



**ZERO
WASTE**
Montgomery
County

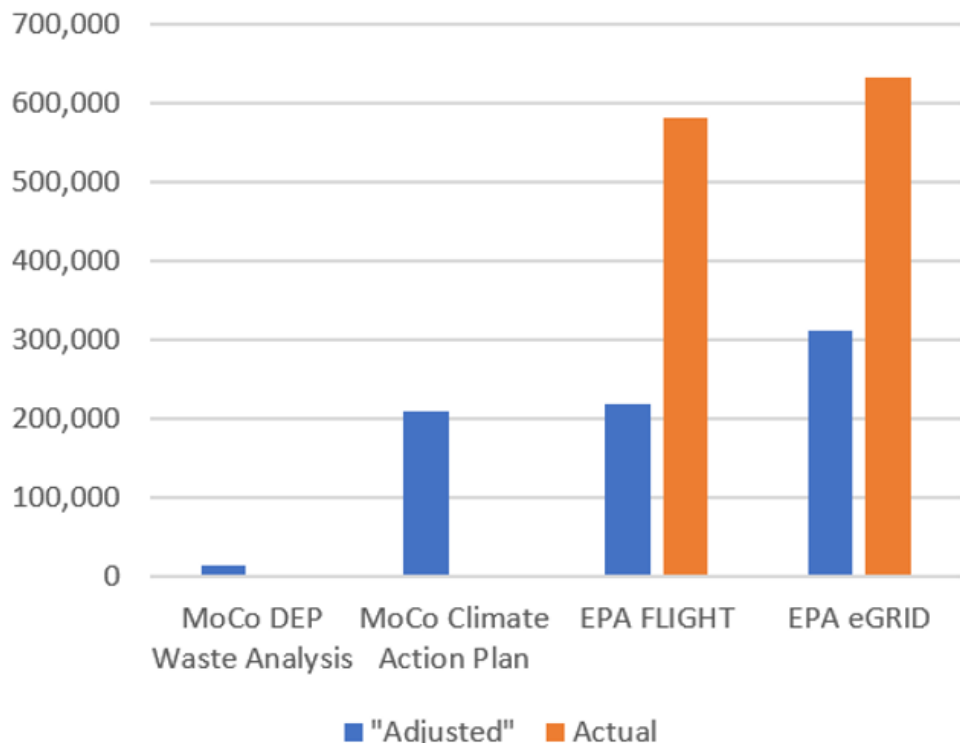
All of these numbers should be the same...

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

What are the real GHG emissions from the incinerator?
(2018 MTCO₂e)

