ZERO WASTE

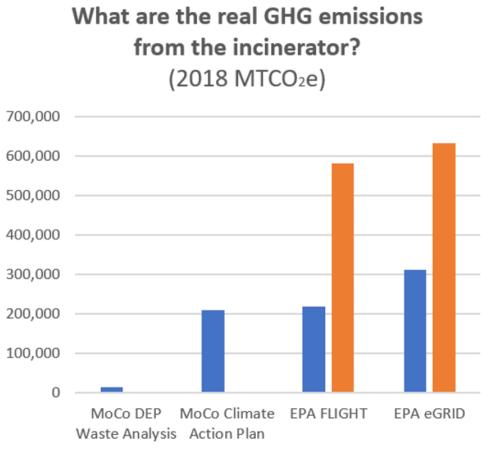
Montgomery County

All of these numbers should be the same...

Why is DEP assuming the incinerator's emissions are 50 times lower than reported to EPA?

Figure 3-1: MCRRF 2018 GHG Emissions

Table 3-1: MCRRF 2018 GHG Emissions



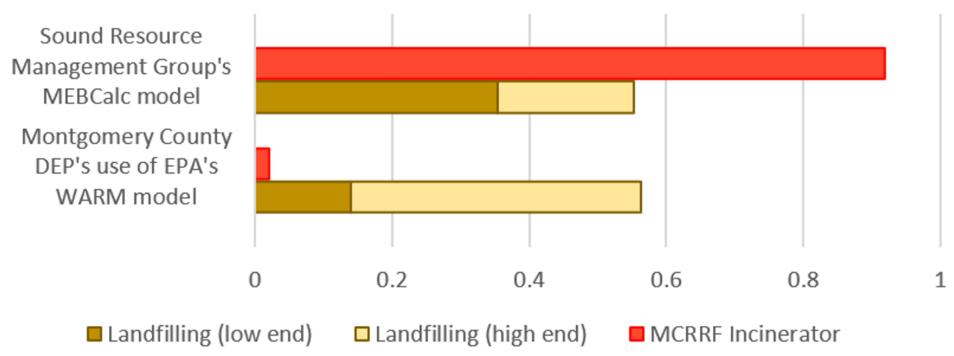
"Adiusted" Actual

2018 MTCO ₂ e	"Adjusted"	Actual
MoCo DEP Waste Analysis 124	12,600	
MoCo Climate Action Plan ¹²⁵	209,558	
EPA FLIGHT ¹²⁶	218,249	580,469
EPA eGRID ¹²⁷	311,500	631,235

← These should all be the same amount, showing how much climate pollution came from the county's incinerator in 2018. Why are EPA and the county's numbers so different from their own and from one another?

Figure 3-4: DEP GHG analysis with WARM model vs. MEBCalc model GHG analysis

Metric Tons CO₂e per ton waste disposed



^a The Monetizing Environmental Benefits Calculator (MEBCalc) life cycle assessment model arrived at these numbers based on 128-700 round-trip trucking miles or 166-1,230 rail miles, and a 75% landfill gas capture rate. As found below, <u>transportation</u> is a minor factor, accounting for 3% of the life cycle emissions from landfilling or incineration. Rainfall and landfill gas management account for most of the variation.

^b The low end is DEP's estimate for Site 2 Landfill. 0.407 and 0.563 are DEP's estimates for landfilling by rail and truck, respectively, based on 167 truck miles to Maplewood Landfill in VA, or 615 rail miles to Tunnel Hill Partners landfill in OH.

Revelation:

Since 2016, there is <u>no penalty</u> for exiting the incinerator contract with 180-day notice. The ash disposal contract will be canceled along with it upon closure of the incinerator, also without penalty.

No need to wait until 2026.

