

The New York Environmental Lawyer

A publication of the Environmental Law Section
of the New York State Bar Association

A Message from the Chair

The disastrous tsunami in South Asia and the devastating hurricanes in the United States seem to have gotten the general public to begin to acknowledge the practical implications of how we are affecting our environment. Whether one might want to add that this awakening has occurred just in the nick of time, or that it's about time, the fact remains that government officials, regulators, members of the media, educators, and individuals now are paying attention to what many scientists have been trying to alert us to for several years. That is a good, good start.



Greenhouse Gases

Carbon dioxide, nitrous oxide, and certain other greenhouse gases such as methane and ozone occur naturally. Different ones, including hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), only result from human activity. Although the naturally occurring gases are important to the environment because they retain radiated heat and create a blanket of warm air around the Earth, excessive amounts of the gases—and particularly heat-absorbent ones such as HFCs and PFCs—are causing havoc.

The problem is a big one, to say the least. A recent article in the journal *Science* reported that there is more of three of these heat-trapping greenhouse gases—carbon dioxide, nitrous oxide, and methane—in the atmosphere now than at any time in the past 650,000 years, and that the fastest rate of increase occurred at the same time humans began to clear forests and use

significant amounts of fossil fuels. It also was reported that a Boulder, Colorado, laboratory's annual greenhouse gas index has risen 20 percent in 15 years, from 1.0 to 1.20.

The power of greenhouse gases to affect the environment is reflected in increasing average global temperatures (which, of course, is why a slight late autumn cold snap should not be sufficient to permit us to move on to other problems). Although some scientists reject the global warming analysis, many believe that rising temperatures have a wide range of effects, from raising sea levels and altering habitats—potentially leading to tens of millions of “environmental refugees” within a

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matter of years—to greater health risks due to the increasing geographical range of diseases such as malaria. In recent articles, Andrew C. Revkin of *The New York Times*, who was the keynote speaker at our Section's Annual Meeting in January, has particularly focused on the potential loss of the Arctic tundra as a direct result of global warming. The loss of the Arctic tundra is significant because the tundra absorbs more carbon dioxide than it releases, thereby helping to keep the whole planet healthy. It has been observed that warmer ocean temperatures can affect the number and intensity of tropical storms—emphasizing the significance of the record number of tropical storms and hurricanes this year—and even the duration of the season.

Steps Being Taken

As we discussed at our Annual Meeting, actions have been proposed and some already have been taken to alleviate the global warming problem. On an international level, the United Nations has proposed capturing and storing carbon dioxide from power plants. Scientists from G-8 countries have called for reducing greenhouse gas emissions, and the G-8 itself proposed a joint statement on global warming. Several months ago, the U.S. announced an agreement among China, South Korea, India, Australia, and the U.S. to develop technology to cut the production of greenhouse gases. As I write this message, a United Nations conference is underway in Canada. About 10,000 delegates from 189 governments, environmental lobby groups and businesses are working together to step up the fight against global warming by drawing as many nations as possible into U.N.-led agreements beyond 2012.

Although the Bush administration is reluctant to support mandatory global warming steps, a coalition of 130-plus mayors from cities across America recently expressed their support for the Kyoto Protocol. States are acting as well. Several months ago, California Governor Arnold Schwarzenegger announced a plan to reduce California's emissions in fewer than five years to levels that existed in 2000. More recently, the New York State Environmental Board approved state regulations that require significant reductions in greenhouse gas emissions from motor vehicles. New York and other states also are discussing how to develop a regional effort to reduce carbon dioxide emissions from power plants.

Individuals have begun to take steps, too, from using more insulation in their homes and purchasing energy-efficient products to driving less and encouraging conservation.

The situation remains dire, but knowledge and the marketplace may be starting to have an impact. Of course, what has euphemistically been called "climate change litigation" also may change attitudes, as well as some of the underlying economics contributing to global warming.

There is a long way for environmental lawyers and other environmentally sensitive players to go. But, to paraphrase Winston Churchill, we may, at last, be at the beginning of the beginning when it comes to dealing with the problem of global warming.

Miriam E. Villani

Catch Us on the Web at
WWW.NYSBA.ORG/ENVIRONMENTAL



From the Editor

The New York City (and Westchester) water system has been described as an engineering marvel. The system's continuing daily capacity to move rivers of water, to be disbursed across a sizable and geographically complex metropolitan region, is also a wonder. This characterization, though, does not minimize the need to worry about the operational and structural integrity of the system, the urgency of reliably providing potable water supplies to a burgeoning population, and, of course, security. Members may recall some of the controversy engendered by New York City's promulgation of regulations a few years ago, which were devised to restrict various kinds of construction activities and development in upstate municipalities in furtherance of maintaining the water quality of the City's drinking water sources. These regulations and the City's assertion of ownership rights occurred in the context of the potential need for the City to construct and maintain a significantly expensive filtration system. Previously, the Giuliani Administration, to plug budgetary gaps, also had been exploring ways to convey the water system to the New York City Water Board. That gambit raised numerous issues of constitutional and statutory interpretation (*Giuliani v. Hevesi*, 228 A.D.2d 348 (1st Dep't 1996), *aff'd*, 90 N.Y.2d 27 (1997)). The unsuccessful fiscal gimmick was not immediately related to watershed issues, but it underscored the extent to which this mammoth water system was in play. With regard to land uses in the watershed region, the City's genuine concerns clashed with the very different concerns of upstate communities. The threatened litigation had David-and-Goliath overtones. Members may also recall that Section members, including, if memory serves, Bill Ginsberg, were instrumental in devising the extant Watershed Agreement that currently governs land use in watershed communities. All aspects of this marvel of social infrastructure present continuing fascination, but also constant attention.

In this issue, David Leon provides our readers with a primer on the administrative appeals process for New York City's watershed regulations as they pertain to the construction of residential sewage treatment systems in watershed communities. After providing a short history, David explains the legal recourse for landowners who seek a variance, and the appeals process if the variance is denied. He illustrates the procedural path with actual cases. The article should be valuable for many of our suburban and Catskills region members.



Walter Mugdan, EPA's Director of Environmental Planning and Protection, and, of even more importance, our incoming Chair, submits an article which not only provides a primer on vapor intrusion, but also alerts members to current understandings of the dangers thereby imposed and policy changes. Walter's regular contributions to the *Journal* always provide good information and better advice.

Dan Riesel and Dan Chorost provide an alert that the U.S. Department of Justice, OSHA and EPA recently announced a joint program by which workplace violations may be criminally prosecuted by relying on environmental laws. RCRA may be an especially powerful statute in this regard, though the Clean Air Act and Clean Water Act are also available enforcement statutes. The enforcement initiative allows these agencies to share resources and to coordinate compliance and enforcement activities. The authors note that a similar strategy, using state environmental statutes to prosecute workplace safety crimes, has also been initiated by New York's Attorney General Eliot Spitzer. Although the public benefits of such a strategy may be significant, the article also serves as an alert to corporate and litigation defense counsel.

During the January 2006 Annual Meeting, discussions arose concerning a DEC permitting policy that allowed the New York State Department of Transportation to remove substantial amounts of timber from transportation corridors through the Forest Preserve. As many of our members know, the Forest Preserve enjoys a unique protection under the New York State Constitution. The question presented is whether an agency, let alone a conservation agency, may authorize conduct that at least appears to contravene constitutional prohibitions. I am told that the question, and its resolution, is the subject of ongoing discussion. Rosemary Nichols and Nick Robinson provide an article that explains the background of the controversy and its legal ramifications. Those ramifications, one might posit, extend beyond the immediate issue of whether trees may be removed from state roads. Governor Pataki's administration certainly has been supportive of open space and preservation endeavors, but agency actions that chip away at the Forest Preserve, even for understandable reasons, may inadvertently establish unfortunate precedents with unanticipated future consequences. The *Journal* anticipates that a future issue can report the final resolution of the constitutional dispute.

David Freeman, who has established his reputation in the area of hazardous waste and site remediation, and Desirée Giler Mann submit an article advising readers on aspects of due diligence practices that will

require modification with the "All Appropriate Inquires" rule. Larry Schnapf, another regular contributor to the *Journal* who enjoys a similar reputation, and Daryl Cabbagestalk, submit an article that addresses remediation of New York City contaminated sites, which undoubtedly will be valuable to many of our members.

Wendy Thomas of Columbia Law School (and presently at the Bronx County District Attorney's Office) provides a very comprehensive article on the current regulation of mercury under, *inter alia*, the Clean Air Act, Clean Water Act and RCRA. The author provides extensive documentation of the risks to human health posed by the ingestion and consumption of mercury-containing products, threats posed by traditional dental practices, and the ubiquitous presence of mercury compounds in the environment. She discusses the theoretical underpinning of the regulatory regime. She also addresses statutory and regulatory shortcomings, and agency failures to mitigate the demonstrated risks. Finally, the author proposes control options for existing as well as new facilities. The article is valuable for the depth of its research and the breadth of its discussion.

Joel Sachs provides information about the Section's trip to China in October 2006. Joel has been actively involved in the planning of several international excursions in the past that were sponsored by the Environmental Law Section, all of which drew rave reviews. China is a rapidly emerging economy and a major regional political actor. However, China has profound environmental problems, not least of which is its reliance on coal and other fossil fuels, which necessarily

burden its population but also present global concerns. This trip should provide a first-rate opportunity to get an up-close look at a fascinating ancient culture facing modern problems that would challenge the most adroit political system. China is especially interesting as a case study of a liberalizing economy within an unwieldy autocratic political structure that races to contend with a number of daunting generational, ethnic, geopolitical and infrastructural crises, as the environmental bill for its economic rush to modernity is being presented for payment. How China's state system as well as its society handle the health and environmental stressors will have ramifications for the world. Joel's information is included on page 70.

The *Journal* is actively interested in receiving proposals for articles from members and non-members that provide for our readers useful information and perspectives in the field of environmental law. Given the hybrid nature of the field, the *Journal* is receptive to a wide range of topics, which may vary in format from scholarly expositions, to updates on legal developments, to primers that help newer or less experienced members navigate some of the challenging pathways of environmental compliance and litigation.

Section committees are particularly urged to submit articles that will not only provide readers with valuable information about our numerous committees' respective fields, but may also likely attract readers to committee participation.

Kevin Anthony Reilly



REQUEST FOR ARTICLES

If you have written an article you would like considered for publication, or have an idea for one, please contact *Environmental Lawyer* Editor:

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Articles should be submitted on a 3½" floppy disk, preferably in Microsoft Word or WordPerfect, along with a printed original and biographical information.

The Floodgates Remain Closed: Administrative Appeals Under New York City's Watershed Regulations

By David Mark Leon

I. Introduction

On May 1, 1997, New York City's Department of Environmental Protection (DEP) implemented regulations restricting construction of new residential sewage treatment systems in the upstate watersheds from which the City derives its drinking water. Since then, nine different upstate landowners have filed administrative appeals from denials of variance applications in which they sought to construct new sewage treatment systems or to connect to existing local systems.

This article examines the nine cases and draws some conclusions based on common themes, with the objective of illuminating the bases upon which an upstate landowner can expect to have a variance application granted or denied. The focus here is on the substance of the administrative tribunal's decisions, as opposed to the administrative tribunal's procedure, or any New York State Supreme Court decisions.

II. A Brief History of New York City's Watershed Regulations

Every day, 1.3 billion gallons of water is delivered to New York City's 8 million residents from a watershed spanning 1,969 square miles, across eight counties north and northwest of the City.¹ In 1989, pursuant to the Safe Water Drinking Act amendments of 1986, the U.S. EPA promulgated the Surface Water Treatment Rule (SWTR), requiring that public water supply systems like New York City's, supplied by unfiltered surface water sources, either provide filtration systems or meet a series of water quality, operational and watershed control criteria.²

The New York City Department of Environmental Protection responded by submitting applications for filtration avoidance in 1991, 1992 and 1993. Each application was granted, but two elements of the 1993 application—upstate land acquisition and promulgation of regulations for the upstate watersheds—proved unacceptable to the residents of the upstate watershed communities. To address these and other concerns, Governor George Pataki convened a group of the involved government agencies and private parties. In November 1995, the parties reached an Agreement in Principle, and in January 1997, the parties signed a Memorandum of Agreement (MOA). The MOA supplemented the City's existing watershed protection programs with—among other things—revisions to the City's Watershed

Rules and Regulations, which address land use and development in the upstate watershed communities, including construction of new sewage treatment systems.³

III. Appeals to the New York City Office of Administrative Trials and Hearings

Landowners seeking to build any structure that does not comply with the watershed regulations may apply to DEP for a variance. A variance applicant must:

- (i) Identify the specific provision of the rules and regulations from which the variance is sought or identify the nature and extent of the alteration or modification of the noncomplying regulated activity;
- (ii) Demonstrate that the variance requested is the minimum necessary to afford relief;
- (iii) Demonstrate that the activity as proposed includes adequate mitigation measures to avoid contamination to or degradation of the water supply which are at least as protective of the water supply as the standards for regulated activities set forth in these rules and regulations; and
- (iv) Demonstrate that for the proposed use or activity for which the variance is requested, compliance with the identified provision of the rules and regulations would create a substantial hardship due to site conditions or limitations.⁴

The applicant bears the burden of proof on its variance application.⁵

If the variance is denied, the landowner may appeal to the New York City Office of Administrative Trials and Hearings (OATH), the City's central administrative tribunal.⁶ To prevail, the petitioner must show that DEP abused its discretion in denying the variance application.⁷ The OATH ALJ issues a report and recommendation to the DEP Commissioner, who then adopts, modifies, or rejects the ALJ's determination.⁸

Of the nine appeals so far filed at OATH, seven petitioners sought variances to build subsurface sewage treatment systems (SSTSs), commonly referred to as septic tanks. Two sought to connect to a local sewage treatment system. The sizes of the petitioners' properties ranged from one petitioner seeking a variance for his own single-family home on less than two acres, to a developer seeking a variance to build homes on over 130 acres. Four of the nine petitioners proceeded *pro se*. The most salient commonality among the cases, however, is the outcome: all nine of the OATH decisions affirmed DEP's variance denials.

The rest of this article analyzes each case and the OATH ALJs' bases for affirming the variance denials. Based on an analysis of the cases, one can draw some conclusions about what arguments may or may not succeed in these administrative appeals.

A. Early Cases (1998-2002)

*Simmons v. Department of Environmental Protection*⁹ was the first appeal from a DEP variance determination to be filed at OATH. The *pro se* petitioner sought reversal of DEP's denial of her SSTS variance application. Ms. Simmons' application for a variance was denied because proposed construction of an SSTS for her home violated watershed regulations for site, slope, separation, and depth.

On appeal, the OATH ALJ determined that DEP's denial of the variance application was not an abuse of discretion, because the petitioner had failed to demonstrate that the variance requested is the minimum necessary to afford relief, that the proposal would include any mitigation measures, or that denial would create a substantial hardship. Addressing the petitioner's "substantial hardship" argument, the ALJ noted, "the appellant's claimed hardship is the 'poor choice of contractor,' which presumably has ultimately led to her inability to legally occupy her house. However, § 18-61 requires substantial hardship due to *site conditions or limitations*."

Shortly after *Simmons* came *Guard Hill Farms Associates v. Department of Environmental Protection*.¹⁰ There, the petitioner owned a 138-acre parcel of land in the Town of Bedford in Westchester County. Petitioner proposed developing the parcel into a 30-lot residential subdivision, with 25 houses sharing access to a common subsurface sewage disposal area and four or five houses with individual septic systems.

DEP denied petitioner's variance application because the percolation rate of the soil at the development site was faster than three minutes per inch.¹¹ In denying the variance application, the Department concluded that petitioner had two alternatives to a vari-

(i) bring[ing] in soil from other locations which, when blended with existing soils on site, could yield soils with physical characteristics that meet the requirements (including percolation rates) for the design and construction of a common SSTS to serve lots 1 through 25; or

(ii) design[ing] and construct[ing] a sewage treatment plant with subsurface discharge, to serve lots 1 through 25.

The Department also noted that petitioner had not demonstrated that denial of a variance would create a substantial hardship.

On appeal petitioner argued it would be subjected to a substantial hardship if the variance were not granted. Petitioner based its argument on the cost of implementing either of DEP's proposed alternatives, which it estimated at between \$250,000 and \$500,000.

The ALJ noted that "the cost figures . . . do not by themselves demonstrate hardship. At the very least, some comparison of those cost figures to the total cost of the development, and to the profit anticipated from the development, is necessary in order to show hardship." The ALJ also noted that the Department's denial of the variance application was based on petitioner's purported failure to prove that the variance requested is the minimum necessary to afford relief. The ALJ interpreted the "minimum necessary" requirement to mean that the requested variance be the minimum variance that is required to enable the proposed project to go forward.

However, in affirming the rest of the ALJ's report and recommendation, the DEP Commissioner disagreed with the ALJ's interpretation of the minimum necessary requirement, noting, "[t]he existence of alternatives makes it impossible to satisfy the criterion that the variance sought be the 'minimum necessary' to afford relief, since the minimum necessary in such case is, in fact, no variance at all."

In *Prato v. Department of Environmental Protection*,¹² the petitioner had purchased a lot in Yorktown Heights to build a single family home. The lot was too small to build a septic system, and prior to the purchase, a moratorium had been placed on new connections to the local sewer system.¹³ In his variance application, the petitioner proposed that he be allowed to connect to the local sewer system. His proposed mitigation measures included installing water-saving devices on all his household water outlets and paying for a repair to the local sewer system. The Department denied the variance application.

On appeal, the ALJ found that the Department did not abuse its discretion by denying the variance application. The ALJ noted that the petitioner had failed to show substantial hardship, because when the petitioner purchased the property, it was already subject to the watershed regulations and the town's moratorium on new sewer connections. The ALJ also found the petitioner's mitigation measures lacking, because the town's sewer system repairs were already planned, and because water-saving devices on home outlets were merely "a drop in the bucket."

B. Recent Cases (2003-2006)

In *Frackman v. Department of Environmental Protection*,¹⁴ the petitioners owned 5.18 acres of property in the Town of Kent, in Putnam County, within the Boyd's Corner Reservoir drainage basin. Approximately one month after the petitioners submitted an application for approval of an on-site SSTS, DEP issued a letter of objection to the proposed SSTS because of its location within 100 feet of a watercourse. Approximately one month thereafter, petitioners submitted applications for a variance seeking to be exempted from four different portions of the watershed regulations. DEP denied the variance, finding that the proposed absorption area for the SSTS was within 100 feet of a watercourse.¹⁵ The Department also found petitioners' proposed mitigation measures insufficient.

The OATH ALJ determined that the petitioners failed to demonstrate that the Deputy Commissioner abused his discretion, noting:

It is uncontroverted that petitioners' proposal does not meet the requirements of section 18-38 of the regulations in that the petitioners' proposed SSTS will be 73 to 79 feet from the watercourse. The Deputy Commissioner concluded that neither increasing the width of the impervious barrier at the lower end of the SSTS from two to ten feet, nor construction of a silt fence, were as protective of the water supply as the standards for regulated activities set forth in these rules and regulations. Nothing in petitioners' appeal papers establishes that these conclusions were unreasonable.

The ALJ also noted that petitioners had not shown substantial hardship.

In *Buckskin Realty, Incorporated v. Department of Environmental Protection*,¹⁶ the petitioner had acquired 16 lots within the New York City watershed, in the Town of Windham, in Greene County, within the Schoharie

Reservoir drainage basin. The petitioner submitted an application for a variance in order to construct and use an on-site SSTS to treat human and household wastes from a three-bedroom, single-family residence. Petitioner's request for a variance sought an exemption from the prohibition of SSTS's on land with slopes greater than 15%.¹⁷ DEP denied the variance application, noting that failure to maximize economic return "does not, by itself, constitute substantial hardship."

On appeal, petitioner reiterated its substantial hardship argument, asserting that it would lose more than \$65,000 as a result of the denial of the variance, and that DEP's calculation of the financial hardship was incorrect. Petitioner's engineering report indicated that "[w]ithout these variations from the standards, construction of this residence on this property is not feasible."

However, the ALJ noted, "speculation as to possible lost profits and failure to maximize economic return is insufficient to demonstrate substantial hardship where, as here, petitioner has made no showing that the parcel can not be used for other, albeit less profitable uses. . . . [Petitioner's] conclusory assertion is not sufficient to demonstrate a 'substantial hardship.'"

In 2005, OATH issued three more decisions determining watershed variance appeals. In the first of these cases, *Primavera v. Department of Environmental Protection*,¹⁸ the petitioner—like the petitioner in *Prato*—had also purchased property in Yorktown Heights, New York. Here, however, petitioner purchased two adjacent lots, and had purchased those lots in 1996, before the implementation of the watershed regulations. Petitioner planned to build a four bedroom house on each of the lots. He submitted a variance application in July 2000, proposing to connect two sewer lines to the local sewage system. To mitigate the increased daily inflow from the two new homes, petitioner offered to repair two manholes located elsewhere in the local sewer district. DEP denied the variance.

On appeal, the ALJ found that DEP did not abuse its discretion. The petitioner did not meet the "minimum necessary" requirement because—as in *Guard Hill*—the Department had proposed an alternative. Here, DEP proposed that petitioner build only one house with one sewer connection. In addition, the ALJ found that petitioner did not show "substantial hardship." Petitioner argued that if he were to build only one home, he would make a profit of only \$30,000, as opposed to \$60,000 for two homes. Relying on *Buckskin*, the ALJ held that inability to maximize profit is insufficient to show substantial hardship.¹⁹

In *Carreras v. Department of Environmental Protection*,²⁰ petitioners were owners and residents of a

four-bedroom house on 2.7 acres in the Town of New Castle in Westchester County. They sought to expand their home, install a swimming pool, and install a new SSTS. They applied for a variance to permit the new SSTS to be installed 80 feet from a watercourse, rather than 100 feet, as required by the watershed regulations.²¹

As for the petitioners' case, the ALJ found that they had satisfied none of the requirements of section 18-61(a)(1). Petitioners conceded that they could have adopted alternative designs for the site that may not have required a variance, such as building a three-bedroom house, but petitioners were unwilling to consider such alternative plans. Petitioners also included no mitigation plans in their application, other than a silt fence and hay bales, which DEP considered "important and typical erosion control measures but are not mitigation for the variance requested." Finally, petitioners argued that they suffered a substantial hardship because the regulations constituted an unconstitutional taking of their property, and a deprivation of their due process rights. Noting that petitioners could still make reasonable use of their property, and had only submitted conclusory allegations with respect to the use of their land, the ALJ held that "[t]his putative deprivation of property is not of constitutional proportions,"²² and that petitioners had not established a substantial hardship by alleging an inability to maximize return on investment.

In the final case of 2005, *Cmar v. Department of Environmental Protection*, OATH Index No. 179/06 (Oct. 6, 2005),²³ the *pro se* petitioner had purchased a 1.4 acre lot in Dutchess County in 2002. On the property was a small house that had been abandoned since 1980. Petitioner proposed to demolish the old house and construct a new two-bedroom house with a new SSTS. He applied for, and was denied, a variance allowing him to construct the SSTS within 100 feet of a watercourse, and at a grade of greater than 15%.

On appeal, the ALJ found that petitioner had satisfied none of the requirements for a variance. Petitioner argued that his old SSTS should be exempted from compliance with the watershed regulations because it predated the watershed regulations' promulgation. The ALJ noted that although the old SSTS predated the regulations, it had been abandoned for 25 years, and where a system is discontinued for one year or more, it must comply with the regulations.²⁴

The first case decided in 2006, *Farley v. Department of Environmental Protection*,²⁵ followed the pattern established by its predecessors. In 2003, petitioner had purchased seven lots in an eight-lot, 200-acre subdivision in the Town of Roxbury, in Delaware County, within the Pepacton River Basin. Petitioner had obtained DEP

approval for developing six of the lots. The seventh lot, on which petitioner sought to build a three-bedroom house on 46.79 acres, was the subject of the appeal. DEP had denied petitioner's variance application, in which he proposed installation of an SSTS on an 18% slope.

In support of his variance application, petitioner argued to DEP that the variance sought was the minimum necessary because all other parts of the property were steeper or within 100 feet of a watercourse. Petitioner proposed several mitigation measures, including installation of two rain gardens to treat runoff from the impervious surfaces created by the house. Finally, petitioner claimed that denial of the variance would impose a substantial hardship because the lot would become "difficult to develop."

DEP denied the variance application because of petitioner's failure to show substantial hardship. The OATH ALJ affirmed the denial based only on petitioner's failure to show substantial hardship, noting that petitioner did not establish that the property was unusable, and that inability to maximize return on investment does not establish substantial hardship.

IV. Conclusion

Thus, we go forward with no examples of a successful administrative appeal in an upstate watershed variance denial case. We are therefore left asking what is sufficient to have a variance granted? What is sufficient mitigation? What is the minimum necessary variance? And what would constitute a substantial hardship?

The OATH cases define these terms in the negative. Adequate mitigation is not achieved by installing a silt fence and hay bales, or by paying for repairs to the local sewage treatment system, at least if the repairs would have been done anyway. There can be no minimum necessary variance if DEP proposes alternative development scenarios.²⁶ And substantial hardship must be due to site conditions, must involve some calculation of the cost of alternatives with the proposed development, and cannot be mere failure to maximize profits.

Combined with DEP's interest in keeping the City's water supply clean, and the abuse of discretion standard of review at OATH, appealing from a variance denial is certainly an uphill battle, especially where the property was purchased after the watershed regulations were promulgated. For now, at least, the floodgates remain closed. Landowners within the New York City watershed may be wise to heed this advice from *Carreras*: "[p]erhaps the parties can explore together alternative layouts and come to mutually acceptable terms upon which petitioners could renovate their property without compromising the city's water supply."²⁷

Endnotes

1. <<http://www.nyc.gov/html/dep/watershed/html/history.html>>. For a map of the upstate watersheds, see <<http://www.nyc.gov/html/dep/html/wsmaps.html>>.
2. <<http://www.nyc.gov/html/dep/watershed/html/regcontext.html>>.
3. *Id.* See generally 15 RCNY §§ 18-11 *et seq.*
4. 15 RCNY § 18-61(a)(1).
5. 15 RCNY § 18-61(a)(4).
6. 15 RCNY §§ 18-61(b), 18-28(a); see generally <www.nyc.gov/oath>.
7. 15 RCNY § 18-28(d)(3).
8. 15 RCNY § 18-28(g). All decisions cited herein have been adopted, unless otherwise noted.
9. OATH Index No. 1542/98 (May 20, 1998). OATH decisions are available at: <www.citylaw.org/cityadmin.php>.
10. OATH Index No. 1757/98 (Aug. 11, 1998).
11. "Proposed sites with soil percolation rates faster than 3 minutes per inch or slower than 60 minutes per inch shall not be approved by the Department for locating a subsurface sewage treatment system." 15 RCNY § 18-38(b)(6).
12. OATH Index No. 890/01 (Dec. 29, 2000).
13. "A new service connection to a sewerage system is prohibited where the wastewater treatment plant to which the sewerage system has been connected and which discharges within the watershed has had a SPDES flow parameter violation in the prior twelve months, or where the additional flow from the new service connection will cause or can be expected to cause such wastewater treatment plant to have a SPDES flow parameter violation." 15 RCNY § 18-37(b).
14. OATH Index No. 1228-29/03 (Oct. 1, 2003).
15. "No part of any absorption field for a new conventional individual subsurface sewage treatment system . . . shall be located within the limiting distance of 100 feet of a watercourse or wetland." 15 RCNY § 18-38(a)(5).
16. OATH Index No. 216/04 (Dec. 30, 2003).
17. 10 N.Y.C.R.R. § 75, Appendix 75-A.4(a)(1) (incorporated into the watershed regulations at 15 RCNY § 18-38(a)(2)).
18. OATH Index No. 1017/05 (Jan. 31, 2005).
19. The ALJ noted that if the land were unusable or unsalable, it "may constitute a significant hardship." *Primavera*, OATH Index No. 1017/05, at 5 (citing *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 112 S.Ct. 2886 (1992)).
20. OATH Index No. 1529/05 (June 2, 2005).
21. 15 RCNY § 18-38(a)(5).
22. Citing *Lingle v. Chevron*, __ U.S. __, 125 S. Ct. 2074, 2005 U.S. LEXIS 4342 (2005).
23. OATH Index No. 179/06 (Oct. 6, 2005).
24. "In the event that any noncomplying regulated activity is discontinued for a period of one year or more, it shall permanently desist." 15 RCNY § 18-27(4).
25. OATH Index No. 941/06 (Jan. 19, 2006).
26. Although it is possible that the petitioner's arguments for a variance at the agency level in *Farley* would pass muster on appeal, the issue was not squarely addressed.
27. *Carreras*, OATH Index No. 1529/05, at 7.

David Leon is an associate counsel in the environmental review division at the New York City Department of Sanitation. From 2004 to 2006, he was a law clerk at the New York City Office of Administrative Trials and Hearings. The views expressed in this article are those of the author.



Save the Dates
Environmental Law Section
FALL MEETING
October 13–15, 2006
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Vapor Intrusion: The Next Big Thing

By Walter Mugdan¹

During the past few years it has become apparent that intrusion of toxic vapors into occupied buildings is a serious and potentially widespread problem associated with contaminated sites—specifically, sites at which soil and groundwater are contaminated with volatile organic compounds (VOCs). The phenomenon has long been understood, but it was generally and erroneously believed that it was rare for vapor intrusion in buildings to reach levels that present health concerns, especially at sites where groundwater contamination has been satisfactorily addressed. We are now learning that the problem is more common, more persistent and more severe than had been imagined as recently as three or four years ago.

What Is Vapor Intrusion?

The term “vapor intrusion” (or “soil vapor intrusion”) refers to the process by which volatile chemicals move from an underground source—usually contaminated groundwater—up through the soil and into the indoor air of a building.

“We are now learning that [vapor intrusion] is more common, more persistent and more severe than had been imagined as recently as three or four years ago.”

“Soil vapor” or “soil gas” is the gas found in the pore spaces between soil particles. This gas can be air, a naturally occurring gas such as radon that emanates from a sub-surface source, or a non-naturally occurring VOC that emanates from a sub-surface source. This article addresses VOC vapor intrusion.

Why Does Vapor Intrusion Occur?

When there is lower pressure inside than outside, soil vapor can enter buildings through cracks and openings in slab foundations or basement floors and walls. This intrusion is very similar to how radon gas seeps into buildings. Radon is a serious and widespread environmental health hazard which has been recognized and well understood for several decades. Where radon gas is present, it is in most cases a naturally occurring substance; not so with the volatile chemicals that are typically addressed under the heading “vapor intrusion.”

The chemicals associated with vapor intrusion problems are VOCs. Among these, some of the most common and the most dangerous are chlorinated compounds such as trichloroethylene (TCE), trichloroethane (TCA), and tetrachloroethylene (also known as perchloroethylene, PCE or Perc). These chemicals are used in a wide variety of consumer products and industrial applications. For example, TCE is one of the most common degreasers; and PCE is used almost universally in dry cleaning.

Where VOCs contaminate groundwater aquifers, they can readily volatilize near the water table and pass into the soil pores above. Pressure gradients drive vapors up through the soil towards the surface. When they encounter a natural or man-made obstacle or confining layer, such as a concrete building foundation, the vapors may accumulate, or move laterally, or continue to move upward through cracks or openings in the obstacle. When the obstacle is a building foundation, and the vapors find a pathway through it, the result is the intrusion of vapors into the interior living or working space.

As noted, it is a difference in pressure above and below foundations that can drive vapors indoors. Such differences can be induced by a variety of common phenomena including—

- convection (driven by temperature differences, especially in winter when the soil is cold and the building is warm);
- mechanical equipment such as dryers and exhaust fans;
- heating, ventilation and air conditioning (HVAC) equipment;
- fireplaces;
- weather (barometric pressure changes; wind passing over a building can also create a “chimney” effect).

Pressure differences can be further exacerbated by obstacles or barriers that “force” the vapors into particular pathways. These may include naturally occurring barriers such as rock layers, saturated soil or frost; and man-made barriers such as paved areas adjacent to a building. Relative differences in the permeability of soils (e.g., clay compared to gravel) can also contribute to pressure differentials.

Why Is Vapor Intrusion a Concern?

Many common groundwater contaminants are volatile. In their vapor phase they can move readily through soil and into structures. These vapors can be hazardous, even in low concentrations. Chlorinated VOCs like TCE and PCE, when inhaled, are carcinogenic and can cause a variety of other illnesses.²

What's New About This?

Vapor intrusion is *not* a new phenomenon. We have been concerned about radon gas intrusion for decades,³ and we have long understood that toxic chemicals volatilizing off contaminated groundwater can similarly migrate up through soil and into buildings.

However, our understanding of the vapor intrusion process has evolved rapidly during the past few years, largely as a result of investigations at several high profile groundwater contamination sites. As these investigations have progressed, we have begun to recognize that many old assumptions are invalid or must be modified substantially.

