

Contamination Warning Systems & Consequence Management

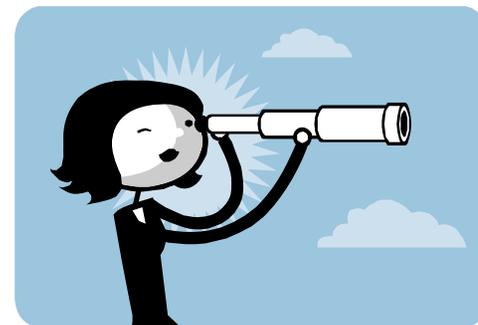
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Water Security Division

Michigan Water Utility Security Summit
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Presentation Outline

- 1. Water Security (WS) initiative Background**
- 2. Contamination Warning System Design**
- 3. Consequence Management Plan (CMP)**
 - a. Essential Elements**
 - b. CMP and Existing Response Plans**
 - c. Content: Outlining CMP Actions**
 - d. Constructing the CMP**
 - e. Communications**
- 4. Training**
- 5. Summary/Conclusions**

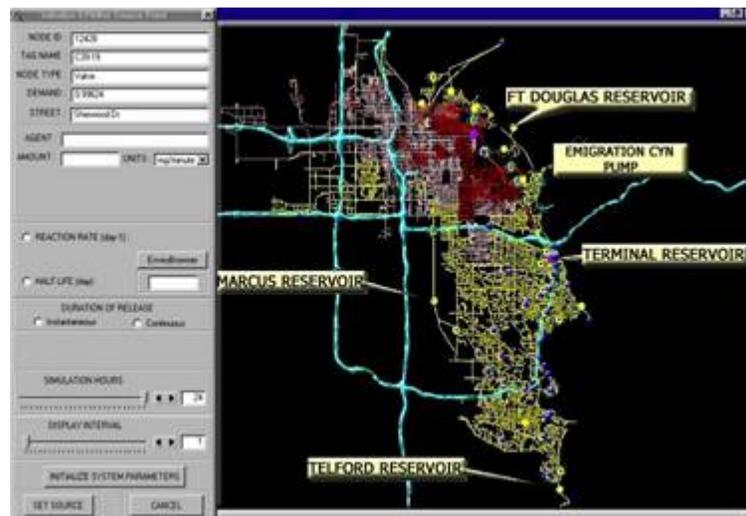


- Homeland Security Presidential Directive/HSPD-9
 - Establishes a national policy to defend the agriculture and food system against terrorist attacks, major disasters, and other emergencies.
 - Signed January 30, 2004
- HSPD-9 requires EPA to
 - “develop robust, comprehensive, and fully coordinated surveillance and monitoring systems . . . for . . . water quality that provide early detection and awareness of disease, pest, or poisonous agents”
- EPA’s Water Security initiative responds to the HSPD 9 charge



Purpose

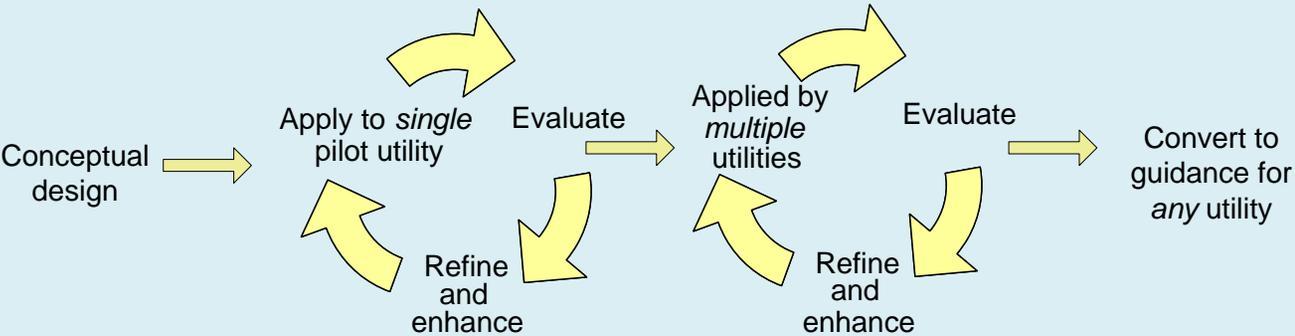
- Through studies, EPA has concluded that:
 - The distribution system is the most vulnerable component of a drinking water system
 - Contaminants are readily available that could produce staggering public health consequences
 - A contamination warning system has the potential to reduce public health and economic impacts from a contamination event



The WSi comprises work in three areas:

1. **Develop a conceptual design** for a system that achieves *timely detection* and *appropriate response* to drinking water contamination incidents to mitigate public health and economic impacts;
2. **Demonstrate**, test, and evaluate the conceptual design in contamination warning system **pilots** at drinking water utilities;
3. **Issue practical guidance** and conduct outreach to promote voluntary national adoption of effective and sustainable drinking water contamination warning systems.

