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Thinking Outside the Box: Property Rights as a Key to Environmental Protection

ROBERT H. CUTTING and LAWRENCE B. CAHOON*

Professor Oliver Houck wrote in Science that the promise of incorporating objective science into environmental law and policy has been subverted by the political system. We offer a solution based on the property rights of receptors of pollutants, rather than the current focus on the rights of the “generators” of pollution. Environmental law must require internalization of all costs to the generator, as demanded by market economics, which is difficult given the vast gaps in data (the Data Deficit). The burden should be placed on the generator to quantify and to demonstrate scientifically containment of all trans-boundary effects. The present systems effectively subsidize polluters by permitting them to deposit waste into public and private property and to use the population as test subjects while unconstitutionally taking their property rights. These hidden subsidies distort the market by shifting costs to uncompensated receptors.

Tulane’s Professor Oliver Houck argued in his critique of the rocky marriage of science and law in environmental policy that the promise of scientific regulation designed to protect human and planetary health has been degraded by the political process to a regulatory scheme that requires only the best available technological solutions.¹ The Clean Air Act (1970), for example, requires protection of health regardless of feasibility² and while the Clean Water Act was in 1972 keyed to “best available technology (BAT),” the tradeoff was that discharges to surface waters would be completely eliminated by 1985³—which did not happen. Along the way, the field of environmental law became incomprehensible to

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1. Oliver Houck, *Tales From A Troubled Marriage: Science and Law in Environmental Policy*, 302 SCI. 1926 (2003).

2. *Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457 (2001).

3. Clean Water Act § 101, 33 U.S.C. § 1251 (2001).

any one person.⁴ As Houck notes, State Implementation Plans for air quality and new Total Maximum Daily Loading standards to restore surface waters have become programs which, “. . . eat up heroic amounts of money, remain information-starved, feature shameless manipulation of the data, face crippling political pressure, and produce little abatement.”⁵

Professor Houck also cautions that science is itself influenced by the political agenda of the time and by the funding source (consider Galileo), a criticism also recently leveled by the Union of Concerned Scientists against the current Administration.⁶

We agree that because of the political influence of the “regulated community” (the “agency capture” phenomenon),⁷ environmental law does not always require protection of public health and the environment (the “receptors” of pollution), as promised by the policy declarations, but focuses instead on technological feasibility and cost to the *generators* of pollutants. Standards are ultimately decided by *political* appointees, and the courts defer to the agency unless the decision is clearly “arbitrary and unreasonable.”⁸ BAT is certainly better than no standards, but why stop

4. ZYGMUNT PLATER, ET AL., ENVIRONMENTAL LAW AND POLICY: NATURE, LAW AND SOCIETY, p.xxvii (2d ed. 1998).

5. Houck, *supra* note 1, at 1928.

6. “‘Science, to quote President Bush’s father, the former president, relies on freedom of inquiry and objectivity,’ said Russell Train, head of the Environmental Protection Agency under Nixon and Ford, who joined the scientists in calling for action. ‘But this administration has obstructed that freedom and distorted that objectivity in ways that were unheard of in any previous administration.’” Press Release, Union of Concerned Scientists, Preeminent Scientists Protest Bush Administration’s Misuse of Science, at http://www.ucsusa.org/news/press_release.cfm?newsID=381 (Feb. 18, 2004).

7. Eric W. Orts, *Reflexive Environmental Law*, 89 Nw. U. L. REV. 1227, 1236 (1995).

8. The U.S. Court of Appeals (D.C. Cir.), for example, found that the discretion given to EPA under the Clean Air Act (similar to most environmental acts) § 109(b)(1), 42 U.S.C. § 7409(b)(1) (2001), to set ambient air quality standards which “. . . in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health,” was so extensive that it constituted an unconstitutional delegation of the power of Congress to legislate. *Am. Trucking Ass’n v. EPA*, 175 F.3d 1027, 1057 (D.C. Cir. 1999), *rev’d in part*, 531 U.S. 457 (2001). The Supreme Court held that the delegation of power, while very broad, was sufficiently definite. Worse yet, agencies can simply ignore statutory commands, as the U.S. Army Corps of Engineers did with the Rivers and Harbors Act of 1899. See Oliver A. Houck, *The Water, the Trees, and the Land: Three Nearly Forgotten Cases that Changed the American Landscape*, 70 TUL. L. REV. 2279, 2287-90 (1996) (describing two 1960’s Supreme Court cases that resurrected the Act’s prohibition on discharging “any refuse matter”).

there when the property and personal rights of receptors are at stake?⁹

The politics Professor Houck spotlights has led to both a funding shortage and a lack of regulatory authority that have prevented acquisition of data sufficient to run a sound regulatory program (the "Data Deficit"). We maintain that the balance ought to be shifted to generators to demonstrate the safety of materials before they are introduced into the environment, much as the FDA requires of new drugs. Instead, the Bush Administration has just succeeded in convincing the European Economic Union to table its new REACH (Registration, Evaluation and Authorization of Chemicals) regulations that would have required more testing, primarily because of the cost to generators.¹⁰

The focus on technological feasibility sidesteps completely the demand of free market economics that the complete short and long-term costs of any goods or services must be reflected in the price structure or there is a "market failure". Instead, generators of pollutants use the air, water and soil as disposal sites, and some of those materials become part of living organisms, as well. The health effects, diminished property values and cleanup costs are what economists call "Externalities". Politics has also hamstrung enforcement of existing law at all levels, notwithstanding that the President's Science Advisory Committee in 1965 found that, ". . . pollution from farm animal wastes could be alleviated by vigorous enforcement without technological advances. The same is true of particulate matter in air and sewage effluents in water."¹¹

