Message from the Editor

Dear Committee Members:

Welcome to the latest volume of the Committee's newsletter. Once again we've managed to assemble an excellent selection of timely articles. Andrew Perelis discusses the implications of FASB's requirement under FIN 47 that potential liabilities relating to an asset, including those relating to possible contamination, be accrued and reported even where their quantities remain highly uncertain. Robert Steele provides a thorough analysis of the workings of Superfund taxation, arguing against the re-imposition of the former Superfund "special" taxes. Jane Kimball Warren looks ahead to the looming environmental issues relating to the burgeoning nanotechnology industry. And Sean Sullivan reviews EPA's newly released reporting exemptions with respect to Nitrogen oxide/dioxide. For your convenience, we have hyperlinked references to legislation and other external documents wherever possible.

As always, we are interested in contributions for our next newsletter. If you would like to contribute or discuss a contribution please contact me as noted below.

Cheers,
Jim Harbell
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Spring Meeting 2007

Our committee is planning two exciting programs for the upcoming Spring Meeting in Washington, DC and we certainly hope to see you there on March 15-18. In case you have not yet received your copy, here is a web link to the ABA brochure for the meeting.

The programs we are planning are as follows:

1. Program: Environmental Issues Don’t Have to Tank a Deal – Managing Environmental Risk and Closing Deals (Friday March 16th from 2:30-4:30 PM) Co-chaired by Cynthia Rettalick and Stephen Humes

2. Committee Forum: Annual Review of Hot Topics in Environmental & Energy Law for Business Lawyers (Saturday March 17th from 9:00-11:00 AM) Co-chaired by William A. Anderson, II and Reed Neuman

As is our custom, we welcome your suggestions for specific topics within these two programs and for speaker ideas, if you would like to propose a speaker to participate. We have about a week to complete our program panels, so please
give this some thought and respond by Wednesday, December 13, 2006.

If anyone has any questions or other comments on our upcoming activities or the Spring Meeting, please let me know.

**Stephen J. Humes, Esq.**  
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**Featured Articles**

**Companies Grapple to Quantify Asset Retirement Obligations**  
*Andrew H. Perellis*

A review of recent public reporting disclosures, submitted by companies in an attempt to comply with a financial accounting interpretation issued last year, suggests that substantial confusion exists in the marketplace. Under applicable accounting principles, a company is to accrue the costs associated with an asset's retirement during the life of the asset. Financial Accounting Standard 143 says so, and it has been around for a number of years. Even so, most publicly traded companies failed to comply, contending that uncertainty as to the timing of the asset retirement, or uncertainty in the cost of the retirement obligation, precluded them from quantifying the liability. In response, the Financial Accounting Standards Board issued Financial Interpretation 47 (FIN 47). That interpretation, in a nutshell, requires companies to report liabilities now, with uncertainty as to timing or amount to be built into the estimate of the obligation.

*More...*

**The Truth About Superfund Taxes**  
*Robert M. Steele*

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*More...*
EPA Issues Release Reporting Exemption for Oxides of Nitrogen
Sean M. Sullivan

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Nanotechnology's Big Legal Issues
Jane Kimball Warren

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Companies Grapple to Quantify Asset Retirement Obligations

By: Andrew H. Perellis

A review of recent public reporting disclosures, submitted by companies in an attempt to comply with a financial accounting interpretation issued last year, suggests that substantial confusion exists in the marketplace. Under applicable accounting principles, a company is to accrue the costs associated with an asset retirement during the life of the asset. Financial Accounting Standard 143 says so, and it has been around for a number of years. Even so, most publicly traded companies failed to comply, contending that uncertainty as to the timing of the asset retirement, or uncertainty in the cost of the retirement obligation, precluded them from quantifying the liability. In response, the Financial Accounting Standards Board issued Financial Interpretation 47 (FIN 47). That interpretation, in a nutshell, requires companies to report liabilities now, with uncertainty as to timing or amount to be built into the estimate of the obligation.

