, our capacity analysis considers the more conservative figures.

### 2.3 10-Year Solid Waste Tonnage Forecast and Disposal Capacity Comparison

The following assumptions were made:

- 40% of the annual Bergen County tonnage is disposed at in-county transfer stations (as observed in 2018).
- In 2021, the in-county transfer stations will begin receiving the fraction of Bergen County waste (10.9%) that was previously disposed at Keegan Landfill.
- 245,000 tons of solid waste will be imported annually to in-county transfer stations. This figure is similar to the 2018 import tonnage.
- The total available disposal capacity is based on the total weekly permitted capacities for six in-county transfer stations operating six days per week and 52 weeks per year.
- Keegan Landfill will no longer be available as disposal alternative.
- During the 10-year planning horizon, Waste Management’s Hillsdale Borough transfer station will not reinstate operations. As such, no disposal capacity can be expected from this facility over this term.
- Keegan Landfill and Waste Management’s Hillsdale Borough transfer station represent the only loss of disposal capacity over the 10-year planning horizon.
- All permitted facilities that accepted Bergen County waste in 2018 (i.e. in-county, out-of-county, and out-of-state), with the exception of Keegan Landfill and Waste Management’s Hillsdale Borough transfer station

as noted above, will maintain their currently permitted capacities and will remain viable disposal options over this term.

Table 5 provides a 10-year projection of solid waste disposal capacity at Bergen County transfer stations, based on:

1. disposal projection figures cited in the BCUA (2019) Solid Waste Composition and Generation Study
2. proportion of solid waste arising in Bergen County disposed of at in-county transfer stations
3. total solid waste received at in-county transfer stations
4. fixed total capacity from 2019 to 2029 of 1,396,980 tons per year

The following assumptions were made:

- 40% of the annual Bergen County tonnage is disposed at in-county transfer stations (as observed in 2018).
- In 2021, the in-county transfer stations will begin receiving the fraction of Bergen County waste (10.9%) that was previously disposed at Keegan Landfill.
- 245,000 tons of solid waste will be imported annually to in-county transfer stations. This figure is similar to the 2018 import tonnage.
- The total available disposal capacity is based on the total weekly permitted capacities for six in-county transfer stations operating six days per week and 52 weeks per year.
- Keegan Landfill will no longer be available as disposal alternative.
- During the 10-year planning horizon, Waste Management’s Hillsdale Borough transfer station will not reinstate operations. As such, no disposal capacity can be expected from this facility over this term.
- Keegan Landfill and Waste Management’s Hillsdale Borough transfer station represent the only loss of disposal capacity over the 10-year planning horizon.
- All permitted facilities that accepted Bergen County waste in 2018 (i.e. in-county, out-of-county, and out-of-state), with the exception of Keegan Landfill and Waste Management’s Hillsdale Borough transfer station as noted above, will maintain their currently permitted capacities and will remain viable disposal options over this term.

**Table 5: Ten-Year Projection of Disposal and Capacity at In-County Transfer Stations (2020-2029)**

Calendar Year	Total Bergen County Solid Waste Disposal <sup>1</sup> (Tons)	Bergen County Solid Waste Disposed at In-County TS <sup>2</sup> (Tons)	All Solid Waste Disposed at In-County TS <sup>3</sup> (Tons)	Unused Permitted Capacity at In-County TS <sup>4</sup> (Tons)
2020	918,307	367,323	612,323	<b>784,657</b>
2021	916,219	466,356	711,356	<b>685,624</b>
2022	914,393	465,426	710,426	<b>686,554</b>
2023	912,826	464,629	709,629	<b>687,351</b>
2024	911,515	463,961	708,961	<b>688,019</b>
2025	910,456	463,422	708,422	<b>688,558</b>
2026	909,647	463,011	708,011	<b>688,969</b>
2027	909,087	462,725	707,725	<b>689,255</b>
2028	908,772	462,565	707,565	<b>689,415</b>
2029	908,702	462,529	707,529	<b>689,451</b>

Notes:

<sup>1</sup> Tonnage from Mott MacDonald January 31, 2019 Solid Waste Composition and Generation Study.

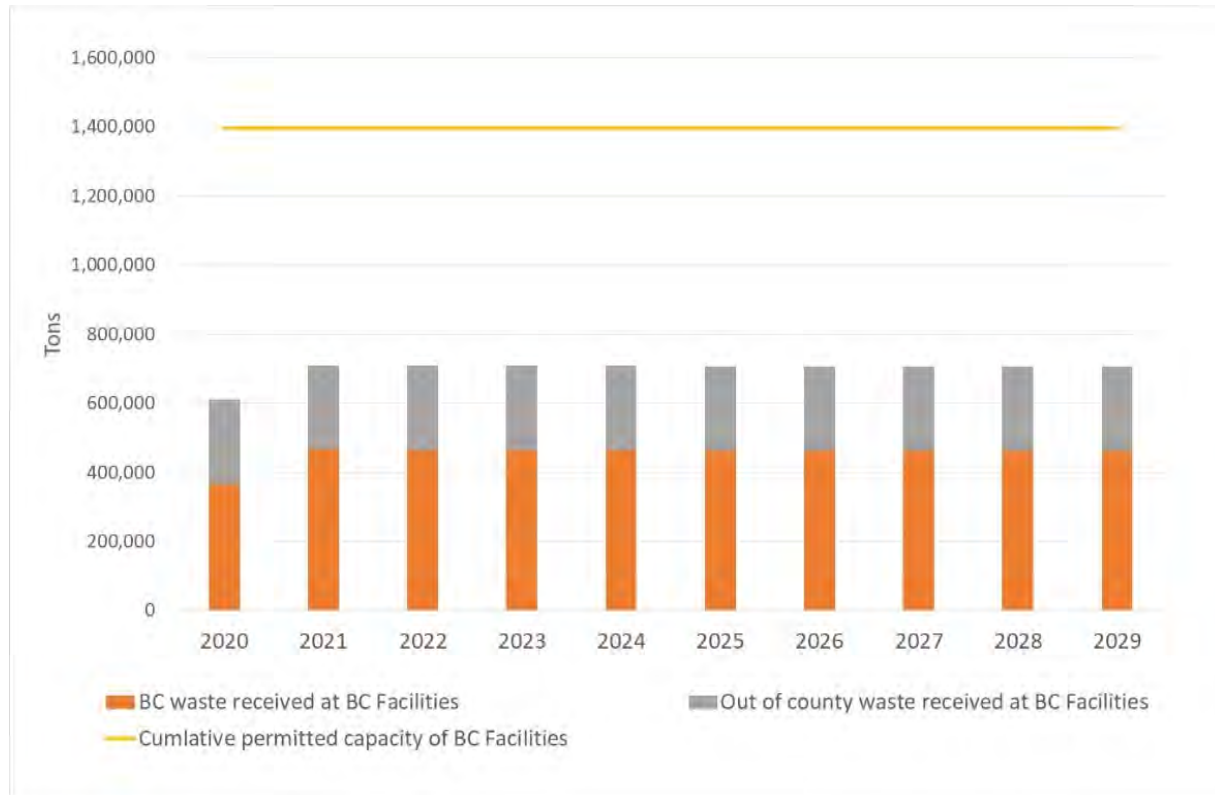
<sup>2</sup> Bergen County waste being disposed at in-county transfer stations (40%) and increased by Keegan tonnage upon closure.

<sup>3</sup> Anticipates 245,000 tons of out-of-county solid waste disposed at in-county transfer station annually as observed in 2018.

<sup>4</sup> Total annual permitted disposal capacity of all six operating in-county transfer stations is 1,396,980 tons (26,865 tons weekly).

The results of the capacity analysis reported above are illustrated in Figure 1. Based on this evaluation and the stated assumptions, it is likely that capacity will be available for the disposal of solid waste arising in Bergen County between 2019 and 2029. However, it should be noted that more than 75% of the total permitted capacity in Bergen County is handled by two facilities: Waste Management Fairview (31%), and SAJO (45%). Should these facilities cease operations then it will be necessary to find alternative capacity at new or out-of-county facilities. All non-operational, permitted in-county facilities should remain in the Plan allowing them to remain available as a source of additional capacity within Bergen County.

**Figure 1: Projected Waste Disposal Capacity and Availability at Bergen County Transfer Stations**



## 2.4 Remaining Capacity of Keegan Landfill

The Keegan Landfill is permitted to accept 3,000 TPD of NJDEP solid waste types 13, 13C, and 27. On average, this facility only accepts approximately 1,800 TPD. As of December 2018, the Keegan Landfill was filled to approximately elevation 69.0 feet above mean sea level (MSL) and has a permitted elevation of 100 feet above MSL. According to the May 2016 Keegan Landfill Vertical Expansion Closure and Post-Closure Care Plan, filling to permitted grades is expected to be completed by January 2020.

On June 12, 2019, the NJ Supreme Court ordered the NJ Sports and Exposition Authority to temporarily close the landfill pending the outcome of a plenary hearing - scheduled for July 25, 2019. At issue is a Town of Kearny lawsuit against the state agency seeking the shutdown of the landfill due to odor/hydrogen sulfide issues.

The Keegan Landfill therefore cannot be relied upon as a long-term disposal option for Bergen County's waste, and therefore should not be considered in the County's long-term waste management strategy.

## 3 Review of Bergen County Recycling Plan

This Section reviews the existing Bergen County Recycling Plan for conformance with NJDEP requirements and provides recommendations to improve the Plan for inclusion in the updated BCUA Solid Waste Management Plan.

### 3.1 Scope and Approach

Bergen County's Recycling Plan is included in the Current BCUA Solid Waste Management Plan (SWMP) (October 2006) and was updated with a May 15, 2008 Administrative Action. Since the original plan and 2008 update, changes in legislature, market conditions, and waste stream composition have occurred, which may affect the implementation of the current recycling plan. Mott MacDonald has reviewed the BCUA SWMP, the NJ Solid Waste Plan (2006), the Bergen County Solid Waste Composition and Generation Study 2003 to 2029 dated January 31, 2019, and BCUA's Municipal Recycling Program Database, to evaluate whether changes are warranted to meet NJDEP's recycling requirements.

The following sub-sections provide a summary of recycling plan requirements, discussion on BCUA compliance with those requirements, and recommendations for improving compliance. In addition, general recommendations for improving the recycling plan have also been provided where appropriate.

### 3.2 Recycling Plan Requirements

The New Jersey Statewide Mandatory Source Separation and Recycling Act (April 1987) requires each county to develop a recycling plan, including the designation at least three mandatory recyclable materials in addition to leaves. NJDEP requirements also state that counties shall:

- Designate a certified County Recycling Coordinator position;
- Designate the recyclable materials to be source-separated in each municipality from the municipal solid waste stream;
- Designate the recyclable materials to be source-separated in the commercial and institutional sectors;
- Designate the recovery targets in each municipality of recyclable materials from the municipal solid waste stream which shall include, at a minimum, the recycling of at least 50% of the municipal solid waste stream;
- Designate the countywide recovery targets of recyclable materials from the total solid waste stream which shall include, at a minimum, the recycling of at least 60% of the total solid waste stream;
- Describe the County's public education program and indicate minimum requirements for each municipal education program to inform generators of their source separation and recycling responsibilities;
- Designate the strategy for the collection, marketing and disposition of designated source-separated recyclable materials in each municipality, including a listing of those entities providing these services for each of the designated recyclable materials; and
- Outline a comprehensive enforcement program.

#### 3.2.1 County Recycling Coordinator

BCUA Solid Waste Division has established and intends to maintain the full-time position of Solid Waste Manager who shall serve as the designated certified County Recycling Coordinator.

##### 3.2.1.1 Recommended Action

No action required.

### 3.2.2 Mandated Recyclable Materials

The recycling plan shall mandate the source-separated recycling of at least three recyclable materials in addition to leaves in each municipality from the municipal solid waste stream. The materials listed in the 2006 Bergen County Recycling Plan as mandatory recyclables (both residential and Commercial Institutional and Industrial (CII)) are shown in Table 6.

**Table 6: Bergen County Mandated Recyclables**

Residential	Commercial, Institutional, and Industrial (CII)
Newspaper	High-Grade Office Paper
Glass Beverage Containers	Glass Beverage Containers
Aluminum Cans	Aluminum Cans
Ferrous Scrap	Ferrous Scrap
Leaves	
White Goods	White Goods
Tin Cans	
Grass	
Construction and Demolition Debris (concrete, brick, tree, parts, nonferrous/ferrous metal, asphalt, corrugated cardboard; where practical)	Construction and Demolition Debris (concrete, brick, tree, parts, nonferrous/ferrous metal, asphalt, corrugated cardboard; where practical)
Corrugated Cardboard	Corrugated Cardboard
Mixed Paper	Mixed Paper
Type 1 and 2 Plastic Containers	Type 1 and 2 Plastic Containers

Source: BCUA (2006) Bergen County Solid Waste Plan

The Mandated recyclables have been organized in Table 7 alongside the NJDEP’s material recycling categories and classes as well as the closest matching category from the BCUA (2019) study for comparison purposes.

**Table 7: Bergen County Recyclables as Closest Matching NJDEP and 2018 Study Categories**

NJDEP ID and Material Recycling Category	Class	2006 SWMP Mandatory Recyclables- Residential	2006 SWMP Mandatory Recyclables- CII	Closest matching category from SW Generation Study
01 – Corrugated	A	Corrugated Cardboard	Corrugated Cardboard	Corrugated
02 – Mixed office paper	A		High-Grade Office Paper	Mixed office paper
		Mixed Paper	Mixed Paper	Magazines/glossy & other
03 – Newspaper	A	Newspaper		Newspaper
04 – Other paper/ magazines/ junk mail	A	Magazines	Magazines	Magazines/glossy & other
05 – Glass containers	A	Glass Beverage Containers	Glass Beverage Containers	Glass
06 – Aluminum Containers	A	Aluminum Cans	Aluminum Cans	Aluminum - containers
07 – Steel containers	A	Tin Cans		Steel/tin & mixed - Containers
08 – Plastic containers	A	Types 1 and 2 Plastic Containers	Types 1 and 2 Plastic Containers	Plastic containers
09 – Heavy Iron	A	Ferrous Scrap	Ferrous Scrap	Automobile Scrap, heavy iron & non-ferrous
11 – White goods & light iron	A	White Goods	White Goods	White goods & appliances
18 – Grass clippings	C	Grass		
19 – Leaves	B/C	Leaves		



NJDEP ID and Material Recycling Category	Class	2006 SWMP Mandatory Recyclables- Residential	2006 SWMP Mandatory Recyclables- CII	Closest matching category from SW Generation Study
22 – Concrete/Asphalt/Brick/Block	B	Construction and Demolition Debris (concrete, brick, tree, parts, nonferrous/ferrous metal, asphalt, corrugated cardboard; where practical)	Construction and Demolition Debris (concrete, brick, tree, parts, nonferrous/ferrous metal, asphalt, corrugated cardboard; where practical)	Concrete/Asphalt/Brick/Block

Source: BCUA (2006) Bergen County Solid Waste Plan, BCUA (2019) Bergen County Solid Waste Composition and Generation Study 2003 to 2029, NJDEP Solid Waste and Recycling Statistics (Online).

Bergen County Municipalities are required to collect and market mandatory recyclables listed in the County Plan, as a minimum.

The following NJDEP recycling categories are not mandated in the 2006 Plan:

- 12 – Anti-freeze (Class D)
- 13 – Batteries (automobile) (Class D)
- 14 – Automobile scrap (Class D)
- 15 – Tires (Class D)
- 16 – Used motor oil (Class D)
- 20 – Stumps (Class B)
- 21 – Consumer electronics (Class D)
- 23 – Food waste (Class C)
- 24 – Other material not listed
- 25 – Other glass (Class A/B)
- 26 – Other plastic (Class A/B)
- 27 – Oil contaminated soil (Class B)
- 28 – Process Residue (Class B)
- 29 – Textiles
- 30 – Wood Scraps (Class B)

It is recommended to include Steel containers from CII sources in the list of mandatory recyclables, as this category of materials is easy to collect, separate, and recycle and has a relatively high market value.

The updated (recommended) list of mandatory recyclables is shown in Table 8, along with the NJDEP category definitions and additional recommended clarifications to be considered by BCUA for inclusion in the updated Solid Waste/Recycling Plan.