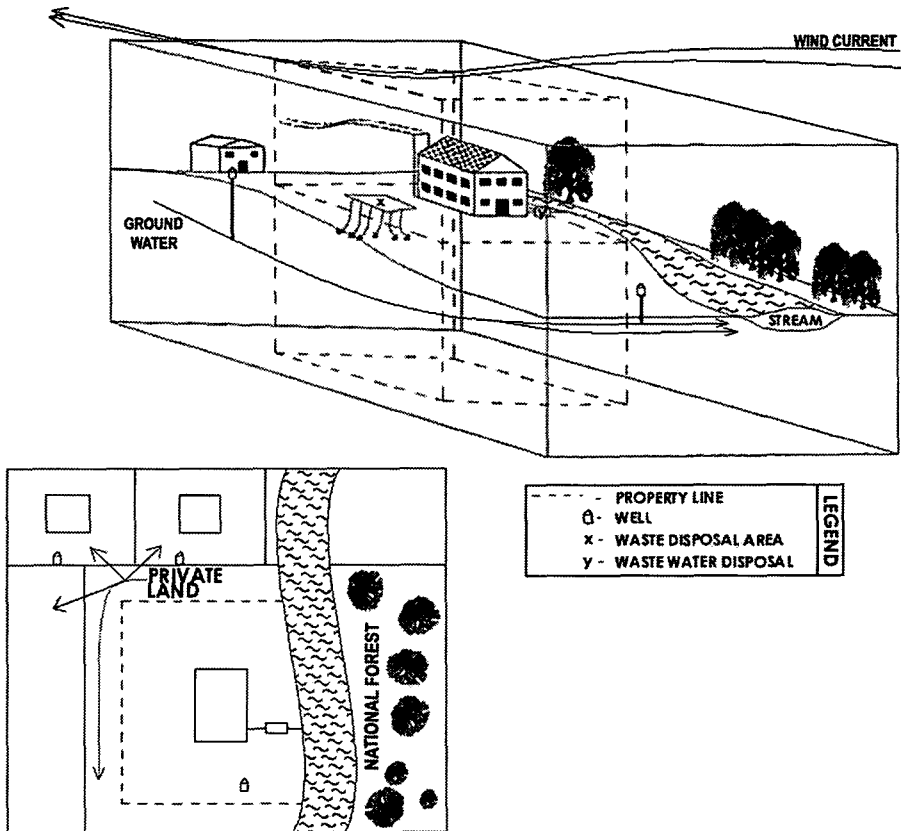
The real question is where to go next? We suggest that the problems outlined by Professor Houck will never be overcome by a system of regulation that does not focus on the true effects on *re-*

9. EPA was able to adopt only eight standards for hazardous air pollutants using a risk-based standard, but standards are mandated for some 178 air pollutants per the deal that delivered the Clean Air Act Amendments of 1990—with "available technology" limitations on those standards. See 42 U.S.C. § 7412 (2001); 40 C.F.R. pt. 61 (2004).

10. Press Release, European Union in the U.S., REACH/Chemicals: EU Spokesman Anthony Gooch's Statement on the Waxman Report: "A Special Interest Case Study: The Chemical Industry, the Bush Administration and European Efforts to Regulate Chemicals," at <http://www.eurunion.org/news/press/2004/20040054.htm> (Apr. 5, 2004).

11. ENVIRONMENTAL POLLUTION PANEL, PRESIDENT'S SCIENCE ADVISORY COMMITTEE, RESTORING THE QUALITY OF OUR ENVIRONMENT, 1-2, 5-7, 10-15 (1965); see, e.g., R. Steven Brown, *When the Axe Falls — How State Environmental Agencies Deal with Budget Cuts*, Environmental Council of States (2002), at <http://www.sso.org/ecos/ECOStatesArticles/Ecostates%20Steve's%20budget%20articles/when%20the%20axe%20falls-%202002.pdf> (last visited Nov. 10, 2004).

ceptors. Rather than attempt to address all the inherent flaws in the political process, from campaign finance reform to the budget battles, why not look “outside the box” of the current system for a solution or at least a new method to visualize a solution? We think that generators ought to utilize sound science to quantify proposed activity, with a “bright-line” test based on the *property rights of receptors*.¹²



The political institutions and the Property Rights Movement since the Industrial Revolution have honed in on the rights *within* private property boundaries (the “generators”), to the exclusion of the rights of those *outside* those boundaries (the “receptors”). This has created a classic, “can’t see the forest for the trees” scenario, and we suggest that the field of vision ought to be broadened to include: 1) the *rights* of all receptors (landowners and lawful oc-

12. Robert H. Cutting, *One Man’s Ceilin’ is Another Man’s Floor: Property Rights as the Double-Edged Sword*, 31 ENVTL. L. 819 (2001).

cupiers, public or private) to be free of the effects of pollution ("externalities"), and 2) the *responsibility* of all generators of environmental alteration to safeguard those rights. To paraphrase George Carlin: "You should keep your stuff in your space."¹³ Any alteration of nature must (in addition to any other onsite regulations) be contained within the three-dimensional construct of the property boundaries. This methodology directly internalizes all potential off-site effects of any action. The burden should be on the *generator* to identify, and to contain or mitigate, all trans-boundary effects.

