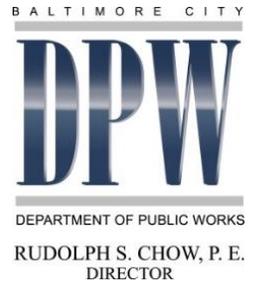


Exhibit O



Catherine E. Pugh
Mayor



BALTIMORE CITY DEPARTMENT OF PUBLIC WORKS

Fiscal Analysis of Possible Impacts of City Council Bill 18-0306 - Health Code - Clean Air Regulation

February 2019

On Wednesday, January 30, 2019, the Baltimore City Council Land Use and Transportation Committee held a hearing on City Council Bill 18-0306 - Health Code - Clean Air Regulation, which, if enacted, would impose stricter emissions standards on commercial solid waste incinerators in Baltimore City. This legislation would apply to two facilities - the Curtis Bay Medical Waste Services incinerator and the Baltimore Refuse Energy Systems Company (BRESKO) waste-to-energy facility. The owners of BRESKO have expressed that there may be a need to shut down the facility as a result of this legislation.

This fiscal analysis was prepared by the Department of Public Works (DPW) to estimate the impact the near-term closure of BRESKO would have on DPW Bureau of Solid Waste operations and on the City's revenues and expenditures.

DPW is currently in the early stages of a [Long-Term Solid Waste Master Planning process](#). The consultant engaged in this study will compile the data and feedback gathered to develop a set of recommendations to DPW for increasing waste reduction, reuse, recycling, and composting. It will also include recommendations for managing what's left in a sustainable and cost-conscious manner. While the results of this study will not be available until the end of this calendar year, we do know that waste reduction facilities and programs will certainly require capital and operating investments to effectively reduce, reuse, and manage the City's solid waste stream.

As a result, this fiscal note is limited to assessing the impact of several BRESKO scenarios on the scope of our current waste stream and disposal means.

City's Relationship with Baltimore Refuse Energy Systems Company (BRESKO)

Baltimore City is one of several jurisdictions, along with private refuse haulers, that use the services of BRESKO to dispose of its collected mixed refuse. Prior to disposing of the collected mixed refuse, BRESKO recovers recyclable materials and then combusts the remaining mixed refuse, reducing the volume of the refuse by 90% in the form of ash¹. The combustion process produces steam and electricity which is sold to local businesses and to the City.

DPW's Bureau of Solid Waste collects municipal waste from City households, small businesses, small non-profits, municipal buildings, and some condos. About half of this waste (51%)² is brought to BRESKO for disposal. The portion of mixed waste that does not go to BRESKO is disposed of at the City's Quarantine Road Landfill (QRL). Baltimore City has a contractual relationship with BRESKO for acceptance of the residential mixed refuse it collects for disposal for a per ton tipping fee.

In addition to tipping fees, Baltimore City receives revenue from BRESKO that include a host fee for this regional facility, site lease payments, and property taxes. In the past, it also received

¹ <https://www.epa.gov/smm/energy-recovery-combustion-municipal-solid-waste-msw>

² 156,885 tons of trash was incinerated at BRESKO and 149,635 tons were landfilled in CY 2017.

electricity SWAP payments. Combusting the majority of the City's mixed refuse into ash significantly reduces the amount of landfill space needed for disposal, saving landfill space; combustion of waste results in approximately a 90% reduction in volume. Under the Maryland Recycling Act, Baltimore City receives a 5% credit toward its State-mandated 35% recycling goal of mainstream waste, due to its use of a waste-to-energy facility.

