Interagency Modeling and Atmospheric Assessment Center

Grab your gear, grab your phone and call 877-240-1187 to activate IMAAC

IMAAC Mission

Provide a single point for the coordination and dissemination of federal dispersion modeling and hazard prediction products that represent the Federal position during actual or potential incidents involving hazardous atmospheric releases.

IMAAC is a Partnership

IMAAC Technical Operations Hub

- Managed by the Defense Threat Reduction Agency (DTRA)
- Coordinates the production and dissemination of IMAAC plume modeling products
- Staffed 24/7 by CBRNE subject matter experts
- Turns around requests quickly
- Utilizes numerous decision support tools to assist interagency customers

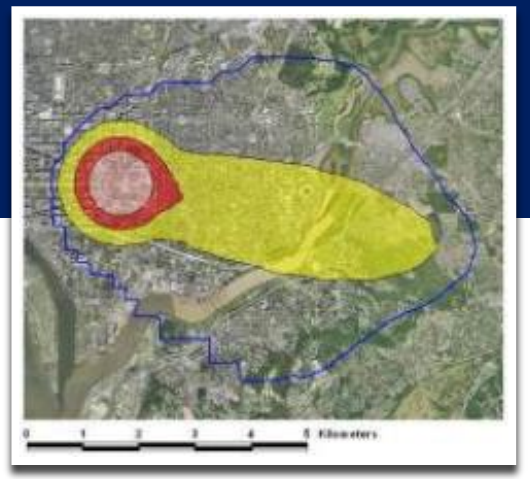
IMAAC Can Help

- Assess danger
- Understand interactions

- Weather
- Products/ Weapons
- Terrain/Built Environment

- Background and injects resources
- Assist/serve as the SimCell
- Most likely scenario projections

IMAAC Provides Atmospheric Modeling Support



- **Real-world events**
  - Emergencies
  - National Special Security Events (NSSEs)
- **Exercises**
  - Gotham Shield
  - Southern Exposure
  - Chicago BioWatch exercise
  - Marble Challenge
- **Training**
  - Webinars
  - On-site
  - Classroom/Hazard prediction assessment capability (HPAC)