Recent widespread adoption of intensive livestock production techniques highlights the paradoxes and failures of the current approach, and illustrates the model. Concentrated Animal Feeding Operations (CAFOs) employ close confinement of large numbers of animals, net import of the large quantities of feeds required, and cheap waste management techniques, relying largely on land disposal of wastes and animal mortalities.¹⁴ The general permits for these operations have typically been so-called "non-discharge" permits,¹⁵ which *is* consistent with our model. However, the reality is that various discharges are now well documented, including air pollution by noxious odors and ammonia, water pollution by spills, flooding and runoff, and groundwater pollution by nitrogen and phosphorus.¹⁶ Thus, neighboring

13. George Carlin, *Brain Droppings*, page 36 Hyperion, "Stuff" New York, 1997.

14. Michael A. Mallin, *Impacts of Industrial Animal Production on Rivers and Estuaries*, 88 AM. SCI. 2, 2-13 (2000); Lawrence B. Cahoon et al., *Nitrogen and Phosphorus Imports to the Cape Fear and Neuse River Basins to Support Intensive Livestock Production*, 33 ENVTL. SCI. TECH. 410, 410-415 (1999); *Carcass Disposal Symposium*, at <ftp://ftp.ncagrgis.com/> (username = disposal, password = 2004disposal) (last visited Nov. 10, 2004); D.W. Murphy et al., *Purdue University Cooperative Extension, Disposal of Dead Swine, Pork Industry Handbook Fact Sheet No. 133* (1996).

15. EPA now requires individual NPDES permits of larger CAFOS, but is not authorizing point source discharges.

16. See *supra* note 12; Steve Wing et al., *The Potential Impact of Flooding on Confined Animal Feeding Operations in Eastern North Carolina*, 110 ENVTL. HEALTH PERSP. 387 (2002); Viney P. Aneja et al., *Agricultural Ammonia Emissions and Ammonium Concentrations Associated with Aerosols and Precipitation in the Southeast United States*, 108 J. GEOPHYSICAL RES. 4152 (2003); see National Atmospheric Deposition Program, *Animated Isopleth Maps*, at <http://nadp.sws.uiuc.edu/amaps/> (last visited Nov. 10, 2004); William J. Showers et al., *Nitrogen Isotope Tracing of Eutrophication Sources on a Watershed Scale: Neuse River Basin, North Carolina*, in *NORTH CAROLINA WATER RESOURCES: THE YEAR OF THE HURRICANES* 42 (2000); Sacoby M. Wilson et al., *Environmental Injustice and the Mississippi Hog Industry*, 110 ENVTL. HEALTH PERSP. 195 (2002); Dana Cole et al., *Concentrated Swine Feeding Operations and Public Health: A Review of Occupational and Community Health Effects*, 108 ENVTL. HEALTH PERSP. 685 (2000); Steve Wing & Susanne Wolf, *Intensive Live-*

properties have become unwilling and sometimes unknowing receptors of pollutants conducted by various media, generated by a politically powerful agricultural industry protected from many environmental rules and regulations, and often resistant even to basic external monitoring, particularly of human health effects.¹⁷

We recognize that the legislatures and executive branches of government are unlikely to adopt protections for receptors because it is far less expensive for producers to contribute to electoral campaigns than to contain all wastes and effluents.¹⁸ However, because we advocate a return to historic property rights of receptors tweaked to reflect modern scientific realities, we think the highest court of any state could adopt this principle since the U.S. Supreme Court has repeatedly held these issues are a matter of state law.¹⁹ Courts are *almost* there, but they continue to favor generators without any scientific basis. We also offer several concrete steps that could be taken in the time necessary to implement the concept.

THE DATA DEFICIT

The bottom line is that there is a "Data Deficit" so vast that the bases for the regulatory system must be questioned. The lack of data provides a clever dodge for those who do not want the full effects of their activities to be known. The lack of harm demonstrated by epidemiological studies is used to imply a positive assertion: that substances are safe, which is one reason why only

stock Operations, Health, and Quality of Life among Eastern North Carolina Residents, 108 ENVTL. HEALTH PERSP. 233 (2000).

17. Initially, the industry succeeded in convincing the North Carolina General Assembly to eliminate (1) private nuisance actions based on farm activities, and (2) the authority of local government to zone agricultural uses. See Pat Stith & Joby Warrick, *Boss Hog*, RALEIGH NEWS & OBSERVER, Feb. 19-26, 1995, available at <http://www.pulitzer.org/year/1996/public-service/works/about.html> (last visited Nov. 10, 2004) (Pulitzer-prize winning series on hog farm pollution, corporate farming, and politics).

18. For example, Bill Moyers reported in his PBS program, *Trade Secrets*, "Gentlemen, this is a campaign that has the dimension and detail of a war," wrote one committee chairman of the Chemical Manufacturer's Association (now called the American Chemistry Council) in a 1979 report to the CMA board of directors. The report lays out plans 'to moderate, change or stop governmental regulations in the pollution control arena,' and urges more corporate financial support to fund "an effective army" that would include lobbyists, lawyers and public relations specialists. "The dollars expended on offense," the committee chairman wrote, "are token compared to future costs." *Trade Secrets: A Moyers Report* (PBS Television Broadcast, 2001).

19. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1030 (1992).

sixty known carcinogens have been identified.²⁰ Thus the human population and environment are used as test subjects until harms are uncovered. It was an accidental epidemiological study that led to the evidence of the harms of fine particulates in air, for example.²¹ Some ninety percent of new chemical substances enter the marketplace without rigorous health-based testing. Basic toxicity data are not publicly available for some seventy-five percent of the top volume chemicals produced in the United States.²² Interestingly, commentators contend correctly that industry may actually be *over-regulated* because of the lack of data, but how can one know?

All questions of comparative risk are plagued by the inadequacy of information about the nature and severity of environmental problems. There is not enough toxicity data on most chemical[s] to know whether they cause adverse effects. There are not enough monitoring data to know to which pollutants people are exposed. We do not understand many fundamental aspects of the earth's ecology. . . Knowledge about how pollutants travel from one part of the environment to another is woefully inadequate.

