

**ANALYSIS**  
*of*  
**Unjust Enrichment**

*in:*

**Maria Aguinda et al.**

**v.**

**Chevron Corporation**

Case No. 002/2003

Court of Justice of Nueva Loja

*prepared on:*

September 13, 2010

*prepared by:*

Jonathan S. Shefftz

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**Analysis of Jonathan S. Shefftz:  
Unjust Enrichment  
September 13, 2010**

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**1. Summary of Analysis**

I have been asked by counsel for Plaintiffs in this matter to provide an analysis of the potential unjust enrichment that accrued to Defendant. In the process of preparing this analysis, I have also reviewed the unjust enrichment calculations in the report prepared by Court-appointed expert Richard Stalin Cabrera Vega ("Cabrera").

Starting with the Cabrera report's engineering figures and cost estimates, I have performed my own financial analysis to arrive at an unjust enrichment estimate range of between approximately \$4.57 and \$9.46 billion, reflecting present values as of 2010. The lower end of the range represents all costs adjusted to their after-tax equivalents at the highest marginal statutory tax rates (U.S. federal and state combined), whereas the upper end of the range represents no after-tax adjustment at all.

Were these figures to be adjusted by the probability of detection, prosecution, and ultimate payment, the results would be substantially higher. For example, were the probability of detection, prosecution, and ultimate payment 50 percent, then the appropriate unjust enrichment recapture for the purposes of establishing financial indifference (i.e., the first step in achieving deterrence) would be \$9.13 and \$18.93 billion (with the range corresponding to the tax treatment as described above). For a 25-percent probability, the results would be \$18.26 and \$37.86 billion.

I may revise my analysis as additional information becomes available to me or upon the reconsideration of existing information.

**2. Basis for Analysis**

My analysis is based broadly on my expertise in economic and financial analysis. I hold both undergraduate and graduate degrees with a focus on economics in various contexts.

My experience with unjust enrichment analysis back to 1992, encompassing expert witness casework, computer model development, training of state and federal agency staff, as well as involvement in federal agency public comment and peer review processes.

More specifically, I have been involved since 1992 with the periodic revisions and modifications to the U.S. Environmental Protection Agency ("EPA") "BEN" computer model. This

involvement was first in my capacity as an employee of Industrial Economics, Incorporated ("IEc"), a contractor to EPA, and then since April 2006 as a subcontractor to IEc. Both federal and state environmental enforcement staff use the BEN model to develop their unjust enrichment estimates (termed "economic benefit" in the U.S. environmental noncompliance context) for penalty determinations. In 1998, I managed IEc's development (under contract to U.S. EPA) of an entirely new version of the model for the Windows operating system. Since then, I have continued to work on all aspects of IEc's support to EPA on the BEN model, encompassing researching relevant tax code changes, implementing new features, supervising a helpline that assists EPA and state environmental agencies, managing academic peer reviews, developing training course materials, and even typing in individual formulas. I have also published articles on the subject matter (both concerning the BEN model, and related unjust enrichment issues).

Attached to the main body of this analysis is my resume, which includes a list of my publications and a list of the cases in which I have testified going back at least four years.

Documents that I have reviewed in this case include the Cabrera report as previously referenced. I have also conducted independent research for various economic inputs as cited throughout my calculations.

### **3. Unjust Enrichment: Context, Theory, and Methodology**

In this section, I explain unjust enrichment's context, theory, and methodology. In the section after this one, I summarize and then provide my unjust enrichment analysis.

#### **a. Context**

As described in the Cabrera report's annex/appendix for unjust enrichment, ChevronTexaco should have incurred certain costs for reinjecting produced water, properly disposing of well wastes, and capturing produced gas. Therefore, ChevronTexaco avoided these costs over a period of many years. With the funds that should have been expended for compliance in a timely manner, ChevronTexaco could have instead, for instance, increased investment at these fields, increased investment at other financially productive ventures, and/or provided greater returns to its ownership.

#### **b. Theory**

When companies (such as ChevronTexaco in this case) delay or avoid compliance with environmental requirements, a financial gain can occur from such delay or avoidance. By postponing compliance, a company can realize a gain from delaying investing in capital equipment and/or incurring other costs, from delaying or avoiding business interruption losses necessitated by upgrades for compliance, and/or from avoiding the payment of certain necessary costs. Unjust enrichment represents the financial gains that accrue through such delayed and/or avoided

expenditures. Funds not spent on environmental compliance are available for financially productive economic activities or, alternatively, the costs associated with obtaining additional funds for environmental compliance are avoided.<sup>1</sup>

Unjust enrichment is hence the amount by which a company is financially better off as a result of not having complied with environmental requirements in a timely manner. Unjust enrichment is “no fault” in nature: a company need not have deliberately chosen to delay compliance (for financial or any other reasons) – or in fact even have been aware of its noncompliance – for it to have accrued the unjust enrichment from its environmental noncompliance.

The appropriate unjust enrichment estimate should represent the amount of money that would make the company indifferent between compliance and noncompliance. Ideally, in the penalty-setting context, the unjust enrichment result should be adjusted for the probability of detection, prosecution, and ultimate payment.<sup>2</sup> That is, if ChevronTexaco in this case knew that for every noncompliant company in the industry, the probability of ultimately paying a penalty that recaptured unjust enrichment was only 25 percent (i.e., one-fourth), then the unjust enrichment result would have to be multiplied by a factor of four for penalty-setting purposes. As the probability of detection-prosecution-payment declines, then the amount of money proportionately increases that would make the company indifferent between compliance and noncompliance. Unfortunately, even rough estimates of these probabilities (whether industry- or medium-specific) are unavailable.<sup>3</sup> Were my results to be used as the basis for a civil penalty without any further adjustments, this would implicitly assume a 100-percent probability of detection-prosecution-payment for these types of violations. Therefore, I provide adjustments to my results based simply upon examples of different probability levels.

If a civil penalty or other court award fails to recover at least this unjust enrichment, then ChevronTexaco will retain a gain from noncompliance. Because of the precedent of this retained gain, ChevronTexaco and even other entities may see an economic advantage in similar noncompliance, and the penalty will fail to deter potential violators. Unjust enrichment does not represent compensation to Plaintiffs as in a typical “damages” calculation for a tort case, but instead is the minimum amount that ChevronTexaco must pay as a civil penalty so as to return

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<sup>1</sup> The concept that the true cost of any action can be measured by the value of the alternative that must be foregone is known in economics as the concept of “opportunity cost.”

<sup>2</sup> This issue was raised by a peer review panel of academic experts in *An Advisory of the Illegal Competitive Advantage (ICA) Economic Benefit (EB) Advisory Panel of the EPA Science Advisory Board* (September 7, 2005). The advisory report is available for downloading at:  
[http://www.epa.gov/sab/pdf/ica\\_eb\\_sab-adv-05-003.pdf](http://www.epa.gov/sab/pdf/ica_eb_sab-adv-05-003.pdf)

<sup>3</sup> See U.S. EPA Office of Inspector General, *EPA Performance Measures Do Not Effectively Track Compliance Outcomes* (December 15, 2005), available at:  
<http://www.epa.gov/oig/reports/2006/20051215-2006-P-00006.pdf>

ChevronTexaco to the position it would have been in had it complied in a timely manner. Therefore, were the unjust enrichment not to be fully disgorged in the form of a civil penalty payment, the residual financial gain could be construed as representing an unfair competitive advantage to ChevronTexaco over other companies in its industry.

