April 1999

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EXPLAINING THE CONTROVERSY SURROUNDING UNITED STATES v. SMITHFIELD FOODS, INC.

ROBERT H. FUHRMAN AND PATRICK D. TRAYLOR

Since the U.S. District Court for the Eastern District of Virginia levied a $12.6 million fine against Smithfield Foods, Inc. in August 1997, Smithfield has been held up as a poster child for strong federal environmental enforcement. The $12.6 million penalty—the largest in Clean Water Act history—has been cited with vigorous approval by environmentalists and government officials in support of the view that courts and federal agencies are becoming increasingly intolerant of state-sponsored “sweetheart deals” with corporate polluters, and that these corporations will eventually face a day of economic reckoning. These commenters energetically contend that the federal government rightfully forced Smithfield to disgorge the benefit of its bargain with state regulatory authorities in order to restore a level playing field among regulated entities.

Lost in the tumult concerning “sweetheart deals” and “leveling the playing field” is a single, inescapable fact: Smithfield gained no economic benefit from its compliance with state orders. Indeed, Smithfield will

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3 See generally Okster, supra note 2.
spend considerably more money to comply with the Commonwealth of Virginia's orders than it would have spent to comply under the method of compliance preferred by the federal government. This incontrovertible fact renders moot much of the rhetoric surrounding the case. Without the spectre of a corporation intentionally fattening its bottom line at the expense of the environment, the case is reduced to a relatively routine set of enforcement issues.

The premise of this Article is that the government's testimony and the court's decision constitute indisputable deviations from established principles of calculating economic benefit. The result of a correct application of sound economic principles is that Smithfield obtained no economic benefit through noncompliance.

This Article first outlines the facts that led to the filing of the federal enforcement action. Next, it outlines the primary legal issues raised by Smithfield both at the trial and appellate levels. Finally, the Article articulates the proper economic principles that should be used in cases like Smithfield, provides a first-hand illustration of how the federal government and the court deviated from them, and explains how even in deviating from accepted principles, the government grossly overstated Smithfield's economic benefit of noncompliance.

I. FACTUAL BACKGROUND

In 1975, the Commonwealth of Virginia assumed primary authority to administer the Federal Water Pollution Control Act (the Act, the Clean Water Act, or CWA) within Virginia. A central feature of Virginia's administration of the Act is its ability to issue Virginia Pollutant Discharge Elimination System (VPDES) permits to point sources of water pollution. In accordance with the 1975 Memorandum of Understanding (MOU) executed between Virginia and EPA Region III (Region III), Region III retains an important oversight role in Virginia's permit issuance

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4 See discussion infra notes 104 through 170 and accompanying text.
5 See Memorandum of Understanding Regarding Permit and Enforcement Programs between the State Water Control Board and the Regional Administrator, Region III, Environmental Protection Agency (1975) [hereinafter MOU] (on file with author).
6 See id. pt. III para. 1.
process. Region III’s oversight role includes the authority to review and comment on draft VPDES permits.

Smithfield owns and operates two hog-slaughtering facilities in Smithfield, Virginia. Both the Smithfield Packing Company and the Gwaltney of Smithfield facilities discharged process wastewater containing phosphorus to the Pagan River in accordance with the terms of their pre-1992 VPDES permits. The Pagan River is a tributary of the James River, which itself discharges into the lower Chesapeake Bay at Norfolk, Virginia.

A. Smithfield’s Challenge to Virginia’s Policy for Nutrient Enriched Waters

Because of concerns that the Chesapeake Bay was beginning to exhibit signs of eutrophication from excess nutrient loading, Virginia promulgated its Policy for Nutrient Enriched Waters (Policy) in 1988. The Policy targeted certain point sources discharging phosphorus into the Chesapeake Bay watershed, and established for these sources a concentration-based effluent limit for phosphorus of 2 milligrams per liter (mg/l).

Importantly, EPA did not, and does not today, have a nationwide limit on the discharge of phosphorus into nutrient-enriched waters. The Policy was wholly a state initiative promulgated as a state regulatory requirement.

Shortly after promulgation of the 2 mg/l limit, Smithfield filed suit challenging the application of the Policy to its facilities on the Pagan River. Specifically, Smithfield contended that Virginia had calculated the phosphorus limit based on the ability of large-volume municipal

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7 See generally id. pt. III. The Commonwealth of Virginia administers its Clean Water Act program in accordance with the inherent power of the state to protect the public health and welfare. EPA’s role in the Commonwealth is therefore not as a primary enforcement authority, but as a federal overseer of the Commonwealth’s implementation of national Clean Water Act standards.

8 See id. pt. III paras. 5-8.


10 See id. at 774.

11 See id. at 773.


13 See id. § 25-40-30.

wastewater treatment plants to achieve the phosphorus concentration of 2 mg/l.\footnote{See Petition for Appeal, ¶ 30 Smithfield Foods Inc. v. Commonwealth of Virginia, Chancery No. 3912 (Va. Cir. Ct. Isle of Wight Co. June 3, 1988) (on file with author).} Large-volume municipal wastewater facilities typically receive influent containing only 6 mg/l of phosphorus, and are well-suited to reduce that concentration to the 2 mg/l level. In contrast, Smithfield’s facilities generated wastewater containing as much as 60 mg/l of phosphorus.\footnote{See VPDES Permit No. 0059005, Application for Renewal at 9 (Dec. 18, 1990) (on file with author).} To achieve the same 2 mg/l concentration, Smithfield’s treatment plant would have had to achieve a 97 percent reduction in phosphorus concentrations.

Smithfield argued that the 2 mg/l concentration limit was not reasonable and practicable of attainment.\footnote{See Smithfield, 965 F. Supp. at 774.} Indeed, Smithfield found no other animal slaughterhouses of its size in the United States that were subject to such a stringent limit on phosphorus discharges.\footnote{See Wells Engineers Environmental, Inc., Study and Report: Phosphorus Removal: Smithfield Foods, Inc., Smithfield, Virginia 12 (1990).} To Smithfield, the state had inadvertently included an industrial discharger in a Policy designed for municipal wastewater treatment plants.\footnote{See Petition for Appeal, supra note 15, ¶¶ 30-34.}

Notwithstanding Smithfield’s state court challenge, the Virginia Department of Environmental Quality’s Tidewater Regional Office, in accordance with the Policy, modified Smithfield’s VPDES permit on January 4, 1990, to include the 2 mg/l phosphorus limit.\footnote{See id.} In response, Smithfield appealed the permit modification.\footnote{See id. at 774-75.} Faced with the prospect of having the Policy declared inapplicable throughout the state because of Smithfield’s dual appeals, Virginia agreed to reconsider whether the 2 mg/l limit had been inappropriately applied to Smithfield.\footnote{See id. at 774–75.}

**B. Virginia’s Settlement of Smithfield’s Challenge to the Policy**

In an administrative Special Order dated March 21, 1990, Virginia
agreed to suspend commencement of the phosphorus removal facility construction schedule in Smithfield’s 1990 permit for a short period during which time Smithfield would finance a study to determine the feasibility of complying with the 2 mg/l phosphorus limit. Smithfield was required to report back to Virginia by November 13, 1990, on the results of the study and the possibility of connecting to HRSD. Virginia later deferred Smithfield’s decision deadline for three months to February 15, 1991.

