

Daniel M. Byrd, III, Ph.D., D.A.B.T.; *
Robert Golden, Ph.D.; B. Frank Vincent,*
Ph.D.; American Council on Science *
and Health, *

Amici on behalf of *
Appellant. *

No. 05-3153

United States of America, *
*
Plaintiff/Appellee, *
*

Arkansas Department of Pollution *
Control and Ecology, *
*
Plaintiff, *
*

v. *

Vertac Chemical Corporation; *
Hercules, Inc.; Inter-Ag Corporation; *
Department of Defense; Dow Chemical *
Corporation; Velsicol Chemical *
Corporation; John Does, 1-5; *
*
Defendants, *

Crompton Co./CIE, *
*
Defendant/Appellant. *

Submitted: March 13, 2006
Filed: July 13, 2006

Before WOLLMAN, FAGG, and RILEY, Circuit Judges.

WOLLMAN, Circuit Judge.

Hercules, Inc. (Hercules) and Crompton Co./Cie (Uniroyal)¹ raise constitutional claims and argue that the district court² erred in assigning and apportioning liability for environmental cleanup costs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601-0675, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. No. 99-499, 11 Stat. 1613. We affirm.

I. BACKGROUND

This case involves twenty-six years of litigation and numerous district court and appellate opinions, both published and unpublished. At issue is the cost the United States has incurred in its environmental cleanup efforts at the Vertac Chemical Plant site in Jacksonville, Arkansas (the Jacksonville site or the site). The full procedural and factual history of this case has been discussed in several previous decisions. This opinion will address the relevant portions of each.

A. Factual History

¹As of January 30, 2001, Uniroyal Chemical Limited changed its name to Crompton Co./Cie. For consistency, we will use Uniroyal throughout this opinion.

²The Honorable George Howard, Jr., United States District Judge for the Eastern District of Arkansas.

The Jacksonville site was originally developed by the federal government in the 1930s as a munitions factory. In the late 1940s, the site was sold to Reasor-Hill Corporation (Reasor-Hill), a now-defunct company. Reasor-Hill first manufactured various pesticides, but began manufacturing phenoxy herbicides in 1958. These herbicides included dichlorophenoxyacetic acid (2,4-D) and trichlorophenoxyacetic acid (2,4,5-T), synthetic hormones that kill weeds or brush by accelerating growth to the point of natural death. Although these herbicides biodegrade into harmless substances, the manufacture of 2,4,5-T (but not 2,4-D) creates a toxic byproduct that is now viewed as hazardous to humans, 2,3,7,8-tetrachlorodibenzo-p-dioxin (dioxin). While Reasor-Hill operated the site, an unknown quantity of these and other untreated chemical wastes from the production processes flowed through cooling ponds on the west side of the plant into a nearby stream, Rocky Branch Creek. Other wastes were stored in drums stacked in a field on the site.

In 1961, Hercules bought the site and continued to manufacture herbicides, including 2,4-D and 2,4,5-T, at the plant until 1970. During this period, Hercules sold the bulk of its product to the United States Department of Defense as the defoliant Agent Orange, a herbicide made from a mixture of 2,4-D and 2,4,5-T that was used in Vietnam to clear jungle undergrowth.

Soon after Hercules took over the site, it buried the deteriorating drums left by Reasor-Hill in unlined trenches in the southeast corner of the site. Until late 1964, Hercules continued Reasor-Hill's practice of discharging untreated waste water directly into Rocky Branch Creek. Hercules then constructed a waste water pretreatment system, but the system did not remove dioxin. It consisted of a neutralization trench designed to reduce the acidity of the water, an equalization basin designed to stabilize the rate of flow into the City of Jacksonville's sewage system, and a pump and pipe to deliver the treated water to the sewage system. The system's equalization basin frequently overflowed during heavy rainfalls, and it leaked.

After it learned of the toxicity of dioxin in 1965, Hercules instituted a toluene extraction process designed to remove organic impurities from 2,4,5-T products. This process yielded residue (stillbottoms) containing extremely high levels of dioxin. Hercules placed this residue in drums, some of which it buried at the site and some of which it disposed of at a nearby landfill. Hercules acknowledges that numerous leaks and spills occurred during its operation of the site. When the drums leaked in the process area before being transported to the drum burial pit, Hercules's practice was to place any contaminated soil into the drum.

In 1970, Hercules ceased production at the site. Hercules cleaned out all of its equipment and production vessels, buried its waste, and shipped empty drums off-site. In 1971, it leased the facility to Transvaal, Inc., which later became Vertac Chemical Corp. (Vertac).³

Vertac continued to manufacture 2,4-D and 2,4,5-T and followed Hercules's practice of burying most of the waste. In 1975, however, Vertac began shipping its 2,4-D waste to off-site landfills and began to store its 2,4,5-T stillbottoms above ground with the hope that the waste would someday be recycled. In 1976, Vertac purchased the site from Hercules. Vertac voluntarily ceased manufacturing 2,4,5-T and 2,4,5-TP on March 15, 1979.