**Table 8: Recommended List of Recyclable Materials and Definitions**

NJDEP ID and Material Recycling Category	NJDEP Definition of Recyclable Materials	Additional Recommended Description
01 – Corrugated**	Containers and similar paper items, usually used to transport supplies, equipment, parts, or other merchandise.	Boxes and packaging generally made of wood pulp and consisting of two smooth sides with a corrugated inner layer. Brown paper grocery bags are included in this category.
02 – Mixed office paper	Items listed in computer printout/white ledger category when mixed with envelopes, manila folders and colored paper. Material is generated by commercial/institutional sources	Includes High Grade Office Paper** – White office printer paper. High grade office paper shall be kept separate from other paper products.
03 – Newspaper**	All paper marketed as newsprint or newspaper and containing at least 70% newsprint or newspaper (American Paper Institute grades #6, #7 and #8 news).	
04 – Other paper/ magazines/ junk mail**	All magazine stock, white and colored paper and envelopes	Mixed Paper – Colored paper, telephone books, computer paper, office paper (when mixed with other paper), non-metallic wrapping paper, soft cover books, hard cover books with cover removed, magazines and flyers.
05 – Glass containers*	All glass containers used for packaging food or beverages	
06 – Aluminum Containers*	Food and beverage containers made entirely of aluminum.	
07 – Steel containers*	Rigid containers made exclusively or primarily of steel, tin-plated steel, and composite steel and aluminum cans used to store food, beverages, paint, and a variety of other household and consumer products.	
08 – Plastic containers*	Containers such as polyethylene terephthalate (PETE - #1) soda bottles, high density polyethylene (HDPE - #2) milk, water or detergent bottles, low density polyethylene (LDPE - #4) containers, vinyl (V - #3) or polyvinyl chloride (PVC - #5) bottles and rigid and foam polystyrene (PS - #6).	The BCUA webpage 'What to Recycle in Bergen County' further specifies plastic containers consisting of #1 and #2 from both residential and CII sources.
09 – Heavy Iron	All structural steel or ferrous metal components.	Includes non-auto ferrous scrap – All structural steel or ferrous metal, cast iron components. Products made from sheet iron such as shelving, file cabinets metal desks, steel drums, and other ferrous scrap.
10 – Non-Ferrous/ Aluminum Scrap	All non-container aluminum including auto parts, siding, aircraft parts, lawn chairs, window and door frames, pots and pans, foils and pie plates. Non-ferrous scrap consists primarily of copper and zinc. Copper generally takes the form of cable (utility wires), plumbing, wiring harnesses, motors, house wiring and bulky items.	Metal or metal alloys which do not contain iron in appreciable amount. Products made of aluminum, copper, brass, zinc, lead, etc. While auto parts and aircraft parts are included in the NJ definition, these items are covered separately in the NJ statistics.
11 – White goods & light iron	All large appliances such as washers, dryers, refrigerators, etc., as well as products made from sheet iron, such as shelving, file cabinets, metal desks, recycled or reconditioned steel drums, stainless steel and other non-structural ferrous scrap.	All CFCs in any white goods must be properly evacuated by licensed individuals and all CFCs recovered must be sent to an EPA approved reclaimer.
17 – Brush/Tree Parts	Yard waste = 17,18,19+20.	Vegetative waste or unfinished wood from land clearing projects or storm damage.
18 – Grass clippings		Cuttings from a mown lawn or pasture.
19 – Leaves		

NJDEP ID and Material Recycling Category	NJDEP Definition of Recyclable Materials	Additional Recommended Description
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22 – Concrete/ Asphalt/ Brick/ Block	Asphalt, concrete, brick, cinder block, "patio blocks," ceramic materials, stones and other masonry and paving materials. Note that the regulations at N.J.A.C. 7:26A allow for asphalt to be handled in two ways: incorporated into the asphalt production process (milled asphalt); or asphalt is taken to a Class B recycling center and used to produce construction aggregate. Either form of the material is acceptable for reporting purposes	
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Source: After NJDEP Webpage 'Category/Definition of Recyclable Materials', available at: <https://www.nj.gov/dep/dshw/recycling/material.htm>

Notes: \* The waste generator shall clean recyclable glass, plastic, or metal containers of contaminants such as food remnants and oils.  
\*\* A fiber-based recyclable product. The waste generator shall separate and dispose of fiber products that are food-soiled or has oil stains. The waste generator shall store fiber products in a dry location until collection or drop-off.

### 3.2.2.1 Recommended Actions

It is recommended that BCUA consider the following actions for inclusion in the new Bergen County Solid Waste Plan

- Align naming of designated mandatory recyclables with the categories used by NJDEP for recycling statistics, as listed in Table 7 (column 1).
- Include recyclable material definitions into recycling plan for clarification.
- Add "07 – Steel containers" to the list of mandatory CII Recyclables

### 3.2.3 Diversion / Material Recovery Targets

The NJ Statewide Mandatory Source Separation and Recycling Act has designated minimum recycling recovery targets for each municipality and county in New Jersey. The Bergen County plan currently has the following targeted rates in place which match those of the Act:

- Each municipality shall recycle at least 50% of the current year's municipal solid waste stream.
- Bergen County shall recycle at least 60% of the current year's total solid waste stream.

Recyclables that count toward the 50% target are listed in Table 9.

**Table 9: Recyclables Included in 50% Target Calculation**

Recyclable Materials	
Aluminum Cans	Mixed Paper
Antifreeze	Newspaper
Brush/Tree Parts	Other Glass
Corrugated Cardboard	Other Plastic
Food Waste	Plastic Containers (All Types)
Glass Beverage Containers	Rechargeable Batteries
Grass	Steel Cans
Leaves	Textiles
Magazines	Used Motor Oil

Source: Statewide Mandatory Source Separation and Recycling Act

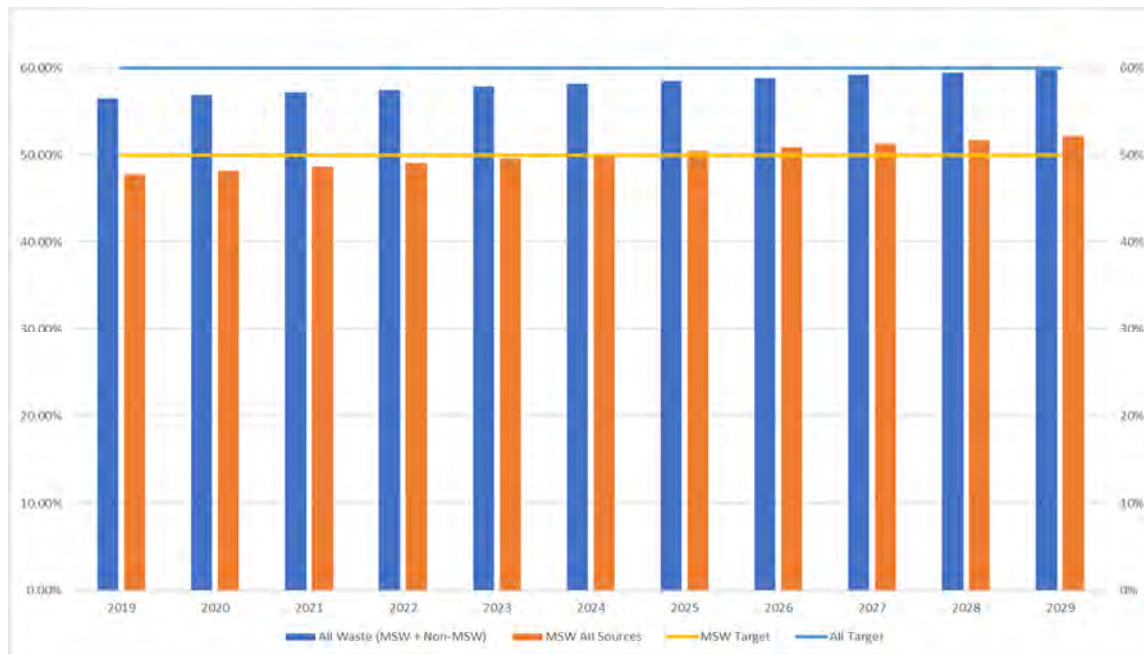
All recyclables diverted from the waste stream are countable toward the 60% goal.

Historically, Bergen County municipalities have had mixed results in meeting the 50% target; however, overall recycling diversion rates have been increasing, and in 2018 the recycling rate was estimated to be 47.3% for 'MSW' and 56.2% for 'all waste'.

In the short-term reduction in recycling rates in the County is expected to occur in response to market conditions. However, the BCUA (2019) study projects diversion rates to gradually recover as the market corrects, as shown in Figure 2. According to this projection, it is anticipated that Bergen County will achieve the 50% target for MSW by 2024 and both the 50% and 60% targets by 2029. Therefore, it is recommended that BCUA should maintain the NJDEP-mandated 50% and 60% recycling targets, and not impose more ambitious targets unless prevailing market conditions so dictate.

Table 19 to Table 22 in **Appendix D** provide a summary of projected MSW and CII recycling rates for 2019 and 2029.

**Figure 2: Projected Diversion Rates 2019 to 2023**



Source: BCUA (2019)

Yard waste (leaves, grass, brush and tree parts from residential and CII sources) constitutes around half the total quantity of recyclables diverted from municipal (residential and CII) sources (46.7% in 2019). Yard waste makes up almost 70% of the total waste diverted from residential sources. It is also variable by season and location. As such, the inclusion of yard waste in the total can obscure analysis of solid waste costs and tonnages. The NJDEP therefore also recommends calculating recycling rates without yard waste focusing on the first eight categories of recyclables included in NJDEP tonnage reports, with a target of at least 35% for those materials. Based on the BCUA (2019) study, the projected recycling rates for 2019 and 2029 only for the eight specified materials are shown in Table 10. The projections suggest that the overall recycling rates for these materials exceed the 35% target and are expected to remain at around 50% over the period.

**Table 10: Recycling Rates without Yard Waste and other Materials 2019 and 2029**

Material	2019			2029		
	All Sources	Residential	CII	All Sources	Residential	CII
Corrugated	72.4%	42.6%	84.4%	79.6%	34.3%	99.1%
Mixed Office Paper	79.8%	66.1%	84.2%	19.4%	66.6%	85.4%
Newspaper	70.6%	73.0%	64.3%	77.4%	84.5%	64.3%
Magazines/glossy & other	14.9%	8.0%	23.6%	55.6%	55.4%	55.9%
Glass	54.3%	56.2%	50.8%	17.2%	8.3%	26.3%
Aluminum - Containers	43.1%	43.0%	43.3%	25.0%	19.1%	32.1%
Steel/tin & mixed - Containers	31.6%	26.2%	39.4%	19.4%	25.2%	12.0%
Plastic Containers	24.9%	26.1%	22.9%	42.7%	49.8%	35.3%
<b>TOTAL</b>	<b>50.4%</b>	<b>38.1%</b>	<b>61.8%</b>	<b>49.3%</b>	<b>37.7%</b>	<b>69.8%</b>

For all residential and commercial ‘MSW’ recycling, including yard waste, the BCUA (2019) Solid Waste Study found that municipalities would need to recycle an additional 25,000 tons of included materials to achieve the 50% target in 2019, and an additional 73,400 tons of all materials to achieve the 60% target.

To overcome these potential shortfalls municipalities could increase the recovery rate from the recyclables currently mandated in the new Bergen County SWMP and/or target enhanced collection of additional recyclable materials not designated as mandatory in the County Plan. The County may also consider including additional materials in the list of mandatory recyclables in the Recycling Plan (see Section 3.2.2). A discussion of materials which could be potentially targeted for improvement by BCUA through the Recycling Plan are discussed in the following sub-sections.

**3.2.3.1 Food Waste**

According to the BCUA (2019) study, it is estimated that around 24.3% of the total 159,125 tons of food waste generated will be recycled in 2019. Food waste represents around 15% of the total waste generated and 7% of the total diverted for recycling. The total quantity of food waste diverted is expected to increase from 38,684 to 46,364 tons between 2019 and 2029, but the recycling rate is not projected to change significantly over the period overall. The vast majority of food waste diverted is collected from CII sources, and the recycling rate for food from CII sources is around 40% compared to just 8% from residential sources. As no Bergen County municipalities collect source separated food waste at the curbside, it is assumed that the reported 38,622 tons of food waste which were reported as diverted in 2016 were separated out from single collections at permitted Class C recycling facilities.

Based on the BCUA (2019) study projections, achieving a 50% recycling rate for food waste would require diversion of an additional 42,249 tons from all sources. Using the same data, approximately 85,000 tons would be available from residential sources and 45,000 tons from CII sources. There is room for improving the CII food waste recycling rate, and this could be targeted by the municipalities. However, the recycling rate could also be increased significantly by collecting food waste from residential sources as part of municipal curbside collections, if political and economic barriers can be overcome.

Diversion of food waste as part of municipal curbside recycling collections is often difficult to successfully implement due to numerous factors, including public perceptions of hygiene, operational costs, public hygiene considerations, feedstock variability and quality issues, lack of infrastructure, and limited markets. Nevertheless, the number of municipal food waste recycling programs is increasing across the US. In NJ, several municipalities have adopted food waste collection programs, including the following:

- The City of Lambertville, Hunterdon County, food waste recycling program, collects food scraps and soiled paper from participating households for a fee of \$65 a year, including curbside cart, kitchen pail, compostable bags, troubleshooting support and free compost three times per year. The city collects around

10 pounds per household per week on average, which is delivered to the Ag Choice composting facility in Sussex County.

- The Township of Lawrence, Mercer County, has offered residents optional weekly organic recycling collection services (including food waste and food-spoiled biodegradable packaging) since December 2018. A fee of \$38.50 per month is charged to participating households to cover the cost of collections.

While it is not recommended presently to list food waste as a mandatory recyclable material, BCUA could consider encouraging municipalities to adopt voluntary food waste recycling programs targeting both the residential and CII sectors.

### 3.2.3.2 Consumer and Rechargeable Batteries

'Consumer Batteries' are defined by NJDEP as: "Any type of button, coin, cylindrical, rectangular or other shaped, enclosed device or sealed container which is utilized as an energy source for commercial, industrial, medical, institutional or household use". Many consumer batteries fall under the USEPA 'Universal Waste' regulations aimed at streamlining management standards for commonly generated hazardous wastes and promoting their recycling.

Most rechargeable batteries including, Nickel Cadmium (Ni-Cd), Nickel Metal Hydride (Ni-MH), Lithium Ion (Li-ion), Nickel Zinc (Ni-Zn), and small sealed lead (Pb) batteries less than 11 lbs are recyclable and permitted for Class D recycling facilities in NJ. As such they are included in the list of allowable materials prescribed by the NJ Recycling Act counting towards the 50% target.

Recyclable batteries are not collected by municipalities in Bergen County at the curbside. However, consumers can drop off recyclable batteries at most recycling centers and DPWs, and at scheduled BCUA regional collection events, and are accepted by many suppliers of electronics equipment. Non-recyclable non-hazardous batteries (regular AA, AAA, C, D and 9V) are usually accepted in regular household curbside waste collections.

It is difficult to monitor the quantity of recyclable batteries diverted from household and CII sources using NJ recycling statistics for two reasons: (1) the quantity of consumer batteries is recorded by NJDEP together with other materials in the aggregated category of 'Household Electronics', and (2) recyclable batteries are not differentiated from non-rechargeable in the statistics. However, a database provided by BCUA recorded 'rechargeable batteries' collection at recycling centers in five municipalities, and the collection of 'household batteries' from six municipalities in 2018. It is not known if these two categories of batteries are used interchangeably.

### 3.2.3.3 Consumer Electronics

According to the NJDEP definition, "Consumer Electronics" includes the components and sub-assemblies that collectively make up the electronic products and may, when individually broken down, include batteries, mercury switches, capacitors containing PCBs, cadmium plated parts and lead or cadmium containing plastics. The recycling consumer electronics is important to recover high-value components and remove hazardous materials from the waste stream.

The NJ Electronic Waste Act (N.J.S.A. 13:1E-99.94 et seq.) established a recycling program for the safe and environmentally sound management of consumer electronics, which are referred to as Covered Electronic Devices (CEDs). CEDs include consumer products such as desktop or personal computers, computer monitors, portable computers (tablets), printers, fax machines, or televisions.

Bergen County residents have four main options for depositing CEDs for recycling:

1. Bergen County municipalities local recycling depots or Department of Public Works (DPW) depots
2. Retail collection programs
3. BCUA Computer and Electronics Recycling Depot
4. BCUA regional collection events

BCUA facilities also accept CEDs from commercial generators.

Used consumer electronics fall under the USEPA 'Universal Waste' regulations aimed at streamlining management standards for commonly generated hazardous wastes and can be recycled at permitted Class D recycling facilities in NJ.

