



Development of a Chemical Decontaminant for Critical Areas

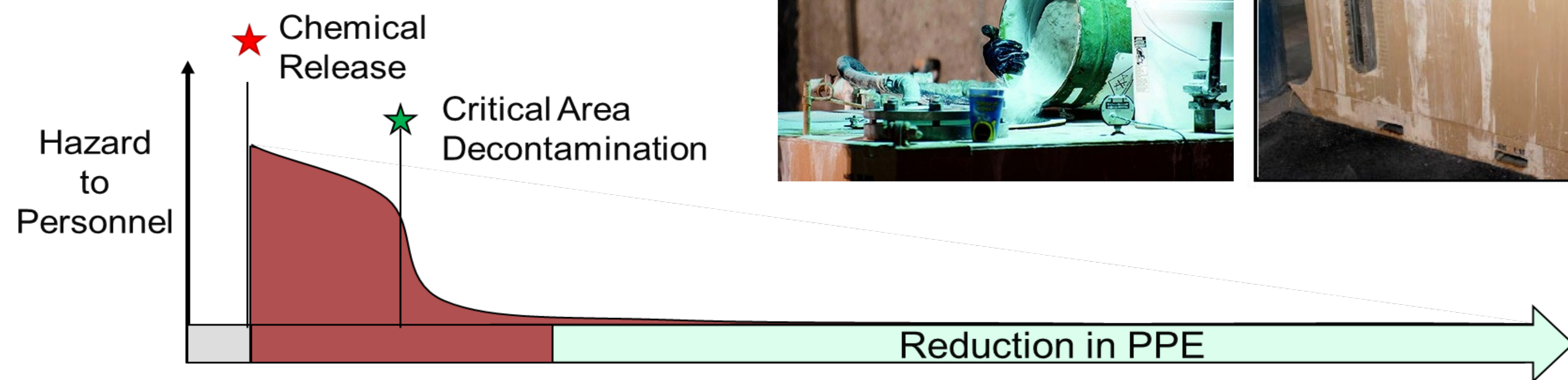
Janlyn Eikenberg, Michelle Sheahy, Doug Nichols, Kevin Morrissey, Brent Mantooth, John Davies, David Gehring, Brian Luthardt¹, Jill Ruth², Michael Chesebrough³

¹U.S. Army Combat Capabilities Development Command Chemical Biological Center, Aberdeen Proving Ground, MD, ²Leidos Inc., ³DCS Corp.