Groundwater as a Source

OLD ASSUMPTION: Very high concentrations of volatile chemicals would need to be present in groundwater for there to be a potential for indoor air problems.

NEW FINDINGS: Indoor air problems may occur even when levels of groundwater contamination are quite low. Moreover, the model most commonly used to make predictions about vapor intrusion, the "Johnson-Ettinger" Model,⁴ has been found to significantly underpredict indoor air vapor levels in a variety of situations.⁵

One of the sites at which this new understanding was first developed is the Endicott Site, a RCRA⁶ corrective action site located near Binghamton, New York. The site was the location of an IBM facility that used TCE as a degreaser, which contaminated the groundwater, due at least in part to a spill in 1979. The groundwater was also contaminated by PCE from local dry cleaners. IBM reported the TCE spill in 1979, and the groundwater investigation and cleanup started soon thereafter and has continued to the present. Although the contaminated groundwater was not used as a potable water supply, IBM has carried out an extensive groundwater remediation program under the supervision of the New York State Departments of Environmental Conservation (NYSDEC) and Health (NYS-DOH). A large number of groundwater monitoring wells were installed, and the hydrogeology of the area

and the behavior of the contaminant plume are consequently well understood. Currently there are 17 groundwater extraction wells operating. Since 1980, more than 2 billion gallons of groundwater have been pumped up and passed through one of six groundwater treatment systems. An estimated 785,000 pounds of VOCs have been removed during these 25 years, and the groundwater contaminant levels are now very close to the Maximum Contaminant Levels (MCLs) for drinking water established by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act.⁷

For TCE, the MCL is 5 micrograms per liter (ig/l). TCE levels in the groundwater at Endicott range from 9 to 13 ig/l. Based on this information, and using the Johnson-Ettinger model, it had been assumed that vapor intrusion would not be a significant problem in buildings above or near the contaminated aquifer. However, when confirmatory investigations were commenced, unexpected elevated levels of TCE and PCE vapors were found. Under State supervision, IBM has carried out an extensive vapor intrusion investigation and mitigation program. To date, mitigation systems have been installed in some 450 homes.

TCE quickly evaporates from water, including groundwater. However, it may stick to soil particles for quite a long time.⁸ This may partially account for why a vapor intrusion problem can persist long after the groundwater underneath has been cleaned to rather low levels of contamination—there may remain a "reservoir" of VOC contaminant stuck to the soil particles, which serves as a continuing source of vapors.

Soil Vapor Levels as Predictor

OLD ASSUMPTION: Soil vapor samples collected near a building, at foundation depth, are representative of soil vapor conditions beneath the building's foundation, and can therefore be used for screening.

NEW FINDINGS: At Endicott and elsewhere, it has been found that vapor levels beneath the foundation may be more than a hundred times greater than in samples collected near the building. The foundation can act as a "confining layer" beneath which vapors accumulate and concentrate.

Attenuation (or Dilution) Factor

OLD ASSUMPTION: The ratio of vapor levels in soil to those inside a building is high—at least 10:1 for shallow soil gas (less than 5 feet below the surface), and 100:1 or even 1,000:1 for deeper soil gas. The foundation was assumed to

be effective at blocking most of the vapors from entering the building, and those vapors that do get in become diluted in the ambient indoor air. Thus, indoor vapor levels are assumed to be many times lower than the soil vapor levels outside. This assumption is also used in the screening process to determine whether to perform indoor air sampling.

NEW FINDINGS: Attenuation factors or ratios actually vary widely, and are often much lower than previously expected. No single ratio can be applied to all sites. At sites with dry wells or similar structural openings, which represent “preferential” pathways for the vapor, there may be very little dilution at all (i.e., an attenuation factor near 1.0).

Implications of the New Findings

One of the important implications of the new findings superseding the old assumptions is that groundwater VOC contamination sites, which were considered to have been adequately addressed, may require further investigation and remedial work. Indeed, EPA and some States (e.g., New York) have already commenced reviews of such “completed” sites.⁹ More than 55% of CERCLA NPL sites have TCE contamination in groundwater. Presumably, TCE contamination is similarly typical at RCRA corrective action sites and State-listed hazardous sites.

The major implication of the new findings is, of course, that human exposures at potentially dangerous levels may have occurred for years or decades, even after a site was recognized and (as we thought), satisfactorily addressed. We may presume that our relative ignorance in this arena will unfortunately have contributed to some number of additional cancers or other illnesses that could have been prevented.

A related implication is that there is the potential for significant toxic tort liability for responsible parties. A first round of settlements has already occurred at Endicott, with IBM agreeing to pay millions of dollars to hundreds of parties for property damage (i.e., devaluation of homes). The settling plaintiffs retained their rights to sue for bodily injury.

EPA Guidance

EPA’s current guidance on investigation and evaluation of potential vapor intrusion problems was published as a draft in 2002.¹⁰ It was never finalized, and is currently undergoing what are expected to be significant revisions.

EPA’s 2002 Draft Guidance used a screening approach with a decision tree. Under that Guidance, information about the level of groundwater contamination and the geology of the area would be used to decide whether to move to the next step, which would be soil gas sampling.¹¹ The results of soil vapor sampling, if performed, would be used to decide whether to proceed to more intrusive indoor air sampling. In providing guidelines for making that decision, the 2002 Draft Guidance assumed the higher attenuation factors formerly believed to be applicable but now shown to be highly variable, and often much lower.

EPA is currently revising the Guidance, with the new version anticipated in 2006. The revised document is expected, *inter alia*, to utilize more conservative attenuation factors and place more reliance on professional judgment in determining when to proceed to indoor sampling.

Human Exposures

Even if indoor air sampling is performed, is that sufficient to determine the potential for risk from vapor intrusion? Clearly, such sampling can determine the vapor levels currently occurring in an occupied building; this represents the actual (or current) exposure to those occupants. Using accepted risk assessment techniques, judgments can be made about the additional risk of cancer or other disease that such occupants face as a consequence of the measured vapor levels.

A growing body of evidence suggests, however, that a thorough risk assessment should include a sampling of the vapors that may have accumulated immediately below the foundation or concrete slab of the building (sub-slab sampling). These levels are likely to be higher than current indoor levels, but nevertheless represent the potential (or possible future) exposure to the occupants. As vapors continue to build up under the foundation over time, and additional cracks or other openings appear in that foundation, the indoor vapor level may increase substantially. This potential, or risk of future elevated exposure, should be taken into full account when mitigation decisions are made.

A related concern is applicable to assessment of vapor levels in and under currently *unoccupied* buildings, or in areas that do not presently have buildings but may be developed in the future. These, too, represent a potential future exposure scenario, if and when the buildings are re-occupied or new buildings are constructed.

Sampling for Vapor Intrusion

Based on the new findings replacing the old assumptions, best professional judgment may suggest that sampling for vapor intrusion should be performed in many more situations than would formerly have been thought necessary. Sampling may well be indicated where groundwater is contaminated with even comparatively low levels of volatile hazardous chemicals, the contaminated aquifer is located under or near occupied buildings,¹² and the local geology is conducive to soil vapor movement.

Moreover, current evidence suggests that less reliance should be placed on outside soil vapor sampling; instead, sampling should more frequently proceed to indoor *and* sub-slab sampling, to assess both current and potential future risks.

If the purpose of sampling is to rule out the potential for unhealthy exposure levels, then indoor air samples should be collected when building conditions represent the greatest likelihood for vapor intrusion. This is typically during the heating season for residential buildings, when the furnace is on and the windows and doors are kept shut. (This may differ for commercial buildings.)

If indoor air sampling is performed, it is important that background and other indoor sources of VOCs be accounted for and, if possible, eliminated.

Other Possible Sources of VOCs in Indoor Air

The assessment of vapor intrusion is complicated by the large number of potential additional or alternate sources of such vapors in indoor air. Vapors similar to those from VOC contaminated groundwater may come from off-gassing from—

- building materials;
- furnishings and carpeting;
- dry-cleaned clothing;
- household products such as cleaners, degreasers, paints, etc.;
- attached or underground garages, in which engines may run and fuels may be stored;
- occupant activities (e.g., from hobbies or crafts that use volatile chemicals); and
- domestic water supply (if contaminated with VOCs, vapors can be released when water runs, particularly hot water).

The ambient outdoor air itself may carry vapors indoors, if there are nearby sources.

Risk Levels

No federal regulatory standards exist for indoor residential air quality for most contaminants of concern. Moreover, for some of the most common contaminants of concern there is not yet a broad, scientific consensus on “safe” indoor air vapor levels, and consequently there is a wide disparity in the numbers currently used by various governmental authorities when making decisions about whether to require mitigation of indoor vapor intrusion occurrences. Among the factors contributing to this disparity is the relative paucity of research on the inhalation pathway (as compared to the ingestion or dermal contact pathways) for many chemicals of concern, which means that scientists have to extrapolate and make assumptions.¹³ Finally, the science is evolving, so if a given agency has a somewhat older value it may simply be out of date.

For TCE, the maximum residential indoor vapor levels recommended by various governmental authorities range very widely, from 0.016 to 14 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$, comparable to parts per billion or ppb)—almost three orders of magnitude difference.¹⁴

Vapor Intrusion in the Workplace

There are existing federal regulatory standards governing occupational exposures—the Permissible Exposure Limits (PELs) set by the Occupational Safety and Health Administration (OSHA). The PELs for some of the common contaminants of concern are, however, seriously outdated, and are almost without question *not* protective. For example, the PEL for TCE, established in 1967, is 537,000 $\mu\text{g}/\text{m}^3$,¹⁵ an incredible seven orders of magnitude less protective than the lowest figures in use today.

The EPA 2002 Draft Guidance (now being revised) states that EPA will generally defer to OSHA on protection from workplace exposures. However, it also recognizes that EPA’s Superfund cleanup program generally uses an up-to-date, risk-based analysis to determine the need for action and to set cleanup targets for both residential *and* workplace exposures; in other words, these decisions do not consider or rely on the OSHA PELs (*provided* that the same or similar chemical is not currently being used in the work space under consideration). Some states, like New York and California, approach workplace vapor intrusion the same way.

Decision Matrices to Guide Response Decisions

EPA Region 2, and NYSDEC and NYSDOH, have developed separate but quite similar matrices to guide their decisions about when and how to respond to a vapor intrusion problem. The vertical axis of both

matrices indicates actual, measured sub-slab vapor concentrations; and the horizontal axis indicates actual, measured indoor vapor concentrations. In both cases, concentrations are presented as a range that pertains to a given column or row on the matrix. Thus, the various cells in the matrix—created by the intersection of rows and columns—effectively represents an attenuation or dilution factor. That is, each cell represents a combination of measured sub-slab and indoor concentrations. The difference between the two presumably represents the attenuation of sub-slab concentrations as the vapors seek to intrude into the indoor space. If the values for the two concentrations are similar, it suggests that there is very little attenuation occurring, and vapors appear to be entering freely. If the sub-slab concentration is, say, one thousand times higher than the indoor concentration, then considerable attenuation is occurring. And if the situation is reversed—if indoor values are *higher* than sub-slab values, it suggests there may be a separate indoor source.

One of the following choices is associated with each individual cell in the matrix, and is thus dependent on the measured attenuation factor:

- take no further action;
- investigate further and/or monitor; or
- mitigate.

Both the EPA Region 2 matrix and the New York matrix are at present working drafts, subject to further revision but currently being used by agency staff when making decisions about specific sites.

Remediation and Mitigation

Vapor intrusion problems can be permanently addressed by remediating contaminated groundwater (e.g., pump-and-treat) and soil vapor (e.g., soil vapor extraction). Mitigation may be required in the interim, however, if vapor levels of concern are present indoors or sub-slab.

Mitigation methods are similar to those that have long been used for radon. The most effective methods involve sealing cracks and other openings in foundation floors and walls, as well as ductwork in the building; and actively manipulating the pressure differential between interior and exterior space. The latter approach can be accomplished by either increasing the pressure above the foundation (inside the building) through, e.g., introduction of forced air; or decreasing the pressure below the foundation (outside the building) through, e.g., vacuum extraction, also known as Active Sub-Slab Depressurization (SSD). Relatively low pressure differentials (as little as 0.002" of water) are sufficient to

reverse flow across a foundation and prevent vapors from entering the building. The choice of methodology will depend on a variety of factors, including building design. Different approaches may be appropriate depending on whether the building is built with a full basement, slab-on-grade, or a crawl space with an earthen floor.

Institutional Controls Needed for Effective Mitigation Program

Mitigation systems have shown to be effective. However, they must be installed, maintained and operated properly, and should be checked regularly. Where installation and operation of a mitigation system such as an SSD is the responsibility of a third party (not the property owner), it may be advisable to provide for an annual check and certification process. There should also be a mechanism for notification by the property owner to the responsible party of potential problems, damage, anticipated building renovations, property transfers, etc.

Where a mitigation program is carried out by a responsible third party, the program should address—

- vacant lots in the affected area (with an eye to potential future construction);
- property owners who decline offer to install system (it is wise to renew the offer annually);
- provision of notification to the third party and the new owner when property is transferred; and
- discontinuance of the program if and when it is no longer needed.

Endnotes

1. Any opinions expressed in this paper are those of the author, and do not necessarily reflect the position of the U.S. Environmental Protection Agency. For invaluable assistance in preparing this paper, the author is deeply indebted to his colleagues Bill Wertz of the New York State Department of Environmental Conservation and Jim Reidy of U.S. EPA Region 2.
2. See, e.g., "ToxFAQs for Trichloroethylene" (July 2003) and "ToxFAQs for Tetrachloroethylene" (September, 1997), Agency for Toxic Substances and Disease Registry, <<http://www.atsdr.cdc.gov/tfacts19.html>> and <<http://www.atsdr.cdc.gov/tfacts18.html>>, respectively.
3. See, e.g., the radon page on the website of the U.S. Environmental Protection Agency, <<http://www.epa.gov/iaq/radon/>>.
4. The Johnson-Ettinger model considers variables such as the degree of contamination in the groundwater, the depth of the water table below a building and the type of soil through which the vapors must pass. The model uses these inputs to make predictions about the amount of vapor reaching the surface and entering the building. For a description of the model, see: <<http://www.epa.gov/correctiveaction/eis/vapor/guidance.pdf>>.

5. It may have been inappropriate to rely on the Johnson-Ettinger model for predicting vapor intrusion from VOC groundwater contamination sources, as the model was designed for evaluating vapor from petroleum contamination and—as the model’s designers noted—may not be appropriate for contamination by other volatile chemicals.
6. The Solid Waste Disposal Act, as amended by the Resource Conservation & Recovery Act (RCRA), 42 U.S.C. §§ 6901 *et seq.*
7. 42 U.S.C. §§ 300f *et seq.*
8. “ToxFAQs for Trichloroethylene,” Agency for Toxic Substances and Disease Registry, July 2003; <<http://www.atsdr.cdc.gov/tfacts19.html>>.
9. CERCLA requires that, if a remedy is selected which results in hazardous substances remaining at a site, that remedy must be reviewed at least once every five years to determine whether public health and the environment are still being adequately protected, or whether additional response is needed. CERCLA § 121(c), 42 U.S.C. § 9621(c). Reassessment of the potential for vapor intrusion problems should certainly now be part of the 5-year review process for sites with VOC groundwater remediation, even where pump-and-treat systems have been successfully operated and MCLs have been achieved or nearly so.
10. “Draft Guidance For Evaluating The Vapor Intrusion to Indoor Air Pathway From Groundwater And Soils (Subsurface Vapor Intrusion Guidance),” U.S. EPA, Nov. 29, 2002, <<http://www.epa.gov/correctiveaction/eis/vapor.htm>>.
11. This kind of sampling, which is done near but outside buildings, is much less intrusive than indoor or sub-foundation (“sub-slab”) sampling. It can therefore be done more quickly and inexpensively, and with less disruption to building occupants. If it were a reliable predictor of indoor vapor levels, those would be sufficient reasons to use the screening approach.
12. Vapors can travel laterally through the ground from the source of contamination. They may do so because of confining layers between the water table and the surface; or because of preferential pathways such as pipes, drains or utility lines. A common rule of thumb is that buildings up to 100 horizontal feet from a groundwater contamination plume should be assessed for vapor intrusion; if preferential pathways are present, this distance should be increased accordingly.
13. There may also be differences in the degree to which a worst case assumption is used. The worst case for vapor intrusion is usually in the winter time, when the heat is on and the doors and windows are closed. Risk assessors and regulators may vary as to whether they assume that worst case level of vapor exposure for the entire year. Different regulators may also make different choices about whether their “safe” levels should reflect a cancer risk of 10⁻⁶, 10⁻⁵ or even 10⁻⁴. Each of these steps involves a ten-fold increase in the acceptable vapor level.
14. EPA Region 3 uses the 0.016 ppb level; Michigan uses 14 ppb.
15. See list of OSHA PELs on OSHA website: <http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9993>. Note that 100 ppm, the OSHA 8-hour PEL for TCE, is equivalent to 537,000 $\mu\text{g}/\text{m}^3$, the units commonly used when describing indoor vapor levels.

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When Regulatory Universes Collide: Environmental Regulation in the Workplace

By Daniel Riesel and Dan Chorost

Introduction

On both the federal and state levels, prosecutors increasingly are using environmental laws instead of the Occupational Safety and Health Act (OSH Act)¹ to prosecute employers causing or threatening to cause the death or serious injury of their employees. Environmental laws are supplanting the OSH Act because, unlike the relatively modest penalties contemplated by traditional workplace safety law, environmental statutes carry the possibility, not only of substantial pecuniary penalties, but also of felony convictions and lengthy incarceration. There is more than a modicum of irony in the fact that the prosecutors who are vigorously enforcing workplace safety standards appear to have all but abandoned the OSH Act.

This intersection of the formerly distinct spheres of environmental regulation and workplace safety regulation emerged from developments in interagency coordination and state and federal regulations. This interplay of environmental and workplace regulation is of particular consequence to businesses dealing with hazardous substances, because even routine workplace safety incidents may subject an employer and its management structure to increased scrutiny in both the safety and the environmental spheres.

The trend combining the workplace safety and environmental regulatory spheres took on new significance with the May 2005 announcement of a major federal inter-agency initiative (Initiative)² whereby workplace safety violations would be enforced through the use of environmental statutes. The Initiative, spearheaded by the United States Department of Justice (DOJ), the United States Department of Labor Occupational Safety and Health Administration (OSHA), and the United States Environmental Protection Agency (EPA), seeks to increase the prosecution of workplace safety violations by improving training and coordination among the involved agencies. The trend is not limited to the federal government; New York's Attorney General recently unveiled a similar initiative using state environmental laws.³

Although the Initiative was announced in May 2005, DOJ has been employing this strategy in the New York/New Jersey/Delaware area since at least 2003. In regional "pilot" cases brought after the death or serious injury of employees, the DOJ has relied on environmental laws—and ignored the OSH Act—to obtain millions of dollars in criminal penalties and lengthy incarceration

sentences. A March 2005 settlement arising from an explosion in Delaware resulted in a \$10 million criminal fine, while, in a New York asbestos case decided in December 2004, DOJ secured the two longest prison sentences for an environmental crime in American history.⁴ Also, in December 2003, an indictment was issued against a New Jersey pipe foundry and five executives alleging substantive violations of, and conspiracy to violate, numerous environmental laws.⁵ Despite their common thread of workplace safety violations, none of these recent cases involve alleged OSH Act violations.

Part I of this article examines the historical underpinnings of the Initiative, in order to put into context the federal government's newest litigation strategy for addressing workplace safety violations. Indeed, the theoretical basis of the workplace-environmental intersection can be seen in an earlier alliance between OSHA and EPA, as memorialized by two Memoranda of Understanding entered into by the agencies in the 1990s.⁶ In addition, federal statutes such as the Resource Conservation and Recovery Act,⁷ the Oil Pollution Act,⁸ and the Clean Air Act⁹ have evolved from strictly environmental legislation into tools used to prevent and punish incidents of worker injury caused by exposure to hazardous substances. Other environmental laws, such as the Emergency Planning and Right-to-Know Act,¹⁰ have opened the door to citizen lawsuits for safety violations, and various federal and state environmental regulations now require certain employers to assess and improve the adequacy of the equipment and training provided to employees who are responsible for responding to, among other things, a release of hazardous waste.

Part II explains the Initiative as well as the similar initiative announced in New York State, and the most recent cases brought thereunder. The public statements issued by federal and state prosecutors, together with the fact that OSH Act violations have not been alleged in the most recent cases triggered by employee injury or death, indicate that use of environmental statutes to punish serious workplace safety offenses is supplanting enforcement under the OSH Act.

I. Historical Underpinnings of the Initiative

A. The OSHA-EPA Connection

In November of 1990, OSHA and EPA entered into a Memorandum of Understanding (MOU), the stated purpose of which is to:

[I]mprove the combined efforts of the agencies to achieve protection of workers, the public, and the environment at facilities subject to EPA and OSHA jurisdiction . . . [and] to provide guidelines for coordination of interface activities between the two agencies with the overall goal of identifying and minimizing environmental or workplace hazards.¹¹

In the MOU, OSHA and EPA acknowledge that although some of their responsibilities are distinct, others are complementary. Where the agencies recognized complementary responsibilities, they committed to “work together to maximize the efforts of both agencies to ensure the efficient and effective protection of workers, the public, and the environment.”¹²

The authors believe the MOU is significant because it was the first time that high-level officials in both OSHA and EPA publicly recognized that the two agencies had compatible interests. The five separate general operating procedures for OSHA-EPA interagency activity set forth in the MOU deserve mention because they were a means to coordinated activity by the agencies, even though it is unclear to what extent, if any, the procedures were put into practice.

First, the MOU requires “the fullest possible cooperation and coordination . . . at all organizational levels” between the agencies regarding referrals of alleged violations and other enforcement-related activities.¹³ Pursuant to the MOU, the agencies were to develop a joint annual workplan identifying and defining interagency enforcement priorities.¹⁴

Second, OSHA and EPA agreed to conduct joint inspections, including ad hoc inspections, in response to an accident or injury to workers that is reported to either agency.¹⁵ Third, the MOU requires the agencies to develop a regular system to manage referrals of potential violations and situations requiring inspection or follow-up by either agency.¹⁶ Accordingly, if either agency learns (either through a complaint, inspection, or investigation) of matters that appear to fall within the other agency’s purview, that matter would be reported to the other agency.¹⁷ The MOU sets forth the following examples of matters that OSHA (or its state counterparts, if applicable) would report to EPA:

- a. Worker allegations of significant adverse reactions to a chemical or chemical substance which poses a potential hazard to public health or the environment;
- b. Accidental, unpermitted, or deliberate releases of chemicals or chemical substances beyond the workplace;

- c. Unsafe handling, storage, or use practices involving chemicals, chemical substances, or waste materials in apparent violation of EPA-administered laws;
- d. Other readily detectable potential violations of EPA-administered laws, such as the by-passing of treatment systems; and
- e. Asbestos dispersal or contamination affecting the public or the environment.¹⁸

The fourth MOU operating procedure facilitates the sharing of data between OSHA and EPA.¹⁹ And finally, pursuant to the fifth MOU procedure, the agencies must develop and conduct periodic training programs for each other’s personnel regarding their respective laws and regulations.²⁰ Thus, while the extent to which the MOU’s five procedures were implemented is difficult to ascertain, it appears to the authors that the MOU represents the earliest articulation of the convergence of the formerly distinct regulatory spheres of workplace safety and environmental protection.

Generally speaking, EPA is empowered to investigate chemical accidents pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) section 104(e)²¹ and Clean Air Act (CAA) §§ 103, 112, 114, and 307.²² In December 1996, OSHA and EPA entered into a second MOU (the Chemical MOU) designed to coordinate their investigation of the “root cause” of major chemical accidents and, where appropriate, to issue reports recommending preventative measures.²³ As highlighted in the Chemical MOU, “[m]uch of the information required to meet the objectives of the two agencies is similar. Therefore, it is in the best interests of the government and the public that investigations and information-gathering be conducted in the most efficient and effective manner possible, with minimum duplication of activities.”²⁴

The Chemical MOU applies to any chemical release: (i) resulting in human death or the hospitalization of at least three workers or other persons; (ii) causing property damage in excess of \$500,000; (iii) presenting “a serious threat to worker health or safety, public health, property, or the environment”; or (iv) causing “significant off-site consequences” such as large-scale evacuations, closing of major transportation routes, substantial environmental contamination, or a chemical release that “is an event of significant public concern.”²⁵

Like the MOU, the Chemical MOU outlines a number of measures intended to better facilitate OSHA-EPA investigation and enforcement. First, the agencies must immediately inform each other of any chemical accident not already reported to the National Response Center hotline.²⁶ Once on-site, the agencies must determine

whether the event merits a joint root-cause investigation and issuance of a public report.²⁷

Second, the Chemical MOU requires the development of inter-agency accident investigation teams, to be co-led by OSHA and EPA.²⁸ These teams are designed to reduce any duplication of effort and to maximize efficiency. In addition to looking for the root cause(s) of the accident, the OSHA-EPA team investigates to determine compliance with their respective regulations.²⁹ The Chemical MOU also streamlines criminal probes: “[i]n the event that the potential for criminal case development exists related to a particular accident, OSHA and EPA will coordinate with each other on a case-by-case basis to ensure the maximum cooperation with criminal investigators.”³⁰

Finally, the Chemical MOU sets forth several provisions designed to enhance both agencies’ enforcement powers. For example, OSHA and EPA will not enter into any settlement agreement with any employer or potentially responsible party that would compromise the sharing of information between the agencies or the ability to use information that may otherwise be lawfully disclosed in the development of a public report.³¹ In addition, the Chemical MOU provides that the agencies share all factual data gathered during investigations and, if necessary, withhold the identities of cooperating employees to ensure their protection.³² This latter measure complements OSH Act section 11(c),³³ CAA section 322,³⁴ and CERCLA section 110,³⁵ all of which forbid discrimination or reprisal against an employee who reports unsafe conditions or otherwise is involved in accident investigations.³⁶

Pursuant to the Chemical MOU, from 1996 through approximately 1999, OSHA and EPA jointly investigated a number of major chemical accidents and issued several reports aimed at identifying each accident’s root cause and suggesting measures to prevent recurrences.³⁷ Since 1999, OSHA and EPA have coordinated their joint investigations of chemical accidents with the independent Chemical Safety and Hazard Investigation Board (CSB),³⁸ which was created by the 1990 Clean Air Act Amendments³⁹ but not funded until 1998.⁴⁰ As they did under the Chemical MOU, today OSHA and EPA, along with the CSB, continue jointly to respond to and investigate serious chemical accidents, and to suggest measures aimed at preventing future accidents. CSB’s *Strategic Plan to Congress* for fiscal years 2004 through 2008 notes that “CSB works closely with EPA, OSHA and [the Bureau of Alcohol, Tobacco, and Firearms] on accident investigations to minimize duplication of activities. . . . [T]his is accomplished through sharing of forensic test results, coordinating accident site control, and preserving evidence.”⁴¹

The cooperation engendered by the MOU, Chemical MOU, and CSB underscores the compatibility, at least in part, of the respective missions of OSHA and EPA. Perhaps more importantly, this cooperation put into practice a strategy whereby workplace safety and environmental safety were no longer treated by the federal government as separate regulatory universes, and served as the predecessor to the Initiative discussed in Part II.

But even setting aside the Initiative, this early OSHA-EPA collaboration has serious repercussions for employers who transport, store, or otherwise utilize hazardous substances. Because even a relatively minor workplace accident would subject an employer’s operations to increased OSHA scrutiny under the OSH Act alone, OSHA-EPA collaboration has increased the number of regulatory eyes that are drawn to any reportable incident. Therefore, it is more important than ever for businesses that handle hazardous waste or hazardous substances to ensure that their operations comply with all applicable safety and environmental laws and regulations because workplace-injury incidents are prosecuted with increasing frequency under environmental statutes.

B. RCRA’s Workplace Safety Requirements and Use of the “Knowing Endangerment” Provision Instead of the OSH Act to Prosecute Workplace Exposure Incidents

The broad purpose of the Resource Conservation and Recovery Act (RCRA),⁴² enacted in 1976, is to regulate hazardous wastes “from cradle to grave.” RCRA, which is administered by the EPA,⁴³ has spawned a detailed regulatory system aimed at reducing the release and improper disposal of hazardous waste.⁴⁴ RCRA declares it a national policy that, “wherever feasible, the generation of hazardous waste is to be reduced or eliminated [and that] [w]aste that is nevertheless generated should be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment.”⁴⁵ To achieve that policy, RCRA: (i) establishes a nationwide tracking system and extensive record-keeping requirements to document the movement of all hazardous wastes from point of origin to final disposal;⁴⁶ (ii) prevents the release of hazardous wastes and ensures their safe disposal;⁴⁷ and (iii) provides mechanisms to enforce the statute’s tracking, treatment, storage, and disposal requirements.⁴⁸

The connection between RCRA—a cornerstone of federal environmental legislation—and worker safety is not an obvious one. After all, worker safety under the OSH Act traditionally has required only that each covered employer “furnish to each of [its] employees . . .

a [workplace that is] free from recognized hazards that are causing or are likely to cause death or serious physical harm to [its] employees.”⁴⁹ The OSH Act achieves this goal, in part, by requiring that employers comply with occupational safety and health standards promulgated by OSHA.⁵⁰ RCRA supplements traditional workplace safety law by its host of requirements pertaining to the safe storage and use of hazardous waste. But perhaps even more significantly, RCRA’s severe criminal penalties have caused the statute to emerge as a powerful tool for the prosecution of companies and individuals whose employees are improperly exposed to workplace hazards. Indeed, while recent cases show that OSH Act violations are no longer even alleged in the most serious cases, prosecutors have used RCRA’s knowing endangerment provision⁵¹ in workplace safety cases with increasing frequency and success.

Generally, the provisions of RCRA with which regulated parties must comply are found in Subchapter III (hazardous waste management),⁵² Subchapter IX (regulation of underground storage tanks),⁵³ and Subchapter X (tracking and handling of regulated medical waste).⁵⁴ The remaining RCRA subchapters are of less consequence to private parties: for example, Subchapters II and V authorize creation of the Office of Solid Waste and detail the duties of the Commerce Department,⁵⁵ Subchapter IV authorizes the development of state or regional solid waste plans,⁵⁶ and Subchapter VI details federal responsibilities under the statute.⁵⁷

Generators of hazardous waste are subject to Part 262 of RCRA’s regulations,⁵⁸ which set forth numerous obligations including several implicating worker safety concerns. For example, applicable generators must comply with certain safety-related standards for the packaging, labeling, marking, and placarding of hazardous waste.⁵⁹ Generators accumulating hazardous wastes at the facility for more than ninety days are deemed under RCRA to operate a storage facility,⁶⁰ and so also are subject to the additional, and more stringent, requirements set forth in Part 264.⁶¹

Owners and operators of hazardous waste treatment, storage, and disposal facilities are subject to Part 264,⁶² which contains numerous highly detailed regulations concerning workplace safety. For example, such owners and operators must:

- prepare a contingency plan designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste;⁶³
- develop and follow a written schedule for the inspection of monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment (such as dikes and

sump pumps) critical to preventing, detecting, or responding to environmental or human health hazards;⁶⁴

- remedy any deterioration or malfunction of such equipment or structures to ensure that the problem does not lead to an environmental or human health hazard;⁶⁵
- conduct instruction or training of facility employees to ensure that the facility complies with applicable RCRA regulations;⁶⁶
- take precautions to prevent the accidental ignition or reaction of ignitable or reactive waste, such as separating and protecting such waste from sources of ignition or reaction (open flames, smoking, welding, etc.), and by placing conspicuous “no smoking” signs wherever there is a hazard from ignitable or reactive waste;⁶⁷ and
- equip the facility with (i) internal communications or an alarm system capable of providing immediate emergency instruction to facility employees, (ii) portable fire extinguishers, fire-and spill-control equipment, and decontamination equipment, and (iii) a water- or foam-based, facility-wide system to combat fire.⁶⁸

Enforcement of such RCRA regulations can take the form of administrative compliance orders or penalties issued by the EPA, or civil suits for injunctions and/or penalties brought in federal court.⁶⁹ As of March 15, 2004, the maximum civil penalty for violating RCRA regulations was \$32,500 per violation per day,⁷⁰ which can translate to enormous penalties for noncompliance events, which typically occur over long periods of time. Pursuant to EPA’s RCRA Civil Penalty Policy, three basic factors go into the calculation of a RCRA penalty: the gravity of the violation, the economic benefit of noncompliance to the violator, and any adjustments for special circumstances.⁷¹

But RCRA’s impact on workplace safety goes far beyond the above requirements and their associated monetary penalties because violations also may be addressed through criminal penalties and imprisonment. Indeed, in recent years, federal juries and federal courts have established RCRA as a powerful tool for the prosecution of individual officers who jeopardize the health and safety of their employees.