Smithfield’s challenge to the Policy was finally resolved on May 9, 1991, when Virginia issued a final administrative Special Order to Smithfield. In the 1991 Special Order, Virginia noted that Smithfield had completed the required phosphorus removal feasibility study. Smithfield had determined, as it had argued to Virginia in its original challenges, that compliance by Smithfield with the 2 mg/l standard was not consistently achievable, and therefore not reasonable and practicable of attainment. Virginia also noted in the 1991 Special Order that HRSD needed more time to evaluate the suitability of Smithfield’s effluent. Therefore, the 1991 Special Order required Smithfield to advise Virginia no later than June 15, 1991, of Smithfield’s “commitment to connect to HRSD or to upgrade their facilities to comply with the 2 milligram per liter phosphorus standard.”

The Special Order stated that if Smithfield decided to connect to

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23 See id.
24 See id. at 775.
25 See id.
26 See id.
27 See id.
30 See May 9, 1991 Special Order, supra note 28, at 2.
31 Id.
HRSD, it was obliged to complete the connection within ninety days after HRSD notified Smithfield that the connection was available.\footnote{See id.} Conversely, if Smithfield decided not to connect to HRSD, Smithfield would be required to submit a construction schedule for completing the onsite facilities necessary to enable it to comply with the 2 mg/l standard as a direct discharger.\footnote{See id.} In exchange for these compliance alternatives, Smithfield agreed to dismiss its pending judicial challenge to the Policy.\footnote{See Smithfield, 965 F. Supp. at 775.}

On June 7, 1991, Smithfield formally notified Virginia that it had elected to comply with the 2 mg/l phosphorus limit by connecting to HRSD.\footnote{See id.} After eighteen months of negotiations, Virginia had secured a binding commitment from Smithfield to completely eliminate its discharge of wastewater to the Pagan River, while at the same time protecting the applicability of the Policy to sources of excess nutrients.\footnote{See generally id.}

C. Smithfield's 1992 VPDES Permit

In 1991, Smithfield's VPDES permit was due for renewal.\footnote{See Commonwealth of Virginia, State Water Control Board, Authorization to Discharge Under the Virginia Pollutant Discharge Elimination System, Permit, No. VA 0059005 (May 13, 1986) (on file with author) [hereinafter 1986 VPDES Permit].} In July of that year, Virginia permit writers carried over the 2 mg/l phosphorus limit from Smithfield's 1990 permit.\footnote{See Smithfield, 965 F. Supp. at 776.} Under the terms of the 1975 MOU, a pre-release version of Smithfield's draft permit was transmitted to EPA Region III.\footnote{See MOU supra note 5, pt. III para. 6.} Region III approved the terms in the pre-release draft permit and reminded Virginia that any significant public comments or modifications of the draft permit in response to public comments should also be transmitted to Region III.\footnote{See Smithfield, 965 F. Supp. at 776.}

When Smithfield was presented with a copy of the draft permit in September, the pre-settlement 2 mg/l phosphorus limit was still in the
On October 1, Smithfield filed a formal written comment on the draft permit with Virginia. In its comment, Smithfield stated:

Compliance dates of the effluent characteristics and engineering milestones listed in the Part I, section C tables (pages 6 and 7) cannot be met by Smithfield Foods, Inc. now that we have agreed to abandon the plans to upgrade our existing facilities and tap onto HRSD when it becomes available. Relief from such compliance is not specifically present or is not apparent in the [1991] Consent Order. In view of these factors, Smithfield Foods, Inc. requests that if these compliance dates and milestones are required in the proposed permit, some documentation or letter be provided by the State Water Control Board stating that alternate compliance will be maintained with Smithfield’s agreement to connect to HRSD as soon as it becomes available regardless of the time frame in which this occurs.42

In this statement, Smithfield clearly noted its concern that the terms of the draft permit did not match the agreement reached with Virginia only five months earlier.

Virginia responded to Smithfield’s comment on October 10, by stating:

The compliance schedules and related goal dates contained in the permit are there to afford the permittee necessary time to comply with the established effluent limitations. Any special order agreements relative to compliance with water quality standards, the Permit regulation and associated studies that have been approved by the Board take precedence over the VPDES Permit.43

Virginia’s October response indicated that a copy had been sent to EPA Region III in accordance with the 1975 MOU.44 On January 3, 1992,

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41 See id.
42 Id. (emphasis added).
43 Id. (emphasis added).
44 See id.
Virginia issued the final VPDES permit, including the 2 mg/l phosphorus limit.\textsuperscript{45} Region III had almost three months in which to comment on Virginia's response exempting Smithfield from compliance with the 2 mg/l standard, but said nothing to either Virginia or Smithfield.

The above statements notwithstanding, the trial court was not persuaded that the May 9, 1991, Special Order took precedence over permit requirements. The court reasoned that the terms of the 1991 Special Order did not take precedence over the 1990 Permit because the 1991 Special Order specifically provided in a footnote that the Special Order did not modify the terms of the 1990 Permit.\textsuperscript{46} Moreover, the court reasoned that because Smithfield's 1992 Permit also included the 2 mg/l limit, it was illogical to conclude that the 1991 Special Order took precedence over a later-issued permit.\textsuperscript{47} Last, the court reasoned that because Smithfield had not applied for a formal permit modification embodying the terms of the 1991 Special Order, Smithfield could not now be heard to complain of the application to it of the strict terms of the 1990 Permit.\textsuperscript{48}

D. Smithfield's Connection to HRSD

Smithfield and HRSD began working together in late 1991 to facilitate the connection.\textsuperscript{49} Three tasks had to be completed. First, HRSD had to complete the expansion of its Nansemond, Virginia wastewater treatment plant before it would be able to treat Smithfield's wastes.\textsuperscript{50} Second, HRSD had to construct a 17-mile pipeline from Nansemond, Virginia, to Smithfield, Virginia, to carry Smithfield Foods' wastes.\textsuperscript{51} An additional benefit of this pipeline was that the entire Smithfield, Virginia area would be served by the Nansemond facility and end decades of water quality problems associated with rural septic systems and the Town of

\textsuperscript{45} See id.
\textsuperscript{46} See id. at 786.
\textsuperscript{47} See id. at 788.
\textsuperscript{48} See id. at 787-88.
\textsuperscript{49} See Trial Tr., supra note 29, at 787.
\textsuperscript{50} See Smithfield, 965 F. Supp. at 778.
\textsuperscript{51} See id.
Smithfield’s outdated sewage treatment plant. Notably, Smithfield Foods provided $300,000 to construct a pumping station to facilitate the connection of the Town of Smithfield to HRSD. Last, Smithfield Foods had to construct on-site wastewater pretreatment works before it could discharge its effluent to HRSD.

Smithfield’s commitment to connect permanently to the HRSD system, and Smithfield’s irrevocable commitment to pay HRSD in excess of $2 million per year in user charges were key factors in securing the financing of the $54.4 million dollar expansion of HRSD’s Nansemond facility and construction of the $14.6 million pipeline. HRSD obtained these construction funds from the EPA-administered State Revolving Loan Fund. Without such financial assurances, HRSD would not have been able to support the bond issuance necessary to repay the Revolving Loan Fund. In its review of the HRSD-Smithfield project, EPA Region III noted that the loan "offers a cost effective solution for this major regional industry."

In addition to agreeing to connect to HRSD, Smithfield committed to construct an on-site pretreatment facility to service its two plants, which ultimately cost $2.8 million. These pretreatment facilities were by their nature insufficient to enable Smithfield to comply as a direct discharger with the 2 mg/l phosphorus limitation and were constructed only to facilitate Smithfield’s connection to HRSD. Indeed, in order for HRSD’s biological treatment facilities to work efficiently, Smithfield could not reduce the pollutants in its effluent to extremely low levels. HRSD would be responsible for complying with the ultimate 2 mg/l phosphorus limit.