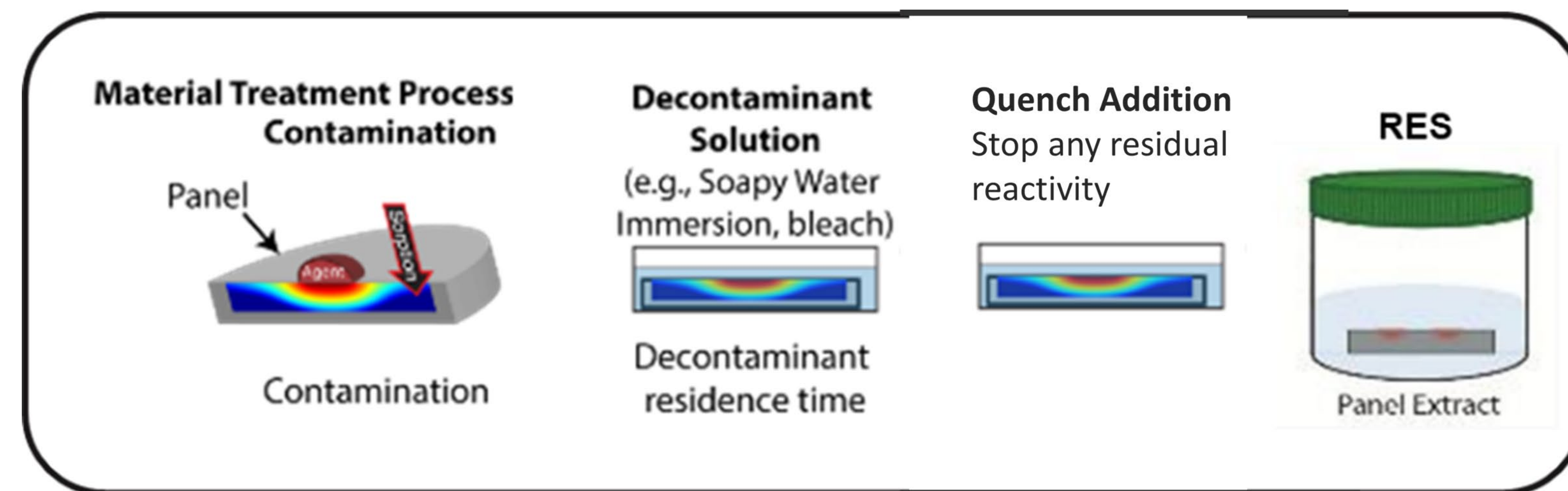


Introduction/ Background

Toxic chemical release at key points (e.g., airfields, seaports) can disrupt activities and pose hazardous health situations. Current decontamination technologies are hazardous to users, storage, and equipment. Objective is the development of a chemical decontaminant using commercially available chemicals to reduce the hazard while also minimizing the logistical burden.



