
Reliability Is the Gauge: Recent *Daubert* Challenges to Experts in Environmental Litigation

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Environmental litigators face unique challenges in dealing with the expert phase of a lawsuit. For example, a lawsuit involving alleged environmental contamination of soil, groundwater, or surface waters may require the use of experts such as environmental/civil engineers, hydrogeologists, hydrologists, geologists, soil scientists, agronomists, analytical chemists, toxicologists, environmental chemists, risk assessment experts, wetlands scientists, health physicists, biologists, and statisticians. These experts must often present difficult and complicated technical information in a way that can be understood by judges, lawyers, and juries, who in most cases are not engineers and scientists. In some cases, environmental litigators face the task of having to deal with many of these disciplines simultaneously. Before any of these experts can testify at trial, however, each expert and his/her work must satisfy evidentiary standards applicable to expert testimony, many of which are grounded in the principles laid out in the U.S. Supreme Court decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

This article provides a review of recent decisions where the opinions of environmental experts, from disciplines mentioned above, have been the subject of *Daubert* challenges based on reliability of methods or principles and how those challenges were successfully presented or defended. But first, a brief review of the standards for expert testimony will set the stage.

Rule 702 of the Federal Rules of Evidence establishes the standard for admissibility of expert testimony in federal courts:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness

has applied the principles and methods reliably to the facts of the case.

Other jurisdictions have a similar evidentiary rule. See, e.g., Article 702 of the Louisiana Code of Evidence; Rule 702 of the Delaware Rules of Evidence; Rule 702 of the North Dakota Rules of Evidence; Rule 702 of the Utah Rules of Evidence; and Rule 702 of the Alaska Rules of Evidence. The Eleventh Circuit interpreted the Supreme Court's holding in *Daubert* and Rule 702 to require that the following three elements be met before an expert can testify:

(1) the expert is qualified to testify competently regarding the matters he intends to address; (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in *Daubert*; and (3) the testimony assists the trier of fact, through the application of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue.

City of Tuscaloosa v. Harcros Chemicals, Inc., 158 F.3d 548, 562 (11th Cir. 1998), cert. denied, 528 U.S. 812 (1999) (the Louisiana Supreme Court has adopted the Eleventh Circuit approach in *Cheairs v. State ex rel. Dep't of Transp. and Dev.*, 2003-0680 (La. 2003), 861 So.2d 536, 542). Although the first and third factors, qualifications and "fit," are key determinations that the trial court must make, the reliability factor is where many battles are fought.

The reliability assessment of an expert opinion is a crucial part of the trial court's "gatekeeping" function to "ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable." *Daubert*, 509 U.S. at 589. To satisfy its obligation, "the trial court must first make a 'preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue,' focusing specifically on the methodology and not the conclusions." *Synergetics, Inc. v. Hurst*, 477 F.3d 949, 955 (8th Cir. 2007) (citing *Daubert*, 509 U.S. at 592-593); See also *Dodge v. Cotter Corp.*, 328 F.3d 1212, 1221-1222 (10th Cir. 2003). The goal is to verify that the testimony has "a reliable basis in the knowledge and experience of [the relevant] dis-

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cipline” and that the evidence “is genuinely scientific, as distinct from being unscientific speculation offered by a genuine scientist.” *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 149 (1999) (quoting *Daubert*, 509 U.S. at 592); *Mitchell v. Gencorp Inc.*, 165 F.3d 778, 783 (10th Cir. 1999) (quoting *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 318 (7th Cir.1996), cert. denied, 519 U.S. 819 (1996)). The reliability factor is “ensured by a requirement that there be ‘a valid scientific connection to the pertinent inquiry as a precondition to admissibility.’” *State v. Foret*, 628 So. 2d 1116, 1122 (La. 1993) (citing *Daubert*, 509 U.S. at 592). As one court has said, “any step that renders the [expert’s] analysis unreliable under the *Daubert* factors renders the expert’s testimony inadmissible,” regardless of whether “the step completely changes a reliable methodology or merely misapplies that methodology.” *In re Paoli R.R. Yard PCB Litigation*, 35 F.3d 717, 745 (3d Cir. 1994), cert. denied, 513 U.S. 1190 (1995).