According to the BCUA 2019 Study, the recycling rate for consumer electronics in Bergen County is estimated to be around 58.9% in 2019, although this category represents only a small fraction of overall material generation (around 0.5% in 2019). The recycling rate in this category is expected to rise to around 73%. Therefore, overall Bergen County's plan for recycling consumer electronics can be considered a successful approach in terms of the 60% target. However, the Electronic Waste Management Act bans the disposal of televisions and all personal or portable computers in the regular waste stream, therefore the actual target should be closer to 100%. This extended producer responsibility law requires manufacturers to provide "free and convenient" recycling options for their products. However, no publicly available information on the level of compliance or enforcement has been identified during this review.

Measures to improve the CED recycling rate, could include improving accessibility/convenience for acceptance of CEDs, stricter enforcement, and education/outreach. Most municipalities in Bergen County either collect or have drop-off centers for CEDs.

#### 3.2.3.4 Tires

Scrap tires can be recycled at permitted Class B facilities in NJ. The requirements for managing scrap tires in NJ is set out in Section E of the 2006 NJ Solid Waste Plan, and the NJ Recycling Regulations (N.J.A.C. 7:26A-1).

According to the BCUA (2019) study, it is estimated that 2,235 tons (83%) of tires were diverted for recycling, and 454 tons were disposed of at landfill or incinerated in 2016. While this represents a very small fraction of the total material recycled in Bergen County, the quantity of tires diverted is expected to increase to 3,069 tons in 2029, while the quantity disposed is projected to decrease to just 70 tons.

Recycling of tires is not currently mandated by law. However, in 2016 a bill was introduced, which if enacted would require mandatory recycling of all used tires arising in the State of NJ, as well as the licensing of scrap tire haulers.

BCUA allows residents to dispose of residentially generated tires at a NJDEP approved BCUA designated sites at no cost. BCUA also sponsors a Municipal Tire Recycling Program, which in 2019 consists of four one-day tire amnesty collection days located throughout the County to allow residents to drop off tires for recycling.

#### 3.2.3.5 Recommended Actions

- Maintain 50% municipality recycling target
- Maintain 60% Bergen County total recycling target.
- Consider implementing measures to encourage municipalities to increase recycling of additional materials to improve MSW recycling rate, including food waste and batteries to achieve 50% target earlier than 2024.



- Consider implementing measures to encourage municipalities to increase recycling of additional materials to improve total recycling rate, including consumer electronics and tires to achieve 60% target earlier than 2029.

### 3.2.4 Public Education Program

The recycling industry is now demanding a cleaner product with lower moisture for those recyclables included in single-stream collection. If the recyclables do not meet the end market's allowable contamination and moisture contents, they will be disposed as waste. Public education is an important tool for improving recycling compliance and quality.

Bergen County's Recycling Plan currently notes several ways it meets the NJDEP requirement for Public Education Program. BCUA runs public education programs and classroom presentations and publishes assistance publications and the BCUA website hosts educational information and details of the recycling services available. BCUA should review the existing plan to ensure the County is still committed to these publications and services.

#### 3.2.4.1 Recommended Action

Update SWMP to reflect current educational programs offered and BCUA publications.

### 3.2.5 Municipal Recycling Collection, Marketing, and Disposition Strategies

Each municipality must adopt an ordinance which mandates, at a minimum, the source separation of recyclables mandated by the County for residential, and CII sectors. Municipalities may specify recycling of materials not mandated in the County Plan.

The municipal ordinances shall provide a system of either curbside collection or drop-off centers for generators to recycle mandated materials if not otherwise provided for by the generator. Collection may be by public or private operation and using single-stream or multi-stream systems provided that the facility receiving the material has the ability to separate the mandated recyclables. Unless otherwise provided, the municipalities are required to develop methods of marketing collected recyclable materials. BCUA provides a list of recycling markets available.

It is the municipalities' collective responsibility to achieve the County's 50% and 60% recycling targets. The municipalities are rewarded for recycling through the Recycling Tonnage Grant, and each municipality's recycling coordinator must complete a Tonnage Grant Report each year and provide a copy to BCUA. The report aids the County in monitoring and recording progress against recycling targets. Municipal ordinances specify provisions for enforcement including issuing warnings and violations. Ordinances establish penalties for non-compliance.

The municipality is also responsible for educating residential and CII occupants about the municipality's recycling program twice a year by mail. This includes a list of recyclable materials, recycling rules, collection schedule and the operational hours of drop-off centers. The managers/owners of multifamily dwellings must notify new residents upon arrival. Recycling publications prepared by the County will be available to the municipalities for distribution. It is recommended that municipalities also provide additional education information to their participants through various outlets such as newsletters, social media, public events, etc.

BCUA maintains a database which includes key data for each municipality. Each municipality is asked to notify BCUA within 30 days of changes to their recycling ordinances and is asked to fill out a questionnaire to maintain current records. While this is a useful resource, there are 70 municipalities in Bergen County, and it is understood that response rates to requests for information vary, and information received is often inconsistent or inaccurate. Therefore, the database is difficult for BCUA to maintain as an up-to-date resource for monitoring municipal compliance. In addition, the way information is presented in the database makes analysis difficult.

To improve the monitoring of recycling data at the municipal level, BCUA could consider several improvements to the database, including providing guidance / instructions to municipal recycling coordinators when they are providing the data.

#### 3.2.5.1 Recommended Actions

- Obtain current versions of municipal recycling ordinances.
- Provide instructions with Municipal Recycling Program Summary sheets to maintain consistency.

#### 3.2.6 Enforcement Program

The SWMP and Recycling plan require a comprehensive enforcement program to ensure municipal, commercial, industrial and institutional sectors within Bergen County comply. The County's enforcement program is established in the SWMP and has been amended with the May 15, 2008 and September 3, 2008 Administrative Actions.

The Bergen County Department of Health Services (BCDHS) is the only County Agency with statutory authority designated in the County Environmental Health Act to enforce the New Jersey Solid Waste Management Act. In Bergen County, they are also responsible for monitoring compliance with the Recycling Plan. The BCDHS conducts regular inspections to monitor compliance. The County also relies on the municipality to enforce their municipal recycling ordinances. The ordinances were included in Appendix L of the SWMP.



## 4 Review of Truck Route Ingress and Egress at Transfer Stations

This Section evaluates the existing solid waste truck ingress/egress routes for Bergen County's permitted transfer stations.

### 4.1 Scope and Approach

Approved solid waste transfer trailer traffic ingress and egress routes at each of the permitted transfer stations in Bergen County are incorporated by law in the SWMP. The current routes were added to the SWMP by the May 15, 2008 Administrative Action. Those routes and maps are included in this report as **Appendix E**.

A desktop study has been conducted to evaluate the routes currently included in the SWMP. As part of the study, potential alternative routes for some sites were identified, and these routes have also been evaluated. The evaluation criteria included consideration of factors affecting the appropriateness of the routes, such as overall route length, affected residential and other sensitive areas, and suitability of the roadway.

The following sub-sections present the findings of the evaluation along with recommended actions. Alternate routes should be discussed with the permitted facility operator and/or reviewed further prior to amending the SWMP.

### 4.2 Permitted Transfer Stations Routes

#### 4.2.1 I.W.S. Transfer Systems of NJ, Inc.

##### 60 Railroad Ave., Closter, NJ 07624

The SWMP provides a Primary North Route, Primary South Route, and Secondary South Route for I.W.S.'s Closter transfer station.

The northbound travel is primarily on Livingston St., a principal arterial road with limited residential development. Alternate routes, including travel on Tappan Road or Piermont Road, were considered but they were either mostly through residential areas or too lengthy.

The North Route for both inbound and outbound traffic remains the best route.

The Primary and Secondary South Routes include travel on Closter Dock Road towards US 9W when leaving the Facility, which is optimal for southbound and westbound traffic. The optimal route between the facility and Closter Dock Road is not as apparent and various sequences have been reviewed in closer detail. An alternate route was developed; see Table 12 for a comparison of the two existing routes and the alternate route.

The Alternate Route may be favorable as it avoids travel through Closter's downtown and pedestrian traffic. The Primary Route is longer than the Secondary Route, however the additional mileage is traveled on Livingston Street, a principal arterial which is favorable over Herbert Avenue, a minor arterial.

##### 4.2.1.1 Recommended Actions

- Review proposed Alternate Route (Table 11) as Primary Route.
- Relabel Primary Route as Secondary Route.

**Table 11: I.W.S. Closter – Alternate Route**

**Outbound Route**

Follow...	Direction	To...	Continue...
Railroad Ave.	North	Van Sciver St.	Left
Van Sciver St.	Northwest	West St.	Right
West St.	Northeast	Blanche Ave.	Right
Blanche Ave.	East	Herbert Ave.	Right
Herbert Ave.	South	Homans Ave.	Left
Homans Ave.	East	Piermont Road	Right
Piermont Road	South	Closter Dock Road	Left
Closter Dock Road	East	US 9W	South
US 9W	South	I80	West

**Inbound Route**

Follow...	Direction	To...	Continue...
I-80	East	US 9W	North
US 9W	North	Closter Dock Road	Left
Closter Dock Road	West	Piermont Road	Right
Piermont Road	North	Homans Ave.	Left
Homans Ave.	West	Herbert Ave.	Right
Herbert Ave.	North	Blanche Ave.	Left
Blanche Ave.	West	West St.	Left
West St.	Southwest	Van Sciver St.	Left
Van Sciver St.	Southeast	Railroad Ave.	Right
Railroad Ave.	South	Facility	

**Table 12: I.W.S. Closter - South Routing**

	Total Mileage**	Residential Mileage	Geometric Roadway Concerns	Comments
Primary (Inbound & Outbound*)	3.0	1.1		Travels through downtown and past a park and middle school.
Secondary (Inbound & Outbound*)	2.0	1.1	Narrower Streets	Travels through downtown.
Alternative (Inbound & Outbound*)	2.1	0.6		

\* Inbound and outbound routes travel same streets in reverse.

\*\*Total Mileage was mileage between the Facility and intersection of Piermont Road and Closter Dock Road

**4.2.2 Waste Management of NJ, Inc.**

**61 Broad Ave., Fairview, NJ 07022**

The SWMP provides a Primary North Route to the NJ Turnpike, a Secondary North Route to the George Washington Bridge, and a South Route to the County Border. The transfer station is located on Broad Ave. (NJ Route 1-9) which is a principal arterial road. All travel for each of the three established routes remains on principal arterial roadways. These routes remain the optimal transfer trailer traffic routes.

**4.2.2.1 Recommended Action**

No change to approved routes recommended.

### 4.2.3 National Transfer, Inc.

#### 445 North Main St., Lodi, NJ 07644

The SWMP provides primary outbound and inbound routes and only an outbound Route 80 Route. The transfer station is located on a minor arterial road and all travel for each of the three established routes remains on principal arterial or minor arterial roadways. These routes remain the optimal transfer trailer traffic routes.

#### 4.2.3.1 Recommended Action

No change to approved routes recommended.

### 4.2.4 I.W.S. Transfer Systems of NJ, Inc.

#### 19-35 Atlantic St., Garfield, NJ 07026

The SWMP provides a Primary and Secondary Route between the facility and I-80. If needing to go south, the hauler could take NJ Route 21 South as opposed to NJ Route 21 North towards I-80. The transfer station is located on the corner of Atlantic Street and Commerce Street, but the routes start on River Drive. See Table 13 for revised routes.

A large school is being constructed on Dayton Avenue in Passaic, which may increase congestion on the Primary Route. The Secondary Route should remain in the SWMP and could be used for outbound traffic during times of school traffic. There is no southbound exit for Ackerman Avenue on NJ Route 21 so all inbound traffic must use the Primary Route at all times.

#### 4.2.4.1 Recommended Action

Revise all routes to begin or end at Facility, not River Street. This is a minor revision to correct the written routes and will not have any effect on local roads as the trucks are currently driving this route.

**Table 13: I.W.S. Garfield - Revised Routes**

#### Outbound Route

Follow...	Direction	To...	Continue...
Commerce St.	East	Midland Ave.	Left
Midland Ave.	North	Monroe St.	Left
Monroe St.	West	Dayton Ave.	Right
Dayton Ave.	North	NJ Route 21	North
NJ Route 21	North	NJ Route 20	North
NJ Route 20	North	I-80	West

#### Inbound Route

Follow...	Direction	To...	Continue...
I-80	East	NJ Route 20	South
NJ Route 20	South	NJ Route 21	South
NJ Route 21	South	Dayton Ave. Exit	South
Dayton Ave.	South	Monroe St.	Left
Monroe St.	West	Midland Ave.	Right
Midland Ave.	South	Commerce St.	Right
Commerce St.	West	Facility	

## Secondary Route (Outbound Only)

### Outbound Route

Follow...	Direction	To...	Continue...
Commerce St.	East	Midland Ave.	Left
Midland Ave.	North	Monroe St.	Left
Monroe St.	West	River Dr.	Right
River Dr.	North	Outwater Ln.	Left
Outwater Ln.	West	Ackerman Ave.	Straight
Ackerman Ave.	West	NJ Route 21	Right
NJ Route 21	North	NJ Route 20	North
NJ Route 20	North	I-80	West

### 4.2.5 S&L Zeppetelli, Inc.

#### Moonachie Road, Moonachie, NJ 07074

The construction of the American Dream Meadowlands shopping and entertainment complex is nearing the completion of construction and will be opening soon on Route 120 in East Rutherford. This complex will generate additional congestion in the surrounding areas but is expected to have minimal effect on the existing routes. A small percentage of guests will ingress or egress from Washington Avenue, limiting the effects of the current Primary and Secondary Routes and congestion at the transfer station.

The current Primary and Secondary Routes established for this location are similar in terms of travel through residential areas. The Primary Route includes Moonachie Avenue, which is heavily congested and subject to delays. The Secondary Route avoids Moonachie Avenue and is shorter in terms of overall mileage. The Secondary Route should be considered to become the Primary Route and vice versa.

#### 4.2.5.1 Recommended Actions

- Relabel Primary Route as Secondary Route.
- Relabel Secondary Route as Primary Route.

**Table 14: S&L Zeppetelli, Inc. - South Routing**

	Total Mileage	Residential Mileage	Geometric Roadway Concerns	Comments
Primary (Inbound & Outbound*)	6.5	0.2	None	Moonachie Ave is frequently congested.
Secondary (Inbound & Outbound*)	3.7	0.2	None	None

\* Inbound and outbound routes travel same streets in reverse.

### 4.2.6 Waste Management of NJ, Inc.

#### 77 Brookside Place, Hillsdale, NJ 07642

The SWMP provides a route to get from the Facility to NJ Route 17 southbound. Once on NJ Route 17, haulers could travel west by following the route onto I-80. Southbound haulers could remain on NJ Route 17, exit onto NJ Route 3 and then continue onto NJ Turnpike Southbound. The route between the Facility and NJ Route 17 was closely reviewed as there is no direct route.

The Primary Route was compared to several combinations of principal and minor arterial roads. After reviewing mileage and roadways concerns, the existing outbound and inbound routes were compared to a feasible alternate route. The outbound Alternate Route consists of a right turn off Pascack Road onto Washington Ave followed by a left turn onto Van Emburgh Avenue. The hauler would follow Van Emburgh Ave. to NJ Route 17.

The current Primary Outbound and Inbound routes remain acceptable. Table 15 provides a comparison showing that these Primary Routes are optimal. If necessary, the Alternate Route including Washington Ave and Van Emburgh Avenue could serve as reasonable Secondary Route.

**Table 15: Waste Management of NJ, Inc. - South Routing**

	Total Mileage**	Residential Mileage	Geometric Roadway Concerns	Comments
Primary (Inbound & Outbound*)	3.9	2.9	None	
Alternate (Inbound & Outbound*)	3.9	3.5	One additional RH turn.	Immaculate Heart Academy on Van Emburgh Ave.

\* Inbound and outbound routes travel same street in reverse.

\*\* Total Mileage was mileage between the Facility and NJ Route 17 only.

**4.2.6.1 Recommended Action**

No change to approved routes recommended.

