Proactive Risk Communication Strategies for Managing Emerging Contaminants

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Overview

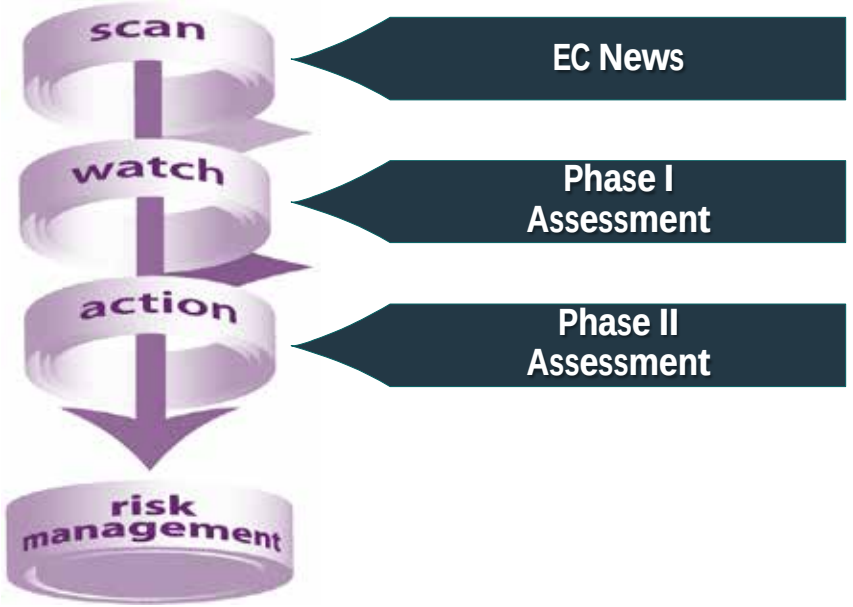
1. Introduction and Definitions
   - What is an emerging contaminant?
   - How is risk defined?
   - Risk communication challenges
   - Why are PFAS different from classic contaminants?
2. Stakeholder Evaluation and Communications Tools
   - Crisis planning
   - Long-term mitigation
3. Case Study and Lessons Learned
4. Close-out and Take-Aways

Introduction and Definitions

What is an emerging contaminant?

DoD and EPA definitions generally state:

1. Presents **potential unacceptable risk**
2. Has no published standard
3. New science, detection, or exposure pathway available[1,2]



DoD Scan, Watch, Action Process

[1] DoD Instruction 4715.18, *Emerging Contaminants*, June 11, 2009. DUSD (I&E) is Deputy Under Secretary of Defense for Installation and Environment

[2] EPA Federal Facilities Restoration and Reuse Office: http://www.epa.gov/fedfac/documents/emerging_contaminants.htm#additional_ec

How is risk defined? By the numbers

In simple terms…

RISK = **EXPOSURE** X **HAZARD**

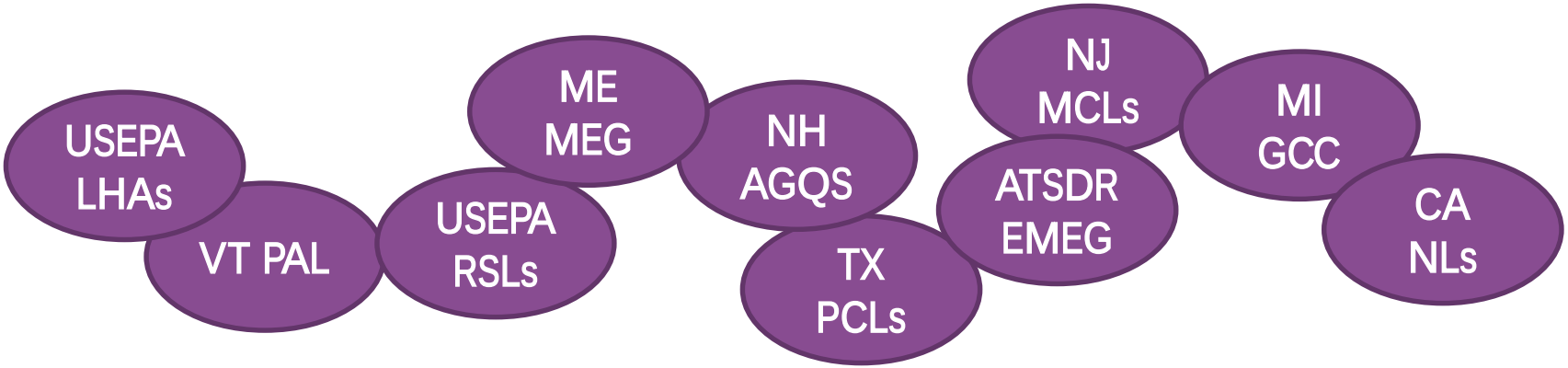
$$\text{Drinking Water Screening Levels or Regulatory Levels} = \frac{\text{Toxicity Value} \times \text{Body Weight} \times \text{Relative Source Contribution}}{\text{Water Intake}}$$

