

# Temporal Posture and Discount Rates for Groundwater Contamination Damages

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Recent experience as an economic expert in a groundwater contamination lawsuit reveals that lawyers and financial experts are unclear about what criteria govern temporal posture for determining economic losses. Whether damages should be benchmarked *ex ante* at the time of harm, or *ex post* at the time of trial, has a long intellectual history in financial and legal journals—and in case decisions. The theoretical elegance of some of the considerations discussed in the literature may overwhelm the practical issues governing choice of temporal posture in a contamination case.<sup>1</sup>

A much-cited 1992 article by John Taurman and Jeffrey Bodington concludes that the distinction between *ex ante* and *ex post* benchmarking of damages is “a choice between two well-defined methodologies.”<sup>2</sup> After an exhaustive survey, they conclude: “The historical trend to damages law is toward more detailed inquiry into the particulars of a plaintiff’s loss.”<sup>3</sup> They wrap up their article by saying: “[I]n the hands of juries, the allure of hindsight can be expected to be strong.”<sup>4</sup>

While relying on factual evidence uncovered between the time of harm and time of trial may have great appeal, some experts may argue that the standard practice for an economic damages calculation is to benchmark the value *ex ante* to the date of the harm. Ultimately, damages measured at the time of harm presume that the values are not undone by factual evidence uncovered while various legal activities delay the trial date further into the future. The longer the delay before trial, the more plaintiff’s and defendant’s experts’

damage estimates might diverge, if only because of considerations of rates for prejudgment interest. For the practitioner, the choice between “two well-defined methodologies” needs more concrete guidance. The allure of hindsight is not a sufficient condition to support the choice.

Some guidance arises from various areas of the law; however, the guidance works both ways. For example, U.S. Tax Court cases require that valuation experts use only information available as of the date of valuation in determining the value of a financial asset. To the contrary, in other areas of business valuation, for example, eminent domain, appraisers often take into account events subsequent to the time of a property condemnation in determining any loss of business goodwill.<sup>5</sup> They do this primarily because the actual impact on a business affected by condemnation is not known until after the fact. In the Court of Federal Claims, *Independence Park Apartments v. United States*,<sup>6</sup> a temporary taking case, set the valuation date as the end of the taking period for calculation of damages. Finally, in determining economic losses by estimation of a “reasonable royalty” in patent litigation cases, economists routinely rely on what is called the “Book of Wisdom,” whereby one can consider *ex post* events and information in determining the value of a reasonable royalty on the date of first infringement, i.e., the date of harm.<sup>7</sup> Taken together, these examples confirm that no single method is set by law to measure damages at the date of harm or at the date of trial.

This Article examines conceptual and practical issues bearing upon the choice between Taurman’s and Bodington’s “two well-defined methodologies” in a situation involving losses caused by contaminated groundwater. The Article begins with definitions and factual background, discusses

*Authors’ Note: William W. Wade represented plaintiff valuing the contaminated groundwater and related business losses in the unreported contamination case discussed in this Article.*

1. See Robert F. Lanzillotti & Amanda K. Esquibel, *Measuring Damages in Commercial Litigation: Present Value of Lost Opportunities*, 5 J. ACCT. AUDITING & FIN. 125, 141 (1990) (concluding “that where a choice of methodology exists, it does not necessarily follow that the more theoretically elegant approach is the most appropriate in light of practical considerations”).
2. John D. Taurman & Jeffrey C. Bodington, *Measuring Damage to a Firm’s Profitability: Ex Ante or Ex Post?*, 37 ANTITRUST BULL. 57, 60 (1992).
3. *Id.* at 105.
4. *Id.* at 106.