**c. Methodology**

The unjust enrichment calculation incorporates the concept of the "time value of money." For example, in simple terms, a dollar yesterday is worth more than a dollar today, because one had investment opportunities for yesterday's dollar. Thus, the further in the past that the dollar was obtained, the more it is worth in "present-value" terms. The greater the time value of money (i.e., the greater the "discount" or "compounding" rate), the more value past costs have in present-value terms.

To calculate unjust enrichment, I use standard financial cash flow and net present value analysis techniques, based on modern and generally accepted financial principles. Such an approach is the underpinning of any capital budgeting exercise, and is the standard approach by which alternative investments should be judged according to any financial economics or corporate finance text. This is the same approach that the U.S. EPA's "BEN" economic benefit computer model employs, and is also the same approach that I employ when testifying, whether on behalf of U.S. EPA, U.S. DOJ, state environmental enforcement agencies, or citizen litigators.

First, I calculate: (a) the costs that ChevronTexaco should have incurred in order to attain full on-time compliance; and, (b) the costs of delayed compliance that Respondent eventually incurred. In this matter, however, all of the costs that I lay out were avoided entirely over the period in question, and hence the "delayed compliance" scenario has no costs associated with it, and therefore does not appear in my calculations. I then adjust for the tax deductions available for these costs. Next, I calculate the present value of the costs, or "cash flows." This adjustment is performed with a rate that reflects the cost of capital over the period of noncompliance. And finally, although typically I would subtract the present value of the delayed compliance from the present value of the on-time compliance, as mentioned earlier, with all costs avoided, this final step is not necessary.

A civil penalty insufficient to disgorge the entire amount of the unjust enrichment figure would fail to make a company financially indifferent between compliance and noncompliance. Such indifference is the first step in achieving financial deterrence, which would additionally require an even higher penalty over and above the disgorgement of the unjust enrichment. For example, if the unjust enrichment were \$1,000 and the civil penalty only \$700, the company would have a \$300 incentive to violate the law. By contrast, if the civil penalty were exactly \$1,000, the company would come out even, and have no incentive either to comply or not comply. Alternatively, if the penalty were \$1,500, the company would have a \$500 incentive to comply. Note that all of these examples implicitly assume a 100-percent probability of detection, prosecution, and payment. As previously explained in section 3.b. above, as the probability of detection-prosecution-payment

declines, then the amount of money proportionately increases that would make the company indifferent between compliance and noncompliance.

#### **4. Unjust Enrichment Analysis**

Below I explain how I calculate ChevronTexaco's unjust enrichment from avoiding the necessary environmental compliance costs. First I describe the avoided cost calculations, then I describe some of the financial parameters they reference, and finally I summarize the results. All of these calculations and results should be fully replicable for any analyst. (Note that although many figures are rounded off in the display, they are not rounded off in the calculations.)

##### **a. Avoided Cost Calculations: Exhibits 1, 2, 3**

Exhibits 1, 2, and 3 are my versions of the Cabrera report's Tables 1, 2, and 3. (Note that the Cabrera report's Table 3 on page 5 is incorrectly labeled as a second Table 2.) For each set of calculations, I start with each year's quantity estimates, then multiple by a year-specific cost estimate as derived from Exhibits 4 and 5 (as explained in the following section of my analysis). The pre-tax avoided costs are then adjusted to their after-tax equivalents at the year-specific U.S. federal and state combined marginal corporate tax rates (as provided in Exhibit 6). I use the highest marginal corporate tax rates. The highest marginal rates produce the lowest after-tax value of compliance costs, and therefore the most conservative, downwardly biased unjust enrichment results.

##### **b. Financial Parameters: Exhibits 4, 5, 6**

Exhibit 4 deflates the Cabrera report's 2008 cost estimates back to the end of the period for the avoided costs, i.e., 1990. Since the 2008 cost estimates mainly rely on U.S. data, this inflation adjustment is performed using the U.S. Producer Price Index series for "Support activities for oil and gas operations." The 1990-adjusted cost estimates are used as a starting point in Exhibits 1, 2, and 3 for the avoided cost calculations, as explained below.

Exhibit 5 then combines Ecuador Consumer Price Index ("CPI") data with foreign currency exchange rates to derive a U.S. dollar-denominated Ecuador CPI and then further derive each year's ratio to 1990. These ratios are used in Exhibits 1, 2, and 3 to adjust the 1990 cost estimates (from Exhibit 4) to each year in order to calculate the avoided costs.

Exhibit 6 provides the derivation of the company-specific weighted-average cost of capital ("WACC"), which is used to compound the avoided costs to their present values as of 2010 in Exhibits 1, 2, and 3. (Also note that the tax rates in Exhibit 6 are referenced in the formulas for the after-tax adjustments in Exhibit 1, 2, and 3.) The detailed WACC calculations are explained in notes at the bottom of Exhibit 6.

The WACC represents the cost of a company's debt and equity weighted by the value of each source of financing. On average, a company must earn a rate of return that enables it to repay its debt holders (e.g. banks, bondholders) and satisfy its equity owners (e.g., partners, stockholders). Although companies can earn rates in excess of their WACC, companies that do not on average earn returns equivalent to their WACC will not survive (i.e., their lenders will not receive their principal and/or interest payments, and their owners will be dissatisfied with their returns). As a result, standard business practices dictate that a company should make its business decisions by discounting cash flows at its WACC. Therefore, the WACC represents the return that would have been expected to be earned on monies not invested in environmental controls, or, viewed alternatively, represents the avoided costs of financing the investment in environmental controls.

**c. Results: Exhibit 7**

Exhibit 7 provides a summary of the unjust enrichment results. The unjust enrichment ranges from \$4.57 to \$9.46 billion depending on the tax treatment, reflecting present values as of 2010. The lower end of the range represents all costs adjusted to their after-tax equivalents at the highest marginal statutory tax rates (U.S. federal and state combined), whereas the upper end of the range represents no after-tax adjustment at all.

As previously noted, this unjust enrichment is calculated as of 2010. Note that this would continue to be compounded at the annual rate of 6.7 percent (i.e., my most recent figure for the company-specific weighted-average cost of capital) going into future years if not disgorged from the company, for an annual increase of approximately \$305 to \$632 million (corresponding to the previously provided range of results).

Exhibit 7 also provides the results when adjusted for the probability of detection, prosecution, and ultimate payment (as explained previously in section 3b, "Theory," under "Unjust Enrichment: Context, Theory, and Methodology"). Based upon an example probability of 50 percent for detection, prosecution, and ultimate payment, then the appropriate unjust enrichment recapture for the purposes of establishing financial indifference (i.e., the first step in achieving deterrence) would be \$9.13 and \$18.93 billion (with the range corresponding to the tax treatment as described above). For a 25-percent probability, the results would be \$18.26 and \$37.86 billion.

Also, in the alternative, if Chevron were to claim that the various environmental costs for reinjection, disposal, and capture would have rendered the fields economically unviable at the time, then the unjust enrichment is simply the entire after-tax present value of the profits from the operations over this entire period. In other words, the other means of preventing the environmental contamination would have been never operating there in the first place.

**5. Qualifications**

As previously noted under the section entitled Basis for Analysis, following the main body of this analysis is my resume, which also provides a list of publications and testimony experience.