One reason for the increased reliance by prosecutors on RCRA instead of the OSH Act may derive from the difficulty prosecutors face in amassing a sufficient quantum of evidence to meet the government’s production burden under the OSH Act. For example, OSHA establishes permissible exposure limits (PELs) for several toxic and hazardous substances by setting ceiling val-

ues and eight-hour time-weighted averages.⁷² Given the potential complexities involved in proving an exposure case over eight-hour shifts extended over forty-hour work weeks, prosecutors may be more inclined to use the relatively straightforward standards of the RCRA and other environmental statutes.

Another reason that workplace safety enforcement increasingly has looked toward environmental statutes such as RCRA is the fact that the OSH Act's penalty structure is more lenient than that of many environmental laws. OSH Act § 666(e) controls in cases where employer conduct causes an employee death. This section provides that if an employer willfully violates any rule or regulation promulgated pursuant to OSH Act, and that violation causes the death of an employee, the employer "shall, upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than *six months*, or by both. . . ."⁷³

When compared to OSH Act § 666(e), the criminal penalties under RCRA are markedly more severe. Under RCRA § 6928(e), the so-called "knowing endangerment" provision, the stakes are raised significantly where the handling of hazardous waste places an employee in imminent danger of death (or serious injury):

Any person who knowingly transports, treats, stores, disposes of, or exports any hazardous waste [in violation of section 6928(d)⁷⁴] *who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury*, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment for not more than *fifteen years*, or both. A defendant that is an organization shall, upon conviction of violating this subsection, be subject to a fine of not more than \$1,000,000.⁷⁵

The term "serious bodily injury" is defined as: "(A) bodily injury which involves a substantial risk of death; (B) unconsciousness; (C) extreme physical pain; (D) protracted and obvious disfigurement; or (E) protracted loss or impairment of the function of a bodily member, organ, or mental faculty."⁷⁶ This statutory language makes plain that Congress intended that § 6928(e) be reserved for "the occasional case where the defendant's knowing conduct shows that his respect for human life is utterly lacking and it is merely fortuitous that his conduct may not have caused a disaster."⁷⁷ The statute provides an affirmative defense to a § 6928(e) prosecution if the defendant can prove, by a preponderance of the evidence, that the conduct charged was consented to by the endangered person, and that the danger and conduct charged were reasonably foreseeable occupational hazards.⁷⁸

Section 6928(e) thus created a severe penalty for employers who failed to ensure the safety of employees exposed to hazardous substances in the workplace. It also raised the monetary penalty cap for corporate defendants to \$1,000,000.⁷⁹ While it is unclear why Congress saw fit only to supplement RCRA instead of amending the OSH Act's penalty scheme,⁸⁰ the result has been that RCRA's knowing endangerment provision has been used to prosecute workplace safety cases with increasing frequency and success.

The first conviction under RCRA § 6928(e) was obtained in 1987 against Protex Industries, Inc.⁸¹ Protex Industries operated a facility in which used fifty-five gallon drums were purchased and recycled.⁸² Protex cleaned and repainted these drums, many of which previously stored toxic chemicals, then used them as storage and shipping containers.⁸³ Following two EPA inspections, a nineteen-count indictment was returned against Protex, including three counts of knowingly placing three Protex employees in imminent danger of death or serious bodily injury.⁸⁴

The trial court found that Protex failed to provide its employees with safety equipment adequate to protect them from exposure to the toxic chemicals.⁸⁵ Medical experts testified at trial that, without adequate safety measures, Protex employees were at an increased risk of suffering solvent poisoning that could cause "psychoorganic syndrome" of varying severity and which led to, among other ailments, an increased risk of developing cancer.⁸⁶

After being convicted of violating RCRA § 6928(e), Protex sought relief in the United States Court of Appeals for the Tenth Circuit.⁸⁷ On appeal, Protex argued that its conviction should be overturned because any injury to its employees—namely, the danger of developing a permanent form of psychoorganic syndrome, or of contracting an indeterminate type of cancer at some unspecified future date—was not sufficient to constitute "serious bodily harm" as defined by RCRA.⁸⁸ The Tenth Circuit was not receptive to this argument. In affirming the conviction, the court stated that, "[Protex's] position demonstrates a callousness toward the severe physical effect the prolonged exposure to toxic chemicals may cause or has caused to the three former employees," who, according to the trial court, in fact had suffered from a form of the syndrome that causes permanent health effects.⁸⁹

Following *Protex*, there were no major convictions under RCRA § 6928(e) for a decade. Then, in 2001, the United States Court of Appeals for the Eleventh Circuit affirmed in *United States v. Hansen*,⁹⁰ what at the time was the longest sentence ever imposed for an environmental workplace crime. The *Hansen* case was brought against LCP Chemicals and its officers.⁹¹ LCP Chemicals manufactured bleach, soda, gas, and acid. Due to

inadequate safety and maintenance measures, LCP employees suffered chemical burns after exposure to hazardous materials including mercury, caustic soda, hydrochloric acid, and chlor-alkali bleach.⁹²

The government indicted three of LCP's officers along with its environmental health and safety manager for conspiracy to commit environmental crimes, and for various substantive crimes including violations of the Clean Water Act, RCRA, CERCLA, and the Endangered Species Act.⁹³ Among the charges was the allegation that LCP knowingly exposed its employees to hazardous materials in violation of RCRA § 6928(e).⁹⁴ After the jury rendered a guilty verdict, the district court sentenced LCP's chief executive officer to a nine-year prison sentence. The chief operating officer received almost four years, and the plant manager was sentenced to over six years in prison.⁹⁵ The environmental health and safety manager received an eighteen-month sentence after agreeing to testify against the other defendants and pleading guilty to two counts.⁹⁶

As suggested by the language of the provision itself, RCRA § 6928(e) is most likely to be used to prosecute cases where employees have been seriously injured or killed due to the conduct of the employer. One of the best examples of a preventable workplace tragedy forming the basis of a § 6928(e) prosecution is *United States v. Elias*,⁹⁷ wherein the United States Court of Appeals for the Ninth Circuit in late 2001 affirmed the RCRA conviction and seventeen-year prison sentence of a company owner—to date, the third longest criminal sentence imposed for an environmental crime.⁹⁸

The defendant Allen Elias owned Evergreen Resources, an Idaho fertilizer company.⁹⁹ In August 1996, Elias ordered four Evergreen employees to enter and clean a thirty-six-foot-long, eleven-foot-high tank containing two tons of cyanide-laced sludge, a byproduct of a cyanide leaching process.¹⁰⁰ Despite repeated requests from the employees, Elias failed to provide any safety equipment and sent two workers into the tank wearing only their regular work clothes.¹⁰¹ Because they were unable to clean the tank, the workers emerged fifteen minutes later suffering from sore throats and nasal passages, which are early symptoms of cyanide poisoning.¹⁰²

The next day, the workers explained to Elias the health effects they suffered and again requested the safety equipment required by the OSH Act.¹⁰³ Elias agreed to provide such equipment in the future, but ordered his employees to clean out the tank that morning.¹⁰⁴ A short time after re-entering the tank, employee Scott Dominguez was overcome by cyanide fumes and collapsed.¹⁰⁵ Because of their lack of adequate rescue equipment, Evergreen employees were unable to extricate Dominguez from the tank's small opening.¹⁰⁶ When arriving firefighters and Dominguez's treating

physician asked whether there was cyanide in the tank, Elias denied knowing that anything was in the tank other than water and "sludge."¹⁰⁷ Dominguez ultimately was treated for cyanide poisoning, but not before suffering permanent brain damage as a result of the toxic cyanide levels in his body.¹⁰⁸

After a nearly month-long trial, a federal jury convicted Elias of violating three RCRA counts: one charged that Elias knowingly endangered his employees in violation of § 6928(e), and two others charged that Elias illegally disposed of hazardous cyanide waste on separate occasions in violation of § 6928(d).¹⁰⁹ Elias also was convicted of making a material false statement under the OSH Act, stemming from his fabrication of a confined-space permit after the accident occurred.¹¹⁰

The *Hansen* and *Elias* convictions amply demonstrate both the severity of punishment possible for workplace safety incidents and the increased application of environmental laws such as RCRA to prosecute cases traditionally viewed through an OSH Act lens. Remarkably, only a single, minor OSH Act violation was charged between the *Hansen* and *Elias* cases, despite their subject matter. This fact is attributable to RCRA's substantial penalty provisions, which offer prosecutors far more leverage than the OSH Act's relatively meager enforcement tools.

C. Plans Required by Environmental Regulations that Implicate Workplace Safety

As discussed above, the cooperation between OSHA and EPA, along with prosecutors' increasing reliance upon environmental statutes to enforce workplace safety violations, have resulted in the intersection of the workplace safety and environmental protection spheres. In addition to these developments, numerous federal and state environmental regulations are furthering the overlap between these formerly separate regulatory areas.

Together with its accompanying regulations, the Oil Pollution Act (OPA)¹¹¹ of 1990, part of which amended section 311 of the Clean Water Act,¹¹² facilitated and strengthened the EPA's ability to prevent and respond to catastrophic oil spills occurring in navigable waters. The OPA is similar to CERCLA insofar as it authorizes the use of a trust fund¹¹³ financed by a tax on oil to subsidize oil spill cleanups when there is no cooperating responsible party.¹¹⁴ Although unmistakably an "environmental" statute, the OPA's regulations implicate worker safety issues insofar as they require oil storage facilities and vessels to prepare plans detailing their anticipated responses to discharges.¹¹⁵

For example, a Facility Response Plan (FRP) must be prepared under the OPA by any owner or operator of a nontransportation-related onshore facility (defined to include, for example, any industrial, commercial,

agricultural, or public facility that uses and stores oil, excluding terminal facilities¹¹⁶) that, because of its location, could cause substantial harm to the environment by discharging oil into navigable waters.¹¹⁷ Such a facility may escape regulation if (i) its total aboveground storage capacity is less than 1,320 gallons (with no single container exceeding 660 gallons) and (ii) its total underground storage capacity is less than 42,000 gallons.¹¹⁸

OPA's extensive regulations mandate that each FRP describe the training of employees and include documentation of numerous worker safety concerns related to the response to an oil spill. For example, the FRP must include:

- a requirement that individuals or organizations be contacted in the event of a discharge;
- a description of the facility's response equipment and its location;
- a description of immediate measures to secure the source of the discharge;
- plans for the evacuation of the facility and a reference to community evacuation plans, as appropriate;
- a diagram of evacuation routes; and
- a description of self-inspection, drills, exercises, and response training for employees, including record-keeping requirements for inspections of all tanks, secondary containment and response equipment, as well as logs documenting all training sessions, drills, and exercises.¹¹⁹

The OPA regulations further mandate that each facility owner is responsible for "the proper instruction of facility personnel in the procedures to respond to discharges of oil and in applicable oil spill response laws, rules, and regulations."¹²⁰

The OPA regulations also require that each facility required to prepare a FRP appoint and train a "qualified individual" who must, among other things, coordinate rescue actions with response personnel and "[a]ssess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release. . . ."¹²¹

In July 2002, EPA published a ruling requiring each facility regulated under the OPA to prepare a Spill Prevention, Control and Countermeasure Plan (SPCCP).¹²² Unlike the FRP, which is a contingency plan primarily addressing measures to be taken after a spill occurs,¹²³ the SPCCP requires that facilities put measures into place with the goal of preventing a spill from reaching navigable waters.¹²⁴

The SPCCP, like the FRP, requires employers to supply employees with both the equipment and the training to safely and effectively respond to a spill.¹²⁵ At a minimum, the facility is required to train its oil-handling personnel in numerous safety-related areas, such as the operation and maintenance of equipment to prevent discharges, discharge procedure controls, applicable pollution control laws, rules, and regulations, and the contents of the facility's SPCCP.¹²⁶

While there are no criminal penalties for violating the SPCCP or the FRP regulations, the available civil penalties are, as is the case with most environmental statutes, prohibitive. Pursuant to CWA section 311(b)(6)–(7), any regulated facility failing to comply with any of the FRP and SPCCP requirements is subject to a civil penalty of up to \$27,500 per violation per day,¹²⁷ and also may be assessed a Class I administrative fine (ranging from \$10,000 to a maximum of \$25,000) or Class II fine (ranging from \$10,000 to a maximum of \$125,000).¹²⁸

EPA's "Civil Penalty Policy for section 311(b)(3) and section 311(j) of the Clean Water Act,"¹²⁹ sets forth how the agency exercises its enforcement discretion, and how courts should determine the civil penalties for non-compliance with, among other things, the SPCCP and FRP regulations. According to the EPA, a CWA section 311 civil penalty assessment should be based upon the following factors: (i) the seriousness of the violation; (ii) the degree of culpability involved; (iii) the nature, extent, and degree of success of any efforts of the violator to minimize or mitigate the effects of any discharge; (iv) history of prior violations; (v) any other penalty for the same incident; (vi) any other matters "as justice may require;" (vii) the economic impact of the penalty on the violator; and (viii) the economic benefit to the violator, if any, resulting from the violation.¹³⁰

The EPA CWA Penalty Policy also addresses the agency's approach to arriving at a penalty through settlement by considering the seriousness, culpability, mitigation, and history of prior violations at issue.¹³¹ When characterizing the "seriousness" of FRP and SPCCP violations, the agency construes as "major noncompliance" the failure to have or to implement a plan, or inadequate implementation resulting in hazardous site conditions. "Moderate noncompliance" includes having an inadequate or incomplete plan, or inadequate or incomplete implementation not causing a hazardous site condition.¹³² Federal courts may review civil penalties levied by EPA.¹³³

Those responsible for compliance with health, safety, and environmental laws and regulations must not overlook state requirements that may be analogous to the FRP and/or SPCCP regulations. For example, under the aegis of New York's Hazardous Bulk Storage Act

(HBSA),¹³⁴ owners of chemical bulk storage facilities¹³⁵ in New York must comply with a comprehensive set of regulations, including the preparation of a Spill Prevention Report (SPR).¹³⁶ The primary purpose of the SPR is to detail the various on-site chemicals, storage facilities, and transfer points; assess causes of spills; and identify measures to be taken in response to future spills.¹³⁷

Workplace safety concerns are at the heart of several requirements of the SPR's mandatory "plan for spill response." For example, the SPR must set forth "a list of equipment and materials to contain a spill; name and phone number for emergency contacts, coordinators and clean-up contractors; spill reporting procedures; plans for annual drills and other information consistent with generally accepted spill prevention control and countermeasure practices."¹³⁸ Safety concerns are also central to other HBSA regulations, such as those setting forth procedural requirements for the transfer of hazardous substances and the maintenance and repair of storage facilities.¹³⁹

Violations of the regulations promulgated under the HBSA—including the SPR regulations—are punishable by civil and administrative sanctions of up to \$25,000 per violation per day, and by misdemeanor criminal penalties calling for a fine of up to \$25,000 per violation per day and up to one year in prison.¹⁴⁰ The penalty caps are doubled for repeat offenders.¹⁴¹

D. Applicability of Environmental Citizen Suit Provisions to Workplace Safety Issues

Although the OSH Act contains no citizen suit provision, noncompliance with workplace safety regulations can potentially expose an employer to a citizen suit brought under certain environmental statutes.

RCRA authorizes three types of citizen suits, two of which can be applied to workplace safety violations.¹⁴² First, RCRA § 6972(a)(1)(A) permits any person to commence a lawsuit against any person "alleged to be in violation of any permit, standard, regulation, condition, requirement, prohibition, or order which has become effective pursuant to [RCRA]."¹⁴³ This type of suit may be brought to remedy an employer's failure to comply with, for example, the Part 264 regulations requiring the preparation of a contingency plan, the implementation of an inspection schedule and employee training, and the installation of systems for emergency communication and fire control.¹⁴⁴

A RCRA citizen suit also may be brought against any person who has contributed or is contributing "to the past or present handling, storage, treatment, transportation or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment."¹⁴⁵ When applied to worker safety, this "substantial endanger-

ment" provision obviously requires that the alleged violation present a heightened risk to an employee exposed to hazardous waste. For example, it is possible that an agency could invoke this provision in response to an employer's failure to provide adequate safety equipment or failure to prepare the contingency plan required by Part 264.¹⁴⁶

Either type of citizen suit under RCRA must be brought on ninety days' notice,¹⁴⁷ unless the suit alleges a violation of Subchapter III's requirements pertaining to the management of hazardous waste, in which case the suit may be commenced immediately.¹⁴⁸

The Emergency Planning and Right-to-Know Act (EPCRA)¹⁴⁹ also has a citizen suit provision that could be used to redress violations of workplace safety regulations. EPCRA is a unique environmental law in that rather than addressing the cleanup of existing pollution, it focuses on disseminating information regarding where chemicals are being stored and how to deal with them in the event of an accidental release.¹⁵⁰ EPCRA's citizen suit provision permits "any person" to sue on his or her own behalf either an owner or operator of a facility for failure to satisfy a variety of the statutory reporting requirements.¹⁵¹

A citizen suit under EPCRA must be brought on sixty days' notice, but is barred if the EPA already is "diligently pursuing an administrative order or civil action to enforce the requirement concerned or to impose a civil penalty under this chapter."¹⁵² The courts are empowered under the statute to "enforce the requirement concerned and impose any civil penalty provided for violation of that requirement," with such penalties typically ranging from \$11,000 to \$27,500 per violation.¹⁵³ In addition, the courts may award "reasonable attorney and expert witness fees" to the "prevailing party or the substantially prevailing party."¹⁵⁴

EPCRA's citizen suit provision can be used to pursue what is essentially a violation of the OSH Act. For example, OSHA regulations require chemical manufacturers and importers to assess the hazards of their chemicals, and require all employers to provide information to their employees about the hazardous chemicals to which they are exposed.¹⁵⁵ Such information is transmitted to employees through a hazard communication program, labeling and other forms of warning, and the distribution of material safety data sheets (MSDS) and training.¹⁵⁶ Meanwhile, EPCRA requires owners and operators to distribute the MSDS to state and local emergency officials—and permits the initiation of a citizen lawsuit in the event of employer non-compliance.¹⁵⁷ Other EPCRA requirements subject to citizen suit enforcement include the distribution of emergency and hazardous chemical inventory forms, along with toxic chemical release forms.¹⁵⁸

Although such suits remain uncommon, a business that manufactures or uses chemicals may find itself the target of a citizen lawsuit if it fails to comply with EPCRA's reporting requirements, including those related to workplace safety and in fact based upon OSH Act requirements.¹⁵⁹

II. The Initiative and Similar State Initiatives

A. Announcement of the Initiative

In May 2005, the DOJ, EPA, and OSHA announced the inter-agency Initiative, which is being spearheaded by the DOJ's Environment and Natural Resources Division ("ENRD"). The Initiative already has resulted in significant inter-agency training and coordination, and increased enforcement activities.

According to Andrew Goldsmith, Assistant Section Chief for the Environmental Crimes Section and the ENRD attorney primarily responsible for the Initiative, the Initiative was first contemplated when ENRD supervisors recognized a pattern in several investigations and prosecutions then underway. "We noticed that employers who ignored worker safety often ignored environmental safety, and that gross violations of environmental laws and regulations often precipitated worker injury or death."¹⁶⁰ The Initiative thus represents an attempt to address these most serious of violators by training OSHA compliance officers to recognize, and refer to DOJ, environmental violations, and by enhancing communication between OSHA, EPA and DOJ so that the "worst offenders" are identified, investigated and prosecuted.¹⁶¹

Although the Initiative was made public in May 2005, DOJ has been conducting a "pilot program" in the northeastern United States since 2003. The pilot program included a coordinated review of EPA and OSHA dockets and training of OSHA employees. Between 2003 and May 2005, ENRD attorneys have conducted nationwide trainings for over 700 OSHA supervisors, managers, and compliance officers as part of the Initiative. Recently, Mr. Goldsmith explained that OSHA trainees are excited about the Initiative because "whereas there used to be only one DOJ attorney to handle enforcement nationwide, today several of the ENRD's thirty-nine prosecutors spend significant portions of their time on these cases—and that number will continue to increase as more cases come in."¹⁶² The fact that OSHA's rank-and-file are beginning to refer cases for prosecution represents a change in OSHA's culture, which historically disfavored criminal enforcement. In fact, between 1982 and 2002, OSHA declined to seek prosecution in 93% of the 1,242 cases where workers were killed due to willful safety violations.¹⁶³

The pilot program also resulted in several recent, high-profile prosecutions, discussed below. The com-

mon thread throughout these pilot cases is that, following a trend evidenced in *Hansen* and *Elias*, not a single OSH Act violation has been alleged despite the fact that they each involve the death or serious injury of employees as a result of the conduct. Underlying this trend is the fact that the OSH Act provides no criminal redress for those cases involving a "serious violation," defined as a condition creating "a substantial probability that death or serious physical harm could result";¹⁶⁴ for such occasions, the statute calls not for criminal penalties but only a citation that could result in the assessment of a civil penalty of up to \$7,000.¹⁶⁵

Moreover, although the pilot cases that involved employee deaths could have been prosecuted criminally under OSH Act § 666(e), such charges were not brought. Section 666(e) provides only for a fine of \$10,000 or less and for up to six months imprisonment for violations of any OSH Act standard that results in an employee death,¹⁶⁶ penalties that pale in comparison to the penalty provisions of the major environmental statutes. Due to the OSH Act's relative lack of teeth, § 666(e) simply could not have resulted in the severity of fines and incarcerations that have been achieved in the CWA, CAA, and RCRA cases discussed below.

B. Prosecuting Salvagno Under the Clean Air Act and Other Statutes

Pursuant to section 112 of the CAA, EPA promulgated National Emissions Standards for Hazardous Air Pollutants (NESHAP) for asbestos in April 1973 (Asbestos NESHAP).¹⁶⁷ The purpose of the Asbestos NESHAP regulations is to protect the public by limiting the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material, such as the renovation or demolition of all structures, installations, and (with certain exceptions) buildings.¹⁶⁸

Noncompliance with the Asbestos NESHAP by any regulated owner or operator is punishable by CAA section 113. Civil penalties of up to \$27,500 per violation per day may accrue, and the government may seek a temporary or permanent injunction.¹⁶⁹

Section 113 also includes several categories of criminal penalties for violations of CAA provisions (including the NESHAPs). For example, section 113(c)(1) provides for a fine and/or imprisonment of not more than *five years* for the knowing violation of various CAA provisions, including any requirement or prohibition of an applicable implementation plan, new source review standard, or inspection requirement.¹⁷⁰ Section 113(c)(2) provides a fine and/or imprisonment up to *two years* for any knowingly false statement, or for knowingly altering or failing to maintain a required document, or for knowingly falsifying or otherwise rendering inaccurate any required monitoring device or method.¹⁷¹

The most severe criminal penalties under the CAA are set forth in section 113(c)(5)(A), which provides that:

Any person who knowingly releases into the ambient air any hazardous air pollutant . . . or any extremely hazardous substance . . . and who knows at the time that he thereby places another person in imminent danger of death or serious bodily injury shall, upon conviction, be punished by a fine under Title 18, or by imprisonment of not more than 15 years, or both.¹⁷²

Violations of this section by a corporation are punishable by a fine of up to \$1,000,000.¹⁷³ Moreover, for each of the CAA violations described above, the fine and imprisonment maximums are doubled as to individual and corporate defendants in the event of a second or subsequent violation.¹⁷⁴

In December 2004, due in large measure to the potent penalty provisions of the CAA, a United States District Court judge imposed, in *United States v. Salvagno*, the two longest prison sentences for an environmental crime in history, as well as massive fines and restitution payments.¹⁷⁵ *Salvagno* involved a classic “rip-and-run” asbestos operation; the evidence established that between 1990 and 1999, Raul and Alex Salvagno, a father-and-son team, conspired to violate the CAA and the Asbestos NESHAP by directing their over 500 employees to remove dry asbestos instead of wetting it first, as required under the Asbestos NESHAP. Their motive was to reduce the cost of asbestos abatements and thereby maximize their profits. Moreover, the defendants defrauded clients on 1,555 abatement jobs by directing a laboratory, purportedly independent but in fact secretly co-owned by Alex Salvagno, to falsify some 75,000 laboratory samples so that the samples would indicate that the asbestos had been abated.¹⁷⁶

The defendants were convicted in March 2004 of nine counts of substantive violations of the CAA and the Asbestos NESHAP (including violations of section 113(c)(1) and (2)), as well as of conspiracy to violate the CAA, the Toxic Substances Control Act,¹⁷⁷ and the Racketeer Influenced and Corrupt Organization Act.¹⁷⁸ After experts testified that, as a result of the Salvagnos’ conduct, most of the 100 employees who suffered the worst exposure would contract asbestosis, lung cancers, and mesothelioma, Alex Salvagno was sentenced to twenty-five years in prison, and his father Raul was sentenced to nineteen years. In addition, Alex and Raul were ordered to forfeit a combined \$3.7 million to the United States, and to pay approximately \$23 million each in restitution to their victims.¹⁷⁹ The Salvagnos’ abatement company, AAR Contractor, Inc., also was ordered to forfeit over \$2 million and to pay approximately \$23 million in restitution.¹⁸⁰ Finally, convictions

were also obtained against thirteen supervisors (most of whom cooperated with the government) from AAR and the affiliated laboratory.¹⁸¹

Besides the severity of the sentencing, *Salvagno* is significant insofar as not a single OSH Act violation was alleged, despite the nature of the underlying crimes and the focus on the exposure of AAR’s 500 employees to asbestos. The *Salvagno* case therefore continued the trend of *Hansen* and *Elias*, which, as discussed previously, also involved employee injury but included only a single OSH Act charge between them.¹⁸²

C. The Motiva Plea Agreement

On March 17, 2005, Motiva Enterprises LLC (Motiva), the fifth largest oil-refining operation in the United States,¹⁸³ pleaded guilty to two CWA counts and one CAA count arising from a 2001 explosion that killed one employee and injured nine others.¹⁸⁴ The incident occurred at Motiva’s Delaware City, Delaware, refinery when flammable vapors emanating from a corroded steel tank used to store up to 415,000 gallons of sulfuric acid (designated by EPA as an “extremely hazardous substance”¹⁸⁵), reached a heat source and exploded.¹⁸⁶

Motiva admitted to improperly converting the tank, and to failing to take numerous steps that could have averted the explosion despite knowledge of corrosion and leaks in the tank over a period of eight years.¹⁸⁷ In addition to the human toll, the explosion caused approximately 99,000 gallons of sulfuric acid to spill into the Delaware River and resulted in the death of 2,500 fish and 250 crabs.¹⁸⁸ Under the agreement, Motiva pleaded guilty to (i) knowingly discharging a pollutant into a water of the United States (via the local wastewater treatment plant) in violation of a National Pollutant Discharge Elimination System (NPDES) permit and the CWA,¹⁸⁹ (ii) negligently releasing an extremely hazardous substance into the ambient air that negligently placed a person in imminent danger of death or serious bodily injury, a CAA violation,¹⁹⁰ and (iii) negligently discharging a pollutant into the Delaware River in violation of Motiva’s NPDES permit and the CWA.¹⁹¹

No individuals were involved in the plea deal, whereby Motiva agreed to a three-year probation and a \$10 million fine—the largest criminal environmental fine in Delaware history¹⁹²—to resolve the criminal case.¹⁹³ As was the case with the *Salvagno*, *Hansen* and *Elias* cases, no violation of the OSH Act was alleged in *Motiva*.

D. The Atlantic States Indictment

On December 15, 2003, the DOJ filed an indictment in the United States District Court for the District of New Jersey against the Atlantic States Cast Iron Pipe

Company.¹⁹⁴ Atlantic States is a pipe foundry with a long history of alleged workplace injuries, fatalities, and environmental violations.¹⁹⁵ By the indictment, Atlantic States and five executives were charged with substantive violations of the CWA and CAA, conspiracy to violate the CWA and CAA, conspiracy to make false statements and obstruct EPA and OSHA and to defeat the lawful purpose of EPA and OSHA, as well as false statement and obstruction counts.¹⁹⁶

The indictment alleges, among other things, that the defendants discharged petroleum-contaminated wastewater onto the ground and into the Delaware River, and concealed such discharges from governmental regulators, in order to maximize the production of cast iron pipe at the Phillipsburg, New Jersey facility without concern to environmental pollution or worker safety.¹⁹⁷ The defendants also are charged with systematically altering accident scenes and existing conditions at the facility in order to conceal the unsafe working practices from OSHA.¹⁹⁸

At the time of this writing, the *Atlantic States* trial was scheduled to begin in September 2005.

E. New York's Strategy Complements the Initiative

There is evidence that state law enforcement officials, too, are following the trend embodied in the Initiative. Presenting the keynote speech at the annual meeting of the New York Committee for Occupational Safety and Health (a union and public interest coalition) on December 7, 2004, New York Attorney General Eliot Spitzer stated that his office was beginning to prosecute workplace safety crimes using environmental statutes as a way to avoid federal preemption by OSHA.¹⁹⁹ Mr. Spitzer noted that by using state environmental laws, he has the "sword of Damocles of criminal prosecution hanging over the owner of the company, and criminal prosecution is what people fear, because the sanctions and the consequences are very significant, not only to the individual but to the company."²⁰⁰

It appears that New York's initiative will rely heavily on the state's analog to RCRA § 6928(e). Article 71 of the New York Environmental Conservation Law (ECL), which generally regulates the storage and prohibits the release of hazardous waste, was amended in 1986 to create the crime of "endangering public health, safety or the environment" (EPHSE) of which there are five degrees.²⁰¹

Under the New York law, persons are guilty of EPHSE in the first degree when they *knowingly* engage in conduct that causes the release of a substance hazardous to public health or the release of a substance, which at the time of the conduct they know to meet any of the criteria set forth in ECL § 37-0103(b), and such release *causes physical injury* to any other person.²⁰² The

aforementioned criteria in ECL § 37-0103(b) include New York's list of waste exceeding certain hazardous toxicity thresholds, or waste that causes or is capable of causing death, serious illness, or serious physical injury to any person as a consequence of its release into the environment.²⁰³ Conviction of first-degree EPHSE, a Class C felony, subjects a defendant to a fine of \$200,000 and up to *fifteen years* in prison.²⁰⁴

Persons are guilty of EPHSE in the second degree when they either *knowingly* engage in conduct that causes the release of a substance hazardous to public health, and such release *causes physical injury* to any person who is not a participant in the crime, or when they *recklessly* engage in conduct which causes the release of a substance acutely hazardous to public health, and such release *causes physical injury* to a person who is not a participant in the crime.²⁰⁵ Conviction of second-degree EPHSE, a Class D felony, subjects a defendant to a maximum fine of \$150,000 and up to *seven years* in prison.²⁰⁶

As an example of New York's initiative, Attorney General Spitzer pointed to the September 2004 indictment of a Bronx junkyard and two of its officers with reckless endangerment and two counts of EPHSE.²⁰⁷ These charges stemmed from the serious injury suffered by a twenty-one-year-old employee. The indictment alleges that these injuries resulted from cleaning an underground storage tank that contained gasoline and other vehicle waste fluids without proper protective gear. The Commissioners of the New York Police Department and the New York State Department of Environmental Conservation convened to announce the indictment. At the press conference, Mr. Spitzer warned, "[b]usiness owners who put profit before the safety of their workers and violate environmental laws will be held accountable."²⁰⁸

By filing this indictment and the attorney general's statements, New York has publicly acknowledged the adoption of a strategy similar to that adopted by the federal government in its Initiative for dealing with workplace safety violations. Just as the Initiative will affect employers nationwide with respect to potential violations of federal law and regulations, New York companies are likely to face more serious state-based charges for conduct that causes an injury or death to an employee.

Conclusion

On both the state and federal levels, environmental statutes and regulations increasingly are being used to regulate workplace safety, and to supplant enforcement efforts that historically relied upon the OSH Act. The formerly distinct regulatory universes of workplace safety and environmental protection are now bound by historical trends as well as by current developments,

such as the Initiative and similar state initiatives mandating interagency activity and using environmental laws to prosecute workplace safety violations.

Moreover, in light of the requirements contained in environmental statutes such as RCRA, the Oil Pollution Act, and the Clean Air Act, as well as other regulatory requirements such as the preparation of Facility Response Plans, Spill Prevention, Control and Countermeasure Plans, and Spill Prevention Reports, today's employers not only must consider the health effects that a discharge may have upon their employees, but also must acquire and inspect relevant safety gear, conduct applicable safety training, and inspect potential sources of health hazards. In addition, the citizen suit provisions of environmental statutes such as RCRA and EPCRA may be brought to bear on employers who fail to comply with safety rules.

Cumulatively, such developments have reinforced workplace safety standards while simultaneously causing a shift away from enforcement under the OSH Act. As a result, these developments have dramatically changed the legal landscape for employers by threatening more significant penalties for noncompliance—including extended prison sentences for corporate officials—than would be possible in enforcement proceedings brought under the OSH Act alone. These changes, in turn, raise the inevitable question about the appropriateness of replacing a statutory regime specifically designed for the protection of the workplace with statutory regimes generally thought to apply to areas outside of the workplace.