The triggering date for application of the new interpretation starts with fiscal years ending in December 2006, so companies that have begun implementing the new methodology have begun to take accounting charges for the cumulative effect of the change in accounting principle. Rockwell Automation just took an $18.1 million after-tax charge related to the adoption of FIN 47. Johnson Controls recorded a non-cash, after-tax charge of $7 million. Some utilities have recorded charges in excess of $200 million. Tammy Whitehouse, a reporter with Compliance Week (Aug. 29, 2006), analyzed the disclosures of many companies to determine if similarly situated companies were responding in the same fashion. The reporter concluded that they were not; in fact, the results were "wildly disparate."

No doubt, there are many aspects of FIN 47 that breed confusion. One vexing aspect of FIN 47 that concerns most companies is determining whether FAS 143 and FIN 47 require them to investigate existing property to determine if it is contaminated and what it might cost to clean up. Land typically has an indeterminate life, so no asset retirement obligation may exist. On the other hand, if a company anticipates that it will be selling the real estate at some point in the future, then the requirements of FAS 143 could trigger because the sale constitutes a "retirement" of the asset. Another issue that companies face is determining whether the asset retirement obligation has arisen from "normal" operations. If so, FAS 143 applies; if not, it doesn't. What does the company do regarding spills and leaks that cause contamination? In some situations, the spills and leaks might be considered to be normal; on the other hand, a catastrophic event causing a major spill probably should not be accounted for under FAS 143, although it might need to be addressed under other accounting standards.

The fact that similarly situated companies might view their reporting obligations differently is no surprise given that judgment from a multi-disciplinary team – melding legal, environmental, engineering, and accounting talent – is needed to assess how to apply the standard. With so many players bringing diverse backgrounds and perspectives into the evaluation, it is not surprising to see a lack of consistency in the application of FIN 47, particularly so in its early stages of adoption.
While there may be confusion among those who have already reported, there likely is a far larger number of companies that are completely unaware of FIN 47 and its application, particularly outside of heavily-regulated industries such as utilities and mining companies that are laden with asset-retirement obligations. Many companies have not considered what legal obligations attach to their asset retirement while others likely have not adequately performed this analysis. Ask a client about it and don’t be surprised to get a blank stare in return. Executives, by and large, are simply unaware of what this could mean to their company, and instead view it as something to leave to the accountants. But accountants can not make these determinations alone, because accountants generally do not understand the long term asset retirement obligations that may exist for companies other than obvious ones like nuclear power plants or mining operations, with decommissioning and reclamation costs, respectively. Moreover, even professionals within the organization who are expected to understand the company’s regulatory and environmental compliance obligations may not have the information needed to evaluate these liabilities. Future “closure obligations” typically are not included in environmental audits, either those performed in connection with the purchase of an asset, or those periodic “operational audits” performed to measure and maintain environmental and OSHA compliance.

FIN 47 mandates that a company recognize the fair value of the liability it possesses for cleanup costs associated with future plant closure, such as the presence of asbestos in a building or factory. Yet FIN 47 also extends beyond plant closure, and attaches to any asset retirement activity - even if that activity can be deferred indefinitely - so long as an existing law, regulation or contract requires an entity to perform the activity upon retirement of the asset. For example, a telecommunications entity whose communication network uses wood poles treated with certain chemicals has certain legal obligations regarding the disposal of the poles once removed from the ground. Although the company is under no legal obligation to remove the poles, it has sufficient experience to determine its replacement frequency, or in the words of the Interpretation, “the entity has information to estimate a range of potential settlement dates, the potential methods of settlement, and the probabilities associated with the potential settlement dates and methods… [and] is able to estimate the fair value of the liability for the required disposal procedures using an expected present value technique.”

Once the legal obligations attaching to retirement of an asset are properly identified, the company’s FAS 143 analysis will shift to whether the entity has sufficient information to reasonably estimate the fair value of the asset retirement obligation. Uncertainty about the timing and (or) method of settlement of a conditional asset retirement obligation will need to be factored into the measurement of the liability. The practical effect is that a company will need to obtain a better estimate of the closure costs it is likely to face, and then price those obligations using present value techniques, or other methods of valuation (for example if an active market exists for the transfer of the obligation).

