Zero Waste Montgomery County
www.zwmc.org

Frequently Asked Questions about Incineration

August 2024

Content:

1. Where does Montgomery County's waste go?

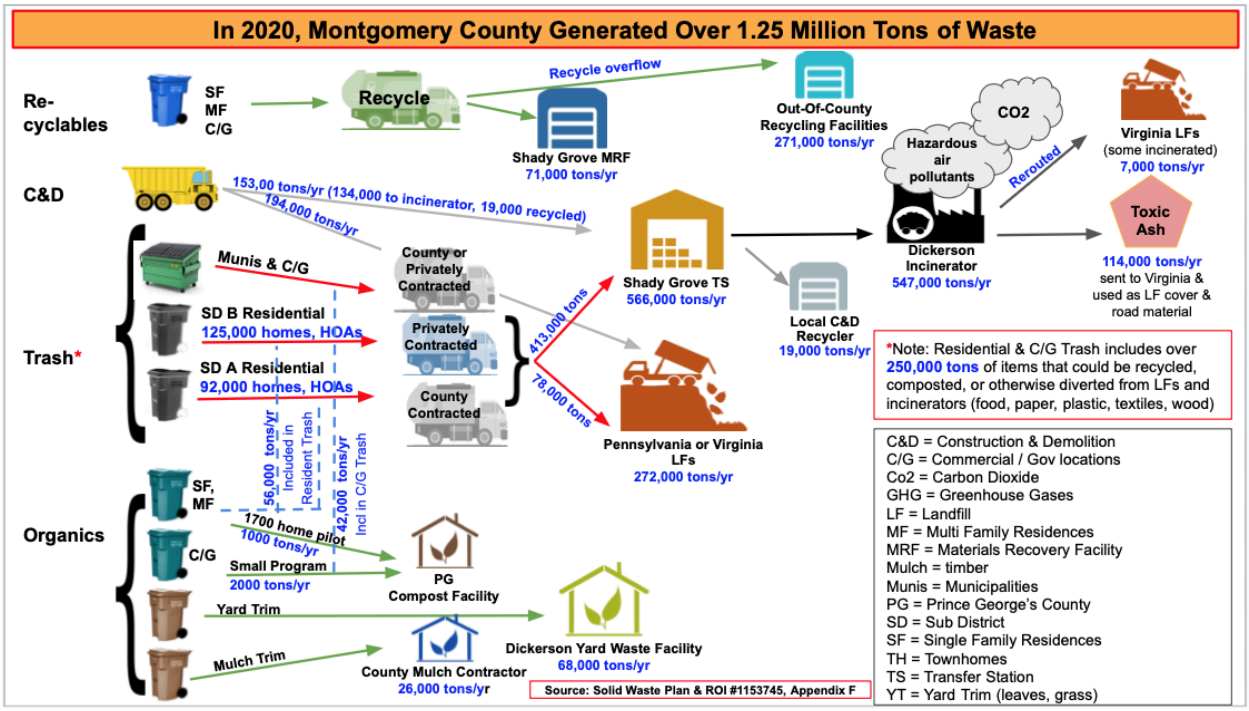

Figure 1: Montgomery County Waste Flow 2020[1]

Well over 1 million tons of waste are produced in the county annually, and more than half of the waste that isn't recycled is burned in the incinerator in Dickerson. We are unnecessarily burning or landfilling valuable materials that could be recovered with better management. In 2020, the incinerator burned approximately 547,000 tons of waste including about 134,000 tons of construction and demolition waste, which is especially toxic to burn.[2] Moreover, the county is currently routinely either landfilling or burning a significant portion of its waste outside of the county because the owner of the facility, Covanta/Reworld is allowed under its current contract to send "bypass" and "non-processable" waste to landfills and to a large incinerator it owns in Fairfax, Virginia, the largest industrial air polluter within at least 25 miles of the District of Columbia.

In 2020, the county sent 7,000 tons of waste to Virginia. In addition, it sent 114,000 tons of toxic ash to be dumped in a landfill in Henrico County, Virginia with no protective cover.[3]

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[1] In 2023, 126,000 tons of toxic ash was sent to Virginia landfills according to public documents.

[2] https://www.energyjustice.net/incineration/cd.pdf

[3] Historically, landfills must use soil to cover waste at night to prevent it from blowing into the community, but increasingly, state agencies are allowing the use of waste in place of soil as "alternative daily cover material." Montgomery County's incinerator ash is considered to be daily cover for itself, even though it can blow off-site. The Old Dominion Landfill operators even use our county's ash to build internal roads for trash trucks to drive over while delivering waste to the landfill, risking more of the ash being kicked up into the air and being tracked off-site as trucks return.

