DISSERTATION

REFORMING THE CULTURE OF PARTIALITY:

DIFFUSING THE BATTLE OF THE EXPERTS IN WESTERN WATER WARS

Submitted by

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WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY MARIAM J. MASID ENTITLED REFORMING THE CULTURE OF PARTIALITY: DIFFUSING THE BATTLE OF THE EXPERTS IN WESTERN WATER WARS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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ABSTRACT OF DISSERTATION

REFORMING THE CULTURE OF PARTIALITY:
DIFFUSING THE BATTLE OF THE EXPERTS IN WESTERN WATER WARS

The admissibility of expert testimony in water matters is based on the rules of evidence in civil cases. Problems with expert testimony continue to plague the courts even after the change in the rules of evidence and guidance from the U.S. Supreme Court in the *Daubert Trilogy* of cases. There is a movement abroad in civil cases to change the way expert witnesses interact in the courtroom to make the expert accountable to the court, and to provide expert evidence that is more useful to the judge.

An empirical study was conducted to assess the need for reform concerning expert witness testimony in Western United States water cases; and to assess the receptiveness of judicial and quasi-judicial officers to various reforms that have been proposed or adopted in England, Australia and other jurisdictions.

A survey was created for the members of Dividing the Waters (DTW) a water education project for judges and quasi-judicial officers. The study revealed that western water judges and administrative officers experience the same problems with expert witness testimony that are experienced in other common law adversarial systems abroad. The DTW survey also revealed substantial support for many of the reforms adopted in

England, Wales and Australia which involve a change in the culture of the adversarial use of expert witness evidence.

The DTW judges and administrative officers support reforms that will make experts acknowledge that their role and paramount duty is to be an advisor to the court, and not to be an advocate of the parties. They want greater transparency in expert witness reports. The judges and administrative officers want to know: what instructions the expert received; what the expert relied upon to base his or her opinion; what assumptions the expert made; whether and to what extent the written reports were edited by the parties or attorneys; whether the reports are inconsistent with other reports made by the expert in another tribunal; and whether the parties have used or intend to use a "shadow expert".

There is overwhelming support to require the experts to meet prior to trial or the hearing in order to narrow the issues, and to provide a joint report of matters upon which the experts agree and those upon which they disagree. They want the parties to consider whether or not a single expert should be appointed, and they want to encourage more frequent use of court appointed experts. Proposed rules are offered for consideration to implement the reforms that are supported by the majority of the participants in Dividing the Waters.

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I want to especially thank Dr. Freeman M. Smith, my advisor who kept me on task and provided steadfast guidance along the way. Co-Advisor Dr. Robert C. Ward and Dr. Neil S. Grigg, my other two committee members have been amazingly supportive, as well as great teachers and mentors. Dr. Lyn Kathlene and Jewlya Lynn from the Colorado Institute of Public Policy at Colorado State University provided invaluable guidance with the survey process.

Special thanks and love to my friends, colleagues and family, whose support, love and encouragement has always motivated me. My parents always encouraged me to take advantage of every educational opportunity. My children supported my decisions to

continue my scholarly studies. However, my husband Tommy H. Moss deserves the most appreciation for his amazing patience and encouragement.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

1.1 Introduction

In the last decade, drought, water shortages and increased pressure on urbanization have made water issues headline material. There is increasing pressure on water courts and administrative bodies to resolve disputes as a result of increasing competition for water resources. Added to the water scarcity and population increases are advances in technology in hydrology and engineering. The combination of these factors has emphasized the need for useful and reliable scientific and engineering expertise in the courtroom and administrative hearings to assist the decision makers.

Adding to the court's burden, have been the changing standards for admissibility of expert witness testimony under the state and federal rules of evidence, and the need to assimilate the standards by which those rules have been interpreted by the courts. Greater pressure has been placed on the judge to act as a gatekeeper. The judge is required to assess the qualifications of the expert, and his or her proposed theories and processes in order to determine whether or not to allow the expert to testify as to his or her opinions and conclusions. This gatekeeping function has translated into recommendations for judges to become more learned in the scientific method so that they

can assess whether the expert's methodology is scientifically valid, and whether that methodology can be properly applied to the facts at issue in the case.

The complexity of hydrological science and engineering in water matters makes this challenge even more pronounced. Most U.S. judges are generalists without special education in the sciences. They must rely heavily on the expert witnesses to assist them to understand the facts upon which their decision must be made. In the U.S. common law tradition, the parties select the witnesses and present them to the court for consideration. The process is by its nature adversarial and the culture is combative. The parties and their lawyers select expert witnesses whose role it is to help them win. The opposing parties will marshal their own experts, and the courtroom is transformed into a battle of experts. The judge or hearing officer is left to discern which party's expert to believe, often with experts reaching diametrically different opinions.

In water allocation cases, a water right must be defined and quantified, and in prior appropriation states there must be a showing that there is no injury to other water users. The judge or hearing officer must be informed as to the effect of altering diversions and return flows. Enforcement of prior appropriation requires sophisticated knowledge of complex systems involving surface and ground water sources that are hydrologically connected. As a result of technological advances of computers, hydrologic models have become an essential tool by the parties and their experts in water cases.

Because hydrologic modeling can be misused, the judge's gatekeeping role becomes that much more difficult. The quality and reliability of a hydrologic model may be suspect because of its complexity, the paucity of data used in calibration and

validation, and the lack of transparency. The existing rules of evidence and standards of admissibility dictate that a judge must become sufficiently knowledgeable in hydrologic science and engineering in order to assess the reliability, not only of the model, but also of the method by which the model is operated. The judge must not only understand the concepts of calibration and validation, he or she must determine whether the model has been operated in such a fashion that the results are reliable and useful to the court.

1.2 Purpose/Problem

The admissibility of expert testimony in water matters is based on the rules of evidence in civil cases. The literature describes the problems with expert testimony in general and the various ways in which courts have addressed the problems. There is a movement abroad in civil cases to change the way expert witnesses interact in the courtroom to provide expert evidence that is more useful to the judge.

The purpose of this study is twofold: 1) to assess the need for reform concerning expert witness testimony in Western water cases; and 2) to assess the receptiveness of judicial and quasi-judicial officers to various reforms that have been proposed or adopted in England, Australia and other jurisdictions. If the research reveals receptiveness to certain reforms, the goal is to make recommendations for ways to incorporate those reforms in water courts and administrative proceedings.

1.3 Methodology

A survey was created for the members of Dividing the Waters (DTW) a water education project for judges and quasi-judicial officers. The DTW survey instrument served two purposes, first to compare the issues and problems experienced by DTW with

experiences of Australian judges and magistrates; and second to determine the receptiveness of Western water judges and administrative officers to the various reforms that have been adopted in England and Wales and in Australia and New South Wales.

The DTW survey instrument included some questions that were patterned after two surveys conducted by the Australian Institute of Judicial Administration (AIJA). The first survey was of Australian judges. (Freckelton, Reddy, & Selby, 1999) The second survey was of Australian magistrates. (Freckelton, Reddy, & Selby, 2001) Additional questions in the DTW survey ask the participants to rank their support for sixteen different reforms.

The co-conveners of DTW agreed to participate in this study and provided mailing labels for the members. A letter encouraging participation from Colorado Supreme Court Justice Gregory J. Hobbs, Jr. was included in the survey package. The study was approved by the Colorado State University Human Research Committee. The DTW survey was mailed to all persons on the DTW mailing list, totaling 184 individuals in eighteen states. The list included state and federal appellate judges, trial judges, magistrates, referees, special masters, administrative hearing officers, permitting agency board members, and a few in other categories.

The survey instrument went through many reviews and iterations and was completed in consultation with Dr. Jerry Vaske, of Colorado State University, an expert in survey design. Practical advice was also gleaned from books including one by Salant and Dillman. (Salant, 1994). Also consulted were Dr. Lyn Kathlene, Director of the Colorado Institute of Public Policy at Colorado State University, and Jewlya Lynn, CIPP

Project Director; both with substantial experience with social science research. They provided guidance particularly as it related to pilot testing the survey.

Consideration was given to the style, format of question and answer choices, and terminology. In addition to my graduate committee, including Justice Hobbs, early drafts of the survey were reviewed by various individuals with experience in the U.S. court systems. Later versions of the survey instrument were reviewed in consultation with former Colorado Supreme Court Justice Rebecca Love Kourlis and others, at the Institute for Advancement of the American Legal System at the University of Denver. Input was further provided by former District Court Judge William Dressel, currently President of the National Judicial College.

A formal pilot survey was structured and conducted with sixteen participants, from three states, including appellate judges, trial judges, magistrates, a special master, water lawyers and engineers. Witten surveys were provided to each participant followed by an interview, conducted in person, on the telephone, or via email. The testing was conducted in two phases, with revisions to the survey made after the first phase.

The first phase included the Larimer County Colorado District Court bench, including all five judges and two magistrates. Several water attorneys and engineers participated in the first phase of the pilot study as well as an Arizona appellate judge.

After the first phase, several language changes were made in both the questions and answer choices to avoid misunderstandings and to provide appropriate answer choices. Some of the answer scales were changed and rearranged at the suggestion of the pilot testers.

One of the issues that arose related to the term 'bias.' It became clear that participants were each defining the term in their own way. This issue was also noted in the AJIA survey results. The AIJA survey did not define the word bias, and the variation in the recipients' interpretation caused some concerns with the AIJA results. (Freckelton, Reddy, & Selby, 1999) Prior to revising this question, contact was made with Ian Freckelton and Hugh Selby, who conducted the AIJA surveys, and they agreed that in hindsight a definition of the term would have been useful for the AIJA surveys. (Freckelton & Selby, 2007)

My proposal was to use the term "adversarial bias" and define it as "predisposition, inclination, or favoritism towards the party who called or hired the expert." I also discussed the proposed change with several first phase pilot-testers. There was concurrence that this was an appropriate definition and approach. The new definition was inserted in the survey instrument during phase two of the pilot testing. Feedback during phase two of the pilot testing confirmed that the issues that arose during the first phase had been resolved.

The DTW survey was mailed to all individuals on the DTW mailing list in June 2007. The final survey instrument is found in **Error! Reference source not found.** . In addition to the written survey, the survey was duplicated for access on the Internet. After approximately three weeks, a follow-up mailing was sent to those who had not responded, encouraging their participation and inviting them to use the survey posted on the internet for their convenience. Controls were put into place to limit access to the internet survey only to those DTW participants who had not already returned the paper survey. The follow-up mailing resulted in several additional surveys both on the internet

and by mail. Several individuals contacted me to explain that they had not completed the survey as they were on the DTW mailing list, but were not judges or quasi-judicial officers. Those individuals were removed from the survey's total population.

1.4 Organization of this Dissertation

This dissertation is an interdisciplinary study. It describes why the legal system needs scientists and other experts to help resolve conflicts; how science was first introduced into the courts; how courts have attempted to manage the opinions of the experts; and the problems that have plagued and continue to plague the interaction. The purpose of this study is to look at this interaction in the environment of water disputes. However, since civil rules and laws of evidence apply to the adjudication of water disputes, the literature concerning the general interaction of science and law and the rules of evidence are first described. In Chapter 4.3 these rules and laws are discussed in the context of water disputes.

Furthermore, in the United States the rules of evidence require the judges to only allow experts to give their opinions if they possess scientific, technical or other specialized knowledge. The court must determine if the expert's testimony is the product of reliable principles and methods and the expert has applied those principles and methods reliably to the facts. Judges are now expected to understand the 'scientific method' of truth seeking as well as concepts such as falsifiabilty and error rate. This gatekeeping role as discussed in the literature is described in Chapter 3.3.4.

The science of water is hydrology. Hydrologic models and their use in the adversarial setting are discussed in Chapter 4.3. The challenge for judges and quasi-judicial officers to be effective gatekeepers requires very specialized knowledge and

understanding of hydrology as well as other related sciences. The assessment of a hydrologic model is briefly discussed in Chapter 4.2.

International reforms concerning expert witnesses and the AIJA surveys are discussed in Chapter 5.2.4. The DTW survey and its results are reported in Chapter 6.3. Having been informed by the results of the DTW survey, proposed reforms are offered for consideration in Chapter 7.

1.5 Research Conclusions

The DTW survey revealed that western water judges and administrative officers experience the same problems with expert witness testimony that are experienced in Australia and in other international jurisdictions. The DTW survey also revealed substantial support for many of the expert witness reforms adopted in England, Wales and Australia.

The DTW survey informs us that there is support on the part of the bench for reforms that involve a change in the culture of the adversarial use of expert witness evidence. The DTW judges and administrative officers support reforms that will make experts acknowledge that their role is to be an advisor to the court, and not an advocate of the parties.

The DTW respondents want greater transparency in expert witness reports. The judges and administrative officers want to know: what instructions the expert received; what the expert relied upon to base his or her opinion; what assumptions the expert made; whether and to what extent the written reports were edited by the parties or attorneys; and whether the reports are inconsistent with other reports made by the expert in another tribunal. There is overwhelming support to require the experts to meet prior to trial or the

hearing to narrow the issues, and provide a joint report of matters upon which they agree and those upon which they disagree.

CHAPTER 2: WATER ALLOCATION LAWS IN THE WEST

2.1 History of Water Allocation in the West

The genealogy of western water adjudications is described in depth by John E. Thorson, a California Administrative Law Judge, the former Special Master for the Arizona General Stream Adjudication, and a co-convener of Dividing the Waters, water education project for judges. (Thorson, 2005) Thorson states that conflicts over scarce water resources are endemic to the western United States. Westerners rely on formal legal institutions to resolve water right conflicts along rivers and streams. In earlier times other cultural institutions exercised social control over water.

As early as 2000 B.C.E., the inhabitants of the Southwest progressed from a hunting and gathering subsistence to an economy based on domesticated agriculture. The Hohokam desert farmers and the Anasazi culture built impressive systems of irrigation. For early inhabitants of the American West, water embodied spiritual, cultural and utilitarian values and many of their traditions reflected a communitarian approach to water allocation and dispute resolution.

Later, around 1542, the Spanish arrived and the New Spain northern frontier included lands now comprising California, Arizona, New Mexico and Texas. According to Thorson, Spanish water law paralleled some of the community practices of Southwestern Indians but placed a greater emphasis on land and water as private

property. The Spanish water law system continues to impact water adjudications in the American Southwest, including the legal tradition that the Hispanic water regimen rested on a philosophical foundation designed to serve broad individual and community goals, and challenges judges to be guided by what is right and proper.

The settlement of the Mormons in the Salt Lake valley in 1847 resulted in the diversion of water for irrigation and the construction of diversion dams. The Mormon leadership applied principles of stewardship and productive use, and decided that natural resources were for public not private use. The doctrine of riparian rights was rejected and water publicly owned and managed. According to Thorson, similar water management institutions were established in Idaho, Arizona, Nevada and southern California. However, by 1880 the communitarian use of water began to give way, and pressure from a growing economy and populace encouraged the Utah territorial legislature to authorize county officials to grant individuals water rights.

Eventually territorial and state courts throughout the West, assumed the role of resolving water right disputes. Despite the Hispanic and Mormon influences, courts applied the rules and procedures of the Anglo-American legal tradition. That tradition involved common law principles of equity, where parties appeared in court seeking injunctive relief or money damages. Disputes rarely involved only two litigants and more frequently involved most water users on a river. Faced with an increasing workload generated by constant conflict over water rights, courts developed various procedures for trying these complicated cases. Some courts used referees or commissioners to hear and summarize the evidence for the court's benefit before trial. In other cases, the judge

would personally examine the water source; but in majority of cases the judge would submit questions of fact to the jury to solicit advisory opinions.

The population in the western states has increased approximately thirty-two percent in the past twenty-five years, compared with a nineteen percent growth rate in the rest of the nation. It is estimated that by the year 2025, the West will likely add another twenty-eight million residents. According to Justice Gregory Hobbs, the accelerating growth of the West makes fair and efficient administration of water rights the single most deserving feature of Twenty-first Century water policy. (Hobbs, 2007)

The regulation by states of water resources is accomplished through regulation of initial appropriations, supervision of diversion, distribution and use of water, and by the adjudication of existing water rights. According to Thorson, one of the major water policy issues in the West during the last one hundred and thirty years has been whether the executive or judicial branch should control these water management functions. Some states entrust these matters to the judiciary, others to an administrative agency, yet others fall between the two extremes. Illustrating the differences are the adjacent states of Colorado and Wyoming. Colorado relies almost entirely on an adjudicatory system, while Wyoming uses an administrative approach. (Thorson, 2005)

2.2 The Colorado System

The history of the Colorado administrative system began in 1878 with an irrigation convention called to develop legislation to end the disputes among rival irrigation colonies along the Cache la Poudre River. The convention proposed an administrative system of water commissioners empowered to determine and enforce water rights within each irrigation district. The proposed legislation empowered a water

commissioner to hear the case and render a decision that was appealable to the district court. However, when the bill reached the irrigation committee of the Colorado House of Representatives and its lawyer-members, the bill was rewritten to place the determination of water rights under the domain of the courts. Upon passage, the 1879 law authorized the judge to appoint a water referee to hear the evidence and present a report to the judge, who issued a decree. Water commissioners enforced the decrees. This approach committed Coloradoans to quantification and allocation of water rights in a judicial setting.

The system was criticized by District Judge Victor Elliott in 1880, when he refused to enter a decree, stating that to do so would be a departure from the English and American systems of jurisprudence. In the administration of justice, there must be parties and a dispute to be resolved. After the Colorado Supreme Court refused on a writ of mandamus to force Judge Elliott to enter a decree, the legislature amended the law to require adjudication proceedings to be initiated by petition. After filing a petition, the district judge appointed a referee, who issued notice to all claimants, held a hearing, and prepared a draft decree for the judge. The judge then conducted hearings issued a decree after making appropriate modifications. The clerk of the court thereafter provided the successful claimants with a certificate awarding an appropriation date and setting a quantity of water.

The revised laws did not allow the state engineer to participate in the adjudication or question the accuracy of claims. The courts operated without vital hydrologic information and awarded rights exceeding the capacity of the streams. The need for

involvement of the state engineer has since been remedied in subsequent legislation and restructuring of the water adjudication system.

Colorado water law underwent major revision with the Water Rights Determination and Administration Act of 1969, which applies to surface and groundwater that is tributary to surface water. Together, these are waters of the 'natural stream' that, under the Colorado Constitution's water provisions, are subject to appropriation and administration in order of adjudicated priority. The 1969 Act divided the state into seven water divisions, one for each of the seven major drainages in the state. Each division has a water engineer and water judges who are selected annually from among the district court judges in the division by the chief justice. These water judges have exclusive jurisdiction over all water rights adjudications.

Under the procedure, an application is filed with the clerk of the court for determination of water rights. Notices are provided by publication of a monthly resume of applications, the referee conducts a fact-finding inquiry, and the division engineer evaluates each application and makes a recommendation to the court. The referee may enter rulings or re-refer the application to the water judge. If the referee enters a ruling and the ruling is not protested, the water judge generally adopts the referee's findings and enters it as a judgment and decree of the water court. Once the application is referred to the water judge, it is placed on the judge's docket and is set for trial. The case proceeds in a manner similar to other civil cases. Any appeal to the water judge's final judgment is to the Colorado Supreme Court. (Johnson & Huff, 2006)

The essence of the Colorado system is that all surface and groundwater in Colorado is a public resource for beneficial use by public agencies and private persons.

A water right is a right to use a portion of the public's water resources. Those rights are usafructuory in nature and scope, and are evidenced by court decree. The Colorado Division of Water Resources, which includes the State Engineer, division engineers and water commissioners, has authority to administer all surface and tributary ground water in the state. Colorado has granted the state engineer considerable permit authority to administer designated, nontributary, and Denver Basin ground water, although they are allocated and administered differently than waters of the natural stream. In addition, the state engineer is authorized, for waters of the natural stream, without court adjudication to approve temporary changes of water rights, substitute supply plans, stored water banks and loans of water rights by farmers to cities, subject to an appeal to the water court. (Hobbs Jr., 2006)

2.3 The Wyoming System

The Wyoming system has its genesis with a former Coloradoan, Elwood Mead. Mead moved to Colorado in 1882 to teach math at Colorado Agricultural College (now known as Colorado State University). During the summers he gauged irrigation ditches for the state engineer and become concerned about the over-appropriation of streams that overly optimistic court decrees had caused. In 1886 and 1887 Mead helped to promote legislation to create a Board of Control to govern all water diversions using a water permit system. Mead was frustrated that the legislation never made it to the floor of the legislature for debate.

Mead thereafter moved to Wyoming and was appointed the first territorial engineer. Mead was influential with the Wyoming irrigation and water rights committee of the state constitutional convention to include an article in the Wyoming constitution

declaring that streams were the property of the state, therefore placing streams under the Board of Control, dividing Wyoming into four water divisions and creating the office of the state engineer. The legislature thereafter passed legislation providing that the only way to obtain new water rights was to apply to the state engineer.

In addition to awarding new water rights, the state engineer oversaw the adjudication of existing rights. The Wyoming process withstood a challenge to its constitutionality under the doctrine of separation of powers. The Wyoming Supreme Court found that the Board acted in a quasi-judicial capacity which was appropriate for boards under the executive branch of government. (Farm Investment Company v. Carpenter, 1900)

The essence of the Wyoming system is that it subordinates the individual appropriator's rights to the welfare of the state. Alaska and Nebraska generally follow the Wyoming permit system. (Thorson, 2005) Water is considered the property of the state; the rights to its use are granted by the state, adjudicated by the state, and protected by the state. (Dunbar, 1983) The state engineer can initiate adjudication by measuring stream flow and gauging the capacities of the ditches it serves. The divisional superintendent conducts hearings and compiles evidence on existing uses. Final reports of the superintendent and engineer are submitted to the Board of Control which makes a final quantification decision and sets priority dates.

Under Wyoming Statute section 41-2-111, upon the request of the state engineer, the attorney general shall bring suit in the name of the state of Wyoming in district court to enjoin the unlawful appropriation, diversion, or use of the waters of the state. An appeal from the district court judgment or decree is to the Wyoming Supreme Court; and

at the request of one of the parties the case will be moved to the head of the docket and given precedence over all other civil matters.

2.4 Hybrid Approaches

In 1904 a model code for state administration was drafted by a U.S. Reclamation Service lawyer-engineer by the name of Morris Bien. The "Bien Code" called for a state administrative agency to make hydrographic surveys and develop related data. Upon completion of the survey the agency delivered the data to the state attorney general, who then brought suit and made all water users in the basin parties to the action. The Code also gave the attorney general the authority to intervene in pending water adjudications. After the court completed hearings on objections it issued a final decree. Throughout the proceedings the court could call upon the administrative agency to provide it with hydrological facts. (Thorson, 2005)

The Bien Code also vests the state engineer with the authority to issue permits for new water uses. Once a user established a beneficial use under the permit rules, the state engineer issued a certificate of water right. According to Thorson, the Bien Code was used as a model for general stream adjudications in North Dakota, South Dakota, New Mexico and Oklahoma.

Another hybrid system was formulated in 1909 in the state of Oregon. Similar to Wyoming, the Oregon adjudication process begins with the state engineer who undertakes a hydrographic survey and prompts water users to secure their claims with filings. The state engineer then develops a proposed order of determination specifying water rights and their respective priorities. The proposed order is filed with the district court, which holds hearings on objections to the proposed order. If there are no

objections, the district court is required to affirm the proposed order. The Oregon approach is substantially followed in Arizona, California, Nevada, Texas, Utah, Washington and Idaho. (Thorson, 2005)

Whether they use the permit system or a hybrid system, all of the states have found they need some sort of court-adjudication for settling the relative priorities of all users in a stream system. (Hobbs Jr., 2006) None of such cases are tried to a jury; therefore the judge is the sole decision maker. (Hobbs Jr., Personal Communication, 2007)

CHAPTER 3: LITERATURE REVIEW

3.1 The Need for Reform

There are cultural differences between science and law as well as differences in their objectives. Scientists are trained to be in search of "truth" with no time limits and no point at which a final decision must be made; while lawyers are trained as advocates and the courts are expected to settle disputes; with a final decision sought by the parties to be rendered by the court in a limited period of time. (Bair, 2001)

Robert Angus Smith in an address to the Royal Society of Arts in 1860 stated that the root of all evils lies in the partisan position that men of science have come to occupy in the courtroom. If the scientist is allowed or encouraged to become an advocate, the very ideal of his character is destroyed and the scientist is given duties which he never was intended to perform. Scientists are taught to study impartially and then in the courtroom are told to practice with partiality. This division of the moral nature of man is extremely hurtful, both to the individual and to society. Smith believed that no class of men would so fully agree with each other as the scientific, if they were not kept separate by the system, and no class of men will spread a more beneficial influence over society, if they are not contemptuously treated by counsel, as they often are, in a witness box. (Smith, 1860)

The problems outlined by Robert Angus Smith in 1860 have continued to plague the civil justice system and in many instances have been compounded. The need for civil

justice reform in England and Wales was the focus of an inquiry by Lord Harry Woolf beginning in 1994. Lord Woolf was appointed in March of 1994 by the Lord Chancellor of the Department for Constitutional Affairs to review the rules and procedures of the civil courts in England and Wales. The aims of the review were to: (a) improve access to justice and to reduce the costs of litigation; (b) reduce the complexity of the rules and modernize technology; and (c) to remove unnecessary distinctions of practice and procedure.

Lord Woolf's inquiry in part disclosed that expert witness testimony was expensive, time consuming and fraught with partisanship. The problems that persist in England parallel the problems that generally are found in all legal systems that are derived from the adversarial common law tradition. Lord Woolf asserted that the fundamental problems throughout common law legal regimes did not concern the substance of court decisions, but concerned the processes leading to judicial outcomes. Common law process is "too expensive, too slow, and too complex" and advantages certain litigants over others, and as a result the process within the common law tradition affords inadequate access to justice and produces an inefficient and ineffective legal system (the "Interim Report"). (Woolf, 1995)

Lord Woolf's solutions for alleviating the problems of process, however, proved to be even more important than his findings. (Vorrasi, 2004) Discontented with the consequences of an unfettered adversarial system in which the parties maintain decisive control over the progress and costs of litigation, Lord Woolf called for a "fundamental shift" in the responsibility for the management of civil litigation in England from the litigants to the courts. Under this transformation, there is a heightened responsibility of

judges to engage in active case management drastically altering the former adversarial culture. Judges, rather than the parties, maintain the ultimate task of identifying and narrowing the issues and setting stringent timetables in an effort to reduce cost and delays and to encourage settlement. Commonly referred to as the “Woolf Reforms”, the reforms’ enlightenment and emphasis on judicial case management now constitute the foundational philosophy of the Civil Procedure Rules 1998 and the English civil litigation system as a whole. (Vorrasi, 2004)

Although both the English and United States systems experience similar problems giving rise to judicial case management, judges function in distinct contexts and within differing sets of procedural values in England and the United States. For example, judicial management of civil litigation in England has only taken root within the past two decades, while case management in the United States was contemplated in the original drafting of the Federal Rules of Civil Procedure in 1938. (Vorrasi, 2004)

As it relates to expert witness testimony, the Woolf Reforms give the court control over the introduction and scope of any expert evidence sought to be adduced. They emphasize the expert's primary duty to the court rather than to the client. They require the expert to acknowledge that duty, and to agree to adhere to a specified code of conduct which promotes independence and impartiality. The Woolf Reforms also promote the use of a single joint expert. The Woolf Reforms have received favorable attention internationally, and similar reforms have been adopted or proposed in many other jurisdictions. The Woolf Reforms and the international response are described in Chapter 3.2.2.

The United States civil justice system which primarily adopted the English civil system has also recognized problems with expert testimony in the courts. However, the approach to solving the problems has been very different. The focus has been primarily on avoiding 'junk science' by limiting the admissibility of the experts or their testimony. Reforms in the rules of evidence which define the standards of admissibility and the outcome of those reforms have received a great deal of attention in the legal literature as described in Chapter 3.4.

3.2 The Evolution of Scientific Expert Testimony in England

Historian Tal Golan describes the history of scientific expert testimony in England and America, and shows that the discontent with scientific testimony in the courts has existed as long there have been scientific expert witnesses. (Golan, 2004) According to Golan, the story begins in eighteenth century England. At that time, natural philosophy was a scholarly study of nature in general. By the end of the eighteenth century the focus was on the inanimate world, and scientists were using experimentation and mathematics to apply book learning to more practical utilitarian purposes.

At the same time, lawyers were taking control of the production of evidence in the courtroom. According to Golan, at the beginning of the eighteenth century, the courts were dominated by criminal cases in which the accused represented themselves. Evidence was presented either by an in-court altercation between the accuser, the accused, and other witnesses, or the judge examined the parties and the witnesses himself. However, by the end of the eighteenth century the lawyers had taken over the examination of witnesses, had developed techniques for cross-examination, had established their right to argue points of law, and had transformed the legal system into

the adversarial system as we know it today. The role of the judge became more akin to that of an umpire.

Early in the eighteenth century, experts appeared in the court, either as part of the jury or as court advisers. In such instances the experts were there at the request of, and under the control of, the judge. However, as the judge gradually assumed a neutral position and as litigants summoned their own experts to represent them before the jury, the adversarial system gave way to a new place for the expert witness.

The conflict between men of science and men of law is said to have come to a head in 1782. (Folkes v. Chadd, 1782) This case is also known as the Wells Harbor case where litigants brought many "men of science" to testify before the jury as to what had caused the decay of a certain harbor on the Norfolk coast of England. The testimony of one of the experts, a prominent Newtonian philosopher was disallowed because of the adverse party's objection that his philosophical explanations were a "matter of opinion, which could be no foundation for the verdict of the jury." It was on appeal, that Lord Mansfield, Chief Justice of the King's Bench, found it to be an error to have silenced the philosopher, and he granted a new trial on the ground that the philosopher's theory "was very proper evidence." (Golan, 2004)

Legal literature cites Lord Mansfield's opinion on appeal as the principal precedent for use of expert knowledge in the modern Anglo-American courtroom. According to Golan, the Wells Harbor litigation constituted an important historical moment in the deployment of expert knowledge in the courtroom, because it was a junction where the expanding late eighteenth century cultures of law and science crossed paths. The lawyers had been solidifying their control over the production and

presentation of evidence in the courtroom, and natural philosophy had shown signs of becoming a competent branch of applicable knowledge.

This intersection was recognized by the famous John Henry Wigmore, the leading early twentieth century authority on legal evidence. According to Wigmore, Lord Mansfield's decision epitomized "the general recognition by the end of the 1700's, that there was a class of persons, i.e., those skilled in matters of science, proved, though they personally knew nothing about the circumstances of the particular case, might yet, perhaps by way of exception, give their opinion on the matter." (Wigmore, 1904)

Therefore, by the end of the eighteenth century, there was recognized a new class of persons, skilled in matters of science, who could give their opinion, even if it was not based directly on the traditional trustworthiness of the senses. This was the birth of an exception to the doctrine that opinion evidence is not evidence at all and is not admissible in the courtroom. Men of science brought to the courts knowledge that was often based on the imponderables of nature, which was left to the philosophers to discover by reasoning upon a chain of facts. Lord Mansfield was unwilling to distinguish one science from the other and therefore measured professional reputation instead. If the proposed witness was known as an expert on the matter before the Court, according to Mansfield, his opinion, formed on facts, was proper evidence. (Folkes v. Chadd, 1782)

In addition to heralding the exception to the opinion rule, Mansfield's decision also heralded an exception to the rule that a witness with an interest in the result of the trial was rendered an unreliable witness. Persons were not allowed to testify in cases in which they had a financial interest, husbands could not testify against wives and vice versa, and parties to the lawsuit themselves were not allowed to testify. Golan suggests

that the reason that the partisan scientific expert was allowed to testify was that judges counted on men of science to give, by ties of honor, unbiased opinions on matters beyond the ken of the jurors. (Golan, 2004)

Men of science had long adopted a gentlemanly code of honor as a necessary condition for the reliability of the scientific discourse. The status of the gentlemen (his economic independence, his freedom of action, his moral discipline) guaranteed the credibility of his word. Nothing would ruin a gentleman's status more than to be perceived as dishonest. As noted by Golan, during the eighteenth century, the Royal Society continued to strengthen its status as a body of disinterested gentlemen, who impartially investigated nature and worked only for the improvement of the public good. The judges, therefore, were not worried about the behavior of men of science. The judges trusted that their expert testimony would correspond to their true opinion, and that their opinion would not be swayed by the party for whom they would be testifying.

In the early nineteenth century, there was a tremendous expansion of science and technology into industry and other public sectors. This quickly established the scientific expert witness as a pivotal figure in the courtroom and partisan expert testimony became acrimonious. Often experts found themselves manipulated in the hands of lawyers whose job in the courtroom was to win a case. According to Golan, the result was a continuous parade of leading men of science, zealously contradicting each other from the witness stand. This parade cast serious doubts on their integrity and on their science in the eyes of the legal profession and in the eyes of the public. Thus, according to Golan, while the volume of expert testimony was constantly increasing throughout the nineteenth century, the respect paid to it by the courts and the public was constantly diminishing.

The respect for scientific evidence shown by Lord Mansfield in 1782, had been so diminished that by 1862 the conviction of most judges was that scientific testimony rather than being decisive and convincing, was instead, the most suspicious and unsatisfactory of the testimony before them. (Golan, 2004) Scientific expert testimony became the subject of public scandal. By 1859, a campaign was underway and brought before the National Association for the Promotion of Social Sciences (NAPSS) to reform the legal procedures of expert testimony. A letter to the editor of the *London Times* published August 27, 1859, by a highly respected lecturer on chemistry in London, wrote that the contradiction of science in the courts, the uncertainty of its results, and the conflicting testimony of the expert witnesses, have deprived the testimony of its value. The letter concluded that if science is ever going to be become a true ally of law, it must be taken out of the hands of the interested parties and employed methodically as a state engine. (Golan, 2004)

Also speaking before the NAPSS was Robert Angus Smith a leading expert for the defense in an 1857 pollution case. According to Golan, Smith must have found his experience in that case very disturbing because he never again appeared in the courts of law. Smith argued that the only way a judge could understand science would be by being made into a scientific man or by having a scientific advisor. Smith did not desire to make the judge into a scientific man, nor the scientific man into a judge, but he believed that the use of science in the courtroom needed to be regulated by law.

Smith recommended a three-part reform:

1) Give the scientific men who represented the party an independent status in relation to the barristers (attorneys);

2) Allow the scientific men to give their evidence in writing, with examination and cross-examination by the attorney to follow; and

3) Have a scientific assessor on the bench besides the judge, to examine the witnesses and advise the judge.

The reforms proposed at that time were to eliminate the jury in civil cases of a technical nature and instead have the trial to the judge and up to three skilled assessors (experts). The lawyers voiced the other side of the discourse, stating that the legal system had no place for such reforms by the scientific community. Getting rid of the jury ran against the fundamental right of trial by jury of one's peers. Further, allowing the court to call in expert witnesses was contrary to the right of the parties and their lawyers to present their evidence to a neutral court. Such remedies were considered by lawyers to be remedies worse than the disease.

No resolution was reached, and the expanded use of experts made courts more dependent on their advice and lawyers more likely to bolster their cases with experts. By the end of the nineteenth century, there were many scientific gentlemen who instead of laboring for the love of knowledge were earning their living from appearances in court and tailoring their opinions to the wants of their clients. (Golan, 2004) It was not until the end of the twentieth century did things change substantially.

3.2.1 The Ikarian Reefer

A turning point for expert witness testimony occurred in 1993 in an English case which set out the duties and responsibilities of expert witnesses. The case is commonly referred to as "*The Ikarian Reefer*". (National Justice Compania Naviera SA v. Prudential Assurance Co. Ltd., 1993) In that case, the Court had to decide whether the ship had

been deliberately set on fire by its crew based on the instruction of its owners, and whether the defendant insurance company should pay the amount insured.

The pretrial and trial judges went to great lengths to control the use of experts, because of the number and complexity of technical issues. Throughout the trial, Justice Cresswell held regular reviews with counsel concerning the use of expert evidence, and unsuccessfully attempted to narrow the issues with a pretrial meeting between experts. Despite this, the use of expert evidence at the trial was often unnecessary. For example, one expert spent several days giving testimony on the heating of a valve mechanism, but the valve mechanism was not considered in the defense counsel's closing submissions, indicating that the defendants did not consider it important in their case. In addition, the trial judge believed that the expert opinion was at times biased, shaped towards their client's case, and intended to conceal information from the other side. (Dwyer, 2003)

The court's frustration is evidenced in the final opinion which stated:

a. Expert evidence should be, and should be seen to be, the independent product of the expert uninfluenced as to form or content by the exigencies of litigation;

b. An expert witness should provide independent assistance to the Court by way of an objective, unbiased opinion in relation to matters within his or her expertise. An expert should never assume the role of advocate;

c. An expert witness should state the facts or assumption upon which his or her opinion is based. He or she should not omit to consider material facts which could detract from his or her concluded opinion;

d. An expert should make it clear when a particular question or issue falls outside his or her expertise;

e. If an expert's opinion is not properly researched because he or she considers that insufficient data is available, then this must be stated with an indication that the opinion is no more than a provisional one.

f. In cases where an expert witness who prepared a report cannot assert the report contains the truth without some qualification, that qualification should be stated in the report;

g. If, after exchanging reports, an expert changes his or her view on a material matter having read the other side's expert's report or for any other reason, such change of view should be communicated through legal representatives to the other side without delay and, when appropriate, to the Court;

h. Where expert evidence refers to photographs, plans, calculations, analyses, measurements, survey results or other similar documents, these must be provided to the other side at the same time as the exchange of reports.

The points made by the opinion in *The Ikarian Reefer* case have been cited favorably and proposed as an expert witness code of conduct by Lord Woolf in the Interim Report, by the New South Wales Law Commission (New South Wales Law Reform Commission, 2005) and by a number of Canadian decisions. (Bogoroch & Goldstein, 2003)

3.2.2 The Woolf Reports

Lord Woolf's review resulted in an Interim Report published in 1995 (Woolf, 1995) and a Final Report published in 1996 (Woolf, 1996) The Interim Report quoted an editorial from the journal *Counsel* for November/December 1994:

> "Expert witnesses used to be genuinely independent experts. Men of outstanding eminence in their field. Today they are in

> practice hired guns: there is a new breed of litigation hangers on, whose main expertise is to craft reports which will conceal anything that might be to the disadvantage of their clients. The disclosure of expert reports, which originally seemed eminently sensible, has degenerated into a costly second tier of written advocacy. Costs of experts have probably risen faster than any other element of litigation costs in the last 20 years. This deplorable development has been unwittingly encouraged by a generation of judges who want to pre-read experts' reports before coming into court, and by practice directions stipulating that the reports be lodged in court to enable them to do so. What litigant can ignore an opportunity to implant his case in the judge's mind before the hearing begins?"

Lord Woolf stated that the situation described above is not confined to England and Wales. The change in the role of experts into additional advocates of the parties is a phenomenon well known in the United States of America and one which is causing real concern in Australia. Unless remedial measures are taken the position is likely to deteriorate further rather than improve. (Woolf, 1995)

Lord Woolf was troubled not only that experts had become partisan advocates rather than neutral givers of opinions, but also by the escalating cost of expert witnesses and the delay caused by the need to engage experts.

Following the Final Report’s recommendations for reform, the Civil Procedure Rules 1998 (CPR) were implemented and adopted on April 26, 1999. These rules have been called the most far-reaching reforms to court procedures in England and Wales in 125 years. (Hunton & Williams, 2003) The Final Report included many recommendations for reform; however this study is limited to the reforms which deal with the use of expert witness testimony. A detailed review of the reforms related to expert witnesses is found in Chapter 5.1.

3.3 The Evolution of Scientific Expert Testimony in the United States

The issues surrounding expert testimony in England were also concerns in the United States. A study conducted on expert testimony took first prize in 1870 at Harvard Law School. The study reported that eminent judges and jurists were attaching less and less importance to expert testimony because of "the surprising facility with which scientific gentlemen will swear to the most opposite opinions upon matters falling within their domain." (Anonymous, 1870) U.S. Supreme Court Chief Justice Morrison Remick Waite in 1874, commented on how experts were arrayed against each other, "prostituting at times the science which they professed to represent . . ." (Waite, 1874)

Although similar problems developed with expert witness testimony there was a difference between the English and American courtrooms. Although the English legal system recognized the jury as the final adjudicator on the facts of the case, it **did** allow judges the freedom to take part in the questioning of the witnesses, to advise the attorneys in the framing of their questions, and to comment on the weight of the evidence and the credibility of the witnesses to the jury. In addition, by the 1870's, the English judges were given the discretion in civil actions to order a trial without a jury in any matter requiring scientific investigation that in their opinion could not conveniently be made with a jury. The American judges did not have this discretion. Judges were expressly forbidden by Constitutional provisions to charge the jury on questions of fact. Only in Federal courts and a minority of state courts were judges allowed to comment on the weight of the evidence as they charged the case to the jury. (Golan, 2004)

In spite of these differences, the problem with expert testimony developed in both countries in the same manner. The American courts involved the same adversarial

procedures of common law and the American scientific community had the same expectations of the scientific method as their English counterparts. In 1866, similar to the lobbying efforts of Dr. Smith to the Royal Society of Arts, Judge Emory Washburn brought the same issue before the members of the American Society of Arts and Sciences. However, according to Golan, the nineteenth century American scientific community lacked the organization, status, and political resources needed to challenge the legal system and its procedures.

