SAND2020-4119C

Aerosol Facility

April 2020

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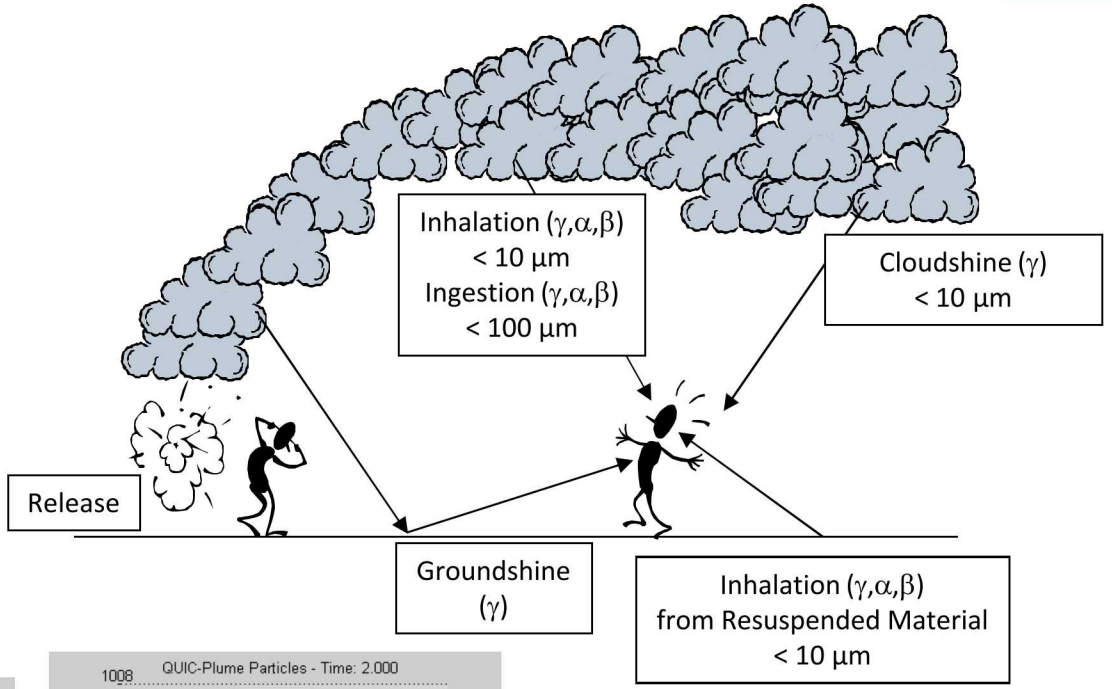
Widespread Dispersion

Small particles (< 10 μm)

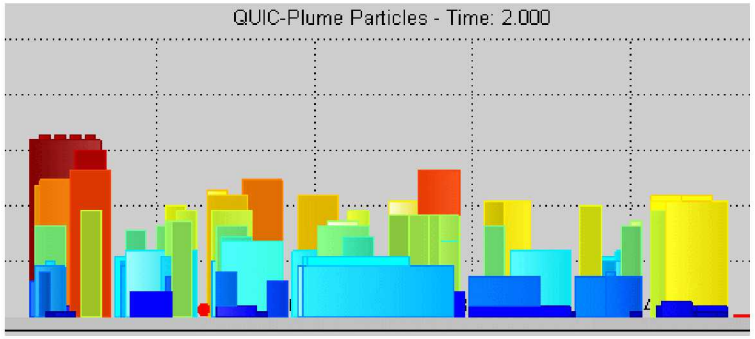
- Also referred to as respirable particles
- Will travel kilometers down wind

Intermediate particles (10-100 μm)

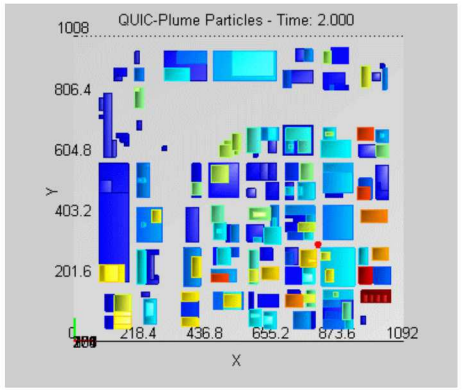
- Primarily a groundshine problem but can also be an ingestion problem
- Will travel a few 100 meters to a few kilometers down wind