Modeling Tools

DoD/DTRA
- HPAC

EPA
- CAMEO/ ALOHA
- HYSPLIT

HHS
- Population modeling

DoD/DTRA
- HPAC

DoE/NNSA
- NARAC

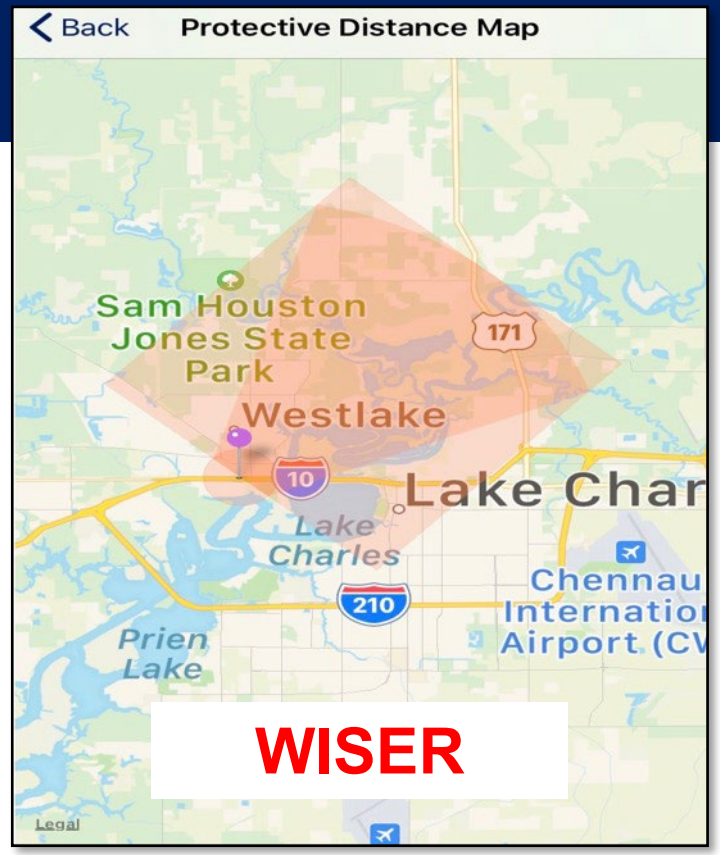
EPA

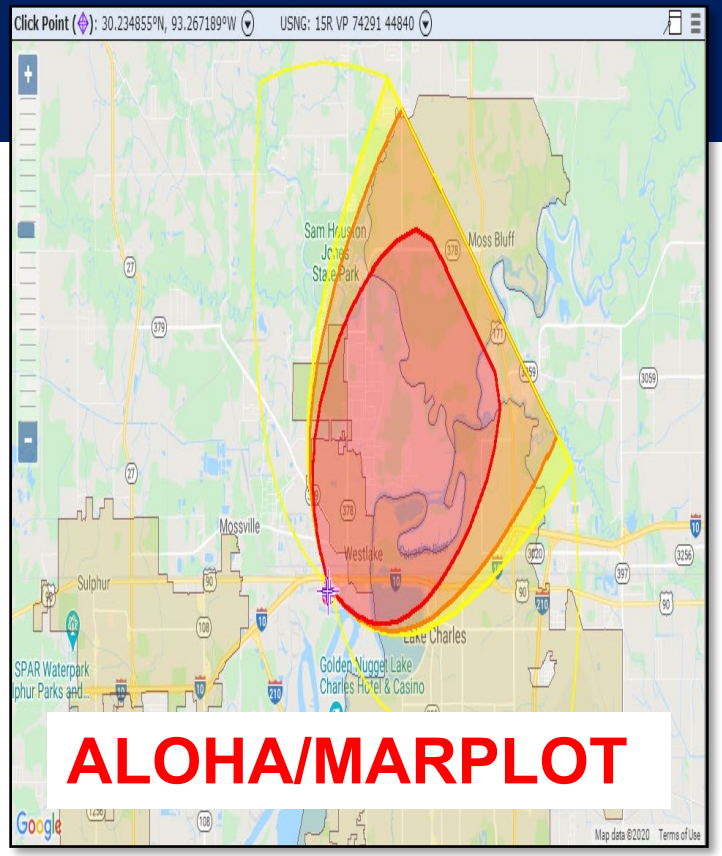
NOAA

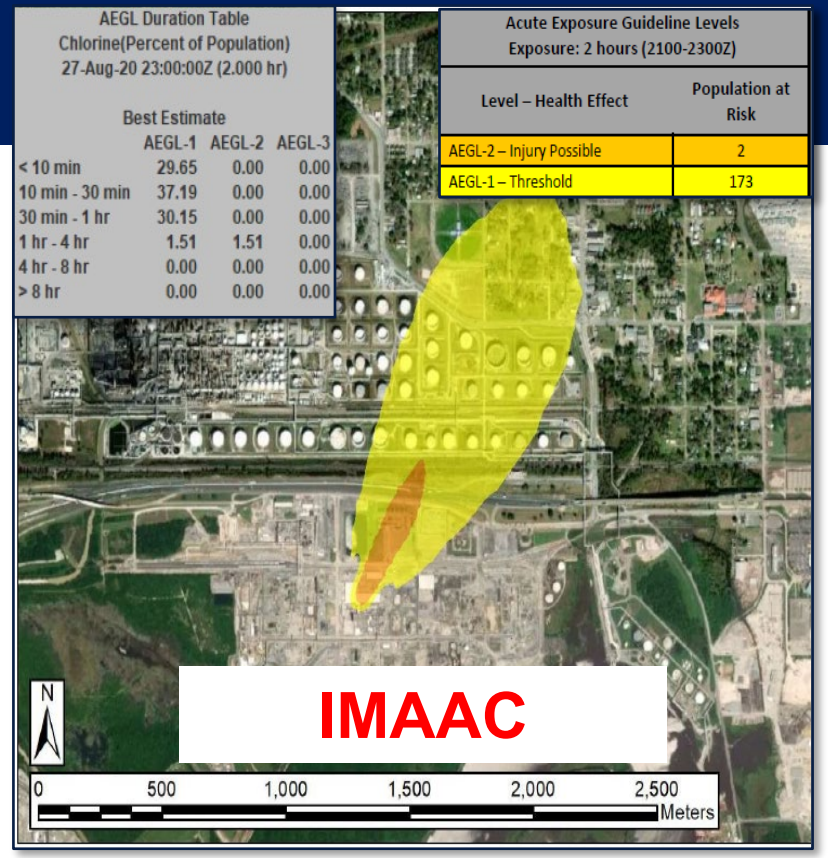
NRC
- RASCAL

DoD/DTRA
- HPAC
- VAPO

Building on HazMat Modeling Expertise







IMAAC can bolster first responder understanding of other HazMat models, such as CAMEO/ALOHA and WISER models.