53 See Brief for Appellants at 12, Smithfield Foods Inc. v. United States (No. 97-2709) [hereinafter Brief for Appellants].
55 See id.
56 See id.
57 See Trial Tr., supra note 29, at 787-88, 790-91.
58 Smithfield, 965 F. Supp. at 784–85.
60 See Trial Tr., supra note 29, at 783, 797.
Because of HRSD's delays in obtaining funding and unforeseeable construction delays by HRSD's contractors, the 17-mile pipeline was not available until March 1996. The Nansemond upgrade was not complete at that time, so in August of 1996, Smithfield was only able to connect the Gwaltney plant to the HRSD system.

In June 1997, the Nansemond upgrade was complete and Smithfield connected its remaining facilities to the HRSD system on August 6, 1997, thereby completely eliminating its discharge of phosphorus and other effluents to the Pagan River. Compared to complying as a direct discharger (which would have allowed Smithfield to continue to discharge 2 mg/l of phosphorus into the Pagan River), this zero discharge result was the product of HRSD, Smithfield, and Virginia, all cooperating to ensure that the basin-wide nutrient reduction goals of Virginia were achieved, while providing HRSD with a steady stream of income with which to finance and operate its major facility upgrade, and providing Smithfield with a guaranteed means to comply with its obligations under the CWA.

At no time during the five year period between 1991 and 1996 did EPA Region III suggest in any way that Smithfield's connection to the HRSD system was anything other than a "win-win" situation between the industry and federal and state environmental regulators.

E. The United States' Enforcement Action Against Smithfield

On December 16, 1996, more than five years after EPA had sufficient information to understand that Virginia had decided to allow Smithfield not to comply with the 2 mg/l limit for phosphorus pending its

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61 For example, HRSD experienced certain difficulties with its contractors and its entire construction headquarters burned down during construction. See id. at 795-96.

62 See Smithfield, 965 F. Supp. at 778. Importantly, Smithfield had little or no control over HRSD's construction schedule. Though Smithfield cooperated with HRSD in providing effluent samples and worked with the Town of Smithfield to arrange for a pumping station to connect the Town to HRSD, HRSD was the governmental authority responsible for constructing the required facilities.

63 See id.

connection to HRSD, the United States filed a complaint against Smithfield in federal district court in the Eastern District of Virginia, Norfolk Division. The allegations in the complaint suggested almost 7,000 violations of Smithfield’s VPDES permit. Over seventy-three percent of these violations were attributed to discharges of phosphorus under the terms of Virginia’s Special Orders.

Barely three months later, before discovery had concluded, the United States moved for partial summary judgment on liability. Smithfield responded with three main arguments. First, Smithfield argued that the 1991 Special Order superseded inconsistent provisions in the 1992 permit. Second, Smithfield argued that the United States’ action was barred by section 309(g)(6) of the Clean Water Act, which provides that when a state has commenced and is diligently prosecuting an enforcement action under state law comparable to section 309, the federal government is precluded from bringing a parallel enforcement action under state law comparable to section 309, the federal government is precluded from bringing a parallel enforcement action. Last, Smithfield argued that section 510 of the Act precluded the United States from interfering with Virginia’s right to enforce its state phosphorus standard, which was more stringent than necessary to satisfy nationwide pollution guidelines and requirements.

On May 30, 1997, the trial court granted the United States’ motion for partial summary judgment on liability for at least 164 days of nonreporting and for nearly six thousand violations of effluent limitations for phosphorous, ammonia-nitrogen, total Kjeldahl nitrogen, fecal coliform, minimum pH, cyanide, oil and grease, carbonaceous biochemical oxygen demand (CBOD), BOD, and total suspended solids. Seventy-three percent of the cited violations were attributable to phosphorus, a

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65 See Smithfield, 965 F. Supp. at 779. Shortly before the United States filed its action, the Commonwealth of Virginia filed an enforcement action against Smithfield alleging violations of its fecal coliform, TKN, nitrogen, and chlorine limits, as well as a number of recordkeeping and monitoring violations. See id.
67 See id.
68 See Smithfield, 965 F. Supp. at 780.
69 See id. at 784.
70 See id. at 791.
71 See id. at 795.
72 See id. at 796.
substance not regulated by federally-promulgated effluent limitations. The court concluded that Smithfield was liable because the 1991 Special Order and October 1991 correspondence did not exempt Smithfield from compliance with the 2 mg/l limit. Moreover, the court held that the 1991 Special Order was not relevant to a federal enforcement suit because EPA had not consented to be bound by the state orders, and Smithfield had not requested that its 1992 permit be formally modified. The court also held that section 309(g)(6) did not bar the United States’ suit because Virginia’s water pollution control statute was not comparable to the CWA, in that Virginia could only assess administrative penalties on consent, and the public had no right to comment on administrative penalty orders. Last, the court rejected out of hand Smithfield’s section 510 argument.

II. OVERVIEW OF LEGAL ISSUES

In its brief on appeal, Smithfield argued that the district court made three distinct errors in granting summary judgment. First, Smithfield argued that the court erred in not holding that the 1991 Special Order took precedence over inconsistent terms in the 1992 Permit. Specifically, Smithfield argued that because the 2 mg/l standard was entirely a creature of state law, and that Virginia had applied the Policy for Nutrient Enriched Waters (i.e., the 2 mg/l limit on phosphorus) to Smithfield in a way that excused Smithfield from complying with the Policy until it connected to HRSD, the inconsistent terms of the 1992 Permit were superseded by the

73 Another 14% of the violations attributed to Smithfield arose from scattered and infrequent violations of Smithfield’s fecal coliform, total Kjeldahl nitrogen, total suspended solids, cyanide, and chlorine limits. The remaining 13% of the violations arose from a single unauthorized act of records destruction by a Smithfield employee. If the violations associated with destruction of records are excluded from the count, the percentage of effluent violations attributable to phosphorus rises to 86%, a significant portion of the United States’ case. See Smithfield, 972 F. Supp. at 343.
74 See Smithfield, 965 F. Supp. at 784–85.
75 See id. at 787–88.
76 See id. at 795.
77 See id. at 795–96.
78 See Brief for Appellants, supra note 53, at 21.
1991 Special Order. Importantly, Smithfield argued that issuance of the 1991 Special Order was not an exercise of enforcement discretion, but was more akin to a regulatory variance with respect to Smithfield and the Policy. Smithfield argued that because Virginia had bound itself through the 1991 Special Order not to apply the 2 mg/l limit to Smithfield, Virginia had no authority to incorporate the 2 mg/l limit in Smithfield's 1992 Permit, and the United States therefore had no authority to enforce an unlawful permit term.

Moreover, Smithfield argued that EPA was fully aware of Virginia and Smithfield's understanding that the 1991 Special Order took precedence over inconsistent terms in the 1992 Permit. Virginia had provided EPA Region III, in accordance with the MOU between the state and EPA, with copies of all Special Orders directed to Smithfield, all permits, and the October 1991 correspondence in which Virginia stated the 1991 Special Order took precedence over the 1992 Permit.

