NOTE

EQUITY THROUGH EFFICIENCY: RETHINKING SUPERFUND POLICY IN LIGHT OF TORT LAW-PROVOKED ENVIRONMENTAL RACISM

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INTRODUCTION

The location selected for a hazardous waste site, as well as the amount of time that waste lingers there before being cleaned, are the two factors that dictate which communities will be plagued by

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hazardous waste for the longest durations. This Note labels the first factor the *siting stage* and the second factor the *cleanup stage*. At the siting stage, private polluters or local governments decide where to dispose of hazardous waste. At the cleanup stage, EPA decides which of these hazardous waste sites require cleaning and the appropriate order in which to clean those sites. Decisions made during the siting stage, therefore, determine the communities that will face the health risks posed by hazardous waste, and cleanup stage decisions inform a community's duration of exposure to those risks.

One might expect that decisions about where to site hazardous waste are based primarily on safety and are reached by comparing the environmental suitability of various proposed locations. But that expectation would not match reality. Evidence instead indicates that, in an attempt to minimize potential losses from hazardous waste-related lawsuits, both private polluters and local governments make siting stage decisions according to where court-awarded damages are most likely to be small.[1] In other words, hazardous waste stalks the communities whose members are expected to be least compensated for their injuries.

Inadvertently or otherwise, tort law dooms communities of color to suffer this toxic stalking. It does so by linking the size of a damages award to the plaintiff's race.[2] When calculating damages, expert witnesses use employment statistics that vary along racial lines.[3] Due at least partially to past and ongoing workplace discrimination, these employment statistics are generally lower for people of color than they are for white tort victims.[4] Communities with large populations of color thus become the locations that siting stage decisions favor for hazardous waste disposal.[5] Indeed, scholarship

[1] *See* discussion *infra* Part II.

[2] *See* Kimberly A. Yuracko & Ronen Avraham, *Valuing Black Lives: A Constitutional Challenge to the Use of Race-Based Tables in Calculating Tort Damages*, 106 CALIF. L. REV. 325, 327 (2018).

[3] *See id.*

[4] *See* Martha Chamallas, *Civil Rights in Ordinary Tort Cases: Race, Gender, and the Calculation of Economic Loss*, 38 LOY. L.A. L. REV. 1435, 1439 (2005); Martha Chamallas, *Questioning the Use of Race-Specific and Gender-Specific Economic Data in Tort Litigation: A Constitutional Argument*, 63 FORDHAM L. REV. 73, 75 (1994); Michael I. Meyerson & William Meyerson, *Significant Statistics: The Unwitting Policy Making of Mathematically Ignorant Judges*, 37 PEPP. L. REV. 771, 806 (2010).

[5] *See* Yuracko & Avraham, *supra* note 2, at 327.

confirms that hazardous waste is disproportionately sited in or near communities of color.[6]

EPA, as the key actor of the cleanup stage, is poised to mitigate the effects of discriminatory siting stage decisions by ensuring that people of color are exposed to hazardous waste for the shortest time possible. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "the Superfund law"), EPA has the authority to remediate a hazardous waste site itself or to compel parties responsible for the hazardous contamination to conduct the cleanup.[7] CERCLA also establishes the Superfund Trust Fund, which supplies EPA with financing for the remediation of certain hazardous waste sites—those that the agency deems most dangerous.[8] To determine which of these sites warrant the highest priority for Trust Fund resources, EPA performs risk assessments designed to gauge the threat posed by each site.[9] Properly framed, Superfund risk assessments could enable EPA to reduce the amount of time people of color must endure exposure to hazardous waste.

Currently, however, the agency is missing this opportunity. Risk assessments for Superfund sites fail to either consider the size of the exposed population or distinguish between risks that are

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[6] *See* Kathy Seward Northern, *Battery and Beyond: A Tort Law Response to Environmental Racism*, 21 WM. & MARY ENV'T L. & POL'Y REV. 485, 485, 499–501 (1997); Robert D. Bullard & Beverly Wright, *Disastrous Response to Natural and Man-Made Disasters: An Environmental Justice Analysis Twenty-Five Years After Warren County*, 26 UCLA J. ENV'T L. & POL'Y 217, 225 (2008).

[7] *See* 42 U.S.C. §§ 9606–9607; FRANK P. GRAD, TREATISE ON ENVIRONMENTAL LAW § 4A.02[1](c) (2021) ("[EPA] may issue an administrative order to direct a responsible party to abate the danger under § 106(a); it may obtain injunctive relief in the district court to order the abatement; or it may itself undertake the abatement using Superfund resources and sue the responsible party under § 107."); Martha L. Judy & Katherine N. Probst, *Superfund at 30*, 11 VT. J. ENV'T L. 191, 194 (2009).

[8] *See* 26 U.S.C. § 9507; Judy & Probst, *supra* note 7, at 195, 197, 213; *About the Superfund Cleanup Process*, EPA, https://www.epa.gov/superfund/about-superfund-cleanup-process (last visited Nov. 5, 2021); *Hazard Ranking System (HRS)*, EPA (last visited Feb. 5, 2021), https://www.epa.gov/superfund/hazard-ranking-system-hrs; *Superfund Site Assessment Process*, EPA, https://www.epa.gov/superfund/superfund-site-assessment-process (last visited Feb. 5, 2021).

[9] *See* JAMES T. HAMILTON & W. KIP VISCUSI, CALCULATING RISKS? THE SPATIAL AND POLITICAL DIMENSIONS OF HAZARDOUS WASTE POLICY 27–28 (1999); W. KIP VISCUSI, PRICING LIVES: GUIDEPOSTS FOR A SAFER SOCIETY 153–57 (2018).

already occurring and those that could possibly emerge at some point in the future.[10] As a result, EPA often prioritizes sites that generate future risk to which relatively *few* people *might* be exposed, above sites that generate present risk to which *many* people are *actually* experiencing exposure. The agency thereby neglects to allocate its resources efficiently, spending money to remediate sites that are less certain to cause harm and which would harm smaller numbers of people.[11] But more than that, the misallocation of resources exacerbates an issue of environmental justice, as perverse tort incentives at the siting stage make certain that the communities in closest proximity to hazardous waste are comprised disproportionately of people of color.

The environmental justice connection between Superfund policy and tort law is underexplored. Considerable research documents the environmental justice issue posed by the fact that people of color suffer greater exposure to hazardous waste than do white Americans.[12] There is some literature explaining how the incentive structure created by tort law facilitates that phenomenon.[13] And very little scholarship is aimed at the environmental justice implications of the risk methodology used to prioritize Superfund sites.[14] But nowhere are the dots of Superfund policy and tort law connected to reveal that the two conspire, each one at its own stage of hazardous waste decision-making, to amplify environmental racism. This Note contends that, to avoid compounding the harm that tort law channels toward communities of color at the siting stage, EPA must reform its policy at the cleanup stage when determining the remediation priority assigned to Superfund sites.

The Note proceeds in three Parts. It works backward from the cleanup stage to the siting stage, with Part I demonstrating how EPA's risk methodology leads to inequitable treatment of large populations currently exposed to hazardous waste, and Part II showing that, due to perverse tort incentives, those populations are disproportionately communities of color. Part III asserts that alleviating the burden on communities of color that is put there by tort law and

[10] *See* HAMILTON & VISCUSI, *supra* note 9, at 21.

[11] *See* VISCUSI, *supra* note 9, at 153–55.

[12] *See, e.g.*, Northern, *supra* note 6, at 486, 499–501; Bullard & Wright, *supra* note 6, at 225.

[13] *See, e.g.*, Yuracko & Avraham, *supra* note 2, at 327.

[14] *See, e.g.*, VISCUSI, *supra* note 9, at 156.

kept there by Superfund policy requires EPA to account for population size and risk type when conducting its risk assessments. By so reforming its policy, EPA can accelerate the march toward environmental justice rather than remain an accomplice to environmental injustice.

I. THE CLEANUP STAGE

A. *Structure of CERCLA*

Though now an issue that is heavily regulated, the management of hazardous waste was once an afterthought that received little attention from the public and which stirred minimal legislative action by the government.[15] By the time Congress enacted CERCLA in 1980, it was estimated that anywhere between twenty and fifty thousand improperly managed or abandoned hazardous waste sites festered within the country's borders.[16] The Superfund law granted EPA the money necessary to undertake remediations itself as well as the authority necessary to compel polluters to conduct cleanups on the agency's behalf.[17]

While CERCLA enables EPA to remediate a hazardous waste site on its own, the agency has embraced an "enforcement first" position.[18] Enforcement first indicates that EPA prefers and will attempt to induce potentially responsible parties (PRPs)[19] to conduct

[15] *See* EPA, HAZARDOUS WASTE, https://cfpub.epa.gov/roe/indicator_pdf.cfm?i=54 (last visited Nov. 5, 2021); GRAD, *supra* note 7, § 4A.02[1][a] ("CERCLA was passed in 1980 to address what many believed was a relatively limited problem."); Judy & Probst, *supra* note 7, at 192 ("Prior to CERCLA such contamination was addressed, if at all, by common law causes of action such as nuisance, trespass, and strict liability for ultra-hazardous activities.").

