

wood.

# Now What? Prioritizing your Emerging Contaminants Portfolio

RemTech, October 15, 2021, 11:15-11:45 am

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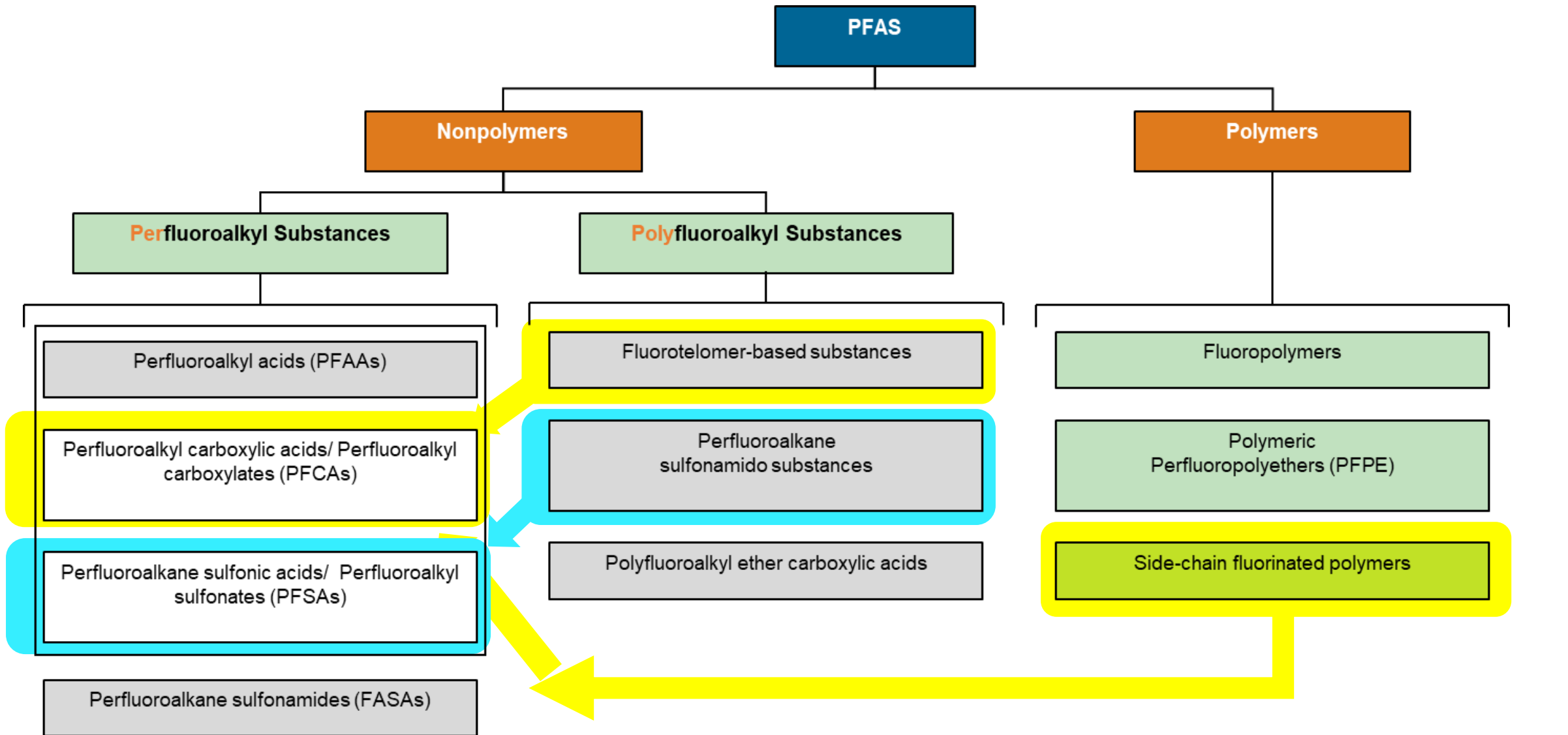


# Agenda

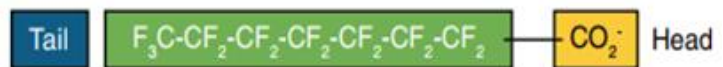
1. How to determine use and presence
2. Developing risk-based prioritization strategy
3. Lessons learned and future considerations

***Objective:***  
Understand how to  
evaluate and  
prioritize liability  
related to PFAS  
use

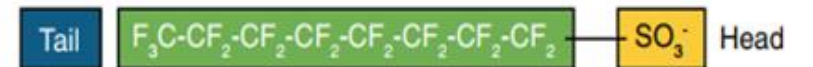
# How to determine use and presence?