The reform of expert testimony became one of the hottest topics in the meetings of the various bar associations in the late nineteenth century, and many bills were drafted to remedy the evils of expert testimony. However, the American legislative bodies were reluctant to make such reforms and those that did were promptly held to be unconstitutional. (Golan, 2004) According to an article written in 1999, expert witnesses testify in approximately eighty percent of all civil cases, and they are often scientists and engineers. (Petroski, 1999)

3.3.1 The Law of Evidence

The judicial process concerning expert testimony has been likened to a communication system. The expert witness is the source or transmitter of data, the testimony is the communication channel, and the jury is the receiver. Both the English and the United States systems were unable to control the transmitter (the expert witness) during the nineteenth century. The English royal judges were able, to an extent, to control the operation of the receiver (the jury), but the United States courts were not so allowed. The only option was to control the communication channel - the forms in which the experts were allowed to communicate their opinions to the jury. The United States

courts concentrated their attempts for reform related to scientific expert testimony within the laws of evidence. (Golan, 2004)

A number of rules were developed to prevent the expert from giving an opinion on the ultimate issue to be decided by the jury. Rules allowed hypothetical questions based on long and cumbersome premises. However, since hypothetical questions were designed and controlled by the interested parties and their attorneys, they often resulted in manipulating the facts. Forced to assume such facts as true, the expert was subjected to manipulation and forced to give an answer contrary to his true conviction. As described by Professor Wigmore, Dean of Northwestern Law School, and well known expert on the laws of evidence, it was ironic that one of the truly scientific features of the law of evidence, the hypothetical question, became that feature which caused scientists the most disgust with the laws of evidence. The laws of evidence had become so complex, filled with exceptions, exclusions and distinctions, that it took Professor Wigmore four volumes to cover it. (Wigmore, 1904)

The struggle by the United States courts to stem the tide of scientific experts, and the onslaught of creative scientific theories in the courtroom, finally came to a head in the early 1900's. Science had permeated the courtroom and scientists were playing an increasingly pivotal role in the litigious activities of relatively new activities such as energy (gas and electricity), environment (pollution and contamination), public health (food and drug adulteration, water supply, sewage treatment), communication, transportation, agriculture, mining, industry, insurance, malpractice, and patents. (Golan, 2004) There were also many cases in the forensic sciences such as microscopy and toxicology. As declared by Justice Oliver Wendell Holmes in 1897, "The black letter

man may be the man of the present, but the man of the future is the man of statistics and the master of economics." (Holmes, 1897) Holmes' statement reflected the growing acceptance by the legal community that law is an organic part of the greater society and should reflect its mores.

3.3.2 The Frye Test

By the early years of the twentieth century, some of the social sciences also found themselves in the courtroom. A turning point in American legal and scientific history occurred in the context of experimental psychology. Hugo Münsterberg, born and educated in Germany and having earned a Ph.D. in physiological psychology, conducted experiments and published articles which tied law and psychology together in the form of physical evidence. A Harvard undergraduate student named William Marston was a student in Münsterberg's laboratory when they conducted experimental work on the psychology of testimony. Marston conducted his own experiments with what is known as deception tests. He found success with the blood pressure cuff and published his results. During the First World War the United States Government summoned him to Washington and the government found his test to be superior over others, with a ninety-seven percent success rate. He was thereafter allowed to participate as a civilian volunteer in spy cases.

At the same time that Marston was continuing his work and publishing the results with respect to lie detection, the desire to use a deception test in defense of the accused arose in a Washington D.C. criminal case. The accused was a young African-American, named James Alphonso Frye who had been arrested on robbery charges. A few days after his arrest, Frye had confessed to an unsolved murder of a wealthy African-American

physician who had been shot in his office eight months earlier. Frye retracted his confession, stating that he had confessed only because an investigator told him that he would squash the robbery charges on Frye and give him half of the $1,500 reward for the conviction of Dr. Brown's murder. According to Frye, the detective that promised him such things stated there would be nothing to the murder charge after the reward was paid because he knew that Frye had a rock-bottom alibi. (Starrs, 1982)

At that time, Frye's attorney did not believe him and advised him to plead guilty. When Frye refused to plead guilty, the original attorney dropped the case and the Court assigned Frye to an energetic, young attorney named Richard Mattingly who had, according to Golan, no reputation to lose and was willing to represent Frye for the experience and the small fee paid by the District of Columbia. (Golan, 2004) After a number of unsuccessful attempts to discredit Frye's confession and to explain to the court that Frye had been lying at the time of the confession, Mattingly contacted Marston. (Marston, 1938)

Marston conducted experiments on Frye proving that he had been lying and that the confession was not true. Unfortunately, Mattingly was unsuccessful in getting Marston accepted as an expert witness to testify to the result of the deception test. The judge refused to admit the results of the deception test on various technical grounds. Mattingly then attempted to get Marston admitted as an expert to testify for the purpose of showing that the detection deception test was not mere theory, but that it was generally known among experts, and that it had been in practical use to determine when an individual was lying. (Marston, 1938)

The judge did not rule for the admissibility, stating that until there is an infallible instrument for ascertaining whether a person is speaking the truth or not, he would not rule for its admissibility. The case was appealed to the Court of Appeals at the District of Columbia and on December 3, 1923, the Court of Appeals submitted its written decision. In a very short opinion, the Court chose to exclude Marston's deception test on the strength of an innovative argument that it had not yet gained "general acceptance in the particular field in which it belongs."

> "Just when the scientific principle or discovery crosses the line between the experimental and the demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while Courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs. We think that the systolic blood pressure deception test has not yet gained such standing qualifying scientific recognition among physiological and psychological authorities as would justify the Courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made. The judgment is affirmed." (Frye v. United States, 1923)

Hence, this historic decision, now known as the *Frye* test or the "general acceptance test," set the standard for the exclusion of scientific evidence in the courtroom. This decision has survived decades, and was accepted for most of the twentieth century as the standard for admissibility of new scientific evidence in practically all of the courts in the United States.

3.3.3 The Federal Rules of Evidence

The *Frye* test was the sole guidance for federal courts for the admissibility of expert testimony until 1975, with the enactment of the Federal Rules of Evidence. The Federal Rules of Evidence created a new standard for federal courts to evaluate the

admissibility of expert testimony. Rule 104(a) placed the power of determining the qualifications of a witness in the hands of the judge. That rule stated that preliminary questions concerning the qualifications of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by court, subject to the provisions of Rule 104(b). In making this determination, the court is not bound by the Federal Rules of Evidence except those with respect to privilege.

The newly-created Rule 702 set out new criteria for courts to employ while evaluating the admissibility of expert testimony. Under that Rule, if scientific, technical, or otherwise 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.

3.3.4 The *Daubert* Trilogy

In 1993, the U.S. Supreme Court found the enactment of Federal Rules of Evidence had superseded the traditional *Frye* general acceptance test for the admission of supposedly scientific testimony. (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993) In *Daubert*, the Court noted that Federal Rule of Evidence 402 appears to require the admission of all logically relevant evidence unless the judge can rationalize the exclusion under the Constitution, a statute, the Federal Rules of Evidence, or Court rules adopted pursuant to statutory authority. It therefore appeared that *Frye* did not survive the passage of the Federal Rules of Evidence.

In addition, Justice Blackmun delivering the majority opinion of the Court wrote that the text of Rule 702 states that a witness can qualify as an expert by reason of

possessing “scientific, technical, or other specialized knowledge.” Justice Blackmun explained that in order to qualify as scientific knowledge, an inference or assertion must be derived by the scientific method. That scientific method is “a process for proposing and refining theoretical explanations about the world that is subject to further testing and refinement.” (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993) The Court further stated that the methodology is based on generating hypotheses and then testing them.

Unlike an ordinary witness, an expert is permitted wide latitude to offer opinions, including those that are not based on firsthand knowledge or observation. Presumably, this relaxation of the usual requirement of firsthand knowledge is premised on an assumption that the expert's opinion will have a reliable basis in the knowledge and experience of his discipline. Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset, whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a twofold preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid, and whether that reasoning or methodology can be properly applied to the facts at issue in the case.

In order to give the lower courts additional guidance, the majority opinion added general observations which identified factors that trial judges could consider in assessing the soundness of the methodology underlying scientific testimony. The Court emphasized that it did not intend to set out a definitive checklist or test, however the Court did enumerate four factors:

(1) Whether the theory or technique has been tested or is subject to being tested? (falsifiability)

(2) Has the theory or technique been subjected to peer review and publication? (peer review)

(3) What is the known or potential rate of error in applying the particular scientific theory or technique? (error rate)

(4) To what extent has the theory or technique received general acceptance in the relevant scientific community? (general acceptance)

The result of enumerating those factors was that the *Frye* general acceptance test was no longer the ultimate standard of admissibility, but was merely a factor to be considered among the other factors when the *Daubert* case was remanded to the trial court for application of the new test. According to the trial judge on remand, this was a daunting task and had thrust him and other trial judges into a Brave New World. (Daubert v. Merrell Dow Pharmaceuticals, Inc. , 1995)

The previous *Frye* standard had spared judges from having to assess directly the caliber of scientific testimony. (Faigman, Porter, & Saks, 1994) It has been noted that one of the reasons that the *Frye* test had been so popular, was that trial judges could apply the test without learning anything about the relevant science; all the judge had to do was determine the degree of popularity of the theory. Hence the *Frye* general acceptance test is sometimes referred to as "nose counting."

The factors enumerated by the U.S. Supreme Court in *Daubert* have since come to be known as the *Daubert* factors, and the analysis under Rule 702 has come to be known as the *Daubert* analysis. Therefore, faced with a proffer of expert scientific testimony the trial judge must determine at the outset, whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or

determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid, and whether that reasoning or methodology properly can be applied to the facts in issue. *Daubert* made it clear that trial judges were to be the gatekeepers of expert testimony in the courtroom in accordance with Rule 702.

Two subsequent U.S. Supreme Court cases confirmed and extended the *Daubert* decision. (General Electric Co. v. Joiner, 1997) (Kumho Tire Co. v. Carmichael, 1999) The three cases together have since been referred to in the literature as the *Daubert Trilogy*. In *Joiner*, the Court examined the proper standard that appellate courts should use when reviewing a trial court's decision to admit or exclude evidence. It concluded that appellate courts should not overturn the admissibility decision of a trial court unless the trial court has abused its discretion.

The U.S. Supreme Court in *Kumho* explicitly extended the *Daubert* factors to expert evidence outside of those narrowly defined as scientific, stating that judges are to insure the relevance and reliability of all expert evidence, not just expert evidence in so-called hard sciences. The Court also confirmed that the *Daubert* factors were examples of matters that judges should consider in evaluating reliability, but that they were neither mandatory nor exhaustive.

Rule 702 was amended in the year 2000 to specify certain requirements concerning the admissibility of expert testimony. The additional factors in Rule 702 are: 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.

An avalanche of articles, analyses, and studies has analyzed the *Daubert Trilogy* from nearly every possible angle. In addition, the issue has been discussed in many forums. The Carnegie Corporation of New York established the Commission on Science, Technology, and Government to explore the increasing importance of scientific understanding to decision-making in government. The Commission's work dramatized the connections and tensions between science and the law. In response to those connections and tensions, the National Academies created the Science, Technology, and the Law Program (STL) in 1998 to more fully explore these issues. A two-day meeting was held in March, 2000, in which a major topic, "Scientific Evidence", was explored and resulted in a workshop held on September 7, 2000.

The purpose of the Scientific Evidence Workshop was to fully air all points of view about the controversial issue of admitting scientists and their testimony into the courtroom. A primary goal of the workshop was to seek ways to improve communication between scientists, lawyers, judges, and juries. In addition, the workshop recognized the need to inform the scientific community about how and why science is presented in a certain manner in court, revealing why some points of view that find their way into the courtroom may seem "extreme" or outside the prevailing scientific community consensus. In addition, it recognized the importance to inform the legal community about the scientific method, the scientific concept of the "truth," and the reasons why some of the most qualified scientists may be reluctant to testify in court. (Science, Technology, and Law Panel, National Research Council, 2002)

The National Academies had earlier promoted the argument that scientific evidence in the courtroom should be evaluated by the standards of the scientific

community; and through filing an *amicus* brief (friend of the court) it had some influence on the U.S. Supreme Court's final decision in *Daubert*. Justice Blackmum noted that "there are no certainties in science," and quoted the American Association for the Advancement of Science/National Academies of Science joint *amicus* brief that science is not an encyclopedic body of knowledge about the universe. Instead, it represents a *process* for proposing and refining theoretical explanations about the world and is subject to further testing and refinement. (Science, Technology, and Law Panel, National Research Council, 2002) However Chief Justice Rehnquist, in the *Daubert* minority opinion expressed concern, stating although Rule 702 confides some gatekeeping responsibility on the trial court, it does not impose on them either the obligation or the authority to become amateur scientists in order to perform that role.

The impact of *Daubert* is not limited to federal courts. The shadow of *Daubert* now casts itself over state court opinions even in jurisdictions that have not formally adopted the *Daubert* test. (Faigman, 2003) and (Gianelli, 2003) Most states followed *Frye* at least with respect to new scientific theories and processes. Over the years a number of states have formally adopted the *Daubert* standard; many have expressly rejected the *Daubert* standard and chosen to retain *Frye*; and yet others have a combination or hybrid standard for admissibility. (Cwik & North, 2003)

3.3.5 Defining Terminology

In the aftermath of *Daubert*, lawyers and scientists have attempted to simply define the following terms: falsifiability, error rate, peer review and general acceptance. This is because, although most people appreciate scientific knowledge, they do not understand how science works, through formulation of hypotheses and testing, nor do

they understand the institutional mechanisms that science has developed for sharing and evaluating results. (Ayala & Black, 1993)

The scientific method has been described as follows. Initial observations are made and a question is formulated. A hypothesis is then developed and experiments are prepared to test the hypothesis. The experimental data are analyzed and conclusions (inferences) are drawn as to whether to accept or reject the hypothesis. If the hypothesis is accepted, the work is commonly submitted for publication in a professional journal where it is scrutinized by peer reviewers to assess its acceptability for publication. This process is generally referred to as 'peer review.' If accepted for publication, the greater scientific community makes the final acceptance or rejection of the hypothesis. This ultimate goal is generally referred to as 'general acceptance,' the standard under *Frye.* The evaluation of professional opinion in the scientific process is slow, is made by fellow experts and the final decision may not be reached for years as other scientists try to replicate the work. (Bair, 2001)

The majority opinion in *Daubert* cites two prominent philosophers, Karl Popper and Carl Hempel, who require testing and testability of any theories claiming to be scientific. The Court wrote that scientific methodology is based on generating hypotheses and testing them to see if they can be falsified, and a scientific explanation must be capable of being empirically tested. The Court further stated that the criterion of the scientific status of a theory is its falsifiability, refutability, or testability. (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993)

An early commentary on Daubert was written by a prominent attorney and the then President of the American Association of the Advancement of Science. (Ayala &

Black, 1993) They stated that judges who have to base their decisions on scientific information need to understand the importance of formulating hypotheses and corroborating them through testing. Ayala and Black stated that a well formulated hypothesis that explains observed phenomena, and is consistent with accepted theories must still be tested empirically.

Testing is accomplished by predicting what should be observed if the hypothesis is correct, and then seeing if the predictions accord with what was actually observed. Any meaningful test can result in the falsifying of a hypothesis. It is only when a hypothesis survives efforts at falsification that it becomes corroborated and accepted. (Ayala & Black, 1993)

Within the context of hydrologic modeling, the need for testing takes on different challenges. The terms 'verification' and 'validation' are being used in ways that have been called contradictory and misleading. (Oreskes, Shrader-Frechette, & Belitz, 1994) In hydrology, numerical models represent complex open systems in which the operative processes are not completely understood and the required empirical input data are not completely known. Therefore, such models can never be verified. What passes for verification and validation is at best 'confirmation' and as such it is a matter of degree and is inherently partial.

If judges do not understand the meaning of falsifiability, then the impact of *Daubert* may be the exact opposite of what the majority opinion intended and could lower the threshold for expert testimony. (Bjur & Richardson, 1999)

The example of bloodletting has been used to demonstrate the concept of falsification. For about two hundred years physicians believed that drawing bad blood

could cure some diseases. It has been said that bloodletting killed George Washington who was suffering from a bad cold or flu. Physicians reasoned that if the patient recovered from the bloodletting, then the treatment worked. If not, and the patient died, he or she was too sick to help or the bloodletting was too late. Such reasoning made it impossible to disprove the theory that bloodletting was helpful; therefore the theory was not falsifiable. (Bjur & Richardson, 1999)

In an essay by Arizona State University Law Professor D. H. Kaye, he states that it is falsification, and not falsifiability, that matters when it comes to admissibility. (Kaye, 2005) "The essential question under *Daubert* is whether the expert's purportedly scientific theory provides 'good grounds' for the testimony". The parenthetical phrase, in the *Daubert* opinion, "*has been* tested," is far more significant than the hypothetical, "*can be* tested," and the blurring of these matters in the majority has permitted misapplications of the demand for testing. (Kaye, 2005)

Bjur and Richardson define 'error rate' within the context of *Daubert* as the probability that the application of a particular technical procedure or theory leads to a mistake in the classification of an object, event or person. Under *Daubert*, the court should survey studies regarding the error rates of the specific technique (the possibility of falsely classifying the subject) as well as the standards controlling the technique's operation. Two types of error contribute to the error rate – false positives and false negatives. Using the spectrograph example from *Daubert*, a false positive is identifying a voice from a specific person, when it is not their voice. A false negative is claiming that the voice is not of a specific person, when in fact it is their voice.

3.4 Studies on Expert Testimony Reform in the United States

Writing about *Daubert* has been compared to writing about Salem witchcraft:

Question: "What are you working on now?"

Answer: "Salem Witchcraft."

Response: "But … surely there's nothing new to say." (Caudill & Redding, 2000)

Is there anything new to say about *Daubert*? Perhaps, if only to determine if it has accomplished what the Supreme Court intended. The attention of scholars has turned to attempt to assess the **impact** of the changed standard for admissibility of expert testimony under the *Daubert Trilogy* and Rule 702.

A number of empirical studies on the admissibility of expert testimony and scientific evidence have been undertaken from various perspectives. Although *Daubert* has brought the issue of expert testimony to the forefront it does not appear to have made a major difference **in the admissibility** of expert or scientific evidence. One of the major criticisms is that it has had unintended consequences; limiting access by plaintiffs, or rejecting evidence that was derived by accepted methods and procedures that arguably should have been allowed.

The results of three surveys in connection with the Federal Judicial Center (one each of federal judges in 1991 and 1998 and another of attorneys in 1999) published in 2002 indicates that practices and beliefs concerning expert testimony have changed in the wake of the *Daubert.* (Krafka, Dunn, Johnson, Cecil, & Miletich, 2002) Reporting both on their general experience with expert testimony, and on their most recent civil trial involving such testimony, judges and attorneys indicated that judges were more likely in

1998 than in 1991 to scrutinize expert testimony before trial. Both judges and attorneys are taking a more active role in scrutinizing proffered testimony.

A third of judges in 1998 claimed to admit expert evidence less often than they did before *Daubert*, and well over half of the attorneys surveyed reported the same trend in judges' rulings. According to the Krafka article, judges are handling admissibility issues most often in the context of *motions in limine* (pretrial). *Motions in limine* are in much greater use than they were prior to *Daubert*, so it is not surprising to find that judges are holding more pretrial *Daubert*-like hearings than previously.

Krafka concludes that the bases for limiting or excluding testimony do not appear to have been greatly affected by *Daubert*. Judges who excluded testimony in the Krafka survey did so most often because it was not relevant, the witness was not qualified, or the testimony would not have assisted the trier of fact. These reasons are similar to reasons most frequently cited by judges in 1991, and they do not reflect the factors cited in *Daubert*.

According to Krafka, in addition to changing the way judges deal with expert evidence, *Daubert* appears to have altered the behavior of many attorneys. Attorneys reported more closely scrutinizing the credentials of their own experts and filing more motions to exclude opposing expert evidence. **They also reported greater involvement in the preparation of their expert's testimony.**

Several studies have concluded that expert testimony reform in the United States through the Federal Rules of Evidence and the *Daubert Trilogy* has had serious and presumably unintended consequences. In their eagerness to enforce their gatekeeping responsibilities courts have rejected evidence that was derived by methods and

procedures which are accepted outside of the courtroom by highly regarded scientific bodies. In some instances judges have demanded more substantiation than scientists themselves would require. (Cranor & Eastmond, 2001)

Cranor and Eastmond warn that if judges do not become more familiar with legitimate forms of scientific inference and reasoning, they are more likely to be manipulated by litigants. Under the guise of mere procedural changes, the *Daubert Trilogy* has affected substantive law, changed the relationship between judge and jury, and shifted the scales of justice against injured parties.

In federal courts, *Daubert* has become a potent weapon of tort reform by causing judges to scrutinize scientific evidence more closely. According to one study, the resulting effects of *Daubert* have been decidedly pro-defendant. In the civil context, *Daubert* has empowered defendants to exclude certain types of scientific evidence, substantially improving their chances of obtaining summary judgment and thereby avoiding what are perceived to be unpredictable and often plaintiff-friendly juries. (Cheng & Yoon, 2005)

Another study conducted by the Tellus Institute (Tellus Institute, 2003) concluded that after *Daubert*:

1. The percentage of expert testimony by scientists excluded from the courtroom has risen significantly.

2. The exclusion of expert testimony, leaving the plaintiffs without the ability to prove their cases, has resulted in an increase in successful motions for summary judgment filed by the defendants. The percentage of summary judgments granted post-*Daubert* more than doubled with over 90 percent against the plaintiff. (Dixon & Gill, 2002)

3. The expense of defending a *Daubert* challenge appears to be having a "chilling effect" upon plaintiffs, who don't have the same resources as large corporations and often cannot afford to defend against aggressive attacks on their experts. (Berger, 2003)

4. Scientists and physicians are likely to be increasingly reluctant to provide expert testimony in civil litigation cases because of the lengths to which defendants go to discredit them and their work.

5. Powerful interests are now trying to extend the reach of *Daubert*-like evidentiary standards to the regulatory arena, where they may affect the federal government's ability to understand and act to reduce risk from hazardous exposures. (Tellus Institute, 2003)

Although expert testimony has received increased judicial attention in the years since *Daubert*, problems with testifying experts have been largely unaffected by the passage of time. **Judges and attorneys in the Krafka surveys reported frequent problems with partisan experts and the excessive expense of experts.** These same issues dominated in pre-*Daubert* times. (Krafka, Dunn, Johnson, Cecil, & Miletich, 2002)

A study conducted for the RAND Institute of Civil Justice, used a sample of federal district court opinions between 1980 and 1999 to examine how judges, plaintiffs, and defendants responded to *Daubert.* (Dixon & Gill, 2002) The report concluded that judges had become more watchful gatekeepers for expert evidence since *Daubert*. The findings suggest that standards for reliability have tightened and that judges have examined evidence that is challenged by a party more carefully with respect to other criteria as well. Because multiple criteria enter the decision to admit or exclude evidence,

the researchers were unable to conclude that there was any change in the proportion of evidence excluded.

In response to the following question: *How Well Are Judges Performing the Gatekeeping Function?* the study by Dixon and Gill concluded that judges may be more actively evaluating reliability, but they do not know whether they are doing so in ways that produce better outcomes. Judges may feel compelled to evaluate reliability and yet not be knowledgeable enough in the relevant field to make accurate determinations. **Evidence could be excluded merely because it is difficult to understand rather than because it is unreliable. Likewise, evidence could be admitted because the judge does not understand a flaw in the argument rather than because it is reliable.**

A study conducted in 2001 which was discussed in an article published in 2005 reported on how the *Daubert* guidelines were applied to psychological syndrome and profile evidence, and the impact of the decision on the admissibility of such evidence. The results reveal a strong tendency for judges to continue to rely on more traditional standards, such as general acceptance and qualifications of the expert, when assessing psychological syndrome and profile evidence. (Dahir, Richardson, Gingsburg, Gatowski, Dobbin, & Merlino, 2005) The article states that similar findings with respect to other types of evidence have been noted in other research, and this probably **reflects judges' relative unfamiliarity with the technical concepts of falsifiability and error rates**, or the relative lack of precedents with respect to syndrome and profile evidence in this first decade *post-Daubert*.

Although the Dahir article is not proposing that judges become scientists, they do **propose that judges be trained to ask relevant questions** when determining the

admissibility of proffered scientific evidence, citing the obvious need for remediation before most judges become trained to handle decisions concerning scientifically based expert testimony.

A study by Cheng and Yoon was intended to determine whether formal, doctrinal standards have any effect on scientific admissibility determinations. (Cheng & Yoon, 2005) Cheng and Yoon found no evidence that *Frye* or *Daubert* makes a difference in the rate of removal of cases from state to federal court (under the assumption that parties might prefer the federal standard of admissibility over the standard existing in state court). Their research suggests that researchers should stop focusing on the merits and drawbacks of the *Daubert* versus the *Frye* standard, but should focus more broadly on how judges actually make decisions about admissibility of scientific evidence. The real contribution of *Daubert* was in raising the overall awareness of judges in all jurisdictions to the problem of unreliable or "junk" science. (Cheng & Yoon, 2005)

A recent article discusses an empirical study to determine whether a judge's ideology plays a role in admissibility decisions on expert testimony. (Buchman, 2007) *Daubert* and Rule 702 give trial judges substantial discretion over their scrutiny of expert testimony, therefore external constraints on admissibility rulings are minimal. Buchman performed an analysis of federal district court *Daubert* rulings in tort cases from 1983 to 2003 and found substantial support for the claim that trial judges' ideology can predict decisions to admit or exclude expert testimony. He found less support, however, for the claim that *Daubert* affected trial judges' willingness to admit such testimony, and no evidence that such decisions are affected by the prospect of reversal on appeal.

Buchman's findings show specifically that judges nominated by liberal presidents were more likely to admit expert testimony than were those nominated by conservative presidents. Judges were less likely to admit expert testimony when it was profferd by plaintiffs, and especially by individual and class-action plaintiffs, than by defendants. Buchman's study concluds that *Daubert* has had no consistent effect on trial judges' willingness to admit scientific or technical expert testimony. (Buchman, 2007)

Another study was conducted by a group of researchers to assess the effects of the *Daubert Trilogy* on criminal appellate courts' treatment of expert evidence and on the admissibility of expert testimony. (Groscup, Penrod, Studebaker, Huss, & O'Neill, 2002) The researchers expected to find increased discussion of the *Daubert* criteria, increased importance attributed to the criteria, and some changes in admissibility following the *Daubert* decision. Instead they found no observable change in the overall rate of admission for all types of expert evidence. However, the study did show increased scrutiny of expert evidence and changes in the way criminal appellate court judges evaluated evidence after *Daubert*.

The Groscup study also noted that appellate courts devoted little discussion to the *Daubert* criteria; that the *Daubert* criteria did not appear as influential as expected in admission decisions; and that the *Daubert* criteria did not predict appellate admissibility. According to the Groscup study, judges are gatekeeping in their own way but not necessarily by applying the suggested *Daubert* criteria. The gatekeeping instead is accomplished by increased and differential application of the rules of evidence to different types of testimony.

An explanation for these results may be drawn from another study conducted by Gatowski which concluded that judges may simply lack sufficient understanding of the *Daubert* criteria and of scientific reliability in general to apply them to their admission decision making. (Gatowski, Dobbin, Richardson, Ginsburg, Merlino, & Dahir, 2001) The Gatowski survey indicated that judges felt it was appropriate for them to act as evidentiary gatekeepers and that the *Daubert* criteria created a useful decision-making framework for this role. Although judges reported that they did understand the *Daubert* criteria, the researchers concluded that the judges' actual understanding of some of the *Daubert* criteria was very limited. **Although the judges demonstrated an understanding of general acceptance and peer review, the vast majority of judges did not understand the meaning or correct application of error rate and falsifiability.** This level of understanding did not vary significantly between *Daubert*-adopting and non-adopting jurisdictions. (Gatowski, Dobbin, Richardson, Ginsburg, Merlino, & Dahir, 2001)

A critical analysis of the Gatowski survey and its conclusions provides a deeper insight into the science/law debate. (Caudill & LaRue, 2003) One must first understand the natural science/constructed science debate before determining what judges must know to apply the *Daubert* criteria or other standards for admissibility of expert testimony. The "science wars" have been between those that on one side believe that science is an enterprise that reports on natural reality, or at least successfully represents nature with models that correspond to reality; and those who view science as structured in social, rhetorical, and institutional enterprises which determine what scientists will research and submit for publication. According to Caudill and LaRue, legal commentary on the

Daubert Trilogy is dominated by the idealization of science to a degree that the social and institutional aspects of science are neither acknowledged nor discussed.

The Gatowski survey focused primarily on the methodological aspects of *Daubert* and whether judges understood the concepts of falsifiability, peer review, error rate, and general acceptance. Caudill and LaRue caution that an undue focus on methodological factors creates the risk that courts will idealize science, and consequently, keep reliable science out of the court because of its pragmatic goals and limitations. Judges also risk deferring to science and consequently allowing unreliable science into the court because of its social authority (not necessarily an indication of reliability). Further judges risk constructing a "legal science" that is out of sync with mainstream science. On the other hand, understanding the methodological ideals of the scientific enterprise, will help judges recognize reliable science, recognize unreliable science even when it appears authoritative, and to appropriate science into court and not just its "legalistic shadow" into court. (Caudill & LaRue, 2003)

The growing influence of legal proceedings on the production of new scientific knowledge and techniques is described by Jasanoff. (Jasanoff, 1995) When scientific expertise is produced in response to litigation, the normal scientific processes of validation can be bypassed or distorted. Peer review standards for courtroom science are either nonexistent or may evolve in an ad hoc fashion, reflecting the scientists' perception of what the law requires.

An example of the social construct referred to by Caudill and LaRue and Jasanoff is described in an article by W.R. Freudenburg, a social scientist and scholar. (Freudenburg, 2005) The article describes the measures which a major corporation

(Exxon) took in order to make certain that its version of science was supported in peer reviewed journals, in anticipation of arguments and briefs involving a major punitive damage award.

Freudenburg coined the phrase “seeding science” much like seeding clouds, to describe the process engaged in by Exxon to “seed” the content of peer-reviewed scientific journals in order to shape future legal decisions by federal appeals courts and the U.S. Supreme Court. The article describes the conflicted emotions that the author experienced as he was courted by Exxon to write a favorable article. Although they did not tell him what to write, after the company determined that his article would not be useful to them, they dropped his contract and the lucrative funding.

An investigative reporter, Alan Zarembo, of the *Los Angeles Times*, published an expose’ on December 3, 2006, entitled: “Funding Studies to Suit Need”. (Zarembo, 2006) The article revealed that in the 1990s, Exxon began paying for research into juries and the damages they award. In 1994 an Alaskan federal jury awarded plaintiffs $5.3 billion against Exxon as a result of the spill of the Exxon Valdez oil tanker. A new line of research appeared in several academic journals and Ivy League law reviews. Some articles challenged the competence of juries to fairly set punitive damages. Others suggested that such awards are ultimately bad for society.

According to Zarembo the first use of the research in court came in the Exxon Valdez case itself. In its appeal of the $5.3-billion verdict to the U.S. Ninth Circuit Court of Appeals in San Francisco, Exxon as well as industry groups cited several of the Exxon-sponsored papers. The company argued that "these articles present recent social science research demonstrating that jurors are generally incapable of performing the tasks

the law assigns to them in punitive damage cases." Plaintiffs' attorneys countered in their responsive brief that the studies were "junk social science."

Scientific conflict of interest has also arisen in the rapidly growing area of academic entrepreneurship. (Krimsky, 2005) Conflicts of interest among scientists have been linked to research bias as well as the loss of a socially valuable norm among academic researchers, namely “disinterestedness.” Krimsky’s comments are similar to those of Caudill and LaRue. He states that the judiciary could benefit from an understanding of the means by which advocacy science surreptitiously enters the courtroom, and the ways in which this science is distinct from science that is not designed to support a predetermined financial interest. Judges should be informed, not only about scientific standards of the specific disciplines from which expertise is drawn, but also about the ways in which corporate stakeholder interests may socially construct those standards.

“Given the growing evidence that advocacy science has a potentially distorting effect on scientific objectivity, the funding effect in science should be no less relevant to trial judges than considerations of whether a scientific analysis has been peer reviewed, whether a meta-analysis of data is reliable, or whether a technique has a known error rate.” (Krimsky, 2005)

The need for institutional reform continues to be debated. At one time a ‘science court’ was proposed but has been abandoned as unworkable. (Kantrowitz, 1967) More modest approaches include the use of court appointed experts, special masters or technically trained law clerks. Authority for these processes are already in place under the Federal Rules of Evidence, which grant judges broad powers to seek help from court-

appointed experts or panels if they believe such a process will aid with fact-finding. This practice is only rarely used. (Jasanoff, 1995) According to Jasanoff, proposals for use of special masters and technically trained law clerks have also proved to be problematic.

Jasanoff is also of the view that science is contructed in the courtroom in accordance with tightly circumscribed rules and procedures and under economic and sociological constraints. The science is also constructed to serve widely divergent normative agendas. The proposed reforms previously described would change the balance of interests, but would not enable scientists to offer pure factual guideance to the law.

Jasanoff recommends a less politically contentious strategy: educating judges, lawyers, and scientific experts in each other's modes of reasoning and discourse. (Jasanoff, 1995) The Federal Judicial Center has embarked on a project to educate judges and assist them with dealing with scientific evidence. (Federal Judicial Center, 1994) Video tapes on various topics are available for judges from the Federal Judicial Center as well. (Science in the Courtroom Series, 2001) The American Association for the Advancement of Science has a handbook to assist judges with court-appointed experts. (American Association for the Advancement of Science, 2002)

Jasanoff briefly mentions the European civil law jurisdictions which require expert witnesses to be appointed by the court and answerable to the judge alone. However, she does not give this suggestion much hope because of the common law culture in the United States that is "wedded to the virtues of party autonomy." She does however indicate that there needs to be greater scrutiny of why judges may be reluctant to invoke their power to appoint an impartial expert witness.

Jasanoff appears to favor pretrial hearings among scientific experts to broaden the range of expertise beyond the polarized extremes usually sought by the parties. They may create a more informative record than the more formal rituals of trial-type examination and cross-examination. In addition, Jasanoff suggests that incremental solutions are appropriate in the interaction between science, law, and technology. Such an approach allows localized, context-specific solutions and respects the need for diversity in problem solving approaches. (Jasanoff, 1995)

CHAPTER 4: HYDROLOGY IN DISPUTE RESOLUTION

4.1 Hydrologic Models Generally

Hydrologic models are used to evaluate historic hydrologic events or conditions, and are used to predict future hydrologic events or conditions. The first use of hydrologic models founded on solving partial differential equations using numerical methods may be traced to England in 1941. A finite-difference model was used to address a groundwater seepage problem. (Bair, 2001) Advances in numerical methods, and in the theoretical and applied knowledge of hydrologists; added to the ease, power, and cost of computers, have allowed hydrologists to address problems that were previously considered to be intractable. (Bair 2001)

In the context of hydrology, a model is an approximation or simplified representation of a real system and how it behaves. Models of systems that exchange energy and materials with their surroundings are inherently uncertain. (Luecke & Committee, 2007) Although models as used in the courtroom are extremely useful, they are often suspect because of their complexity, the paucity of data used in calibration and validation, and their lack of transparency. (Luecke & Committee, 2007)

The discourse on models in the context of hydrology reveals differences of opinion as to whether, and if, a model may in fact represent a real world system. For example, ground water systems have been described by Woessner and Anderson as

inherently uncertain, and that model verification is unobtainable. This uncertainty needs to be accepted by modelers and model users. Acceptability of a modeling effort is founded on the number and strengths of confirming observations; and a subjective judgment will always be required to determine if the model appropriately represents the ground water system. (Woessner & Anderson, 1996)

A model has even been compared to a novel, which may resonate with nature, but it is not the real thing. With regard to a novel, one might ask how much the characters are drawn from real life and how much is artifice. Similarly with regard to a model, one might ask how much is based on observation and measurement and accessible phenomena; how much is based on informed judgment; and how much is convenience? The fundamental reason to model is due to a lack of full access, either in time or space to the phenomena of interest. Any expert asked to use a model to verify or validate a predetermined result should be suspicious. (Oreskes, Shrader-Frechette, & Belitz, 1994)

As described by Anderson and Bates in a book entitled "Model Validation," the term validation may be inappropriate and should be used as a stimulus to discuss the underlying fundamental issues and the widely recognized agreement that model validation, in an absolute sense is not possible. The book contains numerous articles by experts in the field summarizing the discourse on hydrologic models from various perspectives. (Anderson & Bates, 2001)

The complexity of hydrologic testimony and models when proffered as evidence in civil litigation gives rise to particular difficulty for the judge. Use of such models may also give rise to a quandary for the hydrologic expert in a courtroom. He or she might be asked to use analysis techniques that produce results that are more favorable to their

client's case. Furthermore, parties might not be able to afford a complex analysis that is more accurate than a simplistic one-dimensional analytical model that is less accurate. The overly simplistic approach is difficult to defend on cross-examination. However, the more complex analysis may not be understood by the lawyer or the judge. (Bair, 2001)

In order to discuss the challenges of applying of the legal analysis of admissibility of expert testimony to water cases, it is useful to provide examples of cases in which hydrologic models were used by the expert. This chapter will describe the admissibility standard in Colorado, the state which relies almost entirely on courts for quantification and allocation of water rights, and provide case study examples. This chapter will also: (a) review proposals for evaluation of the adequacy of a model; (b) provide examples of how models may be manipulated in an adversarial setting; and (c) describe how a ground water models have been jointly developed by opposing parties to reach settlement.

4.2 Hydrologic Model Assessment

Models are created with inherent uncertainty and sparse and noisy data. In most cases involving site specific application of hydrologic models, many factors are unknown and therefore uncertain. Assuming that a model cannot be constructed that is 100% accurate, given a probability range from 0 to 1.0 that a hydrologic model accurately represents the flow system, then a range of 0.75 to 0.90, or 75% to 90% accuracy would demonstrate a high rate of correspondence between the model results and measured values. (Bair, 2001)

A number of authors and professional associations have suggested modeling protocols. (American Society of Testing Materials) (Anderson & Woessner, 1992)

Professor E. Scott Bair provides a simplified description of the process commonly followed by modelers as depicted in Figure 1.

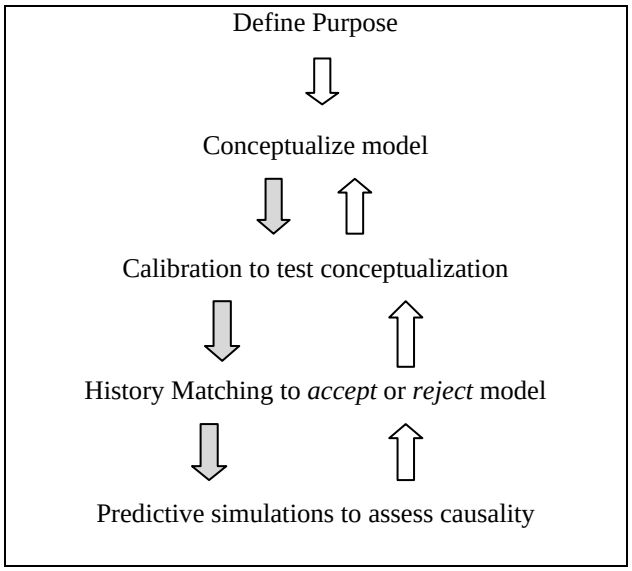

Figure 1 Bair Steps of Hydrologic Model (Bair, 2001)

Woessner and Anderson suggest that a model's acceptability may be evaluated by confirming observations, comparing field data and considering alternative hypotheses with simulated results. The acceptability of the model is ultimately a subjective assessment made in the context of the model's stated purpose. The model's defined purpose is the first step in the model development and will influence not only the results but also the remaining steps in the model development. (Woessner & Anderson, 1996)

A two step process is suggested to assess the acceptability of a model. First one should look for fatal errors that would prove the model false, such as misrepresented boundary conditions, or improper interpretation of hydrogeologic information. If no fatal errors are detected, then each step within the modeling process should be evaluated to determine if the results provide confirming observations. "The purpose for the model forms the context for the judgment." In the context of that purpose, a rational subjective

judgment can be made as to the appropriateness of the modeling effort. (Woessner & Anderson, 1996)

A report from the United States Geological Survey (USGS) provides some guidelines and discussion on how to evaluate complex ground water flow models used in the investigation of ground water systems. (Reilly & Harbaugh, 2004) Consistent with the comments of Bair, Woessner, and Anderson, that the first step in model development is to define the purpose, Reilly and Harbaugh state that to adequately evaluate the adequacy of a model, the objectives of the study must be specified.

Three different terms are often seen in the literature concerning models: conceptual model, computer model program, and model. A “conceptual model” is the hydrologist’s concept of a ground water system. A “computer model program” is a computer program that solves ground water equations. Computer model programs are general purpose in that they can be used to simulate a variety of specific systems by varying input data. A “model” is the application of a computer model program to simulate a specific system. Hence, a model incorporates the computer model program and all of the input data required to represent a ground water system. The modeler attempts to incorporate what he or she believes to be the most important aspects of the conceptual model into a model, so that the model will provide useful information about the system. (Reilly & Harbaugh, 2004)

Reilly and Harbaugh describe how a computer model may be used with different approaches to solve a problem. Approaches that are commonly used are: calibrated model, hypothetical system model, sensitivity analysis, superposition, and particle tracking. Frequently, several approaches are combined to address a problem.

Model calibration may be defined simply as the modification of model input data for the purpose of making the model more closely match observed heads and flows. The parameters may be adjusted manually or may be done automatically using nonlinear regression statistical techniques. In a broader definition of model calibration, parameter adjustment is only one aspect of calibration; evaluated and adjusted as needed are other key aspects of the model that influence the capability of the model to meet the problem objectives. The amount of effort needed to calibrate a ground water flow model is dependent upon the intended use of the model (the objective of the investigation). Most models of specific ground water systems that are used to: estimate aquifer properties; understand the past; understand the present; or to forecast the future, are calibrated by matching observed heads and flows. Determining if the calibration is sufficient for the intended use of the model is very important in evaluating whether the model has been constructed appropriately. (Reilly & Harbaugh, 2004)

A hypothetical model is a model of an idealized or representative system as opposed to a model of a specific system. Hypothetical models are not calibrated, but input data are adjusted during model development to make the model fit the idealized system or to test how the model responds. Hypothetical models have been used to examine various processes that affect, or are affected by, ground water flow such as boundary conditions, contributing areas to wells, and model calibration. (Reilly & Harbaugh, 2004)

Sensitivity analysis is the evaluation of model input parameters to see how much they affect model outputs. The relative effect of the parameters helps to provide fundamental understanding of the simulated system. Sensitivity analysis also is inherently

part of model calibration. The most sensitive parameters will be the most important parameters for causing the model to match observed values. Reilly and Harbaugh give the example in which a model that is insensitive to hydraulic conductivity generally indicates an area where there is relatively little water flowing. If the model is being calibrated, then changing the value of hydraulic conductivity in this area will not help much in causing the model to match observations. Such a model, however, would probably not be suitable for evaluation of recharge or withdrawal in this area the level uncertainty from the calibration would be unacceptable.