ALOHA/CAMEO & WISER vs. HPAC

ALOHA/CAMEO & WISER

- Greater simplicity
- Less input of data
- Faster run time
- Makes more assumptions (e.g., weather & terrain)
- Better for smaller-scale, shorter-term incidents (e.g., model distance limit of 6 miles, shorter plume output times)

HPAC

- Better captures behavior of transport
- Longer processing time due to data input requirements
- More incident-specific
- Tied to population models
- Better for larger-scale, longer-term incidents

Activate the IMAAC for current or potential real-world emergencies involving significant hazardous atmospheric releases

877-240-1187

IMAAC@FEMA.DHS.GOV

When you call be prepared to share as much information as you have, including:

- **WHEN** the incident occurred
- **WHERE** the incident is located
- **WHAT** is happening including type of incident and material
- Your contact information

Activation Sequence

1. IMAAC activated
2. Initial IMAAC products developed
3. Initial IMAAC products distributed
4. IMAAC coordination teleconference
5. IMAAC deactivated

Real World IMAAC Activation

Arkema Chemical Plant, Crosby, TX

August 29 — September 3 2017

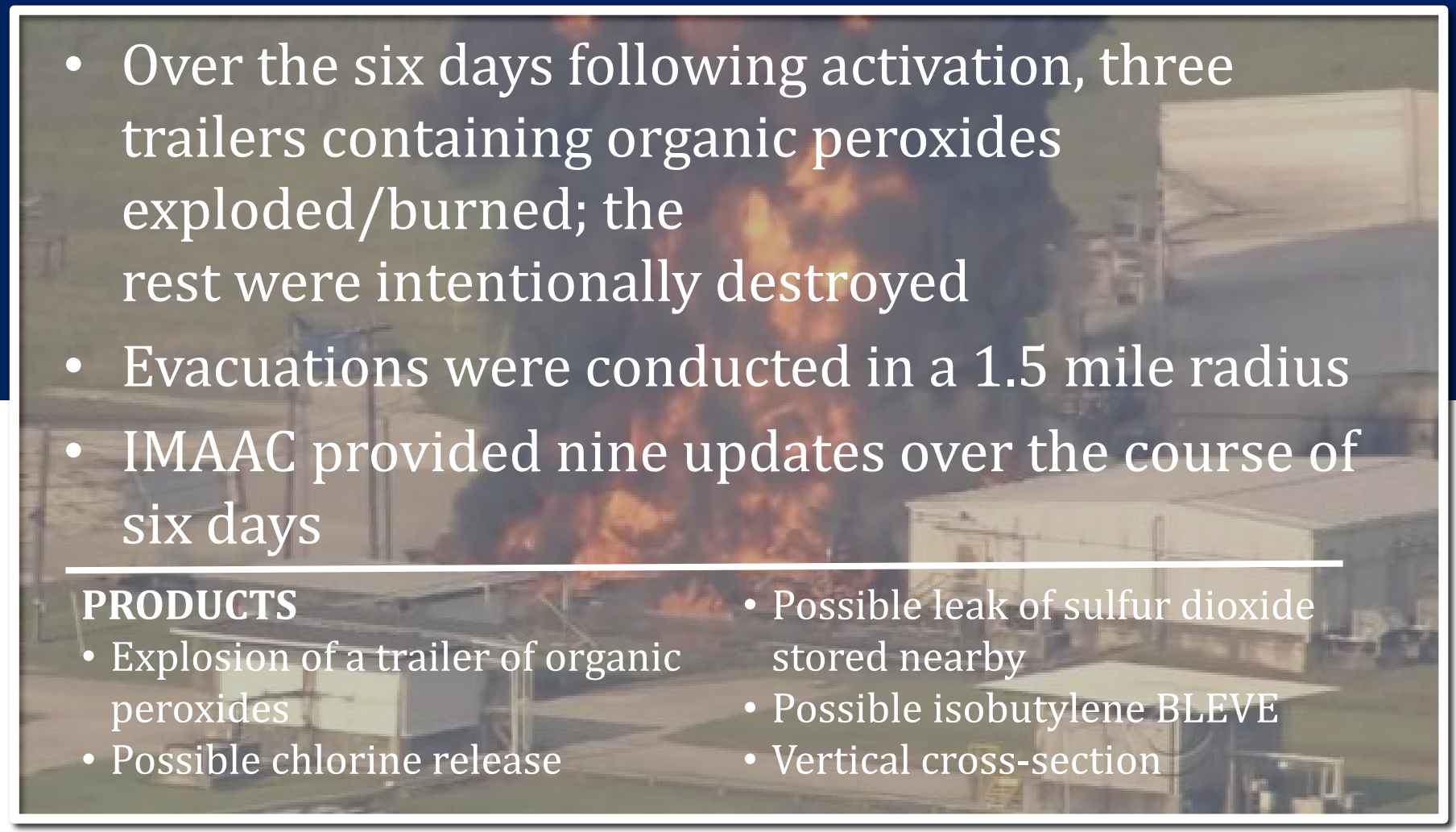
IMAAC was activated to respond to an incident at the Arkema Chemical Plant in Crosby, Texas