Pilot Demonstration Approach

Phase	DESIGN	DEMONSTRATE		EXPAND
	System Architecture	Initial Pilot	Additional Pilots	Voluntary National Adoption
Approach				
Scope	Not applicable			
Design Specificity	Low	High - Applies to pilot utility only	High – Applies to each pilot	Medium – Applies to range of utilities
Funding	EPA Funds			Utility Funds

Cincinnati Pilot Timeline

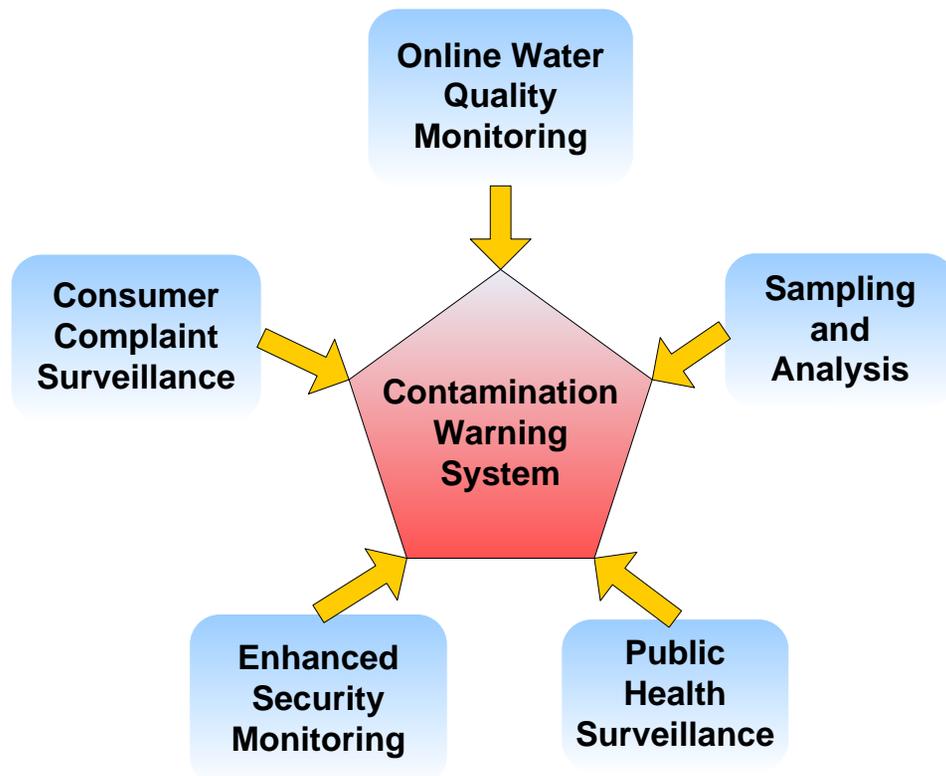
FY 2006				FY 2007				FY 2008				FY2009			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		CRADA signed												CRADA ends	
Initial assessment															
	Work plan development														
		Implementation of enhancements													
						Baseline development									
								Full deployment							
						Evaluation									

1. Detection of a broad spectrum of contaminant classes
2. Spatial coverage of the entire distribution system
3. Detection of contamination in sufficient time for effective response
4. Reliable indication of a contamination incident with a minimum number of false-positives
5. Able to be implemented and sustained



CWS at a Glance

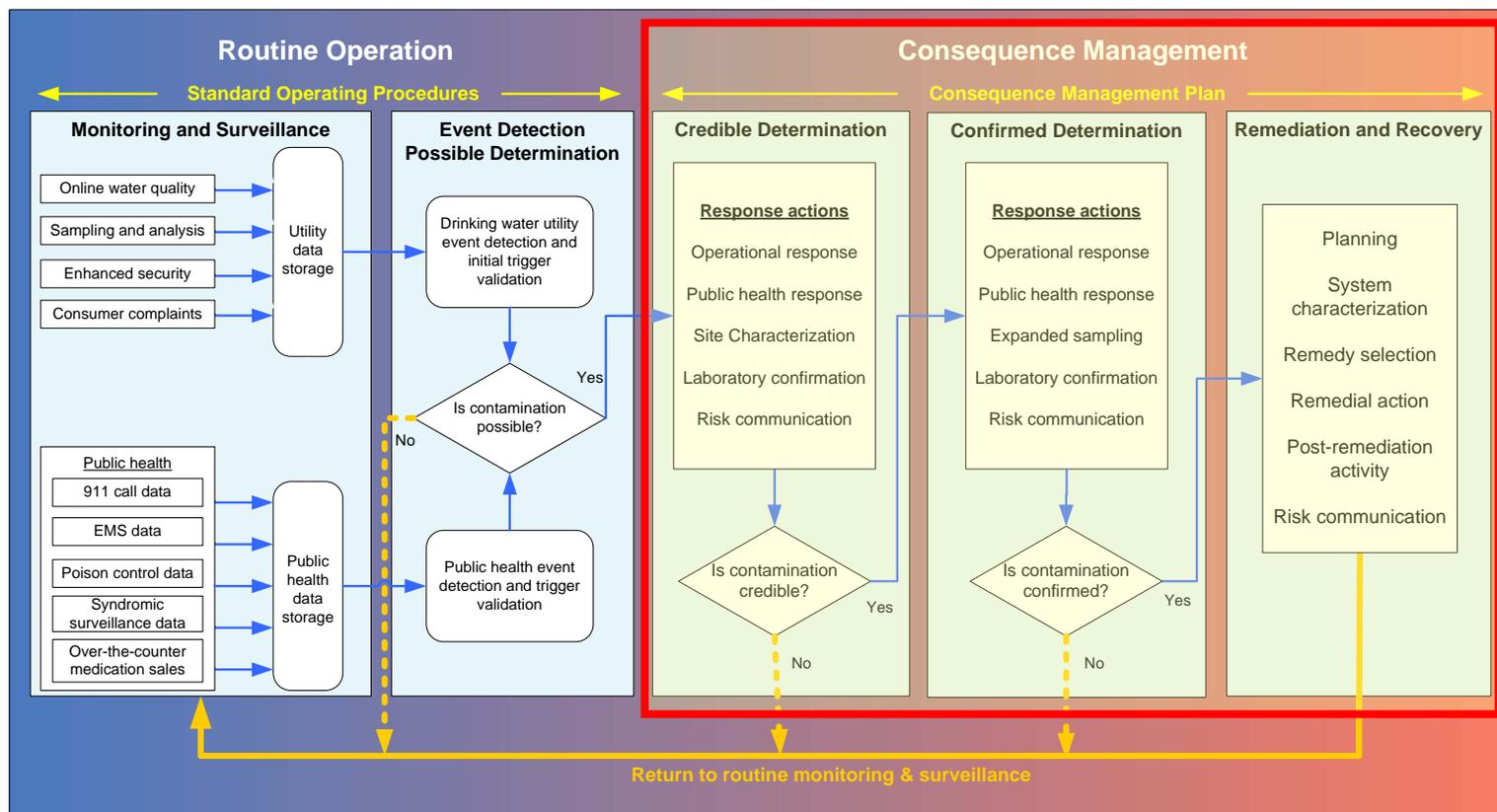
- Involves deployment and use of active monitoring and surveillance components for timely detection of possible contamination
- Use of multiple components provides opportunity for faster detection of a broader range of potential contaminants and increased strength of signal
- May also provide dual-use applications to utilities and local partners



