107:The Sleeping Giant Awakes: How States & Plaintiffs' Lawyers Are Transforming Natural Resource Damages

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Message From the Chair

By David Rifkind and Ken Mack, Committee Co-Chairs

After a decade of one ABA Section Committee that covered both Superfund and Hazardous Waste, we decided to realign to better reflect the way practitioners have segmented their practices. Thus, this is the maiden voyage of a new committee known as the Superfund and Natural Resource Damages Litigation Committee. Note the emphasis on litigation. As we step into the next phase of Superfund and NRD, we all expect the litigation to continue. This committee is devoted to providing practical information, resources and tools to assist those lawyers whose focus is in the Superfund and NRD areas.

We expect to embark on an ambitious campaign to educate those coming into this area, as well as foster focused discussion and debate among those who are long established in these areas. Finally, we hope to engage both the regulatory agencies and the lawmakers in a dialogue on the proper way to administer, and perhaps correct, the underlying statutes that have been the cause of so much (and perhaps so much unnecessary) litigation in these arenas.

We look forward to your active participation in the Committee this year, and for years to come. To get involved, contact David Rifkind at david.rifkind@corporate.ge.com or Ken Mack at kmack@foxrothschild.com.

The Newsletter At A Glance

By Ira Gottlieb, Committee Vice-Chair

It is noticeable to even a casual observer of trends and developments in environmental law that federal and state trustees have expressed a reinvigorated or new level of interest in Natural Resource Damages ("NRD"). Any discussion of NRD raises a wide variety of cross cutting subjects and issues involving multiple disciplines. This inaugural issue of the Committee's Newsletter presents a primer series of articles designed to provide an overview of subjects and issues, as well as a review of recent developments in the law.

The issue includes basic overviews of issues arising from the federal statutes and regulations, practical points to consider under *Daubert* with regard to experts, economic methodologies for valuation of damages, as well as a review of two significant recent court opinions, *Coeur d'Alene Tribe v. ASARCO Inc.* and *Montana v. Atlantic Richfield Company.* The emergence of a vigorous NRD recovery initiative by the State of New Jersey as trustee for groundwater resources is a possible precursor of similar actions by other States. The Newsletter therefore features a timely article concerning the situation in New Jersey and some of the pertinent precedents related alleged injuries and damages to groundwater.

All of the following articles first appeared in the ABA, Section of Environment, Energy, and Resources, Superfund and Natural Resource Damages Litigation Committee Newsletters (for more information go to www.abanet.org/environ <http://www.abanet.org/environ>). ACC wishes to express its sincere appreciation to each of the authors for providing permission to reprint the articles herein. ACC also thanks the co-chairs of the Committee, David Rifkind and Ken Mack, and the Vice-Chair for Publications, Ira Gottlieb for their assistance in obtaining permission for the materials to be reprinted herein.

As one author suggests, after more then 20 years of NRD experience many questions remain unanswered, or perhaps more aptly stated, unasked. Although the Newsletter's space constraints do not permit a more in-depth treatment of the topics, we hope that the articles provide a solid introduction to the topics, facilitate discussion, and are thought provoking and helpful to the bar. As Vice-Chair of the Committee, I welcome your thoughts and comments, as well as suggestions for future issues. Please feel free to contact me by email: igottlieb@mccarter.com.

The Federal NRD Case

By Tom Milch

[Editor's Note: Tom Milch is a partner at Arnold & Porter in Washington, D.C.]

The proper scope and reach of the natural resources damages ("NRD") provisions in federal environmental law has long been debated, but the reality of over 20 years of NRD experience is that the program has been largely inconsistent and ineffective in practice. Like the member of a famous family who simply fails to live up to high expectations, it is perhaps inevitable that federal natural resource trustees would be evaluated against the enormous success of EPA and the Department of Justice in wielding remedial authority at a wide range of sites throughout the country. It is tempting to conclude that the NRD cause of action is simply far more limited than once thought, but the fact is that the jury remains out – even this long after statutory enactment and regulatory rulemaking. In sharp contrast to legal claims relating to remediation of contamination, what we do not yet know about federal NRD law is more than what we do know.

The Relevant Background. There are two principal statutory sources for NRD authority: the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") and its oil spill counterpart, the Oil Pollution Control Act of 1990 ("OPA"). These provisions have been the subject of a series of important rulemakings by two key federal trustees, the Department of the Interior ("DOI") and the National Oceanic & Atmospheric Administration ("NOAA") of the Department of Commerce. These rules, principally embodying a regulatory framework for assessing natural resources damages, were the subject of lengthy court opinions. The original DOI rules promulgated in 1986 and 1987 were reviewed in *Ohio* v. *U.S. Department of Interior*, 880 F.2d 432 (D.C. Cir. 1989) and *Colorado* v. *U.S. Department of Interior*, 880 F.2d 481 (D.C. Cir. 1989). These decisions provide helpful background to the practitioner.

A second generation of rulemaking is also significant. DOI promulgated two different set of assessment rules in 1994 (59 Fed. Reg. 14285) and 1996 (61 Fed. Reg. 20560), and NOAA issued a final rule early in 1996 (61 Fed. Reg. 440). The DOI rules were essentially upheld in two different cases. *See NAM* v. *U.S. Dep't of Interior*, 134 F.3d 1095 (D.C. Cir. 1998); *Kennecott Utah Copper Corp.* v. *Dep't of Interior,* 88 F.3d 1191 (D.C. Cir. 1996). The NOAA rule was vacated in part and upheld in part by the D.C. Circuit in *General Electric Co.* v. *U.S. Department of Commerce*, 182 F.3d 767 (D.C. Cir. 1997). NOAA subsequently adopted

amendments addressing the vacated portions of its rule in 2002 (67 Fed. Reg. 61483). These rules and the reviewing case law together provide a key regulatory framework for federal NRD law.

In contrast to this fairly robust regulatory backdrop, there is a paucity of cases involving the application of federal NRD law to particular circumstances. There are scattered district court decisions on a number of key issues, but a dearth of appellate opinions. Major issues that will shape liability and damage determinations remain unclear.

Difficulties in Implementation. The essential idea behind the NRD provisions is that remediating a release of hazardous substances may not be enough. NRD recovery is supposed to reflect both the costs of restoring the natural resources injured as a result of the contamination at issue and the diminution in their value during the time before they are restored. For example, if the release of a chemical destroys an active fishery, the costs of restoring the fishery, as well as the value of the loss of that fishery, may be recovered on top of the costs of cleaning up the chemical release. Thus, by definition, there is a residual quality to the world of NRD – it is to address what cannot be fully addressed by the remedy at a site.

One would think that, with this mission, a large number of major sites would have been the basis for the application of the NRD rules. But there are a number of factors that have inhibited NRD actions. One is linking the contamination problem to particular trustees. The federal trustees include the Secretaries of Defense, Interior, Agriculture, Commerce and Energy pursuant to Presidential Executive Order. *See* Executive Orders 12580 (52 Fed. Reg. 2923 (January 29, 1987)) and 13016 (61 Fed. Reg. 45871 (Aug. 28, 1996)); *see also* 40 CFR § 300.600 *et seq.* Since federal trusteeship is derived from a number of overlapping federal statutes, more than one federal trustee will likely be involved at a given site, and overlaps with State and Indian tribe trustees frequently occur as well. Thus, an initial obstacle is the coordination of trustee activities at a given site and the determination of which trustee, if any, will be in the lead.

Indeed, in the early days of CERCLA, EPA did not routinely coordinate with federal or other trustees with respect to sites that may warrant NRD assessment. However, the SARA Amendments required EPA to notify trustees of possible natural resource impacts and to coordinate its investigatory work with the trustees. *See* CERCLA § 104(b)(2). While there is more coordination now, it is still the case that overlapping trustee authority has inhibited action. For example, at some sites parties have been unable to achieve prompt resolution of NRD issues at the time that remedial issues are being settled with EPA or a State, due to the need for multiple trustee signoffs. Moreover, the overlap of trustee authority underscores the potential importance of differences in how various federal trustees and their state or Indian tribe counterparts value NRD injuries and consider early dollar settlements.

Compounding the coordination problem is the time and cost of NRD assessments, an essential first step in determining injury. For the more complicated site-specific assessments, the necessary field work can be very substantial and take years to complete. A number of federal trustees have had funding challenges, and there have been years in which DOI in particular has sought special Congressional funding for the NRD assessments. It is difficult to point to particular sites at which federal funding limits have constrained investigations, but there is little doubt that funding difficulties have hampered the program.

Of course, timing is further aggravated by the recognition, generally embraced by trustees, that NRD actions should seek to recover for residual harm and therefore taken only after EPA has selected a site remedy. CERCLA recognizes this reality at NPL sites, prohibiting NRD actions if an RI/FS is underway. *See* 42 U.S.C. § 9613(a)(c)(B)(ii). *See also Coeur d' Alene Tribe* v. *ASARCO Inc.*, 280 F. Supp. 1094, 1109 (D. Idaho 2003). In that case, the NRD action was permitted because it was deemed ahead of the RI/FS; in (*e.g.*, Montrose Chemical) a few other circumstances federal trustees have acted apart from the remedial program.

Causation. The small number of litigated NRD cases leaves many substitution issues in play. Perhaps the single most challenging issue in NRD law is causation -- linking the release of a hazardous substance to the claimed injury to the resource. For remediation under CERCLA, the courts have required a minimal connection between the responsible party and the response costs incurred in connection with a release. *See, e.g., Dedham Water Co.* v. *Cumberland Farms Inc.*, 889 F.2d 1146 (1st Cir. 1989). However, the issue is not yet resolved for NRD actions. On one level, the issue is defining the legal standard. The language in CERCLA, that the liability is for injury to resources "resulting from" a release (Section 107(a)(C)), begs the question. Some courts have rejected the common law standard of "substantial contributing factor" (Restatement of Torts (Second Section 431(1965)) in favor of a less stringent "contributing factor" test. *See, e.g., In re Acushnet River*, 722 F.Supp. 893, 897, n.8 (D.Mass. 1989); *Coeur d' Alene Tribe* v. *ASARCO Inc.*, 280 F. Supp. 1094, 1124 (D. Idaho 2003).

On another level, however, it is not the wording of the standard, but how causation is proved that presents the knotty issue. DOI has developed "acceptance" criteria that purport to establish the necessary link. An example is showing that a particular biological response by a resource is "commonly documented" to occur upon exposure to the hazardous substance. *See* 43 CFR § 11.62(f). Yet at many mining and sediment sites, target circumstances for close NRD review, there may be multiple parties, multiple contaminants, and multiple exposure pathways. The link between chemical X and thinning of eggshells, for example, hardly establishes that Company A's release is what caused the biological response in particular eggshells. Moreover, DOI's regulations contemplate the use of predictive computer models to establish causation, an approach effectively endorsed by the D.C. Circuit in the *NAM* case. *See* 134 F.3d at 1005-06. The parameters for trustee proof of causation will be an issue in individual cases which will test the willingness of federal judges to allow trustees to take shortcuts in proving this critical element of their cases.

Other Issues. Space does not permit a discussion of all the other substantive issues that have yet to be decided. However, here are three additional examples of how major legal questions remain unclear:

*The statutory provisions (§107(f)(2)(C)) contemplate that a trustee determination conducted in accordance with applicable rules should be entitled to a rebuttable presumption of validity. This point, along with the requirement that funds be used only for resource restoration or replacement, have formed the basis upon which trustees have argued in favor of limited record review of NRD determinations. At the same time, the district courts that have addressed the issue have generally found that defendants in NRD actions are entitled to a jury trial. *See, e.g.*, In re *Acushnet River*, supra, 712 F. Supp. at 1000. This issue may have enormous practical implications in future cases.

*There are a series of complicated statute of limitations questions raised by the NRD statutory provisions. As an example, the statute limits a trustee's time to file a claim with respect to non-NPL sites to three years after the date the loss in resources is discovered. What that standard means is up in the air. Is it the date the loss was actually discovered or when it should have been discovered? Who is the discovering party for purposes of the provision--the trustee agency as a whole or any government official? How much knowledge constitutes discovery of the loss?

*The extent of recoverable damages is also very much in play. "Damages" include both the costs of restoring or replacing injured resources and compensation for loss of the value of the resources during the time of injury. But how to measure that lost value is subject to dispute. For example, NOAA continues to assert that it may use contingent valuation methodology ("CVM") to determine use and nonuse values. This survey technique (*e.g.*, "how much are you willing to pay for a pristine wilderness in Northern Maine?") is subject to considerable controversy.

* * *

Federal NRD actions have not been a robust area of litigation. But past may not be prologue here. There remains considerable potential for aggressive trustee action at major sites, resulting in litigation that may provide more insight into the many uncertain issues left unresolved by the statute, the rules and the few cases interpreting them.

Valuation Methodologies in Measuring Compensable Value from Injury to Natural Resources: Injury Determined, Now What Is It Worth?

By Dov Frishberg, PhD

[Editor's Note: Doctor Frishberg is the Director, Economic Services, with Deloitte & Touche LLP.]

Standard valuation techniques derive their estimates of economic damages from marketplace values. The injured party is awarded a sum of money which allows them to purchase that which was (wrongfully) injured, lost or denied. In assessing the value of damages to natural resources, aspects of a private marketplace are often absent. First, frequently no private marketplace exists to provide prices by which the injured party could purchase replacement products or services to make them whole. Second, even when it is possible to determine what prices would have prevailed in a private market, the specific product or service is often no longer available for "purchase" after injury occurred (e.g. the water is not fit for drinking, the beach cannot be used to bathe).

Federal regulations answered the challenge of measuring the compensable value of damages to natural resources by prescribing two distinctly different, non-exclusive, approaches. Analytically, the two are at opposite ends of the spectrum in terms of their economic complexity and conceptual novelty, at least to the non-economist.

Restoration and Replacement

The first approach is to measure the compensable value as the funds needed to restore nature to its original state, the so-called "baseline". Some latitude is granted in that the measured amount may be the cost of (or combinations of the costs of) "restoration, rehabilitation, replacement, and/or acquisition of equivalent resources."(CFR § 11.83 (b)). It should be noted that these costs are not easily determined is a matter of physical science and financial techniques. Interestingly, current regulations seem to sidestep those aspects of restoration and replacement that are most prone to complexity and uncertainty (and sometimes, outright disagreement).

Furthermore, for replacement or "acquisition of equivalent resources" there is no clear requirement that in replacing or acquiring an equivalent resource that the benefits flow to the same individuals who suffered the loss (a result called the "redistribution effect" by economists). The only statutory requirement appears to be that, by default, the citizenship subject to the powers of a Trustee (e.g., a certain State or Indian tribe) benefit as a group. However in practice considerable efforts are made to align the actual injured individuals with the compensated beneficiaries.

Certain complexities of assessing restoration and replacement costs are prevalent and persistent. One such complexity is the risk emanating from uncertainty about the feasibility and efficiency of alternative technologies for restoring or replacing the injured resources. A related complication is the non-additivetly of the quantum of economic damages where multiple injuries occurred at a single site. Generally, the subsequent contamination is of lesser impact than if it had been the first, though sometimes the opposite occurs. Also, time is an important factor. Since interest is assessed to compensate for the difference in timing between receipt (of the assessed amount) and expenses (for restoration and replacement), any substantively missed forecast of a project milestone can cause either over or under assessment of the compensatory amount.

Non-restoration and Replacement Costs

When restoration or replacement are not feasible or advisable, or when natural resources benefits are lost while the restoration and replacement is undergoing, the second approach provides a set of methods for assessing the economic value of the loss and providing an estimated amount of compensable value. These methods are planted in concepts and technique that, while well known and highly valued by the trained economist, are largely unknown to others.

The regulations state (CFR § 11.83 (c)):

> "…[C]ompensable value is measured by changes in **consumer surplus**, **economic rent**, and any fees or other payments collectable by a Federal or State agency or an Indian tribe…"
>
> (Emphasis added.)

In economics consumer's surplus is the amount, measured monetarily, that a consumer values a unit of a product or service *above and beyond* the price paid for that unit. Similarly, economic rent is the amount of benefits, measured monetarily, that the producer of a good or

service derives from a resource above and beyond the cost involved in production. As a matter of economic theory, the welfare of society is the sum of all consumers' surplus and all producers' rents.

To measure this economic value of the injury to natural resources, the regulations suggests that the "official" use certain methodologies listed therein, although he or she "may choose other methodologies." As listed in the regulations, these methodologies bear names that are analytically similar to the names used in the context of academic discussion, though they do not necessarily adhere to the intricacies of the present day academic consensus.

The regulations list the methodologies that are most common in practical application and in academic discussion, though those most common in application are not necessarily those drawing the most interest in academic study. An additional, seventh methodology incorporates Federal appraisal standards into the list. While not specifically a set of standards or methods designed to measure the damages to natural resources, this methodology is listed with reservations. The seven methodologies are:

a. Market Price methodology – If there exists a sufficiently competitive market for an injured natural resource or of its service, the compensable value is the reduction in the market price of the natural resource or the services from the natural resources. This technique is based on certain assumptions. It must be the case that the resource belongs to, be managed by, is held in trust by, appertains to, or be otherwise controlled by the government (CFR § 11.14 (z)). Such a resource, however, is not likely to be freely traded in a private marketplace. In fact, two such markets are needed for the calculation; a market for "baseline" resource and a market for the "injured" resource. Even if the baseline resource is traded in a private marketplace, the injured resource is generally not. However, if it can be assumed that the injured resources have no value and the baseline resource is traded in a private market then this method readily applies. However, only if the injured parties can actually proceed and purchase sufficient replacement, baseline-quality, amount of the injured resources with the compensatory amount is it guaranteed that their lost consumers' surplus would be restored to them.

b. Appraisal methodology – This methodology points the Trustees to the methods of the "Uniform Appraisal Standards for Federal Lands Acquisition". The measure of compensable value under this methodology is the difference between the appraised value of the borderline condition and the injured condition of the resources as calculated by Federally approved methods. To the degree that such valuation is anchored in monetary values observable in a competitive market, this methodology is not truly different or distinct from the aforementioned Market Price methodology. To the extent that the valuation under the Standards relies on non-market estimates, generally, they will diverge from the premise that the assessment is offered as a means to measure consumers' surplus or economic rent.

c. Factor Income methodology – Under this methodology the compensable value of an injury to a damaged natural resource is the decline in profit due to its unavailability or diminished value in light of its use in commercial production. This methodology is the premier technique for measuring damages to commercial

enterprises from an injury to a natural resource. Even with the need to employ certain approximations, the methodology is effective when sufficient data is available. Nonetheless, the methodology depends, among other significant requirements, on the ability to ferret out the effect on profit of the injury to the natural resources from the effect of other changes that regularly experienced by a manufacturer or an industry. At times, such differentiation can prove daunting.

d. Travel Cost methodology – This methodology measures compensable value according to the value of time expended and related costs incurred by those members of the public traveling to and enjoying the services of a natural resources. Under this methodology the diminution in time traveled and number of visitors is a reflection of the value lost due to injury. This method has considerable didactic appeal and is probably the most widely used by academics to demonstrate the value of a natural resource that is not used or consumed commercially. Aside from the difficulties in securing sufficient data on travel time and number of visitors, the method is dependent on a reliable estimate of individuals' value of time. Producing a reliable estimate of the value of time to a given set of individuals suffering from the injury to a certain natural resource is not a simple undertaking.

e. Hedonic Pricing methodology – Its ominous name not withstanding, this methodology suggests that the injury to a natural resource can be economically quantified by reference to prices and quantities in private markets transactions. Most commonly under this method the economic value of an injury to a natural resource is said to be reflected in the change in value of private assets or products whose attributes include benefits of the injured resources. Thus, value of an injury to a pristine stream is reflected in the change in value of adjacent properties. This methodology is generally the most capable in capturing in full the loss in consumers' surplus and economic rents due to an injury. It can show that some individuals may actual gain from an injury. The net amount determines the compensable values. Also, data required for its application is often readily available from records of actual or comparable transaction and appraisals of property values.

f. Unit Value methodology – Under this method unit values are reassigned to various types of non-marketed resources or services from non-marketed resources (e.g., a day at a public beach) and the amount of the compensable value is equal to the arithmetic product of lost units or lost units of service due to the injury *times* the unit value. This methodology, where appropriate, produces an estimate of compensable value with limited effort and substantial consistency. However, the unit values themselves, when economically meaningful, are established by application of the other methods discussed herein. Developing a large, relevant and current array of unit values pertaining to a range of natural resources or natural resources services can be demanding, if not prohibitively burdensome. Thus unit values are most commonly developed for popular recreational activities that are likely to suffer from hazardous releases, such as fishing or recreational bathing.

g. Contingent Valuation methodology – This methodology is best known for the controversy it generates and the wide variation in diverging, apparently valid, assessed amounts of compensatory value for the same injury. It is based on the notion that value and diminution in value can be determined through responses elicited from a sample of individuals asked about the value they attach to the resource or injury. It is a method that attempts to assess "existence" value (i.e., the value individuals attach to a natural resource that they do not actually use). In practice, it is difficult to determine when and if the individuals' responses are meaningful. Even unsophisticated responders may be inclined to bias answers, driven by their perception that certain responses will influence the final result to their benefit or detriment, or reflect on their good standing and sense of social responsibility.

There are both common and distinct advantages and disadvantages to each methodology, particularly when objectives include more than just an interest in measuring loss of consumers' surplus or economic rent. However, when feasible and properly applied each can provide a useful estimate of the lower or upper bound of the compensatory value, and sometimes both.

Other valuation methods

The regulations explicitly permit the use of other methodologies to measure compensable value provided they are "in accordance with the public's WTP", or the public's "Willingness-To-Pay". Equating compensable value with WTP is mentioned for emphasis in other sections of the regulations. It is an important conceptual distinction with substantial implications. The alternative to measurement by WTP is measurement by Willingness-To-Accept (a monetary amount willingly received for the sale of the right to benefit from the natural resource). Generally, the same resource will have a higher value when measurement is based on WTP as opposed to WTA. The preference for WTP over WTS appears to emanate more from practical consideration than theoretical superiority, but controversies of both theoretical and practical nature persist.

Other disputed conceptual and practical aspects related to the proper measurement of damages to natural resources, while not mentioned in the regulations, continue to haunt this complex subject. However, today few doubt that rigorous application of relevant methods and techniques will in most instances provide a useful estimate.