9-13-2010  
Dated

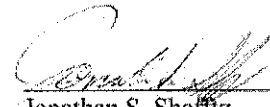
  
Jonathan S. Shefftz



Exhibit 1

**PRODUCED WATER REINJECTION**

Year	Volume (barrels)	Adjusted from	Avoided Costs:		Present Value at 2010:	
		1990 Cost of: \$0.43	Pre-Tax	After-Tax	After-Tax	0% tax rate
1972	3,014,675	\$0.24	\$728,361	\$344,661	\$16,226,429	\$34,290,848
1973	12,058,700	\$0.27	\$3,292,534	\$1,558,027	\$64,944,010	\$137,244,316
1974	9,044,025	\$0.34	\$3,045,297	\$1,441,034	\$52,812,977	\$111,608,150
1975	9,044,025	\$0.39	\$3,513,143	\$1,607,614	\$51,856,412	\$113,322,579
1976	16,882,179	\$0.43	\$7,257,687	\$3,321,118	\$95,767,904	\$209,283,008
1977	21,102,724	\$0.49	\$10,252,774	\$4,798,298	\$123,766,341	\$264,457,994
1978	21,102,724	\$0.54	\$11,447,220	\$5,357,299	\$123,503,861	\$263,897,139
1979	27,132,074	\$0.60	\$16,228,829	\$7,887,211	\$163,307,905	\$336,024,497
1980	24,117,399	\$0.68	\$16,308,020	\$7,925,698	\$145,932,828	\$300,273,308
1981	27,132,074	\$0.79	\$21,353,013	\$10,377,564	\$164,421,479	\$338,315,799
1982	27,132,074	\$0.69	\$18,721,397	\$9,098,599	\$119,498,737	\$245,882,175
1983	26,529,139	\$0.63	\$16,649,328	\$8,091,573	\$89,755,163	\$184,681,406
1984	27,132,074	\$0.66	\$17,996,234	\$8,746,170	\$83,435,123	\$171,677,208
1985	25,323,269	\$0.60	\$15,081,324	\$7,329,523	\$62,118,522	\$127,815,888
1986	21,102,724	\$0.48	\$10,105,834	\$4,911,435	\$37,314,702	\$76,779,222
1987	9,044,025	\$0.41	\$3,709,731	\$2,025,513	\$14,323,167	\$26,232,907
1988	21,102,724	\$0.33	\$7,013,702	\$4,212,430	\$27,499,291	\$45,786,365
1989	24,117,399	\$0.39	\$9,391,200	\$5,640,355	\$33,424,785	\$55,652,322
1990	27,132,074	\$0.43	\$11,585,630	\$6,855,101	\$36,709,671	\$62,042,067
<b>Totals:</b>					<b>\$1,506,619,307</b>	<b>\$3,105,267,198</b>

## Exhibit 2

## PRODUCED WELL WASTE DISPOSAL

Year	Volume (m <sup>3</sup> )	Adjusted from 1990 Cost of: \$37.16	Avoided Costs:		Present Value at 2010:	
			Pre-Tax	After-Tax	After-Tax	0% tax rate
1967	33,392	\$21.41	\$715,081	\$351,391	\$31,171,486	\$63,434,037
1968	40,070	\$22.34	\$895,140	\$392,931	\$31,100,970	\$70,851,489
1969	53,427	\$23.75	\$1,269,038	\$557,057	\$39,089,643	\$89,050,580
1970	166,960	\$17.98	\$3,001,823	\$1,418,181	\$87,044,364	\$184,244,271
1971	220,387	\$19.49	\$4,294,628	\$2,032,218	\$108,194,381	\$228,644,084
1972	207,030	\$21.02	\$4,352,317	\$2,059,516	\$96,960,896	\$204,904,683
1973	327,242	\$23.76	\$7,774,630	\$3,678,955	\$153,351,676	\$324,073,703
1974	200,352	\$29.30	\$5,870,059	\$2,777,712	\$101,801,330	\$215,133,833
1975	66,784	\$33.80	\$2,257,290	\$1,032,936	\$33,319,158	\$72,812,845
1976	93,498	\$37.41	\$3,497,461	\$1,600,438	\$46,150,316	\$100,852,964
1977	46,749	\$42.28	\$1,976,315	\$924,915	\$23,857,077	\$50,976,661
1978	93,498	\$47.20	\$4,413,109	\$2,065,335	\$47,612,964	\$101,737,102
1979	113,533	\$52.05	\$5,908,907	\$2,871,729	\$59,460,315	\$122,346,327
1980	66,784	\$58.84	\$3,929,380	\$1,909,679	\$35,162,183	\$72,350,171
1981	73,462	\$68.48	\$5,030,600	\$2,444,872	\$38,736,393	\$79,704,513
1982	53,427	\$60.04	\$3,207,724	\$1,558,954	\$20,474,909	\$42,129,443
1983	60,106	\$54.61	\$3,282,254	\$1,595,176	\$17,694,365	\$36,408,159
1984	120,211	\$57.71	\$6,937,831	\$3,371,786	\$32,165,552	\$66,184,263
1985	93,498	\$51.82	\$4,845,102	\$2,354,719	\$19,956,508	\$41,062,773
1986	53,427	\$41.67	\$2,226,257	\$1,081,961	\$8,220,214	\$16,914,020
1987	80,141	\$35.69	\$2,860,331	\$1,561,741	\$11,043,658	\$20,226,479
1988	33,392	\$28.92	\$965,678	\$579,986	\$3,786,224	\$6,304,069
1989	0	\$33.88	\$0	\$0	\$0	\$0
1990	6,678	\$37.16	\$248,121	\$146,811	\$786,185	\$1,328,711
<b>Totals:</b>					<b>\$1,047,140,765</b>	<b>\$2,211,675,180</b>

Exhibit 3

**PRODUCED GAS CAPTURE**

Year	Volume (ft <sup>3</sup> )	Adjusted from	Avoided Costs:		Present Value at 2010:	
		1990 Cost of: \$0.000938	Pre-Tax	After-Tax	After-Tax	0% tax rate
1972	1,831,994,817	\$0.000531	\$972,670	\$460,268	\$21,669,140	\$45,792,774
1973	7,327,979,269	\$0.000600	\$4,396,925	\$2,080,625	\$86,727,700	\$183,279,163
1974	5,495,984,452	\$0.000740	\$4,066,758	\$1,924,390	\$70,527,643	\$149,044,047
1975	5,495,984,452	\$0.000854	\$4,691,531	\$2,146,844	\$69,250,225	\$151,333,534
1976	10,259,170,976	\$0.000945	\$9,692,080	\$4,435,096	\$127,890,632	\$279,481,277
1977	12,823,963,720	\$0.001068	\$13,691,787	\$6,407,756	\$165,280,378	\$353,163,201
1978	12,823,963,720	\$0.001192	\$15,286,877	\$7,154,258	\$164,929,856	\$352,414,223
1979	16,487,953,355	\$0.001314	\$21,672,346	\$10,532,760	\$218,085,077	\$448,734,727
1980	14,655,958,537	\$0.001486	\$21,778,099	\$10,584,156	\$194,882,006	\$400,991,781
1981	16,487,953,355	\$0.001729	\$28,515,298	\$13,858,435	\$219,572,168	\$451,794,584
1982	16,487,953,355	\$0.001516	\$25,000,978	\$12,150,475	\$159,581,321	\$328,356,627
1983	16,121,554,391	\$0.001379	\$22,233,890	\$10,805,670	\$119,861,079	\$246,627,735
1984	16,487,953,355	\$0.001458	\$24,032,578	\$11,679,833	\$111,421,154	\$229,261,634
1985	15,388,756,464	\$0.001309	\$20,139,941	\$9,788,011	\$82,954,481	\$170,688,233
1986	12,823,963,720	\$0.001052	\$13,495,560	\$6,558,842	\$49,830,899	\$102,532,713
1987	5,495,984,452	\$0.000901	\$4,954,059	\$2,704,916	\$19,127,481	\$35,032,017
1988	12,823,963,720	\$0.000730	\$9,366,257	\$5,625,374	\$36,723,176	\$61,144,150
1989	14,655,958,537	\$0.000856	\$12,541,221	\$7,532,257	\$44,636,215	\$74,319,372
1990	16,487,953,355	\$0.000938	\$15,471,713	\$9,154,458	\$49,022,926	\$82,852,382
<b>Totals:</b>					<b>\$2,011,973,558</b>	<b>\$4,146,844,174</b>