5. In states where recovery for loss of business goodwill is allowed.
6. 61 Fed. Cl. 692, 709-10, 34 ELR 20090 (2004). The court rejects the position “that events occurring after the beginning of the temporary takings period [are] ‘ex post’ and should be disregarded . . . [T]he events during the temporary takings period are relevant not just to delineate the period itself but also to provide an objective, non-speculative basis for assessing value.” *Id.* at 709 n.16 (second emphasis added).
7. See *Sinclair Ref. Co. v. Jenkins Petroleum Process Co.*, 289 U.S. 689, 698-99 (1933).

conceptual issues that are brought up, analyzes some examples, and draws conclusions based upon the analysis.

## I. Definitions and Factual Background

Ex ante, which means “from before,” states that damages are benchmarked to the time of economic harm or first discovery of harm. Only information known at the time of harm can be used to calculate the damages. The analyst stands at that point in time and asks: “What is the forecast of future lost earnings?”

Ex post, which means “from after,” is the alternative: benchmarking damages to the time of trial. The analyst looks back from the time of trial and uses all readily available information, both before and after the date of harm, to estimate economic damages. Benchmarking the claim to the time of trial allows the expert to rely on factual discovery affecting the plaintiff’s subsequent business operations and to make more informed expectations about the extent of the losses in the future. Typically, the rest of the trial is about this information. Damages based on the same facts have intuitive appeal.

A practitioner’s manual describes a hybrid approach between ex ante and ex post methodologies that uses ex post information, but an ex ante measurement date. Losses are benchmarked to the time of harm; however, information discovered between time of harm and time of trial is used under the rationale that ignoring this information fails the commonsense test; in other words, using factual information eliminates speculation about what the lost earnings would have been.<sup>8</sup>

To examine issues that bear on more concrete guidance, this Article examines factual circumstances somewhat different from cases found in the financial literature on this topic.<sup>9</sup> Losses arise from contaminated groundwater underlying a large upscale mobile home park housing approximately 450 people. The groundwater was the source of residents’ drinking water at a cost to pump and distribute below \$1.50 per month per unit; it provided the park owner with a cost advantage over competing mobile home parks reliant on public water supply at between \$25 and \$30 per month per unit.

Test results of groundwater samples taken in 2002 showed that harmful chlorinated and aromatic hydrocarbons were present in the groundwater—leachate from the nearby sanitary landfill. The owner of the mobile home property became aware of contamination of his groundwater in the second quarter of 2002. The owner immediately switched his drinking water source to wells in an uncontaminated area of the

aquifer, which he and the residents relied upon until the trial that occurred in late 2009. After the lawsuit was resolved, the property owner connected to the public water utility to avoid risk of migration of the contaminated plume into the pocket of uncontaminated water.

Litigation delays stretched by seven years the period between the time of discovery (2002) to the time of trial (2009). The trial was bifurcated with liability and damages presented separately. The defendant was found liable in the first phase for the contamination of the groundwater. This Article discusses issues that arose in the damages portion of the trial.

## II. Causes of Damages

While great consternation arose among the owner and tenants at the discovery of the contaminated water supply, the ability to shift to a clean source of water placated the tenants. The owner maintained below-market rents throughout the seven years while scientific monitoring and treating progressed and numerous legal activities ensued. In both phases of the trial, hydrologists and scientists working for both the plaintiff and defendant agreed that substantial uncertainty governed the effectiveness of the pump and treat system installed to remedy the problem in 2005. Remediation was estimated to require anywhere from 10-15 years to many decades after the leachate from the landfill was controlled. Experts presented sampling data at trial, which implied that the contaminated plume was still expanding under the plaintiff’s property.

The mobile home park did not go out of business after discovery of the contaminated groundwater underlying the property. The owner remained in business, albeit at a reduced level of revenues because he kept rents below market to maintain the tenants.

Damages estimated in the case arose from three sources of loss:

- **past** rental income losses following time of discovery (mid-year 2002) through year-end 2009;
- **future** rental income losses post-trial into the future caused by the overhanging stigma of contamination, continuing landfill leakage, and inability to regain parity with market rental rates, which will continue to rise;
- **future** economic losses keyed to replacement costs of groundwater supplied to residents with purchased public water in place of groundwater.