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Daubert v. Merrell Dow Pharmaceuticals, Inc. – An Essential Tool in Natural Resource Damages Litigation

By Eric G. Lasker

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Since the United States Supreme Court's landmark ruling in *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993), judges have been tasked with the obligation to serve as gatekeepers to keep scientifically unreliable and irrelevant expert testimony out of the court room. While there have to date been few natural resource damages ("NRD") cases that have involved adjudicated *Daubert* challenges, the standards set forth in *Daubert* provide a useful tool for counsel defending against the often novel models and methodologies put forth by expert witnesses in NRD litigation. Under *Daubert* and its progeny, much of this testimony should not be admissible, and natural resource damages claims can be significantly pared down, if not defeated altogether, prior to trial. In this article, I provide a brief introduction to the *Daubert* admissibility standards and provide some examples of how these standards can come into play in NRD litigation.

I. The *Daubert* Admissibility Standards

The trial judge's first step under *Daubert* is to determine whether the expert is qualified by "knowledge, skill, experience, training or education" to render the proffered opinion. *Ralston v. Smith & Nephew Richards, Inc.*, 275 F.3d 965, 969 (10th Cir. 2001). The mere fact that an expert has general qualifications in a relevant field does not render the expert qualified to testify on all matters arising in a NRD case.

If the trial court finds that a proffered witness has the requisite expertise, it must then determine that the expert testimony, even non-scientific and experience-based expert testimony, is both reliable and relevant. *See Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147 (1999). Expert testimony may not be admitted unless "the reasoning or methodology underlying the testimony is scientifically valid and . . . can properly be applied to the facts in issue." *Daubert*, 509 U.S. at 592. A "key question to be answered" is whether the expert's theory "can be (and has been) tested." *Id*. at 593. Further, the scientific theory must fit the factual issue in the case. "'Fit' is not always obvious, and scientific validity for one purpose is not necessarily scientific for other, unrelated purposes." *Id.* at 591.

While the focus of the court's inquiry should be the expert's reasoning and methodology rather than his conclusions, nothing "requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered." *General Electric v. Joiner*, 522 U.S. 136, 146 (1997).

II. Application of *Daubert* Admissibility Standards to Natural Resource Damages Litigation.

A. Is the Expert Qualified to Offer the Testimony at Issue?

Attorneys defending NRD claims should carefully assess a proffered expert's qualifications against their proffered opinions. For example, while a civil engineer may be qualified in designing groundwater remediation systems, they may not have the hydrogology expertise necessary to testify on the fate and transport of contaminants. *See, e.g., Bahrle v. Exxon Corp.*, 652 A.2d 178, 191-190 (N.J. Super. Ct. App. Div. 1995), *aff'd*, 678 A.2d 225 (N.J. 1996) (hydrogeologist not qualified to testify regarding cause of gasket deterioration in wells).

Further, the Seventh Circuit recently held that an expert hydrologist should not be allowed to testify based on groundwater modeling analysis performed by other employees at his consulting firm. *See Dura Automotive Systems of Indiana, Inc. v. CTS Corp.*, 285 F.3d 609 (7th Cir. 2002). The Court held that without the independent expert testimony of the assistants "explaining and justifying the discretionary choices they made, [the expert's] testimony would have rested on air." *Id.* at 615.

B. Is the Expert Testimony Scientifically Reliable?

Defense counsel in NRD cases will often have strong arguments for exclusion of expert testimony that relies on speculation or on sophisticated and untested modeling.

For example, numerous courts have excluded expert testimony based solely on the possibility of groundwater contamination. *See Kalamazoo River Study Group v. Rockwell International*, 171 F.3d 1065, 1072 (6th Cir. 1999); *Thomas v. FAG Bearings Corp.*, 846 F. Supp. 1382, 1394 (W.D. Mo. 1994); *Renaud v. Martin Marietta Corp.*, 749 F. Supp. 1545, 1553 (D. Colo. 1990), *aff'd*, 972 F.2d 305 (10th Cir. 1992). Defense counsel have a particularly strong argument if the modeled predictions are contrary to real world data. In *Ramsey v. Consolidated Rail Corp.*, 111 F. Supp. 2d 1030 (N.D. Ind. 2000), the court excluded a hydrologist's opinion despite finding that "[m]uch of [the hydrologist's] methodology passes the *Daubert* inquiry with flying colors" and that the hydrologist's flow model "has as much accuracy as anything else in contemporary hydrology as a predictor of the general direction of groundwater flow." *Ramsey*, 111 F. Supp. 2d at 1036, 1037. The court held that the hydrologist's analysis could not be deemed admissible in light of its failure to accurately predict the real world data:

> In any event, use of the groundwater flow model as a comparatively accurate predictor of the general direction of VOC migration doesn't support a finding of reliability when the model is used to support an opinion that VOC's traveled from one point (anywhere on the railyard) to a specific second point (the Ramsey's well) despite lack of support in years of actual testing.

Id., 111 F. Supp. 2d at 1037. *See also Carroll v. Litton, Sys. Inc.*, (No. B-C-88-253) 1990 WL 312969, at *45 (W.D.N.C. Oct. 29, 1990) (excluding expert's opinions regarding TCE concentrations where expert's opinions were contradicted by actual well monitoring data), *aff'd in relevant part*, 47 F.3d 1164 (table), 1995 WL 56862, at *5 (4th Cir.), *cert. denied*, 516 U.S. 816 (1995).

Likewise, courts have been particularly skeptical of contingent valuation models and other hedonic damages approaches often proffered in NRD cases. *See Idaho v. Southern Refrigerated Transport, Inc*., 1991 WL 22479, *18-*19 (D. Idaho 1991) (excluding contingent valuation study of existence value of injured fish population in NRD case as speculation and conjecture); *see also Smith v. Ingersoll-Rand Co.*, 214 F.3d 1235, 1245 (10th Cir. 2000) (citing consistent line of cases excluding contingent value and hedonic damages studies in personal injury litigation).

3. Does the Expert Testimony Fit the Facts of the Case?

Finally, defense counsel must consider whether the expert testimony properly "fits" with the issue in the case. For example, plaintiffs' economic experts may seek to value natural resources based on hypothetical replacement schemes that are not feasible in the real world. Because natural resource damages should be based upon the costs of *possible* alternatives, *See* 43 C.F.R. § 11.82(b)(1), these opinions do not "fit" and should be excluded. *See Puerto Rico v. SS Zoe Colocotroni*, 628 F.2d 652 (1st Cir. 1980), *cert. denied*, 450 U.S. 912 (1981).

Similarly, expert opinions based on analogy to other sites should be excluded where the expert has not properly linked those sites to the site at issue. *See In re Voluntary Purchasing Groups, Inc. Litig.*, No. CIV.A.3: 94CV2477H, 2000 WL 1842779, at *3 (N.D. Tex. Dec. 14, 2000) (rejecting expert opinion regarding airborne emissions at plant that was based on analogy and extrapolation from emissions at a different plant); *Bahrle*, 652 A.2d at 189-90 (excluding expert opinion regarding routine gasoline spills that was based on experience at other gas stations and no site-specific analysis).

Likewise, a federal district court in California held that a contingent valuation study proffered in an NRD claim alleging injuries to fish and bird habitats and species did not "fit," as required by *Daubert*, because of numerous inconsistencies between the survey questions and the actual scientific evidence developed by the trustees own scientists. *United States v. Montrose Chem. Corp.*, No. CV 90-3122-R (C.D. Cal. Apr. 17, 2000), Hrg. Tr. at 1.

III. Conclusion

As the Supreme Court warned in *Daubert*, "[e]xpert evidence can be both powerful and quite misleading." *Daubert*, 509 U.S. at 595. By holding NRD plaintiffs and their experts to *Daubert's* admissibility requirements, defense counsel can help insure that fact finders are not misled to their client's detriment.

Groundwater Damages In New Jersey

By Michael L. Rodburg

[Editor's Note: Michael L. Rodburg is the Managing Director of Lowenstein Sandler, PC. The author acknowledges the research, assistance, and comments of Jay Stewart, Esq., Kristina Pasko, Esq. and Priya Masilamani, Esq.; any errors are solely the responsibility of the author.]

The State of New Jersey has embarked upon an ambitious effort, fueled by the resources of private plaintiffs' contingency fee lawyers, to collect damages for injury to groundwater resources of the State caused by historic environmental releases and discharges. In the State's view, any groundwater in any water bearing strata, without regard to its actual use or utility, has been "injured" if it is contaminated in excess of applicable groundwater quality criteria. As a consequence of such injury, the State claims it is entitled to compensation from those "in any way responsible" for the contamination. In its efforts to settle such claims without the necessity of litigation, the State has sought to short-cut the damage determination through a "surrogate" damage formula. The formula quantifies the damages in dollar terms by applying the retail price of water as charged by public utilities to the amount in gallons of annual precipitation that can be expected to infiltrate a groundwater contaminated area during the time-frame that contamination will exceed standards (or 30 years). (As this is written, a new "more robust" formula is due to be unveiled in January, 2004.)

A claim by the State for natural resource damages because of contaminated groundwater necessarily invites a search for precedent to guide compensation issues. This article is a portion of a much larger analysis of these issues by the author.

The common law of groundwater did not develop in parallel with that for tidally flowed lands because the science of groundwater movement, the mechanisms of recharge and discharge, and the principles of contaminant impact and migration, until relatively recently, were very poorly understood. Indeed, in 1850, the Connecticut Supreme Court remarked:

> "Water, whether moving or motionless in the earth, is not, in the eye of the law, distinct from the earth. The laws of its existence and progress, while there, are not uniform, and cannot be known or regulated. . .. These influences [over the movement of groundwater] are so secret, changeable and uncontrollable, we cannot subject them to the regulations of law, nor build upon them a system of rules, as has been done with streams upon the surface." *Roath v. Discoll*, 20 Conn. 532 (1850), cited in *Woodsum v. Pemberton Township*, 172 N.J. Super. 489, 496, 412 A.2d 1064, 1067 (L. Div. 1980), *aff'd* 177 N.J. Super. 639, 427 A.2d 615(App. Div. 1981).

The American rule for groundwater is attributed to the New York Court of Appeals decision in *Forbell v. City of New York*, 164 N.Y. 522, 58 N.E. 644 (1900), where the Court held that it was an unreasonable use to transport groundwater off the overlying land if the extraction of the groundwater caused injury to other overlying landowners. Eva H. Hanks & John L. Hanks, *Law of Water in New Jersey: Groundwater*, 24 Rutgers L. Rev. 621, 636 (1970).

In the Court of Errors and Appeals decision in *Meeker v. City of East Orange*, 77 N.J.L. 623, 74 A. 379 (E. & A. 1909), New Jersey adopted a rule similar to the correlative rights doctrine under which there is no propriety interest in groundwater *per se*, but the uses and rights of all landowners must be accommodated. *See Woodsum*, 172 N.J. Super. at 502, 412 A.2d at 1071. The *Meeker* Court held the law recognized all reasonable uses of groundwater for the benefit of one's property, limited, however, by consideration of the reasonable use by others of their property:

> [The law] does prevent the withdrawal of underground waters for distribution or sale for uses not connected with any beneficial ownership or enjoyment of the land whence they are taken, if it results therefrom that the owner of adjacent or neighboring land is interfered with in his right to the reasonable user of subsurface water upon his land, or if his wells, springs, or streams are thereby materially diminished in flow, or his land is rendered so arid as to be less valuable for agriculture, pasturage or other legitimate uses.

Id. at 638-39, 74 A. at 384-85.

Five years later, in a case that factually resonates with the issues of today, the Court of Errors and Appeals applied the *Meeker* principles to a classic groundwater contamination case. In *P. Ballantine & Sons v. Public Service Corp.*, 86 N.J.L. 331, 91 A. 95 (1914), the famous brewery lost use of the wells it relied upon to brew beer as a result of tar contamination of the groundwater emanating from the adjacent Public Service coal gas plant adjoining the Passaic River. The court applied *Meeker*, focusing on rights of use, not ownership, and held that a landowner has the right to use groundwater "in a reasonable manner and to a reasonable extent, for his own benefit . . . without undue interference with the rights of other landowners to the like use and enjoyment of such water." *Id.* at 333-34, 74 A. at 96 (emphasis added).

Meeker was revisited in 1980 in *Woodsum*, 172 N.J. Super. at 500, 412 A.2d at 1070. In *Woodsum*, the township developed its property as a water source for public consumption, thereby lowering the water table and rendering the plaintiffs' private well unusable. The plaintiffs could have deepened their well for a modest cost. Instead, they abandoned their home (which vandals then looted) and brought suit against the municipality, alleging among other things, a "taking" without just compensation. On appeal, the Appellate Division held, assuming without deciding there was a taking, that "plaintiffs would be limited to the traditional measure of damages," *i.e.* the difference in the value of the property with and without the well. Moreover, the court adopted the view that "[t]he measure of damages does not include any special damages suffered through frustration of the owner's plans." The court held that the home owners could have and

should have simply deepened their own well and were not entitled to damages beyond that modest cost.

The trial court decision examined *Meeker* in light of 70 years of "[s]ignificant changes in scientific knowledge, demand for water and legislation." *Woodsum*, 172 N.J. Super at 494-95, 412 A. 2d at 1068. The court concluded:

> Today New Jersey is a populous urban state with water needs which are much different than they were in 1909. It is now ever more necessary that private users of subterranean water acknowledge the public interest in that water source, an interest to which the Legislature has given increasing recognition. A reasonable use of such water is one which accommodates that public need.

As to damages, however, the court re-asserted the *Meeker* principle:

> In addition to the rule of reasonable use by the complaining owner (as well as his competing user), *Meeker* denies recovery unless there is a material diminution in his flow of underground water. That diminution is not material unless it is so significant that it interferes with the reasonable use of the overlying owner.

Id. at 512, 412 A. 2d at 1076.

Significant by its omission is the fact that no New Jersey case at common law has ever applied the public trust doctrine to groundwater. Nor is that surprising. The public trust doctrine has traditionally dealt with the ownership, dominion, control and/or sovereignty over *lands flowed by tidal waters*, held in trust for the public for purposes of navigation, commerce, fishing, and recreational values.

New Jersey has codified these common law principles. Under the Spill Act, N.J.S.A. 58:10-23.11a et. seq., the Spill Fund is liable to pay for all cleanup and removal costs and all damages caused by a hazardous substance discharge. N.J.S.A. 58:10-23.11g(a). The liability of the Fund is as broad as the liability of dischargers or those in any way responsible for a discharge under the Spill Act. *Compare* N.J.S.A. 58:10-23.11(g) *with* -23.11g(c). The regulations implementing the Fund payment procedures make clear that only damages actually incurred are entitled to compensation:

> A claim shall not be eligible for compensation from the Fund unless the claimant has actually suffered the damages which are the subject of the claim. A claim shall be ineligible for compensation from the Fund to the extent that the damages which are the subject of the claim are contingent or speculative. N.J.A.C. 7:1J-2.4(a).

Unless there is interference with actual use of the groundwater, the claimant has suffered no actual damage and the claim is contingent and speculative. It is ironic at least for the State to argue that the Fund will only compensate claimants for damages to actual use of the

groundwater, but the State can recover damages when groundwater has never been used or considered for use. *See Puerto Rico v. SS Zoe Colocotroni*, 628 F.2d 652 (1st Cir.) *cert. den*, 450 U.S. 912 (1981) (holding that damages of restoration costs "should be awarded only to make the trust whole, not to provide a windfall to the public treasury.")

In sum, in New Jersey, groundwater was never a resource embraced by the "public trust" doctrine. Therefore, any extension of the public trust doctrine to groundwater is only by reason of legislative fiat, a topic beyond the scope of this article. The *Woodsum* decision affirms that even in our modern world, the measure of damages is to be based on principles of use-based losses or diminution in property value damages. In other words, in New Jersey the law of groundwater accommodates competing actual users and uses of the resource, and compensates only for actual lost uses, not for "ownership" *per se* or, most pertinently, for non-use "values." In a proper case, undoubtedly, the State may document and prove compensable damage, but it should be based on actual lost uses and impairment of the functions and services of the groundwater as managed by the State for the benefit of the public in a specific factual setting. Short-cut formulae that ignore these fundamentals do nothing to achieve justice or promote fairness.

Case Comment: Coeur d'Alene Tribe v. Asarco Incorporated

By Keith E. Lynott

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> "The liability of certain responsible parties including Hecla [Mining Company] and Asarco [Incorporated] is evident but the Defendants are correct when they argue that there has been an exaggerated overstatement by the Federal Government and the Tribe of the conditions that exist and the source of the alleged injury to natural resources. To put this case in proper perspective, one has to review the history of over 100 years of mining in the Coeur d'Alene Basin, what efforts were made to deal with problems as they become evident, what direction the Courts and the State of Idaho legislature gave to interested parties, what contribution, if any, the Federal Government and [the Coeur d'Alene] Tribe made to the conditions, how urbanization, forest fires and floods also impacted the environment, how settlements between certain parties may have changed the landscape and what are the observations and experiences of the people who live in the Coeur d'Alene Basin today."

With refreshing candor, Judge Edward J. Lodge thus begins his thoughtful and incisive opinion in *Coeur d'Alene Tribe v. Asarco Incorporated*, 280 F. Supp. 2d 1094, 1101 (D. Idaho 2003), following the liability phase of a CERCLA cost recovery and natural resource damages (NRD) trial against two mining companies. In a wide-ranging tour across the CERCLA landscape, the court addresses an array of critical issues in emerging NRD litigation, including

divisibility, retroactivity, trusteeship, injury and causation and the liability of the federal government.

Although asserting that its hands are "often tied" by a statute that was "passed by politicians who at the time could not have imagined the factual scenario pending before this Court" and acknowledging its duty to construe CERCLA liberally to effectuate legislative objectives, the court observes that "justice and fairness" are required to address the issues presented by the complex factual record. *Id.* at 1102. What follows is a palpably earnest attempt to arrive at a balanced adjudication of the issues before the court. Even if one disagrees - as this observer does - with certain of the court's rulings, the opinion as a whole makes a valuable contribution to CERCLA jurisprudence. Here are a few of the highlights:

Divisibility

One of the crucial holdings of *Coeur d'Alene* is the court's acceptance of the divisibility defense proffered by the defendants. Quoting the standard for divisibility set forth in Section 433 (A) of the Restatement (Second) of Torts, the court concludes that the defendants established a "'reasonable basis for determining the contribution of each cause to a separate harm'." *Coeur d'Alene*, 280 F.Supp.2d at 1119-1120 As a result, the court imposes several liability, with shares based on the approximate volume of mine tailings each defendant released into the Basin.

The court states that the question of divisibility is "guided by principles of causation alone and is not an "opportunity for courts to 'split the difference' in an attempt to achieve equity." *Id.* The court rejects the Trustees' contention that a defendant seeking divisibility must show that its waste can be fingerprinted with precision, as "grossly unfair and unjust" and an "unrealistic standard" of proof. *Id.*

Instead, the court finds that the record presented a "reasonable basis" for apportionment, because each generator was contributing tailings, the tailings contained the same hazardous substances, and the "milling methodologies used in the Basin did not differ significantly from mill to mill . . .." *Id.* The court finds that defendants established a "reasonable relationship between the waste volume, the release of hazardous substances and the harm at the site." Id. The court properly distinguishes the result in *United States v. Monsanto Corporation*, 858 F. 2d 160 (4th Cir. 1988), where a divisibility defense, premised upon volumetric calculations of hazardous substances, was rejected because the defendants failed to establish such a relationship among the volume of releases and resulting harm.

Trusteeship

The nature and scope of the trusteeship of the federal and tribal plaintiffs was particularly significant in *Coeur d'Alene* because the two defendants had already settled with the other Trustee - the State of Idaho. In assessing the right of the putative federal and tribal Trustees to seek natural resource damages, the court concludes that the "factual predicate of trusteeship" is based on a case-by-case determination of whether a claimant "exercises the hands on day-to-day activity of the various natural resources." 280 F. Supp. 2d at 1115. The court expressly rejects the contention that statutory authority over a resource, without more, is sufficient. "It is what is done in practice, not the underlying 'statutory authority,' that the Courts must look to." *Id.* at 1116. Moreover, although recognizing that co-trusteeship is typical, the court holds that awards

must be based upon each co-trustee's percentage of "actual management and control" to avoid double recovery and unjust enrichment. *Id.*

Applying these principles, the court rejects certain claims to trusteeship. The "cultural use" of water and soil by Coeur d'Alene Tribe did not give rise to a cognizable claim of trusteeship over such resources. *Id.* at 1107, 1117. Moreover, the court rejects the plaintiffs' arrogation of 100% of the trusteeship over resources located on federal and tribal-owned land because the State of Idaho actually exercised some control over these resources. The court leaves until the damages phase the determination of the specific percentages of trusteeship.

Retroactivity

The court is on more tenuous legal ground in its rejection of the defendants' argument that the NRD claim was barred by §107(f)(1), which precludes retroactive application of CERCLA's liability scheme to such claims: "There shall be no recovery [for NRD under §107(a)(C)] where such damages and the release of hazardous substances from which such damages resulted have occurred wholly before the enactment date of this Act [December 11, 1980]." The court's holding is based on two alternative lines of reasoning. First, it finds that, although there were only minimal releases of mine tailings in the Coeur d'Alene Basin after 1968, there were post-enactment "re-releases" that occurred "via the passive form of seepage, leaching and migration due to flowing water." *Coeur d'Alene,* 280 F.Supp.2d at 1112. The court states that "[t]his passive movement and migration of hazardous substances by mother nature (no human action assisting in the movement) is still a 'release' for purposes of CERCLA in this case." *Id.* Second, the court concludes that, even if its ruling on "re-releases" is incorrect, liability for NRD could still be imposed because the record showed that a "significant amount of damages" occurred after the date of enactment, in that the United States and the Tribe incurred costs after that date to study both the injury caused by the mining industry and the means of restoration. *Id.* at 1114. Thus, according to the court, the statutory provision expressly barring retroactive application of the statute in relation to NRD only applies to NRD-related expenses that were incurred pre-enactment.

As to the latter point, the court concludes it is bound by *Aetna Casualty and Guaranty Co., Inc. v. Pintlar Corp.*, 948 F. 2d 1507 (9th Cir. 1991), even though that case fundamentally deals with the availability, under Idaho law, of insurance coverage for environmental claims. In *Pintlar*, an insurer asserted (among other defenses) that its occurrence-based policies, issued prior to 1980, could never afford coverage for claims seeking NRD because, as a result of the operation of §107(f)(1), such claims perforce can only relate to property damage that occurred after 1980. Rejecting this argument, the court concluded that NRD claims can be maintained with regard to pre-enactment injuries, provided the damages sought were incurred post-enactment. The court stated that the term "damages," as used in §107(f)(1), refers not to the existence pre-enactment of "injury" to natural resources, but to the "monetary quantification stemming from an injury." *Id.* at 1515.

