



WasteExpo

Events & Conferences: April 23-26, 2018

Exhibits: April 24-26, 2018

Las Vegas Convention Convention Center (Las Vegas, NV)

Fire Safety: The Threat Is Real

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In Collaboration with



wasteexpo.com

Fire Rover™ WasteExpo2018 Fire Protection Discussion





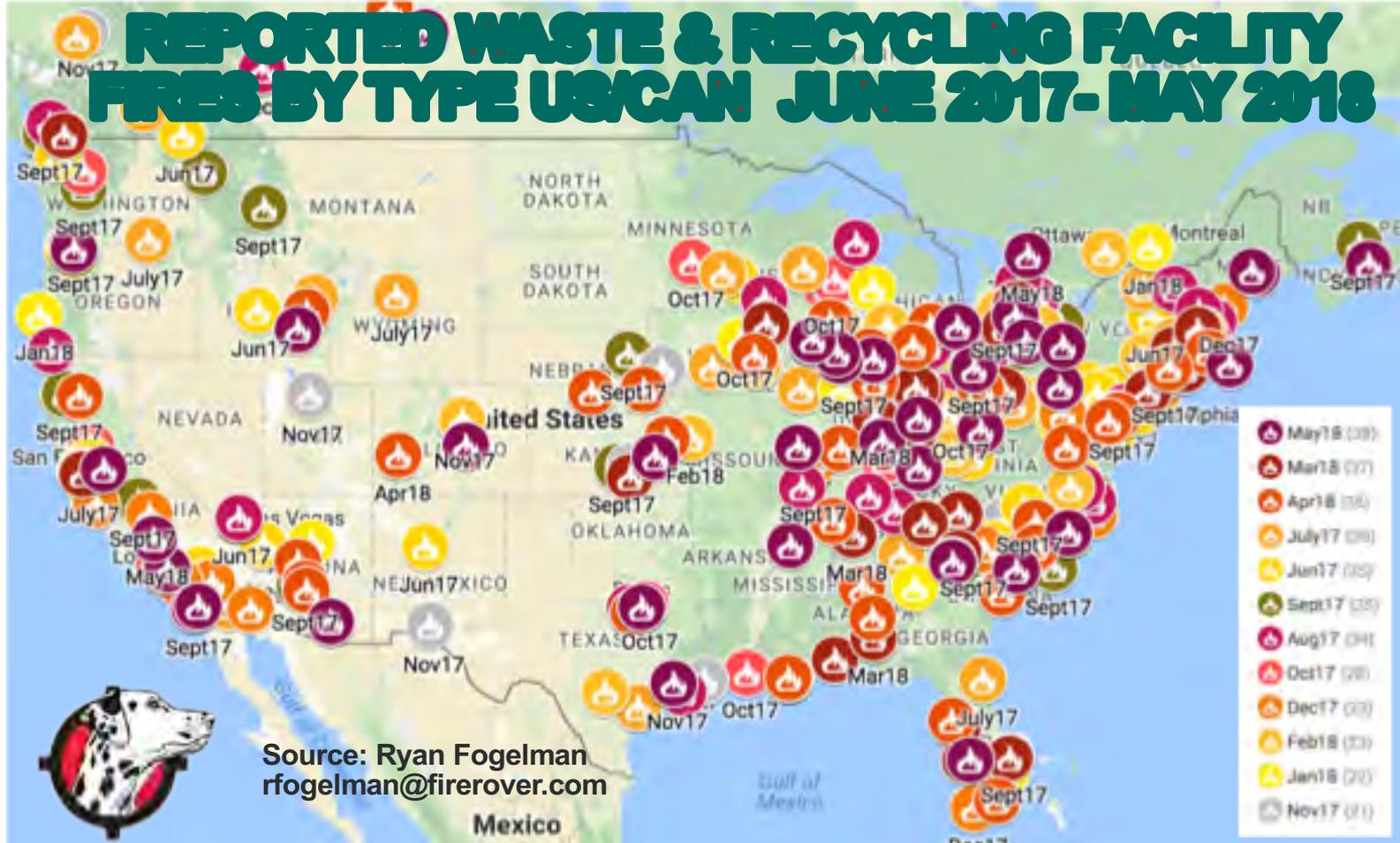
Scope Of Waste & Recycling Facility Fires In The US & CAN



Scope Of The Problem

*368 unique incidents were reported; based on reasonable assumptions, we can extrapolate that 1700+ facility fires have occurred in the past 12 mo.

*5 Deaths
*7 Injuries





Scope Of The Problem

CFOA (Chief Fire Officers Asso) reported from the EA an average of 332 documented fires at waste fires btw 2001 and 2014. The CFOA also reported* 250 fires in 2015 at waste & recycling companies.

The equivalent number in the US would be well over 1700 fires annually based on an a reasonable extrapolation of population alone.

“Data was compiled from news articles we found by searching for the keywords “fire” + "transfer station"; "MRF"; "shredder"; and "recycling.”

The latest statistics, from the Environment Agency, show the incidence of Waste Fires from 2001 to 2013.

Year	Regulated ¹ Sites	Unregulated ² Sites	Total fires
2001	154	92	246
2002	203	140	343
2003	288	110	398
2004	254	83	337
2005	239	107	346
2006	284	95	379
2007	236	54	290
2008	227	48	275
2009	282	55	337
2010	286	59	345
2011	348	77	425
2012	247	55	302
2013	248	50	298

Data is for all categories of incident recorded.

1. Regulated – where a permitting regime specific to the source has been identified, eg waste operations and waste installations.
2. Unregulated – where no permitting regime specific to the source had been identified.



Scope Of The Problem

According to the California Product Stewardship Council (CPSC) in a survey released March 9 of 2018, 26 respondents from waste facilities across California, including northern and southern counties, as well as rural and urban:

65% of the reported fires were due to batteries.

35% of reported Fires were made up of combustibles (aerosols, butane cans), chemicals, hot ashes, and talking greetings cards.



Figure 1. Reported sources of fires at waste/recycling facilities from a survey of CPSC stakeholders



Scope Of The Problem

40%+ of Waste & Recycling Facilities In The USA Have Experienced A Fire Incident During 2017!*

Assumptions:

- 7% of the fires are documented/reported
- EREF's Municipal Solid Waste In The US published in 2016: 2013 there were 3,913 recycling facilities, 81 WtE, 1540 Landfills and 3494 Composting Facilities in the USA
- With Reasonable Assumptions: 5% of Composting Facilities In The USA have been subject to a reported or non-reported fire incident within the past 12 months
 - Includes Recycling & WtE Facilities
- Does not included composting and landfills



Scope Of The Problem

Gut Check: Is This Number Real?

According to the California Product Stewardship Council (CPSC) in a survey released March 9th 2018, 26 respondents from waste facilities across California:

**83% reported having a fire
at their facility in the last
two years!**



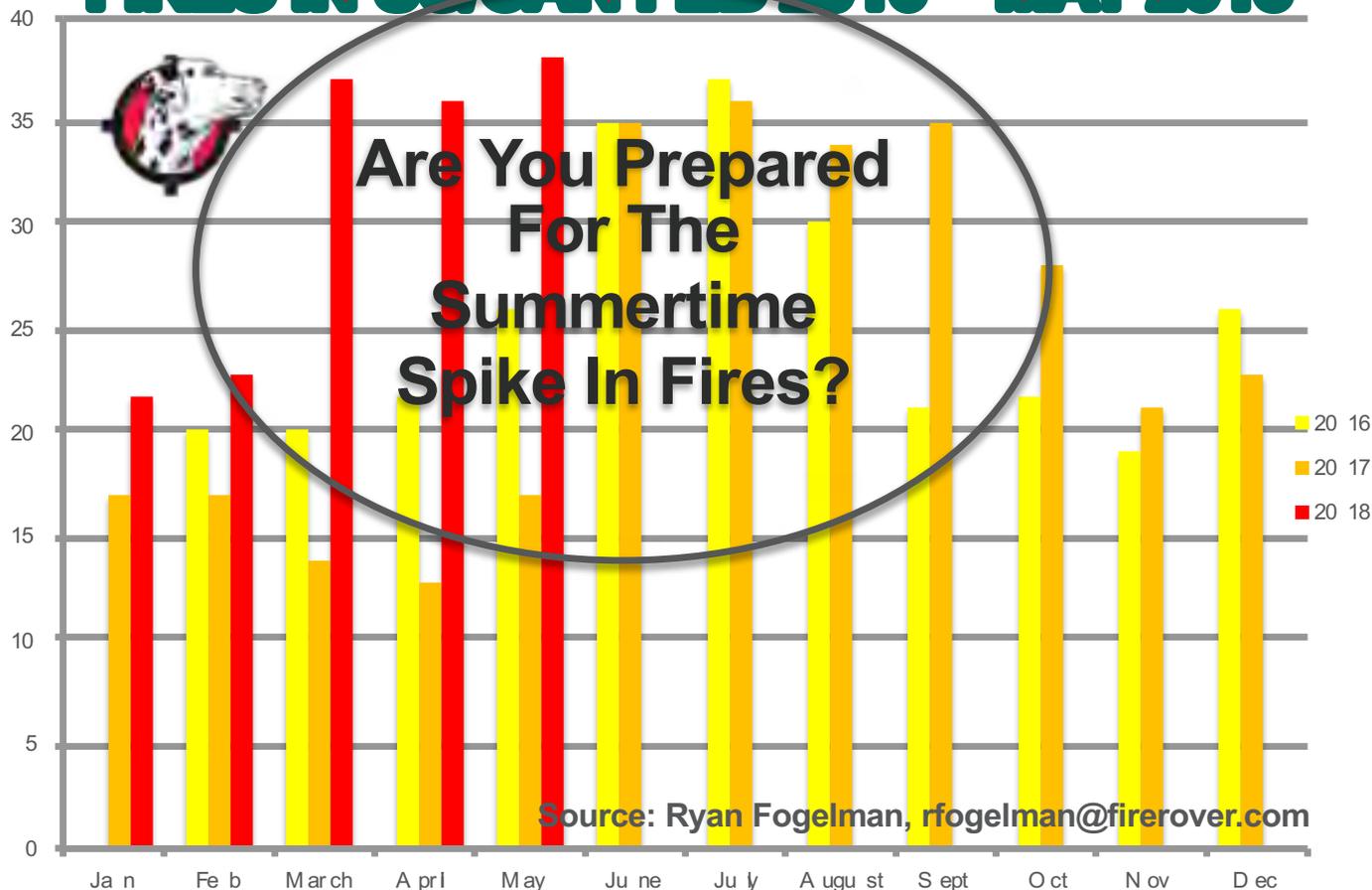
Scope Of The Problem

REPORTED WASTE & RECYCLING FACILITY FIRES IN US CAN FEB 2016 – MAY 2018

*368 unique incidents were reported in the past year; based on reasonable assumptions, we can extrapolate that 1700+ facility fires have occurred in the past 12 mo.

*5 Deaths

*7 Injuries

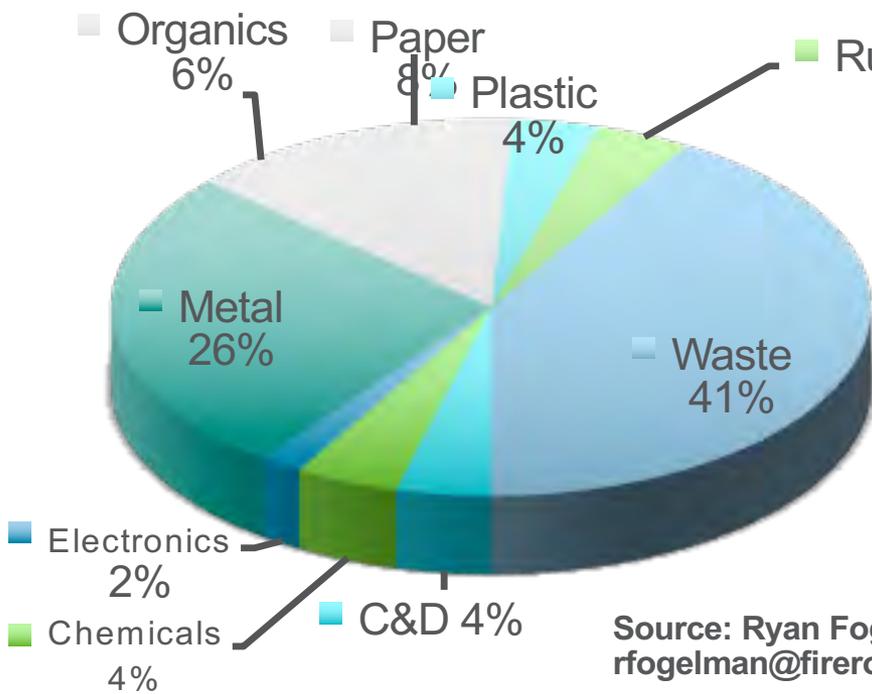


Source: Ryan Fogelman, rfogelman@fireover.com



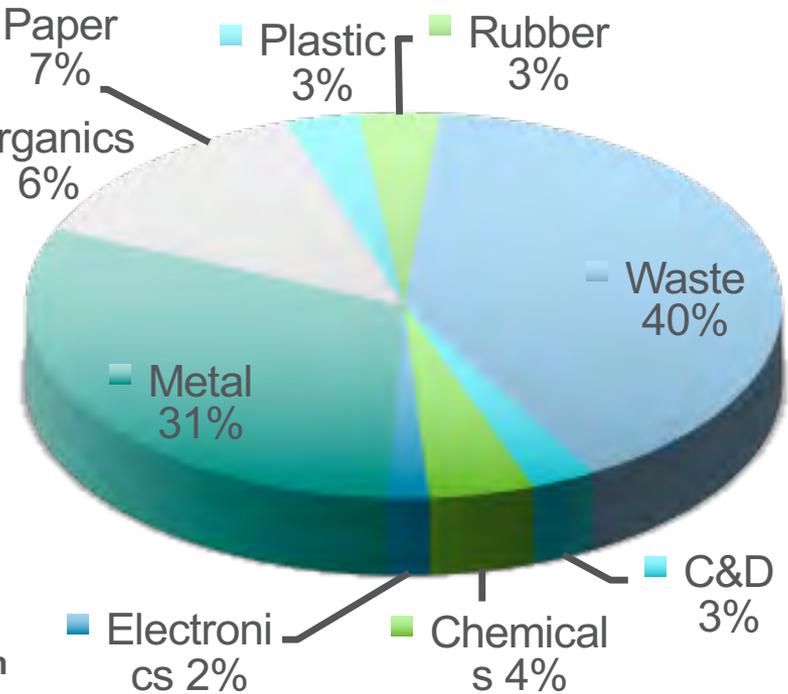
Scope Of The Problem

REPORTED WASTE & RECYCLING FACILITY FIRES BY MATERIAL YEAR OVER YEAR



2016

Source: Ryan Fogelman,
rfogelman@firerover.com



2017

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Scope Of The Problem

What Is Causing The Increase In Fires?

- 1) **Heat / Dry Environments** – We have seen an increase in fires during the summer months, but when we see weather patterns that are dry and hot, we see spikes during other times of the year.
- 2) **China Recycling Restrictions** – Increased restrictions is causing our facilities to hold inventory that is open to fires.
- 3) **Lithium-ion Battery's** – The issue is not only the shire number of these batteries being manufactured an incorrect placed in waste and recycling bins, but also the size makes them almost impossible to remove from the processing streams.
- 4) **General Awareness** – Increased awareness of the fire problem is causing more news coverage when events occur.
- 5) **Arson** – With fiber pricing at an all time low, some operators are desperate to hold on.



Scope Of The Problem

Is This Is Lithium-Ion Wave Finally Here?