Perfluorooctane carboxylate (PFOA)



Perfluorooctane sulfonate (PFOS)



# Where are they used?

*Gluge et al, 2020. An overview of the uses of per- and polyfluoroalkyl substances (PFAS)*

**Electrical equipment,  
appliance, and component  
manufacturing - Functional  
fluid**

**Machinery  
manufacturing -  
Functional fluid**

**All other basic inorganic chemical  
manufacturing - Refrigerant  
(heat transfer fluid)**

**Industrial gas  
manufacturing - Air  
conditioner/refrigeration**

**All other chemical  
manufacturing - Fire-  
fighting foam agents**

# Other Sources for Use Data

## US Sources

- TSCA Chemical Data Reporting
- Manufacturer information
- Market Reports

## Global Sources

- Literature
- OECD database
- SPIN Database (Nordic Countries)
- Patents



# Other Sources -REACH Restriction Efforts

## Use Study



Cleaning agents, polishes and waxes (non-industrial uses)  
Cosmetics



Food contact materials & packaging

Lubricants

Construction products

Medical devices

Medicinal products



Metal plating & manufacturing of metal products

PFAS production (manufacturing)



Ski treatment

TULAC (textiles, upholstery, leather, apparel and carpets)

Petroleum & mining



F-gas uses

Electronics & energy

Transportation

Waste

AFFF



\*\* Studies by Wood

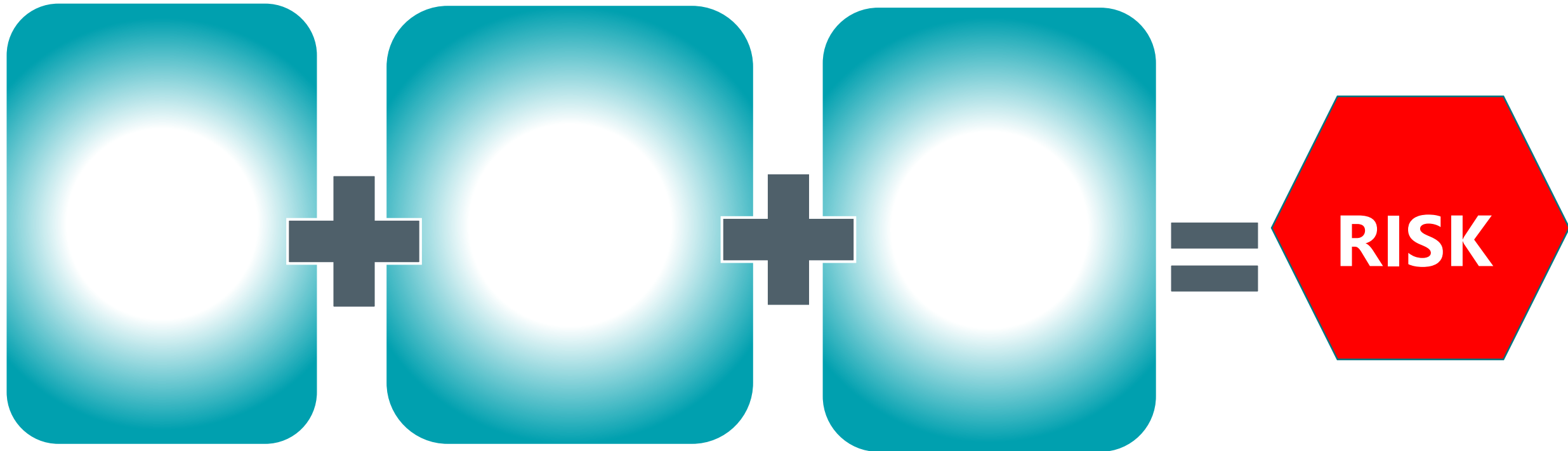
# Developing risk-based prioritization strategy