Our county's incinerator is the largest single source of greenhouse gasses (CO_2, methane, and nitrous oxide) – with methane emissions even exceeding those from the closed Oaks and Gude Landfills combined. And, it is the largest single source of these pollutants regulated by the Clean Air Act: ammonia, arsenic, beryllium, cadmium, chromium (VI), hydrochloric acid, mercury, nitrogen oxides, filterable particulate matter (PM10), filterable fine particulate matter (PM2.5), and sulfur dioxide. It is the county's second largest source of lead emissions.

The incinerator burns plastics, wood, food waste, batteries, metals, diapers, carpet, and mattresses, all of which create toxic emissions. Stronger source separation and recycling through increased public education and enforcement could otherwise divert thousands of tons of these materials. For example, the county has an extremely low business and multi-family housing recycling rate.

2. What gets burned in Montgomery County's incinerator?

Montgomery County residents, businesses, and government offices throw away over **250,000 tons** of items that could be recycled, composted, or otherwise diverted from landfills and incinerators (food, paper, plastic, textiles, wood).

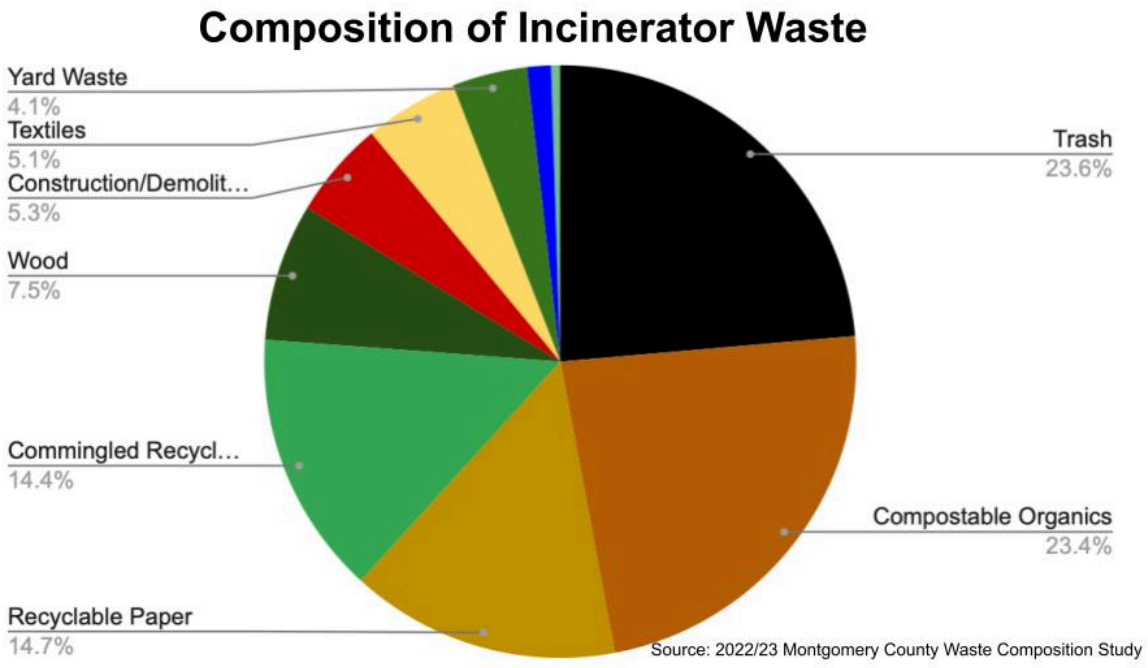

Figure 2: Composition of Montgomery County Incinerator Waste

3. Why is incineration worse than landfilling for Montgomery County?

Incineration is worse than landfilling for three reasons. The process of burning waste like non recycled plastics, wood and metals emits multiple types of air toxins that threaten our residents, aquatic life, land and water. Burning trash also creates greenhouse gasses primarily from burning organics like food, paper and wood: the Montgomery County incinerator is the largest stationary source of air polluting carbon dioxide in the county. Finally, the resulting by-products from burning waste is a highly toxic ash that still must be disposed of.