The United States could not, and did not at trial, argue that it was unaware of Virginia's settlement with Smithfield of the challenge to its Policy on Nutrient Enriched Waters. Instead, the United States argued that the plain terms of the 1992 Permit established Smithfield's obligations, regardless of the settlement with Virginia. More specifically, the United States argued that if Smithfield disagreed with the presence of the 2 mg/l limit, Smithfield could have and should have pursued a formal permit modification. The United States argued that because Smithfield did not pursue such a modification, the plain terms of the permit were applicable, and the 1991 Special Order had no relevance to a federal enforcement action. Additionally, the United States took issue with the argument that either the 1991 Special Order or the October 1991 letter from Virginia to

79 See id.
80 See generally id.
81 See generally id.
82 See id. at 9-11, 20-23.
84 See Brief for Appellee at 22, Smithfield Foods, Inc. v. United States (No. 97-2709) (4th Cir. Apr. 13, 1998) [hereinafter Brief for Appellee].
85 See id.
86 See id. at 23.
Smithfield could have modified the requirements of the 1992 Permit.\(^87\)

Last, the United States argued that while it could be bound by its silence on draft permits under the MOU, the October 1991 letter was not a draft permit, and the United States had no duty to comment on the letter, and could not therefore be bound by statements in the letter.\(^88\)

Second, Smithfield argued that the court erred in rejecting the argument that section 510 of the Act precludes the United States from interfering with Virginia's enforcement of its own more stringent state effluent standard.\(^89\) Section 510 states: "Except as expressly provided in this chapter, nothing in this chapter shall (1) preclude or deny the right of any State or political subdivision thereof or interstate agency to adopt or enforce (A) any standard or limitation respecting discharges of pollutants."\(^90\) Smithfield argued that because the 2 mg/l limit was a more stringent state standard, Virginia had the right to adopt and enforce the standard without interference from the federal government.\(^91\)

In support of the general principles of section 510, Smithfield cited the Supreme Court's opinion in *Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Foundation, Inc.*\(^92\) There, the Court stated:

Suppose . . . that the Administrator agreed not to assess or otherwise seek civil penalties on the condition that the violator take some extreme corrective action, such as to install particularly effective but expensive machinery, that it otherwise would not be obliged to take. If citizens could file suit, months or years later, in order to seek the civil penalties that the Administrator chose to forgo, then the Administrator's discretion to enforce the Act in the public interest would be curtailed considerably. The same might be said of the discretion of state enforcement authorities.\(^93\)

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\(^{87}\) See id. at 19–21.

\(^{88}\) See id. at 20–21.

\(^{89}\) See Brief for Appellants, *supra* note 53, at 22–23.


\(^{91}\) See Brief for Appellants, *supra* note 53, at 37.

\(^{92}\) 484 U.S. 49 (1987).

\(^{93}\) Id. at 60–61.
Although the Gwaltney Court was dealing with a question of citizen suit standing, in the present case Smithfield argued that the United States’ belated enforcement action was precisely the sort of parallel proceeding restricted by the Gwaltney Court. Specifically, Virginia agreed that Smithfield would take “extreme corrective action” that the company “otherwise would not be obliged to take” in order to act in “the public interest” by defusing Smithfield’s challenge to the statewide Policy. In so doing, Virginia secured the protection of nutrient enriched waters across the state, and insured that Smithfield would reduce its phosphorus discharges to the Pagan River to zero. Smithfield argued that the requirements of section 510 and the complementary logic of Gwaltney should preclude the United States from upsetting the balance of the agreement in an enforcement action brought five years after the fact.

The United States briefly responded by stating that its decision to bring an enforcement action did not bind Virginia or require the state to bring its own enforcement action, and that Virginia remains free not to enforce the 2 mg/l limit; therefore, section 510 was not transgressed. As Smithfield explained in its brief, the United States’ argument misses the point: the fact that the United States brought an enforcement action destroyed the balance created by Virginia in agreeing not to apply the Policy to Smithfield in exchange for the hookup to HRSD. Stated differently, the United States’ belated enforcement action is tantamount to undoing Virginia’s work, and therefore interferes with Virginia’s rights under section 510.

Last, Smithfield argued that Virginia’s enforcement scheme was in fact comparable to the Clean Water Act. Citing Arkansas Wildlife Federation v. ICI Americas, Inc., and North and South Rivers Watershed

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94 See Brief for Appellants, supra note 53, at 36–37.
95 Id. at 35–37 (citing Gwaltney, 484 U.S. at 60–61).
96 See Brief for Appellants, supra note 53, at 38.
97 See Brief for Appellee, supra note 84, at 25.
98 See Brief for Appellants, supra note 53, at 22–23.
99 29 F.3d 376, 381 (8th Cir. 1994) (comparability established where “overall regulatory scheme affords significant citizen participation, even if the state law does not contain precisely the same public notice and comment provisions as those found in the [FWPCA]”).
Association v. Town of Scituate, Smithfield argued that comparability under section 309(g)(6) does not require that state law administrative enforcement provisions be mirror images of their federal counterparts, but instead should be adequate to enforce the provisions of state law.

The United States responded by arguing that the inability of Virginia to assess an administrative penalty without the consent of the permittee, and the lack of public participation rights in the assessment of administrative penalties rendered the Virginia statutory scheme incomparable to the federal scheme.

These three issues, among others, are contentious and have been submitted to the Fourth Circuit for resolution. Appeals briefs submitted to the court on behalf of the defendants and amici curiae also raise issues dealing with the proper calculation of the economic benefit, if any, in this case. These issues are discussed in the next section.

III. DISCUSSION OF ECONOMIC ISSUES

A. Economic Benefit of Noncompliance

The Clean Water Act authorizes EPA and the courts to require violators of environmental laws to pay civil penalties that reflect, among other things, the amount of money the violators saved through noncompliance. section 309(d) of the Act states:

In determining the amount of a civil penalty, the court shall consider the seriousness of the violation or violations, the economic benefit (if any) resulting from the violation, any history of such violations, any good-faith efforts to comply

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100 949 F.2d 552, 556 n.7 (1st Cir. 1991) (comparability established “[s]o long as the provisions in the State Act adequately safeguard the substantive interests of citizens in enforcement actions”).

101 See Brief for Appellants, supra note 53, at 38–42.


103 See generally Brief for Appellants, supra note 53; Brief for Appellee, supra note 84.
with the applicable requirements, the economic impact of the penalty on the violator, and such other matters as justice may require.\textsuperscript{104}

Although the statute does not prescribe how economic benefit should be calculated, economic benefit traditionally has been defined as the difference between the amount of money a violator should have spent to come into compliance on time, and the amount it actually spent to comply at a later time.\textsuperscript{105}

\textsuperscript{104} 33 U.S.C. § 1319(d) (1994) (emphasis added).

\textsuperscript{105} "To determine a company's economic benefit from noncompliance with its permit, one must compare the company's cash flows associated with the delayed permit compliance measures to what those cash flows would have been if the company had obtained the necessary pollution control equipment on time." Friends of the Earth, Inc. v. Laidlaw Envtl. Serv. (TOC), Inc., 890 F. Supp. 470, 481 (D.S.C. 1995).

In contradiction to the manner in which Mr. Robert L. Harris, the government's economic expert in Smithfield, actually performed his analysis, he wrote in his May 19, 1997, expert report:

In order to estimate the economic benefit that Smithfield Foods, Inc. through its subsidiaries, has gained by noncompliance with its NPDES permit under the Clean Water Act, two scenarios are compared:

(1) The On-time Compliance scenarios represent the approaches that Smithfield Foods, Inc., through its subsidiaries, could have taken in order to be in compliance with its NPDES permit at all times.

(2) The Delayed compliance scenarios depict Smithfield Foods, Inc. subsidiaries' actual investments or actions that brought facility into compliance.