Exhibit 4

**INFLATION ADJUSTMENTS FROM 2008 ORIGINAL COST YEAR TO 1990**

	<u>2008</u>	<u>1990</u>
U.S. PPI	196.9	103.8
Injection (per barrel)	\$0.81	\$0.43
Waste Disposal (per m <sup>3</sup> )	\$70.48	\$37.16
Gas Capture (per ft <sup>3</sup> )	\$0.00178	\$0.000938

*Producer Price Index ("PPI") from U.S. Department of Labor Bureau of Labor Statistics Series ID # PCU213112213112 for "Support activities for oil and gas operations"*

Exhibit 5

**CONSUMER PRICE INDEX AND CURRENCY EXCHANGE ADJUSTMENTS**

Year	Ecuador	Nat'l Currency Per SDR		U.S - EC	EC CPI in	Ratio to
	CPI	Ecuador	U.S.	Rate	U.S. \$	1990
1967	0.0195097	18.0000	1.00000	0.05556	0.00108	0.5764
1968	0.0203521	18.0000	1.00000	0.05556	0.00113	0.6012
1969	0.0216397	18.0000	1.00000	0.05556	0.00120	0.6393
1970	0.0227498	25.0000	1.00000	0.04000	0.00091	0.4839
1971	0.0246572	27.1427	1.08571	0.04000	0.00099	0.5245
1972	0.0266006	27.1427	1.08571	0.04000	0.00106	0.5658
1973	0.0300618	30.1587	1.20635	0.04000	0.00120	0.6394
1974	0.0370726	30.6087	1.22435	0.04000	0.00148	0.7886
1975	0.0427681	29.2665	1.17066	0.04000	0.00171	0.9097
1976	0.0473320	29.0457	1.16183	0.04000	0.00189	1.0068
1977	0.0534919	30.3677	1.21471	0.04000	0.00214	1.1378
1978	0.0597237	32.5697	1.30279	0.04000	0.00239	1.2704
1979	0.0658551	32.9332	1.31733	0.04000	0.00263	1.4008
1980	0.0744485	31.8852	1.27541	0.04000	0.00298	1.5836
1981	0.0866487	29.0990	1.16396	0.04000	0.00347	1.8431
1982	0.1007360	36.5681	1.10311	0.03017	0.00304	1.6159
1983	0.1495260	56.6400	1.04695	0.01848	0.00276	1.4697
1984	0.1962240	65.8456	0.98021	0.01489	0.00292	1.5533
1985	0.2511340	105.1740	1.09842	0.01044	0.00262	1.3947
1986	0.3089700	179.1970	1.22319	0.00683	0.00211	1.1215
1987	0.4001290	314.2330	1.41866	0.00451	0.00181	0.9606
1988	0.6330690	582.0290	1.34570	0.00231	0.00146	0.7783
1989	1.1119700	852.1280	1.31416	0.00154	0.00171	0.9119
1990	1.6514900	1249.3800	1.42266	0.00114	0.00188	1.0000

*International Monetary Fund data series ID #s:*

24864...ZF...	Consumer Price Index ("CPI")
248..AA.ZF...	Ecuador sucre per Special Drawing Right ("SDR")
111..SA.ZF...	U.S. dollar per Special Drawing Right ("SDR")

