PRECEDENTIAL

IN THE UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

NO. 02-4346

UNITED STATES OF AMERICA

v.

ALLEGHENY LUDLUM CORPORATION,

Appellant

On Appeal from the United States District Court
For the Western District of Pennsylvania
(D.C. No. 95-cv-00990)
District Judge: Honorable Robert J. Cindrich

Argued December 16, 2003

Before: ALITO, FUENTES and BECKER, *Circuit Judges*

(Filed April 28, 2004)

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OPINION OF THE COURT

BECKER, *Circuit Judge*.

This is an appeal from an order of the District Court granting judgment for the plaintiff United States and against defendant Allegheny Ludlum Corporation ("ALC") in an action brought for violations of the Clean

Water Act ("CWA" or the "Act") at five of ALC's Western Pennsylvania manufacturing facilities. The judgment is multifaceted, flowing from: (1) pretrial legal determinations by the Court; (2) a jury verdict on a number of liability issues; and (3) determinations by the Court following a penalty hearing. The jury verdict was mixed; each side prevailed on a number of issues, and ALC's appeal leaves unchallenged significant portions of the judgment against it. However, the appeal does challenge major aspects of the judgment and also of the civil penalty assessment leveled against ALC for the alleged violations in the sum of $8,244,670.

The first important question presented by the appeal concerns the viability of the so-called "laboratory error defense." The CWA operates under a self-monitoring and reporting system whereby the discharger of toxic waste measures and reports to the Environmental Protection Agency ("EPA") the volume of its discharge. ALC maintains that the EPA predicated certain aspects of the violation upon reports submitted by ALC that were tainted by laboratory error caused by a contaminated reagent resulting in *over*reporting of the amount of the toxic zinc discharge. The District Court declined to allow the laboratory error defense on the grounds that it had not been recognized in the Third Circuit, and that to allow such a "new defense" would contravene the CWA.

Although the CWA operates under a regime of strict liability, designed to ensure that polluters will take responsibility for ensuring the correct and precise measurements of their waste (which they are obliged to certify), we do not believe that a laboratory error defense—where the error resulted in overreporting—is inconsistent with this regime. Rather, inasmuch as the penalty imposed is for an unlawful discharge and not for faulty reporting, we think that deprivation of the defense would not advance the purpose of the CWA and that it would be grossly unfair, especially in view of the presence of companion provisions of the CWA imposing liability for monitoring and reporting violations. We will therefore vacate the judgment in part and remand so that the laboratory error defense can be considered and adjudicated with respect to the affected claims.

The appeal also requires us to determine whether the District Court made either a mistake of law or abused its discretion in calculating the economic benefit that ALC obtained from those violations that are unchallenged on appeal. Section 1319(d) of the CWA requires that the District Court, when determining the amount of a civil penalty under the CWA, consider "the economic benefit (if any) resulting from the violation," so as to "level the playing field." The District Court's calculation here was an agglomeration, based on a number of factors. The largest single factor was the 12.73% interest rate used by the government and the District Court to compute interest from the date of violation to the date of the judgment so as to calculate the total economic benefit to ALC. This rate was predicated largely on a calculation of ALC's weighted average cost of capital ("WACC"). Noting that it was uncontested at trial that ALC had an actual rate of return on capital that was less than half the 12.73% rate used by the District Court, ALC contends that the 12.73% rate is excessive.

We conclude that the application of the 12.73% rate may so vastly overstate the economic benefit to ALC of its improper discharges, that it does not "level the playing field," and that it constitutes an abuse of discretion. As a prelude to making this determination we explore the potential ramifications of the notion of economic benefit under § 1319(d). We conclude that there are two possible approaches to calculation of economic benefit: (1) the cost of capital, i.e., what it would cost the polluter to obtain the funds necessary to install the equipment necessary to correct the violation; and (2) the actual return on capital, i.e., what the polluter earned on the capital that it declined to divert for installation of the equipment. Because these factors are so variable, depending upon market conditions and the financial soundness of the polluter, we leave it to the District Court, in the sound exercise of its discretion, to decide which approach to apply and how to apply it (there are a variety of models). However, we explain why the District Court's application of the WACC in this case was, at a minimum, unsupported by the evidence, and needs to be recalculated should the District Court on remand elect to pursue that approach.

In contrast, we conclude that the District Court's application of the other legally required factors to calculate ALC's economic benefit—the least costly method of compliance and the periods of non-compliance—were supported by the record. In the course of this determination, we clarify that the proper method for determining economic benefit is to base the calculation on the least costly method of compliance. On the issue of economic benefit, we therefore vacate and remand with respect to the interest rate issue.

Finally we must decide whether, in compiling the number of violations for the purpose of assessing a penalty, the District Court erred by counting violations of monthly averages as violations for each day of the month. We, of course, follow our precedent in *Natural Resources Defense Council, Inc. v. Texaco Refining & Marketing Inc.*, 2 F.3d 493 (3d Cir. 1993), that the daily average limit is computed by averaging effluent levels only for days on which the facility operated. Although some Courts—most notably the Fourth Circuit in *Chesapeake Bay Foundation, Inc. v. Gwaltney of Smithfield, Ltd.*, 791 F.2d 304 (4th Cir. 1986), *vacated on other grounds*, 484 U.S. 49 (1987)—have held that a violation of a monthly average parameter constitutes a violation for each day of the month, we find this approach incomplete. We adopt *Gwaltney* insofar as it establishes an absolute upper bound on the penalty that can be assessed for a monthly average violation. However, permit limits can be exceeded in many different ways, both by very large, isolated discharges and by moderate continuous discharges.

Furthermore, daily and monthly average limits are designed to avoid distinct environmental harms. As a result, in some cases a violator's wrongful conduct will merit punishment for both daily and monthly violations, while in others, the conduct will have been sufficiently punished by penalties for daily violations alone. We hold that district courts have discretion to determine, on the facts of each case, how many violation days should be assessed for penalty purposes for the violation of a monthly average limit, based on whether violations are already sufficiently sanctioned as violations of a daily maximum limit. In this case, the District Court did not have the benefit of this standard, so we will vacate its penalty assessment and remand for further proceedings.

We will therefore affirm in part, vacate in part, and remand for further proceedings consistent with this opinion.

I. Facts and Procedural History

ALC manufactures steel and owns and operates five plants comprising three specialty steel manufacturing facilities in Western Pennsylvania: the Brackenridge Facility (the Brackenridge and Natrona plants); the West Leechburg Facility (the West Leechburg and Bagdad plants); and the Vandergrift Facility. The Brackenridge Facility conducts melting, continuous casting, rolling, and finishing operations. The West Leechburg and Vandergrift Facilities are finishing operations.

The steelmaking process generates a considerable amount of pollution. ALC's steel-making process uses water from adjacent rivers. The water is used as process water and as non-contact cooling water. Process water is used directly in the process of making steel, and makes contact with steel or steel-making equipment. Non-contact cooling water cools the steel-making equipment without actually touching the steel. ALC operates six on-site wastewater treatment plants ("WWTPs") at these facilities. The three WWTPs at the Brackenridge facility discharge to the Allegheny River, pursuant to a National Pollution Discharge Elimination System ("NPDES") permit issued by the Pennsylvania Department of Environmental Protection ("PADEP"). The two WWTPs at the West Leechburg facility discharge to the Kiskiminetas River pursuant to another NPDES permit. The Vandergrift WWTP discharges treated process waters to the Kiski Valley Water Pollution Control Authority ("KVWPCA") pursuant to permits with it. After applying further treatment, KVWPCA discharges to the Kiskiminetas River.

The United States filed this action against ALC on June 28, 1995. The Complaint, as amended, alleged three types of violations: (1) discharges at each of ALC's five facilities containing discharges in excess of ALC's permits as shown by the Discharge Monitoring Reports ("DMRs") submitted to the EPA; (2) discharges from the Vandergrift facility that interfered with the operations of the Kiski Valley WPCA; and (3) ALC's failure to report violations as required by its permits. The parties filed cross motions for summary judgment. In response, the District Court ruled that ALC could not raise several defenses to the reported violations, including the "laboratory error" defense by which ALC contended that its reported violations resulted from erroneous laboratory analyses—later discovered to be caused by a contaminated reagent—which overstated zinc pollutant levels.[1] The Court opined that the defense had not been recognized in this Circuit, and that it would not adopt such a new defense, "especially since the Act can be interpreted as creating an obligation to insure that the self-monitoring of pollutants is accurate, assigning the risk of inaccuracy to the company." The Court thus granted partial summary judgment to the United States on that issue. The Court denied the government's motion for summary judgment on the reporting failure and interference claims, finding that ALC had provided sufficient evidence to create triable issues of fact.

The District Court held a jury trial on liability from January 5 to February 2, 2001. The jury found in favor of ALC on all of the interference and reporting failure claims, but in favor of the government on half of the remaining reported violations claims. In total, the violations for which ALC stipulated to liability, those for which the court granted summary judgment, and those for which the jury returned a verdict against ALC added up to 1,122 days of violations

[1] ALC's overreporting of zinc exceedences was based upon effluent sample analyses performed by ALC's Technical Laboratory which turned out to be flawed. ALC allegedly tried to determine the cause of the zinc exceedences, without success. In February 1996, it started to examine its own laboratory's performance. ALC took samples of effluent and had part analyzed at the ALC Laboratory and part analyzed by two outside laboratories, a protocol known as "split sampling." According to ALC, the zinc results obtained by its laboratory were significantly higher than those obtained at the outside laboratories, while the outside laboratories' results were consistent with each other. In this split sampling, each laboratory performed its own digestion of the samples. In March, 1996, ALC again split samples with the two outside laboratories, but this time provided each laboratory with two sample sets, one undigested and one predigested by ALC's Laboratory. According to ALC, the values generated by the samples that were both digested and analyzed by the outside laboratories showed significantly lower zinc results than the corresponding results from ALC's laboratory. However, the sample sets analyzed by the outside laboratories after the samples were predigested by ALC's laboratory were as high in zinc as the results from ALC's laboratory, leading ALC to the conclusion that it was the digestion process in ALC's laboratory that was causing zinc values to be overstated. Once ALC switched to a different reagent, it no longer reported zinc exceedences.

from July 1990 through February 1997.