Let's look at the health impacts of incineration. A life cycle assessment conducted for Montgomery County using a peer-reviewed analytical tool that has been employed in multiple U.S. waste management districts[4], compared incineration (and landfilling ash) to direct use of landfills. The assessment found that the health and environmental consequences of waste incineration are more than three times that of sending waste directly to landfills, where waste is more contained. *Figure 3* below summarizes those impacts, showing the monetized health and environmental costs that are externalized on impacted communities. The analysis includes transportation impacts, which are relatively minor, even when trucking waste to landfills hundreds of miles away.

Figure 3 shows that the health impacts of just one of these pollutants – particulate matter, microscopic particles which are associated with increased risk of heart attacks, strokes, COPD, cancers, and other severe health effects. The green area shows the impact of nitrogen oxides – a key component of smog – which can trigger asthma attacks. The purple and light blue sections at the top of the bar chart represent the toxic chemicals linked to cancers, birth defects, learning disabilities, immune system problems, and reproductive disorders, among other health effects. Collectively, these impacts from incinerator air pollution (even after pollution controls have been applied) add up to far greater impacts than landfilling without burning waste first. The process of burning also creates new chemicals such as highly toxic dioxins and furans, acid gasses, nitrogen oxides, sulfur oxides, and more. Pollution control devices reduce some of these threats. However, even with air pollution controls, burning trash is still more polluting than burning coal, per unit of energy produced.

[4] **MEBCalc™** computes environmental costs and benefits of a community's choices for waste diversion and disposal methods over the full life cycle of each product and packaging material in the community's municipal solid waste, from resource extraction and refining through production to end-of-life fate. These economic values for the environment can then be compared to the traditional financial costs and benefits of each waste management method for each MSW component. https://srmginc.com/mebcalc/

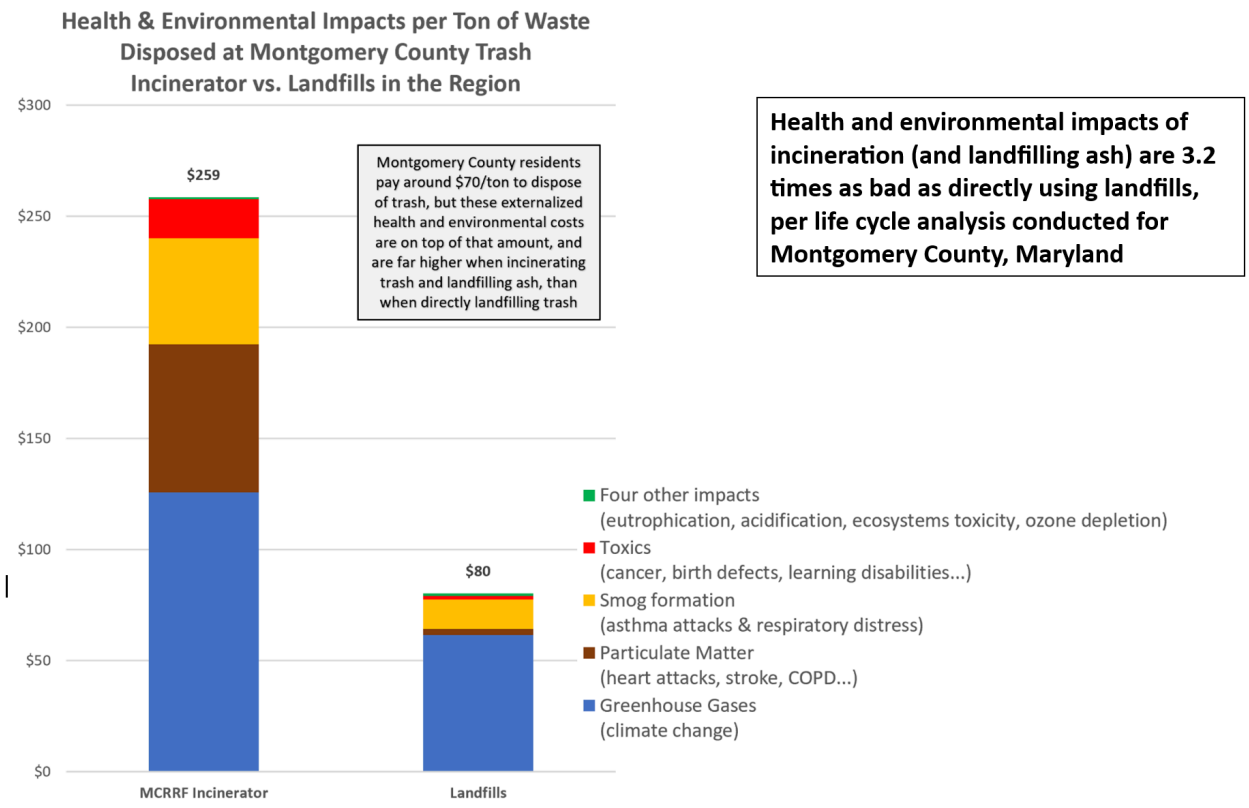

Figure 3: Monetized Health & Environmental Impact of Waste Disposal in the Montgomery County Trash Incinerator (MCRRF) with Ash Landfilling vs. Regional versus Landfills