Endnotes

1. Occupational Safety and Health Act, 29 U.S.C. §§ 651–678 (2000).
2. Discussed *infra* at pages 19–24.
3. See *infra* notes 199–207.
4. See *infra* text accompanying note 175.
5. See *infra* text accompanying notes 194–196.
6. Memorandum of Understanding Between the U.S. Department of Labor, Occupational Safety and Health Administration and the U.S. Environmental Protection Agency, Office of Enforcement (Nov. 23, 1990) [hereinafter OSHA/EPA Working Relationship MOU], available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=MOU&p_id=237; Memorandum of Understanding Between the United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Office of Enforcement and Compliance Assurance and the United States Department of Labor, Occupational Safety and Health Administration, on Chemical Accident Investigation, available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=MOU&p_id=246 (Dec. 1, 1996) [hereinafter Chemical Accident Investigation MOU].
7. Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992 (2000).
8. Oil Pollution Act of 1990, 33 U.S.C. §§ 2701–2761 (2000).
9. Clean Air Act, 42 U.S.C. §§ 7401–7671 (2000).
10. Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. §§ 11001–11050 (2000).
11. OSHA/EPA Working Relationship MOU, *supra* note 6, § I.
12. *Id.* § II.
13. *Id.* § III(A)(1).
14. *Id.* § III(A)(2).
15. *Id.* § III(B)(1).
16. *Id.* § III(C)(1).
17. *Id.* § III(C)(2)–(5).
18. *Id.* § III(C)(3).
19. *Id.* § III(D).
20. *Id.* § III(E).
21. 42 U.S.C. § 9604(e) (2000). CERCLA is triggered when any hazardous substance is released or there is a substantial threat of such a release into the environment, or when there is a release or substantial threat of release into the environment of any pollutant or contaminant that may present an imminent and substantial danger to the public health or welfare. *Id.* § 9604(a)(1).
22. *Id.* §§ 7403, 7412, 7414, 7607.
23. Chemical Accident Investigation MOU, *supra* note 6, §§ I, III.
24. *Id.* § II.
25. *Id.* § III(A).
26. *Id.*
27. *Id.*
28. *Id.* § III(B).
29. *Id.*
30. *Id.*
31. *Id.* § III(C).
32. *Id.*
33. 29 U.S.C. § 660(c) (2000).
34. 42 U.S.C. § 7622(a) (2000).
35. *Id.* § 9610(a).
36. Chemical Accident Investigation MOU, *supra* note 6, § III(C).
37. See, e.g., EPA/OSHA Joint Chemical Accident Investigation Report for BPS, Inc., West Helena, Arkansas (1999) [hereinafter Arkansas Report] (investigation of May 1997 explosion at facility that caused the death of three firefighters, the closing of several major transportation routes, and the evacuation of hundreds of people), available at <http://yosemite.epa.gov/oswer/CeppoWeb.nsf/content/ap-chai.htm>.
38. See *id.* at i–ii.
39. 42 U.S.C. § 7412(r)(6) (2000).
40. Arkansas Report, *supra* note 37, at ii; Rick Weiss, *Chemical Safety Panel Survives Veto Pen*, Wash. Post, Nov. 4, 1997, at A-15; U.S. Chem. Safety & Hazard Investigation Bd., Mission Statement, at www.csb.gov (last visited June 6, 2005).
41. U.S. Chem. Safety & Hazard Investigation Bd., Strategic Plan to Congress, FY 2004–2008, at 17 (n.d.), available at http://www.csb.gov/news_releases/docs/CSBStrategicPlan2004-2008.pdf (last visited June 6, 2005).
42. 42 U.S.C. §§ 6901–6992 (2000).
43. EPA can delegate the administration of certain RCRA powers to any state with an approved hazardous waste program. *Id.* § 6926(b). However, even when EPA approves a state's hazardous waste program, the United States (through EPA) retains the

- authority to prosecute federal crimes. *See, e.g., United States v. Elias*, 269 F.3d 1003, 1012 (9th Cir. 2001); *United States v. MacDonald & Watson Waste Oil Co.*, 933 F.2d 35, 44 (1st Cir. 1991).
44. Whether a waste is “hazardous” for RCRA purposes can be a complicated question—and one commonly raised by defendants in RCRA enforcement actions. Although this issue is beyond the scope of this article, generally speaking, in order for a solid waste to be deemed “hazardous,” either it must be on a specific list of hazardous waste, or it must be on a list of wastes specifically excluded by regulation and meet any of certain criteria (ignitability, corrosivity, reactivity, and toxicity). *See, e.g., EPA Identification and Listing of Hazardous Waste*, 40 C.F.R. §§ 261.3(a)(2)(i)–(iv), 261.4(b), 261.21–261.24 (2004).
 45. 42 U.S.C. § 6902(b) (2000).
 46. *See, e.g., id.* §§ 6922(a)(1), 6922(a)(5), 6923(a)(1), 6924(a)(1)–(2).
 47. *Id.* § 6925.
 48. *Id.* § 6928.
 49. 29 U.S.C. § 654(a)(1) (2000).
 50. *Id.* § 654(a)(2).
 51. 42 U.S.C. § 6928(e) (2000).
 52. *Id.* §§ 6921–6939e.
 53. *Id.* § 6991–6991i.
 54. *Id.* § 6992–6992k.
 55. *Id.* §§ 6911–6917, 6951–6956.
 56. *Id.* § 6941–6949a.
 57. *Id.* § 6961–6965.
 58. EPA Standards Applicable to Generators of Hazardous Wastes, 40 C.F.R. § 262 (2004).
 59. *See id.* § 262.30–262.33.
 60. *Id.* § 262.34.
 61. EPA Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities, 40 C.F.R. § 264 (2004).
 62. *Id.*
 63. *Id.* § 264.51(a). Note that this contingency plan requirement under RCRA may be satisfied by making minor adjustments to the facility’s Spill Prevention, Control and Countermeasures Plan, as required by the Oil Pollution Act. *See id.* § 264.52(b); *see also infra* text accompanying notes 122–126.
 64. 40 C.F.R. § 264.15(b)(1) (2004).
 65. *Id.* § 264.15(c).
 66. *Id.* § 264.16(a)(1).
 67. *Id.* § 264.17(a).
 68. *Id.* § 264.32.
 69. *See generally* 42 U.S.C. § 6928 (2000).
 70. *Id.* § 6928(a)(3). This penalty increased pursuant to the Civil Monetary Penalty Inflation Adjustment Rule. 40 C.F.R. § 19.4 (2004) (revising upward the applicable penalty for violations occurring on or after March 15, 2004).
 71. RCRA Enforcement Division, EPA, RCRA Civil Penalty Policy § I (2003), available at <http://www.epa.gov/compliance/resources/policies/civil/rcra/rcpp2003-fnl.pdf>.
 72. *See, e.g., OSHA Occupational Safety and Health Standards*, 29 C.F.R. § 1910.1000 (2004).
 73. 29 U.S.C. § 666(e) (2000) (emphasis supplied).
 74. RCRA includes criminal penalties for, among other things, knowingly transporting or causing to be transported any hazardous waste without a permit, knowingly treating, storing, or disposing of any hazardous waste without or in violation of a permit. 42 U.S.C. § 6928(d) (2000). Upon conviction, the statute provides for penalties of up to \$50,000 for each day of violation, or imprisonment not to exceed five years. *Id.* These RCRA penalties require only general intent on the part of a defendant; that is, the defendant need only have intended the act charged, and need not specifically have intended to violate the law.
 75. *Id.* § 6928(e) (emphasis supplied).
 76. *Id.* § 6928(f)(6).
 77. H. R. Conf. Rep. No. 96-1444, at 38 (1980), *reprinted in* 1980 U.S.C.C.A.N. 5028, 5038.
 78. 42 U.S.C. § 6928(f)(3) (2001).
 79. *Id.* § 6928(e).
 80. Two bills introduced in the Senate in 2004 propose increases in criminal penalties under the OSH Act. The Protecting America’s Workers Act was introduced on April 29, 2004 by Senator Kennedy and would increase certain maximum statutory fines and periods of incarceration. S. 2371, 108th Cong. § 308 (2004). The Safety Advancement for Employees Act of 2004, which also proposes increased fines and incarceration maximums under the OSH Act, was introduced on July 22, 2004, by Senator Enzi. S. 2719, 108th Cong. § 13 (2004). Both bills were referred to the Committee on Health, Education, Labor, and Pensions.
 81. *See United States v. Protex Indus., Inc.*, 874 F.2d 740, 741 (10th Cir. 1989).
 82. *Id.*
 83. *Id.*
 84. *Id.* at 742.
 85. *Id.*
 86. *Id.*
 87. *Id.* at 740.
 88. *Id.* at 743.
 89. *Id.*
 90. 262 F.3d 1217 (11th Cir. 2001).
 91. *Id.* at 1225.
 92. *Id.* at 1243.
 93. *Id.* at 1231.
 94. *Id.*
 95. *Id.* at 1232.
 96. *Id.* at 1231 n.15.
 97. 269 F.3d 1003 (9th Cir. 2001).
 98. The two longest criminal sentences imposed for environmental crimes were handed down in *United States v. Salvagno* in December 2004. *See infra* text accompanying notes 175–182.
 99. 269 F.3d at 1007.
 100. *Id.*
 101. *Id.*
 102. *Id.*
 103. *Id.*
 104. *Id.*
 105. *Id.*

106. *Id.*
107. *Id.* at 1008.
108. *Id.*; Answering Brief for the United States at 2, *United States v. Elias* (9th Cir. Nov. 28, 2000) (No. 00-30145), 2000 WL 33982562.
109. 269 F.3d at 1008.
110. *Id.*
111. 33 U.S.C. §§ 2701–2761 (2000).
112. *Id.* § 1321(b)(3), (j).
113. A component of the OPA, the Oil Spill Liability Trust Fund, was created pursuant to the Internal Revenue Code. I.R.C. § 9509(a) (2000).
114. 33 U.S.C. § 2712(a) (2000).
115. *See, e.g.*, EPA Oil Pollution Prevention, 40 C.F.R. § 112.20(a)(1) (2004).
116. *Id.* § 112.2. Note that other, less common types of facilities also are subject to OPA jurisdiction. *See id.* § 112.1.
117. *Id.* § 112.20(a)(1).
118. *Id.* § 112.20(f)(1)(i).
119. *Id.* § 112.20(h)(1).
120. *Id.* § 112.21.
121. *Id.* § 112.20(h)(3)(ix)(F). The indirect effects of a release include “the effects of any toxic, irritating, or asphyxiating gases that may be generated, or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion.” *Id.*
122. *See generally id.* § 112.
123. *Id.* § 112.20(h)(1).
124. *Id.* § 112.1.
125. *See, e.g., id.* § 112.7(c), (f) (SPCCP requirements); § 112.20(h)(3), (8) (FRP requirements).
126. *Id.* § 112.7(f)(1).
127. 33 U.S.C. § 1321(b)(7)(C) (2000). This penalty increased pursuant to the Civil Monetary Penalty Inflation Adjustment Rule. 40 C.F.R. § 19.4 (2005) (revising upward the applicable penalty for violations occurring on or after March 15, 2004).
128. 33 U.S.C. § 1321(b)(6) (2000).
129. Office of Enforcement & Compliance Assurance, EPA, Civil Penalty Policy for Section 311(b)(3) and Section 311(j) of the Clean Water Act (1998) [hereinafter EPA CWA Penalty Policy], available at <http://cfpub.epa.gov/compliance/resources/policies/civil/cwa/>.
130. *Id.* at 3; *see also* 33 U.S.C. § 1321(b)(8) (2000).
131. EPA CWA Penalty Policy, *supra* note 129, at 7–11.
132. *Id.* at 8–9.
133. *See* 33 U.S.C. § 1319(g)(8) (2000).
134. N.Y. Env’tl. Conserv. Law §§ 40-0101–40-0123 (McKinney 2004).
135. A storage facility is regulated under this part if it has (i) an aboveground tank storing a hazardous substance, or mixture thereof, with a capacity of 185 gallons or more, (ii) an underground tank storing a hazardous substance, or mixture thereof, of any capacity, or (iii) a nonstationary tank used to store 2,200 pounds or more of a hazardous substance or a mixture thereof for more than ninety consecutive days. 6 N.Y.C.R.R. §§ 596.1(b), 598.1(b) (2004).
136. *Id.* § 598.1(k)(1).
137. *Id.* § 598.1(k)(2).
138. *Id.* § 598.1(k)(2)(x).
139. *Id.* §§ 598.4, 598.9.
140. N.Y. Env’tl. Conserv. Law § 71-4303 (McKinney 2004).
141. *Id.*
142. The third type of citizen suit is one that may be brought against the EPA for failure to perform a nondiscretionary act or duty. *See* 42 U.S.C. § 6972(a)(2) (2000).
143. *Id.* § 6972(a)(1)(A).
144. 40 C.F.R. §§ 264.15(b)(1), 264.16(a)(1), 264.51(a) (2004).
145. 42 U.S.C. § 6972(a)(1)(B) (2000).
146. *See* 40 C.F.R. §§ 264.15(b)(1), 264.51(a) (2004).
147. 42 U.S.C. § 6972(b)(2)(A) (2000). This section mandates that a citizen suit may not be filed until ninety days after the plaintiff has given written notice of the endangerment to the EPA, the state government where the alleged endangerment may occur, and any person alleged to have contributed to the endangerment.
148. *Id.* § 7002(b)(1)(A)(iii).
149. Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. §§ 11001–11050 (2000).
150. *See, e.g., id.* §§ 11021–11022.
151. *Id.* § 11046(a)(1)(A).
152. *Id.* § 11046(e).
153. *Id.* § 11045; 40 C.F.R. § 19.4 (2004).
154. 42 U.S.C. § 11046(f) (2000).
155. 29 C.F.R. 1910.1200 (2004).
156. *Id.* 1910.1200(b)(1).
157. 42 U.S.C. § 11021 (2000).
158. *Id.* §§ 11022–11023.
159. *See, e.g., Williams v. Leybold Techs., Inc.*, 784 F. Supp. 765 (N.D. Cal. 1992) (denying a motion to dismiss a citizen lawsuit brought against company for failing to submit an MSDS for nickel, a hazardous chemical pursuant to the OSH Act regulations); *Atl. States Legal Found., Inc. v. Whiting Roll-up Door Mfg. Co.*, 772 F. Supp. 745 (W.D.N.Y. 1991) (denying motion to dismiss EPCRA citizen suit against company for failing to submit MSDS forms, despite fact that company cured failure prior to filing of lawsuit).
160. Telephone Interview with Andrew Goldsmith, Senior Trial Attorney, DOJ Environment and Natural Resources Division, and Assistant Section Chief, Environmental Crimes Section (May 3, 2005).
161. *Id.*
162. *Id.*
163. David Barstow & Lowell Bergman, *With Little Fanfare, a New Effort to Prosecute Employers That Flout Safety Laws*, N.Y. Times, May 2, 2005, at A17.
164. 29 U.S.C. § 666(b), (k) (2000).
165. *Id.*
166. *Id.* § 666(e).
167. 42 U.S.C. § 7412(d) (2000); EPA National Emissions Standards for Hazardous Air Pollutants, 40 C.F.R. § 61 (2004).
168. *See, e.g.,* 40 C.F.R. § 61.145 (2004).
169. 42 U.S.C. § 7413(b) (2000); 40 C.F.R. § 19.4 (2004).
170. 42 U.S.C. § 7413(c)(1) (2000).

171. *Id.* § 7413(c)(2).
172. *Id.* § 7413(c)(5)(A) (emphasis supplied).
173. *Id.*
174. *Id.* §§ 7413(c)(1)–(2), (5).
175. See *United States v. Salvagno*, 375 F.Supp. 2d 117, 118 (N.D.N.Y. 2005) (reconsidering sentence in light of Supreme Court holding in *United States v. Booker*, 125 S. Ct. 738 (2005)). See also Press Release, U.S. Attorney’s Office (N.D.N.Y.), Two Men Sentenced for Criminal Violations Relating to Illegal Asbestos Removal Activities Throughout New York State (Dec. 23, 2004), at <http://www.usdoj.gov/usao/nyn/NewsReleases/NewsReleases.htm>; William Kates, *25 and 20 Years for Son, Father Who Ran Massive Asbestos Fraud*, Assoc. Press, Dec. 23, 2004; *Lengthy Jail Sentences Imposed for Illegal Asbestos Removal Activities*, Daily Record (Rochester, N.Y.), Jan. 6, 2005, 2005 WLNR 390616.
176. See Press Release, U.S. Attorney’s Office (N.D.N.Y.), *supra* note 175.
177. 15 U.S.C. §§ 2601–2629 (2000).
178. 18 U.S.C. §§ 1961–1968 (2000). Alex Salvagno also was convicted of three counts of tax fraud. Press Release, U.S. Attorney’s Office (N.D.N.Y.), *supra* note 175.
179. See Press Release, U.S. Attorney’s Office (N.D.N.Y.), *supra* note 175.
180. See *id.* See also Kates, *supra* note 175; *Lengthy Jail Sentences Imposed for Illegal Asbestos Removal Activities*, *supra* note 175.
181. See *Lengthy Jail Sentences Imposed for Illegal Asbestos Removal Activities*, *supra* note 175.
182. Moreover, while Alex and Raul Salvagno have appealed their verdicts, their sentences exceeded those of both the *Hansen* and *Elias* cases. See *supra* text accompanying notes 164–165.
183. Information ¶ 1, *United States v. Motiva Enter. LLC* (D. Del. Mar. 16, 2005) (No. 05-CR00021), 2005 WL 691605.
184. Memorandum of Plea Agreement ¶ 1, *United States v. Motiva Enter. LLC*, (D. Del. Mar. 16, 2005) (No. 05-CR00021), 2005 WL 691606.
185. Information ¶ 4, *Motiva*; see also 42 U.S.C. § 11002(a)(2) (2000); EPA Emergency Planning and Notification Rule, 40 C.F.R. § 355, app. A (2004).
186. Information ¶¶ 3, 16, *Motiva*.
187. *Id.* ¶¶ 8–13.
188. *Id.* ¶ 17.
189. Memorandum of Plea Agreement ¶ 1(a), *Motiva*; 33 U.S.C. §§ 1311, 1319(c)(2)(A) (2000).
190. Memorandum of Plea Agreement ¶ 1(b), *Motiva*; 42 U.S.C. § 7413(c)(4) (2000).
191. Memorandum of Plea Agreement ¶¶ 7–8, 14, *Motiva*; 33 U.S.C. §§ 1311, 1319(c)(1)(A) (2000).
192. Steve Cook, *Motiva Pleads Guilty to Air, Water Violations Stemming from Delaware Refinery Explosion*, Daily Env’t Rep. (BNA), at A-2, Mar. 18, 2005.
193. Memorandum of Plea Agreement ¶¶ 7–8, 14, *Motiva*.
194. Press Release, DOJ, Major N.J. Iron Pipe Manufacturer, Top Managers Charged in Eight-Year Conspiracy to Pollute, Expose Employees to Danger, Cover Up and Impede Investigations (Dec. 15, 2003), at http://www.usdoj.gov/opa/pr/2003/December/03_enrd_691.htm.
195. Indictment at 14–36, *United States v. Atl. States Cast Iron Pipe Co.* (D.N.J. Dec. 15, 2003), available at http://www.usdoj.gov/usao/nj/publicaffairs/NJ_Press/files/pdf/atlanticindict.pdf.
196. *Id.* at 37–46.
197. *Id.* at 14–15.
198. *Id.* at 15–16.
199. John Herzfeld, *Attorney General Spitzer Urges Unions To Use Environmental Laws For Job Safety*, Daily Env’t Rep. (BNA), at A-2 (Dec. 9, 2004); *Attorney General Spitzer Discusses Criminal Prosecution at NYCOSH Meeting*, NYCOSH Update (N.Y. Comm. for Occupational Safety and Health, New York, N.Y.), Dec. 9, 2004, available at http://www.nycosh.org/UPDATE/update_index.php.
200. See Herzfeld, *supra* note 199, at A-2.
201. N.Y. Env’tl. Conserv. Law §§ 71-2710–2714 (McKinney 2004).
202. *Id.* § 71-2714.
203. *Id.* § 37-0103(b).
204. *Id.* §§ 71-2714(2), 71-2721(2); N.Y. Penal Law § 70.00(2)(c) (McKinney 2004).
205. N.Y. Env’tl. Conserv. Law § 71-2713 (McKinney 2004).
206. *Id.* §§ 71-2713, 71-2721(2); N.Y. Penal Law § 70.00(2)(d) (McKinney 2004).
207. Press Release, Office of New York State Attorney General Eliot Spitzer, Bronx Company Indicted After Near Death of Employee (Sept. 9, 2004), at <http://www.oag.state.ny.us/press/agpress05.html>.
208. *Id.*

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The 2005 Constitutional Violation of New York's Forest Preserve: *What Remedy?*

By Rosemary Nichols and Nicholas A. Robinson

In September 2005, Dan Plumley photographed many of the more than 5,000 trees felled on both sides of eleven miles along New York Route 3 west of Saranac Lake in the New York State Forest Preserve. Emblematic of all this tree cutting is one photo. It shows both the stump of a mature, healthy white fir tree and its severed majestic trunk (with mangled limbs), still boldly emblazoned with a large bright yellow sign, which features the green and blue logo of the Department of Environmental Conservation and the words: "FOREST PRESERVE."¹ The tree once graced the edge of the wild forest, along a State highway that had won national awards for its beauty and sensitive routing through the Forest Preserve.

During last summer crews from the NYS Department of Transportation (DOT) and its contractors clear-cut trees back 50-75 +/- feet from the pavement on Route 3. When it is necessary to trim tree limbs, or remove old and diseased trees or limbs that may threaten highway use and safety, New York provides that the target trees may be marked and selectively removed as part of highway maintenance, after receipt of a permit from the NYS Department of Environmental Conservation (DEC).² DEC indicates that it informally authorized removal of up to 1,000 trees along Route 3. DOT or its agents cut upwards of 4,000 more trees and left the exposed roadsides open to erosion.³ DEC's Forest Rangers, DEC's Lands & Forest staff and its Environmental Conservation Officers all took no action in the face of this clear-cutting. The Adirondack Park Agency (APA), which has authority over land use planning in association with the transportation corridors within the Adirondack Park's "Blue Line" borders, questioned DOT about the cutting but took no action. By September, the State DOT had clear-cut 22 miles of forest on both sides of Route 3 for eleven miles and done the damage while the State's watchdogs were slumbering.

What Plumley's camera documents is a *prima facie* violation of Article XIV of the New York State Constitution: "The lands of the state, now owned or hereafter acquired, constituting the forest preserve as now fixed by law, *shall be forever kept as wild forest lands*. They shall not be leased, sold or exchanged, or be taken by any corporation, public or private, *nor shall the timber thereon be sold, removed or destroyed*."⁴ The cutting of trees within the Forest Preserve has been unlawful since 1894, when Article XIV was adopted at a Constitutional Convention.⁵ By amendment of the Constitution, the people of New York have allowed a circumscribed authority for

tree cutting to permit maintenance of highways to access and cross the Forest Preserve.⁶

Stewardship of the "forever wild" Forest Preserve is entrusted to the Department of Environmental Conservation.⁷ Before New York's Department of Transportation (for the 1,200 miles of State highways), or any town highway department (for the 3,000 miles of county and town roads), can trim trees along roadways in the Forest Preserve, the highway maintenance project requires a temporary, revocable permit from the DEC.

"No explanation has been provided to journalists or the public for why this vast, apparently premeditated clear-cutting along Route 3 was undertaken. Requests for explanations have not been answered."

DOT crews never marked any of the presumably "dangerous" target trees along Route 3 in order to single them out for selective cutting. DEC has not produced any evidence that it issued any formal permit for the cutting. A DOT Purchase Order, dated July 28, 2005, provided for "felling dead trees along Route 3," and contemplated use of the Feller Buncher, a machine that can reach deep into the forest from its edge. Once work began, DOT quickly moved from selective cutting with a bucket truck to the more intrusive Feller Buncher methods, apparently with a verbal approval by DEC. Cutting now penetrated deep into the adjacent woods of the Forest Preserve. In August, citizen complaints about the clear-cutting of trees immediately emerged, and by early September, DOT ceased its cutting. The legendary wilderness guide, Clarence Petty (born 1901), was among the first to protest.⁸

No explanation has been provided to journalists or the public for why this vast, apparently premeditated clear-cutting along Route 3 was undertaken. Requests for explanations have not been answered.

Municipal workers or private citizens cutting trees in the Forest Preserve have been subject to criminal and civil liability for more than a century.⁹ The prohibition on cutting has been consistently enforced. Indeed, recent legislative amendments in 2003¹⁰ to the Environ-

mental Conservation Law have increased the penalty sanctions for unlawful tree cutting to \$250 per tree, or the stumpage value, with provisions for treble damages of that value.¹¹ Were the State to sanction DOT's contractors for this violation of the Forest Preserve,¹² the fines for 5,000 trees cut would total \$750,000 (at \$250.00 per tree cut), or a stumpage value of perhaps \$1,500,000 +/- . With treble damages, the fine might reach \$4.5 million. The costs for the restoration of the forest area may also be assessed in addition to the fines.¹³

Even if the State were to levy the full fine authorized by law, when a State agency violates State law it may be doubted that any fine is a wholly inadequate remedy. DEC has the authority to enforce the law against DOT.¹⁴ However, for DEC to collect a fine to be paid from the DOT budget (whose funds are allocated from the general fund of the State) only then to be paid into the general fund of the State, is essentially a symbolic act, providing neither effective compensation nor deterrence. Moreover, just as the tourism season for the fall foliage was underway, with tour buses traveling along what was once the scenic Route 3, the DOT began to clean up the unsightly debris and cut trees, tidying up after itself,¹⁵ even to the extent of securing penal laborers from the Department of Corrections to help with the work. DOT has proffered no authority to justify its clean-up activities, received no permit from DEC for this further work in the Forest Preserve, and held no public consultations with local towns or the public, and seems to have done none of the scientific studies that would be expected.¹⁶

However well intended this DOT effort at clean-up may have been, "two wrongs do not make a right." DOT's further acts in the Forest Preserve and its unremediated clear-cut are a continuing violation of Article XIV. Competent silvacultural and ecological analysis is needed to provide an environmentally sound restoration. The recently exposed interior forest trees along the edge of the clear-cut are vulnerable to sunburn and wind shear. Neither DEC nor DOT have evaluated how to curb further forest dieback because of the cutting.

Article XIV authorizes citizens to sue to enforce its provisions, as the Association for the Protection of the Adirondacks has done in the past.¹⁷ The Association's Trustees, at their 504th Meeting,¹⁸ authorized giving notice of the Association's intent to sue and suing, should the DEC and DOT fail to embrace suitable remedies for this Constitutional violation. Public debate and scrutiny are needed with respect to the question: What remedies should be sought?

A citizen plaintiff, or the Attorney General,¹⁹ could seek an injunction obliging the DOT to consult the public, give public notice of its decision-making, design an ecological restoration plan, and replant trees to restore

the Forest Preserve along both sides of Route 3. A citizen plaintiff could also seek to restrain on-going and future DOT violations of Article XIV by ordering internal agency reforms to prevent a recurrence of this sort of Constitutional violation. A citizen suit against the DEC could seek a mandamus to compel its enforcement of its Forest Preserve stewardship duties. It would be appropriate for DEC to secure a settlement of DOT's violations by requiring environmental public benefit projects, such as restoring Forest Preserve areas along other stretches of State highways in addition to Route 3.²⁰

These sorts of remedies for this Route 3 clear-cut may not be enough. When DOT violated Article XIV in the past, past Commissioners of Transportation acted to avert a recurrence of such behavior by establishing the Adirondack Highway Council in 1974,²¹ and by 1986 DOT, in cooperation with DEC, had issued its "Guidelines for the Adirondack Park," known as the green book. The DOT has since allowed the Highway Council to lapse, and seems to take little guidance from the green book. Evidently advisory councils and well-conceived manuals are not sufficient to ensure that DOT understands its Constitutional duties for the Forest Preserve under Article XIV. If all else fails, new legislation may be required to establish a permanent highway council for the Forest Preserve, and make other provisions to ensure that DOT can respect the "forever wild" values of Forest Preserve. In addition, if a financial penalty is required from the DOT, legislation could establish it as a permanent fund to enhance the buffers between highways and the Forest Preserve.

The Executive Committee of the NYS Bar Association has tasked its Committee on the Adirondacks, Catskills, Forest Preserve and Natural Resources to study the DOT violations of Article XIV, and examine what remedies are appropriate for the effective enforcement of Article XIV.²² Since Article XIV contains both affirmative and negative provisions, stewardship for the "forever wild" Forest Preserve requires more than superficial compliance with the mandate not to cut or destroy trees. Implicit in Article XIV's mandate that the Forest Preserve be "*forever kept as wild forest lands*" is a duty to *more* than minimally observe the prohibitions explicitly set forth in Article XIV. The spirit of "forever wild" has been construed by the N.Y.S. Court of Appeals to require safeguarding the Forest Preserve as a sanctuary of quiet and appreciation of nature, for hunting and fishing and recreation and beauty.²³

The Forest Preserve exists not for today alone. Our generation carries forward the wisdom of our forebears in the 19th and 20th centuries. In addition to its historic, intrinsic wild forest values, today the Forest Preserve affords new benefits. As our population grows the com-

mercial value of eco-tourism mounts, and healthy and beautiful wild forests sustain much of the North Country's economy. Moreover, as a consequence of climate change, habitats and migration patterns of species, as well as weather patterns are altering. This evolution can and must be studied. The Adirondacks afford a vast laboratory where the changes can proceed naturally, and we can learn how to adapt and cope to the new circumstances. Moreover, since the Forest Preserve was established to safeguard the sources of water supplies for much of New York, because of the climactic changes forecast in rainfall patterns, there are new reasons why the Forest Preserve's vast hydrologic assets become ever more important.²⁴ Highway tree buffer zones preserve the quality and the quantity of the Forest Preserve's waters, and cannot be reduced merely to a highway amenity, merely an object of highway maintenance.

New York's Constitution literally creates and defines our State. New Yorkers are justifiably proud to have a government of laws, under the rule of law. There is no room for rogue behavior among individuals in any State agencies, especially when express Constitutional provisions govern and are ignored. Like all its other provisions, the State Constitution's safeguards in Article XIV are fundamental. They impose an *affirmative* duty on all authorities in New York to sustain the "forever wild" values in the Forest Preserve.

If DOT is to honor and work within its Constitutional mandate, DOT needs to embrace what scientists know about ecology. DOT's administrative systems should incorporate the constitutionally mandated methods of ecosystem management in DOT's work within the Forest Preserve. Roads and Forest Preserve must co-exist, but the Constitution puts roads under the umbrella of the Forest Preserve, not the other way around. In like vein, the Adirondack Park Agency and the Department of Environmental Conservation need to affirmatively discharge their Constitutional and statutory duties to progressively strengthen "forever wild" values. There is no room in Article XIV for APA and DEC to sleep on their stewardship duties. These Constitutional violations along Route 3 should motivate DOT, DEC and APA each to rethink how best to govern with regard to their respective "forever wild" duties.

"Forever wild" entails and embraces what the eminent ecologist Dr. Aldo Leopold conceived as the "land ethic."²⁵ Because wilderness is a place where natural systems predominate over human constructs, any breach of the land ethic is particularly transparent. In addition to offending the letter of the Constitution, DOT's cutting of 5,000 trees assaults the most basic of our society's environmental norms: the integrity, stability and beauty of the biotic community. The breach of New York's Constitutional land ethic for the Forest Preserve occurred. What now will the remedy be?