Materials and Methods



Asphalt



Concrete

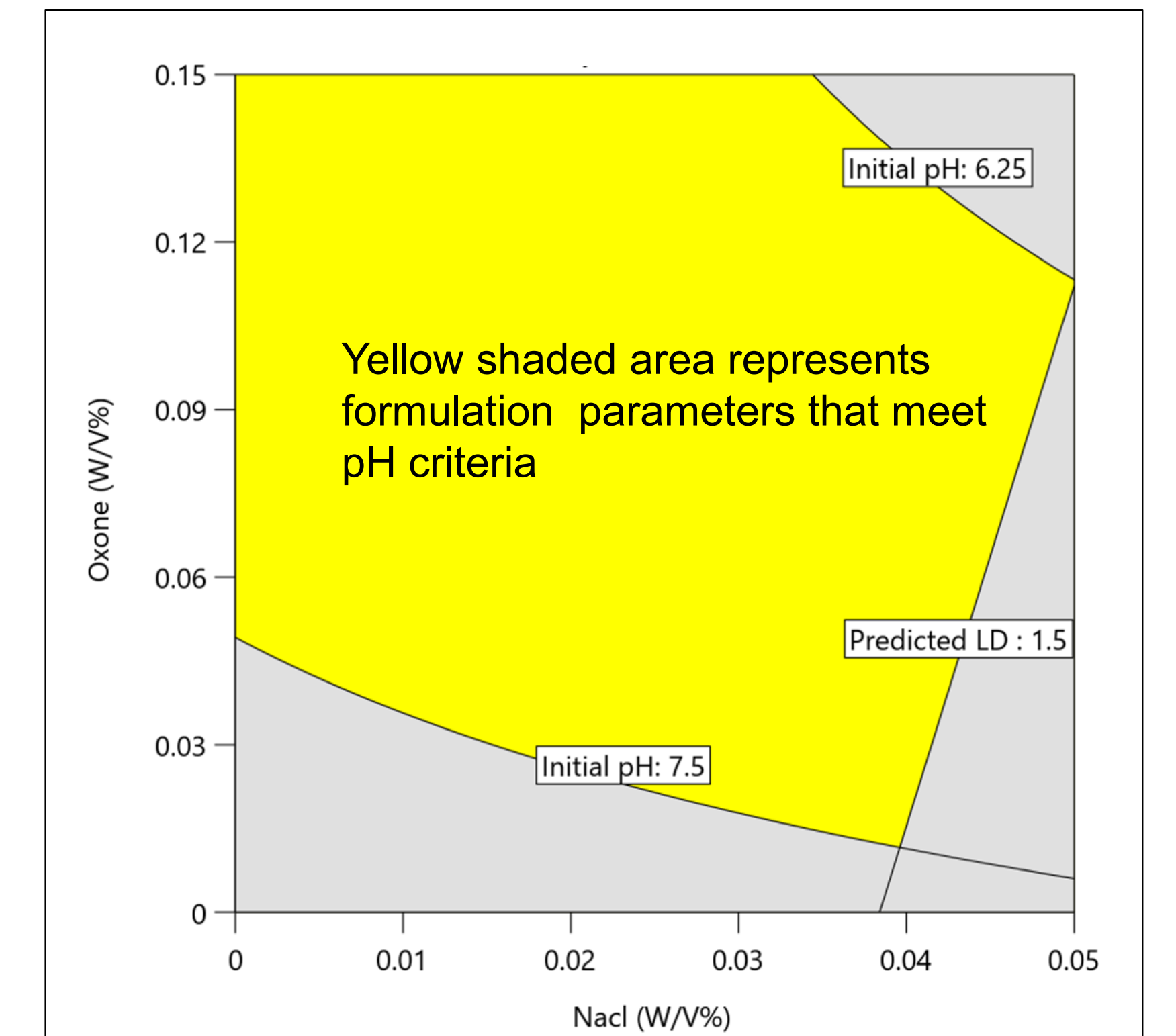
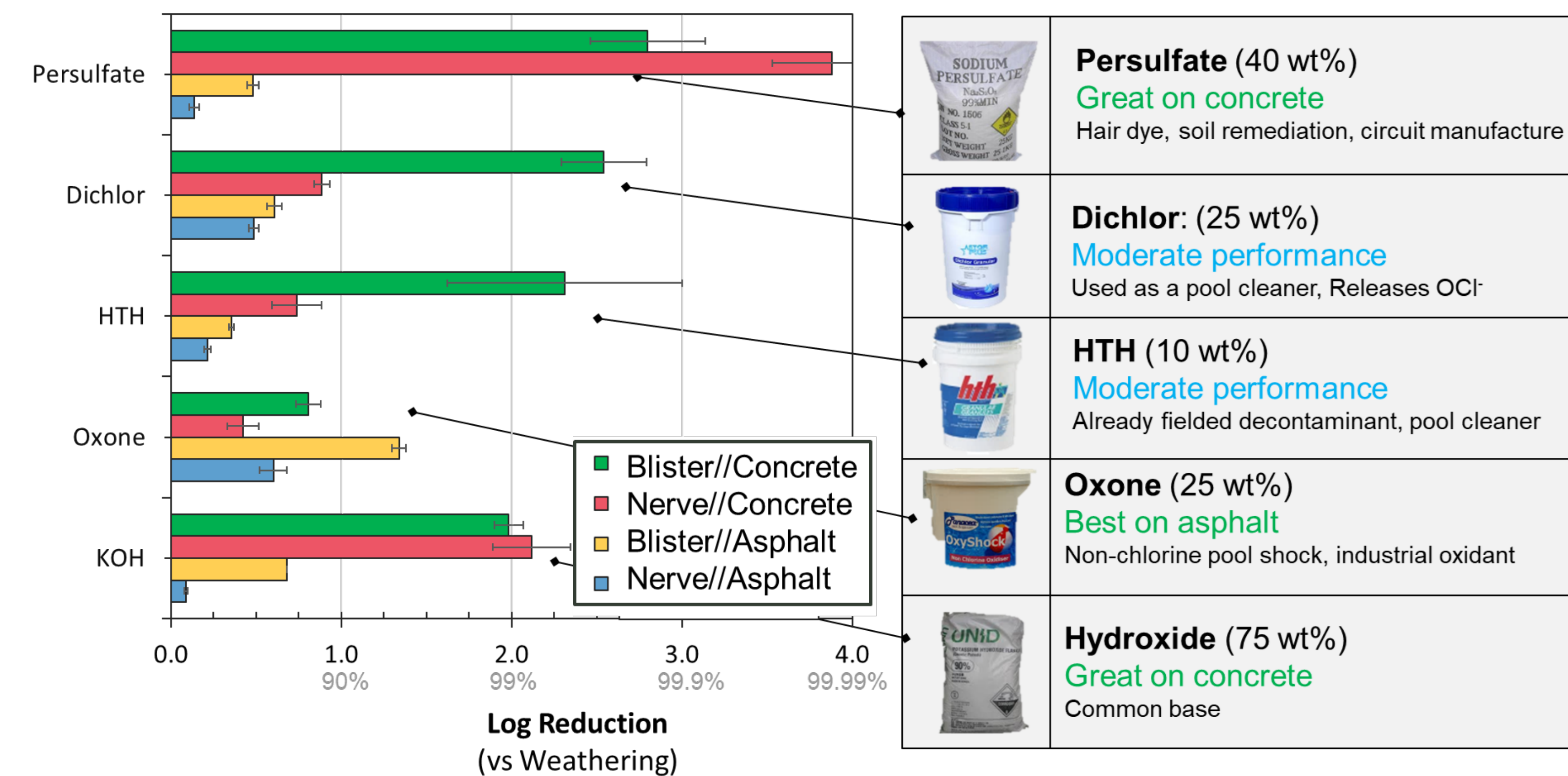