Now, let's examine the climate impacts of incineration. The dark blue component of the bars in *Figure 3* represent the climate impacts, which are greater from incinerators because all of the carbon burned is immediately injected into the atmosphere as CO_2 when incinerated. At landfills, much of the carbon, especially that emitted from the incineration of plastics and durable materials like wood, would otherwise stay put and be stored in a landfill. The burning of food scraps and yard waste in incinerators is also problematic and should be discontinued through mandatory source-separation programs. When dumped in landfills, decomposing organic matter produces methane, which is over 80 times more potent than CO_2 over a 20-year period. However, burning organic matter in incinerators actually releases more carbon than it would in landfills. That is because the gas that is captured at landfills is turned back into CO_2 when burned, reducing climate impacts.

Finally, let's review the impacts of ash byproducts of incineration. The end-products from incineration are extremely toxic and pose a second significant disposal problem for

Montgomery County. For every 100 tons of trash burned, approximately 30 tons of ash are produced and sent to a landfill in a majority Black community in Virginia. Ash contains highly toxic dioxins/furans, per- and polyfluoroalkyl substances (PFAS–long lasting chemicals that break down very slowly over time), and heavy metals such as lead, mercury, arsenic, and cadmium. The process of burning makes these toxic ingredients in the ash, which contains dioxins, PFAS, and heavy metals (including lead, mercury, arsenic, and cadmium) more likely to expose people, other animals, and the environment. Ash has a higher surface area than unburned trash, and is smaller and lighter, thus more available to blow off of trucks or off of the top of the landfill when it's used as daily cover. The landfill operator also uses the ash to build service roads for waste trucks within the landfill. These conditions enable trucks to kick up toxic ash dust into the air, to track the ash off-site when they leave the landfill, and to allow rainwater to absorb the toxics and risk contaminating groundwater.

4. Would transporting waste to landfills (either by truck or rail) generate more pollution vs. incineration?

One common assumption not supported by science is that transportation emissions are significant and that transporting waste long distances is too polluting to justify landfilling over using an incinerator.

As *Figure 4* shows, the MEBCalc analysis comparing life cycle CO2 equivalent emissions from incineration in-county (and ash landfilling in Virginia) with transportation of waste to any of various landfills in the region, found that transportation emissions are minor compared to the emissions from landfilling or incineration, even if waste is transported by truck, not rail. If using trucks, the transportation share of the emissions from direct use of landfills average just 3 percent of the total GHG impacts of any of multiple landfills considered within 250 miles (all but Tunnel Hill). In any case, GHG emissions from using in-county incineration exceed landfill GHG emissions from even the most remote landfills being considered.