Time Period		Fires
Jan-18	May-18	156
Jan-17	May-17	78
Yr./Yr. Increase		100%

We have experienced an 25% increase in reported fires from June 16 – May 17 to June 17-May 18

Time Period		Fires
Jun-17	May-18	368
Jun-16	May-17	268
Yr./Yr. Increase		37%

YTD 2018 we have experienced a 100% increase in reported fires YTD 2017

Year	May
2018	38
2017	17
2016	26

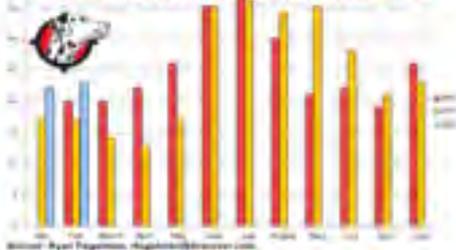
May 2018 facility fires were 124% higher than May 2017 and 46% higher than May 2016

Source: Ryan Fogelman, rfogelman@firerover.com

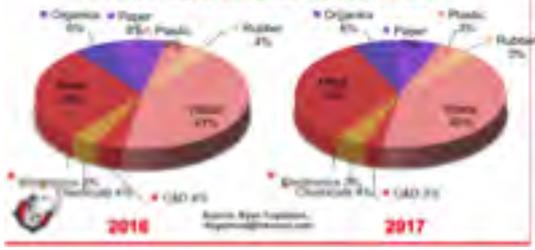


2017 Annual Waste & Recycling Facility Fire Report

REPORTED WASTE & RECYCLING FACILITY FIRES IN US/CAN FEB 2015 - FEB 2017



REPORTED WASTE & RECYCLING FACILITY FIRES BY MATERIAL YEAR OVER YEAR

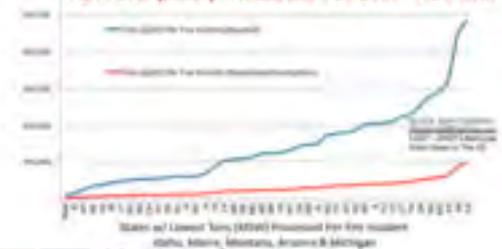


Top States for Waste & Recycling Facility Fires
California, Michigan, WI, OH, & Virginia

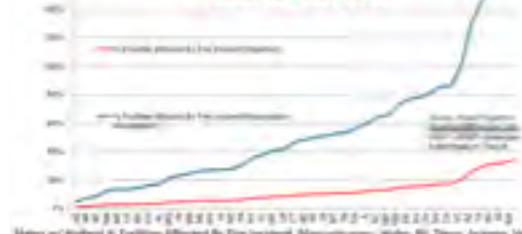


Top States for Waste & Recycling Facility Fires
California, Michigan, WI, OH, & Virginia

US STATES WASTE & RECYCLING FACILITY FIRES PER TONS (MSW) PROCESSED FEB 2016 - AUG 2017



US WASTE & RECYCLING FACILITY FIRES BY STATE % FACILITIES AFFECTED BY FIRE INCIDENT FEB 2016 - AUG 2017



(e) rfoelman@firerover.com



Fire, Thermography & Proactive Suppression Solutions



Goals Of Technology In Fire Safety

Safety

Goal: Solutions that do not require on-site potentially life threatening activities

Property Protection

Goal: Solutions that can proactively mitigate the source of the fire over traditional reactive fire protection technology

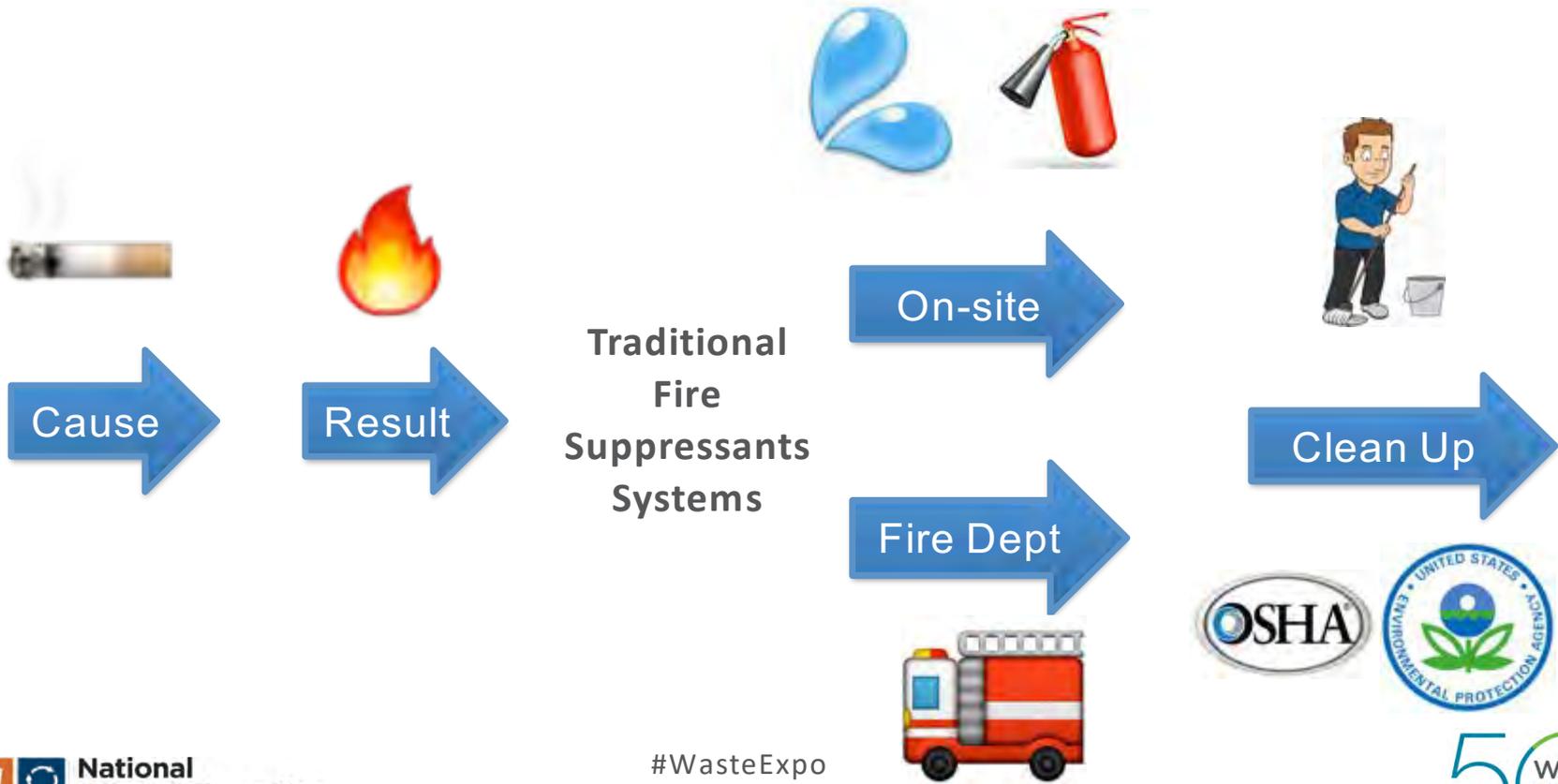
Protection of Operations

Goal: Proactive fire mitigation solutions that allow for continuity of business as well as ongoing fire watch



Reality Of A Fire Incident

Traditional Chain Of Events





Reality Of A Fire Incident



“A Fire Incident Typically Doubles In Size & Cost Every 30 Seconds”

—Michael Hughes, Corp Dir Of Safety & Compliance Casella



Reality Of A Fire Incident

Our Goal: Do Not Have A Major Fire Incident!

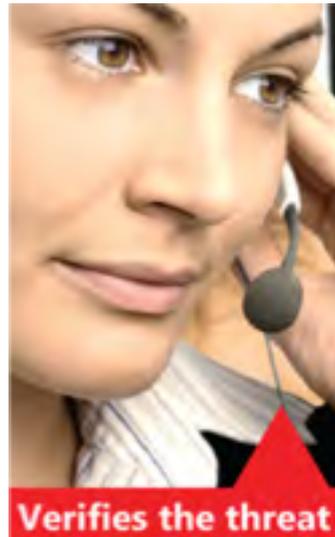




What Is The Fire Rover?

