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DEFINING HYDROSTRATIGRAPHIC UNITS WITHIN A HETEROGENEOUS ALLUVIAL SETTING-- LAWRENCE LIVERMORE NATIONAL LABORATORY

At the Lawrence Livermore National Laboratory (LLNL) Livermore Site, the properties of ground water flow were used to define a series of hydrostratigraphic units (HSUs) within a thick sequence of previously undivided, heterogeneous alluvial sediments. A methodology using multiple independent data sets was used to define the HSU boundaries. The methodology employs an iterative process to minimize uncertainty in the HSU correlations. Monitoring of the ground water system under stressed conditions during extraction well pumping and during long-term pumping tests provided the most effective data set for identifying and verifying the HSU boundaries.

The HSU framework has allowed for the mapping of a complex network of co-mingled contaminant plumes, each of which can be traced back to their respective source areas. Ground water cleanup systems at the site have been designed to treat and capture individual contaminant plumes and are optimized with respect to their location, geometry, and mobility. This strategy has proven successful at LLNL, based on over 10 years of remediation history.