Endnotes

1. This photograph has been published in the Annual Report 2005 of the Association for the Protection of the Adirondacks (December 2005), at page 5 (available from the Association for the Protection of the Adirondacks, 897 St. Davids Lane, Niskayuna, New York 12309, <http://www.protectadks.org>). Plumley is the Association's North Country Director of Park Protection. Judge Warren Higley, Lt. Governor Timothy L. Woodruff, and Col. William F. Fox and a group of businessmen, private property owners, and conservationists established the Association in 1901 "to protect and enhance the natural resources and the human values of the Adirondack Park and the New York State Forest Preserve of the Adirondacks and Catskills." See Edith Pilcher, *A Centennial History of the Association for the Protection of the Adirondacks, 1901-2003* (Schenectady, NY).
2. See Section 9-0105 of the Environmental Conservation Law, 17½ McKinney's Consol. Laws of N.Y. These procedures also are based on memoranda of understanding between the DEC and DOT. See Will Abruzzi, "Generic Response to Rt. 3 Tree Inquiry," *Adirondack Daily Enterprise*, October 24, 2005.
3. At the DEC's Forest Preserve Advisory Committee meeting on October 27, 2005, the Director of the DEC's Lands & Forests Division, Robert Davis, indicated that a count of the cut trees showed that 3,000 trees had been cut within the Forest Preserve located within the Route 3 right of way, and 2,000 deeper within the Forest Preserve beyond the right of way.
4. Constitution of the State of New York, Article XIV, Section 1.
5. Opinions of the Attorney General have reaffirmed the illegality of any tree cutting in the Forest Preserve, see, e.g. 1908 Op. Att. Gen 143, 1909 Op. Att. Gen. 663; 1915 Op. Att. Gen 190; 1933 Op. Att. Gen 395; 1948 Op. At. Gen 166; 1970 Op. Att. Gen. 327. The Court of Appeals has noted the prohibition in connection with highways in *Association for the Protection of the Adirondacks v. MacDonald*, 253 N.Y. 234 (1930) at 240: "If it were deemed necessary to obtain a constitutional amendment for the construction of a state highway, the use of which the Forest Preserve might be put with Legislative sanction was greatly limited. Trees could not be cut or the timber destroyed, even for the building of a road."
6. Section 9-0303(1) of the Environmental Conservation Law is clear that, *inter alia*, "no person shall cut, remove, injure, destroy or cause to be cut, removed, injured or destroyed any trees or timber" in the State's forests in the Adirondacks. With respect to highways, Constitutional amendments to the original language of Article XIV made it possible to construct the Northway (voters approved provisions in 1959 to the effect that "... Nothing herein contained shall prevent the State from constructing, completing, and maintaining any highway heretofore specifically authorized by constitution amendment, nor from constructing and maintaining to federal standards federal aid interstate highway route five hundred and two ...". Earlier, in order to provide DEC some authority over highways, the adjacent forests of which remain in the Preserve on Nov. 5, 1957, the State's voters amended the Constitution to allow the use of no more than 400 acres to relocate, reconstruct, or maintain highways; DOT has not claimed to be seeking to use this authorization for its work on Route 3.
7. NYS Environmental Conservation Law, Article 9, "Lands & Forests," 17 ½ McKinney's Consolidated Laws of New York.
8. See Christopher Angus, *The Extraordinary Adirondack Journey of Clarence Petty* (Syracuse University Press, 2002).
9. See, e.g., *People of the State of NY v. Fisher*, 190 NY 468, 83 NE 482; 1908 LEXIS 1200 (1908)
10. L. 2003, Ch. 202.

11. A violation of Section 9-0313(1) of the NYS Environmental Conservation Law, subjects any person to a civil fine of \$250/tree or treble damages based on the stumpage value of the trees, or both. Section 71-0703(6)(a), ECL. Stumpage value is the fair market value of the timber as it stood before cutting. Section 71-0703(6)(a), ECL.
12. Section 9-0101 defines "person" to exclude the State, but a private contractor would be covered within "any person." This leads to a double standard in the law. The responsibilities of State agencies with respect to the Forest Preserve may need to be revised by future legislation.
13. Section 71-0703(7), Environmental Conservation Law.
14. NYS Environmental Conservation Law § 9-0303(1) and 6 N.Y.C.R.R. 190.8.
15. Andy Bates, "DOT To Remove, Chip Rt. 3 Trees," *Adirondack Daily Enterprise*, December 23, 2005.
16. See, e.g. the environmental impact assessment procedures required by the NY State Environmental Quality Review Act, Article 8, Environmental Conservation Law, 17 ½ McKinney's Consolidated Laws of NY.
17. Article XIV, Section 4, provides that "A violation of any of the provisions of this article may be restrained at the suit of the people, or, with the consent of the supreme court of the appellate division, on notice to the attorney-general, at the suit of any citizen." See also *Association for the Protection of the Adirondacks v. MacDonald*, 228 App. Div. 73, *aff'd*, 253 N.Y. 234 (1930).
18. November 11, 2005, meeting at the Adirondack Nature Conservancy, Keene Valley, N.Y.
19. It is a delicate question whether the Attorney General's duty lies first to the Constitution, and enforcement of Article XIV, or to the defense of his clients, the DOT, for its violations of Article XIV, and the DEC for not fulfilling its statutory duties. It was because this sort of situation may paralyze the executive branch that the people includes Section 4 in Article XIV, authorizing citizen suit to ensure that the courts could vindicate the Constitutional safeguards.
20. DEC has statutory authority to settle the violations against DOT on this basis. See Section 71-0523, Environmental Conservation Law.
21. The Adirondack Highway Council consisted of representatives of State and local governmental agencies and of the public, to promote free interchange of ideas between citizens and public agencies and the resultant coordinated actions to ensure the preservation and enhancement of the Park's special character. The Council was to advise DOT in providing an efficient transportation system compatible with the unique, natural character of the Adirondack Park.
22. NYSBA Section on Environmental Law, Executive Committee meeting of January 28, 2006, NY City. The Committee on Adirondacks, Catskills, Forest Preserve and Natural Resources is to report to the Executive Committee in April, 2006.
23. The oft-quoted language from *Association for the Protection of the Adirondacks v. MacDonald*, in the Appellate Division decision, construes "forever wild" thus: "Giving to the phrase 'forever kept as wild forest lands' the significance which the term 'wild forest' bears, we must conclude that the idea intended was a health resort and playground with the attributes of a wild forest park as distinguished from other parks so common to our civilization. We must preserve it in its wild nature, its trees, its rocks, its streams. It was to be a great resort for the use of all the people, but it was made a wild resort in which nature is given free rein. Its uses for health and pleasure must not be inconsistent with its preservation as forest lands in a wild state. It must always retain the character of wilderness. . . . It is essentially a quiet and healthful retreat from the turmoils and artificialities of a busy urban life. Breathing its pure air is invigorating to those sick. No artificial setting is required for any of these purposes." 228 App. Div. 73.
24. In 1899, the Court of Appeals of New York noted that "The primary object of the park, which was created as a forest preserve, was to save the trees for the threefold purpose of promoting the health and pleasure of the people, protecting the water supply as an aid to commerce and preserving timber for use in the future." *People v. Adirondack Railway Co.*, 60 N.Y. 228, at 248 (1899).
25. See Aldo Leopold, *A Sand County Almanac* (Oxford University Press, 1949), in the section on "Wilderness," pp. 188-200, and on "The Land Ethic," pp. 201-226. Leopold restates the land ethic at pp. 224-5, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

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EPA Issues Final All Appropriate Inquiries Rule

By David J. Freeman and Desirée Giler Mann

On November 1, 2005 the U.S. Environmental Protection Agency (EPA) issued its long-awaited regulations for conducting “all appropriate inquiries” (AAI) of environmental conditions in connection with transactions involving real property.¹ Adhering to these requirements is one key element to providing property owners and tenants protection from federal Superfund liability as innocent landowners, bona fide prospective purchasers, and/or contiguous property owners. Even those not seeking to avail themselves of these liability protections are likely to conduct their due diligence in accordance with the AAI rule (Rule), so the impact of these new provisions will be widely felt.

The Rule, which becomes effective on November 1, 2006, will replace the interim AAI standard (ASTM E1527-00).² The Rule also recognizes the newly published ASTM Environmental Site Assessments standard (ASTM E1527-05) and confirms that ASTM E1527-05 satisfies the Rule and the statutory requirements for AAI.

This article will discuss the Rule’s provisions; compare them with current practices reflected in the interim standard for Phase I Environmental Site Assessments; and discuss how the final standards differ from the draft rule promulgated by EPA in August 2004.³ In addition, we will discuss some practical implications that this new standard will have for due diligence in connection with future property acquisitions and dispositions.

Key Elements of the AAI Rule

There are six principal elements of the Rule. **First**, the Rule requires an environmental professional (EP) to investigate the property in question and to prepare a report regarding environmental conditions at the property and its immediate vicinity. The report must include the EP’s opinion as to whether his or her investigation indicates the possibility of a release or threatened release of hazardous substances.⁴ It also requires the “user” (whoever is commissioning the report, usually the prospective purchaser) to collect certain information and consider it in evaluating the property’s likely environmental condition.⁵

Second, the Rule sets standards for those who can qualify as an EP.⁶ The interim standard contains only a general requirement that the person conducting AAI be someone who is knowledgeable, qualified and sufficiently experienced to conduct this type of investiga-

tion. By contrast, the Rule establishes specific standards for an EP which include certification, licensing, education and/or relevant experience. An EP must hold a current professional engineer’s or geologist’s license or a governmental license to perform environmental inquiries and have three years of relevant full-time experience; have a bachelor’s (or higher) degree in science or engineering and five years of relevant full-time experience; or have ten years of full-time experience in the field.⁷ The latter requirement is a change from the proposed rule, which mandated a bachelor’s degree at a minimum for all EPs.

Not all persons involved in the AAI process need to meet these requirements. But the overall effort must be carried out under the supervision of an EP.⁸ That individual must sign a written declaration that he or she meets the minimum qualifications of an EP, and that the investigation was carried out in accordance with the Rule.⁹

Third, the Rule provides, as does the interim standard, a list of tasks which the EP must perform. The EP must inspect the site, including an onsite visit, a requirement which is similar to the ASTM standard.¹⁰ (A limited exception is provided for “unusual circumstances,” which must be documented.)¹¹ The EP must also view the adjoining property, at least from a property line, with particular attention to areas where hazardous waste was used, treated or stored.¹²

The EP must interview the current owner and occupant, and if the owner and occupant are not the same person, then both parties must be interviewed.¹³ If there are multiple occupants, interviews must be conducted of all “major” occupants and those likely to use hazardous substances.¹⁴ These requirements are an important departure from the interim standard, which requires merely a reasonable attempt to conduct interviews. Under the interim standard, Phase I reports based on a single interview of an owner’s representative were commonplace.

The Rule also requires that additional interviews be conducted with current and past facility managers, past owners, operators or occupants of the property, and employees of past and current occupants of the subject property, if necessary to meet the objectives and performance criteria of the Rule.¹⁵ In addition, the Rule requires interviews with owners and occupants of neighboring and nearby properties, where the subject property is abandoned and there is evidence of “poten-

tial unauthorized uses” or “uncontrolled access.”¹⁶ Under these circumstances, such interviews may provide the only means of obtaining the information necessary to meet the objectives of the Rule.

Similar to the interim standard, the Rule contains a requirement for a review of federal, state, tribal and local records and databases that reflect use and disposal of hazardous substances, not only at the subject site but also at surrounding properties.¹⁷ Such databases include CERCLIS, ERNS, the National Priorities List, RCRA generators and corrective action lists, and registries of underground storage tanks.¹⁸ The requirement to review local and tribal records is a change from the interim standard, under which that review is discretionary. The databases to be reviewed, many of which are accessible through the web, are very similar to those specified by ASTM E1527-00, with the most significant changes being (a) the obligation to include searches for engineering¹⁹ and institutional controls²⁰ and environmental liens²¹; and (b) the EP’s ability to modify the search radius requirements with a documented justification for doing so.²²

One change from the interim standard is the Rule’s requirement that historical documents be reviewed only as far back in time as the property contained structures or was used for agricultural, residential, commercial, industrial, or governmental purposes.²³ By contrast, ASTM E1527-00 required that all obvious uses of the property be identified from the present back to the property’s first developed use, or back to 1940, whichever is earlier. The EP is also required to consider, in reaching his or her conclusions, (a) any commonly known or reasonably ascertainable information,²⁴ and (b) the degree of obviousness of the presence or likely presence of contamination.²⁵

Fourth, the Rule requires that for each area of inquiry the EP must (1) identify data gaps which impact his or her ability to identify conditions indicative of releases or threatened releases of hazardous substances on, at, in, or to the subject property; (2) identify the sources of information consulted to address such data gaps; and (3) comment upon the significance of those gaps.²⁶ Such an analysis was, at least to some extent, implicitly required by the interim standard; but its importance is much more heavily emphasized in the Rule, and the documentation of data gaps is no longer discretionary.

Fifth, the Rule expressly requires the user to conduct its own investigation and to consider providing the results of that inquiry to the EP. Such information includes specialized knowledge of the subject property and surrounding areas²⁷; commonly known or reasonably ascertainable information about the property²⁸; environmental liens (if not otherwise provided by the

EP)²⁹ and the relationship of the purchase price to the fair market value of the property if uncontaminated.³⁰ Although disclosure by the user to the EP is not mandatory (a significant change from the draft Rule), it is strongly encouraged.³¹ If the user does not provide such information, then the EP must determine if this “data gap” hinders his or her ability to make a judgment about the likelihood of disposal of hazardous substances at the property.³² If so, that lack of information must be noted in the EP’s report.³³ The emphasis on such user-generated information is an important difference between the Rule and interim standard.

Sixth, the Rule establishes a shelf life of one year for a Phase I.³⁴ Under the interim standard, use of prior reports which were over 180 days old was acceptable if certain criteria were met. The Rule technically extends the shelf life of an investigation to one year prior to the acquisition date (defined as the date of closing of the purchase) and expressly permits reliance on previously obtained information. However, various aspects of the investigation (such as interviews, on-site visual inspections, historical records review, and search for environmental liens) must be performed within 180 days of the acquisition date.³⁵ In addition, certain information, such as specialized knowledge of the site, and a comparison between purchase price and fair market value of the property if uncontaminated, must be newly evaluated by the appropriate party for each transaction.³⁶

One key question is whether the Rule requires that a Phase II ESA (which involves sampling and analysis of environmental media) be conducted where the Phase I indicates the possibility of hazardous waste disposal. Technically, the Rule does not expressly mandate that any site undergo a Phase II. As a practical matter, however, if there is a data gap as a result of which the EP indicates that he or she cannot confirm the absence of a hazardous substance release without a Phase II, the user will have very little choice about conducting one if it wants to qualify for liability protections under CERCLA. EPA’s preamble emphasizes a truism: that if the matter is contested, ultimately a court will decide if the user has caused a sufficient inquiry to be conducted.³⁷ If a data gap exists, there is a chance that inquiry will be found insufficient. Moreover, as EPA emphasizes, there are additional obligations on the part of the user—such as stopping ongoing releases, preventing future releases and preventing exposure to others—which must be satisfied in order to qualify for CERCLA liability protection.³⁸ These ongoing obligations are much more difficult to satisfy in the absence of adequate information about the nature and extent of any prior release of hazardous substances.

Finally, of course, environmental due diligence is performed for a variety of reasons, only one of which is to qualify for liability relief. Prospective purchasers

want to know about hazardous substances on-site in order to determine market value and price for the property; to negotiate appropriate contractual indemnities and cleanup responsibilities; to protect occupants, invitees and neighbors from exposure; to satisfy lenders; and to facilitate the purchase of environmental insurance. If the investigation has identified a potential hazardous waste disposal issue, there is going to be pressure to perform Phase II testing, even if the Rule on its face does not so require.

Significant Changes from Current Due Diligence Practices

While there will be substantial continuity between current due diligence practices and the procedures mandated by the Rule, there will also be some notable changes. Superimposed over the specific procedural changes is a fundamental shift in the approach to due diligence under the Rule. The Rule requires a subjective, performance-based approach to due diligence rather than the more formulaic “checklist” used previously. Thus, EPs and users have a certain flexibility in determining what is and is not significant during due diligence, but users will also have an increased burden to ensure that such discretion is executed in a manner adequately protective of its long-term CERCLA defenses.

One specific change is the requirement for and emphasis on site interviews. Under the interim standard, they were often perfunctory affairs. The Rule requires a more searching inquiry and, potentially, multiple interviews. It may become commonplace for entities to be questioned about properties (and corresponding operations) which have long since disappeared from their portfolios. Such entities may want to consider implementing standard procedures to ensure that the appropriate individuals are interviewed and necessary information made available. Companies may want to develop protocols for how interviews should be conducted (including who should be present) and how the results should be memorialized.

A second change is the emphasis on “appropriate inquiries” by the user. Under the interim standard, the typical approach is to commission a bare-bones, checklist-type Phase I by an environmental consulting firm and count on the resulting report to satisfy AAI requirements. That is no longer sufficient. The Rule requires the user itself to conduct certain inquiries and either share the findings with the EP or risk having the EP consider the lack of sharing a “data gap” requiring qualification of his or her conclusions. The user’s need to be involved in the process represents a fundamental

change in emphasis and will require an adjustment in thinking about Phase Is on the part of both users and EPs.

A third notable change is an outgrowth of the second: the pressure that the user’s involvement, and the encouragement to share data, will put on the relationship between the user and the EP. One can certainly envision situations where the failure of the user to conduct the requisite inquiries, or to share results with the EP, will create friction as the EP struggles to determine how, and to what extent, the user’s failure or refusal to disclose information will require the Report to be qualified. At the very least, the Rule’s requirements will lead to some interesting discussions between users and their EPs.

A fourth difference between current practice and due diligence under the Rule is likely to be the cost and time required to conduct a typical Phase I. Many of the Rule’s new requirements are likely to drive up the cost of performing such an investigation. The EPA has conducted a cost analysis to determine the impact of the new AAI rules, referred to as the “Economic Impact Analysis for the Final All Appropriate Inquiries Regulation,” which is available on the public docket.³⁹ That analysis concludes that the increased costs associated with the Rule are minimal (between \$52 and \$58 per Phase I). However, many observers (including the authors) believe that EPA’s estimate seriously understates the likely increased costs of AAI under the Rule. Moreover, the need in many cases to conduct multiple site interviews; the requirement to review databases that may not be easily accessible; and the obligation to render and document the rationale for sophisticated judgments (including the extent and significance of data gaps) will likely make the performance of Phase Is under the Rule a much more time-consuming process than under the interim standard.

It is unlikely that the changes implemented in the final Rule will impact international property transactions or become institutionalized procedures of international or foreign national companies, at least in the short term. Of course, there is no need to conduct AAI to preserve any CERCLA defenses for properties outside of the United States since CERCLA liability only attaches to properties within the U.S. However, even where multinationals wish to standardize their environmental due diligence procedures, it will be difficult to meet the Rule’s EP qualification and database review requirements in countries where professional environmental expertise and governmental recordkeeping are not well developed. Thus, in such countries AAI procedures specified by the Rule will likely be primarily aspirational for the time being.

Conclusion

EPA's new All Appropriate Inquiries rule does not drastically overhaul existing environmental due diligence standards, but there are some significant changes which will require users and EPs to adjust their thinking and practices in performing Phase I Environmental Site Assessments. Both EPs and users, especially those with large real estate portfolios or which regularly acquire and divest properties, should re-examine their current environmental due diligence practices and update them to reflect the provisions of the Rule well in advance of its November 1, 2006 effective date.

Endnotes

1. 70 Fed. Reg. 66070 (November 1, 2005), to be codified at 40 C.F.R. Part 312.
2. The prior version of the ASTM Standard, ASTM E1527-97, is also accepted as an interim standard for AAI.
3. 69 Fed. Reg. 52542 (August 26, 2004). For a detailed discussion of the Proposed Rule, see David J. Freeman and Desirée C. Giler, "EPA Releases 'All Appropriate Inquiries' Rule for Public Comment," BNA Daily Environment Report, October 7, 2004.
4. While there is no specific document retention requirement, the EP's report should be maintained for as long as the user may want to preserve its CERCLA liability defense.
5. 40 C.F.R. Part 312.22.
6. *Id.* at 312.10 (definition of Environmental Professional).
7. *Id.* at subparagraph (2)(i)-(iv).
8. *Id.* at subparagraph (5).
9. *Id.* at 312.21(d).
10. *Id.* at 312.27(a)(1).
11. *Id.* at 312.27(c).
12. *Id.* at 312.27(a)(2).
13. *Id.* at 312.23(a).
14. *Id.* at 312.23(b).
15. *Id.* at 312.23(c).
16. *Id.* at 312.23(d).
17. *Id.* at 312.26.
18. *Id.* at 312.26(b).
19. *Id.* at 312.26(b)(6).
20. *Id.* at 312.26(b)(7).

21. *Id.* at 312.25.
22. *Id.* at 312.26(d).
23. *Id.* at 312.24(b).
24. *Id.* at 312.30.
25. *Id.* at 312.31.
26. *Id.* at 312.20(g).
27. *Id.* at 312.28.
28. *Id.* at 312.30.
29. *Id.* at 312.25.
30. *Id.* at 312.29.
31. *See id.* at 312.22 (a)(1)-(4), 40 C.F.R. Part 312.25(b); 70 Fed. Reg. at 66092, 66097-99.
32. 40 C.F.R. Part 312.21(c)(2).
33. *Id.*
34. *Id.* at 312.20 (a).
35. *Id.* at 312.20 (b).
36. *Id.* at 312.20(c)(4). *See also* 70 Fed. Reg. at 66085.
37. 70 Fed. Reg. at 66098.
38. *Id.* at 66072-74.
39. *See* 70 Fed. Reg. at 66103-04 (November 1, 2005).

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Remediating Contaminated Sites in New York City Under the E-Designation Program

By Darryl H. Cabbagestalk and Larry Schnapf

I. Introduction

During the past few years, New York City has rezoned vast tracts of land to allow residential development in areas that historically were limited to manufacturing uses. Because these amendments to the New York City Zoning Map¹ were approved after preparation of environmental impact statements (EISs) pursuant to the City Environmental Quality Review (CEQR),² developers and property owners often assume that they will be able to obtain building permits and proceed with their developments without further environmental review.

However, during the process of approving zoning amendments, many tax lots may be assigned an “E-designation” requiring mandatory review by the New York City Department of Environmental Protection’s Office of Environmental Planning and Assessment (DEP) for evaluating the potential of contamination by hazardous materials as well as noise and air quality impacts.³ As a result, developers eager to take advantage of the hot residential real estate market could find their projects delayed by an unanticipated environmental investigation and may have to modify their design plans during construction to accommodate mitigation measures or even perform disruptive post-construction investigations or building modifications. In some instances, the E-designation program may impose investigation or remedial obligations that go beyond those required by the New York State Department of Environmental Conservation (DEC).

This article will discuss the requirements and procedures that DEP has established under the E-designation program for addressing potential contamination from hazardous materials and provide practical advice on how to minimize delays that could be associated with the E-designation process.⁴

II. E-Designation Listing Process

A. Property Subject to E-Designation

The E-designation is a tool used when environmental reviews identify the potential for significant impacts from hazardous materials⁵ contamination on tax lots that are likely to be developed as a direct result of rezoning.⁶ CEQR requires environmental reviews for zoning map amendments that need approval pursuant to Sections 197-c and 197-d of the New York City Charter.

The potential for significant impacts related to hazardous materials can occur when elevated concentrations of hazardous materials exist at a site, when development creates new pathways of exposure to the hazardous materials, or when the activity increases the risks by using hazardous substances.⁷ For example, contaminated soil or dust could be transported to adjacent sites during excavation or construction. Construction activities could cause contaminants to migrate offsite. Contaminated vapors from gasoline or chlorinated solvents from soil or groundwater may concentrate beneath impermeable barriers or migrate into adjacent buildings creating a potential health hazard.

Pursuant to Section 11-15 of the Zoning Resolution of the City of New York, three city agencies play key roles in implementing the E-designation program. DEP has adopted comprehensive regulations governing the implementation of the E-designation program for potential contamination from hazardous materials. DEP has identified certain types of facilities, uses and conditions that warrant an E-designation or at least require some level of investigation to determine if an E-designation is warranted.⁸ The agency is also responsible for setting standards and procedures for assessing and remediating contamination from hazardous materials, determining when proposed developments must comply with the requirements of the E-designation program, as well as finding when those requirements have been satisfied.⁹ As will be discussed in more detail later, DEP has developed three types of approvals: Notice of No Objection, Notice to Proceed, and Notice of Satisfaction.

The New York City Department of City Planning (DCP) has the primary responsibility for identifying tax lots that are to be assigned an E-designation in connection with a zoning map amendment. DCP may assign an E-designation to tax lots when the agency determines that a tax lot has a potential for development and where there is a possibility of contamination from hazardous materials.¹⁰ DCP will generally make this determination based on the current or past uses of the affected parcel or proximity to a manufacturing or commercial site. When a tax lot is proposed for E-designation pursuant to an application for rezoning under Section 197-c and Section 200 or Section 201 of the City Charter because of the potential for hazardous material contamination, DCP is required to notify the property owner no less than 60 days prior to such designation.¹¹

The CEQR Technical Manual contains a list of actions that may require hazardous materials assessments. Developers are advised to examine sites that have been potentially impacted from the presence of existing or historical land uses involving hazardous materials to evaluate possible exposure pathways¹² and potential impacts on public health or the environment. Actions that may require hazardous materials assessments include but are not limited to the following:

- Rezoning a manufacturing zone to a commercial or residential zone;
- New development in a manufacturing zone;
- Development adjacent to a manufacturing zone or existing manufacturing or commercial facilities (including nonconforming uses) listed in Appendix I of the Technical Manual;
- Rezoning from commercial to residential, including mixed-use zones, if the rezoned area would have allowed a use that may have stored, used, disposed of, or generated hazardous materials;
- Development on a vacant or underutilized site if there is a reason to suspect contamination or illegal dumping;
- Development in an area with fill material of unknown origin;¹³
- Development on or adjacent to a solid waste landfill site, inactive hazardous waste site, power-generating/transmitting facility, or railroad tracks or a railroad right-of-way;
- Development where underground and/or above-ground storage tanks are on or adjacent to the site;
- An action directly affecting a site on which asbestos-containing materials or transformers possibly containing PCBs are present;
- Development adjacent to former municipal incinerators or coal gasification sites; or
- Granting of variances or permits allowing residential use in manufacturing zones.

DEP has codified a list of facilities, activities or conditions requiring hazardous materials assessment.¹⁴ If the affected parcel or an adjacent property has had one of the environmentally suspect activities or conditions, DCP is required to perform a preliminary screening assessment, which generally consists of a review of historical documentation or regulatory records to determine current or past uses of the potential development site.

B. Interaction with the Department of Buildings

Perhaps the key enforcement mechanism of the E-designation process is that the New York City Department of Buildings (DOB) is prohibited from issuing building permits for tax lots with E-designations without first receiving a notice from DEP that the environmental requirements for the lot have been satisfied.¹⁵ The DOB E-designation process operates much like that used for Landmarks Preservation Commission approval. After receiving notice of an amendment to the zoning map from DCP, DOB will record the E-designation in its Building Information System (BIS) Property Profile Overview Screen to alert examiners and clerks that DEP approval is a required application item for the proposed work. During their initial review, plan examiners and clerks will review the application to make sure that the required DEP approval is obtained.¹⁶ Where there is a merger or subdivision of tax lots or zoning lots with an E-designation, the E-designation will apply to all portions of the property.¹⁷ Thus, when an E-designated lot is subdivided, all the newly created lots will be E-designated.

For building applications involving E-designated lots, the DOB will not issue any approvals, building permits, sign-offs, certificates of completion, Temporary Certificates of Occupancy (TCO) or final Certificates of Occupancy (COO) without either a Notice of No Objection or a Notice to Proceed from DEP for the following categories of construction activity:

- Any development;
- An enlargement, extension or change of use involving a residential or community facility use; or
- An enlargement that disturbs the soil on the lot.¹⁸

DOB will not issue any application approvals until it receives either a DEP Notice of No Objection or a Notice to Proceed, and will not issue any final sign-offs until receipt of a Notice of Satisfaction (when a Notice to Proceed was previously issued) or a previously issued Notice of No Objection.¹⁹ Although the E-designation program is comprehensive, there are a number of moving parts that sometimes do not mesh as seamlessly as envisioned and can result in knotty problems for regulators and developers. For example, sometimes a developer knowing that a zoning change is imminent may submit a building permit application so that construction could begin as soon as the zoning change is approved. If DCP has not yet completed the E-designation process, the BIS might not reflect any need for DEP approval. Thus, DOB could issue a building permit without requiring any approval from DEP and then be notified that the parcel has been assigned an E-designa-

tion. What happens if the developer then proceeds with the project without compliance with the DEP requirements? The DEP E-designation regulations prohibit the DOB from issuing any TCO or COO without DEP issuing a determination that the developer has complied with its E-designation requirements.²⁰ Thus, when the developer applies for its TCO or COO, the BIS will indicate that the developer must obtain DEP approval. In such case, DEP could require the developer to perform post-construction investigation such as having to drill through the slab to collect soil vapor samples or implement post-construction modifications such as a vapor barrier.

Moreover, any permit issued by the DOB for work on an E-designated application is conditioned upon full satisfaction of all DEP environmental requirements related to the hazardous materials E-designation. Thus, a failure to obtain the appropriate DEP approval prior to an application for certificate of occupancy, or prior to final inspection and verification of compliance with applicable law, can result in a revocation of the permit. For example, if a developer obtains a DEP Notice to Proceed but DEP refuses to issue a Notice of Satisfaction because of failure to adequately comply with DEP requirements, DOB may revoke the permit.²¹

If projects are modified after construction, it is possible that further excavation could cause previously unanticipated health impacts to residents or construction workers or may result in significant impacts in the future. An applicant may have to file a post-approval amendment (PAA) and obtain DEP approval of the modified application or plans where the PAA would disturb soil or increase the scope of the remedial work previously approved by DEP.²²

Another question that frequently arises is, how does the E-designation process work when a redevelopment involves only an interior renovation to an existing building (e.g., conversion of industrial space to residential units) where no exposed soil will be disturbed? Project proponents frequently argue that since no soil is being disturbed, the E-designation procedures concerning contamination from hazardous materials should not be triggered and DOB should not hold up a building permit until the developer prepares a work plan acceptable to DEP. If the issue of concern is the potential for disbursement of asbestos fibers from asbestos-containing materials within a building to be renovated, DEP could issue a Notice of No Objection as long as the renovation complies with the DEP's asbestos workpractice rules. However, where the current or former use involved chemicals that could have infiltrated or been absorbed into building materials such as floor beams or walls, or if the structure is likely to contain lead-based paint, DEP could issue a Notice to Proceed requiring the applicant to perform certain indoor air sampling.

Thus, it is advisable for developers who believe that an E-designation is likely to be imposed on a property to consult with DEP about the proposed construction plan as soon as possible. If a developer is unsure if a particular lot has or is likely to be assigned an E-designation, the developer should contact DCP.

III. E-Designation Investigation and Remediation Process

Many sites in urban areas contain soils and/or groundwater that may be contaminated. However, the presence of hazardous materials on a site may not be obvious. Sites that appear to be clean and have no commonly known sources of contamination may have been affected by past uses on the site or in the surrounding area, or by fill material of unknown origin.

Developers with projects on E-designated sites must complete and submit to DEP a Phase I Environmental Site Assessment conducted in accordance with the requirements of the E-1527 "Standard Practice for Environmental Site Assessments: Phase I Site Assessment Process" developed by the ASTM International for Development Sites; Certified Architectural Plans; and a detailed written description of the proposed development project. Based on the review of the aforementioned material, DEP may determine that hazardous materials may have impacted a site. If this is the case, DEP will request a Phase II Environmental Site Assessment (ESA) to characterize the type and potential extent of contamination from those materials.

A Phase II scope of work (Phase II protocol) and Health and Safety Plan (HASP) prepared in accordance with the CEQR Technical Manual must be approved by DEP prior to implementation.²³ Because DEP sampling protocols may differ in some respects from that required by DEC, the developer should consult with DEP prior to developing the Phase II protocol.²⁴ Once DEP approves the Phase II protocol and HASP, the Phase II Investigation may begin.

Approval of a Phase II protocol does not eliminate the need to comply with any reporting requirements under state or federal environmental laws. If a petroleum spill or discharge or evidence of a reportable quantity of hazardous materials or hazardous wastes that poses a potential or actual threat to public health or the environment is discovered on the affected tax lot, the developer must comply with all Federal, State, or local notification requirements.²⁵

IV. Remediation Plans

Upon completion of the Phase II sampling, a Phase II ESA Investigative Report must be prepared and submitted to DEP.²⁶ Based on DEP's review of the Phase II sampling results, DEP may require preparation and implementation of a Remedial Action Plan (RAP) and a

site-specific HASP.²⁷ DEP should be notified at least 10 days prior to implementing the RAP. DEP's goal is to eliminate, reduce to acceptable levels, or control sources of contamination that may result in a significant impact on public health or the environment. DEP allows a risk-based approach in determining the proper course of remediation. A risk-based approach evaluates the current and proposed future land use of the site along with the proposed action (i.e., construction, excavation, etc.) against the known contaminants of concern and potential exposure pathways in determining what remedial course of action, if any, is appropriate for a site.

The RAP may require, for example, excavation of contaminated soil, removal of underground storage tanks (including dispensers, piping, and fill-ports), placement of at least two feet of clean soil in all areas that will either be landscaped or otherwise not covered by an impermeable cap, or installation of a vapor barrier to prevent migration of contaminated vapors from soil or groundwater. DEP may allow historically impacted soils such as "Urban Fill" to be addressed as part of the construction for redevelopment of the property. In other words, the removal of impacted soils can be combined with the demolition and excavation activities for the new project.