20. A. Rosenthal et al., *Legislating Acceptable Cancer Risk from Exposure to Toxic Chemicals*, 19 *ECOLOGY L.Q.* 269, 269-362 (1992).

21. Fine particulate matter regulations which resulted only after a nearly-accidental epidemiological study revealed that, though previously thought relatively benign, they were harmful, particularly to children. See John J. Fialka, *Provo, Utah, Provides Combatants in Clean Air Fight*, WALL ST. J., Nov. 25, 1996, at A20. (describing the process which led to the regulations which were the subject of the decision in *Whitman v. Am. Trucking Ass'n*, 531 U.S. 457 (2001)). Approximately 70 percent of the cancer risk from air pollution in the state comes from diesel-particle pollution, according to recent California studies. Natural Resources Defense Council, *No Breathing in the Aisles Diesel Exhaust Inside School Buses* (Feb. 2001), at <http://www.nrdc.org/air/transportation/schoolbus/sbusinx.asp> (last visited Nov. 10, 2004) (citing South Coast Air Quality Mgmt. Dist., *Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-II)*, at ES-2 (Mar. 2000); Cal. Air Res. Bd., *Risk Reduction Plan to Reduce Particulate Matter Emissions From Diesel-Fueled Engines and Vehicles* at 15 (Sept. 2000)). See also, EPA, Office of Water, *How Safe is it to Swim in Santa Monica Bay? Epidemiology Study Assess Health Risks*, at <http://www.epa.gov/owow/estuaries/coastlines/96summer.pdf> (1996); See, e.g., Am. Lung Ass'n, *Factsheet on Secondhand Smoke*, at <http://www.lungusa.org/site/pp.asp?c=DVLUK900E&b=35422> (Nov. 2004).

22. 15 U.S.C. §§ 2601-2692 (1994 & Supp. IV 1998). See 15 U.S.C. § 2603 (setting forth the requirements for testing of chemical substances and mixtures under the Act). Some ninety percent of new chemical substances enter the marketplace without rigorous health-based testing, and there are not even basic toxicity data publicly available for some seventy-five percent of the top volume chemicals produced in the United States. John Murphy, *Risky Business*, AMICUS J., Spring 1998, at 23, 23-25. See generally THEO COLBORN, ET AL., *OUR STOLEN FUTURE* (1996).

quate. These are problems both of fundamental scientific knowledge and of inadequate data collection.²³

EPA has even developed a program entitled, "The P2 (Pollution Prevention) Framework," designed to screen the 2000 new applications for potentially toxic chemicals submitted each year based on computer models, i.e., without empirical data since it lacks the legal authority to require testing data unless EPA has already made a determination of unreasonable risk *at EPA's expense*.²⁴ That is not likely given that according to the Sierra Club's latest tally, the present administration has cut \$492 million from the EPA budget and the Bush Administration has proposed a five per cent (5%) cut overall for 2005-2006.²⁵ Because of public interest and liability issues, the American Chemistry Association (formerly the Chemical Manufacturers Association) and Environmental Defense have begun to analyze High-Production Volume (HPV) Chemicals.²⁶ Critics point out that manufacturers of some 25% of HPV chemicals have not provided information, however, and that the voluntary cooperation from the industry was calculated to deflect calls for greater regulatory scrutiny.²⁷

23. J. CLARENCE DAVIES & JAN MAZUREK, *REGULATING POLLUTION: DOES THE U.S. SYSTEM WORK?* 27-29 (RFF Press 1997).

24. Before manufacture for commercial purposes, industry must submit a PMN to EPA, and EPA, OPPT has 90 days to identify chemicals posing risk(s) and regulate when needed. There is no requirement under TSCA that the submitter conduct testing on new chemicals, however if tests are conducted, this data must be submitted with the PMN. Less than 10% of PMNs submitted have publicly available data such as an LD50. An alarmingly small number of PMNs have enough publicly available data to perform a rudimentary assessment of risk. Uncertain Risks Industry submits 2,000 PMNs annually. In many cases, when alternative chemicals or processes are considered at R&D, commercialization decisions are based on factors such as efficacy, yield, performance, and cost. While EPA sees 2,000 PMNs per year, industry has made thousands of other decisions early in R&D, long before PMN submission. By the time EPA sees the PMN, most of the P2 opportunities have been lost. Industry has needed to make decisions without understanding risk tradeoffs of product/process alternatives. EPA, Office of Pollution Prevention and Toxics, *Pollution Prevention (P2) Framework*, available at <http://www.epa.gov/oppt/p2framework/images/p2man0103001020intromodelsepi.pdf> (last edited Jan. 2004).

25. Sierra Club, *By the Numbers*, SIERRA MAG., Sept./Oct. 2004, available at <http://www.sierraclub.org/sierra/200409/ol.asp> (last visited Nov. 10, 2004).

26. Environmental Defense, *Chemical Testing and Assessment*, at <http://www.environmentaldefense.org/system/templates/page/subissue.cfm?subissue=14> (last visited Nov. 10, 2004).

27. See Environmental Defense, *Orphan Chemicals in the HPV Challenge, A Status Report*, (June 17, 2004), at http://www.environmentaldefense.org/pdf.cfm?ContentID=3810&FileName=HPVorphansReport_062004.pdf&CFID=9299386&CFTOKEN=28953686 (last visited Nov. 10, 2004); *Trade Secrets: A Moyers Report* (PBS television broadcast, 2001).