		Option 1	Option 2	Option 3	Option 4	Option 5		
	e ES-2: Waste	Incinerate until	Incinerate	Develop Site 2	Landfill by	Landfill by		
	osal Options ptions in green; worst in red)	April 2026	through 2040	Landfill	Rail	Truck		
,	Ability to Lower Cost by Reducing Waste	No, due to fixed costs, inclu boiler in :	•	Somewhat (county would have some fixed costs and liabilities)	Y	25		
	Accommodates Zero Waste	Disincentivizes diversion as		Incentives diversion to maximize landfill capacity, minimize cost	Incentives diversio	itives diversion to minimize cost		
	GHG Emissions ⁸	2,024 lbs of CO₂ equivalent 631,235 metric tons of 0 biogenic material (actual e	CO2e in 2018 including	far less if organic materials diverted or stabilized prior to di				
ors	Health Impacts	Most toxic option for co landfill community; unqu from air emissions and	antified health impacts I ash residue disposal	Potential risk to sole- source aquifer	selection criteria, and	mote location, site diversion/processing materials		
n Facto	Environmental Justice	Ash currently landfille communities; clustering of downwind impacts on div	of facilities in Dickerson;	Clustering of facilities in Dickerson		rural area that meets ce selection criteria		
Evaluation Factors	Ability to Provide Long- Term Solution	Annual volume larger than needed as county reduces waste, but limited to five years	Annual volume larger than needed as county reduces waste, but lifetime limited by aging of facility; vulnerable to abrupt closure	Unavailable until built, (could take 10 years depending on litigation); 30-year projected lifetime if built (depends on waste volumes)	Fairly unlimited due to available choices with >30 Years remaining capacity	Unlimited due to choice of many more facilities and a glut of regional landfill capacity in PA & VA.		
	Uncertainty in Cost Estimates	Highly variable cost estima markets and outcomes of share of capital improven costs; pending disqualifica credits will remove \$2-7	contract negotiations for nents; decommissioning tion of renewable energy	Med-High - depends on potential litigation, construction delays, final costs once project is bid	Low once contract is in place; opportunity to renegotiate costs incrementally as tonnage decreases			
	Other Environmental Impacts and Considerations	Leaves county in search of another solution in next five years	Leaves county in search of another solution in <20 years	Litigation delays; potential cleanup liability; Can reduce GHGs with removal/stabilization of organic waste	Somewhat flexible; Can reduce GHGs with removal/stabilization of organic waste	Flexible/most options; Can reduce GHGs with removal/stabilization of organic waste		
sts	Capital Cost ⁹	\$12-27 million in repairs At low ends, HDR has ackn not be in a state of "good	owledged the facility will	\$100-107 million (unclear if includes cost of access road, 30-year post closure care)	\$70 million for new rail car fleet (HDR) \$86 million (DEP)	~\$1M+ to modify transfer station to accommodate long haul		
Capital Costs	Add'l Cap. Costs to Protect Health & Environment ¹⁰ Capital Cost	\$60-95 million plus an est to come up to modern air for continuous monitoring that are currently of \$72-122 million	pollution standards and g of additional pollutants	Material recovery (removing more recyclables) and biological treatment (anaerobic digestion for biological stabilization) (MRBT) can be privately financed at no cost to county, and made available for \$50-60/ton, dramatically reducing waste to landfill and minimizing landfill impacts. \$100-107 million \$70-86 million \$70-86 million				
	[TOTAL]	plus \$1.5 million/year	plus \$1.5 million/year	+ \$150-180 million for cour	nty to own MRBT syster	n; pays off in 6-7 years		
Operating Costs	Total Estimated Cost/Ton ¹¹ [includes transfer station and transportation costs; does not include externalized health and environmental costs]	\$53.50/ton (HDR) \$64.36/ton (2020 invoice) plus approx \$2.50/ton pollution controls (fixed controls as waste	ost that will increase per	\$44.50/ton (HDR) \$59.56/ton (DEP)	\$73-78/ton Need RFQ for hauling and disposal and estimate for rail haul reconfiguration at transfer station	\$50-59/ton Need RFQ for hauling and disposal		

Table ES-1: Results of Life Cycle Analysis of Montgomery County's incineration vs. landfilling options