# Example 1: State Program

# Basic Program Premise

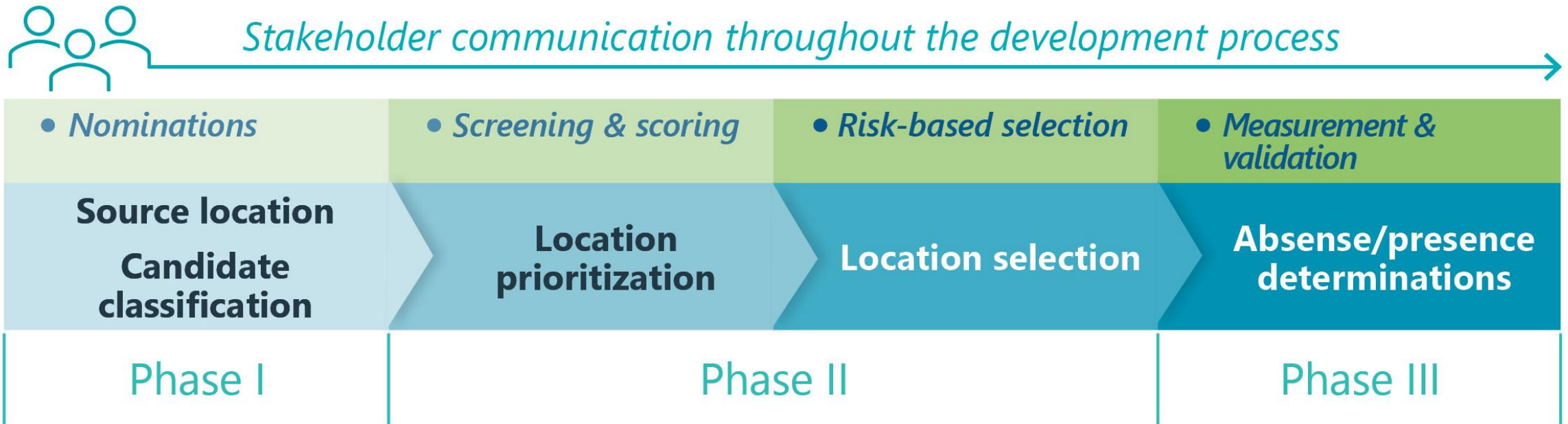
Basic blocks of the example program



# Example Programmatic PFAS Approach



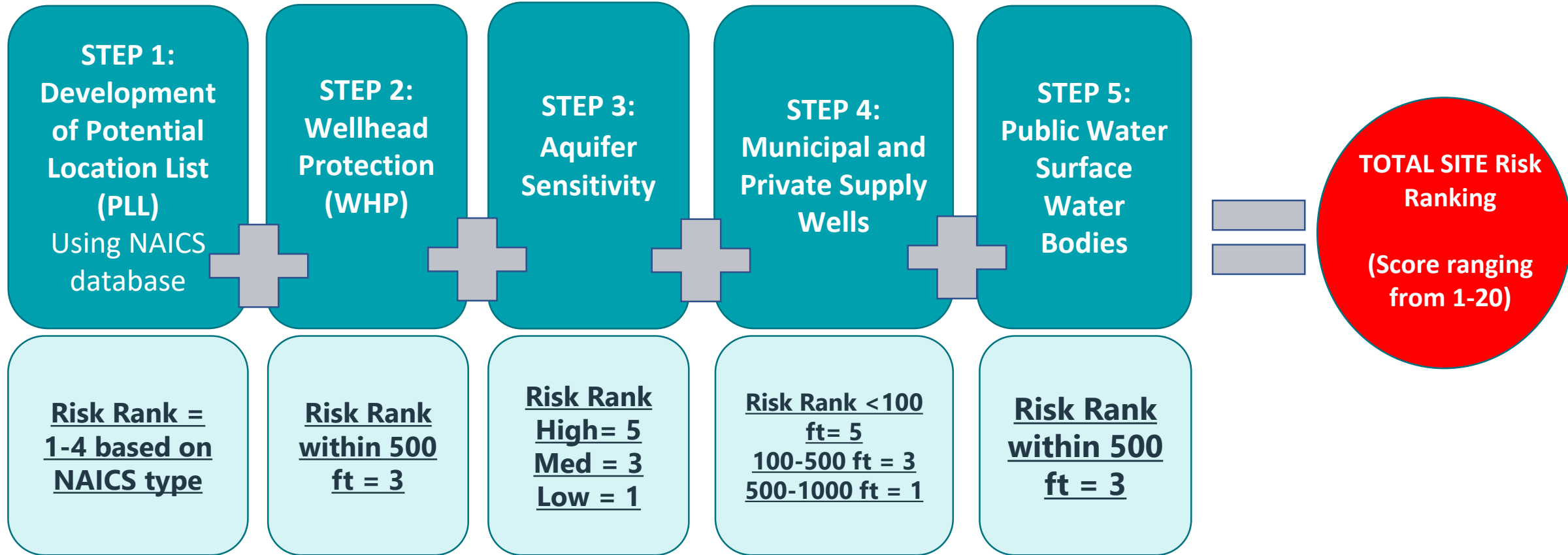
Overview of the Process- the theoretical model



# Example Programmatic PFAS Approach



## Quantitative Outcome/Results of the Pilot Program



# Example Programmatic PFAS Approach



## Quantitative Outcome/Results of the Pilot Program

**Airport**  
County, MN

**SUMMARY**

<b>Site Name:</b>	Airport	<b>Level II Rank Score:</b>	17/20
<b>Current Address:</b>	St W	- NAICS Rank:	4
<b>County:</b>	Dakota	- Wellhead Protection Rank:	0
<b>Parcel ID:</b>		- Aquifer Sensitivity Rank:	5
		- Private/Supply Wells:	5
		- Surface Water:	3