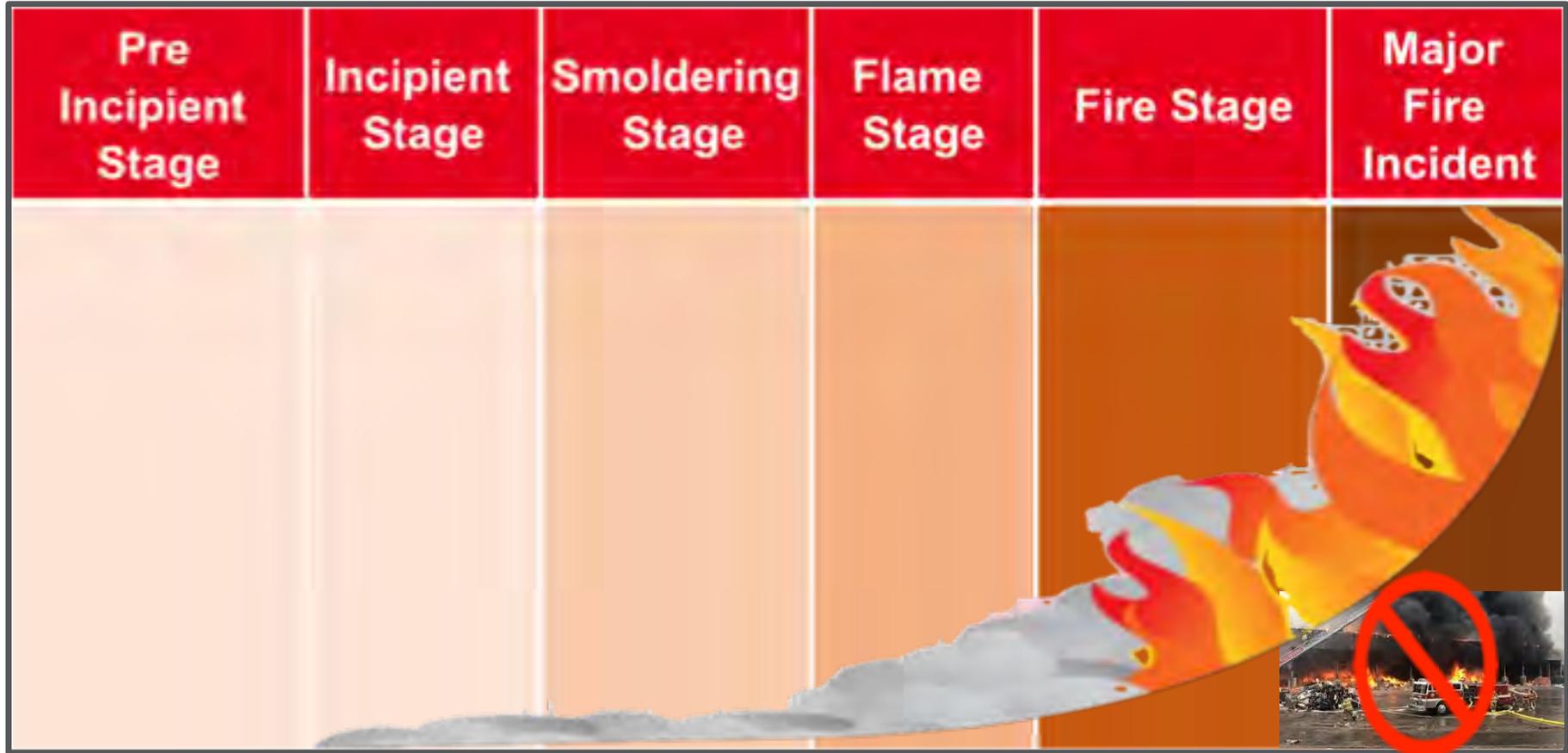
The Fire Rover is the only fire elimination solution that fights incipient fires & explosions combining:

- 1) Automated Thermal Detection;
- 2) Remote Human Verification, and;
- 3) Remotely Operated On-Site Suppressant/Elimination.





Our Goal: No Major Fire Incidents!



The Fire Development Stages



What Is The Fire Rover?





What Is The Fire Rover?

- Self Contained
- 20m x 8m x 8m Shipping Container
- Fully insulated – (Heated & Cooled)
- 97% Water / 3% Foam
- Shoots for 6–12 minutes
- 110v Outlet Compatible
- 1000 Gallon Tank
- Nitrogen Powered
- Shoots 150psi
- Range up to 150m
- Removable
- Built in Fire Watch
- Typical “smoldering” event uses < 10% of the tank
- Can be placed in “remote” locations
- Lack of water source ok
- Lack of water pressure ok
- Can be removed and reinstalled

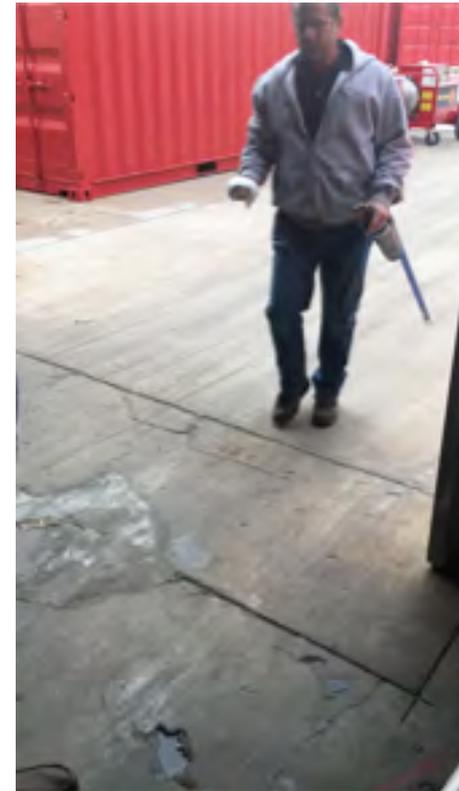




What Is The Fire Rover?