From February 5 to 8, 2001, the Court conducted a bench trial on the penalty amount. To save time, the Court allowed the experts to give their direct testimony in the form of written proffers, and allowed live cross-examination. Following the penalty trial, the parties submitted proposed (judicial) opinions, and on February 20, 2002, the Court filed an opinion and entered judgment against ALC in the amount of $8,244,670. ALC filed a motion under Fed. R. Civ. P. 59(e) to alter or amend the judgment, which the District Court denied. On November 26, 2002, ALC filed a notice of appeal from the District Court's summary judgment order of September 28, 2000, the reconsideration order of November 28, 2000, the final judgment of February 20, 2002, and the Rule 59(e) order of October 8, 2002.

The District Court had jurisdiction pursuant to 28 U.S.C. § 1331. ALC's appeal is timely under Fed. R. App. P. 4(a)(1)(B), and we have appellate jurisdiction pursuant to 28 U.S.C. § 1291. Our review of the grant of summary judgment is plenary. *See Shelton v. Univ. of Med. & Dentistry of N.J.*, 223 F.3d 220, 224 (3d Cir. 2000). We review the imposition of a penalty under Section 1319(d) of the CWA for abuse of discretion, *see Tull v. United States*, 481 U.S. 412 (1987), but our review of the legal construction of Section 1319(d) is plenary, *see Public Interest Research Group, Inc. v. Powell Duffryn Terminals, Inc.*, 913 F.2d 64, 80 (3d Cir. 1990).

II. The Laboratory Error Defense

A. Overview of the Clean Water Act

The Clean Water Act ("CWA") was enacted by Congress in 1972 "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). In order to achieve this goal, the CWA prohibits the discharge of any pollutant into waters of the United States except as expressly authorized under the Act. *See* 33 U.S.C. § 1311(a). In order to discharge pollutants into navigable waters, one must obtain a National Pollution Discharge Elimination System ("NPDES") permit. 33 U.S.C. § 1342. Discharges that comply with the limits and conditions in an NPDES permit are deemed to comply with the Act. 33 U.S.C. § 1342(k). The CWA requires NPDES permittees to test their effluent and report the results to the EPA in Discharge Monitoring Reports ("DMRs"). 33 U.S.C. § 1318(a); 40 C.F.R. §§ 122.41(j), 122.48. Section 307 of the CWA authorizes the EPA to promulgate regulations prohibiting the discharge of any pollutant into a Publicly Owned Treatment Works ("POTW") that "interferes with, passes through, or otherwise is incompatible with" the POTW. 33 U.S.C. § 1371(b)(1). The Act prohibits discharges to POTWs that are in excess of those pretreatment standards. 33 U.S.C. § 1317(d). The EPA has issued general pretreatment standards and national categorical pretreatment standards for the iron and steel manufacturing industry. *See* 40 C.F.R. Pts. 403, 420.

The Act authorizes the EPA to bring civil enforcement actions for injunctive relief and penalties, at times relevant, to up to $25,000 per day for each violation. *See* 33 U.S.C. § 1319(d). A violation of the Act can be established by showing that the defendant is a person who discharged pollutants from a point source into navigable waters in violation of the terms of the applicable NPDES permit or into a POTW in violation of a pretreatment standard. *See* 33 U.S.C. §§ 1311, 1317(d). In assessing a civil penalty for a violation of § 1311 or § 1317, the court must 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 with the applicable requirements, the economic impact of the penalty on the violator, and such other matters as justice may require." 33 U.S.C. § 1319(d).

B. The Government's Contentions

The government argues that the CWA establishes a scheme of strict liability aimed at facilitating enforcement. It first notes that Congress gave the EPA the "authority to require information, data, and reports, as well as establish monitoring requirements," recognizing that such an authority is a "necessary adjunct to the establishment of effective water pollution requirements and the enforcement of such requirements." Government Br. at 16 (citing S. Rep. 92-414, at 62 (1971)). Furthermore, it points out that Congress intended "these new requirements" to "avoid the necessity of lengthy fact finding, investigations, and negotiations at the time of enforcement." *Id.* (citing S. Rep. 92-414, at 62 (1971)). The government then argues that, consistent with the Act's requirement for accurate self-reporting, courts should treat DMRs, which must be certified by the discharger, as admissions that are sufficient to establish liability under the CWA.

The government relies in this respect on *Sierra Club v. Union Oil Co.*, 813 F.2d 1480, 1491-92 (9th Cir. 1987), *vacated on other grounds*, 485 U.S. 931 (1988), where the Court of Appeals held that a CWA defendant could not escape liability based on alleged sampling violations. The Court noted that the "NPDES program fundamentally relies on self-monitoring" and that Congress deemed accurate DMRs "critical to effective operation of the Act." *Id.* It opined that allowing CWA permittees to impeach their own DMRs "would be sanctioning countless additional hours of NPDES litigation and creating new, complicated factual questions for district courts to resolve." *Id.* at 1492. The Court further reasoned that if permittees could impeach their own reported violations with claims of laboratory error, it would "create the perverse result of rewarding permittees for sloppy laboratory practices" and "undermine the efficacy of the self-monitoring program." *Id.*; *accord Conn. Fund for the Env't, Inc. v. Upjohn Co.*, 660 F. Supp. 1397 (D. Conn. 1987).

Relying on this reasoning, the government submits that we should reject ALC's laboratory error defense. Because the regulations require dischargers to amend their sworn DMRs whenever they discover an error in their reporting, and because failure to do so constitutes a criminal violation in and of itself, the government contends that allowing dischargers to contest their own DMRs conflicts with the statute and the applicable regulations. *See* 40 C.F.R. §§ 122.41(k)(2), (1)(8). The government further argues that allowing a laboratory error defense would frustrate "congressional intent, would reward companies for inaccurate monitoring practices, and would give them an incentive to wait until they are sued to ensure the accuracy of their DMRs."

C. The Authorities Relied upon by ALC

ALC first counters the government's arguments by citing a number of cases from district courts within this Circuit that have recognized—either explicitly or implicitly—the availability of the laboratory error defense. While no defendant in these cases has actually made it past the summary judgment stage based on the laboratory error defense, that lack of success has been due to district courts finding that the defendants failed to raise a genuine issue of material fact as to the existence of a laboratory error, and not because the defendants were precluded from raising the defense *as a matter of law*.

In *Public Interest Research Group, Inc. v. Elf Atochem North America, Inc.*, 817 F. Supp. 1164 (D.N.J. 1993), a similar case of potential overreporting came before the District Court. The defendant claimed that errors in its laboratory testing had resulted in the overreporting of toxic discharges. Split sampling over a six-month period revealed large discrepancies between the defendant's results and those from outside laboratories, though no consistent pattern could be detected in those discrepancies (sometimes the defendant's results were higher, and sometimes they were lower than the outside laboratories' results).

The Court explained that "if a defendant wishes to contest the accuracy of its DMRs, it 'has a heavy burden to establish faulty analysis.'" *Id.* at 1178 (quoting *Student Pub. Interest Research Group, Inc. v. Georgia-Pacific Corp.*, 615 F. Supp. 1419, 1429 (D.N.J. 1985)). "The 'defendant must present direct evidence of reporting inaccuracies' and 'may not rely on unsupported "speculation" of measurement error.'" *Id.* (quoting *Georgia-Pacific Corp.*, 615 F. Supp. at 1429). The fact that "no court in this district ha[d] thus far found a defendant to have met this heavy burden," *id.*, however, did not preclude the possibility of the defense as a matter of law.

The *Elf Atochem* Court, in discussing the reasoning in *Upjohn*, quotes *Chesapeake Bay Foundation v. Bethlehem Steel Corp.*, 608 F. Supp. 440, 452 (D. Md. 1985), which stated that "'[g]iven the heavy emphasis on accuracy in the Act and the clear Congressional policy that DMRs should be used for enforcement purposes, the court will not accept claims of inaccurate monitoring as a defense.'" *Elf Atochem,* 817 F. Supp. at 1179. The *Elf Atochem* Court agreed that "the Act places the burden of accurately monitoring the levels of pollutants in their effluent squarely on the shoulders of permit holders, and that we must hold them to that obligation," but it ultimately held that

> while we agree with the [*Upjohn*] court that it is inconsistent with the structure and purpose of the Act to allow permit holders to escape liability altogether on the basis of laboratory error, *we find it more accurate, where laboratory error has been shown, to hold a defendant liable for a monitoring violation rather than a discharge violation.*

Elf Atochem, 817 F. Supp. at 1179 (emphasis added).