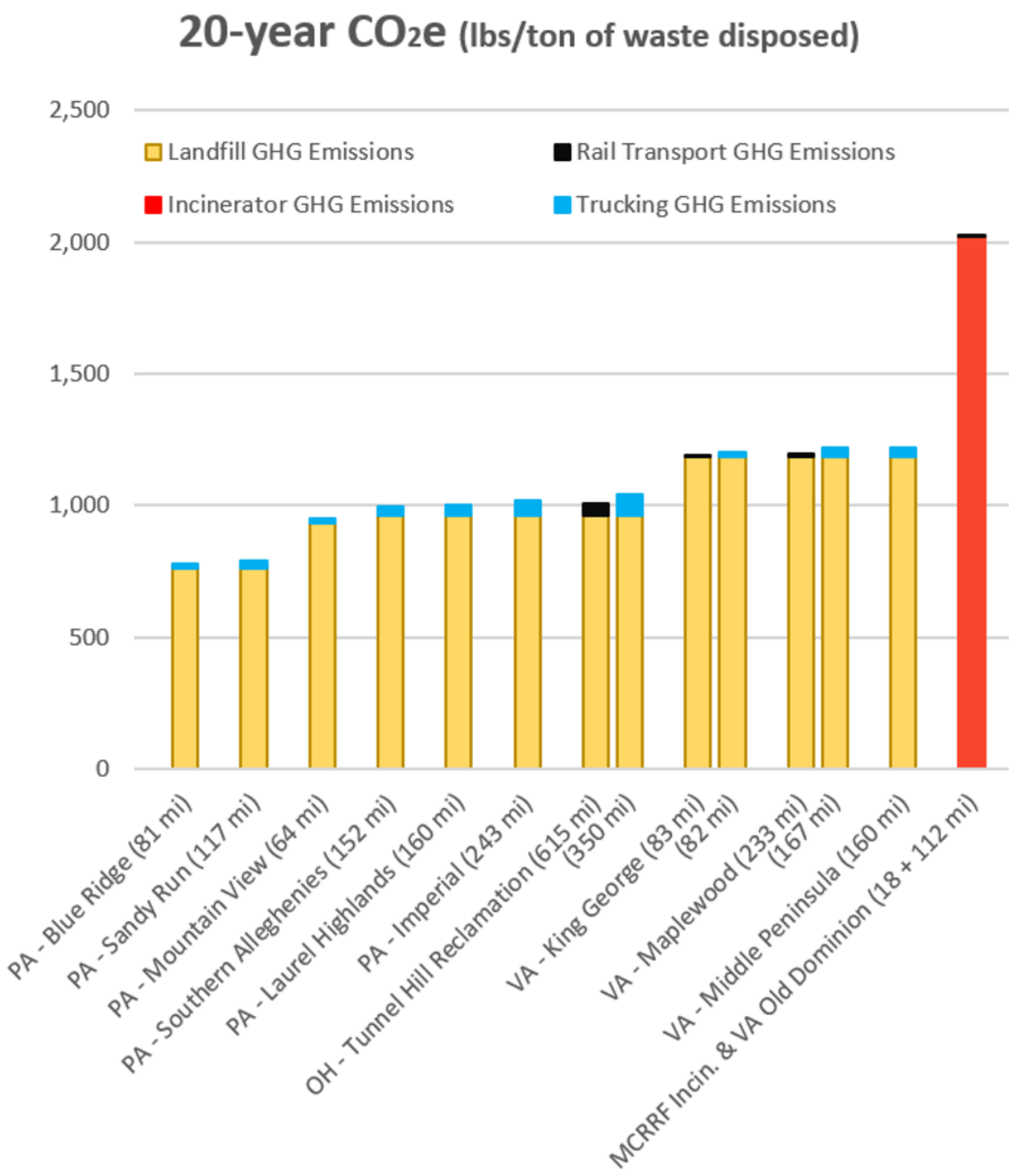

Figure 4: Greenhouse Gas Emissions from Montgomery County Trash Incinerator (MCRRF) with Ash Landfilling vs. Regional Landfills

A similar analysis was conducted comparing the GHG impacts of continuing incineration at Delaware County, Pennsylvania's facility with trucking waste to nearby landfills. The

analysis found that incineration is 69% worse than landfilling for the climate, and 134% worse (2.3 times as bad as) than landfilling when other health and environmental impacts are included. This accounts for additional trucking needed to bring all of the waste directly to the county's landfill. It also accounts for the 20-year impacts of methane from landfills, which are over 80 times as potent as CO_2.[5]

5. If we have to use landfills, what's the best way to further reduce their greenhouse gas emissions?

While the most immediate climate and public health benefit from switching our waste management system to landfill would come from eliminating incineration, the climate impacts of landfills can be further reduced by source separating food scraps and yard waste for aerobic composting. Methane and carbon dioxide are natural byproducts of the anaerobic decomposition of organic material in landfills. However, the gasses emitted would be significantly reduced through mandatory curbside and commercial organics separation programs and by aerobically composting the organic waste, which avoids production of methane gas if organic waste is anaerobically digested first, or is placed directly in a landfill. In Montgomery County, organics make up about 27 percent of the municipal waste stream.[6] The incinerator industry fails to inform decision-makers of this beneficial use of organic materials because it has no financial interest in diverting materials. Composting organics benefits the climate by further reducing greenhouse gas emissions at landfills, and in promoting the storage of carbon dioxide when compost is used to grow plants.

Residents are already accustomed to placing their yard trim out on the curb weekly; this shows by the near 90% recycling rate for yard trim. Residents could easily learn to adapt behavior to also separate their food waste and place it in the same container.