Technological & Economic Considerations

How is risk defined? What's in a number?

Determining the validity of the number…

- Is it based on sound science?
- Does it use standard approaches/methodologies?
- Does it protect human health adequately?



How is risk defined? By perception

- August 9th release
- Implies 664 Military PFAS sources
- Academic Article published same day as press release in NPR, Washington Post, etc.
- Emphasizes social drivers influencing actions

ENVIRONMENTAL Science & Technology LETTERS

Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants

Xindi C. Hu, David Q. Andrews, Andrew B. Lindstrom, Thomas A. Bruton, Laurel A. Schaider, Philippe Grandjean, Rainer Lohmann, Courtney C. Carignan, Arlene Blum, Simona A. Balan, Christopher P. Higgins, and Elsie M. Sunderland

Harvard T. H. Chan School of Public Health, Boston, Massachusetts 02215, United States
Harvard John A. Paulson School of Engineering and Applied Sciences, Cambridge, Massachusetts 02138, United States

Real or perceived risk?

Ultimately.....risk communication strategies need to accommodate both because:

- People simplify
- Once a person makes up their mind, it is difficult to change it
- People remember what they perceive (see)
- People cannot detect omissions in risk information they receive
- Individuals find it difficult to evaluate expertise

Risk communication challenges

What is perceived by stakeholders…

When you have one number….

- Sense of confidence
- Security/trust
- Safety
- Consistency/clarity/accuracy

When you have several numbers….

- Doubt/uncertainty
- Insecurity/lack of trust
- Danger
- Inconsistency/ambiguity/ inaccuracy

Why is PFAS different?

Classic Contaminants

- IRIS toxicology data available
- Science used to evaluate risk and exposure is “Accepted”
- Analytical methods are tested and verified
- Remedial options are available
- **PUBLISHED AND ACCEPTED CRITERIA**

Emerging Contaminants

- Often no peer-reviewed toxicology data available or risks unknown
- Science used to evaluate risk and exposure is “Evolving”
- Analytical methods are in development, not commercially available
- Remedial options not generally commercially available
- **NO CRITERIA OR VARIABLE CRITERIA**