Similarly, in *Public Interest Research Group, Inc. v. Yates Industries, Inc.*, 757 F. Supp 438, 447 (D.N.J. 1991), the Court expressly recognized the laboratory error defense, noting that "DMRs may be deemed admissions when establishing liability in summary judgment motions," but are not conclusive proof of liability. The Court held that under some circumstances, a "defendant may avoid liability at the summary judgment stage on the basis of inaccurate data in DMRs." *Id.* While the *Yates* Court also recognized the heavy burden on the defendant to prove laboratory error, it stated that a showing of "'errors in the actual tests performed which showed a permit violations [sic]'" may defeat a summary judgment motion. *Id.* (quoting *Student Pub. Interest Research Group, Inc. v. Tenneco Polymers, Inc.*, 602 F. Supp. 1394, 1400 (D.N.J. 1985)). Thus, while the Court ultimately granted summary judgment against the defendant—based on the fact that the cover letters the defendant submitted to the Court were too speculative in that they merely asserted that the defendant "felt" and "believed" that laboratory errors had occurred—it clearly implied that had the factual situation been different, Yates could have survived a summary judgment motion based on a laboratory error defense. *See id.*

D. Discussion

We find the reasoning of the *Elf Atochem* Court persuasive. The violations at issue here alleged that ALC discharged pollutants in violation of the terms of its permit. In order to prove these violations, it was necessary for the government to establish that ALC did in fact violate the permit terms. If a permittee reports that it has violated a permit limit, the report is sufficient to discharge the government's burden of production, but neither the CWA itself nor any regulation of which we are aware makes such a report conclusive.[2] The

[2] The question before us is whether a permittee violates its permit if its discharges in fact comply with the terms of the CWA but its reports erroneously indicate the permit was violated. This is a pure question of law, and our review is plenary. In its brief, the government did not argue that, in interpreting the relevant provisions of the Act or any relevant regulations, we should give any degree of deference to any formal or informal administrative interpretations of the Act or

trier of fact must still be convinced that the permit was in fact violated. Evidence that the reports inaccurately overreported the level of discharge are certainly relevant to show that no violation occurred.[3]

The government stresses the fact that the civil liability provisions of the CWA create a regime of strict liability, but this argument misses the mark. Strict liability relieves the government of the obligation to show *mens rea*, not the *actus reus*. *See, e.g.*, *W. Fuels-Utah, Inc. v. Fed. Mine Safety & Health Review Comm'n*, 870 F.2d 711, 713-14 (D.C. Cir. 1989). In the context of the present case, strict liability means that the CWA is violated if a permittee discharges pollutants in violation of its permit, regardless of the permittee's *mens rea*. Strict liability does not mean that a permittee may be held liable for violating its permit even if it does not in fact do so.

While the government's policy arguments are certainly forceful in the case of a permittee *under*reporting levels of toxic waste and then claiming a laboratory error defense, we are unpersuaded that they prove compelling in a case like this where the permittee alleges that the laboratory error resulted in the *over*reporting of the levels of toxic waste.[4] From a public policy perspective, a polluter should not be given the opportunity to underreport levels of toxic waste, thereby dumping in excess of its permit, and then, when caught, cry "laboratory error kept me from knowing that I was in violation!" But in the case at bar, the opposite apparently occurred: ALC was conducting its sampling but a contaminated reagent used in the ALC laboratory's analysis was causing the laboratory systematically to overreport the amount of toxic zinc that was dumped into the water. We fail to see what incentive ALC could have had to overreport how much zinc it was dumping into the river when it knew that such amounts would result in fines. We do not believe that a scheme assigning strict liability for discharge violations in the case

regulations. By failing to make any such argument in its brief, the government waived any contention based on deference. Moreover, when counsel for the government was questioned on this point at oral argument, she did not call to our attention any administrative interpretation to which she claimed that deference was owed. Nor has the government brought any such interpretation to our attention after the argument.

[3] We use the term "laboratory error defense" in this opinion because the term has been used in prior cases and is used by the parties here, but it is important to note that laboratory error is not an affirmative defense to liability. Instead, evidence of laboratory error is simply evidence that is relevant to the question whether a violation of a permit requirement in fact occurred.

[4] In the underreporting situation, the permittee would be attempting to use laboratory error to show that it lacked *mens rea*, which is irrelevant under the civil liability provisions of the CWA.

of overreporting errors makes sense, nor do we infer from the CWA that such was Congress's intent.

In citing *United States v. Pozsgai*, 999 F.2d 719, 725 (3d Cir. 1993), the government correctly asserts that a discharge that is not in compliance with a permit "is the archetypal Clean Water Act violation, and subjects the discharger to strict liability." But in *Pozsgai*, strict liability was imposed based upon an unlawful discharge, not the mistaken report of a discharge. The government seems to be aware of this difference when it argues that strict liability should be imposed on reporting requirements, as it writes about the conjunction of the "CWA's reporting requirements *and* imposition of strict liability for permit violations." (emphasis added). So, while the CWA unambiguously imposes strict liability for unlawful *discharges*, it is by no means obvious that a similar strict liability regime has been imposed on faulty reporting.

In fact, the existence of a mechanism to correct erroneous DMRs suggests the opposite. *See* 40 C.F.R. § 122.41(l)(8) (requiring a permittee who becomes aware of any inaccuracy in a DMR to promptly notify the EPA). That regulation was promulgated pursuant to the Administrator's authority under 33 U.S.C. § 1318(a) to impose reporting requirements. Since 33 U.S.C. § 1319 authorizes administrative, civil, and even criminal penalties for violations of § 1318, the failure to correct an inaccurate DMR is an independent violation of the CWA and regulations thereunder. Moreover the very circumstances that would support a laboratory error defense would also likely support the finding of a monitoring violation. *See* 40 C.F.R. § 122.41(j). In light of these direct sanctions on inaccurate DMRs, we find wanting the government's argument that CWA provisions addressed to actual discharges ought to be made surrogate enforcers of the reporting requirements. In sum, barring the assertion of a laboratory error defense seems unfair and at odds with the overall plan of the CWA, especially in a case such as this where the alleged laboratory error caused overreporting rather than underreporting.

We have considered the arguments of the government and the *Union Oil* Court that recognizing a laboratory error defense would reward sloppy practices and undermine the self-monitoring program by giving companies an invitation to wait until they are sued. But these arguments do not apply to overreporting, which is almost certainly involuntary. We also suspect that overreporting is rare, for only the most penny-wise and pound-foolish of permittees would expose itself to the cost of a decade of litigation (as here) if it had any chance of clearing the matter up with improved laboratory testing and amended NPDES reports. Concomitantly, we are underwhelmed by the government's argument that permitting the defense will add time to NPDES litigation. At bottom, we do not believe that efficiency should override fairness in administration. Thus, while we do not gainsay the validity of the government's argument that, consistent with the Act's requirement for accurate self-reporting, courts should treat DMRs, which must be certified by the discharger, as admissions that are sufficient to establish liability under the CWA, we hold that the presence of certified DMRs does not preclude the laboratory error defense in cases of overreporting.

The government has argued that even if the laboratory defense is recognized, there is insufficient evidence in this record to support it. The District Court did appear to endorse this position in a post-trial opinion: "Nothing in ALC's proffer or testimony on this issue persuades the court that these violations arise solely from laboratory error." But that statement followed a trial at which the laboratory error defense had been *excluded*. More specifically, while the District Court did have available some of ALC's laboratory error evidence in the penalty phase, having already determined that ALC was liable for discharge claims, this after-the-fact consideration of the evidence for penalty purposes does not cure the error in precluding the laboratory error defense in the liability jury trial. Arguably the District Court's evaluation of ALC's laboratory error evidence in the penalty phase strengthens ALC's argument that it was entitled to have the jury evaluate such evidence because, what the District Court was doing was to assess the credibility to that evidence ("[I]t is not credible that laboratory error would persist . . . .", normally a jury function.

Since the District Court did not consider the sufficiency of laboratory error defense argument in the proper light, it, not this Court, should consider the defense in the first instance. We will therefore vacate and remand so that the laboratory error defense can be considered and adjudicated with respect to the claims that it affected.

III. The Penalty Calculation - Economic Benefit

A. ALC's Objections to the Penalty Assessment

The assessment of civil penalties for these violations as sought by the United States is governed by 33 U.S.C. § 1319(d). Section 1319(d) provides that the violator of a permit issued pursuant to the Act shall be subject to a civil penalty not to exceed $25,000 per day for each violation. This penalty provision further states that in assessing the penalty, the court shall consider the following factors:

> 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 with the applicable requirements, the economic impact of the penalty on the violator, and such other matters as justice may require.

Id. The District Court considered each of these factors in connection with the penalty determination. The Court found ALC's violations of the CWA to be serious. It questioned the level of ALC's commitment to the obligations imposed by the Act. It found the economic benefit to ALC to be considerable, primarily in terms of the avoided cost stemming from reduced (inadequate) staffing at its wastewater treatment plants, its delay in a plant upgrade at the Vandergrift facility, and a number of other smaller projects. The Court totaled the economic benefit at $4,122,335, and ultimately doubled it to $8,244,670 as the final penalty. *See infra* note 6.

The imposition of a penalty under § 1319(d) is subject to the exercise of a district court's discretion. *See Tull v. United States,* 481 U.S. 412, 426-27 (1987). In general, a district court abuses its discretion when it "bases its opinion on a clearly erroneous finding of fact, an erroneous legal conclusion, or an improper application of law to fact." *LaSalle Nat'l Bank v. First Conn. Holding Group, L.L.C. XXIII*, 287 F.3d 279, 288 (3d Cir. 2002).

Many of the District Court's findings are supported, and unchallenged on appeal. The primary issue contested here relates to economic benefit—i.e. the Court's use of the government's experts' computation of ALC's weighted average cost of capital ("WACC") as the interest rate to use to bring the money forward to the penalty judgment date. WACC is defined as "the average cost of capital on the firm's existing projects and activities, ... calculated by weighting the cost of each source of funds by its proportion of the total market value of the firm." Stephen A. Ross, Randolph W. Westerfield & Jeffrey Jaffe, *Corporate Finance* 932 (6th ed. 2002).[5]

ALC asserts that the District Court's economic benefit calculation did not "level the playing field," as required by law, but rather imposed a severe penalty. ALC also contends that the District Court's calculations failed to apply other principles required by law, including that (1) expenditures made and included in the economic benefit calculation must relate directly to the violations; (2) the least costly method of compliance should be used in calculating economic benefit; and (3) economic benefit calculations must be based only on periods of non-compliance. We reject the argument that the District Court did not apply the proper legal precepts. Rather the question is the manner of application, and whether the District Court made clearly erroneous fact findings which skewed the calculations to ALC's detriment.