The American Society for Testing and Materials (ASTM) defines sensitivity analysis as the process of determining how model results are affected by deliberate and systematic variation in selected parameter values, input data and other features of the model. It is important to note the ASTM definition places emphasis on "deliberate and systematic variation" as well as parameters and other model features that are not included in the Reilly and Harbaugh description. (Luecke D. , 2007)

Superposition is a modeling approach that is useful in saving time and effort and eliminating uncertainty in some model evaluations. Models that are designed to use superposition evaluate only changes in stress and changes in responses. Most aquifer tests that analyze drawdown use superposition. Only the change in the drawdown and change in flows are analyzed, which assumes the response of the system is only due to the stress imposed and is not due to other processes in the system.

Particle tracking is the determination of the path a particle will take through a three-dimensional ground water flow system. The determination of the paths of water in

the flow system aids in conceptualizing and quantifying the sources of water in a modeled system.

Many model programs can be used in one, two, or three dimensions, and they can be applied as transient or steady state. The simplification of the model domain to one or two dimensions is used to minimize the cost of constructing a model. Reilly and Harbaugh caution that the simplification of the system to one or two dimensions must be consistent with the flow field under investigation and consistent with the objectives of the study. Consistent with the flow field, means that there is no or negligible flow orthogonal to the line or plane of the one- or two-dimensional system being simulated.

Steady-state models are used frequently, even though true steady-state conditions do not exist in natural systems. All natural systems fluctuate in response to climatic variations that can be seasonal, annual, decadal or longer. In steady-state models, an assumption is made that a system can be represented by a state of dynamic equilibrium or an approximate equilibrium condition. If the objectives of the investigation do not require information on the time it takes for a system to respond to new stresses or the response of the system between periods of relative equilibrium, then simulation of the system as a steady-state system may be a reasonable approach. However, if the system is not at a period of equilibrium or approximate equilibrium during the periods of interest, then a transient analysis is required.

Reilly and Harbaugh recommend the following questions be asked to assist in the evaluation of the appropriateness of the modeling approach to analyze the problem:

1. Is the overall approach (calibrated model, hypothetical system model, sensitivity analysis, superposition, and particle tracking) for using simulation in addressing the objectives clearly stated and appropriate?

2. If the analysis is not three dimensional, is the representation of the system using one or two dimensions appropriate to meet the objectives of the study and justified in the report?

3. If the model is steady state, is adequate information provided to justify that the system is reasonably close to a steady-state condition?

Reilly and Harbaugh discuss the need for complete documentation of the model development so that the reviewer may: (a) understand the hypotheses; (b) understand the methods used to represent the actual system with a mathematical counterpart; and (c) determine if the model is sufficiently accurate for the objectives of the investigation. The appropriate level of documentation varies depending on the study objectives and the complexity of the simulations.

According to Reilly and Harbaugh, a well-constructed report describing simulation is much the same as one for any investigative study. It should present (1) the objectives of the study, (2) a description of the work that was done, (3) logical arguments to convince the reader that the methods and analyses used in the study are valid, and (4) results and conclusions. (Reilly & Harbaugh, 2004)

In a Technical Memorandum on documenting the use of ground water simulation in project reports, the USGS listed ten topics (with explanation) that should be addressed. (U.S. Geological Survey Office of Ground Water, 1996)

Ten specific topics that should be addressed in reports documenting model studies are:

1. Describe the purpose of the study and the role that simulation plays in addressing that purpose.

2. Describe the hydrologic system under investigation.

3. Describe the mathematical methods used and their appropriateness to the problem being solved.

4. Describe the hydrogeologic character of the boundary conditions used in the simulation of the system.

5. If the method of simulation involves discretizing the system (finite-difference and finite-element methods for example), describe and justify the discretized network used.

6. Describe the aquifer system properties that are modeled.

7. Describe all the stresses modeled such as pumpage, evapotranspiration from ground water, recharge from infiltration, river stage changes, leakage from other aquifers, and source concentrations in transport models.

8. For transient models, describe the initial conditions that are used in the simulations.

9. If a model is calibrated, present the calibration criteria, procedure, and results.

10. Discuss the limitations of the model's representation of the actual system and the impact those limitations have on the results and conclusions presented in the report.

The Technical Memorandum states that the report should address the ten topics above, but no specific format is required. However, the report should describe the

purpose of the simulation and convince the reader that the use of simulation is credible. The report should further describe the system being simulated, the methods of simulation, and the data that are used.

4.3 Admissibility of Expert Testimony in Water Cases

Colorado has not adopted the *Daubert* standards for admissibility of expert testimony. Instead the Colorado Supreme Court has held that the Colorado Rules of Evidence provide the current guidelines for admissibility. (People v. Shreck, 2001) Scientific evidence is admissible under Colorado Rule of Evidence 702 if the testimony is reliable and relevant. To determine reliability, the court must consider whether the scientific principles underlying the testimony are reasonably reliable and whether the expert is qualified to opine on such matters. The inquiry should be broad in nature and consider the totality of the circumstances. The *Shreck* analysis is less restrictive than the *Daubert* analysis.

In a very recent case the Colorado Supreme Court held that admissible expert testimony must be grounded in methods and procedures of science rather than subjective belief or unsupported speculation. The proponent need not show that the expert's testimony is generally accepted in the scientific community. Instead there must be a showing that the method employed by the expert in reaching the conclusion is scientifically sound and that the opinion is based on facts which sufficiently satisfy the reliability requirements of Rule 702. (People v. Ramirez, 2007) After finding the proffered testimony is reliable, the court must then determine if it is relevant, i.e. is it useful to the fact finder. In determining if the evidence will be helpful to the fact finder, the court should consider the elements of the claim, the nature and extent of other

evidence in the case, the expertise of the proposed witness, the sufficiency and extent of the foundational evidence upon which the expert witness' ultimate opinion is to based, and the scope and content of the opinion itself. (People v. Ramirez, 2007)

A telling comment was made by Colorado Water Judge O. John Kuenhold in the Findings of Fact, Conclusions of Law, Judgment and Decree. (Confined Aquifer New Use Rules for Division 3, 2004) He observed that computational fluid dynamics is not taught in law school and during the course of the trial the Court and attorneys struggled at times to understand the nature and mechanism of mathematical modeling. The "solution" to a problem posed to a groundwater model will not have the absolute certainty of the solution to a simple subtraction problem. (Confined Aquifer New Use Rules for Division 3, 2004)

The Colorado Supreme Court had the opportunity to review a water court's decision on the admissibility of expert witness testimony in 2005. (In the Matter of the Application for Water Rights of Park County Sportsmen's Ranch, et.al. v. Colorado State Engineer, et. al., 2005) The applicant sought approval of a project that would allow it to pump water from aquifers and deliver it to the City of Aurora for municipal use. It also sought approval of an augmentation plan to replace injurious depletions to the South Platte tributaries. Water court Judge Jonathan Hays dismissed the application for conditional underground and surface water rights because he found the proposed augmentation plan to be fatally flawed.

Judge Hays held that the scientific evidence presented at trial was not sufficiently reliable to be admissible under Rule 702. He did not hold a separate pretrial hearing to determine the admissibility of the scientific evidence, but conducted the reliability

analysis during the trial. The judge found that the applicant used a computer model (MODFLOW) that was widely used to model aquifer parameters, and is capable of producing reliable and relevant results. MODFLOW is a three dimensional finite difference ground water flow model developed by the USGS and is publicly available and may be downloaded from the USGS website. (U.S. Geological Survey, 2007)

The problem as pointed out by Judge Hays is not the computer model, but the sloppy way the applicant's expert used MODFLOW. In order for the model to be reliable and hence produce relevant results for predicting timing and amounts of both depletions and recharge, the model must be operated in a manner that is consistent with accepted modeling techniques. If the model is operated in some other manner, there must be sufficient evidence that such other methods are valid and reliable.

Judge Hays specifically found that the applicant's experts committed errors in technique with respect to the groundwater model because they: failed to conduct a sensitivity analysis on the model; failed to properly calibrate the model; failed to explain anomalous results and residual errors; ignored another expert's report suggesting further evaluation; and failed to complete an independent peer review of the model. The experts also committed errors with the surface water model by: failing to adjust calculations for the changing call regime; failing to factor out irrigation run-off; failing to consider variables other than precipitation; and failing to determine the range of errors for its simulated stream flows.

The Dividing the Waters Assessment Committee is considering ways of improving the process for assessing hydrologic models in a Hydrologic Models in the Courtroom Working Paper. (Luecke & Committee, 2007) Attached as Appendix B to the

Working Paper are comments from Judge Hays. The judge stated that he did not think it would have made much difference to the results in the *Park County* case whether one applied the standards for admissibility under *Frye, Daubert, Shreck* or Rule 702. Under any of those tests, the proponent must show that the correct protocol was followed in conducting the test at issue. Judge Hays further commented that he believes that groundwater evidence will be regularly received in evidence at trials in both state and federal courts because the model and its results will meet the threshold for admissibility. However, one must distinguish between the threshold tests of admissibility and the factors that a court will likely consider in determining whether the threshold has been met. (Luecke & Committee, 2007)

In commenting on the *Daubert* factors, Judge Hays stated that the term "known error rate" is often repeated but to his knowledge never quantified. He is unaware of any court which has decided whether the absence of a known error rate or the magnitude of a known error rate is fatal to the admissibility of groundwater modeling evidence. (Luecke & Committee, 2007)

Luecke points out in a footnote that he discussed the issue of known error rate with the Arkansas River Special Master, Arthur L. Littleworth. In commenting on the *Daubert* factors when assessing admissibility of a particular hydrologic model, whether or not there is a known error rate may be inappropriate for complex models. This is because important parts of the model output, such as flow depletion estimates, cannot be assessed against any field data - because they do not exist.

The DTW Working Paper also contains a discussion as to the problem of assessing models when parties to a dispute do not consider it to be in their interests to

cooperate. The most common approach to assessing conflicting evidence is through cross-examination; however this does not fix problems, it merely finds flaws. Luecke suggests alternatives to cross-examination should be considered for dealing with conflicting models in an adversarial setting. Consideration should be given to court appointed experts, peer review, third-party experts chosen by the parties for review, or a third expert chosen by the parties for arbitration. The options, other than arbitration with a third party expert, can be combined with cross-examination, i.e. the parties could cross examine a court appointed expert or peer reviewer. However, none of the options change the underlying dynamics of the process – there are limited incentives to pool resources, experience and expertise.

According to Luecke and the Committee, the objective of using a third party expert in an arbitration would be to create an environment that gives parties their full say, but at the same time encourages combining expertise rather than placing opposing experts at loggerheads. Alternatives to cross-examination are needed that are effective, efficient and fair. (Luecke & Committee, 2007)

4.4 The Manipulation of Models

Although water rights cases are not tried to juries, an example of how hydrologic modeling might impact the decision maker is described by Bair in the well publicized 1986 Woburn Toxic Trial. (Anderson, et.al. v. Cryovac, Inc., et. al., 1983) (Note this case was prior to the *Daubert* decision by the Supreme Court which established the gate-keeping standard for trial judges.) The case was sensationalized in a book entitled “A Civil Action” (Harr, 1995) and the motion picture with the same name. (Zaillian, 1998)

The plaintiffs sued the defendant manufacturing facilities, alleging improper disposal of five industrial chemicals which flowed into the groundwater and into the two municipal wells. The claims were that prolonged ingestion and exposure to toxic chemicals caused leukemia, central nervous system disorders and other health problems.

Three hydrologist experts were employed, one for the plaintiffs and one for each of the defendants. The jurors were asked to comprehend a list of hydrologic topics that are described by Bair, as equivalent to the content of courses a graduate student is required to take for a master's degree in hydrology. Bair read the over 1800 pages of testimony presented by the three hydrologic experts, and helped construct three-dimensional numerical flow and transport models of the wells. He described the three approaches in modeling by each expert.

The plaintiff's expert analyzed well logs and portrayed the geology as a heterogeneous assemblage of glacial materials. He used this geologic framework to construct an uncalibrated three-dimensional numerical flow and transport model for illustrative purposes. According to Bair, "the one-dimensional analytical question he used to compute contaminant travel times inadequately incorporated the heterogeneous nature of the glacial materials, converging three-dimensional flow to the pumping wells, induced infiltration from the river and wetland, leakage from bedrock, hydrodynamic dispersion, spatial and temporal variations in recharge, and temporal variations in pumping rates". (Bair, 2001) Based on these limitations, Bair believed the probability that the analysis used by the plaintiff's expert realistically represented the flow system when the wells were in use, was no more than 0.4 or 40%.

The defendant Beatrice's expert plotted and analyzed the water level and stream flow data from the 30-day pumping test. He constructed no models and made no travel time calculations. The analysis ignored the interaction between surface water and groundwater flow systems, and ignored the three-dimensional nature of groundwater flow system created by the partial penetration of the wells and the river. Bair ranks the probability that this analysis realistically represents the flow system between 1964 and 1979 to be less than 0.25 or 25%.

The defendant W.R. Grace's expert used available geologic, hydrologic and pumping data to construct a transient three-dimensional numerical flow and transport model. It was the most comprehensive and sophisticated of the three models. The flow model was calibrated using two sets of measured water level and stream flow gain/loss data. The transport model was not calibrated, although a sensitivity analysis was performed. The model included more parameters and processes and fewer unrealistic assumptions than the other two approaches. Bair ranked the probability at 0.75 or 75% that this analysis represents the actual behavior of the flow system during the relevant period.

The jury, after ten days of deliberation, found Beatrice not liable and W.R. Grace liable for the contamination and injuries to the plaintiffs. This result is the inverse of the ranking of the sophistication and purported accuracy of the hydrologic models. Bair observes that the nagging question for lawyers and hydrologists studying the Woburn Toxic Trial is whether the science itself was too complicated for the judge and jury, and/or whether the presentation of the science was too confusing.

Another example of differing results from hydrologic modeling is not within the context of trial, but was instead within the context of an administrative process. A report for the U.S. Army Corps of Engineers was completed by D.B. McLaughin in 1984, to compare the considerably different results of three studies of a proposed pumping plan using the same data and the same model. (McLaughlin, 1984)

The case study concerns a public utility, which sought permission to pump groundwater from the San Andres-Glorieta aquifer in northern New Mexico. As part of its application, Plains Electric introduced models that suggested that the impacts of the proposed pumping would be acceptable. Several local users responded with their own independent modeling studies. These studies all used the same model developed by the U.S.G.S., but the inputs and general approaches to model application differed. Some of the modeling studies predicted rapid dewatering in the vicinity of the Plains Electric well field. Other studies predicted only minor effects on the local water levels. McLaughlin reports that overall the computer modeling caused more confusion than it dispelled.

One commentator, upon review of the McLaughlin report stated that it was clear by the assumptions made by the modelers (aquifer parameters, types of boundary conditions) that:

"Models 1 and 3 were optimistic (they wanted to *limit* drawdowns and to *create* water) and Model 2 was pessimistic (they wanted to predict *scary* drawdowns and they were not about to *concede* that there was an available groundwater supply). . . I have no doubt the hydrologists were competent. In fact they knew *very well* what parameters to choose and what assumptions to make in order to obtain results that would meet their clients' desire. Obviously Models 1 and 3 were developed for a client that wanted the

developments to proceed and Model 2 was carried out for a client that did not favour the development. What is needed is an *independent* study, from a party that has no axe to grind . . . .” (Morel-Seytoux, 2001)

4.5 Joint Development of Models

An approach to avoiding the type of partisan expert opinions and model construction and use as seen in the McLaughlin Report and the Woburn Toxic Trial is described by Barbara Cosens of the University of Idaho. (Cosens, 2006) Cosens participated in the development of a database for the Milk River in north-central Montana. With its headwaters in the Rocky Mountain front, natural flows in the Milk River are estimated to range from a high of 35,000 cubic feet per second during spring runoff to as low as 5 cubic feet per second during late summer and early fall of a dry year. The Milk River basin is home to four Indian reservations and numerous Indian allotments. The basin was also the site of the dispute that led to the *Winters* Doctrine and the recognition by the U.S. Supreme Court of Indian reserved water rights. (Winters v. United States, 1908) The basin is also the site of a national park, several national wildlife refuges, bull trout (a listed species under the Endangered Species Act) and is also site of the Milk River Project, an early federal reclamation project.

As part of the state-wide general stream adjudication, the State of Montana launched a new program for resolution of reserved water rights through negotiation. It identified the Milk River basin as its highest priority. The parties in the Milk River settlement talks developed a hydrologic model to test the impacts and water supply available from different solutions proposed to settle tribal water rights for the Fort Belknap Reservation. Considering the steps of construction of a hydrologic model, as

described by Anderson and Woessner, the first step was to determine the overall purpose of the model. The parties agreed that they needed a model to evaluate the proposed settlement solutions.

Cosens describes two keys to the success of the negotiation. First the model was to be developed by joint technical teams representing the parties to the negotiation. This avoided the need to resolve differences between competing models and avoided (what Cosens referred to as the means commonly found at the interface of science and law) character assassination of the opposing technical expert. The parties also left the technical modeling choices to the modelers, avoiding the second guessing of decisions by negotiators concerned with the outcome for their party. The modelers were charged with the task of agreeing on a single model and were charged with avoiding the coloring of their positions with the desires for their clients. According to Cosens, the results in the Milk River suggest that the modelers accomplished both of these requirements.

The second key to success was that the parties agreed not only to relinquish the technical work to the modelers, but to use the results of their efforts even when unfavorable to their position. Cosens comments that this approach was essential to the success of the water negotiation. ". . . to the extent that an understanding of the hydrologic impacts of a proposed solution seem relevant to the decision, the analysis of those impacts by the joint technical team should be followed." (Cosens, 2006)

Another example of cooperative model building may found in the case of *Kansas v. Nebraska and Colorado*. (Kansas v. Nebraska and Colorado, 1998) The State of Kansas filed a complaint with the United States Supreme Court claiming the State of Nebraska had violated the Republican River Compact by allowing the unimpeded

development of thousands of wells in hydraulic connection with the Republican River and its tributaries. Kansas further alleged that Nebraska was using more water than its allocation under the Compact and was depriving Kansas of its full entitlement. The State of Colorado was joined in the lawsuit because it contains the headwaters of the Republican River and is a party to the Republican River Compact.

The State of Nebraska filed a Motion to Dismiss upon the premise that the Republican River Compact did not specifically mention ground water; therefore ground water could not be restricted or included in the allocation or consumptive use computations. The State of Kansas argued the opposite and asserted all forms of ground water should be included within the computation of virgin water supply and consumptive use. The State of Colorado offered an intermediate position and claimed the compact and historic practice of the Compact justified the inclusion of alluvial ground water, but did not include wells located on the tablelands that pump from the Ogallala aquifer. (Colorado Division of Water Resources, 2007)

Special Master McKusick denied Nebraska's Motion to Dismiss and concluded ground water is to be included within the allocation and consumptive use computations in the Republican River Compact. He found that although the Compact never uses the word "ground water," a comprehensive definition of virgin water supply which the Compact fully allocates, includes streamflow which comes from both surface runoff and ground water discharge and interception of either of those sources can cause a State to receive more than its Compact allocation and violate the Compact.

The denial of Nebraska's Motion to Dismiss was pivotal and prompted the three states to request a stay in the trial schedule to undergo mediation. The three states

reached a settlement and stipulation which contained the waiver of new claims, a moratorium on new wells, compact administration mechanisms, a dispute resolution system and other features. The U.S. Supreme Court approved the Final Settlement Stipulation. (Kansas v. Nebraska, 2003)

In accordance with the Final Settlement Stipulation, the Republican River Ground Water Modeling Committee developed a comprehensive ground water model to represent the ground water flow system in the Republican River Basin. The primary purpose of the Republican River Compact Administration Ground Water Model (RRCA Model) is to determine the amount, location, and timing of streamflow depletions to the Republican River caused by well pumping and to determine streamflow accretions from recharge of water imported from the Platte River Basin into the Republican River Basin.

Representatives from the State of Colorado, State of Kansas, and State of Nebraska developed the RRCA Model, with participation from the United States Bureau of Reclamation and United States Geological Survey. According to the executive summary, the data and information used in construction and calibration of the RRCA Model were provided and shared by all three States and the United States in a collegial manner. Similarly, the RRCA Model was constructed and calibrated in a collaborative exercise by technical experts from all three States. (Republican River Water Conservation District, 2006)

A comprehensive review of Republican River Compact Administration was made by Kenneth W. Knox, now the Colorado State Engineer, in his doctoral dissertation, in

2004. (Knox, 2004) The Knox dissertation provides a unique insight into the decision-making processes and shows the effectiveness of the RRCA Model.

CHAPTER 5: INTERNATIONAL REFORMS

5.1 England and Wales – The Woolf Reforms

The Woolf Reforms have been called the most far-reaching reforms to court procedures in England and Wales in 125 years. (Hunton & Williams, 2003) The Final Report included many recommendations for reform, most of which were adopted resulting in new Civil Procedure Rules for England and Wales.

The Civil Procedure Rules in Part 35 (Ministry of Justice, 2007) established new requirements for expert reports in the civil courts in England and Wales. The basic premise of the new rules which relate to expert witness testimony is that the expert's function is to help the court, and not to advance the case of the party which retained him. The new rules state, in no uncertain terms, that the duty of the expert is to help the court on the matters within his expertise and that this duty overrides any obligation to the person from whom he has received instructions or by whom he is paid.

Further guidance is provided to expert witnesses in the form of practice directions and protocols. The Civil Justice Council offers guidance to experts and to those instructing them in the interpretation of, and compliance with, Part 35 of the Civil Procedure Rules (CPR 35) and its associated Practice Direction (PD 35). (Civil Justice Council, 2005) Very specific directions are included for experts who are called upon to give opinions in court proceedings.

5.1.1 Duty to the Court

The overriding duty of the expert testifying in civil proceedings in England and Wales is to help the court on matters within the expert's expertise. This duty specifically overrides any duty to the person instructing or paying them. The expert also owes a duty to exercise reasonable skill and care to those instructing them and a duty to comply with any relevant code of ethics. The protocol further directs experts to provide opinions that are independent, regardless of the pressures of litigation. The suggested test for this independence is that the expert would express the same opinion if given the same instructions by an opposing party. Experts are cautioned not to promote the point of view of the party instructing them, or to engage in the role of an advocate.

The protocol states that the opinion should be confined to matters of material dispute between the parties, and should also be confined to opinions that lie within their expertise. All material facts must be taken into account, and the reports should state those facts and any literature or other material on which they have relied in forming their opinions. The expert should indicate if an opinion is provisional, or qualified, or if they consider that further information is required in order to give an unqualified opinion.

Any failure by the expert to comply with the Civil Procedure Rules or court orders, or any excessive delay for which they are responsible may result in the parties who instructed them being penalized in costs and even, in extreme cases, being denied permission to present the expert's evidence before the court. The courts may also enter an order for costs directly against expert witnesses who by their evidence caused significant expense to be incurred, and did so in flagrant and reckless disregard of their duties to the Court.

5.1.2 Right to ask Court for Directions

Experts may request directions from the court to assist them in carrying out their functions as experts. Experts should normally discuss such a request first with those instructing them. Unless the court orders otherwise, a copy of the proposed request for directions from the court should be provided to the party who retained the expert at least seven days before filing any request to the court, and to all other parties at least four days before filing it. The experts may also use this process to secure information from the other party that has not been otherwise disclosed.

5.1.3 Content of Expert Reports

In preparing reports, experts should maintain professional objectivity and impartiality at all times. Experts' reports should be addressed to the court and must contain statements that they understand their duty to the court, and have complied and will continue to comply with that duty. The reports must also be verified by a statement of truth. The mandatory form of the statement of truth is as follows and may not be modified:

> "I confirm that insofar as the facts stated in my report are within my own knowledge I have made clear which they are and I believe them to be true, and that the opinions I have expressed represent my true and complete professional opinion."

The details of experts' qualifications to be given in reports should be commensurate with the nature and complexity of the case. It may be sufficient merely to state academic and professional qualifications. However, where highly specialized expertise is called for, experts should include the detail of particular training and/or experience that qualifies them to provide that highly specialized evidence.

Where tests of a scientific or technical nature have been carried out, experts should state: (a) the methodology used, and (b) by whom the tests were undertaken and under whose supervision; summarizing their respective qualifications and experience.

When experts rely in their reports on literature or other material and cite the opinions of others without having verified them, they must give details of those opinions relied on. They should also list the qualifications of those on whom they have relied.

When addressing questions of fact and opinion, experts should keep the two separate and discrete. Experts must state those facts (whether assumed or otherwise) upon which their opinions are based. They must distinguish clearly between those facts which experts know to be true and those facts which they assume. Where there are material facts in dispute, experts should express separate opinions on each hypothesis advanced. They should not express a view in favor of one or other disputed version of the facts unless, as a result of particular expertise and experience, they consider one set of facts as being improbable or less probable, in which case they may express that view, and should give reasons for holding it.

If the summary of the range of opinion is based on published sources, experts should explain those sources and, where appropriate, state the qualifications of the originator(s) of the opinions from which they differ, particularly if such opinions represent a well-established school of thought. Where there is no available source for the range of opinion, experts may need to express opinions on what they believe is the range which other experts would arrive at if asked. In those circumstances, experts should make it clear that the range that they summarize is based on their own judgment and explain the basis of that judgment.

The report includes a mandatory statement of the substance of all material instructions received by the expert and it should not be incomplete or otherwise misleading. Transparency is imperative. The protocol defines the term "instructions" to include all material which solicitors (attorneys) place in front of experts in order to gain advice. The omission from the statement of ‘off-the-record’ oral instructions is not permitted. Courts may allow cross-examination about the instructions if there are reasonable grounds to consider that the statement may be inaccurate or incomplete.

Although not required by the CPR, practice directions or protocol, the Academy of Experts has created an Expert’s Declaration to be inserted into the expert’s report between the end of the report and the expert’s signature. A copy of said declaration may be found at Appendix A.

5.1.4 Following receipt of expert reports

Following the receipt of experts' reports, those instructing them should advise the experts whether, and if so, when the report will be disclosed to other parties; and, if so disclosed, the date of actual disclosure. If experts' reports are to be relied upon, and if experts are to give oral evidence, the experts should be given the opportunity to consider and comment upon other reports which deal with relevant issues within their area of expertise.

If the persons instructing the experts (attorneys or parties) become aware of material changes in circumstances, or that relevant information within their control was not previously provided to the experts, they should instruct experts to review and update the contents of their reports if necessary.

It may become necessary for experts to amend their reports either: 1) as a result of an exchange of questions and answers; or 2) following agreements reached at meetings between experts; or 3) where further evidence or documentation is disclosed. Experts should not be asked to, and should not, amend, expand or alter any parts of reports in a manner which distorts their true opinion. They may, however, be invited to amend or expand reports to ensure accuracy, internal consistency, completeness and relevance to the issues and clarity. Although experts should generally follow the recommendations of attorneys with regard to the form of reports, they should form their own independent views as to the opinions and contents expressed in their reports and exclude any suggestions which do not accord with their views.

Where experts change their opinion following a meeting of experts, a simple signed and dated addendum or memorandum to that effect is generally sufficient. In some cases, however, the benefit to the court of having an amended report may justify the cost of making the amendment. Where experts significantly alter their opinion as a result of new evidence, because evidence on which they relied has become unreliable, or for any other reason, they should amend their reports to reflect that fact. Amended reports should include reasons for amendments. In such circumstances those instructing experts should inform other parties as soon as possible of any change of opinion. When experts intend to amend their reports, they should inform those instructing them without delay and give reasons.

Written questions to the experts are provided for in the protocol in order to facilitate the clarification of opinions and issues after experts' reports have been served. Experts have a duty to provide answers to questions properly put. Where they fail to do

so, the court may impose sanctions against the party instructing the expert, and, if, there is continued non-compliance, disallow a party from relying on the report. Experts' answers to questions automatically become part of their reports. They are covered by the statement of truth and form part of the expert evidence.

If the experts believe that questions are not properly directed to the clarification of the report, or are disproportionate, or have been asked out of time, they should discuss the questions with those instructing them and, if appropriate, those asking the questions. Attempts should be made to resolve such problems without the need for an application to the court for directions.

5.1.5 Single Joint Experts

CPR 35 and PD35 deal extensively with the instruction and use of joint experts by the parties and the powers of the court to order their use. The Civil Procedure Rules encourage the use of joint experts, and state that one should be obtained wherever possible. The protocol provides instructions for single joint experts; states that they have an overriding duty to the court; and they should maintain independence, impartiality and transparency at all times. Single joint experts should not attend any meeting or conference which is not a joint one unless all the parties have agreed in writing or the court has directed that such a meeting may be held, and directs who is to pay the experts' fees for the meeting. Furthermore, single joint experts may request directions from the court.

Single joint experts should serve their reports simultaneously on all parties. A single report is required even though the expert may have received instructions which contain areas of conflicting fact or allegation. If conflicting instructions lead to different

opinions (for example, because the instructions require experts to make different assumptions of fact), reports may need to contain more than one set of opinions on any issue.

Single joint experts do not normally give oral evidence at trial but if they do, all parties may cross-examine them. The preference is for written questions to be provided to the single joint expert before a request is made for them to appear in court for cross-examination.

5.1.6 Discussions between experts

The court has the power to require discussions between experts for the purposes set out in the Rules (CPR 35.12). The parties may also agree that discussions take place between their experts. The purpose of discussions between experts should be, wherever possible, to:

(a) identify and discuss the expert issues in the proceedings;

(b) reach agreement on those issues, and, if that is not possible, to narrow the issues in the case;

(c) identify those issues on which they agree and disagree and summarize their reasons for disagreement on any issue; and

(d) identify what action, if any, may be taken to resolve any of the outstanding issues between the parties.

Arrangements for discussions between experts should be proportionate to the value of the case. Some cases will not justify a meeting between experts, or justify only discussion via telephone or exchange of letters. In more substantial cases, discussion

may be face to face, but as a matter of practicality, the discussions may be via telephone or video conference.

The parties, their lawyers and experts, should cooperate to produce the agenda for any discussion between experts, although primary responsibility for preparation of the agenda should normally lie with the parties' attorneys. The agenda should indicate what matters have been agreed upon, and summarize concisely those which remain in issue. If the parties cannot agree, or if a party is not represented by counsel, the court may give directions for drawing up the agenda. The agenda should be circulated to experts and those instructing them to allow sufficient time for the experts to prepare for the discussion.

The parties' lawyers may only be present at discussions between experts if all the parties agree or the court so orders. If lawyers do attend, they should not normally intervene except to answer questions put to them by the experts or to give advice about the law. The content of discussions between experts should not be referred to at trial unless the parties agree in writing to do so.

At the conclusion of any discussion between experts, a statement should be prepared setting out:

(a) a list of issues that have been agreed upon, including, in each instance, the basis of agreement;

(b) a list of issues that have not been agreed upon, including, in each instance, the basis of disagreement;

(c) a list of any further issues that have arisen that were not included in the original agenda for discussion;

(d) a record of further action, if any, to be taken or recommended, including as appropriate the holding of further discussions between experts.

The statement should be agreed upon and signed by all the parties to the discussion. Agreements between experts during discussions do not bind the parties unless the parties expressly agree to be bound by the agreement (CPR 35.12(5)). The protocol cautions, however, that in view of the overriding objective, parties should give careful consideration before refusing to be bound by such an agreement, and be able to explain to the court their refusal should it become relevant to the issue of costs.

5.1.7 Discourse Concerning Woolf Reforms

Shortly after the CPR was implemented, much of the criticism directed at the Woolf Reforms related to the difficulties with transition. The complaints were that too little time had been allowed for the transition and that the of number changes in the first few months had made it hard to keep up with them, or even to ascertain what was the latest position regarding the CPR or the associated practice direction. (Civil Justice Reform Judiciary Hong Kong Administrative Region, 2005)

On the other hand, many comments were optimistic. A comment from the scientific community suggested that the Woolf Reforms would give experts a greater ability to both affect and effect settlement of litigation. The changes to the civil justice system were described to be as much cultural as procedural, stating the reforms should be seen as the beginning, not the end, of the process of change. (Fenn, Jinks, & O'Shea, 1999)

The English Crown’s Department of Constitutional Affairs (DCA) issued a series of reports after the implementation of the Woolf Reforms to assess the success or failure

of the new system. An early report published in 2001 included as a key finding that the use of single joint experts appears to have worked well and it is likely that their use has contributed to a less adversarial culture, earlier settlement and lower costs. (Department of Consitutional Affairs, 2001)

That report quotes a speech by District Judge Wyn Rees in which he outlined the changes and the differences with the earlier system, and noted that a change of culture had taken place in relation to expert evidence. Judge Rees commented that the changes were leading to a great deal of expert evidence being agreed upon and that, in turn, was also contributing to earlier settlement or resolution of claims. The changes are listed below:

1. the acceptance of single joint experts;
2. written questions being put to experts;
3. where there are separate experts, imposing the requirement that experts discuss the issues arising from their reports and prepare schedules of the issues upon which they agree and those upon which they disagree, specifying any reasons for disagreement;
4. requiring the court's permission to enable a party to use the written or oral evidence of an expert.

The 2001 Report contained concerns that the use of a single joint expert may not be saving costs (one of the goals of the Woolf Reforms) as some parties were hiring their own expert to shadow the single joint expert. However, even in such a situation, the use of a single joint expert seemed to be leading to settlement and a less adversarial approach.

The Department published an updated evaluation of the reforms in a report called "Further Findings: A Continuing Evaluation of the Civil Justice Reforms". (Department for Constitutional Affairs, 2002) Building on the earlier evidence and including additional information, the 2002 Report was based on various surveys and studies carried out in the prior few years, judicial statistics , and also anecdotal evidence. The 2002 Report confirmed that the use of single joint experts was continuing to work well. It repeated the findings from the 2001 Report that it is likely that their use has contributed to a less adversarial culture and helped achieve earlier settlements. However, the 2002 Report did not find that the use of single joint experts was reducing costs.

A more recent report published in 2005 confirms the change in the culture in the English courts when experts are involved. (Peysner & Seneviratne, 2005) In addition to the more frequent use of the single joint expert, is the requirement that the expert sign a statement of truth of the report and the instructions include a reminder of the mandate that experts' duty is to the court. According to Peysner & Seneviratne, **the overall effect of these changes is that the days of the "hired gun" (the expert generally hired by one side only and perceived to be pro-claimant or pro-defendant) are largely over, and neither practitioners nor judges expressed any nostalgia.** The changes also reinforce trends of reining in the expert witness industry and of an increased focus on the judge as a finder of fact.

An attempt to assess why the Woolf Reforms have succeeded in changing the culture in English courts was made in an article that compared the English system to the Italian system. (Dwyer, 2003) Dwyer conducted a series of confidential interviews with eleven civil judges of the Queen's Bench Division of the High Court on the assessment of

expert evidence in medical negligence cases. The subjects included Masters and District Judges, who deal with case management before trial, and High Court and Circuit judges, who hear cases at trial. The overwhelming consensus of judges interviewed was that post Woolf Reforms experts are used more effectively, and that they feel a positive cultural change has been effected in that the CPR gives control of the use of experts back to the courts instead of the parties.

Dwyer concludes that the change in procedural culture has been successful for four reasons: first, the reforms transfer more power to the judiciary in the management of cases; second, the 'spirit' of the reforms has been supported in the Court of Appeal; third, the 'adversarial tradition' in England has only been applied to expert evidence since the 18th Century, and has never been judicially popular; fourth, there are epistemological difficulties with the judicial assessment of expert evidence, where experts disagree.

As described in Chapter 3.2 the use of 'adversarial' experts dates only from the later eighteenth century, and replaces the use of court experts and 'special' juries. Dwyer observes that the courts have never fully accepted that evidence produced by the parties to a dispute, including expert evidence, will be anything other than partisan. This distrust was born from an innate suspicion of the motivation of a man of science in appearing for a party, and because of the experience of experts constantly in disagreement. Commentary could be found in early English case law that experts were being presented not for the maintenance of the same truths, but in martial and hostile array against each other. By the mid-nineteenth century, 'expert shopping' was known to be common practice.

Dwyer further suggests that at the heart of this distrust of party experts, and preference for court or single experts, is a realisation that law is epistemologically unable to assess the evidence of experts. The very reason that experts are permitted to give evidence on opinion, which is otherwise forbidden in Anglo–American law, is that lay jurors (or judges) do not have the expertise to interpret the facts. It therefore seems almost impossible for courts to decide between two conflicting expert opinions. This gives rise to further distrust of multiple experts in a dispute.

Another problem identified by Dwyer is that the discourse of expert evidence is not always the true discourse of the specialists outside of the legal system. The paradox is that the answer to a factual dispute on specialist matters may be decided one way within the legal system, but another way in the specialist system. Dwyer argues that courts prefer to avoid resolving expert disputes, and so prefer the use of single experts.

Expert evidence in South Africa and a review of the Woolf Reforms and other changes occurring in jurisdictions such as in Australia and in the United States were discussed by a Rhodes University professor from South Africa. (Meintjes-Van der Walt, 2003) Meintjes-Van der Walt admits that the legal culture in South Africa is not likely to embrace the Woolf Reforms regarding neutral experts, however, there are still opportunities to consider other reforms to minimize expert bias in the adversarial system.

Alternative suggestions that can ameliorate current systematic inadequacies include pretrial disclosures and meetings of the experts to delineate areas of agreement, leaving areas of disagreement to be dealt with at trial. Also recommended are comprehensive written expert witness reports combined with a code of ethics. The code of ethics might follow the trend adopted in England and Wales as well as the Australian

Federal Court as succintly stated in *The Ikarian Reefer* case. Models for such a code, making the expert an advisor to the court rather than an advocate of the parties, are found in the Academy of Expert in England's Declaration (Appendix A) and the Australian Federal Court's Guidelines (Appendix B).

Whether or not the Woolf Reforms might be appropriate for American civil procedure systems was considered in an article which compared the role of judges as managers in England and at the federal level in the United States. (Vorrasi, 2004) Vorrasi discusses the shifts in power from the parties to judges throughout pretrial civil process, and the core values that each procedural system strives toward in the pursuit of their ultimate goal of achieving justice. The comparison of English and American federal legal sytems reveals different sets of values in their civil procedural systems. The differences are primarily related to the culture. Judicial case management in England indicates a desire for a process that is efficient and predictable for the litigants. In the United States, judicial management aspires to maintain flexibility throughout its civil process, with a reluctance to frustrate the culture of preserving the power of the litigants in the adversarial system.

England has transitioned from an adversary system controlled by the parties to a regime with intense management of process by the courts. Judicial case management in the United States retains a discretionary approach that allows judges to individually tailor disputes as they evolve in the pretrial process, reflecting a willingness to sacrifice efficiency and uniformity for the flexibility to sustain the ideals of the adversarial process. However, Vorrasi suggests that a consideration of some of the Woolf Reforms as they might be applied to judicial case management in the United States would be

appopriate, particularly as related to the notions of efficiency and proportionality expressed in the English system.

The Woolf Reforms as a potential model for the United States has also been suggested within the context of class action securities litigation. (Popeo & Lammi, 2003) The Woolf Reforms' emphasis on keeping the cost of litigation proportionate to the nature of the claims at issue, and in rewarding the injured party rather than his lawyer, can serve as a practical model for reform in this country.

5.2 Other International Reforms

The Woolf Reforms have caught the attention of the international community and examples of proposals for and/or adoption of similar reforms are provided. An exhaustive study of use of expert witnesses internationally was not conducted and is beyond the scope of this study. However, in order to illustrate the nearly universal problems with expert testimony, it is informative to consider the extent with which other international jurisdictions have embraced the Woolf Reforms and have modeled or are considering modeling their own reforms on the CPR adopted in England and Wales.

5.2.1 Hong Kong

In February 2000, a Working Party was appointed by the Chief Justice in Hong Kong with the mandate to review the civil rules and procedures of the High Court and to recommend changes thereto, with a view to ensuring and improving access to justice at reasonable cost and speed. An Interim Report of the Hong Kong Civil Justice System was published in 2001. It identified problems that exist in Hong Kong similar to those identified by Lord Woolf in his Interim Report. (Civil Justice Reform Judiciary, 2005)

Adversarial pressures have distorted the useful practice of having experts testify to assist the court. Problems cited are: (a) experts are often inappropriately or excessively used; (b) experts are called where expert evidence is either not needed, or should be limited to a few issues, instead of wide ranging matters covered in the expert report; and (c) experts are often partisan and lacking in independence, giving the court no objective assistance but deployed as part of the adversarial armory. These are practices which increase costs as well as the duration and complexity of proceedings.

A Hong Kong Civil Justice Final Report was published in 2004 with recommendations to follow some of the Woolf Reforms and some of the reforms adopted by the Supreme Court of New South Wales. (Civil Justice Reform Judiciary Hong Kong Administrative Region, 2005) The Working Party canvassed members of the bar association and judiciary, and rejected some of the recommendations made in the Hong Kong Interim Report, and supported others. A summary of the recommendations is as follows:

1. Expert evidence is presently governed by section 58 of the Evidence Ordinance which lays down as conditions of admissibility, the requirement that the witness and the subject-matter of the evidence qualify for expert status, and that the evidence is relevant to the issues in dispute. The court has power to limit the number of experts to be called and, expert evidence can only be called with the leave of the court if pre-trial disclosure of the substance of his evidence, usually by exchange of expert reports, has been made. Therefore, in the Working Party's view, it is unnecessary to introduce a general discretionary power to exclude expert evidence which has not been excluded under the present rules. The Working Party accordingly recommends against

adopting the recommendation that gives the judge further discretion to limit expert evidence.

