

# EXHIBIT 3

**FILED**

MAR 29 2011

Edward J. Ryan, J.S.C.

**OPINION OF HON. EDWARD J. RYAN, J.S.C.**  
 SUPERIOR COURT OF NEW JERSEY  
 LAW DIVISION: MIDDLESEX COUNTY  
 P.O. BOX 964  
 NEW BRUNSWICK, NJ 08903-0964

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION; THE COMMISSIONER OF THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION; AND THE ADMINISTRATOR OF THE NEW JERSEY SPILL COMPENSATION FUND,  Plaintiff,  v.	SUPERIOR COURT OF NEW JERSEY MIDDLESEX COUNTY, LAW DIVISION  DOCKET NO.: MID-L-5632-07
UNION CARBIDE CORPORATION,  Defendant.	CIVIL ACTION  <u><b>OPINION OF THE COURT</b></u>

**Argued On: October 12 to 26, 2010**

**Decided On: March 29, 2011**

**A. Paul Stofa, Deputy Attorney General, for Plaintiff (Department of Law and Public Safety, Division of Law)**

**Alan E. Kraus, Kira Dabby, Kegan A. Brown, and Shawn M. LaTourette for Defendant (Latham & Watkins, LLP)**

**Ryan, J.S.C.**

Plaintiffs, as designated trustees of the natural resources of the State of New Jersey, have brought suit against the Union Carbide Corporation ("Defendant" or "UCC") to compel the expedited cleanup of contaminated groundwater underlying Defendant's former manufacturing site in Piscataway Township and Middlesex Borough, Middlesex County. Plaintiffs also seek natural resource damages under the New Jersey Spill Compensation and Control Act ("Spill Act"), N.J.S.A.

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58:10-23.11 to -23.24, to compensate the State for decades of groundwater contamination by hazardous chemicals used and manufactured at the site. The issues before the court are: (1) whether this court should order an expedited cleanup schedule to supersede the existing site remediation plan and agreement between Defendant and the New Jersey Department of Environmental Protection (“NJDEP”); and (2) whether Plaintiffs are entitled to compensation for interim damages to groundwater at Defendant’s site, and, if so, in what amount.

**FACTS**

Defendant’s Bound Brook property (the “Site”) is located on River Road in Piscataway Township and Middlesex Borough. The site includes a manufacturing facility on approximately 274 acres (a large portion of which is vacant), and a 13 acre landfill on an adjacent property. Defendant acquired the site in the late 1930s from the Bakelite Corporation, an early innovator in plastics manufacturing that operated a plant on the site from about 1931. Defendant significantly expanded the facility in the following decades to produce phenolic resins, polystyrene, polyethylene, and formaldehyde. At its peak in the 1970s and ‘80s, thousands of workers were employed in manufacturing and research-and-design in more than 50 buildings and offices on the site. Defendant began winding down its manufacturing operations in the 1990s, and decommissioned the plant between 2002 and 2006. Today almost all of the manufacturing buildings have been demolished.

It is undisputed that Defendant’s historical operations contaminated groundwater below the site. For many years UCC disposed of liquid operational wastes by direct discharge to unlined ditches, pits, and lagoons, and to an on-site sewer system that emptied into the Raritan River. Discharges also occurred through raw material storage practices and incidental spills around the property. Between 1940 and 1962, UCC disposed of solid wastes, including certain

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hazardous process wastes, in a landfill located on a narrow strip of property next to the River. These practices contaminated various portions of the plant site with hazardous wastes and byproducts from the manufacturing process, including phenols and volatile organic compounds ("VOCs"). UCC's records indicate that these disposal practices were discontinued over time, that the plant's sewer was connected to the municipal waste treatment system sometime in the late 1950s, and that the company adopted progressively stricter protocols for preventing and cleaning up accidental discharges.

