

Pre-determined Protective Action Plans for EAL-based Initial Response

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The Need for Protective Actions

- **The Objective**
 - Limit doses or exposures to personnel from an unplanned release of hazardous materials
- **The Strategy**
 - Identify populations at risk and implement protective actions (fast enough) to avoid or reduce consequences
- **The Need**
 - A rapid and consistent approach to identifying these populations at risk



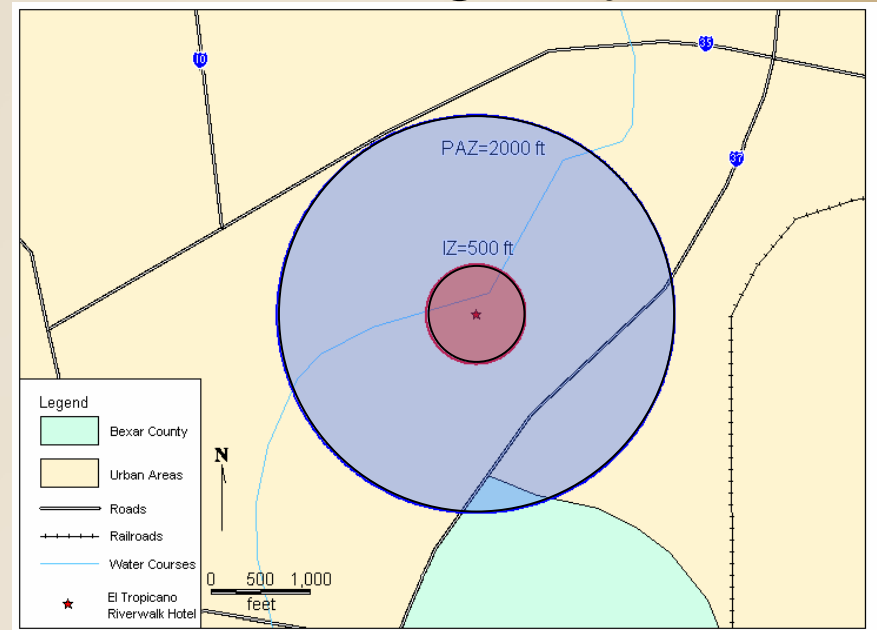
Zones Implement the Graded Approach

- Two protective action zones implement the graded approach
- The **Isolation Zone**
 - The area in which urgent protective actions are needed to avoid potentially life-threatening health effects
- The **Protective Action Zone**
 - The area in which immediate protective actions are needed to avoid serious and irreversible health effects



The Zones in Concept

- Zones are circular (impact might occur in any direction)
- Zones are (usually) centered on emergency location
- Zones are concentric
 - **Isolation Zone** in center
 - **Protective Action Zone** surrounds Isolation Zone
 - Note: **Protective Action Zone** is actually a doughnut (torus), NOT a circle



DOE Protective Action Criteria Define the Zones

- The Threshold of Early Lethality (TEL) defines the **Isolation Zone**
 - Distance to which 100 Rem TEDE (radiological) or ERPG-3/ TEEL-3 (chemical) may be exceeded
- The Protective Action Criterion (PAC) defines the **Protective Action Zone**
 - Distance to which 1 Rem TEDE (radiological) or ERPG-2/ TEEL-2 (chemical) may be exceeded



Primary Protective Actions for Hazardous Materials Events

- The most effective protective action should be determined for each population group or geographic area impacted above protective action criteria
- **Sheltering and Evacuation** should be considered the primary protective actions during the early phase of an emergency for
 - Workers
 - Collocated workers
 - The offsite public (recommendations)



Shelter-in-Place

- Shelter-in-place may be the appropriate protective action when:
 - The dose or exposure will be less than that associated with evacuation
 - It places people in a position where additional instructions can be disseminated
 - Rapid evacuation is impeded
 - Plume arrival is imminent



Evacuation

- For populations lacking substantial shelter, prompt evacuation is preferred
- Evacuation may also be appropriate as a precaution when an event is threatened or slowly unfolding
- Sheltering followed by evacuation may be appropriate when an initial large release is followed by lower exposures or continued risk