Exhibit 6

WEIGHTED-AVERAGE COST OF CAPITAL: TEXACO THROUGH 2000, THEN CHEVRON

Year													Capital Structure:				
	(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(i)	(ii)	(iii)
	Cost of Debt	Tax Rates:			After-Tax Debt	Debt Weight	Treasury Notes	Beta	Horizon Risk Prem	Company Risk Premium	Equity Cost	Equity Weight	WACC	Present Value Factor	Long-Term Debt	Shares Outstanding	Share Price
	U.S.	State	Combined	Cost	Weight	5-Year											
1967	5.51%	48%	5.500%	50.86%	2.7%	8.49%	5.10%	0.79	9.9%	7.84%	12.9%	91.51%	12.1%	88.709	939	541.5	18.68
1968	6.18%	53%	7.000%	56.10%	2.7%	9.32%	5.70%	0.81	10.1%	8.13%	13.8%	90.68%	12.8%	79.151	1095	541.9	19.67
1969	7.03%	53%	7.000%	56.10%	3.1%	9.78%	6.93%	0.86	10.0%	8.62%	15.5%	90.22%	14.3%	70.172	1053	544.9	17.84
1970	8.04%	49%	7.000%	52.76%	3.8%	11.54%	7.38%	1.00	9.4%	9.40%	16.8%	88.46%	15.3%	61.377	1015	544.9	14.28
1971	7.39%	48%	9.000%	52.68%	3.5%	12.32%	5.99%	0.93	9.1%	8.44%	14.4%	87.68%	13.1%	53.240	1290	544.9	16.84
1972	7.21%	48%	9.000%	52.68%	3.4%	13.01%	5.98%	0.92	9.1%	8.39%	14.4%	86.99%	12.9%	47.079	1360	544.5	16.70
1973	7.44%	48%	9.000%	52.68%	3.5%	16.34%	6.87%	0.96	9.2%	8.86%	15.7%	83.66%	13.7%	41.683	1778	544.1	16.73
1974	8.57%	48%	9.000%	52.68%	4.1%	22.18%	7.82%	0.99	8.6%	8.52%	16.3%	77.82%	13.6%	36.649	1897	544.1	12.23
1975	8.83%	48%	12.000%	54.24%	4.0%	25.23%	7.78%	0.87	7.7%	6.72%	14.5%	74.77%	11.9%	32.257	2234	543.4	12.18
1976	8.43%	48%	12.000%	54.24%	3.9%	26.51%	7.18%	0.92	8.1%	7.48%	14.7%	73.49%	11.8%	28.836	2585	542.9	13.20
1977	8.02%	48%	10.000%	53.20%	3.8%	25.64%	6.99%	0.93	8.3%	7.70%	14.7%	74.36%	11.9%	25.794	2559	542.9	13.67
1978	8.73%	48%	10.000%	53.20%	4.1%	35.61%	8.32%	0.89	7.9%	7.03%	15.4%	64.39%	11.3%	23.053	3640	542.9	12.12
1979	9.63%	46%	10.000%	51.40%	4.7%	32.19%	9.51%	0.86	7.7%	6.63%	16.1%	67.81%	12.5%	20.705	3456	542.9	13.41
1980	11.94%	46%	10.000%	51.40%	5.8%	23.54%	11.45%	1.02	7.8%	7.97%	19.4%	76.46%	16.2%	18.413	3175	541.3	19.05
1981	14.17%	46%	10.000%	51.40%	6.9%	23.38%	14.25%	1.32	8.0%	10.58%	24.8%	76.62%	20.6%	15.844	2860	532.9	17.58
1982	13.79%	46%	10.000%	51.40%	6.7%	24.30%	13.01%	1.22	7.5%	9.15%	22.2%	75.70%	18.4%	13.134	2427	519.3	14.56
1983	12.04%	46%	10.000%	51.40%	5.9%	24.04%	10.79%	1.16	7.6%	8.79%	19.6%	75.96%	16.3%	11.092	2789	516.1	17.07
1984	12.71%	46%	10.000%	51.40%	6.2%	56.48%	12.26%	1.13	7.6%	8.59%	20.8%	43.52%	12.6%	9.540	11215	478.8	18.04
1985	11.37%	46%	10.000%	51.40%	5.5%	47.67%	10.12%	0.94	7.4%	6.92%	17.0%	52.33%	11.6%	8.475	7657	475.8	17.67
1986	9.02%	46%	10.000%	51.40%	4.4%	49.98%	7.30%	0.41	7.7%	3.20%	10.5%	50.02%	7.4%	7.598	7560	479.2	15.79
1987	9.38%	40%	9.000%	45.40%	5.1%	45.82%	7.94%	0.40	7.7%	3.09%	11.0%	54.18%	8.3%	7.071	7579	485.3	18.46
1988	9.71%	34%	9.000%	39.94%	5.8%	37.45%	8.48%	0.56	7.6%	4.27%	12.8%	62.55%	10.2%	6.528	6655	486.7	22.84
1989	9.26%	34%	9.000%	39.94%	5.6%	26.49%	8.50%	0.53	7.6%	4.00%	12.5%	73.51%	10.7%	5.926	4714	502.8	26.01
1990	9.32%	34%	10.350%	40.83%	5.5%	22.26%	8.37%	0.49	7.8%	3.84%	12.2%	77.74%	10.7%	5.355	4485	525.8	29.78
1991	8.77%	34%	10.350%	40.83%	5.2%	24.15%	7.37%	0.56	7.5%	4.19%	11.6%	75.85%	10.0%	4.836	5173	516.5	31.46
1992	8.14%	34%	10.350%	40.83%	4.8%	28.83%	6.19%	0.61	7.8%	4.74%	10.9%	71.17%	9.2%	4.396	6441	517.1	30.75
1993	7.27%	35%	10.350%	41.73%	4.2%	27.07%	5.14%	0.41	7.7%	3.15%	8.3%	72.93%	7.2%	4.027	6157	517.6	32.05
1994	7.97%	35%	10.125%	41.58%	4.7%	25.42%	6.69%	0.54	7.6%	4.10%	10.8%	74.58%	9.2%	3.757	5564	518.4	31.49
1995	7.59%	35%	9.675%	41.29%	4.5%	23.85%	6.38%	0.70	7.4%	5.14%	11.5%	76.15%	9.8%	3.440	5503	520.1	33.78
1996	7.37%	35%	9.225%	41.00%	4.3%	17.95%	6.18%	0.81	7.8%	6.35%	12.5%	82.05%	11.1%	3.131	5125	528.4	44.34
1997	7.27%	35%	9.000%	40.85%	4.3%	15.78%	6.22%	0.49	7.9%	3.89%	10.1%	84.22%	9.2%	2.820	5507	531.2	55.33
1998	6.53%	35%	9.000%	40.85%	3.9%	16.87%	5.15%	0.53	8.2%	4.37%	9.5%	83.13%	8.6%	2.582	6352	539.7	58.01
1999	7.05%	35%	9.000%	40.85%	4.2%	17.12%	5.55%	0.40	8.4%	3.40%	8.9%	82.88%	8.1%	2.378	6606	542.9	58.89
2000	7.62%	35%	8.000%	40.20%	4.6%	18.64%	6.16%	0.35	8.5%	2.95%	9.1%	81.36%	8.3%	2.200	6815	552.1	53.88
2001	7.08%	35%	8.84%	40.75%	4.2%	11.85%	4.56%	0.59	8.2%	4.80%	9.4%	88.15%	8.7%	2.032	8989	1499.8	44.58
2002	6.49%	35%	8.84%	40.75%	3.8%	11.28%	3.82%	0.60	7.8%	4.69%	8.5%	88.72%	8.0%	1.868	10666	2135.4	39.29
2003	5.66%	35%	8.84%	40.75%	3.4%	12.32%	2.97%	0.58	7.4%	4.31%	7.3%	87.68%	6.8%	1.730	10651	2137.0	35.47
2004	5.63%	35%	8.84%	40.75%	3.3%	9.02%	3.43%	0.62	7.6%	4.73%	8.2%	90.98%	7.7%	1.620	10217	2133.6	48.30
2005	5.23%	35%	8.84%	40.75%	3.1%	9.02%	4.05%	0.54	7.6%	4.08%	8.1%	90.98%	7.7%	1.504	12131	2123.6	57.65
2006	5.59%	35%	8.84%	40.75%	3.3%	5.17%	4.75%	0.63	7.6%	4.80%	9.6%	94.83%	9.2%	1.397	7679	2212.1	63.73
2007	5.56%	35%	8.84%	40.75%	3.3%	3.29%	4.43%	0.69	7.6%	5.27%	9.7%	96.71%	9.5%	1.279	6070	2144.7	83.17
2008	5.63%	35%	8.84%	40.75%	3.3%	3.32%	2.80%	0.92	7.5%	6.89%	9.7%	96.68%	9.5%	1.168	6083	2063.8	85.89
2009	5.31%	35%	8.84%	40.75%	3.1%	6.73%	2.20%	0.69	6.9%	4.74%	6.9%	93.27%	6.7%	1.067	10130	2007.4	69.91