On February 26, 1980, the United States Environmental Protection Agency (EPA) issued a proposed rule under the Toxic Substances Control Act to prevent Vertac from disposing of the dioxin from the Jacksonville site. This rule, known as the Vertac Rule, became final later that year and prohibited the off-site disposal of 2,4-D wastes that contained dioxin. If Vertac could show that a batch of 2,4-D

³Transvaal reorganized as Vertac in 1976. In this opinion, we will refer to both corporations as Vertac.

produced waste that was free of dioxins, it could dispose of that waste and all subsequent 2,4-D waste off-site.

According to testimony at the hearing on the proposed rule, Vertac had approximately 3200 drums of wastes resulting from the production of 2,4-D. The first set of samples taken from seven hundred drums of waste resulting from the initial production of 2,4-D revealed dioxin levels of approximately twenty parts per billion (ppb). The samples were later sent to Wright State University and Monsanto Company for testing. Monsanto could not detect any dioxin with its analytical equipment, but Wright State detected .7 ppb. In a second sampling of 1000 drums, it detected .5 ppb and the next sampling showed .3 ppb. Because the 2,4-D waste contained dioxin, Vertac stopped analyzing samples of the waste and allowed the drums to accumulate. Later testing by the State of Arkansas, as well as the results of trial burns, revealed the presence of dioxin in the drums.

Vertac continued its operations until 1986. In 1987, it abandoned the site, and the site went into receivership. By then, there were nearly 29,000 drums at the site that contained waste materials including 2,4-D, 2,4,5-T, and dioxin. Some drums were labeled T waste, some D waste, some were marked T and D, and some were not marked at all. Many of these markings were indistinguishable or unreadable. More than 15,000 drums were stored outside and exposed to the elements. The drums were stacked three high on deteriorating pallets and were failing at a rate of between five to three hundred drums per week.

Many of the drums had corroded and leaked, contaminating the soil, groundwater, and buildings at the site. Contamination was found in other areas of the site, at the landfills, in nearby neighborhoods, and in the grounds adjacent to the site. After Vertac abandoned the plant, the EPA took over the site, closed down all operations, and assumed cleanup responsibilities that have cost well over \$110 million to date.

To carry out its response measures, the EPA divided the site into five units: off-site areas, operable units 1, 2, and 3, and the incineration response action. Several removal actions addressed the immediate threat posed by the drummed waste left on the site when it was abandoned. Four remedial actions addressed the long term solutions for the rest of the site and the surrounding area affected by the site. For each of the remedial actions, the National Contingency Plan required the EPA to (1) conduct a remedial investigation of the site conditions, including an endangerment assessment of the threats posed by the contamination at the site; (2) perform a feasibility study examining the various technical alternatives for remediating the site; (3) take public comment on the EPA's proposed remedial action plan based on the alternatives discussed in the feasibility study; (4) compile an administrative record for remedial action decision making; and (5) issue a written record of decision (ROD) explaining the Regional Administrator's reasoning in selecting the final remedial action plan and responding to the public comments received.

Uniroyal was one of Vertac's customers and purchased 2,4,5-T and other products from Vertac in the 1970s. In 1978, Vertac informed Uniroyal that it lacked the funds to purchase enough 1,2,4,5-tetrachlorobenzene (TCB), a key ingredient in the manufacture of 2,4,5-T, to fulfill its contractual obligations to Uniroyal. Uniroyal agreed to supply Vertac with enough TCB to create some 1.3 million pounds of 2,4,5-T that was to be shipped back to Uniroyal. Vertac did not purchase the TCB directly from Uniroyal, but instead reduced the amount it charged Uniroyal for the 2,4,5-T to reflect the value of the TCB that Uniroyal had supplied. This arrangement was embodied in two separate contracts and was carried out between March 1978 and March 1979. The 2,4,5-T that was produced with Uniroyal's TCB represents less than one percent of the more than 150 million pounds of 2,4-D and 2,4,5-T that were manufactured at the site over the course of its operation.

B. Procedural History⁴

On October 12, 1993, the district court granted the government's motion for summary judgment, holding that Hercules was jointly and severally liable under CERCLA sections 107(a)(2) and (3) for the response costs incurred by the United States with regard to the Jacksonville site. 42 U.S.C. § 9607(a)(2) and (3); United States v. Vertac Chem. Corp., 841 F. Supp. 884 (E.D. Ark. 1993). Hercules moved for reconsideration, arguing that disputed issues of fact existed regarding divisibility. On November 1, 1993, the district court denied Hercules's motion, finding that Hercules had failed to present evidence in support of its divisibility of harm defense.