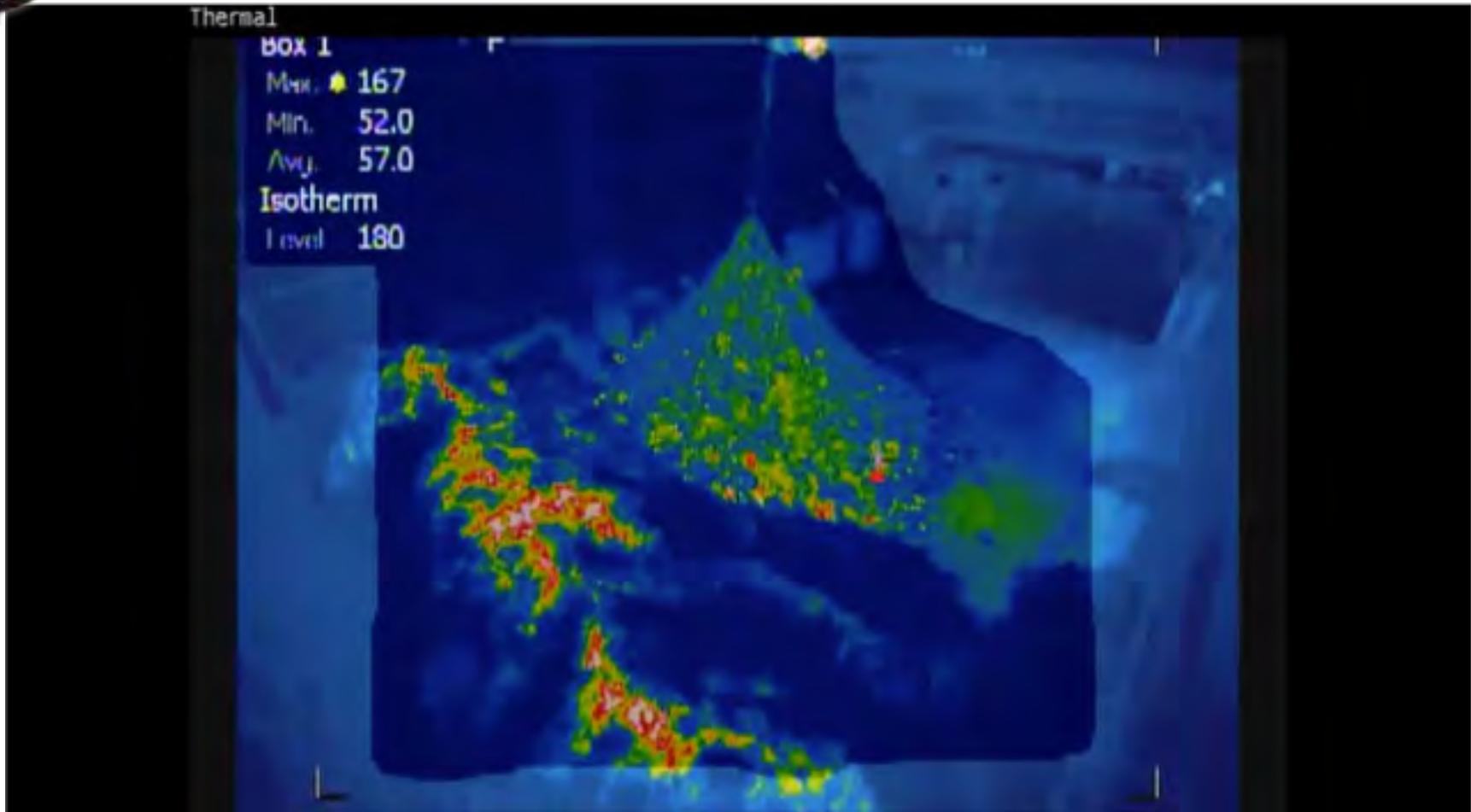


FIREADE 2000	FIREADE AIR EXT	FIREADE CLASS A	FIREADE MIL-SPEC	FIREADE CLIMATE CONTROL CONCENTRATE	FIREADE CLIMATE CONTROL FRS MIX	GREEN AGENT TECHNOLOGY™
Meets Dual UL listed Class A & B Agent	UL 162 listed at 2%	Application rates of .01-1%	Meets Military Specifications MSF 24285F	Tested to -40; as a concentrate	Fire Mixed w/ water	<ul style="list-style-type: none"> Environmentally formulated 98% Organic Compounds Contains no PFOA or PFOS Zero Hazardous Chemicals Encompasses Water Based and Foil Grade ingredients Biodegradable Contains no ingredients reportable under the Superfund amendments and Reauthorization Act (SARA) Title III, Section 313 of 40 CFR 372 or Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
UL 162 Listed	LASTIRE Certified at 1%	pH neutral, non corrosive	Listed on GPR 24385	Suitable for Class A & B Fires	Tested to -40; in solution	
NEPA 1/8 listed	Low Viscosity of 900cps	Completely water soluble	Unlimited Shelf life	Perfect for outdoor foam cache	Suitable for Class A & B Fires	
Meets EN 1508 & ICAO level B approved	Flows through gravity feed foam systems	Unlimited shelf life	NSN # 4210-01-056-8043	Climate control option available on any product	Designed especially for fixed systems	
Unlimited Shelf life	Will not clog or gum equipment	Economically Priced	NSN # 4210-01-056-0863		Climate control option available on any product	
Effective on Class D Fires	25yr shelf life					
Non Corrosive, will not clog or gum equipment						





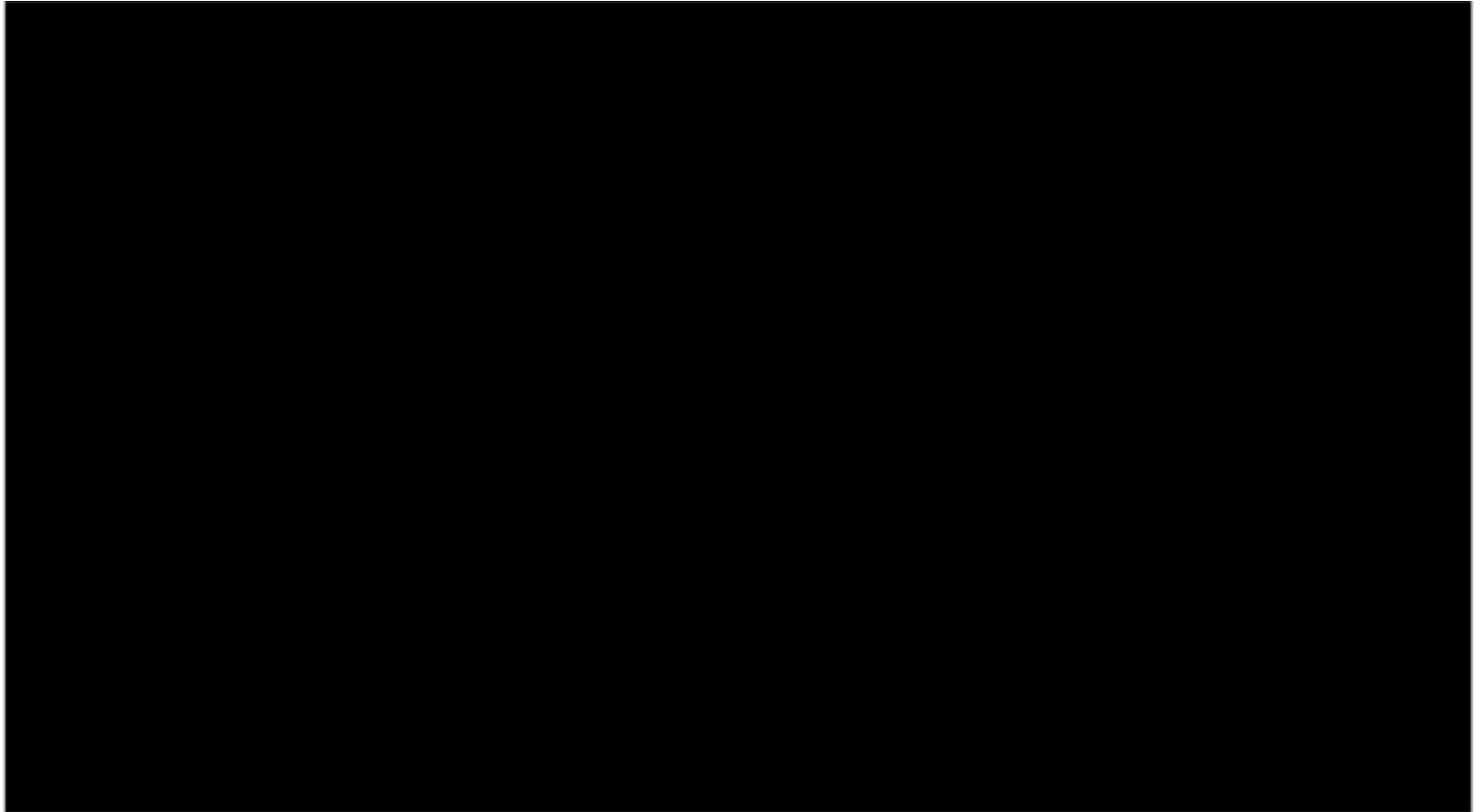
Pre-Incipient Stage Example:



The clock starts ticking BEFORE there is a flame!



MRF Application Example



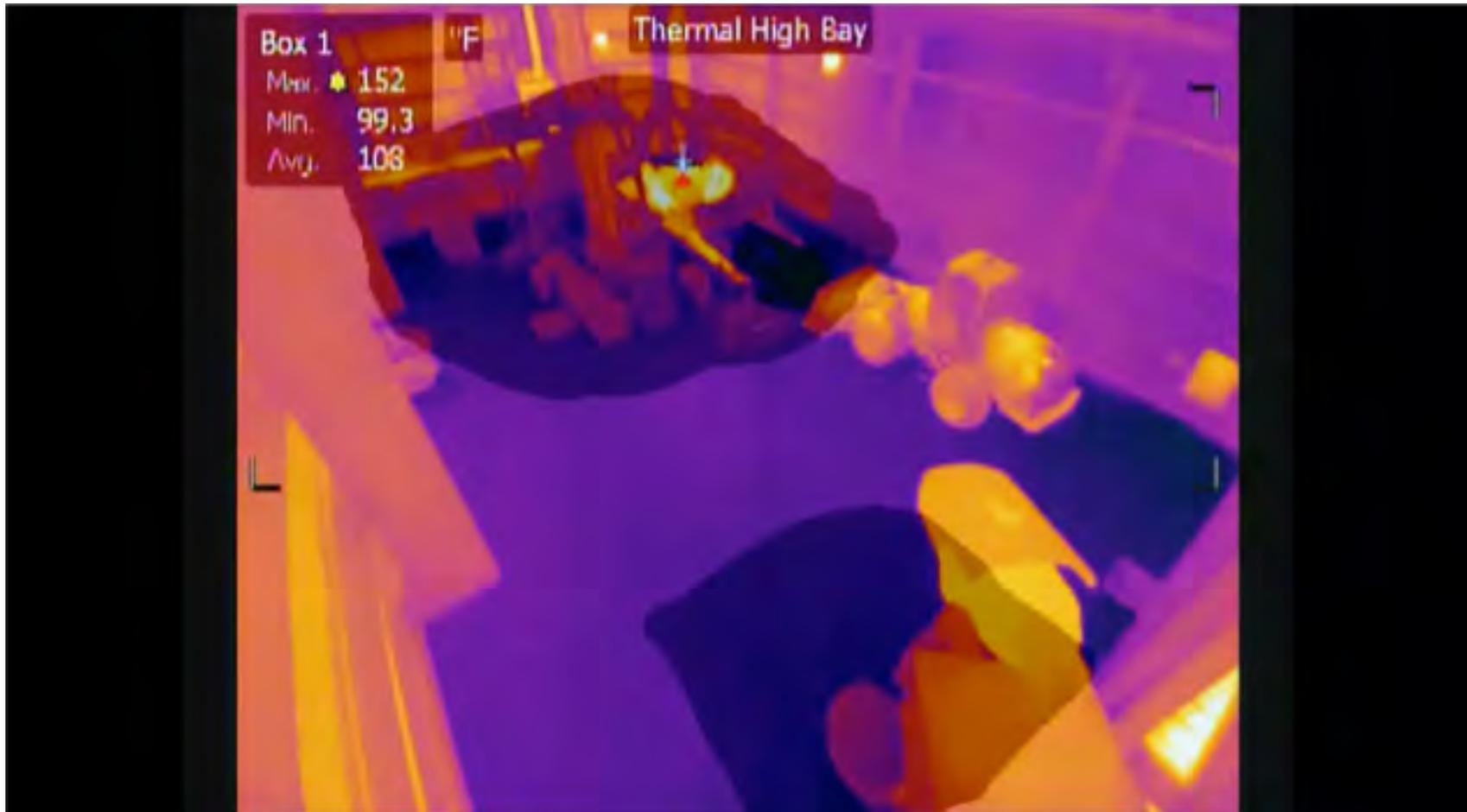
In Public/Private Partnership it is not always clear who the responsible party is for protecting the facility against fire, the owner or the servicer?