The DEP will generally use DEC guidance for determining remedial objectives. DEC has not promulgated formal regulations for remediating contaminated sites. Instead, DEC has issued a series of guidance documents that establish cleanup goals and objectives. The principal guidance for determining soil cleanup objectives and cleanup levels for Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), heavy metals, pesticides and PCBs is the Technical and Administrative Guidance Memorandum (TAGM) 4046. The recommended soil cleanup objectives apply to in-situ (non-excavated) soil and excavated soil that will be placed back into the original excavation or consolidated elsewhere on a site. Since December 2000, TAGM 4046 has also been used to develop soil cleanup objectives for gasoline and fuel oil contaminated soils that will be remediated in-situ. The Spill Technology and Remediation Series (STARS) Memo #1 provides guidance on the handling, disposal and/or reuse of ex-situ (excavated) non-hazardous petroleum-contaminated soil. STARS Memo #1 also provides guidance on sampling soil from tank pits and stockpiles. Excavated petroleum-contaminated soil must meet the guidance values listed in STARS Memo #1 before it can be reused off-site. The principal guidance document for establishing groundwater cleanup goals is the Technical and Operational Guidance Series (TOGS) # 1.1.1.

The groundwater of the five boroughs is classified as Class GA groundwater except where the criteria for

saline groundwater are met. DEP will usually follow the DEC Water Quality Regulations for Surface Waters and Groundwater²⁸ and the TOGS #1.1.1 when evaluating groundwater contamination. However, if volatilization of contaminants from groundwater is a concern, DEP will look to the draft soil vapor guidance developed by DEC and the State Department of Health.

After a remediation action plan has been reviewed and approved, DEP will issue a Notice to Proceed (discussed below) to the DOB, announcing that all permits except a TCO or COO may be issued.²⁹

The DEP-approved RAP must be implemented within a year. Upon the expiration of the one-year approval period, the developer will have to resubmit a new RAP for approval unless a request for an extension is filed at least 30 days before the RAP expiration date and DEP has approved the extension.³⁰

It should be noted that implementation of any remedial measures does not absolve the site owner from additional investigation and remedial measures in the future should conditions warrant (e.g., site use changes). In addition, DEC or other agencies may require additional investigation or remedial measures.

In addition to a RAP, the applicant must also prepare a site-specific HASP to protect the health and safety of all on-site personnel. The site-specific HASP must describe each of the potential hazards at the site and describe the methods to mitigate these hazards. Special attention must be given to the methods to monitor for potential exposure and the various levels of protection required for the tasks to be completed at the site. The site-specific HASP should also describe any community monitoring that may be needed.

Once the items of concern outlined in the RAP or a substantially equivalent remediation are approved by DEC, the work must be summarized in a Closure Report that is certified by a Professional Engineer or Architect. This report should demonstrate that all remediation activities have been implemented.³¹ If a petroleum spill was addressed under DEC oversight as part of the RAP, a copy of the State's spill case closure letter should be included in the Closure Report. It should also include copies of manifests for soil removed from the site and describe the installation of any vapor barriers.

Upon review and approval of the Closure Report, DEP will issue a Notice of Satisfaction to DOB. This notice shall include a description of any post-construction remedial obligations such as an operation, maintenance and monitoring (OM&M) program that may be required beyond the issuance of a TCO or COO.³²

It should be noted that if a developer has determined that a Phase II ESA is warranted, the results of a

Phase I, Phase II Work Plan and the Sampling HASP can be submitted to DEP for review at the same time. Likewise, the Phase II report, RAP and Remediation HASP may also be submitted together.³³

V. DEP Approvals

DEP will issue approvals indicating if the proposed development would affect potential hazardous material contamination on the subject parcel(s), if remediation is necessary in connection with the permit, and if the applicant has completed the remediation work to the satisfaction of the DEP.

A. Notice of No Objection

If DEP determines that the proposed E-sensitive application work does not present hazardous material contamination concerns (or that the E-sensitive application work is not subject to ZR § 11-15), DEP will issue a Notice of No Objection letter to the Department of Buildings. This is typically limited to projects that do not require subsurface activities such as excavations for foundations or utilities.

The Notice of No Objection letter states that DEP does not oppose issuance of an application approval and permit, and that DEP approval is not required upon completion of the E-sensitive application work. Thus, a Notice of No Objection will satisfy both the DEP Notice to Proceed required item and the DEP Notice of Satisfaction required item, and DOB may issue a permit without further review of the application work by DEP.

The Notice of No Objection is issued to the appropriate DOB Borough Commissioner. The notice identifies, at a minimum, the application number, street address, block and lot. In addition, DEP indicates its approval and date of approval on one complete set of application plans. The Notice of No Objection is retained in the DOB job folder.³⁴

B. Notice to Proceed

If DEP determines, based upon review of the Phase II ESA testing results, that remedial work is required because of the potential for hazardous material contamination on the E-designated parcel(s), DOB will not issue a demolition, excavation or building permit until it receives a Notice to Proceed from DEP. The Notice to Proceed indicates that DEP has approved the RAP and site-specific HASP, and that the application has met the environmental requirements related to the E-designation provided that all such requirements are fully implemented and a Closure Report is submitted to DEP for review and approval upon completion of the permitted work.

DEP issues the Notice to Proceed to the appropriate DOB Borough Commissioner. The Notice to Proceed identifies, at a minimum, the application number, street address, block and lot. Upon receipt of the Notice to Proceed, DOB will issue the necessary permits. However, the permits are subject to DEP's final review and approval of the completed application work. The Notice to Proceed is retained in the DOB job folder.³⁵

C. Notice of Satisfaction

DEP will issue a Notice of Satisfaction (NOS) to the appropriate DOB Borough Commissioner after the Closure Report has been reviewed and approved by DEP. The NOS states that the work has met all environmental requirements related to the E-designation and identifies any OM&M requirements. Once the NOS is received, DOB may issue the COO.

If all impacted soil has been removed, a Final Notice of Satisfaction (FNOS) may be issued to the appropriate DOB Commissioner and DCP indicating that there are no longer any E-requirements for the property and requesting that the E-designation be removed. However, these types of final NOS are very rare. In fact, only three have been issued to date. Moreover, it should be noted that DCP will remove the E-designation only when it has received a Notice of Satisfaction for all lots on a given block specified in the CEQR declaration for the rezoning.³⁶

VI. Coordination with the DEC Brownfields Program

In some instances, an applicant may seek to address potential impacts from hazardous materials identified in a Draft Environmental Impact Statement by enrolling in the DEC Brownfields Cleanup Program (BCP).³⁷ In such cases, applicants often assert that there is no need for the tax lot to be assigned an E-designation or that the E-designation process will be addressed through the BCP and therefore no DEP approvals are required before issuance of DOB permits. This poses concerns particularly where the rezoning would allow the developer to be issued a building permit as a matter of right without any further review from DCP or DEP. A developer may build a structure as-of-right if the DOB determines that the project complies with the zoning and the building code.

Because it is possible that an applicant may not be accepted into the BCP or that the applicant could elect to withdraw from the BCP, DEP will generally require the applicant to enter into a Restrictive Declaration or other contingency to ensure that future development would proceed in a manner protective to public health.³⁸

VII. Conclusion

The E-designation program is a powerful tool for remediating contaminated sites. Because it is linked to development projects, it operates in some ways like some state property transfer statutes such as the New Jersey Industrial Site Recovery Act³⁹ and the Connecticut Transfer Act.⁴⁰ Like those state laws, the E-designation can result in unanticipated environmental costs and project delays. For this reason, DEP conducts pre-submission meetings with applicants to discuss the requirements and scheduling of the E-designation program.⁴¹ DEP also reviews submissions and provides comments within 30 days of submission.⁴² DEP strongly encourages applicants contemplating filing an E-sensitive application to consult with DEP prior to submitting the required documentation to expedite the approval process.

Endnotes

1. The Department of City Planning (DCP) has developed 126 zoning maps that are composed of 35 sections. Each of these 35 sections is identified by a number from 1 to 35. The zoning maps are further subdivided into up to four subsections, identified by a letter: a, b, c or d. Each zoning subsection map covers territory of approximately 8,000 feet (north/south) by 12,500 feet (east/west).
2. Executive Order No. 91 of 1977, as amended, established CEQR and centralized most environmental review functions in two "co-lead agencies," the Department of Environmental Protection (DEP) and the DCP. To expedite environmental reviews, the City's CEQR process was substantially modified in 1991 by the CEQR Rules of Procedure (Title 62, Chapter 5 of the Rules of the City of New York) which provide that each City agency acts as lead agency for projects that it approves, funds, and/or directly implements.
3. The DEP E-designation regulations for hazardous materials appear at Chapter 24 of Title 15 of the Rules of the City of New York. 15 RCNY § 24. The process for evaluating noise and air quality impacts is found in the air and noise chapters of the CEQR Technical Manual.
4. This article does not address noise or air quality impact E-designations.
5. 15 RCNY § 24-03 defines "hazardous materials" as any material, substance, chemical, element, compound, mixture, solution, product, solid, gas, liquid, waste, byproduct, pollutant, or contaminant which when released into the environment may present a substantial danger to the public health or welfare or environment, including but not limited to those classified or regulated as "hazardous" and "toxic" pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601 *et seq.*; List of Hazardous Substances, 6 NYCRR Part 597; New York City Hazardous Substances Emergency Response Regulations, 15 RCNY Ch. 11; Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 *et seq.*; Toxic Substances Control Act (TSCA), 15 U.S.C. § 2601; Transportation of Hazardous Materials Act, 49 U.S.C. § 5101; Clean Water Act (CWA), 33 U.S.C. § 1251 *et seq.*; and/or Clean Air Act (CAA), 42 U.S.C. § 7401 *et seq.*
6. The E-designation regulations promulgated by DEP identify two classes of sites subject to the program; development sites and

project sites. 15 RCNY § 24-03 defines a "development site" as one or more tax lots within the rezoned area that are not under the control or ownership of the applicant seeking the rezoning and that are likely to be developed as a result of the zoning map amendment. A "project site" refers to one or more tax lots within the rezoned area that are under the control or ownership of the applicant seeking to remove the E-designation and that the applicant proposes to redevelop.

7. Examples of actions that can lead to exposure of hazardous materials include excavation, dewatering, grading, or construction activities on a contaminated site; creating fugitive dust from exposed soils containing hazardous materials; demolition of buildings and structures that include hazardous materials such as asbestos and lead-based paint; and building on former landfills or swampland where methane production is occurring or may occur in the future.
8. 15 RCNY § 2404; 15 RCNY App. A.
9. 11-15(c) of the Zoning Resolution of the City of New York (ZR 11-15).
10. The maps of E-designated lots are available at <http://www.nyc.gov/html/dcp/html/zone/zmapintr.shtml>. The zoning maps will display an (E) symbol indicating the general location of properties that have CEQR (E) Requirements Declarations. A chart of the CEQR (E) Requirements Declarations is available at <http://www.nyc.gov/html/dcp/pdf/zone/ceqr.pdf>.
11. 62 RCNY § 2-02(e); ZR 11-15(d).
12. Potential routes of exposure to hazardous materials can include direct contact between contaminated soil and skin (dermal), breathing of volatilized chemicals or chemicals associated with suspended soil particles (inhalation), swallowing soil (ingestion), or drinking contaminated water (oral). Public health may also be threatened when soil gases or soil vapors migrate naturally through the subsurface or along preferential pathways (i.e., building foundations, utility conduits, duct work, etc.) and concentrate under barriers of low permeability (i.e., concrete slabs, asphalt, clay liners, etc.) resulting in potentially explosive conditions.
13. Fill material historically used in New York City has included hydraulic dredge material that may contain petroleum and heavy metal contamination, and ash from burning garbage in residential and commercial buildings in the City. Fill material may produce methane if it is composed of organic wastes and/or if present in former low-lying swamp areas. Thus, it is not uncommon to find elevated levels of hazardous materials in fill material where the past and current activities may not suggest that contaminants should be present. This is especially true for properties that are adjacent to waterways where large volumes of fill material may have been used. In some cases, fill material can form preferential pathways for the movement of contaminants especially when utility conduits have been filled with permeable material.
14. 15 RCNY App. A.
15. Operations Policy and Procedure Notice #2/05 (OPPN #2/05). This memo applies to DOB approvals affected by ZR §§ 11-15 and 93-051 (Hudson Yards District). OPPN #2/05 summarizes procedures and requirements for permit applications affecting lots that have a hazardous materials E designation as set forth in Operations Policy and Procedure Notice #1/03 (OPPN #01/03). OPPN #2/05 also establishes that these procedures also apply to lots located within the Special Hudson Yards District that have E designations for potential hazardous materials contamination, noise and/or air quality impacts.
16. *Id.* BIS identifies the E-designation lots in the Little E Restricted field as HAZMAT/NOISE/AIR, as appropriate.

17. *Id.*
18. OPPN #2/05.
19. OPPN #2/05.
20. 15 RCNY § 24-07(b) and (c).
21. OPPN #2/05. OPPN #2/05 also discusses DOB's permit revocation procedures. In general, DOB will issue a letter of intent to revoke that may contain an immediate order to stop work. If the applicant does not provide an adequate response within 10 days or an extended grace period approved by DOB, then DOB will issue a Revocation of Approval and Permit letter with an immediate order to stop work. If the applicant cures the violation, DOB will issue a Rescission of Notice of Intent to Revoke letter.
22. OPPN #2/05.
23. 15 RCNY § 24-06(b).
24. The Phase II ESA Work Plan for E-designated sites generally will include soil samples collected just below grade and at the depth of the bottom of the proposed excavations. If the water table is near the elevation of the bottom of the proposed excavation, groundwater samples should also be collected in case dewatering will be required and to ensure safety of the construction workers. The potential for off-gassing of contaminants into the proposed structure will also be evaluated. In accordance with the CEQR Technical Manual, DEP will require that each sample be analyzed by a State Department of Health (DOH) laboratory certified by the Environmental Laboratory Accreditation Program (ELAP) for: Volatile Organic Compounds (VOCs) by EPA Method 8260; Semi-volatile Organic Compounds (SVOCs) by EPA Method 8270; Pesticides/PCBs by 8081/8082; and Target Analyte List (TAL) Metals. TAL Metals are metals that are commonly found in the environment and that are typically sampled for in site investigations.
25. 15 RCNY § 24-10.
26. 15 RCNY § 24-06(f).
27. 15 RCNY § 24-06(i).
28. 6 N.Y.C.R.R. Parts 700-705.
29. 15 RCNY § 24-07(b)(2).
30. 15 RCNY § 24-07(b)(3).
31. 15 RCNY § 24-07(c)(1).
32. 15 RCNY § 24-07(c)(2).
33. 15 RCNY § 24-06(g).
34. OPPN #01/03.
35. OPPN #01/03.
36. 15 RCNY § 24-08(c).
37. N.Y. Env'tl. Conserv. L § 27-1401 *et seq.*
38. The E-designation rules apply where one or more tax lots are in an area that is subject to a zoning amendment and are not under

the control or ownership of the person seeking the zoning amendment and have been identified as likely to be developed as a direct consequence of the rezoning action. 15 RCNY § 24-02. Therefore, for those lots under the control or ownership of the person seeking the zoning amendment DEP requires a Restrictive Declaration to ensure that required sampling and remediation occur prior to issuance of any DOB permit and that development otherwise proceeds in a manner that is protective of human health and the environment. The Restrictive Declaration is recorded in the land records and is binding on all future owners or lessees or assigns. Thus, the Restrictive Declaration can be an effective tool for ensuring that the site use remains unchanged and that no alterations occur to the site without DEP approval to ensure that potential impacts from hazardous materials have been properly addressed.

39. N.J. Stat. Ann. § 13:1K-6 *et seq.*
40. Conn. Gen. Stat. § 22a-134 *et seq.*
41. 15 RCNY § 24-09(a).
42. 15 RCNY § 24-09(b).

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Through the Looking Glass: A Reflection on Current Mercury Regulation

By Wendy Thomas

I. Introduction

In Victorian England the exterior layer of fabric on a hat was cured with mercurious nitrate to prevent warping and staining. Through years of exposure to these vapors, milliners developed progressively severe mercury poisoning, including such highly visible symptoms as uncontrollable muscle tremors and spasms in their limbs ("hatter's shakes"), distorted vision, confused speech, and eventually full blown hallucinations, psychosis, and early death. It was thus from commonplace observation and not invention that Lewis Carroll derived the character of the Mad Hatter.

"We know far more about the dangers of mercury today . . . yet the sources of exposure, those at risk, and the range of effects are sufficiently diverse—and the special interests that oppose legislative, regulatory, or any other form of corrective measure are sufficiently powerful—that this growing problem has thus far gone largely unobserved and unremedied."

Today not just gentlemen's milliners, but huge swaths of society are being exposed to toxic levels of mercury. We know far more about the dangers of mercury today than did the Victorians; yet the sources of exposure, those at risk, and the range of effects are sufficiently diverse—and the special interests that oppose legislative, regulatory, or any other form of corrective measure are sufficiently powerful—that this growing problem has thus far gone largely unobserved and unremedied.

This article begins with an overview of mercury contamination and its known health effects on humans. It sets forth the legal framework of three major areas of mercury exposure: coal-fired utility boilers, seafood contamination, and dental amalgam restorations. It analyzes the respective statutory, common law, and historical foundations of each source of exposure. It then provides an in-depth examination of one key piece of regulation, the Clean Air Act, in an attempt to explain how environmental regulatory mechanisms often facilitate mercury contamination instead of curtailing it. Finally, it acknowledges the legislative response to mercury contamination

and proposes possible control options to minimize or mitigate mercury exposure in coal power plants.

II. What Is Mercury?

Mercury is a naturally occurring toxic element that is widely distributed around the earth. It cycles in the environment as a result of natural phenomena and human activities. It exists in the environment in three forms: elemental mercury (Hg^0), inorganic mercury (mercurous Hg^{1+} , and mercuric Hg^{2+}), and organic mercury (methylmercury or "MeHg").¹ Mercury is widely used in industrial processes because of its chemical and physical properties (e.g., it conducts electricity, it responds to temperature and pressure changes and it forms alloys with other metals).² Fuel combustion, municipal and medical waste incinerators, and commercial and industrial boilers are all primary sources from which mercury is released into the atmosphere through industrial processes.

The dominant form of mercury is elemental mercury, which is released into the air by the combustion of materials containing mercury, such as coal. Once released, the elemental mercury either adheres to dust or ash particles and is deposited back on the ground or it remains in the air until it reacts with ozone or other oxidants to form inorganic mercury compounds.³ In this highly soluble state, it ultimately is redeposited on the earth with precipitation.

When the inorganic mercury enters waterways, lakes, and streams, it reacts with bacteria and is incorporated into sludge or sediment, where it is methylated by microbial or abiotic processes into methylmercury (mercury's most toxic form).⁴ The contaminated plant and sedimentary materials are consumed by small fish that are consumed by progressively larger fish and finally by humans. Because the organisms cannot actually metabolize methylmercury as they do the rest of their food, quantities of it slowly build up in their systems, usually the liver and lymphatic system. When each organism is itself consumed, it usually has a significantly higher concentration of mercury in it than did any of the food it consumed. Thus repeated iterations of this process (known as bioaccumulation or bioconcentration) during the progression through the food chain result in ever-increasing concentrations of mercury.⁵ Bioaccumulation results in concentrations of mercury in fish tissues that are hundreds of thousands of times as high as the concentration of inorganic mercury in the water. It is this bioaccumulation that results in significant exposures

through the aquatic food web. Through a natural process, bioaccumulation acts in this case as a tragically efficient mechanism by which atmospheric mercury is extracted, concentrated and delivered to the dinner table.

Consumption of contaminated fish is the major source of human mercury exposure.⁶ However, humans are also exposed to mercury by a variety of other potentially serious sources, most notably dental amalgams.⁷ Mercury was and is used in everything from chlor-alkali manufacturing and fluorescent lamps to cosmetics, thermometers, vaccines, and batteries. Some of these sources are carefully regulated or banned from the marketplace while others remain totally unregulated. Unregulated or badly regulated use of mercury in manufacturing and in consumer goods significantly increases the risk of exposure not only to those who make or use the products, but also to the public at large, as waste byproducts may wind up in landfills where the mercury can seep into groundwater and then trickle up the food chain via bioaccumulation.

III. The Health Effects of Mercury

There is evidence that connects both MeHg and inorganic and elemental mercury exposure to a wide array of medical conditions. The general consensus in the scientific community is that MeHg is profoundly toxic to the human brain.⁸ Both adult and fetal brains are vulnerable to MeHg toxicity, but a preponderance of evidence points to the most severe damage occurring in the developing fetal brain.⁹ For inorganic or elemental mercury, the most serious health consequences arise in relation to the kidney and brain. MeHg and Hg exposure have also been credibly linked to other maladies, including: myocardial infarction,¹⁰ renal toxicity,¹¹ impaired immune function,¹² impaired blood pressure regulation,¹³ and reproductive problems.¹⁴ The carcinogenic potential of MeHg is still controversial, but there is evidence in both human¹⁵ and animal¹⁶ studies linking MeHg to cancer.¹⁷

IV. Appropriate Mercury Intake

A. Current Mercury Standards

Two federal regulatory agencies bear the primary responsibility for MeHg and Hg regulation in the United States—the Food and Drug Administration (“FDA”) and the Environmental Protection Agency (“EPA”). The agencies’ responsibilities often overlap. For example, the FDA operates the nation’s seafood safety program for commercial seafood and the EPA compiles state data on freshwater ecosystems. One point of controversy in mercury regulation in recent years is a disagreement over the appropriate level of concern for MeHg exposure, each agency having independently established MeHg reference doses (“RfD”).¹⁸

Prior to the government’s attempt to develop a credible dose-response relationship through independent epidemiological studies, mercury RfDs were based on data collected primarily from notable incidents of widespread mercury poisoning. One example is the Minamata, Japan mercury-poisoning case, widely recognized as one of the most devastating and notorious industrial pollution disasters of the 20th century. In Minamata in the 1950s a petrochemicals and plastics giant named Chisso Corporation dumped untreated inorganic mercury used in the industrial production of acetaldehyde into Minamata Bay where it was ingested by sea organisms. Minamata Bay is in the Shiranui Sea, a calm inland sea located in the southwest region of Kyushu Island.¹⁹ Residents of Minamata Bay who ate the poisoned seafood suffered from MeHg intoxication, later known as Minamata Disease.²⁰ At first, patients’ symptoms resembled encephalitis; then, fish began floating belly-up to the water’s surface, birds fell dead in mid-flight, and cats suffered frenzied deaths characterized by excessive salivation, convulsions, and violent rotational movements.²¹ The disease was first detected in 1956 but mercury emissions continued until 1968. When Chisso denied responsibility, Japanese government officials sided with the company. Minamata victims finally received proper compensation in 1996, when the Kumamoto court found Chisso guilty of negligence and awarded the victims between 16 and 18 million yen per victim (which converts to between \$147,000 and \$165,000 per victim).²²

In 1971 in Iraq, seed grain that was treated with an MeHg fungicide was inadvertently used to make homemade bread. The bread was consumed by thousands of people, triggering cases of MeHg poisoning in every province in the country. Of the 6,530 people admitted to hospitals due to MeHg exposure, 459 people died.²³ Iraq had purchased the 95,000 tons of wheat and barley seeds from an American grain trading company.²⁴ As a result of the Iraq incident, the United States banned the MeHg fungicide. In the Iraqi case, affected individuals consumed 50-400 mg. of MeHg over a six-month period.²⁵ Motor retardation was seen in infants born of mothers with MeHg levels [detected in patients’ hair] in the 10-20 parts per million (“ppm”) range. Based on this data, the FDA then used data from the Minamata Bay and Iraq poisoning incidents to determine the RfD of 1 ppm daily intake (0.1 µg/kgbw/day).²⁶ This RfD was also adopted by the Joint Food and Agriculture Organization/World Health Organization Committee on Food Additives.²⁷

Despite the FDA’s determination of an RfD of 1 ppm, there is still considerable inconsistency in applying acceptable mercury intake limits. Different limits are set based on whether the agency is calculating a true RfD—defined as the level at which there is no observed adverse effect—or whether the agency is using a bench-

mark dose ("BMD")²⁸ which is the dose extrapolated from a mathematical model of effect levels to be the level at which theoretically there should be no adverse effect—quite a different standard than no observed adverse effect. Compare the FDA's RfD of 1 ppm to what it considers the acceptable or tolerable daily intake ("TDI")²⁹ for mercury. The FDA's TDI is 0.3 mg/week total mercury, of which no more than 0.2 mg/week may be present as MeHg.³⁰ The TDI standard is based on a threshold of adverse neurological effects in adults whereas the RfD of 1 ppm is based on data collected from Iraq and Minamata. There is also considerable difference between the FDA standard and that set by the EPA, which developed its RfD of 0.1 micrograms (one-millionth of a gram) MeHg per kilogram of body weight per day, by using a BMD.³¹ The unintended consequence of all these inconsistent standards is that there is no collective recognition of what constitutes an unacceptable amount of mercury contamination.

B. New Studies

In response to disagreement over the appropriate level of concern for MeHg exposure, the National Research Council in its 2000 report, "Toxicological Effects of Methylmercury,"³² analyzed three large epidemiological studies that examined long-term exposure to small amounts of MeHg in an attempt to establish credible dose-response relationships. The studies were conducted in the Faroe Islands in the North Sea between Scotland and Iceland, the Seychelles islands in the Indian Ocean off the Coast of East Africa, and in New Zealand.

In the Seychelles islands study,³³ maternal hair samples collected at the births of 711 children over a 66-month period were tested for mercury concentration. In contrast to Iraq (where the exposure was short-term but high level), the Seychelles study examined long-term, low-level exposure from fish consumption. Children were born of mothers with a range of mercury concentration from 0.5 to 27 ppm (median 5.9 ppm). The children were then tested for global intelligence (using IQ tests) and developmental milestones. The study found no adverse effects that could be attributed to MeHg exposure.

In the Faroe islands study,³⁴ children with similar prenatal MeHg exposures to those in the Seychelles study (maternal hair levels ranged from 0.2-39.1 ppm) exhibited developmental dose-related deficits apparent at seven years of age. An expert panel at the Workshop on the Scientific Issues Relevant to Assessment of Health Effects from Exposure to MeHg examined these studies and issued a report suggesting that since the Seychelles study examined IQ tests and the Faroe study examined domain-specific testing, it is possible that:

[P]renatal exposure to toxic substances might result in no effect on overall IQ,

but might cause an effect in domain-specific findings such as memory deficits, motor delay, or effects on the complex domain involved in formulating behavior called executive function.

... Thus, it might be that the effects of methylmercury at lower doses are domain-specific and only detectable by domain-specific tests used in the Faroe study, but not with the more general tests used in the Seychelles Study.³⁵

In the New Zealand study,³⁶ researchers identified mothers with high levels of mercury concentration (range 6-86 ppm, mean 8.3 ppm). The MeHg exposure was chronic and low-dose, as in the Faroe study. Multiple tests were administered to the children, assessing both psychological and scholastic domains. Researchers found significant dose-related decrements in test performance in the children exposed to MeHg prenatally. Maternal-hair Hg concentration was associated with poorer scores on full-scale IQ, language development, visual-spatial skills, and gross motor skills.

The Committee on Toxicological Effects of Methylmercury, convened by the National Research Council, examined the design and results of these studies and concluded that the Faroe Islands study was the most appropriate for deriving an RfD. The Committee based this decision on the advantages of the Faroe Islands study: it studied a larger population, used two measures of mercury exposure, and underwent extensive peer review and re-analysis in response to questions from the National Institute for Environmental Health Sciences and the National Research Council.³⁷ On the basis of its evaluation, the committee's consensus was that the EPA's RfD for MeHg of 0.1 µg/kg per day was a "scientifically justifiable level for the protection of public health."³⁸

V. Coal Emissions

A. Mercury Contamination from Coal Emissions

When Congress directed the National Academy of Sciences to review the evidence of toxicity of mercury in order to iron out the conflicting RfDs between the FDA and EPA in its House Appropriations Report for EPA's fiscal 1999 funding,³⁹ Congress simultaneously mandated that the EPA not adopt emission limits on coal-fired power plants until the National Academy of Sciences' study was complete. This directive may have been counterproductive, or at least ironic, given that emissions from coal-fired power plants are the single largest contributor to mercury pollution in our oceans and waterways.

The largest identified sources of mercury emissions are coal-fired utility boilers.⁴⁰ Virtually all of these are

pulverized coal boilers. In pulverized coal boilers, coal is milled to a fine powder in a pulverizer, blown into a combustion chamber where the heat and gases resulting from combustion convert water in tubes lining the boiler into steam. This high-pressure steam is passed into a steam turbine to produce electricity. The 1997 EPA report found that for the years 1994-1995, the best estimate of annual anthropogenic U.S. emissions of mercury was 158 tons. Sources of mercury emissions in the U.S. are as follows:⁴¹

| Sources of Mercury | Tons/yr (1994-1995) | % Total of Inventory |
|-------------------------------|------------------------|-------------------------|
| Utility boilers | 52 | 32.8 |
| Municipal waste incinerators | 29.6 | 18.7 |
| Commercial/industrial boilers | 28.4 | 17.9 |
| Medical waste incinerators | 16 | 10.1 |
| Hazardous waste incinerators | 7.1 | 4.4 |
| Residential boilers | 3.6 | 2.3 |
| Other combustion | 1.2 | 0.7 |
| Chlor-alkali | 7.1 | 4.5 |
| Portland cement | 4.8 | 3.1 |
| Pulp & paper | 1.9 | 1.2 |
| Other manufacturing | 1.7 | 1.2 |
| Lamp breakage | 1.5 | 1 |
| General lab use | 1.1 | 0.7 |
| Other area sources | 0.7 | 0.4 |
| Geothermal power | 1.4 | 0.9 |

Roughly 87 percent of these emissions are from combustion sources, including incineration of medical and other waste and fossil fuel combustion.⁴² A March 2002 National Resources Defense Council report examining the top power plant polluters determined that mercury emissions from power plants are concentrated, with three power companies—American Electric Power, Southern Company, and Edison International—accounting for 25% of emissions, and eleven companies accounting for 50% of power plant-based mercury emissions.⁴³ Given the tremendous danger associated with mercury, one wonders how it is these companies manage to get away with emitting tons of mercury into the atmosphere each year. It turns out they do so legally.

B. Mercury Regulation and Coal Emissions

1. The Clean Air Act ("CAA")

Many environmental laws bifurcate regulations and apply different standards to "new" and "old" sources of pollution. This dual standard, though widespread, often frustrates a major goal of the regulations, that of decreasing contamination in our natural environment. For example, the CAA of 1970, as amended in 1977 and 1990, con-

tains a major exemption that permits older coal-burning power plants to release between four and ten times the amount of mercury that new plants may release.⁴⁴ The stricter standards only apply to new or modified sources, and do not apply to older power plants. At the time of the CAA's enactment, legislators likely believed that requiring expensive retrofits to control pollution in coal plants that were decades old would be wasteful, since it was reasonable to conclude such plants would soon retire. Later in this article,⁴⁵ I break down what I perceive to be the regulatory weaknesses of the CAA in detail; the remainder of this section focuses on coal-related mercury regulations that do not fall under the CAA.

2. The Resource Conservation and Recovery Act ("RCRA")

The preferential treatment of existing polluting facilities seen in the CAA is common throughout environmental regulation of mercury. Consider the example of the RCRA. The RCRA authorizes the EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste, focusing only on active and future hazardous waste facilities. It contains two separate regulatory systems for new and old hazardous waste treatment, storage, or disposal facilities. Under this bifurcated scheme, older facilities are allowed to operate without complying with the standards and operating permit requirements applicable to similar new facilities.⁴⁶ Also under the RCRA, certain large volume wastes generated primarily from the combustion of coal or other fossil fuels are exempted from being regulated as hazardous waste under Subtitle C of RCRA, pending completion of a report to Congress and a decision by the EPA to promulgate regulations.⁴⁷ Following a lawsuit against the EPA for failure to complete the regulatory determination report,⁴⁸ the EPA entered into a consent decree to complete the regulatory determinations for fossil fuel wastes. The resulting report concluded that much of the fossil fuel waste should continue to be exempt under Subtitle C of the RCRA because such wastes, according to the EPA, "generally present a low inherent toxicity, are seldom characteristically hazardous, and generally do not present a risk to human health and the environment."⁴⁹ Such generalities should not be applied to materials as hazardous as arsenic and mercury.

3. The Clean Water Act ("CWA")

The same phenomenon exists in the CWA. The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States, authorizing the EPA to implement pollution control programs and set water quality standards for all contaminants in surface waters. Under Title III of the CWA,⁵⁰ the EPA provides national standards for mercury in wastewater discharges to surface waters and publicly owned treatment works. These effluent guidelines require that existing point source subjects abide by the "best practicable

control technology currently available" ("BPT") whereas new source subjects must abide by "new source performance standards" ("NSPS"). Consequently, the permissible mercury levels for our national wastewater are as follows:

Effluent Guidelines: Mercury Limits for Any One Day

| Type of Wastewater | Old Source (BPT) ⁵¹ | New Source (NSPS) ⁵² |
|---|--------------------------------|---------------------------------|
| Smelter wet air pollution control* | 0.325 | 0.195 |
| Silver chloride reduction spent solution* | 0.100 | 0.060 |
| Electrolytic cells wet air pollution control* | 49.500 | 2.970 |
| Electrolyte preparation wet air pollution control* | 0.013 | 0.008 |
| Calciner wet air pollution control** | 46.550 | 3.300 |
| Calcine quench water** | 4.400 | 2.640 |
| Calciner stack gas contact cooling water** | 1.038 | 0.623 |
| Condenser blowdown** | 3.450 | 2.070 |
| Mercury cleaning bath water** | 0.350 | 0.210 |
| * = in mg/troy oz. of metal smelted, refined, etc. ** = in mg/kg (pounds per million pounds) | | |

The effluent guidelines for new sources are, in some instances, as much as sixteen times stricter than for old sources. The inevitable result of this will be to prevent new manufacturers from entering the market because they cannot compete with their less regulated older counterparts. In so doing, the EPA seems to be basing its regulations on the coal industry's desire to minimize both costs and competitors.