DEVCOM CBC @ DTRA CBD S&T Conference

Scan the QR Code to view all of CBC's 2024 DTRA CBD S&T Conference materials
<https://cbc.devcom.army.mil/cbdst-conference/>

Screening Results → Down selection → Optimization

The best performers from screening were the persulfate compounds including Oxone (Peroxymonosulfate) for the different materials. Down selection was based on both reactivity and logistical analysis of each decontaminant. Optimization included persulfate/Oxone mixtures, pH adjustments, surfactant addition, and other reactive additives to maximize efficacy.

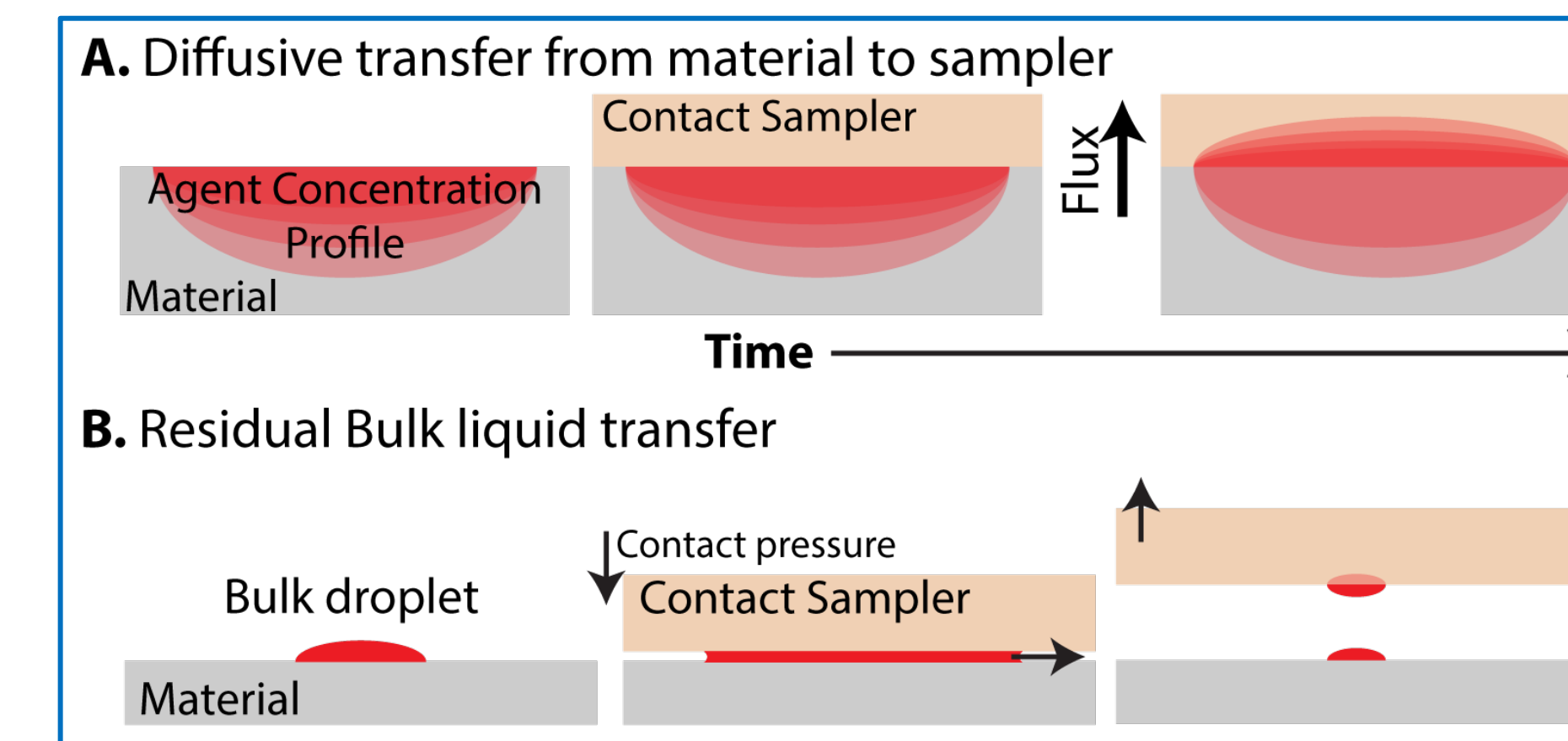
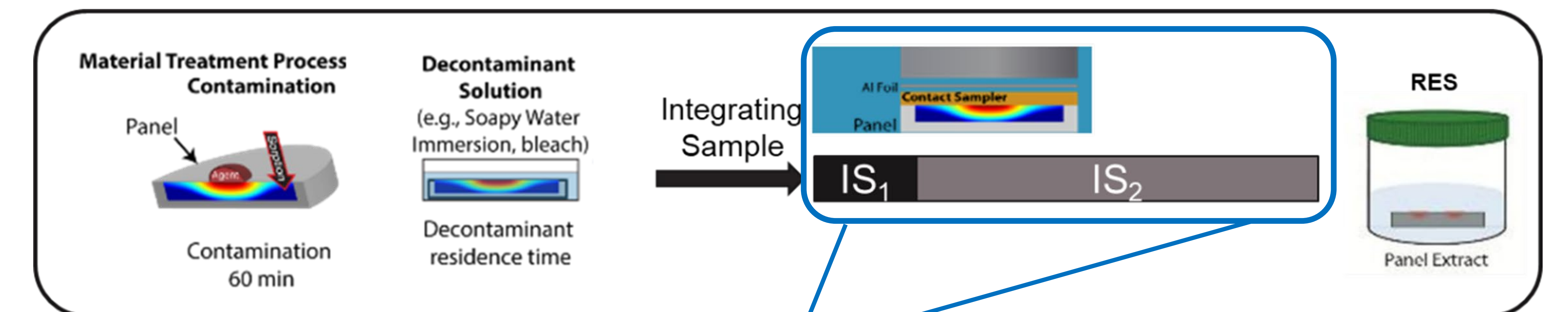


Next Steps - Hazard Assessment

Optimization of a reactive decontaminant against hazardous chemicals is only one piece to the development of a decontaminant. Once optimized for reactivity, the decontaminant is evaluated based on how it can reduce the hazard to personnel.

A sampling technique, Integrated Surface Sampling (ISS) has been used with previous substrates (tire rubber) to understand the potential contaminant release from a material. A sampler is lightly contacted with the material surface to enable bulk liquid and diffusion transfer from the surface material to the sampler.

This technique allows comparison of the contaminant released from an untreated surface to that of a decontaminated surface. Those values could then be used in hazard assessment models to predict hazards at scale.



Next Steps – Scale - up

Production of decontaminants at large scale poses challenges such as possible heat generation, mixing concerns, and foaming.



Acknowledgements: This research was funded and supported by the Defense Threat Reduction Agency (DTRA)/Joint Science and Technology Office (JSTO) under project CB10662 (Dr. Glenn Lawson, and Dr. Charles Bass). We thank the Decontamination Sciences Branch for their hard work and expertise that greatly assisted with the execution of this research project. The views expressed in this presentation are those of the authors and do not necessarily reflect the official policy or position of the Department of Defense or the U.S. Government.