2. Five of the proposals in the Hong Kong Interim Report aimed at countering a lack of impartiality or independence among expert witnesses were canvassed. Three of these received widespread support: (i) a rule expressly emphasizing the supremacy of the expert's duty to the court over and above any duty owed to the client or person paying his fees; (ii) a rule requiring the expert to acknowledge that overriding duty in his report; and (iii) a rule requiring him to declare his agreement to be bound by an approved code of conduct for experts. The Hong Kong Final Report makes recommendations along those lines.

3. The fourth measure, involving the suggestion that experts be required to disclose the substance of the instructions upon which their report is based, raised serious concerns as to the abrogation of legal professional privilege and possible inconsistency with the right to confidential legal advice which is protected. In the light of these concerns (which raise arguable issues), the Working Party has decided against adoption of this proposal.

5.2.2 Canada

The Civil Justice Review was established in April 1994, as the joint initiative of the former Chief Justice of the Ontario Court of Justice and the former Attorney General for Ontario, to address the problems of expense and delay threatening the civil justice system and to propose specific and implementable solutions to those problems. Its mandate was to develop an overall strategy for the civil justice system in an effort to provide a speedier, more streamlined, and more efficient structure which will maximize

the utilization of public resources allocated to civil justice. After a year of intensive consultation, the Civil Justice Review released its First Report. (Ontario Civil Justice Review, 1995) The First Report was followed by a Supplemental and Final Report. (Ontario Civil Justice Review, 1996)

In September 1995, Lord Woolf visited Toronto. The Ontario Final Report comments that the problems identified by Lord Woolf in England and Wales were very similar to the problems addressed by the Civil Justice Review. The Ontario Final Report commented on how remarkable it was that two separate bodies from two different jurisdictions independently arrived at very similar conclusions.

Coinciding with the release of the Ontario Final Report, the Systems of Civil Justice Task Force was formed by the Canadian Bar Association (CBA) to inquire into the state of civil justice on a national basis and to develop mechanisms to help modernize the civil justice system. The Task Force consulted individuals and organizations across Canada with an interest in civil justice reform, including the Civil Justice Review, and on August 25, 1996, the Task Force released its Report. (Canadian Bar Association, 1996). The vision for the civil justice system articulated in the Canadian Bar Association Report has many of the same elements as the framework for the modern civil justice system set out in the Ontario Report. A summary of the discussion from the Canadian Bar Association Task Force follows:

Experts are being used more frequently in the litigation process leading to increased costs and delays at both the discovery and the trial stage. One priority for reform is early and full disclosure of expert reports. This can be accomplished by amending existing rules of procedure to:

» require early disclosure of the anticipated evidence of experts in the form of 'will-say' documents;

»ensure pre-discovery disclosure of expert reports unless the court orders otherwise;

» impose a continuing obligation to disclose expert reports as they become available; and

» require, at a minimum, that disclosure of further or supplementary expert reports occur at least 90 days before the trial or hearing date.

The Task Force was also concerned about the growing tendency to use increasing numbers of experts at trial. Judges do not appear to be using a consistent approach to curtail the scope of opinion evidence offered in complex cases. The Task Force concluded that it is desirable that there be limits on the number of experts that can be called as witnesses, as well as limits on the scope of opinion evidence admissible at trial. These reforms can be achieved, at least in part, if judges conducting case management exercise greater control over the use of experts.

Examples of control include:

» judges can order experts to meet with a view to narrowing the issues in dispute before a trial;

» in appropriate cases, judges could consider using court-appointed experts. While this should not be the general rule, there is room for their use in appropriate circumstances.

» rules of procedure could be amended to provide for the early exchange of expert ‘critique’ reports. These are reports prepared by each party's expert critiquing the

opinions and work undertaken by the opposing party's expert as reflected in the initial expert report. Expert critique reports reflect the rebuttal evidence that experts might be expected to give at trial. The use of critique reports derives from the administrative law forum, where their use has met with considerable success in some regulatory contexts.

The emphasis must be on early disclosure of relevant expert reports, well in advance and by a stipulated time before trial. The utility of disclosing such reports is greatly reduced if disclosure is not timely. Finally, reforms should be aimed at ensuring that expert testimony is introduced at trial as efficiently as possible.

Specific reforms to be considered include:

» increased use of written evidence in chief (subject to supplementary oral examinations in chief with leave of the court);

» limits on the number of experts to be called per issue; and

» in appropriate circumstances, the calling of experts in panels of witnesses rather than sequentially.

A formal Recommendation 17 from the Task Force was that every jurisdiction should amend its rules of procedure concerning experts to:

(a) require early disclosure of expert reports,

(b) provide for the exchange of expert critique reports in a timely fashion before trial or hearing, and

(c) impose a continuing obligation to disclose expert reports as they become available.

Although it is a decision of the British courts, *The Ikarian Reefer* and the duties of the expert witness enumerated by Justice Creswell have been applied in a number of subsequent Canadian decisions. (Bogoroch & Goldstein, 2003)

The common law rule in Canada concerning the admissibility of expert evidence is that it is admissible at trial provided that it meets certain requirements:

(a) the evidence is relevant to some issue in the case;

(b) the evidence is not excluded by a policy rule;

(c) the evidence falls within the proper sphere of expert evidence. (R. v. Mohan, 1994)

If the purported evidence is novel, then evidence must be scrutinized under the *Daubert* test which was adopted by the Supreme Court of Canada in the year 2000. (R. v. Trochym, 2000) The Supreme Court of Canada maintained the position that a judge in exercising the role as "gatekeeper" must carefully scrutinize the admissibility of novel scientific evidence. The evidence will not be admitted if it may distort the fact finding process. (Derwin, 2007)

Reforms to the Canadian Federal Court Rules relating to expert evidence were implemented in September of 2006. (Canadian Forum on Civil Justice, 2006) The new rules provide:

1. Pre-trial conference memoranda must be accompanied by all documents that are intended to be used at trial that may be of assistance at the pre-trial conference, including all affidavits or statements of expert witnesses.
2. An affidavit or a statement of an expert witness shall set out in full the proposed evidence of the expert.

3. A judge may enter orders at a pre-trial conference setting out the time for service of any additional or rebuttal affidavits or statements of expert witnesses.
4. The distinction between expert evidence in chief and rebuttal is removed.
5. Evidence may be adduced by way of affidavit.

The rationale of the Rules Committee for the need to require affidavits of experts before the trial was that the parties should be ready for trial at the pre-trial conference in order to facilitate the setting of earlier trial dates. Full and candid settlement discussion is only possible at the pre-trial conference stage if all expert reports are available. Also the Rules Committee rationale was that the expense in obtaining expert reports at an earlier stage would encourage earlier settlement of cases.

5.2.3 Australia

In Australia there are two systems which govern the admissibility of expert testimony. One system is the 1995 Uniform Evidence Act and the other is the common law derived from the English common law. This is similar to the United States with the Rules of Evidence and case law in each jurisdiction which interpret the rules. However, Australia has not had the explosion of litigation as has been seen in the United States, and experts are commonly used, but have never been subjected to the heated debate surrounding 'junk science' as has been prevalent in the United States. (Selby, Personal Communication Telephone Interview, 2007)

After the reviewing the Woolf reports the Australian Federal Court Chief Justice imposed Practice Notes which include the duty of the expert to the court and not to the party that hired the expert. The rules also require the expert to disclose all sources of

information used to form their opinion, and all sources they would have liked to have but were not available. The expert's reasoning process has become very transparent, as they must disclose their procedures, methods and data used in forming the opinion. (Selby, Personal Communication Telephone Interview, 2007)

Several Australian jurisdictions that have reformed the rules relating to expert witnesses include: New South Wales, Queensland, the Federal Court, the Family Court, and the Australian Capital Territory. The Australian developments were very much influenced by the Woolf Reforms. (New South Wales Law Reform Commission, 2005) The newer approaches feature the formulation of standards either in rules of court or as a code of conduct in the form of a schedule to the rules. They are intended to formulate standards in a coherent and authoritative form, and require expert witnesses to acknowledge and adhere to them. Although many reforms were adopted in the late 1990's, they continue to be modified and updated.

In late 1998, the Australian Federal Court introduced rules and a practice direction to try and deal with the problems of the integrity of expert evidence placed before the courts. The Federal Court of Australia issued Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia in the form of a Practice Direction. The Practice Direction has been updated several times, most recently as of June 2007. A copy of the most current guidelines is included at Appendix B.

The Federal Court of Australia reforms differ from the English reforms in two important respects. (New South Wales Law Reform Commission, 2005) First, while the English reforms were underpinned by a policy of complete control by the court over the use of expert evidence, the calling of expert evidence in the Federal Court is subject to

the control of the parties, with the Court taking some control in exceptional cases. Unlike the English rules, the Federal Court rules do not require parties to seek the permission of the court before they can call expert witnesses. Secondly, the Federal Court has not adopted the concept of the single joint expert introduced in England, although its court rules contain provisions in relation to court-appointed experts.

The Uniform Civil Rules that are now being implemented in various Australian jurisdictions impose requirements that were started by the Australian Federal Court in 1998. The changes to use of expert witnesses and the standards expected of them have been driven by the judges with support from the law reform reports. According to Hugh Selby, the experts generally like the requirements, because they are "freed" from the partisanship that otherwise "infects" their relationship with the client, attorney and the court. Furthermore, he noted that he had not encountered a competent advocate (lawyer) who was unhappy with the changes. Selby stated that it is, however, important to recognize that in Australia, that the general rule is to provide for fee shifting (the loser pays a good part of the winner's legal costs) and an Australian lawyer's primary, overriding duty is to the court, not the client. These differences affect the lawyer's perspective. (Selby, Personal Communication via electronic mail, 2007)

In 1999 Queensland adopted Uniform Civil Procedure Rules, which generally apply to the Supreme, District and Magistrates Courts. The rules contain provisions on expert witnesses with respect to duty of experts; requirements on the contents and form of an expert's report; disclosure of the expert's report, and the process of admitting the expert's report as evidence, including cross-examination of the expert. In July 2004, new rules were adopted with two significant features, where proceedings require

evidence from expert witnesses; the rules establish a presumption in favor of the appointment of a single expert, either by agreement of the parties or by order of the court. The new rules also provide for the appointment of an expert before litigation commences; that expert then becomes the only expert on the relevant issue if proceedings are commenced. These particular features apply only to proceedings in the Queensland Supreme Court.

The New South Wales Supreme Court introduced an "Expert witness code of conduct" in January 2000. As of August 2005, the equivalent provisions and code of conduct are embodied in the Uniform Civil Procedure Rules. The UCPR has provided for court-appointed experts and as of December 2006, parties may appoint a joint single expert. Controls have been imposed on the number of experts which the parties may call. Courts have required experts to meet and discuss their opinions in advance of the trial in order to make the most efficient use of court time, and refine the issue or issues which the court must resolve. Experts have been required to acknowledge that their primary duty is to the court and not a party.

The provisions of the expert witness code of conduct in the rules of court have been strongly influenced by the common law, including the principle that expert evidence presented to the court should be, and should be seen to be, the independent product of the expert uninfluenced by the exigencies of litigation. This follows the direction of *The Ikarian Reefer* and is cited in Report 109 of the New South Wales Law Commission. The provisions of the expert witness code of conduct are not to be treated as rules of admissibility of expert opinion evidence, but as a code of conduct designed to improve

the quality of expert opinion evidence. (Australian Securities and Investments Commission v. Rich, 2005)

Some Australian jurisdictions allow the practice commonly called “hot-tubbing” in which experts give evidence concurrently in the course of a general discussion, presided over by the judge. The parties’ lawyers also participate in the discussion, rather than proceed to the traditional separate sequential examination and cross-examination of each expert witness. The concept has been formalized into a process referred to as “concurrent evidence” and was recently discussed in detail by the Honorable Justice Peter McClellan, Chief Judge at Common Law, New South Wales Supreme Court. (McClellan, 2007)

Concurrent evidence is a procedure in which the experts are provided with an opportunity to contribute their learning and experience to assist the court to resolve issues in an environment where there is a diminished obligation to a party, and the constraints imposed by the adversarial process are avoided. Concurrent evidence requires the experts retained by the parties to prepare a written report in the conventional fashion. The reports are exchanged and the experts are required to meet to discuss those reports. This may be done in person or by telephone. Concurrent evidence requires the experts to prepare a short document which incorporates a summary of the matters upon which they have agreed and those matters upon which they disagree.

The experts are sworn together and using the summary of matters upon which they disagree, the judge in consultation with counsel establishes an agenda for a discussion of the issues which require resolution. The judge then chairs that discussion ensuring that an opportunity is provided for each expert to place their view before the

court on a particular issue or sub-issue. The experts are encouraged to ask and answer each other's questions. Counsel may also ask questions during the course of the discussion. These questions are designed to ensure that an expert's opinion is fully articulated and where necessary challenged by a contrary opinion. At the end of the process the judge will ask questions to ensure that all of the experts have had the opportunity of fully explaining their position.

Justice McClellan commented that he has utilized the process of concurrent evidence on many occasions and has also had the opportunity to speak with many witnesses who have been involved in the process, and with counsel who have appeared in cases where it has been utilized. He commented that although attorneys are often hesitant before being involved in the process, he has heard little criticism once they have experienced it. Provided everyone understands the process at the outset, in particular that it is to be a structured discussion designed to inform the judge, and not an argument between the experts and the advocates, it is not difficult to manage the hearing. "Within a short time of the discussion commencing, you can feel the release of the tension which normally infects the evidence gathering process. Those who might normally be shy or diffident are able to relax and contribute fully to the discussion." (McClellan, 2007)

According to Justice McClellan, this change in procedure has met with overwhelming support from the experts and their professional organizations. They find that they are better able to communicate their opinions and, because they are not confined to answering the questions of the advocates, are able to more effectively respond to the views of the other expert or experts. The experts believe that there is less risk that their evidence will be distorted by the advocate's skill. It is also significantly more efficient.

Evidence which may have required a number of days of examination in chief and cross-examination can now be taken in half or as little as twenty percent of the time which would have otherwise been necessary.

Justice McClellan further stated that because the judge has the opportunity to observe the experts in conversation with each other about the matter, together with the ability to ask and answer each others questions, the capacity of the judge to decide which expert opinion to accept is greatly enhanced. Rather than have a person's expertise translated or colored by the skill of the advocate, the expert's views are expressed in his or her own words. There are also benefits when it comes to writing a judgment, as the judge has a transcript where each witness answers exactly the same question at the same point in the proceedings. The Uniform Civil Procedure Rules in New South Wales now provide for concurrent evidence and the Supreme Court has altered the relevant Practice Note to facilitate the presentation of cases so that they may proceed with concurrent evidence from the experts.

As described by Justice McClellan, many of these changes have been controversial. For many people these changes are seen as an unwarranted intrusion on the rights of an individual to litigate under the adversarial system. Just as case management was seen as an unjust constraint upon a party’s rights, confining a party’s opportunity to call an expert or experts was viewed as contrary to the right to a fair trial. Justice McClellan suggests that those opposing the changes may do so without recognizing that many of the changes of forum are a direct result of the perceived failure of the adversarial system to provide an effective decision at an acceptable price.

One consequence of the adversarial system is that witnesses, including many experts, consciously or unconsciously perceive themselves to be on one side or the other of the argument. The process discourages many of the most qualified experts from giving evidence as they will not subject themselves to a process which is not efficient in using their time. Experts also comment that they do not want to participate in a forum where the fundamental purpose of the participants is to win the argument rather than seek the truth; where the forum confines them to answering only "the questions asked" depriving them of the opportunity, as they see it, to accurately inform the court. Such individuals reject the process as "game playing" and a waste of their time. (McClellan, 2007)

5.2.4 Australian Judicial Institute Empirical Studies

In the wake of actual and potential changes in the way expert testimony is admitted in the courts, questions were arising among the bar and bench in Australia. Would the *Daubert* criterion make their way into Australian law? How far-reaching will be the new Australian Federal Court Rules containing guidelines for experts? Dr. Ian Freckelton, an acknowledged expert in the area of expert testimony, proposed to the Australian Institute of Judicial Administration (AIJA) that a survey be conducted of Australian judges to gather empirical data to inform the debate. (Freckelton, Reddy, & Selby, 1999) The survey overlayed the issuing of expert witness guidelines by the Australian Federal Court. (Selby, Personal Communication Telephone Interview, 2007)

The purpose of the survey was not to test a hypothesis, but to gather information and to empirically ascertain judicial beliefs or approaches in relation to the way in which evidence from other disciplines fares in the contemporary litigation process. All 478

Australian judges were sent a survey by the AIJA in mid-1997. The voluntary responses were substantial and resulted in a 51.05% return.

A second survey was conducted eighteen months later of the Australian magistracy. (Freckelton, Reddy, & Selby, 2001) The magistrates in Australia sit in a number of capacities, and include forums that are fundamentally inquisitorial, as well as children's or juvenile courts with protective jurisdictions that have more relaxed standards of evidence. The second survey was important to assess the perspective of the magistracy because their courts have the largest percentage of litigation in Australia, and their caseloads require a high degree of efficiency. The cases also tend to be shorter than those conducted in the District/County Courts or in the Supreme Court. The second survey was in part intended to assess the differences related to the above factors.

Of the 401 surveys sent out by the AIJA to the magistrates, a nearly identical response rate resulted, i.e. 50.62%. The magistrates' survey was nearly identical to the judges' survey; however there were some modifications made that are not relevant to this discussion.

The survey results from the magistrates' survey may be found in Appendix C. Since the format of those results includes the questions as well as the answers, there is no need to also include the AIJA survey instruments. Similarly, the magistrates' survey results include the judges' survey results, for ease of comparison; therefore there was no need to separately include the judges' survey results.

The AIJA survey results revealed the following conclusions:

1. Judges are concerned about a tendency by some experts toward a lack of objectivity. This was sometimes identified as overt bias; sometimes as partisanship in the expression of opinions; and in some instances it was an unwitting lack of neutrality.

2. High concerns for a perceived lack of independence.

3. Prominent was what was described as the phenomenon of the expert functioning principally as a professional expert - especially the medical practitioner retired or semi-retired from active clinical practice.

4. Eminent experts appeared for each side with irreconcilable views.

5. The need for better clarity of expression on behalf of the experts.

6. A need to crystallize those issues genuinely in dispute amongst the experts prior to the formal commencement of hearings.

7. Most of those who expressed an opinion saw a value in facilitating experts conferring with one another before trial and agreeing on what is an issue in dispute and what is not. (This is also a priority under the 1998 Practice Direction of the Australian Federal Court in relation to expert evidence.)

8. Recognition of the need for efficiency and an expression of support for the proposition that experts should more often remain in court, when other experts are giving evidence.

9. Some respondents advocated the practice of experts giving their evidence together - the so-called ‘hot tub’ approach.

10. Early identification and focus upon the real matters of disagreement between experts.

11. While only a few respondents had ever appointed expert witnesses, assessors or expert referees, there was strong support in principle for such measures - much more so, for instance, than for the imposition of restrictions upon the numbers of expert witnesses permitted to be called by parties. It was apparent that the usage of court-appointed experts, assessors and referees troubled some judges who had not used them because it was inconsistent with the adversarial model. However, most judges said that they had not used court-appointed experts either because they had not been asked to do so by the advocates appearing before them or because they had determined such a course not to be necessary. Some respondents also were worried about the costs and the mechanics of such initiatives.

If there is any **one** underlying theme that stands out in the survey responses, it is the desire of judges for expert help that is objective and reliable. One aspect of that quest is whether expertise in a particular field is sufficiently developed to constitute useful expertise at all. Australian courts, unlike those in the United States, have not had occasion to determine definitively the criteria for the admission of expert evidence. The importance of general acceptance among the community of peers was highlighted in Victoria, albeit not as an admissibility test, more than a decade before the *Frye* test was adopted in the United States (R v Parker, 1912); however, since then appellate decisions have concentrated on issues such as the ultimate issue rule, what is and is not common knowledge, and whether an expert has stepped beyond his or her expertise. No authoritative determination has yet emerged on the threshold question of whether an "area of expertise" test exists along the lines of those applied in the United States, Canada or New Zealand. (Freckelton, Reddy, & Selby, 1999)

In a push toward changing the culture of partiality and improving the quality of expert evidence in Australian courtrooms, Freckelton, Selby and Reddy, recommended development of codes of ethics and practice for forensic experts such as the Federal Court of Australia's Practice Note, "Guidelines for Expert Witnesses." A declaration by an expert which embraces the principles of independence and sound practice expected of the expert report writer or witness similar to the one the United Kingdom-based Academy of Experts requires of its members to be attached to their forensic reports. The recommendation recognized that initially it is merely symbolic. Such a declaration is eloquent in terms of the ideals expressed, however in time it is also likely to forge a culture of obligation on the part of expert witnesses primarily to the courts, rather than to the parties paying their fees. In addition, the presence of such a declaration articulates values, departure from which is likely to lead to little weight being placed upon the defaulting expert's views. There is therefore recommend a mandatory declaration for all Australian expert reports in the form set forth in Appendix D.

CHAPTER 6: DIVIDING THE WATERS SURVEY

6.1 The Need for Empirical Evidence

A committee of the National Academies of Science was convened to consider the impact of *Daubert*. The report of the committee describes how in the adversarial process, scientific data are interpreted by expert witnesses employed by one party with no assurance of their scientific neutrality or the merit of their testimony. The testimony of highly respected scientists can be distorted by other experts, by counsel, or by the court. The report describes how an expert may feel that he or she is on trial, because the adversarial system places great emphasis on discrediting the expert in order to divert attention from the expert's scientific opinion. (National Research Council of the National Academies, 2006)

The committee concluded that further research is needed regarding the involvement, role, and responsibilities of experts in the courtroom. The following questions were posed for further study:

• Has *Daubert* altered the role of scientific experts in litigation? What is the appropriate role of scientists in litigation?

• Has *Daubert* changed the boundary of expertise that a scientific expert can speak to? How has *Daubert* changed the relevance of qualifications? Which scientists qualify or are disqualified in *Daubert* hearings?

• Is it appropriate to require experts to testify in terms of legal standards, such as reasonable degree of certainty, that are not understood in their own disciplines?

• How can we provide esteem and prestige to scientists who work with and participate in the legal system? Are there models that could be used to encourage scientists to participate as experts?

• If experts were selected using a court-appointed process, rather than by adversaries retaining experts, would more scientists be willing to participate?

• If we moved to a consensus model approach, that is, convening a panel of experts to arrive at a consensus about the reliability of the evidence provided, what protocols should govern the interactions of scientists and lawyers in the courtroom?

There has also been a call for empirical research to inform those calling for civil justice reform. Litigation reform efforts in the United States have sounded a consistent theme of the need to reduce expense and delay, described as a common rallying cry for civil justice reform world-wide. (Burbank & Silberman, 1997) Both in the United States and elsewhere, there exists a lack of reliable and systematic empirical data which makes it difficult to assess the severity or extent of the problems.

Burbank and Silberman are skeptical that anecdotal evidence and experiences from the bench provides a sufficient foundation for judicial reform. For example, more information is needed about whether a particular proposal should be adopted across the board, or whether it should be adopted only for specific types of litigation. The culture and context in which lawyers function are critical to the success of any reform effort and meaningful change may be impossible if lawyers merely substitute one set of tactics for

another. At its most ambitious, however, civil justice reform can help recast and redefine the lawyer's role. (Burbank & Silberman, 1997)

6.2 The Survey Instrument

The survey created for this study was in part based on relevant questions in the AIJA surveys. The last section of the DTW survey includes a series of questions designed to measure the receptiveness of the survey participants to the Woolf Reforms, and some of the other reforms proposed or adopted in other jurisdictions. A copy of the DTW survey instrument is attached as Appendix E.

Of the 184 surveys mailed, twelve were return undeliverable or the recipient responded that they did not answer because they were not judicial or quasi-judicial officers. Of the 172 valid surveys, 74 completed surveys were returned by mail or were completed online. The response rate was 43.02 %. This compares favorably to the AIJA survey response rates of just over 50% each.

Of the 172 valid surveys, 139 were mailed to participants working in a state system and 33 were mailed to participants working in the federal system. Fifty-nine of the state surveys were returned and fourteen of the federal surveys were returned. The response rate for the two groups was consistent with the overall response rate: 42.44% for state responses and 42.42% for federal responses.

6.3 The Survey Results

A summary of the overall survey results are found at Appendix F.

6.3.1 The type and frequency of expert evidence

Nearly 39% of the respondents encounter expert testimony in at least 75% of their cases. Another 22% encounter expert testimony in at least 50% of their cases. Therefore sixty-one percent (61%) of all participants experience expert witness testimony more in more than half of their cases. Over 16% encounter experts in at least 25% of their cases. Another 22% encounter experts in less than 10% of their cases. The types and frequency of expert testimony varied, however geology and hydrology were seen most often. The same expert witness was encountered more than one time in a year by over 76% of the respondents. Of those responding 15% saw the same expert more than seven times in a year.

6.3.2 Problems associated with expert evidence

A series of questions was asked as to whether and how frequently certain problems were encountered. The number adjacent to the question correlates to the question number in the summary of results found in Appendix F.

The questions follow:

Q. 10.0 *Have you encountered adversarial bias on the part of the expert [predisposition, inclination, or favoritism towards the party who called or hired the expert]?*

The response was that over 59% encountered adversarial bias **often or always**. Over 34% encountered adversarial bias **occasionally** and only 6% **never** encounter adversarial bias.

Q. 11.2 *Have you encountered use of oral or written language by the expert that was difficult to understand?*

Twenty six percent (26%) of the respondents encountered this problem **often** and 60% encountered this problem **occasionally**. Only 14% said they **never** encountered oral or written language that was difficult to understand.

Q. 12.3 *Have you encountered failure by the expert to stay within the parameters of his or her expertise?*

Over 20% of the respondents **often** encountered experts that did not stay within the parameters of their expertise. Over 59% encountered this problem at least **occasionally**. Approximately 20% **never** encountered this problem.

Q. 13.4 *Have you encountered non-responsiveness by the expert to questions?*

Over 20% of the respondents **often** encounter non-responsiveness by the expert to the questions. Over 53% encountered this problem at least **occasionally**. Over 26% **never** had this problem.

Q. 14.5 *Have you encountered failure to prove the bases of the expert's opinions?*

Over 19% of the respondents **often** encounter experts who fail to prove the bases of their opinions. Nearly 56% of the respondents encounter this problem **occasionally**. Over 25% **never** encounter this problem.

Q. 15.6 *Have you encountered failure by the lawyer to pose direct examination questions appropriately?*

Nearly 31% of respondents **often** encounter the failure by the lawyer to pose direct examination questions appropriately. Nearly 58% **occasionally** have this problem. Only 11% stated this **never** occurs.

Q. 16.7 *Have you encountered failure by the lawyer to cross-examine so as to make the expert accountable?*

Over 31% of respondents **often** encounter failure by the lawyer to cross-examine the expert to make the expert accountable. Approximately 58% have this problem **occasionally**. Only 11% stated this **never** occurs.

Q. 17.8 *Have you encountered failure of the expert to articulate his or her opinion understandably?*

Over 23% of the respondents **often** find that the expert has failed to articulate his or her opinion understandably. Over 63% have this problem **occasionally**. Only 14% never encounter this problem.

Q. 18.9 *Have you encountered failure of the expert to adequately support the opinions given?*

Nineteen percent (19%) of the respondents **often** encounter experts who fail to adequately support the opinions given. Nearly 67% of the respondents encounter this problem **occasionally**. Only 14% **never** have this problem.

Q. 19.B *Of the problems listed above, what **is the single** most **serious** problem you have encountered with expert evidence?*

The **single most serious** problem respondents have encountered is **adversarial bias** on the part of the expert, according to nearly 41% of the respondents. Over 23% reported the most serious problem was the use of **oral or written language** that was

difficult to understand. Over 10% stated the most serious problem was the failure of the expert to adequately support the opinions given.

Q. 20.C *Of the problems listed above, what problem you have encountered* ***most frequently****?*

The **most frequent** problem encountered was **adversarial bias** according to over 56% of the respondents. Over 20% reported the most frequent problem was use of **oral or written language** that was difficult to understand.

6.3.3 Evaluation of evidence

Q. 22.A *Have you encountered evidence from experts that you were* ***not able*** *to evaluate adequately because of its* ***complexity****?*

Over 63% of respondents **occasionally** had problems evaluating evidence adequately because of its complexity. Over 32% **never** had this problem.

Q. 23.B *If you answered occasionally, often or always to the previous question, did the evidence come from a witness or witnesses from the disciplines of biology/life sciences, engineering, economics/finance, geology, hydrology, soil sciences, statistics/mathematics, other?*

Respondents could select all of the disciplines that apply. Fifty percent (50%) listed **hydrology**, 38% listed **engineering**, 25% listed **economics/finance** and 21% listed **statistics/mathematics**.

Q. 24.C *Have you had any difficulty in ensuring that the expertise you consider necessary to assist you in making your decisions is available to you?*

Twelve percent (12%) of the respondents reported **often** having difficulty ensuring the availability of expertise necessary to make the decisions. Nearly 57% reported that this was a problem they encountered **occasionally**. Over 31% **never** had this problem.

Q. 25.D *When expert witnesses are used, do you find the expert evidence useful for the fact-finding process?*

When experts are used, nearly 18% **always** find the expert evidence useful and over 63% **often** find the evidence useful. Nearly 18% reported that the evidence was **occasionally** useful.

Q. 26.E *Have you had any difficulty evaluating the opinions of one expert against those expressed by another?*

Over 20% of the respondents **often** had difficulty evaluating the opinions of one expert against those expressed by another. Over 65% **occasionally** had this difficulty.

Q. 27.F *If you have had difficulty evaluating the opinions of one expert against those expressed by another, which of the following factors was responsible?*

The respondents were asked to select all of the answer options that applied. The following Table 1 describes the responses. The majority of the respondents, over 69%, cited the **fundamental irreconcilability** of the views as the factor in their difficulty evaluating expert opinions against those expressed by another expert. The next highest factor was the **inadequate cross-examination** of expert testimony at over 45%. It is interesting to note that in the question concerning identification of problems (Q.15.6) the respondents indicated that 31% of the time the lawyer **often** fails to pose direct examination questions appropriately, and 31% of the time the lawyer **often** fails to cross-

examine so as to make the expert accountable. From the response to this question, it appears that the failure to cross-examine to make the expert accountable causes much more difficulty than improper direct examination for the judge or administrative hearing officer in evaluating the opinions of one expert against another.

Table 1 Factors Responsible for Difficulty Evaluating Expert Opinions

Q. 27F Answer options	**Response Percent**
inadequate introduction of expert testimony by the lawyer	14.52%
inadequate cross-examination of expert testimony	45.16%
inadequate communication by the expert of his or her opinion to the trier of fact	35.48%
the experts lacked credibility	25.81%
complexity of the expert evidence	43.55%
fundamental irreconcilability of views expressed by opposing experts	69.35%
testimony by the experts failed to directly address issues	32.26%
Other (please specify)	4.84%

Q. 28.G *What is your view about expert witnesses being present in the court or administrative hearing to hear and comment on the evidence of other expert witnesses?*

Over 70% of all respondents were of the view that it was **helpful** to have the expert witnesses present in the courtroom or administrative hearing to hear and comment on the evidence of the other expert witnesses. Nearly 20% were of the view that it made no significant difference and 10% said it was not helpful.

6.3.4 Reliability of expert witness testimony

Q. 30.1 *Is the* ***courtroom*** *a forum in which the reliability of expert theories and techniques is adequately evaluated?*

Most of the respondents, over 72%, responded that the courtroom is a forum in which the reliability of the theories and techniques is adequately evaluated. Over 19% answered "no" to this question and 8% had no opinion.

Q. 31.2 *Is the* ***administrative hearing*** *a forum in which the reliability of expert theories and techniques is adequately evaluated?*

Over 42% of respondents had no opinion as to whether an administrative hearing was a forum in which reliability of expert theories and techniques is adequately evaluated. Nearly 41% said it was, and 17% answered no. The high "no opinion" response could be explained by the fact that 57% of the respondents were either trial or appellate judges.

Q. 32.3 *Are* ***most*** *experts who give evidence before you representative of the views of their discipline?*

Seventy-three percent (73%) of all respondents agree that most experts who give evidence are representative of their discipline. Over 24% had no opinion.

Q. 33.4 *If you answered No or No Opinion to the previous question, do you think that this is a significant problem for the quality of fact-finding?*

Of the total respondents, 26% answered the prior question with a No or No Opinion. Of those answering this question, 65% report that this is a significant problem for the quality of fact-finding.

Q. 34.5 *Do the same expert witnesses appear regularly before you for the same side?*

Over 66% of the respondents have experts regularly appear before them on the same side. Nearly 18% of the respondents do not, and 16% had no opinion.

Q. 35.6 *Have you had expert witnesses appear before you and give testimony that is inconsistent with evidence that was presented by them in a different case?*

Of total respondents, 60% reported that expert witnesses did not appear and give testimony that was inconsistent with evidence presented by them in a different case. However, 27% of the respondents did have this occur.

If the answer to question 35 6 was 'Yes' did this affect:

Q. 36.7 *Your decision to admit the evidence?*

Q. 37.8 *The weight you gave the evidence?*

Q. 38.9 *The ultimate decision in the case?*

Nearly 71% of the respondents who answered that they have had evidence inconsistent with evidence the expert had presented in a different case, said that it did not affect their decision to admit the evidence. However, 74% said it did affect the weight given the evidence, and 55% said it affected the ultimate decision in the case.

Q. 39.10 *Have you encountered partisanship in expert witnesses called to give evidence before you?*

Over 78% of the respondents have encountered partisanship in expert witnesses called to give evidence.

Q. 40.11 *If you answered 'Yes' to the previous question, is this a significant problem for the quality of fact-finding?*

Nearly equal responses were received as to whether this was a significant problem for the quality of fact finding, with 41.4% saying it was a significant problem and 46.6% saying it was not a significant problem.

6.3.5 Participation by lawyers in preparation of expert witness reports

The following questions and tables show that approximately one-third of respondents are uncertain as to the extent of participation that the lawyers have in the preparation of the expert witness reports. The questions were intended to assess the type of participation by the lawyers, and what was the usual effect upon the respondent's assessment of the evidence.

A substantial number, over 30% of the time, the respondent was uncertain as to whether, and to what extent, the lawyer participated in the preparation of the expert witness report. See Table 2, Table 3, Table 4 and Table 5 below. The effect of the editing is shown in Table 6 below. The majority indicated that if the report was edited for spelling or grammar, or for style and presentation, it made no difference to them. However, there was an even split at 42.9% each of those who believe that editing for content either harmed or made no difference. There was a slightly higher percent of respondents who believe that editing for opinion or conclusion harmed at 48.2% over those that believe it makes no difference at 44.6%.

Q. 41.A *In the expert reports that are tendered to you, does it appear that lawyers have played a part in finalizing the report?*

R*eport edited for spelling and grammar?*

Table 2 Report edited for spelling and grammar

Answer options	Percentage
Never	15.2%
Occasionally	18.2%
Often	21.2%
Always	7.6%
Uncertain	37.9%

Report edited for style and presentation?

Table 3 Report edited for style and presentation

Answer options	Percentage
Never	12.1%
Occasionally	27.3%
Often	16.7%
Always	7.6%
Uncertain	36.4%

Report edited for content?

Table 4 Report edited for content

Answer options	*Percentage*
Never	*13.4%*
Occasionally	*19.4%*
Often	*22.4%*
Always	*13.4%*
Uncertain	*31.3%*

Report edited for opinion or conclusion

Table 5 Report edited for opinion or conclusion

Answer options	Percentage
Never	14.9%
Occasionally	22.4%
Often	17.9%
Always	11.9%
Uncertain	32.8%

Q. 42.B *What is the usual effect that this participation by the lawyers has upon* ***your assessment*** *of the expert's evidence?*

Table 6 Usual affect on assessment of expert evidence

	It helps	It harms	It makes no difference
Report edited for spelling and grammar	44.6%	3.6%	51.8%
Report edited for style and presentation	40.4%	7.0%	52.6%
Report edited for content	14.3%	42.9%	42.9%
Report edited for opinion or conclusion	7.1%	48.2%	44.6%

6.3.6 Usefulness of expert witness testimony

Q.44.A *Overall how do you assess the usefulness of the* ***WRITTEN*** *expert reports that are tendered* to you?

Over 17% of the respondents consider the written reports to be **very good** and nearly 41% consider the reports to be **good**. The reports are considered to be **reasonable** by 39% of the respondents and **poor** by 3%.

Q. 45.B *Overall how do you assess the usefulness of the* ***ORAL*** *expert reports that are presented to you?*

The usefulness of oral reports was considered to be **very good** by nearly 13% of the respondents and **good** by 35%. The highest percentage of respondents considers the reports to be **reasonable** at 43%, and nearly 10% consider the oral reports to be **poor.**

6.3.7 Authority to appoint experts

The next set of questions was intended to assess whether or not the respondents had the authority to appoint an expert, and if so if they had exercised the authority. If they had not exercised the authority the questions asked why not, and if they had exercised the authority, the questions assess the usefulness of doing so.

Q. 46.A *Do you have the authority to call an expert witness to assist you in relation to the evaluation of expert evidence?*

Over 82% of the respondents had the authority to call an expert witness.

Q. 47.B *If you have such authority to call an expert witness, have you exercised it in the last five years?*

Of those respondents with the authority to appoint an expert witness, 68% had never exercised the authority in the prior five years. Seven percent (7%) had done so one time and 16% had appointed an expert between two and five times. Only 9% had appointed an expert more than five times in the prior five years.

Q. 48.C *If you have authority to call an expert witness, but have not done so, is this because: it is incompatible with the adversary process; no party has ever requested that I exercise the power; the parties have argued against the procedure; it has not been necessary; other (please specify).*

The respondents were asked to mark all of the answer options that apply. The majority of 55% stated that it has not been necessary; 20% stated that no party has ever requested them to exercise the power; and 16% state that it was incompatible with the adversary process. A large percentage 34% cited other reasons. Of those citing other reasons, the majority commented that it related to the cost of the witness, and either not knowing who to charge, or expressing concern about assessing the cost against a party that may not have the financial resources to pay for the expert.

Q. 49.D *If you have appointed an expert, from the point of view of the quality of the fact-finding process was this not helpful, not very helpful, helpful or very helpful?*

All of the respondents (100%) who had appointed an expert stated that it was **helpful** of which 64% stated it was **very helpful**.

Q. 50.E *If you have appointed an expert, how did you select the expert?*

The respondents were asked to select all applicable answers from the answer choices. Fifty-five percent (55%) selected the expert in consultation with the lawyers; 23% selected an expert in their complete discretion; 18% selected an expert from an

approved list; and 36% responded 'other'. The 'other' category included staff experts or statutorily appointed experts. One respondent used an RFP (request for proposals) process.

Q. 51.F *If you have appointed an expert, who paid the costs of the expert?*

In 56.5% of the cases, the respondents allocated the costs between the parties. In 39% of the cases, the court or administrative agency paid the costs. In 8.7% of the cases, the parties stipulated to the allocations of costs.

Q. 52.G *Are you of the view that more use of court appointed experts would be helpful to the fact-finding process?*

The majority of respondents (65.6%) believe that more court appointed experts would be helpful. Only 9.4% said it would not, and 25% had no opinion.

6.3.8 Receptiveness to reforms

The next sixteen questions were intended to assess the respondents' receptiveness to various reforms that have been adopted or recommended in various international jurisdictions, including England and Wales, and a number of Australian jurisdictions. The summary at Appendix F does not filter for differences between state and federal respondents, or between the various positions held by the respondents. However, those results were separately filtered and compared; and the description of responses that that follows compares the state and federal responses to the combined findings.

Although there were some differences that relate to the level of support for a reform (either definitely yes or probably yes; and definitely no or probably no), in order

to better illustrate all yes and all no answers for this comparison, each table is followed by a chart in which the yes and no answers have been combined.