Bureau of the Budget and Management Research: Baseline Projections

The Bureau of the Budget and Management Research (BBMR) has prepared the following baseline projections based on the City's current solid waste disposal arrangement with BRESKO and QRL, and the City's current planned expansion of the existing QRL landfill, which, per DPW estimates, will reach capacity in 2026. The table below shows a projection of General Fund solid waste disposal revenues and expenditures over the next six years, which would put the City on schedule for its planned expansion of QRL. These figures assume that the City continues with its current disposal model utilizing both BRESKO and QRL, and that the Wheelabrator contract is extended at an annual 2.5% cost increase beyond its 2021 expiration date:

SOLID WASTE DISPOSAL	FY20	FY21	FY22	FY23	FY24	FY25	FY26
	<i>Proj'd</i>						
<u>REVENUES</u>							
<i>BRESKO</i>							
Real Property Tax	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Personal Property Tax	1.7	1.7	1.7	1.8	1.8	1.8	1.8
Lease Payments	2.1	2.2	2.3	2.3	2.4	2.4	2.5
Solid Waste Surcharge	2.6	2.7	2.7	2.8	2.9	2.9	3.0
Host Community Fee	1.0	1.0	1.1	1.1	1.1	1.1	1.2
Ash Disposal	<u>2.4</u>	<u>2.5</u>	<u>2.5</u>	<u>2.6</u>	<u>2.6</u>	<u>2.7</u>	<u>2.8</u>
<i>Sub-Total</i>	<i>10.1</i>	<i>10.4</i>	<i>10.6</i>	<i>10.8</i>	<i>11.1</i>	<i>11.3</i>	<i>11.6</i>
<i>Landfill</i>							
Tipping Fee Revenue	<u>4.6</u>	<u>4.7</u>	<u>4.8</u>	<u>5.0</u>	<u>5.1</u>	<u>5.2</u>	<u>5.3</u>
<i>Sub-Total</i>	<i>4.6</i>	<i>4.7</i>	<i>4.8</i>	<i>5.0</i>	<i>5.1</i>	<i>5.2</i>	<i>5.3</i>
Total	14.7	15.1	15.4	15.8	16.2	16.5	16.9
<u>EXPENDITURES</u>							
<i>Waste Disposal Operations</i>							
Northwest Transfer Station	1.7	1.7	1.8	1.8	1.9	1.9	2.0
Wheelabrator Tipping Fee	8.9	9.1	9.4	9.6	9.8	10.1	10.3
Recycling	2.0	2.1	2.1	2.2	2.2	2.3	2.3
Landfill Operation	<u>5.8</u>	<u>5.9</u>	<u>6.1</u>	<u>6.2</u>	<u>6.4</u>	<u>6.6</u>	<u>6.7</u>
<i>Sub-Total</i>	<i>18.4</i>	<i>18.9</i>	<i>19.3</i>	<i>19.8</i>	<i>20.3</i>	<i>20.8</i>	<i>21.3</i>
<i>Capital Development</i>							
Contribution to Landfill Development	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Contribution to Landfill Closure	<u>0.9</u>						
<i>Sub-Total</i>	<i>9.4</i>						
Total	27.8	28.3	28.7	29.2	29.7	30.2	30.7

Bureau of the Budget and Management Research: Financial Impact Projections

If Council Bill 18-0306 is enacted, significant changes to the BRESKO facility would be necessary to meet the newly required emissions levels. Wheelabrator would ultimately need to make a business decision on whether to invest in the required improvements or to shut down the facility completely. If BRESKO were to shut down immediately, the City would need to find an alternative disposal facility.

The Bureau of the Budget and Management Research has prepared the following financial impact projections based on the assumption that the City would need to choose between two immediate options for solid waste disposal: landfilling at QRL, or transporting waste out of the city (or some combination of both).

BBMR Scenario #1: Landfill

The City could choose to utilize the QRL landfill as its primary disposal location. But, the existing QRL landfill and the expanded landfill site would experience shorter lifetimes due to the higher volume of solid waste. In order to maximize space at the landfill for City usage, private haulers and small haulers would be prohibited from QRL, costing the City an estimated \$4.7 million of revenue per year.

Even after maximizing space for City usage, DPW estimates that QRL's remaining capacity would be reduced with a required opening in Fiscal 2024. Longer-term, the expected capacity of the newly developed landfill site would be reduced from approximately thirty years to twenty years. In turn, contributions to the Landfill Trust Fund would need to accelerate by \$6.4 million per year through Fiscal 2024 (versus baseline of \$8.5 million), and then by \$3 million ongoing to prepare the City for the shorter landfill life-cycle.