To guide trial courts in their evaluation of the reliability of expert testimony, the Supreme Court in *Daubert* identified the following four nonexclusive factors: (1) whether the technique has been subjected to peer review or publication, (2) the “known or potential rate of error,” (3) a “reliability assessment,” in which the “degree of acceptance” within a scientific community may be determined and reviewed, and (4) the “testability” of the technique. *Daubert*, 509 U.S. at 592–594.

The recent cases below in the environmental litigation field highlight some of the difficulties lawyers face in challenging and defending the reliability of expert opinions.

Reliability—Failure to Consider Relevant Data

The failure of an expert to use or consider certain information or data may be serious enough to undermine the reliability of his/her opinion. In recent cases where this type of challenge has been successful, the expert and sponsoring party failed to convince the court that an adequate scientific basis existed for not using or considering the information or data at issue. For example, the case of *LeClercq v. The Lockformer Company* involved claims by various homeowners and residents concerning alleged contamination of drinking water. No. 00-C-7164, 2005 WL 1162979, at 4 (N.D. Ill. Apr. 28, 2005). A causation expert for a defendant third-party plaintiff offered an opinion that various contaminants had traveled from certain defendants’ facilities through a wastewater treatment plant, leaked from the effluent line of the plant, and contaminated groundwater. The contaminated groundwater then supposedly migrated onto the class areas at issue in the case. The expert had relied, in part, on sampling data from the plants’ effluent. The court granted a motion to exclude all of the opinions of the expert as being unreliable because of the expert’s failure to consider what the court categorized as material facts. Specifically, the expert failed to consider seventeen effluent samples where the constituents were not detected. The court found these samples, ignored by the expert, to be material evidence that “would be relevant to [the expert’s]

conclusions.” *Id.* The court said:

[The expert’s] failure to discuss the import of, or even mention, these material facts in his reports amounts to “cherry-pick[ing] the facts he considered to render his opinion, and such selective use of facts fail to satisfy the scientific method and *Daubert*.” This disregard of relevant data undermines the reliability of [the expert’s] entire opinion in this matter.

Id. (citation omitted).

A similar result occurred in *Finestone v. Florida Power & Light Company*, No. 03-014040-CV, 2006 WL 267330 (S.D. Fla. Jan 6, 2006). There, plaintiffs alleged personal injuries caused by exposures to sewage treatment plant sludge, which was supposedly disposed of by the defendant at a location that was not licensed to receive radioactive sludge. One of the plaintiffs’ experts opined that the sludge contained radioactive isotopes based upon sampling for cobalt (Co60) performed on the sludge. However, the court found that the expert failed to consider samples taken where no Co60 isotopes were found, which if included would have reduced the average concentration by an order of magnitude. The court noted:

Though “a court should meticulously focus on the expert’s principles and methodology, and not on the conclusions that they generate” . . . “the court can draw inferences about the methodology from the conclusions.” Put another way, “a district court may properly consider whether the expert’s methodology has been contrived to reach a particular result.”

Id. at 13 (citations omitted). The court found that the expert did not “adequately explain why he chose only the thirty-two samples with the Co60 and not the remaining samples that had no Co60 to compute the average amount of Co60” at the site. *Id.* at 12. The court concluded the expert’s methodology was unreliable. *Id.*