6. Where does the toxic ash from the county incinerator come from and where does it go?

The residue from what is burned (bottom ash) as well as the toxic fine particles captured in the incinerator's air pollution controls (fly ash) are combined and transported to a Virginia landfill via rail and trucks. Everything burned in the incinerator is either released into the air or reduced to small ash particles to be landfilled. In 1997, Montgomery County began shipping the incinerator's ash for use as daily landfill cover

[5] http://www.energyjustice.net/files/incineration/DelcoLCA.pdf.
[6] SCS Engineers,*2022/23 Montgomery County Waste Composition Study, Recycling and Resource Management Division, Department of Environmental Protection,* p.. 6. The total of 27% was derived by combining the categories "compostable organics" (23.4%) with "yard waste" (4.1%).

at the Brunswick Landfill in Brunswick County, Virginia. That population within a 5-mile radius of the landfill is 67 percent Black. In 2011, Montgomery County shifted to using the Old Dominion Landfill in Henrico County just outside of Richmond, Virginia for ash disposal. That community is 72 percent Black within a 5-mile radius and far more densely populated than the community adjacent to the Brunswick Landfill. In 2020, approximately 114,000 tons of this ash was sent to the Old Dominion Landfill. The ash particles can blow into the air and create toxic dust that can be harmful to the community.[7]

7. The incinerator industry claims that the ash it landfills in Virginia is safe because the ash passes Environmental Protection Agency (EPA) tests, so what's the problem with sending our incinerator ash to a landfill ?

Two types of ash are produced when trash or other solid fuels are burned: bottom ash and fly ash. Ninety percent of the ash is "bottom ash," or what remains on the grate of the boiler after the waste is burned. The remaining 10 percent is "fly ash" – smaller particles that are caught by the air pollution control devices. Fly ash is far more toxic than bottom ash and contains heavy metals and dioxins. Prior to 1994, when incinerator ash was tested with the EP Tox test – the test previously used to measure toxicity – the fly ash tested hazardous 94% of the time and the bottom ash tested hazardous 36% of the time. In some other nations, and in two international treaties, incinerator fly ash is categorically defined as hazardous waste.

Until 1994, the U.S EPA categorically exempted incinerator ash from federal hazardous waste regulation but the decision was successfully challenged by environmental groups In May 1994, the U.S. Supreme Court ruled that incinerator ash that tests hazardous for toxic heavy metals such as lead and cadmium must be disposed of in hazardous waste landfills rather than in typical municipal solid waste landfills. In response to that ruling, EPA imposed a testing regiment that consistently enabled this ash to avoid a hazardous waste designation. In February 2022, EPA admitted that their regulations are based only on what leaches out of ash under laboratory tests, not on exposure routes from inhalation or ingestion of particles released when ash blows off of trucks or trains, or from the top of the landfill when it's used as landfill cover (or, when trucks drive over it when it's used as internal roads in the landfill, as it done with Montgomery County's incinerator ash at Old Dominion Landfill).

[7] Beyond Incineration, p. 70.

8. Shouldn't Montgomery County manage its own waste within the county? After all, we have a huge county.

The county already sends a large portion of our waste outside of the county (*See Figure 1*) both materially and through the emissions generated by incineration. There are already existing landfills that take municipal solid waste and others that take only construction and demolition waste, for example, and still have sufficient capacity for many years. Also, we have a huge opportunity to capture and process organics, including the majority of our food waste, that is being burned now and it can be composted, here in the county, and the compost can be used by the residents and the county.

9. Shouldn't Montgomery County develop its own landfill in the county? What about "Site 2"?

The county owns an 820-acre property in the Agricultural Reserve (a special area zoned for farming) known as "Site 2," which could be used as a potential landfill. Current estimated costs and environmental risks to developing Site 2 into a landfill are unknown. Site 2 was identified as a potential landfill site many years ago and has since been leased and managed by farmers as an agricultural property.

The county's Agricultural Reserve, including this potential landfill site, sits on a federally designated sole source aquifer for our drinking water that is part of the Piedmont aquifer system. Constructing a landfill at Site 2 would place this sole source aquifer at considerable risk for contamination. The sole source aquifer in this area is characterized by fractured rock, making groundwater monitoring, rapid detection, and containment of possible contamination more complex.