ROBERT L. HARRIS, EXPERT REPORT FOR UNITED STATES V. SMITHFIELD FOODS INC. 2 (May 19, 1997) (emphasis added) (on file with author) [hereinafter HARRIS REPORT].

U.S. ENVIRONMENTAL PROTECTION AGENCY, ECONOMIC BENEFIT AND THE BEN COMPUTER MODEL (Jan. 1999) contains the following passage at 1-7 that clearly recognizes (1) that the "on-time" and "delay" scenarios may contrast different means of compliance and (2) that the "delay" scenario should recognize the firm's actual expenditures:

- Compliance scenarios can sometime be complex and require many customized calculations:
As outlined in Part II above, Smithfield argued and still believes that its phosphorus discharges did not violate the Act. However, for analytical purposes, at trial Smithfield presented testimony regarding how economic benefit should be calculated.

The trial court ruled that Smithfield was required to be in compliance with the 2 mg/l phosphorus standard in 1993, but failed to achieve compliance for all pollutant limitations until 1997, when its hookup of the Smithfield Packing facility to HRSD was complete. The court ruled that this delay in compliance created an economic benefit of $4.2 million in favor of Smithfield. From the court’s written decision in

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- Here the violator should have started taking action for compliance in 1992, but did not start taking any actions (and hence incurring any costs) until a year later, in 1993.
- But because of the violator’s delay, required actions for delay scenario are very different (perhaps because of new regulations) than for on-time scenario (as opposed to differing merely by inflation).
- Therefore, such scenarios are probably not amenable to a BEN analysis. More customized calculations are necessary.

Id. at 1-7.

106 See supra notes 78 through 103 and accompanying text.


108 See id. at 349. In his May 19, 1997 expert report, Mr. Harris calculated that Smithfield’s economic benefit was $10,350,145. See HARRIS REPORT, supra note 105, at 4. Mr. Harris’ June 16, 1997 supplemental report calculated an economic benefit of $11,118,000. See ROBERT L. HARRIS, SUPPLEMENTAL EXPERT REPORT FOR UNITED
the penalty phase of the litigation, it is apparent that the court was disturbed both by the number of reported values it considered violations and by certain other issues related to environmental management at the two Smithfield Packing and Gwaltney of Smithfield, Ltd. plants in Smithfield, Virginia, both of which are wholly-owned by Smithfield Foods, Inc. These other issues include: falsification and destruction of records by the plants’ environmental manager, who, as a result of these actions, was convicted of criminal wrongdoing; Smithfield’s apparent failure at times to act on consultants’ recommendations; and what the court characterized as the “[d]efendants’ insufficient and inadequate efforts at compliance.” The court reached its penalty figure based on three relevant factors.

First, the court concluded that the more than $2 million Smithfield will spend each year for HRSD to treat its waste is irrelevant to the economic analysis. Nonetheless, this figure is substantially more than Smithfield would have had to pay on an annual basis to comply as a direct discharger. The court’s ruling also explicitly assumed that economic benefit calculations should be truncated at the moment of compliance, and that amounts spent to remain in compliance are not relevant to the

states v. smithfield foods, inc. 3 (june 16, 1997) (on file with author). in the undated rebuttal report produced in july 1997, in response to criticisms raised by smithfield's engineering and economic expert witnesses, mr. harris revised several key assumptions concerning compliance costs and calculated the total economic benefit smithfield derived from “delayed and avoided” costs to be $4,253,070. see robert l. harris, expert rebuttal report for united states v. smithfield foods inc. 5 (undated) (on file with author). additionally, at that time he concluded that smithfield also obtained $16,675,249 in “wrongful profits” by producing pork products at levels in excess of those at which it could comply with applicable environmental laws in the absence of further investments in pollution control. see id. at 3. although the court allowed mr. harris to testify at trial on his “wrongful profits” calculation, this aspect of his testimony was not accepted into evidence “because this opinion had not been properly given to defendants during pre-trial discovery.” smithfield, 972 f. supp. at 353 n.26.

109 see id. at 340–42.
110 see id. at 350–52.
111 see id. at 351.
112 id.
113 see id. at 348 n.16.
114 see robert h. fuhrman, economic analysis provided on behalf of smithfield foods, inc. in u.s. v. smithfield foods inc. et al. tbl.2 (june 20, 1997) (on file with author).
calculation of economic benefit.\textsuperscript{115}

Second, the court concluded that the plaintiff's economic benefit expert was more credible with respect to the mechanics of calculating economic benefit, specifically the proper discount and interest-forward rates to be used in calculating the present value of Smithfield's economic benefit.\textsuperscript{116} In reaching this result, the court heard testimony from DOJ's expert, Mr. Robert L. Harris, a certified public accountant from Birmingham, Alabama, regarding the proper discount and interest-forward rates.\textsuperscript{117} Against Mr. Harris' expert opinion, the court weighed the credibility of two other experts: Dr. A. Lawrence Kolbe, a Ph.D. in economics from the Massachusetts Institute of Technology, co-author of a book entitled The Cost of Capital,\textsuperscript{118} and author of more than two dozen academic papers discussing discount,\textsuperscript{119} interest rate, and related issues; and Mr. Robert H. Fuhrman, a Harvard MBA and former EPA economist.\textsuperscript{120}

Third, the court concluded that certain errors identified by the plaintiffs in Mr. Harris' economic calculations would reduce the economic benefit only by four percent, which the court deemed "not significant."\textsuperscript{121}

Given the absence in the court's decision of an explicit relationship between the various statutory penalty considerations listed in section 309(d) and the $12.6 million judgment assessed by the court against Smithfield, there is at least the appearance of trebling of the economic benefit to derive the final penalty figure. An error of $160,000 (four percent of $4.2 million) would, of course, seem quite significant to the

\textsuperscript{115} See Smithfield, 972 F. Supp. at 349 n.16; Trial Tr., supra note 29, at 412.

\textsuperscript{116} See Smithfield, 972 F. Supp. at 349 n.17.

\textsuperscript{117} See Trial Tr., supra note 29, at 366-367; HARRIS REPORT, supra note 105, at 5.


\textsuperscript{119} Discounting is a technique used in financial analysis to adjust a stream of monetary payments or costs for the time value of money and the risk of the cash flows at issue. The correct discount rate for the calculation of the present value of a set of expected cash flows is the "opportunity cost of capital," which is frequently referred to as the "cost of capital." See RICHARD A. BREALEY & STEWART C. MYERS, PRINCIPLES OF CORPORATE FINANCE, 117–18, ch. 9 (1996).

\textsuperscript{120} See Smithfield, 972 F. Supp. at 349 n.17.

\textsuperscript{121} Id. at 349 n.19.
defendant even without trebling to $480,000.

The following sections discuss each of these conclusions.

B. Decision Not to Consider HRSD-Related Expenses

As outlined in the June 9, 1991, Special Order, Smithfield had two mutually exclusive compliance alternatives available to it in 1991.\textsuperscript{122} Smithfield could have chosen to comply with the 2 mg/l phosphorus limit by constructing an extensive on-site treatment facility.\textsuperscript{123} If Smithfield had chosen this option, the relevant facility would have had to have been constructed by January 4, 1993.\textsuperscript{124} This option would have required Smithfield to pay capital and operating and maintenance costs associated with the direct discharge facility for the life of Smithfield's process operations.

Alternatively, Smithfield could have chosen to comply with the 2 mg/l limit by constructing a limited pretreatment facility through which its effluent would be partially treated and discharged to HRSD once HRSD was prepared to accept the effluent. This option would have required Smithfield to pay capital and operating and maintenance costs associated with the pretreatment facility, in addition to sewer use charges assessed by HRSD for the life of Smithfield's process operations.