Two sources of loss arise post-trial, and one source pre-trial. Damages, of course, must compensate the plaintiff for past and future losses at a single point in time. The question to answer is: What point in time?

8. Michael J. Wagner et al., *Ex Ante Versus Ex Post Damages Calculation*, in *LITIGATION SERVICES HANDBOOK: THE ROLE OF THE FINANCIAL EXPERT*, ch. 8, 8.17 (Roman L. Weil et al. eds., 4th ed. 2007).

9. See cases cited in Wagner et al., *supra* note 8.

### III. Issues Attendant to Choice of Temporal Posture

Conceptual issues that bear on concrete guidance include: (1) When to make the plaintiff “whole”; (2) What data to rely on; and (3) Risk-adjusted discount rates. Ultimately, as we shall discover, the determinant criterion devolves to treatment of risk.

#### A. When to Make the Plaintiff “Whole”

Eighty-six years ago, the U.S. Supreme Court defined “just compensation” as a payment that restores the “full and perfect equivalent”<sup>10</sup> in money of the impairment to plaintiff’s property. An economist would define “just compensation” as an amount necessary to keep plaintiff “whole,” that is, a single lump-sum payment required to restore what the plaintiff would have earned “but for” the contamination of the property. The damage award must compensate the plaintiff for both past and future economic losses.

The first issue to examine is whether the damages should be benchmarked to the time of trial or to the time of discovery. If the objective is to make the plaintiff “whole,” clearly this must occur at the time of payment, which only can transpire attendant to trial. If justice were perfect and instantaneous, payment would be immediate and the question of when to make the plaintiff “whole” would be moot.

The justice system does not work this way. The typical commercial lawsuit entails complicated discovery that requires scheduling courts, lawyers, motions, witnesses, and experts. Substantial lags occur between the time of harm and the resolution at trial. In this particular contamination case, the delay stretched to seven years, and losses related to the replacement of the groundwater will continue into the future for an uncertain number of decades. Past and future losses must be converted to their present value at a single point in time. If measured at the time of trial, past losses would be compounded forward to the time of trial, and future losses would be discounted back to the time of trial. If the time of harm is the valuation benchmark, all losses would be discounted back to 2002, even those losses that occur post trial.

What governs the benchmark date in the presence of delays? William Tye and Stephen Kalos observed in a 1996 article that “[m]aking the victim ‘whole’ means awarding damages sufficient to make the victim indifferent between the damages and the value of the lost opportunity.”<sup>11</sup> They conclude that “[t]he choice of the appropriate date for establishing indifference does not resolve itself by legal authority or by consensus over economic principles.”<sup>12</sup> In other words, as various cases confirm, no law, economic theory, or financial practice sets in stone that the time of harm or the time of trial should be the standard by which economic damages are computed. Benchmarking to the date of harm is some-

times appropriate, and sometimes not. Financial literature and legal decisions do not require damages to be based on ex ante information, thereby ignoring facts revealed between the date of harm and the time of trial.

In a securities fraud case, valuing particular securities on the date of the specific event that affects their value makes perfect sense. The harm is recognized by the investors very quickly, so the extent of the damage is known within a very short time period. When valuing a company put out of business at a specific date, it would make sense to value damages as of the date that it effectively ceases business.

Valuing damages to the mobile home park based on condemnation and purchase by the defendant at mid-year 2002 could make sense as a valuation approach—if that had happened. From this posture, damages could be the full fair market value (FMV) of the 100% loss of the enterprise in 2002. But that is not what happened.