In the early 1980s, UCC opened an investigation into contamination at the site. In 1987, UCC entered into an Administrative Consent Order with NJDEP's Site Remediation Program ("SRP") and assumed responsibility for remediation of contaminated soil and groundwater. The SRP oversees cleanups to ensure that parties responsible by law remediate contaminated sites to comply with health-based standards adopted by NJDEP. Various staff members at the SRP have been assigned to work with Defendant and assess Defendant's progress since the 1980s, including a site manager (currently Mark Souders) and a supervising geologist (Ann Pavelka since 1992). Mr. Souders and Ms. Pavelka, as representatives of the SRP called to testify in this case, explained that, within the NJDEP, the SRP has primary responsibility for review and approval of remedial activities occurring on the site.

UCC submitted two investigation reports in 1989 and 1991 analyzing the results of groundwater testing from monitoring wells around the property to determine the nature and extent of contamination. Using monitoring well data, UCC's environmental consultant derived isoconcentration maps for classes of contaminants at three depths below the site (referred to as the shallow, intermediate, and deep intervals). To create these maps, the consultant interpolated from discrete well readings to estimate contaminant levels across the site at each interval. On the basis of these investigations, UCC's consultant identified six Areas of Concern ("AOCs") that

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roughly correspond to regions on the maps where estimated concentrations exceeded ground water quality standards (“GWQS”) in one or more contaminant class. These AOCs are not, however, representations of contaminant plumes. Areas within the AOC may, upon further investigation, prove to be clean. Instead, the AOCs show discrete regions of known or suspected contamination and serve to focus subsequent cleanup efforts.<sup>1</sup>

After considering various remediation techniques, UCC settled on a pump-and-treat system to extract groundwater from recovery wells for treatment and discharge to the sewer. However, when engineers drilled test recovery wells in the shallow and intermediate intervals, the pumped rate of flow of groundwater was far below the 15 gallons per minute (“gpm”) expected by UCC engineers. James Struck, an engineer who was involved with this project in the 1990s, testified that the wells produced at a rate of only 0.1 gpm, indicating that water moved “very slowly” through tiny pores and fissures in the bedrock. To speed recovery (and thereby shorten the site’s remediation schedule), the engineers decided to mechanically increase flow in the areas of the recovery wells by hydraulically fracturing the bedrock. Short bursts of water under extremely high pressure were pumped into the recovery wells to expand natural fractures in the bedrock and thereby increase groundwater flow back into the recovery wells. This process artificially increases bedrock porosity<sup>2</sup> near the wells, but it does not increase the amount of groundwater under the site.

When UCC submitted its Remedy Selection Report to the SRP for approval of its pump-and-treat system in 1995, its consultant estimated bedrock porosity as 30% to account for the localized effects of hydraulic fracturing at the proposed recovery wells. This figure is

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<sup>1</sup> The term ‘Area of Concern’ is defined in New Jersey’s Technical Requirements for Site Remediation as “any existing or former distinct location where any hazardous substance, hazardous waste, or pollutant is known or suspected to have been discharged . . . .” N.J.A.C. § 7:26E-1.8.

<sup>2</sup> Porosity is a measure of the amount of void space present in an aquifer available for water storage. Primary porosity is roughly analogous to density and describes the amount of void space between particles of ‘solid’ rock, whereas secondary porosity is a measure of void space created by fractures, fissures, and cracks in the bedrock. Total porosity—also called effective porosity—is the cumulative measure.

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significantly higher than other porosity estimates for Brunswick shale bedrock in the Newark Basin that underlies the site. In 1999 the United States Geologic Survey ("USGS") published the results of a tracer test in the Brunswick formation at the same relative depth of study as the conditions at Defendant's site. USGS determined the effective porosity of the shale to be between 0.037% and 0.14%. Mr. Struck testified that the 30% figure used in the Remedy Selection Report does not reflect the natural porosity of the bedrock, and that this number should not be used to calculate the amount of groundwater naturally occurring in the shallow and intermediate intervals, which is, in his words, "very small." In the remedy design approved by SRP, recovery wells were situated to ensure that the radius of influence of the fracturing from the wells would blanket areas of highest concentration indicated by groundwater monitoring.