Hercules appealed that decision, and we reversed and remanded the case to the district court to reconsider Hercules's claim of divisibility in light of the legal standards enunciated in our April 11, 2001, opinion.⁵ United States v. Hercules, Inc., 247 F.3d 706 (8th Cir. 2001) (Vertac XI). In October and December 2001, the district court held an evidentiary hearing on Hercules's divisibility of harm defense, resulting in a transcript of some 2300 pages in length. The parties submitted post-hearing briefs, together with a voluminous record that included documents, exhibits, transcripts, depositions, and the administrative record. The district court considered the entire record, applied the law as stated in Vertac XI, and held that Hercules had failed to establish its divisibility of harm defense, with the exception of one off-site landfill, the Rogers Road landfill (a divisibility finding that the government does not

⁴Litigation began in 1980. For a description of the early procedural history, see United States v. Hercules, Inc., 247 F.3d 706 (8th Cir. 2001) and United States v. Vertac Chem. Corp., 966 F. Supp. 1491 (E.D. Ark. 1997).

⁵In its most recent opinion, the district court noted an inconsistency in our April 11, 2001, opinion. In that opinion, we meant to vacate: (1) the unpublished opinion issued on October 12, 1993, and (2) the denial of the motion to reconsider issued on November 1, 1993.

challenge). United States v. Vertac Chem. Corp., 364 F. Supp. 2d 941 (E.D. Ark. 2005) (Vertac XII).

In its final judgment following its March 30, 2005, memorandum opinion and order, the district court held that Hercules and Uniroyal were jointly and severally liable to the United States for the following amounts: (1) Hercules, in the amount of \$119,318,504, plus any additional response costs, and (2) Uniroyal, in the amount of \$110,410,161, plus any additional costs. The district court had previously allocated the amount of contribution of the total response costs for which each entity was jointly and severally liable. To the extent that the United States enforces its judgment, Hercules is entitled to contribution from Uniroyal in an amount equal to 2.6 percent of \$110,410,161, and Uniroyal is entitled to contribution from Hercules in an amount equal to 97.4 percent of \$110,410,161.

On appeal, Hercules argues that the district court erred in apportioning liability. Uniroyal argues that we should overturn our holding in Vertac XI that affirmed the district court's holding that Uniroyal was liable. Hercules and Uniroyal further argue that the district court's imposition of retroactive liability was unconstitutional.

II. HERCULES'S LIABILITY

Hercules challenges the district court's liability determination on both legal and factual grounds. We will first address Hercules's contention that the district court applied the wrong legal standard in determining whether Hercules established its divisibility of harm defense. We will then turn to Hercules's argument that the drummed waste, the stillbottoms, Operable Unit 1 (OU-1), the Jacksonville Landfill, the soils, and the groundwater are each separate sites capable of further apportionment.

We review *de novo* the district court's legal conclusions. Richardson v. Sugg, 448 F.3d 1046, 1052 (8th Cir. 2006). We review its factual findings for clear error. Id. "Using this standard, we will overturn a factual finding only if it is not supported by substantial evidence in the record, if it is based on an erroneous view of the law, or if we are left with the definite and firm conviction that an error was made." Id. We give due regard to the district court's opportunity to judge the credibility of the witnesses. Id. "A district court's choice between two permissible views of evidence cannot be clearly erroneous." Tadlock v. Powell, 291 F.3d 541, 546 (8th Cir. 2002).

A. Legal Standard

Hercules contends that the district court erred in concluding that the site could not be separated into divisible geographic units. As to the drums, Hercules argues that the district court failed to consider whether there existed a single, divisible harm and addressed only whether there existed distinct harms. The thrust of Hercules's arguments is factual, however, and the district court applied the appropriate legal standard.

In Vertac XI, we held that a defendant must prove by a preponderance of the evidence that there exists a reasonable basis for divisibility. Vertac XI, 247 F.3d at 717.

The proper standard for determining divisibility . . . is that the defendant show either distinct harms or a reasonable basis for apportioning causation for a single harm. A defendant need not prove that its waste did not, or could not, contribute to any of the harm at a CERCLA site in order to establish divisibility, because it is also possible to prove divisibility of single harms based on volumetric, chronological or other types of evidence. A site may also be divisible if a defendant can establish that it consists of non-contiguous areas of contamination.

Id. at 719 (internal quotations and citations omitted). We noted that proving divisibility is a “very difficult proposition” and that where the harms are incapable of division, the district court should not make an arbitrary apportionment. Id. at 717.