The Center for Disease Control recently implemented The National Report on Human Exposure to Environmental Chemicals, "an ongoing assessment of the U.S. population's exposure to environmental chemicals using biomonitoring,"²⁸ i.e., using the citizenry as test subjects. Unfortunately, on April 8, 2005, EPA's acting administrator cancelled one effort to quantify exposure to pesticides and household chemicals (the Children's Health Environmental Exposure Research Study) because the design was so flawed²⁹. Critics charged that the study had ethical problems and design flaws³⁰, including intentionally allowing children's exposure to contaminants known to be harmful to them, funding by the chemical industry and its focus on low-income families of color. While these flaws must be addressed by applying sound science, the results will clearly be substantially delayed.

The list of issues missed because of the dearth of scientific analysis reads like a "who's who" of the history of the environment: lead, mercury, asbestos, Agent Orange, PCB's, PVC, dioxin, all but a handful of hazardous air pollutants (until the Clean Air Act Amendments of 1990) and most of indoor air pollution, for starters.³¹ Also missed were common economic activities: underground storage tanks were buried and surprise expressed when the often-hazardous contents leaked; aerial spraying was not believed to affect surface water until the Ninth Circuit reminded us that the process is not so precise as to remain within property boundaries.³² Recently, the State of North Carolina finally conceded after many years that the evaporation from intensive livestock lagoons and from industrial settling ponds included pollutants such as H₂S,³³ and EPA has acted on overwhelming evidence that mercury in the surface waters of the nation had been

28. Center for Disease Control, *National Report on Human Exposure to Environmental Chemicals*, at <http://www.cdc.gov/exposurereport/> (last reviewed May 12, 2004). Also, K. Sexton, L.L. Needham, and J.L. Pirkle, (2004), *Human Biomonitoring of Environmental Chemicals*, 92 *American Scientist*, pp. 38-45.

29. See <http://www.epa.gov/cheers/>.

30. See <http://www.pested.org/programs/cheers.html#moreinfo>.

31. See, e.g., STEPHEN BREYER, *BREAKING THE VICIOUS CYCLE: TOWARD EFFECTIVE RISK REGULATION* (Harvard Univ. Press 1993).

32. *Headwaters, Inc. v. Talent Irrigation Dist.*, 243 F.3d 526 (9th Cir. 2001).

33. Wade Rawlins, *Mill's Stench Might be Toxic*, *newsobserver.com*, at <http://www.news-observer.com/news/story/1719104p-7979814c.html> (Oct. 10, 2004).

airborne (mostly from fossil-fueled power plants), contrary to what air quality agencies maintained even a few years ago.³⁴

Since Congress has been unwilling to fund this research, we propose a property rights analysis and remedy that would compel generators to provide the data before any discharge leaves property boundaries.

MARKET ECONOMICS DEMANDS THAT EXTERNALITIES BE ELIMINATED

Another major problem is that environmental law is not now designed to attain the pivotal goal noted by both the President's Science Advisory Committee (1965) and President Nixon's first Council on Environmental Quality (1970): to eliminate environmental "externalities".³⁵ What are externalities and how do they affect us?³⁶

34. 40 CFR Parts 60, 63, 72, and 75, [OAR-2002-0056; FRL-] RIN 2060-AJ65 (March 15, 2005); see also discussion by EPA at: <http://www.epa.gov/mercuryrule/rule.htm> (last visited April 22, 2005).

35. ENVIRONMENTAL POLLUTION PANEL, PRESIDENT'S SCIENCE ADVISORY COMMITTEE, RESTORING THE QUALITY OF OUR ENVIRONMENT 1-2, 5-7, 10-15 (1965); COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY: THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 5-18 (1970).

36. Health care effects, for example, are often dramatic. The President's Science Advisory Committee in 1965 wrote that, "Today we are certain that pollution adversely affects the quality of our lives. In the future, it may affect their duration." One of the latest: mercury, found in air emissions from fossil-fueled power plants. "Mercury can interfere with brain development of fetuses and children, although anyone who consumes large amounts of fish is also susceptible to health problems related to this neurotoxin. Because one in 12 women of childbearing age in the United States are estimated to have unsafe levels of mercury in their blood, more than 600,000 newborns each year are put at risk of brain damage and learning disabilities." Environmental Defense, *Mercury Pollution Endangers Public Health*, at <http://www.environmentaldefense.org/system/templates/page/subissue.cfm?subissue=20> (last visited Nov. 3, 2004). Forty states now have partial or statewide consumption advisories for fish consumption, but these are voluntary measures with no enforcement provisions against sources of this poison. EPA, *Fish Advisories*, at <http://www.epa.gov/ost/fish> (last visited Nov. 3, 2004). With respect to diesel exhaust, "EPA has estimated that by 2030, the highway diesel rule will avoid 8,300 premature deaths per year, which otherwise would have been caused by exposure to particulate pollution from diesel emissions (see Table VII-19). The rule is also projected to prevent more than 7,000 hospital admissions, 360,000 asthma attacks and more than 1.5 million lost work days in 2030 (see Table VII-19). The non-road rule similarly promises tremendous health benefits in 2030, including the avoidance of 12,000 premature deaths and 8,900 hospital admissions per year from particulate pollution exposure (see Table 9-11). The non-road rule is also projected to avoid 200,000 cases of exacerbated asthma in children in 2030 (see Table 9)." Jana Milford et al., *Speeding the Transition to Cleaner Diesel Engines to Help Americans Breathe Easier Today* (June 2004), available at http://www.environmentaldefense.org/documents/3799_DieselWhitePaper0604.pdf. Power generation is also estimated to have additional dramatic effects: air pollu-

