# Landfilling Perspectives

## Regional Challenges for Solid Waste Management

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BLACK & VEATCH

# Agenda

- Regional overview
- Challenges
  - Wet materials
  - Odor
  - Organics diversion goals
  - Emerging contaminant concerns
- Navigating a changing landscape

# Regional Overview

# Regional Waste Management Overview

## Maryland (1)

| | |
|---|---|
| Waste Quantities (tons) | • 12 M generated<br>• 8.9 M received at MD Solid Waste Acceptance Facilities (SWAFs)<br>• **2.6 M exported (77% to VA)** |
| Capacity | • 24 MSW landfills<br>• 59 M ton capacity available<br>• **34 years remaining in 2017** |

(1) Maryland Solid Waste Management and Diversion Report 2017 (2016 data)

## Virginia (1)

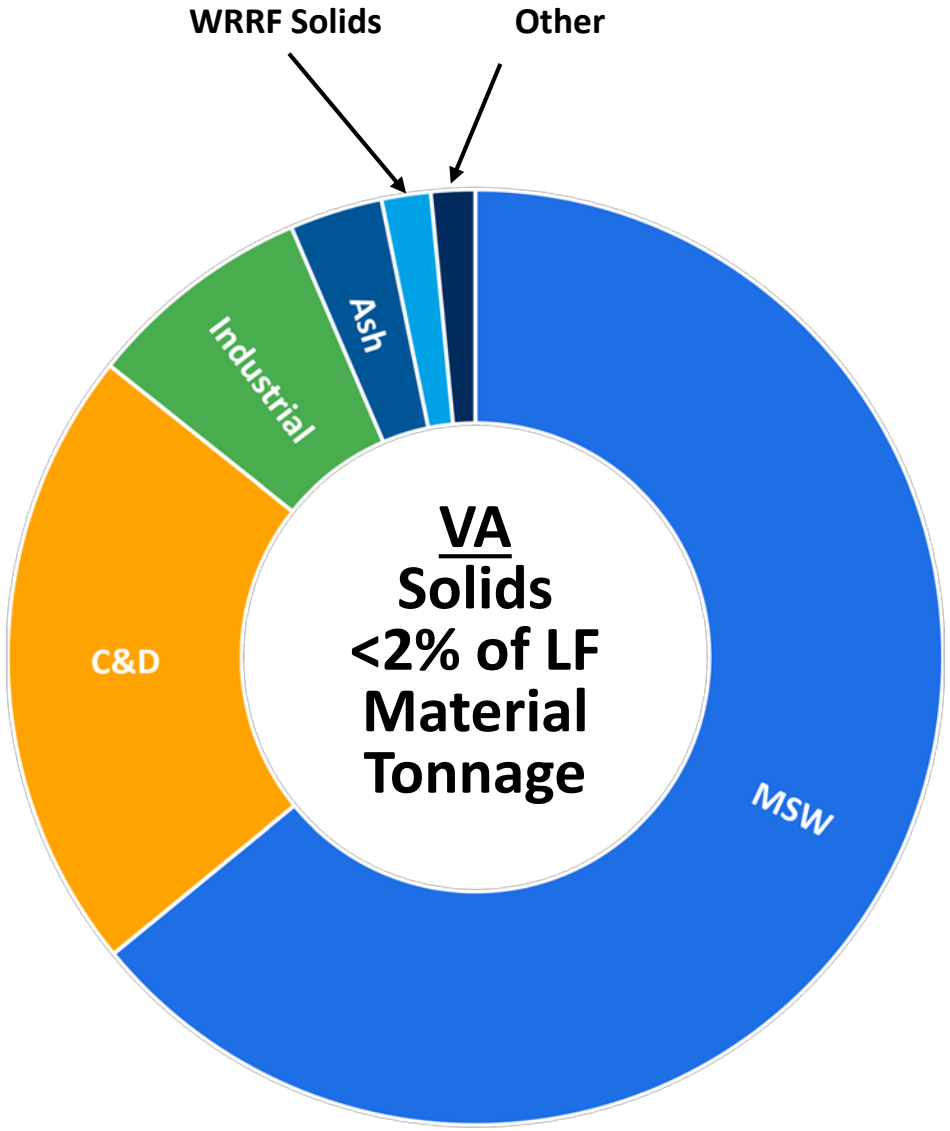
| | |
|---|---|
| Waste Quantities (tons) | • 21.8 M received at permitted facilities(2)<br>• **5.1 M imported**<br>• 13.1 M landfilled |
| Capacity | • 51 MSW landfills<br>• 252 M tons capacity available<br>• **23 years remaining in 2019** |

