

# Surface Fires in the Solid Waste Industry

presented by:  
**Jeff Phillips**



**Environmental Solutions for More Than 50 Years!**

- Landfills • Waste Planning/Diversion • Industrial Compliance
- Brownfields • Industrial Wastewater/PFAS • Site Cleanups
- Carbon Sequestration

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## Agenda

- Industry Fire Trends
- Landfill Fire Events
- Landfill Fire Risk Pre-Plans



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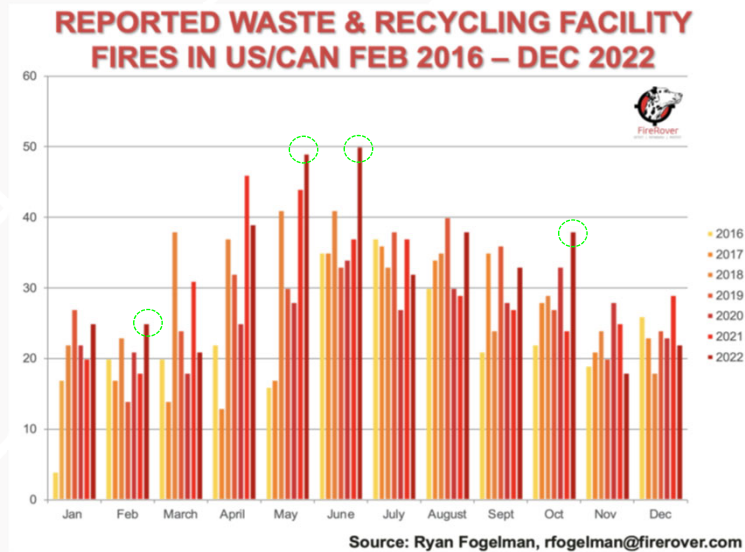
## Fire Trends

- Not Uncommon
- Many go unreported (small working face fires)
- Average of 8,400 landfill fires are reported each year (National Fire Incident Reporting System)

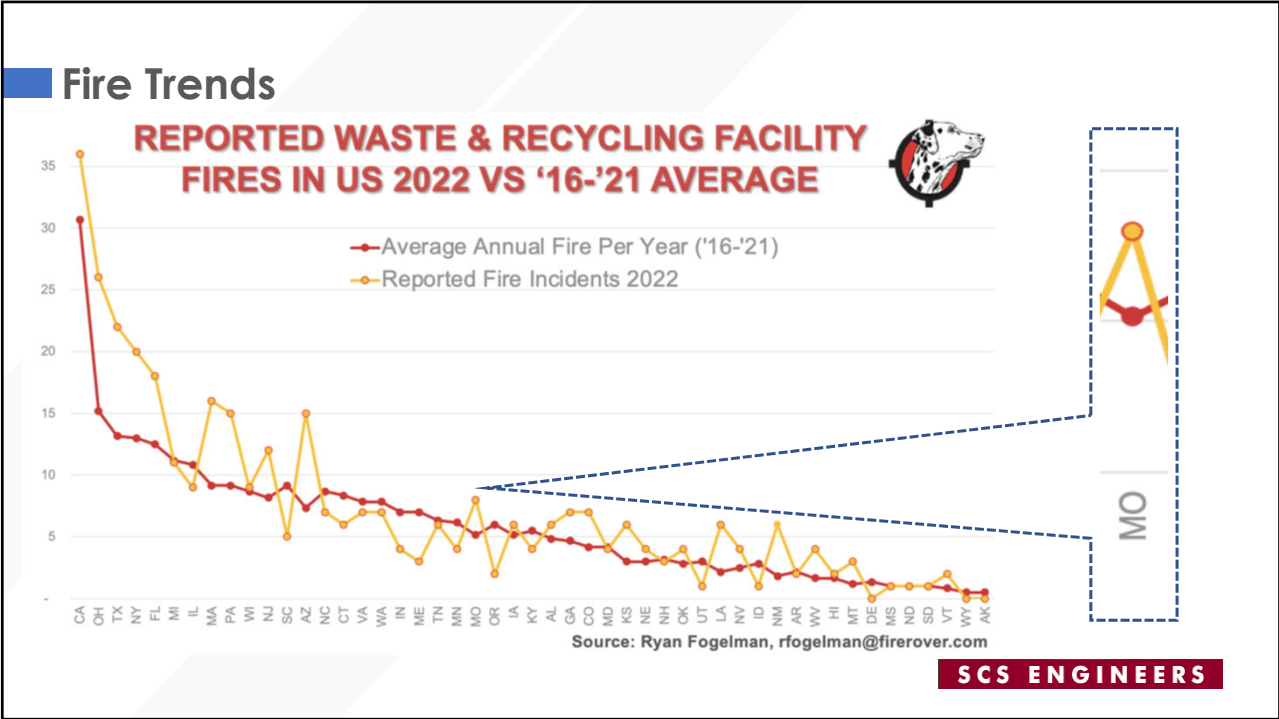
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## Fire Trends