Impact per ton of waste transported and incinerated or landfilled Incineration Landfilling Measure Which is **Impact** (lbs of equivalent emission, (MCRRF) (range of 10 landfills) worse? below, per ton of waste) (lbs/ton of waste) (lbs/ton of waste) Global warming Incineration Carbon dioxide (CO₂) 2,023.89 779 - 1,220Human health (toxic chemicals) Toluene 219.80 0.89 - 4.10Incineration Ozone (O₃) Smog formation (asthma) [NOx & VOCs] 38.64 2.43 - 15.51Incineration Sulfur dioxide (SO₂) 0.08 - 1.28Acidification (acid rain, respiratory) 2.38 Incineration 0.46 0.005 - 1.119* (Depends) Human health (carcinogens) Benzene Fine particulate Human health (respiratory/heart) matter (PM_{2.5}) 0.23 0.001 - 0.012Incineration * (Depends) Eutrophication Nitrogen 0.07 0.036 - 0.159CFC-11 Ozone depletion 0.001 - 0.004Landfilling 2,4-D herbicide 0.00088 0.00002 - 0.00128* (Depends) **Eco-toxicity** U.S. Dollars \$52.37 - \$102.97 Incineration Monetized summary \$258.58

<u>Note:</u> each measure includes weighted values of related pollutants. For example, global warming impacts include methane and nitrous oxide (N_2O) emissions, and toxic chemical impacts include mercury emissions. Impacts are weighted over a 20-year time frame. Landfill options assume a gas capture rate of 75%.

^{*} Carcinogenicity, eutrophication, and eco-toxicity are worse from incineration compared to a landfill that flares its gas, but are worse from landfilling if landfill gas is burned for energy in an internal combustion engine.

MARY M. CHEH

Councilmember, Ward 3 | Chair, Committee on Transportation & the Environment

MEMORANDUM

To: Chairman Phil Mendelson

From: Councilmember Mary M. Cheh

DATE: February 25, 2021

Subject: Requests for the March 2, 2021 Legislative Meeting

Because Covanta is permitted to sell renewable credits into Maryland's renewable energy portfolio (which includes "waste-to-energy" incineration as a tier one renewable energy source), much of the energy produced at the facility is displacing clean renewable energy, likely wind, resulting in a net harm to the region's clean energy efforts.

20-year CO2e (lbs/ton of waste disposed)

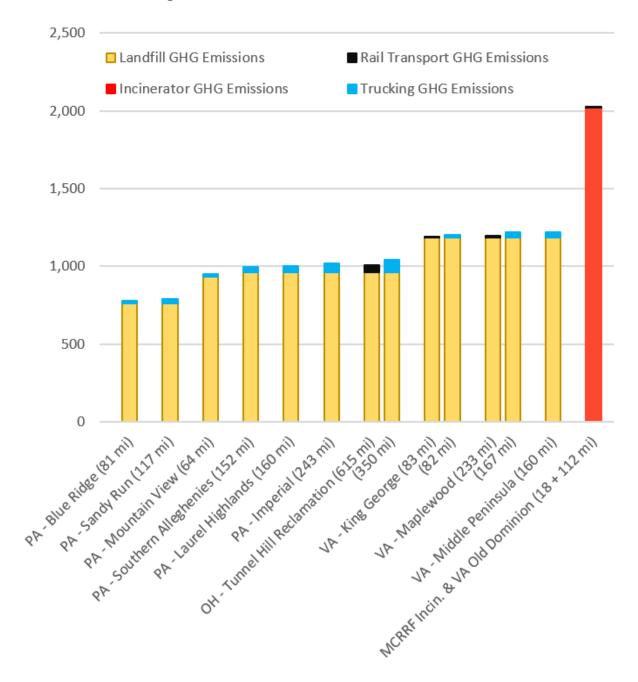
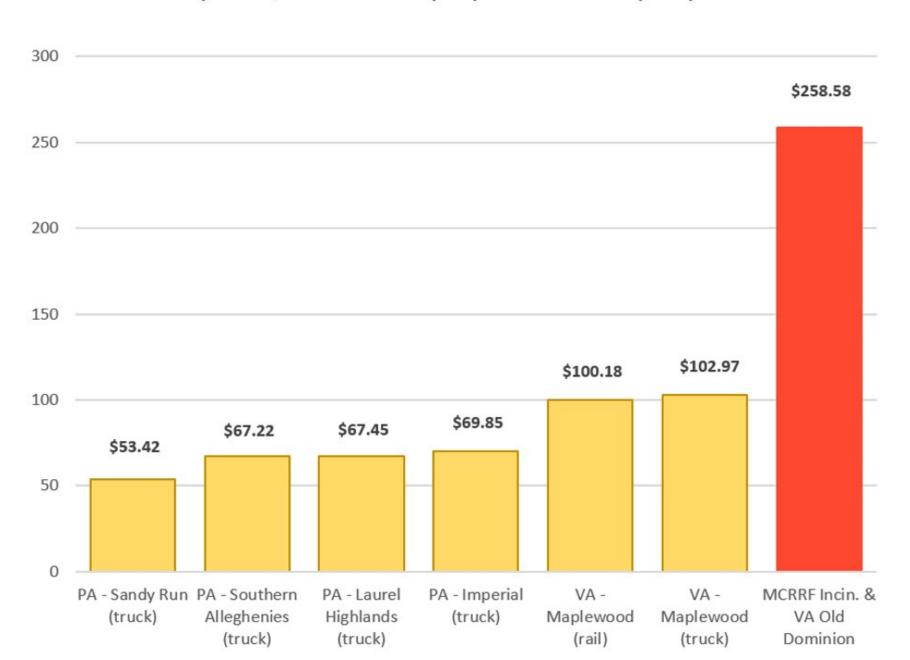