Small Particles
(5 μm)



QUIC simulation by Mike Brown (LANL)

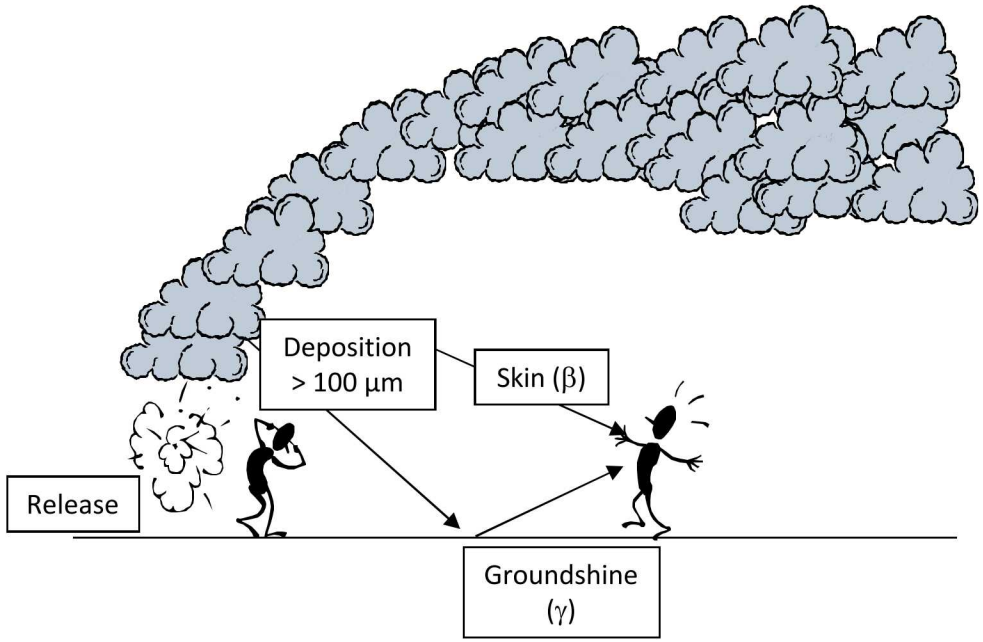


To be an inhalation problem – particles must be in vicinity of people

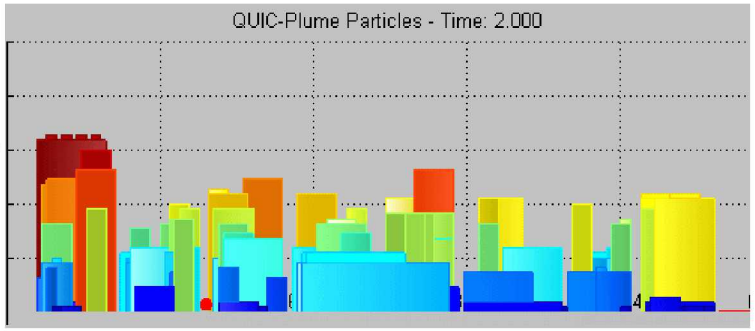
Localized Dispersion

Large particles (> 100 μm)
- Primarily a groundshine problem
- Will stay local only traveling a few hundred meters

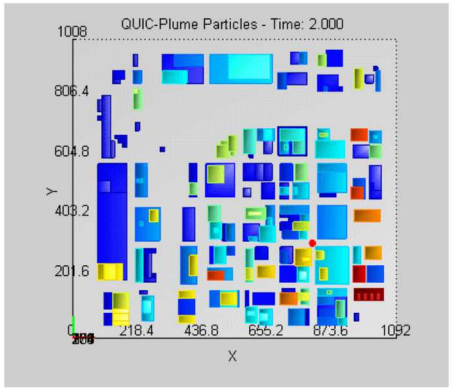
Ballistic fragments (> 1 cm)
- Will travel hundreds of meters causing localized hotspots



Large Particles (250 μm)