In its opinion, the district court applied the standard for determining divisibility as set forth in Vertac XI. The district court first considered whether Hercules established a reasonable basis for divisibility by proving by a preponderance of the evidence that the site could be divisible on a geographical basis.⁶ Under its geographical apportionment theory, Hercules argued that each operable unit within the Jacksonville site is a separate site for purposes of divisibility. In considering and ultimately rejecting Hercules’s argument, the district court found that the EPA divided the site into operable units for the purposes of remediation and that the “operable units did not solely address geographical portions of the Site.” Vertac XII, 364 F. Supp. 2d at 951.

With regard to the drums, Hercules argues that the district court erroneously held that cross-contamination and commingling of dioxin prevented Hercules from establishing a reasonable basis for divisibility. In Vertac XI, we held that a single harm may be treated as divisible when it is possible to discern the degree to which different parties contributed to the damage. “Single harms may also be treated as divisible in terms of degree, based, for example on the relative quantities of waste discharged into the stream. Divisibility of this type may be provable even where wastes have become cross-contaminated and commingled.” 247 F.3d at 718 (internal quotations omitted). Hercules, however, did not argue that the drums caused a single, divisible harm that could be apportioned based on relative quantities of waste or

⁶We have considered Hercules’s argument concerning the information contained in one of the government’s exhibits (Exhibit K). Because the district court expressly stated at the time it granted the government’s motion to withdraw the exhibit that it would not rely on the exhibit in ruling on Hercules’s divisibility defense, we conclude that this argument is without merit.

volumetric evidence. As the government points out, this argument would have been inconsistent with Hercules's argument that it should not be held liable for any of the drummed waste.

B. Drummed Waste

The 28,500 drums contained 2,4-D and 2,4,5-T stillbottom wastes, dioxin, and other hazardous and toxic substances. When the site went into receivership, the drums were leaking, corroding, and failing. By February 1989, the failed drums had been placed inside new, larger drums (overpacked). Because the drums contained corrosive materials, maintenance of the drums was an ongoing process. The EPA determined that the wastes on the site posed a threat to public health and welfare and the environment. The drummed material was considered acutely hazardous waste, and the EPA chose to dispose of the wastes by incineration. The Arkansas Department of Pollution Control and Ecology (ADPC&E) managed the incineration from 1989 until June 1993, when the EPA took over the on-site incineration of the drums.

Hercules argues that the district court clearly erred in finding the following: (1) the EPA and the ADPC&E decided to incinerate the 2,4-D waste drums because of the dioxin contained therein; (2) Hercules was responsible for the cross-contamination of the plant equipment causing 2,4-D waste drums to contain dioxin; and (3) Hercules was responsible for the commingling of the 2,4-D waste and the dioxin contaminated soil, causing the drums to contain dioxin.

Hercules first argues that it should not be held liable for the cost of incinerating the 2,4-D waste drums because those drums would have been incinerated regardless of whether they were contaminated with dioxin. The district court concluded that Hercules's argument did not "withstand scrutiny" and found that the EPA and Arkansas were concerned that a potential fire, explosion, or tornado could spread dioxin into the environment. Vertac XII, 364 F. Supp. 2d at 953. Thus, the district

court determined that “[i]t was not, as Hercules argues, the dirt in the drums that drove the incineration; rather it was the dioxin in the dirt that drove the incineration of the drums.” Id.

As the district court noted in the factual background of the case, the Vertac Rule permitted Vertac to landfill the 2,4-D waste drums only after showing that the drums contained no dioxin. This was never shown, and Phyllis Moore, Ph.D., the former director of the ADPC&E, and Randall Mathis, her successor, testified (1) that time was of the essence, (2) that further testing was expensive and time consuming, (3) that the 2,4-D drums were corroding and failing, and (4) that the drums posed an imminent risk of fire and explosion.

Dr. Moore was involved in the initial decision to incinerate the 2,4-D waste drums. Although she stated that the “issue of dirt” did not influence her decision, Dr. Moore testified that a primary concern was the presence of dioxin in the 2,4-D waste drums, regardless of whether it was transmitted to the drums by cross-contamination at the production facility or by the overpacking of the drums with contaminated soil. J.A. at 26433-34. She further testified that it was important that the method of incineration satisfy the requirements of the ADPC&E and the EPA for destruction of dioxin. Regarding the ultimate decision to incinerate, Dr. Moore testified that the state “would have looked at other options” if there had been no dioxin in any of the drums. J.A. at 26445. We thus reject Hercules’s argument that the incineration of the 2,4-D drums was in no way attributable to dioxin.

Hercules next argues that the district court clearly erred in finding that the equipment at the plant contaminated 2,4-D waste with dioxin after Hercules had cleaned the production vessels in 1970. The district court found that “the cleanup of the equipment was not as thorough as portrayed by Hercules, and that the plant equipment was cross-contaminated with 2,4-D, 2,4,5-T, and dioxin.” Vertac XII, 364

F. Supp. 2d at 952. The district court rejected Hercules's theory that Vertac's chemical production flushed the dioxin out of the production vessels.