- Activated by EPA Region 6
- Plant was inundated with several feet of water as the result of Hurricane Harvey
- Organic peroxides at the site required cooling to prevent spontaneous “instability”
- Inundation caused cooling systems to fail

INTERAGENCY PARTICIPATION

- FEMA (IMAAC Dir., National Watch, Region 6)
- EPA (Region 6 and HQ)
- NOAA (SDM, Emer. Response Div.)
- DHS-CSAC, NORTHCOM
- JTF-CS
- U.S. Dept H&HS
- TRANSCOM

Arkema Plant Activation

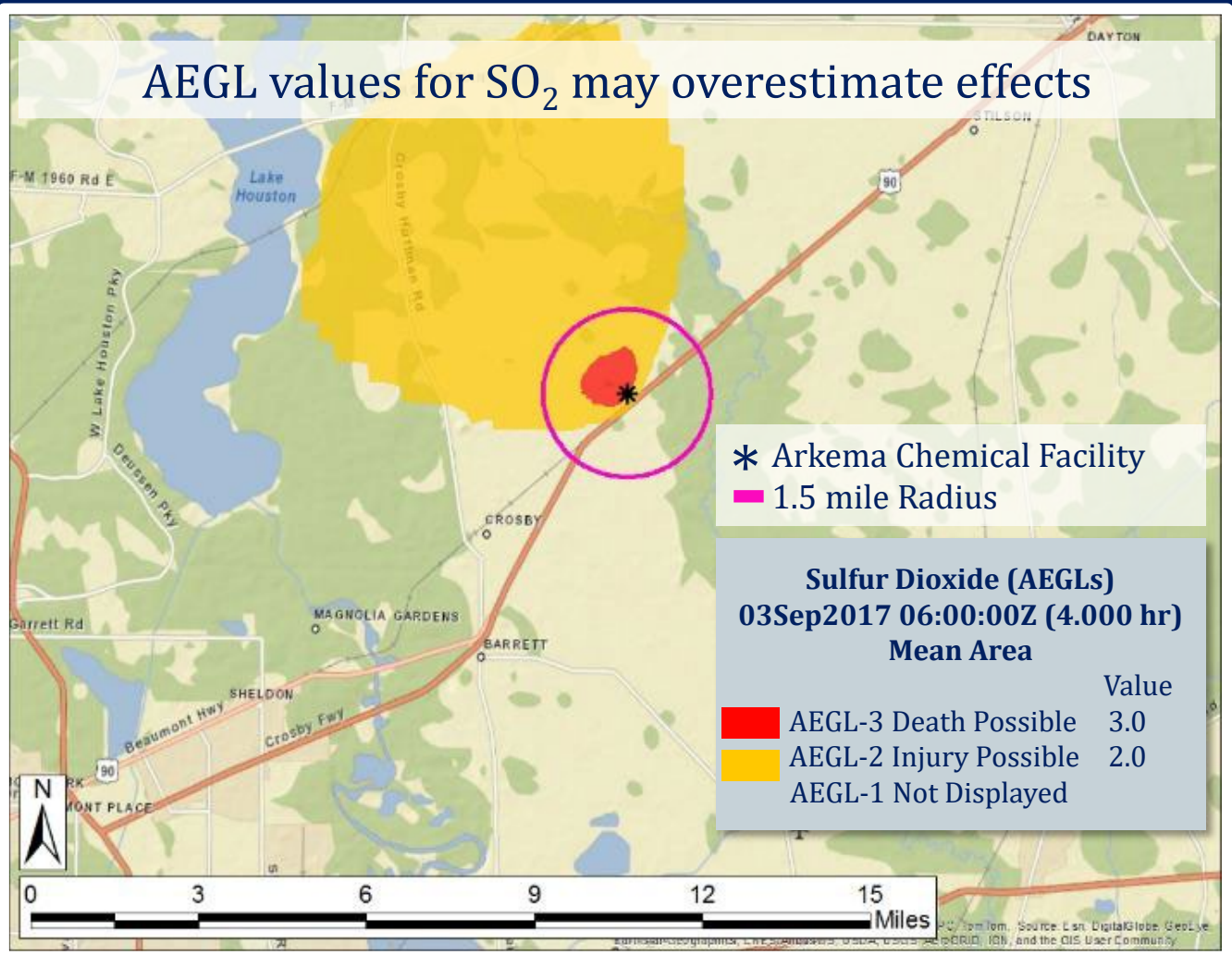


- Over the six days following activation, three trailers containing organic peroxides exploded/burned; the rest were intentionally destroyed
- Evacuations were conducted in a 1.5 mile radius
- IMAAC provided nine updates over the course of six days

PRODUCTS

- Explosion of a trailer of organic peroxides
- Possible chlorine release
- Possible leak of sulfur dioxide stored nearby
- Possible isobutylene BLEVE
- Vertical cross-section