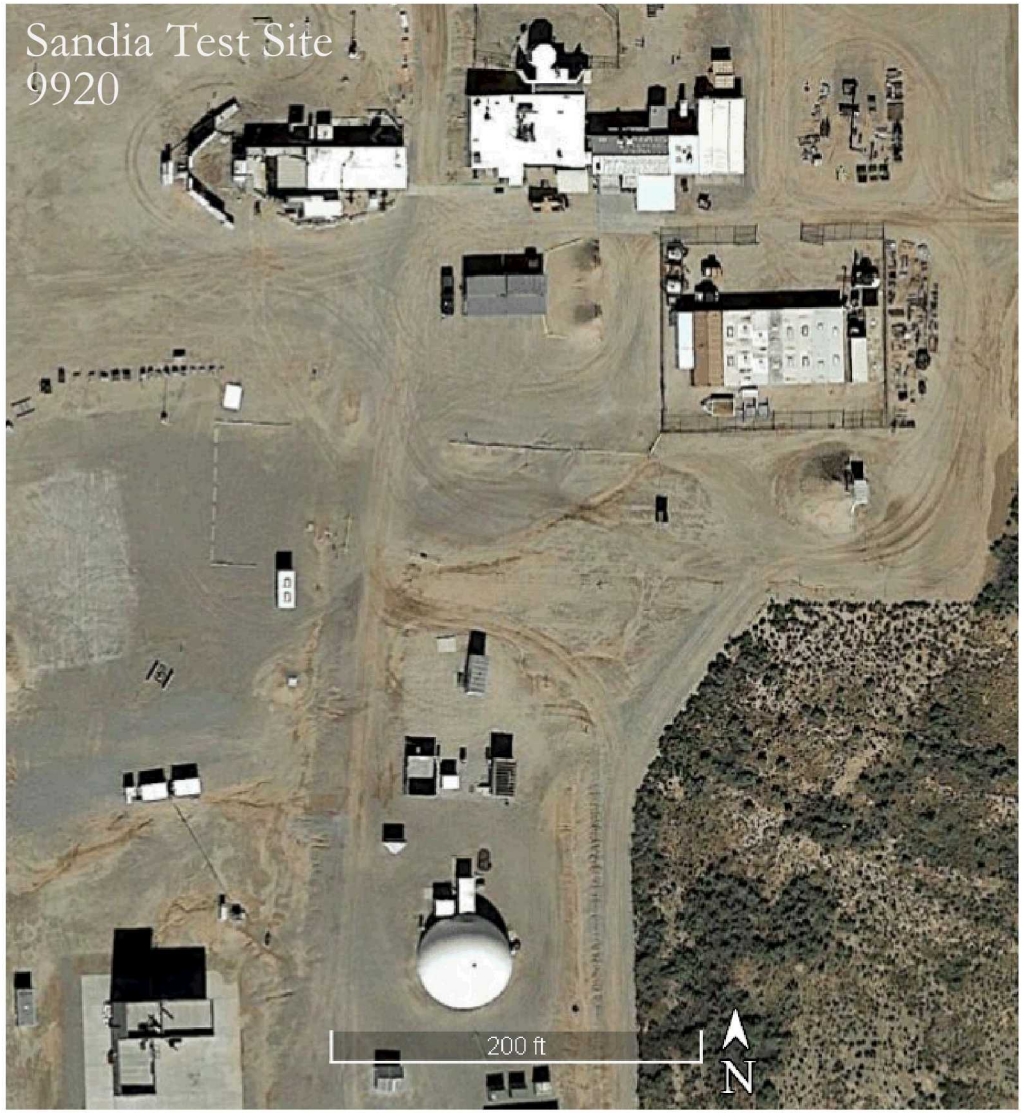


QUIC simulation by Mike Brown (LANL)



Large particles will settle to the ground quickly

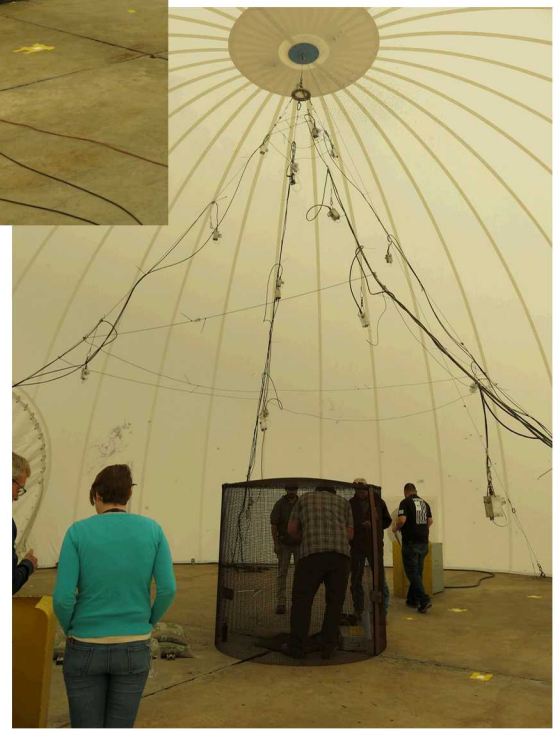
Air Building Used for Source Term Characterization