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# **A. Solid Waste and Recycling Projections 2019 to 2029**

## Final Report

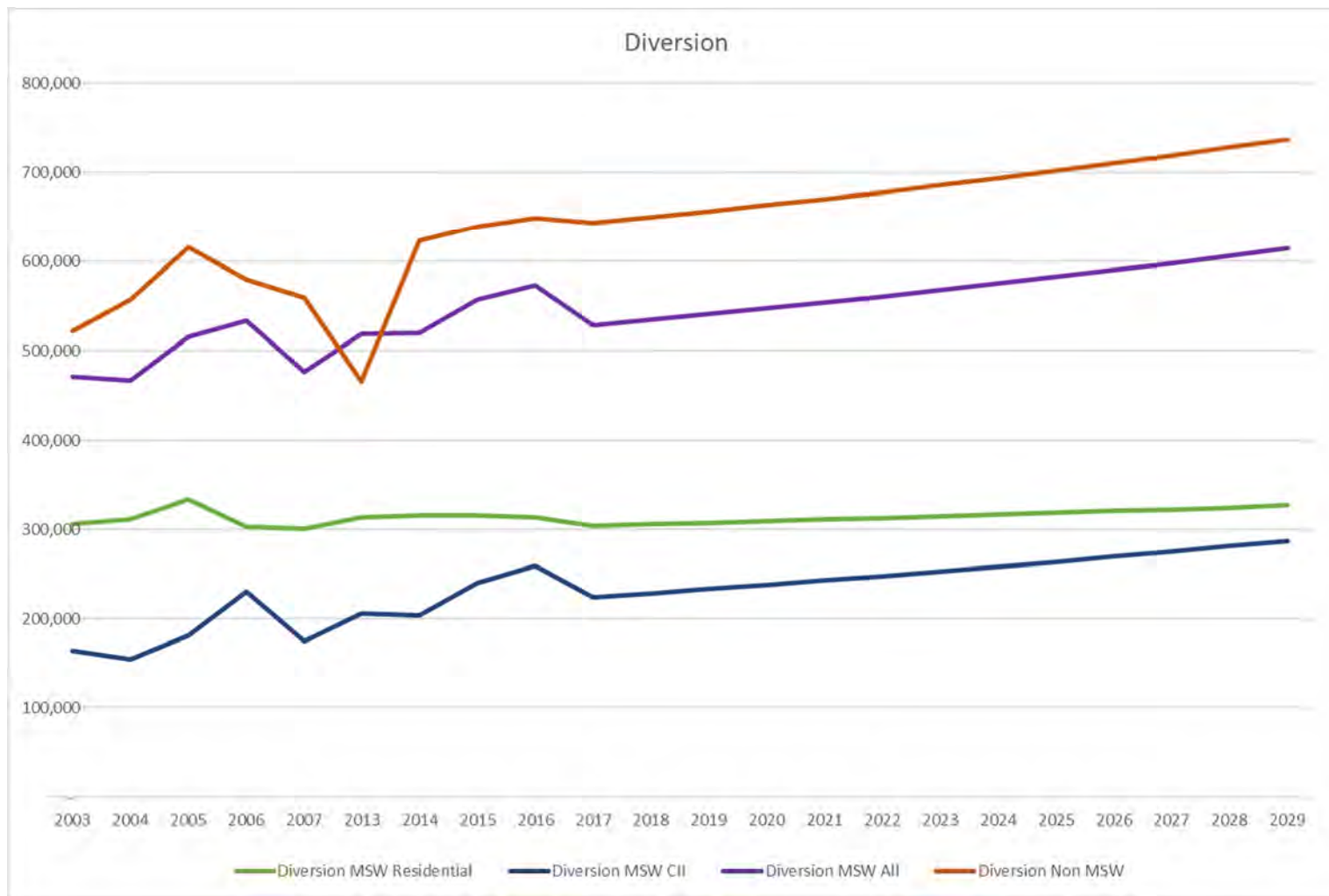
**Table 16: Total Estimated Annual Quantities of MSW and Non-MSW Generated, Diverted and Disposed by Source 2003 to 2029**

	2003	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Generation</b>												
MSW Residential	764,851	663,722	663,126	662,768	662,644	662,753	663,091	663,656	664,445	665,457	666,690	668,141
MSW CII	458,281	468,552	472,020	475,626	479,373	483,263	487,301	491,488	495,827	500,323	504,978	509,796
MSW All (CII+Res)	1,223,132	1,132,274	1,135,146	1,138,394	1,142,017	1,146,016	1,150,392	1,155,143	1,160,273	1,165,780	1,171,668	1,177,937
Non MSW	816,507	979,108	987,002	995,219	1,003,767	1,012,650	1,021,876	1,031,451	1,041,383	1,051,677	1,062,342	1,073,385
<b>All Solid Waste</b>	<b>2,039,640</b>	<b>2,111,382</b>	<b>2,122,148</b>	<b>2,133,613</b>	<b>2,145,784</b>	<b>2,158,667</b>	<b>2,172,268</b>	<b>2,186,595</b>	<b>2,201,655</b>	<b>2,217,457</b>	<b>2,234,010</b>	<b>2,251,322</b>
<b>Diversion</b>												
MSW Residential	306,403	307,610	309,303	311,050	312,852	314,709	316,622	318,590	320,615	322,697	324,836	327,032
MSW CII	165,175	233,486	238,225	243,097	248,106	253,256	258,551	263,996	269,596	275,353	281,275	287,365
MSW All (CII+Res)	471,577	541,096	547,528	554,147	560,958	567,965	575,173	582,587	590,211	598,050	606,111	614,398
Non MSW	522,078	656,313	663,247	670,432	677,875	685,580	693,552	701,797	710,320	719,126	728,222	737,613
<b>All Solid Waste</b>	<b>993,656</b>	<b>1,197,409</b>	<b>1,210,774</b>	<b>1,224,579</b>	<b>1,238,833</b>	<b>1,253,545</b>	<b>1,268,725</b>	<b>1,284,384</b>	<b>1,300,530</b>	<b>1,317,177</b>	<b>1,334,333</b>	<b>1,352,011</b>
<b>Disposal</b>												
MSW Residential	458,448	356,112	353,823	351,718	349,792	348,044	346,469	345,066	343,830	342,761	341,854	341,108
MSW CII	293,107	235,066	233,795	232,529	231,267	230,007	228,749	227,491	226,232	224,969	223,703	222,431
MSW All (CII+Res)	751,555	591,178	587,618	584,247	581,059	578,051	575,219	572,557	570,062	567,730	565,557	563,539
Non MSW	294,429	329,481	330,689	331,973	333,334	334,775	336,296	337,899	339,586	341,357	343,216	345,163
<b>All Solid Waste</b>	<b>1,045,984</b>	<b>920,659</b>	<b>918,307</b>	<b>916,219</b>	<b>914,393</b>	<b>912,826</b>	<b>911,515</b>	<b>910,456</b>	<b>909,647</b>	<b>909,087</b>	<b>908,772</b>	<b>908,702</b>

Source: BCUA (2019) Table 1



**Figure 3: Diversion of MSW CII, Residential and All Sources, and All Non-MSW (2003 to 2029), Tons**



**Table 17: MSW Composition (%), Generation, Recycling & Disposal Quantities (Tons), & Recycling Rate (%) 2003, 2019 & 2029**

Material	2003					2019					2029				
	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate	MSW Composition	Generation	Diversion	Disposal	Recycling rate
<b>Total paper</b>	<b>33.8%</b>	<b>413,667</b>	<b>146,865</b>	<b>266,802</b>	<b>35.5%</b>	<b>30.6%</b>	<b>346,919</b>	<b>183,258</b>	<b>163,661</b>	<b>52.8%</b>	<b>28.9%</b>	<b>340,698</b>	<b>216,980</b>	<b>123,718</b>	<b>63.7%</b>
Corrugated	9.4%	115,306	64,200	51,106	55.7%	11.8%	133,816	96,916	36,900	72.4%	13.0%	152,559	130,601	21,959	85.6%
Mixed Office Paper	2.8%	33,643	15,605	18,037	46.4%	3.9%	44,239	35,288	8,951	79.8%	4.3%	50,685	40,848	9,837	80.6%
Newspaper	7.0%	85,475	49,401	36,075	57.8%	4.1%	46,492	32,822	13,670	70.6%	3.1%	36,379	28,165	8,214	77.4%
Magazines/glossy & other	14.7%	179,243	17,659	161,584	9.9%	10.8%	122,372	18,232	104,140	14.9%	8.6%	101,075	17,366	83,709	17.2%
<b>Total plastic</b>	<b>9.5%</b>	<b>116,597</b>	<b>4,615</b>	<b>111,982</b>	<b>4.0%</b>	<b>8.3%</b>	<b>94,502</b>	<b>7,618</b>	<b>86,884</b>	<b>8.1%</b>	<b>7.7%</b>	<b>90,285</b>	<b>7,886</b>	<b>82,399</b>	<b>8.7%</b>
Plastic Containers	1.3%	15,480	4,206	11,273	27.2%	2.1%	23,828	5,924	17,904	24.9%	2.4%	28,349	5,497	22,853	19.4%
Other Plastic	8.3%	101,117	409	100,708	0.4%	6.2%	70,673	1,694	68,979	2.4%	5.3%	61,936	2,390	59,546	3.9%
Textiles and fabrics	3.5%	42,617	1,281	41,336	3.0%	3.6%	40,869	4,061	36,808	9.9%	3.3%	39,261	5,285	33,976	13.5%
Yard Waste	22.2%	272,096	248,798	23,298	91.4%	25.4%	287,303	250,938	36,365	87.3%	28.3%	333,817	278,331	55,486	83.4%
Food Waste	11.8%	144,464	33,234	111,230	23.0%	14.1%	159,125	38,684	120,441	24.3%	15.0%	177,226	46,364	130,862	26.2%
Other - Misc. organic / animal products	4.2%	51,106	-	51,106	0.0%	1.6%	18,494	-	18,494	0.0%	1.1%	12,951	-	12,951	0.0%
Wood	2.3%	28,559	-	28,559	0.0%	1.1%	12,597	-	12,597	0.0%	0.7%	8,821	-	8,821	0.0%
<b>Total metal</b>	<b>3.8%</b>	<b>46,893</b>	<b>7,812</b>	<b>39,081</b>	<b>16.7%</b>	<b>3.4%</b>	<b>38,650</b>	<b>11,196</b>	<b>27,454</b>	<b>29.0%</b>	<b>3.8%</b>	<b>44,173</b>	<b>12,002</b>	<b>32,171</b>	<b>27.2%</b>
Aluminum - Containers	0.8%	9,462	4,202	5,261	44.4%	0.9%	10,706	4,620	6,087	43.1%	1.1%	12,526	5,344	7,183	42.7%
Steel/tin & mixed - Containers	0.5%	5,865	3,610	2,255	61.6%	1.8%	20,814	6,576	14,238	31.6%	2.3%	26,654	6,658	19,995	25.0%
Other metal	2.6%	31,565	-	31,565	0.0%	0.6%	7,130	-	7,130	0.0%	0.4%	4,993	-	4,993	0.0%
Glass	3.2%	39,122	23,340	15,783	59.7%	5.2%	58,771	31,916	26,855	54.3%	4.7%	55,242	30,717	24,525	55.6%
Consumer electronics	0.6%	6,764	-	6,764	0.0%	0.5%	5,667	3,336	2,332	58.9%	0.5%	6,454	4,705	1,748	72.9%
Household hazardous & batteries	0.7%	8,338	5,632	2,706	67.5%	1.1%	12,408	10,089	2,318	81.3%	1.2%	13,998	12,127	1,870	86.6%
Miscellaneous	4.3%	52,910	-	52,910	0.0%	5.0%	56,969	-	56,969	0.0%	4.7%	55,011	-	55,011	0.0%
<b>TOTAL MSW (10+23)</b>	<b>100.0%</b>	<b>1,223,132</b>	<b>471,577</b>	<b>751,555</b>	<b>38.6%</b>	<b>100.0%</b>	<b>1,132,274</b>	<b>541,096</b>	<b>591,178</b>	<b>47.8%</b>	<b>100.0%</b>	<b>1,177,937</b>	<b>614,398</b>	<b>563,539</b>	<b>52.2%</b>

Source: BCUA (2019) Table 2

**Table 18: Non-MSW Composition (%), Generation, Recycling & Disposal Quantities (Tons), & Recycling Rate (%) 2019 & 2029**

Material	2003					2019					2029				
	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate	Composition	Generation	Recycling	Disposal	Recycling rate
Vegetative waste	10.0%	81,899	3,056	78,843	3.7%	2.8%	27,931	3,290	24,641	11.8%	2.4%	26,527	2,857	23,670	10.8%
White Goods & Appliances	4.1%	33,112	30,870	2,242	93.2%	4.1%	40,441	36,810	3,631	91.0%	5.3%	56,913	42,301	14,612	74.3%
Automobile Scrap, heavy iron & non-ferrous	16.8%	136,820	102,564	34,255	75.0%	7.1%	70,090	54,752	15,338	78.1%	7.5%	80,762	47,552	33,210	58.9%
Batteries (Automobile)	0.1%	645	645	-	100.0%	0.4%	3,539	3,373	166	95.3%	0.3%	3,411	2,505	907	73.4%
Furniture	3.3%	26,792	-	26,792	0.0%	0.8%	8,142	-	8,142	0.0%	0.7%	7,083	-	7,083	0.0%
Textiles, carpet and padding	3.8%	31,417	-	31,417	0.0%	0.9%	8,946	-	8,946	0.0%	0.6%	6,265	-	6,265	0.0%
Electronic	0.3%	2,452	-	2,452	0.0%	0.1%	777	-	777	0.0%	0.1%	777	-	777	0.0%
Tires	0.5%	3,844	1,843	2,002	47.9%	0.3%	3,142	2,595	547	82.6%	0.3%	3,139	3,069	70	97.8%
<b>TOTAL Bulky (Type 13)</b>	<b>38.8%</b>	<b>316,981</b>	<b>138,978</b>	<b>178,003</b>	<b>43.8%</b>	<b>16.5%</b>	<b>163,007</b>	<b>100,821</b>	<b>62,187</b>	<b>61.9%</b>	<b>17.1%</b>	<b>184,878</b>	<b>98,284</b>	<b>86,594</b>	<b>53.2%</b>
Wood	7.1%	57,814	9,353	48,461	16.2%	11.2%	110,498	9,196	101,301	8.3%	8.9%	95,985	10,021	85,963	10.4%
Concrete/Asphalt/Block/Brick	35.7%	291,806	287,056	4,751	98.4%	39.0%	384,651	365,336	19,315	95.0%	44.9%	485,968	463,370	22,598	95.3%
Roofing	2.6%	21,385	-	21,385	0.0%	4.8%	47,026	-	47,026	0.0%	4.4%	47,525	-	47,525	0.0%
Drywall	1.4%	11,164	-	11,164	0.0%	2.5%	24,550	-	24,550	0.0%	2.3%	24,811	-	24,811	0.0%
Soil & Gravel	10.4%	85,080	81,879	3,201	96.2%	18.4%	181,324	175,870	5,454	97.0%	15.3%	165,964	160,117	5,847	96.5%
Corrugated paper	0.5%	4,437	-	4,437	0.0%	1.0%	9,757	-	9,757	0.0%	0.9%	9,861	-	9,861	0.0%
Plastic	0.6%	4,786	-	4,786	0.0%	1.1%	10,524	-	10,524	0.0%	1.0%	10,636	-	10,636	0.0%
Metal	0.2%	1,358	-	1,358	0.0%	0.3%	2,985	-	2,985	0.0%	0.3%	3,017	-	3,017	0.0%
Glass	0.0%	98	-	98	0.0%	0.0%	215	-	215	0.0%	0.0%	217	-	217	0.0%
Other	2.5%	20,622	4,788	15,834	23.2%	3.8%	37,220	2,002	35,218	5.4%	3.6%	39,460	2,824	36,636	7.2%
<b>TOTAL C&amp;D (Type 13C)</b>	<b>61.1%</b>	<b>498,550</b>	<b>383,075</b>	<b>115,475</b>	<b>76.8%</b>	<b>82.0%</b>	<b>808,750</b>	<b>552,404</b>	<b>256,346</b>	<b>68.3%</b>	<b>81.6%</b>	<b>883,442</b>	<b>636,332</b>	<b>247,110</b>	<b>72.0%</b>
Type 25	0.0%	27	-	27	0.0%	0.0%	48	-	48	0.0%	0.0%	54	-	54	0.0%
Type 27	0.1%	923	-	923	0.0%	1.1%	10,413	-	10,413	0.0%	1.0%	10,714	-	10,714	0.0%
Type 27A	0.0%	26	26	-	100.0%	0.3%	3,429	3,088	340	90.1%	0.3%	3,531	2,998	533	84.9%
Type 27I	0.0%	-	-	-	-	0.0%	-	-	-	-	0.0%	-	-	-	-
Type 72	0.0%	-	-	-	-	0.0%	147	-	147	0.0%	0.0%	157	-	157	0.0%
<b>TOTAL Other</b>	<b>0.1%</b>	<b>976</b>	<b>26</b>	<b>951</b>	<b>2.6%</b>	<b>1.4%</b>	<b>14,037</b>	<b>3,088</b>	<b>10,949</b>	<b>22.0%</b>	<b>1.3%</b>	<b>14,456</b>	<b>2,998</b>	<b>11,459</b>	<b>20.7%</b>
<b>TOTAL Non-MSW</b>	<b>100.0%</b>	<b>816,507</b>	<b>522,078</b>	<b>294,429</b>	<b>63.9%</b>	<b>100.0%</b>	<b>985,794</b>	<b>656,313</b>	<b>329,481</b>	<b>66.6%</b>	<b>100.0%</b>	<b>1,082,776</b>	<b>737,613</b>	<b>345,163</b>	<b>68.1%</b>