- Notes:
- (1) Cost of debt based on Corporate bond interest rates, Moody's seasoned Aaa, as reported at: [www.federalreserve.gov/releases/h15/data.htm](http://www.federalreserve.gov/releases/h15/data.htm)
  - (2)(a) U.S. highest marginal tax corporate tax rates: [www.irs.gov/pub/irs-soi/02corate.pdf](http://www.irs.gov/pub/irs-soi/02corate.pdf)
  - (2)(b) NY through 2000: [www.tax.state.ny.us/pdf/stats/policy\\_special/electronic\\_sourcebook/tables/current/pdf/table\\_34\\_2009.pdf](http://www.tax.state.ny.us/pdf/stats/policy_special/electronic_sourcebook/tables/current/pdf/table_34_2009.pdf)  
CA starting in 2001: [www.taxfoundation.org/taxdata/show/230.html](http://www.taxfoundation.org/taxdata/show/230.html)
  - (2)(c) Combined State/U.S. highest marginal tax rates calculated as: U.S. + [1 - U.S.] \* State
  - (3) Calculated as: (1) \* (100% - (2c)). [Adjusts for tax-deductibility of interest payments.]
  - (4) Debt weight. Calculated using book value of debt and market value of equity. See columns (i) through (iii).
  - (5) Federal Reserve Bulletin Table 1.35. [Used as a proxy for the risk-free rate in the Capital Asset Pricing Model (CAPM)].
  - (6) Risk relative to overall market: avg of monthly values calculated as covariance of stock price w/ S&P over prior 60 months divided by S&P variance.
  - (7) Differences of average returns between stock market and 5-yr T-notes, 1926 - prior yr; Ibbotson SBBI Valuation Yearbook (published by Morningstar).
  - (8) Calculated as (6) \* (7).
  - (9) Calculated as (5) + (8). [Reflects risk-free rate of return plus the company risk premium.]
  - (10) Calculated as 100% - (4). [Reflects: total financing - debt = equity financing.]
  - (11) Calculated as (3) \* (4) + (9) \* (10). [Reflects: (debt cost x debt weight) + (equity cost x equity rate).]
  - (12) Present Value ("PV") Factor is calculated by compounding a dollar forward to 2010 at each year's WACC.
  - (i) Value Line.
  - (ii) Annual averages calculated based on monthly data from [CRSP US Stock Database](http://CRSP.US Stock Database) ©2010 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business.
  - (iii) Chicago Booth School of Business.

Exhibit 7

**SUMMARY OF UNJUST ENRICHMENT RESULTS**

<u>Exhibit</u>	<u>Item</u>	<u>After-Tax</u>	<u>0% tax</u>
1	PRODUCED WATER REINJECTION	\$1,506,619,307	\$3,105,267,198
2	PRODUCED WELL WASTE DISPOSAL	\$1,047,140,765	\$2,211,675,180
3	PRODUCED GAS CAPTURE	\$2,011,973,558	\$4,146,844,174
<b>Totals:</b>		<b>\$4,565,733,630</b>	<b>\$9,463,786,552</b>
<b>Adjusted for Probability of Detection/Prosecution/Payment:</b>			
	100%	\$4,565,733,630	\$9,463,786,552
	50%	\$9,131,467,260	\$18,927,573,104
	25%	\$18,262,934,521	\$37,855,146,208

## **JONATHAN S. SHEFFTZ**

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Mr. Shefftz is an independent consultant who specializes in the application of financial economics to litigation disputes, regulatory enforcement, and public policy decisions. Previously he was a consultant with Industrial Economics, Incorporated (“IEc”) from 1992 until 2006 when he moved to western Massachusetts. Mr. Shefftz has extensive experience in settlement and litigation support, and has been qualified as an expert witness in U.S. District Court, a federal agency’s Administrative Court, and a state court.

Mr. Shefftz’s recent experience includes work in the following areas.

- Calculating the economic damages suffered by companies and individuals from alleged wrongful actions.
- Applying financial economics to civil penalty factors in regulatory enforcement actions.
- Analyzing financial economic issues related to public policy decisions.

Mr. Shefftz has performed this work in a variety of contexts, including expert witness testimony, computer model development, training course delivery, and regulatory review. He has supervised project teams comprising economists, accountants, paralegals, and software developers, as well as worked in parallel with engineers, scientists, lawyers, and lobbyists. His clients have included federal and state governmental agencies, private litigators, and other private-sector entities.

Mr. Shefftz holds a B.A. *magna cum laude* and *Phi Beta Kappa* in Economics and Political Economy from Amherst College, and an M.P.P. degree, with concentrations in Government & Business and Energy & Environmental Policy, from the John F. Kennedy School of Government at Harvard University.

Mr. Shefftz’s positions have included Eastern Vice President for the National Association of Forensic Economics (upcoming 2011-14 term), Chair for the Town of Amherst Planning Board, referee for the *Journal of Forensic Economics*, Course Liaison for the “Engineering Economic Decision Making” course at the University of Massachusetts Amherst, and member of the Finance Committee for the Jewish Community of Amherst. He is also a member of the Government Finance Officers Association, Eastern Economics Association, Western Economics Association International, and Amherst Area Chamber of Commerce.



## JONATHAN S. SHEFFTZ

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### Economic Damages

Mr. Shefftz has experience with the following work on economic damages and has provided expert witness deposition testimony in both U.S. District Court and a state court. He has also applied his expertise in unjust enrichment calculation, financial statement analysis, municipal financial assessment, and corporate control/ownership issues to private-party damages cases – this expertise is described in more detail in the “Financial Factors in Regulatory Enforcement” section.

### *Business Damages*

Mr. Shefftz has modeled companies’ cash flows under hypothetical “but-for” states of the world versus actual states of the world to calculate business damages in numerous cases. Sample contexts include an engineering firm that lost business to a spin-off competitor, timber companies that alleged a contract breach from U.S. Forest Service implementation of Congressional legislation, a furniture company whose relationship with a joint venture partner was interfered with by a key customer, a fixed base operator prohibited from selling jet fuel by a municipal airport commission, a brownfields remediation firm with an incapacitated key principal, a state-chartered joint underwriting association whose prior servicing carrier incorrectly determined premiums, a dealer who delivered contaminated diesel fuel, and a sports organization whose apparel licensee breached a contract.

### *Personal Damages*

Mr. Shefftz has assessed lost earnings and household services along with incurred and anticipated medical costs in numerous cases involving wrongful death, personal injury, wrongful termination, estate disputes, and divorce proceedings. Sample contexts for this work include alleged employment discrimination, medical malpractice, workplace injuries, vehicular accidents, retail store accidents, below-market earnings, and an arrest instigated by a former spouse.

### *Groundwater Contamination*

For a private landowner, Mr. Shefftz analyzed the diminution in real estate development value from groundwater contamination, projecting the development schedule with the contamination-induced delay vs. the original schedule. For a U.S. territory, Mr. Shefftz estimated the present value of future expenses for a proposed desalination plant to replace contaminated groundwater sources. On a class action lawsuit by property owners, he evaluated the defense economist’s statistical analysis of property values; on another class action lawsuit, he assisted with present value calculations for whole-house drinking water treatment systems to replace contaminated well water.

### *Intellectual Property*

For defense counsel in a copyright infringement lawsuit, Mr. Shefftz assessed declarations from the plaintiff’s expert economist who asserted that a “companion” book would damage the author of the original series of novels. He also assisted counsel with preparation for trial cross examination.

### *Computer Model Development*

For the U.S. Department of Justice Commercial Litigation Branch, Mr. Shefftz developed a standalone computer application to calculate statutorily determined interest accruing on damages claims under the Contract Disputes Act.

## JONATHAN S. SHEFFTZ

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### Financial Factors in Regulatory Enforcement

Mr. Shefftz has experience with the following work on enforcement actions brought under the Asbestos Hazard Emergency Response Act (AHERA), Clean Air Act (CAA), Clean Water Act (CWA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act (EPCRA), Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Oil Pollution Act (OPA), Resource Conservation and Recovery Act (RCRA), Spill Prevention, Control and Countermeasure (SPCC) rule, Toxic Substances Control Act (TSCA), and others. Mr. Shefftz has been qualified as an expert witness on numerous occasions in Administrative Court, U.S. District Court, and a state court. His clients have included the U.S. Environmental Protection Agency (EPA), U.S. Department of Justice (DOJ), private litigators, state Attorneys General, and a corporate defendant.

