

Session 6: Assessment of the Impact of Water Wash Down for Mitigation of Radiological Dispersal Device (RDD) Contamination

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Abstract:

Water wash down of urban surfaces using fire hoses or pressure washers is an all hazards approach to decontamination. It is critical to assess the effects of water wash down for decontamination of urban surfaces covered with Radiological Dispersal Device (RDD) contamination due to its probable use both during the early phases of the response to an RDD – to mitigate exposure to radiation – and during the late phases of the response – for rapid decontamination of critical infrastructure and long-term remediation of urban areas. While water wash down may reduce the RDD contamination levels on the surface being decontaminated, it may also create a large secondary waste stream, spread contamination to uncontaminated areas, and compromise later decontamination efforts. In addition, fire hoses and pressure washers could re-aerosolize the radioactive particles, creating an additional health hazard. All of these impacts must be assessed in controlled studies to determine if water wash down is an appropriate approach for RDD decontamination.

This presentation will cover recent studies that assess the use of fire hoses to decontaminate porous urban surfaces contaminated with cesium chloride. (¹³³CsCl). During these laboratory scale studies, the fire hose incident water pressure and volume per contaminated surface area were simulated while the decontamination efficacy and fate of the cesium were studied as a function of critical parameters, such as the type of deposition and urban material. The efficacy of the water wash down is influenced by cesium's migration and interaction with urban materials. Therefore, the fate of the cesium was studied as a function of different deposition types (liquid spray, dry particulate deposition, and dry particulate deposition at high relative humidity) and for three prominent urban materials (fine aggregate concrete, coarse aggregate concrete, and brick). The study results on the decontamination efficiency and fate of the cesium will be presented along with estimates of the wastewater volume generated for these particular wash down conditions.

Biographical Sketch of Emily Snyder:

Emily Snyder is the (Acting) Radiological Team Leader for the EPA Office of Research and Development's National Homeland Security Research Center. As team leader she coordinates radiological decontamination research across the center and as a researcher she is involved in several different radiological decontamination projects. She is currently working to assess the impact of water wash down in urban environments and is working with other researchers to evaluate decontamination technologies and study the interactions of radionuclides with urban surfaces.