

Groundwater Modeling and Contaminant Transport

Modeling is one of many tools that can be used to help determine remedial options. The use of groundwater modeling for contaminant fate and transport predictions is common in the risk-based decision-making process. Models range from simple mathematical equations to complex computer-generated models. Models are generally used to support remedial decisions where groundwater contamination exists above a prescribed action level. While models can be used to develop and support remedial options, they should not be expected to substitute for real-world data. DEQ will require contaminant plume delineation and monitoring to confirm model predictions. An approved monitor well network that includes both sentinel wells and contaminated wells is needed. The following procedures should be used to make data provided by the models usable by the DEQ.

1. Develop a Site Conceptual Model. Regardless of the predictive model selected, site characterization and development of an initial site conceptual model is very important. DEQ's approval of the site conceptual model is an important step to help ensure there will be agreement on modeled results.
2. Propose a Predictive Model. Obtain DEQ approval of the proposed predictive model before pursuing the analysis and presenting model results.
3. Propose Input Values. Obtain DEQ approval for proposed input values prior to running the model. Models can be very sensitive to the various input values. Models presented without prior DEQ approval of input parameters are unlikely to be accepted.
4. Calibrate Model to Existing Conditions.
5. Run a Sensitivity Analysis. Identify and evaluate the sensitivity of various input parameters.

Use of a computer model does not always minimize the need for sample data, borings, or wells. In fact, more data may be required to adequately calibrate the model to fit existing site conditions.

DEQ uses approved modeling results as one of many tools for decision-making purposes, but only if sufficient information is obtained to allow verification of the overall model and various model inputs. Information needed typically includes:

- a listing of all computer software necessary to run the various programs,
- a report detailing the models/programs used,
- how the modeling was run,
- copies of maps used as input, and
- spreadsheets for various data inputs in downloadable format.

