

# 2019 Biosolids Conference - “Challenges and Opportunities”

## Wet Waste Disposal Issues

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**THINK GREEN®**

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# OBJECTIVES



**Landfill Basics Overview**

**Wet Waste Challenges**

**Future Outlook**

# LANDFILL BASICS OVERVIEW

- ❑ Over 60 Landfills in Michigan
  - Majority are Type II
    - ❖ Type (Class) II landfills can accept virtually any non-haz solid wastes
  - 52,500,000 cubic yards total waste disposal in 2018 (17.5M Tons)
    - ❖ 75% Michigan / 19% Canada / 6% Other States
  
- ❑ Waste Management
  - 17 Waste Management Landfill Facilities in MI
  
  - Daily volume ranges between ~100 tpd to ~15,000 tpd

# LANDFILL BASICS OVERVIEW

## ACCEPTED WASTE STREAMS FOR TYPE II FACILITIES

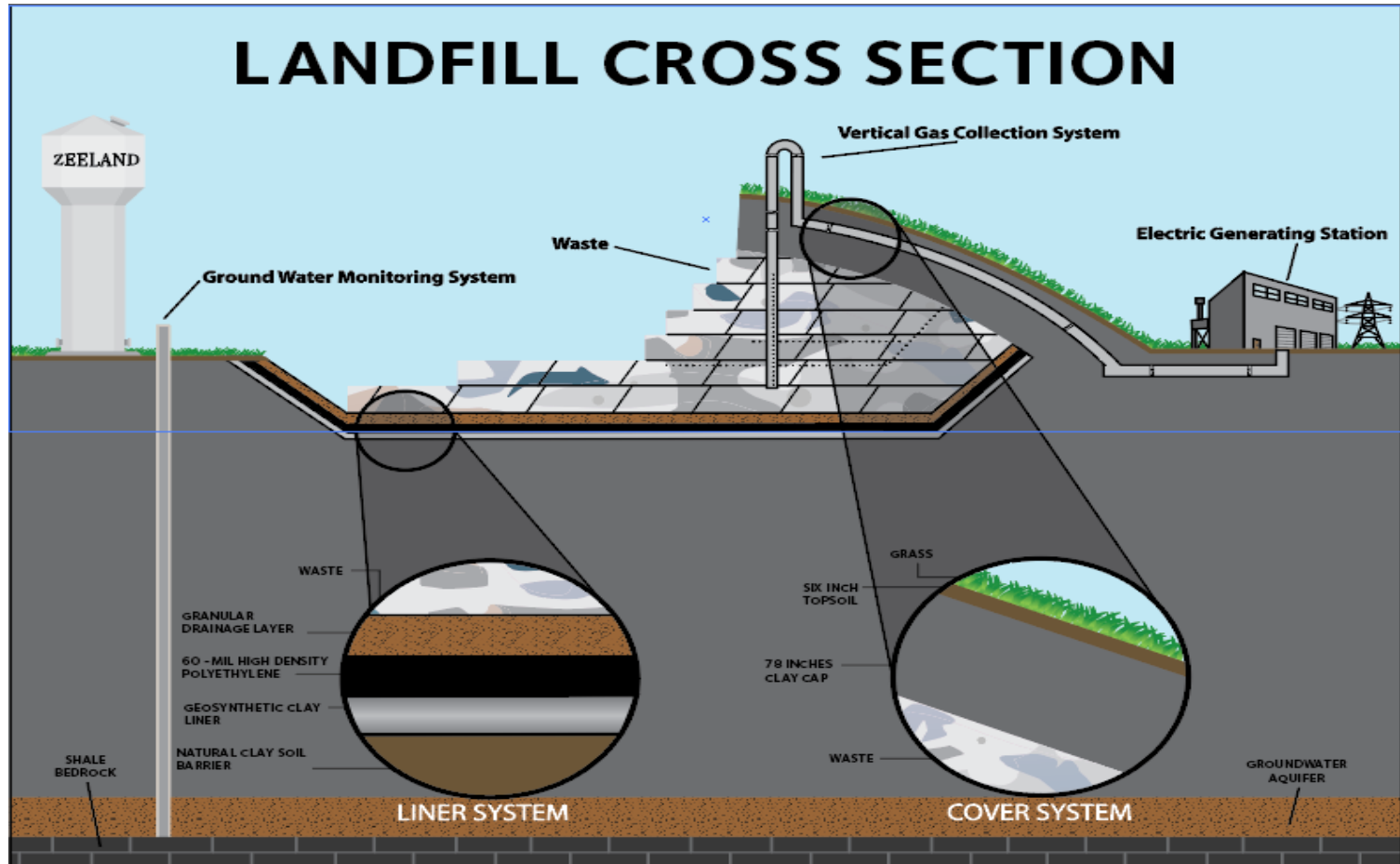
- Household Wastes
- Commercial Wastes
- Constructions & Demolition Debris
- Industrial Wastes
  - Plant trash
  - Special Wastes (foundry sands / contaminated soils / Carwash Sediment etc.)
  - Industrial Sludges
  - POTW Sludges (WWTP Sludge / Grit & Screenings / Alum Sludge)