[16] *See* GRAD, *supra* note 7, § 4A.02[1][a]; Judy & Probst, *supra* note 7, at 193.

[17] *See generally* 26 U.S.C. § 9507; 42 U.S.C. § 9604. *See also* GRAD, *supra* note 7; Judy & Probst, *supra* note 7, at 194–95, 213.

[18] Judy & Probst, *supra* note 7, at 221.

[19] Section 107 of CERCLA outlines the categories of PRP, which include: "(1) the owner and operator of a vessel or a facility, (2) 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, (3) any person who by contract, agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances owned or possessed by such person, by any other party or entity, at any facility or incineration vessel owned or operated by another party or entity and containing such hazardous substances, and (4) any person who accepts or accepted any hazardous substances for transport to disposal or treatment facilities, incineration vessels or sites

the remediation rather than undertake a remediation itself.[20] When PRPs conduct the entirety of a cleanup—either voluntarily to avoid subsequent liability or as the result of a negotiated settlement with EPA[21]—the agency has no costs to recover. CERCLA instead grants a right of action to the cooperative PRPs that allows them to recover their costs of remediation from any PRPs who did not participate in the cleanup efforts.[22] But in scenarios where EPA must expend its own resources to ensure a hazardous waste site is cleaned, that money may be taken from the Superfund Trust Fund.[23]

Use of the Superfund Trust Fund is reserved for the remediation of sites that have been added to the National Priorities List (NPL).[24] This list represents the sites that pose the greatest risk to human health and the environment,[25] and only sites included on the NPL are eligible for the expenditure of Trust Fund money.[26] The primary avenue by which a site is placed on the NPL is the Hazard Ranking System.[27] Data collected during a site's preliminary assessment and site inspection inform that site's Hazard Ranking System score,[28] and any scores above a certain threshold qualify a site for placement on the NPL.[29] CERCLA required EPA to list an initial 400 sites following the Act's passage.[30] Forty years later, over 1,300 sites wait on the NPL for remediation.[31]

selected by such person, from which there is a release, or a threatened release which causes the incurrence of response costs, of a hazardous substance." GRAD, *supra* note 7, § 4.02[1][f][i].

[20] *See* Judy & Probst, *supra* note 7, at 221–23.

[21] *See* Judy & Probst, *supra* note 7, at 214, 227.

[22] *See* United States v. Atl. Rsch. Corp., 551 U.S. 128, 131 (2007) (holding that § 107(a) provides PRPs "with a cause of action to recover costs from other PRPs").

[23] *See* Judy & Probst, *supra* note 7, at 195.

[24] Sites on the National Priorities List will be referred to as "Superfund sites."

[25] *See* GRAD, *supra* note 7, § 4A.02[1][d]; Judy & Probst, *supra* note 7, at 197.

[26] *See* HAMILTON & VISCUSI, *supra* note 9, at 8.

[27] *See About the Superfund Cleanup Process*, *supra* note 8; *Hazard Ranking System (HRS)*, *supra* note 8; *Superfund Site Assessment Process*, *supra* note 8.

[28] *See About the Superfund Cleanup Process*, *supra* note 8; *Hazard Ranking System (HRS)*, *supra* note 8.

[29] *See About the Superfund Cleanup Process*, *supra* note 8; *Hazard Ranking System (HRS)*, *supra* note 8.

[30] *See* Judy & Probst, *supra* note 7, at 197.

[31] *See Superfund: National Priorities List (NPL)*, EPA (Oct. 1, 2021), https://www.epa.gov/superfund/superfund-national-priorities-list-npl; *National Priorities List*, 40 C.F.R. § 300, App. B, 230–49 (Sept. 14, 2021).

Scenarios where EPA uses Trust Fund money occur in three varieties: (1) EPA begins cleaning a Superfund site until a PRP agrees to take over the remainder of remediation; (2) EPA undertakes the entire cleanup and subsequently seeks to recover its costs from PRPs; and (3) EPA undertakes the entire cleanup but is unable to track down any PRPs from whom it can recover costs.[32] In the first and second varieties, the Superfund Trust Fund can be at least partially replenished if EPA successfully brings recovery actions against the PRPs it has identified. On the other hand, in situations where EPA fails to locate any PRPs at all, the Trust Fund will remain depleted by the full amount of EPA's remediation costs.

The Superfund Trust Fund was initially equipped with $1.6 billion to tackle sites on the NPL, reflecting the consensus in 1980 that cleaning hazardous waste would be a fairly straightforward endeavor.[33] Six years after the law was enacted, Congress realized that its task would continue longer and be more expensive than it had first anticipated. The Superfund Amendments and Reauthorization Act was adopted in 1986, which appropriated an additional $17 billion to the Trust Fund over the next eight years.[34] Revenues for the fund were originally raised through taxes on activities that harmed the environment, but Congress neglected to renew these taxes in 1995.[35] Revoking the environmental taxes that had supported the Trust Fund not only shifted the financing burden from corporations to the general public, but also led the fund's annual revenues to decline.[36] As a result, EPA has determined that its Superfund cleanup

[32] *See* Judy & Probst, *supra* note 7, at 213–15.

[33] *See* GRAD, *supra* note 7, § 4A.02[1][a] ("In 1986, it became apparent that the problem was bigger than had been anticipated at the time of CERCLA's enactment.").

[34] *See id.* at 2.

[35] *See* U.S. GOV'T. ACCOUNTABILITY OFF., GAO-08-841R, SUPERFUND: FUNDING AND REPORTED COSTS OF ENFORCEMENT AND ADMINISTRATION ACTIVITIES 3 (2008), https://www.gao.gov/assets/gao-08-841r.pdf [hereinafter SUPERFUND: FUNDING AND REPORTED COSTS].

[36] *See id.*

costs now exceed revenues,[37] and the Trust Fund's balance dropped from $4.7 billion in 1996 to just $225 million as of 2020.[38]

A withering Trust Fund has predictably adverse implications for CERCLA's efficacy. As the fund shrinks, EPA is able to complete fewer cleanups. During 1999, construction completion occurred at 80 Superfund sites out of 630 that were available for completion.[39] That number—and rate—consistently declined over the next fifteen years. By 2013, just thirteen Superfund sites achieved construction completion out of 428 that were available.[40] The number of completed sites fell to six in 2019, the lowest total in more than three decades.[41]

This trend seems especially problematic given the already-slow pace of cleanups. According to the most recent report by the General Accounting Office (GAO), average cleanup time was a sluggish 10.6 years as of 1996—a moment when the Trust Fund was at its most robust.[42] Even during this era, just ten percent of Superfund sites were completed within EPA's five-year expectation.[43] Of all the sites that have been added to the NPL since CERCLA's inception, fewer than 25 percent have attained total remediation by 2021.[44]

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[37] *See* Laurel Adams, *EPA Superfund Cleanup Costs Outstrip Funding*, CTR. FOR PUB. INTEGRITY (May 19, 2014), https://publicintegrity.org/environment/epa-superfund-cleanup-costs-outstrip-funding.

[38] *See* JILLIAN GORDNER, U.S. PUB. INT. RSCH. GRP., SUPERFUND UNDERFUNDED: HOW TAXPAYERS HAVE BEEN LEFT WITH A TOXIC FINANCIAL BURDEN 3 (Feb. 2021).

[39] *See* U.S. GOV'T ACCOUNTABILITY OFF., GAO-15-812, SUPERFUND: TRENDS IN FEDERAL FUNDING AND CLEANUP OF EPA'S NONFEDERAL NATIONAL PRIORITIES LIST SITES 33 (2015), https://www.gao.gov/assets/680/673051.pdf [hereinafter SUPERFUND: TRENDS IN FEDERAL FUNDING AND CLEANUP].

[40] *See id.*

[41] *See* Gordner, *supra* note 38, at 16. Ten construction completions were achieved in 2020. *See id.*

[42] *See* U.S. GEN. ACCT. OFF., GAO/T-RCED-97-69, SUPERFUND: TIMES TO ASSESS & CLEAN UP HAZARDOUS WASTE SITES EXCEED PROGRAM GOALS (1997).

[43] *See id.*

[44] The number of sites deleted from the NPL (438) is equal to 24.8 percent of the total sites (1765) that have been added to the NPL since 1980. *See Superfund: National Priorities List (NPL)*, EPA, https://www.epa.gov/superfund/superfund-national-priorities-list-npl (last visited May 12, 2021). A site is "deleted from the NPL when EPA has determined, in consultation with the state, that no further response action is required to protect human health and the environment." Judy & Probst, *supra* note 7, at 197.