**NAICS Code:** 488119 – Airports

**NAICS SITE DESCRIPTION AND OPERATIONS**

The Site property is approximately 310-acres in size, comprised of multiple parcels of land, located at a County. The property includes an administration office building, approximately 90 aircraft hangars, airfield equipment, and storage buildings with associated paved parking areas, drives, and aircraft pavement. The operates the facility which houses 133 aircraft based at the airport, and experiences more than 33,000 operations annually.

The Site is classified under NAICS code 488119 – Airports. Industries classified under that code are primarily engaged in operating international, national, or civil airports or public flying fields, or, supporting airport operations, such as rental of hangar space, and providing baggage handling and/or cargo handling services.

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**Airport**  
County, MN

**GROUNDWATER AND SURFACE WATER INFORMATION**

As shown on the Site Figure, the Site does not fall within a Wellhead Protection Area. The closest wellhead protection area (F ) is located 1.4 miles to the northeast.

One groundwater supply well is located within 500-feet of the Site. A commercial supply well (ID registered to k) is located on-Site. Based on regional topography, Site groundwater is anticipated to flow to the northeast.

An unnamed stream, a Public Waters Watercourse, appears to be channelized, flowing from west to east, across the northern portion of the Site. The unnamed stream empties to the River, located approximately 3-miles to the east of the Site.

**COMMUNITY INFORMATION OF INTEREST**

Daycares, schools, and medical and long-term care facilities were evaluated to determine potential community populations that either live or spend time in the vicinity of the site. Findings from the community evaluation are presented in the table below. No communities of interest were located within 500-feet of the Site property.

Community Type	100 ft	200 ft	500 ft
Daycares	0	0	0
Schools	0	0	0
Medical & Long-term Care Facilities	0	0	0

**OTHER RELEVANT INFORMATION**

In addition to the information discussed above, various MPCA environmental databases were queried to determine the potential presence of various known contamination sources in the area of the Site. As shown in the table below, MPCA records indicate the presence of two registered storage tanks associated with the Site, and the presence of six remediation sites within 500-feet of the Site property.

Site	On-Site			Within 500-ft of Site		
	Registered Landfills	Registered Tanks	Closed Landfills	MPCA Remediation Sites	Brownfield Sites	Wastewater Permits
Total	No	2	0	6	0	0

Additionally, the majority of the Site falls within a high vulnerability aquifer as defined by the Minnesota Water Table Aquifer Vulnerability database. High vulnerability aquifers are defined as vertical water movement reaching the aquifer within several hours to years. A low vulnerability aquifer underlays portions of the southwest corner of the Site, with water anticipated to reach the aquifer within several decades to over a century in these areas.

**EXISTING PFAS INFORMATION**

The results of previous MPCA PFAS sampling events from across the State were queried to determine if environmental PFAS detections have been reported to date in proximity to the Site. As indicated in the following table, no PFAS detections from targeted sampling events have been reported within one-mile of the Site.

Site	Ambient Groundwater Sampling	Closed Landfill Program Sampling	Wastewater Treatment Plant Sampling	Surface Water Sampling
1-mile	No	No	No	No

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- ✓ Site profiles - high-ranked sites.
- ✓ Profiles support primary objectives
- ✓ Profiles intended as tool for PMs