In contrast, in *Reichhold v. United States Metals Refining Company*, the plaintiff successfully defended a challenge to its expert, who failed to consider certain sampling data that the defendants thought important. No. 03-453, 2007 WL 674686 (D. N.J. Feb. 28, 2007). In the case, the plaintiff sought to recover damages and response costs for alleged property contamination caused by the defendants’ operations. The expert offered an opinion that metal-contaminated dust had been carried by the wind from the defendants’ facility to the plaintiff’s property. The defendants argued that the expert had failed to consider soil sampling data to determine whether the pattern of contamination was consistent with his theory, and, therefore, this failure rendered his opinion unreliable. The plaintiff disagreed, couching the argument as one between “dueling experts” who rely on “different sources of reliable data.” *Id.* at 13. The plaintiff contended that the defense criticisms were for cross-examination at the trial on the merits. *Id.* The court rejected the defense challenge, finding that the expert had relied on “numerous sources” of data “in formulating

his opinion as to the dispersion of particles on the Site.” *Id.* As a result, the court agreed with the plaintiff that the defense challenge went to the weight of the opinion, not the opinion’s reliability and admissibility.

Reliability—Lack of Testing

Lack of environmental testing or sampling may affect the reliability of an expert opinion. For example, lack of sampling played a role in the court’s exclusion of an expert opinion in *Alderman v. Clean Earth*, No. 04C-06-181-FSS, 2007 WL 1334565 (Del. Super. Ct. Apr. 30, 2007). In *Alderman*, homeowners sought damages for contamination of their property by lead, arsenic, and other substances allegedly caused by the defendants’ operations. The plaintiffs’ geologist was challenged under *Daubert* on various grounds, including the argument that the expert’s opinions on causation were unreliable because the expert never tested his hypotheses. The court agreed with the defense challenge:

[The expert’s] lack of testing is problematic for four reasons: (1) he cannot show that Defendants caused any of Plaintiffs’ contamination; (2) even if Defendants are a source of contamination, he cannot say to what extent; (3) [The expert] does not even try to distinguish among Defendants as sources of pollution; and (4) he cannot eliminate other sources of contamination, such as lead paint and passing traffic.

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Id. The expert had opined that the contaminants from the defendants’ operations had been deposited on the plaintiffs’ property by several “transport mechanisms such as wind transport and depository transport by vehicle and foot traffic, surface runoff,” and flooding events. *Id.* at 4. The court was not convinced that the geologist was qualified to discuss air dispersion techniques and methods. More importantly, the court found that the expert had not tested this theory. The expert had visited the site only three times, had never conducted any air sampling, and had based his opinion on “limited empirical observations” of seeing dust being kicked up by trucks on the defendants’ property and watching the direction of the wind. *Id.* at 5. Further, the expert had no data to support his opinion that surface water actually flowed from the defendants’ property to the plaintiffs’ property. The court noted the

importance of *Daubert* in a case where the conclusions of the plaintiffs’ expert “seem to be supported by common sense,” yet were simply untested. *Id.* at 9.

However, in other recent cases where lack of testing has been asserted as grounds to exclude expert opinions, the challenges have not been successful. In those cases, the experts and sponsoring parties were able to convince the courts that the experts had otherwise reliable bases for their opinions. For example, in *Palmer v. Asarco Incorporated*, the defense attempted to exclude the opinions of the plaintiffs’ environmental fate and transport expert as being unreliable because the expert failed to perform his own environmental sampling and testing. No. 03-CV-0498, 2007 WL 2302584 (D. Okla. Aug. 7, 2007). The case involved alleged exposure to lead dust that supposedly was deposited on the plaintiffs’ property. The court rejected the challenge to the expert, finding that the expert had other factual data that supported his opinion. The court noted that “the lack of testing can certainly be a factor in a court’s decision to exclude expert testimony, but lack of testing is not ordinarily an independent basis to exclude expert testimony if the expert has a sufficient factual basis for his testimony.” *Id.* at 4. The court found that the defendants had the burden of showing that “original testing” was required before that could form the basis for exclusion of the testimony in the case. The plaintiffs’ expert relied on previous air modeling done at the site, which the court found was a sufficient factual basis for the expert’s opinion that dust from the defendants’ “chat” piles could have reached the plaintiffs’ residences.