Nationally recognized as the "Poolesville Area Aquifer System," it is the only source of drinking water for all residents and farms of the Agricultural Reserve west of Route 28. According to the EPA, no other economically feasible water source could be made available to this region and "if the aquifer system were contaminated it would create a significant hazard to public health." EPA further states:

"While the quality of the area's ground water is considered to be good, it is vulnerable to contamination due to the relatively thin soil cover and rapid movement of ground water in fractured rock, coupled with increasing development and other land uses. Thin soil cover may allow contaminants to be rapidly introduced into the ground water with minimal assimilation into the soil. Rapid movement of ground water through fractured

rock can allow contaminants to spread quickly, once introduced. Clean up of contaminated fractured aquifers is usually difficult to achieve and an expensive, long term effort. The designated area is underlain primarily by a fractured nonmarine sedimentary rock aquifer system, with some localized diabase intrusions." "The quality of ground water underlying the Poolesville area is generally good, but both the relatively thin soil cover and rapid movement of ground water in fractured rock reduce the capacity for contaminant attenuation, making the aquifer vulnerable to contaminants from point and nonpoint sources." (Emphasis added.)[8]

10. If we were to send our waste outside of Montgomery County, how do we guarantee that it is not dumped in a disadvantaged community?

Zero Waste Montgomery County (ZWMC) helped develop criteria which were used in the county's development of an initial Request for Expressions of Interest (REOI), which sought informal proposals from waste management companies to haul the approximately 600,000 annual tons of waste to landfill. The criteria ZWMC helped develop excluded landfills that were within a 5-mile radius of majority communities of color, as well as excluding landfills in lower-income communities and in more populated communities in general. There are multiple landfills in other states that meet these criteria. And, by not burning our trash, we will end the practice of dumping toxic ash in communities of color. Unfortunately, DEP recently removed these criteria from a subsequent REOI for the same services.

11. How old is Montgomery County's incinerator relative to other incinerators in the United States?

The incinerator started operating in May 1995, and is 29 years old as of 2024. Fifty-two trash incinerators closed between 2000 and September 2024, at an average age at closure of 25 years. In 2018, Covanta completed $13 million in upgrades to its 30-year old incinerator in Long Beach, California. The city now estimates it needs $66 million more to keep the incinerator safely operating and in January 2024 made the decision to shutter the plant and move to process its organics separately and to landfill non-processable waste. No new incinerators have been built at a new site in the U.S. since ours in Montgomery County, despite hundreds of siting attempts since 1995. A

[8] *Sole Source Aquifer Designation of Poolesville Area Aquifer System, Lower Western Montgomery County, MD, 63 Fed. Reg. 6176 (February 6, 1998).*
www.govinfo.gov/content/pkg/FR-1998-02-06/pdf/98-3042.pdf (starts on bottom right of first page) From p.6178: "Houses and farms are located farther apart in the areas outside of Poolesville, and could not be put on a distribution system in an economically feasible way."

handful have been expanded or rebuilt in that time. More than 90 have been shut down since 1995.

The incinerator is aging and the costs to maintain it over the next several years in order to maintain current operations will increase significantly.

In 2018, the County's contractor, HDR, prepared a report ("Task 9") estimating the range of capital investment the County would need to spend to operate the incinerator through 2026 or 2040.[9] The estimated costs per ton and capital cost investments lacked the needed detail and internal consistency required to accurately compare costs between options. For a 2026 closure, HDR estimated total capital costs of between $19 million and $27.4 million. The County's share was estimated at $11.5 million, annualized at $3.83 million for each of Years 2021, 2022, and 2023. For a 2040 closure scenario, HDR's estimates ranged between $37 million and $63 million for total costs. The report dealt with the uncertainty and wide range of estimates by using the average of the high and low estimates ($49.88 million) to develop capital cost investment estimates for a 2040 closure.

A subsequent estimate prepared by Montgomery County's Department of Environmental Protection (DEP) estimated capital costs at $73 million (higher than HDR's high-end estimate of $63 million). The recent estimate noted that three years lead time would still be needed to negotiate a contract or new procurement process to continue use of the MCRRF incinerator and that the outcome of the contract or procurement process would determine final costs for the necessary capital equipment upgrades. DEP's more recent data estimated a cost of $59.31/ton to continue incinerating through 2040. It is difficult to compare this unit cost to numbers in HDR's Task 9 Report because it is unclear exactly what costs are included in DEP's $59.31/ton figure. It is also unclear if this estimate includes reasonable costs for transfer and disposal of ash, non-processable waste, and bypass waste. Our review of Covanta's monthly invoice summaries found that actual per ton cost for 2020 was $64.36 per ton including the non-processibles and bypass waste. A Council staff analysis of the FY25 budget included RRMD's estimate for the average cost per ton as $60.99 based on $ 35,373,471 budget divided by current 580,000 tons processed. The cost per ton estimate increases as total waste going to the incinerator is reduced.[10] It is important to note that these estimates also do not include the probable capital costs mentioned

[9] HDR Report for Department of Environmental Protection, Montgomery County Maryland: Aiming for Zero Waste, Task 9–Options for Collection and Disposal of "What's Left," Final Technical Memorandum #5.

