

Incorporating Molecular Biological Tools into High-Resolution Site Characterizations

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Background/Objectives. Incorporating molecular biological tools into high-resolution site characterization (HRSC) efforts provides key data sets needed to select remediation strategies. While traditional HRSC techniques provide valuable information about a site's hydrostratigraphy and the vertical and horizontal distribution of the contaminants of concern they don't provide lines of evidence that indicate the suitability of a site for remediation strategies like monitored natural attenuation, natural source zone depletion, or enhanced in situ bioremediation.

Approach/Activities. This presentation will discuss how molecular biological tools like quantitative polymerase chain reaction, stable isotope probing, and compound-specific isotope analysis, can be incorporated into HRSC efforts. The knowledge gaps each of these data sets can fill will be discussed, and examples of how these tools have been implemented at sites in the United States, South Africa, and Argentina to drive the decision-making process and the selection of effective remediation strategies will be highlighted.

Results/Lessons Learned. Incorporating molecular biological tools with HRSC data to evaluate source-area and plume stability can reduce project life cycle costs and facilitate efficient and effective sampling events.