Table 7 Paramount Duty to Court

Q. 53.1 Are you in favor of reforms that would create a paramount duty of expert witnesses to the court or tribunal?			
	All	Fed	State
Definitely Yes	32.80%	30.80%	34%
Probably Yes	34.30%	30.80%	36%
Probably No	16.40%	7.70%	17%
Definitely No	3%	0%	3.80%
Undecided	13.40%	30.80%	9.40%
	99.90%	100.10%	100%

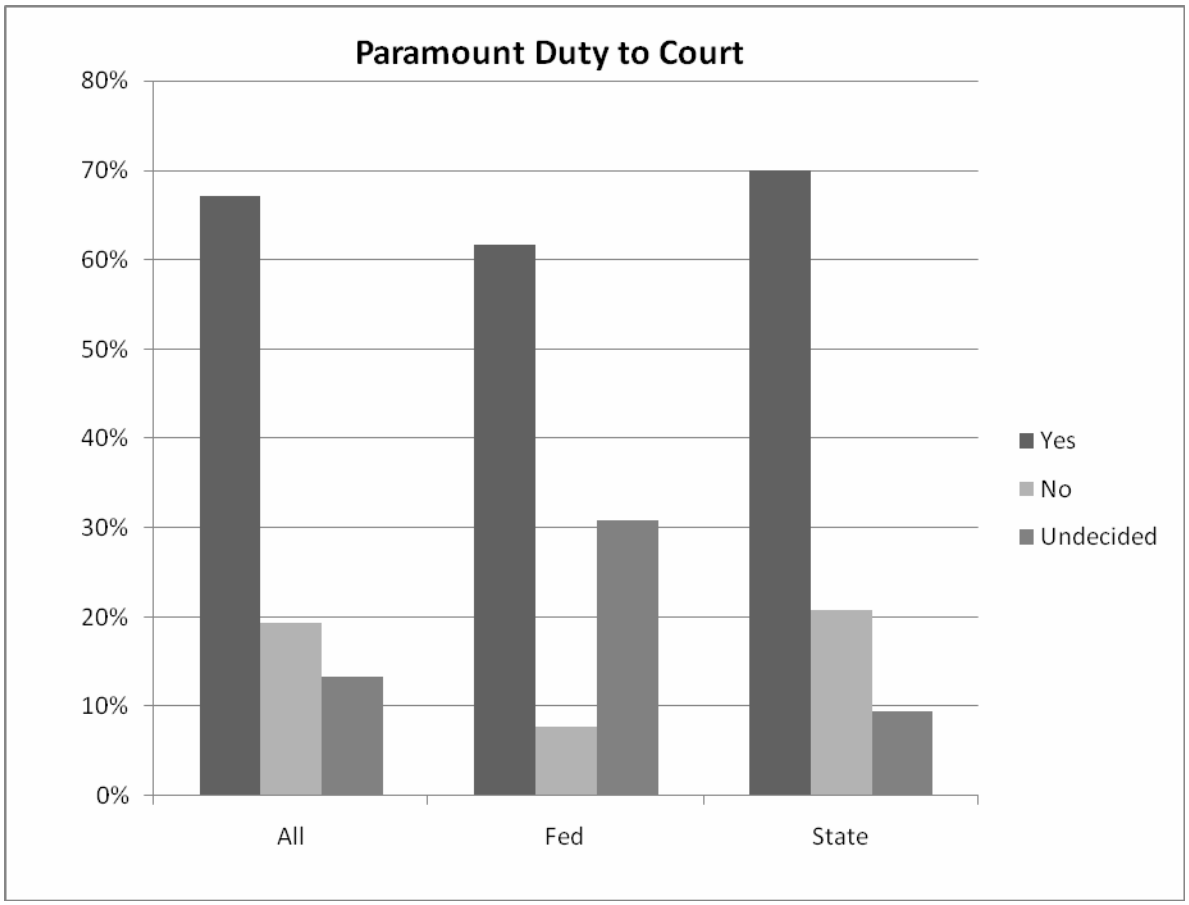

Figure 2 Paramount Duty to Court

Table 8 Prehearing Discussion or Meeting

Q. 54.2 Are you in favor of reforms that would require the expert witnesses to discuss the issues among themselves in a pre-trial or pre-hearing conference or meeting without the attorneys or parties present?			
	All	Fed	State
Definitely Yes	21.70%	15.40%	23.60%
Probably Yes	40.60%	46.20%	38.20%
Probably No	27.50%	38.50%	25.50%
Definitely No	1.50%	0%	1.80%
Undecided	8.70%	0%	10.90%
	100.00%	100.10%	100.00%

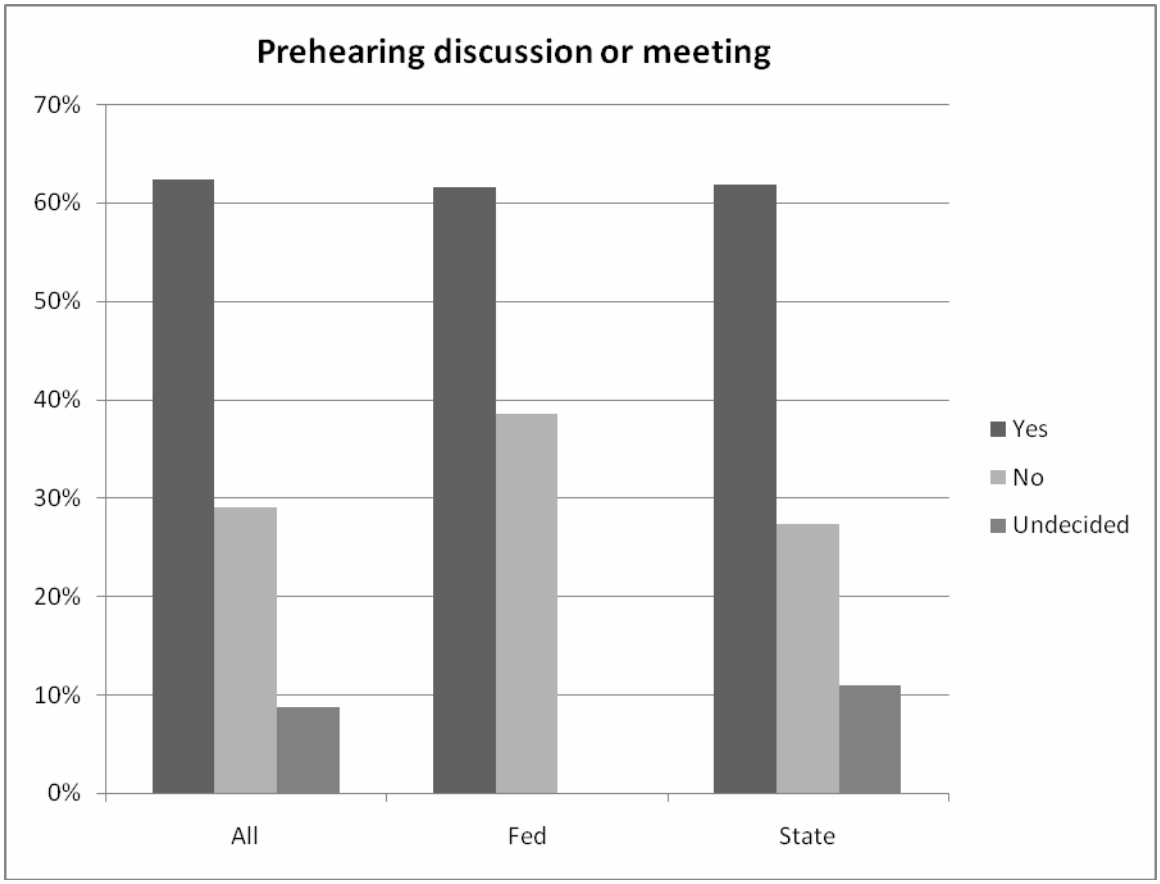

Figure 3 Prehearing Discussion or Meeting

Table 9 Joint Report of Experts

Q. 55.3 Are you in favor of reforms that would require the parties to present a joint report of experts indicating areas of agreement and disagreement?			
	All	Fed	State
Definitely Yes	30.40%	38.50%	29.10%
Probably Yes	53.60%	46.20%	54.60%
Probably No	8.70%	7.70%	9.10%
Definitely No	2.90%	7.70%	1.80%
Undecided	4.40%	0%	5.50%
	100.00%	100.10%	100.10%

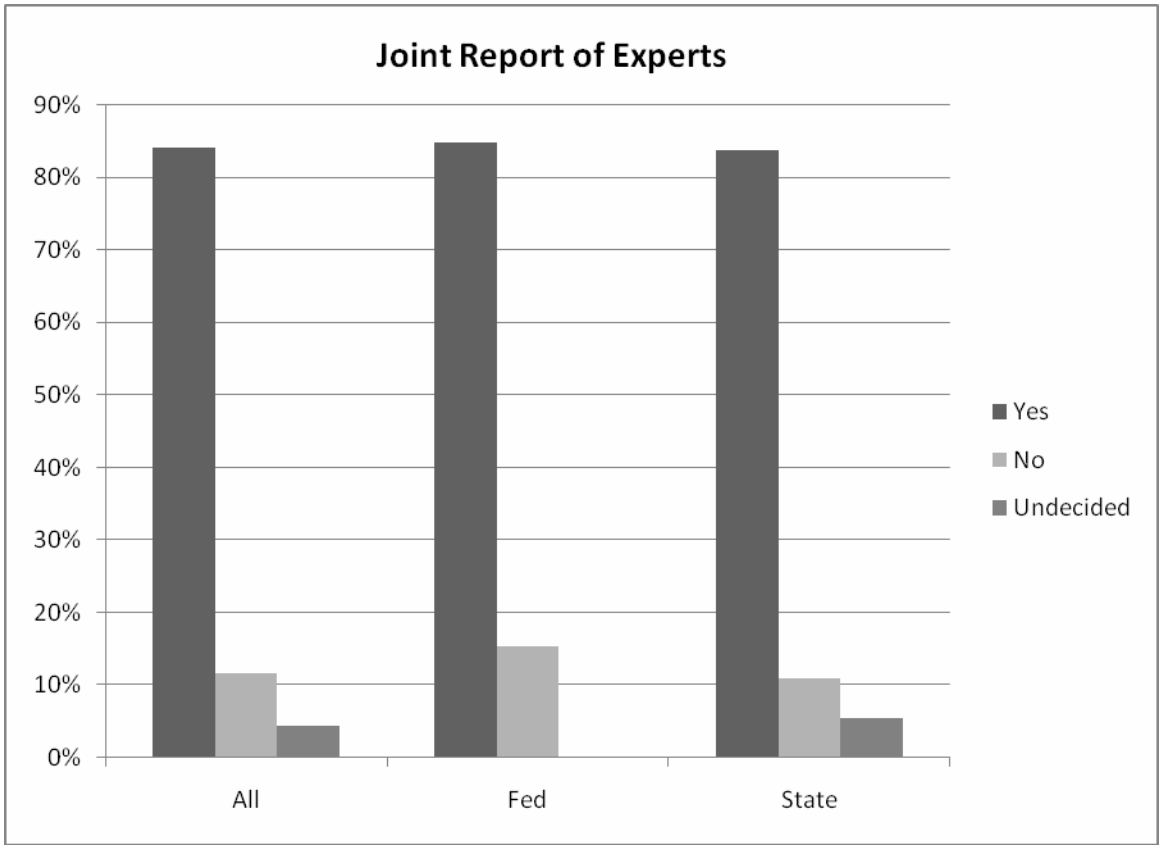

Figure 4 Joint Report of Experts

Table 10 Consider Single Expert

Q. 56.4 Are you in favor of reforms that would require the parties to consider whether a single expert should be appointed, and if this is not appropriate, indicate why not?			
	All	Fed	State
Definitely Yes	26.10%	38.50%	23.60%
Probably Yes	36.20%	7.70%	43.60%
Probably No	21.70%	30.80%	20%
Definitely No	7.30%	15.40%	3.60%
Undecided	8.70%	7.70%	9.10%
	100.00%	100.10%	99.90%

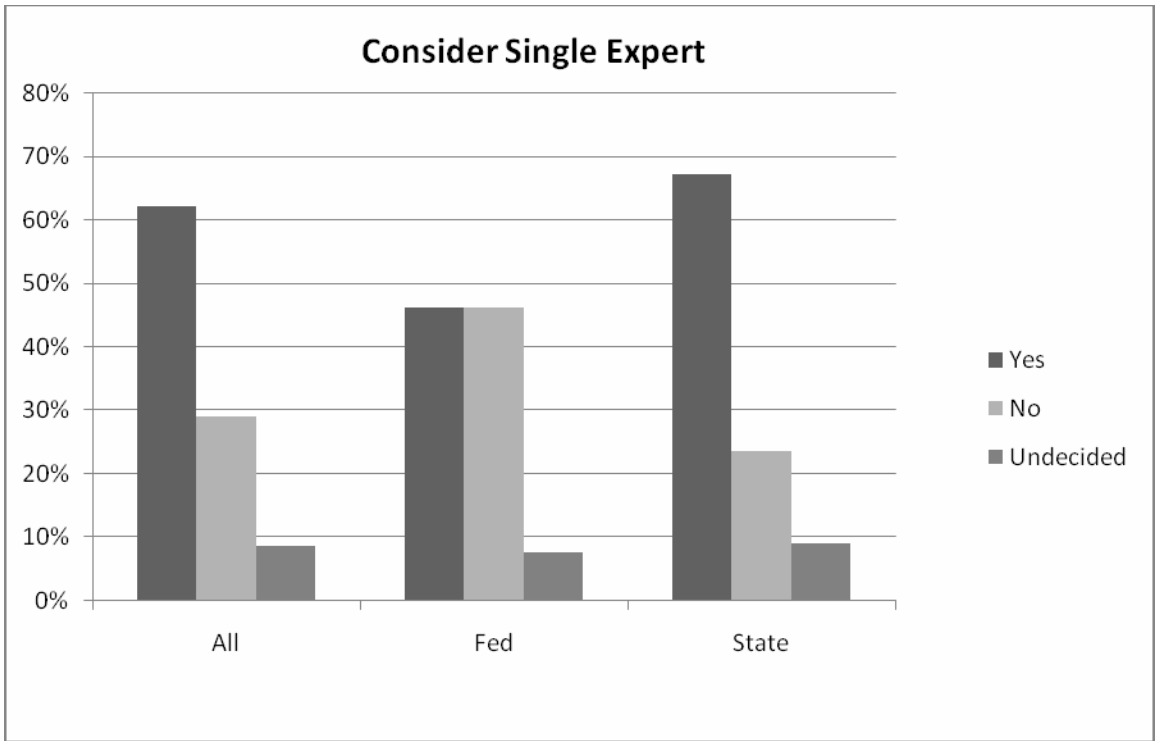

Figure 5 Consider Single Expert

Table 11 Written Instructions Annexed to Report

Q. 57.5 Are you in favor of reforms that would require all written instructions and notes of oral instructions to be annexed to the expert's report?			
	All	Fed	State
Definitely Yes	20.90%	23.10%	20.80%
Probably Yes	29.90%	38.50%	26.40%
Probably No	28.40%	30.80%	28.30%
Definitely No	3%	0%	3.80%
Undecided	17.90%	7.70%	20.80%
	100.10%	100.10%	100.10%

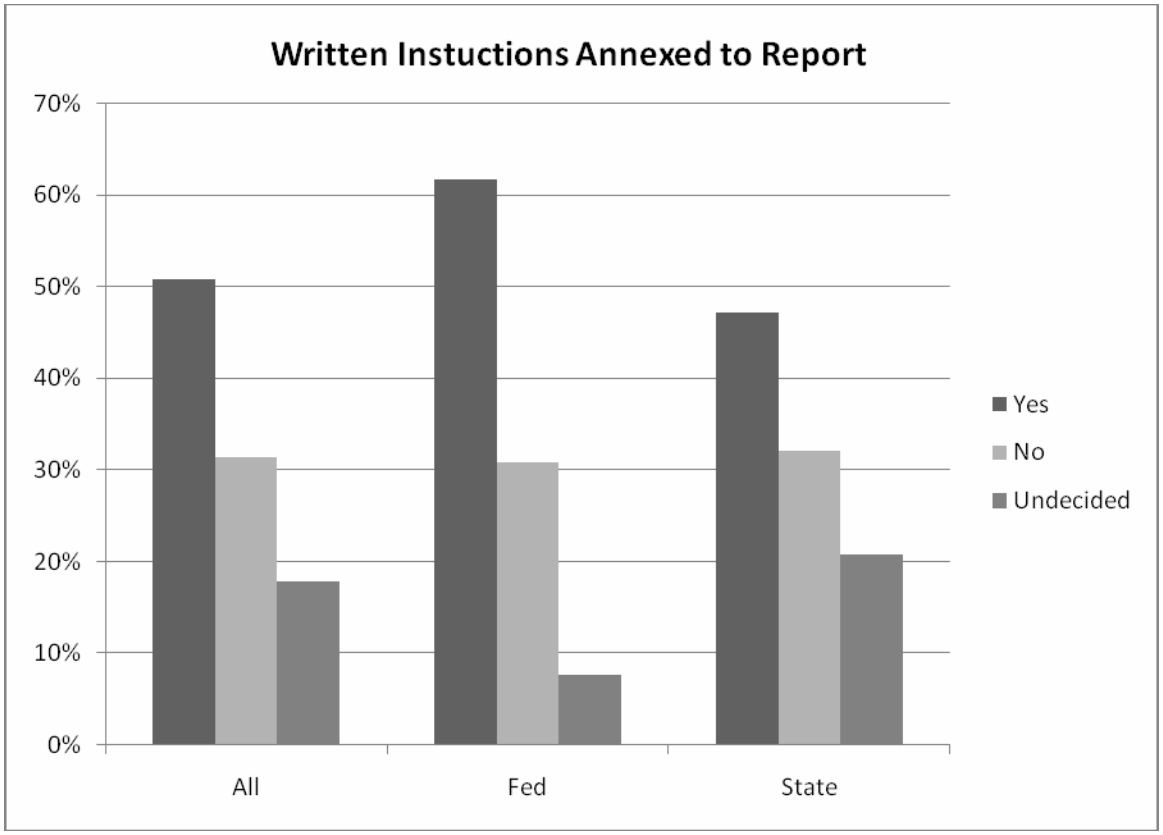

Figure 6 Written Instructions Annexed to Report

Table 12 Specify Bases of Opinion in Writing

Q. 58.6 Are you in favor of reforms that would require expert witnesses to specify the bases of their expert opinion in writing?			
	All	Fed	State
Definitely Yes	47.80%	53.90%	47.30%
Probably Yes	40.60%	46.20%	38.20%
Probably No	11.60%	0%	14.60%
Definitely No	0%	0%	0%
Undecided	0%	0%	0%
	100.00%	100.10%	100.10%

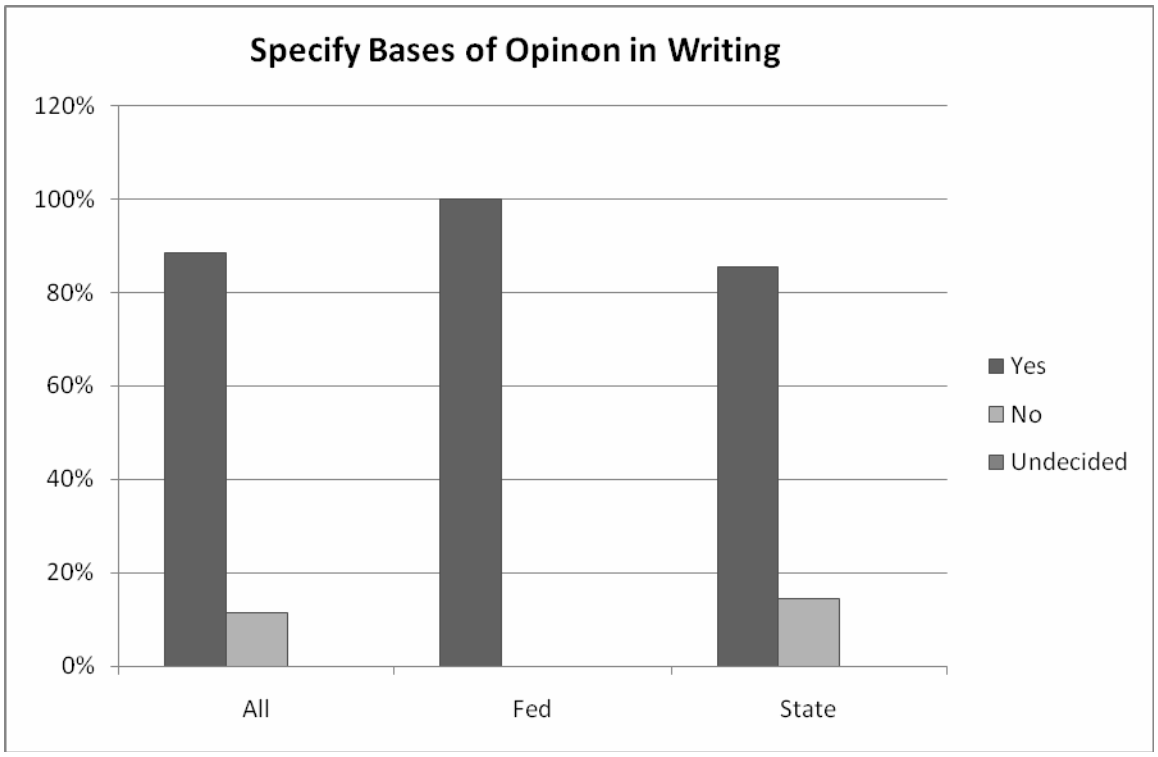

Figure 7 Specify Bases of Opinion in Writing

Table 13 Specify All Assumptions Made

Q. 59.7 Are you in favor of reforms that would require the expert witness to specify all assumptions that they made in forming their opinions?			
	All	Fed	State
Definitely Yes	50.70%	61.50%	49.10%
Probably Yes	40.60%	30.80%	41.80%
Probably No	8.70%	7.70%	9.10%
Definitely No	0%	0%	0%
Undecided	0%	0%	0%
	100.00%	100.00%	100.00%

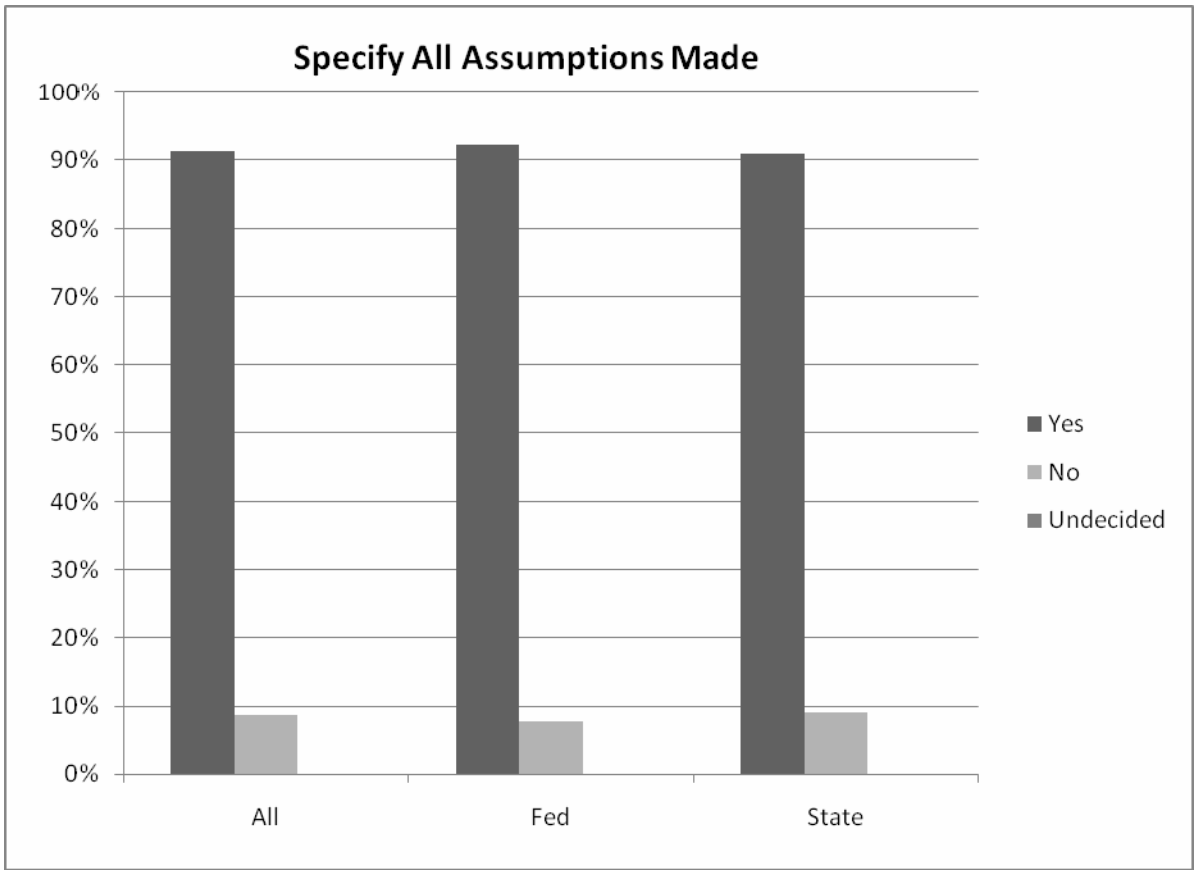

Figure 8 Specify All Assumptions Made

Table 14 Disclose Extent Written Reports Edited

Q. 60.8 Are you in favor of reforms that would require the expert witness to disclose whether and to what extent their written reports have been edited by the parties or attorneys that retained them?			
	All	Fed	State
Definitely Yes	40.60%	38.50%	41.80%
Probably Yes	29%	30.80%	27.30%
Probably No	24.60%	23.10%	25.50%
Definitely No	1.50%	0%	1.80%
Undecided	4.40%	7.70%	3.60%
	100.10%	100.10%	100.00%

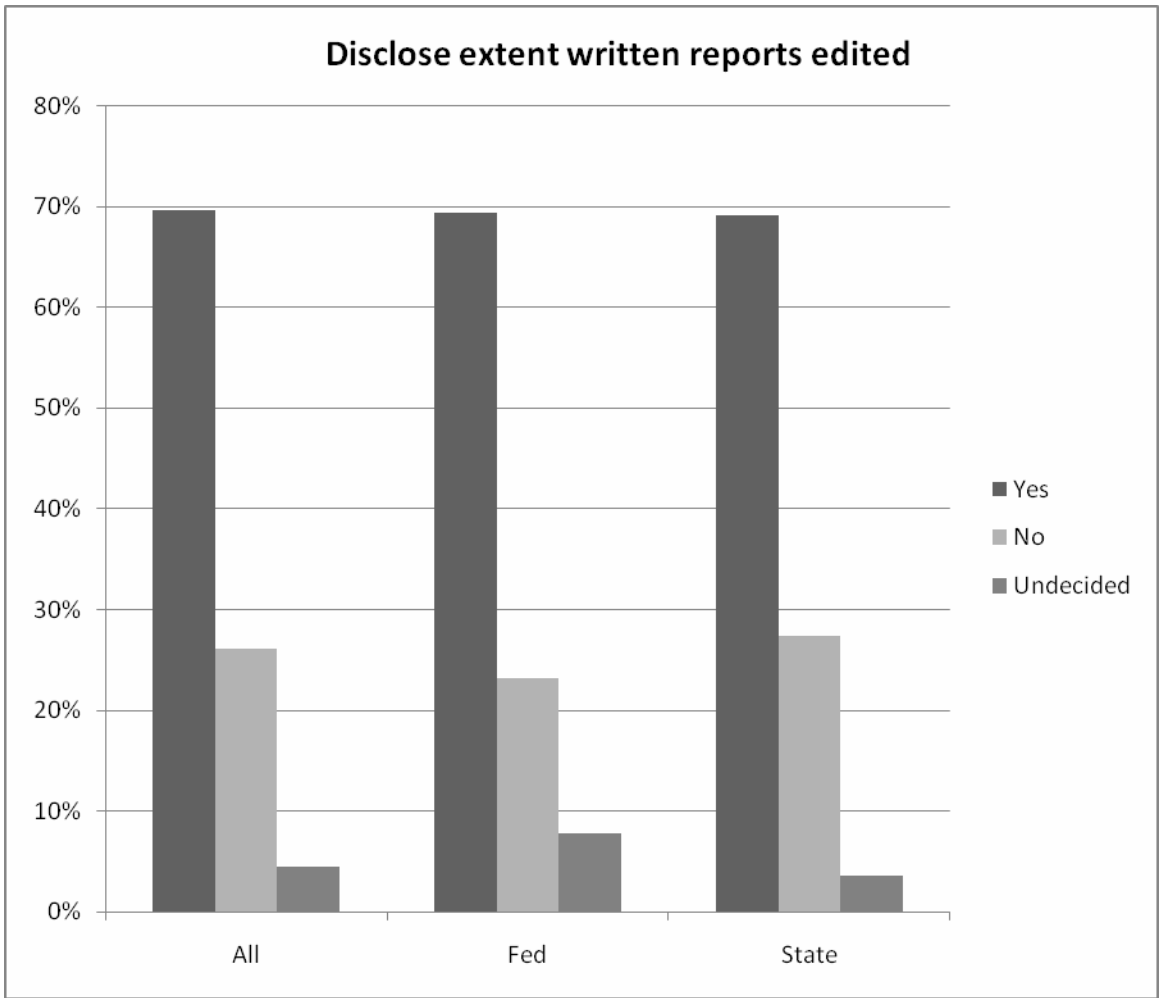

Figure 9 Disclose Extent Written Reports Edited

Table 15 Experts Sign Declaration of Role as Advisors to Court

Q. 61.9 Are you in favor of reforms that would require the expert witness to sign a declaration acknowledging their role as advisors to the court rather than advocates of the parties?			
	All	Fed	State
Definitely Yes	31.90%	23.10%	34.60%
Probably Yes	23.20%	30.80%	21.80%
Probably No	18.80%	23.10%	18.20%
Definitely No	11.60%	7.70%	10.90%
Undecided	14.50%	15.40%	14.60%
	100.00%	100.10%	100.10%

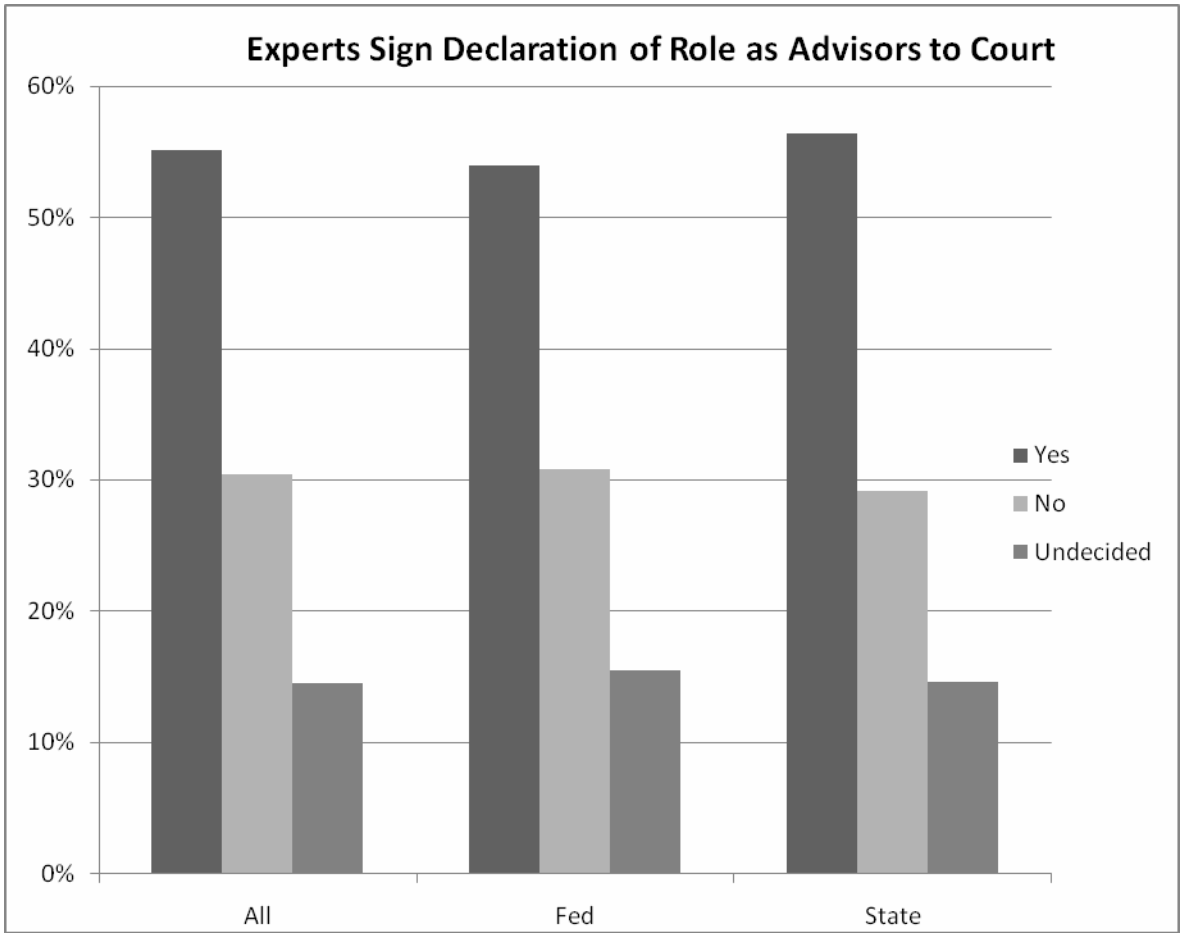

Figure 10 Experts Sign Declaration of Role As Advisors to Court

Table 16 Experts Disclose if Report is Inconsistent with Prior Report in any Other Matter

Q. 62.10 Are you in favor of reforms that would require the expert witness to disclose whether their reports are inconsistent with any other report that the expert has proffered in any other adjudicative or administrative hearing?			
	All	Fed	State
Definitely Yes	22.10%	7.70%	25.90%
Probably Yes	41.20%	53.90%	37%
Probably No	23.50%	30.80%	22.20%
Definitely No	4.40%	0%	5.60%
Undecided	8.80%	7.70%	9.30%
	100.00%	100.10%	100.00%

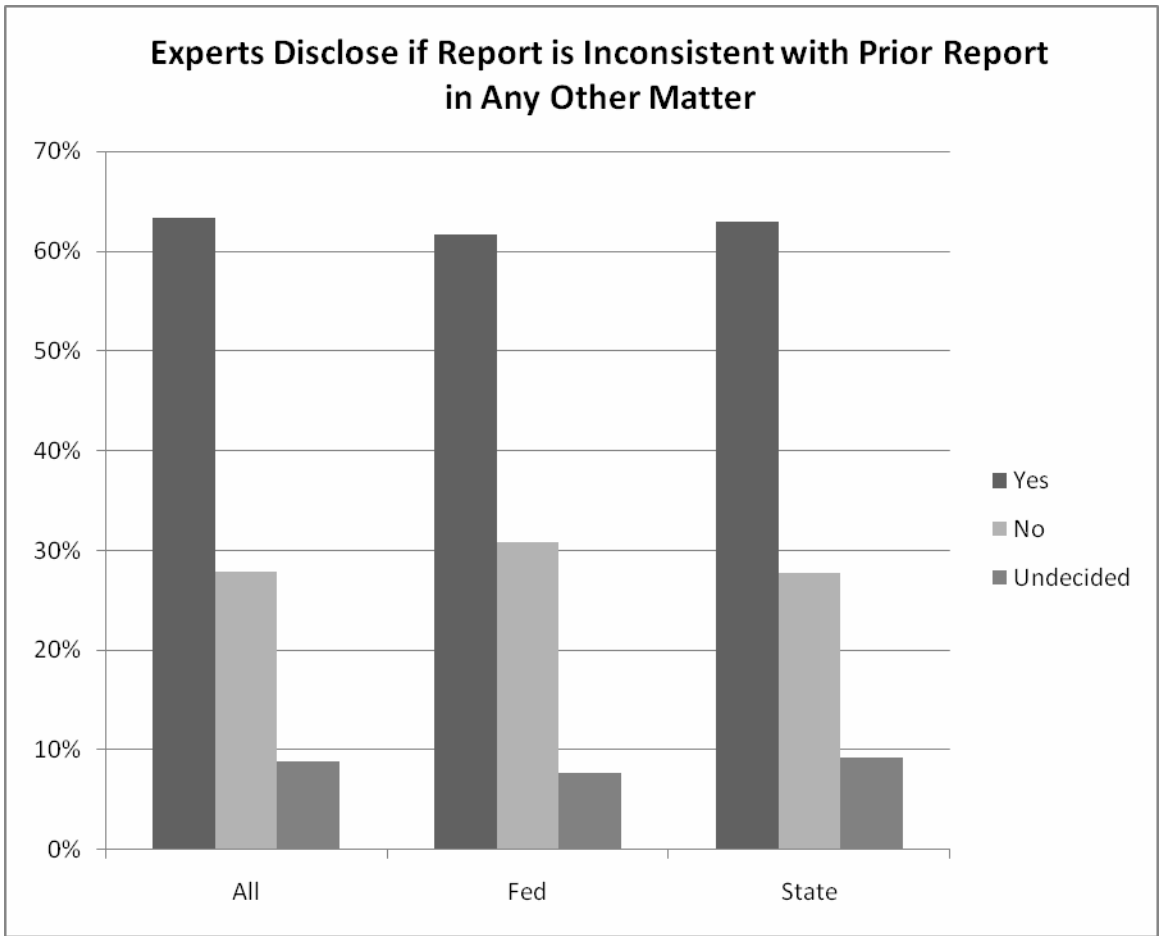

Figure 11 Experts Disclose if Report is Inconsistent wit Prior Report in Any Other Matter

Table 17 Give Evidence Concurrently – Hot Tub Approach

Q. 63.11 Are you in favor of reforms that would require all of the experts to give their testimony together, in a form of discussion presided over by the judicial officer, rather than in a traditional examination and cross-examination form (sometimes referred to as "hot-tubbing")?			
	All	Fed	State
Definitely Yes	8.80%	8.30%	9.10%
Probably Yes	19.10%	8.30%	21.80%
Probably No	32.40%	33.30%	30.90%
Definitely No	16.20%	25%	14.60%
Undecided	23.50%	25%	23.60%
	100.00%	99.90%	100.00%

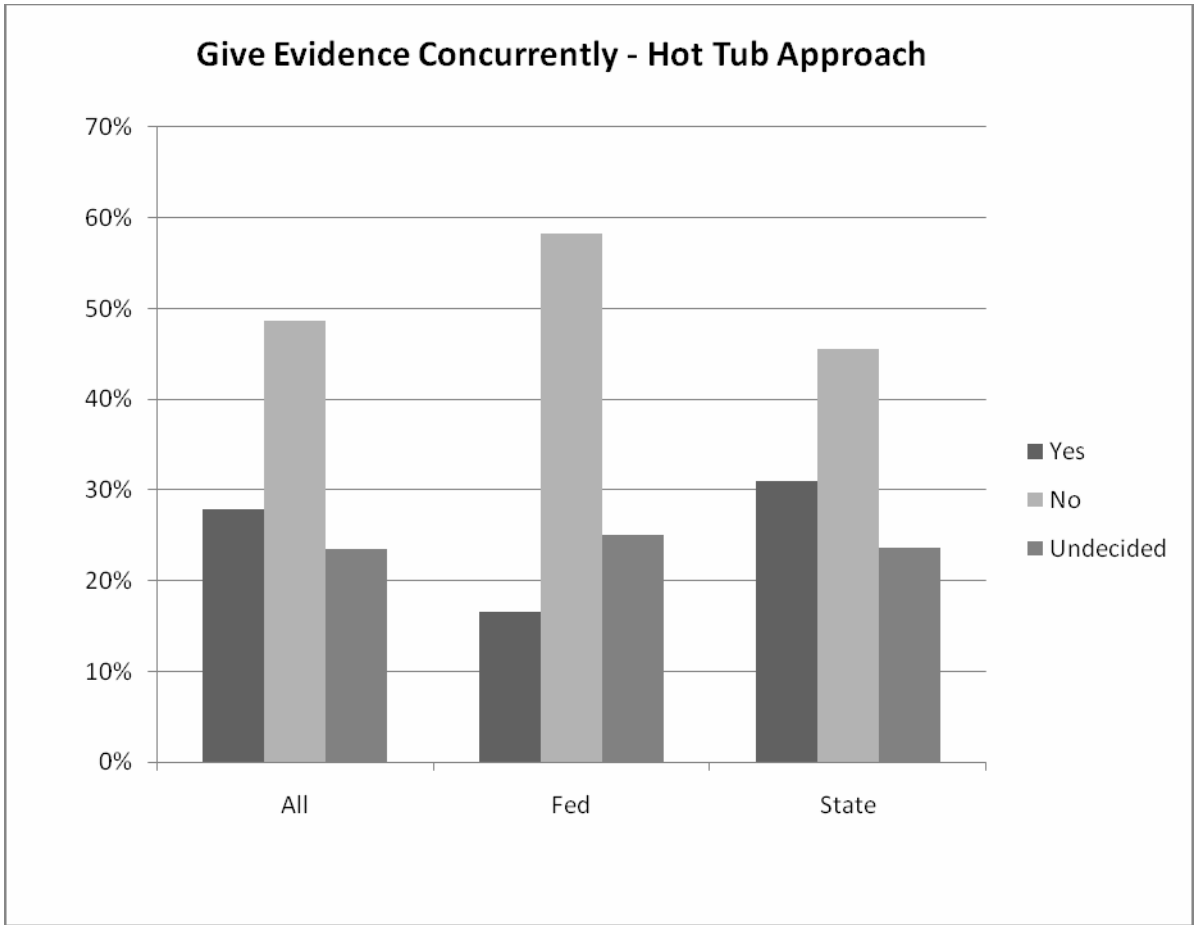

Figure 12 Give Evidence Concurrently - Hot Tub Approach

Table 18 Promote More Frequent Use of Court Appointed Experts

Q. 64.12 Are you in favor of reforms that would promote more frequent use of court-appointed expert witnesses?			
	All	Fed	State
Definitely Yes	23.50%	7.70%	27.80%
Probably Yes	39.70%	53.90%	37%
Probably No	16.20%	30.80%	11.10%
Definitely No	5.90%	0%	7.40%
Undecided	14.70%	7.70%	16.70%
	100.00%	100.10%	100.00%