Water regulations vary substantially

Location	Type	PFOA	PFOS	Other PFAS
USEPA	DW	0.070	0.070	
	GW	0.400	0.400	x1
Alaska (AK)	*GW*	*0.400*	*0.400*	
	DW/GW/SW	0.070	0.070	
California (CA)	DW	0.0051	0.0065	
Colorado (CO)	*GW*	*0.070*	*0.070*	
Connecticut (CT)	DW/GW	0.070	0.070	x3
Delaware (DE)	GW	0.070	0.070	x1
Indiana (IN)	*Protected GW*			x1
Iowa (IA)	*Protected GW*	*0.070*	*0.070*	
	Non-protected GW		*1*	
Maine (ME)	GW	0.400	0.400	x1
Massachusetts (MA)	DW	0.070	0.070	x4
Michigan (MI)	*SW*	*0.420*	*0.011*	
	DW/GW	*0.070*	*0.070*	
	DW	0.009	0.008	x3
Minnesota (MN)	DW/GW	0.035	0.015	
	DW/GW	0.035	0.015	
	DW/GW	0.035	0.015	x3
Montana (MT)	*GW*	*0.070*	*0.070*	
Nevada (NV)	DW	0.667	0.667	x1
New Hampshire (NH)	*GW*	*0.012*	*0.015*	x2
New Jersey (NJ)	*GW*			x1
	DW			x1
	DW	0.014	0.013	
	GW	*0.01*	*0.01*	
North Carolina (NC)	*GW*	*2*		x1
Oregon (OR)	*SW*	*24*	*300*	x2
Pennsylvania (PA)	GW	0.070	0.070	
Rhode Island	*DW/GW*	*0.070*	*0.070*	
Texas (TX)	*GW*	*0.290*	*0.560*	x14
Vermont (VT)	*DW/GW*	*0.020*	*0.020*	x3
	GW	*0.010*	*0.010*	x3

NOTABLES

- USEPA value is an Advisory – not legally enforceable
- More than 20 states have some form of water criteria, over 70% in the last two years
- Nearly half of the states have adopted EPA Lifetime Health Advisories
- CA and MI with lowest proposed criteria
- **Promulgated legally enforceable rules in over half states**
- Over 75% states have adopted criteria for other PFAS
- Trend to add PFAS analytes together and compare to criteria
- Eight states currently with pending regulations/guidance

NOTES
Units: ug/L
DW= drinking water
GW= groundwater
SW= surface water

ITRC. 2019. https://pfas-1.itrcweb.org/fact-sheets/

Are PFAS really any different?

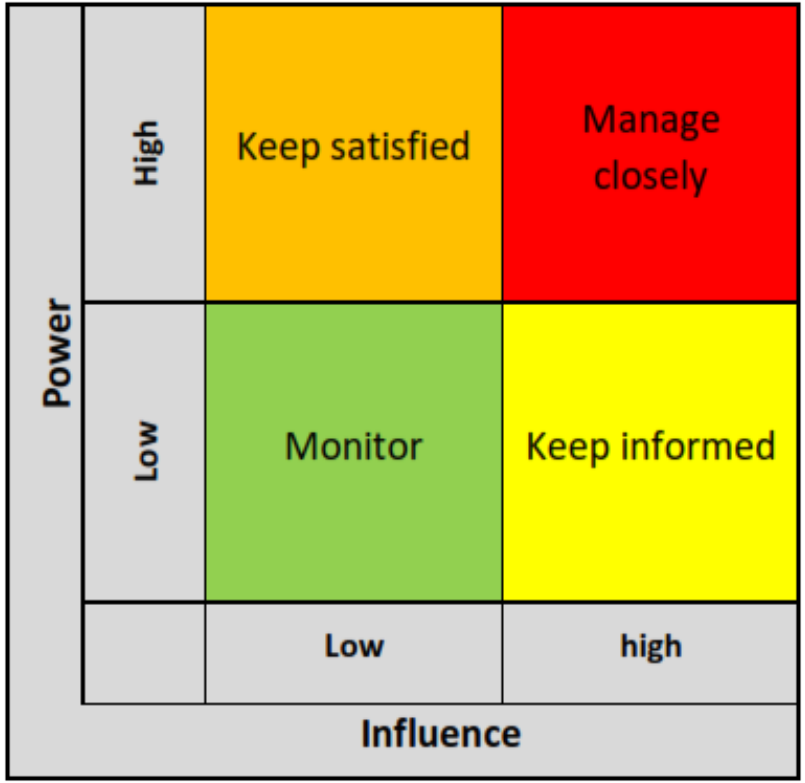
	US EPA MCLs (ppb)	ATSDR Child Chronic EMEG (ppb)	ATSDR Adult Chronic EMEG (ppb)	ATSDR CREG (ppb)	US EPA LHA (ppb)	US EPA Tapwater RSL (ppb)	MDEQ Part 201 Residential Drinking Water Criteria (ppb)
Arsenic	10	2.1	7.8	0.016	NA	0.052 (C)/6 (NC)	10 (MCL)
Benzene	5	3.5	13	0.44	3	0.46 (C)/33 (NC)	5.0 (MCL)
Chloropyrifos	NA	7	26	NA	2	8.4 (NC)	22
Diazionon	NA	4.9	18	NA	1	10 (NC)	1.3
Dibromochloromethane	80 (TTHM)	630	2,300	0.29	60 (TTHM)	0.87 (C)/380 (NC)	80 (TTHM)
1,4-Dioxane	NA	700	2,600	0.24	200	0.46 (C)/57 (NC)	7.2
Ethylbenzene	700	NA	NA	NA	700	1.5 (C)/810 (NC)	74 (aesthetic)
Malathion	NA	140	520	NA	500	390 (NC)	NA
Pentachlorophenol	1	7	26	0.061	40	0.041 (C)/23 (NC)	1.0 (MCL)