Under FAS 143, where the information simply is insufficient to estimate the fair value of the asset, the company must still identify the ARO and explain why insufficient information exists. For example, if an asset has an indeterminate useful life, sufficient
information to estimate a range of potential settlement dates for the obligation might not be immediately available. In such cases, the liability would be initially recognized in the period in which sufficient information becomes available. As such, even where the liability presently cannot be reasonably estimated, the company will need a mechanism that tracks the liability over time and the company’s future plans as they might affect that asset, so that the liability can be timely recognized once sufficient information becomes available.

 Compliance with FAS 143 and FIN 47 presents a pitfall for the uninformed. The SEC is concerned with proper reporting of environmental obligations, and shareholder suits for inadequate and improper reporting are in vogue. It is a classic case of a client not realizing the magnitude of risk presented by a seemingly routine task typically handled at a relatively low level of responsibility within the company. Ask your client what he is doing to accurately report and quantify asset retirement obligations. Then, assemble a qualified team to aid in the evaluation. That’s the type of value-added service your client expects, and deserves.

*Mr. Perellis is a partner in the Chicago Office of Seyfarth Shaw, LLP, where he concentrates his practice in matters involving interpretation and application of environmental law.*
The Truth About Superfund Taxes

by ROBERT M. STEELE
Baker, Donelson, Bearman, Caldwell & Berkowitz, P.C., Nashville TN

The federal Superfund program has always suffered from a split personality. In creating a system for cleaning up old and new hazardous substance sites and for allocating money to fund the program, was Superfund supposed to be a harsh punishment regime directed against “evil corporate polluters” who caused the contamination? Is this so even if many parties with Superfund liability did nothing wrong and followed existing law, best practices, and even government direction at the time of their past waste disposal activities? Or was Superfund supposed to be an emotion-free economic scheme to raise the funds needed for the massive historical cleanup job confronted by the nation in 1980 and thereafter? Is this so even if it means assessing the costs to certain companies just because they or others like them may have benefited in years past from cheap disposal options and a lack of environmental regulation (whether they knew it or not)? Did it also intend to spread the costs to all taxpayers because we all have an interest in repair of the environment and protection of public health by acting now to make up for society’s past legal and scientific oversights?

The answer is … all of the above. Superfund is paid for by asserting pervasive and often unfair liability against private parties connected to its sites, together with and supplemented by an actual trust “Fund” supported by taxes and other general sources of revenue. From this combination of mechanisms and cross-purposes, EPA and American business (and state governments too) have been tackling the job of Superfund site remediation for over 25 years with the full legacy of litigation, politics, and controversy that has come along with it.

Under the original CERCLA statute of 1980 the Fund itself was supported by taxes on crude oil and on certain chemical feedstocks, plus general revenues as a public share of responsibility even from the beginning, at a total initial target level of $1.6 billion over five years. That level was acknowledged at the time as likely to be inadequate to accomplish the widening goals of the cleanup program. In the later debate on Superfund reauthorization and amendment, many ideas were put forth and argued as to necessary appropriation levels and proper mechanisms for funding beyond the original sources and as supplemented by cost recoveries, penalties, and reimbursements obtained from responsible/liable parties. The final choices made in the SARA enactment of 1986 were to increase CERCLA appropriation levels, and also to establish a separate federal Leaking Underground Storage Tank account, by increasing the existing tax on crude oil and imported petroleum products. In addition, the existing chemical feedstocks tax was

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1 Mr. Steele is a shareholder with Baker, Donelson, Bearman, Caldwell & Berkowitz, P.C., resident primarily in its Nashville, Tennessee office. He has practiced environmental law for many years and serves as chair of the Superfund Subcommittee of the ABA Section of Business Law’s Environmental, Energy, and Natural Resources Law Committee. The opinions expressed in this article belong solely to its individual author.

2 Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601 et seq., (“CERCLA” or “Superfund”), first enacted in 1980 and as subsequently amended over the years.
continued, a new tax on certain imported chemicals was created, and a new “corporate environmental income tax” was imposed on a wider range of companies – all together to raise approximately $7 billion over 5 years. Moreover, general tax revenues of $1.25 billion over that same 5 years were also allocated, to join cost recoveries from private parties plus interest to make an $8.5 billion Superfund resource for the 1986 to 1991 period. From 1991 to 1995, the special taxes supplied 66% of the trust Fund’s dollars, general tax revenues accounted for 17%, and other sources also 17%.  