Smithfield's economic benefit testimony asserted that a correct economic benefit analysis would compare: (1) the present value of all past and future costs associated with "on-time" compliance as a direct discharger beginning in 1993, against (2) the present value of all past and future costs associated with "delayed" compliance as an indirect discharger beginning in 1997.\textsuperscript{125} The inclusion of all past and future costs of compliance in the economic benefit analysis was referred to in court and is referred to below as a "life-cycle" analysis.\textsuperscript{126}

According to Mr. Fuhrman's unrebuted trial testimony, consideration of all life-cycle costs, including post-compliance operations and maintenance costs, is the standard method used in Clean Water Act

\begin{thebibliography}{99}
\bibitem{footnote2} See id. at 774.
\bibitem{footnote3} See id. at 777.
\bibitem{footnote4} See FUHRMAN, supra note 114, at 2-3; Trial Tr., supra note 29, at 640-41, 656-57.
\bibitem{footnote5} See Trial Tr., supra note 29, at 640, 642.
\end{thebibliography}
enforcement litigation as well as settlements.\textsuperscript{127} He testified, without rebuttal, that the consideration of past and future life-cycle costs was accepted in “every single case that has gone to court” where the economic benefit of delayed and avoided compliance costs had been at issue.\textsuperscript{128} In all of these cases the economic benefit analysis was based on the difference between: (1) the present value life-cycle stream of costs underlying the hypothetical on-time case; and (2) the present value life-cycle stream of costs the violator actually incurs.\textsuperscript{129} In other words, the comparison drawn by these cases has been between hypothetical on-time case compliance costs and real-world delay-case compliance costs.

Moreover, EPA computer software (the BEN model) and the BEN User’s Manual expressly prescribe the use of life-cycle cost analyses, including an endless sequence of replacement cycles at the end of the useful life of pollution control equipment.\textsuperscript{130} Although BEN is primarily used in settlement, nothing in the BEN User’s Manual or any other publicly-available EPA document indicates that EPA uses dramatically different methodologies in settlement than its testifying economic experts use at trial. Additionally, an expert witness on economic benefit issues who has been a frequent witness for the United States has testified that the method he uses in litigation to determine economic benefit on behalf of the United States “is virtually identical” to the BEN model.\textsuperscript{131}

\begin{footnotes}
\item[127] See id. at 640.
\item[128] Id. at 640 ll.20-24, 644 ll.6-10.
\item[129] See id. at 639-40.

  In general, the BEN computer model is used for calculating economic benefit for purposes of developing a settlement penalty. The BEN model is generally not intended for use at trial or in an administrative hearing. If the Agency is going to present economic benefit testimony at trial or in an administrative hearing, the Agency will generally rely on an expert to provide an independent financial analysis of the economic benefit the firm has obtained as a result of its violations. This independent financial analysis, while consistent with the principles of the BEN model, may not necessarily be identical to that set forth in the BEN User’s Manual.

  Id. at 1-2.
\end{footnotes}
As shown at trial, and not seriously challenged by the government or its economic expert, if all the past and future costs paid by Smithfield to comply by connecting to HRSD are considered in a traditional life-cycle analysis, and compared to the costs of on-time compliance as a direct discharger, it would have been far cheaper for Smithfield to upgrade its own on-site treatment facilities and to continue discharging to the Pagan River.\textsuperscript{3} Based on the financial method propounded by Dr. Kolbe,\textsuperscript{133} Mr. Fuhrman calculated that the present value of the cost of compliance as an indirect discharger actually exceeded by at least $14 million\textsuperscript{134} the present value of the cost of compliance as a direct discharger.\textsuperscript{135} That is to say,

\textsuperscript{132}See Trial Tr., \textit{supra} note 29, at 656-57.


\textsuperscript{134}Had Mr. Fuhrman relied on the discount/interest forward rate methodology advocated by Mr. Harris, Mr. Fuhrman would have calculated that the present value of the indirect discharge alternative involving HRSD to be $13 million more expensive than the cost of complying as a direct discharger to the Pagan River.

\textsuperscript{135}Nothing in the December 1993 version of the BEN USER'S MANUAL indicates that the same compliance scenario must be used in both the "on time" and "delay" cases. In fact, the manual contemplates several "special cases" in which proper analysis of economic benefit requires comparison of different scenarios for on-time and for delayed compliance. See BEN USER'S MANUAL, \textit{supra} note 130, app. B. Economic expert witnesses employed by the U.S. Department of Justice have sometimes issued expert reports for use in litigation in which different means of compliance were assumed for on-time and delay. For example, Gail B. Coad, of the economic consulting firm Industrial Economics, Inc., used this approach in her November 17, 1991, expert report in United States v. Mobil Oil Corp., CTVS-87-0627 LKK(JFM) (E.D. Cal.), which was prepared on behalf of the plaintiff. Ms. Coad provided deposition testimony in that case on
Smithfield will spend more money over time by sending its wastewater to HRSD than it would have spent by installing its own direct discharge facility on time and continuing to operate it into the foreseeable future.\textsuperscript{136} Despite testimony to the contrary, the trial court cut off the cash flows in the economic benefit analysis as of the date of compliance. Importantly, future life-cycle expenses like the HRSD user fees were irrelevant to the court’s reasoning.\textsuperscript{137} According to the court:

> Defendants do not get credit for past or future money spent on HRSD user fees, sewer surcharges, or other equipment installed at Gwaltney to enable them to connect to HRSD, as the court finds based on the credible evidence and testimony, that the user fees and surcharges are neither avoided [sic] or delayed costs, and such equipment was not necessary for a facility upgrade to bring defendants into compliance.\textsuperscript{138}

In its interaction with Mr. Fuhrman during the trial, the court made the same point this way:

> THE WITNESS: Your Honor, I believe a correct economic analysis compares what it would have cost to comply on time in a life cycle approach with what it

\textsuperscript{136} Smithfield’s decision to comply as an indirect discharger was the outcome of two elements. First, Smithfield’s engineers would not guarantee 100\% compliance with the 2 mg/l standard as a direct discharger. With the spectre of intermittent violations and subsequent enforcement, Smithfield chose the more reliable method of compliance. Second, both federal and state effluent limitations had continued to become more strict over the course of time. In order to avoid having the compliance goal posts constantly one step ahead of Smithfield’s facilities, Smithfield opted for what it believed to be the alternative that was more reliable and less subject to change.


\textsuperscript{138} \textit{Id.}
actually does cost to comply. They have two different—

THE COURT: I'm not talking about an economic analysis.

THE WITNESS: Yes.

THE COURT: I’m talking about a correct legal approach to a case, Mr. Fuhrman.

We are not talking here about them being held responsible for being in compliance. They have to be in compliance. They don’t get credit economically for being in compliance. That keeps them from having further penalties on them, and they are not being charged with future penalties. They have to come into compliance.

What is being looked at is what is the penalty until they came into compliance. Once they are in compliance, it is over with, from a standpoint of legal penalties.

THE WITNESS: Your Honor—

THE COURT: And this isn’t a settlement case. This is not an environmental settlement case. The thing is, they didn’t settle. I understand that if you are settling a case, you say, all right, assume you come into compliance, what kind of credit in the future are we going to give you.