Table 4-1: Comparison of features in three major life cycle analysis tools

	Life Cycle Analysis (LCA) Model ¹⁷⁵					
Features	WARM ¹⁷⁶	MSW DST ¹⁷⁷	MEBCalc ¹⁷⁸			
Impacts included in model						
-Climate change	✓	✓	✓			
-Human health (respiratory)		limited	✓			
-Human health (toxic chemicals)		limited	✓			
-Human health (carcinogens)		limited	✓			
-Eutrophication		limited	✓			
-Acidification		limited	✓			
-Eco-toxicity		limited	✓			
-Ozone depletion			✓			
-Smog formation		limited	✓			
Monetized Environmental Score			✓			
Energy Impacts Included	✓	✓	limited			
# of MSW Materials Included	60	~30	27			

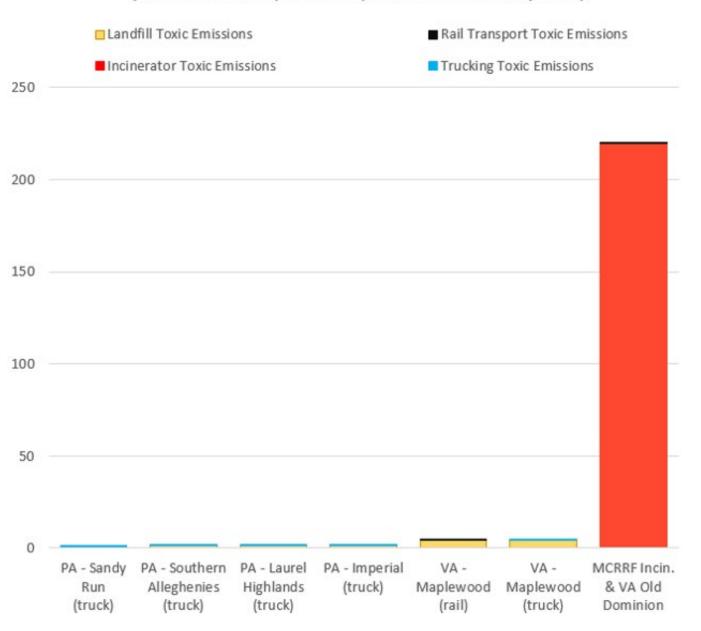
Monetized Environmental Impact

(\$ health/environmental impact per ton of waste disposed)



Human Health (Toxic Air Pollution)

(lbs of toluene equivalents per ton of waste disposed)



DEP's EJ Analysis attempting to justify Site 2 Landfill

Figure 5-2: DEP Table giving Population Density 4% weight and Race and Class 75% weight