# LANDFILL BASICS OVERVIEW

## Daily Operations

- Customer Service and Safety
- Manage and Compact Volume
- Monitor Storm Water Controls
- Daily Cover
- Maintain Heavy Equipment
- Manage Leachate
- Capture and Extract Landfill Gas

# LANDFILL BASICS OVERVIEW



# LANDFILL BASICS OVERVIEW

## Typical Landfill Heavy Equipment

### PRIMARY

Dozer

Compactor

Articulated Dump Truck (ADT)

Excavator

Loader

### SECONDARY

Backhoe

Grader

Tipper

# LANDFILL BASICS OVERVIEW

## SOLIDIFICATION SERVICES





# WET WASTE CHALLENGES

## EXAMPLES OF “WET WASTE”?

- Industrial Sludges
- POTW Sludges (Biosolids)
- Liquid Wastes (solidification)
- Paper Sludges
- Food Wastes
- Dead Animals

# WET WASTE CHALLENGES

## WHAT'S HAPPENING?

Year	Wet Wastes (Tons)	Wastewater Sludges (Tons)	MCW/MSW and C&D
2018	720,798	367,636	13,491,715
2017	641,864	374,652	13,040,024
2016	603,642	327,633	12,728,685
2015	524,928	259,689	12,241,353

Variance

27.2%

29.4%

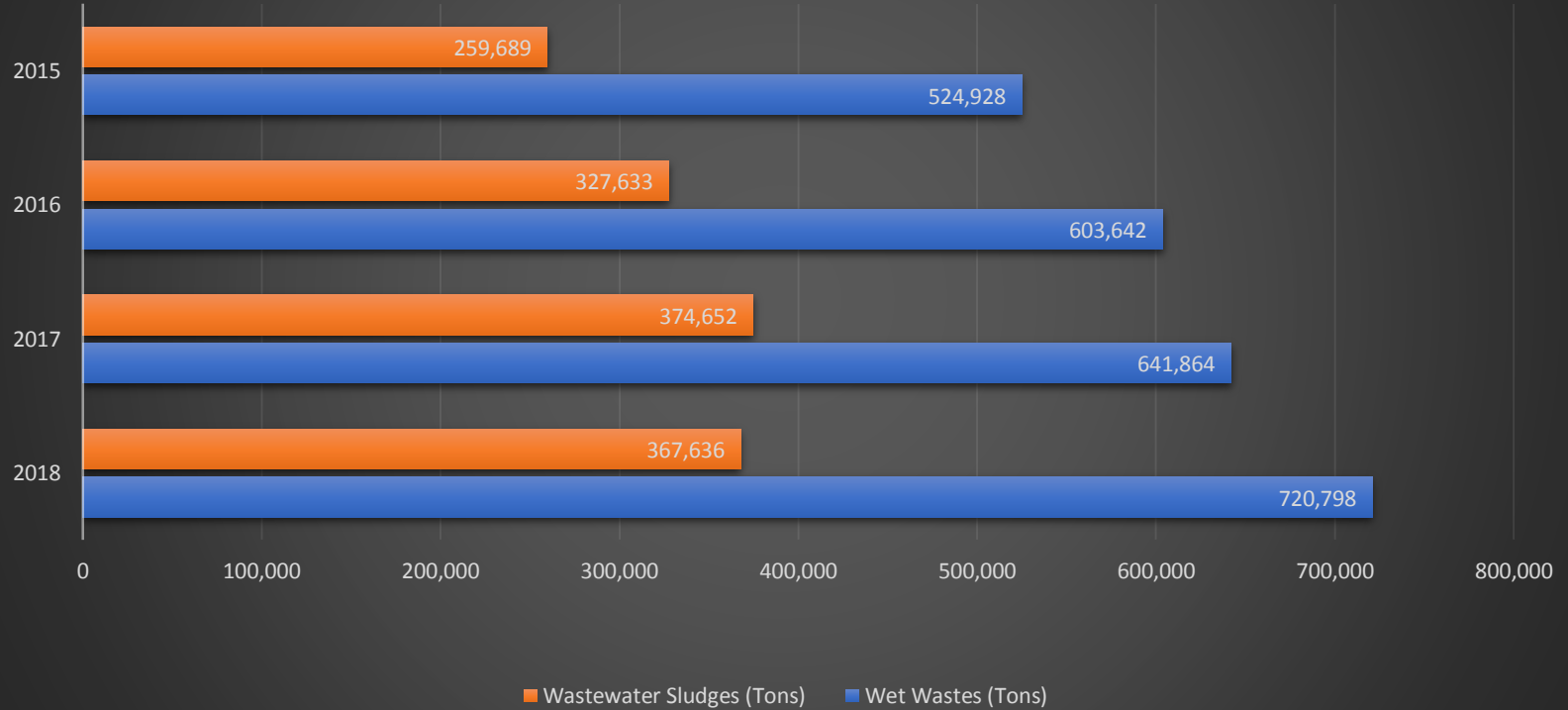
9.3%

- In Michigan, volumes considered to be “wet wastes” continue to increase YOY
- Dry volumes have also increased YOY, but at a slower rate by comparison
- On a more local level, these variances can be more profound

# WET WASTE CHALLENGES

## WHAT'S HAPPENING?

Wet Waste Trends (Annual Tons)