After 1986, Superfund entered its busiest period with billions of dollars applied by potentially liable parties and by EPA to actions at thousands of listed and non-listed sites. However, all of the special Superfund taxes terminated on December 31, 1995 and have not been renewed since then. As the unobligated balance of the Fund has been used up and not replenished by these special taxes in the last decade, increased general tax revenues have instead been appropriated by Congress to meet EPA’s Superfund needs. But total program funding levels have fallen over this time too. In this circumstance and especially after the Bush Administration took office in 2001, efforts in Congress to reinstate the Superfund taxes began in earnest. In each session bills not supported by EPA have been proposed or introduced, sometimes stand-alone and sometimes coupled with CERCLA reforms or amendments, to resume taxing oil and chemical companies as well as many other industries for this purpose. These efforts have been accompanied by much fevered rhetoric about overall site cleanups slowing down, about work starts and finishes being delayed by EPA, about the so-called “polluter pays” principle, and about allegedly burdening the taxpayers with cleanup liabilities that private wrongdoers used to bear in full. The average member of the public reading press reports may be led to believe that Superfund has been entirely a government-works, EPA-performed and Fund-led site cleanup program that was funded entirely by culpable “polluters” through these special taxes, and now those big corporations are not paying anything while the innocent general public must pick up the tab.

What is the truth behind the often misleading statements and attempts at partisan political gain and gamesmanship? While a full or detailed analysis of Superfund dollars, milestones, and site numbers is far beyond the scope of this article, what are some key facts to consider when looking at the current Superfund funding debate?

First, as recognized by EPA and the Congressional Research Service, regardless of the taxes, at a majority of sites Superfund cleanups are paid for directly by the liable parties. That percentage of sites and costs has always been substantial after 1986 and lately it has remained over 70%. That is the result of Superfund’s stated or interpreted strict, retroactive, joint and several liability for site owners, operators, transporters, and arrangers for disposal, regardless of compliance or fault. These parties are still doing vast investigation and cleanup work up front rather than EPA doing it and the parties then reimbursing EPA later on (the higher-cost scenario). These parties still have to pay EPA oversight costs. Often these parties also have to bear the burden of finding and obtaining contribution from other liable parties that EPA has not contacted or pursued. Where such sites have “orphan shares” attributed to bankrupt,
defunct, missing, or legally excluded companies, these parties doing the work and bearing the costs often are paying for these missing shares as well (unless EPA forgives or contributes some of that total). Thus, even without the Superfund taxes, the “polluters,” and many others who should not be called polluters but are caught in CERCLA’s no-fault liability web, and not the Fund itself, are already paying for the sites where they are or arguably may be liable.

At the minority of sites where there are no identifiable, solvent, or viable private parties with liability, EPA can proceed with response and cleanup using the Fund’s resources with or without later cost recovery from anyone. These sites, together with much of EPA’s costs of management, support, administration, and enforcement of the Superfund program, are indeed paid for from the hazardous substances Superfund. Without the special taxes, its sources of funding have included reimbursements, penalties, damages, interest, and general revenue appropriations made and increased by Congress now to reach over $1 billion annually. Also, it seems true that these resources and funding levels have only barely kept up with unmet program needs especially as the number of “mega-sites” taking longer and costing more, and sometimes without private liable parties available, continue to take up more of EPA’s Fund dollars.

Despite its many well-known problems and inefficiencies, and despite the more recent preeminence of state cleanup programs including brownfields and voluntary site variations, Superfund as a federal program deserves continued existence and adequate funding for many good reasons. An unobligated Fund balance and sufficient appropriations allow EPA to take necessary response actions and help to leverage the touted private party site performance levels. Superfund should also be supported despite competing interests under tight federal budgets. But setting its annual budget level, and the sources of its appropriations, are two separate issues.