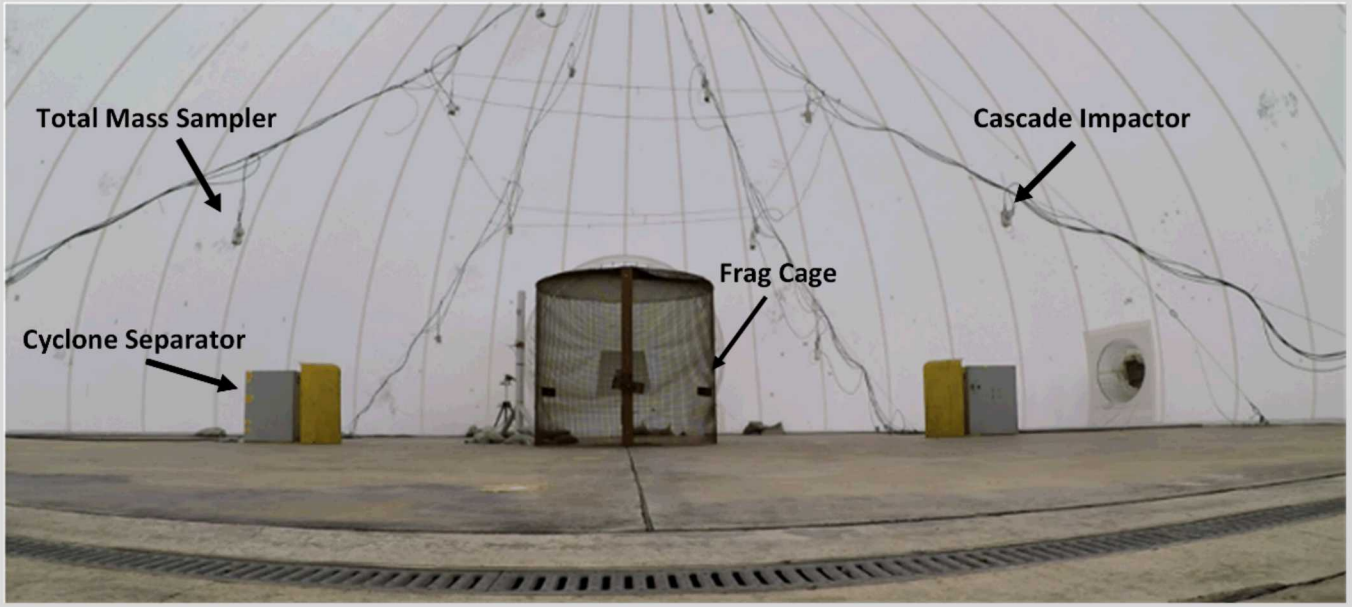


More than 1,000 RDD characterization tests have been performed at SNL in the last 30 years

Size of particulate released depends on device geometry material physical and chemical properties