The system was installed and began pumping in 1997. UCC's design placed 35 wells at shallow and intermediate intervals distributed between the six AOCs. UCC concluded that deep wells were not warranted because its 1989 and 1991 studies indicated minimal contamination levels in the deep interval. SRP reviewed and approved the design of the system, including the number, location, and depth of the recovery wells. Plaintiff's remediation expert, Gaynor Dawson, acknowledged that the system has been successful at containing the contaminant plumes and has reduced contaminant concentrations based on available monitoring data.

UCC has also completed two rounds of soil excavations to remove lingering sources of contamination that threaten to leach into the groundwater. Between 1997 and 1999, the company removed approximately 28,000 tons from the site. After the site was decommissioned and many manufacturing buildings demolished, UCC excavated another 26,100 tons between 2007 and 2009.

Defendant also applied to the SRP for a Classification Exception Area ("CEA") designation in 2001. The application identified areas where groundwater contamination

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exceeded water quality standards, and designated the entire site as a CEA to ensure that groundwater would not be used for drinking water. UCC projected that remediation of groundwater to GWQS levels would be complete by 2024, and committed to regular groundwater sampling to monitor progress. The SRP approved the application in 2002, accepting UCC's projected end date, and acknowledging that there are no drinking wells tapping the contaminated aquifer and that no uses have been proposed. As of the time of this trial, remediation efforts are continuing at the site according to the means and schedule approved by the SRP.

**DISCUSSION**

The main issue in this case is whether Plaintiffs are entitled to primary and compensatory restoration damages under the New Jersey Spill Act. Primary restoration is the remedial action that returns the natural resources to pre-discharge conditions and compensatory restoration is compensation for the natural resource services lost from the beginning of the injury through to the full recovery of the resource. Plaintiff also brings public nuisance and trespass tort claims against Defendant for invasion of a natural resource in the public trust.

***Primary Restoration Damages***

Plaintiff asks the court to compel Defendant to restore groundwater to predischARGE conditions in the shortest amount of time possible. Plaintiffs' remediation expert, Mr. Dawson, estimates that the current pump-and-treat system will require an additional 30 to 36 years to return groundwater under the site to pre-discharge conditions, measured by the lowest technologically detectable amount of any discovered contaminant. According to the testimony of the SRP's site manager at Defendant's property, Mr. Souders, this is not the standard that the SRP requires, nor is it the standard that Defendant relied upon when projecting the completion of its remedial responsibilities in 2024. Defendant argues that it will have met the requirements of

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the law by cleaning the groundwater to GWQS, which tolerate measurable concentrations of many chemicals at levels that do not affect health or safety.

Plaintiffs are not satisfied with this approach, nor do they believe that an additional 20 to 30 years is an appropriate timeframe to complete the cleanup. To that end, Mr. Dawson opined that drilling 24 additional pumping wells in the shallow and intermediate intervals would achieve the cleanup in only 8 to 9 years from now, at an added cost to Defendant of approximately \$500,000. Defendants argue that Plaintiffs have no authority to order UCC to implement additional remediation measures when the existing plan was reviewed and approved, and is currently supervised, by NJDEP's own Site Remediation Program. Further, Defendant contends that there is no statutory or regulatory basis for Plaintiff's position that cleanup must be completed in the shortest time possible.

This Court finds that Plaintiffs have not shown why they are entitled to expedited primary restoration. Defendants are currently remediating the property to the satisfaction of the SRP and Plaintiffs have not cited any authority as to why restoration must be completed in a shorter time frame. Plaintiffs failed to show that the groundwater, in its current state, poses any risk to human health or environmental safety that would justify an expedited cleanup. The Defendant has been working closely with the SRP and has been in full compliance with the requests of the SRP. This Court finds no basis to intervene when a division of the NJDEP has stated that it has no objection to the current primary restoration plan. Therefore, Plaintiff's claim for primary restoration damages is denied.