Operationally, landfill operations would need to be expanded immediately to handle the additional waste going to QRL. Also, the City should expect higher costs for overtime, vehicles, and fuel to account for the longer transit time to QRL. In the current operation, some drivers take waste directly to BRESKO which is more centrally located and more cost-effective.

Finally, the City would lose the revenue generated from BRESKO, which includes real and personal property taxes, lease payments, surcharges, and ash disposal.

The table below shows the potential impact. The cost to the General Fund of this scenario is **\$98.6 million** over seven years, and a recurring cost going forward of **\$12.8 million annually**:

SCENARIO #1: LANDFILL	FY20	FY21	FY22	FY23	FY24	FY25	FY26
General Fund Impact	<i>Proj'd</i>						
Lost tipping fee revenue	(4.6)	(4.7)	(4.8)	(5.0)	(5.1)	(5.2)	(5.3)
Additional Landfill Trust contributions	(6.4)	(6.4)	(6.4)	(6.4)	(3.0)	(3.0)	(3.0)
Cost of expanded landfill operations	(1.9)	(2.0)	(2.0)	(2.1)	(2.1)	(2.1)	(2.2)
Additional collection costs	(1.0)	(1.0)	(1.1)	(1.1)	(1.1)	(1.1)	(1.2)
Lost BRESKO revenue	(9.9)	(10.2)	(10.4)	(10.6)	(10.9)	(11.1)	(11.4)
Savings from BRESKO payments	<u>8.9</u>	<u>9.1</u>	<u>9.4</u>	<u>9.6</u>	<u>9.8</u>	<u>10.1</u>	<u>10.3</u>
Total Impact	(14.9)	(15.2)	(15.3)	(15.5)	(12.3)	(12.5)	(12.8)

BBMR Scenario #2: Transporting Waste out of Baltimore City

The City could choose to truck its waste outside of the City (or region). The existing QRL landfill could be phased out as it nears capacity and only operated at reduced levels to handle smaller volumes of waste disposal. But, this option would require additional costs for transportation, tipping fees to external landfills, and new infrastructure investments to handle the transfer of waste between collection and ultimate disposal.

DPW researched nearby landfills for potential disposal options. Tipping fees ranged from \$72 per ton in Harford County to \$100 per ton in Baltimore County. It is unclear if these landfills would have the capacity or desire to accept large volumes of solid waste from Baltimore. Realistically, the City might need to look further for disposal options. As an example, transit costs for shipping to Pennsylvania are estimated at \$30 per ton plus a disposal fee of \$18.50, for a total of \$48.50 per ton. Currently, the City sends 156,000 tons to BRESKO and 62,000 tons to QRL. Shipping all 218,000 tons of City-collected waste to Pennsylvania would cost \$10.5 million annually.

Shipping waste for disposal out of Baltimore would also require additional infrastructure investments. Currently, some waste is held at Northwest Transfer Station (NWTS) before disposal, but NWTS is only permitted to manage 150,000 tons of material per year, which includes both solid waste and recyclable material. In order to hold and consolidate waste for eventual transit and disposal, an additional transfer station would be required. Estimated construction costs are \$10.1 million, and ongoing operations would cost \$2.2 million annually.

In this scenario, the City would also lose the revenue generated by BRESKO, which includes real and personal property taxes, lease payments, surcharges, and ash disposal.

The table below shows the potential impact. It assumes that the landfill remains available in the short-term and then is phased out when a new transfer facility is available to enable shipping in Fiscal 2023. The cost to the General Fund is estimated at **\$73.6 million** over six years, and a recurring cost going forward of **\$15.8 million annually**:

SCENARIO #2: SHIPPING	FY20	FY21	FY22	FY23	FY24	FY25	FY26
General Fund Impact	<i>Proj'd</i>						
Reduction in landfill operation	0.0	0.0	0.0	4.0	4.0	4.0	4.0
Lost tipping fee revenue	0.0	0.0	0.0	(5.0)	(5.1)	(5.2)	(5.3)
Lost BRESKO revenue	(9.9)	(10.2)	(10.4)	(10.6)	(10.9)	(11.1)	(11.4)
Savings from BRESKO payments	8.9	9.1	9.4	9.6	9.8	10.1	10.3
Cost of new transfer station	(3.4)	(3.4)	(3.4)	0.0	0.0	0.0	0.0
Cost of new transfer station operations	0.0	0.0	0.0	(2.2)	(2.3)	(2.3)	(2.4)
Cost to ship waste	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>(10.2)</u>	<u>(10.5)</u>	<u>(10.7)</u>	<u>(11.0)</u>
Total Impact	(4.4)	(4.5)	(4.5)	(14.4)	(14.8)	(15.3)	(15.8)

Department of Public Works Operational Analysis

1. Current DPW Plans

1.1. Long-Term Solid Waste Master Plan

DPW is currently in the early stages of a [Long-Term Solid Waste Master Planning process](#). The consultant's work will include stakeholder engagement, waste and recycling characterization studies, a comprehensive evaluation of the existing system, benchmarking with other jurisdictions, and research on best practices and successes for reducing waste generation and increasing diversion and recycling rates. The compilation of this data and feedback will be utilized to develop a set of recommendations for the City and public for improving and increasing waste diversion and recycling, as well as managing what's left in a sustainable and cost-conscious manner. This will be formalized in a Less Waste, Better Baltimore Plan, which will be finalized and presented to DPW. This plan will guide the Department in its efforts to reduce waste production and to increase recycling and composting. It will also provide guidance regarding the options for disposing of the waste remaining after recycling and composting.

This fiscal note is limited to the scope of our current waste stream and disposal means. When completed, the master plan will show what additional programs, operations, and facilities are needed to increase the levels of waste reduction, composting, and recycling. There will be a cost to those priorities. This fiscal note does not go into the details of the costs of the programs and facilities that will be necessary for waste diversion because we do not want to bias the master planning process which will become our guide for future needs and plans.

1.2. Quarantine Road Landfill (QRL) Expansion

DPW is in the process of expanding the City-owned Quarantine Road Landfill, which is currently expected to reach full capacity by 2026. DPW plans to expand QRL onto the adjacent former Millennium Landfill (FML) and construct the first landfill cell by FY 2026 to ensure the City has a means to dispose waste (Table 1). The QRL expansion will add an additional 30 years of capacity to QRL at a new estimated cost of \$99.7 million. Previously, DPW estimated the QRL expansion would cost around \$85 million, but the new cost estimates include the installation of a leachate conveyance and the removal of a million cubic feet of dirt stockpiled on FML.

Preliminary Budget Costs for QRL Expansion

Phase/Component	Project Costs (\$)	Timeframe (Fiscal Year)
Geological and Hydrological Site Report	\$700,000	FY 2019
Design/Permitting/Bid Support	\$4,180,000	FY 2020 - FY 2024
Initial Expansion and Cell 1 Construction	\$51,509,120	FY 2024 - FY 2026
Phase 1 Total	\$56,389,120	
Landfill Cell 2 Construction	\$17,352,920	FY 2026 - FY 2027
Landfill Cell 3 Construction	\$17,352,290	FY 2027 - FY 2028
Landfill Cell 4 Construction	\$8,637,200	FY 2028 - FY 2029
Phase 2 Total	\$43,289,020	
Total	\$99,732,160	

2. Current Revenue and Expenditures**2.1. Current Revenue**

The Bureau of Solid Waste is funded through the City's General Fund, and the revenue generated goes back to the General Fund. In CY 2018, Solid Waste generated a total of \$16,820,646 from Quarantine Road Landfill tipping fees, Small Hauler Program payments, and BRESCO payments. The tipping fee at Quarantine Road Landfill is \$67.50 per ton for commercial vehicles, but \$60 per ton for City agency vehicles. In addition, the Small Hauler Program at both Quarantine Road Landfill and Northwest Transfer Station allows haulers that weigh less than 2,000 pounds to dispose waste for \$20 per ton. The City of Baltimore currently receives payments from BRESCO, as shown in the table below. In Calendar Year 2018, the City received \$9,146,698.50 from the combined payments.