(1) 2019 Annual Solid Waste Report for CY2018, Commonwealth of Virginia

(2) Most recycling occurs at other than permitted waste management facilities

# Solids Disposal in Regional Landfills

- Maryland
  - Mostly county LFs
  - No ability to determine specific allocations
    - WRRF solids believed to be <5% of total
  - No target MSW:solids fraction because of LF approach
- Virginia
  - Despite imports, solids fraction in MSW LF low




Derived from: 2019 Annual Solid Waste Report for CY2018, Commonwealth of Virginia

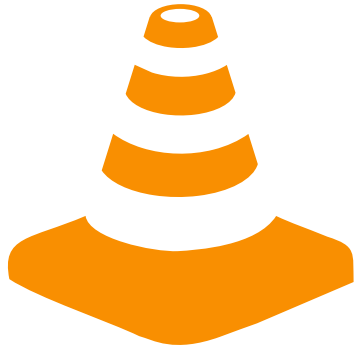
Low sludge contributions could be beneficial with respect to some concerns, possibly problematic for others

# Challenges

# Resiliency Pressures for Utilities

- Chronic
  - Tip fees
  - Hauling costs

- Acute
  - Wet materials
  - Odor
  - GHG reduction/organics diversion goals
  - Emerging contaminant concerns



# Landfilling Costs

- MSW landfilling costs expected to continue increasing near term
  - ~ 5% between 2017-2021
- Pressures driving costs not expected to ease
- Solids landfilling costs increasing at greater rate in some locales due to acute pressures