Our price system fails to take into account the environmental damage that the polluter inflicts on others. Economists call these damages. . . 'external social costs' [externalities]. They reflect the ability of one entity, e.g., a company, to use water or air as a free resource for waste disposal, while others pay the cost in contaminated air or water. If there were a way to make the price structure shoulder these external costs—taxing the firm for the amount of discharge, for instance—then the price for the goods and services produced would reflect those costs. Failing this, goods whose production spawns pollution are greatly underpriced because the purchaser does not pay for pollution abatement that would prevent environmental damage. Not only does this failure encourage pollution but it warps the price structure. A price structure that took environmental degradation into account would cause a shift in prices, hence a shift in consumer preference and, to some extent, would discourage buying pollution-producing products.³⁷

tion from power plants is blamed for some 24,000 deaths and 38,000 non-fatal heart attacks each year. National Campaign Against Dirty Power, *Get the Facts and Clear the Air*, at <http://cta.policy.net/dirtypower/> (last visited Nov. 3, 2004). See also *Trade Secrets: A Moyers Report* (PBS television broadcast, 2001). Air pollution studies have also indicated permanent lung damage in children from existing air pollution levels. California Air Resources Board, (2004) <http://www.arb.ca.gov/research/abstracts/94-331.htm>, and a Columbia University Study indicated that "prenatal exposure to urban air pollutants can cause genetic alterations in babies in utero" http://www.ccceh.org/news-events/ChromMutationsReleaseFinal_Emb-2-15.htm.

Pollution cleanup costs are enormous ("The economic costs of pollution are massive—billions of dollars annually. . . Direct costs to city dwellers can be measured in additional household maintenance, cleaning and medical bills. . . The farmer's crop yield is reduced or destroyed."). COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY: THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 5-18 (1970). For example, Superfund, federal EPA cleanup of the worst of the worst sites (some 1200 on the National Priorities list) was estimated by the CATO institute in 1995 to cost some \$6 billion per year and is estimated to cost \$14-16.4 billion (2000-2009) in the future. KATHERINE N. PROBST ET AL., SUPERFUND'S FUTURE WHAT WILL IT COST? (2001).

Loss of business (e.g., the Santa Barbara oil spill), diminished property value and lost tax revenue (Love Canal, Times Beach), loss of use of property and loss of property value from pollution or proximity to pollution, crop damage (timber and strawberry losses from air pollution) are some common examples. Loss of recreation as well as food sources are exemplified by the recent warnings on mercury (airborne and soil) in inland fisheries as well as tuna. Externalities from the automobile (congestion, air pollution and safety) are estimated to be \$100 billion per year. David Gerard & Lester Lave, AEI-Brookings Joint Center for Regulatory Studies, *CAFE Increases: Missing the Elephant in the Living Room* (June 2004), available at <http://aei-brookings.org/admin/authorpdfs/page.php?id=1003> (last visited Nov. 11, 2004).

Also, see D.O. Ofiara and J.J. Seneca (2001), *Economic Losses from Marine Pollution*, Island Press, Washington, D.C.

37. The Council on Environmental Quality, *The State of the Environment* (1970).

Dean James Huffman of the Lewis and Clark Law School writes:

The efficiency theory assumes that market participants bear the full costs of their activities. When those costs are "externalized" to third parties, there is a *market failure* in the sense that one of the assumed conditions of an efficient market is missing. In such cases, regulations may be designed to internalize the full cost to the decision maker [generator].³⁸

The benefits of environmental strategies, such as improved health and productivity and reduced healthcare costs, preservation and enhancement of property values and even production efficiency, are well known, although generators' complaints of the cost of environmental compliance receive widespread attention.³⁹ The report of the Nixon Administration's Council of Environmental Quality, prepared by the nation's top accounting firms in 1972, even found in a comprehensive sector-by-sector analysis that the economic effects of pollution control would be positive.⁴⁰

Why do generators complain about internalization? As Rose explains, "Landowners [generators] are accustomed to regarding their land as their property, but they simultaneously regard the adjacent air, water and wildlife as goods that are free for the taking."⁴¹ Curious, since it is clearly *other owners'* rights they are invading—public or private. In many if not most cases, of course, the receptors may not even know about the pollution or its effects for years, nor do they have any stake in it. Pollutants ". . . can be carried long distances by air or water or on articles of commerce, threatening the health, longevity, livelihood, recreation, cleanli-

38. James L. Huffman, *Environmental Protection and the Politics of Property Rights: The Public Interest in Private Property Rights*, 50 OKLA. L. REV. 377, 380 n.11, 383-84 (1997); see also William Simmons & Robert H. Cutting, Jr., *A Many-Layered Wonder: Non-Vehicular Air Pollution Control in California*, 26 HASTINGS L.J. 109, 113 (1975); J.H. DALES, *POLLUTION, PROPERTY & PRICES* 7-8 (1968); ERIK T. VERHOEF, *HANDBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS* 197-214 (1999).

39. See EPA, *National Center for Environmental Economics*, at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/homepage> (last visited Nov. 3, 2004).

40. Council on Environmental Quality, *The Economic Costs of Pollution Control* (1972).

41. Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trade and Ecosystems*, 83 MINN. L. REV. 129, 137 (1998). "Historically, man has assumed that the land, water and air . . . would absorb his waste products." COUNCIL ON ENVIRONMENTAL QUALITY, *ENVIRONMENTAL QUALITY: THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY* 5-18 (1970). We like Prof. Rose's analogy to cyberspace and compare trespassing pollutants to adware and spyware invading your computer!

ness and happiness of citizens who have no direct stake in their production but cannot escape their influence.”⁴²

The Data Deficit makes quantification difficult, of course. Then, too, the value of quietude or the price of a sunset in the Sierra Nevada unobstructed by polluting haze are not easily translated to dollars. Although environmental economists are working to quantify these effects, “[M]ost environmental amenities cannot [presently] be adequately monetized, not because they are not valuable, but because they are not supplied through a market.”⁴³

Some, like UCLA’s James Krier, argue that the formula to achieve greatest economic efficiency ought to be “Cost to Receptors plus Cost to Reduce Externalities.” While this may lead to economic efficiency on one level, that is not the only social goal of environmental policy and it ignores issues of equity, that is, “who pays?”⁴⁴ By definition, the cost to reduce the externalities is supposed to be internalized and passed on to customers.