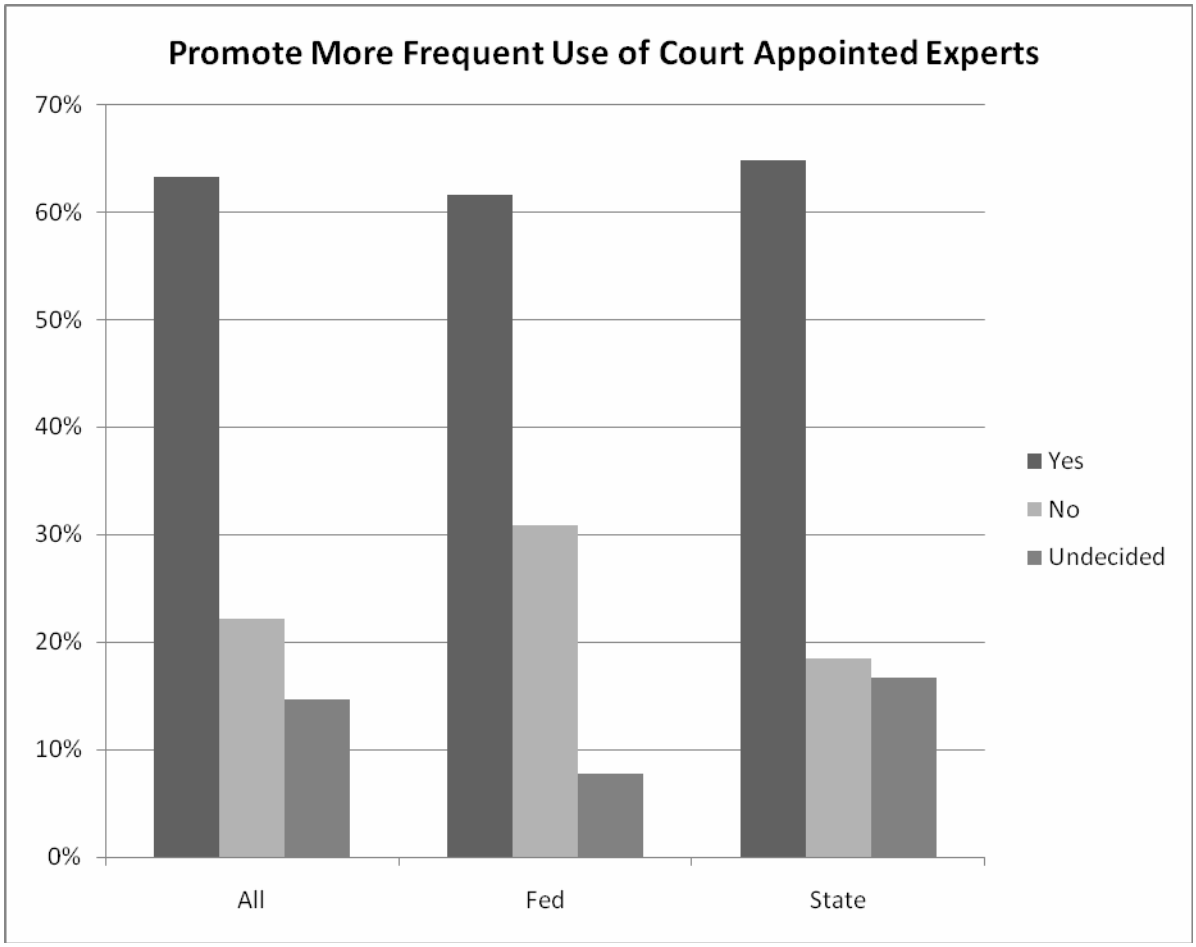

Figure 13 Promote More Frequent Use of Court Appointed Experts

Table 19 Disclose ‘Shadow expert’

Q. 65.13 Are you in favor of reforms that would require the parties to disclose whether a “shadow expert” has been used in preparation for the adjudicative or administrative hearing (an expert that has not been otherwise disclosed)?			
	All	Fed	State
Definitely Yes	26.50%	38.50%	24.10%
Probably Yes	27.90%	23.10%	27.80%
Probably No	30.90%	30.80%	31.50%
Definitely No	4.40%	0%	5.60%
Undecided	10.30%	7.70%	11.10%
	100.00%	100.10%	100.10%

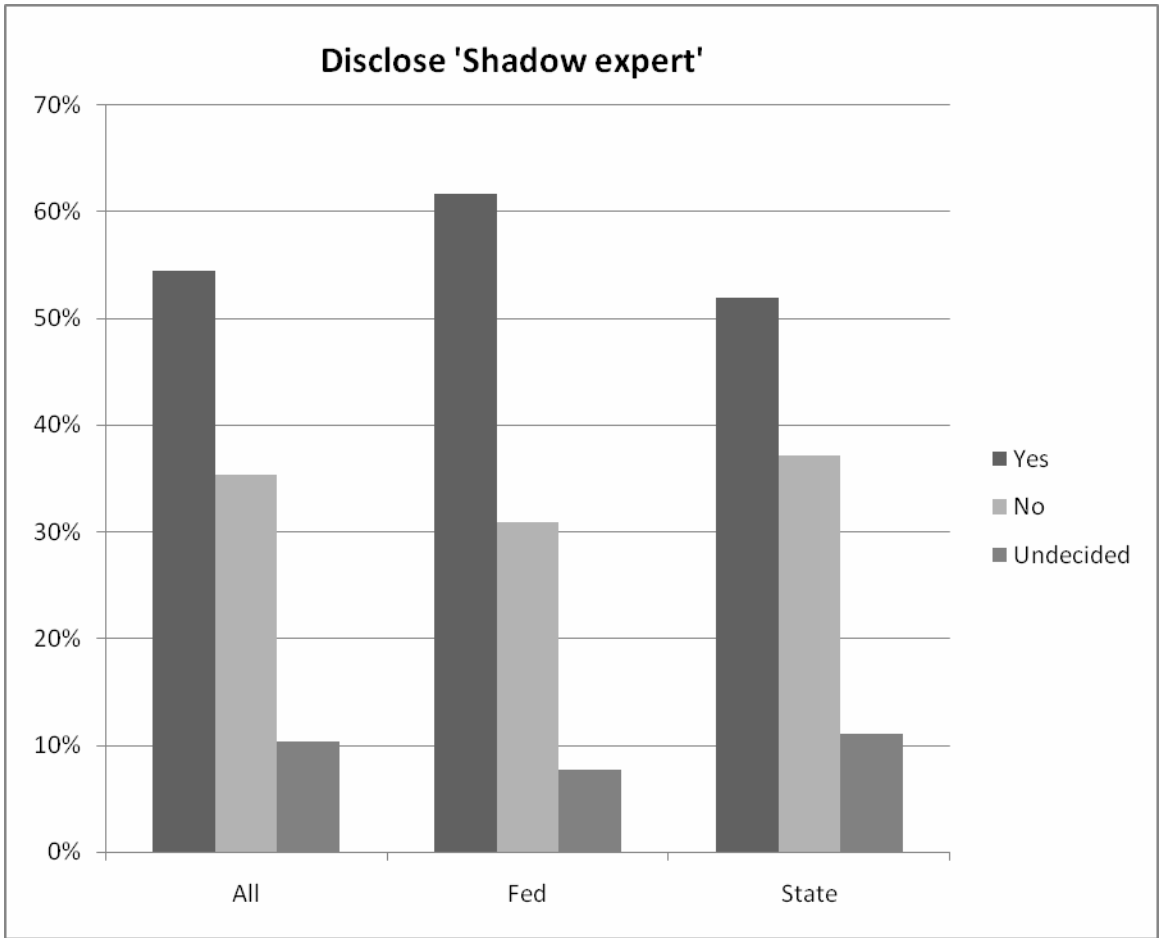

Figure 14 Disclose 'Shadow Expert'

Table 20 Limit Depositions of Experts

Q. 66.14 Are you in favor of reforms that would limit the depositions of expert witnesses?			
	All	Fed	State
Definitely Yes	11.60%	7.70%	12.70%
Probably Yes	17.40%	23.10%	16.40%
Probably No	40.60%	53.90%	38.20%
Definitely No	15.90%	15.40%	14.60%
Undecided	14.50%	0%	18.20%
	100.00%	100.10%	100.10%

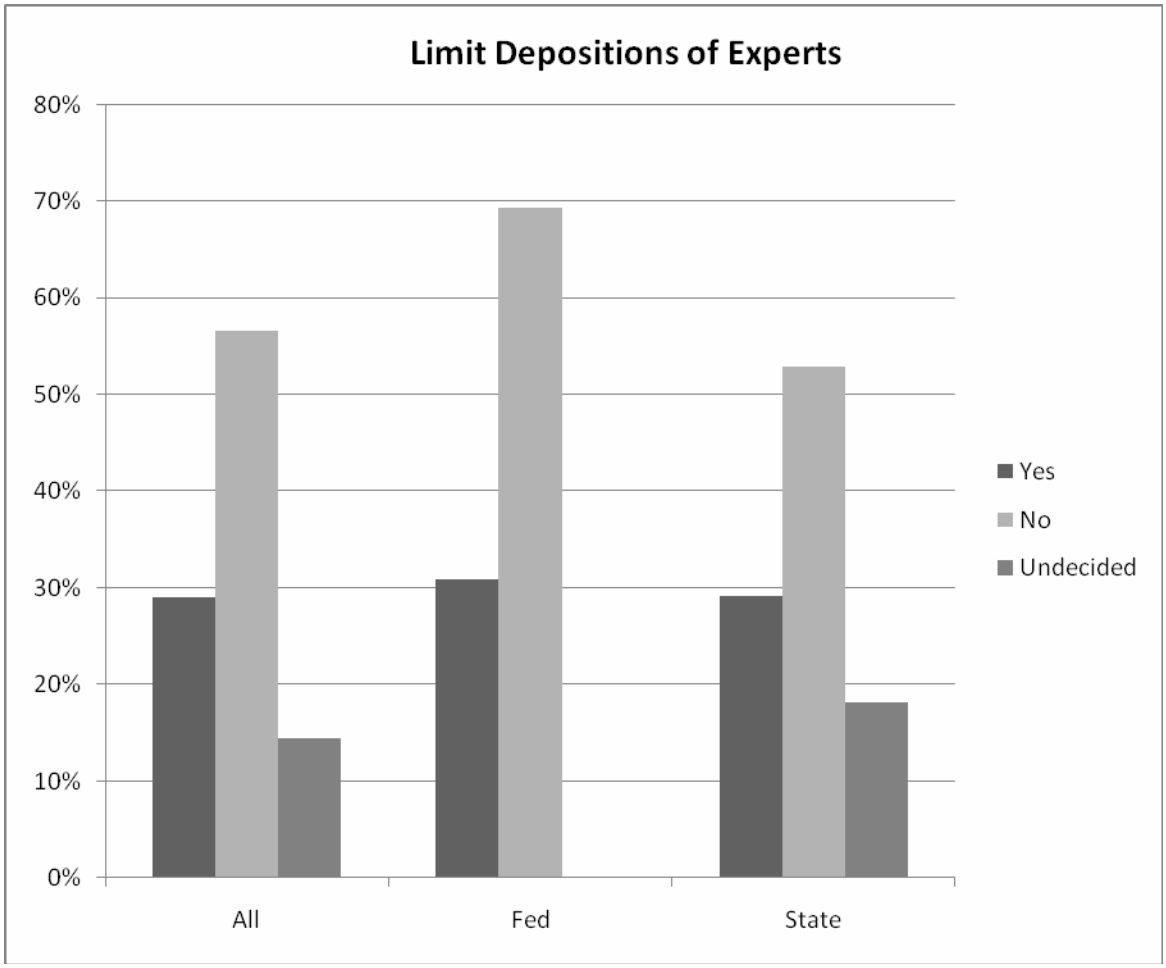

Figure 15 Limit Depositions of Experts

Table 21 Limit Interrogatories of Experts

Q. 67.15 Are you in favor of reforms that would limit the interrogatories of expert witnesses?			
	All	Fed	State
Definitely Yes	11.60%	7.70%	12.70%
Probably Yes	15.90%	23.10%	14.60%
Probably No	44.90%	61.50%	41.80%
Definitely No	13%	7.70%	12.70%
Undecided	14.50%	0%	18.20%
	99.90%	100.00%	100.00%

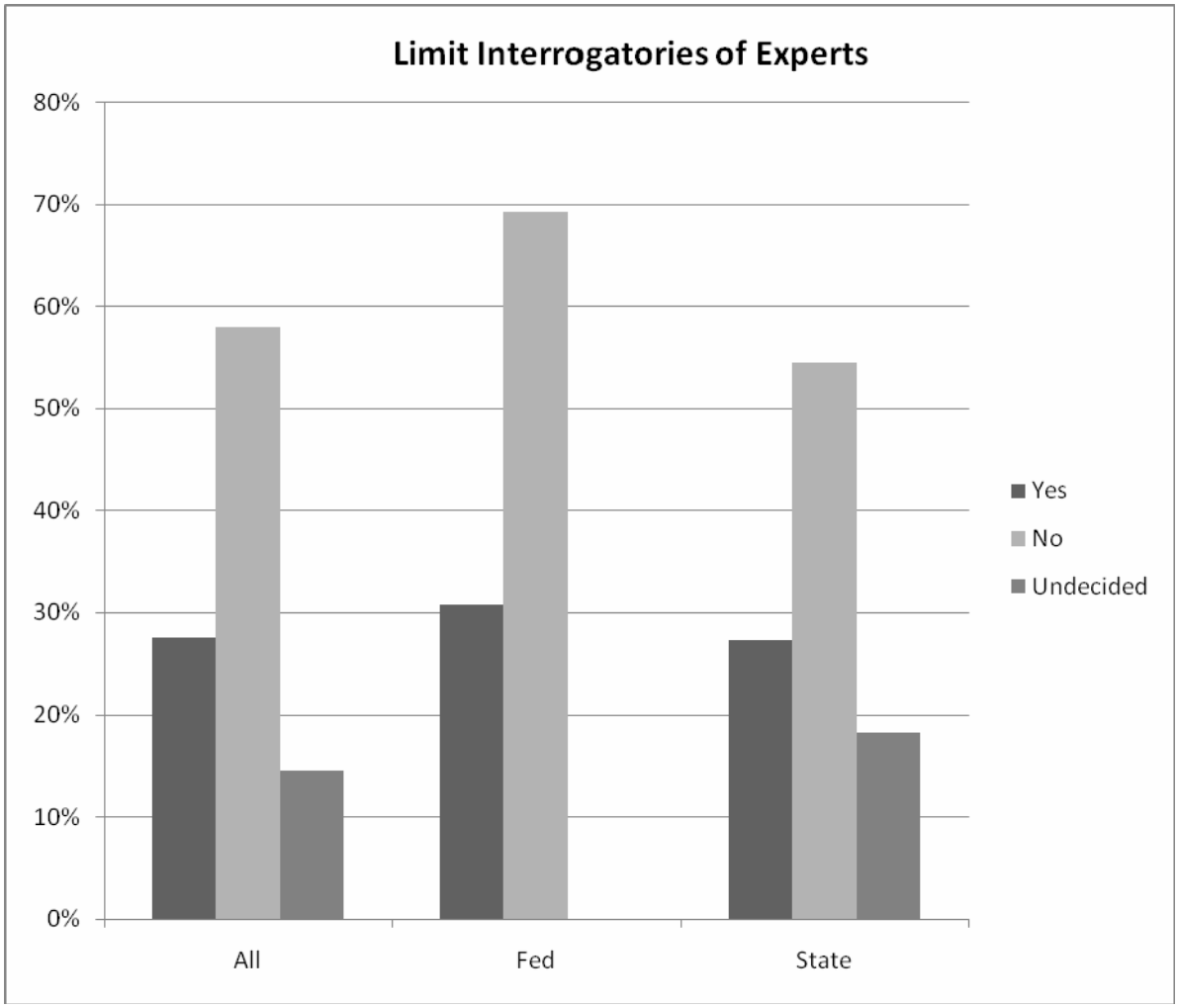

Figure 16 Limit Interrogatories of Experts

Table 22 Promote ‘cost shifting’ to Include Expert Witness Fees

Q. 68.16 Are you in favor of reforms that would promote “cost shifting” to include expert witness fees to compensate the winning party?			
	All	Fed	State
Definitely Yes	7.30%	0%	9.10%
Probably Yes	31.90%	15.40%	34.60%
Probably No	33.30%	53.90%	29.10%
Definitely No	10.10%	15.40%	9.10%
Undecided	17.40%	15.40%	18.20%
	100.00%	100%	100.10%

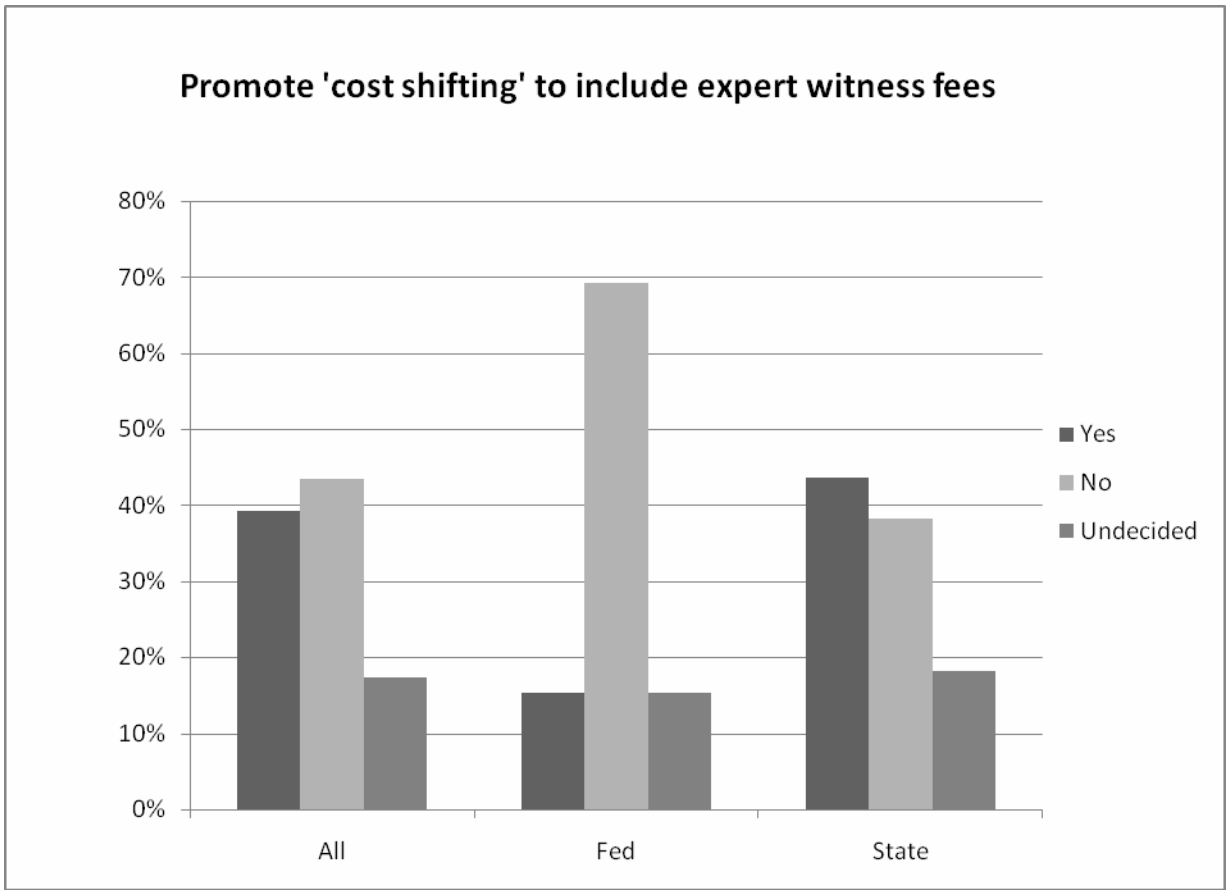

Figure 17 Promote 'cost shifting' to include expert witness fees

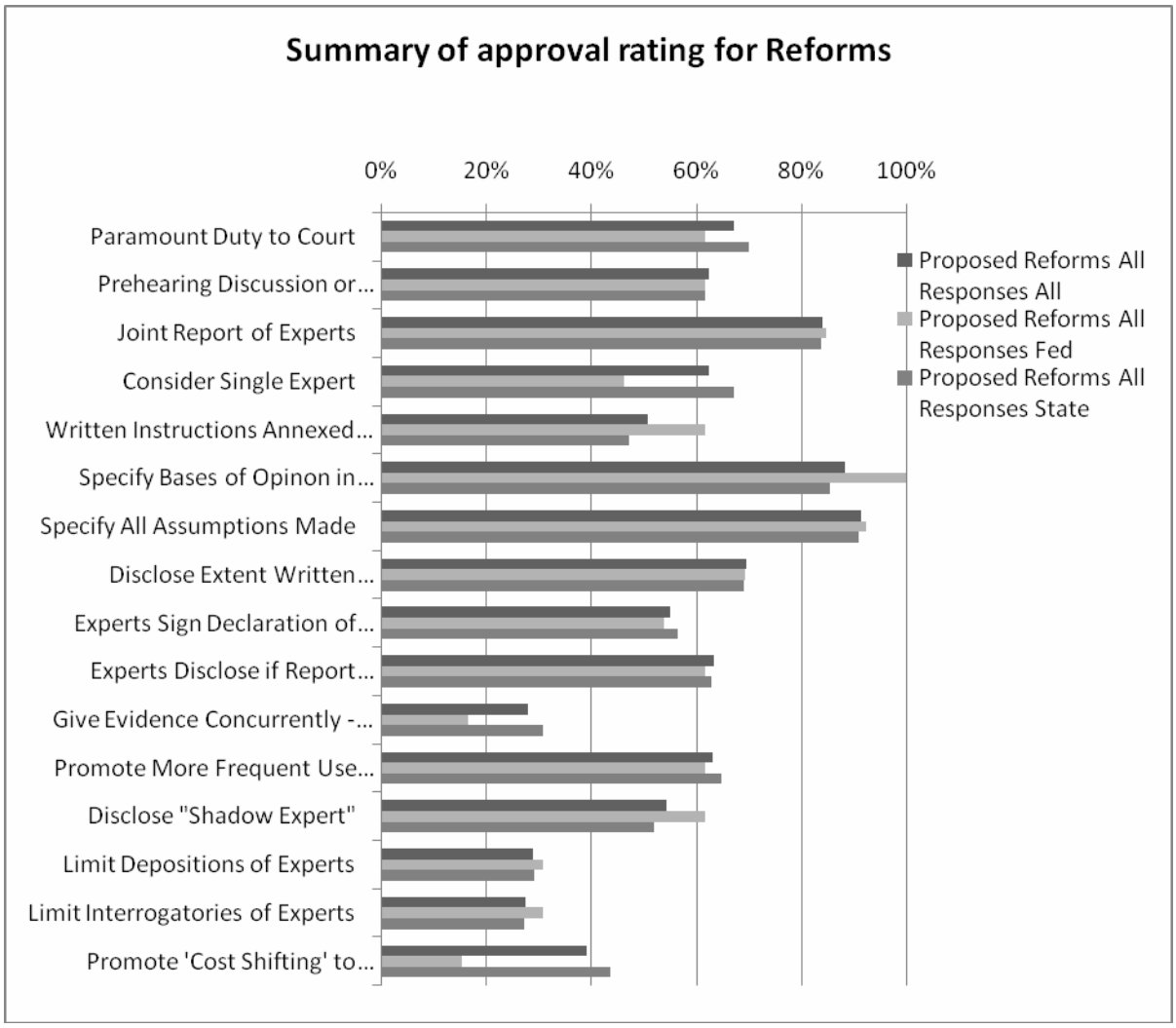

Figure 18 Summary of Approval Rating for Reforms

6.4 Comparison to AIJA Surveys

As described in Chapter 3.2.4, the purpose of the AIJA surveys was to gather information and to empirically ascertain what the judges and magistrates' think about expert evidence, and its presentation in the courtroom. The magistrates' survey built upon the judges' survey that had been conducted eighteen months earlier. Likewise, the DTW survey was in part built upon various questions found in the AIJA surveys. The response rate for DTW survey was 43% compared to the AIJA response rates of 51% .

Several questions in the DTW survey were created to be identical to, or very similar to, certain questions found in the AIJA survey. The purpose was to compare responses in order to determine whether Western water judges and administrative officers faced some of the same problems encountered by the Australian judges and magistrates. Such comparison is useful to assist in determining whether the reforms adopted or proposed in Australia might also be appropriate for the DTW jurisdictions.

Several questions were slightly modified to use terminology more commonly used in the United States. When such language was changed, the survey question for each survey is set forth side by side. The questions and a comparison of responses are set forth below. The changes in terminology were made based upon this researcher's own knowledge and experience as a practicing attorney for more than 25 years in the state courts of Colorado. The water attorneys who pilot tested the survey instrument had no difficulty understanding the words used, and a few of their suggested modifications were included in the final survey instrument.

6.4.1 Frequency of Encountering Expert Evidence

The AIJA magistrates' survey asked the respondents how frequently they encountered expert evidence. The answer choices were: never, occasionally, often, and always. The DTW survey pilot testers commented that such answers choices were not useful and suggested using percentages as can be seen in the final DTW survey instrument. The majority of the AIJA magistrates (60.95%) occasionally encountered expert witnesses and 28% often encountered expert witnesses. In comparison, 72% of the DTW respondents encounter expert witnesses in at least 33% of all of their cases.

6.4.2 Problems Encountered with Expert Evidence

As previously described, expert witnesses are called upon to give their 'expert opinion' with regard to matters at issue as opposed to 'expert evidence'. The term 'expert evidence' was used in the AIJA surveys and the DTW surveys followed course. The survey respondents were all judges and quasi-judicial officers and are presumed to be familiar with the distinction; the pilot testers did not indicate any need to define 'expert evidence', as 'expert opinion'. Therefore, the term 'expert evidence' was used and is consistent with its use by the AIJA surveys.

The series of questions and tables that follow relate to the DTW survey question: *Have you encountered any of the following problems with expert evidence?* The answer choices were: never, occasionally, often or always. These are the same answer choices as provided by the AIJA surveys.

The first question relates to the frequency of bias. The term bias was somewhat troublesome in the AIJA survey and was redefined as 'adversarial bias' for the DTW survey in consultation with the survey pilot testers and Mr. Selby and Mr. Freckelton. (Freckelton & Selby, 2007).

It is not known whether defining the term 'adverse bias' influenced the respondents of the DTW survey to respond differently than how they might have responded without the definition. However, the intent of the question for the DTW survey was to measure frequency of 'adversarial bias.' The surveys show in Table 23 that 'adversarial bias' is encountered more frequently by DTW respondents than the AIJA judges and magistrates encounter 'bias.'

Table 23 DTW- AIJA Comparison – Bias

Adversarial bias on the part of the expert (DTW) *Bias on the part of the expert (AIJA)*			
	DTW	AIJA Magistrates	AIJA Judges
Never	6.3%	7.11%	3.45%
Occasionally	34.40%	71.57%	68.10%
Often	48.40%	19.80%	27.59%
Always	10.90%	1.52%	0.86%
	100.0%	100.00%	100.00%

The DTW survey results show in Table 24 that DTW respondents encounter difficult to understand language slightly more often than the AIJA respondents.

Table 24 DTW - AIJA Comparison - Language Difficult

Use of oral or written language that was difficult to understand			
	DTW	AIJA Magistrates	AIJA Judges
Never	13.90%	13.20%	9.05%
Occasionally	60%	72.08%	76.72%
Often	24.60%	14.72%	14.22%
Always	1.50%	0%	0%
	100.00%	100.00%	99.99%

The DTW respondents have slightly more of a problem with experts staying within the parameters of their expertise than the AIJA respondents as seen in Table 25.

Table 25 DTW- AIJA Comparison - Parameters of Expertise

Failure by the expert to stay within the parameters of his or her expertise			
	DTW	AIJA Magistrates	AIJA Judges
Never	20.30%	15.74%	6.90%
Occasionally	59.40%	74.62%	79.74%
Often	17.20%	9.64%	12.93%
Always	3.10%	0%	0.43%
	100.00%	100.00%	100.00%

Table 26 shows that nonresponsiveness of the expert to the question is more of a problem for DTW respondents than for the AIJA respondents.

Table 26 DTW- AIJA Comparison – Nonresponsiveness

Nonresponsiveness of the expert to the question			
	DTW	AIJA Magistrates	AIJA Judges
Never	26.60%	38.89%	14.17%
Occasionally	53.10%	58.08%	75.83%
Often	20.30%	3.03%	10%
Always	0%	0%	0%
	100.00%	100.00%	100.00%

Failure to prove the bases of the expert's opinion is a problem **occasionally** for the majority of survey respondents, with the DTW respondents showing more similarity to the Australian judges than to the magistrates as reflected in Table 27.

Table 27 DTW- AIJA Comparison - Failure to Prove Bases

Failure to prove the bases of the expert's opinion			
	DTW	AIJA Magistrates	AIJA Judges
Never	25.40%	28.57%	16.03%
Occasionally	55.60%	66.84%	68.78%
Often	19%	4.59%	15.19%
Always	0%	0%	0%
	100.00%	100.00%	100.00%

The failure to pose direct examination questions appropriately was not asked of the AIJA judges. The question was added to the magistrates' survey, therefore the DTW survey is compared only against those responses. As shown in Table 28, the experience of the DTW respondents is consistent with the Australian magistrates' experience.

Table 28 DTW- AIJA Comparison - Failure in Direct Examination

Failure by the lawyer to pose direct examination questions appropriately (DTW) *Failure by the advocate to pose examination-in-chief questions appropriately (AIJA)*		
	DTW	AIJA Magistrates
Never	10.80%	5.08%
Occasionally	58.50%	59.90%
Often	27.70%	35.03%
Always	3.00%	0%
	100.00%	100.01%

The failure to cross-examine so as to make the expert accountable also had very consistent responses among the three surveys as shown in Table 29.

Table 29 DTW- AIJA Comparison - Failure in Cross-examination

Failure by the lawyer to cross-examine so as to make the expert accountable (DTW) *Failure by the advocate to cross-examine so as to make the expert accountable (AIJA)*			
	DTW	AIJA Magistrates	AIJA Judges
Never	10.90%	5.56%	6.33%
Occasionally	57.80%	58.08%	57.81%
Often	29.70%	36.36%	35.44%
Always	1.60%	0%	0.42%
	100.00%	100.00%	100.00%

The answer choices for the single most serious problem among the three surveys are the same with the exception of two additional answers for the DTW survey. Those two responses were suggested by the DTW pilot testers, and between them the 20% response clearly indicates a serious problem. However, as seen in Table 30, it is clear that the most serious problem cited by the DTW respondents and the AIJA respondents is bias. The second most serious problem for DTW respondents is use of oral or written language that was difficult to understand.

Table 30 DTW- AIJA Comparison - Most Serious Problem with Expert Evidence

Single most serious problem encountered with expert evidence			
	DTW	AIJA Magistrates	AIJA Judges
Bias on the part of the expert	40.6%	29.59%	34.84%
Use of oral or written language that was difficult to understand	23.4%	19.39%	9.84%
Failure by the expert to stay within the parameters of his or her expertise	1.6%	9.18%	5.74%
Nonresponsiveness of the expert to the question	3.1%	2.04%	4.92%
Failure to prove the bases of the expert's opinion	3.1%	8.67%	13.93%
Failure by the lawyer to pose direct examination questions appropriately	3.1%	9.18%	13.93%
Failure by the lawyer to cross-examine so as to make the expert accountable	6.3%	19.39%	10.66%
Failure of the expert to articulate his or her opinion understandably	7.8%	n/a	n/a
Failure to adequately support the opinions given	10.9%	n/a	n/a
Other	0%	2.55%	6.15%
Total	99.9%	99.99%	100.01%

The problem with evaluating evidence due to its complexity had consistent responses from all three surveys, with this being an **occasional** issue for a large percentage of the respondents as seen in Table 31.

Table 31 DTW- AIJA Comparison - Complexity of Evidence

Have you encountered evidence from experts that you were not able to evaluate adequately due to its complexity?			
	DTW	AIJA Magistrates	AIJA Judges
Never	32.40%	47.72%	53.19%
Occasionally	63.40%	50.76%	45.11%
Often	4.20%	1.52%	1.70%
Always	0.00%	0.00%	0.00%
	100.00%	100.00%	100.00%

The overwhelming response of the three surveys is that expert evidence is useful for the fact finding process. All responses as set forth in Table 32 were nearly identical.

Table 32 DTW- AIJA Comparison - Usefulness of Expert Evidence

When expert witnesses are used, do you find the expert evidence useful for the fact finding process?			
	DTW	AIJA Magistrates	AIJA Judges
Never	1.50%	0.51%	0.43%
Occasionally	17.70%	22.34%	16.60%
Often	63.20%	62.44%	69.36%
Always	17.70%	14.72%	13.62%
	100.10%	100.01%	100.01%

The majority of survey respondents **occasionally** have difficulty evaluating the opinion of one expert against those expressed by another. The responses to this question as reported in Table 33 were consistent among the three surveys.

Table 33 DTW- AIJA Comparison - Evaluate Evidence against Other Expert

Have you had difficulty evaluating the opinions of one expert against those expressed by another?			
	DTW	AIJA Magistrates	AIJA Judges
Never	14.50%	13.71%	8.05%
Occasionally	65.20%	54.82%	70.34%
Often	18.80%	29.44%	21.61%
Always	1.50%	2.03%	0.00%
	100.00%	100.00%	100.00%

The usefulness of written reports was consistently split between **good** and **reasonable** in all three surveys as seen in Table 34.

Table 34 DTW- AIJA Comparison - Usefulness of Written Report

Overall how do you assess the usefulness of the WRITTEN expert reports that are tendered to you?			
	DTW	AIJA Magistrates	AIJA Judges
Very Poor	0%	0.51%	0.42%
Poor	3.10%	3.06%	2.50%
Reasonable	39.10%	39.80%	48.33%
Good	40.60%	45.92%	37.92%
Very Good	17.20%	10.71%	10.83%
	100%	100.00%	100.00%

As to what factor was most responsible for the difficulty in evaluating one expert's opinions against another, the DTW respondents were asked to mark all that applied, rather than select only one. The AIJA respondents were required to select only one answer choice. One additional answer choice was provided for the DTW respondents: that the testimony of the expert failed to directly address the issue. Again this answer choice was suggested by the pilot testers, and appears to also be a substantial problem for the DTW respondents.

Table 35 shows that for the majority of respondents in all three surveys, the fundamental irreconcilability of views expressed by opposing experts was the primary factor for the difficulty evaluating expert opinions against another. In addition, for the DTW respondents, inadequate cross-examination was a problem for 45% of them and complexity of expert evidence was a problem for 44%.

Table 35 DTW - AIJA Comparison - Factors Responsible for Difficulty

Which of the following factors has been most responsible for difficulty of evaluating expert opinions against another?(DTW mark all that apply)			
	DTW	AIJA Magistrates	AIJA Judges
Inadequate introduction of testimony by lawyer	14.50%	5.29%	2.73%
Inadequate cross-examination of expert testimony	45.20%	8.82%	8.18%
Inadequate communication by the expert of his or her opinion to the trier of fact	35.50%	2.35%	4.09%
The experts lack credibility	25.80%	3.53%	7.73%
Complexity of expert evidence	43.60%	15.88%	19.55%
Fundamental irreconcilability of views expressed by opposing experts	69.40%	62.94%	55.00%
Testimony by the experts failed to directly address the issues	32.30%	n/a	n/a
Other	4.80%	1.18%	2.73%
		99.99%	100.01%

A substantial majority of respondents in all three surveys state that it is helpful to have the expert witnesses in court or administrative hearing to hear and comment on the evidence of the other expert witnesses. As seen in Table 36, the Australians felt that it was helpful slightly more often than the DTW respondents.

Table 36 DTW - AIJA Comparison - Expert Witness in Court to Hear Other Expert

What is your view about expert witnesses being in court or administrative hearing to hear and comment on the evidence of the other expert witnesses?			
	DTW	AIJA Magistrates	AIJA Judges
It is not helpful	9.90%	5.82%	4.68%
It makes no significant difference	19.70%	7.41%	11.06%
It is helpful	70.40%	86.77%	84.26%
	100.00%	100.00%	100.00%

The question as to whether the courtroom is a forum in which the reliability of expert theories and techniques are adequately evaluated received very different responses in the three surveys. As shown in Table 37, the DTW respondents primarily agree that

the courtroom is a forum in which reliability can be measured. The Australian judges agree by a lower majority; however the Australian magistracy was split with a higher percentage answering 'no' to this question.

Table 37 DTW - AIJA Comparison - Courtroom Forum to Evaluate Reliability

Is the courtroom a forum in which the reliability of expert theories and techniques is adequately evaluated?			
	DTW	AIJA Magistrates	AIJA Judges
Yes	72.20%	36.08%	55.22%
No	19.40%	46.39%	30.87%
No Opinion	8.30%	17.53%	13.91%
	99.90%	100.00%	100.00%

The majority of respondents believe that most experts are representative of their disciplines, with the DTW results nearly identical to the experience of the Australian judges. As seen in Table 38, the Australian magistrates have a higher percentage of respondents with no opinion.

Table 38 DTW - AIJA Comparison - Experts Representative of Discipline

Are most experts who give evidence before you representative of their discipline?			
	DTW	AIJA Magistrates	AIJA Judges
Yes	72.90%	53.09%	73.57%
No	2.90%	5.67%	5.29%
No Opinion	24.30%	41.24%	21.15%
	100.10%	100.00%	100.01%

Partisanship is encountered by most of the survey respondents as revealed in Table 39. The responses were consistent between the DTW respondents and the Australian judges, with a smaller percentage of the Australian magistrates encountering partisanship.

Table 39 DTW - AIJA Comparison – Partisanship

Have you encountered partisanship in expert witnesses called to give evidence before you?			
	DTW	AIJA Magistrates	AIJA Judges
Yes	78.30%	69.39%	87.76%
No	11.60%	23.47%	10.13%
No Opinion	10.10%	7.14%	2.11%
	100.00%	100.00%	100.00%

For those respondents responding that there was partisanship (the majority in all surveys) Table 40 shows a nearly evenly split as to whether or not this was a significant problem for the quality of fact finding.

Table 40 DTW - AIJA Comparison - Partisanship Problem for Quality of Fact-finding

If you answered yes to the previous question, is this a significant problem for the quality of fact finding?			
	DTW	AIJA Magistrates	AIJA Judges
Yes	41.40%	50.37%	46.67%
No	46.60%	47.41%	52.38%
No Opinion	12.10%	2.22%	0.95%
	100.10%	100.00%	100.00%

CHAPTER 7: CONCLUSIONS

7.1 Summary

Expert witnesses were initially allowed into the courts only for the purpose of assisting the trier of fact to understand matters beyond their common knowledge. An exception was made to the rule that only fact witnesses could testify, and opinions were not allowed. Furthermore, an exception was made to the rule that persons with a financial interest could not testify. These exceptions were made beginning with the case of *Folkes v.Chadd* (Folkes v. Chadd, 1782) because at that time, scientific men were on their honor to be honest and impartial. Their status depended upon this perception, and so initially judges had no concerns that their testimony might be tainted with partisanship towards the party that retained them.

As changes occurred in the common law system, attorneys took on the role of calling all witnesses and a judge had a less active role in the dispute. Attorneys, whose role it is to win a case for their client, selected and called experts who would testify in support of their client's cause. Experts took on more of a partisan role, advocating a scientific theory or opinion that would support their side of the case.

In the nineteenth century, the courts in England and the United States attempted to control the use of expert witnesses, but met with little success. In the early twentieth

century, the *Frye* case became the nearly uniform standard in the United States; judges required the testimony to be generally accepted in the scientific community before allowing it to be admitted into evidence. It was not until the 1990's that the U.S. Supreme Court ruled in *Daubert* that the *Frye* standard had been replaced by the Federal Rules of Evidence, and general acceptance was only one factor to be considered.

Judges are expected to be gatekeepers, and must now determine whether the witness will testify to scientific knowledge that will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid, and whether that reasoning or methodology properly can be applied to the facts in issue.

A debate has ensued in the literature as to what is expected of judges; how to assist them in learning enough about scientific and technical matters so that they can be effective gatekeepers; and what effect the *Daubert* factors has had on the courts and the admission of expert testimony.

Researchers conducting empirical studies have, for the most part, concluded that *Daubert* has made very little difference with regard to keeping junk science out of the courtroom. Judges do not generally understand the scientific methodology and so are gatekeeping in their own way. *Daubert* has had unintended consequences, and judges are making decisions in pretrial hearings that are preventing many experts from testifying. Good science is not always allowed in, and bad science may be coming in, because judges may not be learned enough in the sciences to make the necessary distinctions.

Problems with experts continue to plague the courts, with complaints of partisanship and bias by experts, the number of experts being used, and the ensuing cost

to the courts and the parties. These problems have also been identified in most international jurisdictions that follow the common law adversarial tradition.

Judges complain that cross-examination is not being used effectively to assist the trier of fact in making the expert accountable, or to help the judge decide between two or more opposing expert opinions. Cross-examination has also been criticized because it is used to attack the expert witness or find flaws, rather than clarify the issues or solve the discrepancies.

Civil justice reforms are occurring internationally. The Woolf Reforms in England and Wales, and the expert witness 'code' set out in *The Ikarian Reefer* case have been catalysts and models for reforms in Australia, New South Wales, Canada and Hong Kong. Reforms concerning the use of expert witnesses have been adopted in many jurisdictions with apparent success.

Literature concerning potential reforms in the United States suggests that reform is needed; however the adversarial system is very much entrenched, and if reform is to occur, it will need to be done with localized, context-specific solutions which respect the need for diversity in problem solving approaches. Water disputes are not tried to juries and therefore are not subject to the concern that reforms will affect the right to a trial by a jury of one's peers.

Water disputes include a very high percentage of expert witnesses, because of the very complex sciences of hydrology, engineering and hydrogeology. Experts in those sciences rely heavily on models to describe the flow systems, and to make predictions on the effects of proposed withdrawals or changes in water usage. These models are complex and require a substantial amount of technical and scientific knowledge. In order

to undertake their gatekeeping function, judges are required to assess whether or not testimony based on a model is reliable and useful.

The *Daubert* factors of falsifiability and error rate may not be relevant in the context of a hydrologic model, and may not assist the judge in determining whether or not to allow the expert to testify concerning the results of the model. Not only is modeling complex, but the assessment of models is also complex and hydrologists and engineers have suggested various ways to assess the reliability of a model.

The literature on hydrologic modeling reveals that the first step in constructing a model is defining the purpose of the model. Case studies show that experts may be constructing models with the primary purpose of providing results that will support the case or position of the party or attorney that hired them.

The DTW survey was intended to determine if western water judges and administrative officers experience some of the same problems with expert witness testimony that the Australian judges and magistrates experienced. The DTW survey was also intended to assess the receptiveness to some of the reforms that have been adopted or proposed in other international jurisdictions.

The DTW survey results revealed that the problems with expert witnesses in the western water courts and tribunals are very similar to the problems encountered in Australia. According to the survey results, water judges and administrative hearing officers, 'adversarial bias' is the most serious problem they have encountered with expert witness testimony. The next most serious problem is use by the expert of oral or written language that is difficult to understand. The DTW survey also revealed that judges who have difficulty evaluating the opinions of one expert against another, blame first the

fundamental irreconcilability of the views expressed by the experts, and second the inadequate cross-examination of expert testimony.