* From PFAS Public Health DW Screening Levels, Presentation by J.Gray MPART Health working Group, MI DHHS –04/09/19

Stakeholder Evaluation and Communication Tools

Stakeholder evaluation

- Instrumental in successful risk communication
- Establishes framework of who, what, when, where, why
- Revisit on regular basis through the project
- Manage uncertainty closely



Stakeholder worksheet

Stakeholder	Power	Influence	Outcome			
			Monitor	Keep Informed	Keep Satisfied	Manage Closely
	Low/High	Low/High	L/L	L/H	H/L	H/H
Regional EPA						
State Regulator						
City/Town Officials						
Community Members at Large						
Local Businesses						
Private Residential Well Owners						
Media and News Outlets						

- Define type, frequency, method, and messenger of communication for each
- Understand interests and drivers
- Consistency is key (in message delivery and staff interface)
- Partnership in messaging results in more positive outcome.

Developing the risk communication plan

Crisis Planning

- Establish the framework
  - 48-hour checklist
  - Message template
  - Staff call list
- Communicate the plan to stakeholders
  - Revisit frequently
- Practice –mock scenarios

Long-term

- Establish the framework
  - Regulatory process and drivers
  - Decision-tree for actions
- Communicate the plan to stakeholders
  - Revisit quarterly or bi-annually
- Establish protocol to track and communicate new developments
  - Science
  - Technology
  - Regulations

Case Study and Lessons Learned

Lessons learned

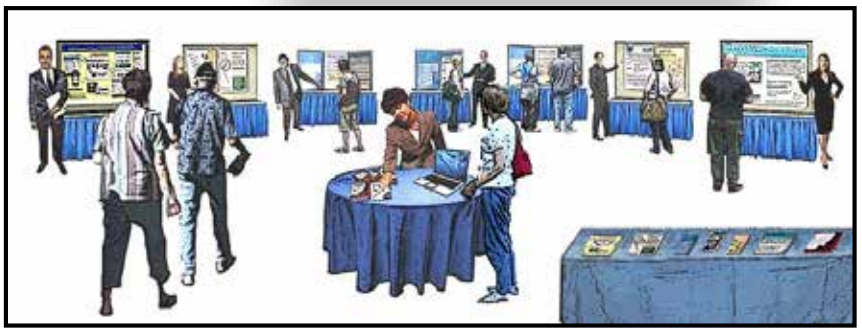
1. Create the plan before the work begins - things move quickly
2. Establish a multi-agency team and calibrate on risk communication procedures and messaging
3. Know how you are going to handle ambiguity and uncertainty
4. Take control and keep control of message – share information with a larger audience. If needed, personal conversations are KEY

Share information

- Communicate early and often
  - Push Information - Google Results can be conflicting/scary
  - Avoid trickling information
  - Transparency is a must
- Notify all residences in the sampling area
  - Neighbors talk
  - Share information within and near the sampling area
  - **Clarify the public water question**