In *Dolomite Products Company, Inc. v. Amerada Hess Corporation*, the plaintiff filed a lawsuit seeking to recover costs associated with the assessment and remediation of soil and groundwater contaminated by petroleum. No. 01-CV-6530T, 2004 WL 1125154 (W.D. N.Y. May 19, 2004). The plaintiff alleged that a nearby property upon which a gas station was operated caused or contributed to the contamination on the plaintiff’s property. The defendant challenged the plaintiff’s causation expert on several grounds, one being that the expert had failed to take soil and groundwater samples. The court rejected the *Daubert* challenge, finding that the expert’s experience and methodology satisfied the requirements of Rule 702 and that the defendant’s criticisms “are better addressed on cross-examination.” *Id.* at 3. The court appeared to be satisfied with the “numerous” admitted and undisputed “sources of information” that the expert was relying on as the basis of his opinion, including history of previous spills on the defendant’s property, proximity of the properties, groundwater flow patterns, and other sampling data. *Id.*

Finally, in *Jaasma v. Shell Oil Company*, the defendant operated a gasoline station pursuant to a lease with the plaintiffs. 412 F.3d 501 (3d Cir. 2005). One week before the lease was to terminate, fuel residue was discovered in adjacent soil, which caused a lengthy investigation by the state environmental agency. The plaintiffs claimed damages for their inability to use the property during the pendency of the state’s investigation. Although the trial court granted a defense motion to exclude the plaintiffs’ causation expert and a motion dismiss-

ing the plaintiffs' claims, the United States Court of Appeals for the Third Circuit reversed and remanded the case. The Third Circuit found that the trial court had misunderstood the nature of the expert's testimony. The trial court appeared to have excluded the expert's opinions based upon the defense contention that the expert was going to testify as to the actual condition of the property at the time of lease termination while relying on sampling data from several years earlier. The plaintiffs succeeded in showing the Third Circuit that the expert's testimony concerned the reasonableness of the plaintiffs' concerns about the property, not actual conditions. Therefore, the expert had a sufficient basis for his opinion. On the lack of testing argument, the Third Circuit noted:

Defendants' main counterargument is that [the expert's] report is "merely a summary of the environmental documents submitted by defendants" which was not based on "independent testing." This argument has no support. We do not require an expert to base his or her opinions on independent data collection or field research; rather, the question is "whether an expert's data is of a type reasonably relied on by experts in the field . . . [and] whether there are good grounds to rely on this data to draw the conclusion reached by the expert." There is no doubt that the data [the expert] relied upon was reliable.

Id. at 514.

Reliability—Incorrect Assumptions/Facts

Experts routinely make and use factual or scientific assumptions in rendering opinions in a litigation setting. Either misusing a material assumption or using an incorrect material assumption could result in the exclusion of an expert report. For example, in *B.H. v. Gold Fields Mining Corporation*, the defendants challenged a particular factor, the climate or "C" factor, used by the plaintiffs' expert in an air dispersion model to calculate the level of lead emitted in the air from the defendants' chat piles and tailings ponds. No. 04-CV-0564-CVE-PJC, 2007 WL 188130 (N.D. Okla. Jan. 22, 2007). The C value accounts for climates that are less susceptible to wind erosion and is used as a reduction factor in the equation. *Id.* at 2. The defendants argued that the C factor used by the expert was 100 times more than what was appropriate and that the expert deviated from accepted applications of the model. *Id.* The plaintiffs' expert acknowledged that he deviated from the normal application of the C value; however, he claimed that this deviation was necessary to determine the windblown emissions on a local scale instead of a regional scale. *Id.* at 2–3. The court rejected the plaintiffs' argument and found the expert's opinion to be unreliable. The court noted that the expert had no support in his report or in the peer-reviewed literature for use of his C factor. *Id.* The court said that it "would not be fulfilling its duty as gatekeeper if it permitted the introduction of novel scientific methodology based solely on the assurances of the expert himself." *Id.* at 3.