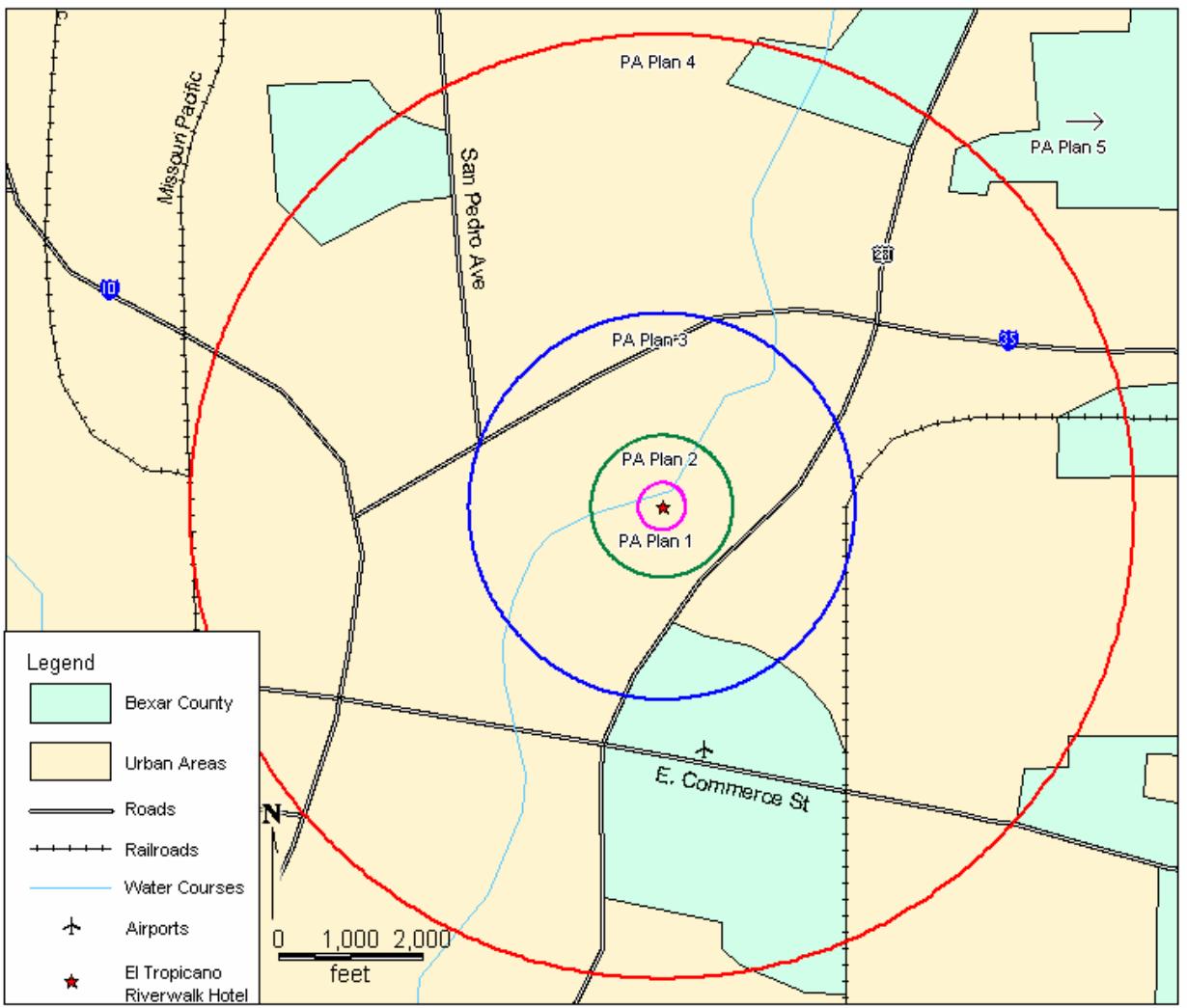


Protective Action Decision Methodology

- Develop pre-determined protective action plans
- Develop tools (EALs) to determine necessary information for
 - Categorization
 - Classification
 - Protective action decisions