Source: BCUA (2019) Table

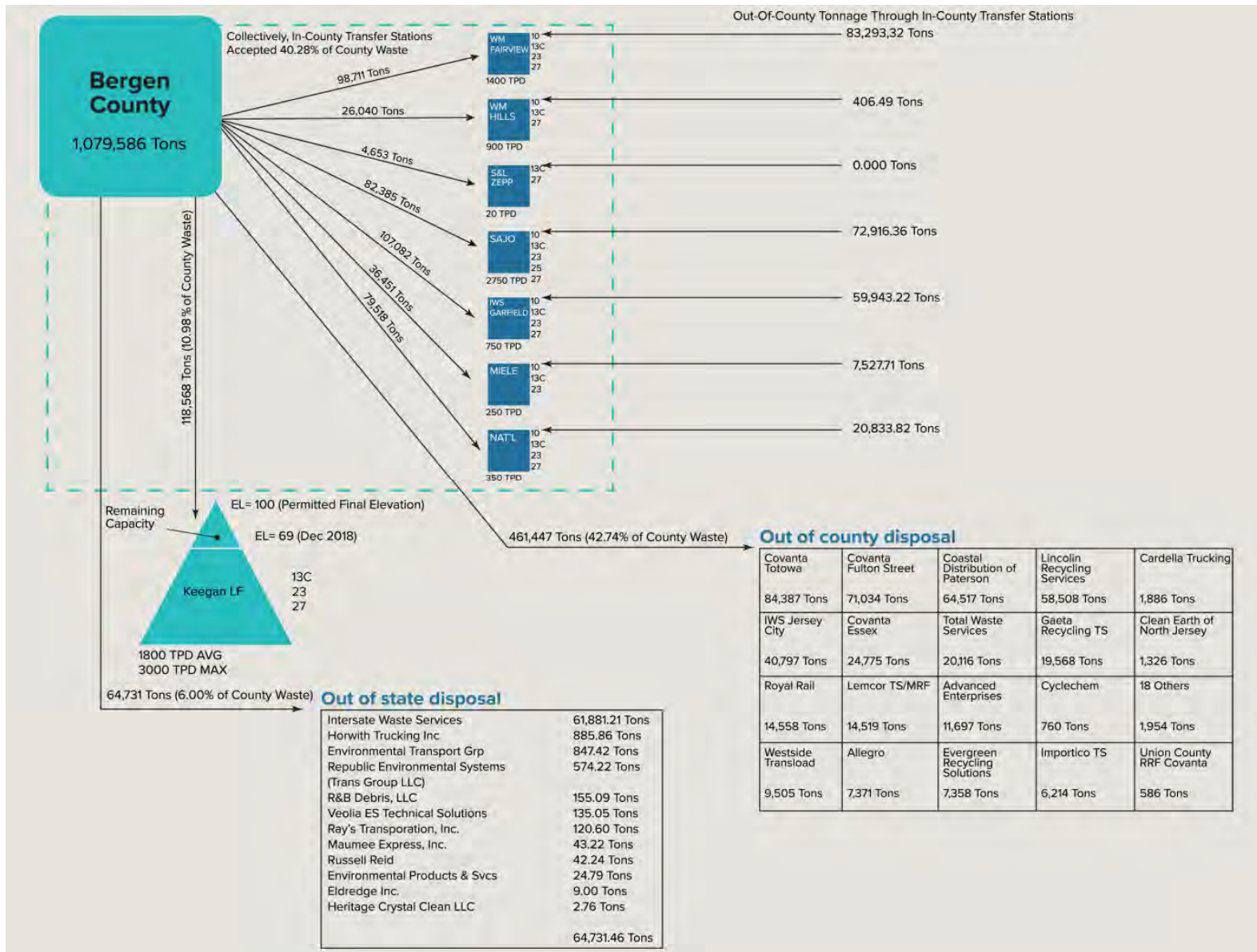
## **B. Operating Transfer Stations in Bergen County**

**Figure 4: Operating Transfer Stations in Bergen County**

Facility Name and Address	Lot and Block Details	Facility Type	Facility ID Number(s)	Authorized Waste and Recyclable Types	Permit Expiration Date	Material Acceptance & Processing Schedule	Permitted Tonnage Details
Waste Management of NJ Inc. 61 Broad Avenue Fairview Borough, NJ	Block 501; Lot 7 and 8	TS/MRF	131871	10, 13, 13C, 23, 27	8/25/2023	Waste Acceptance: Monday - Saturday, 24 H/D	1,400 TPD, not to exceed 8,400 TPW. Inbound Class A and Class B materials limited to 200 TPD, not to exceed 600 TPW 24 H/D
				Class A		Waste Processing: Monday - Saturday, 24 H/D	
				Class B			
Waste Management of NJ Inc. 131 Patterson Avenue Hillsdale Borough, NJ	Block 1210, 1211; Lot 10, 1	TS/MRF	133484	10, 13, 13C, 27	12/15/2022	Waste Acceptance: Monday - Friday, 7:00AM-5:00PM and Saturday 7:00AM-2:00PM Waste Processing: Monday - Friday, 7:00AM-7:00PM and Saturday, 7:00AM-3:00PM	900 TPD
S&L Zeppetelli, Inc. 191 Moonachie Road Moonachie Borough, NJ	Block 38; Lot 3	TS/MRF	131894	13, 13C, 27	11/19/2019	Waste Acceptance: Monday - Friday, 6:00AM-4:00PM and Saturday 6:00AM-1:00PM Waste Processing: Monday - Friday, 6:00AM-4:00PM and Saturday 6:00AM-1:00PM	20 TPD
National Transfer Inc. 445 North Main Street Lodi Borough, NJ	Block 169.02, Lot 21.01 and 21.05	TS/MRF	131883	10, 13, 13C, 23, 27	6/10/2019	Waste Acceptance: Monday - Friday, 6:30AM-2:30PM and Saturday 6:30AM-1:00PM. Waste from Borough of Lodi may be accepted until 3:00PM. Waste Processing: Monday - Friday, 6:30AM-5:30PM and Saturday 6:30AM-1:00PM or later when waste from Borough of Lodi is accepted but NLT 5:30PM.	350 TPD
Owner: NJS&EA Operator: SAJO Transport 100 Baler Boulevard North Arlington Borough, NJ	Block 175 and 177; Lot 1 (partial)	TS/MRF	203153	10, 13, 13C, 23, 25, 27	3/28/2021	Waste Acceptance: Monday - Friday, 6:00AM-4:30PM and Saturday 6:00AM-3:30PM Waste Processing: Monday - Saturday, 6:00AM-10:00PM	2,750 TPD, not to exceed 12,000 TPW
IWS Transfer Systems of NJ, Inc. 19-35 Atlantic Street Garfield, NJ	Block 34.02; Lot 41 Block 48.02; Lot 16.01 Block 52; Lot 46 Block 220; Lot 7 (partial)	TS/MRF	131873	10, 13, 13C, 23, 27	8/6/2023	Waste Acceptance: Monday - Friday, 6:00AM-5:00PM and Saturday 7:00AM-1:00PM Waste Processing: Monday - Friday, 6:00AM-7:00PM and Saturday 7:00AM-5:00PM	750 TPD, not to exceed 3,520 TPW of SW and Class A (total); Maximum Daily Class A 100 Tons
				Class A			
IWS Transfer Systems of NJ, Inc. 60 Railroad Avenue Borough of Closter, NJ	Block 1205 Lot 3.01, 10, 11, 25-foot area along Wellington Block 1206; Lot 19 (storage only)	TS/MRF	131858	10, 13, 13C, 23	4/13/2016 (under renewal)	Waste Acceptance: Monday - Saturday, 7:00AM-5:00PM Waste Processing: Monday - Saturday, 7:00AM-10:00PM	250 TPD of SW, Class A, and Class B (total); Maximum Daily SW 145 Tons; Maximum Daily Class A 30 Tons
IWS Transfer Systems of NJ, Inc. 60 Railroad Avenue Borough of Closter, NJ	Block 1204; Lot 8 (partial) Block 1205 Lot 3.01, 10, 11, 25-foot area along Wellington Block 1206; Lot 19 (storage only)	Recycling Center	197012	Class B	11/30/2019	Material Acceptance: Monday - Saturday, 7:00AM-5:00PM Material Processing: Monday - Saturday, 7:00AM-5:00PM	Maximum Daily Class B 75 Tons

Source: BCUA

## **C. Bergen County Waste Flow Model 2018**





## **D. Bergen County Recycling Data 2019 & 2029**



**Table 19: 2019 Residential Recycling Analysis**

Waste Stream	Tons Generated	% of total generated	Tons Diverted	Recycling rate (% diverted)	% of total diverted	Tons diversion required for 50%	Shortfall / excess for 50% by material
Yard Waste	233,372	35.2%	210,808	90.3%	68.5%	116,686	94,122
Corrugated	38,461	5.8%	16,391	42.6%	5.3%	19,231	(2,840)
Food Waste	80,423	12.1%	6,938	8.6%	2.3%	40,211	(33,273)
Mixed Office Paper	10,882	1.6%	7,192	66.1%	2.3%	5,441	1,751
Newspaper	33,688	5.1%	24,581	73.0%	8.0%	16,844	7,737
Glass	37,761	5.7%	21,235	56.2%	6.9%	18,881	2,355
Magazines/glossy & other	68,173	10.3%	5,427	8.0%	1.8%	34,087	(28,660)
Household hazardous	2,565	0.4%	1,167	45.5%	0.4%	1,283	(116)
Steel/tin & mixed - Containers	12,240	1.8%	3,203	26.2%	1.0%	6,120	(2,917)
Plastic Containers	14,514	2.2%	3,789	26.1%	1.2%	7,257	(3,468)
Aluminum - Containers	6,321	1.0%	2,718	43.0%	0.9%	3,161	(443)
Textiles and fabrics	21,866	3.3%	1,315	6.0%	0.4%	10,933	(9,618)
Consumer electronics	4,365	0.7%	2,821	64.6%	0.9%	2,183	639
Other Plastic	42,355	6.4%	24	0.1%	0.0%	21,178	(21,154)
Other - Misc. organic / animal products	10,353	1.6%				5,177	(5,177)
Wood	7,317	1.1%				3,659	(3,659)
Other metal	4,348	0.7%				2,174	(2,174)
Miscellaneous	34,718	5.2%				17,359	(17,359)
<b>TOTAL</b>	<b>663,722</b>	<b>100%</b>	<b>307,609</b>	<b>46.3%</b>	<b>100%</b>	<b>331,861</b>	<b>(24,252)</b>

Source: BCUA (2019)

**Table 20: 2019 CII Analysis**

Waste Stream	Tons Generated	% of total generated	Tons Diverted	Recycling rate (% diverted)	% of total diverted	Tons diversion required for 50%	Shortfall / excess for 50% by material
Yard Waste	53,932	11.5%	40,130	74.4%	17.2%	26,966	13,164
Corrugated	95,354	20.4%	80,525	84.4%	34.5%	47,677	32,848
Food Waste	78,702	16.8%	31,745	40.3%	13.6%	39,351	(7,606)
Mixed Office Paper	33,357	7.1%	28,096	84.2%	12.0%	16,679	11,418
Newspaper	12,805	2.7%	8,240	64.3%	3.5%	6,403	1,838
Glass	21,011	4.5%	10,681	50.8%	4.6%	10,506	176
Magazines/glossy & other	54,200	11.6%	12,806	23.6%	5.5%	27,100	(14,294)
Household hazardous & batteries	9,842	2.1%	8,922	90.7%	3.8%	4,921	4,001
Steel/tin & mixed - Containers	8,574	1.8%	3,374	39.4%	1.4%	4,287	(913)
Plastic Containers	9,314	2.0%	2,135	22.9%	0.9%	4,657	(2,522)
Aluminum - Containers	4,386	0.9%	1,901	43.3%	0.8%	2,193	(292)
Textiles and fabrics	19,003	4.1%	2,746	14.5%	1.2%	9,502	(6,756)
Consumer electronics	1,302	0.3%	514	39.5%	0.2%	651	(137)
Other Plastic	28,318	6.0%	1,670	5.9%	0.7%	14,159	(12,489)
Other - Misc. organic / animal products	8,141	1.7%			0.0%	4,071	(4,071)
Wood	5,279	1.1%			0.0%	2,640	(2,640)
Other metal	2,782	0.6%			0.0%	1,391	(1,391)
Miscellaneous	22,251	4.7%			0.0%	11,126	(11,126)
<b>TOTAL</b>	<b>468,553</b>	<b>100%</b>	<b>233,485</b>	<b>49.8%</b>	<b>100%</b>	<b>234,277</b>	<b>(792)</b>

Source: BCUA (2019)

**Table 21: 2029 Residential Recycling Analysis**

Waste Stream	Tons Generated	% of total generated	Tons Diverted	Recycling rate (% diverted)	% of total diverted	Tons diversion required for 50%	Shortfall / excess for 50% by material
Yard Waste	257,741	38.6%	232,215	90.1%	71.0%	128,871	103,345
Corrugated	49,549	7.4%	17,012	34.3%	5.2%	24,775	(7,763)
Food Waste	95,979	14.4%	9,787	10.2%	3.0%	47,990	(38,203)
Mixed Office Paper	12,858	1.9%	8,561	66.6%	2.6%	6,429	2,132
Newspaper	23,574	3.5%	19,925	84.5%	6.1%	11,787	8,138
Glass	33,272	5.0%	18,442	55.4%	5.6%	16,636	1,806
Magazines/glossy & other	51,166	7.7%	4,240	8.3%	1.3%	25,583	(21,343)
Household hazardous & batteries	2,687	0.4%	1,497	55.7%	0.5%	1,344	154
Steel/tin & mixed - Containers	14,559	2.2%	2,782	19.1%	0.9%	7,280	(4,498)
Plastic Containers	15,788	2.4%	3,986	25.2%	1.2%	7,894	(3,908)
Aluminum - Containers	6,340	0.9%	3,159	49.8%	1.0%	3,170	(11)
Textiles and fabrics	18,104	2.7%	1,412	7.8%	0.4%	9,052	(7,640)
Consumer electronics	5,059	0.8%	3,980	78.7%	1.2%	2,530	1,451
Other Plastic	36,603	5.5%	34	0.1%	0.0%	18,302	(18,268)
Other - Misc. organic / animal products	7,250	1.1%		0.0%	0.0%	3,625	(3,625)
Wood	5,124	0.8%		0.0%	0.0%	2,562	(2,562)
Other metal	3,045	0.5%		0.0%	0.0%	1,523	(1,523)
Miscellaneous	29,441	4.4%		0.0%	0.0%	14,721	(14,721)
<b>TOTAL MSW</b>	<b>668,139</b>	<b>100%</b>	<b>327,032</b>	<b>48.9%</b>	<b>100%</b>	<b>334,070</b>	<b>(7,038)</b>

Source: BCUA (2019)

**Table 22: 2029 CII Analysis**

Waste Stream	Tons Generated	% of total generated	Tons Diverted	Recycling rate (% diverted)	% of total diverted	Tons diversion required for 50%	Shortfall / excess for 50% by material
Yard Waste	76,076	14.6%	46,116	60.6%	16.0%	38,038	8,078
Corrugated	114,588	22.0%	113,588	99.1%	39.5%	57,294	56,294
Food Waste	81,247	15.6%	36,577	45.0%	12.7%	40,624	(4,047)
Mixed Office Paper	37,827	7.3%	32,287	85.4%	11.2%	18,914	13,374
Newspaper	12,805	2.5%	8,240	64.3%	2.9%	6,403	1,838
Glass	21,970	4.2%	12,275	55.9%	4.3%	10,985	1,290
Magazines/glossy & other	49,909	9.6%	13,126	26.3%	4.6%	24,955	(11,829)
Household hazardous & batteries	11,310	2.2%	10,630	94.0%	3.7%	5,655	4,975
Steel/tin & mixed - Containers	12,094	2.3%	3,877	32.1%	1.3%	6,047	(2,170)
Plastic Containers	12,562	2.4%	1,511	12.0%	0.5%	6,281	(4,770)
Aluminum - Containers	6,186	1.2%	2,185	35.3%	0.8%	3,093	(908)
Textiles and fabrics	21,157	4.1%	3,874	18.3%	1.3%	10,579	(6,705)
Consumer electronics	1,395	0.3%	726	52.0%	0.3%	698	29
Other Plastic	25,333	4.9%	2,356	9.3%	0.8%	12,667	(10,311)
Other - Misc. organic / animal products	5,701	1.1%		0.0%	0.0%	2,851	(2,851)
Wood	3,697	0.7%		0.0%	0.0%	1,849	(1,849)
Other metal	1,948	0.4%		0.0%	0.0%	974	(974)
Miscellaneous	25,570	4.9%		0.0%	0.0%	12,785	(12,785)
<b>TOTAL MSW</b>	<b>521,375</b>	<b>100%</b>	<b>287,368</b>	<b>55.1%</b>	<b>100%</b>	<b>260,688</b>	<b>26,681</b>

Source: BCUA (2019)

## **E. May 15, 2008 Administrative Action Solid Waste Transfer Trailer Traffic Routes**

**Appendix A: Solid Waste Transfer Trailer Traffic Routes**

The BCUA, as implementing agency for the Bergen County District Solid Waste Management Plan, retained the services of the traffic engineering firm of Edwards and Kelcey ("Traffic Engineer") to perform a truck route study for the eight solid waste transfer facilities located within the Bergen County Solid Waste Management District. The Solid Waste Transfer Trailer Truck Route Study ("Study") was performed during 2003 to determine the most appropriate solid waste transfer trailer traffic routes that minimize impact on traffic and the environment.