The survey revealed that the majority of DTW judges and administrative officers are in favor of reforms that will:

»Create a paramount duty to the court or tribunal

»Require experts to discuss issues prior to trial or hearing without attorneys or parties

»Require a joint report of experts that narrows the issues – indicating areas of agreement and areas of disagreement

»Require the parties to consider whether a single joint expert should be appointed

»Require all written instructions and notes of oral instructions to the expert be annexed to their report

»Require the expert to specify the bases of their opinion in writing

»Require the expert to specify all assumptions that they made in forming their opinions

»Require the expert to disclose whether, and to what extent, their written reports were edited by the parties or the attorneys

»Require experts to sign a declaration acknowledging their role as advisors to the court rather than advocates of the parties

»Require the expert to disclose whether their reports are inconsistent with any other report they have proffered in any other adjudicative or administrative hearing

»Promote more frequent use of court appointed expert witnesses

»Require parties to disclose whether a shadow expert has been used

7.2 Recommendations/Proposed Reforms

The majority of water cases or administrative hearings include expert witness testimony. Most of those experts are testifying in the fields of hydrology and geology. These experts rely heavily on complex hydrologic models. The first stage in constructing a model is defining its purpose. If that purpose is to support the case of the party that retained the expert, then the model will be inherently biased. If that purpose instead is to inform the court or tribunal then adversarial bias and partisanship will be minimized.

The DTW survey reveals that judges and administrative officers support reforms that will make experts acknowledge that their role and paramount duty is to be an advisor to the court, and not to be an advocate of the parties. The survey also reveals support for transparency in expert witness reports. The judges and administrative officers want to know: what instructions the expert received; what the expert relied upon to base his or her opinion; what assumptions the expert made; whether and to what extent the written reports were edited by the parties or attorneys; whether the reports are inconsistent with other reports made by the expert in another tribunal; and whether a "shadow expert" has been or will be used by the parties. There is also support to require the experts to meet prior to trial to narrow the issues and to provide a joint report of matters upon which they agree and those upon which they disagree. The judges and administrative officers want the parties to consider whether or not a single expert should be appointed, and they want to encourage more frequent use of court appointed experts.

In short, the DTW survey informs us that there is support on the part of the bench for reforms that involve a change in the culture of the adversarial use of expert witness evidence. Change is always challenging and may be more likely to meet success if it is

accomplished in increments. Stages for accomplishing the reforms supported by the majority of the DTW participants are proposed below. The proposals in each stage are based on the level of support for each reform, with the reforms receiving the highest percentage of support proposed for the early stages as determined from Figure 2. Stage 1 includes reforms which received a support rating of over 80%. Stage 2 includes reforms which received a rating of over 60%. Stage 3 includes reforms which received a rating of over 50%.

No specific reforms are suggested to implement the promotion of more frequent use of court appointed experts. Discussion concerning this topic is found in Chapter 7.3 on further research needs.

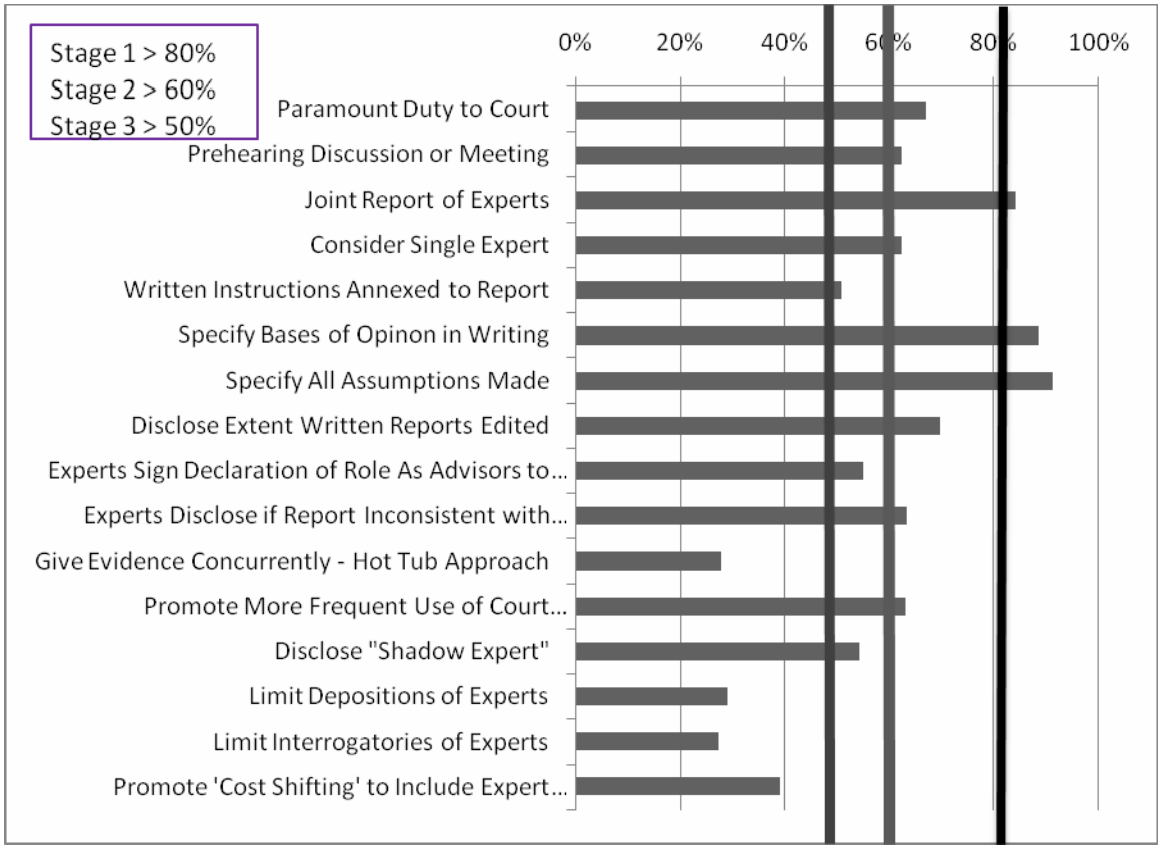

Figure 19 Staging Reforms

Stage 1

Proposed Rule:

1.1 Joint Report of Experts

When there is more than one expert in a case, they shall adopt a co-operative approach and produce a joint report addressed to the court, indicating areas of agreement and areas of disagreement that cannot be resolved.

1.2 Written Reports

Written reports to be proffered to the court or hearing officer shall include the following:

(a) details of the expert's relevant qualifications;

(b) details of the literature and other significant material that the experts have used in arriving at their opinions;

(c) identification of all persons, and their qualifications, who have carried out any data selection, data inspection, tests or experiments upon which have been relied upon in compiling the report;

(d) specify all data, assumptions and methods upon which the experts have significantly relied upon to arrive at their opinions;

(e) specify the bases for each of the opinions which are expressed;

(f) specify whether there are any qualifications to any of the opinions;

(g) include at the end of their written report the following statement:

"I confirm that the matters stated as facts in my report are true to the best of my knowledge and belief; and I further confirm that opinions that I have expressed in my report are my true and complete professional opinion."

Stage 2

Proposed Rules:

2.1 Experts' overriding duty to the court

It is the duty of experts to help the court or hearing officer on matters within their expertise, and this duty overrides any obligation to the person from whom they receive instructions or by whom they are paid.

2.1.1 Expert evidence should be the independent product of the expert, uninfluenced by the pressures of litigation.

2.1.2 An expert should assist the court by providing objective, unbiased opinion on matters within his or her expertise, and should not assume the role of an advocate.

2.1.3 An expert should consider all material facts, including those that might detract from his or her opinion.

2.1.4 An expert should make it clear when a question or issue falls outside his or her expertise, and when he or she is not able to reach a definite opinion, for example because he or she has insufficient information.

2.1.5 If, after producing a report, an expert changes his or her view on any material matter, such change of view should be communicated to all the parties without delay, and when appropriate to the court.

2.1.6 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.1.7 An expert must disclose if the report is inconsistent with any other report that he or she has proffered in any other adjudicative or administrative hearing and the details of the inconsistency.

2.2 Disregard of Duty

If an expert witness completely disregards his or her duty to the court or hearing officer set forth in Rule 2.1, the court or hearing officer may rule that the party may not rely on that expert's evidence.

2.3 Use of Single Expert

All parties and their attorneys shall discuss prior to trial/hearing whether a single expert should be appointed, and if this is not appropriate, indicate the reasons therefore in a joint statement to the court or tribunal.

2.4 Disclose Extent the Written Report was Edited

The expert shall provide details of whether and to what extent the written report has been edited by the parties, the attorneys or any third party.

2.5 Prehearing Discussion between Expert Witnesses

2.5.1 The court has the power to require discussions between experts for the purposes set out in Rule 1.1 Joint Report of Experts. The parties may also agree that discussions take place between their experts. The purpose of discussions between experts should be, wherever possible, to:

(a) identify and discuss the expert issues in the proceedings;

(b) reach agreement on those issues, and, if that is not possible, to narrow the issues in the case;

(c) identify those issues on which they agree and disagree and summarize their reasons for disagreement on any issue; and

(d) identify what action, if any, may be taken to resolve any of the outstanding issues between the parties.

2.5.2 Arrangements for discussions between experts should be proportionate to the value of the case. Some cases will not justify a meeting between experts, or justify only discussion via telephone or exchange of letters. In more substantial cases, discussion may be face to face, but as a matter of practicality, the discussions may be via telephone or video conference.

2.5.3 The parties, their lawyers and experts, should cooperate to produce the agenda for any discussion between experts, although primary responsibility for

preparation of the agenda should normally lie with the parties' attorneys. The agenda should indicate what matters have been agreed upon, and summarize concisely those which remain in issue. If the parties cannot agree, or if a party is not represented by counsel, the court may give directions for drawing up the agenda. The agenda should be circulated to experts and those instructing them to allow sufficient time for the experts to prepare for the discussion.

2.5.4 The parties' lawyers may only be present at discussions between experts if all the parties agree or the court so orders. If lawyers do attend, they should not normally intervene except to answer questions put to them by the experts or to give advice about the law. The content of discussions between experts should not be referred to at trial unless the parties agree in writing to do so.

2.5.5 At the conclusion of any discussion between experts, a statement should be prepared setting out:

(a) a list of issues that have been agreed upon, including, in each instance, the basis of agreement;

(b) a list of issues that have not been agreed upon, including, in each instance, the basis of disagreement;

(c) a list of any further issues that have arisen that were not included in the original agenda for discussion;

(d) a record of further action, if any, to be taken or recommended, including as appropriate the holding of further discussions between experts.

2.5.6 The statement should be agreed upon and signed by all the parties to the discussion. Agreements between experts during discussions do not bind the parties unless the parties expressly agree to be bound by the agreement. However, in view of the overriding objective, parties should give careful consideration before refusing to be bound by such an agreement, and be able to explain to the court their refusal should it become relevant to the issue of costs.

Stage 3

Proposed Rules:

3.1 Disclosures Concerning Shadow Experts

The attorneys must disclose whether a "shadow expert" (an expert which has not been otherwise disclosed) has been or will be used in preparation for the trial or hearing.

3.2 Disclosure of Instructions to Experts

The expert must annex to his or her report, a copy of all written instructions and notes of oral instructions provided to him by the attorneys or party that hired him or her.

3.3 Declaration of Expert of Role as Advisor to Court

The expert shall acknowledge in writing that his or her role is as an advisor to the court rather than an advocate of the parties. A proposed form of declaration is as follows:

Proposed Declaration of Experts (to be inserted into the Expert's Report between the end of the report and the Expert's signature)

Declaration of Experts

I, _____, DECLARE THAT:

1. I understand that my duty in providing written reports and giving evidence is to help the Court or Hearing Officer, and that this duty overrides any obligation to the party who engaged me and/or the person paying my fees. I confirm that I have complied with and will continue to comply with this duty.

2. I confirm that the matters stated as facts in my report are true to the best of my knowledge and belief; and I further confirm that opinions that I have expressed in my report are my true and complete professional opinion.

3. I have provided within my report:

(a) details of my relevant qualifications;

(b) details of the literature and other significant material that I have used in arriving at my opinions;

(c) identification of all persons, and their qualifications, who have carried out any data selection, data inspection, tests or experiments upon which I have relied in compiling my report;

(d) details of any instructions (whether in writing or oral, original or supplementary) which have affected the scope of my report including (i) a statement of the questions or issues that I was asked to address; (ii) the factual premises upon which

the report is based; and (iii) the documents and other materials that I have been instructed to consider;

(e) details of whether and to what extent my written report has been edited by the parties, the attorneys or any third party; and

(f) a disclosure of whether this report is inconsistent with any other report that I have proffered in any other adjudicative or administrative hearing and the details of the inconsistency.

4. I have used and will use my best efforts in my report and in any evidence for which I am called to give:

(a) to confine myself to expressing opinions as an expert within those areas in which I am specially knowledgeable by reason of my skill, training or experience;

(b) to distinguish among the data upon which I have relied, the assumptions which I have made, the methods that I have employed, and the opinions at which I have arrived;

(c) to specify all data, assumptions and methods upon which I have significantly relied to arrive at my opinions;

(d) to specify the bases for each of the opinions which I express;

(e) to specify whether there are any qualifications to any of the opinions;

(f) to indicate whether I have been apprised of any data or choice of method which might entail opinions which are inconsistent with the opinions which I have expressed; and

(g) to indicate if my opinion is not fully researched because insufficient data are available, or for any other reason.

5. I will notify the attorneys and parties immediately and confirm in writing if, for any reason, my existing report requires any correction or qualification, and if I become aware of any error or data which impacts significantly upon the accuracy of my report or the evidence that I give.

6. I will use my best efforts in giving evidence to ensure that my opinions and the data upon which they are based are not misunderstood or misinterpreted by the Court/Tribunal.

7. I have not entered into any arrangement where the amount of payment of my fees is in any way dependent on the outcome of the case.

8. I have made all the inquiries that I believe are desirable and appropriate and no matters of significance that I regard as relevant have, to the best my knowledge, been withheld from the Court or Hearing Officer.

7.3 Further Research Needs

The DTW survey informs us that there is support for more frequent use of court appointed experts. Although the majority of the DTW judges and administrative officers currently have the authority to appoint an expert, very few use that authority. Based on

the comments in the responses, there is a need to provide guidance to the judges and administrative officers concerning how the expert will be paid, and under what circumstances a court appointed expert is appropriate.

The DTW survey also reveals that having the experts in court to hear and comment on the testimony of the other is useful. However, in response to the question concerning use of concurrent evidence, in which the experts all appear together rather than sequentially in the traditional fashion, there was an equal number of survey respondents that said "no" versus those that said "yes" or were "undecided." Considering the comments of Justice McClellan from New South Wales, and the recurrent theme that cross-examination is problematic; concurrent evidence may provide a useful alternative to the traditional direct and cross-examination of experts. Further investigation and study into concurrent evidence is warranted.

Further education for judges and hearing officers has been recommended in the area of statistics and the scientific method. With respect to water cases and applications, it may be useful for researchers to suggest uniform methods by which the judge or hearing officer can assess a hydrologic model. A tool similar to one developed by the Colorado Institute of Public Policy for evaluation and interpretation of water research may be useful in this context. (Colorado Institute of Public Policy, Colorado State University, 2007)

7.4 Final Comment

It is hopeful that if some or all of the proposed reforms are implemented in water cases, that it will be less crucial for the judge or hearing officer to become more educated in the sciences, statistics and hydrology. The original purpose of having experts in the

courtroom was to assist judges in areas of expertise in which they were not trained. A change in the culture of partiality will allow the expert to fulfill his or her duty to inform the court, rather than act as advocate for one side. The expert relying on a hydrologic model will be required to consider the first stage of designing the model with this purpose in mind. The expert will provide unbiased useful information to the court, without requiring the judge to become a scientist or engineer.

These changes will come closer to fulfilling the original purpose of making exceptions to the rules of evidence to allow opinions to be given. Furthermore, men and women of science who appear in a court or tribunal to assist the decision maker will be less likely to be subjected to having their characters impugned or their credibility attacked.

These changes will make the adversarial setting less of a battleground, and should help to diffuse the battle of the experts in western water wars. Reform in water matters is necessary not simply due to the complexity of the issues. Reform in water matters is necessary because water is a public resource, and finding better and fairer ways to share it is critical as we move into a future of increasing populations, urbanization, and water scarcity.

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Appendix A Expert's Declaration – England and Wales

THE ACADEMY OF EXPERTS

EXPERT'S DECLARATION

THE ACADEMY OF EXPERTS

For all civil cases in England & Wales under CPR this Declaration should be inserted into the Expert's Report between the end of the report and the Expert's signature.

I.....DECLARE THAT:
[INSERT FULL NAME]

1. I understand that my duty in providing written reports and giving evidence is to help the Court, and that this duty overrides any obligation to the party by whom I am engaged or the person who has paid or is liable to pay me. I confirm that I have complied and will continue to comply with my duty.

2. I confirm that insofar as the facts stated in my report are within my own knowledge I have made clear which they are and I believe them to be true, and that the opinions I have expressed represent my true and complete professional opinion.

3. I have endeavoured to include in my report those matters, of which I have knowledge or of which I have been made aware, that might adversely affect the validity of my opinion. I have clearly stated any qualifications to my opinion.

4. I have shown the sources of all information I have used.

5. I have not without forming an independent view included or excluded anything which has been suggested to me by others including my instructing lawyers.

6. I will notify those instructing me immediately and confirm in writing if for any reason my existing report requires any correction or qualification.

7. I understand that;
   a) my report, subject to any corrections before swearing as to its correctness, will form the evidence to be given under oath or affirmation;

   b) I may be cross-examined on my report by a cross-examiner assisted by an expert;

   c) I am likely to be the subject of public adverse criticism by the judge if the Court concludes that I have not taken reasonable care in trying to meet the standards set out above.

8. I confirm that I have not entered into any arrangement where the amount or payment of my fees is in any way dependent on the outcome of the case.

This version applies from 25th March 2002

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Appendix B Federal Court of Australia Guidelines

Federal Court of Australia

Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia

This replaces the Practice Direction on Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia issued on 11 April 2007.

Practitioners should give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see **- Part 3.3 - Opinion** of the *Evidence Act 1995* (Cth)).

M.E.J. BLACK
Chief Justice
6 June 2007

Explanatory Memorandum

The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence (footnote #1), and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Ways by which an expert witness giving opinion evidence may avoid criticism of partiality include ensuring that the report, or other statement of evidence:

(a) is clearly expressed and not argumentative in tone;

(b) is centrally concerned to express an opinion, upon a clearly defined question or questions, based on the expert's specialised knowledge;

(c) identifies with precision the factual premises upon which the opinion is based;

(d) explains the process of reasoning by which the expert reached the opinion expressed in the report;

(e) is confined to the area or areas of the expert's specialised knowledge; and

(f) identifies any pre-existing relationship (such as that of treating medical practitioner or a firm's accountant) between the author of the report, or his or her firm, company etc, and a party to the litigation.

An expert is not disqualified from giving evidence by reason only of a pre-existing relationship with the party that proffers the expert as a witness, but the nature of the pre-existing relationship should be disclosed. Where an expert has such a relationship the expert may need to pay particular attention to the identification of the factual premises upon which the expert's opinion is based. The expert should make it clear whether, and to what extent, the opinion is based on the personal knowledge of the expert (the factual basis for which might be required to be established by admissible evidence of the expert or another witness) derived from the ongoing relationship rather than on factual premises or assumptions provided to the expert by way of instructions.

All experts need to be aware that if they participate to a significant degree in the process of formulating and preparing the case of a party, they may find it difficult to maintain objectivity.

An expert witness does not compromise objectivity by defending, forcefully if necessary, an opinion based on the expert's specialised knowledge which is genuinely held but may do so if the expert is, for example, unwilling to give consideration to alternative factual premises or is unwilling, where appropriate, to acknowledge recognised differences of opinion or approach between experts in the relevant discipline.

Some expert evidence is necessarily evaluative in character and, to an extent, argumentative. Some evidence by economists about the definition of the relevant market in competition law cases and evidence by anthropologists about the identification of a traditional society for the purposes of native title applications may be of such a character. The Court has a discretion to treat essentially argumentative evidence as submission, see Order 10 paragraph 1(2)(j).

The guidelines are, as their title indicates, no more than guidelines. Attempts to apply them literally in every case may prove unhelpful. In some areas of specialised knowledge and in some circumstances (eg some aspects of economic "evidence" in competition law cases) their literal interpretation may prove unworkable. The Court expects legal practitioners and experts to work together to ensure that the guidelines are implemented in a practically sensible way which ensures that they achieve their intended purpose.

Guidelines

1. General Duty to the Court (footnote #2)

1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.

1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential (footnote #3).

1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. The Form of the Expert Evidence (footnote #4)

2.1 An expert's written report must give details of the expert's qualifications and of the literature or other material used in making the report.

2.2 All assumptions of fact made by the expert should be clearly and fully stated.

2.3 The report should identify and state the qualifications of each person who carried out any tests or experiments upon which the expert relied in compiling the report.

2.4 Where several opinions are provided in the report, the expert should summarise them.

2.5 The expert should give the reasons for each opinion.

2.6 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that* [the expert] *believes are desirable and appropriate and that no matters of significance that* [the expert] *regards as relevant have, to* [the expert's] *knowledge, been withheld from the Court*."

2.7 There should be included in or attached to the report; (i) a statement of the questions or issues that the expert was asked to address; (ii) the factual premises upon which the report proceeds; and (iii) the documents and other materials that the expert has been instructed to consider.

2.8 If, after exchange of reports or at any other stage, an expert witness changes a material opinion, having read another expert's report or for any other reason, the change should be communicated in a timely manner (through legal representatives) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court (footnote #5).

2.9 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report (footnote #5).

2.10 The expert should make it clear when a particular question or issue falls outside the relevant field of expertise.

2.11 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports (footnote #6).

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

footnote #1
As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].

footnote #2
See rule 35.3 Civil Procedure Rules (UK); see also Lord Woolf "Medics, Lawyers and the Courts" [1997] 16 CJQ 302 at 313.

footnote #3
See *Sampi v State of Western Australia* [2005] FCA 777 at [792]-[793], and *ACCC v Liquorland and Woolworths* [2006] FCA 826 at [836]-[842]

footnote #4
See rule 35.10 Civil Procedure Rules (UK) and Practice Direction 35 – Experts and Assessors (UK); *HG v the Queen* (1999) 197 CLR 414 per Gleeson CJ at [39]-[43]; *Ocean Marine Mutual Insurance Association (Europe) OV v Jetopay Pty Ltd* [2000] FCA 1463 (FC) at [17]-[23]

footnote #5
The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

footnote #6
The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240.

Appendix C AIJA Survey Results

Reprinted with Permission – G.Reinhardt, AIJA, September 9, 2007

APPENDIX TWO: SURVEY RESULTS

Q1.2 Have you served as a magistrate for:

	n	%-NR
(a) less than 2 years;	15	7.43
(b) between 2 and 5 years;	35	17.33
(c) between 6 and 10 years;	49	24.26
(d) between 11 and 20 years; or	81	40.10
(e) more than 20 years?	22	10.89
Valid Responses	202	100.00
No Response	1	
Total	203	

Q1.3 In which State or Territory are you a magistrate:

	n	%
(a) NSW;	59	29.06
(b) Victoria;	43	21.18
(c) Queensland;	44	21.67
(d) South Australia;	21	10.34
(e) Western Australia;	28	13.79
(f) Tasmania;	2	0.99
(g) ACT; or,	3	1.48
(h) Northern Territory?	3	1.48
Valid Responses	203	100.00

Q1.4 How often in cases over which you have presided have experts been called to give 'opinion evidence'?

	n	%
(a) never;	4	1.97
(b) occasionally;	142	69.95
(c) often;	56	27.59
(d) always.	1	0.49
Valid Responses	203	100.00

Q2.1 When expert witnesses are called, do you find the expert evidence useful for the fact-finding process?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	1	0.51	1	0.43
(b) occasionally	44	22.34	39	16.60
(c) often	123	62.44	163	69.36
(d) always	29	14.72	32	13.62
Valid Responses	197	100.00	235	100.00
No response	6		9	
Total	203		244	

Q2.2 Have you encountered any of the following problems with expert evidence?

(i) bias on the part of the expert:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	14	7.11	8	3.45
(b) occasionally	141	71.57	158	68.10
(c) often	39	19.80	64	27.59
(d) always	3	1.52	2	0.86
Valid Responses	197	100.00	232	100.00
No response	6		12	
Total	203		244	

(ii) use of oral or written language by the expert that was difficult to understand:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	26	13.20	21	9.05
(b) occasionally	142	72.08	178	76.72
(c) often	29	14.72	33	14.22
(d) always	0	0.00	0	0.00
Valid Responses	197	100.00	232	100.00
No response	6		12	
Total	203		244	

(iii) failure by the expert to stay within the parameters of his or her expertise:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	31	15.74	16	6.90
(b) occasionally	147	74.62	185	79.74
(c) often	19	9.64	30	12.93
(d) always	0	0.00	1	0.43
Valid Responses	197	100.00	232	100.00
No response	6		12	
Total	203		244	

(iv) non responsiveness by the expert to questions:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	77	38.89	34	14.17
(b) occasionally	115	58.08	182	75.83
(c) often	6	3.03	24	10.00
(d) always	0	0.00	0	0.00
Valid Responses	198	100.00	240	100.00
No response	5		4	
Total	203		244	

(v) failure to prove the bases of the expert's opinions:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	56	28.57	38	16.03
(b) occasionally	131	66.84	163	68.78
(c) often	9	4.59	36	15.19
(d) always	0	0.00	0	0.00
Valid Responses	196	100.00	237	100.00
No response	7		7	
Total	203		244	

(vi) failure by the advocate to pose examination-in-chief questions appropriately

	Magistrates	
	n	%-NR
(a) never	10	5.08
(b) occasionally	118	59.90
(c) often	69	35.03
(d) always	0	0.00
Valid Responses	197	100.00
No response	6	
Total	203	

(vii) failure by the advocate to cross-examine so as to make the expert accountable

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	11	5.56	15	6.33
(b) occasionally	115	58.08	137	57.81
(c) often	72	36.36	84	35.44
(d) always	0	0.00	1	0.42
Valid Responses	198	100.00	237	100.00
No response	5		7	
Total	203		244	

Q2.3 What is the single most serious problem you have encountered with expert evidence?

	Magistrates		Judges	
	n	%-NR	n	%
(a) bias on the part of the expert;	58	29.59	85	34.84
(b) use of oral or written language by the expert that was difficult to understand;	38	19.39	24	9.84
(c) failure by the expert to stay within the parameters of his or her expertise	18	9.18	14	5.74
(d) nonresponsiveness by the expert to questions	4	2.04	12	4.92
(e) failure to prove the bases of the expert's opinions;	17	8.67	34	13.93
(f) failure by the advocate to pose examination-in-chief questions appropriately;	18	9.18	34	13.93
(g) failure by the advocate to cross-examine so as to make the expert accountable;	38	19.39	26	10.66
(h) other - please specify	5	2.55	15	6.15
Valid Responses	196	100.00	244	100.00
No response	7			
Total	203			

Q2.4 Have you encountered evidence from experts which you were not able to evaluate adequately because of its complexity?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never	94	47.72	125	53.19
(b) occasionally	100	50.76	106	45.11
(c) often	3	1.52	4	1.70
(d) always	0	0.00	0	0.00
Valid Responses	197	100.00	235	100.00
No response	6		9	
Total	203		244	

Q2.5 If you answered (b), (c), or (d) to the previous question, did the evidence come from the disciplines of:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) science	32	17.02	33	13.87
(b) psychiatry	30	15.96	38	15.97
(c) psychology	20	10.64	31	13.03
(d) medicine/surgery	34	18.09	25	10.50
(e) accounting	22	11.70	43	18.07
(f) engineering	40	21.28	35	14.71
(g) statistics	8	4.26	23	9.66
(h) planning	2	1.06	3	1.26
(i) other - please specify	0	0.00	7	2.94
Valid Responses	188	100.00	238	100.00
No response	100		6	
Total	288		244	

Q2.6 If you selected more than one field in the previous question, which one field was the most difficult to evaluate adequately?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) science	13	18.84	10	13.89
(b) psychiatry	11	15.94	12	16.67
(c) psychology	6	8.70	6	8.33
(d) medicine/surgery	14	20.29	6	8.33
(e) accounting	11	15.94	14	19.44
(f) engineering	11	15.94	10	13.89
(g) statistics	3	4.35	9	12.50
(h) planning	0	0.00	0	0.00
(i) other - please specify	0	0.00	5	6.94
Valid Responses	69	100.00	72	100.00
No response	134		172	
Total	203		244	

Q2.7 Overall how do you assess the usefulness of the written expert reports that are tendered before you?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) very poor	1	0.51	1	0.42
(b) poor	6	3.06	6	2.50
(c) reasonable	78	39.80	116	48.33
(d) good	90	45.92	91	37.92
(e) very good	21	10.71	26	10.83
Valid Responses	196	100.00	240	100.00
No response	7		4	
Total	203		244	

Q2.7A When expert evidence is presented with 'demonstrative aids'; for example, diagrams, models, charts etc., how helpful have you found those aids to your understanding of the expert evidence?

	Magistrates	
	n	%-NR
(a) unnecessary	3	1.54
(b) useful, but not at all necessary	9	4.62
(c) helpful	145	74.36
(d) necessary	36	18.46
(e) other - please specify	2	1.03
Valid Responses	195	100.00
No response	8	
Total	203	

Q2.8 In the expert reports that are tendered to you, does it appear that lawyers have played an active part in finalising the content (for example, they have settled an expert's draft)?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never - go to 2.10	98	50.26	61	25.85
(b) occasionally	71	36.41	126	53.39
(c) often	25	12.82	42	17.80
(d) always	1	0.51	7	2.97
Valid Responses	195	100.00	236	100.00
No response	8		8	
Total	203		244	

Q2.9 If you answered the previous question (b)m (c), or (d), what is the usual effect that this participation by the lawyers has upon your assessment of the weight to be given to the expert's evidence?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) it helps	25	26.32	72	40.22
(b) it hinders	36	37.89	45	25.14
(c) it makes no difference	30	31.58	62	34.64
(d) other - please specify	4	4.21	0	0.00
Valid Responses	95	100.00	179	100.00
No response	108		65	
Total	203		244	

Q2.10 From the following list please circle the three factors which you consider to be the most persuasive when an expert is giving oral evidence

	Magistrates		Judges	
	n	%	n	%
(a) their appearance	1	0.17	4	0.57
(b) clarity of explanation	151	25.64	194	27.48
(c) educational qualifications	23	3.90	13	1.84
(d) prior experience in the field	155	26.32	158	22.38
(e) prior experience as an expert witness	16	2.72	22	3.12
(f) familiarity with the facts	113	19.19	133	18.84
(g) impartiality	129	21.90	181	25.64
(h) publications	1	0.17	1	0.14
Valid Responses	589	100.00	706	100.00

Q2.11 From the following list please circle the one which you consider to be the single most persuasive factor when an expert is giving oral evidence

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) their appearance	0	0.00	0	0.00
(b) clarity of explanation	84	43.08	122	51.91
(c) educational qualifications	2	1.03	2	0.85
(d) prior experience in the field	49	25.13	31	13.19
(e) prior experience as an expert witness	2	1.03	4	1.70
(f) familiarity with the facts	15	7.69	19	8.09
(g) impartiality	43	22.05	56	23.83
(h) publications	0	0.00	1	0.43
Valid Responses	195	100.00	235	100.00
No response	8		9	
Total	203		244	

Q3.1 How effectively do most advocates appearing before you elicit oral evidence-in-chief from expert witnesses?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) very poorly	3	1.52	0	0.00
(b) poorly	38	19.19	33	13.92
(c) reasonably	123	62.12	161	67.93
(d) well	30	15.15	40	16.88
(e) very well	4	2.02	3	1.27
Valid Responses	198	100.00	237	100.00
No response	5		7	
Total	203		244	

Q3.1A How effectively do most advocates appearing before you employ 'demonstrative aids' (for example, diagrams, charts, models, etc.) to assist the evidence-in-chief of expert witnesses?

	Magistrates	
	n	%-NR
(a) very poorly	16	8.47
(b) poorly	77	40.74
(c) reasonably	85	44.97
(d) well	11	5.82
(e) very well	0	0.00
Valid Responses	189	100.00
No response	14	
Total	203	

Q3.2 On the occasions when there have been difficulties with the way in which advocates appearing before you have elicited evidence-in-chief from an expert witness, has this resulted from one or more of the following:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) inadequate preparation by the lawyers to master the technical issues	124	40.26	166	38.97
(b) inadequate preparation of the expert by their lawyers	55	17.86	80	18.78
(c) poor skills by the lawyer in eliciting the evidence	99	32.14	144	33.80
(d) taking the expert beyond his or her field of expertise	26	8.44	27	6.34
(e) other - please specify	4	1.30	9	2.11
Valid Responses	308	100.00	426	100.00

Q3.3 How effectively do most advocates appearing before you make expert witnesses accountable by cross-examination for the opinions they expressed in examination-in-chief?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) very poorly	1	0.51	3	1.28
(b) poorly	61	31.28	35	14.96
(c) reasonably	109	55.90	145	61.97
(d) well	21	10.77	49	20.94
(e) very well	3	1.54	2	0.85
Valid Responses	195	100.00	234	100.00
No response	8		10	
Total	203		244	

Q3.4 If you answered 3.3 by (a), (b) or (c), how much, if at all, a problem for the fact finding process in your court is this failure to make expert witnesses accountable?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) very unimportant	10	5.88	4	2.19
(b) unimportant	29	17.06	45	24.59
(c) significant	119	70.00	127	69.40
(d) very significant	12	7.06	7	3.83
Valid Responses	170	100.00	183	100.00
No response	33		61	
Total	203		244	

Q3.5 When cross-examination of expert witnesses before you has been inadequate, what have been the most significant reasons (select up to three factors):

	Magistrates		Judges	
	n	%	n	%
(a) inadequate preparation by the cross-examiner	144	29.27	196	33.50
(b) lack of skill by the cross-examiner	126	25.61	194	33.16
(c) non-responsive answers by the expert	27	5.49	42	7.18
(d) confusion in use of terminology by the advocate	80	16.26	77	13.16
(e) confusion in use of terminology by the expert	24	4.88	17	2.91
(f) no application being made to have other experts in court to assist counsel	58	11.79	31	5.30
(g) undue repetition in the evidence	30	6.10	24	4.10
(h) other	3	0.61	4	0.68
	492	100.00	585	100.00

Q3.6 When cross-examination of expert witnesses before you has been inadequate, what has been the single most significant reason:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) inadequate preparation by the cross-examiner	88	46.81	126	52.07
(b) lack of skill by the cross-examiner	63	33.51	84	34.71
(c) non-responsive answers by the expert	10	5.32	9	3.72
(d) confusion in use of terminology by the advocate	7	3.72	11	4.55
(e) confusion in use of terminology by the expert	5	2.66	2	0.83
(f) no application being made to have other experts in court to assist counsel	10	5.32	2	0.83
(g) undue repetition in the evidence	5	2.66	5	2.07
(h) other	0	0.00	3	1.24
Valid Responses	188	100.00	242	100.00
No response	15		2	
Total	203		244	

Q3.7 Have you experienced difficulty in evaluating the opinions expressed by one expert as against those expressed by another?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) never - go to 3.9	27	13.71	19	8.05
(b) occasionally	108	54.82	166	70.34
(c) often	58	29.44	51	21.61
(d) always	4	2.03	0	0.00
Valid Responses	197	100.00	236	100.00
No response	6		8	
Total	203		244	

Q3.8 If you answered (b), (c), or (d) to the previous question, which one of the following factors has been most responsible?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) poor leading of evidence	9	5.29	6	2.73
(b) poor cross-examination of evidence	15	8.82	18	8.18
(c) poor communication by the experts	4	2.35	9	4.09
(d) experts lacking credibility	6	3.53	17	7.73
(e) the complexity of the expert evidence	27	15.88	43	19.55
(f) fundamental irreconciliability of views expressed by opposing experts	107	62.94	121	55.00
(g) other - please specify	2	1.18	6	2.73
Valid Responses	170	100.00	220	100.00
No response	33		24	
Total	203		244	

Q3.9 Have you heard cases where you have formed the view that a key expert has been retained by one side just to make the expert less available as a witness for the other side?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) Never	171	86.80	164	70.39
(b) occasionally	25	12.69	67	28.76
(c) often	1	0.51	2	0.86
(d) always	0	0.00	0	0.00
Valid Responses	197	100.00	233	100.00
No response	6		11	
Total	203		244	

Q6.1 Have you used the voire dire procedure to determine the admissibility Of expert evidence?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) never	102	51.78	57	24.15
(b) occasionally	91	46.19	151	63.98
(c) often	4	2.03	27	11.44
(d) always	0	0.00	1	0.42
Valid Responses	197	100.00	236	100.00
No response	6		8	
Total	203		244	

Q6.2 Should "reliability" of expert evidence be a condition precedent to its admissibility?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) yes	78	40.21	58	25.44
(b) no	59	30.41	131	57.46
(c) no opinion	57	29.38	39	17.11
Valid Responses	194	100.00	228	100.00
No response	9		16	
Total	203		244	

Q6.3 Should "falsifiability" be a criterion for determining "reliability" as a condition precedent to the admissibility of expert evidence in our courts?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) yes	52	27.96	39	17.73
(b) no	37	19.89	99	45.00
(b) no opinion	97	52.15	82	37.27
Valid Responses	186	100.00	220	100.00
No response	17		24	
Total	203		244	

Q6.4 Is the courtroom a forum in which the reliability of expert theories and techniques is adequately evaluated?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) yes	70	36.08	127	55.22
(b) no	90	46.39	71	30.87
(c) no opinion	34	17.53	32	13.91
Valid Responses	194	100.00	230	100.00
No response	9		14	
Total	203		244	

Q6.5 Are most experts who give evidence before you representative of the views of their discipline?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) yes	103	53.09	167	73.57
(b) no	11	5.67	12	5.29
(c) no opinion	80	41.24	48	21.15
Valid Responses	194	100.00	227	100.00
No response	9		17	
Total	203		244	

Q6.6 If you answered (b) or (c) to the previous question, do you think that this is a significant problem for the quality of fact-finding in your court?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	28	30.77	20	34.48
(b) no	28	30.77	25	43.10
(c) no opinion	35	38.46	13	22.41
Valid Responses	91	100.00	58	100.00
No response	112		186	
Total	203		244	

Q6.7Do the same expert witnesses appear regularly before you for the same side in litigation?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	97	49.49	170	71.73
(b) no	99	50.51	67	34.18
Valid Responses	196	100.00	237	120.92
No response	7		7	
Total	203		244	

Q6.8 Have you encountered partisanship in expert witnesses called to give evidence before you?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) yes	136	69.39	208	87.76
(b) no	46	23.47	24	10.13
(c) no opinion	14	7.14	5	2.11
Valid Responses	196	100.00	237	100.00
No response	7		7	
Total	203		244	

Q6.9 If you answered (a) to the previous question, is this a significant problem for the quality of fact-finding in your court?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) yes	68	50.37	98	46.67
(b) no	64	47.41	110	52.38
(c) no opinion	3	2.22	2	0.95
Valid Responses	135	100.00	210	100.00
No response	68		34	
Total	203		244	

Q6.10 What is your view about expert witnesses being in court to hear the evidence of other expert witnesses?

	Magistrates		Judges	
	n	%-NR	N	%-NR
(a) it is unhelpful	11	5.82	11	4.68
(b) it makes no significant difference	14	7.41	26	11.06
(c) it is helpful	164	86.77	198	84.26
Valid Responses	189	100.00	235	100.00
No response	14		9	
Total	203		244	

Q7.1 Do you classify the knowledge of the rules of expert evidence on the part of advocates appearing before you as:

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) very poor	1	0.52	3	1.25
(b) poor	40	20.83	34	14.17
(c) reasonable	129	67.19	160	66.67
(d) good	22	11.46	39	16.25
(e) very good	0	0.00	4	1.67
Valid Responses	192	100.00	240	100.00
No response	11		4	
Total	203		244	

Q7.2 Have you excluded expert evidence more than five times by virtue of

(a) the expertise rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	30	15.96	66	31.13
(b) no	158	84.04	146	68.87
Valid Responses	188	100.00	212	100.00
No response	15		32	
Total	203		244	

(b) the area of expertise rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	29	15.43	73	33.49
(b) no	159	84.57	145	66.51
Valid Responses	188	100.00	218	100.00
No response	15		26	
Total	203		244	

(c) the common knowledge rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	13	6.91	70	32.86
(b) no	175	93.09	143	67.14
Valid Responses	188	100.00	213	100.00
No response	15		31	
Total	203		244	

(d) the ultimate issue rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	24	12.77	64	29.63
(b) no	164	87.23	152	70.37
Valid Responses	188	100.00	216	100.00
No response	15		28	
Total	203		244	

(e) the basis rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	7	3.72	35	16.75
(b) no	181	96.28	174	83.25
Valid Responses	188	100.00	209	100.00
No response	15		35	
Total	203		244	

(f) the exercise of the prejudice/probative discretion

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	11	5.85	27	12.98
(b) no	177	94.15	181	87.02
Valid Responses	188	100.00	208	100.00
No response	15		36	
Total	203		244	

Q7.3 Without advocates having raised the point, have you ever excluded expert evidence applying any one or more of the above six grounds?