#### *Financial Statement Analysis / Ability-to-Pay / Economic Impact / Corporate Control & Ownership*

Mr. Shefftz has examined the tax returns, financial statements, and other financial documentation for individuals, businesses, municipalities, territorial governments, and not-for-profits to assess the ability to pay for – and/or economic impact of – sought environmental expenditures, e.g., compliance costs, penalty demands, and cleanup/remediation costs. He has reviewed discovery documents and conducted research in many cases to assess the extent to which subsidiaries can rely on their corporate parents for financial support and the extent to which corporate control of their subsidiaries goes beyond that exercised by mere ownership.

#### *Financial Gain / Economic Benefit / Unjust Enrichment*

Mr. Shefftz has modeled companies' and municipalities' cash flows under hypothetical full and timely compliance states of the world versus actual delayed compliance states of the world to calculate the economic benefit (i.e., financial gain or unjust enrichment) on numerous enforcement actions. As part of this work, he has estimated the weighted-average cost of capital for a wide variety of companies and industries.

#### *Other Financial Factors in Regulatory Enforcement Actions*

Mr. Shefftz has performed work on other financial factors in regulatory enforcement actions: the "size of violator" penalty element; the relative weight of different financial indicators for establishing deterrence; and, the adequacy of financing plans to ensure environmental compliance.

#### *Computer Model Development, Training, and Support*

Mr. Shefftz has managed the development of the current versions of the BEN, PROJECT, ABEL, INDIPAY, and MUNIPAY computer models that U.S. EPA's Office of Enforcement and Compliance Assurance applies to financial economics issues in enforcement actions. He has prepared the models' help systems and training materials, as well as presented training courses and provided related support for federal and state enforcement staff. Mr. Shefftz has also assisted in several U.S. EPA academic peer reviews and public comment processes for the BEN computer model and related economic benefit recapture issues.

## JONATHAN S. SHEFFTZ

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### Public Policy

#### *Cost of Capital Estimation*

Mr. Shefftz assessed peer reviewer comments and then revised a draft report on cost of capital estimation for water systems. His work included applying the capital asset pricing model to the commercial drinking water industry and correcting for the earlier draft's assumptions regarding capital structure and industry-level business risk.

#### *Financial Assurance*

For a state agency, Mr. Shefftz proposed appropriate inflation forecasts and discount rates, drafted a guidance document, and then developed a stand-alone computer model to calculate the net present value of future remediation costs. For EPA's Office of Solid Waste, he provided recommendations on discounting future cleanup costs; for the Office of Site Remediation and Enforcement, he created a computer model to assess the combined affordability of financial assurance and cleanup costs; for another EPA office, he created a spreadsheet model to calculate the insurance and/or trust fund amounts necessary to provide for post-closure care. For the U.S. Department of the Interior's Office of Surface Mining Reclamation and Enforcement, he reviewed other agencies' approaches and developed a spreadsheet model to calculate initial trust fund amounts and then recalculate subsequent years' annual rebalancings to reflect actual returns and additional future costs.

#### *Joint Cost Allocation*

For a study of Bureau of Reclamation rate setting for California's Central Valley Project, Mr. Shefftz researched economically efficient methods for allocating water project costs to user classes.

#### *Proposed Legislation*

For an industry association, Mr. Shefftz designed and implemented a survey and analyzed its results to predict the impacts of a proposed national lead tax upon lead consumption and dependent industrial sectors. For a national waste management firm, he analyzed the financial impacts of a proposed state tax on hazardous waste land disposal.

#### *Superfund Impacts*

Mr. Shefftz examined the Department of Energy SURE model's predictions of economic impacts from Superfund liability and cost allocation reform. At a Superfund site, he critiqued a small city's claims that a proposed contaminated soil cleanup would lead to widespread economic disruptions.

#### *Legislative Review*

For the 1990 Clean Air Act amendments, Mr. Shefftz investigated the potential of fuel oxygenation requirements to cause petroleum refinery closures. For the Safe Drinking Water Act, he reviewed EPA's national-level drinking water affordability criteria, assessed their implications for small water systems' finances, proposed alternative criteria, created databases to predict how many systems would be judged unable to afford drinking water rules, and evaluated public comments.

## JONATHAN S. SHEFFTZ

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### Representative Clients

Mr. Shefftz has been retained by the following clients, whether directly as an independent consultant, during his prior employment at Industrial Economics, Incorporated ("IEC"), and/or as an independent consultant via subcontract with IEC.

#### *Private Law Firms*

Adler, Cohen, Harvey, Wakeman & Guekguezian LLP  
Law Office of Jacqueline L. Allen  
Arnold & Porter LLP  
Bayh, Connaughton and Malone  
The Collins Law Firm, P.C.  
D'Ambrosio Law Offices  
Law Offices of John K. Dema, P.C.  
Doherty, Wallace, Pillsbury & Murphy  
The Garcia Law Firm  
David S. Hammer, Esq.  
Hanson Curran LLP  
George E. Hays, Esq.  
Henrichsen Siegel Moore, PLLC  
Kasowitz, Benson, Torres & Friedman LLP  
James E. Kolenich  
Lucentini & Lucentini LLP  
Marr Law Offices  
Meyers Nave  
Morrison Mahoney LLP  
Law Office of Michael D. Parker  
Edward M. Pikula, Esq.  
Ryan, Ryan, Johnson & Deluca, LLP  
Simonds, Winslow, Willis & Abbott  
Smith & Lowney, PLLC  
Stoel Rives LLP  
Wilson Elser Moskowitz Edelman & Dicker LLP  
Joseph J. Zajac III (pro se)  
Reed Zars, Esq.

#### *Federal Agencies*

U.S. Department of Justice (Civil Division – Commercial Litigation Branch; Environment and Natural Resources Division – Environmental Enforcement Section, Environmental Defense Section)  
U.S. Environmental Protection Agency (various Headquarters Offices and Regional Counsels)  
U.S. Fish and Wildlife Service (within U.S. Department of Interior)  
National Oceanic and Atmospheric Administration (within U.S. Department of Commerce)  
Office of Surface Mining Reclamation and Enforcement (within U.S. Department of Interior)

#### *Citizen Groups and Industry*

Alabama Environmental Council  
Biodiversity Conservation Alliance  
CWM Chemical Services, Incorporated  
Grand Canyon Trust  
Lead Industries Association

National Environmental Law Center  
National Parks Conservation Association  
Natural Resources Defense Council  
Our Children's Earth Foundation  
Sierra Club  
Tulane Environmental Law Clinic

#### *State Agencies*

California  
Connecticut  
Illinois  
Indiana  
Massachusetts  
Michigan  
New Hampshire  
New Mexico  
Ohio  
Pennsylvania  
Texas  
Virginia  
Wisconsin

## JONATHAN S. SHEFFTZ

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### Publications and Presentations