The Study involved gathering data from each transfer station regarding the daily waste tonnage processed and the number of transfer trailers that enter and exit per day, as well as the routes utilized by the trucks for each of the transfer stations. Once the routes were determined, key intersections along these routes were chosen as study intersections and became the focus of the analysis. Traffic counts were performed at all of the Study intersections to provide a basis against which the impact of the transfer trailers could be quantified. Future traffic conditions were derived by growing the background traffic and then determining the increase in transfer trailer volume due to increased tonnage allowance at the transfer stations. Once future conditions were established, alternate routes were analyzed. Alternate and existing routes were evaluated based upon length, constrained roadway geometry, and impact to adjacent sensitive land uses.

On April 21, 2004, a public hearing was conducted regarding a solid waste plan amendment incorporating the traffic routes set forth in the Study. Public comments were solicited and received at the public hearing. Subsequent to the public hearing, the BCUA commissioned the Traffic Engineer to perform an analysis of the comments regarding alternate routes detailed by the engineer representing the Borough of Hillsdale at the public hearing.

In addition, actions by the Borough of Lodi and the Bergen County Board of Chosen Freeholders required that further analysis be performed by the BCUA in order to finalize the traffic route study and plan amendment. On May 19, 2004, the Bergen County Board of Chosen Freeholders adopted an ordinance placing speed restrictions on trucks utilizing Closter Dock Road. Closter Dock Road is included in the plan amendment as a route for ingress and egress to the Miele Sanitation transfer station located in the Borough of Closter. Although the speed restrictions will not have an effect on the movement of solid waste transfer trailers utilizing the Miele Sanitation facility, the change in speed limitations may affect routing decisions. In addition, on July 21, 2004, the Borough of Lodi entered into a host community agreement with National Transfer transfer station. The host community agreement included traffic routes for ingress and egress to the National Transfer facility that differ from routes set forth in the plan amendment that was the subject of the April 21, 2004, public hearing.

As a result, these alternate routes were analyzed by the Traffic Engineer. The analysis was completed and the supplemental analysis, assumptions, procedures, and findings were documented in two addenda to the Study.

Based on the original Study recommendations and the recommendations incorporated in the two addenda to the Study, the Bergen County District Solid Waste Management Plan is hereby amended to incorporate the following solid waste transfer trailer truck routes.

Facility	Solid Waste Transfer Trailer Truck Routes			
<b>Waste Management Transfer of New Jersey, Inc. Transfer Station/Material Recovery Facility</b> 144 Kinderkamack Road Park Ridge, New Jersey 07656 Block 1801, Lot 5 Block 1802, Lot 6 and 7 NJDEP Facility No. 0247000101	<b>North Route:</b>			
	<b>Outbound Route</b>			
	<b>Follow...</b>	<b>Direction</b>	<b>To...</b>	<b>Continue...</b>
	Kinderkamack Rd.	North	Railroad Ave.	Left
	Railroad Ave.	Southwest	Grand Ave.	Right
	Grand Ave.	West	Spring Valley Rd.	Right
	Spring Valley Rd.	North	Red Schoolhouse Rd.	North
	Red Schoolhouse Rd.	North	G.S. Parkway Ext.	Merge North
	<b>Inbound Route</b>			
	<b>Follow...</b>	<b>Direction</b>	<b>To...</b>	<b>Continue...</b>
G.S. Parkway Ext.	South	Red Schoolhouse Rd.	South	
Spring Valley Rd.	South	Grand Ave.	Left	
Grand Ave.	East	Kinderkamack Rd.	Right	
Kinderkamack Rd.	South	Facility		
<b>South Route:</b>				
<b>Outbound Route</b>				
<b>Follow...</b>	<b>Direction</b>	<b>To...</b>	<b>Continue...</b>	
Kinderkamack Rd.	South	Park Ave.	Right	
Park Ave.	West	Broadway	Left	
Broadway	South	Parkview Dr.	Right	
Parkview Dr.	West	Lake Dr.	Left	
Lake Dr.	South	Patterson St.	Straight	
Patterson St.	South	Hillsdale Ave.	Right	
Hillsdale Ave.	West	Pascack Rd.	Left	
Pascack Rd.	South	Linwood Ave.	Right	
Linwood Ave.	West	NJ Route 17	South	
NJ Route 17	South	Essex St. Exit	Right	
Essex St.	West	Riverview Ave.	Left	
Riverview Ave.	South	I-80	West	
Trucks may also follow NJ Route 17 to I-80 Eastbound or NJ Route 3 Eastbound to NJ Turnpike Southbound.				

	<p style="text-align: center;"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr><td>I-80</td><td>East</td><td>Essex St. Exit</td><td>Left</td></tr> <tr><td>Riverview Ave.</td><td>North</td><td>Essex St.</td><td>Right</td></tr> <tr><td>Essex St.</td><td>East</td><td>NJ Route 17</td><td>North</td></tr> <tr><td>NJ Route 17</td><td>North</td><td>Linwood Ave.</td><td>Right</td></tr> <tr><td>Linwood Ave.</td><td>East</td><td>Pascack Rd.</td><td>Left</td></tr> <tr><td>Pascack Rd.</td><td>North</td><td>Hillsdale Ave.</td><td>Right</td></tr> <tr><td>Hillsdale Ave.</td><td>East</td><td>Patterson St.</td><td>Left</td></tr> <tr><td>Patterson St.</td><td>North</td><td>Lake Dr.</td><td>Straight</td></tr> <tr><td>Lake Dr.</td><td>North</td><td>Parkview Dr.</td><td>Right</td></tr> <tr><td>Parkview Dr.</td><td>East</td><td>Broadway</td><td>Left</td></tr> <tr><td>Broadway</td><td>North</td><td>Park Ave.</td><td>Right</td></tr> <tr><td>Park Ave.</td><td>East</td><td>Kinderkamack Rd.</td><td>Left</td></tr> <tr><td>Kinderkamack Rd.</td><td>North</td><td>Facility</td><td></td></tr> </tbody> </table> <p>Trucks may also approach NJ Route 17 from I-80 Westbound or NJ Turnpike Northbound to NJ Route 3 Westbound. Once on NJ Route 17, truck will follow above directions.</p> <p><b>Recommended Transfer Trailer Route Map Figure 16</b></p>	Follow...	Direction	To...	Continue...	I-80	East	Essex St. Exit	Left	Riverview Ave.	North	Essex St.	Right	Essex St.	East	NJ Route 17	North	NJ Route 17	North	Linwood Ave.	Right	Linwood Ave.	East	Pascack Rd.	Left	Pascack Rd.	North	Hillsdale Ave.	Right	Hillsdale Ave.	East	Patterson St.	Left	Patterson St.	North	Lake Dr.	Straight	Lake Dr.	North	Parkview Dr.	Right	Parkview Dr.	East	Broadway	Left	Broadway	North	Park Ave.	Right	Park Ave.	East	Kinderkamack Rd.	Left	Kinderkamack Rd.	North	Facility																	
Follow...	Direction	To...	Continue...																																																																						
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Riverview Ave.	North	Essex St.	Right																																																																						
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<p><b>Waste Management of New Jersey, Inc. Transfer Station/Material Recovery Facility</b>                  131 Patterson Street                  Hillsdale, New Jersey 07642                  Block 1210, Lot 10                  Block 1211, Lot 1                  NJDEP Facility No. 0207000074</p>	<p style="text-align: center;"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr><td>Patterson St.</td><td>South</td><td>Hillsdale Ave.</td><td>Right</td></tr> <tr><td>Hillsdale Ave.</td><td>West</td><td>Pascack Rd.</td><td>Left</td></tr> <tr><td>Pascack Rd.</td><td>South</td><td>Linwood Ave.</td><td>Right</td></tr> <tr><td>Linwood Ave.</td><td>West</td><td>NJ Route 17</td><td>South</td></tr> <tr><td>NJ Route 17</td><td>South</td><td>Essex St. Exit</td><td>Right</td></tr> <tr><td>Essex St.</td><td>West</td><td>Riverview Ave.</td><td>Left</td></tr> <tr><td>Riverview Ave.</td><td>South</td><td>I-80</td><td>West</td></tr> </tbody> </table> <p>Trucks may also follow NJ Route 17 to I-80 Eastbound or NJ Route 3 Eastbound to NJ Turnpike Southbound.</p> <p style="text-align: center;"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr><td>I-80</td><td>East</td><td>Essex St. Exit</td><td>Left</td></tr> <tr><td>Riverview Ave.</td><td>North</td><td>Essex St.</td><td>Right</td></tr> <tr><td>Essex St.</td><td>East</td><td>NJ Route 17</td><td>North</td></tr> <tr><td>NJ Route 17</td><td>North</td><td>Linwood Ave.</td><td>Right</td></tr> <tr><td>Linwood Ave.</td><td>East</td><td>Pascack Rd.</td><td>Left</td></tr> <tr><td>Pascack Rd.</td><td>North</td><td>Hillsdale Ave.</td><td>Right</td></tr> <tr><td>Hillsdale Ave.</td><td>East</td><td>Patterson St.</td><td>Left</td></tr> <tr><td>Patterson St.</td><td>North</td><td>Prospect Pl.</td><td>Left</td></tr> <tr><td>Prospect Pl.</td><td>West/North</td><td>Knickerbocker Ave.</td><td>Right</td></tr> </tbody> </table>	Follow...	Direction	To...	Continue...	Patterson St.	South	Hillsdale Ave.	Right	Hillsdale Ave.	West	Pascack Rd.	Left	Pascack Rd.	South	Linwood Ave.	Right	Linwood Ave.	West	NJ Route 17	South	NJ Route 17	South	Essex St. Exit	Right	Essex St.	West	Riverview Ave.	Left	Riverview Ave.	South	I-80	West	Follow...	Direction	To...	Continue...	I-80	East	Essex St. Exit	Left	Riverview Ave.	North	Essex St.	Right	Essex St.	East	NJ Route 17	North	NJ Route 17	North	Linwood Ave.	Right	Linwood Ave.	East	Pascack Rd.	Left	Pascack Rd.	North	Hillsdale Ave.	Right	Hillsdale Ave.	East	Patterson St.	Left	Patterson St.	North	Prospect Pl.	Left	Prospect Pl.	West/North	Knickerbocker Ave.	Right
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Knickerbocker Ave.	East	Patterson St.	Right
Patterson St.	South	Facility	

Trucks may also approach NJ Route 17 from I-80 Westbound or NJ Turnpike Northbound to NJ Route 3 Westbound. Once on NJ Route 17, trucks will follow above directions.

**Recommended Transfer Trailer Route Map Figure 16**

<b>Miele Sanitation Company, Inc. Transfer Station/Material Recovery Facility</b> 60 Railroad Avenue Closter, New Jersey 07624 Lot 3.01, 10 and 11, Block 1205 Lot 8 (a portion), Block 1204 NJDEP Facility No. 0207001306	<b>Primary North Route:</b>																																							
	<b>Outbound Route</b>																																							
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US 9W	North	Closter Dock Rd.	Left
Closter Dock Rd.	West	Old Closter Dock Rd.	Right
Old Closter Dock Rd.	North	Harrington Ave.	Left
Harrington Ave.	Northwest	Livingston St.	Straight
Livingston St.	East	Blanche Ave.	Right
Blanche Ave.	South	West St.	Right
West St.	Southwest	Van Sciver St.	Left
Van Sciver St.	Southeast	Railroad Ave.	Right
Railroad Ave.	South	Facility	

**Secondary Route:**

**Outbound Route**

Follow...	Direction	To...	Continue...
Railroad Ave.	North	Van Sciver St.	Left
Van Sciver St.	Northwest	West St.	Right
West St.	Northeast	Blanche Ave.	Right
Blanche Ave.	East	Herbert Ave.	Right
Herbert Ave.	South	Old Closter Dock Rd.	Left
Old Closter Dock Rd.	East/South	Closter Dock Rd.	Left
Closter Dock Rd.	East	US 9W	South
US 9W	South	I-80	West

**Inbound Route**

Follow...	Direction	To...	Continue...
I-80	East	US 9W	North
US 9W	North	Closter Dock Rd.	Left
Closter Dock Rd.	West	Old Closter Dock Rd.	Right
Old Closter Dock Rd.	North/West	Herbert Ave.	Right
Herbert Ave.	North	Blanche Ave.	Left
Blanche Ave.	West	West St.	Left
West St.	Southwest	Van Sciver St.	Left
Van Sciver St.	Southeast	Railroad Ave.	Right
Railroad Ave.	South	Facility	

**Recommended Transfer Trailer Route Map Figure 17**

**City of Englewood  
Transfer Station**  
125 South Van Brunt Street  
Englewood, New Jersey  
07631  
Block 2411, Lot 1.01 (a  
portion)  
NJDEP Facility No.  
0215000060

**North Arlington Route:**

**Outbound Route**

Follow...	Direction	To...	Continue...
S. Van Brunt St.	South	Forest Ave.	Left
Forest Ave.	East	S. Dean St.	Right
S. Dean St.	South	Van Nostrand Ave.	Left
Van Nostrand Ave.	East	Broad Ave.	Right
Broad Ave.	South	I-80	West
I-80	West	Polifly Rd. Exit	Left
Polifly Rd.	South	NJ Route 17	South
NJ Route 17	South	NJ Route 3 Service Rd.	West
NJ Route 3 Service Rd.	West	Orient Way	Left
Orient Way	South	Page Ave.	Left
Page Ave.	East	Schuyler Ave.	Right
Schuyler Ave.	South	Belleville Tpke.	Left
Belleville Tpke.	East	Facility	

**Inbound Route**

Follow...	Direction	To...	Continue...
Belleville Tpke.	West	Schuyler Ave.	Right
Schuyler Ave.	North	Page Ave.	Left
Page Ave.	West	Orient Way	Right
Orient Way	North	Rutherford Ave.	Right
Rutherford Ave.	East	NJ Route 17	North
NJ Route 17	North	Polifly Rd. Exit	Right
Polifly Rd.	North	I-80	East
I-80	East	Broad Ave.	North
Broad Ave.	North	Van Nostrand Ave.	Left
Van Nostrand Ave.	West	Grand Ave.	Right
Grand Ave.	North	Forest Ave.	Left
Forest Ave.	West	S. Van Brunt St.	Right
S. Van Brunt St.	North	Facility	

**Fairview Route:**

**Outbound Route**

Follow...	Direction	To...	Continue...
S. Van Brunt St.	South	Forest Ave.	Left
Forest Ave.	East	S. Dean St.	Right
S. Dean St.	South	Van Nostrand Ave.	Left
Van Nostrand Ave.	East	Grand Ave.	Right
Grand Ave.	South	Broad Ave.	Straight
Broad Ave.	South	Facility	