[10] https://montgomerycountymd.granicus.com/MetaViewer.php?view_id=169&event_id=16170&meta_id=178963

above to keep the facility operating safely. The County Executive's FY 2025 draft budget recommends maintaining a $70 per ton tip fee for solid waste.[11]

12. Europeans rely heavily on incinerators. Isn't that a good model for us?

Incinerator advocates like to point across the ocean and claim that incineration works in Europe and Japan, where they rely heavily on incineration due to lack of landfill space. However, countries in the European Union incinerate only about 20% of their waste, compared to around 50% in Montgomery County (see Figure 1). Moreover, *per capita* EU waste generation is much lower than ours – 0.5 tons per capita in the EU compared to 1.5 tons per capita per year in Montgomery County.[12]

Incinerators in these countries are also very polluting, still compete with recycling, and some European countries have found themselves having to import waste from neighboring countries just to keep their incinerators fed with enough waste to operate. As the deadline for the assessment of disposal operations mandated by the EU Waste Framework Directive is approaching in December 2024, Zero Waste Europe has called for a moratorium on waste incinerators in the EU to address waste treatment capacity and steer waste management toward a more sustainable path.[13]

13. What will happen to our county's waste if we close the incinerator?

The County has committed to closing the incinerator; the contract expires on April 1, 2026. As stated on its "Aiming for Zero Waste" webpage, *"Montgomery County is committed to serving as a model for both the state and country through continuous improvement of our materials management system. To this end, the County is taking steps to close the incinerator and change how Montgomery County handles its solid waste and recycling in an ongoing effort to aim for zero waste . . . "*

To change the way it handles waste coming into the Shady Grove Transfer Station – waste that is currently simply collected, dumped on the tipping room floor, compacted and placed on rail cars before being bound for incineration – DEP has hired two consulting firms (Arcadis and B&L) to evaluate proposals from private firms to handle

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[11] https://montgomerycountymd.granicus.com/MetaViewer.php?view_id=169&clip_id=17284&meta_id=175364

[12] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_management_indicators&oldid=461870

[13]

the waste using technologies that can reduce as much of the currently discarded organic fraction and recyclables as possible. For residual waste that cannot be recycled or reused but has been treated as much as possible, the County will contract with a firm that will collect and deliver it to a well-managed pre-existing landfill, thus providing the residents of Montgomery County with a much safer, cleaner and environmentally just solution. No waste management strategy is perfect but this is the one that will do the least harm.

The County also has existing programs and additional plans to handle a range of waste types that should never end up in an incinerator or landfill. These include certain types of construction and demolition debris, bicycles, clothing, mattresses, metals, electronics, furniture and household goods.

In addition the DEP is considering transitioning to a Save As You Throw payment plan to eventually include all residential properties in the county. In 2021 it began two organics pilot programs: one to remove food scraps from residential trash, and the other purchasing a truck to collect food scraps from businesses. Food scraps are currently delivered to the PG County composting facility but the DEP is planning to build an in-county facility of its own that would process food scraps along with yard trim.

As of June 2023, about 1,400 households in three neighborhoods were enrolled in a food scraps collection pilot program. The county has provided backyard compost bins to more than 1,000 volunteers. On the commercial side, about 37 businesses or institutions receive food scrap collection from the county. The County's goal is to offer all residents source separation by commingling yard waste and food waste in a single container. As has been successfully demonstrated in many other cities, when combined with organics separation, a save-as-you-throw collection system can result in significant waste reduction.

The county has also hired additional education and enforcement personnel to increase recycling rates at multifamily and commercial properties. It is hiring a manager to develop additional zero waste programs.

For residual waste that cannot be recycled or reused, the County has issued an REOI to identify a hauler who will collect and deliver it to a well-managed pre-existing landfill thus providing the residents of Montgomery County with a much safer, cleaner and environmentally just solution. These efforts are designed to improve our resource management and we want the county to also make sure they focus their decision making on management strategies that will do the least harm to the community and the environment.