B. The Economic Benefit Principle

As noted above, § 1319(d) requires the District Court to consider "the economic benefit (if any) resulting from the violation" when determining the amount of a civil penalty under the CWA. ALC argues that the purpose of the economic benefit component of the penalty is to "level the

[5] Of course, this general definition is only so useful; moving from the broad definition to the actual numbers (in particular establishing the "cost of ... funds") can be extremely complex and subject to dispute as this case so aptly demonstrates.

economic playing field." We agree. *See United States v. Mun. Auth. of Union Township*, 150 F.3d 259, 263-64 (3d Cir. 1998) [hereinafter *Dean Dairy*]. In other words, the purpose is to prevent a party violating the CWA from gaining an unfair advantage against its competitors, and to prevent it from profiting from its wrongdoing. See Powell Duffryn Terminals, 913 F.2d at 80. The government, on the other hand, submits that CWA penalties are intended to "promote immediate compliance" and "deter future violations" by the defendant and other regulated entities. *Friends of the Earth, Inc. v. Laidlaw Envtl. Servs., Inc.*, 528 U.S. 167, 185 (2000). Therefore, while the government agrees that the economic benefit analysis is designed to calculate how much money was illegitimately gained by failing to spend the appropriate amounts on environmental safeguards, it does not agree that the assessment of a penalty need stop at that figure. In our view, the latter point addresses a different aspect of the Act, as explained in the margin.[6]

Putting aside the ultimate way in

[6] The CWA does not prescribe a specific method for determining appropriate civil penalties for violations. In *Dean Dairy*, we noted that some courts use the "top down" approach in which the maximum penalty is set ($25,000 per day of violation at the times relevant here), and reduced as appropriate considering the six enumerated elements of § 1319(d) as mitigating factors, while other courts employ the "bottom up" approach, in which economic benefit is established, and the remaining five elements of § 1319(d) are used to adjust the figure upward or downward. *Dean Dairy*, 150 F.3d at 265. In *Dean Dairy*, we held that the method used in assessing the civil penalty is best left to the trial court's discretion. *See id*. In the case at bar, the District Court followed the "bottom up" approach. Having arrived at a figure of economic benefit totaling $4,122,335, the District Court then conducted a detailed analysis of the remaining factors enumerated in § 1319(d) and found that, while the government advocated a trebling of the economic benefit, a doubling would be more appropriate under the circumstances of the case for a total penalty of $8,244,670. In *Dean Dairy*, we approved the doubling of economic benefit as a possible method for assessing a penalty stating that, even after the doubling of economic benefit, the "penalty was barely 9% of the maximum statutory penalty to which Dean Dairy was subject." *Dean Dairy*, 150 F.3d at 265. In the case at bar, the statutory maximum penalty that could have been leveled against ALC was $28.05 million, counting $25,000 for each of the 1,122 days of violations. While $8,244,670 is approximately 29% of $28.05 million, a much larger proportion than the 9% approved in *Dean Dairy*, we are satisfied that the District Court was well within its discretion to assess such a penalty in this case.

which the result of the economic benefit calculation might be employed, such a calculation is intended, at its base, to identify the benefit realized by a violator from delayed expenditures to comply with the CWA. The economic benefit calculation starts with the costs spent or that should have been spent, to achieve compliance. Once that figure is established, an appropriate calculation of economic benefit should also reflect the time value of money. In order to make that calculation, a court must "apply an interest rate to determine the present value of the avoided or delayed costs." *United States v. Smithfield Foods, Inc.*, 191 F.3d 516, 530 (4th Cir. 1999). Herein lies the crux of the disagreement: ALC contends that the District Court used an interest rate so high that the effect was punitive rather than "leveling," whereas the government contends that the interest rate used by the District Court was entirely appropriate and yielded a result that was well within the Court's discretion.

C. The Interest Rate Adopted by the District Court

The District Court, in arriving at its penalty assessment, adopted the economic analysis proffered by the government. In that submission, the alleged economic benefit stemming from each violation was computed forward from the date of violation to February 28, 2001 (roughly the date of the judgment) at a rate of 12.73% annually, to arrive at a $4,122,335 total economic benefit at the time of judgment.

The District Court derived this rate from the proffer of government witnesses Gary Amendola and Robert Harris who explained the three steps they took to calculate the WACC. First, they determined that ALC had a debt rating of "A," as assigned by Standard & Poor's ("S&P"). Then, they researched what the typical monthly interest rate was for A-rated bonds in each relevant year and computed yearly averages. This rate was adjusted to account for the advantageous tax treatment of interest payments on corporate debt. Second, they calculated the cost of equity as follows: They started with a 30-year treasury bond as a baseline. They next looked up the company's "beta," which is a measure used to evaluate the relative risk of a particular stock for an equity investor. Finally, they assumed a generic value for the market-risk premium—the premium that a person would demand to invest in stock rather than in a (risk free) treasury instrument. At that point, they multiplied the beta by the market-risk premium, and added an "intermediate stock premium" for the years before ALC merged with another entity and became a bigger, "safer" company. They then added this to the 30-year treasury bond rate to arrive at an equity cost by year. Third, they combined these cost of debt and cost of equity measures by taking a weighted average of them, based on the relative proportions of debt and equity in ALC's capital structure for that year.[7]

[7] In its brief, the government mischaracterizes its own experts' testimony and states that the WACC was

1. The Contentions of the Parties

ALC characterizes the 12.73% rate as "a theoretical, risk-adjusted rate (denominated by EPA as the weighted average cost of capital or 'WACC'), based on broad averages across the U.S. capital markets." As the foregoing explanation suggests, this characterization is generally accurate. ALC contends that using such a hypothetical rate of interest was an error of law because ALC had presented evidence of its actual rate of return on capital which, at the time of the penalty trial, showed that the average rate of return on capital for ALC and its parent company between 1990-2000 was 5.7%. This fact was uncontested, and thus ALC submits that the 12.73% rate did not achieve the legal purpose of "leveling the economic playing field," but rather was used to exact a severe penalty "reflecting not the time value of money nor ALC's benefits from retaining funds, but rather theoretical investment averages that indisputably were not achieved by ALC.

ALC submits that, instead of the 12.73% rate, one of four alternative rates should have been used:

> (1) the statutory interest rate (6%)
>
> (2) the risk-free rate represented by the short-term U.S. treasury rates during
>
> the relevant time period
>
> (3) the actual average rate of ALC's return of capital from 1990-2000
>
> (4) the actual average rate of ALC's return of capital from 1990-2001

Each of the rates suggested by ALC results in approximately the same interest rate, hovering between 5.2% and 6%, which is less than half the rate that the District Court actually used.[8] ALC adds that the "theoretical WACC has been rejected consistently when applied to companies and industries that are not achieving such theoretical rates of return."[9]

calculated by "first determining the rate at which ALC borrowed funds during the relevant time period." This representation implies that the government experts relied on figures that were much more ALC specific than was actually the case. As we have explained, the experts seem to have relied primarily on general market numbers for companies situated similarly to ALC over a long period. We do not know the reasons for the government's mischaracterization, but we do note our disapproval.

[8] Although the government maintains that the only alternatives to the WACC preserved by ALC for appeal are the T-bill rate and the Pennsylvania statute rate, we have examined the record and do not find that ALC waived any of the proposed alternative rates.

[9] We think that ALC overstates the principle—if any—that may be drawn

The government responds with a number of arguments. First, the government correctly notes that the economic benefit calculation need not be precise. In *Dean Dairy*, we recognized that economic benefit "may not be capable of ready determination," and the Court gave "the district court's award of a penalty wide discretion, even though it represents an approximation." 150 F.3d at 264 (citing *Tull*, 481 U.S. at 426-27). The government couples this deference accorded to district court awards with the suggestion that, since the statutory maximum penalty for ALC's violations was $28.05 million, the District Court gave ALC "a break." The government advocated taking other statutory factors into account and trebling the economic benefit to yield a penalty of approximately $12.3 million, *see supra* note 6, but the District Court only doubled the economic benefit and ordered ALC to pay $8,244,670. The government points to this discrepancy between what it asked for and what the Court actually did as proof that the District Court really does have, and should have, a great amount of discretion in determining these types of penalties.

The government also points to the decisions of other courts that have approved the use of WACC to discount economic benefit when calculating CWA penalties, particularly *Smithfield Foods* where the District Court, crediting expert testimony, used the WACC to discount the defendant's

from the cases it cites. The two cases it discusses are *Chesapeake Bay Foundation v. Gwaltney of Smithfield, Ltd.*, 611 F. Supp. 1542 (E.D. Va. 1985), *aff'd*, 791 F.2d 304 (4th Cir. 1986), *vacated on other grounds*, 484 U.S. 49 (1987), and *United States v. Sheyenne Tooling & Mfg. Co.*, 952 F. Supp. 1420 (D.N.D. 1996).

In *Gwaltney*, 611 F. Supp. at 1559, the Court held that "the actual interest rate Gwaltney itself paid on borrowed funds [] is a more accurate basis for determining Gwaltney's economic benefit from delay" than "the ten-year rate of return on equity earned by Smithfield Foods, Inc.—Gwaltney's parent corporation." While this case does not *adopt* WACC as a measure of economic benefit, it also does not affirmatively *reject* it.

Likewise, in *Sheyenne Tooling*, 952 F. Supp. at 1426, the Court held that

> the principle of requiring that persons at fault must be held to a 'level playing field' means that the defendant must be held to the conditions of his field, not that of larger or more wealthy players. And the economic experts for the United States used averages and generalizations which were not compatible with the playing field in which the defendant operated.

This is doubtless a sound principle, but simply does not address what the appropriate measure is for determining economic benefit.

economic benefit. *See United States v. Smithfield Foods, Inc.*, 972 F. Supp. 338, 349 & n.17 (E.D. Va. 1997), *cited with approval in Dean Dairy*, 150 F.3d at 266.

2. The Appropriate Interest Rate

The methodology used by the District Court and those advanced by the parties do not exhaust the possible interpretations of economic benefit under § 1319(d). It will be helpful to analyze the options. There are, as we see it, two possible approaches. The first is the cost of obtaining capital—i.e., the interest rate necessary to acquire the capital with which to make the improvements (which were never made). The second is the use of the corporate offender's actual return on its capital, which, it is conclusively presumed, was not used to make the improvements. These are both highly variable factors, turning on the cost of money to the company (which depends not only on the general market forces but also on its financial strength and credit rating) or on the profitability of the company at a given time.

