

# PRedictive Integrated Stratigraphic Modeling (PRISM®)



PRISM® combines Environmental Sequence Stratigraphy (ESS), Facies Analysis, and mapping techniques to accurately predict preferential groundwater flow pathways. PRISM® provides a much more accurate picture of groundwater flow pathways than previous models — invaluable for developing cost-effective remedial strategies.

### Industry Applications Include:

- Mass Flux
- Emerging Contaminants (such as PFAS)
- Water Supply
- Remedial Process Optimization (RPO)
- Liability Reduction
- Abandoned UST Assessment
- Hazardous Waste Site Assessment
- Property Condition Assessments



Look for AECOM's chapter on the application of sequence stratigraphy in the upcoming book "Advances in the Characterization and Remediation of Sites Contaminated with Petroleum Hydrocarbons" - publication by Springer-Nature expected in September 2022

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### Overview

When groundwater remediation projects underperform, it is primarily because of an inadequate understanding of the subsurface — especially the preferred migration pathways of the contaminants. This means cleanup projects may require additional spending for more wells, incur extended cleanup time, or never meet the cleanup goals (O&M without an end point). To solve this problem, AECOM employs PRISM® (PRedictive Integrated Stratigraphic Modeling).

PRISM® is the industry's first fully-integrated Conceptual Site Model. By leveraging innovative best-practices from the fields of geology, hydrology, and chemistry, PRISM® acquires a holistic understanding of the subsurface that more accurately predicts contaminant migration pathways at complex remedial sites. Having been applied to over forty projects across North America, PRISM® has established itself as an EPA-endorsed and trustworthy tool that can be used to develop more effective investigative and remedial strategies, save millions of dollars in cleanup costs, and reduce time to site closure. PRISM® is the future of remediation.

### Our Approach

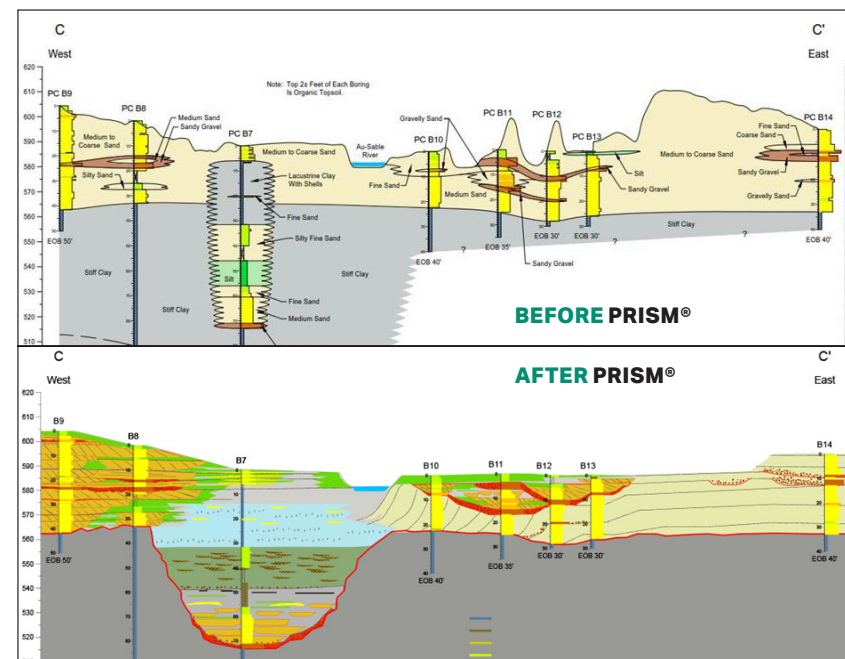
Dynamic challenges require dynamic solutions. By harnessing our collective intelligence and driving technical innovation, we're able to solve our client's most complex remedial challenges.

- **ENVIRONMENTAL SEQUENCE STRATIGRAPHY (ESS).** ESS is an EPA-endorsed, state-of-the-art investigative approach that provides a detailed understanding of the subsurface geology in order to better predict the fate and transport of contaminants at complex sites. Although originally developed in the petroleum industry to find oil and natural gas reservoirs, PRISM® leverages this technology to refine conceptual site models (CSMs). In contrast to the traditional method of subsurface correlation, which involves matching sand with sand and clay with clay, ESS depicts a detailed cross-section of sediment layering that is consistent with known depositional patterns. These cross-sections are then utilized to identify and map formations with high fluid transmissive properties.
- **HYDROLOGY & CHEMICAL ANALYSIS.** Our expert hydrogeologists leverage ESS analysis, hydraulic models, and isotope analysis to develop EPA-approved Fate and Transport (F&T) models. Each F&T model is customized to help our clients save time and resources in achieving their project goals.
- **GEOLOGY THROUGH A NEW LENS.** Unlike previous models, PRISM® constructs a geologically defensible framework that better defines subsurface heterogeneity. This information is then used to accurately predict preferential pathways in sediments, reduce data gaps, and reduce the number of future wells for plume measurements through stratigraphic guidance.

### Key AECOM Attributes

PRISM® has wide-ranging applications for site investigation and remediation at complex geologic sites.

- **ENHANCED SITE INVESTIGATIONS.** PRISM® enhances site investigations by leveraging all pre-existing geologic information to critically assess potential data gaps. Our expertise in geology gives us a comprehensive understanding of the local geological features that can affect the quality and accuracy of data collected at the site.
- **REMEDIAL PROCESS OPTIMIZATION (RPO).** PRISM® accurately defines and identifies contaminant migration pathways. By incorporating PRISM® during the pre-design phase, our experts can streamline the remedial process and ensure the design of an effective remedial system.
- **COMPREHENSIVE, INTEGRATED CSMS.** PRISM® delivers a more accurate understanding of the site and relevant geologic features that impact groundwater flow pathways. A conceptual site model guided by PRISM® will decrease site uncertainty, increase cost savings, and is sure to impact how the industry approaches environmental remediation.



In this example, our team applied PRISM® to develop a conceptual site model for a US Air Force Base. Different types of rock have varying levels of water permeability, which can make it difficult to see where water would ultimately flow within a complex subsurface structure. PRISM® was especially successful because it enabled us to better understand the heterogeneous sedimentary layers of this aquifer, allowing us to accurately predict how contaminated water would flow through different layers of rock and provide the basis for future actions needed to remediate the site.

“AECOM's PRISM® technology was critical to developing accurate base-wide groundwater flow models for over 20 bases across America. Their unique methodology & expert stratigraphers provided a realistic basis for analyzing groundwater flow and contaminant migration pathways at these complex sites. These models saved millions of dollars by reducing the uncertainty around cost to closure for Performance-Based Remediation.” *AFCEC Client*