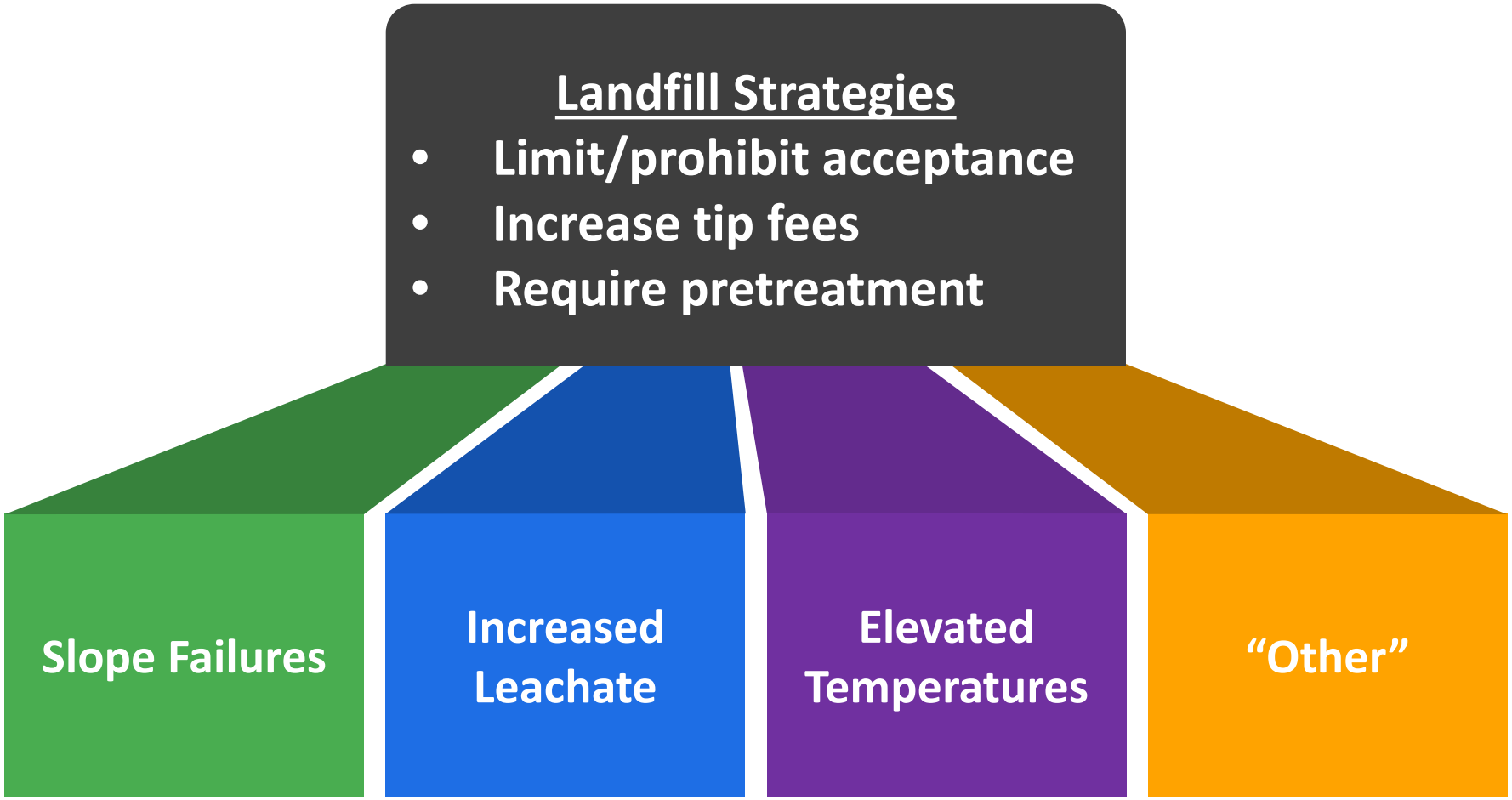
# General Landfill Cost Pressures


- Recycling market constriction (Chinese “National Sword”)
- Labor shortage (hauling especially)
  - Wages increasing
- Supply/demand
  - VA – significant imports
  - Less interest in WRRF solids

# Other Landfilling Cost Considerations

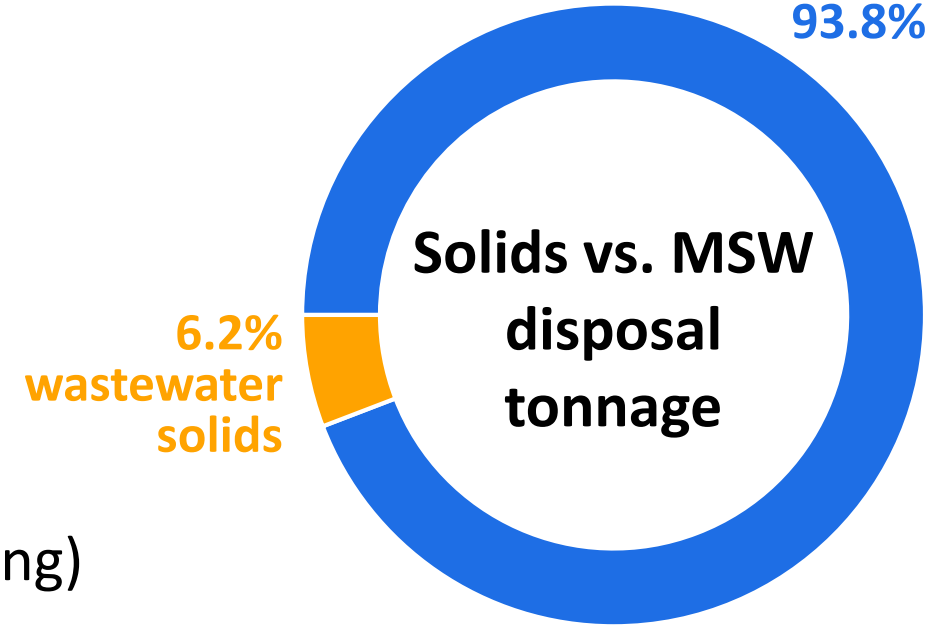
- Use as back-up
  - Spot market fees high
  - Low-priority customer (“first-out”)
- Few (no?) long-term contracts
- Saw doubling of fees in some cases in last year
  - $35-40 to $80-$100