2022 Missouri:  
• 8 Reported



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### Fire Trends

#### Fire Causes

- Traditional Methods
  - Waste reactions
  - Equipment sparks
- Lithium-ion Batteries
- Lightning
- Arson
- Poor Cover Operations
- Burn Barrel Management
- Previous Hot Loads
- Move In/Move Out Days at Colleges/Universities
- New Process/Staff at Manufacturing Facility








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## Fire Trends

### Fire Causes

- Lithium-ion Batteries
  - Bluetooth headsets
  - Cell phones
  - Computer peripherals
  - Digital cameras
  - Game controllers
  - Laptops
  - Smartwatches
  - Smoke, fire, carbon monoxide detectors
  - Tablets
  - Vape devices

Examples of common electronic devices containing lithium cells or batteries

Video cameras	Walkie talkies (2 way radio)	GPS devices	Radio controlled toys
			
Cameras	Scanner	Cellular Phones	MP3 players
			
Bluetooth headsets	Smartphones/mobiles	Laptop computers	Shavers
			
Power Drills	Tablets	Portable DVD players	Measuring equipment
			

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## Fire Trends

### Elsewhere at Landfill

- Compost piles
- Containers
- Debris piles
- Equipment
- Structures
- Incoming vehicles



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## Fire Trends

“So what?”  
“What’s the big deal? It’s just a dump fire.”



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## Fire Trends

1 ton of MSW = 100 Gallons of fuel

600,000 ton/year facility  
2,000 tons/day  
206,000 gallons of fuel per day  
That is about 17 fuel tankers per day...

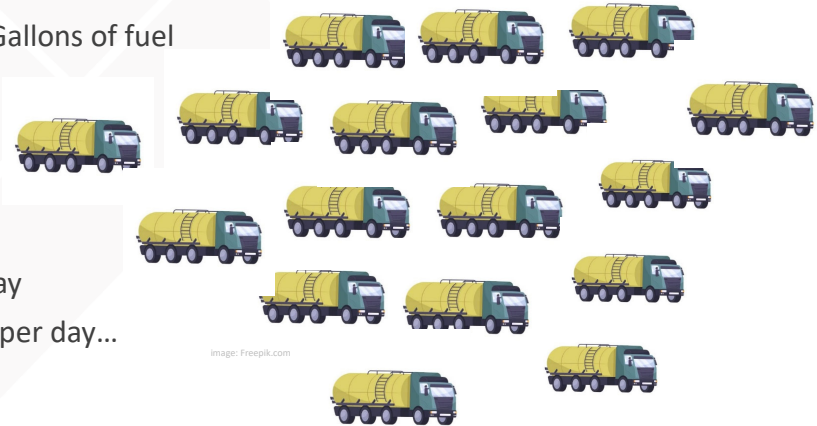
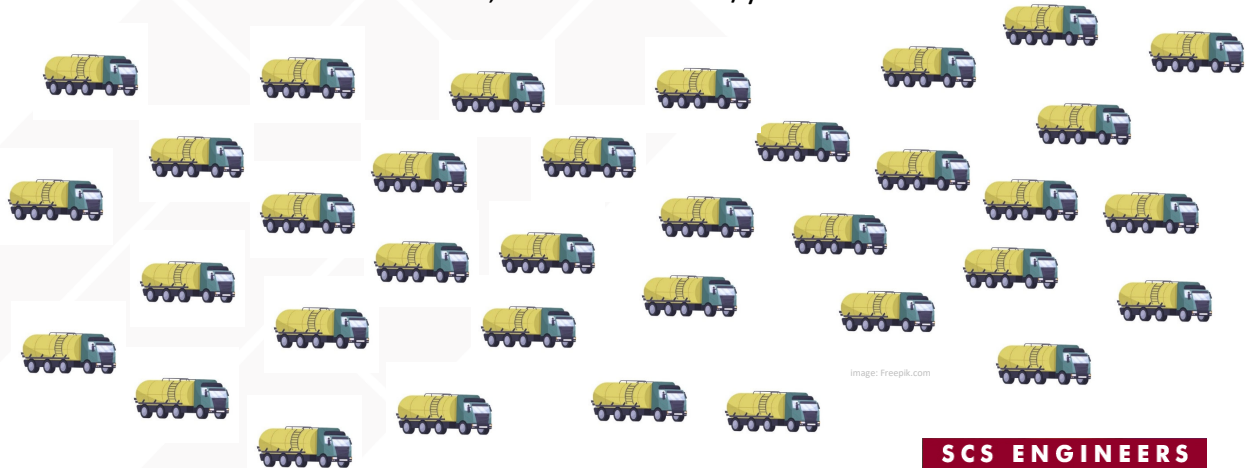