More than just Water Quality Monitors...!

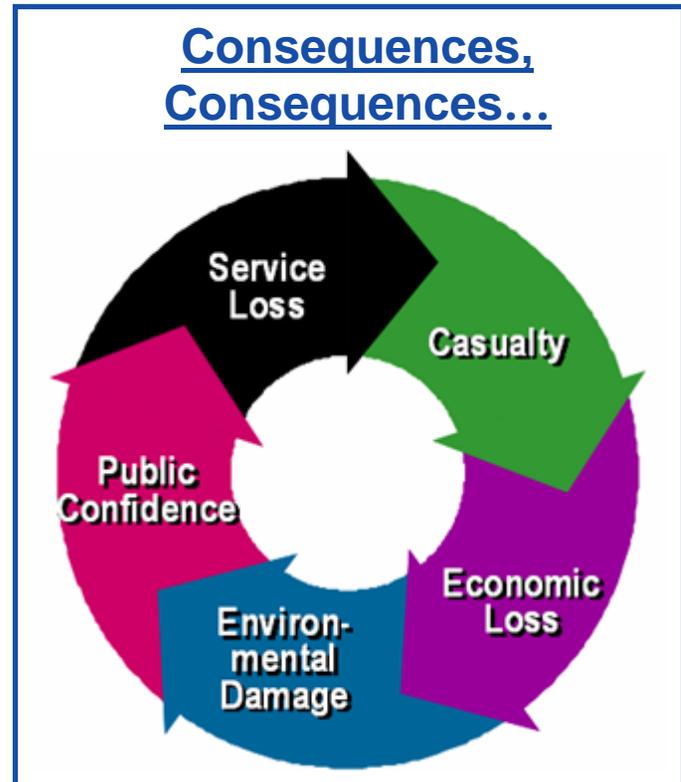
CM and the CWS

- Consequence Management is a key aspect of the CWS design...



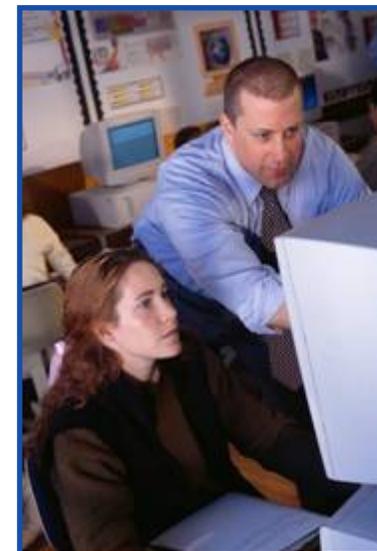
What *is* Consequence Management?

- *Consequence management* consists of actions taken to plan for and respond to potential drinking water contamination incidents.
- Goal: minimize response and recovery timelines through a pre-planned, coordinated effort