But this is not about settlement. It is about not settling a case, not being in compliance up to a certain date. Once you are in compliance, it is over with.¹³⁹

Not only did the court reject consideration of any post-compliance costs, including over $500,000 in HRSD user charges by the date of the trial, it also refused to consider any past costs Smithfield had incurred to comply through HRSD (e.g., $238,233 spent to construct a pumping station).¹⁴⁰ Given that this case is about Smithfield becoming an indirect discharger, it is troublesome from a legal and policy perspective that the trial court’s economic benefit analysis compared: (1) what it presumably would have cost Smithfield to construct a direct discharge facility in 1993 and operate it until the time of the actual hookups to HRSD; and (2) those costs that Smithfield actually spent that would have been incurred in

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¹³⁹ See Trial Tr., supra note 29, at 642-43.
¹⁴⁰ See Smithfield, 972 F. Supp. at 348 n.16.
conjunction with a *direct* discharge facility in the 1996-97 timeframe.\textsuperscript{141}

Fatal to this premise is the fact that Smithfield did not construct a direct discharge facility in 1997, but instead constructed an indirect discharge facility. In short, the plaintiff's economic expert made a comparison between two hypothetical worlds (both of which were based on Smithfield complying as a direct discharger), and not a comparison between a hypothetical and the actual world.\textsuperscript{142}

The distinction is critical. In most Clean Water Act cases, the economic benefit of delayed compliance is determined by comparing what it would have cost to install and operate pollution control equipment on time to what it cost to install and operate the *same* equipment later in time. In this typical calculation, operating and maintenance (O&M) costs incurred after compliance may be safely ignored. They are identical and cancel each other out.

But in the *Smithfield* case, future O&M figures associated with on-time and delayed compliance did not cancel out because Smithfield’s actual compliance method, as an *indirect* discharger, was \$2.25 million more expensive per year than the *direct* discharge alternative.\textsuperscript{143}

The court should have taken this information into account in calculating the economic benefit that Smithfield obtained by failing to comply as a direct discharger in 1993 but complying instead several years later as an indirect discharger. To do otherwise omits costs that were mandated by the method of compliance upon which Smithfield relied to achieve compliance. Other than the decision in *Smithfield*, there is no other adjudicated case in which the cash flows in an economic benefit analysis were truncated to exclude such actual pre-compliance pollution control costs and/or post-compliance O&M costs when elimination of such costs from the analysis would alter the calculated net economic benefit.

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\textsuperscript{141} See Trial Tr., *supra* note 29, at 411–12.

\textsuperscript{142} The poor logic of this comparison may be illustrated as follows. Given that Smithfield saved a certain sum of money by failing to comply as a direct discharger but chose instead to comply as an indirect discharger, it is clear that Smithfield did not "save" (meaning Smithfield was able to invest in profit-making activities) the total amount of money that it would have had to spend to comply on-time as a direct discharger. Nonetheless, that is the approach taken by Mr. Harris and adopted by the court.

\textsuperscript{143} See FUHRMAN, *supra* note 59, tbls. 2, 3.
In its decision, the Smithfield court paraphrased the court in Public Interest Research Group, Inc. v. Powell Duffryn Terminals, Inc. as follows: "Since it is difficult to prove the precise economic benefit to a polluter, a reasonable approximation of economic benefit is sufficient." Exactly what constitutes a reasonable approximation is open to interpretation, but presumably at minimum it is an analysis grounded in the sound application of economic principles.

C. Discount/Interest Forward Rate

As indicated above, an economic benefit analysis compares the value of two sets of cash flows, one associated with "on-time" compliance and one associated with delayed compliance. To place the value of these two cost streams on a comparable basis as of a particular point in time, discount and interest rates must be employed.

In his expert report and trial testimony, Dr. Kolbe opined that the risk-free rate should be used in calculating the economic benefit resulting from noncompliance with environmental requirements. According to Dr. Kolbe, "[o]ne of the most fundamental lessons of modern finance theory is that the appropriate rate of return at which to discount future cash flows or to accrue interest on past cash flows is the 'cost of capital' for the cash flows at issue" as contrasted with the average cash flows available to investors from other projects. This precept has profound implications for

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144 913 F.2d 64, 80 (3d. Cir. 1990).
145 Smithfield, 972 F. Supp. at 348.
146 See supra notes 104 through 105 and accompanying text.
147 "Discounting" is a technique used in financial analysis to adjust a stream of monetary payments or costs for the time value of money and risk associated with the relevant cash flows. The concept underlying this adjustment is that a dollar received today is worth more than a dollar received one year from now, and the further the payment is in the future, the less it is worth today. For example, using a 10% discount rate, a dollar received one year from now is only worth 91 cents today. One dollar received two years from now is worth 83 cents today. Discount factors may be found in a "discount table" published in any introductory finance textbook. Assuming that all "discounted" future costs are expressed as a present value at a given point in time, past costs may be adjusted to the same point in time by compounding each of them at an appropriate interest forward rate.
148 A. LAWRENCE KOLBE, EXPERT REPORT OF A. LAWRENCE KOLBE ON DISCOUNT AND INTEREST RATE ISSUES IN CALCULATING THE ECONOMIC BENEFIT FROM NON-COMPLIANCE 1 (June 18, 1997) (on file with author).
the method that should be used in economic benefit cases. Among other things, it led Dr. Kolbe to conclude that, in these cases, past cash flows should be brought forward to present values by compounding at the risk-free rate associated with short-term U.S. Treasury bills, with adjustments for taxation, and future cash flows should be discounted to present value by use of rates that reflect the time value of money and the risk of the cash flows at issue.\textsuperscript{149}

The economic benefit analysis of the plaintiff's expert witness assumed that all savings from noncompliance should be adjusted to present value by use of a single adjustment factor, which is based on the corporation's weighted average cost of capital (WACC).\textsuperscript{150} This is also the approach specified in EPA's BEN User's Manual,\textsuperscript{151} which has never been subjected to a public rulemaking procedure.\textsuperscript{152}

The differences in economic benefit calculations resulting from the use of a risk-free rate versus the WACC can be significant.\textsuperscript{153} Depending on the length of period of noncompliance and other input assumptions in a given case, these methodological differences can produce results that differ by orders of magnitude. Therefore, a court's selection of a particular discount rate/interest forward methodology can have a profound impact on the economic benefit of noncompliance.

In prior economic benefit cases, different judges have selected different financial methodologies upon which to base economic benefit determinations. For example, in United States v. Roll Coater,\textsuperscript{154} the court selected the use of the WACC rate as the discount/interest forward rate

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\item[\textsuperscript{149}] See id. at 2-4. See also Kenneth T. Wise et al., EPA's 'BEN' Model: Challenging Excessive Penalty Calculations, 6 Toxics L. Rep. (BNA) 1492, 1495-6 (May 6, 1992).
\item[\textsuperscript{150}] See Harris Report, supra note 105, at 3.
\item[\textsuperscript{151}] See BEN User's Manual, supra note 130, at 4-30.
\item[\textsuperscript{152}] See Robert H. Fuhrman, A Discussion of Technical Problems with EPA's BEN Model, 1 ENVTL. LAW. 561, 589 (Feb. 1995).
\item[\textsuperscript{153}] For illustrative purposes, Mr. Fuhrman performed a calculation very similar to the one performed by Mr. Harris in that it excluded all expenses that were solely related to compliance as an indirect discharger. In that calculation, Mr. Fuhrman used corrected cost figures and the financial methodology Dr. Kolbe opined to be correct. Under those assumptions, he calculated an economic benefit figure of $630,370, substantially less than the $4.2 million figure calculated by Mr. Harris and accepted as the economic benefit of noncompliance by the court. See Trial Tr., supra note 29, at 648.
\item[\textsuperscript{154}] No. IP-898C, slip op. at 10. (S.D., Ind., March 22, 1991).
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and rejected use of the significantly-higher rate recommended by the plaintiff’s economic expert in that case, which was based on the cost of equity capital.\textsuperscript{155} In \textit{In re Harmon Electronics, Inc.},\textsuperscript{156} an EPA administrative law judge accepted an economic benefit calculation that was explicitly based on the use of U.S. Treasury bill (i.e., risk-free) rates for the interest forward calculation.\textsuperscript{157}