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Live Operational Hazard Example



We integrate as a partner with our Clients' Team in their daily hazardous material operations.



The Lithium Ion Battery Problem

“...batteries can blow up or melt when internal electrical components short-circuit, when mechanical problems crop up, when they are subjected to an accident, or when they are installed incorrectly” (See: “*Why some Lithium-Ion Batteries Explode*”).



“forecast demand for lithium-ion batteries is expected to increase up to seven-fold by 2024”

– Industrial Minerals
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Lithium Ion Mini-Explosion Example

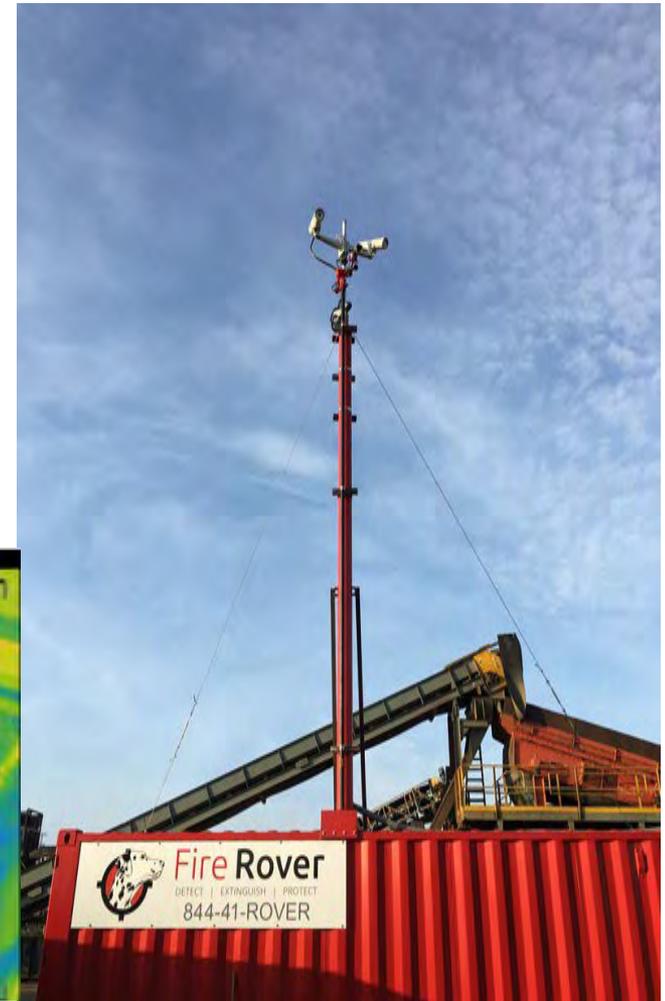
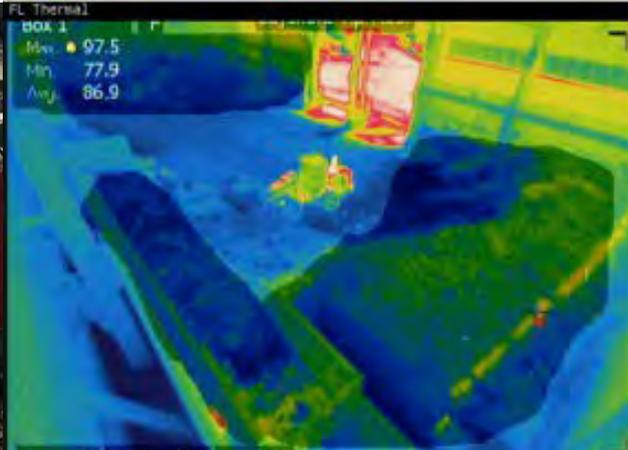


Apple is going to add an estimated three billion mini lithium-ion batteries to the market along with their new AirPods wireless headphones over the next ten years



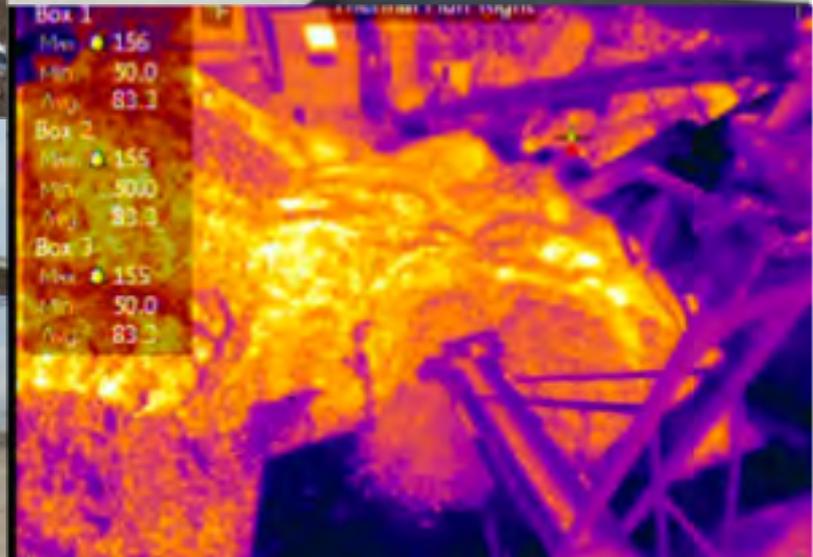
Fire Rover Applications

- Waste & Recycling
- Industrial Equipment
- Metals
- Transfer Stations
- Tipping Floors
- Refining/Re-Refining
- Hazardous Material
- Rubber Feedstock
- Fleet
- Landfill
- Organics/Wood
- Paper/Cardboard
- MRFs
- Pre & Post Storage
- Industrial
- & More