- Present Value and the Resolution of Uncertainty*, paper discussant at Allied Social Sciences Associations Conference (Denver CO), 1/8/11 (anticipated).
- Alternative Perspectives for Breach-Nonbreach Scenario Specifications in Commercial Litigation*, paper presentation at Western Economics Association International Annual Conference (Portland OR), 7/1/10.
- Sampling Issues in Commercial Damages Cases*, paper discussant at Western Economics Association International Annual Conference (Vancouver BC), 7/1/09.
- Net Discount Rates: Does Duration Matter?*, paper discussant at Eastern Economics Association Annual Conference (Boston MA), 3/7/08
- Enforcement Economics: Deterrence, Economic Benefit, & Ability to Pay*, presentation at California Environmental Protection Agency State Water Resources Control Board "Enforcenomics" Workshop (Berkeley CA), 1/11/08.
- Alternative Focuses for "But-For" Scenario Specification in Commercial Litigation*, paper presentation at Western Economics Association International Annual Conference (Seattle WA), 6/30/07
- Expert Witness Role Play*, presentation at U.S. EPA 9<sup>th</sup> Financial Analyst Workshop (Atlanta GA), 5/3/07.
- Working with Experts in Environmental Cases: An Expert Economist's Perspective on Expert Testimony*, presentation at Public Interest Environmental Law Conference (Eugene OR), 3/2/07.
- Alternative Measures and Focuses for Economic Damages Calculations*, paper presentation at Eastern Economics Association Annual Conference (New York NY), 2/23/07.
- Lost Profit as a Measure of Lost Earning Capacity*, panelist at Western Economics Association International Annual Conference (San Francisco CA), 7/7/05
- "EPA's Economic Benefit Analysis Policy and Practice," *Natural Resources and Environment*, Fall 2004.
- "Taxation Considerations in Economic Damages Calculations," *Litigation Economics Review*, Summer 2004.
- Economic Benefit and Wrongful Profits in the Calculation of Penalties for Environmental Violations*, presentation to Boston Bar Association Environmental Litigation Committee, 9/23/04.
- Business Valuation / Commercial Damages*, panelist at Western Economics Association International Annual Conference (Vancouver BC), 7/1/04.
- "Wrongful Profits: Setting the Record, and the Concept, Straight," *Environment Reporter*, 1/2/04.
- Present Value Sensitivity to Ex Ante vs. Ex Post Perspective*, paper presentation at Western Economics Association International Annual Conference (Denver CO), 7/12/03.
- Taxation Considerations in Economic Damages Calculations*, paper presentation at Eastern Economics Association Annual Conference (New York NY), 2/22/03.
- Economic Benefit from Illegal Competitive Advantage and Complex Economic Benefit Scenarios*, presentation at U.S. EPA 5<sup>th</sup> Financial Analyst Workshop (Boston MA), 7/26/00.
- Economic Benefit in Wetlands Cases: Financial Analysis Issues*, presentation at U.S. EPA Wetlands Enforcement Conference (Alexandria VA), 3/22/00.
- Economic Benefit*, presentation at U.S. EPA 4<sup>th</sup> Analyst Workshop (Denver CO), 3/10/99.

## JONATHAN S. SHEFFTZ

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### Testimony History

*Elizabeth Russell and Katherine Gates v. Joseph Reilly and James Georges, Executors of the Estate of K. Mildred Dooling, a/k/a Mildred K. Dooling, and Patrick Curtin, Individually and as Trustee of the M.D. Realty Trust* (Massachusetts Superior Court), courtroom testimony 7/21/10.

*Hildagarde Bartling, et al. v. Country Villa Bay Vista Healthcare Center, et al.* (California State Court), deposition 1/29/10.

*Joseph J. Zajac III v. Pamela J. Trueblood, et al.* (USDC, MD Fla.), affidavit 9/16/09.

*In the matter of 99 Cents Only Stores* (U.S. EPA Administrative Court), courtroom testimony 6/24/09.

*U.S. v. Government of Guam* (USDC, Guam), courtroom testimony 12/9/08 and 4/13/09.

*U.S. v. James and Nancy Oliver d/b/a Safety Waste Incineration* (USDC, Alaska), courtroom testimony 3/25/09 and 3/27/09.

*In the matter of Valimet, Inc.* (U.S. EPA Administrative Court), courtroom testimony 12/10/08.

*Rectrix Aerodome Centers, Inc. v. Barnstable Municipal Airport Commission, et al.* (USDC, Mass.), deposition 12/2/08.

*State of Ohio v. The Shelly Holding Company et al.* (Franklin County Municipal Court), depositions 7/30/08 and 9/19/08, courtroom testimony 10/16/08 and 10/17/08.

*In the matter of Lowell Vos Feedlot* (U.S. EPA Administrative Court), courtroom testimony 9/17/08.

*French Heritage, Inc. v. Ethan Allen, Inc.* (Connecticut State Court), deposition 6/28/06 and 6/29/06.

*Oregon Public Interest Research Group, Diane Heintz, and Rena Taylor v. Pacific Coast Seafoods Company, Pacific Surimi Joint Venture, LLC, Pacific Surimi Co., Inc., and Dulcich Inc. d/b/a Pacific Seafood Group* (USDC, Oregon), deposition 4/18/06.

*In the matter of Rizing Sun LLC* (U.S. EPA Administrative Court), courtroom testimony 2/7/06.

*State of Ohio v. Container Recyclers, Inc.* (Franklin County Municipal Court), deposition 4/1/05.

*In the matter of Vico Construction Corporation and Smith Farm Enterprises* (U.S. EPA Administrative Court), courtroom testimony 6/20/02 and 10/8/03.

*U.S. v. The New Portland Meadows, Inc.* (USDC, Oregon), courtroom testimony 5/20/03.

*In the matter of Vico Construction Corporation and Amelia Venture Properties* (U.S. EPA Administrative Court), courtroom testimony 1/14/03.

*United States Public Interest Research Group, Stephen E. Crawford, and Charles Fitzgerald v. Heritage Salmon, Inc.; U.S. PIRG et al. v. Stolt Sea Farm, Inc.; U.S. PIRG et al. v. Atlantic Salmon of Maine LLC* (USDC, Maine), deposition 6/5/01, courtroom testimony 10/15/02.

*U.S. v. Murphy Oil USA, Inc.* (USDC, WD Wis.), deposition 4/24/01.

*U.S. v. Royal Oak Enterprises, Inc.* (USDC, ED Va.), depositions 3/22/00 and 5/19/00.

*In the matter of Titan Wheel Corporation of Iowa* (U.S. EPA Administrative Court), affidavit 11/24/99.

*U.S. v. Gulf States Steel, Inc.* (USDC, ND Ala.), affidavit 12/30/98, deposition 10/22/99.

*U.S. v. Koch Industries, Inc.* (USDC, ND Okla. and SD Tex.), depositions 5/24/99 and 6/1/99.

*State of Wisconsin v. I-K-I Manufacturing Company, Inc.*, deposition 4/13/99.

*U.S. v. Borden Chemicals & Plastics* (USDC, MD La.), deposition 2/5/98.

*State of New Hampshire v. Johnson Products, Incorporated*, deposition 2/3/98.

*In the matter of EK Associates, L.P., d/b/a EKCO/GLACO, and EK Management Corporation* (U.S. EPA Administrative Court), courtroom testimony 8/14/97.

*U.S. v. Smithfield Foods, Inc., et al.* (USDC, ED Va.), deposition 7/9/97.

*U.S. v. Nucor Corporation* (USDC, ND Ala.), deposition 6/12/97.

*U.S. v. U.S. Metallics, Inc., and Town of Onalaska, Wis.* (USDC, WD Wis.), affidavit 10/21/96.