Pre-determined Protective Action Plans

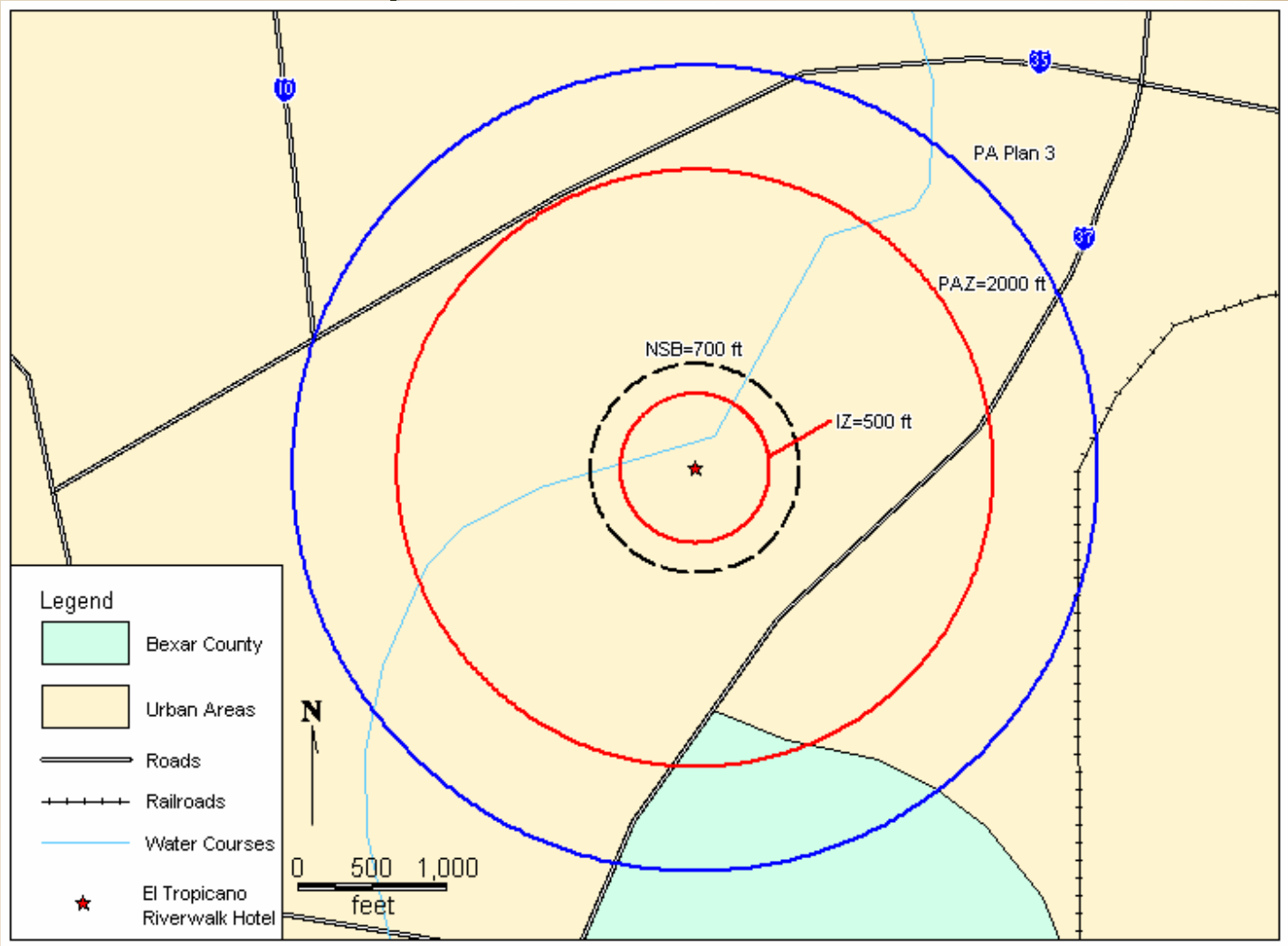


Scenario Summary of Indicators

- Isolation Zone distance: **500 ft.**
- Protective Action Zone distance: **2000 ft.**
- Plume release conditions:
Release occurring, 15 minute duration
- Nearest Site boundary distance: **700 ft.**
- Protective Action Plan 3
- Classification: **General Emergency**