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<p><b>S &amp; L Zeppetelli, Inc.</b>  <b>Transfer Station</b>                  131 Moonachie Road                  Moonachie, New Jersey                  07074                  Block 38, Lot 3                  NJDEP Registration No.                  0237A</p>	<p><b>Primary Route:</b></p> <p style="text-align: center;"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>Moonachie Rd.</td> <td>South</td> <td>Moonachie Ave.</td> <td>Right</td> </tr> <tr> <td>Moonachie Ave.</td> <td>West</td> <td>NJ Route 17</td> <td>South</td> </tr> <tr> <td>NJ Route 17</td> <td>South</td> <td>NJ Route 3</td> <td>East</td> </tr> <tr> <td>NJ Route 3</td> <td>East</td> <td>NJ Turnpike</td> <td>South</td> </tr> </tbody> </table> <p style="text-align: center;"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>NJ Turnpike</td> <td>North</td> <td>NJ Route 3</td> <td>West</td> </tr> <tr> <td>NJ Route 3</td> <td>West</td> <td>NJ Route 17</td> <td>North</td> </tr> <tr> <td>NJ Route 17</td> <td>North</td> <td>Moonachie Ave.</td> <td>Right</td> </tr> <tr> <td>Moonachie Ave.</td> <td>East</td> <td>Moonachie Rd.</td> <td>Left</td> </tr> <tr> <td>Moonachie Rd.</td> <td>North</td> <td>Facility</td> <td></td> </tr> </tbody> </table> <p><b>Secondary Route:</b></p> <p style="text-align: center;"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>Moonachie Rd.</td> <td>South</td> <td>Washington Ave.</td> <td>Straight</td> </tr> <tr> <td>Washington Ave.</td> <td>South</td> <td>NJ Route 120</td> <td>South</td> </tr> <tr> <td>NJ Route 120</td> <td>South</td> <td>NJ Route 3</td> <td>East</td> </tr> <tr> <td>NJ Route 3</td> <td>East</td> <td>NJ Turnpike</td> <td>South</td> </tr> </tbody> </table> <p style="text-align: center;"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>NJ Turnpike</td> <td>North</td> <td>NJ Route 3</td> <td>West</td> </tr> <tr> <td>NJ Route 3</td> <td>West</td> <td>NJ Route 120</td> <td>North</td> </tr> <tr> <td>NJ Route 120</td> <td>North</td> <td>Washington Ave.</td> <td>Straight</td> </tr> </tbody> </table>	Follow...	Direction	To...	Continue...	Moonachie Rd.	South	Moonachie Ave.	Right	Moonachie Ave.	West	NJ Route 17	South	NJ Route 17	South	NJ Route 3	East	NJ Route 3	East	NJ Turnpike	South	Follow...	Direction	To...	Continue...	NJ Turnpike	North	NJ Route 3	West	NJ Route 3	West	NJ Route 17	North	NJ Route 17	North	Moonachie Ave.	Right	Moonachie Ave.	East	Moonachie Rd.	Left	Moonachie Rd.	North	Facility		Follow...	Direction	To...	Continue...	Moonachie Rd.	South	Washington Ave.	Straight	Washington Ave.	South	NJ Route 120	South	NJ Route 120	South	NJ Route 3	East	NJ Route 3	East	NJ Turnpike	South	Follow...	Direction	To...	Continue...	NJ Turnpike	North	NJ Route 3	West	NJ Route 3	West	NJ Route 120	North	NJ Route 120	North	Washington Ave.	Straight
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<p><b>BFI Transfer Systems of New Jersey, Inc. Transfer Station/Material Recovery Facility</b>                  61 Broad Avenue                  Fairview, New Jersey 07022                  Block 501, Lot 7 and 8                  NJDEP Facility No. 0218000065</p>	<p><b>North Route:</b></p> <p align="center"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>US Route 1-9 (Broad Ave.)</td> <td>North</td> <td>Grand Ave.</td> <td>Straight</td> </tr> <tr> <td>Grand Ave.</td> <td>North</td> <td>US Route 46</td> <td>West</td> </tr> <tr> <td>US Route 46</td> <td>West</td> <td>NJ Turnpike</td> <td>North/South</td> </tr> </tbody> </table> <p align="center"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>NJ Turnpike</td> <td>North/South</td> <td>US Route 46</td> <td>East</td> </tr> <tr> <td>US Route 46</td> <td>East</td> <td>Grand Ave.</td> <td>South</td> </tr> <tr> <td>Grand Ave.</td> <td>South</td> <td>US Route 1-9 (Broad Ave.)</td> <td>South</td> </tr> <tr> <td>US Route 1-9 (Broad Ave.)</td> <td>South</td> <td>Facility</td> <td></td> </tr> </tbody> </table> <p><b>Secondary North Route:</b></p> <p align="center"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>US Route 1-9 (Broad Ave.)</td> <td>North</td> <td>US Route 46</td> <td>East</td> </tr> <tr> <td>US Route 46</td> <td>East</td> <td>I-95</td> <td>North</td> </tr> <tr> <td>I-95</td> <td>North</td> <td>GW Bridge</td> <td></td> </tr> </tbody> </table> <p align="center"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>GW Bridge</td> <td>West</td> <td>I-95</td> <td>South</td> </tr> <tr> <td>I-95</td> <td>South</td> <td>US Route 46</td> <td>West</td> </tr> <tr> <td>US Route 46</td> <td>West</td> <td>US Route 1-9 (Broad Ave.)</td> <td>South</td> </tr> <tr> <td>US Route 1-9 (Broad Ave.)</td> <td>South</td> <td>Facility</td> <td></td> </tr> </tbody> </table> <p><b>South Route:</b></p> <p align="center"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>US Route 1-9</td> <td>South</td> <td>County Line</td> <td></td> </tr> </tbody> </table> <p align="center"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>US Route 1-9</td> <td>North</td> <td>Facility</td> <td></td> </tr> </tbody> </table>	Follow...	Direction	To...	Continue...	US Route 1-9 (Broad Ave.)	North	Grand Ave.	Straight	Grand Ave.	North	US Route 46	West	US Route 46	West	NJ Turnpike	North/South	Follow...	Direction	To...	Continue...	NJ Turnpike	North/South	US Route 46	East	US Route 46	East	Grand Ave.	South	Grand Ave.	South	US Route 1-9 (Broad Ave.)	South	US Route 1-9 (Broad Ave.)	South	Facility		Follow...	Direction	To...	Continue...	US Route 1-9 (Broad Ave.)	North	US Route 46	East	US Route 46	East	I-95	North	I-95	North	GW Bridge		Follow...	Direction	To...	Continue...	GW Bridge	West	I-95	South	I-95	South	US Route 46	West	US Route 46	West	US Route 1-9 (Broad Ave.)	South	US Route 1-9 (Broad Ave.)	South	Facility		Follow...	Direction	To...	Continue...	US Route 1-9	South	County Line		Follow...	Direction	To...	Continue...	US Route 1-9	North	Facility	
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<p><b>I.W.S. Transfer Systems of NJ, Inc. (old Garofalo Recycling and Transfer Station Company, Inc.)</b>                  19-35 Atlantic Street                  Garfield, New Jersey 07026                  Block 48.02, Lot 16.01                  Block 34.02, Lot 41                  Block 52, Lot 46                  Block 220, Lot 7 (a portion)                  NJDEP Facility No.                  0221000067</p>	<p align="center"><b>Recommended Transfer Trailer Route Map Figure 18 &amp; 19</b></p> <p><b>Primary Route:</b></p> <p align="center"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>River Dr.</td> <td>North</td> <td>Monroe St.</td> <td>Left</td> </tr> <tr> <td>Monroe St.</td> <td>West</td> <td>Dayton Ave.</td> <td>Right</td> </tr> <tr> <td>Dayton Ave.</td> <td>North</td> <td>NJ Route 21</td> <td>North</td> </tr> <tr> <td>NJ Route 21</td> <td>North</td> <td>NJ Route 20</td> <td>North</td> </tr> <tr> <td>NJ Route 20</td> <td>North</td> <td>I-80</td> <td>West</td> </tr> </tbody> </table> <p align="center"><b>Inbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>I-80</td> <td>East</td> <td>NJ Route 20</td> <td>South</td> </tr> <tr> <td>NJ Route 20</td> <td>South</td> <td>NJ Route 21</td> <td>South</td> </tr> <tr> <td>NJ Route 21</td> <td>South</td> <td>Dayton Ave. Exit</td> <td>South</td> </tr> <tr> <td>Dayton Ave.</td> <td>South</td> <td>Monroe St.</td> <td>Left</td> </tr> <tr> <td>Monroe St.</td> <td>East</td> <td>River Dr.</td> <td>Right</td> </tr> <tr> <td>River Dr.</td> <td>South</td> <td>Facility</td> <td></td> </tr> </tbody> </table> <p><b>Secondary Route (Outbound Only):</b></p> <p align="center"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>River Dr.</td> <td>North</td> <td>Outwater Ln.</td> <td>Left</td> </tr> <tr> <td>Outwater Ln.</td> <td>West</td> <td>Ackerman Ave.</td> <td>Straight</td> </tr> <tr> <td>Ackerman Ave.</td> <td>West</td> <td>NJ Route 21</td> <td>Right</td> </tr> <tr> <td>NJ Route 21</td> <td>North</td> <td>NJ Route 20</td> <td>North</td> </tr> <tr> <td>NJ Route 20</td> <td>North</td> <td>I-80</td> <td>West</td> </tr> </tbody> </table> <p>This route is outbound only. There is no southbound exit for Ackerman Ave. on Route 21. Inbound trucks should use Secondary Route.</p> <p align="center"><b>Recommended Transfer Trailer Route Map Figure 21</b></p>	Follow...	Direction	To...	Continue...	River Dr.	North	Monroe St.	Left	Monroe St.	West	Dayton Ave.	Right	Dayton Ave.	North	NJ Route 21	North	NJ Route 21	North	NJ Route 20	North	NJ Route 20	North	I-80	West	Follow...	Direction	To...	Continue...	I-80	East	NJ Route 20	South	NJ Route 20	South	NJ Route 21	South	NJ Route 21	South	Dayton Ave. Exit	South	Dayton Ave.	South	Monroe St.	Left	Monroe St.	East	River Dr.	Right	River Dr.	South	Facility		Follow...	Direction	To...	Continue...	River Dr.	North	Outwater Ln.	Left	Outwater Ln.	West	Ackerman Ave.	Straight	Ackerman Ave.	West	NJ Route 21	Right	NJ Route 21	North	NJ Route 20	North	NJ Route 20	North	I-80	West
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<p><b>National Transfer, Inc. Transfer Station</b>                  445 North Main Street                  Lodi, New Jersey 07644                  Block 169B, Lot 21A and 21 E                  NJDEP Registration No.                  0231A</p>	<p><b>Outwater Lane Route:</b></p> <p align="center"><b>Outbound Route</b></p> <table border="1"> <thead> <tr> <th>Follow...</th> <th>Direction</th> <th>To...</th> <th>Continue...</th> </tr> </thead> <tbody> <tr> <td>Main St.</td> <td>North</td> <td>Outwater Ln.</td> <td>Left</td> </tr> <tr> <td>Outwater Ln.</td> <td>West</td> <td>US Route 46</td> <td>West</td> </tr> <tr> <td>US Route 46</td> <td>West</td> <td>NJ Route 20</td> <td>North</td> </tr> <tr> <td>NJ Route 20</td> <td>North</td> <td>I-80</td> <td>West</td> </tr> </tbody> </table> <p align="center"><b>Inbound Route</b></p>	Follow...	Direction	To...	Continue...	Main St.	North	Outwater Ln.	Left	Outwater Ln.	West	US Route 46	West	US Route 46	West	NJ Route 20	North	NJ Route 20	North	I-80	West																																																								
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<b>Follow...</b>	<b>Direction</b>	<b>To...</b>	<b>Continue...</b>
I-80	East	NJ Route 20	South
NJ Route 20	South	US Route 46	East
US Route 46	East	Outwater Ln.	East
Outwater Ln.	East	Main St.	Right
Main St.	South	Facility	

**Route 80 Route:**

**Outbound Only**

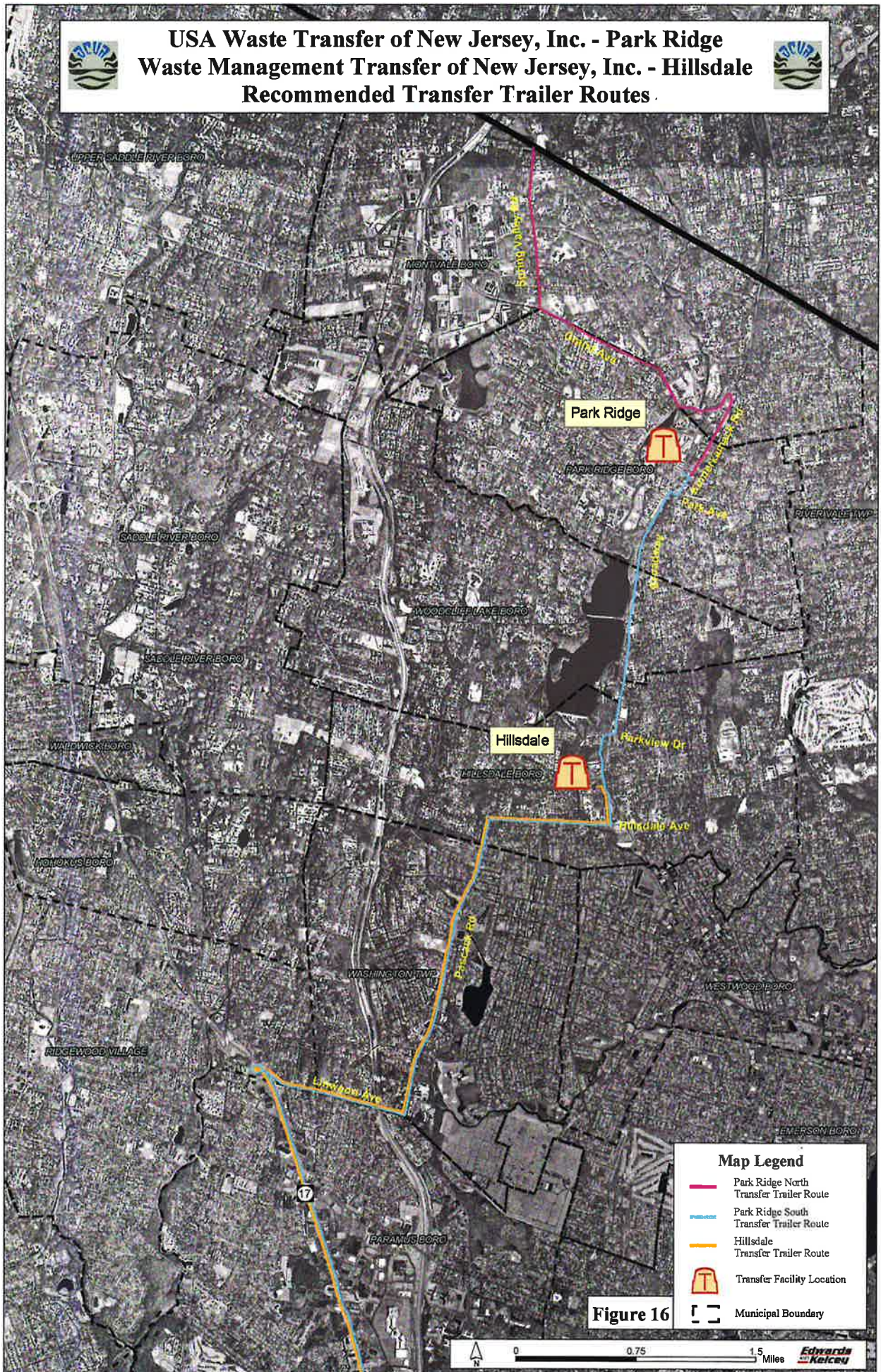
<b>Follow...</b>	<b>Direction</b>	<b>To...</b>	<b>Continue...</b>
Main St.	North	Essex St.	Right
Essex St.	East	Riverview St.	Right
Riverview St.	South	I-80 West Bound Ramp	Right
I-80	West		

**Recommended Transfer Trailer Route Map Figures 21**





**USA Waste Transfer of New Jersey, Inc. - Park Ridge  
Waste Management Transfer of New Jersey, Inc. - Hillsdale  
Recommended Transfer Trailer Routes**