(a) the expertise rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	23	12.11	56	27.05
(b) no	167	87.89	151	72.95
Valid Responses	190	100.00	207	100.00
No response	13		37	
Total	203		244	

(b) the area of expertise rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	17	8.95	53	26.11
(b) no	173	91.05	150	73.89
Valid Responses	190	100.00	203	100.00
No response	13		41	
Total	203		244	

(c) the common knowledge rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	21	11.05	64	30.92
(b) no	169	88.95	143	69.08
Valid Responses	190	100.00	207	100.00
No response	13		37	
Total	203		244	

(d) the ultimate issue rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	23	12.11	53	26.37
(b) no	167	87.89	148	73.63
Valid Responses	190	100.00	201	100.00
No response	13		43	
Total	203		244	

(e) the basis rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	6	3.16	19	9.69
(b) no	184	96.84	177	90.31
Valid Responses	190	100.00	196	100.00
No response	13		48	
Total	203		244	

(f) the exercise of the prejudice/probative discretion

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	20	10.53	14	6.83
(b) no	170	89.47	191	93.17
Valid Responses	190	100.00	205	100.00
No response	13		39	
Total	203		244	

Q7.4 Are you in favour of the abolition of

(a) the expertise rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	5	2.69	6	2.75
(b) no	164	97.04	212	97.25
Valid Responses	169	100.00	218	100.00
No response	34		26	
Total	203		244	

(b) the area of expertise rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	5	2.69	8	3.70
(b) no	164	97.04	208	96.30
Valid Responses	169	100.00	216	100.00
No response	34		28	
Total	203		244	

(c) the common knowledge rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	12	7.10	18	8.41
(b) no	157	92.90	196	91.59
Valid Responses	169	100.00	214	100.00
No response	34		30	
Total	203		244	

(d) the ultimate issue rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	16	9.47	56	26.29
(b) no	153	90.53	157	73.71
Valid Responses	169	100.00	213	100.00
No response	34		31	
Total	203		244	

(e) the basis rule

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	6	3.55	10	4.78
(b) no	163	96.45	199	95.22
Valid Responses	169	100.00	209	100.00
No response	34		35	
Total	203		244	

(f) the prejudice/probative discretion as it applies to expert evidence

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	8	4.73	12	5.50
(b) no	161	95.27	206	94.50
Valid Responses	169	100.00	218	100.00
No response	34		26	
Total	203		244	

Q8.1 Have the 1995 opinion evidence provisions made any difference to the exclusion of expert evidence in hearings over which you have presided?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	12	15.38	31	27.43
(b) no	57	73.08	70	61.95
I do not know	9	11.54	12	10.62
Valid Responses	78	100.00	113	100.00
No response	125		131	
Total	203		244	

Q8.2 If you answered (a) to the previous question have the provisions resulted in the admission of

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) more expert evidence	7	58.33	20	62.50
(b) less expert evidence	2	16.67	3	9.38
(c) the same amount of expert evidence	3	25.00	9	28.13
Valid Responses	12	100.00	32	100.00
No response	191		212	
Total	203		244	

Q8.3 Do you regard the changes to the admissibility rules for opinion evidence to have resulted in

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) an improvement in the quality of the fact-finding process	25	33.33	21	19.63
(b) a deterioration in the quality of the fact-finding process	0	0.00	4	3.74
(c) no real difference in the quality of the fact-finding process	50	66.67	82	76.64
Valid Responses	75	100.00	107	100.00
No response	128		137	
Total	203		244	

Q8.4 Have you found the application of the certificate section (section 177) for proof of expert opinions

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) unhelpful	1	1.41	0	0.00
(b) to have made no significant difference	32	45.07	87	86.14
(c) helpful	38	53.52	14	13.86
Valid Responses	71	100.00	101	100.00
No response	132		143	
Total	203		244	

Q8.5 Are you applying the prejudice/probative discretion in criminal cases to exclude evidence?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) more often than prior to the Evidence Act 1995	12	17.39	10	11.11
(b) less often than prior to the Evidence Act 1995	4	5.80	1	1.11
(c) as before the Evidence Act 1995	50	72.46	32	35.56
(d) I do not preside over criminal cases	3	4.35	47	52.22
Valid Responses	69	100.00	90	100.00
No response	134		154	
Total	203		244	

Q8.6 Are you applying the prejudice/probative discretion in non-criminal cases to exclude evidence?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) more often than prior to the Evidence Act 1995	4	5.80	10	10.10
(b) less often than prior to the Evidence Act 1995	2	2.90	2	2.02
(c) as before the Evidence Act 1995	56	81.16	83	83.84
(d) I do not preside over criminal cases	7	10.14	4	4.04
Valid Responses	69	100.00	99	100.00
No response	134		145	
Total	203		244	

Q8.7 Do you regard the 'reliability' of expert theories and techniques as a relevant criterion in your application of the prejudice/probative discretion?

	Magistrates		Judges	
	n	%-NR	n	%-NR
(a) yes	47	62.67	51	49.51
(b) no	10	13.33	28	27.18
(c) I do not know	18	24.00	24	23.30
Valid Responses	75	100.00	103	100.00
No response	128		141	
Total	203		244	

Appendix D AIJA Proposed Mandatory Declaration of Experts

I, ..., DECLARE THAT:

1. I recognise that my overriding duty in writing reports and in giving evidence is to the Court/Tribunal, rather than to the party commissioning me and/or paying my fees.

2. I have used my best endeavours to produce my report in sufficient time to enable proper consideration of it.

3. I have made myself reasonably available for discussion of the contents of my report with professional representatives of all parties involved in the litigation.

4. I have provided within my report

   (a) details of my relevant qualifications;

   (b) details of the literature and other significant material that I have used in arriving at my opinions;

   (c) identification of any person, and their qualifications, who has carried out any data selection, data inspection, tests or experiments upon which I have relied in compiling my report; and

   (d) details of any instructions (whether in writing or oral, original or supplementary) which have affected the scope of my report.

5. I have used my best endeavours in my report, and will endeavour in any evidence which I am called to give,

   (a) to confine myself to expressing opinions as an expert within those areas in which I am specially knowledgeable by reason of my skill, training or experience;

   (b) to distinguish among the data upon which I have relied, the assumptions which I have made, the methods that I have employed, and the opinions at which I have arrived;

   (c) to indicate those data, assumptions and methods upon which I have significantly relied to arrive at my opinions;

   (d) to give succinct reasons for each of the opinions which I express;

   (e) to be objective and unbiased;

   (f) to make the opinions which I express clear, comprehensible and accessible to those not expert in my discipline;

   (g) to be scrupulous in terms of accuracy and care in relation to the data upon which I rely, my choice of methods, and the opinions which I express arising from those data;

(h) to indicate whether I have been provided with all the data necessary for me to arrive at the views which I have expressed and whether I need further information.

(i) to indicate whether I have been apprised of any data or choice of method which might entail opinions which are inconsistent with the opinions which I have expressed; and

(j) to indicate whether I have been unable for any reason to employ the methodology which I would prefer to use before expressing an opinion.

(6) If I become aware of any error or any data which impact significantly upon the accuracy of my report, or the evidence that I give, prior to the legal dispute being finally resolved, I shall use my best endeavours to notify those who commissioned my report or called me to give evidence.

(7) I shall use my best endeavours in giving evidence to ensure that my opinions and the data upon which they are based are not misunderstood or misinterpreted by the Court/Tribunal.

(8) I have not entered into any arrangement which makes the fees to which I am entitled dependent upon the views I express or the outcome of the case in which my report is used or in which I give evidence

Appendix E DTW Survey Instrument

Reforming the Culture of Partiality: Diffusing the Battle of the Experts in Western Water Wars

Important Questions for Dividing the Waters
Judges, Quasi-Judicial and Administrative Officers

Concerning:

Expert Witness Testimony in Western Water Adjudications
and Administrative Hearings

All Responses are Confidential
Please Complete This Survey. Thank you for your Cooperation
Postage-Paid Return Envelope Provided

A Study Conducted By:
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Colorado Institute of Public Policy
Colorado State University
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Colorado Institute of Public Policy

THIS SURVEY SHOULD TAKE APPROXIMATELY 15 MINUTES TO COMPLETE

This survey is being conducted to ascertain:

- **The need for reform in water matters concerning the admissibility of expert witness testimony**
- **Your receptiveness to the types of reform recently adopted in England and Australia**

For purposes of comparison, this survey includes questions from surveys conducted by the Australian Judicial Institute.

This survey also includes questions to assess your opinion about reforms that have been adopted or proposed in England and Australia.

A. Which one of the following describes your current primary position? (Check ONE)

☐ appellate judge ☐ trial judge
☐ magistrate ☐ referee
☐ special master ☐ administrative hearing officer
☐ permitting agency board member ☐ other – please specify _____

B. Are you working in a state or federal system? (Check ALL that apply)

☐ federal ☐ state ☐ other – please specify _____

C. About how long have you been involved as a judge or administrative officer in water matters? (Check ONE)

☐ less than 2 years ☐ between 2 and 5 years ☐ between 6 and 10 years

☐ between 11 and 20 years ☐ more than 20 years

D. About how long have you been involved in water matters in any capacity? (Check ONE)

☐ less than 2 years ☐ between 2 and 5 years ☐ between 6 and 10 years

☐ between 11 and 20 years ☐ more than 20 years

E. In which State do you perform your duties? (Check ALL that apply)

☐ Arizona ☐ Nevada

☐ California ☐ Oregon

☐ Colorado ☐ Texas

☐ Idaho ☐ Utah

☐ Montana ☐ Washington

☐ Nebraska ☐ Wyoming

☐ New Mexico ☐ Other – please specify: _____

The following questions relate to the type and frequency of expert evidence you encounter

A. In approximately what percentage of water related matters in which you have presided have experts been called to give or present testimony? (Check ONE)

☐ under 10% ☐ at least 25% ☐ at least 33% ☐ at least 50% ☐ at least 66% ☐ at least 75% ☐ over 75% ☐ 100%

B. Approximately how many times **in a year** do you encounter expert witnesses from the following disciplines?

(Circle **ONE** number in each row)	**0**	**1-2**	**3-5**	**5-7**	**more than 7**
Biology/Life Sciences	1	2	3	4	5
Economics/Finance	1	2	3	4	5
Engineering	1	2	3	4	5
Geology	1	2	3	4	5
Hydrology	1	2	3	4	5
Soil Sciences	1	2	3	4	5
Statistics/Mathematics	1	2	3	4	5
Other: please specify:_____	1	2	3	4	5

C. Approximately how many times **in a year** do you encounter the **same individual** expert witness?

(Circle ONE)	**0**	**1-2**	**3-5**	**5-7**	**more than 7**

The following questions are to identify problems associated with expert evidence

A. Have you encountered any of the following problems with expert evidence?

	(Circle **ONE** number for each statement)	Never	Occasionally	Often	Always
1	adversarial bias on the part of the expert [predisposition, inclination or favoritism towards the party who called or hired the expert]	0	1	2	3
2	use of oral or written language by the expert that was difficult to understand	0	1	2	3
3	failure by the expert to stay within the parameters of his or her expertise	0	1	2	3
4	non-responsiveness by the expert to questions	0	1	2	3
5	failure to prove the bases of the expert's opinions	0	1	2	3
6	failure by the lawyer to pose direct examination questions appropriately	0	1	2	3
7	failure by the lawyer to cross-examine so as to make the expert accountable	0	1	2	3
8	failure of the expert to articulate his or her opinion understandably	0	1	2	3
9	failure of the expert to adequately support the opinions given	0	1	2	3

B. Of the problems listed above, what **is the single** most **serious** problem you have encountered with expert evidence? (Circle ONE)

1	2	3	4	5	6	7	8	9

C. Of the problems listed above, what problem you have encountered **most frequently**? (Circle ONE)

1	2	3	4	5	6	7	8	9

Insert comments here or on back page:

The following questions relate to evaluation of evidence

A. Have you encountered evidence from experts that you were **not able** to evaluate adequately because of its **complexity**? (Check ONE)

- ☐ never
- ☐ occasionally
- ☐ often
- ☐ always

B. If you answered occasionally, often or always to the previous question, did the evidence come from a witness or witnesses from the disciplines of: (Check **ALL** that apply)

- ☐ biology/life sciences
- ☐ economics/finance
- ☐ engineering
- ☐ geology
- ☐ hydrology
- ☐ soil sciences
- ☐ statistics/mathematics
- ☐ other - please specify: _____

	(Circle **ONE** number per question)	Never	Occasionally	Often	Always
C.	Have you had any difficulty in ensuring that the expertise you consider necessary to assist you in making your decisions is available to you?	1	2	3	4
D.	When expert witnesses are used, do you find the expert evidence useful for the fact-finding process?	1	2	3	4
E.	Have you had any difficulty evaluating the opinions of one expert against those expressed by another?	1	2	3	4

F. If you have had difficulty evaluating the opinions of one expert against those expressed by another, which of the following factors was responsible? (Check **ALL** that apply)

- ☐ inadequate introduction of expert testimony by the lawyer
- ☐ inadequate cross examination of expert testimony
- ☐ inadequate communication by the expert of his or her opinion to the trier of fact
- ☐ the experts lacked credibility
- ☐ complexity of the expert evidence
- ☐ fundamental irreconcilability of views expressed by opposing experts
- ☐ testimony by the experts failed to directly address the issues
- ☐ other - please specify: _____

G. What is your view about expert witnesses being present in the court or administrative hearing to hear and comment on the evidence of other expert witnesses? (Check **ONE**)

- ☐ it is not helpful
- ☐ it makes no significant difference
- ☐ it is helpful

Insert comments here or on back page:

The following questions relate to reliability of expert witness testimony

	(Circle **ONE** number per question)	Yes	No	No Opinion
1.	Is the **courtroom** a forum in which the reliability of expert theories and techniques is adequately evaluated?	1	2	3
2.	Is the **administrative hearing** a forum in which the reliability of expert theories and techniques is adequately evaluated?	1	2	3
3.	Are **most** experts who give evidence before you representative of the views of their discipline?	1	2	3
4.	If you answered No or No Opinion to the previous question, do you think that this is a **significant** problem for the quality of fact-finding?	1	2	3
5.	Do the same expert witnesses appear regularly before you for the same side?	1	2	3
6.	Have you had expert witnesses appear before you and give testimony that is inconsistent with evidence that was presented by them in a different case?	1	2	3
7.	If the answer to question 6 was 'Yes' did this affect Your **decision to admit** the evidence?	1	2	3
8.	The **weight you gave** the evidence?	1	2	3
9.	The **ultimate decision** in the case?	1	2	3
10.	Have you encountered partisanship in expert witnesses called to give evidence before you?	1	2	3
11.	If you answered 'Yes' to the previous question, is this a **significant** problem for the quality of fact-finding?	1	2	3

The following questions relate to participation by lawyers in preparation of expert witness reports

A. In the expert reports that are tendered to you, does it appear that lawyers have played a part in finalizing the report?

	(Circle **ONE** in each row)	Never	Occasionally	Often	Always	Uncertain
1	report edited for spelling and grammar	1	2	3	4	5
2	report edited for style and presentation	1	2	3	4	5
3	report edited for content	1	2	3	4	5
4	report edited for opinion or conclusion	1	2	3	4	5

B. What is the usual effect that this participation by the lawyers has upon **your assessment** of the expert's evidence?

	(Circle **ONE** in each row)	It Helps	It Harms	It makes No Difference
1	report edited for spelling and grammar	1	2	3
2	report edited for style and presentation	1	2	3
3	report edited for content	1	2	3
4	report edited for opinion or conclusion	1	2	3

Insert comments here or on back page:

The following questions relate to usefulness of expert witness testimony

	(Circle **ONE** in each row)	very poor	poor	reasonable	good	very good
A	Overall how do you assess the usefulness of the **WRITTEN** expert reports that are tendered to you?	1	2	3	4	5
B	Overall how do you assess the usefulness of the **ORAL** expert reports that are presented to you?	1	2	3	4	5

The following questions relate to authority to appoint experts

A. Do you have the authority to call an expert witness to assist you in relation to the evaluation of expert evidence? (Check **ONE**)
- ☐ Yes
- ☐ No

B. If you have such authority to call an expert witness, have you exercised it in the last five years? (Check **ONE**)
- ☐ Never
- ☐ Once
- ☐ Between two and five times
- ☐ More than five times

C. If you have authority to call an expert witness, but have not done so, is this because: (Check **ALL** that apply)
- ☐ it is incompatible with the adversary process
- ☐ no party has ever requested that I exercise the power
- ☐ the parties have argued against the procedure
- ☐ it has not been necessary
- ☐ other - please specify : _____

D. If you have appointed an expert, from the point of view of the quality of the fact-finding process was this: (Check **ONE**)
- ☐ not helpful
- ☐ not very helpful
- ☐ helpful
- ☐ very helpful

E. If you have appointed an expert, how did you select the expert? (Check **ALL** that apply)
- ☐ in consultation with the lawyers
- ☐ from an approved list
- ☐ in my complete discretion
- ☐ other - please specify: _____

F. If you have appointed an expert, who paid the costs of the expert? (Check **ALL** that apply)
- ☐ I allocated the cost between the parties
- ☐ parties stipulated to allocation of costs
- ☐ court or administrative agency paid costs
- ☐ other - please specify: _____

G. Are you of the view that more use of court-appointed experts would be helpful to the fact-finding process? (Check **ONE**)
- ☐ Yes
- ☐ No
- ☐ No Opinion

The following questions are intended to assess your receptiveness to reforms that have been proposed and/or adopted in various jurisdictions including Australia and England

Are you in FAVOR of reforms that would:

	(Circle **ONE** number for each statement)	Definitely Yes	Probably Yes	Probably No	Definitely No	Undecided
1	Create a paramount duty of expert witnesses to the court or tribunal	1	2	3	4	5
2	Require the expert witnesses to discuss the issues among themselves in a pre-trial or pre-hearing conference or meeting without the attorneys or parties present	1	2	3	4	5
3	Require the parties to present a joint report of experts indicating areas of agreement and disagreement	1	2	3	4	5
4	Require the parties to consider whether a single expert should be appointed, and if this is not appropriate, indicate why not	1	2	3	4	5
5	Require all written instructions and notes of oral instructions to be annexed to the expert's report	1	2	3	4	5
6	Require expert witnesses to specify the bases of their expert opinion in writing	1	2	3	4	5
7	Require the expert witness to specify all assumptions that they made in forming their opinions	1	2	3	4	5
8	Require the expert witness to disclose whether and to what extent their written reports have been edited by the parties or attorneys that retained them	1	2	3	4	5
9	Require the expert witness to sign a declaration acknowledging their role as advisors to the court rather than advocates of the parties	1	2	3	4	5
10	Require the expert witness to disclose whether their reports are inconsistent with any other report that the expert has proffered in any other adjudicative or administrative hearing	1	2	3	4	5
11	Require all of the experts to give their testimony together, in a form of discussion presided over by the judicial officer, rather than in a traditional examination and cross-examination form (sometimes referred to as "hot-tubbing")	1	2	3	4	5
12	Promote more frequent use of court-appointed expert witnesses	1	2	3	4	5
13	Require the parties to disclose whether a "shadow expert" has been used in preparation for the adjudicative or administrative hearing (an expert that has not been otherwise disclosed)	1	2	3	4	5
14	Limit the depositions of expert witnesses	1	2	3	4	5
15	Limit the interrogatories of expert witnesses	1	2	3	4	5
16	Promote "cost shifting" to include expert witness fees to compensate the winning party	1	2	3	4	5

If there are other matters concerning expert evidence or reforms which you think may be relevant in the context of this survey, please comment below:

THANK YOU FOR COMPLETING THIS SURVEY, YOUR INPUT IS VERY IMPORTANT
A report of the survey results will be mailed to you upon release.

PLEASE RETURN THE COMPLETED SURVEY AS SOON AS POSSIBLE

Mariam J. Masid, J.D., Ph.D. Candidate
CIPP Graduate Fellow
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Windsor, Colorado 80550-0324

ENCLOSED IS A POSTAGE-PAID ENVELOPE FOR YOUR CONVENIENCE

If you have any questions about this survey, please contact Mariam J. Masid at (970-214-2909 or 303-297-7416) or mariam.masid@colostate.edu

Appendix F DTW Survey Results

Reforming the Culture of Partiality - Dividing the Waters Survey

1. Code

	Response Count
	74
answered question	74
skipped question	0

2. A. Which one of the following describes your current primary position?

	Response Percent	Response Count
appellate judge	9.6%	7
magistrate	1.4%	1
special master	16.4%	12
permitting agency board member	4.1%	3
trial judge	**46.6%**	34
referee	4.1%	3
administrative hearing officer	2.7%	2
Other (please specify)	15.1%	11
answered question		73
skipped question		1

3. B. Are you working in a state or federal system? (Check all that apply)

	Response Percent	Response Count
federal	19.2%	14
state	**80.8%**	59
Other (please specify)	0.0%	0
answered question		73
skipped question		1

4. C. About how long have you been involved as a judge or administrative officer in water matters?

	Response Percent	Response Count
less than 2 years	10.3%	7
between 2 and 5 years	14.7%	10
between 6 and 10 years	25.0%	17
between 11 and 20 years	**33.8%**	23
more than 20 years	16.2%	11
	answered question	**68**
	skipped question	**6**

5. D. About how long have you been involved in water matters in any capacity?

	Response Percent	Response Count
less than 2 years	4.3%	3
between 2 and 5 years	7.1%	5
between 6 and 10 years	17.1%	12
between 11 and 20 years	24.3%	17
more than 20 years	**47.1%**	33
	answered question	**70**
	skipped question	**4**

6. E. In which State do you perform your duties? (Check all that apply)

	Response Percent	Response Count
Arizona	9.6%	7
California	20.6%	15
Colorado	**21.9%**	16
Idaho	5.5%	4
Montana	13.7%	10
Nebraska	2.7%	2
New Mexico	12.3%	9
Nevada	8.2%	6
Oregon	2.7%	2
Texas	4.1%	3
Utah	1.4%	1
Washington	8.2%	6
Wyoming	6.9%	5
Other (please specify)	5.5%	4
	answered question	**73**
	skipped question	**1**

7. A. In approximately what percentage of water related matters in which you have presided have experts been called to give or present testimony?

	Response Percent	Response Count
under 10%	**22.4%**	15
at least 25%	6.0%	4
at least 33%	10.5%	7
at least 50%	16.4%	11
at least 66%	6.0%	4
at least 75%	3.0%	2
over 75%	16.4%	11
100%	19.4%	13
	answered question	**67**
	skipped question	**7**

8. B. Approximately how many times in a year do you encounter expert witnesses from the following disciplines?

	0	1-2	3-5	5-7	more than 7	Response Count
Biology/Life Sciences	**50.9% (27)**	24.5% (13)	7.5% (4)	3.8% (2)	13.2% (7)	53
Economics/Finance	**47.2% (25)**	22.6% (12)	15.1% (8)	3.8% (2)	11.3% (6)	53
Engineering	19.3% (11)	**35.1% (20)**	10.5% (6)	12.3% (7)	22.8% (13)	57
Geology	**44.4% (24)**	38.9% (21)	5.6% (3)	5.6% (3)	5.6% (3)	54
Hydrology	18.5% (12)	**36.9% (24)**	13.8% (9)	4.6% (3)	26.2% (17)	65
Soil Sciences	**54.2% (26)**	31.3% (15)	4.2% (2)	4.2% (2)	6.3% (3)	48
Statistics/Mathematics	**60.4% (29)**	20.8% (10)	10.4% (5)	6.3% (3)	2.1% (1)	48
Other	**54.5% (6)**	9.1% (1)	18.2% (2)	0.0% (0)	18.2% (2)	11
					Other (please specify)	8
					answered question	**66**
					skipped question	**8**

9. C. Approximately how many times in a year do you encounter the same individual expert witness?

	Response Percent	Response Count
0	23.3%	14
1-2	**43.3%**	26
3-5	13.3%	8
5-7	5.0%	3
more than 7	15.0%	9
	answered question	**60**
	skipped question	**14**

10. 1 adversarial bias on the part of the expert [predisposition, inclination or favoritism towards the party who called or hired the expert]

	Response Percent	Response Count
Never	6.3%	4
Occasionally	34.4%	22
Often	**48.4%**	31
Always	10.9%	7
	answered question	**64**
	skipped question	**10**

11. 2 use of oral or written language by the expert that was difficult to understand

	Response Percent	Response Count
Never	13.9%	9
Occasionally	**60.0%**	39
Often	24.6%	16
Always	1.5%	1
	answered question	**65**
	skipped question	**9**

12. 3 failure by the expert to stay within the parameters of his or her expertise

	Response Percent	Response Count
Never	20.3%	13
Occasionally	**59.4%**	38
Often	17.2%	11
Always	3.1%	2
	answered question	**64**
	skipped question	**10**

13. 4 non-responsiveness by the expert to questions

	Response Percent	Response Count
Never	26.6%	17
Occasionally	**53.1%**	34
Often	20.3%	13
Always	0.0%	0
	answered question	**64**
	skipped question	**10**

14. 5 failure to prove the bases of the expert's opinions

	Response Percent	Response Count
Never	25.4%	16
Occasionally	**55.6%**	35
Often	19.1%	12
Always	0.0%	0
	answered question	**63**
	skipped question	**11**

15. 6 failure by the lawyer to pose direct examination questions appropriately

	Response Percent	Response Count
Never	10.8%	7
Occasionally	**58.5%**	38
Often	27.7%	18
Always	3.1%	2
	answered question	**65**
	skipped question	**9**

16. 7 failure by the lawyer to cross-examine so as to make the expert accountable

	Response Percent	Response Count
Never	10.9%	7
Occasionally	**57.8%**	37
Often	29.7%	19
Always	1.6%	1
	answered question	**64**
	skipped question	**10**

17. 8 failure of the expert to articulate his or her opinion understandably

	Response Percent	Response Count
Never	14.1%	9
Occasionally	**62.5%**	40
Often	21.9%	14
Always	1.6%	1
	answered question	**64**
	skipped question	**10**

18. 9 failure of the expert to adequately support the opinions given

	Response Percent	Response Count
Never	14.3%	9
Occasionally	**66.7%**	42
Often	19.1%	12
Always	0.0%	0
	answered question	**63**
	skipped question	**11**

19. B. Of the problems listed above, what is the single most serious problem you have encountered with expert evidence?

	Response Percent	Response Count
1 adversarial bias on the part of the expert	**40.6%**	26
2 use of oral or written language by the expert that was difficult to understand	23.4%	15
3 failure by the expert to stay within the parameters of his or her expertise	1.6%	1
4 non-responsiveness by the expert to the questions	3.1%	2
5 failure to prove the bases of the expert's opinion	3.1%	2
6 failure by the lawyer to pose direct examination questions appropriately	3.1%	2
7 failure by the lawyer to cross-examine so as to make the expert accountable	6.3%	4
8 failure of the expert to articulate his or her opinion understandably	7.8%	5
9 failure of the expert to adequately support the opinions given	10.9%	7
	answered question	**64**
	skipped question	**10**

20. C. Of the problems listed above, what problem you have encountered most frequently?

	Response Percent	Response Count
1 adversarial bias on the part of the expert	**56.3%**	36
2 use of oral or written language by the expert that was difficult to understand	20.3%	13
3 failure by the expert to stay within the parameters of his or her expertise	1.6%	1
4 non-responsiveness by the expert to the questions	1.6%	1
5 failure to prove the bases of the expert's opinion	3.1%	2
6 failure by the lawyer to pose direct examination questions appropriately	4.7%	3
7 failure by the lawyer to cross-examine so as to make the expert accountable	3.1%	2
8 failure of the expert to articulate his or her opinion understandably	6.3%	4
9 failure of the expert to adequately support the opinions given	3.1%	2
	answered question	**64**
	skipped question	**10**

21. Insert comment here

	Response Count
	7
answered question	**7**
skipped question	**67**

22. A. Have you encountered evidence from experts that you were not able to evaluate adequately because of its complexity?

	Response Percent	Response Count
never	32.4%	23
occasionally	**63.4%**	45
often	4.2%	3
always	0.0%	0
answered question		71
skipped question		3

23. B. If you answered occasionally, often or always to the previous question, did the evidence come from a witness or witnesses from the disciplines of: (Check all that apply)

	Response Percent	Response Count
biology/life sciences	12.5%	6
engineering	37.5%	18
economics/finance	25.0%	12
geology	14.6%	7
hydrology	**50.0%**	24
soil sciences	8.3%	4
statistics/mathematics	20.8%	10
Other (please specify)	2.1%	1
answered question		48
skipped question		26

24. C.Have you had any difficulty in ensuring that the expertise you consider necessary to assist you in making your decisions is available to you?

	Response Percent	Response Count
Never	31.3%	21
Occasionally	**56.7%**	38
Often	11.9%	8
Always	0.0%	0
	answered question	**67**
	skipped question	**7**

25. D. When expert witnesses are used, do you find the expert evidence useful for the fact-finding process?

	Response Percent	Response Count
Never	1.5%	1
Occasionally	17.7%	12
Often	**63.2%**	43
Always	17.7%	12
	answered question	**68**
	skipped question	**6**

26. E. Have you had any difficulty evaluating the opinions of one expert against those expressed by another?

	Response Percent	Response Count
Never	14.5%	10
Occasionally	**65.2%**	45
Often	18.8%	13
Always	1.5%	1
	answered question	**69**
	skipped question	**5**

27. F. If you have had difficulty evaluating the opinions of one expert against those expressed by another, which of the following factors was responsible? (Check all that apply)

	Response Percent	Response Count
inadequate introduction of expert testimony by the lawyer	14.5%	9
inadequate cross examination of expert testimony	45.2%	28
inadequate communication by the expert of his or her opinion to the trier of fact	35.5%	22
the experts lacked credibility	25.8%	16
complexity of the expert evidence	43.6%	27
fundamental irreconcilability of views expressed by opposing experts	**69.4%**	43
testimony by the experts failed to directly address issues	32.3%	20
Other (please specify)	4.8%	3
	answered question	**62**
	skipped question	**12**

28. G. What is your view about expert witnesses being present in the court or administrative hearing to hear and comment on the evidence of other expert witnesses?

	Response Percent	Response Count
it is not helpful	9.9%	7
it makes no significant difference	19.7%	14
it is helpful	**70.4%**	50
	answered question	**71**
	skipped question	**3**

29. Insert comment

	Response Count
	7
answered question	7
skipped question	67

30. 1. Is the courtroom a forum in which the reliability of expert theories and techniques is adequately evaluated?

	Response Percent	Response Count
Yes	**72.2%**	52
No	19.4%	14
No Opinion	8.3%	6
answered question		72
skipped question		2

31. 2. Is the administrative hearing a forum in which the reliability of expert theories and techniques is adequately evaluated?

	Response Percent	Response Count
Yes	40.9%	29
No	16.9%	12
No Opinion	**42.3%**	30
answered question		71
skipped question		3

32. 3. Are most experts who give evidence before your representative of their discipline?

	Response Percent	Response Count
Yes	**72.9%**	51
No	2.9%	2
No Opinion	24.3%	17
answered question		70
skipped question		4

33. 4. If you answered No or No Opinion to the previous question, do you think that this is a significant problem for the quality of fact-finding?

	Response Percent	Response Count
Yes	**65.0%**	13
No	15.0%	3
No Opinion	20.0%	4
	answered question	**20**
	skipped question	**54**

34. 5. Do the same expert witnesses appear regularly before you for the same side?

	Response Percent	Response Count
Yes	**66.2%**	45
No	17.7%	12
No Opinion	16.2%	11
	answered question	**68**
	skipped question	**6**

35. 6. Have you had expert witnesses appear before you and give testimony that is inconsistent with evidence that was presented by them in a different case?

	Response Percent	Response Count
Yes	27.1%	19
No	**60.0%**	42
No Opinion	12.9%	9
	answered question	**70**
	skipped question	**4**

36. 7.If the answer to question 6 was 'Yes' did this affect your decision to admit the evidence?

	Response Percent	Response Count
Yes	12.5%	3
No	**70.8%**	17
No Opinion	16.7%	4
	answered question	**24**
	skipped question	**50**

37. 8.If the answer to question 6 was 'Yes' did this affect the weight you gave the evidence?

	Response Percent	Response Count
Yes	**73.9%**	17
No	8.7%	2
No Opinion	17.4%	4
	answered question	**23**
	skipped question	**51**

38. 9.If the answer to question 6 was 'Yes' did this affect the ultimate decision in the case?

	Response Percent	Response Count
Yes	**54.6%**	12
No	31.8%	7
No Opinion	13.6%	3
	answered question	**22**
	skipped question	**52**

39. 10. Have you encountered partisanship in expert witnesses called to give evidence before you?

	Response Percent	Response Count
Yes	**78.3%**	54
No	11.6%	8
No Opinion	10.1%	7
	answered question	**69**
	skipped question	**5**

40. 11. If you answered 'Yes' to the previous question, is this a significant problem for the quality of fact-finding?

	Response Percent	Response Count
Yes	41.4%	24
No	**46.6%**	27
No Opinion	12.1%	7
	answered question	**58**
	skipped question	**16**

41. A. In the expert reports that are tendered to you, does it appear that lawyers have played a part in finalizing the report?

	Never	Occasionally	Often	Always	Uncertain	Response Count
1 report edited for spelling and grammar	15.2% (10)	18.2% (12)	21.2% (14)	7.6% (5)	**37.9% (25)**	66
2 report edited for style and presentation	12.1% (8)	27.3% (18)	16.7% (11)	7.6% (5)	**36.4% (24)**	66
3 report edited for content	13.4% (9)	19.4% (13)	22.4% (15)	13.4% (9)	**31.3% (21)**	67
4 report edited for opinion or conclusion	14.9% (10)	22.4% (15)	17.9% (12)	11.9% (8)	**32.8% (22)**	67
					answered question	**67**
					skipped question	**7**

42. B. What is the usual effect that this participation by the lawyers has upon your assessment of the expert's evidence?

	It helps	It harms	It makes no difference	Response Count
1 report edited for spelling and grammar	44.6% (25)	3.6% (2)	**51.8% (29)**	56
2 report edited for style and presentation	40.4% (23)	7.0% (4)	**52.6% (30)**	57
3 report edited for content	14.3% (8)	**42.9% (24)**	**42.9% (24)**	56
4 report edited for opinion or conclusion	7.1% (4)	**48.2% (27)**	44.6% (25)	56
			answered question	**57**
			skipped question	**17**

43. Insert Comments

	Response Count
	4
answered question	**4**
skipped question	**70**

44. A Overall how do you assess the usefulness of the WRITTEN expert reports that are tendered to you?

	Response Percent	Response Count
Very Poor	0.0%	0
Poor	3.1%	2
Reasonable	39.1%	25
Good	**40.6%**	26
Very Good	17.2%	11
answered question		**64**
skipped question		**10**

45. B Overall how do you assess the usefulness of the ORAL expert reports that are presented to you?

	Response Percent	Response Count
Very Poor	1.6%	1
Poor	7.9%	5
Reasonable	**42.9%**	27
Good	34.9%	22
Very Good	12.7%	8
	answered question	**63**
	skipped question	**11**

46. A. Do you have the authority to call an expert witness to assist you in relation to the evaluation of expert evidence?

	Response Percent	Response Count
Yes	**82.4%**	56
No	17.7%	12
	answered question	**68**
	skipped question	**6**

47. B. If you have such authority to call an expert witness, have you exercised it in the last five years?

	Response Percent	Response Count
Never	**67.9%**	38
Once	7.1%	4
Between two and five times	16.1%	9
More than five times.	8.9%	5
	answered question	**56**
	skipped question	**18**

48. C. If you have authority to call an expert witness, but have not done so, is this because: (Check all that apply)

	Response Percent	Response Count
it is incompatible with the adversary process	15.9%	7
no party has ever requested that I exercise the power	20.5%	9
the parties have argued against the procedure	4.6%	2
it has not been necessary	**54.6%**	24
Other (please specify)	34.1%	15
	answered question	**44**
	skipped question	**30**

49. D. If you have appointed an expert, from the point of view of the quality of the fact-finding process was this:

	Response Percent	Response Count
not helpful	0.0%	0
not very helpful	0.0%	0
helpful	36.4%	8
very helpful	**63.6%**	14
	answered question	**22**
	skipped question	**52**

50. E. If you have appointed an expert, how did you select the expert? (Check all that apply)

	Response Percent	Response Count
in consultation with the lawyers	**54.6%**	12
from an approved list	18.2%	4
in my complete discretion	22.7%	5
Other (please specify)	36.4%	8
	answered question	**22**
	skipped question	**52**

51. F. If you have appointed an expert, who paid the costs of the expert? (Check all that apply)

	Response Percent	Response Count
I allocated the cost between the parties	**56.5%**	13
parties stipulated to allocation of costs	8.7%	2
court or administrative agency paid costs	39.1%	9
Other (please specify)	13.0%	3
	answered question	**23**
	skipped question	**51**

52. G. Are you of the view that more use of court-appointed experts would be helpful to the fact-finding process?

	Response Percent	Response Count
Yes	**65.6%**	42
No	9.4%	6
No Opinion	25.0%	16
	answered question	**64**
	skipped question	**10**

53. 1 Are you in favor of reforms that would create a paramount duty of expert witnesses to the court or tribunal?

	Response Percent	Response Count
Definitely Yes	32.8%	22
Probably Yes	**34.3%**	23
Probably No	16.4%	11
Definitely No	3.0%	2
Undecided	13.4%	9
	answered question	**67**
	skipped question	**7**

54. 2 Are you in favor of reforms that would require the expert witnesses to discuss the issues among themselves in a pre-trial or pre-hearing conference or meeting without the attorneys or parties present?

	Response Percent	Response Count
Definitely Yes	21.7%	15
Probably Yes	**40.6%**	28
Probably No	27.5%	19
Definitely No	1.5%	1
Undecided	8.7%	6
	answered question	**69**
	skipped question	**5**

55. 3 Are you in favor of reforms that would require the parties to present a joint report of experts indicating areas of agreement and disagreement?

	Response Percent	Response Count
Definitely Yes	30.4%	21
Probably Yes	**53.6%**	37
Probably No	8.7%	6
Definitely No	2.9%	2
Undecided	4.4%	3
	answered question	**69**
	skipped question	**5**

56. 4 Are you in favor of reforms that would require the parties to consider whether a single expert should be appointed, and if this is not appropriate, indicate why not?

	Response Percent	Response Count
Definitely Yes	26.1%	18
Probably Yes	**36.2%**	25
Probably No	21.7%	15
Definitely No	7.3%	5
Undecided	8.7%	6
	answered question	**69**
	skipped question	**5**

57. 5 Are you in favor of reforms that would require all written instructions and notes of oral instructions to be annexed to the expert's report?

	Response Percent	Response Count
Definitely Yes	20.9%	14
Probably Yes	**29.9%**	20
Probably No	28.4%	19
Definitely No	3.0%	2
Undecided	17.9%	12
	answered question	**67**
	skipped question	**7**

58. 6 Are you in favor of reforms that would require expert witnesses to specify the bases of their expert opinion in writing?

	Response Percent	Response Count
Definitely Yes	**47.8%**	33
Probably Yes	40.6%	28
Probably No	11.6%	8
Definitely No	0.0%	0
Undecided	0.0%	0
	answered question	**69**
	skipped question	**5**

59. 7 Are you in favor of reforms that would require the expert witness to specify all assumptions that they made in forming their opinions?

	Response Percent	Response Count
Definitely Yes	**50.7%**	35
Probably Yes	40.6%	28
Probably No	8.7%	6
Definitely No	0.0%	0
Undecided	0.0%	0
	answered question	**69**
	skipped question	**5**

60. 8 Are you in favor of reforms that would require the expert witness to disclose whether and to what extent their written reports have been edited by the parties or attorneys that retained them?

	Response Percent	Response Count
Definitely Yes	**40.6%**	28
Probably Yes	29.0%	20
Probably No	24.6%	17
Definitely No	1.5%	1
Undecided	4.4%	3
	answered question	**69**
	skipped question	**5**

61. 9 Are you in favor of reforms that would require the expert witness to sign a declaration acknowledging their role as advisors to the court rather than advocates of the parties?

	Response Percent	Response Count
Definitely Yes	**31.9%**	22
Probably Yes	23.2%	16
Probably No	18.8%	13
Definitely No	11.6%	8
Undecided	14.5%	10
	answered question	**69**
	skipped question	**5**

62. 10 Are you in favor of reforms that would require the expert witness to disclose whether their reports are inconsistent with any other report that the expert has proffered in any other adjudicative or administrative hearing?

	Response Percent	Response Count
Definitely Yes	22.1%	15
Probably Yes	**41.2%**	28
Probably No	23.5%	16
Definitely No	4.4%	3
Undecided	8.8%	6
	answered question	**68**
	skipped question	**6**

63. 11 Are you in favor of reforms that would require all of the experts to give their testimony together, in a form of discussion presided over by the judicial officer, rather than in a traditional examination and cross-examination form (sometimes referred to as "hot-tubbing")?

	Response Percent	Response Count
Definitely Yes	8.8%	6
Probably Yes	19.1%	13
Probably No	**32.4%**	22
Definitely No	16.2%	11
Undecided	23.5%	16
	answered question	**68**
	skipped question	**6**

64. 12 Are you in favor of reforms that would promote more frequent use of court-appointed expert witnesses?

	Response Percent	Response Count
Definitely Yes	23.5%	16
Probably Yes	**39.7%**	27
Probably No	16.2%	11
Definitely No	5.9%	4
Undecided	14.7%	10
	answered question	**68**
	skipped question	**6**

65. 13 Are you in favor of reforms that would require the parties to disclose whether a "shadow expert" has been used in preparation for the adjudicative or administrative hearing (an expert that has not been otherwise disclosed)?

	Response Percent	Response Count
Definitely Yes	26.5%	18
Probably Yes	27.9%	19
Probably No	**30.9%**	21
Definitely No	4.4%	3
Undecided	10.3%	7
	answered question	**68**
	skipped question	**6**

66. 14 Are you in favor of reforms that would limit the depositions of expert witnesses?

	Response Percent	Response Count
Definitely Yes	11.6%	8
Probably Yes	17.4%	12
Probably No	**40.6%**	28
Definitely No	15.9%	11
Undecided	14.5%	10
	answered question	**69**
	skipped question	**5**

67. 15 Are you in favor of reforms that would limit the interrogatories of expert witnesses?

	Response Percent	Response Count
Definitely Yes	11.6%	8
Probably Yes	15.9%	11
Probably No	**44.9%**	31
Definitely No	13.0%	9
Undecided	14.5%	10
	answered question	**69**
	skipped question	**5**

68. 16 Are you in favor of reforms that would promote "cost shifting" to include expert witness fees to compensate the winning party?

	Response Percent	Response Count
Definitely Yes	7.3%	5
Probably Yes	31.9%	22
Probably No	**33.3%**	23
Definitely No	10.1%	7
Undecided	17.4%	12
	answered question	**69**
	skipped question	**5**

69. Comment below

	Response Count
	15
answered question	**15**
skipped question	**59**