The park did not go out of business. This is not consistent with the typical case where an ex ante damages model is appropriate. In the analytic framework where an ex ante methodology will make the plaintiff whole, the plaintiff, on the date of harm, effectively trades his rights to pursue his risky business for the right to seek compensation through the courts, i.e., he goes out of business and files a lawsuit.<sup>13</sup>

The park remained in business, having found a safe area of the aquifer to continue to supply drinking water to residents. Post discovery, it operated at a suppressed level of operating income throughout the period until trial while remediation activities were initiated and experts conducted research to estimate how long it might take to clean up the contamination. Losses after the trial due to continued suppressed rents and increased cost of replacement of public water were evaluated in relation to scientific research ongoing throughout the seven years. Benchmarking damages to the time of trial made sense in this case, because the business continued to operate and scientific research that governed future losses was ongoing.

#### B. Ex Post Information or Ex Ante Information?

Plaintiff found a clean pocket of drinking water in his aquifer, and the park continued to operate, albeit with suppressed rents. By 2009, rents for each of the park’s 260 rental units were \$50 per month below demonstrated market conditions. By that time, the park was losing \$13,000 per month, or \$156,000 per year, due to the contamination. The ex post posture allows using this market information that became

13. Tyler J. Bowles, *Hindsight in Commercial Damages Analysis*, J. LEGAL ECON., March 2008, at 1, 2. Tyler Bowles attributes the remark to an earlier article by James M. Patell et al., *Accumulating Damages in Litigation: The Roles of Uncertainty and Interest Rates*, 11 J. LEGAL STUD. 341 (1982). The Bowles article suggests that plaintiffs benefit when using any date other than the date of harm when considering risk. The model used in the article assumes a symmetric loss situation that would be the case in, for example, a breach of contract litigation. However, many litigation scenarios are asymmetric, and plaintiff could be better off or worse off using the date of harm for valuation, depending on the ultimate outcome. This is particularly true in condemnation cases, where one cannot accurately forecast the probable outcome of subsequent events after the taking. Losses caused by environmental contamination, as suggested at the outset, are best understood after the fact, ex post.

10. *Seaboard Air Line Ry. Co. v. United States*, 261 U.S. 299, 304 (1923).

11. William B. Tye & Stephan Kalos, *Antitrust Damages From Lost Opportunities*, 41 ANTITRUST BULL. 637, 643 (1996).

12. *Id.* at 658.

available during the seven years to estimate both past and future lost profits.

Ex post information that the owner was able to switch to a clean pocket of drinking water revealed that no damages accumulated due to the replacement cost of the water through time of trial. Actual results showed that this was an effective loss mitigation strategy. No nearby water main existed in 2002, in any case. Switching to a public water supply was not possible without an unknown delay.<sup>14</sup> The only effective ex ante assumption for damages would have been park closure and valuation at FMV at the time of discovery.

Scientific information developed from monitoring and testing during the seven years revealed that the original “pump and treat” estimate of 10-15 years to remediate the contamination of the aquifer was overly optimistic. Testimony at the damages trial revealed scientific evidence that foretold substantial uncertainty about how many decades before the aquifer might be a safe source of drinking water. Taking account of the factual “particulars” of the loss made good sense in view of the complexity of the scientific issues literally underlying the problem. Future losses were forecast based on the scientific information about the uncertain decades before the groundwater would become safe to drink.

### C. Discount Rate or Prejudgment Interest Rate Between Time of Harm and Time of Trial?

The fundamental determinant of what rate to apply to losses for the period 2002-2009 is whether the business was at risk of business uncertainty or not. The plaintiff remained in business at a reduced level of profits subjected to the same business risks of the enterprise without the contamination. The defendant’s damages were at risk to the success of the plaintiff’s business during the period before trial. The fact that the plaintiff’s business risk was unchanged governs the discount rate applied to the past losses. As the plaintiff bore the business risks, the damage award carries the plaintiff’s cost of capital. He was deprived of the opportunity to earn his expected return on his invested capital.