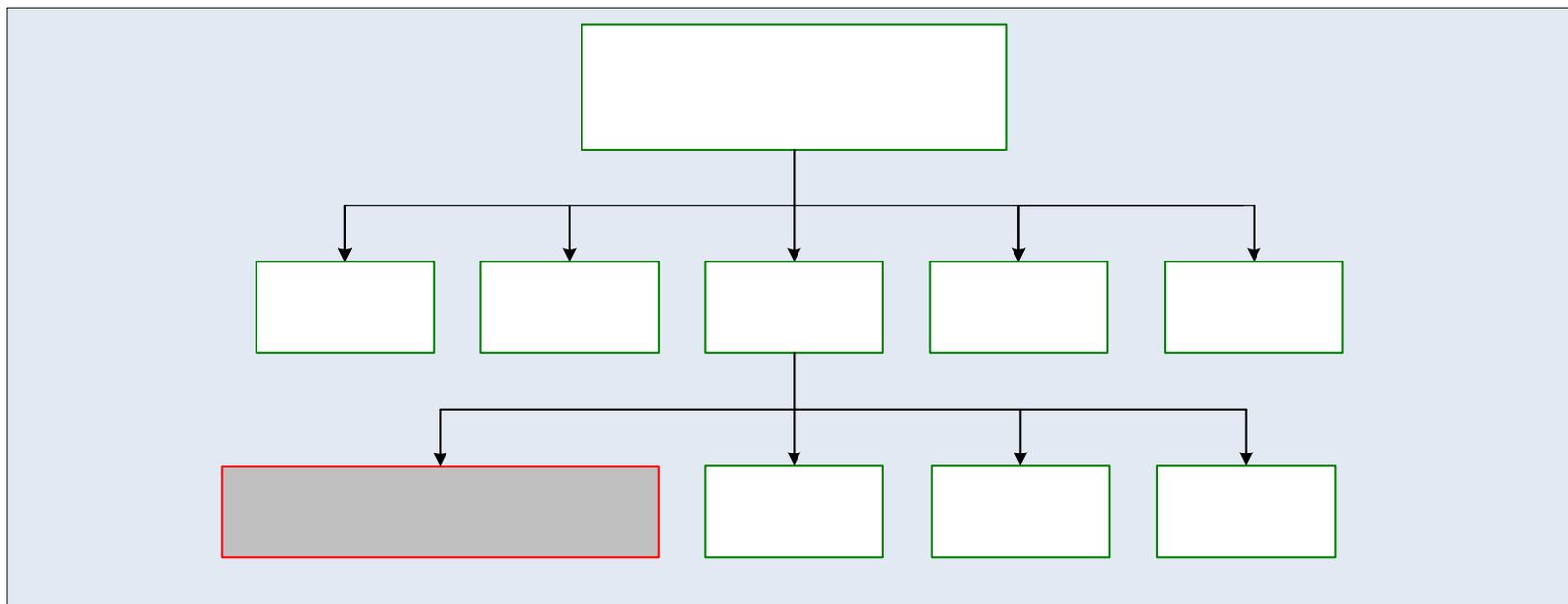
a. CMP Essential Elements

- Credibility Determination actions to investigate validated event triggers
 - Investigative actions (information gathering) to confirm or rule out contamination and inform response actions
 - Adopted Response Protocol Toolbox (RPTB) “Phases” of contamination: Possible-Credible-Confirmed
 - RPTB for *planners*; CMP for decision-makers
- Response actions/Precautionary actions to protect against potential effects of contamination while performing Credibility Determination
 - Operational responses
 - Notifications to partners/stakeholders
 - Assign Roles and Responsibilities for utility *and* response partner personnel
- Remediation and Recovery to return utility to normal operations