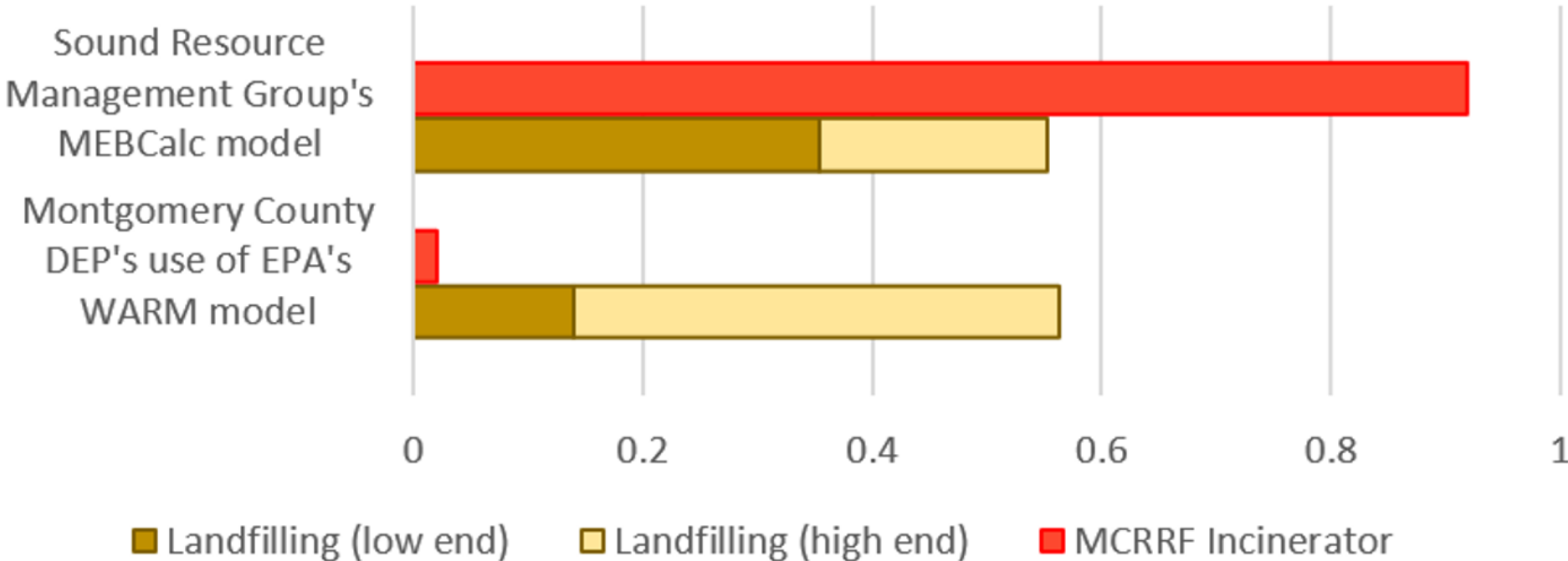


2018 MTCO ₂ e	"Adjusted"	Actual
MoCo DEP Waste Analysis ¹²⁴	12,600	
MoCo Climate Action Plan ¹²⁵	209,558	
EPA FLIGHT ¹²⁶	218,249	580,469
EPA eGRID ¹²⁷	311,500	631,235

← 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, [transportation](#) 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 no penalty 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.

Table ES-2: Waste Disposal Options (best options in green; worst in red)		Option 1	Option 2	Option 3	Option 4	Option 5	
		Incinerate until April 2026	Incinerate through 2040	Develop Site 2 Landfill	Landfill by Rail	Landfill by Truck	
Evaluation Factors	Ability to Lower Cost by Reducing Waste	No, due to fixed costs, including maintaining unused boiler in standby		Somewhat (county would have some fixed costs and liabilities)	Yes		
	Accommodates Zero Waste	Disincentivizes diversion as most efficient operation is with three boilers		Incentives diversion to maximize landfill capacity, minimize cost	Incentives diversion to minimize cost		
	GHG Emissions⁸	2,024 lbs of CO ₂ equivalents (CO ₂ e) per ton of waste 631,235 metric tons of CO ₂ e in 2018 including biogenic material (actual emissions reported to EPA)		779 – 1,220 lbs of CO ₂ equivalents (CO ₂ e) per ton of waste far less if organic materials diverted or stabilized prior to disposal; transportation emissions average about 3% in any scenario			
	Health Impacts	Most toxic option for county residents and for landfill community; unquantified health impacts from air emissions and ash residue disposal		Potential risk to sole-source aquifer	Mitigated with remote location, site selection criteria, and diversion/processing of organic materials		
	Environmental Justice	Ash currently landfilled in majority-Black communities; clustering of facilities in Dickerson; downwind impacts on diverse county population		Clustering of facilities in Dickerson	Can select landfill in rural area that meets environmental justice selection criteria		
	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 estimates depend on electricity markets and outcomes of contract negotiations for share of capital improvements; decommissioning costs; pending disqualification of renewable energy credits will remove \$2-7 million/year in revenue		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	