The *Pintlar* court followed the reasoning employed in *In Re Acushnet River & New Bedford Harbor Proceedings,* 716 F. Supp. 676 (D. Mass. 1989). In that case, the court held that the phrase "such damages" in §107(f)(1) does not mean "injury," but instead refers back to the term "damages" in §107(a)(C). According to the court in *Acushnet*, the term "damages" in §107(a)(C) is "self-evidently distinct" from "injury," because the latter term is also used in that section. 716 F.Supp. at 682.

Such close analysis of CERCLA's text reposes far too much confidence in the quality of the draftsmanship that attended the adoption of the statute. Numerous courts, including the *Acushnet* court itself, have animadverted to the highly imprecise use of language in CERCLA. "Like many a court before it, this Court cannot forbear remarking on the difficulty of being left compassless on the trackless wastes of CERCLA." *Acushnet*, 716 F. Supp. at 681 n.6.

The drafters of CERCLA were especially slipshod in their use of the terms "injury" and "damages." For example, §111(d)(1), the companion provision to §107(f)(1), provides that the Superfund may not be tapped to pay NRD claims "where the injury, destruction, or loss of natural resources and the release of hazardous substances from which such damages resulted have occurred wholly before December 11, 1980." Section 111(d)(1) thus undeniably bars payouts from the Superfund on account of pre-enactment injuries to natural resources, regardless of whether the "damages" sought were incurred after enactment. There is no reason to believe that Congress intended different results to obtain in relation to NRD claims depending upon whether a Trustee is proceeding under §111 as opposed to §107.

Perhaps more importantly, *Acushnet*, and thus *Pintlar* and *Coeur d'Alene*, render the statutory bar on retroactive NRD recoveries a virtual nullity. It stands to reason that "monetary quantification" of damages to assess, restore or compensate for natural resource injury would not take place in any significant way until after the enactment of the very statute that authorizes the recovery of such damages. Yet, Congress appears to have adopted the bar embodied in §§ 107(f)(1) and 111(d)(1) out of concern about the potential for huge recoveries resulting from retroactive application of CERCLA's NRD liability provisions.

Judge Lodge would have done well to examine the cogent opinion of Judge Sam E. Haddon in *State of Montana v. Atlantic Richfield Company*, 266 F. Supp. 2d 1238 (D. Montana 2003) ("*Arco*"), rendered several months earlier. There, the court rejected the State's claim for NRD on the basis of the §107(f)(1) bar. The court found as a fact that, although "re-releases" of hazardous substances had occurred after December 11, 1980, the State had not produced evidence of "new or additional" injuries resulting from such "re-releases." *Arco*, 266 F.Supp.2d at 1241. Moreover, the court concluded as a matter of law that "[d]amages accrue or occur, including restoration costs, when the underlying injury occurs." *Id*. at 1242. In its accompanying Memorandum, the court concluded that the "plain language" of §107(f)(1) barred retroactive recovery of damages that "occurred" pre-enactment. *Id*. at 1244. It reasoned that acceptance of the State's position – that damages do not occur until a trustee incurs expenses to restore resources or such costs are quantified by a court – would "render [] meaningless" the "wholly before" limitation. *Id*. Judge Haddon expressly declined to adopt the interpretation given to §107(f)(1) by the court in *Acushnet*.

The denouement of the Coeur d'Alene Basin saga will occur with the damages trial, expected to begin in early 2005. In actuality, some of the conclusions set forth in Judge Lodge's September 2003 opinion, particularly his determination that environmental conditions in the Basin have been improving since the 1930s, are far more relevant to the assessment of damages than to the adjudication of statutory liability. Accordingly, there is ample reason to expect that, in the damages phase, the court will bring to bear the same equipoise that marked its commendable effort in the liability phase.

Issues Facing NRD Practitioners

By Robert W. Lawrence

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"When I use a word," Humpty Dumpty said in a rather scornful tone, "it means just what I choose it to mean – neither more nor less." "The question is," said Alice, "whether you *can* make words mean so many different things." *From Through the Looking Glass*, by Lewis Carroll. In the world of natural resource damages, words can and do mean many things. Trustees and defendants continue to square off over the following two issues.

- When are trustees barred from recovering natural resource damages because the "damage" occurred "wholly before" the enactment of CERCLA?

- What causation standard exists given that trustees may only recover for damages "resulting from" a release?

The "Wholly Before" Limitation Under CERCLA § 107(f)(1), "there shall be no recovery [for natural resource damages] where such damages *and* the release of a hazardous substance from which such damages resulted have occurred wholly before December 11, 1980." This year, two federal district courts in the Ninth Circuit reached opposite conclusions regarding the applicability of this statutory limitation.

In *Coeur D'Alene Tribe v. Asarco, Inc.*, 2003 U.S. Dist. Lexis 16157 (D. Idaho, September 3, 2003), the United States and the Coeur d'Alene Tribe sought to recover natural resources damages associated with releases of mine wastes. The defendants argued that no hazardous substance releases had occurred after CERCLA's enactment in 1980, and that no post enactment damages had occurred because environmental conditions in the Coeur d'Alene Basin had continuously improved. The trustees argued that hazardous substances were continuing to be released and re-released, and that the critical date is when an injury is quantified.

Judge Lodge in *Coeur d'Alene Tribe* ruled that CERCLA's "wholly before" limitation did not bar the plaintiffs from recovery. The Court found that "passive migration caused by leaching from variations in low and high water is a post-enactment release under CERCLA." *Id.* The Court concluded that the "passive movement and migration of hazardous substances by mother nature (no human action assisting in the movement) is still a release for purposes of

CERCLA in this case." *Id.* The Court then relied on *Aetna Casualty and Surety Con., Inc. v. Pintlar Corp.*, 948 F. 2d. 1507 (9th Cir. 1991) and *In Re Acushnet River and New Bedford Harbor Proceedings*, 716 F. Supp. 676, 681 (D. Mass. 1989) to conclude that "damages" for purposes of the "wholly before" limitation are defined as the "monetary quantification stemming from an injury." The Court held that damages occurred post enactment "when the federal government and the Tribe began studying the 'injury' caused by the mining industry and how to clean up the injury to natural resources." *Id.*

The Court's ruling on the "wholly before" limitation does not mean that constitutional retroactivity arguments are dead. Judge Lodge acknowledged that "the Defendants argument that the retroactive application of CERCLA in this case is a taking or in violation of the due process clause of the Constitution as discussed in *Eastern Enterprises v. Apfel*, 524 U.S. 498, 118 S. Ct. 2131, 141 L.Ed. 2d 451 (1998) is reserved until the dollar amount of damages is determined in the second phase of the trial." *Id.*

In Montana, Judge Haddon reached the opposite conclusion on CERCLA's "wholly before" limitation. *Montana v. Atlantic Richfield Co.*, 266 F.Supp.2d 1238 (D. Mont. 2003). Montana brought an NRD action against Atlantic Richfield seeking to recover restoration costs at "upland areas" in the Clark Fork River Basin. The Court rejected the theory that damages do not occur until expenses are incurred or costs are quantified, *Id.*, at 1244, finding that such a theory is "unpersuasive" and would render the "wholly before" limitation in the statute meaningless. *Id*. at 1242-44. Instead, the Court held that "damages accrue or occur, including restoration costs, when the underlying injury occurs." *Id*., at 1242. The Court barred the State of Montana's claim for restoration cost damages because such damages occurred wholly before December 11, 1980.

Causation, Joint and Several Liability, Divisibility, and Baseline. Under CERCLA § 107(a)(4)(C), NRD trustees must prove injury to natural resources "*resulting from"* a release of a hazardous substance. This requires proof of a causal link between the defendant's release and the injured resource. *Idaho v. Bunker Hill Co.*, 635 F. Supp. 665 (D. Idaho 1986) The debate between trustees and defendants centers on what "resulting from" means and how much of a causal link is required.

Defendants often contend that trustees must prove that a defendant's release is a substantially contributing cause of the resource injury. For NRD liability to attach at all, the defendant's conduct must be a cause in fact of the specific injury alleged. Trustees typically resist any obligation to trace specific hazardous substances causing injury back to a particular defendant or act of disposal. This is particularly the case where hazardous substances from multiple sources are commingled. Trustees may assert that all that is necessary is that they tie the commingled release of hazardous substances to the natural resource injury.

In *Coeur d'Alene Tribe*, the Court held that "in cases where releases of hazardous substances have been commingled, the Trustees have the burden of proving that a release that results in commingled hazardous substance is a 'contributing factor' [more than a *de minimis* amount – to an extent that at least some of the injury would have occurred if only the Defendant's amount of release had occurred]." *Id.* Other courts that have addressed the causation requirement include *Idaho v. Bunker Hill Co.*, 635 F. Supp. 665 (D. Idaho 1986)(proof must include a causal link between releases and damages); *In re Acushnet River & New Bedford*

Harbor, 722 F. Supp. 893 (D. Mass. 1989)(government must establish that defendant's releases were a contributing factor to an injury to natural resources.); *United States v. Montrose Chemical Corp. of California*, 33 Env't Rep. Cas. (BNA) 1207 (C.D. Cal. 1991)(plaintiffs must show that a defendant's release of a hazardous substance was the sole or substantially contributing cause of each alleged injury to natural resources).

The D.C. Circuit has not clarified the issue. In *National Association of Manufacturers v. U.S. Department of the Interior*, 134 F.3d 1095 (D.C. Cir. 1998) the Court stated "CERCLA is ambiguous on the precise question of what standard of proof is required to demonstrate that natural resource injuries were caused by, or 'result[] from,' a particular release." The same Court stated in *Kennecott Utah Copper Corp. v. U.S. Dept. of Interior*, 88 F.3d 1191, 1224 (D.C. Cir. 1996) that "While the statutory language requires some causal connection between the element of damages and the injury —the damages must be 'for' an injury 'resulting from a release of oil or a hazardous substance'—Congress has not specified precisely what that causal relationship should be.")

Trustees likely will claim that once they have proven a commingled release has caused injury to a resource, each defendant responsible for the type of hazardous substances in the release is jointly and severally liable. Defendants will counter that CERCLA does not mandate the imposition of joint and several liability in an NRD case. Defendants should be prepared to prove that harm is divisible and that a reasonable basis for apportionment of harm exists in order to defeat joint and several liability. The key question is what constitutes a reasonable basis for apportionment in the context of an NRD case. Volumetric, temporal, toxicity based, and geographic divisibility all may have their place in proving a reasonable basis for apportionment. See e.g. *Matter of Bell Petroleum Services, Inc. v. Sequa Corporation*, 3 F.3d 889, 903 (5th Cir. 1993)("The Restatement suggests that apportionment is appropriate even though the evidence does not establish with certainty the specific amount of harm caused by each defendant. . . Likewise, pollution of a stream by two or more factories may be treated as divisible in terms of degree, and apportioned among the defendants on the basis of evidence of the respective quantities of each." *Id*. In *Coeur d'Alene Tribe*, the Court concluded that volumetric tailings production provided a sufficiently reasonable basis for apportionment to defeat joint and several liability.

One last causation burden exists for trustees in the context of assessing natural resource damages assessment. The Department of the Interior's natural resource damage assessment regulations, 43 C.F.R Part 11, require that trustees determine the baseline condition of an injured resource and then compare baseline with the injured resource to quantify injury to the resource. "Baseline" is defined under the DOI NRDA regulations as "the condition or conditions that would have existed at the assessment area *had the discharge of oil or release under investigation not occurred."* 43 C.F.R. § 11.14(e). While the Trustee has the burden of determining baseline under the NRDA regulations, defendants should ensure that the trustee is apprised of all appropriate conditions or factors impacting the resource other than the release of the hazardous substance at issue.

RECOVERY OF NATURAL RESOURCE DAMAGES UNDER COMPREHENSIVE GENERAL LIABILITY POLICIES

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I. Introduction

It is apparent to even a casual observer of trends and developments in environmental law that Federal and State authorities have expressed renewed interest in Natural Resource Damage ("NRD") claims. There is a fundamental distinction between liability related to damages for the cleanup of environmental sites and liability for damage to natural resources. Indeed, environmental statutes, as well as the common law, draw a distinction between liability for environmental cleanup response and liability for natural resource damages. Insureds, therefore, may have substantial, viable claims for insurance recoveries where such NRD claims are not specifically released or barred by prior coverage settlement agreements, or otherwise adjudicated and extinguished.

II. The Federal Natural Resource Damage Liability Scheme

Under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601, *et seq.* ("CERCLA"), and comparable federal and state laws, various governmental authorities are designated as trustees for natural resources and are authorized to sue allegedly responsible parties to collect damages for injury to such resources arising from the release of hazardous substances. Primarily, two environmental statutes provide the principal sources of federal authority over natural resource damages: CERCLA, 42 U.S.C. §§ 9607-9675, and the Oil Pollution Act (OPA), 33 U.S.C. §§ 2701-2761. Although other federal statutes also address natural resource damages, The Clean Water Act ("CWA") contains provisions dealing with injury to natural resources. 33 U.S.C. § 1321(f)(5). However, most natural resource damage claims that could be brought under the CWA are generally addressed under CERCLA and the OPA, respectively. CERCLA and the OPA are the most generally applicable and most frequently employed statutory authorities. In addition to these federal natural resource damages

schemes, many states have enacted laws authorizing the recovery of natural resource damages from "responsible parties." *See, e.g.*, the New Jersey Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 g.a.(2).

CERCLA and OPA both establish liability for damages on account of injury to, destruction of, or loss of natural resources. 42 U.S.C. § 9607(a)(4)(C); 33 U.S.C. § 2702(b)(2)(A). In addition to establishing liability of certain parties (generally referred to as "responsible parties") for "costs of removal or remedial action," 42 U.S.C. § 9607(a)(4)(A), CERCLA provides, in pertinent part, that such parties shall also be liable for "damages for injury to, destruction of, and loss of natural resources." 42 U.S.C. § 9607(a)(c). Liability for such natural resource damages is to the United States Government, to any State, for natural resources belonging to, managed by, controlled by, or appertaining to such State, and to any Indian tribe, for pertinent resources belonging to or held in trust for the benefit of such tribe. 42 U.S.C. 9607(f)(1). The President is authorized to designate federal governmental entities to act as trustees for natural resources, which trustees have explicit authority to assess and recover damages for injury to, destruction of or loss of use of natural resources. 42 U.S.C. § 9607(f)(2). State governments are similarly authorized to designate State public authorities to act as trustees for natural resources within such State.

As the States enter the arena of assessing alleged damages to their own natural resources it is nearly certain that they will attempt to follow their own statutory and regulatory schemes and employ distinct economic models for quantifying damages. *See, e.g.*, The New Jersey Superior Court, Appellate Division's unreported decision in *New Jersey Site Remediation Network v. New Jersey Department of Environmental Protection*, No. A-5272-97T3, slip op. (App. Div., April 17, 1997.

II. Natural Resource Damages as "Damages" Under CGL policies

Courts across the United States have routinely determined that CERCLA-imposed remediation costs are "damages," as such term is used in common CGL policies. As discussed below, the reasoning of these courts makes it abundantly clear that natural resource damages are also covered "damages." Indeed, in many of the cases addressing whether CERCLA-imposed cleanup costs are "damages" within the meaning of such policies, the insurers argued that, because CERCLA expressly distinguishes between response costs and natural resource damages, response costs should not be considered "damages" for purposes of insurance coverage. In so contending, the insurers have impliedly accepted the proposition that natural resource damages are covered under CGL policies.

While a careful and considered reading of insurance policies is always required before a coverage determination can be made, in general a comparison with the terms of many standard form CGL policies with the language of CERCLA demonstrates beyond peradventure that such damages fall squarely within the insuring agreement of the general liability. The insuring agreement of many policies provide that the carrier must indemnify for "all sums" that the insured is "legally obligated to pay" as "damages" because of "injury to or destruction of property," or "loss of use" thereof, resulting from an "occurrence." CERCLA, in turn, authorizes designated natural resource trustees to recover from responsible parties "damages" for "injury to,

destruction of or loss of use of" natural resources resulting from a release of hazardous substances.

Until recently, primary environmental initiatives and enforcement actions have focused on liability for cleanup of environmentally impaired sites. Thus, there are few published decisions in which courts have squarely addressed the issue of coverage for natural resource damages (and none holding that such damages are not covered). At the same time, however, courts around the country that have determined that costs to perform remediation of contaminated sites (or to reimburse governmental agencies for the same) are "damages," as such term is used in CGL policies, have made it clear in so holding that claims for natural resource damages are also covered.

IV. A General Overview of the Case Law for Coverage of NRD Claims

In general terms, perhaps the leading case in the country with respect to the interpretation of the "as damages" language in CGL policies in relation to environmental coverage claims, is *AIU Insurance Company v. FMC Corporation*. 51 Cal. 3d 897, 274 Cal. Rptr. 820, 799 P. 2d 1253 (1990). In *FMC*, the Supreme Court of California addressed a claim by a group of insurers that CERCLA-imposed response costs were not "damages" and did so in a way that made it clear that both response costs and natural resource damages are "damages" for purposes of CGL policies. The *FMC* Court held that FMC's insurance policies afforded coverage for remediation expenses, whether such costs were incurred to satisfy a liability under CERCLA to reimburse a government agency or were incurred directly by FMC in order to comply with a CERCLA "injunction." In so holding, the court rejected the insurers' assertion that such response costs could not be deemed to be "damages," which assertion was based in part upon the fact that CERCLA "expressly distinguishes between recovery of 'response costs' and recovery of 'damages to natural resources.'" 51 Cal. 3d at 830, 274 Cal. Rptr. 826, 799 P. 2d 1253. The court stated:

> [W]e do not believe, as the insurers contend and several courts have concluded . . . that CERCLA intended that reimbursement of 'response costs' be treated as definitionally or conceptually distinct from recovery of 'damages.' Congress clearly intended considerable overlap between the two forms of recovery.
>
> * * *
>
> Moreover, we fail to see how the distinction made by CERCLA between "response costs" and "damages to natural resources" forecloses response costs from being characterized as "damages" in a generic sense under CGL policies. [Emphasis in original].

51 Cal. 3d at 831, 274 Cal. Rptr. 826, 799 P. 2d 1253 (citations omitted).

In *Aetna Casualty & Surety Co., Inc. v. Pintlar Corporation*, the Ninth Circuit Court of Appeals, applying Idaho law, reversed a holding of the District Court that an insured's CGL policies did not afford coverage for natural resource damages claims. 948 F. 2d 1507 (9th Cir. 1990). There, the District Court rejected the insured's claim for coverage relating both to CERCLA-imposed response costs and natural resources damages. Reversing the judgment below, the Court of Appeals held first that the term "damages," as used in the CGL policies, affords coverage for the insured's cleanup costs. As to natural resource damages, the Court of Appeals determined that the term "damages," as used in 42 U.S.C. 9607(f)(1), refers to the "'monetary quantification stemming from an injury.'" 948 F. 2d at 1515 (*quoting*, *In re Acushnet River & New Bedford Harbor Proceedings*, 716 F. Supp. 676, 681 (D. Mass. 1989)).

A few courts have held that coverage is not available for CERCLA-imposed response costs under standard forum CGL policies because such costs do not constitute "damages." However, even these courts have recognized that CGL policies must and do respond to natural resource damages claims.

Perhaps the most often cited (and most often criticized and rejected) decision holding that cleanup costs are not covered by CGL policies is *Continental Insurance Companies v. Northeast Pharmaceutical Chemical Company, Inc.* 842 F. 2d 977 (8th Cir. 1987) ("NEPACCO"). There, the court, applying what it predicted would be Missouri law on the issue, held that claims asserted against the insured by the federal government under CERCLA for cleanup costs were not claims for "damages" under the insurance policies purchased by the insured. In reaching this conclusion, the court relied upon the distinction drawn by CERCLA between cleanup costs and natural resource damages. As a result of this statutory distinction, the court determined that "[u]nder CERCLA cleanup costs are not substantially equivalent to compensatory damages for injury to or destruction of the environment." 842 F. 2d at 936. In so holding, the NEPACCO Court nonetheless made it manifestly clear that a different result would have obtained if the government had asserted a claim against the insured for natural resource damages. It is important to note that, several years later, the Supreme Court of Missouri, in *Farmland Industries*, 941 S.W. 2d 505, 510, held that "[t]he *NEPACCO* court misconstrues and circumvents Missouri law." In *Farmland Industries*, the court held that, under Missouri law, CERCLA-imposed cleanup costs are "damages" covered by CGL policies. As a result, *NEPACCO*, insofar as it holds that cleanup costs are not "damages," is no longer good law. For present purposes, the point is that *NEPACCO* demonstrates that, even those few courts that have held (incorrectly as it turned out in many cases) that CERCLA-imposed response costs are not "damages," have established by their holdings that CERCLA-imposed natural resource damages assessments are encompassed by the policy term "damages."

In *Aetna Casualty & Surety Company v. General Dynamics Corporation*, the court addressed a coverage action arising from several underlying claims against the policyholder, some seeking to impose liability for cleanup costs and some alleging liability based upon damage to natural resources. 783 F. Supp. 1199 (E. D. Mo. 1991). The court, following *NEPACCO*, determined that, insofar as the underlying actions asserted against the insured were claims for cleanup costs, the insured was not entitled to a defense and coverage under the insured's CGL insurance policies. At the same time, however, the court found that coverage was available for the underlying claims insofar as they sought recovery of natural resource damages. 783 F. Supp. at 1205-1206 (footnote omitted).

V. Conclusion

A review of the federal statutory framework related to natural resource damages, standard policy language, and the case law strongly supports the proposition that natural resource damage claims are covered under standard CGL policies. The majority of courts that have considered the issue have held that response costs, imposed under CERCLA and comparable laws, are "damages," and such courts have made it equally plain that liabilities for natural resource damage assessments are also covered "damages." In those (few and far between) jurisdictions where courts have barred coverage for cleanup costs, such courts have recognized that natural resource damages claims would receive different treatment.

A related issue is whether past insurance coverage settlement agreements release natural resource damages claims. In situations involving policy buy backs, this may be a moot point depending on the settlement terms. But in situations involving site specific or known claim settlements, it is quite possible that the scope of these releases are not as broad, or that carve outs exist, so that new coverage claims for these distinct natural resource damages claims remain viable. Similarly, in environmental coverage actions that did not involve underlying matters with natural resource damage claims, resulting orders and judgments may not encompass such claims. While general principles of claim preclusion must always be considered in such situations, it is possible that insurance claims for natural resource damages were not adjudicated and remain open for pursuit by insureds. Accordingly, it would be prudent for all those concerned to review their policies, settlements and judgements to determine if claims for natural resource damages remain viable and open for possible payment. Likewise, insureds and insurers should be aware of NRD claims when negotiating settlements so as to memorialize the intent of the parties.