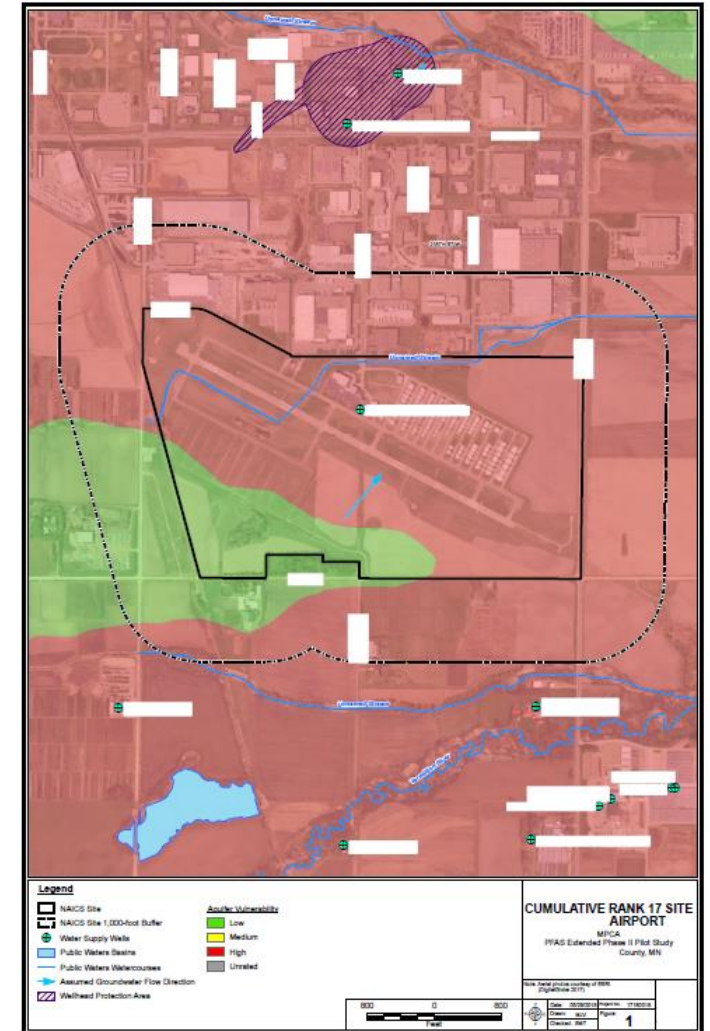


# Example Programmatic PFAS Approach



## Quantitative Outcome/Results of Program

- ✓ Site profiles are accompanied by comprehensive cumulative risk-rank map
- ✓ Map provides visual representation of potential pathway, receptor, and source evaluation
- ✓ Profiles and accompanying map provide communication tool that illustrates consistent, reproducible, validated programmatic approach