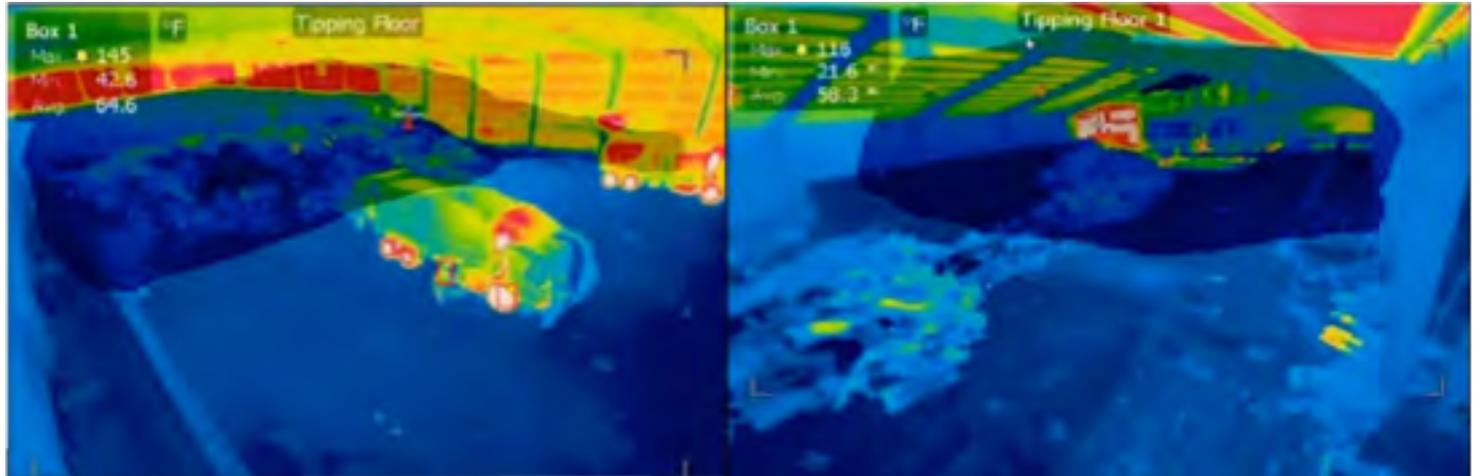
Fire Rover Applications





Fire Rover Applications

Tipping Floors



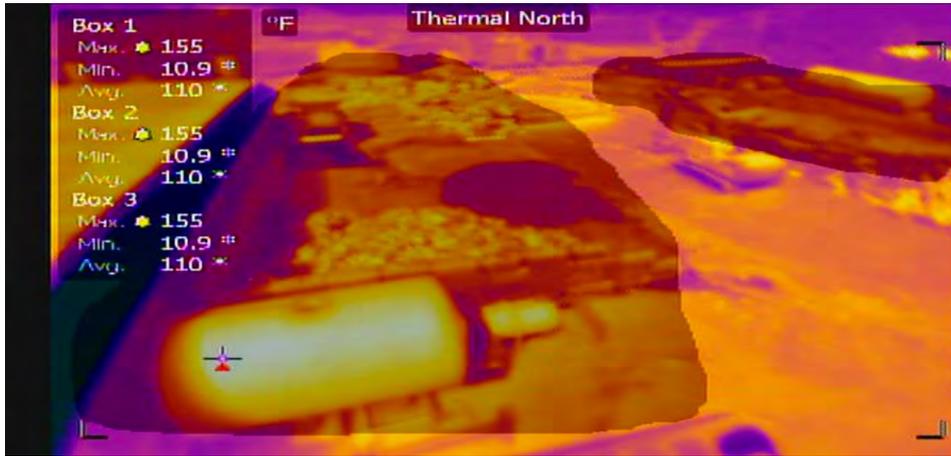
Fleet





Fire Rover Applications

Specialized
Hazards



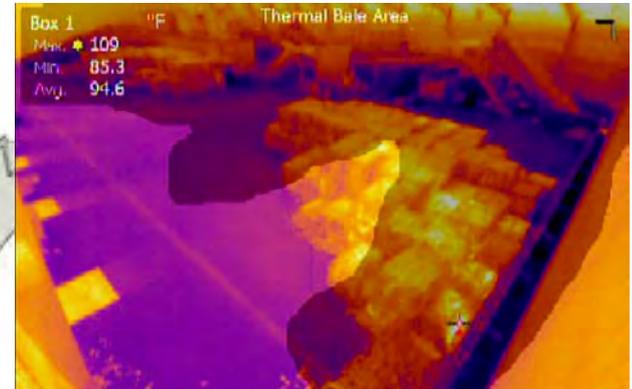
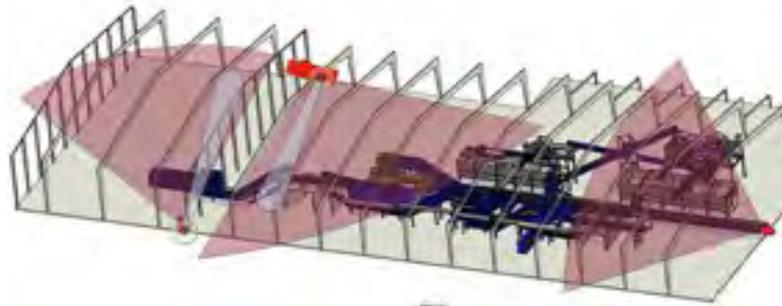
Hazardous
Material
Operations