NEW JERSEY COURT RULES ON CHALLENGE TO STATE'S NATURAL RESOURCE DAMAGES INITIATIVE

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Ruling in a suit brought by industry and trade groups, a New Jersey Superior Court Judge recently rejected a series of early legal challenges to New Jersey's ambitious Natural Resource Damages ("NRDs") recovery initiative. *New Jersey Society for Environmental & Economic Development, et al. v. Bradley M. Campbell, et al.*, Superior Court of New Jersey, Law Division, Mercer County (decided June 18, 2004) ("*NJSEED v. Campbell*").

The New Jersey Department of Environmental Protection ("NJDEP") announced its new NRD policy in a September 2003 Policy Directive, No. 2003-07, which declared the State's intention to assess and collect NRDs for injuries to groundwater at over 4,000 sites located across New Jersey. In February 2004, the New Jersey Society for Environmental & Economic Development, along with five other trade associations (the "Trade Association Coalition") filed suit in New Jersey Superior Court seeking to (1) invalidate NJDEP's contingency fee retainer agreement with nationally known mass tort attorney Allan Kanner, Esq., and various other outside law firms; and (2) compel NJDEP to engage in formal rule making, pursuant to New Jersey's Administrative Procedure Act ("APA"), N.J.S.A. 52:14B-1 *et seq.*, with respect to the proposed implementation of a "new" formula for quantifying injuries to groundwater. On June 18, 2004, Superior Court Judge Jack Sabatino upheld the contingency fee agreement, subject to certain conditions, and transferred the rule making aspect of the case to the Superior Court of New Jersey, Appellate Division, ruling that jurisdiction vested with New Jersey's intermediate appellate court since the case involves challenges to action (or inaction) taken by a state administrative agency. Rule 2:2-3(a)(2).

NJDEP's Proposed "New" NRD Formula

The Trade Association Coalition filed its preemptive complaint in response to NJDEP's stated intention to adopt a new "more robust" formula for calculating NRDs, to be used in litigation and future enforcement proceedings against responsible parties. Historically, NJDEP utilized a formula developed by an NJDEP task force in the 1990s as a surrogate for valuing injuries to groundwater. Policy Directive No. 2003-07 announced that NJDEP would continue to use the existing formula "for settlement purposes only." In a deposition given in December 2003, John Sacco, NJDEP's Director of the Offices of Natural Resource Restoration, testified that NJDEP was not satisfied that the existing formula was properly valuing groundwater. Sacco indicated that NJDEP was in the process of developing a new formula to more accurately calculate injuries to groundwater. He suggested that NJDEP would continue to use the old formula for parties who voluntarily entered into settlement negotiations with NJDEP, but indicated that the new formula would be utilized in suits against recalcitrant responsible parties.

In challenging the State's announced intention to develop a new formula for calculating groundwater injuries, plaintiffs argued that NJDEP was required to engage in formal rule making under New Jersey's APA, N.J.S.A. 52:14B-1 *et seq* Plaintiffs contended that since the State intends to apply its new formula generally and uniformly, and the public has not been allowed to participate in developing the formula, the proposed formula is subject to the formal rule making requirements of the APA prior to use in any proceeding. NJDEP responded that the September 2003 Policy Directive, and subsequent statements concerning the proposed new groundwater formula, were nothing more than informal settlement guidelines. NJDEP described its communications on the subject as informal "intra-agency" statements, which are not subject to formal rule making. NJDEP further argued that Policy Directive No. 2003-07 was merely a guidance document, indicating how the Attorney General's office intends to proceed in pursuing recovery of NRDs under the Spill Act. It conceded that the Policy Directive does not have the immediate force of law.

The Court's Rulings

Although not raised by either party, the Court first ruled on the issue of standing and whether the Trade Association Coalition was in a legal position to challenge NJDEP's proposed formula and the contingency fee agreement with special outside counsel. The Court found that plaintiffs did in fact have standing, noting that plaintiffs' members have a sufficient stake in the NRD assessment process and several members of one or more of the plaintiff organizations are currently involved in lawsuits defending NRD claims brought by the State of New Jersey.

The Court next addressed the State's claim that the trial court lacked subject matter jurisdiction. NJDEP argued that the suit should be dismissed on ripeness grounds since no final decision has been made by the agency concerning the proposed new NRD formula. Alternatively, NJDEP contended that any challenges to its decisions or alleged rule making were required to be filed in the Superior Court of New Jersey, Appellate Division.

In transferring to the Appellate Division all issues related to the Policy Directive, and the issue of whether formal rule making was required, Judge Sabatino noted that the Appellate Division has exclusive jurisdiction to decide matters involving actions of state administrative agencies. R. 2:2-3(a)(2). Rule 2:2-3(a)(2) provides, in pertinent part, that appeals may be taken to the Appellate Division as a matter of right "to review final decisions or actions of any state administrative agency or officer, and to review the validity of any rule promulgated by such agency or officer." In *dicta* the court addressed the implications of collateral estoppel if NRD cases were allowed to proceed before a rule making. The Court declined to rule on the issue of ripeness, but indicated that there were sufficient *indicia* of ripeness to suggest that a transfer to the Appellate Division was warranted.

Contingency Fee Agreement with Special Counsel

In seeking to invalidate the retainer agreement with outside counsel, the Trade Association Coalition advanced three arguments: (1) an appropriation authorizing and providing funding for compensation to outside counsel was not been made in accordance with N.J.S.A. 52:17A-13; (2) the Public Trust Doctrine prohibits the divestiture of monies collected for the public trust to an attorney in private practice; and, (3) the agreement violates the rules of professional responsibility which require a government attorney to remain neutral in matters prosecuted on behalf of the State. Plaintiffs argued that damages assessed for natural resources must be used for restoration of the environment and could not be used to pay attorneys' fees, noting that the New Jersey Spill Act does not allow for the assessment of attorneys' fees in successful Spill Act prosecutions. NJDEP countered that argument by contending that the Spill Act does indeed authorize an award of counsel fees to the State. NJDEP further argued that it followed all appropriate procedures in appointing Special Counsel pursuant to N.J.S.A. 52:17A-13, Special Counsel for State Officers or Departments. In defending the contingency fee arrangement, the NJDEP also noted that the Attorney General would provide oversight on all NRD matters and would retain the authority to approve all settlements negotiated by Special Counsel.

Judge Sabatino found the agreement with Special Counsel to be valid and enforceable, subject to certain Court imposed conditions. In sustaining the contingency fee agreement, the Court relied upon the unpublished opinion in *Phillip Morris, et al v. Verniero*, Middlesex County Chancery Docket No. 114-96, decided March 4, 1997 (appeal dismissed, May 18, 1997), wherein the Superior Court approved the retention of Special Counsel to act on behalf of the State in pursuing Medicaid losses from tobacco companies. Citing *Phillip Morris*, the Court found that the Special Counsel statute did not require an up-front legislative appropriation as a pre-condition to retaining Special Counsel. The Court also rejected plaintiffs' Public Trust Doctrine argument, holding that the Public Trust Doctrine permits reasonable funds to be spent on administering and promoting the interest of the trust. Judge Sabatino further held that the predicate elements for the appointment of Special Counsel, set forth in N.J.S.A. 52:17A-13, had been satisfied.

To insure that the ultimate statutory powers of the Attorney General were retained and exercised, the Court ordered that all papers filed or submitted by Special Counsel (Kanner) must be co-signed by a Deputy or Assistant Attorney General, "who shall retain concurrent professional responsibility for the handling of the litigation." The Court further directed that "[a]ll contingent fees paid to Special Counsel . . . shall adhere to the procedures and percentage limitations set forth in R. 1:21-7," the New Jersey court rule governing tort actions. The Court reasoned that the State's claims for NRDs recoveries are "based upon the alleged tortious conduct of another." On this point, Judge Sabatino distinguished *Phillip Morris*, noting that New Jersey's contingency fee rule for tort recoveries did not apply to Special Counsel retained in the tobacco litigation because the Court there classified the claims as "business torts."

Although the Court affirmed the retainer agreement with Special Counsel, the decision left unresolved the question of whether the New Jersey Spill Act permits an award of attorneys' fees and, if so, how the entitlement to statutory attorneys' fees might be reconciled with the contingency fee provisions set forth in the retainer agreement. The Court noted that, pursuant to N.J.S.A. 58:10-23.11(a)(b)(2), the NJDEP may seek the "costs" of any investigation, cleanup or removal, and the reasonable costs of preparing and successfully litigating an action. The term "costs," however, is not defined in the statute and the Court noted that the State could not cite to any prior instance where it had obtained an order under the Spill Act granting an award of counsel fees and costs. The Court added that if counsel fees were found to be legally recoverable under the Spill Act, the statute could provide a means for compensating Special Counsel independent from the natural resource damages funds actually collected from responsible parties. Judge Sabatino observed: "[a]ssuming *arguendo* such fees are legally recoverable and actually recovered by the DEP from defendants [in one of the pending NRD suits], that avenue may provide a means for compensating Special Counsel without invading any of the *corpus* of any natural resource damages actually collected from defendants."

Conclusion

The June 18, 2004 decision represents an early, if temporary, setback to the Trade Association Coalition's efforts to derail NJDEP's ambitious NRD recovery program. The decision certainly provides guidance on significant issues that will affect the course of NRD litigation. The record of the trial court proceedings have been transferred to the Appellate Division. Additional legal challenges to NJDEP's proposed new NRD formula are anticipated both in *NJSEED v. Campbell* and in recent suits filed by NJDEP seeking to recover NRDs. The stakes are high as NJDEP continues to signal that it plans to aggressively pursue NRDs at major contaminated sites through a voluntary settlement program and, where necessary, litigation against responsible parties.

GROUNDWATER VALUATION, BENEFITS TRANSFER & DAUBERT

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This work was supported by the University of Maine Agricultural and Forest Experiment Station, MAFES Publication No. 2732. I would like to thank Todd Gabe and Robert Unsworth for their comments on a previous draft. All opinions and errors are the sole responsibility of the author.

Introduction

Groundwater is an important source of drinking water in the U.S. About 90% of the public drinking water systems in the U.S. obtain their water from groundwater supplies (http://www.epa.gov/safewater/data/pdfs/factoids_2003.pdf) and about 15 percent of Americans get their drinking water from private wells (http://www.epa.gov/safewater/privatewells). In total, nearly 150 million people, about 50% of the U.S. population, obtain their drinking water from groundwater; many large urban areas rely on surface water as a source of drinking water.

Contamination of groundwater resources has become an important issue. "Every state in the nation since the 1970's has reported cases of contaminated ground water" (http://www.epa.gov/seahome/groundwater/src/quality1.htm). There are 1,005 sites across the country with groundwater contamination listed on U.S. EPA's National Priorities List (http://oaspub.epa.gov/oerrpage/basicqry). This wide spread contamination of groundwater has led to litigation to recover Natural Resource Damages under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or the Oil Pollution Act (OPA).

If damages go beyond the costs of providing a replacement source of drinking water to affected households, economists must use nonmarket valuation methods to assess economic damages (Champ, Boyle and Brown (eds.), 2003, *A Primer on Nonmarket Valuation*, Kluwer Academic Publishers). The most common approach used to estimate groundwater values is contingent valuation, a method where a carefully designed survey is administered to a representative sample of households to ask how much they would pay for improved groundwater. This approach is called a stated preference method because people state how much they would pay, but no money is actually paid by survey respondents.

In many instances it is unlikely that an original contingent-valuation study will be conducted to estimate damages. Estimates will be taken from previous studies in the literature. This approach of transferring a value from an existing study site to a new application is referred to as a benefits transfer. There are two basic types of benefits transfers. The first, a value transfer, takes a single value estimate and transfers it to a new application. An equation transfer, which may utilize an equation estimated from a Meta analysis, uses an estimated equation to adjust, or customize, the transferred value to conditions at the new application.

The purpose of this article is to briefly comment on the credibility of the groundwater valuation literature for use in litigation in the context of benefits transfers. To do this, the literature will be considered in terms of *Daubert* (*Daubert et al. v. Merrell Dow Pharmaceuticals, Inc.,* 509 U.S. 579 (1993))conditions for evaluating expert testimony. Both the existing contingent valuation studies and the use of benefits transfer will be examined in the context of Daubert. This comparison should not be construed as a legal interpretation of the groundwater valuation literature, but an academic assessment of where the academic literature stands in 2004.

Daubert **Factors**

There are five key elements of a *Daubert* evaluation of expert testimony (http://www.daubertontheweb.com/Chapter_2.htm):

- whether the theories and techniques have been *tested*;
- whether they have been *peer reviewed* and *published*;
- whether the techniques have a *known error rate*;
- whether they are subject to application *standards*; and
- whether the theories and techniques enjoy widespread acceptance.

In the case of groundwater valuation for litigation it is necessary to consider contingent-valuation studies of groundwater and the use of these values in benefits transfers.

Have Groundwater Valuation Studies Been Tested?

One of the tests for the validity of a measurement technique is theoretical validity. This test asks whether empirical estimates are sensitive to, increase or decrease in response to, changes in factors that economic theory indicates should affect values. Meta analyses of groundwater valuation estimates indicate that contingent-valuation studies do provide estimates that pass a test of theoretical validity. A Meta analysis uses value estimates from studies as data and attempts to predict how these estimates change in response to changes in study applications and design. For example, Boyle, Poe and Bergstrom found that values for protecting groundwater increase if contaminates are present, the probability that groundwater will become contaminated increases and if contamination changes the supply of potable water (*American Journal of Agricultural Economics*, Vol. 76, No. 5, 1994). They also found that values decrease if survey respondents are told

about the availability of substitute sources of potable water (See also: Poe, Boyle and Bergstrom, Ch. 8 in *The Economic Value of Water Quality*, Edward Elgar, 2002.).

Another test of validity of a measurement technique is convergent validity. Convergent validity tests whether two measurement techniques provide comparable estimates of value. Vandenberg, Poe and Powell (Ch. 6 in *The Economic Value of Water Quality*, Edward Elgar, 2002) conducted similar groundwater valuation studies in Massachusetts, New York and Pennsylvania. They used data from each state to make predictions, conduct benefits transfers, to each of the other two states. Benefits transfers within states and benefits transfers using equations to predict a customized value at the transfer sites were more accurate.

Both of these above tests are confirmed by other studies in the literature that investigate the valuation of other types of environmental resources. Smith and Osborne found that contingent-valuation studies across applications to a variety of environmental media pass a test of theoretical validity (*Journal of Environmental Economics and Management*, Vol.31, No. 3, 1996). Kirchhoff, Colby and LaFrance also found that benefits transfers that use equations to predict customized values at transfer sites are more accurate (*Journal of Environmental Economics and Management*, Vol. 33, No. 1, 1997).

Thus, contingent-valuation estimates of groundwater values have been tested, and the use of contingent-valuation estimates in benefits transfers have been tested. As will be noted below, there are other tests of validity that both the original studies and the benefits transfers could be subject to.

Have Groundwater Valuation Studies Been Peer Reviewed and Published?

Contingent valuation studies of groundwater valuation studies have been peer reviewed and published, and the same holds for Meta analyses. Seven of the eight contingent valuation studies used in the Boyle, Poe and Bergstrom Meta analysis have been published in peer-reviewed journals. The Vandenberg, Poe and Powell benefits transfer of groundwater values was published as a book chapter; while peer reviewed, it was not subject to the level of scrutiny that a journal article receives.

Do Groundwater Valuation Studies Have a Known Error Rate?

There have not been any studies that have looked at the error rate in contingent-valuation studies of groundwater values. However, a contingent-valuation study that used controlled experiments, suggests that contingent valuation overestimates the true value of a resource (Cummings, Harrison and Rutstrom, *American Economic Review*, Vol. 85, No. 1, 1995). This was a test of criterion validity where there was a known proxy for the true value.

The Vandenberg, Poe and Powell study begins to develop an understanding of the error rate in groundwater benefits transfers, and proposes conditions that will reduce the error

rate in benefits transfers. These conditions are to use studies conducted from within the same state and to use equations to develop customized transfer estimates.

The evidence suggests that the direction of error is know for contingent valuation, and the potential magnitude of error is know for benefits transfers when valuing changes in the quality or availability of groundwater.

Are Groundwater Valuation Studies Subject to Application Standards?

The NOAA "Blue Ribbon Panel" report provides standards for conducting contingent-valuation studies for natural resource damage assessment where the value estimates may be used in litigation (*Federal Register*, Vol. 58, No. 10, pp. 4601-4615, 1993). These standards were subject to public comment before they were published.

The U.S. EPA's *Guidelines for Preparing Economic Analyses*, which were peer reviewed, provides standards to guide the conduct of benefits transfers (*Guidelines for Preparing Economic Analyses*, EPA 240-R-00-003, 2000).

Neither of these sets of standards applies to the valuation of a specific environmental media such as groundwater contamination. These are general standards that apply to all types of applications.

Do Groundwater Valuation Theories and Techniques Enjoy Widespread Acceptance?

The answers to this question depend on how you interpret "widespread acceptance." If one interprets this in terms of use of the methods, then the answer is yes for both contingent valuation and benefits transfers. Many contingent valuation studies have been published on a wide variety of applications (Carson, *Contingent Valuation: A Comprehensive Bibliography and History*, Edward Elgar, 2003). Benefits transfers are commonly used by government agencies in the conduct of Regulatory Impact Analyses.

However, there has been considerable controversy about the credibility and accuracy of contingent valuation. Notable among these critiques is the book entitled *Contingent Valuation: A Critical Assessment* (Hausman (ed.), North Holland, 1993), which led to the formation of the NOAA Blue Ribbon Panel and the resulting standards for conducting contingent-valuation studies. Surprisingly, benefits transfers do not appear to be as controversial as contingent valuation. This is surprising for several reasons. First, benefits transfers often use the results of original contingent-valuation studies as the input to, or the basis of, the transfers. Second, very little research has been conducted to investigate the validity of benefits transfers. Third, and finally, benefits transfers appear to be more commonly used in policy decisions and litigation than original valuation studies.

Benefits transfers have been admitted as evidence in court cases. The damage estimate for the Huntington Beach Oil spill was based on a beach visitation value from Florida

that was transferred to California (*People ex rel. Department of Fish and Game v. ATTRANSCO Inc., et al*., Orange County Superior Court, 64 63 39, December 9, 1997). In a recent breach of contract case the plaintiff was allowed to enter a benefits transfer estimate of damages (*Alaska Pulp Corporation, Inc. v. United States of America*, United States Court of Federal Claims, No. 9-153C), January 28, 2004). The benefits transfer estimates for this later case were based in part on value estimates from original contingent-valuation studies.

Thus, both contingent valuation and benefits transfer are widely used, but are not fully accepted by all members of the economics profession. The argument of most academics would be on the relative accuracy of the methods, not whether the methods are invalid.

Remaining Issues

There are several issues that need to be considered when using groundwater values in litigation or even for policy applications in Regulatory Impact Studies by government agencies. The first is the accuracy of original valuation studies and benefits transfers. While both methods appear to meet selected tests of validity, there is suggestive evidence that contingent valuation may overestimate values and no test of criterion validity has been undertaken for benefits transfers. Research is needed on both of these issues.

Second, the literature suggests that contingent valuation is more accurate in the estimation of use values than it is in the estimation of nonuse values. When people respond to continent-valuation questions for groundwater protection, they may be including both use and nonuse values in their valuation responses.

While original valuation studies are based on representative samples of people, benefits transfers are based on samples of convenience. The samples of convenience arise because the analyst is limited to the valuation studies that are available in the literature. These studies may not be fully representative of groundwater conditions and affected households at the new site. This is the reason that equation transfers are more accurate; an individual study my not represent all characteristics at a new valuation site but a number of studies may collectively represent the conditions at the new site. However, while an equation transfer allows for customized damage estimates to be developed at the new site the existing studies may not provide the breadth to fully customize the benefit-transfer estimate to conditions at the new site.

Conclusion

In general, contingent valuation studies of groundwater values and benefits transfers appear to meet minimum Daubert conditions to be admitted as expert testimony in court cases. However, the issues raised here suggest that the available valuation methods, like all empirical methods, must proceed with considerable caution when being implemented and are not invincible.

The Role of Ecological Risk Assessment in NRD

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ERM
Exton, PA

The opportunity for recovery of natural resource damages (NRD) by federal, state, and tribal trustees is established under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Oil Pollution Control Act (OPA) and in some instances, state cleanup statutes. A basic assumption in the recovery of NRD is that a release of chemicals or oil that causes injury to a natural resource also results in a loss to the public that is not compensated merely by cleanup of the release, *i.e.*, there is a requirement for restoration above and beyond the remedy. The focus of this article is on the interrelationship between the remedial and restoration processes for ecological resources: how do government agencies determine that the risks to ecological resources are severe enough to warrant remediation, thereby resulting in the potential for recovery of NRD? And how is this information used to establish injury in the natural resource damage assessment (NRDA) process under CERCLA, OPA, or analogous state programs? For purposes of this article, ecological resources include the populations and communities of plants, fish, invertebrates, and wildlife that make up natural ecosystems. Note that natural resource damages encompass a broader set of resources, which may also include resources such as groundwater that are valued for human use regardless of their contribution to ecosystems.

The CERCLA Ecological Risk Assessment Process

Under CERCLA, the United States Environmental Protection Agency (USEPA) is authorized to protect public health and welfare and the environment from the release or potential release of any hazardous substance. The USEPA is not a natural resource trustee, so consequently the agency is not responsible for establishing injury for NRD purposes. The USEPA, however, is required to notify the appropriate trustees if an injury to natural resources is discovered in the response or remediation process. The government has designated certain coordinators representing resource agencies, such as the United States Fish & Wildlife Service (USFWS), and USEPA has established lines of communication with these coordinators.

Moreover, under CERCLA the USEPA is required not only to notify, but also to coordinate response, assessment, and planning activities among the relevant trustees. In practice, this often involves setting up technical committees with members representing both the USEPA and the trustee agencies. In several USEPA regions, these groups have become standing committees designated as the Biological Technical Assistance Group (BTAG) or similar designations depending on region. In each of its regions, the USEPA has appointed staff ecologists to serve as the BTAG coordinator for their respective region. Other members of the BTAG may include representatives of USFWS, the National Oceanic and Atmospheric Administration (NOAA), or other agencies.

A variety of USEPA documents are available that describe the notification and coordination process, such as *CERCLA Coordination with Natural Resource Trustees* (July 31, 1997).