# WET WASTE CHALLENGES

## WHY IS THIS HAPPENING?

### RECYCLING

- ❑ *According to the 2018 MDEQ Recycling Report, data collected from the first two reporting years indicate that recycling volumes have more than doubled from 2017 to 2018. An increase of 120%.*
- ❑ *Upward trend expected to continue as recycling markets and initiatives continue to evolve.*

- ❑ *Kent County:*



# WET WASTE CHALLENGES

## WHY IS THIS HAPPENING?

### ZERO WASTE PROGRAMS



# WET WASTE CHALLENGES

WHY IS THIS HAPPENING?



# WET WASTE CHALLENGES

## HOW DOES THIS AFFECT LANDFILL OPERATIONS?

### Safety Concerns

#### ❑ Slope Stability

#### Worst Case Scenario

- Kersey, PA
- Compactor Operator Fatality



# WET WASTE CHALLENGES

## HOW DOES THIS AFFECT LANDFILL OPERATIONS?

### Environmental Concerns

- ❑ Slope Stability / Cover Integrity
  - Leachate Breakouts
    - ❖ Stormwater Protection
- ❑ Fugitive Gas Release & Extraction
- ❑ Elevated Temperatures
- ❑ Material Tracking Off-Site
- ❑ Odor



# WET WASTE CHALLENGES

## HOW DOES THIS AFFECT LANDFILL OPERATIONS?

### Operational Costs

#### ❑ Equipment:

##### ➤ Dozer Undercarriage Hours

- ❖ Replacement Costs
- ❖ Downtime
- ❖ Stress on other equipment

##### ➤ Compactor

- ❖ Diminishes the effectiveness of the compactor by not allowing full down pressure of the machine
- ❖ Less compaction = higher operating costs