42. ENVIRONMENTAL POLLUTION PANEL, PRESIDENT’S SCIENCE ADVISORY COMMITTEE, RESTORING THE QUALITY OF OUR ENVIRONMENT 1-2, 5-7, 10-15 (1965).

43. Environmental economics has long been overlooked, for somewhat obvious reasons and is imprecise itself. Property values can assist, but are not precise given reliance on the “comparable sales” formulae. Pollution will sometimes have both short- and long-term direct health effects on third parties, and will often have indirect effects for wildlife and ecosystems. In these circumstances in the recent past, the legislatures created regulatory “referees” to internalize the direct and indirect costs. David B. Hunter, *An Ecological Perspective on Property: A Call for Judicial Protection of the Public’s Interest in Environmentally Critical Resources*, 12 HARV. ENVTL. L. REV. 335-36 (1988).

44. James E. Krier, *The Irrational National Air Quality Standards: Macro- And Micro-Mistakes*, 22 UCLA L. R. 323 (1974); see also, MARK SAGOFF, *THE ECONOMY OF THE EARTH: PHILOSOPHY, LAW, AND THE ENVIRONMENT* (1988) (contends efficiency is not the only model to follow given that our behavior as consumers does not always coincide with our beliefs as citizens). A legion of writers advocate more attention to the Economy of Nature rather than our Transformative Economy: Joseph L. Sax, *Property Rights and the Economy of Nature: Understanding Lucas v. South Carolina Coastal Council*, 45 STAN. L. REV. 1433, 1442 (1993) [hereinafter Sax, *Economy of Nature*]; see also, Joseph L. Sax, *Takings, Private Property and Public Rights*, 81 YALE L.J. 149, 150 (1971) (discussing the view of the interconnectedness between property owners and property rights); Charles A. Reich, *The New Property*, 73 YALE L.J. 733, 771 (1964); David B. Hunter, *An Ecological Perspective on Property: A Call for Judicial Protection of the Public’s Interest in Environmentally Critical Resources*, 12 HARV. ENVTL. L. REV. 311, 313-17 (1988); J. Peter Byrne, *Green Property*, 7 CONST. COMMENT. 239, 244-45 (1990).

A PROPERTY RIGHTS ANALYSIS INTERNALIZES WITHOUT THE POLITICAL SHENANIGANS AND WOULD ALSO REQUIRE BETTER DATA

Our analytical model is straightforward and offers an objective test based on the existing system of property lines. If pollution, including phenomena such as heat, light, odor, and radiation, transgresses the boundaries of the generator or producer property (real or personal), it *by definition* enters the space of other property, whether public or private. We argue that anything that is added to transitory resources such as the air masses or water-courses (surface or ground) or which enters the space of another owner is also a *trespass*.

Once the nature of the release is understood, the burden must be on the generator/producer to quantify all externalities, which can only be accomplished with a great deal more scientific analysis than present government budgets permit, and to eliminate any invasion or demonstrate the consent of the receptor. The immediate advantage is that quite literally both the wastes and the costs to the generator are internalized to space owned or controlled by the generator—subject also to onsite regulations such as the rights of workers and visitors.

There are several sound legal bases for the concept. What we are really recommending, of course, is not the result of an individual case, although it may require such a case to re-establish the property rights of receptors. Instead, we suggest a new (old) way of looking at property issues from the ecosystemic viewpoint.

THE VENERATED RULES OF TRESPASS:

Historically, the law treated any physical incursion into property not owned by the generator/producer as a trespass, which the courts would: (1) terminate, and (2) require the trespasser to pay at least nominal damages even where there was no actual damage. The theory was simply that the legal interest known as property must be vigorously protected or the concept of private property would be valueless.⁴⁵ John Locke himself, the patron saint of the "Property Rights" movement, recognized that the value of property is dependent on the political and legal system

45. For an excellent review of the evolution of trespass and nuisance, See H. Marlow Green, Note, *Common Law, Property Rights and the Environment: A Comparative Analysis of Historical Developments in the United States and England and a Model for the Future*, 30 CORNELL INT'L L.J. 541, 552 (1997).

that creates and protects it.⁴⁶ A classic law school example involves an object, tossed by X from Property A, through the airspace of Property B, which falls to earth on Property C (B and C are not owned or possessed lawfully by X). There has been a trespass to the airspace of Property B, and to both airspace and land of Property C. Regardless of actual harm, damages would be awarded as a deterrent to protect the legal estate we know as property. The Oregon Supreme Court in *Martin v. Reynolds Aluminum* expressed the core of the rights of receptor owners this way:

Probably the most important factor which describes the nature of the interest protected under the law of trespass is nothing more than a feeling which a possessor has with respect to land which he holds. It is a sense of ownership; a feeling that what one owns or possesses should not be interfered with, and that it is entitled to protection through law. This being the nature of the plaintiff's interest, *it is understandable why actual damage is not an essential ingredient in the law of trespass.*⁴⁷ [emphasis added]

The tort of trespass was based on strict liability without even a *de minimis* defense.⁴⁸ The concept proved troublesome during the Industrial Revolution when the air, water and soil were viewed as "free goods" for the taking as waste disposal media.⁴⁹ Courts thus altered the law of trespass radically when the material (water-borne or airborne) was "invisible," concluding without scientific basis that there was no physical invasion. This resulted in a lower-tier category of "indirect trespass", (the so-called, "dimensional test"), which these courts then measured by the much more subjective rules of nuisance. Unlike the clear and objective boundary test of trespass, the concept of "nuisance" allows judges to deny relief unless the invasion caused "unreasonable interference" with the receptor property, providing judges multiple opportunities subjectively to "balance" the interests of the generator and the

46. "[I]t would be a direct contradiction for any one to enter into society with others for the securing and regulating of property, and yet to suppose his land . . . should be exempt from the jurisdiction of that government to which he himself, and the property of the land, is a subject." John A. Humbach, *Evolving Thresholds of Nuisance and the Takings Clause*, 18 COLUM. J. ENVTL. L. 1, 6 n.25 (1993) (quoting 2 John Locke, *Two Treatises of Government* § 3, 124 (Everyman's Library 1991) (1690)).