4. The "Clear Skies" Plan

More serious than the EPA's sluggishness with regard to coal-fired utility boiler regulation is the Bush Administration's recently proposed "Clear Skies" plan.⁵³ At first glance, the "Clear Skies" initiative resembles the "cap and trade" acid rain program of the early 1990s, under which corporations trade "pollution credits" among themselves to achieve emissions reductions collectively. However, the "Clear Skies" plan would eliminate the new source review requirements, thereby enabling coal power plants to upgrade their plants without having to install NSPS control devices.⁵⁴ Furthermore, the "Clear Skies" plan actually raises allowable mercury emissions as compared to current requirements. Under current law, mercury emission levels will be reduced to between five and 15 tons by 2008, as much as a 90% reduction per plant. "Clear Skies" proposes a 50% reduction in mercury emissions by 2010 and 70% by

2018, which represents only a 46% reduction nationwide, and could allow 26 tons of mercury by 2010.⁵⁵ Essentially the Clear Skies policy is cap and trade minus the cap—a rather dubious strategy to achieve reductions.

In response to the Bush administration's "Clear Skies" plan, on February 28, 2003, Earthjustice (in conjunction with a number of environmental groups) filed a lawsuit in the U.S. Court of Appeals for the District of Columbia Circuit, alleging that the Bush administration's amendments to the CAA were illegal. Fifteen other states have filed similar challenges to the new rule. On behalf of a ten-state coalition, New York Attorney General Eliot Spitzer filed a motion on February 5, 2003, to stay the March 3 new source reforms' effective date until the states have finished litigating the matter in court.⁵⁶ Spitzer and other Attorneys General intend to sue under sections 111 and 304 of the CAA, alleging that the EPA has failed to review the NSPS for fossil fuel electric utilities. The AGs hope the EPA will revise its original requirement that the states enact the new source reforms within 60 days of the package's publication in the Federal Register.⁵⁷

VI. Mercury and Seafood

A. Safe and Dangerous Dosages of Mercury in Seafood

The average American consumes 15.2 pounds of fish per year.⁵⁸ Most of that fish is contaminated by MeHg. The major source of MeHg exposure in humans is seafood consumption. Exposure varies according to the types of fish consumed,⁵⁹ the different regions in which it is consumed,⁶⁰ the size of the fish consumed,⁶¹ and the water source from which the fish was taken.

In an effort to measure the ecological stress of lake ecosystems, the EPA initiated the Environmental Monitoring and Assessment Program ("EMAP") in 1989. One of EMAP's first projects was a survey of the problems that can impair lake ecosystems in Northeastern U.S. lakes. EMAP analyzed metals in tissue samples composited from whole fish collected in 167 Northeastern lakes. Elevated levels of mercury were widespread, and mercury concentrations exceeded levels of concern for human consumption in 26% of lakes.⁶² [The widespread distribution of mercury contaminants indicated a common regional airborne source, rather than local discharges or soil conditions.]

Based on information taken from fish samples in more than 36 states between 1990 and 1995 (and as measured by state agencies), average mercury concentrations in several freshwater fish species (including largemouth bass and walleye) exceed the current FDA action level of 1 ppm.⁶³ And in the EPA's 1987 National Study of Chemical Residues in Fish, mercury was detected in fish in 92% of the 374 sites sampled.⁶⁴

However, freshwater fish should not be our greatest concern. Most of the fish consumed by Americans are ocean fish. According to FDA samples of shark and swordfish in 1998 and 1999, 36% of swordfish and 33% of shark exceeded the FDA's 1 ppm RfD for MeHg.⁶⁵ A 1988 EPA program designed to develop management strategies for improving the Gulf of Mexico ecosystem collected samples from over 121 species of fish collected after January 1, 1990, and found MeHg levels exceeding 0.4 ppm in many species, including grouper, sand seatrout, largemouth bass, and mackerel.⁶⁶

More disturbing than the known MeHg contamination levels in ocean fish is the fact that the FDA failed to report any sampling for tuna, the most commonly consumed fish in America, for the years of 1994, 1996, 1997, and 1998.⁶⁷ Because of this sort of inaction, official mercury contamination data is unavailable for many types of fish in the U.S. However, in recent testing by Consumer Reports, MeHg levels in white tuna averaged 0.31 ppm, which, while lower than the FDA's RfD, may pose a health risk because of the sheer quantity of tuna consumed by the American public.⁶⁸ Consumer Reports recommended that a 132-pound woman could safely consume about two cans of tuna a week, and that children should limit their tuna exposure until age five.⁶⁹ Since recent FDA data is unavailable, the following diagram is from the FDA's 1982 compliance program report of findings on pesticide and metals in fish:

**Mean Mercury Levels in FDA
Fiscal Year 1979 Survey⁷⁰**

| Species | Mean Hg level, ppm | Maximum Hg level, ppm |
|--------------------|--------------------|-----------------------|
| Bass, fresh water | 0.19 | 0.62 |
| Bass, salt water | 0.07 | 0.25 |
| Bluefish | 0.19 | 0.81 |
| Carp | 0.11 | 0.37 |
| Catfish | 0.10 | 0.74 |
| Cod | 0.15 | 0.83 |
| Halibut | 0.27 | 0.51 |
| Perch, fresh water | 0.13 | 0.30 |
| Perch, salt water | 0.17 | 0.44 |
| Pike, walleye | 0.26 | 0.75 |
| Pollack | 0.05 | 0.14 |
| Swordfish | 0.83 | 1.82 |
| Trout, fresh water | 0.13 | 1.01 |
| Trout, sea | 0.09 | 0.24 |
| White fish | 0.06 | 0.24 |

This table obviously does not account for mercury bioaccumulation and pollution since 1979. It is likely that

bioaccumulation and accelerated pollution have only increased mercury levels in fish since that time. However, even in 1979, swordfish and trout contamination above a 1 ppm can be observed.

B. Mercury Contamination in the Human Body Due to Seafood Consumption

The gastrointestinal tract absorbs about 95% of the MeHg in fish ingested by humans,⁷¹ while the skin and lungs absorb it in smaller quantities from other sources. Once absorbed, some binds to the hemoglobin in red blood cells⁷² and some binds to plasma proteins. To get to the brain, where the most severe damage occurs, MeHg is transported across the blood-brain barrier by an amino acid carrier⁷³ (transport in endothelial cells may also be assisted by glutathione⁷⁴). Once in the brain or another organ, it slowly demethylates to inorganic mercuric Hg. While the demethylation mechanisms are still controversial, possible reasons for the biotransformation include free-radical mechanisms,⁷⁵ the role of γ -globulin and serum albumin,⁷⁶ or as yet unidentified enzymes in the human body. Mercury remains in the body for many days—MeHg has a whole-body half-life in humans of 70-80 days.⁷⁷

C. Mercury Regulation and Seafood

A January 2001 federal General Accounting Office (GAO) report commissioned by Senator Tom Harkin found the FDA's Hazard Analysis and Critical Control Point ("HACCP") regulations failed to provide guidance to the fishing industry on the hazards of mercury and charged that the FDA had failed to protect the public from mercury-tainted seafood.⁷⁸ According to the report, FDA officials said the fish with the highest average amounts of MeHg were expensive and therefore consumed infrequently. At that time, the FDA considered MeHg so unlikely to occur in fish that HACCP oversight was not needed.

The FDA has not always taken this position with regard to MeHg exposure. In fact, the FDA originally established an action level of 0.5 ppm for mercury in fish in 1969, which it subsequently modified in 1979 to 1 ppm.⁷⁹ The adjustment was in response to *United States v. Anderson Seafoods, Inc.*,⁸⁰ a 1978 case in which the government sought to enforce section 402(a)(1) of the Food, Drug and Cosmetic Act,⁸¹ which prohibited the distribution of adulterated food. The FDA sought to enjoin defendants from distributing adulterated fish. Defendant Anderson Seafoods, Inc. ("Anderson") filed a class action on behalf of itself and all others similarly situated (the FDA and Anderson cases were joined), seeking a declaratory judgment that "fish containing more than 0.5 ppm of mercury are not adulterated, even up to the level of 2.0 ppm"⁸² and an injunction requiring the FDA to establish a tolerance for mercury lower than 0.5 ppm. The FDA advocated a continued action level of 0.5 ppm. The

case turned on the issue of whether mercury was an “added substance” within the meaning of the statute. The FDA argued an added substance was “one that is not inherent or essential to the organism from which the food is derived”⁸³ while Anderson argued that an added substance was one that was “directly and proximately attributable to the acts of man.”⁸⁴ The court adopted Anderson’s definition.

In so doing, the court ignored an important part of the FDA’s definition of a food deemed “adulterated.” The statute stated that a substance not added to the food shall not be considered an adulterating agent only where “the quantity of such substance in such food does not ordinarily render it injurious to health . . .”⁸⁵ So, under *Anderson*, though the cumulative effect of the natural and contributed mercury was to raise the level of contamination over the FDA’s limit, because neither source by itself achieved the limit, the food was not adulterated within the meaning of the Act. The court further analogized mercury to water and salt in defense of the proposition that the fact that it is possible to be harmed by overconsumption of a substance does not mean that the substance should be proscribed.⁸⁶

The court also adopted Anderson’s proposed safety limits in determining a safe level of MeHg exposure. For example, both the FDA and Anderson offered evidence to substantiate their proposals for the minimum clinical effect level⁸⁷ (“MCEL”) of mercury; the FDA argued it was 2.0 ppm while Anderson argued it was 4.0 ppm.⁸⁸ The court adopted Anderson’s 4.0 ppm MCEL. Similarly, there was dispute as to the appropriate safety factor⁸⁹ to employ in determining the acceptable intake level for MeHg; the FDA advocated a safety factor of ten while Anderson advocated a safety factor of five.⁹⁰ The court adopted Anderson’s safety factor of five. The court’s opinion found the following: (1) fish may only be considered “adulterated” within the meaning of the Act to the extent that the mercury in the fish was contributed by man (implying that the remaining mercury, if already in the environment, is somehow not dangerous?); (2) based on Anderson’s standards, swordfish containing 1.0 ppm or less pose no reasonable possibility of injury to anyone’s health; (3) based on swordfish samples provided by Anderson, the MeHg in Anderson’s swordfish fell within acceptable limits (0.53 to 1 ppm) and were not adulterated within the meaning of the statute.

In 1980, the 5th Circuit affirmed the court’s establishment of the MeHg action level of 1 ppm⁹¹ (though the appellate judges did not agree with the lower court’s interpretation of “adulterated” within the meaning of the Act.). The FDA later officially adopted the 1 ppm action level and reaffirmed it in 1984.⁹² This compromise was purely expedient and legalistic, not founded in the science of whether or not a given dosage was toxic. The

Anderson court’s rationale essentially forced the FDA to regulate based on criteria other than whether or not a given food substance was demonstrably toxic to its consumers. In other words, the FDA was effectively forbidden to do its job.

Recently, the FDA has taken some steps in the right direction. The FDA largely concurred with the 2001 GAO report’s findings, stating “[o]ne of the Agency’s priorities for fiscal year 2001 is to review its overall public health strategy for methylmercury in commercial seafood and make any modifications that are found necessary in light of new data that have become available in recent years.”⁹³ Furthermore, in June of 2001, the FDA’s draft Fish and Fishery Products Hazards and Controls Guide listed MeHg as a potential safety hazard for bonito, halibut, Spanish mackerel, king mackerel, marlin, shark, swordfish, and bluefin tuna.⁹⁴

Based partly on the GAO report, U.S. Senators Patrick Leahy and Tom Harkin introduced the Mercury-Safe Seafood Act (S. 555) in 2001,⁹⁵ concluding that seafood with dangerously high MeHg levels was entering the market, the FDA’s action level for MeHg and mercury guidelines were inadequate, and that the FDA and EPA guidelines on MeHg consumption limits were inconsistent. Representative Frank Pallone (D-NJ) reintroduced a bill (H.R. 3885) in Congress,⁹⁶ identical to Senator Leahy’s bill in the Senate, to require the establishment of a tolerance level for MeHg in seafood. In Senator Leahy’s statement to the floor of Congress on the bill’s introduction, he noted the bill was proposed in response to the EPA’s 1997 “Mercury Study Report to Congress”⁹⁷ and the National Academy of Sciences “Toxicological Effects of Methylmercury” report,⁹⁸ and specifically noted the interest in protecting children and pregnant women, who are particularly vulnerable to mercury poisoning. He stated:

[L]ast month the Food and Drug Administration issued new consumer guidance, warning pregnant women, women of childbearing age, nursing mothers, and young children not to eat shark, swordfish, king mackerel, and tilefish in order to avoid exposure to methylmercury. I commend the FDA for issuing this guidance, which is important information for the most vulnerable members of our population. Unfortunately, despite acknowledging the problem of mercury contamination in large fish, the FDA still has not revised its so-called ‘action level,’ which is important data for consumers and local governments, nor do they enforce this level. There is a lot more to be done to protect

the public, and after so many years of delays, we should not wait any longer.⁹⁹

If passed, the bills would amend the Food, Drug and Cosmetic Act to set MeHg limits, establish systematic collection and analysis of seafood for MeHg exposure, and develop a national public education program regarding MeHg in seafood. At the time of this article's publication, the bill was in the Senate Committee on Health, Education, Labor, and Pensions.¹⁰⁰

However, even if the Mercury-Safe Seafood Act were to pass, actually enforcing it would continue to pose a dilemma. Legislation can do little given that the FDA is hamstrung in its ability to remove fish from the marketplace. A major problem is that the FDA's 1 ppm RfD functions as an action level, a non-binding discretionary guideline, and is not legally enforceable.¹⁰¹ Currently, in order for the FDA to actually remove fish from the marketplace, it is required to prove the levels of MeHg in seafood pose a public health threat. For each alleged infraction, the FDA must go before a federal court judge and receive permission to remove seafood found in violation of the current action level. Because the FDA has to surpass a high burden of proof in order to actually remove fish from the marketplace, it has not pursued the matter as rigorously as it might were the 1 ppm action level legally binding.

Many states have preempted federal proposals (like the Mercury-Safe Seafood Act) that mandate disclosure of mercury contamination with advisories of their own. Consumption advisories increased from 27 states in 1993 to 45 states in 2002.¹⁰² Several states have even taken to warning mercury-sensitive populations. The New Jersey Health Department warns that women of childbearing age should drastically limit consumption of shark and swordfish and recommends that children under seven years of age not eat these fish at all.¹⁰³ Michigan and Minnesota health departments advise against any consumption of shark and swordfish and recommend consumption limits on tuna.¹⁰⁴

Despite the dangers of mercury-contaminated fish, fish are a rich source of vitamin D, omega-3 fatty acids, and protein. The regular consumption of fish may help to prevent cardiovascular disease, osteoporosis, and cancer. Therefore, there is a trade-off between the risks of mercury exposure through seafood consumption and the nutritional benefits of a seafood-rich diet. To determine whether to regulate in the face of such tradeoffs, the FDA could employ Cass. R. Sunstein's risk-risk analysis.¹⁰⁵ Under Sunstein's risk-risk analysis, risks unintentionally created by the imposition of a new regulation should never outweigh the risks reduced or alleviated by that regulation. On balance, any new FDA regulations should have a safety-enhancing effect.¹⁰⁶ This would require the FDA to consider:

1. The Substitution Risks

One must consider effects on health risks once other changes in behavior are taken into account. Thomas J. Kniesner and W. Kip Viscusi provide the following example of substitution risks:¹⁰⁷ If the government were considering banning saccharin as an artificial sweetener, then it should consider the health risks associated with a possible increase in the population's consumption of sugar (which could lead to increased obesity) in addition to the net health effects of banning saccharin. In the case of fish consumption, common substitutes might include poultry, soy, beef, and pork. The government should consider the possible health effects of the population's increased consumption of these products in the event that contaminated fish is banned from the market. Conversely, mercury regulation that reduces fish contamination could lead to decreased consumption of fish substitutes.

2. The Health and Safety Risk of any Economic Activity the Regulation Creates

This stems from the notion that regulation is a form of economic activity, and all economic activity poses some form of health and safety risk. For example, stringent FDA regulations might require routine inspection and sampling of seafood on fishing boats. In this case, the FDA samplers might be at increased risk of drowning on fishing boats.

3. The Health Consequences of Excessive Regulatory Expenditures

Kniesner and Viscusi describe this theory as follows:

Regulatory allocations involve an opportunity cost in that they impose real financial costs on consumers and taxpayers because the money spent on regulatory costs would otherwise be spent on other bundles of consumer commodities. Based on the risk-risk approach, economists have estimated that, on balance, regulation harms individual health when government agencies propose risk-reducing regulations that impose a cost per life saved at levels of \$50 million or more.¹⁰⁸

If unregulated, consumers could spend the money on different consumer goods, like health care.

Because of the nutritional advantages of diets rich in fish and the minimal health and safety risks of seafood regulation, the long-term goal of the United States should be a reduction in the concentration of MeHg in fish, rather than a replacement of fish in the diet by other foods. In other words, better to stop poisoning fish than stop eating it.

VII. Dental Amalgam Restorations

A. Mercury Contamination in the Human Body from Dental Amalgams

Mercury pollution in the air we breathe and seafood we consume are not the only pathways of mercury poisoning that pose serious risks to the U.S. population. Elemental and inorganic mercury (“Hg”) that enter the body through mercury dental amalgams also pose health hazards. The ‘silver’ filling, or mercury dental amalgam, has been used by the dental profession to restore teeth for more than 180 years. Silver fillings are the preferred material by 92% of dentists for restoring posterior teeth.¹⁰⁹ Most amalgam used in the United States is made up of approximately 50% mercury, 35% silver, 13% tin, 2% copper, and trace amounts of zinc.¹¹⁰ Approximately 100 million mercury amalgams are filled each year in the United States.¹¹¹ It was once thought that the mercury, once set in a filling, became stable and would not leak mercury vapor. However, after considerable research, it is now accepted that mercury escapes dental amalgams and enters the body in the form of elemental mercury vapor. At that point, the Hg vapor enters tissues, including the brain, where it is oxidized to inorganic Hg.¹¹²

Inorganic Hg is no less toxic than the MeHg that enters the body through seafood: the National Academy of Sciences report suggests that if the real culprit in MeHg toxicity at the cellular level is the inorganic Hg metabolite created by the metabolism of MeHg to inorganic Hg in the brain (the demethylation in the brain from MeHg to inorganic Hg), then “the dose of inorganic Hg to the brain from elemental Hg exposure (particularly from dental amalgams) and MeHg might be cumulative.”¹¹³ If so, then Hg exposure from dental amalgams poses a more severe threat than previously thought. The threat seems particularly severe when one examines the report’s findings with regard to the estimated daily intake and retention of total Hg and Hg compounds in the general population (not including those occupationally exposed to Hg). The National Academy of Sciences estimated that an American adult takes in between 3.1 to 17 micrograms of elemental Hg vapor per day. Of that vapor, approximately .024 micrograms enter the body through the air (including the emissions brought about through both industrial and natural processes), and the remaining 3 to 17 micrograms enter the body through dental amalgams.¹¹⁴ According to these numbers, dental amalgams cause between 125 and 708 times more elemental Hg exposure in humans than does directly breathing air pollution (not including the bioaccumulation pathway by which air pollution indirectly exposes us). The report states, “[A]verage exposure to Hg from dental amalgams might be considerably higher than exposure to Hg from MeHg.”¹¹⁵

Furthermore, those working in the dental profession show significant occupational exposure to mercury vapor from amalgam.¹¹⁶ An independent investigation by the United States Occupational Health and Safety Administration (“OSHA”) found that approximately 10 percent of dental offices in the United States are severely contaminated by mercury.¹¹⁷ There has even been research to suggest that the high suicide rate among dentists may be related to the bioaccumulation of mercury in the brain of exposed dental professionals.¹¹⁸

It is clear, then, that the major source of exposure to *elemental* Hg in the general U.S. population is not air pollution, but rather Hg vapor released from dental amalgams.¹¹⁹ Numerous studies have linked dental amalgams to increased mercury levels in the body¹²⁰ and brain.¹²¹ Moreover, an increasing number of researchers suspect mercury exposure from dental amalgams of involvement in a wide variety of neurodegenerative and autoimmune¹²² disorders, including Alzheimer’s disease¹²³ and antibiotic resistance.¹²⁴ Because autoimmune degradation and antibiotic resistance do not kill patients directly, but merely facilitate their death by other means, and because exposure to dental amalgams is so ubiquitous in our society, it may be impossible to know how many illnesses and deaths a year are partially caused by mercury. It may therefore be difficult to accurately state the economic harm due to lost productivity and increased medical costs done by this commercial use of mercury. This is something to keep in mind when commercial users argue that it would be an economic burden for society to mandate that they switch to using non-toxic products.¹²⁵

B. Mercury Regulation and Dental Amalgams

In spite of all this, the position of the American Dental Association (“ADA”) is that “Dental amalgam has been studied and reviewed extensively, and has established a record of safety and effectiveness.”¹²⁶ The ADA’s adamancy in the face of a genuine public health threat can best be understood by a brief history of the ADA and mercury in dentistry. Fritz L. Lorscheider’s article, *Mercury exposure from ‘silver’ tooth fillings: emerging evidence questions a traditional dental paradigm*, provides the following brief historical overview of mercury use in dentistry:

As early as the 7th century, the Chinese used a ‘silver paste’ containing mercury (Hg) to fill decayed teeth. Throughout the Middle Ages, alchemists in China and Europe observed that this mysterious silvery liquid, extracted from cinnabar ore, was volatile and would quickly disappear as vapor when mildly heated. Alchemists were fascinated that at room temperature Hg appeared to ‘dissolve’ powders of other metals such

as silver, tin, and copper. By the early 1800s, the use of a Hg/silver paste as a tooth filling material was being popularized in England and France and it was eventually introduced into North America in the 1830s.¹²⁷

Actually, dental amalgams were introduced in the United States in 1812, by British chemist Joseph Bell, as a combination of coins and mercury.¹²⁸ Dental practitioners' belief in the safety of mercury amalgams was based on the belief that mercury could not escape a dental filling. However, some dental practitioners expressed concerns about mercury poisoning and consequently founded the American Society of Dental Surgeons (the "ASDS") in 1845.¹²⁹ The ASDS required that members sign a pledge not to use amalgams. Ultimately, ASDS membership declined surrounding the mercury controversy and the organization was disbanded in 1856.¹³⁰ In 1859, mercury amalgam advocates founded an organization based on the *advocacy* of mercury amalgams as a safe tooth filling material, the modern day ADA.¹³¹ Controversy also erupted later in the 1920s, when Alfred Stock, a German chemistry professor, published articles attacking mercury amalgams.¹³² However, the debate in Europe failed to stir much concern in the ADA.¹³³

Thus, the usage of mercury dental amalgams is a bedrock principle of the ADA.¹³⁴ And despite mounting evidence that amalgams pose genuine health risks, the ADA has stuck to its guns on this issue, stating: "The strongest and most convincing support we have for the safety of dental amalgam is the fact that each year more than 100 million amalgam fillings are placed in the United States. And since amalgam has been used for more than 150 years, literally billions of amalgam fillings have been successfully used to restore decayed teeth."¹³⁵ In fact, the ADA's principles of ethics and professional conduct makes removal of serviceable mercury dental amalgams an issue of unethical conduct, if the dentist recommends removal in order to eliminate a toxic material from the body.¹³⁶

Unpersuaded by the ADA's assurances of the safety of amalgams, a number of groups have taken legislative and legal action to ban mercury dental amalgams from use by the dental profession. In California, consumer groups have brought suit under the state's Safe Drinking Water and Toxic Enforcement Act of 1986, commonly known as Proposition 65.¹³⁷ Proposition 65 requires businesses to warn individuals about carcinogens and reproductive toxins (including mercury) to which they are exposed through consumer transactions, employment, and the environment. In 1996, the 9th Circuit upheld Proposition 65's warning requirements when applied to dental mercury fillings in *Committee of Dental Amalgam Manufacturers & Distributors v. Stratton*.¹³⁸ In *Stratton*, defendants Dan Lungren (California Attorney General),

James Stratton (Director of the California Office of Health Hazard Assessment), and the Environmental Law Foundation, appealed the district court's grant of summary judgment to plaintiff dental amalgam manufacturers. The district court had held that the Medical Device Amendments of 1976 to the Federal Food, Drug and Cosmetic Act¹³⁹ preempted Proposition 65. The 9th Circuit reversed, finding that though dental amalgam fell within the reach of the Medical Device Amendments, Proposition 65 was not preempted by the Medical Device Amendments of 1976 to the Federal Food, Drug and Cosmetic Act¹⁴⁰ because the FDA, as the ultimate authority of dental mercury regulation, had failed to put forth a counterpart requirement specific enough to trigger preemption.¹⁴¹ The 9th Circuit noted:

To hold that inaction by the FDA is sufficient to trigger preemption would mean that manufacturers would be free to ignore state laws that are intended to protect consumers, during the period that the FDA is considering whether to issue specific regulations relating to particular products, or after the FDA, for whatever reason, has "decided," through inaction, not to regulate particular products.¹⁴²

Following *Stratton*, on February 28, 2000, Consumers Cause, Inc. sued Community Dental Services, Inc., and SmileCare, alleging defendants had violated Proposition 65 by exposing patients to mercury amalgam fillings without providing a warning.¹⁴³ Defendants, dental care providers, filed a motion for summary judgment, claiming an affirmative defense based on their assertion that the plaintiff bears the burden of showing a triable issue of material fact where a moving defendant points to the absence of evidence to support plaintiff's case.¹⁴⁴ In the *SmileCare* case, a 2-1 decision from a Second District Court of Appeals panel held that when plaintiffs bring suit under Proposition 65, the defendants bear the burden of proving the mercury is not dangerous,¹⁴⁵ and denied defendants' motion for summary judgment.

Also in California, Consumers for Dental Choice, a public interest group, sued the ADA and the California Dental Association ("CDA") in Los Angeles Superior Court on June 12, 2001.¹⁴⁶ The class-action suit alleges the defendants misled the public about the dangers of mercury in tooth fillings and that the professional rules of conduct for the ADA and CDA prevented dentists from discussing the dangers of mercury with patients. Stephen Rivers, a spokesman for the plaintiffs, summarized the ADA's position as follows: "It is toxic before it goes into your mouth, it is hazardous when it is removed from your mouth . . . but the ADA claims in the interim, when it is in your mouth, it is fine."¹⁴⁷

In a related case, the CDA successfully defeated these types of claims by using the California anti-SLAPP (strategic lawsuit against public participation) statute to claim that its activity in connection with mercury amalgams is constitutionally protected speech.¹⁴⁸ Plaintiff, Kids Against Pollution (and other consumer groups) argued that CDA (1) had undertaken a policy and practice, through its ethical rules, to prevent warnings and information from reaching patients; (2) had retaliated against dentists who disclosed risks to their patients; and (3) had disseminated false and misleading information to dentists and the public concerning the risks of mercury amalgam. After the dental association filed its anti-SLAPP motion, the plaintiff withdrew its claim based on public advocacy. As to the plaintiff's claims based solely on enforcement of the dental association's ethical code, the court held that the activity was protected, and that the plaintiff had failed to submit sufficient evidence to show that the CDA was enforcing the ethical code in an illegal manner.¹⁴⁹ This was in spite of the fact that plaintiffs submitted the affidavit of a dentist who was reprimanded by the CDA for mentioning during a televised interview that he did not use amalgams.¹⁵⁰ The court of appeal remanded with instructions to dismiss the action. The plaintiffs petitioned the California Supreme Court for review on the ground that the appellate court had issued a "catch-22" decision:

Under the ruling, the plaintiffs maintain, a large trade association—the California Dental Association—has SLAPP protection to prevent free speech on the part of its members. It also can use intimidation to "chill" the concerns of thousands of California dentists who want to provide scientifically based information, in plain English, about the health risks associated with amalgam fillings, the petition said.¹⁵¹

Despite this, there has been some action taken against professional dental associations still advocating dental amalgams. When the ADA failed to promulgate a fact sheet in compliance with warning requirements, the California Assembly Health Committee approved a bill (SB-134) that was later signed by former Governor Gray Davis on October 5, 2001, that stripped the California Dental Board for its recalcitrance, and shifted oversight of the ADA to the Department of Consumer Affairs.¹⁵² Similar disclosure requirement laws have seen success in Maine¹⁵³ and New Hampshire.¹⁵⁴

In response to Proposition 65 and the litigation that ensued, the Dental Board of California issued a Dental Materials Fact Sheet that was adopted by the Board on October 17, 2001. While it was offered as proof of the ADA's compliance with Proposition 65, the fact sheet still fails to adequately warn patients about the dangers of mercury amalgam fillings. It states:

There is no research evidence that suggests pregnant women, diabetics and children are at increased health risk from dental amalgam fillings in their mouth. A recent study reported in the JADA¹⁵⁵ factors in a reduced tolerance (1/50th of the WHO safe limit) for exposure in calculating the amount of mercury that might be taken in from dental fillings. This level falls below the established safe limits for exposure to a low concentration of mercury or any other released component from a dental restorative material. Thus, while these sub-populations may be perceived to be at increased health risk from exposure to dental restorative materials, the scientific evidence does not support that claim.¹⁵⁶

It seems that unless there is national action in the form of a bill that would impose a federal ban, restriction, or disclosure requirement on the ADA, the dental profession is too entrenched to re-think its attitude towards mercury dental amalgams. On April 10, 2002, Congresswoman Diane Watson (D-CA) and Congressman Dan Burton (R-IN) introduced the Mercury in Dental Filling Disclosure and Prohibition Act to Congress. If passed, the bill would amend section 501 of the Federal Food, Drug, and Cosmetic Act¹⁵⁷ to state, "A drug or device shall be deemed to be adulterated effective January 1, 2007, if it contains mercury intended for use in a dental filling."¹⁵⁸ The bill is intended to prohibit the introduction of mercury for use in a dental filling into interstate commerce and would also impose labeling requirements on devices containing mercury to be used in dental fillings. At the time of this article's publication, the bill was in the House Committee on Energy and Commerce.¹⁵⁹ If passed, it would be the first federal law aimed at regulating the use of mercury amalgams by the dental profession.¹⁶⁰

VIII. What Are the Problems with Mercury Regulation Today?

Mercury regulation suffers from a collective action problem present in attempts to limit a negative externality like pollution. While mercury pollution imposes diffuse deleterious health costs on all of American society, its effects are so dispersed that individuals are unlikely to appreciate the costs imposed. Nor are such costs easily quantified. Furthermore, since all Americans are affected, the transaction costs associated with organizing any movement against mercury polluters are significant. And without an organized movement, individuals are unlikely to assume the costs of challenging the mercury polluters themselves, opting instead to free-ride on the actions of others.

There are also significant political externalities associated with mercury regulation. While the effects of mercury pollution are borne by the population at large, the responsible parties are well-organized, concentrated groups that strongly oppose efforts to regulate their actions: coal utilities, fishermen, and the American Dental Association. Since these groups have asymmetrical power, no political leader can go out on a limb for stricter regulations without total grassroots support. However, because of the afore-mentioned collective action problem, grassroots support is unlikely to develop.

The CAA provides an excellent example of the moral hazard created by the bifurcated regulations of the RCRA and the CWA discussed earlier in this article. Without preferential regulation, old power plants might well have been replaced; since the plants receive special and economically advantageous privileges they endure much longer. The law has perversely provided an incentive for ownership, diligent maintenance, and maximum usage of the most egregiously toxic and undesirable plants. More than 20 years after the enactment of CAA, many of these same plants, built in the first half of the 20th century, are still operating, largely without environmental controls. For example, in Virginia, eight out of the ten operating coal plants are exempt under the CAA. The oldest plant, Glen Lyn in Giles County, began operation in 1944.¹⁶¹

These two-tiered regulations also allow legislators to implement stringent legislation, but delay its application, or apply it in a discriminatory fashion. This enables legislators to publicly declare a commitment to rigorous environmental standards and reap the constituent rewards, while privately avoiding a backlash from polluting industries that would suffer from implementing tough environmental controls.¹⁶² As long as environmental regulations are so constructed, polluting industries will have incentives to avoid implementing cleaner technologies in their facilities.

The best way to understand the technical regulatory failures associated with mercury exposure is through a close examination of a major piece of legislation that regulates mercury. What follows is a detailed examination of the CAA as it relates to mercury regulation.