# WET WASTE CHALLENGES

## HOW DOES THIS AFFECT LANDFILL OPERATIONS?

### Operational Costs

- ❑ Gas Wells and Leachate Pumps:
  - Sludge & Leachate infiltrate our gas wells making them ineffective (\$10k to drill new gas wells)
  - Sludge often plugs our leachate pumps requiring replacement adding cost and labor

# WET WASTE CHALLENGES

## HOW DOES THIS AFFECT LANDFILL OPERATIONS?

### Operational Costs

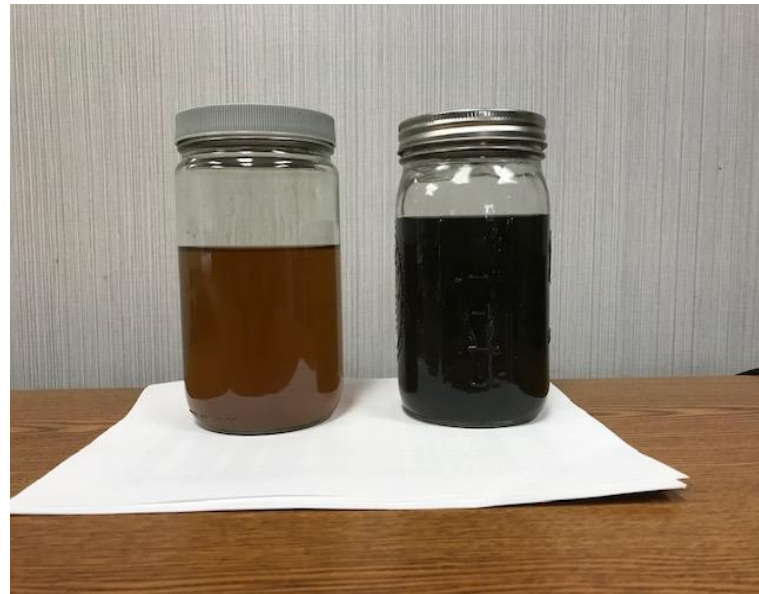
#### ❑ Leachate:

##### ➤ Leachate Strength

❖ High BOD

❖ High Ammonia

##### ➤ Increased Leachate Volume



# WET WASTE CHALLENGES

## HOW DOES THIS AFFECT LANDFILL OPERATIONS?

### Operational Costs

- ❑ Leachate: Case Study - 10 Acre Working Face / Intermediate Cover
  - 1 inch rain per acre = 27,154 gallons
  - Michigan annual rainfall = 32 inches/year
  - Total leachate attributed to annual rainfall = 868,928 gallons
  - Total gallons of rainfall on 10 acre site = 8,689,280 gallons
  - Total leachate produced in 2018 = 19,234,000 gallons
  - 10,544,720 gallons of waste generating leachate

# WET WASTE CHALLENGES

## WHAT ARE WE DOING ABOUT IT?

### □ Site-Specific Capacity Evaluation:

- What is our remaining capacity at each site?
- Can we divert volume to other sites?
- Can we manage it differently?

### ❖ Different Blending Techniques?

- Prior failed attempts: Trenching / Encapsulating

# WET WASTE CHALLENGES

## WHAT ARE WE DOING ABOUT IT?

### □ Solidification Agent Evaluation:

#### ➤ Common Solidification Agents:

- ❖ Paper Pulp
- ❖ Sawdust
- ❖ Autofluff

#### ➤ Actively investigating agents that provide more absorption for our solidification processes

# WET WASTE CHALLENGES

## WHAT ARE WE DOING ABOUT IT?

- Investigating Alternative Technologies
  - Commercial Digester??
    - ❖ Landfills typically have large footprints of permittable acres
    - ❖ Infrastructure

# WET WASTE CHALLENGES

## WHAT CAN YOU DO?

- ❑ Start an early dialogue with your local disposal facility
- ❑ We are committed to a path to “YES” but it may require some creativity to find a solution for additional wet waste capacity
  - Your local disposal facility may not have additional capacity for your volume and may require longer haul distances to find an outlet
- ❑ Continue to investigate improvements in dewatering technologies, polymers, etc.



# WET WASTE CHALLENGES

Thank You!!

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