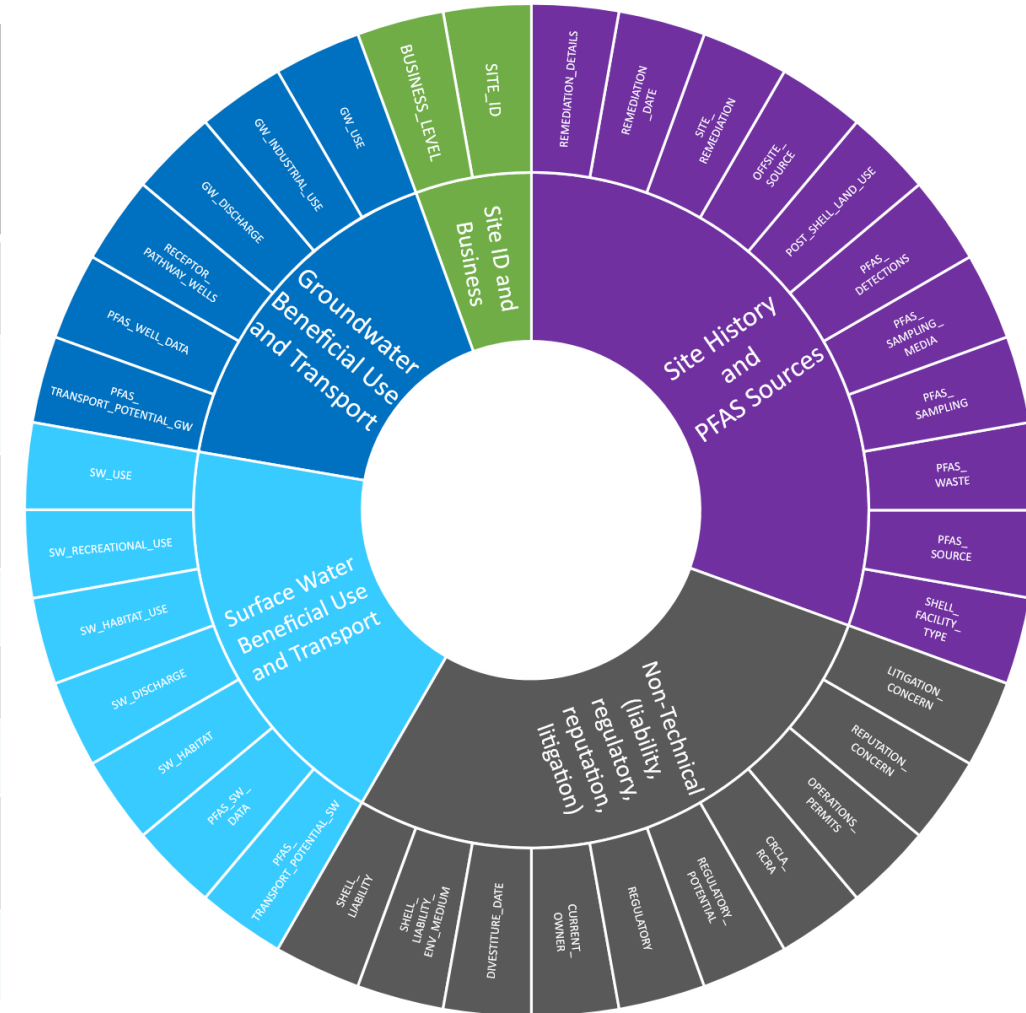


# Example 2: Legacy Program



# Scoring/Ranking/Prioritization Approach


Site History and Potential PFAS Sources	Site Remediation History	Source to Groundwater Pathway	Source to Surface Water Pathway	Client Liability and Current Owners	Non-technical Regulatory	Reputation/Litigation
Nature of Facility	Site Remediation	Drinking Water Use	Drinking Water Use	Client Liability	Lead Agency	Reputational Concern
PFAS Use	Remediation Date	Other Beneficial Uses	Fishing/Swimming Use	Environmental Media Liability	PFAS Regulatory Potential	Litigation Concern