Capital Costs	Capital Cost⁹	\$12-27 million in repairs At low ends, HDR has acknowledged the facility will not be in a state of "good condition and repair."	\$37-\$73 million in repairs	\$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	
	Add'l Cap. Costs to Protect Health & Environment¹⁰	\$60-95 million plus an estimated \$1.5 million/year to come up to modern air pollution standards and for continuous monitoring of additional pollutants that are currently only tested annually		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.			
	Capital Cost [TOTAL]	\$72-122 million plus \$1.5 million/year	\$97-168 million plus \$1.5 million/year	\$100-107 million	\$70-86 million	~\$1 million	
Operating Costs	Total Estimated Cost/Ton¹¹	\$53.50/ton (HDR) \$64.36/ton (2020 invoice)	\$59.50/ton (HDR) \$59.31/ton (DEP) \$64.36/ton (2020 invoice) (long term prices depend on final contract negotiations and cost share)	\$44.50/ton (HDR) \$59.56/ton (DEP)	\$73-78/ton	\$50-59/ton	
	[includes transfer station and transportation costs; does not include externalized health and environmental costs]	...plus approx \$2.50/ton for improvements to air pollution controls (fixed cost that will increase per ton as waste is reduced)			Need RFQ for hauling and disposal and estimate for rail haul reconfiguration at transfer station	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				
<u>Impact</u>	<u>Measure</u> (lbs of equivalent emission, below, per ton of waste)	<u>Incineration</u> (MCRRF) (lbs/ton of waste)	<u>Landfilling</u> (range of 10 landfills) (lbs/ton of waste)	<u>Which is worse?</u>
Global warming	Carbon dioxide (CO ₂)	2,023.89	779 – 1,220	Incineration
Human health (toxic chemicals)	Toluene	219.80	0.89 – 4.10	Incineration
Smog formation (asthma)	Ozone (O ₃) [NO _x & VOCs]	38.64	2.43 – 15.51	Incineration
Acidification (acid rain, respiratory)	Sulfur dioxide (SO ₂)	2.38	0.08 – 1.28	Incineration
Human health (carcinogens)	Benzene	0.46	0.005 – 1.119	* (Depends)
Human health (respiratory/heart)	Fine particulate matter (PM _{2.5})	0.23	0.001 – 0.012	Incineration
Eutrophication	Nitrogen	0.07	0.036 – 0.159	* (Depends)
Ozone depletion	CFC-11	0	0.001 – 0.004	Landfilling
Eco-toxicity	2,4-D herbicide	0.00088	0.00002 – 0.00128	* (Depends)
Monetized summary	U.S. Dollars	\$258.58	\$52.37 – \$102.97	Incineration