In view of this variability, we think that it would be inappropriate for us to decree which methodology should be used since in any given situation, "leveling the playing field" might be more readily achieved with one or the other. Therefore, we think that the choice of methodology should be left to the sound discretion of the District Court.[10] In this case, however,

[10] We note a provision from the field of trusts that enables the District Court to exercise its discretion in choosing the appropriate measure for assessing a trustee's liability in the case of a breach of trust. The choice to make here (i.e., both cost measures and actual returns are possible ways of valuing economic benefit, so which should be adopted?) resembles that choice. The Restatement (Second) of Trusts § 205 provides (in the disjunctive):

> If the trustee commits a breach of trust, he is chargeable with:
>
> (a) any loss or depreciation in value of the trust estate resulting from the breach of trust; or
>
> (b) any profit made by him through the breach of trust; or
>
> (c) any profit which would have accrued to the trust estate if there had been no breach of trust.

As in *Gwaltney*, 611 F. Supp. at 1558-59 & n.17, the choice is within the discretion of the District Court, and we are confident that it will give due consideration to the equities involved in selecting an appropriate measure of economic benefit. Indeed, we do not even hold that economic benefit is the sole permissible approach to assessing a penalty; there may well be other ways. Given this variability, we disagree with the dissent's contention that it is not clear that the District Court was aware of or considered the range of options available.

a. Economic Benefit as Measured by the Cost of Capital

As noted above, economic benefit can be measured by an entity's cost of capital. In accepting the government's experts' position, the District Court adopted one such measure—WACC—but there are others. In commenting upon the cost-of-capital measure adopted by the District Court, we hope to provide some guidance as to what constitutes an appropriate cost-of-capital measure of economic benefit.

With respect to the cost-of-capital measure used by the District Court, we conclude that both the calculation and application are, at the very least, unsupported. The first problem is the government's calculation of the WACC. That calculation relied on values that were not ALC-specific. Instead of using the actual yield on bonds that ALC had issued, the government experts computed the WACC by using the yield on Standard & Poors A-rated bonds. While using the S&P figure might well have been a reasonable approximation of ALC's bonds' yield, a more accurate calculation could easily have been achieved by using figures specific to ALC's bonds.[11]

The second problem is the government's application of the WACC. WACC averages are constructed on the basis of a company's existing capital structure (that is, the relative proportions of debt and equity). A WACC figure based on a company's *existing* capital structure at a given time is not, without further support, necessarily the same as a company's *marginal* or current cost of capital at that time (i.e., what it would cost to obtain additional capital) because new capital might come in a different mix of debt and equity. *See* Aswath Damodaran, *Applied Corporate Finance* 108 (1999) ("In estimating [the current cost of capital using WACC], we have in a sense conceded the status quo in terms of financing mix, since we have estimated the cost of capital at the existing mix. It is entirely possible that a firm, by changing its mix, could lower its cost of capital."). Unless WACC is shown to be a good approximation for the marginal or current cost of capital, it sheds little light on how expensive it would have been for the company to go to the market for its capital, instead of diverting funds that should have gone to improving pollution

our holding saps too much discretion from district courts in cases under the CWA.

[11] In contrast, as far as we can tell, the cost of equity calculation was as ALC-specific as could reasonably be achieved: The value for beta seems to have been ALC-specific, and the other figures that entered into the computation (the market-risk premium and the "intermediate stock premium") are not by their nature company specific.

controls.

As noted above, the government and the District Court relied on *Smithfield Foods*. But, upon closer analysis, *Smithfield Foods* does not help the government. There are reasons to suspect that in the food processing industry (in which Smithfield operated), the WACC may have been an entirely appropriate approximation of Smithfield's economic benefit, whereas conditions in the steel industry (in which ALC operates) are radically different. More precisely, it may have been that in *Smithfield Foods* that the WACC was a good approximation for the terms on which money could have currently been raised; the food processing industry is a stable industry where companies probably attract new capital on terms similar to their existing capital structure. The steel industry, in contrast, has been highly volatile and rife with stiff foreign competition, dislocations, and bankruptcies. Indeed, as the District Court noted, the industry is going through a "brutal restructuring," and more than twenty-five United States steelmakers have sought bankruptcy protection since 1997. Thus, a company in ALC's position may not have, at the times in question, been able to raise capital on the same terms as its existing capital structure. We need not (indeed, cannot) resolve this; but for our purposes, it is enough that there was insufficient evidence for the District Court to say that ALC's existing capital structure was representative of the terms on which new capital would be raised. Thus, if the economic benefit to ALC is to be established by a cost-of-capital measure, the measure to use is ALC's *marginal* or current cost of new capital in the years in question.[12] Some courts appear to have endorsed this approach. *See, e.g.*, *Gwaltney of Smithfield*, 611 F. Supp. at 1559 ("[T]he actual rate Gwaltney itself paid on borrowed funds . . . is a more accurate basis for determining Gwaltney's economic benefit from delay.").

It is of course possible that this approach might make an offender *worse* off than under the government's WACC proposal. For example, a company in dire financial straits may well have a marginal cost of capital (offered by lenders who see it as a high-risk investment) that exceeds its WACC. This is no anomaly. For companies that are hard up for capital and cannot afford to raise it in the market, it is doubtless all too tempting to forego the sometimes costly improvements and pollution controls that are required by the CWA and EPA regulations. But such companies must still be held to the law. To do otherwise is, in essence, to allow capital-

[12] This could be established by looking to, for example, the cost of any capital *actually raised* by ALC at the relevant times, or by the expert opinion of an investment banker regarding the terms on which ALC *could have raised* capital. Of course, if expert testimony can establish to the District Court's satisfaction that WACC is—in this particular case—a good approximation for marginal cost of capital, then WACC could be accepted as a surrogate measure of the marginal cost of capital.

strapped polluters to take out low-interest loans against the environment.

We of course intimate no view on what a remand may develop respecting ALC's situation in the 1990s. The government's experts' proffer shows debt costs for S&P A-rated bonds were in the 6.68% - 10.06% range in the 1990s. That is significantly lower than the 12.73% WACC figure relied on by the District Court. Moreover, in recent years, which would also figure in the calculations, interest rates have been very low. The record does not reflect ALC's actual financial strength, and it may (or may not) also have (or have had) a good credit rating throughout the relevant period.

b. Economic Benefit as Measured by Actual Return

We have so far been talking about measuring the economic benefit of additional capital by the cost to obtain that capital elsewhere. But the other option is to use actual rates of return on capital to compute economic benefit. The government's experts cited the importance of leveling the economic playing field "in the same industry." It is obvious, for example, that ALC and the steel industry were not, at times relevant, enjoying stellar returns. Indeed, as noted above, it was uncontested at trial that ALC had a return on capital that was less than half the 12.73% rate used by the District Court. On this view, any advantage that ALC enjoyed over its competitors by avoiding the cost of CWA compliance is measured by the return that ALC actually realized on its retained funds or the risk-free return it might have enjoyed using those funds. We think that the return on capital is a quite viable means of leveling the playing field, along with the marginal or (then) current cost of capital.

3. Other Observations About the District Court's Analysis

There are other potential problems with the District Court's calculation, which relied on the methodology provided by the government's experts. It appears that the government's experts computed annual estimates of WACC for each of the years 1990-1998, and came up with the 12.73% figure by taking the arithmetic mean.[13] Since the savings from different violations accrued on different dates over a several year period, it is questionable whether an average interest rate is appropriate, when year-to-year interest rate estimates are known and could be used with only minimal additional effort by the experts.[14] The

[13] To be clear, by "mean" we are referring *not* to WACC (which, as a "weighted *average*" is a mean of sorts) but rather to the further step of taking the mean of a whole series of WACC figures (one for each of the years in the relevant period). We have no objection, as the dissent suggests, to the use of the WACC formula to assess economic benefit.

[14] While any correction will be slight, in the interest of precision the District Court might also consider whether, if an average is to be used, the correct procedure would

potentially problematic practice of using a mean interest rate over a large time span is present in the government's experts' report.[15] As it happens, this wound up hurting ALC: The theoretical WACC figures from the early 1990s (15.85% in 1990 and 1991, and 13.95% in 1992) are the highest of the group, but really have no bearing on the economic benefit conferred by post-1992 violations. Thus, the average WACC was biased toward the less-relevant higher WACC estimates from the early 1990s.

Finally, we note that the government is unquestionably correct in its assertion at oral argument that any computation must use the same discount rate for both forward and backward computations during the same period. For example, it would be clearly inappropriate to discount all economic benefit backwards to a uniform date using one rate, and then use a different rate to carry the value forward to the date of judgment.

4. Conclusion

We are, of course, acutely aware that we review the District Court's interest rate determination for abuse of discretion, and that its determination need not be exact. *See Dean Dairy*, 150 F.3d at 264-65. Our deferential scope of review does not mean, however, that we cannot intervene when a District Court makes a finding that is methodologically flawed, even if, under such theory, the penalty figure it ultimately arrives at is plausible.

In the dissent's view "given our highly deferential standard of review, the District Court did not clearly err in crediting the government's witness over ALC's witness and adopting the WACC to calculate economic benefit." Of course, when presented with two sound but conflicting expert opinions, a district court has discretion to credit one over the other. But this discretion is not a license to adopt an opinion based on unsound methodology, whatever its source.

Based upon our analysis of the government's expert's methodology, we are unconvinced that the use of the 12.73% interest rate achieves the stated purpose of "leveling the economic playing field," nor are we sure that it bears much connection to a meaningful measure of ALC's cost of capital (much less its return on capital). We therefore must set aside the penalty calculation and remand for further proceedings with respect to the interest rate, fully open to the possibilities that the record on remand will support a higher, lower, or substantially similar penalty. We will not choose among the alternatives we have suggested (or those suggested by ALC) in

be to use a *geometric* mean (computed as the *n*th root of the product of *n* items), since the percentages involved are applied in consecutive multiplications. *See* Damodaran, *Applied Corporate Finance* at 69-70.