The discount rate for the losses between 2002 and 2009 benchmarked ex post is the plaintiff’s opportunity cost of capital, not a statutory rate or a risk-free rate. Franklin Fisher and R. Craig Romaine argue to the contrary in an influential article that ex post damages should not be used and ex ante damage estimates should not carry a discount rate including a risk premium: “The violation did not merely deprive the plaintiff of the stream of returns that would have accompanied the asset. It also relieved the plaintiff of the uncertainty surrounding that stream. To use hindsight is to ignore the latter effect.”<sup>15</sup>

The plaintiff in the contamination case was not relieved of the uncertainty surrounding his ongoing, if diminished, business. The facts reveal that the Fisher and Romaine argument does not preclude use of the plaintiff’s opportunity cost to estimate the present value of damages at time of trial. He was not relieved of uncertain market conditions, competition, and the general economy affecting his business success.<sup>16</sup>

The ex ante temporal posture discounts annual losses back to the time of harm with the plaintiff’s risk-weighted discount rate and then compounds the ex ante damage estimate to the time of trial with a risk-free or statutory rate.<sup>17</sup> The ex ante approach ignores the fundamental facts that both contamination and the business operation continued during the seven years. The resultant annual losses only could be known after the fact, considering the interrelated uncertainty of each. Discounting to time of discovery misconstrues the evaluation of an investment, which is intrinsically an ex ante activity, with the calculation of damages where the business operation continues. Fact-specific information governs the choice of temporal posture and choice of an interest rate.

The ex post posture incorporates the facts of what actually occurred since discovery of the contamination. Plaintiff and defendant were at risk of these factors once the decision was made not to pay an FMV amount back in 2002. Damages are calculated ex post with the plaintiff’s opportunity cost of capital as demonstrated by Equation (1).

$$\sum_{t=1}^T [(1+k)^t * NCF] \quad (1)$$

Where:

k = discount rate

t = time periods, 1 thru T

T = count of years to time of trial, 2009

NCF = annual net cash flow

Discounting annual losses back to the time of harm at an opportunity cost of capital and then compounding the ex ante present value forward to the time of trial at a lower statutory rate is biased against the plaintiff. The theory of damages is clear that the amount paid should make the plaintiff “whole,” or as the Supreme Court ruled in the *Seaboard Air Line Ry. Co. v. United States*<sup>18</sup> decision decades ago, should provide the “full and perfect equivalent” in money of the impairment to plaintiff’s property. If the plaintiff’s losses have been exposed to the risk of his business, benchmarking to the time of discovery as the point in time to make plaintiff whole and applying a statutory rate to shift losses from this period to the time of trial does not provide the perfect

14. The public utility ran a connector line past the park in 2006, and the defendant offered to pay for connection fees (but not the commodity, water) as part of a settlement in exchange for plaintiff’s dismissal of the complaint. Plaintiff rejected the offer.

15. Franklin M. Fisher & R. Craig Romaine, *Janis Joplin’s Yearbook and Theory of Damages*, 5 J. ACCR. AUDITING & FIN. 145, 154 (1990). This article famously argues that the damages due for the theft of a high school yearbook owned by a classmate of Janis Joplin at her Port Author, Texas, high school—signed

by Janis Joplin—should be valued at the ex ante price paid for the original yearbook, \$5.00, regardless of her untimely death and paucity of Janis Joplin signatures in a collectors’ market.

16. Had the business closed in 2002, this assumption could be different.

17. William B. Tye et al., *How To Value a Lost Opportunity: Defining and Measuring Damages From Market Foreclosure*, 17 RES. L. & ECON. 83, 98 (1995). Beginning at page 97, the authors provide an excellent discussion of the choices and considerations for choosing prejudgment interest rates. A number of choices are revealed, in addition to risk-free or statutory rates.

18. 261 U.S. 299, 304 (1923).

equivalent in money to make the plaintiffs whole at the time of trial.