Largest impact → smallest impact

Note: each measure includes weighted values of related pollutants. For example, global warming impacts include methane and nitrous oxide (N₂O) 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.

OFFICE OF
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)

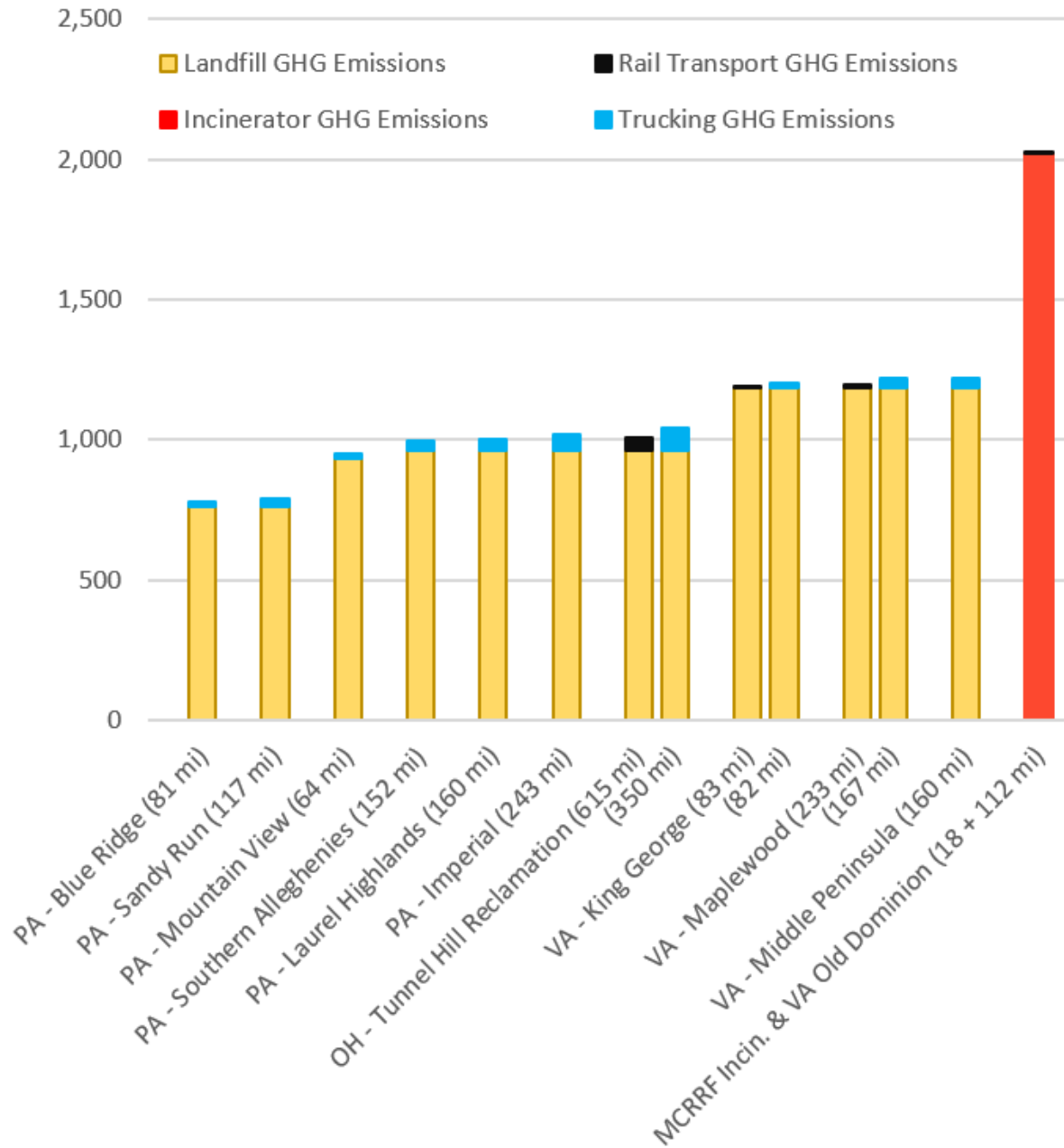
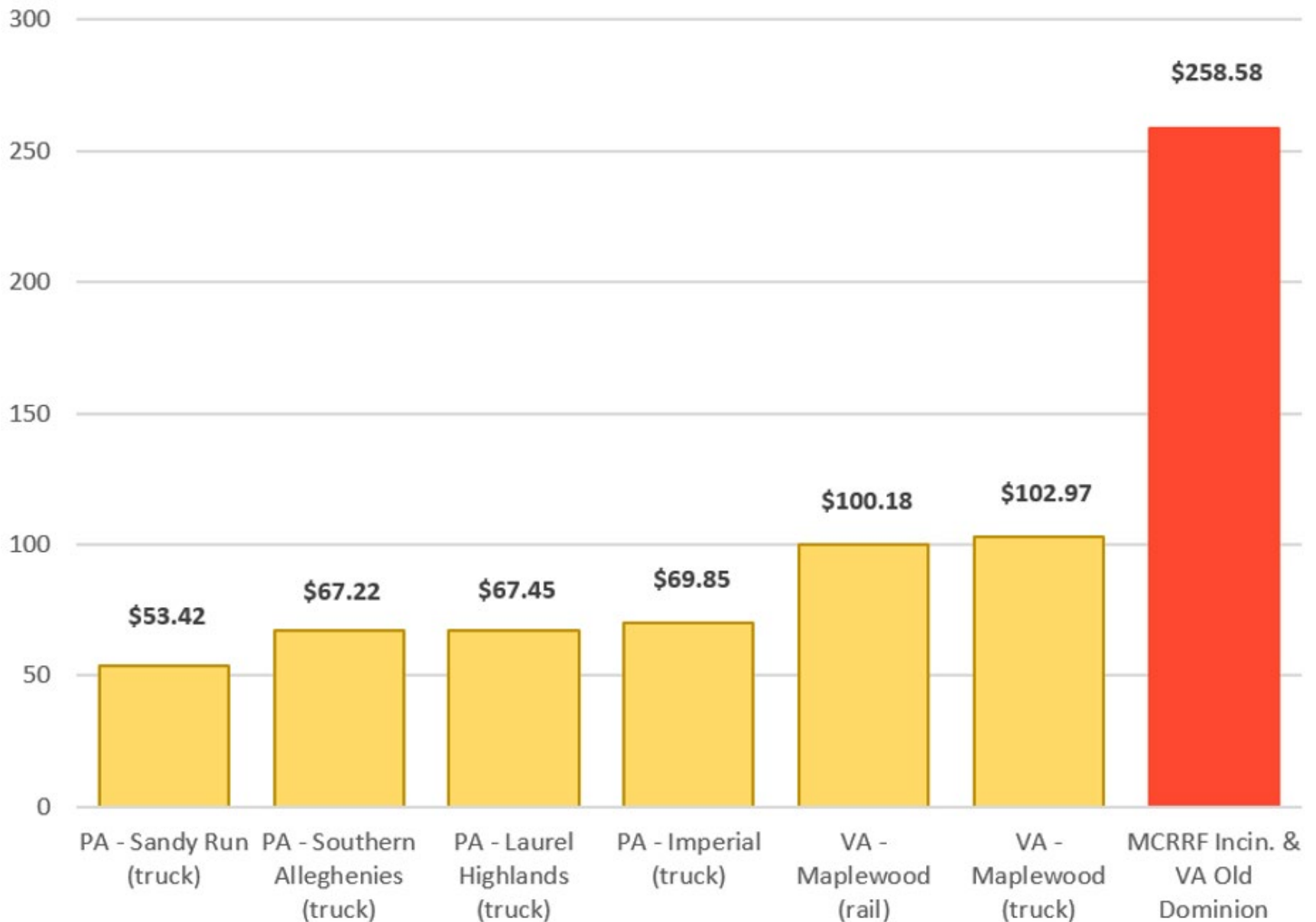