Scenario Map



PA Plan 3 GE

- Choose ICP from predetermined options
- Choose a site that will be upwind
- Choose a different site if conditions dictate



Emergency Response Protective Action Plan

Building 110		PA Plan 3	GE
El Tropicano Riverwalk Hotel			Page 1 of 4

RECOMMENDED INCIDENT COMMAND POST

<input type="checkbox"/>	1	HW corner of I-10 & I-35	<input type="checkbox"/>	4	<input type="checkbox"/>
<input type="checkbox"/>	2		<input type="checkbox"/>	5	<input type="checkbox"/>
<input type="checkbox"/>	3		<input type="checkbox"/>	6	<input type="checkbox"/>

RECOMMENDED TRAFFIC CONTROL POINTS

1	I-10 and I-35	10	<input type="checkbox"/>
2	I-35 and N St Marys St	11	<input type="checkbox"/>
3	I-37 and Sherman St	12	<input type="checkbox"/>
4	I-37 and E Commerce St	13	<input type="checkbox"/>
5		14	<input type="checkbox"/>
6		15	<input type="checkbox"/>
7		16	<input type="checkbox"/>
8		17	<input type="checkbox"/>
9		18	<input type="checkbox"/>

TAR AND PAGER MESSAGES (If Directed by IC)

If directed by IC, Com Communicator issues TAR and pager notifications: "SHELTER IN PLACE AND AWAIT FURTHER INSTRUCTIONS."

TAR Notifications		Evacuation Team Pager Notifications	
1	Hotel Facilities	1	Corporate Staff
2	Inner Mall Tenants	2	Housekeeping
3	Exterior Mall Tenants	3	Security
4		4	Hotel Maintenance
5		5	Grounds Maintenance
6		6	Restaurant/Catering

PA Plan 3 GE

- TCPs are predetermined for size of Protective Action Zone
- Implement as indicated on worksheet & map

Emergency Response Protective Action Plan

Building 110		PA Plan 3	GE
El Tropicano Riverwalk Hotel		Page 1 of 4	

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	2				5	
	3				6	

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4	4 Hotel Maintenance
5	5 Grounds Maintenance
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PA Plan 3 GE

- Fill in EAL # used
- Fill in Isolation Zone distance
- Fill in Protective Action Zone Distance



Emergency Response Protective Action Plan

Building 110		PA Plan 3	GE
El Tropicano Riverwalk Hotel		Page 2 of 4	

NOTES AND SPECIAL INSTRUCTIONS

EAL # used:	<input type="text"/>
Nearest site boundary:	<input type="text" value="700"/> ft
Isolation Zone distance:	<input type="text" value="500"/> ft
Protective Action Zone distance:	<input type="text" value="2,000"/> ft

PA Plan 3 GE

- Key receptors listed by distance
- Draw vertical line to identify key receptors in Isolation Zone
- Draw vertical line to identify key receptors in Protective Action Zone
- Fill in evacuation instructions



Emergency Response Protective Action Plan

Building 110		PA Plan 3	GE
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ONSITE PROTECTIVE ACTIONS

Note: SHELTER-IN-PLACE initiated for entire Protective Action Zone via TAP and pager notification.