image: Freepik.com

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## Fire Trends

206,000 gallons/day = 61.6 million gallons/year  
5,000 tanker trucks/year



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## Landfill Fire Events



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## Landfill Fire Events

Iowa City, IA



- In May of 2016, Iowa City Landfill in Iowa City had a fire that engulfed nine acres of new landfill cell
- Within 12 hours, the fire either destroyed or damaged the following:
  - Liner system
  - Leachate collection system
  - Underground drainage layer
  - Associated infrastructure
- Landfill operators attempted to build fire breaks, but all failed

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## Landfill Fire Events

Iowa City, IA



- Over several weeks, landfill operators, fire departments, city staff, county emergency managers, contractors, and county and state regulators coordinated fire mitigation
- Cause of fire was not determined, but suspected coals from grill in waste
- Total fire and environmental mitigation costs exceeded \$3 million (not including redesign or constructing)

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## Landfill Fire Events

Iowa City, IA



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## Landfill Fire Events

Key Takeaways – Iowa City Landfill



- Joint safety meetings with landfill operators, city staff, and FD



- Knox-box with landfill gate and building keys



- Have landfill site map printed and available



- Maintain stockpile of cover soil



- When using tire chips as leachate drainage, place first-lift quickly

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## Landfill Fire Events

### General Takeaways

- Knox-Box
- Consistent communication between responders and landfill staff
- Identify individual with authority to make decisions
- Educate public/customers about proper waste disposal and fire risks their actions may present
- Maintain landscape around and throughout landfill
- Design and maintain access roads for emergency vehicles
- Emergency lighting and signage
- Battery collection and recycling programs

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## Landfill Fire Risk Pre-Plans



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■ Landfill Fire Risk Pre-Plans



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■ Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans



**WHEN**

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## Landfill Fire Risk Pre-Plans

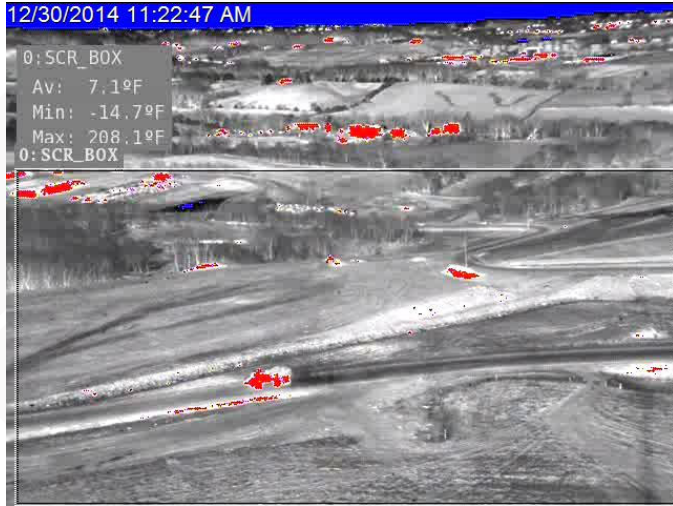
### Fire Prevention:

- Waste screening
- Special waste acceptance and management
- Good/consistent cover operations
- Education and outreach
- Dedicate area for hot loads
- Technology (thermal cameras)

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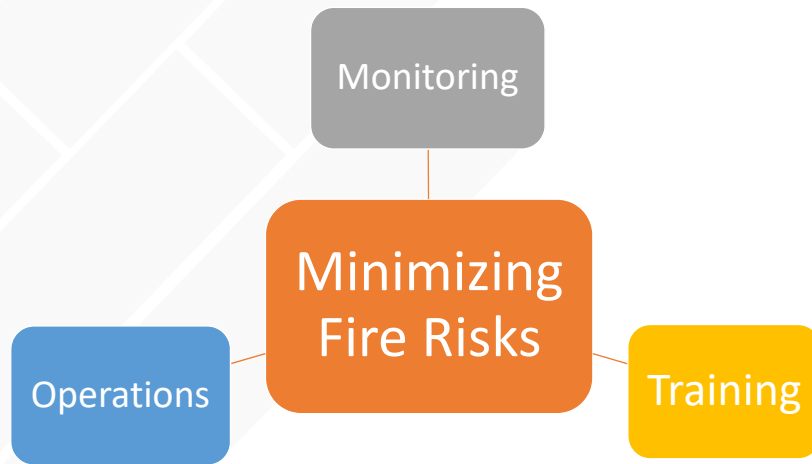