In its brief, Hercules recites portions of Arthur Treisback's affidavit, which was excluded as hearsay at trial and is not part of the record on appeal, and relies primarily on Treisback's deposition testimony, portions of which were read into evidence by Richard Karkkainen during his testimony. Treisback was Hercules's plant manager in charge of the 1970 plant cleanup, and Karkkainen was Vertac's director of environment and safety from 1979 to 1986. Karkkainen testified that Treisback's deposition testimony described the common practice of cleaning plant equipment and, although Karkkainen had no personal knowledge of the cleaning, that it was likely that Hercules followed the common practice. J.A. at 26458. Karkkainen further testified that there was no indication that the cleaning process was successful. J.A. at 26562.

The district court also heard the testimony of Reddie Ray and Stephen Quigley. Ray worked for Hercules from 1964 to 1970 and was involved in the plant cleanup. Ray testified extensively about how the equipment was cleaned. To clean the tanks, "[w]e washed them out with a water hose. . . . Only time we heated the water if there was sediment in the bottom of the tank." Regarding the process lines, "Process lines were cleaned with steam. . . . We had to disassemble the lines to get water out of the tank." Ray did not recall using any solvents: "The only time we used solvent is where we wanted to take the sediment and circulate and dissolve something in it, but I don't think we used solvent. I think we just used water and steam, that's all." J.A. at 27522-23. Quigley, Uniroyal's expert, testified that it was unlikely that solvents were used to clean the equipment and even if they were, it is likely that some contamination would remain in the equipment. J.A. at 28089-90. Given the evidence before the district court, we conclude that it did not err in finding that dioxin remained in the plant after Hercules's 1970 cleaning.

Hercules contends that the district court clearly erred in rejecting its flushing theory. According to this theory, after Vertac shifted plant production exclusively to products that do not generate dioxin, about ten production runs would have flushed out any significant amount of dioxin remaining in the plant equipment. Because Vertac stopped producing 2,4,5-T in March 1979, three years after Hercules sold the plant to Vertac, Hercules argued that there could be no detectable dioxin in the 2,4-D waste in late 1979, when Vertac began to accumulate the 2,4-D waste drums. The district court disregarded the flushing theory as, “just that—a theory” and noted that “[a]fter nearly eight years of only 2,4-D production, dioxin and 2,4,5-T were present in plant equipment.” Vertac XII, 364 F. Supp. 2d at 952.

We conclude that the district court did not err in rejecting Hercules’s flushing theory.⁷ The district court stated that, because the plant equipment contained dioxin and 2,4,5-T after nearly eight years of 2,4-D production, “the evidence basically disproves the theory.” The finding that dioxin was present in the plant equipment is supported by the evidence. An EPA inventory of the process vessels and tanks in the central process area of the Jacksonville site showed that 140 of the 213 process vessels contained chemical material including 2,4-D, 2,4,5-T, and dioxin. J.A. at 19779-80. Of the ninety-six vessels sampled, more than half were contaminated with dioxin at levels greater than 0.3 ppb. J.A. at 19780. Hercules argues that the data showing contamination of the plant equipment was untrustworthy, but Hercules has failed to show that the EPA or the district court relied on that evidence. Hercules’s expert witness, Randal Maud, Ph.D., served as the project manager for Hercules at the Jacksonville site to assess the environmental consequences of the site. He testified that the unreliable data, “would likely not be used because of the quality assurance problems.” J.A. at 28256.

⁷Hercules argues that the government’s attorney made a judicial admission supporting Hercules’s flushing theory. Having reviewed the record, we conclude that the statements in question did not rise to the level of a binding judicial admission.

Finally, with regard to the drummed waste, Hercules argues that the district court erred in holding Hercules liable for the waste that was placed in the drums during overpacking. Hercules contends that either the placement of the dioxin-contaminated soil into the 2,4-D drums constituted a second disposal under CERCLA, for which it is not liable, or that the overpacking by Vertac or the EPA constituted a superseding cause, thereby relieving Hercules of liability. Hercules does not dispute, however, that it contaminated the soil with dioxin at the Jacksonville site.

As the district court recited in its decision, disposal under CERCLA is defined as the “discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such . . . waste . . . may enter the environment.” 42 U.S.C. §§ 6903(3), 9601(29). Hercules caused dioxin to enter the environment, thereby disposing of the waste. That Vertac and the EPA overpacked leaking drums in an effort to contain the further contamination of the site does not absolve Hercules of CERCLA liability. Accordingly, Hercules remains responsible for the ongoing contamination caused by the dioxin, for that contamination was not solely caused by the act of a third party.