On a regional level, the BTAG often plays a significant role in establishing the ground rules for the ecological risk assessment (ERA) at contaminated sites. An ERA evaluates the potential adverse effects that human activities have on the plants and animals that make up ecosystems. An ERA is typically conducted following the USEPA's national guidance documents such as *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (1997), commonly known as ERAGS. This guidance document describes the so-called "eight-step process" which serves as the basic framework for conducting an ERA. When the entire eight-step process is completed, it provides for BTAG involvement at a minimum of five "scientific/management decision points." The purpose of the ERA is primarily to support the Remedial Investigation and Feasibility Study (RI/FS) process. The RI/FS ultimately identifies and characterizes the baseline risks to human health and the environment resulting from site contamination and establishes the appropriate remedy to manage or eliminate those risks. In addition, the government has recognized that the information generated by the ERA is useful to resource trustees. Thus, investigations are often designed by the BTAG to include information that the trustees review during the NRD screening phase to establish that an injury has occurred and to evaluate its potential severity.

The USEPA has taken the additional step of establishing risk management guidelines for Superfund in its *Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund* (October 7, 1999). This guidance document points out a number of important issues that may be of concern in the risk management process, such as (1) uniformly protective remediation goals have not been established for ecological receptors similar to those developed for human health and (2) federal standards do not exist for ecological protection of media such as soils and sediments. These issues have been found to complicate the ecological risk management decision-making process, since cleanup goals must be determined on a site-specific basis. As a result, the ecological risk management process is not only completed at considerable expense, but there is also a heavy reliance on expert scientific judgment to design, implement, and interpret the appropriate studies. Inevitably, disagreements and ambiguities arise with regard to the degree and significance of the risks, and whether or not there is a need for remediation solely to address potential ecological injuries.

One of the USEPA's ecological risk management principles is to coordinate with natural resource trustees, and to work with them to achieve levels of protection that minimize the residual ecological risks at sites. This mandate leads BTAGs to take what appears to Responsible Parties (RPs) to be a highly precautionary approach to the ecological risk assessment and cleanup goals. The USEPA and trustees, however, recognize that cleanup activities themselves can cause physical damage to resources, whether these activities are taken to address human health or ecological concerns. Therefore, the remediation process can involve an assessment to determine whether the damage caused

by remediation outweighs the benefits of contaminant removal. As with the ERA process itself, there are no uniform management standards available for making this determination, and decisions are often made based on *ad hoc* determinations of experts.

Under CERCLA, following conclusion of the response and remedial phase directed by the USEPA, the Trustee might conduct a separate injury assessment to establish a basis for NRD according to the established regulations. This process is described under Department of Interior (DOI) regulations, and detailed discussion of the injury assessment is beyond the scope of this article. While the Trustee's injury assessment differs from the ERA process in several key respects, there are major issues under both ERA and NRDA processes that pose parallel technical and regulatory hurdles.

For example, under CERCLA's NRD provisions, the trustee is required to establish causation, *i.e.*, a linkage of the contamination and the resource injury. This linkage becomes increasingly difficult to establish in situations involving multiple parties, release sites, contaminants, exposure pathways, etc. ERA practitioners face similar challenges identifying source-receptor and stressor-response relationships under these circumstances. Another example arises under NRDA regulations where the government must determine baseline conditions in order to quantify resource injuries with respect to baseline. Similarly, ERAs often compare site conditions to "reference areas," as a means of identifying risks attributable to the site. Difficulties may arise in both the ERA and NRDA processes in defining the appropriate reference or baseline conditions that allow reasonable comparability of environmental conditions and stressors unrelated to the site, such as ubiquitous sources of anthropogenic contamination.

OPA Injury Assessment Process

The USEPA is also designated as a response agency for oil spills under OPA, but as with CERCLA, the USEPA is not designated as a natural resource trustee. Perhaps because oil spills often pose an immediate or acute threat, the determination of the appropriate actions to address releases do not have the luxury of extended ERAs. Because the evidence gathered to demonstrate acute effects of oil spills could be transitory, injury assessments conducted by trustees often commence immediately.

The regulations for NRD under OPA have been developed by NOAA, and differ in some respects from the DOI process under CERCLA. Although space does not permit a complete comparison of the two approaches, it is of interest to note that there is a greater emphasis placed on restoration in the NOAA regulations, as well as in practice. In recent years, this has resulted in the development by NOAA of standardized approaches for scaling restoration projects to compensate for damages using methods such as Habitat Equivalency Analysis (HEA). NOAA has also been at the forefront of developing a cooperative assessment framework for NRDA, in which the government and RPs work together to share data and approaches with the intention of avoiding litigation and moving more rapidly and efficiently toward restoration of the resource.

State-Lead Sites

Many states have established their own procedures for evaluating ecological risk under state-lead cleanup programs. Examples of states with guidance for ERA include New York, Massachusetts, Oregon, New Jersey, Texas, California, and others. Each state is unique in the way ERAs and NRDs are handled, and the use of ERA information in the NRD process varies from state to state.

Some state environmental agencies are in the position of being responsible for both the cleanup as well as being trustees for natural resources of the state. For example, in New Jersey the Office of Natural Resource Restoration administers NRD activities within the Department of Environmental Protection (NJDEP), which is responsible for oversight or direct involvement in cleanups. As a result, in New Jersey, the recent promulgation of NJDEP Policy 2003-07 has generated notable interest in how ecological injury is established. In practice, the ERA process required under New Jersey's site remediation program is also being used by the State as a trigger for NRD, in part as an attempt to streamline the process and to avoid lengthy and costly assessments.

Because financial and technical resources are limited at the state agency level, few states are able to conduct or oversee extensive ecological risk or injury assessments to support natural resource damage claims. A recent comprehensive review of state NRD programs is provided by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) in a report titled *Cooperation in the Natural Resource Damages Process: Initiation, Assessment, and Restoration*.

Conclusion

In summary, ecological risk assessments have been performed at many contaminated sites throughout the United States, following procedures that vary somewhat regionally but which are generally consistent with the framework provided by USEPA in ERAGS. By contrast, full-scale NRDAs have been performed at only a few high profile sites where the stakes warrant extensive, in-depth evaluation. The ERA is an opportunity for early involvement by natural resource trustees to evaluate the presence and magnitude of ecological injury that could provide for compensation through the NRDA process. Although ERAs and NRDAs are not equivalent, they focus on many of the same issues that relate to the remediation and restoration of ecological injury. An understanding of the processes and how they are interrelated is essential in developing comprehensive strategies for site remediation that comply with the full scope of federal and state laws protecting natural resources.

LETTING SLEEPING DOGS LIE

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Let sleeping dogs lie. – Old English Proverb
The New Dictionary of Cultural Literacy, Third Edition. 2002.

Cry "Havoc," and let slip the dogs of war.
Julius Cæsar. Act iii. Sc. 1.

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Introduction

Those regularly involved in the Superfund process are aware that at the majority of Superfund sites – probably the vast majority – the issue of a natural resource damage ("NRD") claim never arises. Undoubtedly, there are certain Superfund sites that are more obvious candidates for NRD claims than others, for example, sites that encompass a wetland or a navigable waterway, especially one fished by the public. Nevertheless, these Superfund sites are the exception rather than the rule. Therefore, when a typical potentially responsible party ("PRP") receives a Special Notice Letter informing it of possible liability at a Superfund site, the PRP should know that the odds are in its favor that there will not be a future notice for an NRD claim. Despite this fact, on more than one occasion PRPs have taken these odds and unintentionally turned them dramatically against themselves. This "reversal of fortune" occurs because PRPs are unaware of the distinct roles played by EPA and the various natural resource trustees at a Superfund site and the interaction among these roles. Ignorance of these roles sometimes leads PRPs to unwittingly provoke the natural resource trustees to bring NRD claims where the trustees where not initially planning to bring a claim. The purpose of this article is to explore the nature of these roles, their interactions and tensions, so that the PRP community can weigh these factors in their decision making process and, hopefully, avoid facing an NRD claim in a case where one would not normally be brought.

Legal Requirements

Section 122 of the Comprehensive Environmental Response, Compensation and Liability Act, as amended, ("CERCLA") provides that where EPA is conducting settlement negotiations regarding the release or threatened release of a hazardous substance (*e.g.*, negotiations arising from the issuance of a Special Notice Letter), and where such release may have resulted in damages to natural resources, the President shall notify the "Federal natural resource trustee of the negotiations and shall encourage the participation of such trustee in the negotiations." 42 U.S.C. §9622(j)(1). This statutory requirement is augmented by a provision of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP") that provides:

> If natural resources are or may be injured by the release, ensure that state and federal trustees of the affected natural resources have been notified in order that the trustees may initiate appropriate actions, including those identified in subpart G of this part. The lead agency shall seek to coordinate necessary assessments, evaluations, investigations, and planning with such state and federal trustees.

40 C.F.R. §300.430(b)(7).

In practice, EPA complies with these legal requirements by sending a letter to all the potential natural resource trustees, federal and state, prior to commencing any settlement negotiations pursuant to Section 122 of CERCLA. As noted above, unless there is an obvious natural resource significantly impacted at the site in question, the natural resource trustees, for example the Department of the Interior ("DOI"), will not get involved in the negotiations. If the natural resource trustees do not get involved initially, history suggests that they are unlikely to bring an NRD claim at the site in the future. The parties most likely to make the natural resource trustees reconsider their positions are the PRPs, and in most cases, the PRPs are completely unaware of this.

Post Record of Decision "Roles"

At a typical Superfund site with no obvious natural resources significantly impacted by the contamination at the site, EPA, perhaps the state, and the PRPs will probably negotiate a Remedial Design/Remedial Action ("RD/RA") Consent Decree that will provide for the clean up of the site. Alternatively, EPA will issue a unilateral order to the PRPs to perform the clean up. In either case, EPA will appoint a Remedial Project Manager ("RPM") to oversee the PRP clean up, and – hopefully -- at this point the relationship between EPA and the PRP group will become more cooperative. The RPM is not necessarily a technical expert. Rather the role of the RPM is to bring to bear, as needed, the technical expertise of the agency. Typically, an RPM will be supported by a government contractor, an in-house hydrogeologist, an in-house toxicologist, and a Biological Technical Assistance Group ("BTAG"). Unlike the in-house hydrogeologist and in-

house toxicologist, the BTAG members are usually not EPA employees but rather ecological experts loaned to EPA by other federal agencies, typically DOI. When acting in their role as BTAG members, these ecological experts do not wear their "trustee hats." Instead, they supply technical expertise to the RPM; however, BTAG's presence, as well as the presence of the state representatives, ensures that the natural resource trustees will be notified of activities at the site.

A good RPM (and in Region III we have some excellent RPMs) will synthesize all the comments and information supplied by the RPM's "team" and present it to the PRPs as a single consistent position. This can lull the PRPs into believing that EPA "speaks with one voice" on the matter and can mask internal debate and tensions that underlay the position. In fact, because the various members of the team have different technical perspectives and strengths, the RPM has probably performed a delicate balancing operation to obtain consensus among all team members. These different technical perspectives, however, can be very important in determining whether the natural resource trustees will eventually bring an NRD claim.

As noted above, most Superfund sites do not pose obvious significant impacts to natural resources. However, it is a rare Superfund site that has *no* impact or potential impact on *any* natural resource. Like everyone else in these times of tight budgets, the natural resource trustees have to husband their limited resources and focus their attention on the more significant impacts to natural resources, confident in the knowledge that minor impacts or potential impacts to natural resources will be adequately addressed by the Superfund remediation. Undermining a natural resource trustee's confidence in this matter can serve as the genesis of an unexpected NRD claim.

Alerting the Trustee

At a Superfund site where the Record of Decision ("ROD") has not specified restoration or remediation of a particular natural resource, the PRPs may approach the RD/RA assuming that there are no natural resource issues to consider. However, as the PRPs' design is reviewed by the RPM's team, BTAG members may spot some minor natural resource issues that were not evident during the Remedial Investigation/Feasibility Study ("RI/FS"). Often BTAG simply wants some additional delineation to ensure that a natural resource is not impacted by the site contamination. Other times BTAG may want a modification or augmentation of the RA to protect a natural resource. When the RPM forwards these comments to the PRPs, the PRPs may resist the comments on the grounds that neither the ROD, nor the Consent Decree requires the work requested by the comments. The PRPs may be perfectly within their rights, and, if so, the RPM will have to tell BTAG as much, but the PRPs have unwittingly set up an escalation of the NRD issue.

If BTAG (or the state trustee) believes that the RD/RA will not adequately address their concerns regarding protection of natural resources, they will take off their "consultant hat" and put on their "trustee hat." In the case of federal natural resource, BTAG will inform the federal trustee that – despite their prior assumptions to the contrary – the RD/RA may not be protective of a natural resource, and that the only way to ensure the protection of this natural resource is to undertake the full panoply of activities set forth at 40 C.F.R. §400.600 *et seq.* The end result is that the PRPs may suddenly find themselves faced with an NRD claim. The PRPs may feel like

they have been hit from "out of the blue," because they were completely unaware of the dynamics among the various parties. Moreover, depending upon the nature of the work requested by BTAG, the PRPs may have been willing to have voluntarily performed the requested activities rather than face a full blown NRD claim.

How Best to Let Sleeping Dogs Lie

Communication is one of the keys to avoiding waking the "sleeping dog." When an RPM provides PRPs with feedback which includes requests for ecological activities that the PRPs believe are beyond the scope of the ROD and/or Consent Decree, the PRPs would be well advised to ask the RPM to meet and discuss the disputed feedback. The PRPs should explore the basis for the disputed comments. The RPM may be reluctant to attribute the comments to the ecological experts or appear to disavow the comments, because the RPM fears that the PRPs are trying to divide and conquer; however, if the PRPs have a good working relationship with the RPM, then all the parties should be able to have a candid discussion regarding the interests of the PRPs, the EPA and the natural resource trustees.

The PRPs should try to determine from these discussions whether the impetus behind the disputed comments is a "trustee issue" rather than a "ROD issue." This is not to imply that the PRPs should be obligated to perform work that goes beyond the terms of the ROD and/or their Consent Decree. If, however, the PRPs understand the concerns of the natural resource trustee and the potential implications of not addressing those concerns, the PRPs can perform their own cost-benefit analysis, guided by enlightened self interest. Perhaps the work requested by the natural resource trustee is not particularly significant; perhaps the PRPs can explore other ways of addressing the natural resource trustee's concerns; perhaps there are some "win-win" scenarios available that will take advantages of synergies arising from the interaction of the RD/RA and the natural resource trustee's concerns. Ultimately, the PRPs may decide not to address the natural resource trustee's concerns, and the trustee will have take whatever action it deems appropriate, but at least the PRPs will have made a calculated decision and will not be surprised if the natural resource trustee initiates an action.

Conclusion

Some Superfund sites are obvious candidates for NRD claims, and the natural resource trustees will naturally wish to concentrate their enforcement resources at these sites which pose a significant threat to an important natural resource. At many other sites, however, the natural resource trustees may be comfortable that the RD/RA process will adequately address any minor impact or minor potential impact that may result to a natural resource from the Superfund site. It is at these sites that the PRPs may wake the "sleeping dog," not intentionally, but because of an unawareness of the relationships and dynamics among EPA, BTAG, and the natural resource trustees. By understanding these relationships and maintaining open lines of communication, PRPs may able to avoid provoking an NRD claim at a site where it would not otherwise arise.

Assessing the Sources of Contaminants for Remediation Planning and for NRDA

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Identifying the sources of contaminants is a critical component of natural resource damage assessment, as well as remediation planning. Thirty years ago, this was, in general, relatively easy: ongoing discharges needed to be stopped. Now, nonpoint contaminant sources are often dominant, and individual source contributions to impaired resources are at times not easy to pin down. Nonpoint sources to aquatic ecosystems may include contaminants washing down from the watershed and from upstream reaches of a river, contaminants slowly released from sediments, or contaminants leached from groundwater. Any of these sources may contribute chemicals that subsequently make their way into natural resources such as fish, birds and mammals.

Remedial Investigations

Accurate source assessments are necessary for effective management planning. In this context, it is important to distinguish proximate from ultimate sources. For example, the contaminated waters of a stream may be the proximate source of contaminant in the food web: algae absorb the contaminant from the water, are eaten by snails, which in turn are eaten by fish, which in turn are eaten by small mammals. The water-borne contaminant may originate in part from the sediments, and thus it may seem reasonable to remediate sediments, perhaps by removal or capping. However, if an ongoing groundwater discharge from, say, a nearby landfill continues to recontaminate the sediments of a creek, then sediment removal will be at best a temporary solution.

Source assessments must take into account the fact that relatively small releases may have dramatic impacts on contaminant levels up the food chain. This is due to bioaccumulation. Hydrophobic compounds such as PCBs, DDT and mercury bioaccumulate, which means that the concentration of these compounds increases with each link the food web. In aquatic ecosystems, the highest concentrations of these compounds are found, for example, not in the worms, insects and other invertebrates which actually consume the contaminated sediments or take up the contaminant from the water, but in the birds and mammals that consume fish that consume the small organisms at the base of the food web. Very small concentrations in water (e.g. 1 part per trillion), may result in relatively high concentrations in fish-eating wildlife (e.g. 20 parts per million).

One of the challenges in evaluating contaminant sources is the distinction between "new" and "old" sources. For example, in aquatic systems, ongoing (or "new") sources are sometimes discounted, because permitted releases have long-since stopped. However, residual land-based contamination may still be present, resulting in the leaching of contaminants from groundwater. For example, in Lavaca Bay, Texas, mercury contamination in fish was initially thought to originate from the surface sediments of the bay. Upon further evaluation, however, it was discovered that a significant amount of mercury was continually being added to the bay from groundwater sources.

In many locations, "new" mercury enters water bodies each year as a result of atmospheric deposition to their watersheds. Effective strategies to reduce mercury levels in fish depend on the importance of this "new" mercury as compared to the "old" mercury stored in watershed soils and receiving water sediments as a result of past discharges from point and non-point sources. Overall, the relative importance of "old" and "new" mercury depends on the ability of mercury from each source to be methylated and thus to provide a direct source of methyl mercury to the biota. Sorting out the roles of "new" and "old" mercury is also a critical component of TMDL development.

Natural Resource Damage Assessment

The parallel issue in NRDA is pathway determination: establishing a causative link between a putative source and the damaged resource. For example, in the Montrose NRDA, a key contention between the trustees and the responsible parties was the source of PCBs and DDE found in the fish, mammals and birds of the Southern California Bight. (DDE is a breakdown product of DDT. It is the dominant form present in the marine environment of the Southern California Bight.) The trustees asserted that a region of contaminated sediments underlying the coastal waters off Los Angeles was the dominant source of DDE to the biological community. The DDE in these sediments came primarily from the Los Angeles County Sanitation District (LACSD) outfall, through which Montrose waste had been discharged in the past. The responsible parties asserted that runoff from agricultural lands in the watershed was a primary source of DDE to the coastal waters.

Neither source involved an ongoing point source discharge, and estimating the contribution of each source was a difficult task. In this case, a key piece of information was the evaluation of spatial gradients in contaminant concentrations in the coastal waters. A weight-of-evidence analysis based upon measurements in sediments, mussels and fish indicated that there was only one clearly observable source for DDE, the sediments near the LACSD outfall (Figure 1). In contrast, multiple sources of PCBs along the coast probably contributed to PCB contamination in the fish, birds and mammals.

How Are Sources Assessed?

Sometimes, the identification of the primary source is obvious. Sometimes, there is no silver bullet, nothing with the power of a DNA test to establish the identity of the source. Under these circumstances, a weight-of-evidence approach is called for. Lines of evidence may include fingerprinting, spatial gradients, temporal trends, and mass balance modeling.

Fingerprinting

Fingerprinting can be performed when the particular mix of chemicals differs in each presumed source. For example, PCBs are actually a mixture of up to 209 individual molecules, differing in the number and arrangement of chlorine atoms attached to the carbon skeleton. Various PCB mixtures were produced in the past, each meant for different industrial applications. Thus, to the extent that different presumed sources used different mixtures, fingerprinting may provide a basis for assessing source contributions.

When using chemical signatures to fingerprint sources, it is critical to account for differences between chemicals in their physical properties. For example, the ratio of the concentrations of two chemicals might be used as a signature to identify a source. Say, for example, the ratios of chemicals A and B are 10:1 in source #1 and 1:1 in source #2. A ratio of 1:1 observed in fish might be used as evidence that source #2 is the dominant source. However, if the two chemicals differ in their weathering properties, this may not be true. For example, if chemical A weathers very quickly compared with chemical B, then releases from source #1 (in a 10:1 ratio) may result in the observed 1:1 ratio in fish. Thus, fingerprints may give a false impression of sources, if fate and transport processes are not considered.

Gradient evaluation

Spatial gradients in chemical concentrations can provide strong evidence for sources. The most obvious example would be the presence of the chemical in a stream, starting just downstream of the outfall from the presumed source. In some cases, multiple types of data are available to develop a convincing case. DDE and PCBs in the Southern California Bight, described above, provide a good example in which evidence included chemical analyses in sediments, mussels and fish.

As for fingerprinting, when evaluating gradients, it is important to consider chemical fate and transport. For example, hydrophobic chemicals such as PCBs, DDE and mercury preferentially sorb to organic carbon in the sediment, so for source evaluation, it is important to consider the carbon content of the sediment. Two samples may differ in PCB concentration solely because of differences in carbon content, independent of any source influences. Thus, one might reach the wrong conclusion without considering chemical fate processes.

Trend analysis

Often, contaminant concentrations in the environment decline in the absence of intervention. In the field of contaminated sediments, this is known as natural recovery; in groundwater, it is called natural attenuation. A decline in source strength over time may provide useful information. For example, the observation that the contaminant levels in a resource decline at a rate similar to one presumed source and not another provides evidence of the importance of the first source.

Relative source contributions may change over time, resulting in changing trends. For example, as a local source of contaminant is remediated or recovers naturally, its importance declines relative to background sources. This means that the long-term benefits of remediation depend on how soon background sources will begin to dominate. Dynamic modeling can be used to project future trends.

Mass balance modeling

Mass balance modeling is a powerful tool that relies on the quantitative assessment of the strengths of each source and sink. In such an analysis, the mass of contaminant originating from each source and the mass of contaminant lost from the system to each sink is quantified, in units, for example, of kg/yr. In an aquatic system, sources may include flow from upstream, flow from groundwater, and atmospheric deposition. Sinks may include volatilization into the air, flow downstream in a river, and burial in the sediment bed. Mass balance analyses are by their nature comprehensive, that is, all major sources and sinks must be quantified, so that, in the end, the sum of the sources equals the sum of the sinks. The comprehensive nature of mass balance modeling is its strength, because it provides a check on each individual source and sink. If sources do not equal sinks, then there is an error somewhere, and at least one source or sink assessment is wrong.