After having considered the expert reports and testimony of both EPA and Smithfield’s witnesses, the court stated in its August 6, 1997, opinion:

\begin{quote}
The court was more persuaded by the testimony of the United States’ economic benefit expert, Robert Harris. The court rejects in most part the testimony of defendants’ experts Robert H. Fuhrman and A. Lawrence Kolbe, and particularly the risk-free rate analysis.\textsuperscript{158}

Although the court acknowledged that “there are various methods for calculating defendants’ economic benefit gained from noncompliance,”\textsuperscript{159} its decision justified use of the WACC as both the discount and interest forward rate in the economic benefit analysis by declaring this approach “both the best and the appropriate method to determine how much money defendants made on the funds they did not spend for compliance.”\textsuperscript{160} Significantly, the court did not state why it disagreed with use of the risk-free rate, which would have required it to explain why it disagreed with Dr. Kolbe’s testimony: the court simply rejected it.\textsuperscript{161}

The court’s lack of specificity is important. As posited by \textit{amici} American Automobile Manufacturers Association, et al. in their brief to

\textsuperscript{155} \textit{Id.} at 11.


\textsuperscript{159} \textit{Id.} at 349.

\textsuperscript{160} \textit{Id.}

\textsuperscript{161} \textit{Smithfield}, 972 F. Supp. 348 n.17.
the Fourth Circuit in *Smithfield*:

When faced with competing expert opinions, a trial court must “examine the differences between the procedures used” because it is not sufficient “merely [to] determine that one expert was more credible.” *U.S. v. Roll Coater, Inc.*, 1991 U.S. Dist. LEXIS 8790 at *12. A trial court must state its reasons for rejecting a party’s evidence as unpersuasive, and a decision that fails to do so is insupportable. *Wilson v. Volkswagen of America, Inc.*, 561 F.2d 494, 519 (4th Cir. 1997). That principle applies with full force to credibility determinations; the trial court must enumerate the criteria it uses to determine whom it believed. See *Kilburn v. United States*, 938 F.2d 666, 673 (6th Cir. 1991). Furthermore, [Federal Rule of Civil Procedure] 52(a) requires a district court to identify the reasons underlying its choice between the alternatives presented in the record, and failure to provide that explanation requires a remand. *U.S. Fire Ins. Co. v. Allied Towing Corp.*, 966 F.2d 820, 827 (4th Cir. 1992).162

The trial court’s lack of specificity leaves the rationale for its decision unknown.

D. Admitted Errors

In his trial testimony, the United States’ expert Mr. Harris admitted that he may have made certain technical assumptions in his economic benefit calculations (i.e., the tax rate and the use of the same “beta”163 for each relevant year) that he agreed were probably erroneous.164 However,

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163 “Beta” is a measure of the correlation between historical changes in the price of a common stock and price movements in the stock market. Beta is an important variable in calculating the cost of equity capital according to the “Capital Asset Pricing Model.” See BREALEY & MYERS, supra note 119, ch. 9.

164 See Trial Tr., supra note 29, at 398–400.
he stated that the net effect of remedying these incorrect assumptions would only lead to approximately a four percent reduction in economic benefit.\textsuperscript{165} The court acknowledged this matter in its opinion, but did not reduce the economic benefit to reflect this overage.\textsuperscript{166}

Additionally, the court did not reach any conclusions about the following unrebutted matters that Dr. Kolbe cited as errors in calculating the WACC rate that Mr. Harris used: use of the coupon rate rather than the market rate for determining the cost of debt; use of book value rather than market value in determining the debt weight in the cost of capital calculation; improper use of the 30-year bond as the benchmark for the cost of equity calculation; and improper estimation of separate WACCs for Gwaltney and Smithfield Packing.\textsuperscript{167} Dr. Kolbe further testified that Mr. Harris erred in applying his miscalculated WACC rate by compounding on a daily basis.\textsuperscript{168} Because components of Mr. Harris' WACC calculation are annual benchmarks, according to Dr. Kolbe, daily compounding constitutes double compounding.\textsuperscript{169} Dr. Kolbe testified that if Mr. Harris had calculated his WACC rate correctly, he would have used a rate of 10.5 percent, rather than the effective rate of 13.3 percent he used through improper compounding.\textsuperscript{170}

Although the above list of issues may appear quite technical to a lay audience, assuming Dr. Kolbe is correct about these alleged errors, the economic benefit in this case was significantly miscalculated.

IV. CONCLUSION

Whether Smithfield should have been subject to penalties for its phosphorus discharges before it connected to HRSD is a contentious question that continues to be litigated in the Fourth Circuit. Legal issues aside, there remain three major economic issues regarding the $12.6 million penalty assessed against Smithfield. First, Smithfield will spend considerably more money due to its connection to HRSD than it would

\textsuperscript{165} See id. at 399.
\textsuperscript{166} See Smithfield, 972 F. Supp. at 349 n.19.
\textsuperscript{167} See Trial Tr., supra note 29, at 601-606.
\textsuperscript{168} See id. at 597, 606.
\textsuperscript{169} See id. at 606.
\textsuperscript{170} See id. at 597, 626.
have spent as a direct discharger. This indisputable economic fact rationally should lead to the conclusion that Smithfield has not, and will not, gain any economic benefit from having continued to discharge into the Pagan River while it waited for its connection to HRSD to become available. Logic supports that conclusion, as do traditional economic principles that have been used in other adjudicated environmental civil penalty cases.

Second, in the absence of a well-articulated discussion of the alternative economic methods advocated by each side's expert witnesses, the Smithfield court has not firmly established that the approach it selected as "both the best and most appropriate method" actually provides a "reasonable approximation of economic benefit." Given the magnitude of the penalty and the wide disparity between the results produced by the different methodologies, the absence of such a discussion is particularly unfortunate.

Finally, the calculation errors essentially acknowledged by Mr. Harris should have lowered the ultimate penalty assessed against Smithfield. It is puzzling how the court could dismiss $160,000 as an insignificant amount.

The legal and economic issues in the Smithfield litigation are complicated and do not easily yield to simplification. These complexities, however, should not obscure the fact that Smithfield did not economically benefit from its decision to comply with the Commonwealth's orders. Absent the federal overfiling issue, the Smithfield case is reduced to a routine set of enforcement issues. If the case stands for anything, it is that Smithfield was caught in a struggle between EPA and the Commonwealth of Virginia regarding Smithfield's understanding with Virginia of which EPA was aware for five years prior to the filing of the complaint. Because of the irregularities in EPA's enforcement action and the decision of the Court not to consider all relevant costs in its economic benefit analysis, the

171 If, as the court articulated, "[c]ourts use economic benefit analysis to level the economic playing field and prevent violators from gaining an unfair competitive advantage," it is hard to understand how disregarding Smithfield's actual costs due to its connection to HRSD achieves that goal. Smithfield, 972 F. Supp. at 348.
172 Id. at 349.
173 Id. at 348.
174 See id. at 348 n.19.
trial court’s decision in Smithfield may not be the final judgment in this case.