

HYDROGEOLOGY  
& GROUNDWATER  
MODELING

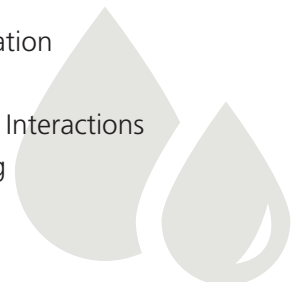
**Considering groundwater resources for a project?  
Let us help.**

**We specialize in evaluating groundwater resources  
to meet a variety of needs for our clients.**

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We provide a full range of services including groundwater resource management, aquifer characterization, and contaminant transport evaluation. We design and implement field programs using state-of-the-art technologies to collect site data efficiently and then use this data to evaluate the groundwater resource and create analytical and numerical computer models. These models allow us to evaluate and solve complex problems in resource and strategic planning and guide risk-based decision making. We also use visualization software to produce 3D images and videos that enable us to effectively communicate with technical specialists, managers, legal teams, and the general public. Services include:

- Water Resources Management
- Resource Planning and Optimization
- Contaminant Source Identification
- Contaminant Migration
- Risk Assessment
- Remedial Design and Optimization
- Travel Time Analyses
- Groundwater – Surface Water Interactions
- 3D Visualization and Modeling
- Water Balance Development



# How We Can Help

NewFields understands that each project is different and we excel at customizing solutions to meet the unique challenges faced by our clients. Below is a sample of the most common groundwater-related services we provide.

## ■ Hydrogeologic Characterization

Our experts have experience solving complex hydrogeologic problems in a wide array of environments. Our work plans emphasize safety and quality, while focusing on project objectives. We also apply innovative, state-of-the-art technologies to optimize collection groundwater data including statistical analysis of sample locations and parameters, sensor arrays, hydraulic profiling tools, and geophysics. NewFields' experienced scientists and engineers specialize in the analysis of hydrogeologic and geochemical data, including:

- Tracer and pump tests
- Groundwater-surface water interactions
- Simple and complex aquifer systems
- Coastal tidally influenced water-bearing units

## ■ Groundwater Flow and Transport Modeling

Our staff includes a team of modeling experts who have used groundwater modeling to evaluate fate and transport of chemical constituents and contaminants at various project sites, including remediation sites, industrial facilities, mining sites, injection wells, oil and gas production facilities, and leaking pipelines. Groundwater modeling has also been used to predict water table drawdown from pumping/dewatering systems and evaluate interconnection with surface water.

## ■ Remedial Design and Optimization

One of our primary areas of expertise is the remediation of groundwater and soil. Our scientists and engineers have decades of experience in a wide range of contaminants including petroleum hydrocarbons, chlorinated solvents, and metals as well as emerging contaminants such as 1,4-Dioxane and polyfluoroalkyl substances (PFAS). We address the remediation of contaminants on a site- specific basis and our multicomponent approach includes:

- Comprehensive technical analyses for remedial selection
- Monitoring and recovery/injection optimization
- Risk and liability mitigation
- Effective regulatory and third party communication
- Life-cycle cost management

## ■ Water Rights

Through the needs of our diverse clientele, we have considerable experience working with local, state, and federal agencies, providing us with an excellent understanding of agency needs for completing project studies, reports, and permit applications. Our water rights experts are well-versed in preparing beneficial use permit applications, criteria addendums, and water right change applications.



# Case Study

## THE CHALLENGE

The client has a project that requires remedial design and optimization of a groundwater recovery system that is capturing a plume that has the potential to impact an adjacent property.

## THE APPROACH

Our experts meet with the client to understand the technical and business challenges of the project. Most importantly, we listen to the goals of the client, including topics such as complexities associated with source control, regulatory requirements, facility operations, timing, costs, exposure, liability mitigation, and safety. A technical assessment of the problem is then conducted, incorporating the client's needs and goals. Short-term and long-term milestones are defined and a path forward is determined.

Technical analyses are conducted to understand the hydrogeologic and chemical conditions associated with the contamination. A preliminary data review is completed to assess data reliability, sufficiency, potential uncertainty, and the need for additional characterization. Visualization of the existing data via 3D and GIS software is conducted to augment the data review, and a conceptual site model is developed. The conceptual site model is then used to support the development of a numerical groundwater and contaminant transport model that simulates the movement of the contaminant plume. The numerical model is then used to evaluate remedial alternatives for the site. Results from the numerical model, along with life-cycle costs for each viable remedial alternative are evaluated. The results of the alternatives analyses are discussed with the client and a path forward is defined. The selected remedy is then refined and discussed, as needed, with regulators and third parties. Engineering designs are developed, permits are received, and implementation of the project is initiated. Milestones are maintained through transparent engagement with key parties and well-defined scheduling.

NewFields' groundwater modeling team has developed models to support:

- ✓ Mine Permitting
- ✓ Operations
- ✓ Compliance
- ✓ Remediation


## The NewFields Difference

What sets us apart? Knowledge, experience, a unique approach, and out-of-the box solutions. Our team includes hydrogeologists and others who specialize in hydrogeologic characterization, conceptual modeling, remediation design and optimization, water supply, water rights, analytical/numerical groundwater and contaminant transport modeling.

Our hydrogeologists are experts in evaluating the feasibility of developing, remediating, or altering groundwater resources, from comprehensive field investigations, to data analysis, to litigation support and expert witness work. We have completed studies in the United States and internationally that include: design and implementation of baseline and compliance water quality/quantity monitoring programs; development of quality assurance/quality control plans; statistical analysis and validation of water quality/quantity data; water balance development; dewatering system design; mitigation and remedial planning and design; predictive geochemical analyses; developing and applying various water resource models; and, design of water management and treatment systems.

***Let us help you with your next project and experience the NewFields difference!***





**Since 1995** we have been providing businesses with practical and tactical expertise. We collect, research, refine and provide the actionable intelligence needed to resolve your complex business needs.

## About NewFields

NewFields is an environmental, engineering, and construction management consulting firm. We provide access to a global network of recognized experts and professionals who work together to resolve our clients' complex business needs.

Our talented staff is a diverse group of accomplished individuals, most of whom are senior level engineers, scientists, and specialists, who offer our client base both practical and strategic solutions.

We look forward to helping you achieve success and sustainability in a rapidly changing, interconnected world.



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