Mass balance analyses may be static or dynamic. Static, or steady state, analyses involve estimating a single value for each source and sink and then summing them. Trends over time are not considered. Dynamic analyses incorporate variation over time, and may include day-to-day, seasonal, and year-to-year trends and cycles. Dynamic mass balance analyses are performed using computer models. These models provide not only source evaluations, but the ability to project the impacts of alternative remediation actions into the future. For NRDA, mass balance models can support pathway determination and can provide estimates of the future impacts of restoration activities, as well as estimates of future residual injury.

Uncertainty is the key concern associated with mass balance modeling and is typically addressed with a combination of qualitative and quantitative tools, including sensitivity analyses, quantitative uncertainty analyses, and peer review (USEPA 2003. Draft Guidance on the Development, Evaluation, and Application of Regulatory Environmental Models. http://cfpub.epa.gov/crem/whatsnew.cfm).

Summary

One of the most difficult challenges associated with remedial investigations and with NRDA can be the identification of the ultimate sources of contaminants. Incorrectly identifying sources can lead to ineffective cleanups and inappropriate NRD assessments. Sometimes, the source is obvious. When the answer is not obvious, there are several techniques available to evaluate contaminant sources, and for difficult sites, a weight-of-evidence approach is usually appropriate, including the evaluation of chemical fingerprints, spatial gradients, temporal trends, and mass balance modeling.

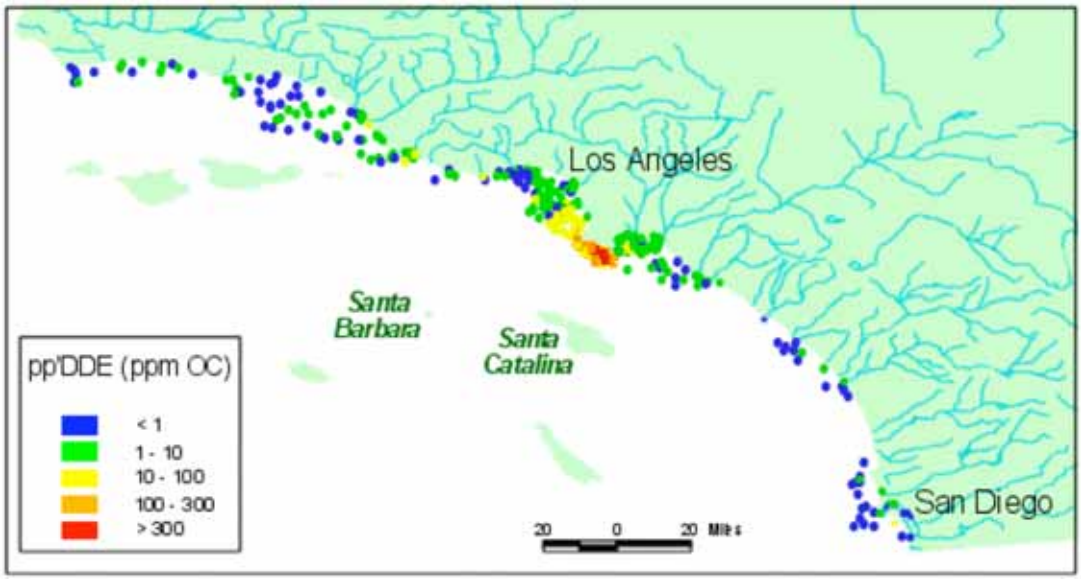

Figure 1. DDE concentration in sediments of the Southern California Bight (normalized to organic carbon content). This figure shows one clear peak in sediment DDE concentrations centered around the LACSD outfall.

An Overview of the Newsletter

Ira Gottlieb, Committee Vice-Chair,
Editor, Superfund and Natural Resource Damages
Litigation Committee Newsletter

This issue of the Committee's Newsletter presents a series of articles that focus on technical issues, the interrelationship of EPA programs and the Agency's interactions with federal and state trustees, as well as other legal issues of concern for NRD practitioners. In an effort to present a wide range of viewpoints, the articles in this issue come from authors who are technical consultants, a USEPA Senior Assistant Regional Counsel, a distinguished professor and members of the private bar.

In a nutshell, the Newsletter's articles briefly examine the interrelationship between the remedial and restoration processes for ecological resources. For example, one article addresses how government agencies determine risks to ecological resources, while another article explores the interactions and tensions between the competing administrative processes for CERCLA remediation and NRD assessment. Another article provides a brief comment on the credibility of groundwater valuation methodologies that may be used in litigation by considering the validity of those methodologies in light of the *Daubert* standards. This issue also contains an article that presents an interesting perspective on sourcing of contaminants for both remedial and NRD purposes. On a different note, the Newsletter concludes with articles concerning insurance coverage for NRD and a summary of a New Jersey Superior Court Judge's recent opinion in a trade association challenge to New Jersey's aggressive groundwater NRD efforts.

While the issues raised in this Newsletter might easily be the subjects of much longer articles, and perhaps even book chapters, we hope that their brief discussions will be interesting and useful to members of the Committee, the Section and the bar as a whole. As a Vice-Chair of the Committee and Editor of the Newsletter, I welcome your thoughts and comments, as well as suggestions for future issues. Please feel free to contact me by email: igottlieb@mccarter.com.

COOPERATIVE ASSESSMENT PROJECT (CAP)
FRAMEWORK

October 2003

Introduction

This document provides a framework[1] for conducting cooperative Natural Resource Damage Assessments as envisioned under the Cooperative Assessment Project (CAP). As with similar efforts, CAP is intended to further promote cooperative damage assessments by, among other means, allowing for greater participation between natural resource trustees (Trustees) and Potentially Responsible Parties (PRPs) and encouraging the use of more streamlined and innovative approaches to settle damage assessment liability and restore natural resources.

Recognizing that cooperation is not always possible, there nevertheless are sites and circumstances where cooperation could prove useful. The focus of this framework is on potential damage assessments where cooperation is viable, appropriate, and beneficial.

The CAP framework is consistent with and does not modify in any way current regulations governing the conduct of natural resource damage assessments. The commitment to a restoration-based approach that includes determination of injury, quantification of loss, and evaluation of restoration alternatives is still relevant and critical to the conduct of cooperative damage assessments.

CAP is not intended to compromise the authority or responsibility of either the Trustees or response agencies. Nor is CAP designed to complicate the relationship between PRPs and response agencies, or to slow the response process. Instead, CAP hopes to help optimize the integration of response and natural resource restoration needs without jeopardizing agency responsibilities.

This framework outlines the concept and scope for conducting cooperative natural resource damage assessments. A compendium entitled “Cooperative Assessment Project (CAP), Compendium of Additional Ideas and Example Documents” provides further insight on potential ways to conduct a cooperative damage assessments. It is hoped that these two documents will be used by damage assessment practitioners in government and industry to

[1] This framework reflects concepts and suggestions submitted by a stakeholder work group formed in January 2002 to facilitate cooperative natural resource damage assessments. The content of this framework should not be understood as an endorsement by the stakeholder work group *per se*. Instead, based on the substantial background and experience of the stakeholder work group, the framework should serve as a construct that will help guide cooperative damage assessments to successful outcomes.

seek prompt settlement of damage assessment liability and restoration of natural resources in cooperative contexts.

Potential Incentives

There are potentially numerous and varied incentives for conducting cooperative natural resource damage assessments. Regardless the type of incentive or reason for participation, the clear benefit in a cooperative process is that parties are motivated to resolve their respective concerns.

For PRPs, participation in a cooperative damage assessment may include: reducing transaction costs and time commitments by PRP staff and contractors; resolving liability and reaching closure in a timely fashion; investing in restoration rather than potential legal preparation; enhancing predictability and certainty relative to the objectives, scope, outcome, timing, and budget of an effort; receiving positive recognition from the Trustees and the public; and strengthening relations among all stakeholders.

For Trustees, many of the PRP incentives also apply. However, Trustees may further benefit by: restoring contaminated sites that might not otherwise be addressed or be addressed more slowly; and receiving PRP funding upfront or through timely reimbursement to participate in a cooperative damage assessment.

For non-government organizations, providing an opportunity for early and continued public involvement represents an incentive for their commitment in a cooperative damage assessment effort. When successful, cooperative damage assessments should also allow Trustees to increase program outputs in the form of restoration by reducing the expenditure of resource on litigation and other adversarial processes. Thus, the public benefits from the accomplishment of more restoration.

CAP Efforts

CAP evolved with dual efforts in mind. The first effort includes the formation of an ongoing stakeholder work group with representatives from industry, response agencies, environmental interest groups, and tribal, state and Federal natural resources Trustees (see http://www.darp.noaa.gov/cap.htm for further information on CAP). The CAP stakeholder work group provides input on the CAP effort, including how best to conduct outreach. CAP is intended to serve as a clearinghouse for the collection and dissemination of lessons learned about innovative damage assessment approaches. The stakeholder work group also serves as a liaison to their respective stakeholder communities on CAP efforts. The CAP stakeholder work group will not direct or participate in a cooperative assessment site, unless explicitly requested to do so by the parties engaged in that project. The second CAP effort focuses on identifying and encouraging cooperative damage

assessments so that lessons learned can be shared among government and industry practitioners.

Potential Cooperative Assessment Projects[2]

Cooperative natural resource damage assessments can be appropriate in many circumstances. The greatest need and opportunity for cooperation, however, are for sites affected by chronic hazardous substances or oil contamination. Focusing on chronic conditions allows more time to create partnerships and develop cooperative approaches than would be allowed by the typical catastrophic spill, and provides opportunities to integrate response and restoration actions. Cooperative assessment opportunities may exist where there is a potential damage assessment liability under CERCLA (National Priority List (NPL) and non-NPL sites), OPA, Resource Conservation or Recovery Act, or other appropriate regimes - be they Federal- or state-lead sites.

Cooperative damage assessment projects are also likely where Trustees have jurisdictional authority, where affected parties are willing and capable to commit to the project, and where injuries to natural resources and their services are sufficient for affected parties to engage in the project. The scope of cooperation, however, should not be constrained by complexities related to the nature of contamination, parties involved, or other factors. Cooperative projects may be contemplated where:

- Cleanup is planned or underway such that Trustees and response agencies can integrate their respective efforts;
- Response agencies have decided on a response, or concluded response actions; or
- Response agencies will not be involved, but PRPs are willing to address restoration while mitigating response concerns.

In all the above circumstances, the Trustees need to consult with the appropriate response agencies to address any response issues up front. In the last circumstance where response agencies decide not to be involved in a cooperative project, the Trustees need to keep the response agencies apprised of the cooperative project if initiated.

Suggestions for Getting Started on a Cooperative Assessment Project

To achieve success, a cooperative natural resource damage assessment must be balanced by ground rules that define the assessment process yet allow for sufficient flexibility to save time and money, and to adapt to changes in project circumstances. This section is intended to provide some

[2] In this context, the term “project” refers to the entire damage assessment and restoration process; not necessarily to a unique component of the process.

fundamental concepts for parties considering a cooperative assessment project prior to engaging in that project. These concepts are organized according to the general sequence of events that may be expected for cooperative assessment projects as pictured under CAP.

Proposing a Cooperative Assessment Project

When a cooperative assessment project is proposed, it is the responsibility of the potentially affected Trustees to determine whether the project fulfills the project criteria. As stated previously, the Trustees need to determine the appropriateness of the project against criteria that address jurisdictional authority, willingness and capability to commit to the project, and degree and scope of injuries to natural resources and their services.

Ideally, all Trustees that have jurisdictional authority would be at the table and agree on a common approach to the project. However, where certain Trustees support but decide not to participate in a project, they need to be kept informed on project activities by the participating Trustees. Reasons that Trustees may not wish to participate in a project may include the nature and extent of injury does not justify their participation, the injured resources that are under their jurisdiction need to be adequately addressed by other participating Trustees, or the resources necessary to devote to the project may not be available. Non-participating Trustees can join in a settlement or enter a project effort prior to settlement as long as prior decisions made by the participating Trustees will not be revisited without new and substantive information.

PRPs should have the opportunity to fully participate in a cooperative assessment project, e.g., plan and implement restoration projects. Where PRPs wish to participate in a project, Trustees and PRPs should address statute of limitations issues, and particularly, evaluate whether a tolling agreement is appropriate.

Sites with multiple PRPs present additional complications and challenges, e.g., some PRPs may not want to work cooperatively with the Trustees. For such sites, Trustees and PRPs should evaluate if and when a natural resource damage assessment following the concepts outlined here would proceed.

According to Federal law, PRPs are responsible for paying reasonable costs incurred by Trustees in conducting a natural resource damage assessment. Payment of these costs should be discussed at the outset of a cooperative assessment project. In many instances, Trustees need to seek payment of costs in advance on a periodic basis, with cost documentation submitted to the PRP before approval of a subsequent cost request. In addition, PRPs will often be asked to pay for scientific studies and expert consultants needed to support the project. Funds for these purposes may be provided to the Trustees on a project-by-project basis.

Agreements on the cooperative assessment project process, protections, funding, and other mutual arrangements should be reached at the outset of a project. Such agreements may be formal or informal and may also address project-specific concerns collectively or individually as circumstances warrant.

Prior to accepting a cooperative assessment project, Trustees and PRPs need to also coordinate with response agencies (Federal and/or state) to ensure that proposed actions do not interfere with or duplicate planned or on-going response actions. Where response actions are planned or on-going at a proposed project, Trustees and PRPs need to work with response agencies to determine how to optimally integrate proposed project actions with response actions as early as possible. For example, the parties should consider how best to: gather and share response and damage assessment data in a cost-effective manner; conduct response and damage assessment investigations for the benefit of all parties; and provide advice on potential liabilities associated with various response and damage assessment options. Where response actions are not planned or on-going at a proposed project, Trustees and PRPs need to determine how best to apprise the response agencies about the progress of the cooperative assessment project and how best to address possible cleanup concerns in the absence of a response action by the response agencies.

Conducting Cooperative Assessment Projects

Trustees involved in a cooperative assessment project are accountable to the public for the conduct and outcome of the project. While PRPs should be encouraged to conduct injury assessment and restoration planning as appropriate, Trustees cannot forgo their responsibility to approve and oversee damage assessment actions taken on the part of PRPs.

Trustees and PRPs need to jointly take responsibility for the sharing of public information. The Trustees and the PRPs also need to ensure compliance with applicable Federal and state laws.

The success of cooperative natural resource damage assessments may be attributed to a number of characteristics that have evolved among Trustees and PRPs in addressing cases. These characteristics are listed as follows and are incorporated in this framework.

- Coordinate between the Trustees
  - All Trustees are at the table
  - Trustees agree on a common approach
- PRPs are invited to fully participate
- Communicate with the public
- Commit to a Cooperative Restoration-Based Approach

    - Negotiate a restoration-based settlement with a focus on in-kind restoration
    - Consider site-specific agreements that address process, protection, and funding (alternatively, consider existing umbrella agreements where possible)
- Integrate Restoration Concerns Early into the Response Process
    - Consider cost-effective data collection and sharing using
        - Response-related data, e.g., remedial investigation, ecological risk assessment, etc.
        - Literature benchmarks
        - Site studies as needed
        - Stipulations
    - Provide advice on damage assessment liability associated with various response options

As previously stated, critical to the success of cooperative assessment projects is a flexible process that will allow for refinements, iteration, and the ability to address scientific and technical uncertainties in a matter that protects the public interest in natural resources. Consequently, the parties need to balance the use of reasonable, protective assumptions against the need to conduct additional studies.

The parties need to collect or share information relevant to the project, and have the opportunity to participate in or oversee planned project activities. When considering additional studies, the parties need to address the necessity and relevance of such efforts.

In lieu of conducting additional studies, the parties may agree to stipulations. Stipulations may include agreements by the parties concerning the disposition of some relevant point, and may be easily documented through technical or general memoranda. These stipulations may serve as the basis for decisionmaking and need not be reconsidered except where justified by new, substantive information.

The parties need to document information considered in making decisions for the project. This information needs to be reasonably available and accessible to the public in some form of public record, subject to privileged or confidentiality information that would ordinarily be protected even outside of the context. Trustees are responsible for establishing and maintaining this public record. As part of the public record, the parties need to provide the restoration plan for public review, which serves as the basis for resolving the project.

If disagreements arise during the conduct of a cooperative damage assessment, the parties should have a prearranged method for resolving such disagreements without unduly disrupting the continuation of the

assessment.

Ending Cooperative Assessment Projects

Upon completion of a natural resource damage assessment, the PRPs may be allowed to implement the selected restoration alternative as identified in the restoration plan. Where appropriate, PRPs should be encouraged to implement the selected restoration alternative.

Either the Trustees or the PRPs should have the opportunity to withdraw from a cooperative assessment project at any time, for any reason. Any information developed up to that point may be used by any party for any purpose. The Trustees may pursue a natural resource damage assessment under the existing regulations, and the PRPs would be free to engage that process using any strategy that they might select.

In cases where the PRPs have agreed to pay Trustee costs as they are incurred, upon termination of the project, the PRPs should be required to compensate Trustees for all costs up until the point the project is terminated.

MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

Among:

U.S. Department of Interior
(Fish and Wildlife Service)
(Bureau of Land Management)
(Bureau of Reclamation)

ASARCO Incorporated

U.S. Environmental Protection Agency

Resurrection Mining Company

Newmont Mining Corporation

State of Colorado
(Department of Natural Resources)
(Department of Public Health and Environment)
(Office Of The Attorney General)

Res-ASARCO Joint Venture

March 1999

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MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

This Memorandum of Understanding ("MOU") is entered into as of the Effective Date (as defined in paragraph 7(j) below), by and among the United States (by and on behalf of, the United States Department of the Interior ("DOI") and the United States Environmental Protection Agency ("EPA")); the State of Colorado (by and on behalf of the Colorado Department of Public Health and Environment, the Colorado Department of Natural Resources, and the Colorado Office of the Attorney General (collectively "the State")); Resurrection Mining Company and Newmont Mining Corporation (collectively "Resurrection"); ASARCO Incorporated ("ASARCO"); and the Res-ASARCO Joint Venture as an expression of their mutual good faith and interest in evaluating and, as appropriate, conducting restoration in the Upper Arkansas River Basin and response activities in the Eleven-Mile Reach. The United States, the State, ASARCO, Resurrection and the Joint Venture are herein referred to individually as a "Party" and collectively as the "Parties." ASARCO, Resurrection, and the Res-ASARCO Joint Venture are collectively herein referred to as "the Mining Companies." DOI and the State are herein referred to collectively as the "Trustees." For the purposes of this MOU, "restoration" includes restoration, replacement, or acquisition of the equivalent of injured natural resources.

For purposes of this MOU, the "Upper Arkansas River Basin" is defined as the portion of the Arkansas River from its headwaters downstream to and including Pueblo Reservoir. The "Eleven-Mile Reach" is defined as the 500 year floodplain portion of the Upper Arkansas River Basin beginning at the confluence of the Arkansas River and California Gulch and extending downstream for approximately 11 miles.

PURPOSE

This MOU is intended to facilitate:

1. the identification and restoration of injured natural resources in the Upper Arkansas River Basin;

2. cooperation between the Trustees and EPA and coordination of EPA's potential response actions and the Trustees' potential restoration efforts in the Eleven-Mile Reach;

3. the settlement of claims among the Parties, if any, including:

a. claims by the Trustees for natural resource damages in the Upper Arkansas River Basin;

b. claims by EPA under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), the Resource Conservation and Recovery Act ("RCRA"), and the Clean Water Act ("CWA") concerning the Eleven-Mile Reach; and

c. claims by the State under CERCLA, RCRA, CWA, or State counterpart statutes concerning the Upper Arkansas River Basin.

BACKGROUND

A. DOI and the Department of Agriculture ("USDA") have been designated as Federal trustees for natural resources pursuant to CERCLA and Executive Order No. 12580. DOI and USDA are concerned that natural resources within their trusteeship may have been injured in the Upper Arkansas River Basin due to releases of hazardous substances resulting from mining-related and other activities in and around Leadville, Colorado.

B. The Colorado Attorney General and the respective Executive Directors of the Colorado Department of Public Health and Environment and the Colorado Department of Natural Resources have been designated as the State trustees for natural resources.

C. EPA has been delegated authority to respond, consistent with the National Contingency Plan ("NCP") and as necessary to protect human health and welfare and the environment, to the release or threat of release of any hazardous substance into the environment.

D. The Mining Companies, along with various other individuals and entities, including but not limited to Hecla Mining Company, Denver & Rio Grande Western Railroad Company, and the United States, allegedly have been involved in mining or mining-related activities in and around Leadville, Colorado. Those historic activities may have contributed to the deposition of mining-related wastes within the Upper Arkansas River Basin from which there may have been releases or threats of releases of hazardous substances.

E. The Mining Companies assert that, to the extent they are liable for any natural resource damages or for response actions or response costs in the Upper Arkansas River Basin, such liability is limited.

F. The Trustees and the Mining Companies desire to reach a settlement of claims, if any, that the Trustees may have or could assert against the Mining Companies for natural resource damages in the Upper Arkansas River Basin.

G. EPA and the Mining Companies desire to reach a settlement of all CERCLA, RCRA, and CWA claims, if any, that the United States may have or could assert against the Mining Companies for response actions or response costs arising from or relating to the Eleven-Mile Reach.

H. The State and the Mining Companies desire to reach a settlement of all CERCLA, RCRA, and CWA or State counterpart statutory claims, if any, that the State has or may have against the Mining Companies arising from or relating to the Upper Arkansas River Basin.

I. The Parties are willing to participate in a voluntary, cooperative effort as described in this MOU so long as no party is prejudiced if a settlement of claims is not achieved.

J. The Parties are aware of the interest of private land owners and the public with regard to possible injuries to and restoration of natural resources within the Upper Arkansas River Basin and with regard to the removal or remediation of hazardous substances within the Eleven-Mile

Reach. The Parties intend to coordinate activities with such property owners and other interested persons or entities.

AGREEMENT

1. Negotiations

a. The Parties will enter into settlement negotiations intended to fully resolve the liability, if any, that the Mining Companies may have pursuant to CERCLA, RCRA, or CWA for natural resource damages, response costs, or other matters or actions relating to the release or threat of release of mining-related hazardous substances concerning the Upper Arkansas River Basin; provided, however, that EPA's participation in the negotiations will be limited to the Eleven-Mile Reach.

b. The Parties agree that such negotiations will be mediated by a neutral third party acceptable to all Parties. The United States, State, Resurrection, and ASARCO will share equally (1/4 paid by each Party) the fees and expenses of the mediator. Within sixty days after entering into this MOU, the Parties will develop a plan and schedule for negotiations.

c. These settlement negotiations shall be confidential in accordance with applicable law. Any settlement of claims will be incorporated into a consent decree or administrative order, as appropriate, and made available for public notice and comment.