[15] Moreover, this practice is not unique to the use of WACC as a measure of economic benefit; it is an issue regardless of the method used to derive the interest rate.

the discussion above; rather we shall leave it to the District Court, after receipt of further submissions by both parties, to decide what alternative rate is best applied to the circumstances developed in the record on remand.[16]

D. The District Court's Determination of Costs of Compliance

1. Introduction—The Least Costly Method of Compliance

The second basis on which ALC asks us to overturn the District Court's calculation of economic benefit is its contention that the District Court erred in calculating the amount of money it would have cost ALC to institute the changes that would have led to compliance with the requirements of its permits. In brief, ALC argues that the numbers the EPA came up with (which were adopted by the Court) and the kinds of solutions it proposed were considerably overpriced, especially considering that, according to ALC, it had already fixed the problems for much less money and could show that the solutions it had implemented already worked.

The threshold question is whether, as a matter of law, the District Court must calculate economic benefit using the least costly method of compliance. This question does not appear to have been addressed by any Court of Appeals. Those District Courts that have addressed the issue hold that the calculations should be based on the least costly method of compliance. *See, e.g.*, *Gwaltney of Smithfield*, 611 F. Supp. at 1563 n.25 (holding that economic benefit calculations could not be based on a more expensive, "permanent solution" when a less expensive "interim solution" had already achieved compliance); *United States v. WCI Steel, Inc.*, 72 F. Supp. 2d 810 (N.D. Ohio 1999) (finding credible the defendant's expert testimony regarding possible compliance measures and calculating economic benefit based on significantly less expensive method of compliance than that proposed by the government's expert). We find these decisions persuasive, and hold that economic benefit analysis should be based on the least costly method of compliance. However, *contra* ALC's contentions, it does not appear to us that the District Court took a different approach.

2. The Vandergrift Plant

ALC cites to two main instances of alleged miscalculation of benefit. The first, relating to the Vandergrift plant, stems from the District Court's calculation which incorporated a $600,000 project that the government's expert posited would have brought ALC into compliance with the pretreatment permit issued for that site. ALC, however, claims that, in October of 1993, shortly before the Vandergrift violations ceased, it installed and began to operate a diversion tank connected to the discharge piping leading to the Vandergrift

[16] The District Judge who originally heard and decided this case has resigned from the bench. Accordingly, the parties will doubtless have to develop a record for the edification of the newly assigned judge.

facility WWTP outfall. This diversion tank cost no more than $150,000 to buy and install. According to ALC, the pretreatment violations stopped shortly after the installation of the diversion tank although there were two monthly average and four daily maximum violations in November and December 1993, which ALC attributed to "start-up problems." ALC contends that starting December 15, 1993, not a single violation occurred. ALC then argues that, in adopting the government's proposed $600,000 project to solve the problem and bring ALC into compliance, the District Court made clearly erroneous findings of fact.

There is, however, another side to the story. As noted above, there were several so-called "start-up violations" after the diversion tank was installed, and ALC cannot claim a clean record until December 15, 1993. ALC claims that the District Court should have used the December 15, 1993 date as the compliance date because that is the last reported pretreatment violation before the WWTP upgrade in August of 1994. However, the government's expert, Gary Amendola, explained that he chose to use August 1994 as the compliance date (as did the District Court) because the diversion tank installed in October 1993 was not sufficient to address the problem at Vandergrift. Amendola explained that the fact that ALC had reported no violations during the first half of 1994 did not establish that the diversion tank was a sufficient compliance measure because the facility had previously operated for months at a time without reporting any violations. The District Court chose to credit the testimony of the government's expert that the diversion tank "would not have been adequate to prevent all violations." A decision to credit the expert testimony of one expert witness over another is entitled to deference. *See Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 143 (1997) (holding that a District Court's assessment of expert testimony is to be accorded "the deference that is the hallmark of abuse-of-discretion review"). Under these circumstances the District Court's findings of fact were not clearly erroneous, and they must therefore be left to stand.

3. Outfall 107

The next issue concerns a $476,090 project that the government's expert posited was necessary to bring ALC into compliance for non-contact cooling water violations at Outfall 107. ALC contends that the District Court's economic benefit calculation which adopted that figure was premised on clearly erroneous findings of fact which led to misapplication of the least costly method of compliance legal principle. ALC argues that violations at the outfall were limited to June though October 1994 and that those violations were resolved through various maintenance efforts, including repairing cracks in certain trenches and sumps. The government, however, points out that ALC's brief does not contain any record citation indicating that it presented factual material to the District Court at trial relating to its maintenance efforts, and that to the extent that there is such evidence in the record, the evidence is limited to ALC's own pleadings. Furthermore, the government contends that ALC reported violations long after it alleges that it cured them in October 1994.

This difference of opinion as to whether more violations occurred stems from the fact that ALC identifies only one internal monitoring point, "Outfall 107," associated with the $476,090 re-lining project. The government expert, Amendola, however, opined that the re-lining project was required to cure violations associated with Number 90 Anneal and Pickle Line, which discharged through Outfall 007. Outfalls 107 and 207 are internal monitoring points that discharged through Outfall 007. Since ALC reported violations at Outfall 007 through December 1995, long after ALC alleges it cured those violations with maintenance efforts in October 1994, the government contends that the maintenance efforts at Outfall 107 are not enough to carry the day.

It is clear that the District Court decided to adopt the government's framework regarding the monitoring and links between these different outfalls. In view of the *bona fide* evidentiary dispute, its findings were not clearly erroneous and must be upheld.

E. Periods of Non-Compliance

ALC's final complaint relating to the economic benefit analysis undertaken by the District Court is the identification of the period of non-compliance. Obviously, the length of the period of non-compliance has a direct relationship to the calculation of economic benefit: The longer the period of non-compliance, the greater the amount of economic benefit, and the higher the penalty. ALC contends that the government miscalculated the period of non-compliance and that, in adopting the government's calculations, the Court calculated ALC's purported economic benefit on lengths of time that bore no semblance to reality.

We do not find it necessary to engage in a lengthy analysis of the various contentions regarding the periods of non-compliance and will set forth some of the factual disputes only in the margin.[17]

[17] ALC relies on a table it has created that purports to show the non-compliance periods designated by the government were far greater than the actual non-compliance periods that occurred. In the table, ALC challenges the non-compliance dates for the $476,090 relining project discussed above. That project was completed in 1996 and was necessary to cure violations at Outfall 007, at which ALC reported violations through December 1995. However, government expert Amendola extended the non-compliance date back to the beginning of the limitations period for this case because ALC reported violations associated with the Number 90 Anneal and Pickle Line beginning at the time it came online in 1988. *See* App. 583-88; *see also* App. 991-92, 994-95 (ALC documents stating need for treatment upgrade to attain compliance).

ALC also appears to be repeating

Having thoroughly reviewed the record, we hold that the District Court's findings as to the periods of non-compliance are supported by the record, were not clearly erroneous, and must be left to stand.

IV. Monthly Average Violations

In a pretrial ruling the District Court held:

> Plaintiff's Motion in Limine on Counting Days of Violation, Doc. No. 242, is GRANTED. All violations of the monthly average parameters of defendant's NPDES permits shall be counted as violations equal in number to all the days in the monitored month. *See Atlantic States Legal Found'n v. Tyson Foods, Inc.*, 897 F.2d 1128, 1139 (11th Cir. 1990).

ALC maintains that the District Court erred in so ruling, and in particular by improperly excluding evidence that actual exceedences occurred on fewer days. ALC relies primarily on *Texaco Refining & Marketing*, 2 F.3d at 507. The relevant portion of the holding of that case is that violations of the daily average limits result in penalties only for the number of days within the month that the facility operated. That decision does not, however, resolve this case.

The leading authority in this area is the Court of Appeals for the Fourth Circuit's opinion in *Gwaltney*. *Gwaltney* held that a violation of a monthly average parameter constitutes a violation of each day of the month. The Court reasoned:

> While the statute does not address directly the matter of monthly average limitations, it does speak in terms of penalties per *day* of violation, rather than penalties per

its contention that the $150,000 diversion tank it installed in October 1993 cured its pretreatment violations at Vandergrift, but the District Court found that it was not until the WWTP upgrade in August 1994 that the pretreatment problem at Vandergrift was solved, and we have declined to disturb that finding.

Additionally, ALC's table challenges the non-compliance date of December 1994 for the 24-hour staffing the District Court deemed necessary to alleviate pretreatment violations at Vandergrift. The Court found that ALC did not have 24-hour staffing in place until "late 1994" or 1995. ALC's contemporaneous internal documents confirm that 24-hour staffing was necessary and was not in place before December 1994. Thus, like the WWTP upgrade, the 24-hour staffing problem was not solved until December 1994. ALC's table also challenges the non-compliance dates for 24-hour staffing at West Leechburg. The District Court rejected this challenge, finding ALC's analysis "misleading" because ALC committed 599 violations between 1990 and November 1993 that were the subject of consent agreements with the State.

> *violation*. This language strongly suggests that where a violation is defined in terms of a time period longer than a day, the maximum penalty assessable for that violation should be defined in terms of the number of days in that time period.

791 F.2d at 314 (footnote omitted). The Court of Appeals for the Eleventh Circuit has followed *Gwaltney*. *See Atl. States Legal Found., Inc. v. Tyson Foods, Inc.*, 897 F.2d 1128, 1139-40 (11th Cir. 1990).

ALC contends that charging it with a month's worth of violations based on the excedence of a monthly average permit limit yields illogical and unfair results. For example, ALC claims that a single upset caused the average of the four samples for May and September 1991 to exceed the monthly average limit, while three of the months' samples were within the effluent limits. ALC submits that the District Court's ruling "automatically converted a single event into 31 violation days, despite evidence to the contrary."