Similarly, the opinions of two experts in *Finestone* were excluded based, in part, on incorrect material assumptions the experts made. As mentioned above, the plaintiffs in *Finestone* alleged exposure to radioactive sludge. 2007 WL 267 330 at 1–4. Based on sampling, the plaintiffs' experts concluded that the site contained certain levels of the radioactive isotope Co60. In calculating exposure rates, the experts computed the presence of other, more radioactive isotopes using ratios contained in a preoperation report prepared by the facility for the regulatory agency. The defendants argued that the experts' calculation of radiation rates incorrectly assumed that spent fuel-rod wastewater was present in the sludge when it was not. Further, the experts had assumed that cesium, a more radioactive isotope, was present in the sludge when actual sampling data negated that assumption. The court rejected the experts' opinions as unreliable based in part on these inaccurate assumptions: "[the experts'] assumptions as to the presence of the amount and type of radioactive isotopes fail the 'test' of their theory—as their extrapolations cannot stand next to the actual data retrieved from the site and surrounding environment." *Id.* at 12. The court also found that the opinions had "not been subjected to peer review and publication," and the "the error rate of their particular scientific technique in this case is quite large." *Id.*

Reliability—Difference in Approaches

Two cases highlight the difficulty in attacking an expert opinion when experts simply disagree on how best to analyze an issue. The case of *Fisher v. Ciba Specialty Chemicals Corporation* involved claims by five landowners alleging diminution in value of their property due to alleged contamination caused by air emissions of dichlorodiphenyltrichloroethane (DDT) from the defendants' facility. No. CIV.A.03-0566, 2007 WL 2302470 (S.D. Ala. Aug. 8, 2007). The defendants challenged one of the plaintiffs' experts, a civil engineer, who opined on causation. The defendants argued the engineer's methodology was unreliable because of his "failure to derive quantitative proof (via air modeling or other technique[s]) establishing the existence of a specific pathway linking DDT emissions from the [facility] to contamination on plaintiffs' property." *Id.* at 6. The court rejected the argument, finding that the engineer's method (an inferential analysis) was reliable and, therefore, his opinion would be admissible. Specifically, the court found that "quantitative scientific evidence" was not the "only way to establish causation in an environmental contamination case, or that the inferential methodology employed by [the engineer] is inherently unreliable because it is circumstantial." *Id.* The court reviewed the work and analysis actually performed by the engineer and was satisfied that the method was reliable:

[The engineer] has offered an inferential, scientific methodology that creates, analyzes and identifies trends in data (much of which he himself collected and produced); considers and rules out alternative sources; points to evidence that [the defendant] emitted DDT; explains the various mechanisms through

which [defendant]-emitted contamination could have reached plaintiffs' property; and concludes that the contamination on plaintiffs' property originated from the [defendant's] plant. That is sufficient to satisfy *Daubert's* reliability standard.

Id. at 8.

In the case of *New Mexico v. General Electric Company*, a groundwater contamination case brought by the state, multiple challenges were made to one of the state's groundwater experts and particularly to the groundwater modeling conducted by the expert. 335 F. Supp. 2d 1266 (D. N.M. 2004). Challenges on reliability grounds included arguments that the expert used "flawed software," the modeling results were inconsistent with real sampling data, and incorrect methods were used to calibrate the model. The court discussed in detail the reliability of the expert's opinion that involved "kriging," which the court explained as the groundwater model interpolating "known (measured) values to infer missing values for adjacent points or locations where no measurements were made." 335 F. Supp. 2d at 1282. The defendants argued that the expert's opinion was unreliable because the model overestimated the contaminated groundwater plume, "predicting above MCL-groundwater contaminated . . . at locations where such contamination did not exist" based upon actual data. Although the court noted problems with the expert's analysis, it ultimately concluded that the opinions were reliable and that defendants' challenges were best left to cross-examination:

statistical probabilities and estimation techniques, and go to the weight and credibility that the trier of fact should afford to [the expert's] opinions.

335 F. Supp. 2d at 1284. The court found:

The statistical tools and methods used by [the expert] and his associates in making estimates appear to have "a grounding in the methods and procedures of science' based on actual knowledge, not 'subjective belief or unsupported speculation.'" His estimates appear to have "a reliable basis in the knowledge and experience of [the relevant] discipline," and appear to be "applicable to a particular set of facts" as required by Rule 702. [The expert's] estimates do not fall "outside the range where experts may reasonably differ, and where the jury must decide among the conflicting views of different experts, even though the evidence is 'shaky.'"