So why not reinstate the prior special Superfund taxes to pay for the continued needs of the program? The primary reason is that instead of upholding a “polluter pays” principle, such a move would in fact be more of a “polluter pays twice” decision. The companies that bore those taxes before and would likely bear them again have already stepped up to the plate (whether voluntarily or under compulsion) at most if not all CERCLA sites where factual evidence connects them to the sites and their liability is established under the law’s very broad reach. These companies have paid many hundreds of millions of dollars to reclaim the environment from the legacies of the industrial revolution and Cold War when society had not yet understood about environmental damage or chosen to enact controls or to elevate environmental values to a higher level as in current times. These same parties also bear the transaction costs, orphan shares, and natural resource damages of “their” sites, often far out of proportion to their respective “fair shares” or any arguable level of culpability for their actions.

Now as a policy choice are we going to have these same existing viable companies be penalized again and pay also for all of the other sites not associated with them (or else they would have been named as liable parties there too), based on some vague idea of collective profit or collective “guilt” in that companies like them typically handled these chemicals and must have wrongly created these sites? If so, why go to all of the trouble of developing facts and proof of connection and allocations for specific parties at most Superfund sites under the law’s strict liability system? Are these
companies now to pay for it when a competitor goes bankrupt and leaves the competitor’s Superfund liability in the hands of EPA at sites unconnected to them? Are these companies to be made to pay again when Superfund contains a petroleum exclusion such that fuel and petroleum product releases (absent added hazardous substances and wastes) are not even eligible to be Superfund sites in the first place? Are these companies to pay extra while facing foreign competition often without such burdens, and thus have limited ability to spread the costs to the companies’ customers and the general economy by increasing the prices of their goods and services? Or are the continuing but evolving needs of the Superfund – beyond the 70% already paid up front by these companies, plus EPA’s other recoveries, damages, and reimbursements mostly from them as well – better funded by spreading the remaining cost over the larger body of benefiting citizens as with most governmental programs for the public good and that seek to correct past regulatory failures? Such taxpayer program examples arguably include federal budgets covering the savings and loan crisis of the 1980’s, appropriations for disaster recoveries, and the general tax-derived billions being spent to clean up Department of Defense and Department of Energy facilities with historic environmental problems.

No doubt there are some reasonable policy arguments that can be made for reinstatement of the expired Superfund special taxes, despite their targeted nature or “doubling” of the Superfund burden on its recipients. Perhaps the best have to do with dedicating sources only to Superfund to help fend off other federal appropriation priorities, while the worst may be simple anti-business, anti-capitalism bias. But most such arguments – such as the need to have enough money there to threaten Fund cleanup first or otherwise enforce private parties’ response actions – have more to do with maintaining adequate Fund size rather than the appropriateness of the special taxes mechanism as the best way to do that. Perhaps in the prevailing mood of 2006, sincere proponents of special taxes could try to make a case for selective taxation to capture alleged energy company windfall profits, with those revenues then dedicated to the Fund and other purposes albeit unrelated to oil or responsibility for Superfund sites. That, too, may be fraught with peril and unfairness. But if any such action is considered, it should be discussed and weighed in an honest manner perhaps accompanied by an abolition of CERCLA’s private party liability scheme altogether if targeted industry taxes are to become the norm for future remaining Superfund program funding. Any debate over what policies are the most sound, and what choices are fair or make sense in a macroeconomic view, should not be obscured by false rhetoric and political posturing over how tax reinstatement is required by the “polluter pays” principle and how that concept is now somehow lost without these taxes.\(^4\)

Under current law, where there is an identifiable and viable responsible party and liability is shown, that party already pays – even if it is not a “polluter” in that word’s commonly understood and morally tinged meaning. These companies also paid the special taxes before but were not the only types of persons and institutions that contributed to historical Superfund sites, nor

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\(^4\)BNA Environment Reporter, Current Developments, Vol. 36, No. 49, p. 2580, quoting only one example of many: “...without polluter fees [Superfund] is being short-changed and important cleanups that will improve the health and safety of millions of Americans are being ignored.” Rep. Hinchey (D–N.Y.) 12/16/05. Even if reinstated, Congress must still appropriate the revenues of these taxes to Superfund annually.
did they even contribute the most wastes or contamination at many sites. The rest of the cost of Superfund should arguably be everyone’s responsibility.⁵

Instead of red herrings, let us have a serious debate over how best to fund that minority portion of the total Superfund program price tag that is not already being paid for by industry and other private parties, what total program funding levels are truly needed now and going forward, and how best to implement these choices to protect health and the environment while distributing the additional incremental burden equitably within the economy. Only when that honest discussion is held and acted upon can Superfund’s financial future be secured by well-informed decisions while not mistakenly increasing its longstanding impact on American business.