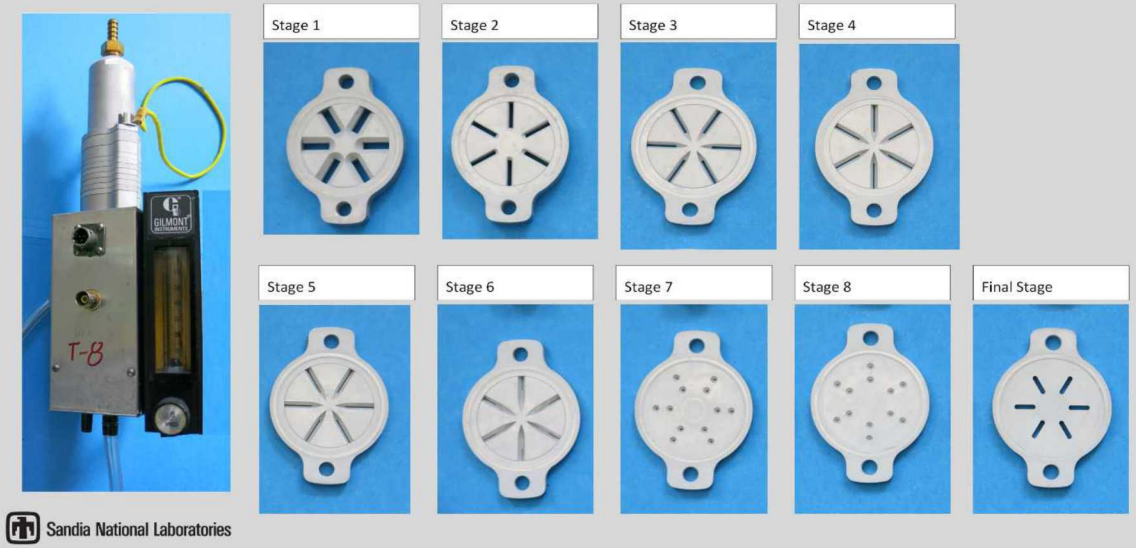
Inside the Air Building



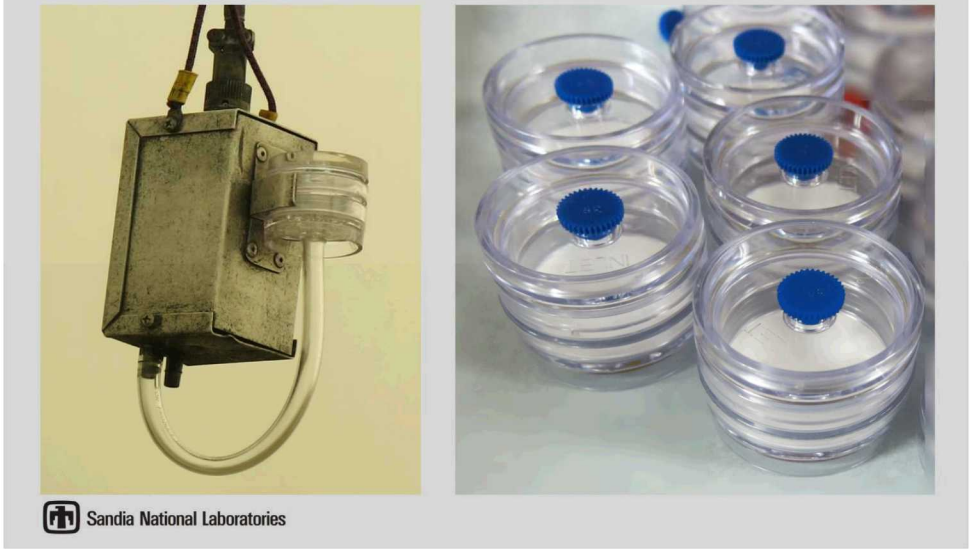


Particle Samplers

Marple Cascade Impactors 0-30 µm

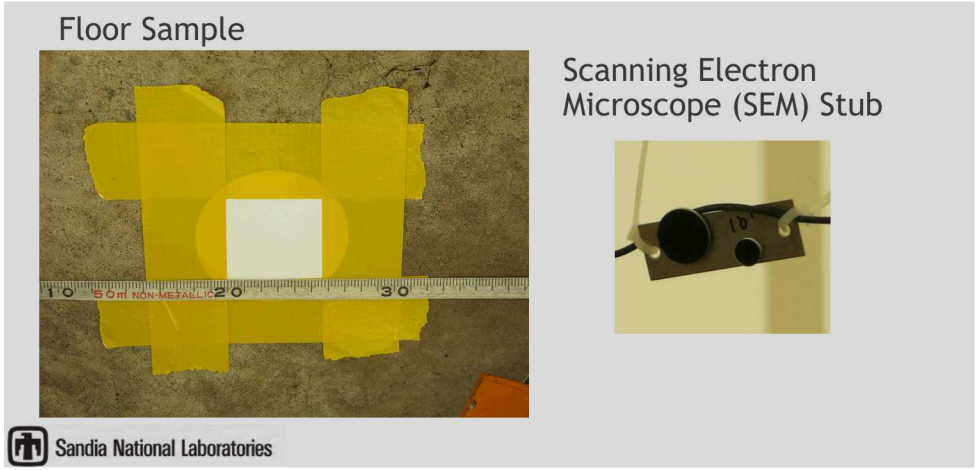