# “Wet Material” Concerns are Impacting Solids Landfilling Nationally



# Wet Material Concerns: Georgia Example

- Slope failure at one landfill
- Regulators focus on handling of wet materials and possible new requirements
- LFs reassess solids acceptance considering costs to address regulator concerns
- Result
  - LF costs more than double (now ~$90-100/ton)
  - LF acceptance plummets
  - Many contracts not renewed
  - Utilities hauling to AL or moving to Class A (drying)




Source Georgia EPD survey (July 2018)

# Odor Impacts

- Some LFs have halted solids acceptance…with week(s) notice
  - An issue across the country – solids “not worth the odors”
- What to do when faced with imminent “shut out”
  - Haul further (one OH facility now going 250 mi RT after shut out at local LFs)
  - Employ odor reduction additives
    - Offer quick implementation and durational control
    - Can be costly long-term
  - Consider planning for solids process improvements

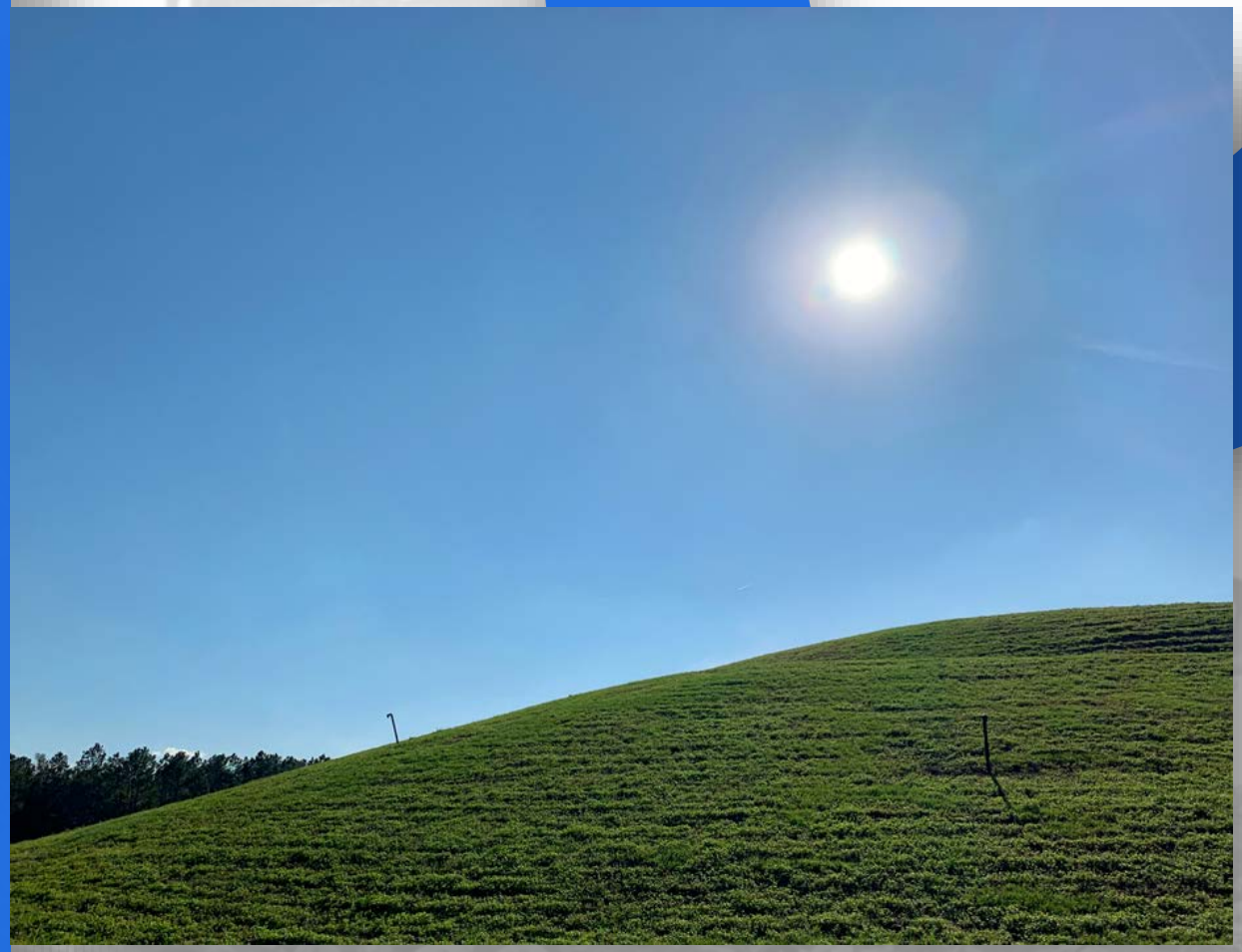
# Waste Diversion Impacts Vary

## Regional organics diversion not an apparent focus

- Historically focused on EPA hierarchy
- WRRF solids not generally included

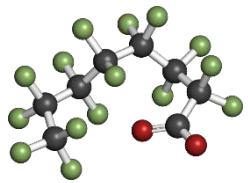
## CA SB 1383 focuses on LF emissions as GHG source

- 75% organics diversion by 2025
- PROFOUND impact on WRRF solids landfilling

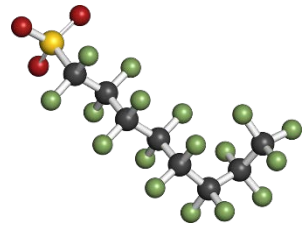