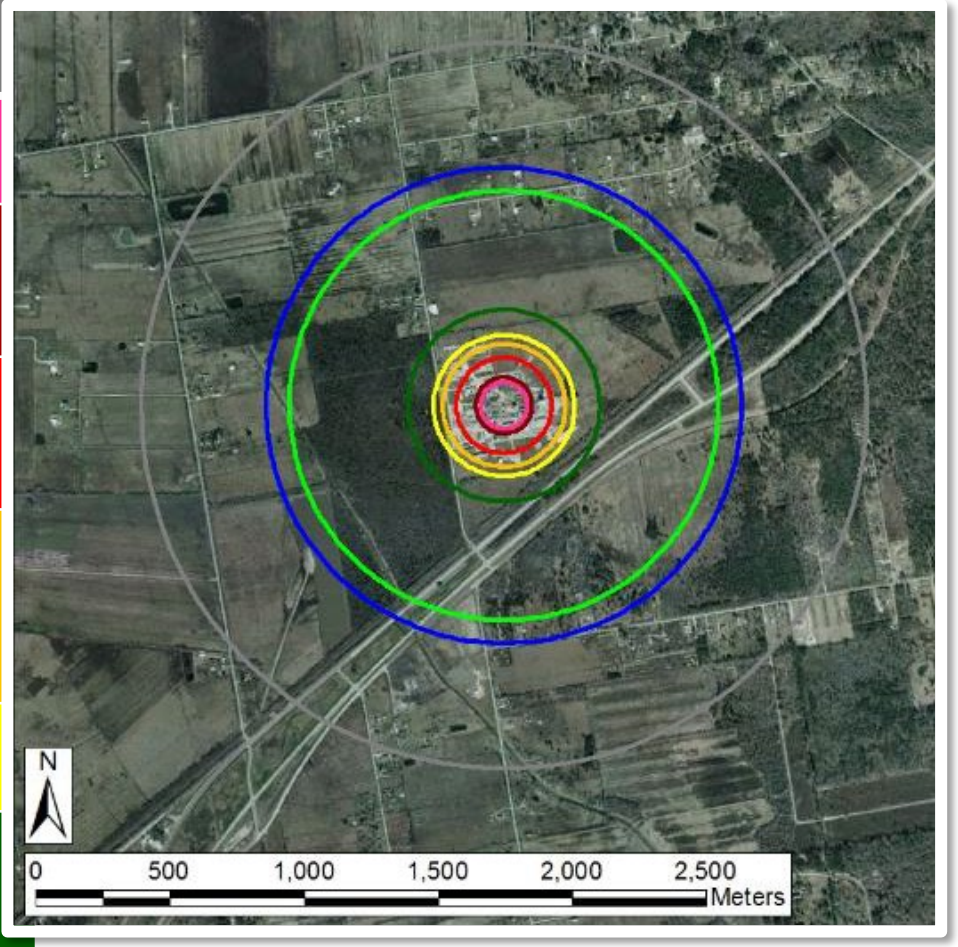
Arkema Activation: SO_2 Release



- Crosby, Texas
- Event Time: 9 PM CDT, 02SEP2017
- Type: Sulfur Dioxide
- Dissemination: Release over two hours
- Weather: 3 km NAM
- Static Population Estimates: LandScan 2015

Arkema Activation: Human Injury and Structural Damage Contours

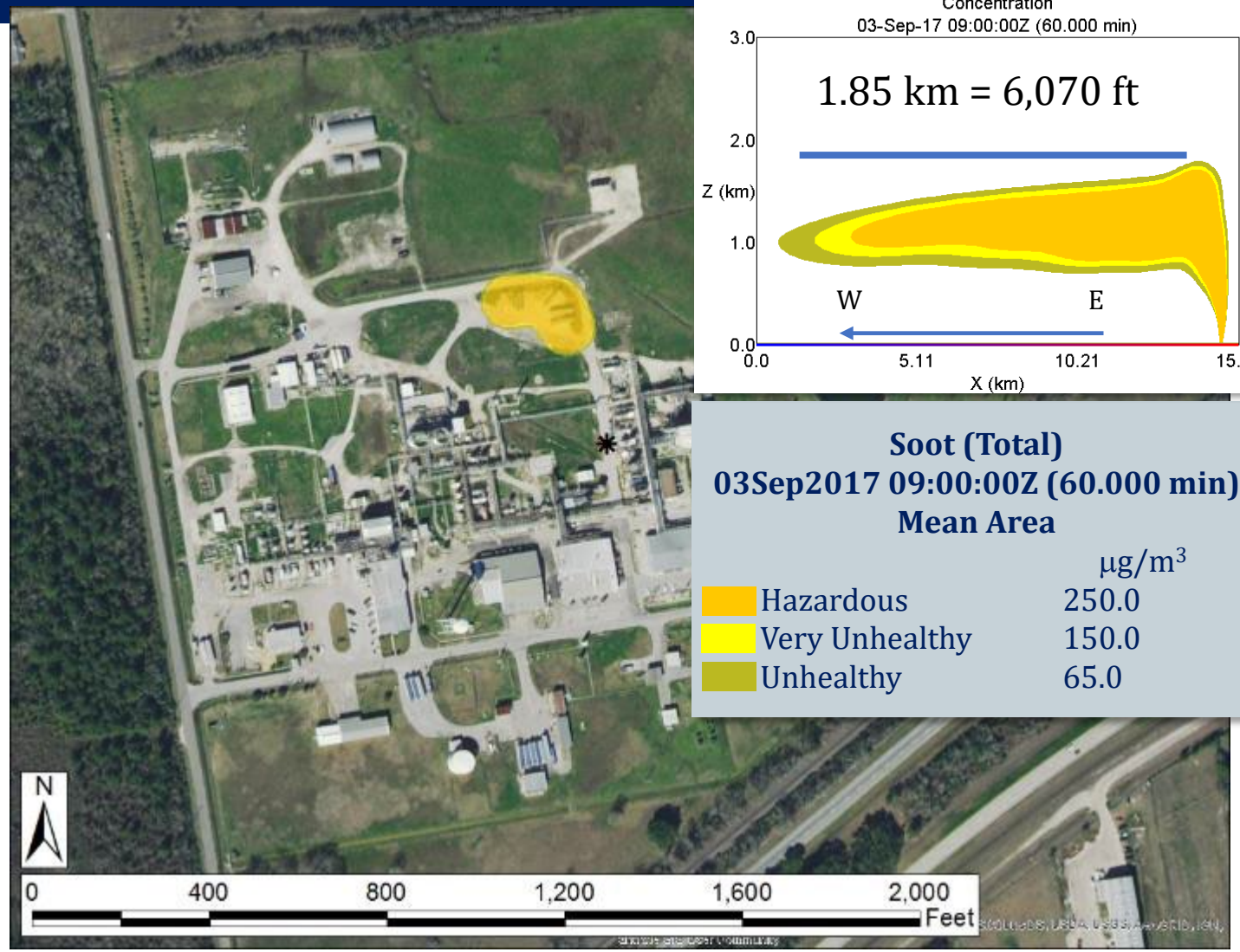
Overpressure and frag	Human Injury/Structural Damage
55 psi	100% fatalities Complete structure blowout
30 psi	Near 100% fatalities Destruction of primary structural components
10 psi	High fatality rate Severe damage to primary structural components
7 psi	Widespread fatalities, 50% eardrum rupture Damage to primary structural components
5 psi	Universal injuries Sever damage to light structures
3 psi	Serious injuries common Light damage to primary structural components, light structures damaged
1 psi	Light injuries occur Non-structural components damaged
0.5 psi	Temporary eardrum damage Glass breaks, non-structural components damaged
Hazardous frag	Probability of being struck in the open by primary/hazardous fragmentation is less than 1%