Total Mass Samplers < 30 µm

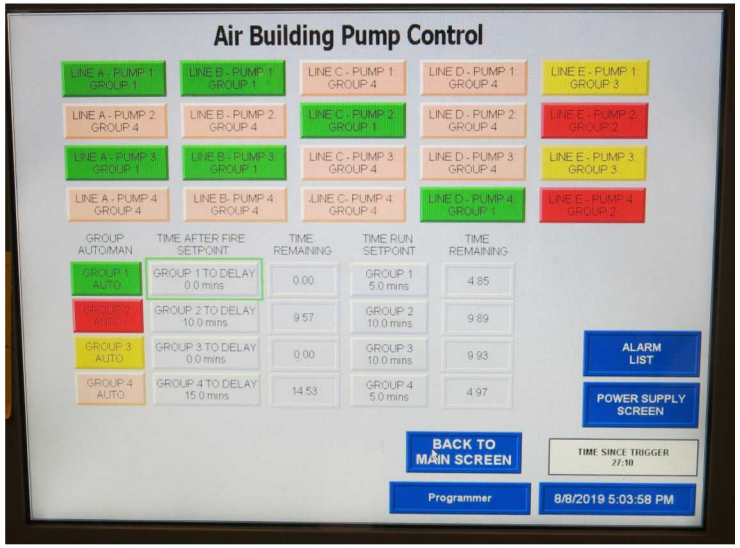


Marple Cascade Impactors 0-30 µm

Particle Collection

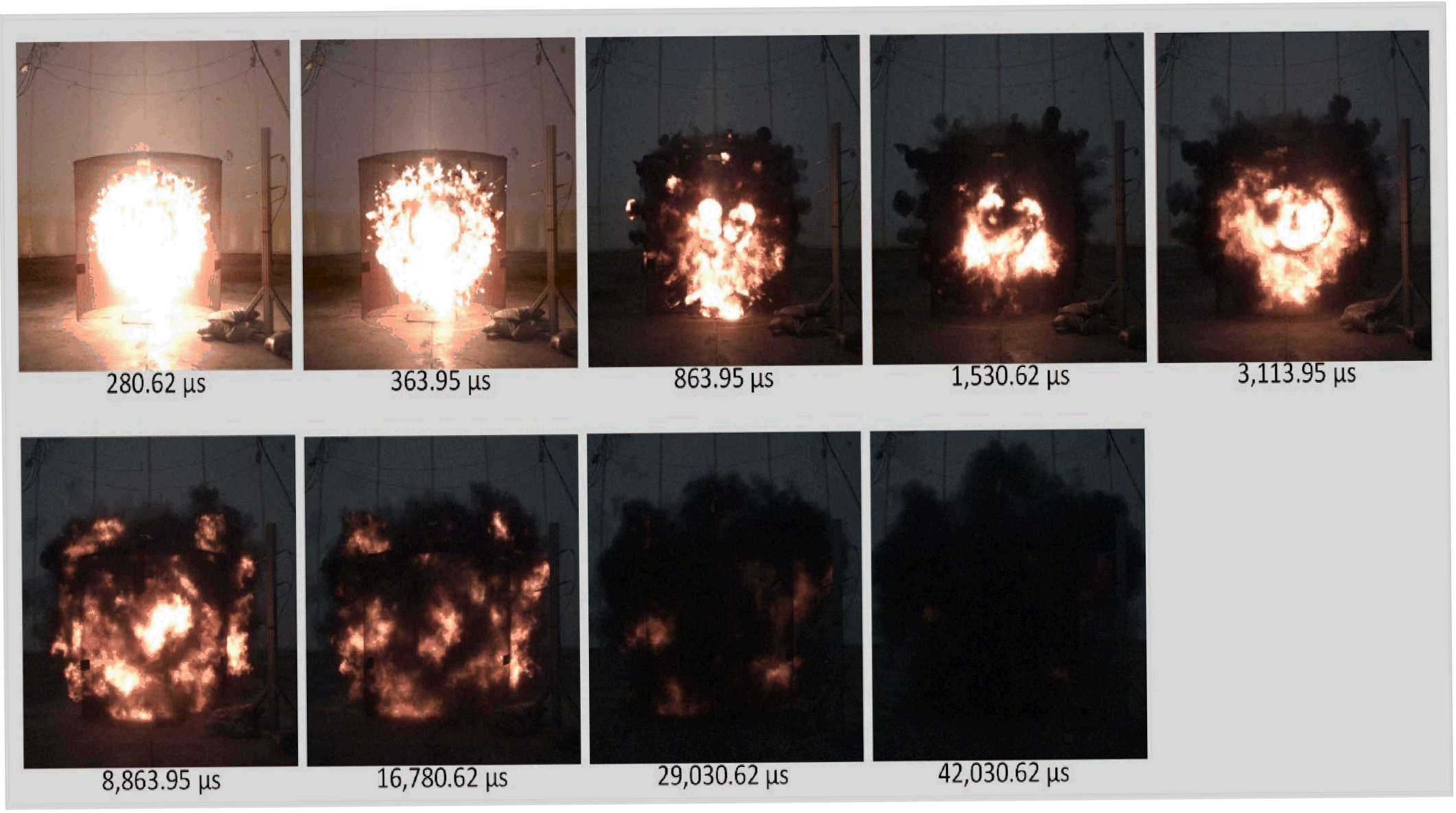


Control Room View