PFAS Waste	Remediation Details	Discharge to Surface Water	Habitat Use	Divestiture Date	CERCLA/RCRA	State Promulgated PFAS Rules
PFAS Sampling	--	Receptor Wells	Waste Discharge Use	Current Owner Use	Operations and Permits	--
PFAS Media	--	Off-site Contaminants	Nearby Habitat	--	--	--
PFAS Sample Data	--	PFAS Well Data	PFAS Surface Water Data	--	--	--
Current Post-Divestiture Land Use	--	PFAS Transport Potential	PFAS Transport Potential	--	--	--
Nearby Off-Site Sources	--	--	--	--	--	--

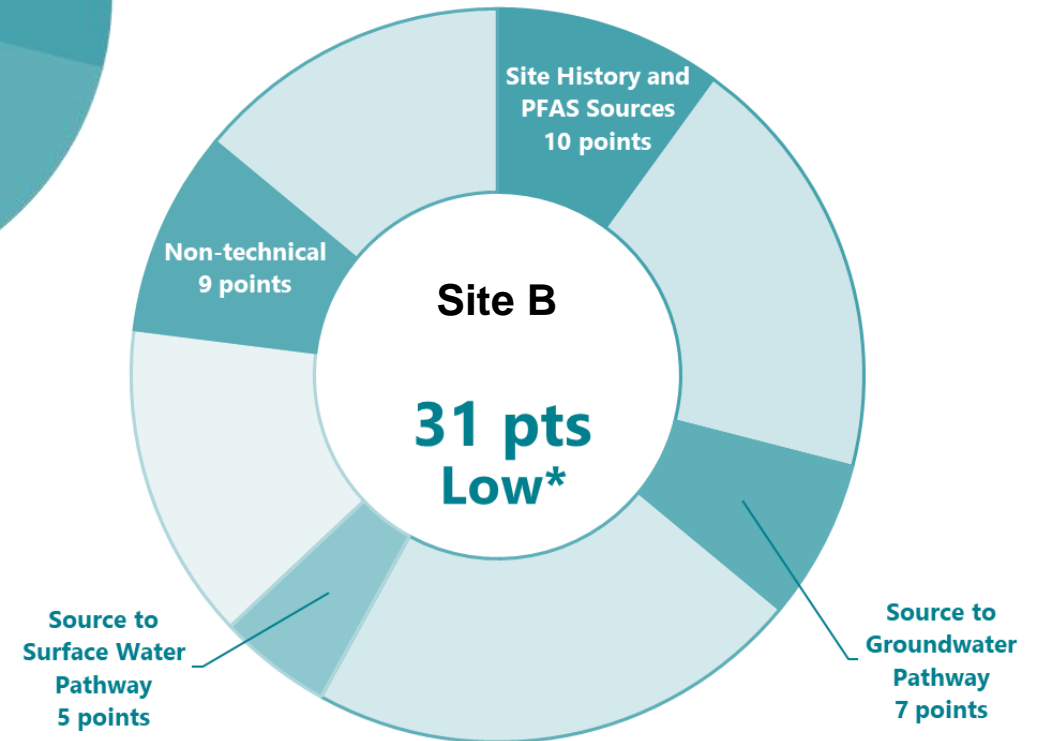
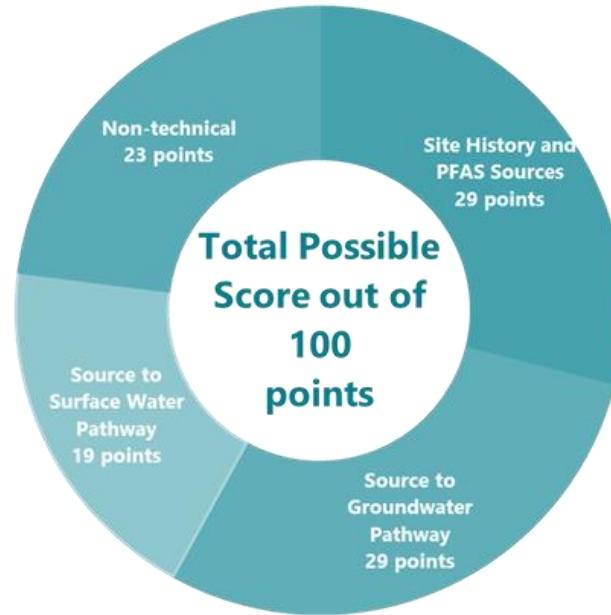
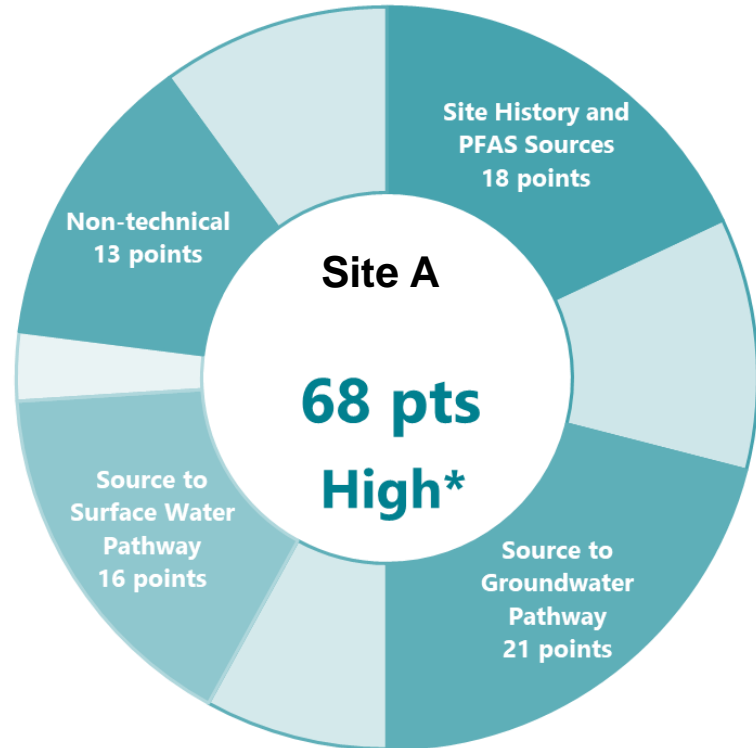