⁵ A recent and much more in-depth look at the evolution of the so-called “polluter pays” principle and CERCLA legislative history may be found in P. Bohannon, “Superfund Mega-Sites: Is the Polluter Pays Principle All There is to Allocating Environmental Liability?,” BNA Environment Reporter, Vol. 37, No. 35, p. 1870, 9/8/06.
EPA Issues Release Reporting Exemption for Oxides of Nitrogen

by SEAN M. SULLIVAN
Williams Mullen, Washington DC

EPA recently issued a final rule exempting certain releases of nitrogen oxide and nitrogen dioxide from the release reporting requirements under Section 103 of the Comprehensive Environmental Response Compensation and Liability Act and Section 304 of the Emergency Planning and Community Right-to-Know Act. These statutes require the owner or operator of a facility to report releases of hazardous substances to the National Response Center if the amount released within a twenty-four hour period exceeds the substance’s Reportable Quantity. Effective November 3, 2006, facilities are not required to report releases of less than 1,000 pounds of nitrogen oxide and 1,000 pounds of nitrogen dioxide, collectively NOx, to the air within a 24 hour period due to “combustion, or combustion related activities.” Releases of NOx that are unrelated to combustion, however, are still subject to the 10 pound Reportable Quantity (“RQ”) found in 40 C.F.R. Parts 302 and 355.

Although EPA did not define the term “combustion related,” it did provide several examples of the types of NOx emissions that it intended to exempt. These include emissions from blasting or detonations at construction and mining sites, emissions from nitric acid plants, and emissions from internal combustion engines. Without this new provision, a facility could exceed the RQ for NOx and be required to report by operating equipment for just a short period of time. EPA noted that emissions from a 100 horsepower engine would exceed the NOx RQ in a little over five hours.

In setting the new reporting level for combustion-related NOx releases, EPA listed several reasons for its conclusion that releases of less than 1,000 pounds over a 24-hour period should be exempt. First, the agency said it was unaware of any data suggesting that emissions at this level would affect human health. Second, it noted that a CERCLA-based response to the exempted releases is unlikely because (1) the Clean Air Act does not regulate emissions of NOx at or below this level, and (2) EPA has not responded to these releases in the past.

The final exemption contains one substantial deviation from the proposal. Initially, EPA proposed to include a caveat to this provision whereby releases of NOx due to an accident or malfunction would still be subject to CERCLA and EPCRA reporting requirements. EPA deleted this caveat from the final rule, however,

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1 Sean Sullivan is an associate in the Washington DC office of Williams Mullen. His practice involves compliance counseling and auditing regarding statutes such as the Clean Water Act, the Clean Air Act, the Emergency Planning and Community Right to Know Act, and the Resource Conservation and Recovery Act. Mr. Sullivan has significant experience with judicial review of U.S. Environmental Protection Agency regulations issued under the Safe Drinking Water Act and the Clean Air Act.


4 See 71 Fed. Reg. at 58527.

5 See id.

reasoning that if normal emissions of less than 1,000 pounds of NOx over a 24 hour period do not pose a threat to human health, then releases of NOx below that level from accidents or malfunctions also would not pose a threat. EPA further explained that, “to the extent that start-up, shutdown, and up-sets are part of ... combustion, or combustion related activity, they are eligible for the [exemption], provided such releases are below the 1,000 pound level per 24 hours.”

Comment

It is important to remember that releases unrelated to combustion (including accidents or malfunctions) do not qualify for this reporting exemption. For example, EPA stated that releases of NOx due to a storage tank failure would not qualify for this exclusion because there is a higher likelihood that the agency would need to perform a CERCLA response to such a release. Thus, before deciding that no report is required, regulated entities should be sure that the release is truly due to combustion or combustion-related activity.

7 71 Fed. Reg. at 58530.
In the view of some, nanotechnology is expected to become the transformational technology of the 21st century. This technology focuses on controlling matter at the scale of one billionth of a meter (approximately 100,000th the width of a human hair) in order to create new materials with novel properties and functions. The National Science Foundation predicts that nanotechnology “eventually could impact the production of virtually every human-made object” and “lead to the invention of products yet to be imagined.” Yes, the technology of the very small could become very big.