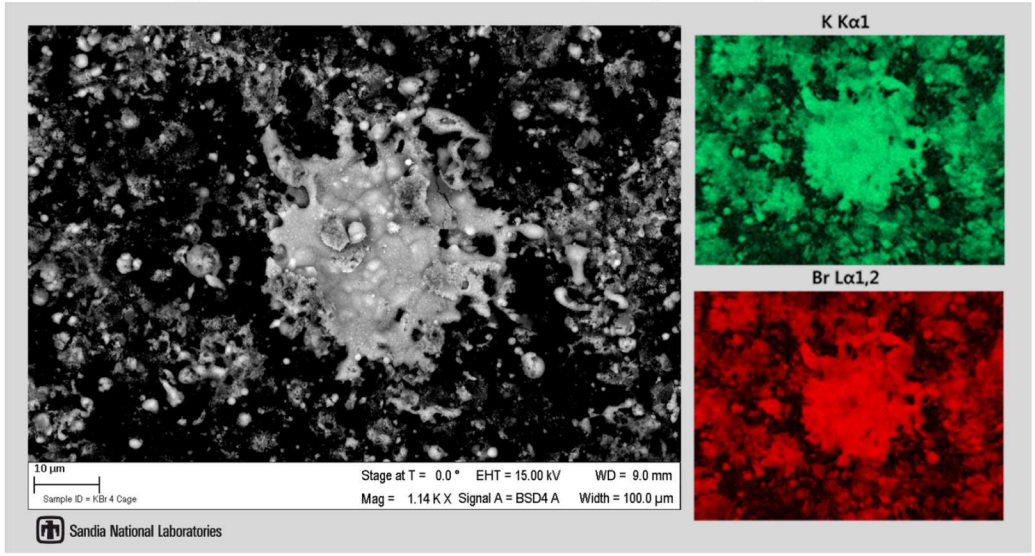
Real Time Video Images

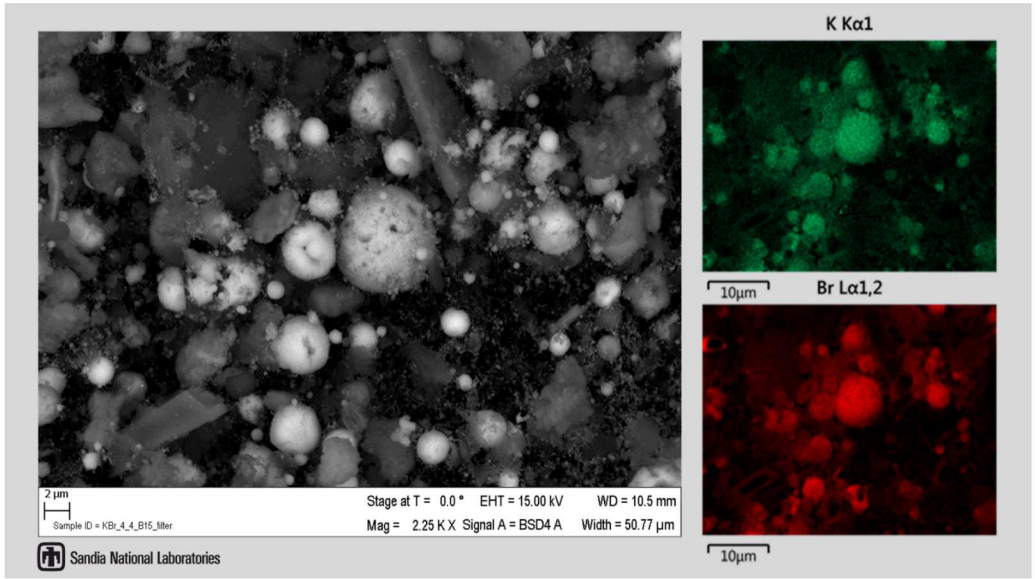
High Speed Video Images



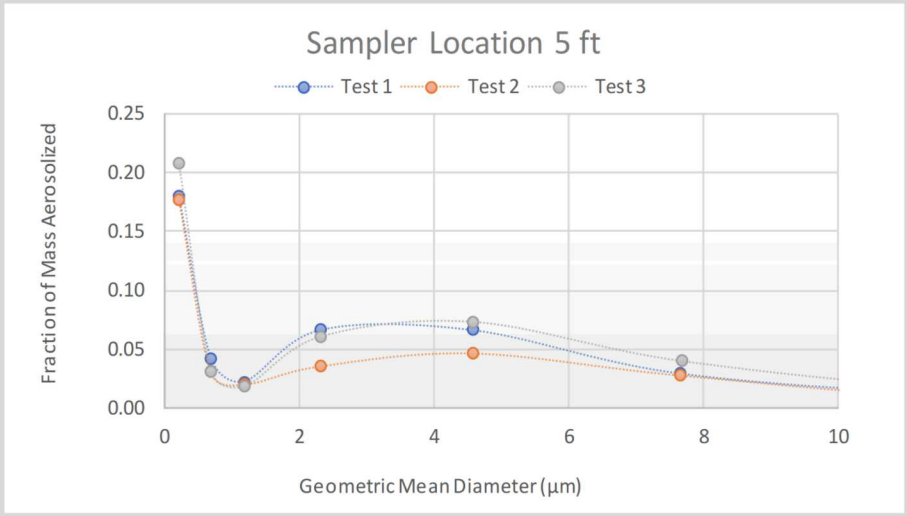
Example Data

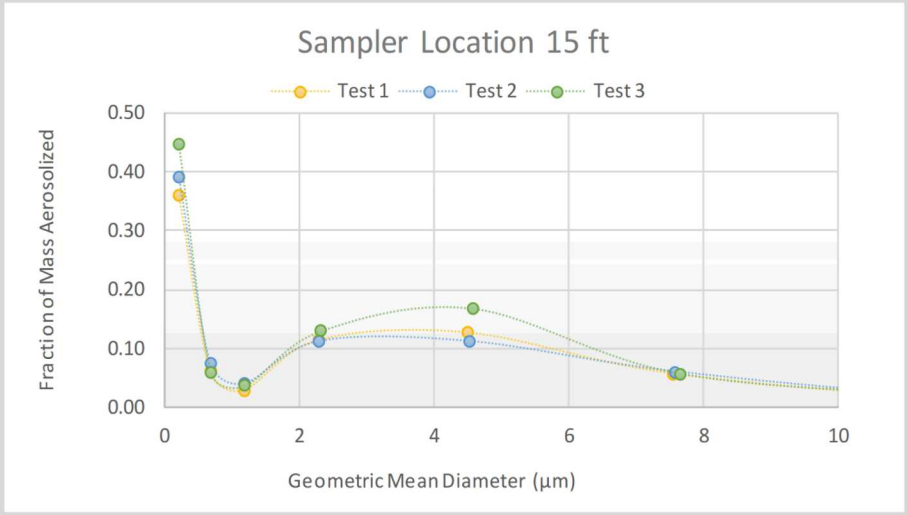
Scanning Electron Microscope (SEM) Results





Cascade Impactor Summary





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Questions ?

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