A. Regulatory Failure: The Structure and Implementation of the Clean Air Act

1. The EPA Fails to List the Single Largest Contributor to Mercury Pollution, Coal-Fired Utility Boilers, as a Major Source Category of Mercury Pollution

Under Section 112 of the CAA, mercury qualifies as a hazardous air pollutant ("HAP"), as distinguished from a criteria pollutant. Criteria pollutants tend to be more

pervasive but less hazardous than HAPs, and are regulated by the National Ambient Air Quality Standards.¹⁶³ HAPs are pollutants that are regulated by maximum achievable control technology ("MACT") standards.¹⁶⁴

Before the 1990 amendments to the Clean Air Act, Section 112 required the EPA to establish limits for HAPs that would provide "an ample margin of safety to protect the public health." Confronted by the economic costs this would require, the EPA opted to take into consideration process cost and technical feasibility in establishing National Emission Standards for Hazardous Air Pollutants ("NESHAPs").¹⁶⁵ The Natural Resources Defense Council (NRDC) challenged the EPA's decision to consider cost in establishing NESHAPs in the controversial case, *Natural Resources Defense Council v. EPA*,¹⁶⁶ when the EPA withdrew its vinyl chloride standards. In finding for the EPA, the court held that though cost should not be considered in establishing "safe" levels of exposure, safe did not mean risk-free.¹⁶⁷ Subsequent proceedings vacated in part the Circuit court's ruling.¹⁶⁸

Following the NRDC decision, Congress passed the 1990 Clean Air Act amendments. The 1990 amendments were intended to address the difficulty in conducting the necessary analyses under the pre-1990 risk-based standards by shifting to technology-based standards. In the 1990 amendments, Congress (1) shifted from a risk-based ambient air quality standards approach to technology-based standards, (2) directed the EPA to develop standards by industrial source category rather than by individual pollutants, and (3) included an expanded list of HAPs in the statute,¹⁶⁹ removing from the EPA's discretion the ability to determine which pollutants should be listed.

Though Congress removed the EPA's ability to list HAPs in the 1990 amendments, it did require the EPA to promulgate a list of all categories of major sources that emitted one or more HAP¹⁷⁰ to be subject to the new MACT standards. Technology-based MACT standards are based on the "maximum degree of reduction in emissions of the hazardous air pollutants subject to this section . . . that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources in the category or subcategory to which such emission standard applies."¹⁷¹ Under the post 1990 technology-based scheme, the EPA establishes MACT standards for each category of source, as opposed to regulating the pollutants themselves. Unlike NSPS standards, MACT standards apply to both new and existing sources of pollution.¹⁷² Unfortunately, the EPA's initial listing of source categories was not subject to notice comment rule making under CAA Section 307, nor was it subject to judicial review.¹⁷³ This might explain the fact that its final source category list included industrial

boilers among the major source categories of pollution¹⁷⁴ but did not include coal-fired utility boilers.

Upon close reading, it is not clear which source categories the EPA intends to be included—but the decision not to specifically list coal-fired utility boilers, which emit 250% more mercury than do industrial coal boilers, does not stand to reason.¹⁷⁵ By excluding coal-fired utility boilers from its list of mercury pollution sources, the EPA vitiates its own regulations.

2. The EPA Has Allowed the Coal Industry to Circumvent the Clean Air Act Through an Environmental Grandfather Clause

In 1970, Congress created NSPS in Section 111 of the Clean Air Act.¹⁷⁶ The NSPS functions as a “grandfather” clause that allows older plants to avoid meeting the modern pollution control standards that new facilities had to adopt. When it grandfathered the coal-fired plants, Congress assumed that they would be decommissioned following NSPS review of control technology for all major stationary source construction or modification as mandated by Title I of the Clean Air Act.¹⁷⁷ However, the majority of these older plants are still in operation today.

In order to limit abuse of this loophole, Congress created the New Source Review (“NSR”) provision of the Clean Air Act. This provision treats grandfathered power plants as “new sources” when they expand or significantly modify their facilities. It requires them to either (1) prevent additional pollution by offsetting any increases with reductions in other sources at the same plant site, or (2) obtain a clean air permit demonstrating that the best available pollution control technology has been installed. However, NSR has itself been hampered by the WEPCO Rule.

The WEPCO Rule was promulgated by the EPA following the case of *Wisconsin Electric Power Co. v. Reilly* (“WEPCO”).¹⁷⁸ Prior to 1990, the EPA determined the potential to emit from non-routine like kind replacements “comparing actual pre-renovation emissions with potential post-renovation emissions” using an “actual-to-potential” methodology.¹⁷⁹ In WEPCO, the Court struck down this interpretation and held that a power plant’s potential-to-emit had not increased enough to trigger NSR.¹⁸⁰ It did so with the understanding that “[a] too restrictive interpretation of ‘modification’ might upset the economic-environmental balance in unintended ways.”¹⁸¹ This decision was codified by the EPA in its own WEPCO Rule.¹⁸²

The EPA’s WEPCO Rule established regulatory exemptions for modifications at grandfathered power facilities that could cause an increase in future emissions. It waived application of environmental laws if the rise in

emissions following renovations was at all attributable to a growth in the demand for electricity.¹⁸³ Consequently, the WEPCO Rule allows emission control exemptions whenever there are modifications that might increase emissions, such as routine repairs at old facilities.¹⁸⁴

Since NSR is not triggered by routine maintenance at old facilities, utility companies attempt to bypass NSR requirements by constantly modifying and repairing the facilities to increase cheap, unregulated power production, and then claim they are engaging in routine maintenance when they are in fact expanding capacity. However, Congress never intended such “routine maintenance” to “permanently exempt existing plants from these [control technology] requirements; section 7411(a)(2) provides that existing plants that have been modified [by renovations that require NSR] are subject to the Clean Air Act programs at issue here.”¹⁸⁵ According to the Sierra Club, the EPA has brought NSR enforcement actions against thirteen power companies at 51 power plants in the United States.¹⁸⁶

Most recently, Judge Sargus in the Southern District of Ohio found that Ohio Edison Company violated the NSR program when it undertook 11 construction projects at seven units of the W.H. Sammis Station (a coal-fired electric generating facility located in Jefferson County, Ohio) and contended the projects were not modifications but were instead “routine maintenance, repair and replacement.”¹⁸⁷ Believing the projects were exempt under the Clean Air Act, Ohio Edison failed to project and calculate post-construction emissions to determine whether the new standards applied and failed to obtain a pre-construction permit. The court concluded the company was not exempt, finding “each of the eleven activities undertaken at the Sammis plant effected a non-exempt physical change to a major source, for which compliance with the CAA was required. In reaching this conclusion, the Court adopts the EPA’s interpretation of the ‘routine maintenance, repair or replacement’ exemption.”¹⁸⁸

The EPA could address environmental grandfather clauses in a number of ways. It could enact environmental controls based on environmental impact or risk, thereby creating one standard for all polluters. A more politically viable option would be to create amortization provisions in existing regulations that would allow older sources to continue to operate under less stringent standards until all owners and investors in the older sources had recouped their investment, then force them to comply with the new source standards. Or, since owners of older plants probably recouped their investment many decades ago, the EPA could implement similar incremental regulations that would force all old sources to comply with new source standards over a prescribed set of deadlines.¹⁸⁹

3. The CAA's Complexity Precludes a Clear Understanding of Meaning

To understand why industry emits massive amounts of mercury every year despite 30 years of efforts at regulating it, a brief reading of the CAA may lead one to conclude it is so rife with confusing terminology as to make it inscrutable. Terms are commonly used in multiple sections of the act, but defined slightly differently and then inconsistently applied. For example, a "major source" is defined as:

[A]ny stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.¹⁹⁰

Whereas a "major stationary source" is defined as:

[A]ny stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant (including any major emitting facility or source of fugitive emissions of any such pollutant, as determined by rule by the Administrator).¹⁹¹

Whereas a "stationary source" is defined as:

[A]ny building, structure, facility, or installation which emits or may emit any air pollutant. Nothing in title II of this Act relating to nonroad engines shall be construed to apply to stationary internal combustion engines.¹⁹²

Whereas an "area source" is defined as:

[A]ny stationary source of hazardous air pollutants that is not a major source.¹⁹³

Whereas an "affected source," which designates the specific source or group of emission units subject to a particular Section 112 standard, is not defined at all—the particular "affected source" for each standard is defined in that standard.¹⁹⁴ It is no wonder attempts at wholesale revision of the Act have found little success. The sheer complexity of the Clean Air Act precludes a clear understanding of its meaning.¹⁹⁵

4. The EPA's Shift to Technology-Based Regulations Has Significant Political Externalities

The 1990 CAA amendments shifted the CAA from a risk-based to technology-based system. Under this sys-

tem, the EPA sets emission standards reflecting the "degree of emission limitation achievable" through the technology the agency determines has been "adequately demonstrated" to be the best.¹⁹⁶ Such bifurcated regulations have also been adopted in other areas of environmental regulation. Under this two-tiered regulatory system, regulations are technology-based (i.e., they are based on the performance of treatment and control technologies) and they are not based on risk or impacts to the environment.

The EPA's shift to technology-based regulations reflected a desire to take into consideration the economic burdens associated with environmental regulation, in spite of earlier courts' conclusions that cost should not be taken into account in providing regulations for the public's health. In *Lead Industries Association v. EPA*, the court explained that Congress designed Section 109 of the Clean Air Act to promulgate standards that might be economically infeasible.¹⁹⁷ This position was affirmed in *American Petroleum Institute v. Costle*, in which the court held that "[a]ttainability and technological feasibility are not relevant considerations in the promulgation of national ambient air quality standards."¹⁹⁸ Instead, the EPA administrator must use his or her own judgment to determine what regulations provide an adequate margin of safety for the public. In *Lead Industries*, the court referred to its previous opinion in *Environmental Defense Fund v. EPA*, and described the administrator's duty to the public as follows:

"If administrative responsibility to protect against unknown dangers presents a difficult task, indeed, a veritable paradox calling as it does for knowledge of that which is unknown, then the term "margin of safety" is Congress's directive that means be found to carry out the task and to reconcile the paradox."¹⁹⁹ As we saw in *Anderson*,²⁰⁰ when a regulatory agency is forbidden to regulate based on the science of what is and is not safe, standards can become meaningless, regulation unproductive, products and practices toxic, and the public completely unwarned.

The EPA has thus far justified its refusal to develop emission standards for mercury emission from power plants by claiming that the cost of controlling mercury is too high to justify regulation. It has instead regulated sources of mercury which pose a much smaller public health threat, including seeds,²⁰¹ prosthetic devices,²⁰² cosmetics,²⁰³ thermostats,²⁰⁴ and lamps.²⁰⁵

The political failures of the EPA's system of regulation are articulated persuasively by Cass Sunstein as follows:

Most fundamentally, the BAT approach is severely deficient from the standpoint of a well-functioning political process. BAT strategies ensure that citizens and

representatives will focus their attention on largely incidental and nearly impentable questions about currently available technologies, rather than on the appropriate levels of reduction. Technological debates are singularly ill-suited for democratic resolution. They also distract attention from the central issue of determining the appropriate degree and nature of regulatory protection. Moreover, the focus on “means” increases the power of well-organized private groups, by allowing them to use regulation to serve their own parochial ends.²⁰⁶

B. Legislative Failure: Insufficient Regulation

There is currently no national regulation on mercury dental amalgams, limited regulation of mercury in seafood, and no mercury emissions standard for coal fired utility boilers. However, there are bills in Congress right now that propose major overhauls of mercury regulation. If passed and enforced, many of these bills would contribute significantly to improving our environment and public health with regards to mercury contamination. They include:

| 107th Congress (2001-2002) | | |
|----------------------------|---|-----------------|
| Sponsor | Name | Bill # |
| Allen (D-ME) | “Clean Power Plant Act of 2001” ²⁰⁷ | HR 1335 |
| Allen (D-ME), Leahy (D-VT) | “Omnibus Mercury Emissions Reduction Act of 2001” ²⁰⁸ | HR 2729, S 1875 |
| Jeffords (I-VT) | “Clean Power Act of 2002” ²⁰⁹ | S 556 |
| Leahy (D-VT) | “Mercury-Safe Seafood Act of 2001” ²¹⁰ | S 555 |
| Pallone (D-NJ) | “Seafood Safety and Mercury Screening Act of 2002” ²¹¹ | HR 3885 |
| Sweeny (R-NY) | “Acid Rain Control Act” ²¹² | HR 25 |
| Watson (D-CA) | “Mercury in Dental Filling Disclosure and Prohibition Act” ²¹³ | HR 4163 |
| Waxman (D-CA) | “Clean Smokestacks Act of 2001” ²¹⁴ | HR 1256 |
| 108th Congress (2003-2004) | | |
| Jeffords (I-VT) | “Clean Power Act of 2003” ²¹⁵ | S 366 |
| Leahy (D-VT), Snowe (R-ME) | “Omnibus Mercury Emission Reduction Act of 2003” ²¹⁶ | S 484 |

Sadly, none of the proposed bills offers a comprehensive strategy for controlling mercury from coal-fired utility boilers.²¹⁷ Most recently, the EPA, under the new stewardship of Michael O. Leavitt, proposed that mercury emissions from coal-burning power plants not be regulated, signaling a major pro-industry policy shift by the Bush Administration.²¹⁸ The EPA’s proposal resembles the “cap and trade” acid rain program of the early 1990s, under which corporations trade “pollution credits” among themselves to achieve emissions reductions collectively. However, this proposal effectively removes mercury from regulation under the Clean Air Act, thereby giving power plants free rein to emit tons of mercury every year.

1. Control Options for Existing Plants²¹⁹

In addition to standard coal cleaning, the government should consider implementing innovative control options in existing plants to minimize mercury exposure. For example, some power plants use electrostatic precipitators (ESPs) and fabric filters (baghouses) to limit fly ash emissions through the removal of particulate matter from flue gases.²²⁰ ESPs charge particles and pass them between oppositely charged plates that create an ionized field, attracting the particles.²²¹ Baghouses are an array of cylindrical bags that filter flue gases through a densely woven fabric capturing particulates and leaving a layer of dust on the bags.²²² Removal efficiencies for the best electrostatic precipitators can exceed 99.7 percent.²²³ Fabric filters are considered more efficient than ESPs in collecting particles smaller than two microns, but either approach can achieve extremely high levels of particulate removal.²²⁴ Since many of the metals in incinerator emissions condense onto fly ash particles, metal removal of over 99 percent can be achieved for most metals with ESPs and fabric filters.²²⁵

The EPA could require the installation of flue gas desulfurization (wet scrubbers), already in place to reduce SO₂ emissions, to remove trace metals, including mercury. In wet scrubbers, the flue gas enters a large vessel (spray tower or absorber), where it is sprayed with an absorbing solution (water slurry). Currently, about 25% of coal-fired utility boilers are equipped with wet scrubbers.²²⁶ Various pilot studies show that wet scrubbers capture up to 90% of the oxidized mercury from the flue gas (though they capture relatively little elemental mercury).²²⁷ Evidence suggests wet scrubber mercury removal efficiency depends on whether the boiler fires sub-bituminous or bituminous coal.²²⁸ Because of the differences in the forms and distribution of mercury in these different types of coal, wet scrubber mercury removal efficiency is highest when treating flue gas from a boiler firing bituminous coal.²²⁹

2. Control Options for New Plants

For new plants, the EPA should implement stringent control options to preclude further mercury pollution from coal-fired utility boilers. For example, the EPA has recently stepped up testing of carbon injection as a means of preventing mercury pollution. In this process, activated carbon is injected into the flue gas stream exiting the boiler, where the carbon is collected in downstream particulate control equipment, such as electrostatic precipitators.²³⁰ The added carbon absorbs trace contaminants like mercury. Pilot scale studies by the EPA indicate that carbon injection varies with several factors, but mercury removal efficiency as high as 99% has been observed, with median reductions as high as 86%.²³¹

The EPA could also require the use of carbon filter beds for removing high mercury concentrations from utility boilers. Like carbon injection, the carbon filter bed enables carbon to absorb pollutants. Flue gas flows throughout a packed bed of carbon with three layers, while the absorbent percolates through the filter.²³² Each bed layer removes different contaminants and is periodically sloughed of the collected material.²³³ Carbon filter beds have been used in Europe for the reduction of residual organic compounds, heavy metals, and acid gases.²³⁴ A pilot-scale application in Germany resulted in greater than 99 percent mercury emissions reductions.²³⁵

IX. Conclusion

Despite ample evidence of exposure and consumption of toxic levels of mercury by many groups in society the total impact of mercury in its several toxic forms on the American public has never been properly quantified. We know that mercury is linked to childhood autism, but not how many of today's cases of autism (the fastest growing diagnosis in California) are linked to mercury. We know that illness and death by a wide variety of causes is enabled by the damage mercury does to the immune system, but no study tells us roughly how many illnesses and deaths it has contributed to, or how significantly it has contributed. The question is, do we have to wait for complete epidemiological evidence of the breadth and depth of mercury's impact on the health, wealth and productivity of our nation before we confront the epidemic?

Although well intentioned, the current efforts at reform attempt to stiffen regulations about warnings and consumption of a major environmental toxin, but are too timid to try to stop or reduce the ongoing poisoning of the environment with that toxin. This approach is highly problematic. Quite simply, the more mercury is permitted to be released and built up in the air, water and food chain, the more difficult it will be to mitigate human exposure and consumption in one form or another. To allow that to continue to happen would be as mad as any hatter.

Endnotes

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7. U.S. Environmental Protection Agency, *supra* note 1, at 2-1.
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162. This is not to suggest that the legislature is the only political entity benefiting from the CAA coal loophole. Indeed, with regard to coal power plants, the Bush administration may be using the "Clear Skies" proposal as an electoral strategy—West Virginia, Kentucky and Pennsylvania are the center of coal production in the East and key swing states during a presidential election. Under current CAA standards, the expenses necessitated by NSPS would considerably impair the coal industry's ability to function as the cheapest source of fuel for the country. CAA associated costs could result in a shift in energy consumption from coal to natural gas. The Bush administration may be using "Clear Skies" as an opportunity to respond to the coal industry and win key voters for the next election cycle. See Eric Pianin & Dan Morgan, *EPA Will Ease Coal Plant Rules; Incentives to Replace Pollution Lawsuits*, Washington Post, March 18, 2002, at A01.
163. See the EPA's web site on criteria pollutants, at <http://www.epa.gov/oar/oaqps/greenbk/o3co.html> (last visited Oct. 24, 2003).
164. CAA § 112(d)(2), 42 U.S.C. § 7412(d)(2) (2003); CAA § 112(d)(3); CAA § 112(g)(2).
165. 40 Fed. Reg. 59, 532, 59, 534 (1975) (proposed NESHAP for vinyl chloride).
166. *Natural Res. Def. Council, Inc. v. EPA*, 824 F.2d 1146 (D.C. Cir. 1987) (en banc).
167. *Id.* at 1153.
168. *Natural Res. Def. Council, Inc. v. EPA*, 705 F. Supp. 698 (D.D.C. 1989); *Natural Res. Def. Council, Inc. v. EPA*, 707 F. Supp. 3 (D.D.C. 1989).
169. CAA § 112(b)(1), 42 U.S.C. § 7412(b)(1).
170. CAA § 112(c)(1).
171. CAA § 112(d)(2).
172. The MACT standards seem to apply preferentially as well. For new sources, MACT must be at least as stringent as the average emissions achieved by the best-controlled sources in the same category (40 C.F.R. §§ 60.14-15 (2003)). For existing sources, MACT may not be less stringent than the average emission limitation of the best performing 12% of existing units (CAA § 112(d)(3)(A), 42 U.S.C. § 7412(d)(3)(A) (2003)). Of course, one might wonder, in a state like Virginia, where eight of the ten power plants are not even subject to the CAA, and plants are as much as sixty-five years old, how stringent are the top 12% of plants going to be?
173. CAA § 112(e)(4).
174. 57 Fed. Reg. 31, 576 (July 6, 1992).
175. According to the EPA's Mercury Study Report to Congress (*supra* note 2, at 36), industrial coal boilers emit 18.8 Mg/yr of mercury, while coal-fired utility boilers emit 46.9 Mg/yr of mercury. EPA-452/R-97-003, pp. 3-6.
176. The politics behind the development of NSPS standards was the focus of the influential work, Bruce A. Ackerman & William T. Hassler, *Clean Coal/Dirty Air: Or How the Clean Air Act Became a Multibillion-Dollar Bail-Out for High-Sulfur Coal Producers and What Should Be Done About It* (1981). The book studies the development of NSPS for coal-burning plants and examines the association of forced scrubbing to compliance with numerical ceiling standards for sulfur dioxide (SO₂) emissions. In addition to discussing whether these standards in any way achieve the ultimate goal of cleaning the air, the authors suggest instructional clues for better future policymaking.
177. See Mark Mininberg & Katharine Goodbody, *Why Deregulate the Retail Electric Industry?*, Conn. L. Trib., Nov. 4, 1996, available in LEXIS, News Database, CURNWS file. See generally Legislative History of the Clean Air Act Amendments of 1990, Cong. Rec. S6675-76, Senate Debate on S. 1630, (statement of Sen. Baucus) ("The issue is whether old facilities that are substantially renovated and refurbished should continue to be allowed to emit at much higher rates or to emit more pollution, and with little or no pollution control equipment, compared to new sources. The obvious answer is that they should not.").
178. *Wis. Elec. Power Co. v. Reilly*, 893 F.2d 901 (7th Cir. 1990) (interpreting Requirements for Preparation, Adoption and Submittal of Implemented Plans, 57 Fed. Reg. 32,314 (1992)).
179. *Id.* at 906.
180. *Id.* at 909.
181. *Id.*
182. Requirements for Preparation, Adoption and Submittal of Implementation Plans; Approval and Promulgation of Implementation Plans; Standards of Performance for New Stationary Sources, 57 Fed. Reg. 32, 314, 32, 314 (July 21, 1992) (to be codified 40 C.F.R. §§ 51, 52, & 60). ("WEPCO Rule").
183. Mininberg & Goodbody, *supra* note 177.
184. Richard E. Ayres & Richard W. Parker, *The Proposed WEPCO Rule: Making the Problem Fit the Solution*, 22 Env'tl. L. Rep. 10201, 10207 (1992) (the WEPCO Rule was a political compromise involving the EPA, the Department of Energy, and the White House).
185. *Wisconsin Electric Power Co.*, 893 F.2d at 909. See also CAA § 111, 42 U.S.C. 7411 (1998).
186. Sierra Club web site, <http://www.sierraclub.org/cleanair/factsheets/factsheet7-01.asp>.
187. *United States v. Ohio Edison Co.*, No. 2:99-CV-1181, 2003 U.S. Dist. LEXIS 13799, at *10 (S.D. Ohio, eastern division, Aug. 7, 2003).
188. *Id.* at * 170-171.
189. For more on the treatment of environmental grandfather clauses, see Heidi Gorovitz Robertson, *If your grandfather could pollute, so can you: environmental "grandfather clauses" and their role in environmental inequity*, 45 Cath. U.L. Rev. 131 (1995).

190. CAA § 112(a)(1), 42 U.S.C. § 7412(a)(1).
191. CAA § 302(j), 42 USC §7601(j).
192. CAA § 111(a)(3), 42 U.S.C. 7411(a)(3).
193. CAA § 112(a)(2), 42 U.S.C. § 7412(a)(2).
194. 59 Fed. Reg. 12,408, 12,412-13 (March 16, 1994).
195. For those who desire a more complete understanding of the Clean Air Act, read Robert J. Martineau, Jr. & David P. Novello, *The Clean Air Act Handbook*. (1998); *see also* Gary C. Bryner, *Blue Skies, Green Politics: The Clean Air Act of 1990 and Its Implementation* (1995).
196. CAA § 111(a)(1), 42 U.S.C. § 7411(a)(1) (Supp. V. 1993).
197. *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1149 (D.C. Cir), cert denied, 449 U.S. 1042 (1980).
198. *Am. Petroleum Inst. v. Costle*, 665 F.2d 1176, 1185 (D.C. Cir. 1981).
199. *Env'tl. Def. Fund v. EPA*, 598 F.2d 62, 81 (D.C. Cir. 1978).
200. *Anderson Seafoods, Inc.*, 447 F. Supp. 1151, *supra* note 80.
201. Federal Seed Act, 7 C.F.R. § 201.58(c) (2003).
202. 21 C.F.R. § 872.3080 (2003).
203. 21 C.F.R. § 700.13 (2003).
204. 40 C.F.R. § 273.4 (2003).
205. 21 C.F.R. § 1040.30 (2003).
206. Cass Sunstein, *Administrative Substance*, 1991 Duke L.J. 607, 629 (1991).
207. Clean Power Plant Act of 2001, H.R. 1335, 107th Cong. (2001).
208. Omnibus Mercury Emissions Reduction Act of 2001, H.R. 2729, 107th Cong. (2001); Omnibus Mercury Emissions Reduction Act of 2001, S. 1875, 107th Cong. (2001).
209. Clean Power Act of 2002, S. 556, 107th Cong. (2002).
210. Mercury-Safe Seafood Act of 2001, S. 555, 107th Cong. (2001).
211. Seafood Safety and Mercury Screening Act of 2002, H.R. 3885, 107th Cong. (2002).
212. Acid Rain Control Act, H.R. 25, 107th Cong. (2002).
213. Mercury in Dental Filling Disclosure and Prohibition Act, H.R. 4163, 107th Cong. (2002).
214. Clean Smokestacks Act of 2001, H.R. 1256, 107th Cong. (2001).
215. Clean Power Act of 2003, S. 366, 108th Cong. (2003).
216. Omnibus Mercury Emission Reduction Act of 2003, S. 484, 108th Cong. (2003).
217. As a sidenote, soft money may play a significant role in delaying or terminating meaningful mercury legislation. Legislators have previously acted to the public's detriment in supporting industries with mercury interests that make soft-money contributions. For example, when a rider amendment protecting pharmaceutical companies from lawsuits stemming from vaccines containing thimerosal was attached to last year's Homeland Security Bill in an 11th hour special interest maneuver, the public responded with outrage. Pharmaceutical giant Eli Lilly used thimerosal, a preservative containing mercury, in vaccines for children until two years ago, when it was linked to autism in children. Eli Lilly is credited with being one of the major financiers behind the Senate shift in power in the 2002 election cycle, donating \$1.6 million to candidates that year. In response to accusations of outrageous pandering from the parents of autistic children, congressional Republicans agreed to remove the thimerosal amendment from the Homeland Security Bill in January of 2003. This came as sad news to the amendment's most vocal supporter and sponsor, Senate Majority Leader Bill Frist, who was also a recipient of Lilly's generosity. Not long after Frist introduced the legislation, Eli Lilly's trade group, the Pharmaceutical Research and Manufacturers of America, gave \$10,000 to his political action committee. Lilly was also kind enough to buy 5,000 copies of Frist's most recent book. The thimerosal rider amendment typifies money's influence on legislation in Washington, and why important mercury regulation has been so slow in coming. See Homeland Security Act of 2002, H.R. 5005, 107th Cong. (2002), available at <http://news.findlaw.com/hdocs/docs/terrorism/hsa2002.pdf> (last visited 10/22/03); Edward Epstein, *Homeland bill's surprise side effect; Vaccine maker protected from class-action suit*, The San Francisco Chronicle, November 22, 2002, at A1; Jonathan D. Salant, *In funding Frist, health industry champions one of its own*. The Post and Courier, January 12, 2003, available at http://charleston.net/stories/011203/wor_12frist.shtml (last visited 10/21/03); Nick Anderson, *Frist's Ties to Drug Firm Face Test in New Senate; Likely next GOP leader must decide whether to honor a deal brokered by his predecessor*, L.A. Times, December 22, 2002, at A-26.
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220. Office of Technology Assessment, U.S. Congress, *Facing America's Trash: What Next for Municipal Solid Waste?* at 235 (1989).
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222. *Id.*
223. *Id.*
224. *Id.* at 238.
225. *Id.*
226. Office of Air Quality Planning and Standards and Office of Research and Development, U.S. EPA, EPA-452/R-97-010, *Mercury Study Report to Congress, Vol. VIII: An Evaluation of Mercury Control Technologies and Costs*, at 2-46 to 2-47 (1997).
227. *Id.* at 2-47.
228. *Id.* at 2-48.
229. *Id.*
230. *Id.* at 2-29.
231. *Id.*
232. *Id.* at 2-19.
233. *Id.*
234. *Id.* at 2-19.
235. *Id.* at 2-21.

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The International Environmental Law Committee
Environmental Law Section
in Conjunction with the
International Law and Practice and Real Property Law Sections
New York State Bar Association
Presents
Shanghai Conference and China
October 2006

The International Environmental Law Committee of the Environmental Law Section will be holding a conference in Shanghai, China in October 2006. We are coordinating this conference with the Fall Meeting of the International Law and Practice Section which is being held in Shanghai during the same period of time. The Real Property Law Section agreed to be a co-sponsor of the conference. We intend to have a half-day joint MCLE program with the International Law and Practice Section as well as our own half-day program with the assistance of the Environmental Law Faculty of the University of Shanghai. After the conference, an optional six night tour to Xian and Beijing has been scheduled. The tentative schedule for the complete 10 day, 11 night trip is as follows:

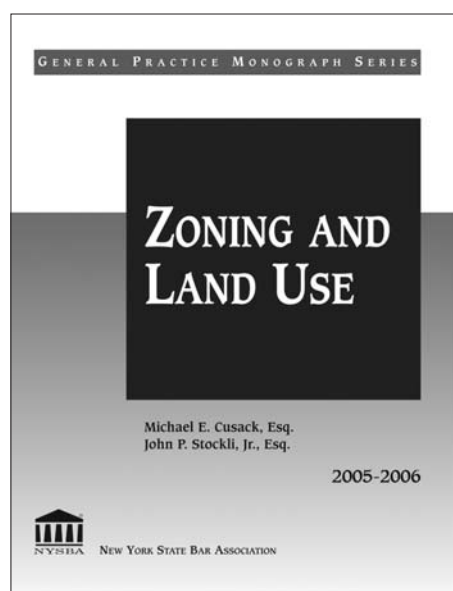
| | |
|-------------------------|---|
| Wednesday, October 18th | Depart New York City or other gateway city for overnight flight to Shanghai. |
| Thursday, October 19th | Afternoon arrival in Shanghai. Group transfer to Okura Garden Hotel (a Leading Hotel of the World). Remainder of day at leisure. |
| Friday, October 20th | Morning—Optional MCLE Program with International Law and Practice Section at JW Marriott Hotel. (B) Afternoon—half-day Shanghai City Tour, including visits to the Jade Buddha Temple and the Yu Garden. (B) Evening—Optional social event with International Law and Practice Section. |
| Saturday, October 21st | Morning—Optional meeting with Environmental Law Faculty of University of Shanghai. Evening—Chinese acrobat performance with dinner. (B, D) |
| Sunday, October 22nd | Full-day tour to Suzhou, the “Venice of the East” famous for its many canals, traditional Chinese gardens and homes, including visit to Silk Factory. (B, L) |
| Monday, October 23rd | Group transfer to Shanghai Airport for flight to Xian, an ancient capital of China. Transfer to the Sofitel Renmen Square Hotel. Afternoon—Xian City Tour, including Big Wild Goose Pagoda and Provincial Museum. (B) |
| Tuesday, October 24th | Full day tour to Museum of Terra Cotta Warriors, a World Heritage Site. Visits to Huaqing Hot Springs, City Markets and Han Museum. Evening—Dinner theatre performance of the Tang Dynasty. (B, L, D) |
| Wednesday, October 25th | Transfer to Xian Airport for flight to Beijing. Transfer to Peninsula Palace Hotel. Remainder of day at leisure. (B) |
| Thursday, October 26th | Full day tour features the Temple of Heaven and an excursion outside Beijing to the Great Wall of China at Badaling and the 13 Tombs of the Ming Emperors. (B, L) |
| Friday, October 27th | All day Beijing City tour, including Forbidden City Palace, Tiananmen Square, Summer Palace and visit to traditional Northern Chinese country home. (B, L) |
| Saturday, October 28th | Entire day free to explore Beijing on your own. Evening—Farewell Peking Duck Dinner. (B, D) |
| Sunday, October 29th | Group transfer to Beijing Airport for return flights to New York or other city. (B) |

The all inclusive price which includes deluxe hotels throughout, buffet breakfast daily (B), other meals as indicated (L, D), all sightseeing, group transfers to and from airports in Shanghai Xian and Beijing and flights to Xian and Beijing. Private Chinese escort for group throughout China. Program details available in Spring 2006 will be finalized by representatives of Environmental Law, Real Property Law and International Law and Practice Sections. Optional tours, including Guilin and Yangtse River Cruise—available upon request. Airfare between New York and China—available upon request—or utilize frequent flyer awards.

For additional information e-mail rsachs@richtravel.com.

Zoning and Land Use

2005–2006 Edition



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