Table 4-1: Comparison of features in three major life cycle analysis tools

Features	Life Cycle Analysis (LCA) Model ¹⁷⁵		
	WARM ¹⁷⁶	MSW DST ¹⁷⁷	MEBCalc ¹⁷⁸
<u>Impacts included in model</u>			
-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	✓
<u>Monetized Environmental Score</u>			✓
<u>Energy Impacts Included</u>	✓	✓	limited
<u># of MSW Materials Included</u>	60	~30	27

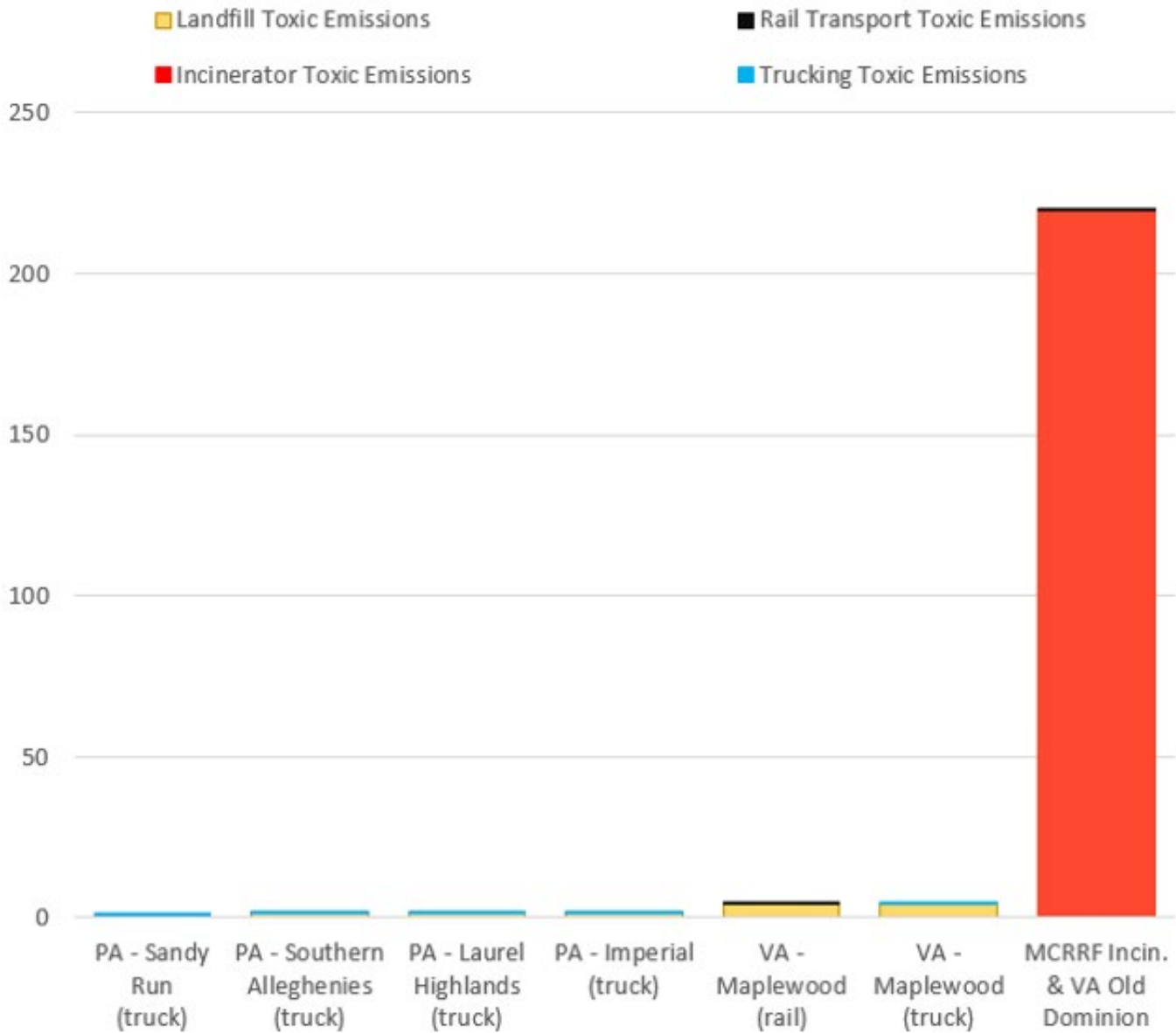
Monetized Environmental Impact

(\$ 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 8/30/2020										
Environmental Justice Landfill Options										
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
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	10	0	0	20	5	10	0	0	5	50
	20%	0%	0%	40%	10%	20%	0%	0%	10%	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	2.60
Maplewood - Amelia	3	3	3	4	3	2	2	4	5	3.40
King George	4	4	4	2	4	4	3	2	2	3.00
Atlantic Waste	2	2	2	5	2	1	1	5	4	3.20
Tunnel Hill Partners	1	1	1	3	1	5	5	3	3	2.80

Note: 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

DEP's Analysis

5 Landfills

Factors:

- Class (36%) using poverty rate, median income & median housing value
- Race (40%) using Black, Hispanic & White
- Population density (4%)
- Distance (11%)
- Remaining capacity (10%)

* Our analysis rules out Site 2 Landfill 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

42 Landfills*

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

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 Regional Landfill		260	Rougemont	Person	NC	Republic Services		50		2057	^t
Uwharrie Env'l Regional Landfill		384	Mount Gilead	Montgomery	NC	Republic Services		50		2067	
Blue Ridge Landfill		81	Scotland	Franklin	PA	Waste Connections		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}
Laurel Highlands Landfill		160	Johnstown	Cambria	PA	Waste Management		53	459,223	2124	^{t, w}
Mostoller Landfill		159	Somerset	Somerset	PA	Waste Management		51	417,681	2056	^w
Mountain View Reclamation Landfill		64	Greencastle	Franklin	PA	Waste Management		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 Disposal	233	167	Jetersville	Amelia	VA	Waste Management		44		2167	^{w, x}
Shoosmith Sanitary Landfill		180	Chester	Chesterfield	VA	Shoosmith Brothers		47		2070	^v

^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

Table ES-2: Waste Disposal Options (best options in green; worst in red)		Option 1	Option 2	Option 3	Option 4	Option 5	
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	Accommodates Zero Waste	Disincentivizes diversion as most efficient operation is with three boilers		Incentives diversion to maximize landfill capacity, minimize cost	Incentives diversion to minimize cost		
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	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.	
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	Capital Cost [TOTAL]	\$72-122 million plus \$1.5 million/year	\$97-168 million plus \$1.5 million/year	\$100-107 million	\$70-86 million	~\$1 million	
Operating Costs	Total Estimated Cost/Ton¹¹	\$53.50/ton (HDR) \$64.36/ton (2020 invoice)	\$59.50/ton (HDR) \$59.31/ton (DEP) \$64.36/ton (2020 invoice) (long term prices depend on final contract negotiations and cost share)	\$44.50/ton (HDR) \$59.56/ton (DEP)	\$73-78/ton	\$50-59/ton	
	[includes transfer station and transportation costs; does not include externalized health and environmental costs]	...plus approx \$2.50/ton for improvements to air pollution controls (fixed cost that will increase per ton as waste is reduced)			Need RFQ for hauling and disposal and estimate for rail haul reconfiguration at transfer station	Need RFQ for hauling and disposal	

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.



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