Revised Environmental Justice Landfill Options										
8/30/2020	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9	
CRITERIA DESCRIPTION	Poverty Rate	Median Income	Median Housing Value	Populaton Density	Distance - Road Miles	Race % White	Race % Black	Race % Hispanic	Remaining Capacity	
	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9	WEIGHTED SCORE
WEIGHT	7	6	3	2	5	1	9	8	4	45
	16%	13%	7%	4%	11%	2%	20%	18%	9%	100%
Landfills w/Rail Service	Criteria 1 SCORES	Criteria 2 SCORES	Criteria 3 SCORES	Criteria 4 SCORES	Criteria 5 SCORES	Criteria 6 SCORES	Criteria 7 SCORES	Criteria 8 SCORES	Criteria 9 SCORES	Rank
Montgomery County - Site 2	5	5	5	1	5	3	4	1	1	3.51
Maplewood - Amelia	3	3	3	4	3	2	2	4	5	3.18
King George	4	4	4	2	4	4	3	2	2	3.18
Atlantic Waste	2	2	2	5	2	1	1	5	4	2.62
Tunnel Hill Partners	1	1	1	3	1	5	5	3	3	2.51

Minor tweaks in DEP's weightings result in opposite conclusions

Figure 5-3: Revised Table giving Population Density 40% weight and Race and Class 40% weight

Environmental Justice Landfill Options Revised Criteria 1 Criteria 3 Criteria 7 Criteria 8 Criteria 9 8/30/2020 Criteria 2 Criteria 4 Criteria 5 Criteria 6 Median Median **Populaton** Distance -**CRITERIA Poverty** Race Race Race Remaining Housing **Road Miles** % White % Black % Hispanic DESCRIPTION Rate Income Density Capacity Value WEIGHTED Criteria 1 Criteria 2 Criteria 3 Criteria 4 Criteria 5 Criteria 6 Criteria 7 Criteria 8 Criteria 9 SCORE WEIGHT 20 50 10 0 0 5 10 0 0 5 20% 0% 0% 40% 10% 20% 0% 0% 10% 100% Criteria 1 Criteria 2 Criteria 3 Criteria 4 Criteria 5 Criteria 6 Criteria 7 Criteria 8 Criteria 9 Landfills w/Rail Service Rank **SCORES SCORES SCORES SCORES SCORES SCORES SCORES SCORES SCORES** Montgomery County -5 5 5 5 3 1 2.60 4 Site 2 3 3 3 3 2 2 5 3.40 Maplewood - Amelia 4 4 King George 2 3 2 2 3.00 4 4 4 4 4 2 Atlantic Waste 2 2 2 5 1 1 5 4 3.20 Tunnel Hill Partners 3 5 5 3 3 2.80 1 1 1 1

<u>Note:</u> on class, all three measures have the same 1-5 scores for the five landfill options, so the choice of poverty rate over median income or housing value has no impact on the result. On race, choosing percent white is the same as saying "percent people of color" and is the most robust way to summarize impact by race.

The County Deserves a Better Analysis

<u>DEP's Analysis</u>

<u>Our Analysis</u>

5 Landfills

42 Landfills*

Factors:

-Class (36%) using poverty rate, median income & median housing value

-Race (40%) using Black, Hispanic & White -Population density (4%)

-Distance (11%)

Pomaining can

-Remaining capacity (10%)

Exclusion Criteria:

-Class (5 mile <\$35K median household income)

-Race (5 mile Black population >30%)
-Population (5 mile pop >20K)

-Distance (very excessive ones ruled out)

-Public ownership

-Future waste market

-Public opposition

-Gas collection system

Inclusion Criteria:

-Flaring collected gas

-Rainfall

-Smaller waste company

-Available capacity

-Rail access

-Environmental track record

because it creates a new landfill in a risky location, is prohibitively expensive, would not be available in the short-term, and is not a long-term solution.

* Our analysis rules out Site 2 Landfill

Table 7-3: Best Landfill Options for Montgomery County

[Includes the 12 of 42 landfills that survived the exclusion criteria.]