Not surprisingly, the promise of nanotechnology also carries with it unique risks and technical issues. Studies have already shown that certain nanoparticles may pass through cell membranes and distribute to sensitive sites throughout the body, including bone marrow, spleen, heart and brain. Other nanomaterials have been found to potentially interfere with the body’s antioxidant defenses. The assessment of nanotechnology hazards, which is only in its preliminary stages, is complicated by the difficulty of detecting nanoparticles at low concentrations and the difficulty of applying studies of macro materials to their nano counterparts.

Nanotechnology is likely to have a significant impact on both our environment and the laws that regulate it in the next decade. Since it is far more efficient than the macro-technologies of today, nanotechnology can drastically reduce consumption of natural resources, as well as the generation of waste. There is already a market for remediation technologies using nanoparticles that can inexpensively clean the environment by breaking down contaminants into less harmful materials. Nanotechnology also has the potential to make an impact on the detection of pollutants, such as toxic substances in drinking water.

Unfortunately, nanomaterials may also present risks to the environment. For example, waterborne nano-engineered Carbon 60 was found to lead to “oxidative stress” in the brains of largemouth bass. Some scientists are concerned that runaway nanoparticles could self-replicate into destructive masses, either accidentally or through acts of terrorism. Based on the perception that the current, very limited regulatory frameworks in the United States and in other parts of the world do not adequately address the use of nanomaterials, a task force of the Section of Environment, Energy and Resources of the American Bar Association prepared briefing papers for the Environmental Protection Agency to assist the Agency with the creation and implementation of new laws to regulate the development and use of nanotechnology. Existing environmental laws, such as the Toxic Substances Control Act, already provide EPA with broad powers over manufacturers of products using nanomaterials, including the ability to review new materials and new uses of materials before they enter the stream of
commerce, as well as the power to require manufacturers to develop new data to assess potential risks.

Nanotechnology will also have great implications on occupational safety and health and other workplace issues. Studies of ultrafine aerosol particles in the workplace have shown that inhalation of nano-sized fibers and particles can lead to increased rates of cancer, lung disease and respiratory problems. Given the emerging indications that the toxicity of nanomaterials depends on their shape, solubility, surface chemistry and surface area, scientists have already concluded that typical toxicity screening studies cannot be effectively used to evaluate nanomaterials and that, therefore, little is really known about how such materials could effect exposed workers. Not surprisingly, OSHA does not have any specific standard which addresses permissible exposure limits for nanomaterials and, given the potential for a wide variety of nanomaterials being introduced into the workplace, developing standards on a substance-by-substance basis may be impossible. In the fall of 2005, the National Institute for Occupational Safety and Health released its plans for pursuing strategic nanotechnology research. If research identifies a clear, quantifiable hazard involved with the production or use of nanomaterials, OSHA can be expected to utilize the general duty clause or even its authority to issue emergency temporary standards to regulate these materials, at least on a limited basis.

It has been estimated that by 2004, there were already $13 billion worth of products incorporating nanotechnology in the global marketplace; it is estimated that the number will rise to $1 trillion by 2015. The Project on Emerging Nanotechnologies reports that there are already approximately 1,200 nanotech start-ups worldwide, with more than 60% of these located in the United States. This activity suggests the possibility that nano-products will be pushed to market before their risks, particularly long-term risks, are fully understood. Since nanoparticles can enter the body through a variety of routes, including the possibility of penetrating the skin, and since – as noted earlier – nanoparticles may travel within the body in unconventional ways, the risk assessment which is typically done before a product is introduced in commerce may be very difficult for nanomaterials.

The evolving situation indicates that there is a critical need for research findings to be shared widely so that product risk assessment can be done as quickly and as thoroughly as possible. The Project on Emerging Nanotechnologies is compiling an inventory of worldwide risk-related research in order to facilitate this process. Although we know little about the risks associated with nanoproducst, we know enough to be aware that the premature introduction of such materials into the marketplace and the environment could produce significant product liability litigation and result in unknown potential environment impact and corresponding legislative changes.