Beyond the effects on EPA directly, an emptier Trust Fund reduces the willingness of PRPs to participate in cleanups. EPA has noticed that, when the fund is healthy, PRPs tend to be more receptive to initiating remediation.[45] It appears as though PRPs worry that delaying a cleanup could prompt EPA to remediate a site on its own in circumstances where the agency has the money to do so. In these cases, a delay could lead to recovery actions that are more expensive for the PRP than would be the costs of personally conducting the cleanup.[46] But EPA loses this leverage when its fund runs low. And without leverage, the agency may only be capable of eliminating the Superfund sites it remediates itself.

CERCLA's tightening budgetary constraints heighten the significance of Superfund prioritization choices. Lack of funding impedes construction progress and extends response times. It also emboldens PRPs to withhold their cooperation, narrowing the field of actors within the cleanup stage and rendering each decision by EPA that much more pivotal. The order in which EPA decides to address Superfund sites thus becomes paramount in determining just how long a community afflicted with hazardous waste will have to wait before receiving relief.

B. *EPA's Risk Assessment Methodology*

Once a site is placed on the NPL, EPA commences a comprehensive analysis to establish more precisely the level of risk posed by the site's hazardous waste.[47] It is this more precise risk level that helps determine a Superfund site's remediation priority. Although Hazard Ranking System scores can be dispositive of whether a site is designated to the NPL, the information used to compute these scores is too preliminary to dictate the order in which Superfund sites will receive funding.[48] Instead, after a site is added to the NPL, EPA engages in a more thorough risk assessment as part of the Remedial Investigation phase of the Superfund cleanup process.[49] This

45 *See* SUPERFUND: FUNDING AND REPORTED COSTS, *supra* note 35, at 6.
46 *See id.*
47 *See Hazard Ranking System (HRS)*, *supra* note 8.
48 *See id.*
49 *See* HAMILTON & VISCUSI, *supra* note 9, at 8, 28.

risk assessment is relied upon heavily to inform decisions about prioritization.[50]

EPA models its methodology for risk assessments based on an "individual risk approach."[51] Employing this approach, the agency does not incorporate population size, but instead calculates the level of risk which one person would face if that individual were exposed to the particular hazardous waste found at a Superfund site.[52] Risk level is established by considering "exposure pathways,"[53] which represent the various possible routes through which hazardous waste could reach an individual who comes into contact with a site.[54] Pathways are defined by the variables that influence how a person would become exposed to hazardous waste, such as population type (residential or worker), population age (adult or child), exposure medium (groundwater or soil), exposure route (dermal or ingestion), exposure frequency (daily or yearly), and exposure timeline (present or future).[55] An example exposure pathway might look something like a child (population age) living near an abandoned chemical facility who currently (exposure timeline) plays in and eats dirt (exposure route, exposure medium) from her backyard (population type) once a week (exposure frequency) that is contaminated with chemicals from the facility.

Risk assessors for Superfund sites are afforded broad discretion in envisioning exposure pathways.[56] Assessors essentially design

[50] EPA's Risk Assessment Guidance for Superfund, the guidance document used in performing risk assessments during the Remedial Investigation phase, has three categories into which it sorts Superfund sites: action-warranted, action-discretionary, and action-not-warranted. Sites with a calculated cancer risk level greater than 1/10,000 are sorted into the action-warranted category, sites with a calculated cancer risk level between 1/10,000 and 1/1,000,000 are sorted into the action-discretionary category, and sites with a calculated cancer risk level lower than 1/1,000,000 are sorted into the action-not-warranted category. There are also corresponding risk-level ranges for non-cancer risks. *See* HAMILTON & VISCUSI, *supra* note 9, at 26–27; VISCUSI, *supra* note 9, at 153; *see also* EPA, RISK ASSESSMENT GUIDANCE FOR SUPERFUND, VOLUME I (1989).

[51] VISCUSI, *supra* note 9, at 153.

[52] *See id.* at 153–54.

[53] *See* HAMILTON & VISCUSI, *supra* note 9, at 11.

[54] *See* W. Kip Viscusi & James T. Hamilton, *Are Risk Regulators Rational? Evidence from Hazardous Waste Cleanup Decisions*, 89 AM. ECON. REV. 1010, 1013 (1999).

[55] *See id.*

[56] *See* HAMILTON & VISCUSI, *supra* note 9, at 10.

pathways based on what they view as plausible scenarios and make assumptions regarding each of the relevant variables.[57] As such, the exposure pathways used to determine risk levels are not always constrained by the current circumstances at the site and its surrounding areas, but instead these pathways can include hypothetical scenarios that would arise if—at some point in the future—the land use were to change, or the exposure frequency were to increase, or some other variable were to adjust.[58]

To help clarify the distinction between real and hypothetical exposure pathways, consider two factories that, in the past, had both allowed some of the hazardous waste produced there to contaminate the surrounding area. The first factory is located within a residential neighborhood and continues to operate; the second is many miles from the nearest population center and was closed down after the release of hazardous waste. The pathways for the first factory would be real, because the exposure suffered by the factory's employees as well as the nearby residents is actually occurring at the present moment. Any exposure pathways for the second factory, however, could only be hypothetical. Risk assessors might predict that the factory will one day reopen and see its workers return, or believe that the area surrounding the factory might one day be developed into houses, but the exposure that would occur through these pathways is predicated merely on possible changes in the usage of currently-abandoned land. So real exposure pathways reflect risks emanating from the actual land use at the time of the risk assessment, whereas hypothetical exposure pathways are based on risks that might emerge in the future if the site's current land use changed moving forward.

Two key features of EPA's risk assessment methodology are referenced above but merit further elaboration here. First, in accordance with the individual risk approach, the size of the exposed population is not taken into account. Exposure pathways capture the risk a single individual would face by encountering a Superfund site, so hazardous waste with which one person might come into contact is evaluated no differently than hazardous waste with which one thousand people might come into contact.[59] The second crucial feature

[57] *See* VISCUSI, *supra* note 9, at 154–55.
[58] *See id.*
[59] *See* HAMILTON & VISCUSI, *supra* note 9, at 6, 15.

is that exposure pathways can be completely hypothetical, and more than that, risks associated with hypothetical pathways are given the same weight as risks associated with real pathways.[60] Risks presently faced by actual people are not distinguished from potential future risks to fabricated individuals.[61] The ultimate consequence of this combination of features is that, for the purposes of assessing risk, EPA treats a small number of hypothetical individuals who may never actually be exposed to hazardous waste the same as it treats a large number of real people who are already experiencing exposure.

C. *Inefficiencies in EPA's Methodology*

The methodological choices made by EPA suggest a belief that ensuring the cleanup of sites to which any single individual is or may one day be exposed offers the greatest degree of protection and creates the safest possible environment.[62] Taking individual and future risk levels into account might be a better idea if agency resources were unlimited and response times were rapid. Unfortunately, this is not the case.[63] Instead, EPA's risk assessment methodology diverts the Trust Fund's scarce resources away from large populations that need relief most urgently. By analyzing risk at the individual level rather than considering population size, EPA neglects the number of cancer cases that a Superfund site may cause and which remediation could prevent. Sites with less toxic contamination but with larger populations may be overlooked in favor of sites with more toxic contamination and smaller populations, even in circumstances where remediating the former would prevent more cases of cancer.[64] By valuing future risks identically to present risks, EPA ignores the probability that the land use surrounding a site will

[60] *See id.* at 6, 21.

[61] Risks presently faced by actual people will be referred to as "present risks," whereas potential future risks to fabricated individuals will be referred to as "future risks." Real exposure pathways generate present risks. Hypothetical exposure pathways, on the other hand, generate future risks.

[62] *See* VISCUSI, *supra* note 9, at 154.

[63] *See* SUPERFUND: TRENDS IN FEDERAL FUNDING AND CLEANUP, *supra* note 39, at 33; *Superfund Underfunded*, *supra* note 37, at 25; U.S. GEN. ACCT. OFF., *supra* note 42, at 1–2 ("EPA officials attributed the increased completion times for cleanups to the growing complexity of sites, efforts to reach settlements with parties responsible for site contamination, and resource constraints.").

[64] *See* VISCUSI, PRICING LIVES, *supra* note 9, at 154.

not change, meaning the site's hypothetical exposure pathway will never materialize and people will never actually be exposed to risk.[65] This oversight is a significant one, as over 70 percent of exposure pathways relied upon in Superfund risk assessments are hypothetical rather than real.[66] Once again, the limited budget for cleanup is rendered less successful at protecting real people from the dangers of hazardous waste.