CY 2018 BRESKO Payments to Baltimore City

Description	Cost
Host Community Fee (\$)	\$828,533
City Surcharge (\$)	\$2,747,397
Property Taxes (\$)	\$271,407
Personal Property Taxes (\$)	\$1,696,398
Site Lease Payments (\$)	\$1,760,562
Ash Disposal (\$)	\$2,513,332
Total BRESKO Payments	\$9,817,629

The total revenue generated in CY 17 to 18 by the Bureau of Solid Waste is provided in Table 2.

Bureau of Solid Waste Revenue Generated in CY17 and CY18

Description	CY 2017	CY 2018
Tipping Fee	\$7,194,360	\$5,981,615 ³
Small Hauler Program	\$610,278 ⁴	\$1,021,402
BRESKO Payments	\$8,475,768	\$9,817,629
Total	\$16,280,406	\$16,820,646

2.2. Current Expenditures

Expenses to maintain and operate the Bureau of Solid Waste (Bureau) for FY 2017 and 2018 are provided in the table below. These expenditures provide operational costs such as salaries, materials and supplies, and equipment for each service provided by the Bureau. The Bureau budgets for the following services:

- Solid Waste Administration
- Public Right-of-Way Cleaning, includes the Street and Alley Cleaning and the Mechanical Street Sweeping programs
- Vacant and/or Abandoned Property Cleaning and Boarding, includes the Rat Abatement Program
- Waste Removal and Recycling Collection Services
- Waste Re-Use and Disposal

³ Tipping Fees decreased in CY 2018 because the Northwest Transfer Station was closed for a few weeks in 2018 for facility upgrades

⁴ Small Hauler Program began in April 2017 which accounts for the low revenue generated in CY 2017

FY17 and FY18 Bureau of Solid Waste Expenditures

Description	FY 2017	FY 2018	Percent Change (%)
Solid Waste Administration	\$1,597,149.00	\$1,439,614.00	-9.86%
Public Right-of-Way Cleaning	\$21,205,984.00	\$22,233,366.00	4.84%
Vacant/Abandoned Property Cleaning and Boarding	\$8,242,964.00	\$11,240,584.00	36.37%
Waste Removal and Recycling Collection Services	\$29,137,592.00	\$29,693,420.00	1.91%
Waste Re-Use and Disposal	\$17,725,367.00	\$18,416,296.00	3.90%
Total	\$77,909,056.00	\$83,023,280.00	6.56%

2.2.1. Recycling Market's Impact on Waste Re-Use & Disposal Program Expenditures

The overall expenditure numbers indicate a year-to-year expense increase of 5% each year. Breaking down the waste and reuse disposal program expenditures in the table below, the cost to process the City's single-stream recycling has increased by 191.04% due to the decline in recyclable material demand and increase in contaminated materials. This increase in expenditure for recyclable materials accounts for over half of the overall expenditure increase in Waste Re-use and Disposal and indicates a scaling issue with the cost of recyclable material.

The recycling markets for various recyclable materials have always fluctuated from year to year depending on the demand for the materials or the cost differential between recycled materials and virgin materials. Due to those fluctuations, the cost or savings to recycle has also fluctuated. Recent events driven mostly by China's change in its recycling contamination policy has driven up the City's costs to recycle. Should American businesses step in to fill this void, it would be expected that the recycling markets would become more stable in the future.