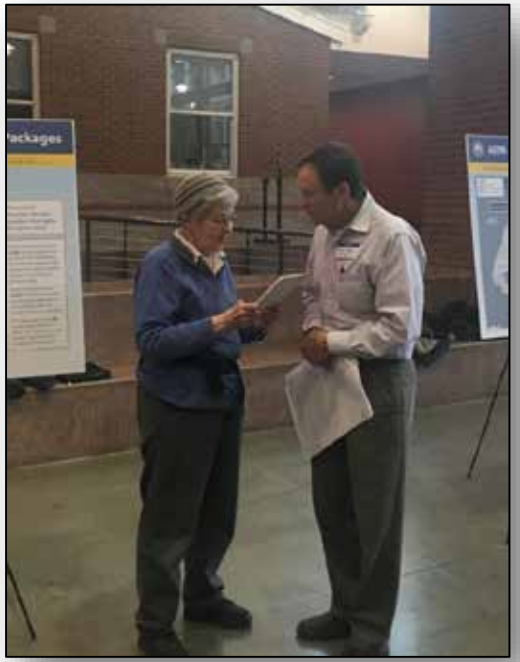
Personal conversations

- Written information does not satisfy everyone
  - People want to discuss “THEIR” situation
  - Need to begin building the relationship and information foundation before the first sample is taken
- Open house meetings work



Multi-agency teams

- Supporting Agencies are Critical
  - If working with DoD, utilize Non-DoD health experts
  - EPA explanation of PFOS/PFOA as Emerging Contaminants
  - Agency support of the “Proactive Client Policy” message
- Team Involvement and Preparation a must
  - Who will your community turn to for answers?
  - Inform elected officials and agencies in advance
  - Multi-agency strategy sessions for public meetings



Typical outreach plan

- Notification
  - Congressional Delegation
  - Individual property owners
  - Other community members in sampling area
  - Local elected officials/impacted stakeholder groups
  - General public
- Initial Public Meeting or Personal Meetings – immediately prior to sampling
  - Why we are sampling?
  - Where we are sampling?
  - What we will do with the results?
- Notification of Results
- Results and Next Steps Public Meeting (as needed)

What our audience wants to know

WHY?
- Why are you doing the investigation here?
- Why are PFAS/PFOS/PFOA a concern in drinking water?
- Why now?

WHERE?
- Where will you be sampling?
- Where have you sampled/have data previously?

HOW?
- How did the water get contaminated?
- How will you do the sampling?
- How will you share the results?
- How long has this been in my water?

WHEN?
- When are you doing the sampling?
- When will I know the results?
- When did you know about the problem?

WHAT?
- What are the chemicals you are investigating?
- What actions will you take based on the results?
- What is a Health Advisory?

WHAT ABOUT ME?
- Should I stop using my water - Is it safe to drink, give to pets, shower, water garden, livestock etc.?
- Are you still contaminating my water (i.e. is the Navy still using AFFF)?
- Has this caused my health problems?
- Should I have a medical test to see if I've been exposed?
- Will you pay my medical bills?
- Will you pay my water bill if you hook me up because my well isn't safe?
- Will this hurt my property value?

Some key considerations

- Develop top line messages and be consistent in messages across stakeholders communicating to public
- Share often about progress, next steps and commitment
- Consider centralized platform for information (website, blogs, social media)
- Be available (set-up 1-800- numbers, inquiry email addresses, etc.)

Closeout and Takeaways

Takeaways

Be proactive

Focus on drinking water receptors first

Set-up plan, revisit often and communicate

Be prepared for change

What does the future hold? Are you prepared?

SDWA	CERCLA	State-specific
MCL Regulatory Determination	GW Clean-Up Recommendations	Screening levels Regulatory levels New Analytes
	Hazardous Substance Designation	

For risk communication…

OR

?

References

1. http://www.cdc.gov/healthcommunication/risks/index.html
2. http://www.who.int/risk-communication/en/
3. http://www.npr.org/sections/thetwo-way/2016/08/09/489369852/federal-data-shows-firefighting-chemicals-in-u-s-drinking-water-sources
4. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=988342
5. https://emergency.cdc.gov/cerc/resources/templates-tools.asp

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Questions?

Thank you!

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