The imprudence of weighing future risks and present risks equally grows clearer after reviewing the scenarios that have been envisioned for hypothetical exposure pathways. Many of these scenarios are contingent on people in the future gravitating toward Superfund sites.[67] This future behavior would be taking place after the sites have already been added to the NPL, despite the fact that areas are generally avoided once hazardous waste has been discovered and publicized.[68]

To illustrate the general unlikeliness and occasional absurdity of hypothetical exposure pathways, it is helpful to examine two scenarios that were used as part of risk assessments. The first was for a Superfund site in North Carolina. In designing an exposure pathway, risk assessors hypothesized that a factory would be built near the site on land that was currently unoccupied.[69] The assessors also made an assumption that hazardous waste from the Superfund site would leak into a creek close by, and further imagined that the hypothetical employees of the factory would cool off in this creek on their breaks.[70] So the level of risk attributed to this Superfund site was based on exposure that would occur only if a factory were built near the site, waste from the site were to reach a nearby creek, and the factory's employees were to seek out this creek for a swim during their downtime. Remarking on this exposure pathway, a professor at Duke University noted that, "[a]lthough I was on the Duke faculty in North Carolina for just over a decade, including some very

65 *See id.* at 154–55.

66 *See* HAMILTON & VISCUSI, *supra* note 9, at 11 (describing the role of future risk in EPA's risk assessment calculations).

67 *See id.*

68 *See id.*

69 *See* VISCUSI, *supra* note 9, at 155–56.

70 *See id.*

hot days, I don't know of any workers who went swimming in nearby creeks to cool off"[71]

The second example is no less far-fetched. At a hazardous waste site in New Hampshire, risk was measured according to children playing in the soil and ingesting some of the dirt on 245 days out of the year.[72] In addition to the assumption that children would have a craving for dirt three or four times each week, it was also an assumption that children would show up at all, as the area was a swamp, and future land development had been deemed unlikely.[73]

When EPA assigns the same weight to risks faced by a single, hypothetical person as it does to risks faced by many real people, large populations currently experiencing risk are treated inequitably. This inequitable treatment can be demonstrated by comparing costs per averted case of cancer.[74] As a result of its individual risk approach, EPA expends a greater cost per averted case of cancer at sparsely populated sites than it does at sites which are densely populated. Similarly, because EPA declines to adjust the risk level of hypothetical exposure pathways to capture the probability that these pathways may never arise, the cost per averted case of cancer spent protecting hypothetical individuals is greater than that spent protecting real people.

Although studies measuring cost per averted case of cancer do not distinguish between cancer cases prevented in real and hypothetical individuals, there is some evidence as to how the cost per averted case of cancer differs between sparsely and densely populated sites. In a study of 150 Superfund sites, researchers found that EPA planned to spend $2.2 billion in remediation costs and expected to prevent 731 cases of cancer, yielding $3 million as the

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[71] *Id.* at 156.

[72] *See* STEPHEN BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION 11–12 (1993).

[73] *See id.*

[74] The cost per averted case of cancer attempts to capture the dollar amount that must be spent on a regulatory intervention in order to prevent an individual from developing cancer. An averted case of cancer in this context, therefore, refers to a person who would have developed cancer as a result of exposure to a Superfund site, but did not because the site was remediated through CERCLA. *See* PRICING LIVES, *supra* note 9, at 158. *See generally* W. Kip Viscusi, *Risk Equity*, 29 J. LEGAL STUD. 843 (2000).

average cost per averted case of cancer across these sites.[75] However, when the median cost per averted case of cancer was calculated, that figure surged to $388 million.[76] The costs per averted case of cancer at each particular Superfund site varied from as low as $20,000 to as high as $1 billion, and 70 percent of sites had costs per averted case of cancer greater than $100 million.[77]

Sites with the highest costs per averted case of cancer had bloated figures not because their cleanups were more expensive but because they had the lowest number of expected cancer cases without remediation.[78] This might indicate[79] that these sites had the fewest people living nearby. Therefore, beyond demonstrating that the amount of resources devoted to preventing each case of cancer ranges widely from site to site, these numbers also suggest that EPA is remediating more Superfund sites that are sparsely populated than those that are densely populated, apparently as a result of its individual risk approach. EPA's exorbitant expenditures per averted case of cancer seem even more questionable in light of the fact that the most common exposure pathway is hypothetical, not real.[80] A significant portion of Superfund resources are thus "preventing" cancer cases in mere hypothetical people—that is, "people" who may never have come into contact with a Superfund site regardless of EPA's cleanup actions.[81]

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[75] *See* James T. Hamilton & W. Kip Viscusi, *How Costly Is Clean? An Analysis of the Benefits and Costs of Superfund Site Remediations*, 18 J. POL'Y ANALYSIS & MGMT. 2, 18 (1999).

[76] *See id.*

[77] *See id.*

[78] *See id.* at 19–21.

[79] Unfortunately, data on the size of the exposed population was not available in the study.

[80] *See* HAMILTON & VISCUSI, *supra* note 9, at 11 (observing that hypothetical exposure pathways account for over 70 percent of the total exposure pathways on which EPA risk assessments are based).

[81] It is relevant to acknowledge that the average cleanup cost for Superfund sites that carry present risks (those generated by real exposure pathways) is greater than the average cleanup cost for sites that carry future risks (those generated by hypothetical exposure pathways). *See* Hamilton & Viscusi, *supra* note 75, at 21. While it is reassuring that EPA tends to allocate more resources toward present risks than toward future ones, whether the agency does so intentionally is unclear. More importantly, though, average dollar amounts do not speak to the type of risk that EPA addresses most frequently or to the total dollar amount devoted to addressing each risk type. Hypothetical exposure pathways still outnumber real exposure pathways by a ratio of more than two-to-one. *See* HAMILTON & VISCUSI,

D. *An Issue of Environmental Justice*

The inefficiencies in EPA's methodology become an environmental justice concern when one recognizes that the communities surrounding Superfund sites are comprised disproportionately of people of color. Approximately six percent of all people in the United States live within one mile of a Superfund site. That number expands to 22 percent when the radius is widened to three miles. For people of color, however, eight percent live within one mile of a site and 28 percent live within three, representing a roughly 30 percent bump above the average for each.[82] Examining the population demographics at the sites themselves, people of color account for 49.8 percent of people living within one mile of a Superfund site and 49.4 percent of people living within three miles of a site, yet make up only 39.6 percent of all people living in the United States.[83] Thus, people of color are represented at Superfund sites at a rate that is 25 percent higher than their share of the overall population. Moreover, communities of color are the most likely to be exposed in residential settings, where exposure may occur on a daily basis and where children—who are typically the most vulnerable[84]—will experience the exposure.[85]

Scholarship specifically associating EPA's risk methodology with environmental justice is sparse, and limited evidence has been gathered that directly displays the relationship. But one study examining population demographics at remediated Superfund sites is helpful. The study found that people of color were represented at the sites that EPA chose to remediate at just 17 percent[86]—staggeringly low compared to the 50 percent representation across all Superfund

supra note 9, at 11 (observing that hypothetical exposure pathways account for over 70 percent of the total exposure pathways on which EPA risk assessments are based). Future risks therefore persist as a significant object of Superfund spending, and EPA must more seriously incorporate the probability that the hypothetical exposure pathways from which these future risks spring may never materialize.

82 *See Population Surrounding 1,857 Superfund Remedial Sites*, EPA (Sept. 2020), https://www.epa.gov/sites/production/files/2015-09/documents/webpopulationrsuperfundsites9.28.15.pdf.

83 *See id.*

84 *See* LIZ CREEL, CHILDREN'S ENVIRONMENTAL HEALTH: RISKS AND REMEDIES 1 (2002).

85 *See* VISCUSI, PRICING LIVES, *supra* note 9, at 156.

86 *See* Viscusi, *Risk Equity*, *supra* note 74, at 860.

sites.[87] The first figure is barely one-third the size of the second, indicating that the current Superfund policy habitually overlooks sites that have the largest nearby communities of color. More information is vital, but even early signs show that the current policy is inadequate to equitably protect people of color.

EPA's failure to either consider population size or distinguish between real and hypothetical exposure pathways adversely affects anybody who currently resides near a Superfund site. The sites that should be given priority—those to which the largest number of people are currently exposed, and which therefore generate real risk and can cause the most widespread, near-term harm—too often wait in line for remediation behind sites to which fewer people are exposed, or that merely have potential to someday generate risk, as, currently, there is no exposed population. All people facing Superfund exposure are disadvantaged by this backward prioritization. But because of the disproportionate rate at which people of color both live in close proximity to Superfund sites and are exposed in residential capacities, these groups are especially disadvantaged by EPA's risk methodology.

II. THE SITING STAGE

A. *Tort Law and Perverse Incentives*

It may be more than mere coincidence that people of color have the highest rates of exposure to Superfund sites. Instead, polluters may be responding to an incentive structure created by tort law. When damages are granted in tort cases, conventional practice is to calculate the award using employment statistics that vary by race.[88] Because past and ongoing discrimination has stifled wages and restricted job opportunities for people of color, tort law—by incorporating race-based data—encourages the allocation of risk toward these groups.[89]

After proving that she has been wrongfully injured, a plaintiff is entitled to recover those lost wages which she would have

[87] *See* EPA, *supra* note 82.