***Compensatory Natural Resource Damages***

Plaintiffs also seek compensatory natural resource damages for the period in which groundwater at the site has been, and will continue to be, contaminated until the primary restoration is complete. Plaintiffs have determined that the appropriate means of compensation



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is to ensure that a comparable volume of groundwater is protected from contamination in perpetuity, for which Plaintiffs seek monetary damages for the permanent protection of 200 undeveloped acres as open space. Plaintiffs' expert in hydrogeology, Gary Hokkanen, estimated the total volume of contaminated groundwater at the site from the time that UCC acquired the property. Relying on Mr. Hokkanen's volume calculations, as well as land value estimates compiled by a local appraiser, Plaintiff's natural resource damages expert, David Chapman, has assessed damages of \$31.3 million.

The parties in this case do not dispute the central importance of services to the valuation of resource damages. But they do disagree about how lost services should be accounted for in defining an appropriate remedy and assessing monetary damages. Defendant insists that lost services must be directly identified and quantified to seek damages for an injury to groundwater. Plaintiffs argue that trustees need not measure lost services directly; that damages can be estimated as the cost of in-kind restoration projects. Mr. Chapman explained his understanding that any injury to a natural resource, by definition, changes the services that that resource provides, and so it is impossible to injure a natural resource without somehow affecting the services it provides. So long as the trustee has an accurate measure of the scope of the injury, a restoration project that fully replaces the injured resource will restore services that have been compromised. Plaintiffs argue that direct replacement of the resource in an equivalent setting obviates the need for quantification of lost services.

Mr. Chapman and Defendant's economic expert, Dr. William Desvousges, disagreed about whether Mr. Chapman's method of assessment without quantifying services—called a Resource Equivalency Analysis (“REA”)—is appropriate to estimate damages for injuries to groundwater. Mr. Chapman acknowledged that REA is generally used for assessing damages to wildlife, specifically birds and fish, and not for groundwater injuries. However, Plaintiffs argue

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that NJDEP is entitled to deference in its interpretation and implementation of the provisions of the New Jersey Spill Act, including Plaintiffs' choice of remedy, although the agency has not formally adopted any rule or regulation concerning the calculation of natural resource damages. While federal regulations promulgated by the Department of the Interior and the National Oceanic and Atmospheric Administration both require trustees to identify and quantify lost services to establish damages under federal law, Plaintiffs argue that federal regulations are not binding here and do not limit the NJDEP's implementation of the state Spill Act.

This Court finds that the Plaintiffs failed to adequately identify a loss for which the public must be compensated. Mr. Chapman's use of REA in the context of groundwater is not supported by the testimony at trial or the prior uses of such an analysis. Even the Plaintiffs concede that REA is typically used in the context of wildlife, where it is almost impossible to quantify lost services. Groundwater is not such a resource that does not lend itself quantification. Plaintiffs merely failed to provide any real proof of those lost services that Plaintiffs assume to be present. The Plaintiffs claim they need not prove lost services to recover compensatory restoration damages. However, even assuming that is true, the Plaintiffs' calculation of the damages is far from irrefutable.

Mr. Chapman broke the REA into three steps: (1) quantify the interim injury by asking how much groundwater was contaminated and for how long; (2) determine whether a restoration project could properly offset the injury and how much restoration would be required; and (3) calculate the cost of implementing the project to assess damages.

To estimate the interim injury, Mr. Chapman relied on Mr. Hokkanen's calculations of the total volume of contaminated groundwater at the site through time. Combining calculations of past and future contamination, Mr. Chapman applied a three percent discount factor to inflate past volumes (and discount future volumes) to present value in Discounted Gallon Years

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("DGY") for base year 2010.<sup>3</sup> The total injury to groundwater—called a 'debit'—was calculated as 1.906 billion DGY between 1940 and 2018, the earliest date that primary restoration would be complete under Mr. Dawson's plan.

