Recontamination Evaluation at an Early Action Site: Lower Duwamish Waterway

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Background/Objectives. Earle M. Jorgensen Company (EMJ) and the U.S. Environmental Protection Agency (EPA) entered into an Administrative Settlement Agreement and Order on Consent for Removal Action Implementation at the Jorgensen Forge Early Action Area (EAA) of the Lower Duwamish Waterway Superfund Site in Seattle, Washington. EMJ, who historically operated a metal forging facility, has been performing a non-time-critical removal action (NTCRA) at the Jorgensen Forge EAA. The NTCRA in 2014 consisted of removal of shoreline soils and sediment out to the federal channel line and backfilling with sand as required to maintain subsurface bathymetry. Sediment sampling and data analysis performed after the implementation of the NTCRA in 2014 showed that PCBs are present in surface and subsurface sediments underlying the backfill (i.e., z-layer sediments) at concentrations exceeding the Removal Action Level (RvAL). A breakthrough analysis of the backfill by the USACE for the EPA, suggests that the potential exists for PCB contamination exceeding the RvAL in z-layer sediments to migrate to the surface of the backfill. Therefore, EPA has required a supplemental EE/CA to assess the need for further action.

Additional sampling and testing is underway to understand if z-layer sediments pose a risk to surface receptors and recontamination of the surface sediment adjacent to the facility.

Approach/Activities. Farallon completed a data gaps analysis to identify potential sources of recontamination to the surface and subsurface sediments. Since the LDW site-wide remediation has not been completed, data suggest that PCB concentrations exceeding the RvAL in fine-grained sediments overlying the backfill material may be due to bedload transport of PCB contaminated fine-grained sediments from upstream areas. Input parameters for the backfill breakthrough model should reflect site conditions and would be expected to vary for the different functional areas within the RAB based on differences in bioturbation layer thickness, depth of backfill, backfill total organic carbon content, and underlying sediment concentrations.

Additional data are needed to better define the areal extent of PCB concentrations exceeding the RvAL in the surface sediments as well as in the subsurface at the z-layer. Porewater sampling and backfill characteristics are needed to support the backfill breakthrough modeling. Sampling at 38 surface and 12 subsurface stations is scheduled to occur in Summer 2018.

Results/Lessons Learned. The presentation will discuss the laboratory results received in the Fall of 2018. An initial discussion of the backfill breakthrough modeling will also be included. Additional discussions will include an evaluation of recontamination from upstream sediments using statistical analysis as well as other forensic testing such as principal components analysis (PCA).