[88] *See* Yuracko & Avraham, *supra* note 2, at 327.

[89] *See id.*; Chamallas, *Civil Rights in Ordinary Tort Cases*, *supra* note 4, at 1439; Chamallas, *A Constitutional Argument*, *supra* note 4, at 75; Meyerson & Meyerson, *supra* note 4, at 806.

otherwise gained over her lifetime.[90] This award for lost earning capacity is determined by three central factors: "expected wages, work-life expectancy, and life expectancy."[91] Expected wages mimic the salary with which a plaintiff would have been compensated throughout her career and are compiled in the annual wage tables published by the Bureau of Labor Statistics (BLS).[92] Work-life expectancy measures the length of time a plaintiff would have been likely to remain active in the workforce.[93] This factor dictates the number of years by which the expected wages will be multiplied, and consequently has considerable influence over the total dollar amount a plaintiff will recover.[94] There are two main sources to which experts most commonly refer in determining a plaintiff's work-life expectancy: BLS tables and tables developed by economists Gary Skoog, James Ciecka, and Kurt Krueger.[95]

Compensation for lost earning capacity is not only linked to the plaintiff's income, but also adjusts according to the plaintiff's race.[96] In court, expert witnesses vary their estimates for both expected wages and work-life expectancy along racial lines.[97] While the wage tables provided by BLS do not contain racialized figures, experts tend to modify these numbers so that they ultimately reflect the plaintiff's race.[98] With regard to work-life expectancy, the tables published by Skoog, Ciecka, and Krueger decline to include statistics that differ by race,[99] but the BLS tables do incorporate racial discrepancies.[100] Moreover, practitioner-oriented materials recommend acknowledging race when calculating both expected wages and work-life expectancy.[101]

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90 *See* Ronen Avraham & Kimberly Yuracko, *Torts and Discrimination*, 78 OHIO ST. L.J. 661, 665 (2017).

91 Yuracko & Avraham, *supra* note 2, at 331.

92 *See id.* at 331.

93 *See* Martha Chamallas, *The Architecture of Bias: Deep Structures in Tort Law*, 146 U. PA. L. REV. 463, 481 (1998).

94 *See* Avraham & Yuracko, *supra* note 90, at 666.

95 *See* Yuracko & Avraham, *supra* note 2, at 331.

96 *See id.* at 327.

97 *See* Avraham & Yuracko, *supra* note 90, at 674; Yuracko & Avraham, *supra* note 2, at 331.

98 *See* Yuracko & Avraham, *supra* note 2, at 331.

99 *See* Avraham & Yuracko, *supra* note 90, at 674.

100 *See id.*

101 *See* Chamallas, *A Constitutional Argument*, *supra* note 4, at 82.

Reliance on race-specific data is broadly accepted. In a survey of forensic economists—the expert witnesses who calculate lost earning capacity—almost half of those interviewed stated that they incorporate race-based statistics into their calculations.[102] In fact, a forensic economist who had performed thousands of lost-earning calculations testified in federal court that he had never been asked to provide a race-neutral analysis.[103] Historically, judges have rarely rejected the introduction of race-specific data,[104] and even plaintiffs' lawyers fail to frequently mount challenges to this practice.[105] Studies of tort awards confirm that the imbalances in wages and work-life expectancy statistics leave wide gulfs separating the dollar amounts that are supposed to be making injured parties whole: damages granted to Black plaintiffs are only 74 percent as large as those paid to white tort victims.[106]

Motivated by this tilted damages scheme, tortfeasors may intentionally alter their behavior for the purpose of channeling risk-generating activities away from white plaintiffs and toward people of color. The use of race-specific statistics aggravates discrimination against communities of color by creating incentives to disproportionately allocate risk toward these communities.[107] Because damages granted to plaintiffs of color are skewed downward, tortfeasors can avoid costly litigation outcomes if they conduct their riskiest activities in areas with large populations of color.[108] Tort law thereby encourages the siting of hazardous waste facilities in or

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[102] *See* Dariely Rodriguez & Hope Kwiatkowski, *How Race, Ethnicity, and Gender Impact Your Life's Worth: Discrimination in Civil Damage Awards*, LAWYERS' COMM. FOR C.R. UNDER L. 3 (July 2018).

[103] *See* United States v. Bedonie, 317 F. Supp. 2d 1285, 1315 (D. Utah 2004).

[104] *See* MARTHA CHAMALLAS & JENNIFER B. WRIGGINS, MEASURE OF INJURY: RACE, GENDER, AND TORT LAW 161–66 (2010) (describing rare cases in which courts have rejected this data and noting that "after years of neglecting the issue, some courts are finally expressing doubts about the legality and fairness of . . . race-based assessments . . . .").

[105] *See* Chamallas, *Civil Rights in Ordinary Tort Cases*, *supra* note 4, at 1437 ("[A]ttorneys for plaintiffs are not often primed to detect ways in which the value of their clients' injuries is infected by racial and gender bias or to discern how tort rules reflect a devaluation of particular social groups.").

[106] *See* Jennifer B. Wriggins, *Damages in Tort Litigation: Thoughts on Race and Remedies, 1865-2007*, 27 REV. LITIG. 37, 58–59 (2007).

[107] *See* Yuracko & Avraham, *supra* note 2, at 327.

[108] *See id.*

near communities of color, and it is some of these facilities that eventually devolve into Superfund sites.

B. *Empirical Evidence*

A robust body of evidence has been collected supporting the inference that tort law influences polluters to seek out locations where communities of color reside. Indeed, race has repeatedly been pinpointed as "the single best predictor of the distribution of air pollution, the location of municipal landfills, and the siting of hazardous waste facilities."[109]

Literature on this disparity first began to accumulate in the early 1980s, when the GAO published a study demonstrating that three out of the four major hazardous waste landfills in the southern United States were sited in areas that had disproportionate Black representation.[110] Further, the study determined that while income level may have played a role in the decision-making, these siting outcomes could not be attributed to socio-economic status alone.[111]

Four years after the GAO study was released, the United Church of Christ (UCC) Commission for Racial Justice issued its own report. The UCC report unveiled a national pattern of hazardous waste siting "in communities with the highest composition of racial and ethnic minorities."[112] The research also discovered that, compared to communities with no hazardous waste facilities, the percentage of people of color doubled in areas with a single hazardous waste site and tripled in areas with multiple sites.[113]

Evidence continued to mount through the 1990s. In a survey of literature on hazardous waste, the National Wildlife Federation found that sixty-three out of sixty-four studies reached the conclusion that racial and socio-economic disparities existed in the siting of hazardous waste facilities.[114] The survey also observed that race was deemed a more significant factor than income level in almost 75 percent of the studies.[115]

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109 *See* Northern, *supra* note 6, at 485.
110 *See id.* at 499.
111 *See id.*
112 *Id.* at 499–500.
113 *See id.* at 500.
114 *See id.*
115 *See id.* at 501.

These racial disparities in hazardous waste siting have persisted over time and remain widespread. As of 2008, communities of color were living disproportionately close to hazardous waste sites in 90 percent of EPA regions, and forty out of the forty-four states that contained at least one hazardous waste facility reported racial disparities as well.[116]

Shifting population demographics in the areas surrounding hazardous waste facilities offer particularly compelling evidence of tort law's perverse incentives. Research has revealed that people of color remain consistently overrepresented in the communities closest to hazardous waste facilities.[117] More remarkable, though, is the finding that facilities are sited in areas that are already undergoing a demographic shift toward greater representation of people of color, in that polluters select communities where white residents have already begun moving out and people of color have already begun moving in.[118] Therefore, the data not only suggest that populations of color "attract" hazardous waste, but also undermine the theory that the introduction of hazardous waste is what causes families of color to move into an area by making housing prices more affordable.[119] By at least casting doubt on competing explanations, the study lends strong credibility to the hypothesis that it is tort law incentives that drive Superfund sites to emerge disproportionately in communities of color.

Research has also revealed that, beyond the heightened likelihood that a hazardous waste facility will be located in a community of color, the facilities in these communities are roughly twice as risky as those in white communities.[120] This risk, termed "operations risk," refers to the likelihood that an accidental release will occur at a hazardous waste facility.[121] Disproportionately high operations risk to counties with larger populations of color was found

116 *See* Bullard & Wright, *supra* note 6, at 225.

117 *See* Paul Mohai & Robin Saha, *Which Came First, People or Pollution? Assessing the Disparate Siting and Post-Siting Demographic Change Hypotheses of Environmental Injustice*, 7 ENV'T RSCH. LETTERS, 18 Nov. 2015, at 1, 14–16 (2015).

118 *See id.* at 15.

119 *See id.*

120 *See* M.R. Elliott et al., *Environmental Justice: Frequency and Severity of U.S. Chemical Industry Accidents and the Socioeconomic Status of Surrounding Communities*, 58 J. EPIDEMIOLOGY & CMTY. HEALTH 24, 24 (2004).