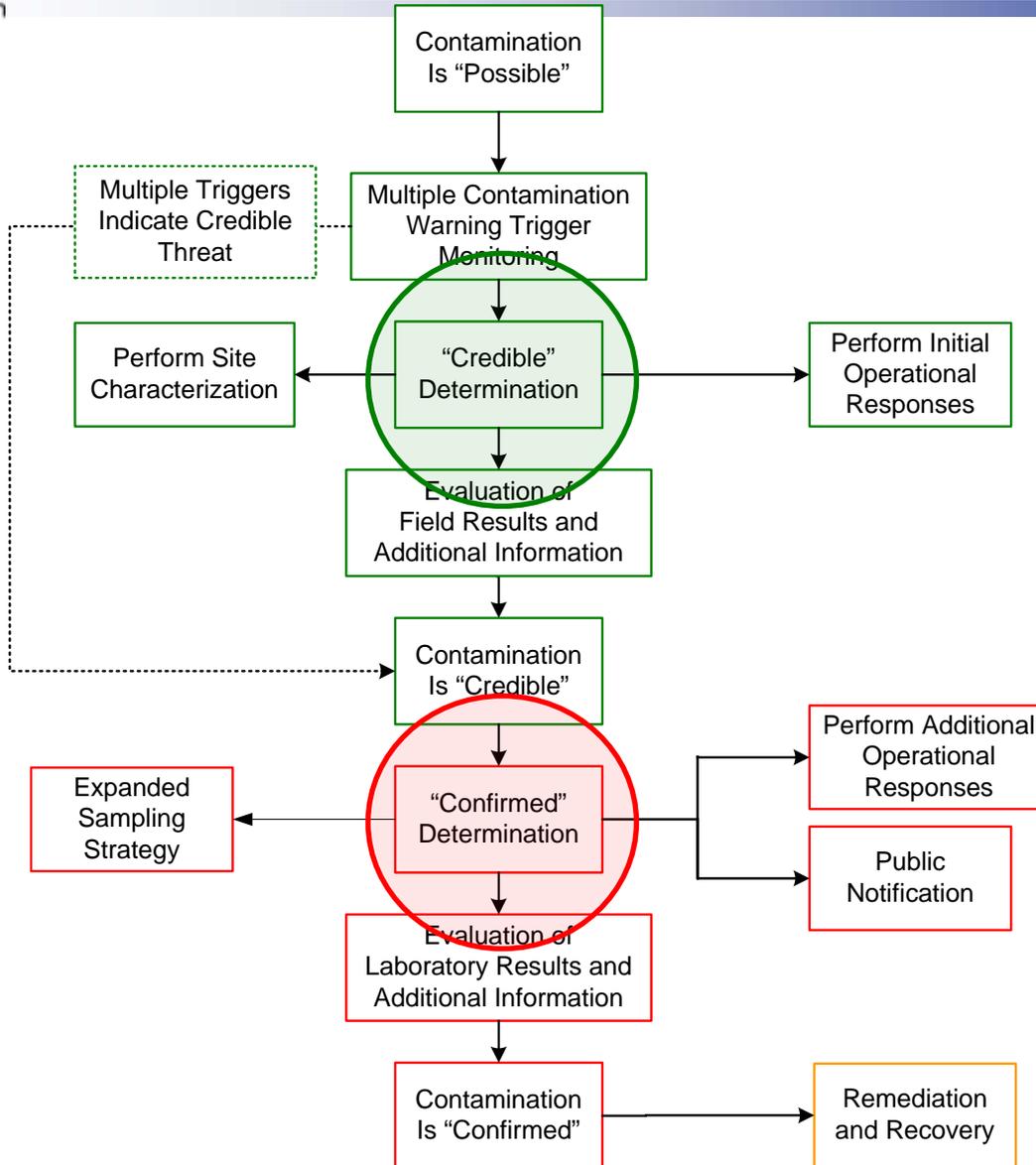


b. CMP and Existing Response Plans

- Great, *another* plan...
- The CMP should be a component of the overall emergency response plan; a incident-specific action plan for a drinking water contamination event in the distribution system