Mr. Chapman admitted that, if Mr. Hokkanen's calculations were wrong—concerning either the starting dates of the contamination or the total volume of groundwater, or both—then Mr. Chapman's calculation of compensatory damages is necessarily flawed. Defendant's hydrogeologist Scott MacDonald testified that Mr. Hokkanen's groundwater volume calculations are "vastly overstated" for many reasons, the most significant of which is his mistake about the porosity of the bedrock at the site. Mr. Hokkanen relied on a porosity value of 30%, although a USGS test in 1999 determined the effective porosity within the Brunswick Formation to be approximately 0.037% to 0.14%. Mr. MacDonald and Mr. Struck both testified that well yields and performance at the site, even after hydraulic fracturing of the recovery wells, indicate that there is far less water under the site than estimated, and that the porosity is a fraction of what Mr. Hokkanen estimated. This mistake alone could reduce Mr. Hokkanen's calculations of 1.9 billion gallons of contaminated groundwater to less than 20 million gallons.

Mr. Chapman's second step was to fashion a 'credit' to offset the injury debit of 1.9 billion DGY calculated in the first step. To offset injuries to groundwater, Mr. Chapman and Mr. Sacco both testified that the NJDEP favors aquifer protection through open space purchases funded by the responsible party. By purchasing private land before it is developed and protecting it in its natural condition, the NJDEP ensures that the underlying groundwater remains pristine. To determine the offset acreage, Mr. Chapman assumes that there will be the same

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<sup>3</sup> Discounting makes past and future costs comparable by converting them into present-day values. Users value consumption in the past more heavily than consumption in the present, so past consumption should be inflated, and future consumption discounted, to estimate the present value. For this reason, loss of groundwater in the past cannot be fairly compensated by replacing or restoring an equal volume today. In Chapman's words: "[I]f we contaminated a gallon of groundwater in 1940 and we're going to compensate by giving groundwater in 2010, just giving a gallon for gallon doesn't account for that time difference. . . . [A] loss in the past has be compensated for by additional amounts this year . . . ."

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volume of groundwater per acre below properties overlying the same or similar aquifer system as Defendant's site. Relying on Mr. Hokkanen's porosity estimates and groundwater volume calculations, Chapman projected that each equivalent acre purchased by the DEP will protect 0.95 billion DGY in perpetuity. Dividing this per-acre figure into the total 1.9 billion DGY debit, Mr. Chapman concluded that the restoration project must permanently protect 200 acres to offset the injury.

However, the restoration proposed in this case amounts to a windfall to Plaintiffs because Mr. Chapman made no adjustment for the different types and quality of services provided by the lost resource (groundwater) and the proposed restoration project (permanent land preservation). Undeveloped land provides services over and above protection of groundwater quality that are not accounted for in Mr. Chapman's analysis. For instance, open space is used and enjoyed by the public for recreation, and it provides wildlife habitat: examples of services that are not supported by groundwater, and were never at issue in this case. Nevertheless, Plaintiffs propose to charge Defendant for the costs of these additional services as part of the price of protecting 200 acres of land.

Finally, Mr. Chapman estimated the cost of implementing this project to assess damages in this case. Mr. Chapman requested a statistical summary of prices for recent sales of undeveloped properties zoned for residential, commercial, or industrial use—in other words, land uses that could potentially lead to contamination of the underlying groundwater if developed. Mr. Chapman relied on a spreadsheet of recent sales prepared in December 2009 by Joseph Baldoni, of Appraisal Associates Inc. At Mr. Chapman's request, Mr. Baldoni compiled a list of 80 undeveloped properties between five and one hundred acres in size within 20 miles of Middlesex Borough. From this survey of transactions, Mr. Chapman omitted high-side "outliers," properties that sold for far more per acre than the average for all the properties in each

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use class. Mr. Chapman averaged the sale price for all properties larger than 20 acres, omitting smaller properties to account for the likelihood that small properties will have a higher per-acre price. He multiplied the average per-acre price of \$156,500 by 200 acres to determine resource damages of \$31.3 million.