# Example Results – Higher and Lower Priority Sites

 Darker shading indicates refined site category score

 Lighter shading indicates the remaining points out of the total possible score.

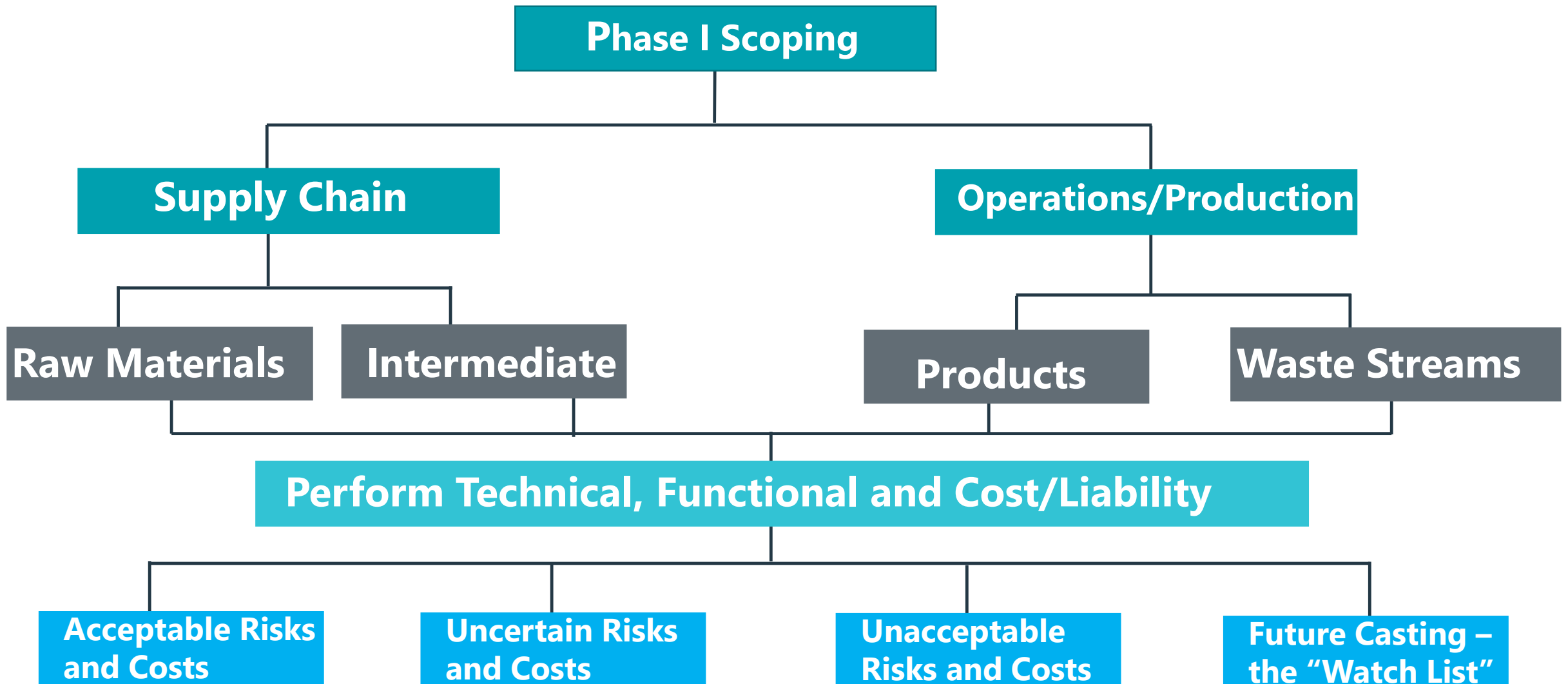


# Total Site Portfolio- Example Scoring

Current Priority (some refined)	All Sites Scored	General Site Characterization
<b>Higher (25%)</b>	25	PFAS containing compounds assumed or confirmed on-site. Both GW and SW pathways are likely/very likely to be complete
<b>Medium (70%)</b>	70	PFAS containing compounds assumed or confirmed on-site. GW and SW pathway completeness ranges from incomplete to very likely; only one of the two pathways may be complete.
<b>Lower (5%)</b>	5	Initial Questionnaire stated no evidence of PFAS on-site. GW and SW pathway completeness is unlikely based on lack of PFAS source

	All Sites	
	State Promulgated	
Priority	Yes*	No
High	10*	15
Medium	48*	22
Low	5	0

# Example 3: Product Stewardship Program



# Lessons Learned and Future Considerations

# Develop Your Strategy and Be Prepared



Always have  
a plan



Scale it to  
meet the  
needs



Revisit  
often

# Thank you!

## Shalene Thomas, VP

Global Emerging  
Contaminants  
Program Manager  
Minneapolis, MN



- 23 years of experience in environmental investigation, risk assessment and communication
- 13 years experience with PFAS
- Co-leader for ITRC PFAS AFFF sub-team
- Technical reviewer for PFAS SIs in more than two dozen different States and 9 of 10 EPA regions
- Contributing author to NGWA PFAS BMPs
- NFPA Research Foundation PFAS Technical Panel

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## Julius Kreissig

Economist / Environmental  
Policy Specialist  
Calgary, AB



- 7 years of experience in economic analysis, and design and assessment of environmental policy
- Led/supported the design of potential regulation of several uses of PFAS for European Union institutions and national authorities
- Led several studies on uses of fluoropolymers in EU and US

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# Wood PFAS Overview- Examples of our work

## AFFF Study- Informing Policy

[https://echa.europa.eu/documents/10162/28801697/pfas\\_flourine-free\\_alternatives\\_fire\\_fighting\\_en.pdf/d5b24e2a-d027-0168-cdd8-f723c675fa98](https://echa.europa.eu/documents/10162/28801697/pfas_flourine-free_alternatives_fire_fighting_en.pdf/d5b24e2a-d027-0168-cdd8-f723c675fa98)

## Remediation and Treatment-Former Pease Air Force Base

<https://www.woodplc.com/news/2020/wood-pfas-remediation-project-at-former-us-military-base-receives-national-recognition>

## Drinking Water- State of MN vs 3M- \$850M settlement

<https://3msettlement.state.mn.us/DrinkingWaterSupply>

## PFAS Risk Screening and Assessment

<https://www.defence.gov.au/Environment/PFAS/Lavarack/publications.asp>

## R&D- Environmental Security Technology Certification Program(ESTCP)

[https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/ER18-5015/\(language\)/eng-US](https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/ER18-5015/(language)/eng-US)

## R&D- Strategic Environmental Research and Development

**Program(SERDP)** <https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater/Emerging-Issues/ER18-1306>