2. Study of the Eleven-Mile Reach

a. The Parties will select a mutually acceptable team of expert consultants (the "Consulting Team") whose primary purpose shall be to inform the settlement process by evaluating possible impacts on natural resources within the Eleven-Mile Reach resulting from the release of hazardous substances relating to past mining-related activities in and around Leadville, Colorado. In addition, the Consulting Team will develop alternatives for addressing any identified impacts within the Eleven-Mile Reach, including the

identification of specific restoration projects or actions, and will undertake other activities as directed by the Parties.

b. In evaluating and identifying appropriate restoration actions for the Eleven-Mile Reach, the Consulting Team will consider the results of investigations currently being conducted on behalf of EPA concerning the chemical and physical properties of the tailing and sediment deposits in, and the geomorphology of, the Eleven-Mile Reach. The Consulting Team also will consider all other pertinent available information. In developing restoration alternatives, the Consulting Team shall consider ongoing and proposed removal and remedial activities that are being conducted or will be conducted by the Mining Companies, the United States, and others on the California Gulch NPL site.

c. The Consulting Team will consist of no more than six individuals with scientific expertise in disciplines relevant to natural resources injury determination and restoration. Those areas of expertise should include but not necessarily be limited to: terrestrial biology, toxicology, aquatic biology/water quality, fluvial geomorphology, and habitat restoration/revegetation. Members of the Consulting Team shall be mutually agreeable to all of the Parties and shall include one member of DOI's technical staff.

d. The work of the Consulting Team will be guided by a work plan("Work Plan")developed by mutual agreement of the Parties. The Work Plan shall establish guidelines for the functioning of the Consulting Team and its interaction with the Parties and will be designed to ensure appropriate oversight, guidance, and management by the Parties without compromising the scientific independence and integrity of the Consulting Team.

e. The Trustees will retain all of their authorities to make decisions concerning assessment and restoration independent of the work done by the Consulting Team. Reports prepared by the Consulting Team will not be binding on any of the Parties, but may be used by any Party as part of the settlement negotiations.

f. Nothing in this MOU shall in any way restrict or limit the nature or scope of response actions that may be required by EPA or the State in exercising their respective authorities under Federal or State law.

g. Resurrection and ASARCO will pay all fees and expenses incurred by the Consulting Team, including DOI's technical staff member's salary and benefits, in performing tasks set forth in the Work Plan and any additional tasks deemed necessary by the Consulting Team and approved in writing by the Parties. All such costs must be incurred pursuant to and in accordance with a written budget approved in advance by the Parties. Budgets may be approved on a task by task basis. Resurrection and ASARCO shall be responsible for all contractual matters (for example, technical services agreements, billing, etc.) involving non-governmental members of the Consulting Team.

h. All funding contributed by the Mining Companies for work done by the Consulting Team to implement the Work Plan shall be considered assessment costs and shall be credited against the liability, if any, that the Mining Companies may have for natural resource damages, including assessment costs, in the Upper Arkansas River Basin. This provision shall survive the termination of this MOU.

3. <u>Downstream Survey</u>

a. The Trustees and the Mining Companies acknowledge that in order for the Mining Companies to fully resolve their liability, if any, for natural resource damages in the Upper Arkansas River Basin, additional information may be required regarding potential impacts to natural resources in the portion of the Upper Arkansas River Basin downstream from the Eleven-Mile Reach, to and including Pueblo Reservoir (the "Downstream Area"), caused by releases of hazardous substances from mining-related activities.

b. In order to evaluate potential liability and plan for appropriate restoration, if any, in the Downstream Area, the Trustees and the Mining Companies will direct the Consulting Team to conduct a literature review to determine

the nature and extent of available information regarding natural resources and associated impacts to natural resources in the Downstream Area. As part of its review the Consulting Team shall identify additional information that is necessary to evaluate impacts to natural resources and shall propose alternatives for the collection of such data.

c. Following completion of the literature review, the Trustees and the Mining Companies will determine whether additional information is needed and, if so, will develop a detailed study plan to collect such information. The plan will be implemented as directed by the Trustees and the Mining Companies.

d. The restoration planning process, if any, for the Downstream Area will be determined during settlement negotiations.

e. Funding for the collection of necessary additional information will be equally shared by DOI, ASARCO, and Resurrection (1/3 to be paid by each) and will be considered costs of assessment. All such costs must be incurred pursuant to and in accordance with a written budget approved in advance by the Parties. DOI's contribution will be based upon the availability of funding.

f. All funding contributed by the Mining Companies or the Trustees for work done in accordance with this section of the MOU shall be considered assessment costs. Funding contributed by the Mining Companies shall be credited against the liability, if any, that the Mining Companies may have for natural resource damages, including assessment costs, in the Upper Arkansas River Basin. This provision shall survive the termination of this MOU.

4. Airshed Survey

a. The Trustees and ASARCO acknowledge that in order to fully resolve ASARCO's liability, if any, for natural resource damages in the Upper Arkansas River Basin, additional information may be required regarding potential impacts to natural resources resulting from the release of hazardous substances through its smelter stack emissions and

subsequent deposition. The area of deposition shall be referred to as the "Airshed".

b. In order to evaluate liability and plan for restoration, the Trustees and ASARCO will direct the Consulting Team and/or other agreed upon individuals to conduct a literature review pertinent to the surrounding and potentially impacted Airshed. The purpose of the literature review is to determine the nature and extent of available information regarding natural resources and associated impacts to natural resources in the surrounding Airshed.

c. Following completion of the literature review, the Trustees and ASARCO will determine whether additional information is needed and, if so, will develop a detailed study plan to collect such information. The plan will be implemented as directed by the Trustees and ASARCO.

d. The restoration planning process, if any, for the Airshed will be determined during settlement negotiations.

e. Funding for the literature review and for the collection of necessary additional information will be provided by ASARCO according to a written budget approved by ASARCO and the Trustees, and will be considered costs of assessment.

f. All funding contributed by ASARCO for work done in accordance with this section of the MOU shall be considered assessment costs and shall be credited against the liability, if any, that ASARCO may have for natural resource damages, including assessment costs, in the Upper Arkansas River Basin. This provision shall survive the termination of this MOU.

5. Products, Budget, and Schedule

a. The Parties will seek to complete tasks according to the schedule set forth in Attachment A.

b. The Parties may, by mutual agreement, modify the tasks to be completed and the schedule or budget as reasonably necessary.

6. Coordination and Public Involvement

a. The Parties recognize that the public has interests in the restoration of natural resources throughout the Arkansas River Basin.

b. The Parties recognize that most of the land adjacent to the Arkansas River within the Eleven-Mile Reach is privately owned and permission to access those properties will be necessary to implement assessment, restoration, or response activities.

c. In order to serve the interests of the public, the Parties will establish a team to develop a public participation plan with input from landowners and other interested members of the public, including local elected officials. Before implementation of the Work Plan, the Parties will complete preparation of the public participation plan and seek appropriate public input.

d. Public comment will be sought on restoration plans prior to implementation. Applicable law may require additional public involvement.

e. The Parties will coordinate and sequence response actions and restoration projects for the Eleven-Mile Reach so as to optimize beneficial impacts to the environment and natural resources and to avoid duplicative, inconsistent, or counter-productive activities.

f. DOI and USDA-Forest Service, Rocky Mountain Region (USDA-Forest Service) have entered into a Memorandum of Agreement (MOA) (Attachment B). The MOA will provide for coordination between DOI and USDA-Forest Service on natural resource issues in the Upper Arkansas River Basin related to the implementation of this MOU.

7. Term and Effect of this MOU

a. This MOU is intended to facilitate settlement discussions among the Parties and to provide a basic framework for such discussions. The participation of the Parties in such discussions is purely voluntary in nature and cannot be compelled. Any Party may, in its sole discretion, withdraw from this MOU at any time, for any reason whatsoever, without liability, by first providing to the remaining Parties a written notice of its intention to withdraw from this MOU ("Notice of Withdrawal"). The Notice of Withdrawal shall include the date of the notice ("Notice Date") and a brief description of the reason the Party intends to withdraw from the MOU. The Notice of Withdrawal shall be sent by registered mail, certified mail, overnight carrier, or telefacsimile on the Notice Date to the contacts listed in Attachment C. Any Party may change its contact by first providing written notice to the other Parties. The Parties agree that during the thirty day period following the Notice Date they will seek to informally resolve any dispute that is the basis for the Notice of Withdrawal. Unless the Party that provided the Notice of Withdrawal withdraws such notice, in writing, during the thirty-day period, that Party shall be deemed to have withdrawn from this MOU on the 31st day after the Notice Date.

b. It is the intent of the Trustees and the Mining Companies that the Mining Companies' potential liability for injured natural resources, if any, in the Upper Arkansas River Basin be fully resolved as part of the settlement process set forth in this MOU. At this time, the Parties mutually expect that a settlement of the Mining Companies' potential liability will not involve a payment of monetary damages for lost use or services of natural resources. The Trustees do not waive any claim that may exist with respect to possible damages for lost use of natural resources, but the Trustees commit to trying to achieve a full settlement of the Mining Companies' potential liability based on the restoration of injured natural resources and the services they provide rather than monetary damages.

c. The Parties recognize that this MOU does not, and cannot, address all the circumstances and issues that may arise during negotiations. The process undertaken as outlined in this MOU will be dynamic in nature, and may change over time by written agreement of the Parties.

d. This MOU is not intended to, and shall not create any rights in any person who is not a party to this MOU.

e. It is the intent and commitment of the Parties that all data and other information necessary for a full resolution of the Mining Companies' potential liability for injured natural resources in the Upper Arkansas River Basin be obtained pursuant to the processes set forth in this MOU. Notwithstanding that fact, any Party may conduct other studies relating to natural resources injuries and associated damages in the Upper Arkansas River Basin that are outside the scope of this MOU. In order to facilitate the settlement process, prior to undertaking any study outside the scope of this MOU, the Party intending to conduct such study shall notify the remaining Parties in writing of its intent to perform such study and shall provide to the remaining Parties a brief summary of such proposed study. Such information shall be provided to the remaining Parties no later than 10 working days prior to the proposed start of such study, and the Party intending to conduct such study shall in good faith consider any comments submitted by the remaining Parties regarding such proposed activities. The purpose of this provision is to support good faith negotiations. The Trustees and EPA retain final authority to decide on studies each may conduct within the Upper Arkansas River Basin.

f. The Parties agree that neither this MOU, nor any Party's consent to enter into this MOU, nor any actions by any of the Parties in accordance with or related to this MOU, shall in any way constitute or be construed as an admission of liability, statement against interest, or a concession by any of the Parties of any factual or legal matters. Neither this MOU, a Party's consent to enter into the MOU, nor any action taken by a Party pursuant to the MOU shall be admissible in evidence against such Party.

g. The Mining Companies agree that if this MOU is terminated, notwithstanding such termination, costs authorized by the Trustees and the Mining Companies and incurred by any Party, except EPA, in fulfilling such Parties' commitments under this MOU shall be considered part of the overall costs of a natural resource damage assessment for the Upper Arkansas River Basin. The Mining Companies agree that, in any subsequent litigation that may arise among the Parties, the Mining Companies will not assert that such costs were not incurred in compliance with 43 C.F.R. Part 11. The Mining Companies reserve the right to challenge such costs on any grounds otherwise available to them, and reserve the right to challenge any costs incurred by the Trustees that were not authorized by the Trustees and the Mining Companies on any basis, including challenges to the reasonableness of these costs. This subparagraph shall survive termination of this MOU.

h. If this MOU is terminated, the Mining Companies agree not to allege the Trustees are unprepared for litigation based on failure to perform normal natural resource damage assessment activities during the term of this MOU.

i. The Parties agree that the allocation of costs set forth in this MOU are not and shall not be asserted by a Party to be binding on the Parties or serve as precedent for any future allocation of liability among the Parties for natural resource damages or response costs concerning the Upper Arkansas River Basin.

j. For purposes of this MOU, "Effective Date" shall mean the latest date on which this MOU is executed by all the Parties as set forth on the signature page.

k. Nothing in this MOU shall be construed as obligating the United States, its officers, agents, or employees, to expend any funds in excess of appropriations authorized by law.

l. No elected or appointed officials of the United States or the State shall be allowed to receive any personal benefit arising from this MOU.

SIGNATURE PAGE
MEMORANDUM OF UNDERSTANDING

ASARCO INCORPORATED

By: _____
Vice President
Title: Environmental Operations
Date: 3/24/99

STATE OF COLORADO
Office Of The Attorney General

By: _____
Title: _____
Date: _____

UNITED STATES
Department of Interior

By: _____
Title: _____
Date: _____

STATE OF COLORADO
Department of Natural Resources

By: _____
Title: _____
Date: _____

UNITED STATES
Environmental Protection Agency

By: _____
Title: _____
Date: _____

STATE OF COLORADO
Department of Public Health and Environment

By: _____
Title: _____
Date: _____

RESURRECTION MINING COMPANY

By: _____
Title: _____
Date: _____

RESURRECTION-ASARCO JOINT VENTURE

By: _____
Title: Asst Manager
Date: 4/6/99

NEWMONT MINING CORPORATION

By: _____
Title: _____
Date: _____

MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

SIGNATURE PAGE

ASARCO INCORPORATED

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Office Of The Attorney General

By:_____

Title:_____

Date:_____

UNITED STATES
Department of Interior

By: Ralph O. Morgenweck

Title: Regional Director

Date: 4-15-99

STATE OF COLORADO
Department of Natural Resources

By:_____

Title:_____

Date:_____

UNITED STATES
Environmental Protection Agency

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Department of Public Health and Environment

By:_____

Title:_____

Date:_____

RESURRECTION MINING COMPANY

By:_____

Title:_____

Date:_____

RES-ASARCO JOINT VENTURE

By:_____

Title:_____

Date:_____

NEWMONT MINING CORPORATION

By:_____

Title:_____

Date:_____

MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

SIGNATURE PAGE

ASARCO INCORPORATED

By: ____________________

Title: ____________________

Date: ____________________

STATE OF COLORADO
Office Of The Attorney General

By: ____________________

Title: ____________________

Date: ____________________

UNITED STATES
Department of Interior

By: ____________________

Title: ____________________

Date: ____________________

STATE OF COLORADO
Department of Natural Resources

By: ____________________

Title: ____________________

Date: ____________________

UNITED STATES
Environmental Protection Agency

By: [signature]

Title: Assistant Reg. Adm.

Date: 3/22/99

STATE OF COLORADO
Department of Public Health and Environment

By: ____________________

Title: ____________________

Date: ____________________

RESURRECTION MINING COMPANY

By: ____________________

Title: ____________________

Date: ____________________

RES-ASARCO JOINT VENTURE

By: ____________________

Title: ____________________

Date: ____________________

NEWMONT MINING CORPORATION

By: ____________________

Title: ____________________

Date: ____________________

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MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

SIGNATURE PAGE

ASARCO INCORPORATED

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Office Of The Attorney General

By:_____

Title:_____

Date:_____

UNITED STATES
Department of Interior

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Department of Natural Resources

By:_____

Title:_____

Date:_____

UNITED STATES
Environmental Protection Agency

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Department of Public Health and Environment

By:_____

Title:_____

Date:_____

RESURRECTION MINING COMPANY

By: [signature]

Title: President

Date: March 15, 1999

RES-ASARCO JOINT VENTURE

By:_____

Title:_____

Date:_____

NEWMONT MINING CORPORATION

By: [signature]

Title: Vice President

Date: March 15, 1999

MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

SIGNATURE PAGE

ASARCO INCORPORATED

By: _____

Title: _____

Date: _____

STATE OF COLORADO
Office Of The Attorney General

By: Ken Salazar

Title: Attorney General

Date: 3/15/99

UNITED STATES
Department of Interior

By: _____

Title: _____

Date: _____

STATE OF COLORADO
Department of Natural Resources

By: _____

Title: _____

Date: _____

UNITED STATES
Environmental Protection Agency

By: _____

Title: _____

Date: _____

STATE OF COLORADO
Department of Public Health and Environment

By: _____

Title: _____

Date: _____

RESURRECTION MINING COMPANY

By: _____

Title: _____

Date: _____

RES-ASARCO JOINT VENTURE

By: _____

Title: _____

Date: _____

NEWMONT MINING CORPORATION

By: _____

Title: _____

Date: _____

MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

SIGNATURE PAGE

ASARCO INCORPORATED

By:_____

Title:_____

Date:_____

UNITED STATES
Department of Interior

By:_____

Title:_____

Date:_____

UNITED STATES
Environmental Protection Agency

By:_____

Title:_____

Date:_____

RESURRECTION MINING COMPANY

By:_____

Title:_____

Date:_____

NEWMONT MINING CORPORATION

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Office Of The Attorney General

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Department of Natural Resources

By: Ronald W. Cattany

Title: Deputy Director

Date: March 11, 1999

STATE OF COLORADO
Department of Public Health and Environment

By:_____

Title:_____

Date:_____

RES-ASARCO JOINT VENTURE

By:_____

Title:_____

Date:_____

13

MEMORANDUM OF UNDERSTANDING
(Upper Arkansas River Basin)

SIGNATURE PAGE

ASARCO INCORPORATED

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Office Of The Attorney General

By:_____

Title:_____

Date:_____

UNITED STATES
Department of Interior

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Department of Natural Resources

By:_____

Title:_____

Date:_____

UNITED STATES
Environmental Protection Agency

By:_____

Title:_____

Date:_____

STATE OF COLORADO
Department of Public Health and Environment

By: Jane E. Norton

Title: EXECUTIVE DIRECTOR

Date: 3-15-99

RESURRECTION MINING COMPANY

By:_____

Title:_____

Date:_____

RES-ASARCO JOINT VENTURE

By:_____

Title:_____

Date:_____

NEWMONT MINING CORPORATION

By:_____

Title:_____

Date:_____

ATTACHMENT A
Memorandum of Undersanding
(Upper Arkansas River Basin)

WORK PRODUCTS AND SCHEDULE*

1. Coordination - Public Participation Plan

   Schedule: 2 months
   Responsibility: Parties

2. Guidelines for negotiations

   Schedule: 2 months
   Responsibility: Counsel/Mediator

3. Work Plan for the consultant team

   A. Operating Guidelines
   B. 11-Mile Reach
   C. Downstream Survey
   D. Airshed Survey

   Schedule: A.: 1 month;
   B.-D.: 3 months
   Responsibility: Parties

4. Final Consultants' Report

   Schedule: 15 months
   Responsibility: Consultant Team

5. Draft Restoration Plan - Eleven-Mile Reach

   Schedule: 18 months
   Responsibility: Parties

6. Settlement Agreement

   Schedule: 24 months
   Responsibility: Counsel/Mediator

*Schedules begin upon signature of MOU by all Parties

ATTACHMENT B
Memorandum of Understanding
(Upper Arkansas River Basin)

MEMORANDUM OF AGREEMENT
between
UNITED STATES DEPARTMENT OF AGRICULTURE -
FOREST SERVICE, ROCKY MOUNTAIN REGION
and
UNITED STATES DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE, REGION 6

This Memorandum of Agreement (Agreement) is entered into between the United States Department of Agriculture - Forest Service, Rocky Mountain Region (USDA-Forest Service) and United States Department of Interior (Interior). Interior and USDA-Forest Service have been designated as Federal trustees for natural resources pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, Sections 104, 107, and 122, 42 U.S.C. §9604, §9607, and §9622; and the Clean Water Act, section 311(f)(5), 33 U.S.C. §1321(f)(5). Interior and the USDA-Forest Service believe that natural resources in the Upper Arkansas River Basin (defined as that area from the headwaters of the Arkansas River downstream to and including Pueblo Reservoir) within their trusteeship may have been injured due to releases of hazardous substances resulting from mining-related activities in and around Leadville, Colorado. Although approximately 10,000 acres of National Forest System (NFS) lands may have been impacted by historic mining disturbances, approximately 24 total acres of NFS lands along the Arkansas River are expected to be addressed by this Agreement.

PURPOSE

This Agreement will provide for coordination between the USDA-Forest Service and Interior on natural resource issues in the Upper Arkansas River Basin related to the implementation of the Memorandum of Understanding (MOU) described below (see Background section). Interior will act as the Federal Lead Administrative Trustee but will keep the USDA-Forest Service informed of all issues related to

natural resources under USDA-Forest Service trusteeship. Other than incidental uses of NSF lands specifically addressed in this Agreement, this Agreement does not authorize any CERCLA response actions on NFS lands, which actions will be addressed by a future Memorandum or other appropriate agreements, entered jointly by all necessary parties.

BACKGROUND

An MOU is being entered into by and among the United States (by and on behalf of, the United States Department of the Interior and the United States Environmental Protection Agency); the State of Colorado (by and on behalf of the Colorado Department of Public Health and Environment, the Colorado Department of Natural Resources, and the Colorado Office of the Attorney General); Resurrection Mining Company and Newmont Mining Corporation (collectively Resurrection); ASARCO Incorporated (ASARCO); and the Res-ASARCO Joint Venture as an expression of their mutual good faith and interest in evaluating and, as appropriate, conducting restoration in the Upper Arkansas River Basin and response activities in the Eleven-Mile Reach. The "Eleven-Mile Reach" is defined as the 500 year floodplain portion of the Upper Arkansas River Basin beginning at the confluence of the Arkansas River and California Gulch and extending downstream for approximately 11 miles. The MOU is intended to facilitate: the identification and restoration of injured natural resources in the Upper Arkansas River Basin; cooperation between the Trustees and EPA; coordination of EPA's potential response actions and the Trustees' potential restoration efforts in the Eleven-Mile Reach; and the settlement of claims, if any, among the parties.

AUTHORITY

Interior has been delegated authority under CERCLA, 42 U.S.C. § 9601 et seq., 42 U.S.C. § 9607 (f); the Clean Water Act, section 311 (f)(5), 33 U.S.C. § 1321 (f)(5), the National Oil and Hazardous Substance Contingency Plan, 40 C.F.R. 300 et seq., (NCP); and Executive Order 12580 as amended, to act on behalf of the public as trustee for "natural resources" as defined at 42 U.S.C. § 9601 (16).

Interior authority includes assessing injuries and damages for injury to, destruction of, or loss of natural resources belonging to, managed by, held in trust by, appertaining to or otherwise controlled by Interior. The Regional Director, Region 6, U.S. Fish and Wildlife Service has been delegated as Interior's Authorized Official for the Upper Arkansas River Basin.