Clearly, there are problems with the Plaintiffs' analysis here. First and foremost, the NJDEP asks the Court to defer to its judgment to use REA instead of quantifying damages through lost services when it, itself, has never declared such an analysis to be appropriate. The federal regulations require quantification of lost services. NJDEP may elect a different theory or practice, but it cannot do so on a whim. There was no evidence presented at trial that REA is the recommendation or practice of the NJDEP. Notwithstanding that fact, the Plaintiffs have failed to adequately substantiate its calculations. For the most part, the Plaintiffs relied on Defendant's internal numbers, which representatives of the Defendant testified to be substantially conservative. Moreover, the porosity values used by the Plaintiffs lack credibility and the Plaintiffs' projected cost of implementing the project was convincingly refuted by the Defendant. Overall, the Plaintiffs failed to set forth a comprehensive calculation of compensatory restoration damages that the Court can endorse. Therefore, Plaintiffs' claim for compensatory natural resource damages is denied.

***Public Nuisance and Trespass***

"The tort of public nuisance fundamentally involves the vindication of a right common to the public." In re Lead Paint Litigation, 191 N.J. 405, 425 (2007).

A public nuisance is an unreasonable interference with a right common to the general public. Circumstances that may sustain a holding that an interference with a public right is unreasonable include the following (a) whether the conduct involves a significant interference with the public health, the public safety, the public peace, the public comfort or the public convenience, or (b) whether the conduct is proscribed by a statute, ordinance or administrative regulation, or (c) whether the conduct is of a continuing nature or has produced a permanent or

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long-lasting effect, and, as the actor knows or has reason to know, has a significant effect upon the public right.

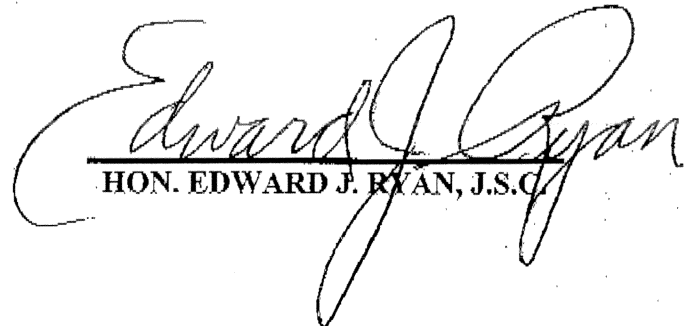
Id. “[A]ny actual invasion that was the direct result of the defendant's act and that interfered with the plaintiff's exclusive possession of his land constituted an actionable trespass, even in the absence of fault.” N.J. Dep't of Env'tl. Prot. v. Ventron Corp., 94 N.J. 473, 488-89 (1983).

In this case, the Plaintiffs have not satisfied their burden by showing that the contamination of the groundwater interfered with the general public's use of groundwater or that the discharges physically interfered with the public's use and enjoyment of the State's groundwater resource. The groundwater in question is under private property and has never been available to the public. Plaintiffs have not shown how the public has been deprived of anything. Therefore, Plaintiffs' claims for public nuisance and trespass must fail.

**CONCLUSION**

In sum, this Court finds that the Plaintiffs failed to meet their burden to obtain an award of primary restoration or compensatory restoration damages. This Court further finds that Plaintiffs' claims for public nuisance and trespass must fail. Therefore, this Court finds in favor of the Defendant and the Plaintiffs' Complaint is dismissed with prejudice.

So Ordered.

  
HON. EDWARD J. RYAN, J.S.C.