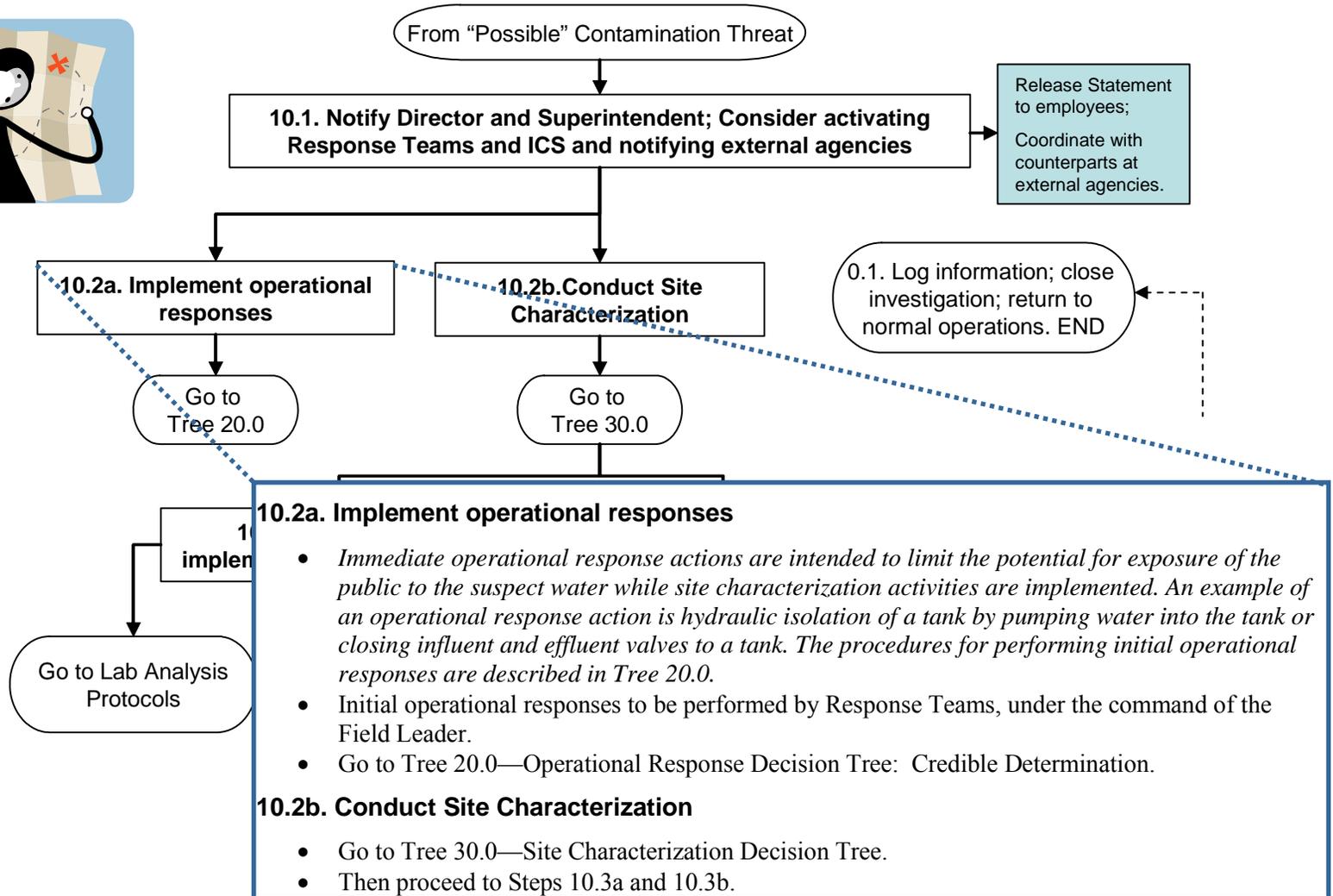


c. Content: Outlining CMP Actions



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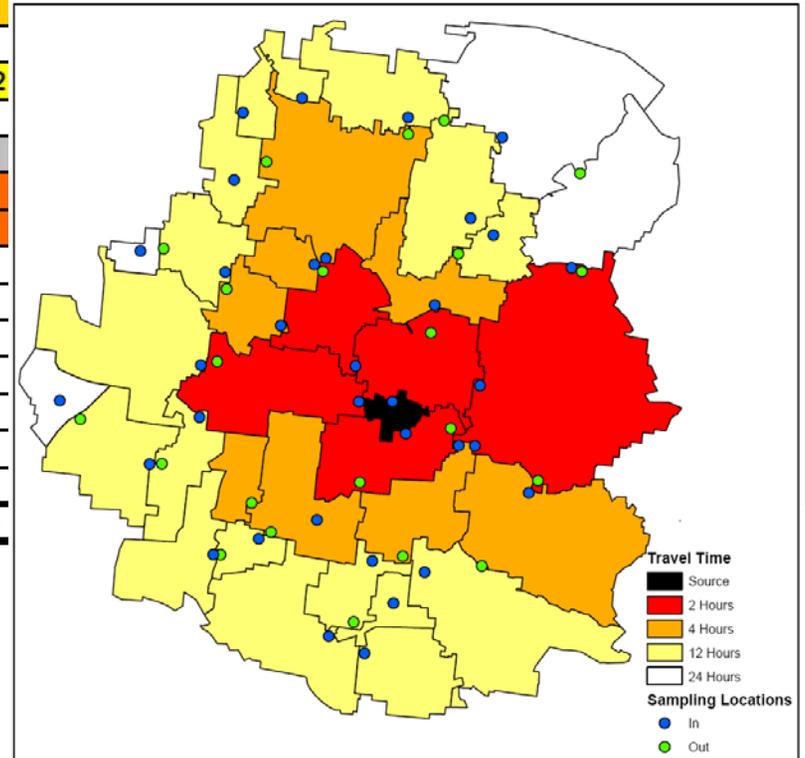
Format: decision trees with supporting bulleted text



c. Content: Outlining CMP Actions

CM Tools: Expanded Sampling Field Kit

		Zone of Impact																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Detection Location	1	1	1	1	2	2	4	4	4	4	12	12	12	12	12	24				1
	2	2	1				2	2	2	12			12							2
	3	2		1							12		24	24	4					3
	4	2			1				12	12	12			24	24		2			4
	5	2		2	2	1			4	4	4									
	6					1	1	2												
	7		4				2	1	12	12										
	8			1			1	1	1											
	9				2		2		1	1										
	10		4	4					2	2										
	11						4	4	4	2										
	12					2														
	13					2														
	14		12			12	12													
	15		24			24	24													
...																				
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...																				
		1	2	3	4	5	6	7	8	9										



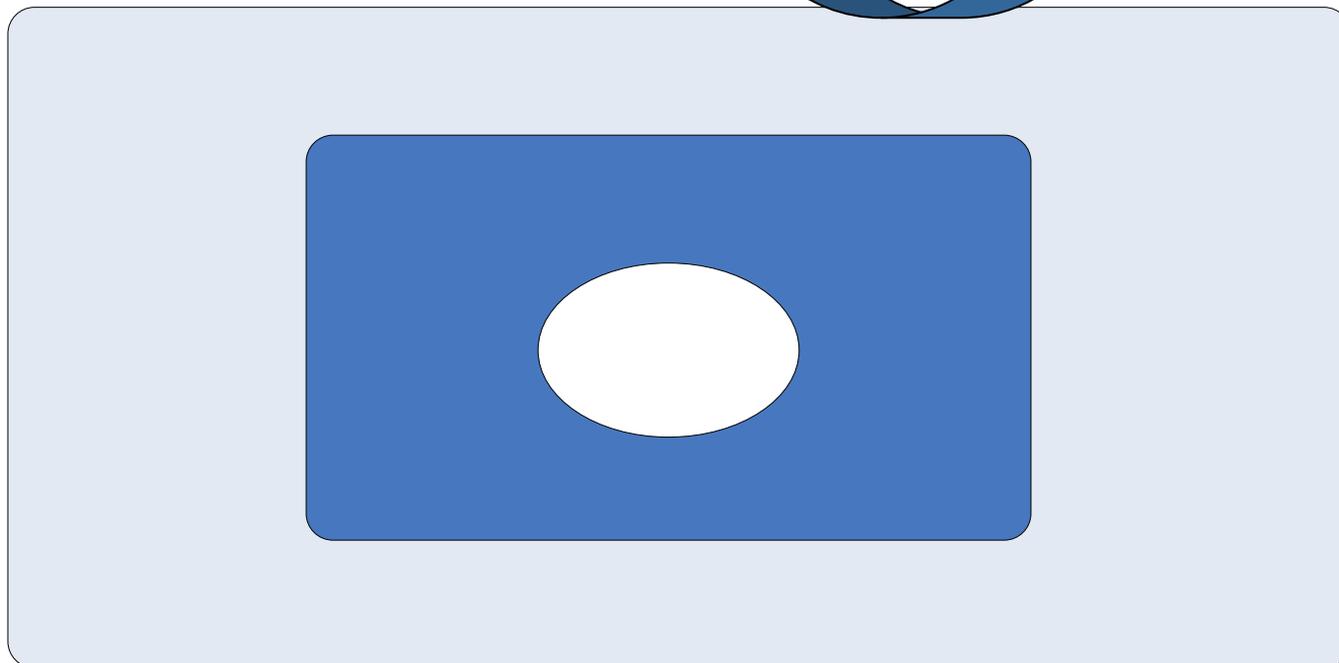
d. Constructing the CMP

- Self-assessment of existing plans
 - Integrate with other internal procedures and plans
- Develop internal utility plan framework *first*
 - Event typically unfolds from just utility to local agencies to state and federal - so should plan development
 - Obtain input from the divisions, departments and experts within the utility