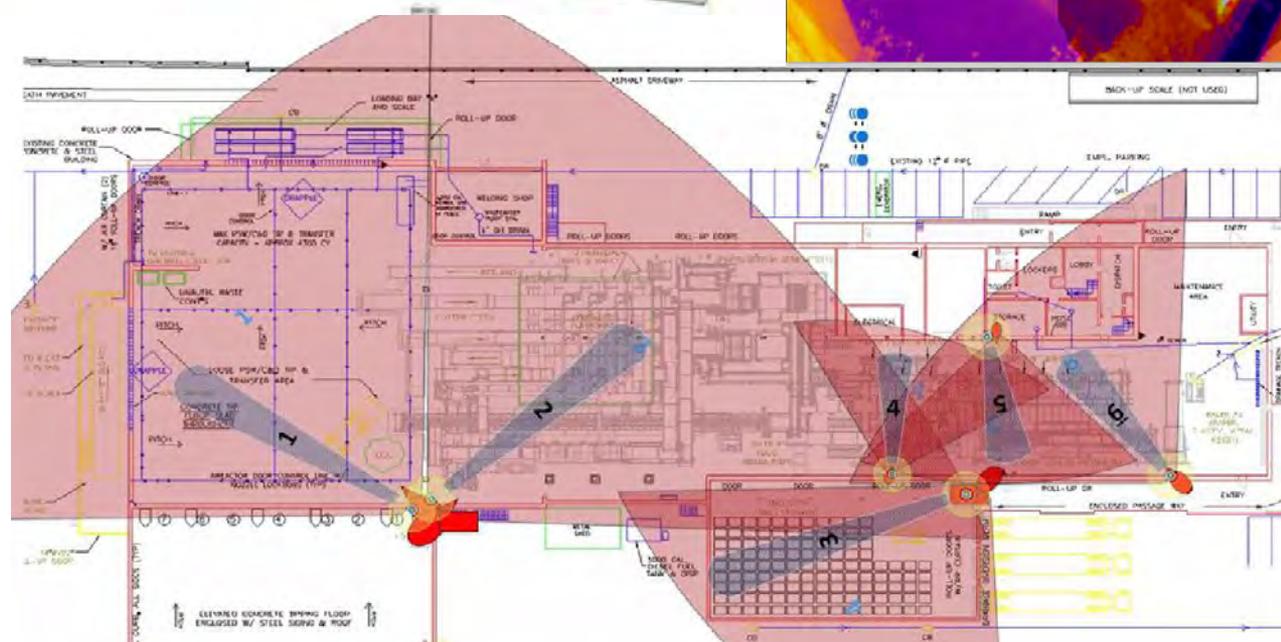


Fire Rover Applications

Pre-emptive
Maintenance
For Industrial
Equipment



Cost Effective
Solution To
Conveyor
Sprinklers





Fire Rover Applications

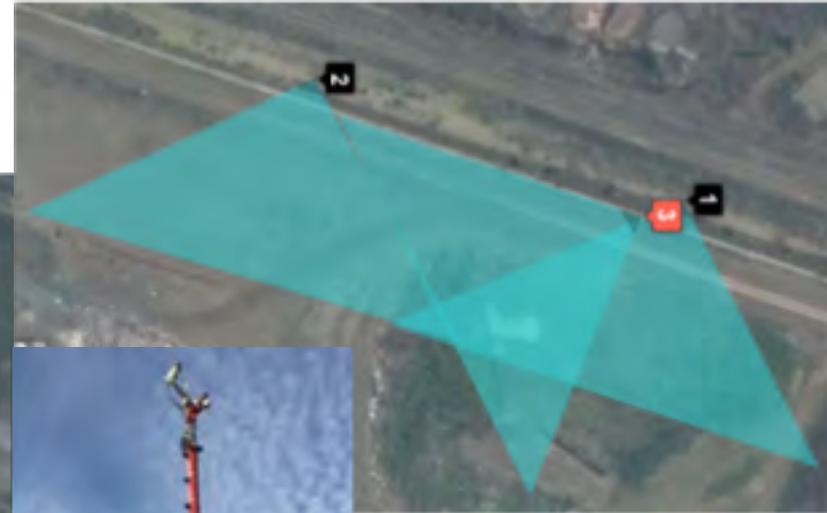
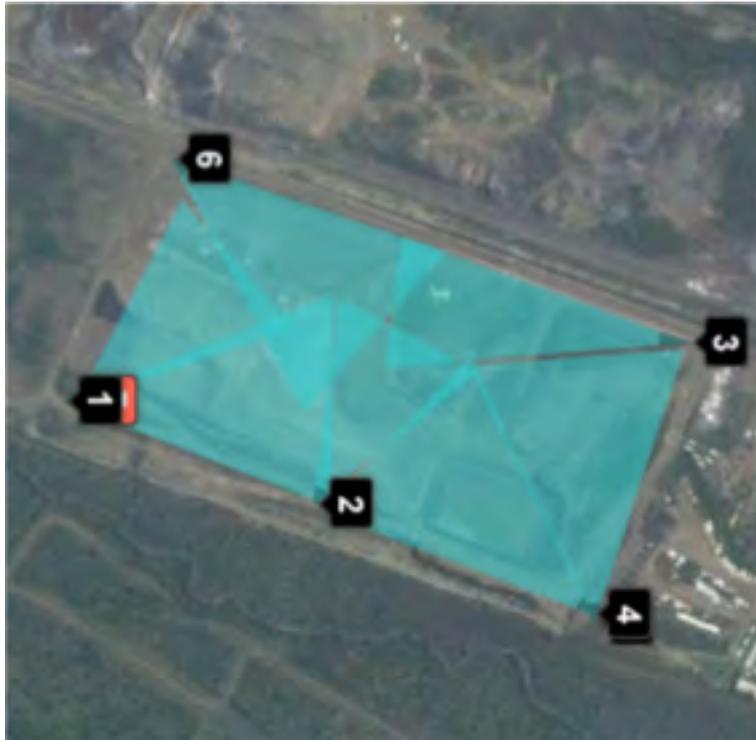
Pre-emptive
Equipment
Optimization &
Maintenance
(Metering Drum)





Fire Rover Large Thermal Applications

Outdoor/
Landfill
Applications





Is Your Organizations First Line Of Defense An Untrained Fire Brigade?

OSHA Standard Number: [1910.156](#) Title: Fire brigades.

1910.156(a)(1) Scope. This section contains requirements for the organization, training, and personal protective equipment of fire brigades whenever they are established by an employer.

1910.156(c)(1) The employer shall provide training and education for all fire brigade members commensurate with those duties and functions that fire brigade members are expected to perform. Such training and education shall be provided to fire brigade members before they perform fire brigade emergency activities. Fire brigade leaders and training instructors shall be provided with training and education which is more comprehensive than that provided to the general membership of the fire brigade.

1910.156(c)(4) The employer shall inform fire brigade members about special hazards such as storage and use of flammable liquids and gases, toxic chemicals, radioactive sources, and water reactive substances, to which they may be exposed during fire and other emergencies. The fire brigade members shall also be advised of any changes that occur in relation to the special hazards. The employer shall develop and make **available for inspection by fire brigade members, written procedures** that describe the actions to be taken in situations involving the special hazards and shall include these in the training and education program.

1910.156(d) Fire fighting equipment. The employer shall maintain and inspect, at least annually, fire fighting equipment to assure the safe operational condition of the equipment. Portable fire extinguishers and respirators shall be inspected at least monthly. Fire fighting equipment that is in damaged or unserviceable condition shall be removed from service and replaced.



Fire Brigade Tools

MODEL	ENFORCER 3 SUPER DUTY	ENFORCER 3 BACK PACK	ENFORCER 10	ENFORCER 30	ENFORCER 60	ENFORCER 200
PRE-MIX SOLUTION CAPACITY	3 US Gallons	3 US Gallons	10 US Gallons	30 US Gallons	60 US Gallons	200 US Gallons
MAX. FINISHED FOAM CAPACITY	60 US Gallons	60 US Gallons	200 US Gallons	600 US Gallons	1200 US Gallons	4000 US Gallons
MAX. THROW DISTANCE	45 Feet	45 Feet	45 Feet	75 Feet	95 Feet	120 Feet
MAX. DISCHARGE DURATION	1 Minute	1 Minute	2:30 Minutes	3 Minutes	6 Minutes	20 Minutes
DISCHARGE HOSE	4 Ft. x 3/8" Booster	4 Ft. x 3/8" Booster	75 Ft. x 1/2" Booster	50 Ft. x 3/4" Booster	50 Ft. x 1" Lay Flat	300' x 1" Booster 50Ft. x 1.5" Lay Flat
HEIGHT	22.5"	22.5"	22"	38.5"	38.5"	45"
WIDTH	13"	13"	22"	42"	42"	44"
LENGTH	8.25"	8.25"	26"	54.5"	54.5"	98"
EMPTY WEIGHT	23 lb	23 lb	95 lb	407 lb	485 lb	1200 lb
LOADED WEIGHT	48 lb	48 lb	175 lb	677 lb	965 lb	2800 lb



Fire Brigade Tools

Performance

Pressure Vessel Capacity: 10 U.S Gallons

Finished Foam Capacity: Up to 200 U.S.
Gallons Finished Foam

Throw Distance: Up to 45 Feet

Discharge Duration: Up to 2 Minutes





Fire Brigade Tools



Performance

Pressure Vessel Capacity: 60 U.S. Gallons

Finished Foam Capacity: Up to 1200 U.S. Gallons Finished Foam

Throw Distance: Up to 95 Feet

Discharge Duration: Up to 6 Minutes



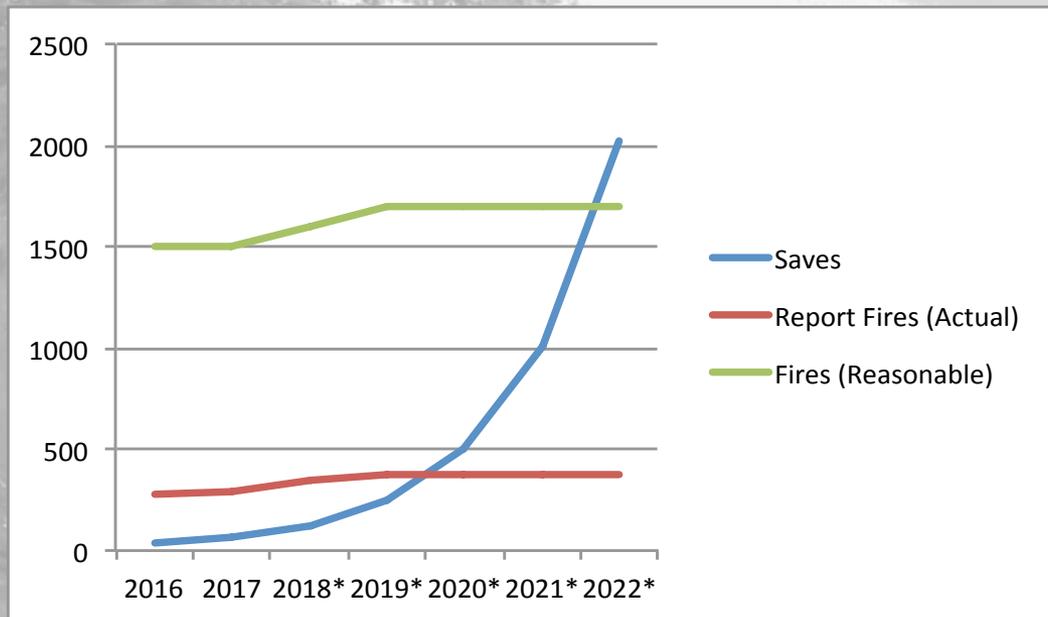
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Fire Rover Solution Results

We Have Eliminated 78 Fire Incidents In Past 12mo!



How Do We Stop The Wave?

Source: Ryan Fogelman, rfogelman@firerover.com



Further Discussion



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Thank You

Please fill out your session evaluation for a chance to win an Amazon Echo.*

*All responses will be kept confidential



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