Landfill Name	Rail Miles	Road Miles	City	County	St	Owner	Operator	Annual rainfall	Available Capacity (tons/year)	Landfill Closure Year	Inclusion criteria
Upper Piedmont		260	Bougament	Dorson	NC	Donublia	Consisos	50		2057	t
Regional Landfill		200	Rougemont	Person	NC	керивно	Services	50		2057	
Uwharrie Env'l Regional Landfill		384	Mount Gilead	Montgomery	NC	Republic	Services	50		2067	
Blue Ridge Landfill		81	Scotland	Franklin	PA	Waste Co	nnections	39	0	2031	t, u, v
Evergreen Landfill		195	Blairsville	Indiana	PA	Waste Management	Pellegrene Construction	53	200,506	2077	
Imperial Sanitary Landfill		243	Imperial	Allegheny	PA	Republic	Services	43	388,381	2044	t, w
<u>Laurel Highlands</u> <u>Landfill</u>		160	Johnstown	Cambria	PA	Waste Ma	nagement	53	459,223	2124	t, w
Mostoller Landfill		159	Somerset	Somerset	PA	Waste Ma	nagement	51	417,681	2056	w
Mountain View Reclamation Landfill		64	Greencastle	Franklin	PA	Waste Ma	nagement	35	237,366	2057	u
Sandy Run Landfill		117	Hopewell	Bedford	PA	GFL Environmental		40	203,199 (PA DEP) 73,000 (revised est.)	2130	t, u, v, y
Southern Alleghenies Landfill		152	Davidsville	Somerset	PA	GFL Environmental		56	598,237	2091	t, v, w
Maplewood Recycling & Waste											w, x
Disposal	233	167	Jetersville	Amelia	VA	Waste Management		44		2167	
Shoosmith Sanitary Landfill		180	Chester	Chesterfield	VA	Shoosmith Brothers		47		2070	ν

t Flaring captured landfill gas or injecting into pipelines

^u Lower rainfall

v Smaller waste company

w Larger available capacity

x Rail access

y Environmental track record

^z Cost (not filled in for lack of recent RFQ/RFP data)

The Five Best Landfill Options

- GFL Environmental's Sandy Run and Southern Allegheny Landfills in PA (the county would need a combination because the closer landfill has limited space)
- Republic Services' Imperial Sanitary Landfill in PA
- Waste Management's Maplewood Landfill in VA and Laurel Highlands Landfill in PA

		Option 1	Option 2	Option 3	Option 4	Option 5		
	e ES-2: Waste	Incinerate until	Incinerate	Develop Site 2	Landfill by	Landfill by		
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Recommendations:

- 1) Starting in calendar year 2021, the county should accurately account for waste diversion.
 - a) Stop counting ash as "beneficial use" in county recycling percentages.
 - b) Correct recycling reporting by not counting alternative daily cover (ADC) at landfills, or material sent to material recovery facilities (MRFs) that is not ultimately recycled.
- 2) Seek County Council approval for the following changes to the Waste Disposal and Service Agreements, as required in the County's Ten-Year Solid Waste Management Plan.

Recommendations:

- 3) On or before Earth Day (4/22/2021), issue the following RFPs and notices:
 - a) Issue an RFP for truck hauling to a landfill, utilizing the exclusion and inclusion criteria outlined within this report in order to make the most responsible choice.
 - b) Give 180-day notice to the Northeast Maryland Waste Disposal Authority (NMWDA) to end the incineration contract (by 10/18/2021, if notice is given on 4/22/2021).
 - c) Issue request for proposals (RFP) for a new material recovery facility (MRF) with material recovery and biological treatment (MRBT) capacity.

Recommendations:

4) On Earth Day, announce aggressive pursuit of Zero Waste strategies ready to be rolled out in 2021. Priority programs, even if just starting as pilots in 2021, should include unit-based pricing, aerobic composting of source separated organics, and a deconstruction mandate for reusable building materials.

By October 2021, cease use of the MCRRF and switch to truck hauling to one or more existing landfills. Once MRBT is operating, switch to only sending reduced, stabilized residuals to landfill.

ZERO WASTE

Montgomery County