This was the justification rejected in *Gwaltney*. In that case the defendant presented the Court with hypotheticals similar to ALC's contentions. 791 F.2d at 314-15. The Court noted that the defendant's hypotheticals ignored the fact that "both large, isolated discharges and moderate, long-term discharges are potentially harmful." *Id.* at 315 n.17. The Court also observed that the statute merely sets a maximum penalty; the District Court retains the discretion to assess a smaller penalty where appropriate. *Id.* The Court stressed that counting average monthly violations as a violation of each day of the month is essential to providing a framework that allows district courts "sufficient flexibility to assess penalties that suit the particular circumstances of each case." *Id.* at 314. We find the reasoning of *Gwaltney* incomplete. A discharger who exceeds the monthly average maximum by a great amount will probably also have committed a number of daily violations, and the penalties for those violations will mete out at least part of the total punishment that the permittee's conduct for the month merits. The penalty for violating the average monthly maximum seems well suited to punish a pattern of discharges that, with a few exceptions, do not violate the daily maximums but are nevertheless, in the aggregate, excessive. However, we find problematic the proposition that the maximum penalty for such a course of conduct should be thirty times the maximum penalty for the worst daily violation imaginable.

Under 33 U.S.C. § 1319(d) a violator is "subject to a civil penalty not to exceed $25,000 per day for each violation," which means that a civil penalty of $25,000 may be assessed for each day that a violation occurs. Under *Gwaltney*, a violation of the monthly average maximum occurs on every day of the month, which could result in a monthly penalty of roughly $750,000, but that does not seem to be the most literal reading of the statutory language. That said, we are fairly confident that no one in Congress ever thought of the question that is now before us, and it does not appear that there is any answer to be found in the text of the CWA or its legislative history. Nor do we think that the structure or purpose of the Act yields any clear answer. Certainly we can infer that Congress wanted to set an upper limit on the civil penalty that a district court can award; Congress did not want to leave this entirely to the district court's discretion. But without knowing Congress's views on the relative severity of a violation of a monthly as opposed to a daily limit, it is difficult to tell what sort of upper limit Congress wanted to propose.

Given the opaqueness of the statute and the consequent muddle that we have described, we urge either that the Congress amend the statute to clarify its intentions or that the EPA consider the matter and, after notice and comment, promulgate regulations that will give more guidance.[18] To that end we will direct the Clerk of Court to send copies of this opinion, directing attention to this section, to the Administrator and General Counsel of the EPA and to the counsel for the relevant House and Senate Committees. But we must still decide this case. We are not prepared to say that *Gwaltney* was simply wrongly decided. Instead—and the best we can do in view of the muddled state of affairs—is to follow *Gwaltney* on the question of the statutory maximum, and to use it as a framework, but to give guidance structuring the way in which a district court is to exercise its discretion in setting an actual penalty. This is the course we follow.

More particularly, in exercising its discretion, a district court should take into account the degree to which the polluter's conduct had already been punished by penalties for daily violations and to use the maximum penalty for a daily violation as a basis for comparison. Thus a district court would not assess a daily penalty of more than $25,000 as a function of the monthly average violation unless it could say that the permittee's violation of the average monthly maximum was as blameworthy (taking into account the factors enumerated in 33 U.S.C. § 1319(d) including environmental harm) as a daily violation for which the $25,000 maximum would be appropriate. This exercise will not always be simple as there is a certain incommensurability between short, intense and prolonged moderate discharges, but we are confident that the district courts, in the exercise of their discretion, can do the job. Since the District Court did not have the benefit of this standard, we must vacate and remand so that it may apply it to reconsider the penalty for monthly average violations.

Our modified *Gwaltney* approach must, however, be applied in accord with

[18] Indeed, in a sense it is the EPA's regulations that have created the quandary, because they inject the concept of a monthly violation into a statute that authorizes penalties denominated only in days.

Texaco. Under such a regime, there must be excluded from the calculation days on which the facility in question did not operate. If there was evidence in this record that the plant did not operate on certain days, this District Court would have to consider that as well. As best we can ascertain, however, there is no such evidence in the record. The closest ALC comes is to represent that the Basic Oxygen Furnaces were not operating during the week of January 24, 1994, but ALC makes no claim that non-functioning furnaces establishes overall plant closure. In fact, one ALC witness testified "all of our facilities typically operate 365 days a year, 24 hours a day" and that "Allegheny Ludlum's facilities generally operate 24 hours a day, 365 days a year." At all events, no date other than January 24, 1994, is identified as a date for (possible) plant shut down. Additionally, we note that the argument maintained by ALC in its briefs is not that the Court's order deprived it of the opportunity of proving that plants were not operating on given days, but rather that it was not discharging or was in compliance during parts of the month.

V. Conclusion

For the foregoing reasons, we will affirm the judgment on liability, except as to those aspects of the government's claims that are affected by the laboratory error defense and the monthly average violations. We will vacate the assessment of penalty and remand for further consideration in light of this opinion. Parties to bear their own costs.

United States v. Allegheny Ludlam,

No. 02-4346

FUENTES, *Circuit Judge*, dissenting.

I concur and join in Part II, Parts IIID and E, and Part IV of the majority's well-crafted opinion. I disagree, however, with the majority's conclusion that the District Court abused its discretion when it credited the EPA's expert economist and used that expert's interest rate to calculate ALC's economic benefit rather than the rate presented by ALC's expert. The majority writes that the District Court committed clear error because, in applying the EPA's 12.73% discount rate, the Court so vastly overstated the economic benefit to ALC of its Clean Water Act ("CWA") violations that it failed to level the economic playing field. In my view, in selecting the 12.73% rate, the District Court acted squarely within its discretionary authority.

I.

Before discussing the discount rate issue and the Court's exercise of discretion, I think it worth commenting on the proceeding conducted by the District Court. The $8,244,670 penalty imposed on ALC came after a three-day penalty hearing during which the District Court heard testimony from 13 witnesses, 11 live and 2 through depositions. These witnesses included experts on economic benefit, cost avoidance and aquatic toxicology, ALC's Director of Environmental Affairs, and officials from the United States Coast Guard, the Pennsylvania Fish and Boat Commission and the Pennsylvania Department of Environmental Protection. Expert testimony was submitted by written proffer with live cross-examination. On the subject of economic benefit, the EPA presented testimony from Robert Harris, an economist, who explained how he calculated the 12.73% WACC. ALC presented testimony from Dr. Howard Pifer, who proposed using the 30-day treasury bill rate to determine the value of the money going forward to the penalty payment date. In a 30-page opinion issued after the hearing, the District Court credited the EPA's expert testimony, concluding that Dr. Pifer's argument was not supported by the facts and that the WACC offered a reasonable approach because it represented an average of potential investments made by ALC during the time it had use of the funds that it did not spend on compliance. The District Court also followed Dean Dairy's endorsement of the WACC, as used in Smithfield Foods.

The majority finds fault with the District Court's analysis, noting that the government's calculation of the WACC "relied on values that were not ALC-specific." Maj. Op. at 19. The majority also believes that, rather than using an average such as the WACC, the government should have applied the actual rate it would have cost ALC to raise capital for the years when it was diverting funds that should have gone to pollution control. Therefore, the majority concludes that the District Court erred in using the 12.73% discount rate.

II.

As I see it, the central issue here is whether the District Court abused its discretion in crediting one expert over another when it determined the interest rate. We have noted many times that abuse of discretion is a highly deferential standard of review. And, we have stated, on numerous occasions, that a decision to credit the testimony of one expert witness over another is entitled to deference. See United States v. Universal Rehabilitation Services (PA), Inc., 205 F.3d 657, 665 (3d Cir. 2000), quoting General Elec. Co. v. Joiner, 522 U.S. 136, 143 (1997), United States v. Mathis, 264 F.3d 321, 335 (3d Cir. 2001), Laverdi v. Jenkins Township, 2002 WL 31108910 at *364 (3d Cir. Sept. 19, 2002), Matlin v. Langkow, 2003 WL 283164 at *382 (3d Cir. Jan. 22, 2003). The Supreme Court has held that a district court's evaluation of expert testimony is to be accorded "the deference that is the hallmark of abuse-of-discretion review." General Elec. Co. v. Joiner, 522 U.S. at 143. A district court abuses its discretion when it "bases its opinion on a clearly erroneous finding of fact, an erroneous legal conclusion, or an improper application of law to fact." LaSalle Nat'l Bank v. First Conn. Holding Group, L.L.C. XXIII, 287 F.3d 279, 288 (3d Cir. 2002). Indeed, we have said that "[i]n order to justify reversal, a district court's analysis and resulting conclusion must be "arbitrary or irrational."

United States v. Universal Rehabilitation Services (PA), Inc., 205 F.3d 657, 665 (3d Cir. 2000), quoting In re Paoli R.R. Yard PCB Litig., 113 F.3d 444, 453 (3d Cir. 1997) (internal quotations omitted). Abuse of discretion requires a showing of clear error, not inappropriateness. In my view, given our highly deferential standard of review, the District Court did not clearly err in crediting the government's witness over ALC's witness and adopting the WACC to calculate economic benefit.

Here, after considering all of the testimony, the District Court credited the testimony of the government's economic expert concerning the WACC, stating that it "represents the rate of return a company must earn annually to continue to attract its current investors and maintain its current levels of operations. It is a rate which is commonly used by companies in making capital budgeting decisions." Dist. Ct. Op. at 22, quoting Harris Proffer at 6 (internal quotations omitted); App. I at 47. The District Court also credited the testimony of the government's expert on avoided costs, noting that he had 30 years of experience in the environmental field, including working for and as a consultant to the EPA and several major steel companies. Dist. Ct. Op. at 16-17; App. I at 41-42. The District Court was not required to explore every possibility. As the Supreme Court has stated, a district court need not have conducted an "exhaustive search" of all possible alternatives. See, e.g., Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579, 597 (1993); see also Kumho Tire Co., Ltd. v. Carmichael, 526 U.S. 137, 147 (1999) (extending Daubert's gatekeeping obligation to all expert testimony).