Isolation Zone	Protective Action Zone	Distance (ft) from	Direction	Facility	Remote vent control	Downwind	Occupancy	Shelter	Evacuation	Evacuation instruction
		###								Dist (ft) / Dir
		57	N	Armadillo Florists	Y		8			/
		78	E	Bubba's BBQ	N		53			/
		125	NE	Horton Haberdashers	N		12			/
		489	SW	Bucks Coffee	N		24			/
		523	W	Mickey D's Lounge	Y		112			/
		574	NE	Silver Spur Tack	N		31			/
		608	S	Burger Queen	Y		27			/
		655	NW	Five Seasons	N		97			/
		673	E	Rooster Cogburn's	Y		74			/
		698	SE	Silverado Saloon	Y		157			/
		753	W	Riverwalk Riviera			212			/
		802	SE	Dogwalk Cafe			47			/
										/
										/
										/
										/

PA Plan 3 GE

- Make Protective Action Recommendation for each offsite PA Zone
- Same process to determine key receptors in isolation and PA Zones

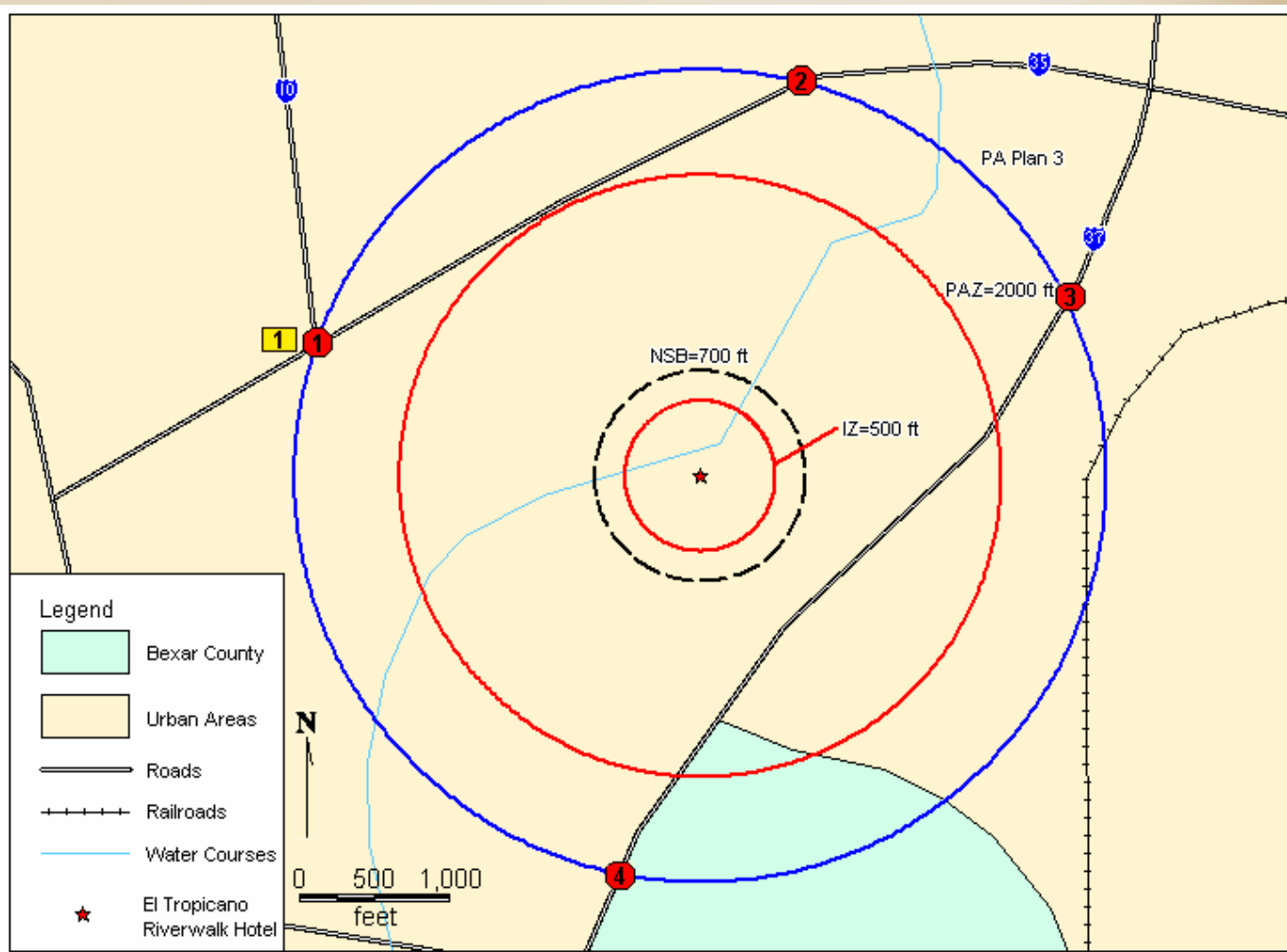


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OFFSITE PROTECTIVE ACTION RECOMMENDATIONS

Isolation Zone Protective Action Zone	Distance (ft) from ###	Direction	Protective Action Zone	Shelter	Evacuation	Evacuation Recommendation Dist (ft) / Dir
	759	E	Winky's Donuts			/
	1123	W	Sagebrush Bail Bonds			/
	1478	SW	Beyond the Lines Graphic Design			/
	1498	II	The Alamo			/
	1533	HW	Sutton's Fine Jewelry			/
	1611	E	McShadey Attorney at Law			/
	1856	S	AT&T Center Stadium			/
	2153	HE	Canyon Springs Golf Club			/
	2287	S	Dailey Inn			/
	2413	SE	Ilavarro Hotel			/
	2631	HW	Amtrak Station			/
	2765	W	Convention Center			/
	2900	HW	U. S. Post Office			/
						/
						/
						/
						/

PA Plan 3 Map



Apply Work Aid

Reliable met data available?	Evacuation practical?	Plume release condition	Sheltering and evacuation guidance	
			Isolation Zone	Protective Action Zone
NO	NO	ALL release conditions	Shelter, then monitor or evacuate when practical after plume passes	Shelter, then monitor or evacuate when practical after plume passes
	YES	Release condition is UNKNOWN	Shelter, then determine release condition and reevaluate	Shelter, then determine release condition and reevaluate
		Release is anticipated but not imminent	Evacuate	Shelter, consider evacuation
		Release is occurring or imminent AND...		