***FY17 and FY 18 DPW Bureau of Solid Waste,
Waste Reuse and Disposal Program Expenditures***

Description	FY 2017	FY 2018	Percent Change (%)
Wheelabrator Disposal	\$8,071,172	\$8,541,613	5.83%
Single-Stream Recycling	\$313,355	\$911,973	191.04%
Landfill Operation	\$5,206,600	\$4,972,702	-4.49%
Landfill Closure and Development	\$2,426,121	\$2,479,495	2.20%
Northwest Transfer Station Operation	\$1,708,119	\$1,715,269	0.42%
<i>Total</i>	\$17,725,367.00	\$18,621,052.00	5.05%

3. Possible Impacts of BRESKO Closure

The City would have to decide what the most cost-effective and feasible option or options would be for redirecting its disposal of approximately 200,000 tons of trash per year in the short- and long-term. The City-owned Quarantine Road Landfill is currently projected to have capacity until 2026, but without the ability to use BRESKO, the increased volume of trash taken to the landfill could result in the landfill's early closure in 2024. The planned expansion of the landfill will likely not be ready to accept waste until 2026, so the City will need to find a location to bring its waste in the interim, even if other public or private waste reduction facilities are available and beginning to provide a means to reduce the tonnage of trash needing disposal. There is not currently a location or locations that have been confirmed to accept the waste in the scenario of the closure of BRESKO, however, based on the available cost data and operational realities, the City will incur significant operational cost impacts if waste has to be transported to neighboring jurisdictions and/or neighboring states.

3.1. Impacts on QRL

Under these scenarios, it would likely be necessary to preserve the landfill space for the waste DPW collects from households and small businesses, and the landfill would no longer be able to accommodate non-profit entities, small commercial haulers, individual residents, or other City agencies. This would result in loss in tipping fees and which could lead to a domino effect on those losing access to the landfill, including the possible increase in illegal dumping, which has a cost to clean. On average, other City agencies, private haulers, and small haulers haul about 75,638 tons of waste a year to the Quarantine Road Landfill. Based upon these averages, Bureau of Solid Waste will generate approximately \$4,379,594 per year from City agency, private hauler, and small hauler tipping fees.

Organizations	Average Tons per Year	Tipping Fee per Ton	Total per Year
Department of Transportation	21,203	\$60.00	\$1,272,180
Bureau of Water and Wastewater	25,954	\$67.50	\$1,751,895
Other City Agencies	5,319	\$60.00	\$319,110
Private Haulers	12,067	\$67.50	\$814,489
Small Haulers	11,096	\$20.00	\$221,920
Total	75,638		\$4,379,594

Waste in Tons Disposed at Quarantine Road Landfill

Category	CY 2016	CY 2017	Average Tons per Year
Baltimore City, DPW	60,752	62,677	61,715
Baltimore City, Other Agencies	46,742	58,209	52,476
<i>Department of Transportation</i>	<i>10,864</i>	<i>31,542</i>	<i>21,203</i>
<i>DPW, Bureau of Water and Wastewater</i>	<i>30,368</i>	<i>21,540</i>	<i>25,954</i>
<i>Other City Agencies</i>	<i>5,510</i>	<i>5,127</i>	<i>5,319</i>
Privately Collected Waste	20,923	25,401	23,162
<i>Private Haulers</i>	<i>7,993</i>	<i>16,140</i>	<i>12,067</i>
<i>Small Haulers</i>	<i>12,930</i>	<i>9,262</i>	<i>11,096</i>
Non-profits	3,340	1,207	2,274
BRESCO Ash	149,143	140,289	144,716
Cover Dirt	73,875	192,896	133,386
Total	354,775	480,679	417,728

Quarantine Road Landfill, the City's only landfill, consumes approximately 908.5 cubic yards per day of daily airspace⁵. Based upon this disposal rate, Quarantine Road Landfill (QRL) will have capacity until CY 2026. However, QRL's current disposal rate is low due to the City's ability to decrease mixed-waste refuse by approximately 90% through waste-to-energy combustion.⁶ For example, about 140,289 tons of ash were disposed at the Quarantine Road Landfill in CY 2017⁷,

⁵ 2018 Quarantine Road Landfill Volume Report

⁶ 10-Year Solid Waste Management Plan, page 44.