C. Stillbottoms

Hercules argues that the stillbottom waste was not disposed of until after Hercules sold the plant and that thus it is not responsible for any of the costs related to that disposal. Vertac began accumulating 2,4,5-T stillbottom drums on-site in 1975, and it bought the plant from Hercules in 1976. Hercules claims that Vertac merely stored the waste for the purpose of later recycling, and thus did not dispose of the waste until 1979, when the registration for 2,4,5-T was suspended. Accordingly, Hercules claims that the 2,4,5-T stillbottom drums constituted a distinct harm and that it should not be liable for their incineration.

Section 103(a) of CERCLA holds liable “any person who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of.” 42 U.S.C. § 9607(a)(2). The term “facility” includes, “any site or area where a hazardous substance has been deposited, stored, disposed of, or placed.” 42 U.S.C. § 9601(9). Finally, as we recounted above, disposal includes placing hazardous waste in a manner that allows the waste to enter the environment. Simply stated, the district court found that Hercules owned a facility at which hazardous waste was allowed to enter the environment. Specifically, it found that the stillbottoms leaked onto the ground when Hercules owned the plant. This finding is supported by Quigley’s expert testimony: “[W]hen the wastes [stillbottoms] were put into drums for disposal, they were put into recycle drums, . . . and those recycle drums did leak, some of them instantaneously upon having the waste put in them, and other times shortly after the waste being put in them.” J.A. at 28082. Robert Fischer, a chemist with Hercules and Vertac, also testified that the deterioration of the T drums was one of the major sources of dioxin contamination at the site. J.A. at 27060. In light of this testimony, we conclude that the district court did not clearly err in holding Hercules liable for the incineration of the stillbottoms.

D. Operable Unit 1

OU-1 consisted of the above-ground media, including the process vessels (e.g. the storage tanks, chemical reaction vessels) in the central process area. The ROD for OU-1 required that plant equipment be dismantled and salvaged to the extent possible and that all other nonsalvageable material be placed in an on-site landfill. Any hazardous material not suitable for the landfill was to be incinerated. Hercules implemented the remedy pursuant to Unilateral Administrative Order (UAO) issued by the EPA.

Hercules argues that the district court erred in holding it liable for the cleanup of OU-1, including the demolition, removal, and disposal of plant buildings and

equipment, and their process waste contents. Hercules admits liability for part of the OU-1.⁸ It contends that it established a reasonable basis of divisibility for further apportioning liability. Hercules argues that the district court erred in finding (1) that the plant buildings were demolished because they contained dioxin, (2) that Hercules was responsible for the contamination of the equipment, the shredded trash, and the pallets, and (3) that the EPA's response action was not arbitrary or capricious.

The district court found that “[t]he buildings were demolished because the risk of collapse might cause release and human exposure to herbicide process contamination, including unacceptable levels of TCDD [dioxin].” We conclude that the record adequately supports this finding. Maud testified that the EPA was concerned about the buildings because they were falling into disrepair and because “they contained large amounts of asbestos siding and roofing and asbestos interiors, some of which also contained dioxin dust.” J.A. at 28265. The ROD states that in the event of a catastrophe, “Based on the 2,3,7,8-TCDD (dioxin) concentrations found in [OU-1], human exposure to concentrations in excess of those considered acceptable . . . could occur.” J.A. at 19811.

Hercules further contends that the district court clearly erred in finding that Hercules was responsible for the contamination of the plant equipment. In his expert testimony, Eugene Meyer, Ph.D., affirmed the statement from his 1998 affidavit that “[t]he presence of 2,3,7,8-TCDD [dioxin] was established through samples in all of the following: surface and subsurface materials collected from the site sewers, distillation bottoms, waste activated carbons, leachate from on-site buildings, trash, shredded pallets, and the sludges generated during the treatment of waste waters.” J.A. at 27928. Although Hercules's project manager for EPA compliance, Douglas Keilman, opined that Hercules did not cause the contamination, his opinion was based

⁸Hercules accepted responsibility for the spent carbon wastes it generated.

on the flushing theory. For the reasons stated above, we again conclude that the district court did not clearly err in rejecting that theory.

The district court found that “Hercules cannot establish that it was not the source of the contamination on the shredded trash and pallets.” Vertac XII, 364 F. Supp. 2d at 955. The shredded trash included things like hard hats, broken tools, and tyvex suits, and the pallets were used to store drummed waste at the site. Although Keilman testified that the trash had been accumulating since 1980, there was no evidence to show that Vertac, and not Hercules, caused the contamination of the trash. The district court found that the pallets were contaminated by both leaking drums and contaminated soil. Because Hercules is responsible for the contaminated soil, the district court did not err in further holding it responsible for the pallets.