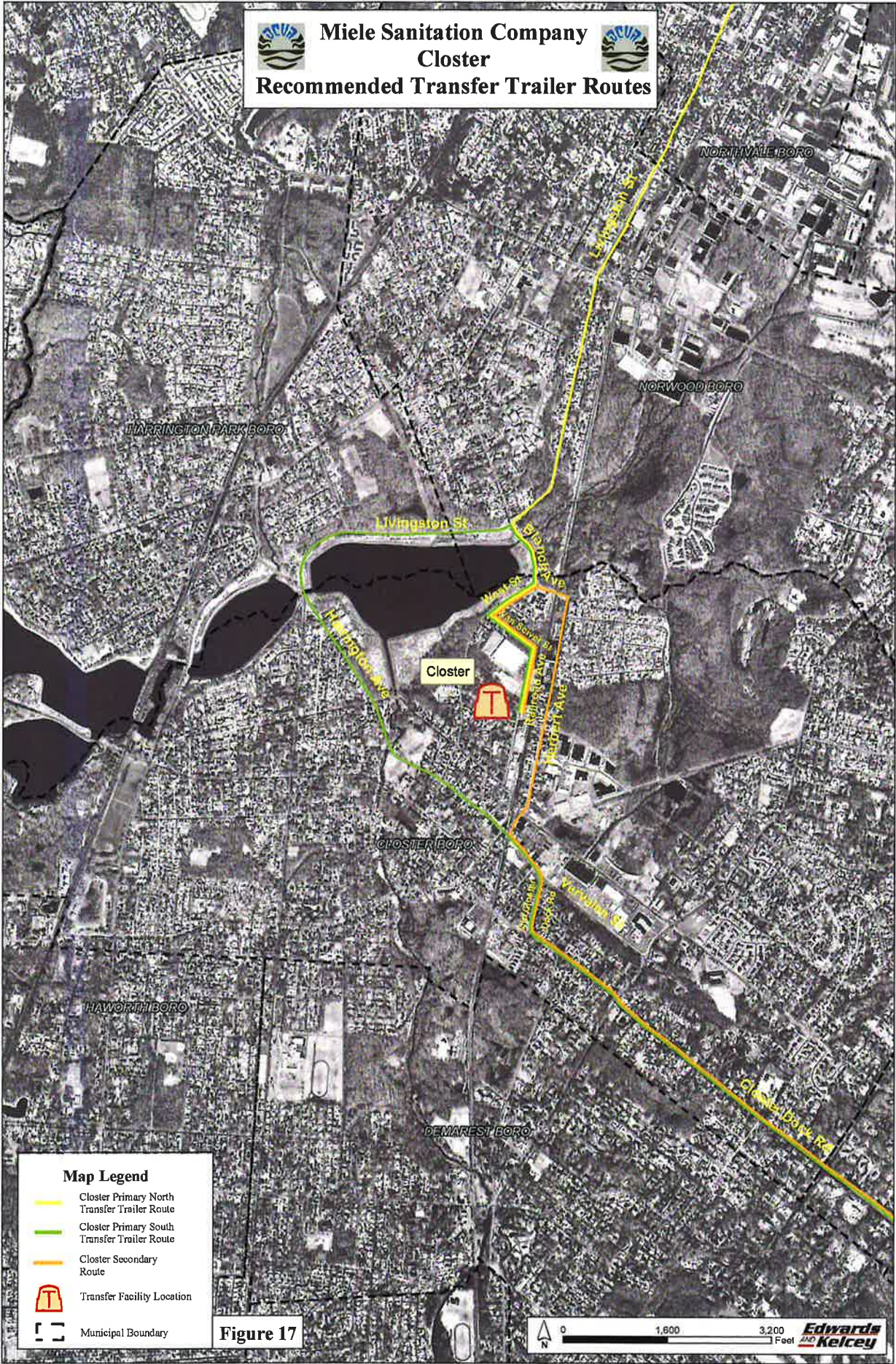
**Figure 16**

**Map Legend**

- Park Ridge North Transfer Trailer Route
- Park Ridge South Transfer Trailer Route
- Hillsdale Transfer Trailer Route
- Transfer Facility Location
- Municipal Boundary





**Miele Sanitation Company**
  
**Cluster**  
**Recommended Transfer Trailer Routes**



**Map Legend**

-  Closter Primary North Transfer Trailer Route
-  Closter Primary South Transfer Trailer Route
-  Closter Secondary Route
-  Transfer Facility Location
-  Municipal Boundary

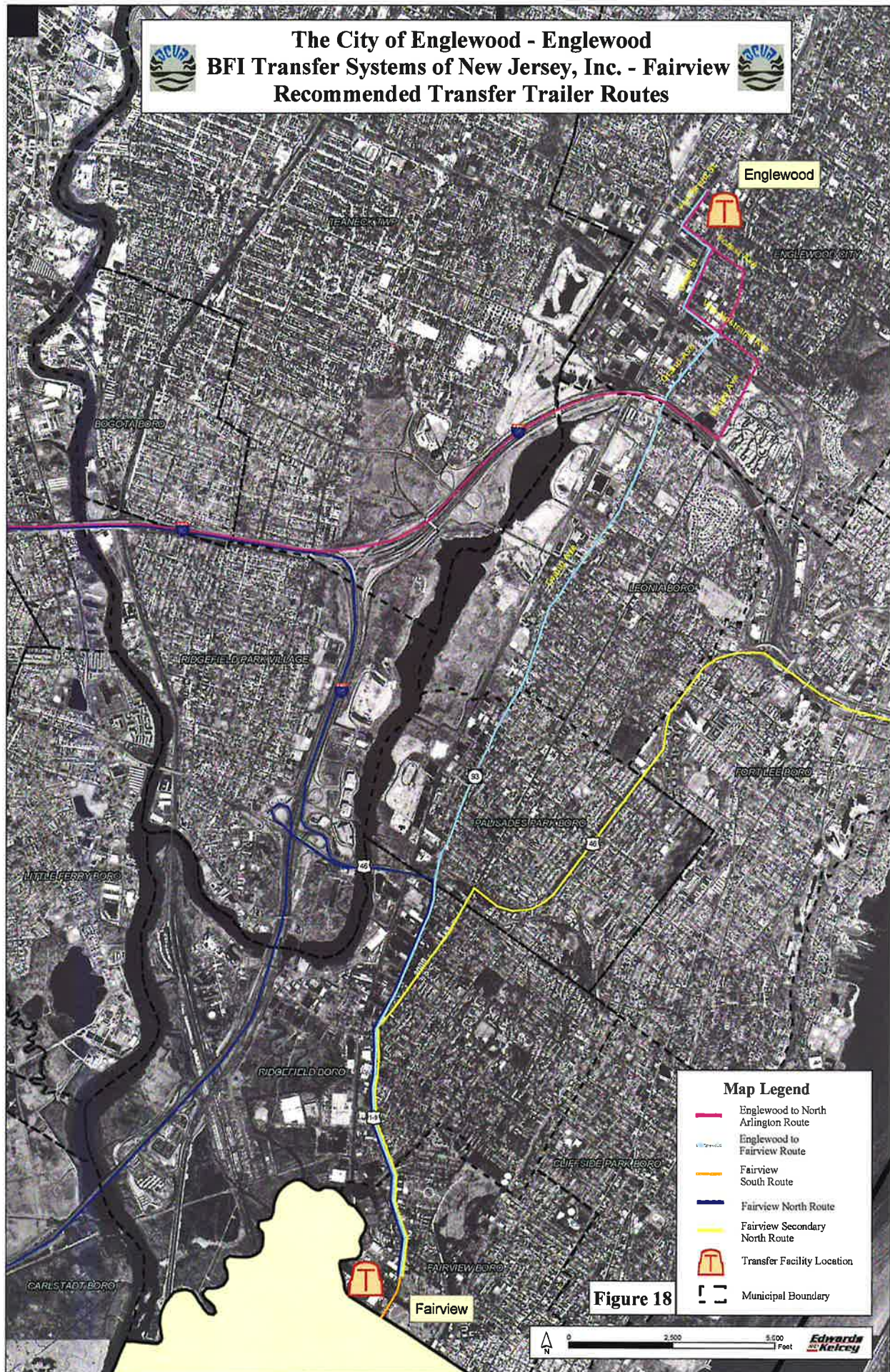
**Figure 17**

 0 1,600 3,200 Feet **Edwards AND Kelcey**





**The City of Englewood - Englewood  
BFI Transfer Systems of New Jersey, Inc. - Fairview  
Recommended Transfer Trailer Routes**



**Map Legend**

- Englewood to North Arlington Route
- Englewood to Fairview Route
- Fairview South Route
- Fairview North Route
- Fairview Secondary North Route
- Transfer Facility Location
- Municipal Boundary

**Figure 18**

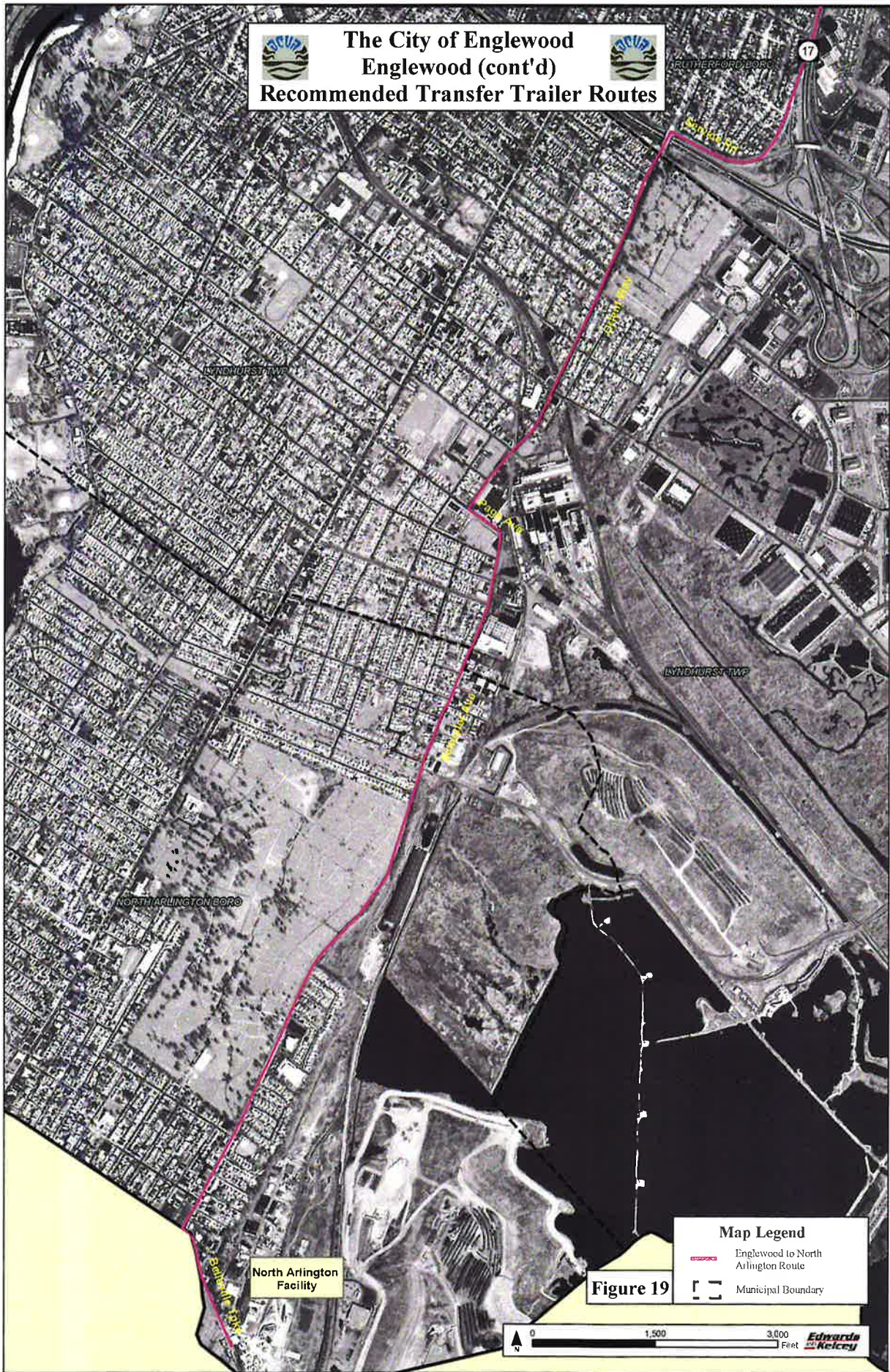




The City of Englewood  
Englewood (cont'd)



Recommended Transfer Trailer Routes



Map Legend



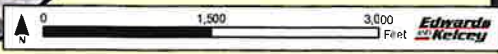
-  Englewood to North Arlington Route
-  Municipal Boundary

Figure 19



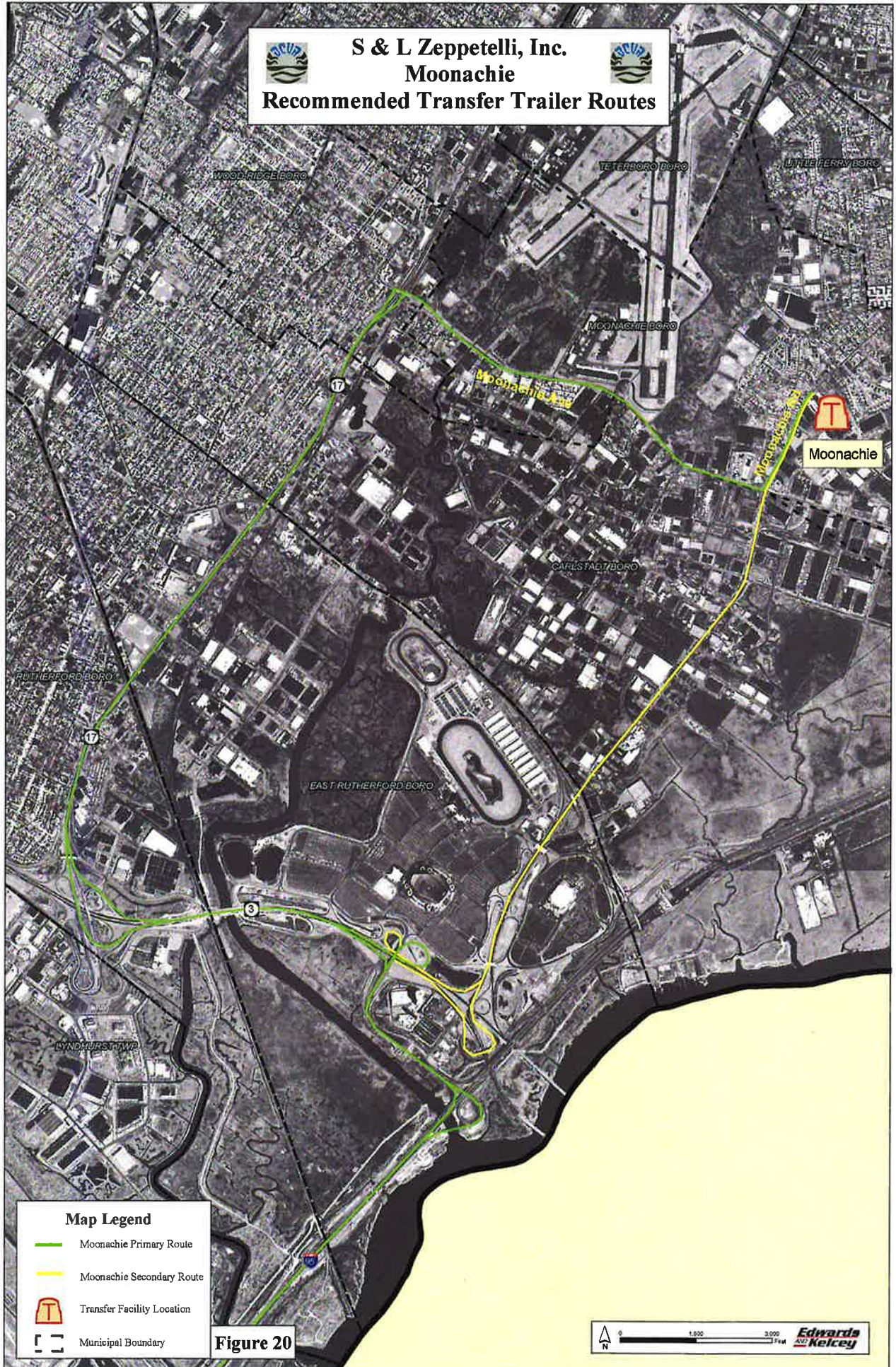




# S & L Zeppetelli, Inc. Moonachie



## Recommended Transfer Trailer Routes



**Map Legend**

- Moonachie Primary Route
- Moonachie Secondary Route
- Transfer Facility Location
- Municipal Boundary

**Figure 20**

0 1,000 2,000 Feet

**Edwards Kelcey**




**National Transfer Station - Lodi**  
**Garofalo Brothers, Inc. and**  
**Garofalo Recycling and Transfer Station Co., Inc. - Garfield**  
**Recommended Transfer Trailer Routes**




**Map Legend**

-  Lodi Route 80 Route
-  Lodi Outwater Lane Route
-  Garfield Primary Route
-  Garfield Secondary Route
-  Yard Truck Route
-  Transfer Facility Location
-  Trailer Staging Area
-  Municipal Boundary

**Figure 21**



**Edwards & Kelcey**