#### IV. Examples Illustrate Considerations for Temporal Posture and Bias of Wrong Choice

An example reveals when an ex ante methodology and statutory interest rates from time of harm to time of payment are appropriate. In a second case, a state failed to issue a permit to operate a landfill after agreeing to do so, after plaintiff invested in the property, and sought its final license, which was never issued. Plaintiff lost the value of its investments plus its expected cash flows. FMV of the ongoing concern was estimated ex ante based on a forecast at the time of the license denial. Interest at the state's statutory rate was used to calculate damages at the time of trial.

The landfill license denial facts do not match what happened to the mobile home park business. The defendant did not offer the park owner FMV for his business coincident with the contamination. The contamination did not put the plaintiff out of business; he continued in business at reduced operating revenues due to the continuing effects of the contamination.

An illustration reveals the bias created by an incorrect temporal posture and the misuse of discount and statutory rates. See the following table, which assumes a 12% discount rate and a 6% statutory rate.

Discounting Example: Ex Post v. Ex Ante	
Undiscounted Past Losses	\$993,236
<b>Ex Ante Approach</b>	
PV @ 2002 @ 12%	\$496,827
FV @ 2009 @ 6%	\$769,130
<b>Ex Post Approach</b>	
PV @ 2009 @ 12%	\$1,230,123
FV @ 2009 @ 12%	\$1,230,123

Note: PV = Present Value  
FV = Future Value

The sum of the annual undiscounted past losses between 2002 and 2009 is shown on the table to be \$993,236. This amount is the sum of the annual foregone earnings expressed in nominal year dollars. At the end of trial, plaintiff is to be made whole in \$2009, not the sum of annual nominal dollars.

If these annual amounts are discounted back to 2002 at 12%, the PV in 2002 is \$496,827. If a statutory interest rate of 6% is then applied to bring forward this 2002 PV and pay damages at the time of trial, labeled FV @ 2009 @ 6%, the amount, \$769,130, is less than the sum of nominal annual losses. Something seems amiss. This doesn't look like the perfect equivalent in money to the lost business income. This cannot be seen as making the plaintiff whole, which would

mean replacing the cash flow stream the business would have earned had it operated as intended.

In the ex post approach, annual losses are compounded forward to 2009 to make the plaintiff whole at time of trial. The estimated PV at 2009 is \$1,230,123. If the annual flows had been discounted back to 2002 at 12% to a PV @ 2002 and then, using the same discount rate, compounded that 2002 value, \$496,827, forward to 2009, the result arrives at the same \$1,234,286. Given the fact that the business operation remained at risk to a host of factors during the delay between discovery of contaminants and the time of trial, the discount rate of 12% is the appropriate rate to establish damages at time of trial. The statutory rate does not reflect the ongoing risks governing both the risks of business operation and the economic losses.

The lower value of the ex ante approach in the example reveals the bias caused by a failure to acknowledge that the operation remained at business risk: [\$1,230,123 - \$769,130 = \$460,993]. This approach benefits the defendant at the expense of the plaintiff. Only if the defendant had exchanged the plaintiff's business risk at mid-year 2002 for a certain amount equal to the FMV of the condemned business would the 6% rate of return been the correct choice. The 6% rate assumes away business risk factors as if only the FMV were at risk to delay until paid.

If the seven years between discovery and trial were governed in part by delays caused by the defendant, that, of course, would worsen the bias against the plaintiff by the ex ante posture. The more years plaintiff earns 6% instead of his opportunity cost of capital, 12%, the more the delay fails to provide damages in an amount perfectly equivalent to what the plaintiff expected to earn from his business. The incorrect choice of an ex ante posture can create an inducement for the defendant to exacerbate delays.

#### V. Hybrid Approach

Recall that Part II reported a hybrid approach, which relies on ex post information, but sets the time of harm as the benchmark measurement date. The example depicted in the table relies on fact-specific information that the hybrid approach to damages could consider. The critical factor is the rate of interest that shifts ex ante damages to an ex post payment. No matter whether losses are estimated with ex ante or ex post information, if they are at risk to plaintiff's business operation during the delay between harm and trial, the damages can only make the plaintiff whole if they are compounded to the time of trial with her opportunity cost of capital.<sup>19</sup> After the court has awarded damages, then the statutory rate would apply until payment is made.

