

**KEEPING MAGICIANS AT THE GATE: JUDICIAL PERSPECTIVES
ON ADMISSIBILITY AND WEIGHT OF PLUME MODELING**

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"Any sufficiently advanced technology is indistinguishable from magic." Arthur C. Clarke 1917, British Science Fiction Writer

Modeling of plumes whether in air or water is really a black art. The jury may see a very sophisticated scientific program, and generally believing that science does not lie, believe the modeler even though the selection of the model's variables is often subjective. It is the job of lawyers and experts to unmask any deceptions so the court can determine the admissibility of the modeler's testimony. As a general rule, courts have held that such testimony is admissible only if (1) the testimony is based on sufficient facts or data; (2) the testimony is the product of reliable principles and methods; (3) the witness has applied the principles and methods reliably to the facts of the case; (4) the theory or technique can be or has been tested; (5) the theory or technique has been subjected to peer review and publication; (6) the theory or technique has a known or potential rate of error; and (7) the theory or technique is "generally accepted." Courts have also considered whether an expert developed his opinions for the purposes of testifying, whether an expert has improperly extrapolated from an accepted premise to an unjustified conclusion, and whether the expert is being as careful as he would be in his regular professional work outside his paid litigation consulting. Based on these criteria, courts have held that if properly used, computer models are invaluable in estimating the size of contaminant plumes. However, at least one court has correctly reasoned that "even in the best of circumstances, a model is only an estimate and the accuracy of the estimate depends to a considerable extent on the data selected for use in the computer model, the quality and reliability of that data and, of course, the skill of the modeler. . . . To be reliable, the expert's testimony must be based on the 'methods and procedures of science' and reflect more than the witness' subjective belief or unsupported speculation." The presentation will delve into recent judicial developments on the admissibility of groundwater and air dispersion modeling, the criteria used in evaluating the variables used by the modeler, Daubert principles, and witness credibility.

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