		Longer than about 30 min	Evacuate within 30 min if HVAC is turned on; evacuate within 1 hour if HVAC is turned off	Evacuate within 30 min if HVAC is turned on; evacuate within 1 hour if HVAC is turned off
		Shorter than about 30 min	Shelter, then monitor or evacuate after plume passes	Shelter, then monitor or evacuate after plume passes
		Release is over and plume is gone	Monitor or evacuate	Monitor or evacuate

Apply Work Aid

Reliable met data available?	Evacuation practical?	Plume release condition	Sheltering and evacuation guidance		
			Isolation Zone	Protective Action Zone	
				Downwind portion	Upwind portion
YES	NO	ALL release conditions	Shelter, then monitor or evacuated when practical after plume passes	Shelter, then monitor or evacuated when practical after plume passes	Precautionary shelter
	YES	Release condition is UNKNOWN	Shelter, then determine release condition and reevaluate	Shelter, then determine release condition and reevaluate	Precautionary shelter, then determine release condition and reevaluate
		Release is anticipated but not imminent	Evacuate	Shelter, consider evacuation	Precautionary shelter, consider evacuation
		Release is occurring or imminent AND...			
		Longer than about 30 min	Evacuate within 30 min if HVAC is turned on; evacuate within 1 hour if HVAC is turned off	Evacuate within 30 min if HVAC is turned on; evacuate within 1 hour if HVAC is turned off	Precautionary shelter, evacuate if wind shifts may occur
		Shorter than about 30 min	Shelter, then monitor or evacuate after plume passes	Shelter, then monitor or evacuate after plume passes	Precautionary shelter, consider evacuation
Release is over and plume is gone	Monitor or evacuate	Monitor or evacuate	Monitor to confirm no impacts		

Summary of Guidance: Example Scenario

- Isolation Zone:
 - Shelter, then monitor or evacuate after plume passes
- Protective Action Zone, Downwind Portion:
 - Shelter, then monitor or evacuate after plume passes
- Protective Action Zone, Upwind Portion:
 - Precautionary shelter, consider evacuation for logistical/control purposes



Conclusions



Acknowledgement

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