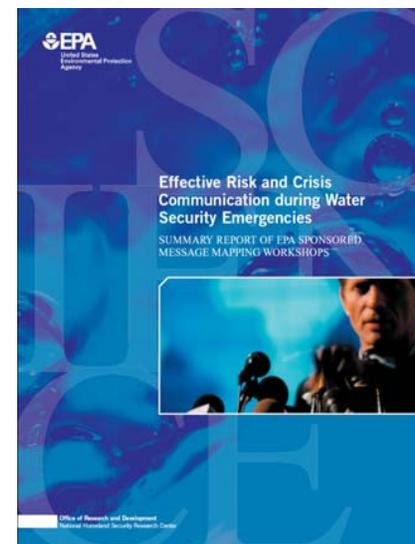
d. Constructing the CMP (con't)

- Use initial CMP draft to reach out to response partners and frame discussions
- Identify and engage key response partners and stakeholders to define roles and responsibilities



e. Communications

- General Communications
 - Internal (Utility) Equipment and Procedures
 - External (Response Partner)
- Risk/Crisis Communications
 - Plan Development for Roles/Responsibilities
 - Public Information Actions and Public Notification Requirements
 - Tools and Resources for Working with the Media
 - > Coordination with other agencies/
Unified message
 - > Message Mapping: How to and
what to communicate

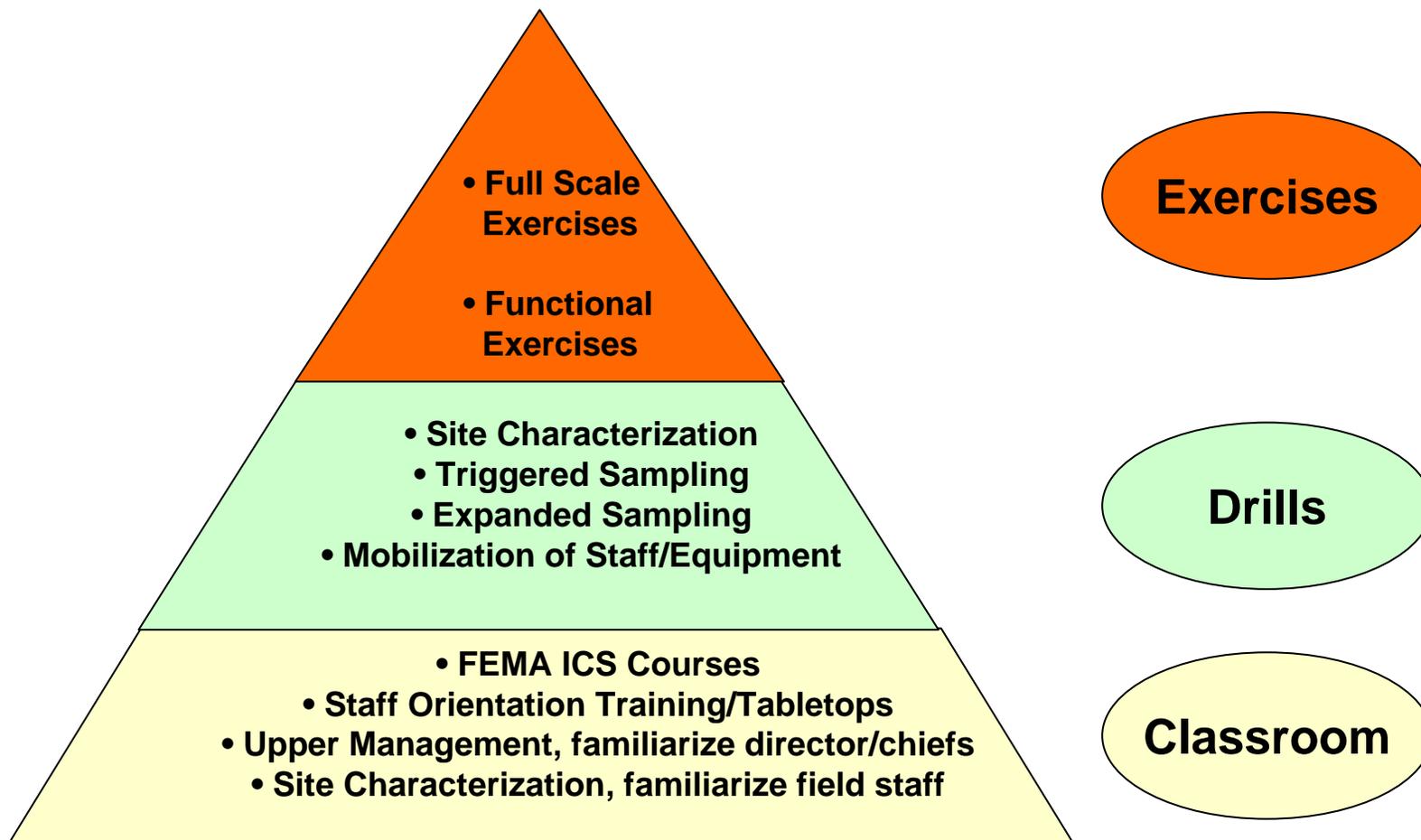


Training

- To ensure an effective consequence management program, training should be conducted to:
 - Familiarize utility staff and response partners with the CMP and their corresponding roles
 - Test and evaluate CMP processes (e.g., credible, confirmed)
 - Test and evaluate participants' ability to implement the guidance of the CMP
 - Identify opportunities for improving the plans
 - Increase response time efficiency and accuracy
- Include both internal and external exercise and drills involving partners at the local, state and federal levels
- Review, Revise, and Advise (alert staff to changes)