## Landfill Fire Risk Pre-Plans



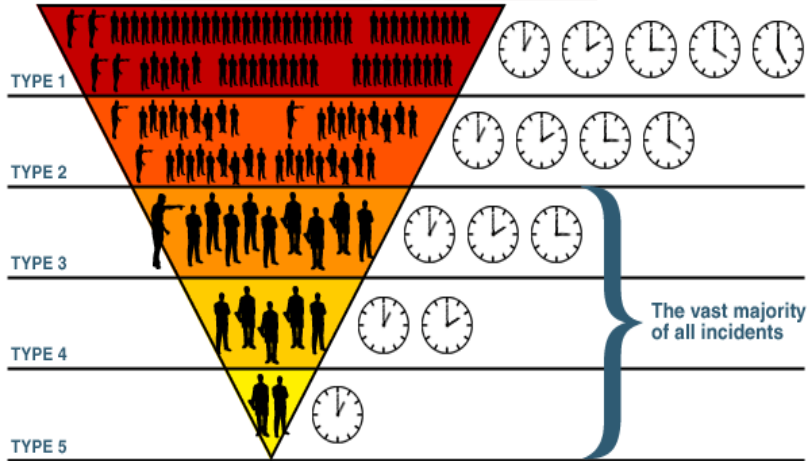
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## Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans

### Fire Mitigation

#### Soil at working face

- Have a dedicated soil stockpile nearby
- How long does it take the site to excavate and place soil?
- How long to cover the entire working face?

#### Designated area for hot loads

#### Foams and suppressants

#### Avoid water if at all possible

- Particulate management
- Lower temps/protect equipment and personnel

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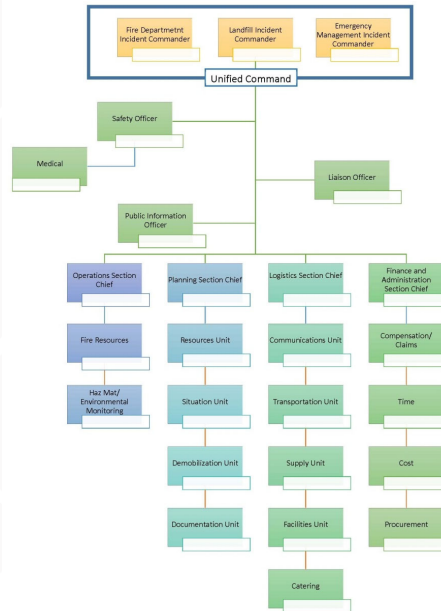
## Landfill Fire Risk Pre-Plans

### Plans:

- Opens dialogue
- Identifies resource and knowledge centers as well as gaps
- Selects contractors and vendors
- Provides emergency contacts
- Interoperability challenges (i.e., communication, connections, fuel cards, etc.)
- Assigns responsibilities (unified command structure)
- Develop a plan of action

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## Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans

### Training Events:

- Train against the plan
- Familiarize landfill operators with emergency responders and vice versa
- Test equipment (i.e., hose connections, communications, potable bladder tanks, etc.)
- Inventory supplies

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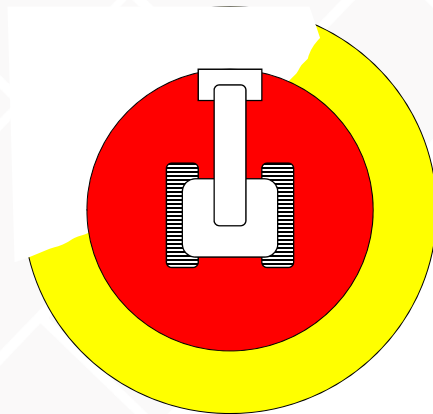
## Landfill Fire Risk Pre-Plans

### Unique Safety Risks:

- Egos
- Toxic smoke
- Fire eruptions
- “Get-er Done” operator mentality
- Slippery liners
- Cave-ins
- PPE (emergency personnel as well as operators)
- Confined space
- Close interaction with heavy equipment

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## Landfill Fire Risk Pre-Plans



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## Landfill Fire Risk Pre-Plans



What is wrong with this picture?

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## Landfill Fire Risk Pre-Plans

### Wrap-Up:

- Fires happen... A LOT!
- Having a plan makes for a more effective response
- Plans identify resource and/or knowledge gaps that can be filled before an emergency occurs

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 **Thank You**

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