# Emerging Contaminants: Landfills and PFAS

- LF leachate quality a concern
  - Especially where discharged to a WRRF
  - Concern somewhat abated after studies
- At least 2 private Indiana landfills have turned away solids from MI because of PFAS concerns



Perfluorooctanoic acid (PFOA)



Perfluorooctanesulfonic acid (PFOS)

| Region | PFOA (ppt) | PFOS (ppt) |
|---|---|---|
| Michigan | 16 – 3,200 | 9 - 960 |
| United States | 30 – 5,000 | 3 – 800 |
| Europe | ND – 1,000 | ND – 1,500 |
| Australia | 17 – 7,500 | 13 – 2,700 |
| China | 281 – 214,000 | 1,150 – 6,020 |
| Worldwide Range | ND – 214,000 | ND – 6,020 |

**Source: NEBRA, reporting on Michigan Waste & Recycling Association Survey, 2019**

# Challenge Summary

- Costs are expected to continue increasing
  - Spot market, wet material costs increasing faster/higher than general trend
- Trend toward restricting solids acceptance expected to continue
  - Potentially not a major factor in region (yet)
- National trend toward organics diversion for GHGs not currently major driver

**Bottom line: Landfilling no longer a reliable AND cost-effective option in some areas**

# Managing Landfilling Risk

- Product quality
  - Low odor
  - Higher solids
- Diversity
  - Enter contracts with multiple landfills
  - Try to minimize overloading one landfill

# THANK YOU

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