121 *See id.*

to persist even after accounting for the disproportionately high presence of hazardous waste sites in these areas.[122] This may reflect a calculus by the owners of hazardous waste facilities that the increased costs of appropriate precautions are more expensive than the potential tort damages that would be awarded to plaintiffs of color in the event of an accident.

Perhaps more disturbing than shocking, it seems as though even local governments respond to the incentives to place hazardous waste sites in communities of color.[123] Cities and states dispose of hazardous waste in locations that have large populations of color, regardless of whether those locations are well-suited to handle such waste.[124] These governments appear conscious of the fact that, if they ever face liability for harm caused by hazardous waste, that liability will be cheaper if the people who suffer the harm are not white. Similarly, when polluters break the law, governments impose penalties that are five times higher when violations occur in white areas as compared to when they occur in communities of color,[125] apparently choosing to avoid deterring business rather than endeavoring to avoid lawsuits from non-white constituents. Indeed, after chemicals from a local landfill leaked into the Dickson County water supply, the government settled every lawsuit brought by its white constituents but refused to settle with the sole Black family who brought litigation, opting instead to take its chances at trial.[126]

C. *Case Studies*

1. Dickson County

The experience of the Holts—the Black family who was denied a settlement with the Dickson County government—is illustrative of how local governments betray an awareness of the tort incentives to direct risks toward people of color. The Holts lived on a 150-acre farm in the Eno Road community within Dickson County, Tennessee.[127] While Black residents accounted for just five percent of the

122 *See id.*

123 *See* Avraham & Yuracko, *supra* note 90, at 691.

124 *See generally* Bullard & Wright, *supra* note 6.

125 *See* Phil Brown, *Race, Class, and Environmental Health: A Review and Systematization of the Literature*, 69 ENV'T RSCH. 15, 22 (1995).

126 *See* Avraham & Yuracko, *supra* note 90, at 692.

127 *See* Bullard & Wright, *supra* note 6, at 227–29.

broader Dickson County population, Eno Road is a predominantly Black area.[128] Beginning in 1968, local businesses buried their industrial waste at an unlined, "open dump" landfill site immediately adjacent to Eno Road.[129] Shortly after the landfill was established, these local businesses also began transferring their waste materials from dumps located in the white areas of Dickson County to the Eno Road site.[130] The landfill constantly violated hazardous waste regulations and received multiple notices of noncompliance, which continued even after the Dickson County government purchased the site and took control of its operations in 1977.[131] Apparently unconcerned with these violations, the Tennessee Department of Environment and Conservation repeatedly extended the permits for the Eno Road landfill.[132]

The closest family to the Eno Road landfill was the Holts, whose farm was precisely fifty-four feet from the dump.[133] The farm had a private well, which the family used for drinking water. This well first displayed contamination with trichloroethylene (TCE)—a possible carcinogen that also may cause liver disease, kidney disease, diabetes, stroke, and various blood disorders—in 1988.[134] Although the initial TCE level was below the threshold deemed safe by EPA, this 1988 test was still noteworthy as the Holt well had never shown any toxic contamination before the Eno Road landfill was built.[135] By 1990, however, a test of the Holt well registered TCE levels that were five times greater than EPA's safety threshold.[136] When the well was resampled in response to the alarming numbers, the TCE level dipped back below the safety threshold but still remained high.[137]

Over the next ten years, the Holt well was consistently omitted from government testing of areas surrounding the Eno Road

128 *See id.* at 229.
129 *See id.* at 227.
130 *See id.* at 228.
131 *See id.* at 227–29.
132 *See id.* at 229.
133 *See id.*
134 *See id.* at 230–31.
135 *See id.* at 230.
136 *See id.* at 231.
137 *See id.* at 232.

landfill.[138] This omission occurred despite the well's history of contamination and its status as the drinking water source closest to the dump.[139] When it was eventually tested again in October 2000, the Holt family's private well had TCE levels at twenty-four times EPA's threshold.[140] This time, the resample showed no improvement: TCE levels increased to twenty-nine times the threshold.[141] The Holts were finally advised to stop drinking from their well and were connected to the county's water system.[142]

The Holts were both the only Black family to bring a lawsuit and the only family with whom Dickson County did not settle, but the county government treated the Holt family differently than white families long before litigation commenced.[143] Testing of water sources upon which white families relied was conducted more frequently than testing of the Holt well, despite the fact that the Holt well was closer to the landfill.[144] White families received prompt and clear communication when their water supplies became unsafe for drinking, whereas the Tennessee Department of Environment and Conservation waited three years to send a letter addressing the Holt family's well and merely expressed some ambiguous concern about the well's contamination.[145] White families were provided bottled water for drinking and cooking within forty-eight hours and the county swiftly integrated their houses into its water system, yet the Holts were allowed to drink from their well for twelve years after contamination was originally detected.[146]

2. Warren County

Another personification of tort law's impact on local governments is the Warren County landfill.[147] Warren was one of just six

138 *See id.* at 234–35.
139 *See id.* at 227–31.
140 *See id.* at 235.
141 *See id.*
142 *See id.*
143 *See id.* at 236–40.
144 *See id.* at 237–39.
145 *See id.* at 237–40.
146 *See id.*
147 The incident at Warren County was so egregiously mismanaged that the catastrophe is widely viewed as an impetus for the environmental justice movement. *See, e.g.*, *Environmental Justice History*, U.S. DEP'T OF ENERGY,

counties in eastern North Carolina in which Black residents made up over 50 percent of the population.[148] In 1982, a 142-acre hazardous waste landfill was introduced to Warren County's Afton community, where 84 percent of residents were Black.[149] The location chosen, however, was not environmentally suitable for a dump.[150] Ground water under the landfill was as shallow as just five feet beneath the surface, and residents depended exclusively on local wells to supply all of their drinking water.[151] The facility was constructed in predominantly-Black Afton nonetheless.[152]

After eleven years of operation, the landfill began to leak.[153] Community leaders pleaded with the state to terminate the facility and confront the environmental hazards the landfill had created.[154] When it was clear that the state had no intentions of doing so, Warren County residents requested the state to at least issue guarantees that the site was safe.[155] The state replied by insisting that the dump would not endanger those living close by, but these promises rang hollow when, in 2001, the state initiated a cleanup costing $18 million.[156]

The Afton landfill turned out to have caused such sweeping contamination that, in order to remediate the site, over eighty thousand tons of soil had to be excavated and then incinerated.[157] Unfortunately, one of the main pollutants produced by the facility was polychlorinated biphenyl (PCB), a substance that lingers in the environment for long periods of time and that can easily accumulate to harmful concentration levels.[158] As such, many Warren County residents worry that the PCBs may have migrated past the site's boundaries prior to cleanup, where the toxins could reach nearby

https://www.energy.gov/lm/services/environmental-justice/environmental-justice-history (last visited Nov. 4, 2021).

148 *See* Bullard & Wright, *supra* note 6, at 223.
149 *See id.* at 221–22.
150 *See id.* at 223.
151 *See id.*
152 *See id.* at 223–24.
153 *See id.* at 222.
154 *See id.*
155 *See id.*
156 *See id.*
157 *See id.* at 221.
158 *See id.*

water bodies and inflict further damage on humans and surrounding ecosystems.[159]

3. West Dallas

The residents of the West Dallas community suffered a similar fate as those of Warren County. The City of Dallas had a Black population that comprised less than 30 percent of its total constituency, but West Dallas—a rural neighborhood on the outskirts of the city—was over 85 percent Black.[160] A lead smelting plant was brought to West Dallas in 1934 and was designated to a plot of land next to one of the community's main school buildings.[161] In 1956, the Dallas Housing Authority decided to develop a public housing project in West Dallas, which the government placed directly in the path of the prevailing winds from the facility.[162] But even before the housing project was built, West Dallas was already "wholly inappropriate as a location for a lead smelter."[163]

By the time the plant reached the height of its operations in the 1960s, the smelter was flooding the West Dallas air with more than 250 tons of lead particles each year.[164] Because few households could afford air conditioning, the lead pollution found its way easily into people's homes during summers thanks to cracked windows and open doors.[165]

The Dallas government finally enacted an ordinance regulating lead emissions in 1968, but the city initially neglected to enforce it.[166] When the city eventually sued six years after passing the ordinance, it settled with the smelter for a paltry $35,000 penalty, which unsurprisingly had no impact on emissions levels.[167] It was ultimately a feature in the *Dallas Morning News* that instigated serious legal action by the city and state governments, but by the time the smelting plant was shut down in 1984, the damage was immense.[168]

159 *See id.* at 221.
160 *See* Northern, *supra* note 6, at 509.
161 *See id.*
162 *See id.* at 510.
163 *See id.*
164 *See id.*
165 *See id.*
166 *See id.* at 511.
167 *See id.*
168 *See id.* at 511–12.