Finally, Hercules argues that the EPA’s issuance of a UAO requiring Hercules to dismantle and to landfill the equipment and buildings at the site was arbitrary and capricious. We disagree. Section 113(j) of CERCLA allows a defendant to avoid paying response costs to the extent that it can show that the response action was arbitrary and capricious. 42 U.S.C. § 9613(j). Hercules does not argue that the disposal of the building and equipment is arbitrary and capricious, but rather that the EPA was arbitrary and capricious in issuing a UAO. To support the issuance of a UAO, there must be evidence that there “*may be* an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from a facility.” 42 U.S.C. § 9606(a) (emphasis added). Because the record contains sufficient evidence to support the EPA’s determination that the cautionary “may be” threat of imminent substantial endangerment had been established, its decision to issue the UAO was not arbitrary and capricious.

E. Jacksonville Landfill

The district court found that Hercules disposed of hazardous wastes at the Jacksonville Landfill and held Hercules liable for the cleanup costs associated with the landfill. In its investigation, the EPA found rusting drums and piles of “white fibrous, absorbent-type materials” at the Jacksonville Landfill. Tests confirmed the presence of dioxin, 2,4,5-T, and other chemicals associated with the Jacksonville site. In its ROD, the EPA called for the excavation of contaminated soils, the replacement and capping of the excavated areas with clean soil, and the cleaning and removal of large refuse items. The contaminated soil and drums were incinerated at the site. Although Hercules admits that it took some nonhazardous waste to the Jacksonville Landfill, it argues that the district court clearly erred in finding that Hercules disposed of hazardous wastes at the Jacksonville Landfill, and it contends that the EPA’s response was arbitrary and capricious.

We conclude that the district court’s finding is supported by substantial evidence. Indeed, the district court cited the testimony by four Hercules employees that they took chemical wastes to the Jacksonville Landfill. Billy Honey worked maintenance at the plant from the time Hercules bought it until it closed. J.A. at 26291. He testified that he hauled drums filled with chemical waste to the Jacksonville Landfill. J.A. at 26299-300. Doyce Shurley worked for Hercules in the early 1960s, and he recalled taking a barrel of stillbottoms to the landfill. Vincent Dodson worked for Hercules in the late 1960s, and he testified that chemical wastes were disposed of at the landfill. When asked what type of waste was taken to the Jacksonville landfill, Leroy Jordan replied, “We took [waste] from each trash pick-up point. We took it from every rig and barrels. We cleaned out the incinerator and carried that stuff over there. Anything that they needed to get rid of, and that included benzen barrels, trash from the lunchroom, barrels of goop, acid, anything and everything.” J.A. at 26352.

Hercules argues that this testimony should be discredited because it presented contradictory evidence to counter it. The short answer to this contention is to note once again that a district court's choice between two permissible views of the evidence is no basis for a conclusion that its factual finding is clearly erroneous. Tadlock, 291 F.3d at 546.

Hercules contends that the EPA's response to the Jacksonville landfill was inappropriate for the following reasons: (1) the cancer potency factor used by the EPA in its risk assessment constitutes a rule under the Administrative Procedures Act (APA) that must be overturned because it was not subject to notice and comment, and (2) the EPA's exposure assumptions were arbitrary and capricious. We disagree.

The cancer potency factor was used to calculate the risk and to set dioxin cleanup standards for the soil and sediments at the Jacksonville site. To determine whether a statement by an agency is a legislative rule or policy, we apply the two-part test of McLouth Steel Prod. Corp. v. Thomas, 838 F.2d 1317, 1320 (D.C. Cir. 1988). A policy statement (1) does not have a binding effect; it does not impose any rights and obligation; and (2) a policy "genuinely leaves the agency and its decisionmakers free to exercise discretion." Id. (internal quotations omitted). The district court concluded that the "Health Assessment Document which set forth the cancer potency factor does not impose any rights [or] obligations. It is at most only a technical and advisory report. It did not obligate the agency or public in determining acceptable risks associated with dioxin." United States v. Vertac Chem. Corp., 33 F. Supp. 2d 769, 779 (E.D. Ark. 1998) (Vertac IX).

This finding is adequately supported by the record. As the district court noted, the EPA Regional Administrator considered the lower figure proposed by Hercules's contractor, ChemRisk, and rejected it. Indeed, in the ROD for the Jacksonville landfill, the EPA addressed why ChemRisk's calculations would not be used, "Hercules Inc. submitted a report prepared by ChemRisk which provided calculations

resulting in cleanup goals differing from EPA's for dioxin. The report utilized certain calculations and assumptions which were contrary to EPA guidance and resulted in cleanup goals much less restrictive than those calculated by the EPA." J.A. at 16407. The document goes on to discuss the discrepancies between the EPA's and ChemRisk's methods of calculating site related risks and to explain that the EPA rejected ChemRisks proposal because "ChemRisk's proposed cleanup goals, using EPA's risk assessment approach, would not result in excess cancer risks (after remediation) within the acceptable risk range." J.A. at 16408. The EPA considered Hercules's comments on the EPA's application of the cancer potency factor with regard to the cleanup levels at the site and responded to the comments in the final RODs.