335 F. Supp. 2d at 1284–1285 (citations omitted).

In contrast, the *Reichhold* case shows that failure to adequately explain a scientific basis for a decision can result in exclusion. In *Reichhold*, the plaintiff sought to recover damages and response costs for alleged property contamination caused by the defendants' operations. The plaintiff challenged a defense expert on grounds that the expert had ignored "undisputed facts" concerning a potential source of lead contamination (a lead plant operated by one of the defendants) when he opined that the defendants did not contribute to the lead contamination. The expert had opined that "there is no information indicating that a lead plant . . . contributed to contamination" on the plaintiffs' property. 2007 WL 674686 at 6. According to the court, the expert's opinion was based on an argument that most of the elevated lead readings were remote from the location of the former lead plant. The court was not impressed with the expert's reliance on a diagram depicting lead concentrations, finding it to be an insufficient basis. The court found that the expert had failed to specify a scientific or factual basis for his opinion, and therefore, the opinion concerning the lead plant's alleged contamination of the site was unreliable.

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Reliability—Remediation Plans

Challenges to remediation plans were the subject of *Daubert* challenges in two recent cases, with mixed results. In *Lambrinos v. Exxon Mobil Corporation*, the court rejected a defense argument that the remediation plan prepared by the plaintiff's expert was unreliable because the proposed remedy was not feasible. No. 00-CV-1734, 2006 WL 2238977 (N.D. N.Y. Aug. 4, 2006). The defendants argued the expert's proposal to excavate beneath a restaurant was "too extreme a measure and ignore[d] the applicable law's feasibility requirement." *Id.* at 4. The court rejected the argument, relying in part on the defendant's failure to prove that the "extraordinary measure" proposed by the expert rendered the opinion unreli-

From the facts currently in this record, it appears that [the expert's] analysis gives some rough estimate of the nature, extent, and location of contaminated water beneath the South Valley Site based upon selected data, and the relationship between model and measurements in this instance is something more than purely ipse dixit. Defendants' criticisms of [the expert's] methods of analysis—including the GEOSCIENCE kriging and calibration exercises—are themselves based upon

able. *Id.* at 5.

However, in *Alderman*, the court excluded the opinions of the plaintiffs' expert that remediation was necessary and that excavation of soil down to one foot below grade was the appropriate remedy, finding the opinions to be unreliable. The court said the expert failed to explain how he had arrived at the one-foot standard and failed to present scientific evidence showing that this depth for remediation was required for all plaintiffs. The court said the expert was "using his personal opinions, or Plaintiffs' desires, to determine what remediation is necessary," rather than "scientific or regulatory support." 2007 WL 1334565 at 7.

Lessons Learned

For litigators challenging expert opinions in environmental litigation, these recent cases offer the following lessons:

Successful challenges can be made to an expert's failure to consider data or an expert's use of incorrect assumptions or facts. Those challenges must focus on the materiality of the

incorrect or unconsidered information and the effects on the expert's opinion.

Challenges based upon lack of testing are difficult to win if the challenged expert can show other "reliable" basis for the opinion. Challenges on this ground have a better chance of success if combined with a broader attack on the expert's opinion.

Challenging an expert's overall methods can be a difficult, uphill battle against an expert who can show his or her method has a scientific/technical basis. To have a chance of success, such challenges must broadly undermine the science, principles, or facts supporting the expert's method.

These recent cases also provide important lessons to experts and their sponsoring parties or attorneys. The expert and his or her sponsoring party must be prepared to defend the reliability of the expert's methods and principles in all phases of the expert's work, and planning for that defense should start from the beginning of the expert's involvement in the case. Those environmental experts and litigators who are prepared to respond to reliability challenges have the best chance of successfully having expert opinions presented to the trier of fact. 🌳