⁷ Table 4: 140,289 tons of BRESCO ash was landfilled at Quarantine Road Landfill in CY 2017

but the landfill's compaction rate remains low at about 1.26 tons per cubic yard.⁸

Waste in Tons Disposed at BRESKO

Category	CY 2016	CY 2017	Average
Baltimore City, DPW	159,141	156,887	158,014
Baltimore City, Privately Collected	224,843	221,656	223,250
Other Jurisdictions	318,036	327,163	322,600
Total	702,020	705,705	703,863

Upon closure of BRESKO, the Quarantine Road Landfill will have to accept the waste originally sent to BRESKO. In CY 2017, DPW sent approximately 156,887 tons to BRESKO for waste-to-energy consumption⁹. If QRL must accept an additional average of 158,014 tons of waste per year, then the landfill's compaction rate could decrease by half due to the amount of airspace mixed-waste refuse has. A lower compaction rate could result in Quarantine Road Landfill reaching full capacity as early as CY 2024.

3.2. Infrastructure and Operational Needs for Alternative Scenarios

3.2.1. Additional Transfer Station

The costs of fuel and staff time will vary based on the length of each trip to a neighboring landfill. Currently, for example, the trailers travel from the Northwest Transfer Station to Wheelabrator, which is 13 to 17 miles round-trip, depending on the route taken. If the trucks traveled to landfill in one of the neighboring jurisdictions instead, they would be traveling 60 to 80 miles round-trip. This would require a second, large transfer station, new routing, and additional tractor trailers. The City could also choose to hire a private company to truck its waste to a Pennsylvania landfill, if they were willing to accept all or part of the tonnage it. This option would also require a second large transfer station and new routes.

The Northwest Transfer Station (NWTS) is permitted by the Maryland Department of Environment (MDE) to process up to 150,000 tons of material per year¹⁰, but the waste generated in every scenario exceeds NWTS' maximum capacity. The City will need to build a second transfer station to process the remaining waste generated by the City.

An additional transfer station, to be located on the east side of the city, will cost approximately \$10.2 million to design and construct. The transfer still will also need to go through a permitting process with the Maryland Department of the Environment (MDE).

⁸ 2018 Quarantine Road Landfill Volume Report

⁹ Table 5: The City sent 156,887 tons of waste to BRESKO for waste-to-energy consumption

¹⁰ State of Maryland, Refuse Disposal Permit no. 2015-WTS-0038, Part II.C.1.

Estimated Cost to Construct and Operate an Additional Transfer Station

Component	Cost
Design	\$80,000
Construction Estimate	\$8,000,000
Post-Award Service	\$800,000
Change Order	800,000
Inspection	\$320,000
Administration	\$160,000
Total	\$10,160,000

An estimated \$2.5 million per year is required to operate the additional transfer station. These operational costs will include hiring 40 new employees to work in two shifts throughout the work day. The transfer station would continue after the QRL expansion is completed with the same operating cost of \$2 million per year.

3.1.2. Route Optimization

Currently, City collection vehicles with routes in the vicinity of BRESCO drive directly to BRESCO to dispose their waste and then return to their routes. If waste is not disposed at BRESCO, then the City will need to hire a consultant to design new collection routes for the Bureau of Solid Waste vehicles which would cost between \$175,000 and \$225,000, depending on the scope of the project. It is imperative that the collection routes optimize the following:

- Minimal miles driven
- Maximization of stops and lifts per hour
- Balanced workloads across the week
- Minimal overtime
- Improved safety

3.2.1. Alternative Waste Disposal Options**3.2.1.1. Out-of-State Disposal**

Based upon existing contract rates, the average tipping fee is \$18.50 per ton and the average transportation cost is \$30.00 per ton to dispose waste in Pennsylvania. However, there is no guarantee that these landfills will or can accept the City's waste. Many transfer stations and landfills are already accepting the maximum tonnage allowed per day and these facilities have the right to refuse disposal if their facility is unable to clear the tipping floor or cover the waste on the active face by the end of the day.