Hercules argues that the exposure assessments used by the EPA were arbitrary and capricious and did not justify the remedial order. Having considered the ROD and related evidence, we conclude that this argument is without merit.

F. Soils and Groundwater

The revised ROD for Operable Unit 2 (OU-2) addressed contaminated on-site soils, foundations, and underground utilities and off-site soils and sediments that had been excavated from off-site areas and stored on the site. The remedy selected required the excavation of dioxin contaminated soil, and the disposal of this soil in an on-site containment vault. The ROD for Operable Unit 3 (OU-3) dealt with groundwater contamination under the site. It states that "groundwater contamination at the site is complex, resulting from past waste management and disposal practices. Sources of contamination include on-site landfills, spills and discharges into the central ditch, Reasor Hill well, and other parts of the central process area." J.A. at 20136.

Hercules argues that the soil and groundwater contamination were divisible as successive harms based on the relative production volumes of 2,4,5-T and 2,4,5-TP attributable to Hercules from 1961 until it sold the plant in 1976 and to Vertac from that point until it ceased production of 2,4,5-T in 1979. Based on the estimated production figures, Keilman determined that Hercules was responsible for 70.74% of the EPA's response costs. J.A. at 27177. To reach this figure, Hercules relied on the following assumptions and evidence: (1) Hercules assumed that leaks and spills took place at roughly the same frequency and severity during the plant's production of 2,4,5-T and 2,4,5-TP; (2) Keilman testified that prior to 1965, most of the dioxin left the plant with the product; (3) Hercules offered evidence that the half-life of dioxin in soil is approximately twelve years, though it ranged from a few days to decades; and (4) Hercules touted its housekeeping and maintenance practices as being far superior to those of Vertac.

The district court determined that this evidence was not sufficiently concrete and specific to apportion the harm. Most importantly, there was no evidentiary basis for Hercules's assumption that the release of wastes at the site was related to production volumes, nor was there any testimony that there was any reasonably constant ratio or direct correlation between the releases of dioxin and production of dioxin generating products. As the district court pointed out and as the record reveals, the production methods changed over the years, the specifications for the product varied, Hercules and Vertac used different methods of disposal of dioxin contaminated filter paper and cardboard drums, and each companies experienced different plant eruptions. Although Hercules may be able to fairly estimate the production volumes of 2,4,5-T and 2,4,5-TP from the time it owned the plant, the district court correctly held that it cannot establish the inferences necessary to prove a reasonable basis for apportionment of harm.

Hercules argues that the EPA's response choices for the soils, groundwater, and off-site areas are arbitrary and capricious and that Hercules should not be held liable

for the corresponding response costs. Having considered the record, we conclude that Hercules's argument is without merit.

III. UNIROYAL'S LIABILITY

Uniroyal argues that we should hold that it is not liable as an arranger under CERCLA, and thus overturn the panel's decision in Vertac XI. "When a case has been decided by this court on appeal and remanded to the district court, every question which was before this court and disposed of by its decree is finally settled and determined." Klein v. Arkoma Prod. Co., 73 F.3d 779, 784 (8th Cir. 1996). Absent intervening controlling authority, we are bound by the decision of the previous panel. Liberty Mut. Ins. Co. v. Elgin Warehouse & Equip., 4 F.3d 567, 571 (8th Cir. 1993). Uniroyal pointed to no new controlling authority, and thus the affirmance of the district court's finding of liability in Vertac XI is the law of the case. Because that holding is not "clearly erroneous" nor does letting it stand "work a manifest injustice," we refuse to disturb it. Liberty Mut. Ins. Co., 4 F.3d at 570-71.

IV. RETROACTIVITY

Hercules and Uniroyal contend that the retroactive application of CERCLA to impose liability is unconstitutional under the Supreme Court's decision in Eastern Enterprises v. Apfel, 524 U.S. 498 (1998). We previously resolved this exact issue in United States v. Dico, in which we held that CERCLA's retroactive application remained constitutional after Eastern Enterprises. Dico, 266 F.3d 864, 879-880 (8th Cir. 2001). We are thus bound by our Circuit's precedent and accordingly will not revisit the issue. See United States v. Wright, 22F.3d 787, 788 (8th Cir. 1994) ("[A] panel of this Court is bound by a prior Eighth Circuit decision unless that case is overruled by the Court sitting *en banc*.").

V. CONCLUSION

The judgment is affirmed.