Training and Exercises (Cont)



CMP Training - Functional



Management Group

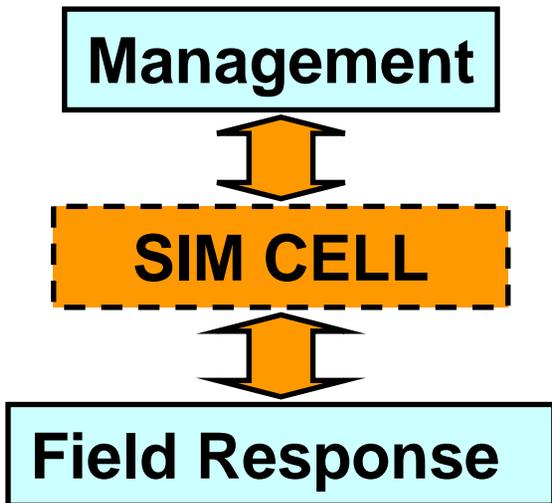


Response Partner Group

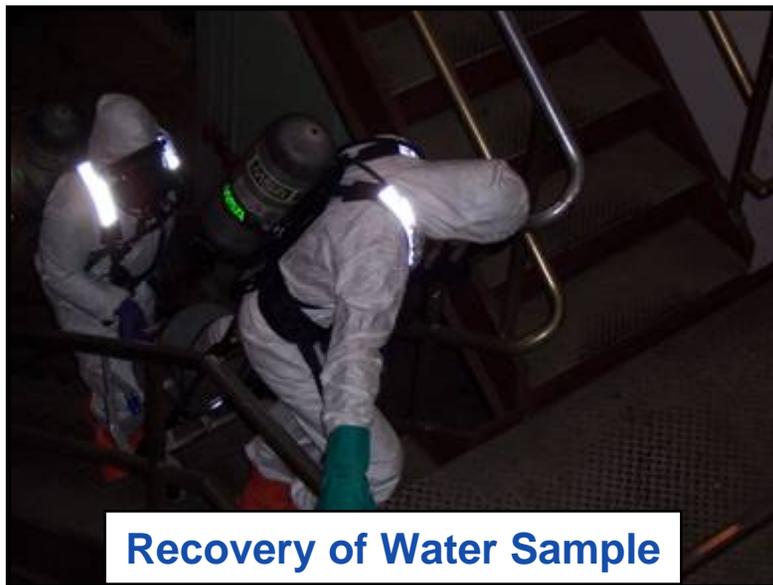


Field Response Group

CMP Training – Full Scale



Response Partner On-scene Arrival



Recovery of Water Sample



Sample Analysis Coordination

Lessons Learned/Challenges

- Volunteer nature of the program = utility *culture* change
- Establish CMP *before* the CWS is online and running
- Matrixing with all local/state/federal agencies across jurisdictions
- Considerations in performing operational responses
 - Isolation of tank versus distribution system
 - Flushing and disinfectant dosages
- Law enforcement and Site characterization - access to possible crime scenes
- Identifying the extent of contamination
 - Use of distribution system models
- Remediation & Recovery
 - Who gives the “all clear”
 - How to rebuild public confidence



Summary & Conclusions

- The WS initiative CWS includes multiple monitoring and surveillance components for contaminant detection
- CMP is a blueprint to guide actions during a contamination event – it addresses the question “Now What?”
- The CMP outlines *credibility determination* actions to investigate alarms and *response actions* to protect against potential effects of contamination
- CMP Development: Planning and preparedness requires partnerships with other agencies, providing for “Dual use benefit”
- Training is essential to ensure effective CMP response

Additional Pilots

- Selected through a competition in 2007
 - Open to utilities serving at least 750,000 people
- Anticipate funding up to four additional pilots
 - Funding through a cooperative agreement
- Pilots will begin in Spring/Summer 2008
 - Three year project period
- Pilots must include:
 - All five WS monitoring and surveillance components
 - > Water quality monitoring, consumer complaint surveillance, enhanced security monitoring, public health surveillance, and sampling and analysis
 - Consequence management plan
 - Evaluation plan



- Water Security Division
 - <http://www.epa.gov/safewater/security>
- Water Security Initiative
 - <http://cfpub.epa.gov/safewater/watersecurity/initiative.cfm>
- *Water Security Initiative System Architecture*; EPA 817-D-05-003, December 2005
- *Interim Guidance on Planning for Contamination Warning System Deployment*; EPA 817-R-07-002, May 2007
- *More guidance to come soon:*
 - *Developing SOPs for contamination detection*
 - *Developing CMP for response*



Questions?



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