Estimated Annual Cost to Dispose Waste Out-of-State Landfill

	Tons	Average Rate per Tons	Estimated Annual Cost
Disposal Fee	219,729	\$18.50	\$4,064,987
Transportation Fee	219,729	\$30.00	\$6,591,855
		Total	\$10,656,832

3.2.1.2. Disposal at Nearby Jurisdiction

The municipal landfills in Baltimore County, Anne Arundel County, and Harford County are the nearest options for alternative disposal sites if BRESKO were to close. However, this would significantly impact the effective lifetime of those landfills so it is unknown whether those counties would be amenable to accepting large quantities of waste and at what cost. BRESKO is utilized by Baltimore County and a number of private haulers, so if it were to close, those entities would also need to find alternative disposal sites. Therefore, it is likely that landfills would increase their tipping fees in the face of high demand and low supply.

Tipping fees (the amount charged per ton to accept garbage at a disposal site) vary, but at the three landfills mentioned they are between \$72 and \$100 per ton. It is possible that an arrangement could be made to lower those costs. However, if these fees were to remain as listed, the annual tipping fees for the City would range between \$15.8 million and \$22 million. DPW Bureau of Solid Waste does not currently pay tipping fees for waste disposed at the City-owned landfill and it pays \$54.95 per ton for the waste disposed at BRESKO. Other City agencies that utilize QRL pay the standard tipping fee of \$60 per ton.

Tipping Fees for Nearby Jurisdictions

Jurisdictions	Tipping fee per Ton	Total Waste (tons)	Estimated Annual Cost¹¹
Baltimore County	\$100.00 ¹²	219,729	\$ 21,972,900
Anne Arundel County	\$75.00 ¹³	219,729	\$ 16,479,638
Harford County	\$72.00 ¹⁴	219,729	\$ 15,820,452

¹¹ The estimated annual cost does not include increased operational costs such as, fuel costs, additional CDL drivers, and equipment like tractor trailers and an additional transfer station.

¹² https://www.baltimorecountymd.gov/Agencies/publicworks/solid_waste/trash_disposal_faq.html

¹³ <https://www.aacounty.org/departments/public-works/waste-management/fee-schedule/index.html>

¹⁴ <https://www.harfordcountymd.gov/1858/HWDC-Disposal-Fees-and-Information>

Average Annual Cost	\$18,090,980
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3.2.2. Third-Party Haulers for City Agencies

With Quarantine Road Landfill limited to the Bureau of Solid Waste operations, other City agencies will need to procure their own waste disposal contract. The cost to procure a disposal contract is unknown, but collectively the other City agencies will need to dispose an average of approximately 52,000 tons per year.

3.3. Other Impacts

3.3.1. Illegal Dumping

Currently, the City struggles with illegal dumping. In FY18, the Department spent \$22,666,770 on right of way cleaning services, which includes street and alley cleaning, mechanical street sweeping, marine operations, graffiti removal, and cleaning of business districts. If BRESKO were to close, this would increase the likelihood of illegal dumping since the only collection sites would be NWTS and QRL.

3.3.2. Steam Production

BRESKO produces steam for the City's central heating grid, a system that is operated by Veolia. It also generates electricity for sale to the electric grid, which is operated by PJM. Veolia uses BRESKO to ensure reliability of the steam supply, as BRESKO provides a minimum amount of steam regardless of how favorable the market prices are. For example, during the many subsequent days of below-freezing temperatures in January of 2018, BGE curtailed gas supply, so Veolia switched their boilers to fuel oil and relied on BRESKO. Many downtown businesses depend on the supply of steam generated at BRESKO.

Conclusion

Currently, the majority of waste collected within Baltimore City is sent to BRESKO for disposal. If this facility were no longer an option, then the City would need to find an alternative waste disposal method due to the limited capacity available at the City-owned landfill. The landfill is currently projected to have capacity until 2026, but the closure of BRESKO will increase landfill usage by possibly 100% a year.

The City would lose approximately \$10 million a year in payments from BRESKO and \$4.5-5 million in tipping fee revenue. There would be necessary expenditures of at least \$10 million for a new transfer station, operating expenses of approximately \$2.2 million a year for the transfer station, increased operating costs at the landfill, and transportation and tipping fees to an outside landfill, which could range from \$10-22 million depending on which landfill is willing and able to accept the waste and how much they would charge.