Still, the majority conducts a protracted survey of economic theories, considers treatises not specifically presented by experts before the District Court, and decides that it disagrees with the District Court's discretionary determination. Of course, there will always be disagreement among experts concerning scientific, or in this case economic, theories. However, it is for the District Court Judge, as fact finder, to resolve those disagreements by judging the credibility of the expert witnesses, resolving the conflicting evidence, and assessing the weight of the expert's testimony. There is nothing in the record here to indicate that the government's expert did not use sound methodology and adequately support his opinion, and nothing to show that the District Court was clearly erroneous in crediting that opinion.

The majority's disagreement as to which interest rate is more "appropriate" is not enough to justify a remand.[19] This is

[19] The majority states, for example, that "[i]n commenting upon the cost-of-capital measure adopted by the District Court [i.e., the WACC], we hope to provide some guidance as to what constitutes an appropriate cost-of-capital measure of economic benefit." Maj. Op. at 19.

especially true in light of Dean Dairy, where we stressed that economic benefit "may not be capable of ready determination," and we accorded "the district court's award of a penalty wide discretion, even though it represents an approximation." 150 F.3d at 264, citing United States v. Tull, 481 U.S. 412, 426-27 (1987). Surely the choice to credit the government's expert over ALC's falls within this wide discretion. Indeed, the Dean Dairy Court went on to say that the "[p]recise economic benefit to a polluter may be difficult to prove" and that "[r]easonable approximations of economic benefit will suffice." 150 F.3d at 264, quoting Public Interest Research Group of N.J., Inc. v. Powell Duffryn Terminals, Inc., 913 F.2d 64, 80 (3d Cir. 1990). As here when the District Court credited one expert's reasonable approximation of the economic benefit over another's, it acted well within its discretion. We ought not substitute our own opinion for that of the District Court's.

In its attempt to fault the District Court's calculation of the WACC for "rely[ing] on values that were not ALC-specific" [i.e., using theoretical yields on bonds issued rather than actual yields], the majority, in fact, concedes that the District Court's analysis contained reasonable approximations. Maj. Op. at 19. It states that while the bond-yield "figure might well have been a reasonable approximation of ALC's bonds' yields, a more accurate calculation could easily have been achieved by using figures specific to ALC's bonds." Id. However, as long as the District Court's calculation was "reasonable," we cannot find the Court to have abused its discretion. Relying on theoretical values rather than actual values to calculate the WACC does not render the District Court's decision "unsupported," as the majority contends.

The record shows that the government's expert gave a satisfactory explanation for his decision to use the WACC in this case instead of, for example, the marginal or current cost of capital for the relevant years, as the majority suggests. He stated:

> [The WACC] is a rate that I consider proper and represents a rate that falls between the risk free rate and the equity rate. The reason that I believe that the WACC rate is appropriate is because a company's cash is fungible. That is, funds are not segregated and used for specific purposes. Funds are used in many different ways and the company receives different returns for each use. Some projects earn a high rate of return. Others earn a low or no rate of return. It is impossible to say exactly how the funds that should have been spent in this example were used. Therefore, I believe the most appropriate rate to use is the average return the company earns on all of its projects. In essence, this is the average return for the company.

App. IV at 1009. The record evidence clearly shows that the District Court's decision to use the WACC was supported by various considerations, including, as testified by the government's expert, the fungibility of a company's funds and the variable rates of return a company receives depending on how it uses those funds.

Further, the Court's exercise of discretion is supported by the case law. Dean Dairy cites the Smithfield Foods Court's use of the WACC favorably, indicating that the WACC is a perfectly acceptable interest rate for a district court in this circuit to adopt when calculating economic benefit. 150 F.3d at 266, citing United States v. Smithfield Foods, Inc., 972 F.Supp. 338, 349 (E.D.Va. 1997).

The majority's failure to find clear error after combing the record is evident in several places. For example, the majority criticizes the government's expert's use of the arithmetic mean (instead of the geometric mean) to compute an estimate of the WACC for the years 1990-1998. Although the majority admits that "any correction will be slight," the WACC comes to 12.71%, as opposed to 12.73%, when it is calculated using the geometric mean. Maj. Op. at 21-22 n.14. Surely, a discretionary choice by a district judge that results in an interest rate .02% higher than an alternative cannot be viewed as clearly erroneous.

The majority also criticizes the government's use of a mean interest rate at all, asserting that it "wound up hurting ALC." Maj. Op. at 22. I do not agree that this calculation unduly punished ALC. Taking an average of the interest rates for all of the years in which ALC was non-compliant is a common and perfectly acceptable method for arriving at a single figure to use when calculating ALC's economic benefit during those years. I disagree with the majority's contention that "[t]he theoretical WACC figures from the early 1990s . . . really have no bearing on the economic benefit conferred by post-1992 violations" simply because they are the highest figures of the group. Maj. Op. at 22. The figures from 1990 to 1992 are equally as relevant as those from 1993 to 1998, as CWA violations occurred in each of the years from 1990 to 1998. There is no record support for the majority's assertion that the WACC figures from the early 1990s are "less-relevant" than those for later years. Id. Therefore, the majority's suggestion that the average WACC was unduly biased towards high numbers is inaccurate.[20] Further, the District Court pointed out that, in some instances, it credited the government's expert in ways that wound up benefitting ALC. For example, in calculating the economic benefit that ALC enjoyed by spending less money to staff its facilities, the District Court noted that the government's expert

> made two assumptions that were favorable to defendant. First, he included in ALC's actual staffing costs time billed by maintenance workers who stopped by the

[20] The majority also overstates the degree to which the highest figures deviate from the rest of those in the calculation. A figure of 15.85% would not be considered a statistical outlier when computing an average, particularly when the same figure appears twice and the rest of the figures range from 10.53% to 13.95%.

> facility, even though having a maintenance worker stop by is not the same as having full-time staffing. Second, [his] calculations do not include money saved by ALC at its West Leechburg and Brackenridge facilities prior to entry of the consent agreements with PaDEP [Pennsylvania Department of Environmental Protection].

Dist. Ct. Op. at 16 n.7, citing Amendola Proffer at 17; App. I at 41. Also, in calculating the least costly upgrade that would have brought ALC into compliance at its Vandergrift facility before 1994, the District Court noted that

> the United States might have pointed to a $1.8 million upgrade considered by ALC in 1988 and 1989, or the entire cost of the $5.7 million upgrade of the Vandergrift WWTP [Wastewater Treatment Plants], and argued that money should have been spent in 1990, rather than 1994. But in an approach that is favorable to ALC, [the government's expert] calculated the least costly upgrade in 1994 that would likely have eliminated the violations, and provided a $600,000 alternative.

Dist. Ct. Op. at 19, citing Amendola Proffer at 12-13; App. I at 44. As with its WACC calculation, the District Court exercised its discretion here and supported its decision with acceptable explanations. Here, however, it arrived at a figure that benefitted ALC. The majority fails to explain how this decision falls within the District Court's discretion while its WACC calculation does not.

The majority also hypothesizes that the WACC may not have been as appropriate an approximation of economic benefit for ALC as it was for the company in Smithfield Foods because of differences in the volatility of the industries in which each company operated. Again, the standard of review is abuse of discretion, and not whether another decision might have been more "appropriate." Further, the majority cites no authority for the proposition that using a theoretical interest rate as opposed to an actual one in a particular industry is clearly erroneous. The majority quotes Chesapeake Bay Found., Inc. v. Gwaltney of Smithfield, Ltd., 611 F. Supp. 1542, 1559 (E.D.Va. 1985), as stating that "[t]he actual interest rate Gwaltney itself paid on borrowed funds . . . is a more accurate basis for determining Gwaltney's economic benefit from delay." Maj. Op. at. 20 (ellipsis in original). When put into context, however, this case does not support the majority's position. In Gwaltney, the plaintiff's calculation computed Gwaltney's economic benefit from delay using "the ten-year rate of return on equity earned by Smithfield Foods, Inc.--Gwaltney's parent corporation." 611 F. Supp. at 1559. The Court went on to hold that "[a]t least in these circumstances, the Court believes that 13%--the actual interest rate Gwaltney itself paid on borrowed funds--is a more accurate basis for determining Gwaltney's economic benefit from delay." Id. The Gwaltney Court, therefore, held against the use of a parent corporation's interest rate, but not the use of a theoretical interest rate per se. In addition, the record shows that the District Court did consider the economic benefit calculation in an industry-specific context, stating that "[f]ailures to comply with the [CWA] can . . . result in indirect competitive benefits when compared with companies in the same field that do comply with the [CWA]." Dist. Ct. Op. at 15; App. I at 40.

Finally, the majority asserts that the District Court abused its discretion in choosing the WACC instead of a lower alternative interest rate because using the WACC evidenced an effort to punish and deter when calculating the economic benefit. However, the District Court clearly recognized that there are two steps to the "bottom up" approach to penalty assessment and it is the second step that is geared toward punishing and deterring the violator. The District Court stated:

> To achieve the goal of deterrence, an appropriate penalty must encompass both the economic benefit that the defendant obtained through its noncompliance, and an additional punitive component that takes into account the penalty factors listed in Section 1319(d). Without the second component, those regulated by the CWA would have nothing to lose by violating it.

Dist. Ct. Op. at 29; App. I at 54. The District Court was clearly mindful of the two-step process to be used when assessing penalty, first calculating the economic benefit and then considering the penalty factors to increase that figure. The Court followed the correct analysis, only taking punitive measures in the second step when it doubled the economic benefit figure. Despite the majority's contention to the contrary, the District Court demonstrated a proper application of the law in assessing the penalty and, therefore, did not abuse its discretion.

In short, there is nothing in the record to show that the District Court committed clear error in its choice of the interest rate to calculate economic benefit. After carefully weighing the evidence presented by experts on both sides during a three-day penalty trial, the District Court exercised its discretion as the trier of fact and credited the testimony of one witness over another. The decision is supported by the expert testimony as well as our case law. Because I do not believe that the District Court's fact-finding was clearly erroneous, its decision is entitled to deference under abuse of discretion review.

I would, therefore, affirm the District Court's decision as to the interest rate used to calculate economic benefit.