USDA-Forest Service has been delegated authority under CERCLA, 42 U.S.C. § 9601 et seq., 42 U.S.C. § 9607 (f); the Clean Water Act, section 311 (f)(5), 33 U.S.C. § 1321 (f)(5), the NCP and Executive Order 12580 as amended and 7 C.F.R. § 2.60 (a)(42)(1998) , to act on behalf of the public as trustee for "natural resources" as defined at 42 U.S.C. § 9601 (16). USDA-Forest Service authority includes assessing injuries and damages for injury to, destruction of, or loss of natural resources belonging to, managed by, held in trust by, appertaining to or otherwise controlled by the United States on NFS lands. This authority has been delegated to the Rocky Mountain Regional Forester.

AGREEMENT

The USDA-Forest Service and Interior agree that the Interior Authorized Official will act as Federal Lead Administrative Trustee for all actions related to implementation of the MOU on all Federal lands in the Upper Arkansas River Basin.

Federal Lead Administrative Trustee shall:

1. Represent USDA-Forest Service's interests at all meetings and other sessions between the MOU parties, at which USDA-Forest Service, or its representative, does not attend; and

2. Consult with USDA-Forest Service before advancing any position that may affect NFS lands; and

3. Provide USDA-Forest Service with copies of documents generated at such meetings, or by any of the MOU parties, which may affect NFS lands; and

4. Provide USDA-Forest Service a minimum of five (5) days to comment on any Statement of Work, Work Plan, or other document the may affect NFS lands; and

5. Provide USDA-Forest Service with timely notice of any meetings, other sessions, or events that may affect NFS lands; and

6. Conduct community relations activities cooperatively with the MOU parties by providing draft copies of news releases for comment and jointly scheduling public meetings or other forms of public involvement; and

7. Provide a written construction schedule to USDA-Forest Service for all construction activities that may affect NFS lands; and

8. Ensure all applicable and necessary permits and other statutory authorizations will be obtained and adhered to when conducting activities on NFS lands; and

9. Keep USDA-Forest Service informed of all changes in procedures and deliverables required by the MOU; and

10. Inform USDA-Forest Service immediately of any vehicle or other accidents on NFS lands; and

USDA-Forest Service shall:

1. Provide timely review (as required by MOU parties) on any documents generated by the parties; and

2. Participate in public meetings at USDA-Forest Service discretion; and

3. Assist Interior in providing access, issuance of special use permits, oversight, and conducting inspections of any access or other activities on NFS lands; and

4. Provide Interior with any specifications for necessary road maintenance and improvements for work that may need to occur on NFS roads as part of this project; and

5. Identify vegetative species for restoration or revegetation activities on NFS lands, including road cuts and fills; and

6. Provide concurrence with any Action Memorandum and amendments thereto, Administrative Orders on Consent, Consent Decrees, or other appropriate documents for any response, restoration, or other actions on or affecting NFS lands requiring USDA-Forest Service concurrence or approval.

DISPUTE RESOLUTION

The Dispute Resolution procedures in this section are the exclusive mechanism for resolving disputes under this Agreement. The Federal Trustees shall attempt to expeditiously and informally resolve any disagreements concerning implementation of this Agreement. If the Federal Trustees fail to resolve such a dispute informally, the Dispute Resolution procedure in the following paragraph shall apply:

If a dispute regarding any work taken pursuant to this Agreement cannot be resolved informally, a final decision regarding any actions scheduled to occur on NFS lands shall be made by the Rocky Mountain Regional Forester.

AGREEMENT TERM

1. This Agreement is executed as of the last date shown below and expires on December 31, 2004 at which time it will be subject to review and renewal, or expiration.

2. Either Federal Trustee may terminate this Agreement, in whole or part, at any time prior to the expiration date by providing a 30 day written notice to the other Federal Trustee.

SPECIAL PROVISIONS

1. This Agreement shall in no way prohibit or restrict either Federal Trustee from participating in similar activities with other public or private agencies, organizations, or individuals.

2. NON-FUND OBLIGATING DOCUMENT. This Agreement is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement, contribution of funds, or transfer of anything of value between the parties to this Agreement will be handled in accordance with applicable laws, regulations, and procedures including those for Government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the Trustees and shall be independently authorized by appropriate statutory authority. This Agreement does not provide such authority. Specifically, this Agreement does not establish authority for noncompetitive award to the cooperator of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

3. This Agreement may be modified or amended as necessary upon written consent of the Federal Trustees.

4. This Agreement is intended only to foster interagency coordination that enhances efficiency and effectiveness. It may not be the basis of any third party challenge, appeal, or judicial review. Nothing in this Agreement creates any rights, defenses, or causes of action in any person, party, or entity.

The designated Interior contacts for this Agreement are:

Interior Authorized Official:
Ralph Morgenweck, Regional Director
U.S. Fish and Wildlife Service
P.O.Box 25486-DFC
Denver, CO 80225-0486
303-236-7920

Interior Project Manager:
Andrew Archuleta
U.S. Fish and Wildlife Service
Colorado Field Office
755 Parfet, Suite 361
Lakewood, CO 80215
303-275-2353

The designated USDA-Forest Service contacts for this Agreement are:

Technical:
Vern Schmitt
USDA-Forest Service, Physical Resources
Rocky Mountain Region 2
P.O. Box 25127
Lakewood, CO 80225
303-275-5091

Legal:
Kenneth P. Pitt
USDA-Office of the General Counsel
P.O. Box 25005
Denver, CO 80225
303-275-5539

NONDISCRIMINATION

Neither Federal Trustee, and any contractors thereof, shall not discriminate against any employee or applicant for employment because of race, color, national origin, handicap, religion, or sex and shall comply with all Federal statutes prohibiting discrimination in any program or activity receiving Federal financial assistance, comply with

all Federal statutes relating to nondiscrimination and all applicable requirements of all other Federal laws, executive orders, regulations and policies. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d) which prohibits discrimination on the basis of race, color, handicap or national origin; (b) Title IX of the Education Amendments of 1972 as amended (20 U.S.C. 1681-1863, 1685-1686), which prohibits discrimination on the basis of sex.

IN WITNESS THEREOF, we the undersigned authorized representatives hereby agree to the terms and conditions set forth in this Memorandum of Agreement as of the last written date below.

United States Department of Agriculture,
Forest Service, Rocky Mountain Region

By__**(Signed 12/18/98)**_____ Date_____
Lyle Laverty, Regional Forester

United States Department of Interior,
Fish and Wildlife Service, Region 6

By___**(Signed 12/21/98)**_____ Date_____
Ralph Morgenweck, Regional Director

ATTACHMENT C
Memorandum of Understanding
(Upper Arkansas River Basin)

Party Contacts

The following representatives shall be the primary Party contacts for the purpose of notification as described herein, for exchange of documents for review and comment, and for coordination and presentation of that Party's position on restoration and response activities:

ASARCO & Res-ASARCO Joint Venture:

Mr. Robert Comer
ASARCO
495 E. 51st Avenue
Denver, CO 80216-2098
phone: 303-296-5116
fax: 303-296-0508

Mr. Michael Thorp
Heller, Ehrman, White, McAuliffe
6100 Columbia Center
701 5th Avenue
Seattle, WA 98104
phone: 206-389-6200
fax: 206-447-0375

Newmont & Resurrection:

Mr. Rick River
Resurrection Mining Company
P.O. Box 584
311 Main Street
Ouray, CO 81427
phone: 970-325-4482
fax: 970-325-4481

Mr. Ron Eddy
Sherman & Howard LLC
633 17th Street, Suite 3000
Denver, CO 80202
phone: 303-299-8338
fax: 303-298-0940

Department of Interior:

Regional Director
U.S. Fish and Wildlife Service
P.O. Box 25486-DFC
Denver, CO 80225-0486
phone: 303-236-7920
fax: 303-236-8295

Mr. Andrew Archuleta
U.S. Fish and Wildlife Service
P.O. Box 25486-DFC
Denver, CO 80225-0207
phone: 303-275-2353
fax: 303-275-2371

Party Contacts

Department of Interior
Office of the Solicitor
Rocky Mountain Region
755 Parfet, Suite 151
Lakewood, CO 80215
phone: 303-231-5353
fax: 303-231-5363

Department of Justice:

Mr. Jerry Ellington
U.S. Department of Justice
999 18th Street, Suite 945, North Tower
Denver, CO 80202
phone: 303-312-7321
fax: 303-312-7331

Environmental Protection Agency:

Mr. Richard Sisk
U.S. EPA, Region 8
999 18th Street, Suite 500
Denver, CO 80202
phone: 303-312-6638
fax: 303-312-6953

Mr. Michael Holmes
U.S. EPA, Region 8
999 18th Street, Suite 500
Denver, CO 80202
phone: 303-312-6607
fax: 303-312-6961

State of Colorado:

Ms. Vicky Peters
Colorado Attorney General's Office
1525 Sherman Street, 5th Floor
Denver, CO 80203
phone: 303-866-5068
fax: 303-866-3558

Mr. Ron Cattany
Colorado Dept. Of Natural Resources
1313 Sherman Street, Room 718
Denver, CO 80203
phone: 303-866-3111
fax: 303-866-2115

Mr. Howard Roitman
Colorado Dept. Of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80222-1530
phone: 303-692-3397
fax: 303-759-5355

Work Plan for Upper Arkansas River Basin Consulting Team Eleven-Mile Reach, Downstream Survey, and Airshed Survey

The Work Plan for this project includes three components, the Operating Guidelines, described in Section A, the Scope of Work, described in Section B, and a Modification clause described in Section C. For the purposes of this Work Plan, all terms not specifically defined herein are defined as set forth in the Memorandum of Understanding for the Upper Arkansas River Basin ("MOU").

A. Operating Guidelines for the Consulting Team

These Operating Guidelines ("Guidelines") are intended to guide the Consulting Team in conducting activities prescribed by the MOU entered into by the United States, the State of Colorado, ASARCO Incorporated, Newmont Mining Corporation, Resurrection Mining Company, and the Res-ASARCO Joint Venture (collectively, the "Parties") dated and effective April 15, 1999. As described in the MOU, the Consulting Team was formed to provide the Parties with objective and sound scientific input concerning the nature and extent of injuries to natural resources in the Upper Arkansas River Basin for which the Department of the Interior (U.S. Fish and Wildlife, U.S. Bureau of Land Management, and U.S. Bureau of Reclamation) (" DOI"), the Department of Agriculture (U.S. Forest Service), and the State (Colorado Department of Public Health and the Environment, the Department of Natural Resources, and the Attorney General's Office) are trustees, and to identify alternatives for achieving appropriate restoration (restoration includes: restoration, replacement, or acquisition of the equivalent of injured natural resources) of those resources. Input from the Consulting Team is to assist the Parties in reaching a settlement of claims concerning the Upper Arkansas River Basin. The services to be provided by the Consulting Team to the Parties (the "Services") are set forth in greater detail in the Scope of Work in Section B of this Work Plan.

Responsibilities and Obligations/ Conflict of Interest

The Consulting Team is charged with the responsibility of providing sound, objective, scientifically defensible input to the Parties regarding possible injuries to natural resources in the Upper Arkansas River Basin and providing alternatives for restoring such injured resources. The Consulting Team, except as provided in the next paragraph, is to act independently in providing these Services, and neither the Consulting Team nor any member of the Consulting Team is or shall be deemed to be an agent or representative of any of the Parties. Each member of the Consulting Team is to provide input without regard to, and shall not be biased or compromised by, any past, present, or possible future affiliation or arrangement with any of the Parties. Although the Consulting Team shall provide input to the Parties, the State and Federal Trustees are ultimately responsible for assessing injuries and planning restoration pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") and the Clean Water Act ("CWA"), and are not delegating these responsibilities to the Consulting Team. The Consulting Team will not make recommendations to the Trustees. Rather, it will prepare an evaluation of injuries, if any, to natural resources, and identify potential restoration alternatives.

19 July 1999

The Parties acknowledge that DOI's representative to the Consulting Team, Andrew Archuleta, shall have dual roles. Mr. Archuleta shall act as a DOI representative in providing guidance to the Consulting Team concerning the Natural Resource Damage and Restoration process and shall serve as a scientist member of the Consulting Team. Mr. Archuleta's role does not include interpretation of the MOU except as authorized by the Parties. In general, questions regarding the meaning and application of the MOU will only be discussed in the presence of representatives of each of the MOU Parties; or as otherwise agreed to by the Parties.

Composition

The following individuals comprise the Consulting Team:

Dr. Edward Redente
Dr. Stan Schumm
Dr. Will Clements
Mr. Steve Werner
Mr. Andrew Archuleta

As provided in the MOU, the composition of the Consulting Team may be modified by the Parties upon mutual consent.

The Parties (collectively or individually) and the Consulting Team may recommend, at any time, that additional technical experts be included on the Consulting Team or be retained as advisors to address issues that are beyond the expertise of the Consulting Team. The decision on whether to add individuals to the Consulting Team or to retain the services of individuals to assist the Consulting Team shall be within the sole discretion of the Parties. No individuals shall be added to the Consulting Team or retained to assist the Consulting Team without the mutual consent of the Parties.

Contracting

The contracting mechanism to be used by the Mining Companies shall be a Consulting Agreement ("Agreement"). The Mining Companies shall be responsible for retaining the services of each of the members of the Consulting Team and for managing the administrative aspects of the Agreement. Prior to entering into any Agreement with a member of the Consulting Team, the other Parties shall be given the opportunity to review and comment on the terms and conditions of the initial Agreement and any subsequent amendments thereto. Such Agreements or contracts shall not be finalized without mutual consent of the Parties. Monthly billing/progress reports will be distributed to all Parties.

The Parties may establish a Contract Management Team if they decide it is appropriate.

Operation

The Consulting Team shall select one of its members and an alternate to serve as coordinator. The coordinator will be responsible for scheduling, record-keeping and facilitating communications within the Consulting Team and between the Consulting Team and the Parties.

The Consulting Team shall hold, at a minimum, quarterly meetings with the Parties to discuss the status of the Services and to receive input from the Parties. The coordinator of the Consulting Team shall coordinate with all members of the Consulting Team and the Parties in setting the date, time and place of each meeting. Written notice shall, if possible, be provided to the Consulting Team members and the Parties immediately upon establishment of a date, but in no event less than 10 days in advance of the proposed meeting. Any Party or the Consulting Team may call such a meeting upon reasonable written notice to the Parties and the Consulting Team. Data or other information being considered by the Consulting Team shall be identified and discussed with the Parties during the quarterly meetings. The Consulting Team shall, as reasonably requested by the Parties, participate in briefings for non-Party individuals or groups.

The members of the Consulting Team (and any individuals retained to assist the Consulting Team pursuant to these Guidelines) shall be subject to and shall conduct their activities in accordance with the Confidentiality Order. Each member of the Consulting Team (and any individuals retained to assist the Consulting Team) shall carefully and fully review the terms and conditions of the Confidentiality Order and abide by its terms and conditions.

To the extent practicable, the Consulting Team will report to all Parties at the same time. This provision shall govern the reporting of all documents, data, observations, and recommendations. If one or more of the Parties cannot be present at a meeting among the Consulting Team and the Parties, the coordinator of the Consulting Team shall advise them of discussions conducted at the meeting. The Consulting Team members are not to have *ex parte* communications with the Parties concerning scientific or technical issues. If the Consulting Team coordinator receives information from one Party that has not been distributed to the other Parties, he will notify the other Parties that the information is available and shall provide the information to them upon request.

B. Scope of Work

This portion of the Work Plan establishes the Scope of Work ("SOW") for the functioning of the Consulting Team, pursuant to the Memorandum of Understanding ("MOU") entered into by the United States, the State of Colorado, ASARCO Incorporated, Resurrection Mining Company, Newmont Mining Corporation and the Res-ASARCO Joint Venture (collectively the " MOU Parties") dated and effective April 15, 1999, in the identification and restoration of natural resources in the Upper Arkansas River Basin which may have been injured as a result of past and current releases of hazardous substances related to historic mining activities in the Leadville area. This SOW lists objectives and tasks to be accomplished by the Consulting Team.

This SOW addresses three activities: study of the Eleven-Mile Reach; and literature reviews of information concerning the Arkansas River downstream of the Eleven-Mile Reach and of the Airshed that may have been impacted by ASARCO smelter stack emission and subsequent deposition. The above activities will be the initial focus of the Consulting Team's evaluation with particular priority on the Eleven-Mile Reach. The Parties may request that the Consulting Team address other issues related to releases of hazardous substances to facilitate resolution of potential claims.

Study of the Eleven-Mile Reach

The Eleven-Mile Reach of the Arkansas River may have been affected by releases of hazardous substances resulting from mining activities in the Leadville Mining District. The reach includes Operable Unit 11 of the California Gulch Superfund Site, which is the stretch of the Arkansas River from the confluence with California Gulch downstream to the confluence with Lake Fork. The objectives of the Eleven-Mile Reach study are: (1) to evaluate the nature and extent of any injuries to natural resources in the Eleven Mile Reach resulting from past and current releases of hazardous substances from mining related activities in the Leadville area; and (2) to develop alternatives for addressing any identified injuries, including identification of specific restoration projects or response actions.

The Upper Arkansas River and California Gulch have been studied extensively. The Consulting Team shall consider pertinent available information, including the results of investigations currently being conducted on behalf of EPA. In developing restoration alternatives, the Consulting Team shall consider ongoing and proposed activities in the Upper Arkansas River Basin to ensure against duplicative, inconsistent, or counter-productive activities.

Task List for the Eleven-Mile Reach Study

The following tasks will be completed by the Consulting Team to achieve the objectives of the study of the Eleven-Mile Reach.

1. Review the regulations concerning natural resource damages at 43 C.F.R. Part 11 as background information for the types of natural resources and injuries that should be considered in this study.

2. Identify and review pertinent available information, including investigations currently being conducted.

3. Conduct site reconnaissance.

4. Identify significant data gaps, if any.

5. Develop and propose a plan to obtain any additional data needed. The proposed plan will provide: (1) a listing of available information, (2) a description of the

findings of the site reconnaissance, (3) a description of additional data needed and justification for the additional data, and (4) a plan for acquisition of the additional data and projected associated costs.

6. Implement the data acquisition plan, subject to approval by the parties.

7. Evaluate the data and produce a Site Characterization Summary that: (1) describes the nature and extent of contamination; (2) provides mapping of areas affected by mine waste; (3) describes injuries to natural resources; (4) identifies potential contaminant pathways; and (5) defines areas where restoration is needed to obtain a healthy, functioning ecosystem and mitigate exposure pathways. The Summary will also include an index or bibliography of all documents/data reviewed and a discussion of uncertainties and minority views, if any, concerning the items identified in this paragraph 7.

Following the submittal of the Site Characterization Summary and after consultation with the MOU Parties, the Consulting Team will develop and evaluate alternatives for restoration within the Eleven-Mile Reach, including the identification of specific restoration projects or actions. The following tasks will be completed:

1. Develop a range of restoration alternatives which will effectively restore injured resources.

2. Evaluate the restoration alternatives based on technical feasibility, the relationship of the expected costs of the proposed actions to the expected benefits from the restoration, cost effectiveness (as defined in 43 CFR 11), potential for additional injury resulting from the proposed actions, the results of any proposed or planned response actions, the natural recovery period, and the ability of the resources to recover with or without alternative actions.

3. Develop alternatives for the coordination and sequencing of the implementation of potential restoration actions.

4. Produce a Restoration Alternatives Analysis Report which describes Tasks 1-3 above. This Report will also include minority views of the Consulting Team, if any.

5. Respond to questions and issues raised by the Parties concerning the final Restoration Alternatives Analysis Report.

Study of the Upper Arkansas River Basin Downstream of the Eleven-Mile Reach

The Consulting Team shall conduct a literature review regarding potential injuries to natural resources in that portion of the Upper Arkansas River Basin downstream from the

Eleven-Mile Reach, to and including Pueblo Reservoir (the Downstream Area), caused by the release of hazardous substances from mining related activities. The purpose of the literature review is to determine the nature and extent of information available for evaluating potential natural resource injury. The Consulting Team will determine the need for additional information as appropriate and the type, amount and cost of acquisition of such needed information. The results of this study/literature review will be included in the Site Characterization Summary.

Airshed Survey

The Consulting Team shall conduct a literature review regarding potential injuries to natural resources in the Upper Arkansas River Basin resulting from the release of hazardous substances through ASARCO smelter stack emissions and subsequent deposition in the surrounding area (the Airshed). The purpose of the literature review is to determine the nature and extent of information available for evaluating potential natural resource injury. The Consulting Team will determine the need for additional information as appropriate and the type, amount and cost of acquisition of such needed information. The results of this study/literature review will be included in the Site Characterization Summary.

Consulting Team Interaction with the Parties

At a minimum, quarterly meetings among the parties and the Consulting Team will be held. At these meetings, the Consulting Team will provide a summary of all activities undertaken and planned. The Consulting Team may recommend changes to the schedule at these meetings. If the Parties determine that additional data acquisition is needed, the Consulting Team will propose a work plan to guide the data acquisition process. The Consulting Team will produce two reports that document the results of their work, a Site Characterization Summary, and a Restoration Alternative Analysis report. All documents will be issued in draft form to the parties for their review and comments. Comments will be addressed by the Consulting Team and final versions of the documents will be issued.

C. Modifications

This Work Plan may be modified only upon the concurrence of the Parties.

19 July 1999

The following is a tentative schedule of the Consulting Team's activities and deliverables:

Activities/Deliverable	Completion Schedule (effective as of 7/15/99)
Conduct site reconnaissance	October 15, 1999
Conduct literature review of the Eleven-Mile Reach, Downstream Area, and the Airshed (w/ complete bibliography or index)	October 15, 1999
Issue draft plan for data acquisition (if required)	November 1, 1999
Receive comments from Parties on draft plan for data acquisition (if required)	November 15, 1999
Issue final plan for data acquisition (if required)	December 1, 1999
Conduct additional data acquisition (if required)	when feasible
Issue outline for Site Characterization Summary	January 1, 2000
Receive comments from Parties on outline for Site Characterization Summary	January 15, 2000
Issue draft Site Characterization Summary	February 15, 2000
Receive comments from Parties on draft Site Characterization Summary	March 1, 2000
Issue final Site Characterization Summary	April 1, 2000
Issue outline for Restoration Alternatives Analysis Report	April 15, 2000
Receive comments from Parties on outline for Restoration Alternative Analysis Report	May 1, 2000
Issue draft Restoration Alternatives Analysis Report	May 15, 2000
Receive comments from Parties on draft Restoration Alternatives Analysis Report	June 15, 2000
Issue final Restoration Alternatives Analysis Report	July 15, 2000