Lead levels in the soil underneath the West Dallas Boys Club, which was walking distance from the facility, were measured at sixty times higher than the level considered dangerous to children.[169]

4. Noxubee County

The impact of tort incentives was on display once more in Noxubee County, Mississippi. Noxubee had the largest percentage of people of color out of any county in the state that had been deemed suitable to host a hazardous waste facility.[170] In 1993, the state was planning to site three different landfills all in Noxubee County.[171] The proposal would have sent 130 thousand tons of hazardous waste to Noxubee County every year, despite the fact that the entire state of Mississippi generated just 45 thousand tons of hazardous waste annually.[172] This plan appears even more unjust upon noticing that Noxubee County was already surrounded by two other hazardous waste facilities just outside its borders.[173] One of these facilities was located on the same drinking water aquifer above which one of the proposed landfills was also slated for siting.[174] The Sierra Club helped local groups file a complaint against the proposal, but it is unclear how the dispute was ultimately resolved.[175]

5. Connection to Tort Law

These scandals highlight the upsetting yet powerful influence of tort law. In Tennessee, not only did polluters switch their dumping grounds from those in the white areas of Dickson County to the landfill in Eno Road, but the government itself treated white and Black families differently throughout the ordeal.[176] In North Carolina, the state selected a location that was not appropriate for hazardous waste but adamantly assured Warren County residents that the landfill was safe for over a decade after it had begun to leak.[177]

169 *See id.*
170 *See id.* at 514.
171 *See id.* at 514–15.
172 *See id.* at 515.
173 *See id.*
174 *See id.* at 514–15.
175 *See* Michael Fisher, *Environmental Racism Claims Brought Under Title VI of the Civil Rights Act*, 25 ENV'T L. 285, 323–24 (1995).
176 *See* Bullard & Wright, *supra* note 6, at 226–41.
177 *See id.* at 222–23.

In Texas, the City of Dallas did little to enforce its own environmental regulations until a newspaper brought wider attention to the injustice being inflicted upon the West Dallas community.[178] And in Mississippi, the local government was entertaining a proposal to dump more hazardous waste in Noxubee County than the total amount produced by the state as a whole.[179]

The behavior outlined above aligns regrettably well with the symptoms that one would predict to find when tortfeasors internalize the incentives flowing from tort law's reliance on race-based data. In situations where such internalization has occurred, tortfeasors will make sure that their riskiest activities are concentrated in communities of color[180] and will decline to take adequate precautions against harm to these communities.[181] The first symptomatic behavior is evident in all four case studies just examined: each hazardous waste site was located in a community where Black residents comprised substantially more than 50 percent of the population.[182] The second is showcased in particular clarity by the actions of Dickson County and the City of Dallas. In Dickson, the dichotomous levels of protection provided by the government to its white and Black constituents typify the tort law-provoked conclusion that the costs of taking precautions to protect people of color outweigh the costs of potential damages if those individuals suffer harm.[183] A similar logic may illuminate the decisions by the City of Dallas to first overlook the lead smelter's environmental violations and to later accept an illusory penalty as settlement: losing the smelter's business seems to have been deemed more costly than facing litigation from the residents of West Dallas.[184]

It is worth noting that the communities in these case studies all had low average income levels and were generally politically

178 *See* Northern, *supra* note 6, at 510–11.

179 *See id.* at 515.

180 *See* Yuracko & Avraham, *supra* note 2, at 327.

181 *See* Ariel Porat, *Misalignments in Tort Law*, 121 YALE L.J. 82, 98–99 (2011).

182 *See* Bullard & Wright, *supra* note 6, at 222, 229; Northern, *supra* note 6, at 509; *Noxubee County, MS*, DATAUSA, https://datausa.io/profile/geo/noxubee-county-ms (last visited Feb. 18, 2022).

183 *See* Bullard & Wright, *supra* note 6, at 226–41.

184 *See* Northern, *supra* note 6, at 510–11.

powerless.[185] So it is plausible that these factors are what drove the discriminatory treatment of Black residents. But the environmental justice literature reviewed earlier, carried out over the course of several decades, persistently points in a single direction: race is the number one most accurate predictor of where hazardous waste sites will appear.[186] That race is more tightly tethered to hazardous waste siting than wealth is telling. Tort damages adjust downward for plaintiffs with low income levels, but those damages are depressed even further when the plaintiff is a person of color. Polluters face the cheapest liability not when the communities they pollute are poor, but when they are poor *and* non-white. Especially because research has indicated that the introduction of a hazardous waste facility does not induce the disproportionately-high representation of people of color near such facilities,[187] the empirical evidence combined with these case studies form a strong argument that the desire to avoid costly litigation—made possible by tort law's incorporation of race-specific statistics—is what pushes pollution toward populations of color.

III. TOWARD EQUITY

A. *Adjusting EPA's Methodology*

The depletion of the Superfund Trust Fund has prolonged response times to the most dangerous hazardous wase sites, elevating the importance of a sound Superfund prioritization process. EPA's current methodology, however, fails to prioritize the sites that have the highest likelihood of causing the greatest amount of harm. This failure impacts each community that finds itself in the shadow of a Superfund site, yet it is communities of color—as a result of tort

185 *See* Bullard & Wright, *supra* note 6, at 225; Northern, *supra* note 6, at 510, 513–14.

186 *See* Bullard & Wright, *supra* note 6, at 225 ("Even when statistical analyses take socioeconomic and other non-racial factors into account, race continues to be a significant independent predictor of commercial hazardous waste facility locations."); Northern, *supra* note 6, at 485, 502 ("[R]ace, as an independent factor irrespective of class, has been found to be the single best predictor of the distribution of air pollution, the location of municipal landfills, and the siting of hazardous waste facilities. . . . [R]ace is the single best predictive factor with respect to the siting of commercial hazardous waste facilities, even when other socio-economic characteristics of communities are taken into account.").

187 *See* Mohai & Saha, *supra* note 117, at 15.

incentives—that most frequently bear such a shadow's burden. To remedy this failure and the environmental justice issue it exacerbates, EPA must recalibrate its risk assessment methodology in a way that more faithfully commits to equity.

One notion of equity in addressing risks might standardize a maximum dollar amount that an agency is authorized to spend on each life that its regulations aim to save.[188] Instead of attempting to guarantee that regulatory programs offer identical outcomes, it is more achievable and arguably more fair to guarantee that regulatory decisions allocate similar resources across each intended beneficiary.[189] An agency would not be precluded from expending more funds on certain individuals than others if the price of the different regulatory interventions necessary to save those lives varies, but an agency might be precluded from spending above a certain dollar amount per any single life saved. This approach embodies the concept of equitable risk tradeoffs, a theory developed by Professor W. Kip Viscusi, which maintains that "a more meaningful and compelling risk equity concept is to have equity in terms of the cost per life saved."[190]

The value of a statistical life (VSL) framework deployed at federal agencies, including EPA, already seems to tacitly embrace this equitable risk tradeoffs concept. The VSL is a benefits measure that agencies assign to each life saved by a proposed regulation when conducting benefit-cost analyses in connection with that regulation.[191] To calculate the VSL, an agency determines the dollar amount that an individual would be willing to accept to face a small risk of death, and then divides that amount by the probability of that risk.[192] So if, on average, Americans would require $900 to face a 1/10,000 risk of death, the average VSL in the United States would be $9 million. The VSL is usually assessed by examining the wage premiums that individuals demand before accepting jobs that carry a slightly elevated risk of death, and therefore is derived from real preferences rather than from agency abstraction.[193] As instructed by

188 *See generally* Viscusi, *Risk Equity*, *supra* note 74.
189 *See id.* at 855.
190 *See id.*
191 *See* CASS R. SUNSTEIN, VALUING LIFE: HUMANIZING THE REGULATORY STATE 51 (2014).
192 *See* VISCUSI, *supra* note 9, at 23–26.
193 *See* SUNSTEIN, *supra* note 191, at 86.

Executive Orders 12,866 and 13,563, federal agencies conduct benefit-cost analyses by multiplying the VSL by the number of lives that a regulation is anticipated to save, and then comparing this figure to the regulation's anticipated costs.[194] While the outcomes of these comparisons are not binding, in that an agency may still be able to implement a regulation even if costs exceed benefits,[195] the incorporation of VSL into the analysis represents a reluctance to spend more than a certain dollar amount per life saved, thus resembling the concept of equitable risk tradeoffs.

The equitable risk tradeoffs concept can be applied to Superfund decision-making. This would simply entail placing a cap on the costs per averted case of cancer that EPA is authorized to spend at any given Superfund site.[196] A cap would still allow EPA to address sites that carry high individual risk levels yet relatively few expected cases of cancer without remediation. But a cap might preclude EPA from confronting sites such as those reviewed previously that have costs per averted case of cancer exceeding $1 billion, and maybe even those exceeding $100 million.