- Crosby, Texas
- Amount: 200,000 lb TNT-equivalent
- Model: BOOM

Soot — Burning Trailer

Update #8



Soot (Total)
03Sep2017 09:00:00Z (60.000 min)
Mean Area

	µg/m³
Hazardous	250.0
Very Unhealthy	150.0
Unhealthy	65.0

- Crosby, Texas
- Event Time: 3 AM CDT, 03SEP2017
- Type: Organic Peroxide
- Dissemination: Release over one hour
- Weather: 3 km NAM
- Static Population Estimates: LandScan2015

‘Partial’ Activations

- An incident that ***could*** happen or is likely to happen
- IMAAC provides a model based on a hypothetical release
  - Support to requesting agency, but no activation of IMAAC community
- Examples
  - Controlled burn – Beaver Dam, WI
  - Potential ammonia release – Vineland, NJ (failing pipe)
  - Pool sanitation factory shutdown – Belding, MI

IMAAC Products

- Descriptive plume products (PowerPoint/PDF)
- GIS shape files
- Available on the IMAAC page on HSIN

IMAAC page on the Homeland Security Information Network (HSIN)

Technical Operations Hub 877-240-1187

https://hsin.dhs.gov/collab/IMAAC

To request access to the IMAAC page on HSIN, email imaac@fema.dhs.gov.

Contacting IMAAC

Emergencies

- **IMAAC Operations: (877) 240-1187**
- **Email: IMAAC@FEMA.DHS.GOV**

General inquiries and exercise support requests

- **Email: IMAAC@FEMA.DHS.GOV**
- **Public website: https://www.dhs.gov/imaac**

DTRA Reachback Contact Information

- DTRA Operations Center (24/7 Operations):
  - Online RFI Forms:
  - https://opscenter.dtra.mil/images/DTRA_RFI_Form_Current.pdf
  - https://jocconops.dtra.smil.mil/index_docs/DTRA_RFI_Form_Current_S.pdf
  - NIPR: dtra.belvoir.pi.mbx.joint-ops-center@mail.mil
  - SIPR: dtra.belvoir.pi.mbx.joint-operations-center@mail.smil.mil
  - JWICS: dtra.opscenter@dtra.ic.gov
  - PHONE: 703-767-2003; DSN (STE): 427-2003
- DTRA Technical Reachback (24/7 Operations):
  - NIPR: dtra-reachback@mail.mil
  - CENTRIXS-K: dtra.reachback@pacom.kor.cmil.mil
  - SIPR: dtra-reachback@mail.smil.mil
  - JWICS: reachback@dtra.ic.gov
  - PHONE: 703-767-3445/3448; DSN (STE): 427-2138
- Training Support (Mobile or in Resident); dtra.belvoir.rd.mbx.reachback-training@mail.mil
- Software Distribution: dtra.belvoir.rd.mbx.reachback-software-distribution@mail.mil