With this in mind, benchmarking damages to the time of harm where a business continues its operation without the "but for" income creates an opportunity for courts to unwit-

19. The interested reader is referred to the discussion of discount rates beginning at page 353 of William W. Wade, "Sophistical and Abstruse Formulas" Made Simple: Advances in Measurement of Penn Central's Economic Prongs and Estimation of Economic Damages in Federal Claims and Federal Circuit Courts, 38 URB. LAW. 337 (2006).

tingly determine biased damages by choice of the incorrect interest rate. The example above reveals what happens when losses from an ongoing, but diminished, operation are benchmarked *ex ante* and shifted to time of trial with statutory interest in place of plaintiff's opportunity cost of capital.

## VI. Conclusions

The purpose of estimating damages is to make the plaintiff whole at the time of payment. If the action that causes the plaintiff's loss puts the plaintiff out of business, or forestalls his startup, *ex ante* damages estimated at the time of harm make sense. If the damages are not paid immediately, they would *not* carry an interest rate at the plaintiff's opportunity cost of capital because when the opportunity was forestalled, its uncertainty also disappeared. Statutory or risk-free rates apply.

If the action that causes the plaintiff's loss diminishes her future income, but the operation remains in business, then the annual losses are the difference between earnings from actual operations and what was expected but for the action. Hence, the business and the resultant losses are at risk to the plaintiff's business uncertainty. Damages should be benchmarked to time of trial with the plaintiff's opportunity cost of capital, compounded from the time of harm to the time of trial.

Making plaintiff in the mobile home park whole means awarding a damage amount equivalent to what he would have earned had he been allowed to run the business as intended. The lump-sum payment must equal the present value of the economic losses of the business at time of trial. If, on the other hand, the business had been condemned and shut

down soon after mid-year 2002, and the defendant agreed to pay the property owner FMV for the lost going concern value of the park, then there would be no issue about the correct point in time: date of discovery. No interest would be due if, in a perfect world, FMV had been paid immediately, because plaintiff could have invested the received funds at that point in time.

If the business were condemned but payment was delayed for whatever reason, and the amount due was fixed and certain, the statutory interest rate would be appropriate during a delay. Plaintiff would no longer expect to earn a business return on the shut-down operation because he no longer faced the attendant business risks. He would only expect to earn interest at a statutory rate on the agreed-upon FMV of the business.

Our conclusion regarding the proper temporal posture in the contamination case is clear: actual economic losses subsequent to the event should be benchmarked to the time of trial, brought forward using the plaintiff's opportunity cost of capital. Future estimated economic losses should be discounted back to the time of trial using a discount rate.<sup>20</sup> This is the proper method where an affected business continues its operations after the date of harm to the business.

This method should apply to many other business interruption litigation cases, as well. It does not apply to instances where the effect of the harm is experienced immediately, such as a securities fraud case, or a situation where a business ceases operations. In those situations, the appropriate temporal posture would be the date of harm. Factual considerations of each case ultimately govern the correct temporal posture and the proper discount rates applicable during the delay between harm and trial.

20. This is consistent with the Federal Circuit's conclusion that "the damages that would have arisen after the date of judgment ('future lost profits') must be discounted to the date of judgment." *Energy Capital Corp. v. United States*, 302 F.3d 1314, 1330 (Fed. Cir. 2002). The lost future income losses in \$2009, governed by business risk, are discounted with plaintiff's discount rate, less inflation. The increased cost of replacement water drinking water is discounted with a different rate governed by risk of power cost saved from not pumping versus risks of water agency costs incurred. These uncertainties reveal a different risk premium than that attached to the business operation *per se*.