Imposing a cap on costs per averted case of cancer would force EPA to abandon its individual risk approach. Faced with a cap, EPA would need to begin more explicitly considering the number of people exposed to a Superfund site in order to assess the expected number of cancer cases without remediation. A cap would also motivate EPA to distinguish between real and hypothetical exposure pathways. Since a cap would serve as a plain instruction that the expected number of cancer cases must feature centrally in cleanup decision-making, EPA may be required to more seriously evaluate the likelihood that the future risks emanating from hypothetical pathways might not actually emerge. Only by doing so could the agency fulfill its obligation to more precisely calculate expected cancer numbers.

B. *Effects of the Methodological Shift*

Prohibiting exorbitant expenditures per averted case of cancer will promote equity amongst all populations living near Superfund sites. Under its individual risk approach, EPA diverts resources

194 *See id.* at 37, 51–53.
195 *See id.* at 37.
196 *See* VISCUSI, *supra* note 9, at 156–57.

away from high-density Superfund sites where many people are threatened by hazardous waste and toward low-density sites where a relatively small number of people are endangered.[197] In declining to distinguish between exposure pathways that are real and those that are hypothetical, EPA similarly diverts resources away from actual people and toward hypothetical ones who, ultimately, may never be exposed to risk.[198] A framework of equitable risk tradeoffs would require EPA to significantly adjust—if not completely abandon—both its individual risk approach as well as its over-reliance on hypothetical exposure pathways. With this new framework, EPA can more fairly distribute the scarce resources available in its Superfund Trust Fund. The distribution will be more efficient, too, as the constraint of a limited cleanup budget means that population size must be considered in order to prevent the greatest number of cancer cases.[199]

Once EPA embraces equitable risk tradeoffs and implements a cap on costs per averted case of cancer, the type of Superfund site that the agency remediates most frequently will start to look quite different. Sites with larger populations will gravitate toward the top of the NPL as individual risk levels fade in significance behind total expected cancer numbers. All else equal, more people exposed yields more expected cancer cases. Higher cancer numbers suppress the cost per averted case of cancer, meaning high-density Superfund sites will more consistently qualify for remediation than will low-density sites.[200] A shift will occur along the real-hypothetical spectrum as well. Because a cap insists that the number of expected cancer cases receive appropriate attention, EPA will begin to incorporate the probability that hypothetical exposure pathways may not

197 *See id.* at 153–54.

198 *See id.* at 154–55.

199 *See* HAMILTON & VISCUSI, *supra* note 9, at 6.

200 Empirical data confirm that a Superfund site's cancer numbers tend to be a more controlling influence on costs per averted case of cancer than does the total dollar amount spent in remediating a Superfund site. The highest costs per averted case of cancer belong not to Superfund sites that have the most expensive cleanups, but to the sites that have the fewest expected cases of cancer. *See id.* at 19–21. Conversely, sites with higher numbers of expected cancer cases have lower costs per averted case of cancer. *See id.* The relationship between population size and expected cancer cases means that, with a bigger role for total expected cancer numbers in EPA's risk methodology, Superfund sites where more people are exposed will more often be remediated.

materialize. Cancer cases associated with these pathways would be weighted downward by the amount corresponding to that probability. As a result, fewer sites with hypothetical exposure pathways will satisfy the cap.[201] Instead of indifference between small numbers of hypothetical individuals and large numbers of real people, risk assessments will finally push the Superfund Trust Fund's desperately-finite resources toward the latter.

EPA should be especially attuned to equitable risk tradeoffs because of the discrimination that tort law inflicts upon communities of color at the siting stage. There is convincing evidence that polluters and local governments alike recognize that the damages granted to non-white plaintiffs are lower than those granted to white tort victims. This awareness has translated into disproportionate siting of hazardous waste facilities in communities of color,[202] and even demographic data for Superfund sites show that people of color are overrepresented at or near these sites.[203] The connection is clear: hazardous waste facilities are intentionally located in areas with large populations of color, and eventually some of these facilities deteriorate and become so dangerous that they are placed on the NPL. Although a major tort reform would be necessary to reverse this trend from the siting stage direction,[204] EPA can at least begin to provide some relief at the cleanup stage by modifying its risk

[201] It should be emphasized that the proposed solution still allows EPA to address sites with hypothetical exposure pathways. The future risks emanating from these pathways do have potential to cause harm, especially in circumstances where EPA finds there is a high likelihood that the hypothetical pathway will eventually emerge. It is important that EPA retain the discretion to determine which hypothetical exposure pathways are the most likely to emerge as well as the ability to address sites that contain these "most likely" hypotheticals. But it is equally important that Superfund risk assessments acknowledge a crucial distinction: Real exposure pathways are *already* generating present risk, while even the "most likely" hypothetical exposure pathways only *might* generate future risk. Accounting for the probability that hypothetical exposure pathways may not materialize in no way precludes EPA from addressing these pathways, it simply tips the scale the appropriate degree toward real exposure pathways, which, necessarily, have a higher likelihood of causing harm.

[202] *See* Bullard & Wright, *supra* note 6, at 225; Northern, *supra* note 6, at 485, 499–501.

[203] *See* EPA, *supra* note 82.

[204] *See, e.g.*, Rodriguez & Kwiatkowsky, *supra* note 102, at 8–9 (showing Congress's failed attempt to pass this type of tort reform). *See generally* Catherine M. Sharkey, *Valuing Black and Female Lives: A Proposal for Incorporating Agency VSL into Tort Damages*, 96 NOTRE DAME L. REV. 1479 (2021).

assessment methodology to reduce the amount of time that communities of color must endure exposure to hazardous waste.

C. *Possible Causes for Concern*

One objection to integrating equitable risk tradeoffs into Superfund policy may be that fewer sites will be eligible for cleanup. While of course imposing a cap on the costs per averted case of cancer would take certain sites out of cleanup contention, the extent of the reduction in eligible sites would likely be less than anticipated. Recall the 150 sites from which data on costs per averted case of cancer were gleaned. The researchers studying these sites determined that, even if EPA adopted a modest cap of just $8.2 million per averted case of cancer, 97 percent of expected cancer cases could be prevented.[205] This statistic may not speak directly to the number of sites that would remain eligible, but it nevertheless illustrates that public health—in terms of cancer cases prevented—would not suffer by a significant margin if a cap were implemented. Arguing that a cap would adversely impact public health misses the mark, since the money saved by avoiding cost-ineffective cleanups would be reallocated to sites that have higher expected cancer cases. As such, this reprioritization promotes public health rather than jeopardizes it, regardless of the fact that the cap will disqualify some sites from cleanup eligibility.

Instead of criticizing the effects of equitable risk tradeoffs on public health, others may worry that this new approach will be less protective of the environment. It might seem reasonable to assume that shifting the focus away from contamination levels for the purpose of reaching the most densely-populated sites could leave behind a more toxic environment for inhabitants other than humans. Happily, the transition to an equitable risk tradeoffs framework might not be incompatible with environmental protection. The costs per averted case of cancer tended to be lower at sites where environmental standards designed to address ecological risks served as the basis for cleanup remedies, indicating that a cap will extinguish neither the eligibility of such sites nor the viability of such remedies.[206]

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205 *See* VISCUSI, PRICING LIVES, *supra* note 9, at 157.

206 *See* Hamilton & Viscusi, *supra* note 9, at 21.

A more complicated problem with the proposed solution stems from EPA itself. There is some evidence that the agency may struggle to respect the goals of the environmental justice movement, and even may make Superfund-related decisions that discriminate against people of color. EPA takes 20 percent longer to add hazardous waste sites located in communities of color to the NPL as compared to sites located in white neighborhoods.[207] And once it places a site on the NPL, EPA tends to take 12 percent to 42 percent longer to commence remediation of sites in communities of color.[208] Moreover, hazardous waste sites in these areas are more frequently addressed with less reliable "containment" cleanups rather than with the more reliable "permanent treatment" method.[209] These discrepancies do not appear to be simply a product of unequal political power. Even when communities of color successfully launched controversies over their Superfund site, these controversies were found to be 28 percent to 42 percent less effective at spurring EPA action as compared to controversies launched by white constituencies.[210] The reasons for this disparate treatment by EPA are unclear, but these studies suggest that the agency may have to do more than just tweak its methodology before it will be ready to equitably protect people of color.

CONCLUSION

The methodology EPA uses to determine which Superfund sites warrant the highest priority disadvantages those sites that truly should be remediated most immediately. EPA refuses to account for population size and declines to distinguish between real people and hypothetical individuals, thereby misallocating the Superfund Trust Fund's depleted resources. Funneled through the incentive structure created by tort law, hazardous waste is disproportionately deposited in communities of color, which in turn means that Superfund sites emerge in these communities at disproportionately high rates. To prevent discrimination against people of color at both the siting stage *and* cleanup stage of hazardous waste decision-making, EPA

207 *See* Brown, *supra* note 125, at 21.
208 *See id.*
209 *See id.*
210 *See id.* at 22.

should implement a framework of equitable risk tradeoffs when prioritizing the Superfund sites that demand attention first.