47. *Martin v. Reynolds Metals Co.*, 342 P.2d 790, 796-797 (Or. 1959).

48. 87 C.J.S. *Trespass* §§ 109-115, 111 (1990).

49. COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY: THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 5-18 (1970).

receptors.⁵⁰ "Industrial progress" was routinely found to outweigh what the courts called, "trifling inconveniences" to receptors (water pollution and air pollution), whose rights had in the past received absolute protection from the courts.⁵¹ Even when a nuisance was found to exist, courts created an escape from liability if control were not technologically feasible.⁵²

But by the late Twentieth Century, at least some U.S. courts began to recognize that in the atomic era, it could not be denied that even materials invisible to the naked eye physically enter the "space" of other property once they exit the generators' boundaries. Courts have even suggested that there may be no nuisance that is not *also* a trespass by some material or disturbance (e.g. odor or sound waves).⁵³ When confronted with the conclusion that the distinction between direct and indirect trespasses had no scientific basis and ought to be discarded, the courts recognized that a return to historic notions of trespass would eliminate all transboundary pollution. As the Alabama Supreme Court noted in *Borland*, "It might appear, at first blush, from our holding today that every property owner in this State would have a cause of action against any neighboring industry which emitted particulate matter into the atmosphere, or even a passing motorist, whose exhaust emissions come to rest upon another's property."⁵⁴

That would be the end of this article, but the courts punted and in another case of radical judicial activism created an exception to venerated law. On *policy* alone, *without any scientific inquiry, evidence or basis*, the courts created *another* inferior category of trespass for pollutants. If the trespass is visible, no damage at all is required under historic rules. But if *invisible* pollutants are involved, these courts have *added* a requirement that there must be *substantial damage to the property itself or persons*

50. Zygmunt J.B. Plater, *Statutory Violations and Equitable Discretion*, 70 CAL. L. REV. 524, 527-528 (1982).

51. *De Blois v. Bowers*, 44 F.2d 621, 623 (D. Mass. 1930); *Pa. Coal Co. v. Sanderson*, 6 A. 453, 459 (Pa. 1886).

52. *Boomer v. Atl. Cement Co.*, 257 N.E.2d 870, 876 (N.Y. 1970).

53. *Martin v. Reynolds Metals Co.*, 342 P.2d at 794-96 (smelting and vibrations from blasting); *Bradley v. Am. Smelting & Ref. Co.*, 709 P.2d 782, 790 (Wash. 1985); *Borland v. Sanders Lead Co.*, 369 So. 2d at 530 (Ala. 1979). Curiously, other courts still engage in the fiction that invisible particles such as smoke, odors, dust or ashes did not "touch" the receptor's "land" although they clearly invaded the legal interest known as "property" and following the laws of nature, some of the particles must have "touched" or even landed on the surface. *Long v. City of Charlotte*, 293 S.E.2d 101 (N.C. 1982) (citing earlier decisions).

54. *Borland v. Sanders Lead Co.*, 369 So. 2d at 530 (Ala. 1979).

on the property—even damage to property value was not enough to permit an action.⁵⁵ These courts have either simply confused the issue of damages with the elements of the cause of action, or they have created an additional element to the cause of action which has no basis in the history of property or trespass. If the cause of action exists, the diminution of property value, including in many jurisdictions the “stigma” which attaches to once-polluted property even after remediation, is an element of damages, not a defense. If the property has no value, the measure is the cost to cure.⁵⁶ Green suggests that use of the substantial injury test is an acceptable component of the inquiry since it is viewed “[from] the vantage point of the plaintiff.”⁵⁷ We are not convinced that courts view the requirement thusly, nor do we think courts ought to be given the discretion to inquire. Either the material is in the “space” known as the property or it is not. If it is, in any form or quantity, the generator ought to be held accountable and an injunction should issue⁵⁸. Why allow a property invasion when the harm might only be apparent to future generations (e.g., DES), or after many years of “belief” that the material is not harmful be-

55. See, e.g., *Ramik v. Darling Int'l, Inc.*, 161 F. Supp. 2d 772, 778 (E.D. Mich. 2001) (noting that harm in the form of decreased property value is not irreparable because it can be compensated with monetary relief).

56. 87 C.J.S. *Trespass* § 111 (1990); 87 C.J.S. *Trespass* § 118 (1990); *Bradley v. Am. Smelting & Ref. Co.*, 709 P.2d 782, 785-86 (Wash. 1985); *Carolina Power & Light v. Paul*, 136 S.E.2d 103 (N.C. 1964) (damages temporary, but the property value could not be restored to pre-injury status). On the subject of “stigma,” courts often distinguish between properties physically affected as opposed to those where there is no physical invasion, but the property lies nearby a source of pollution (so-called “pure stigma” cases). See *Walker Drug Co. v. La Sal Oil Co.*, 972 P.2d 1238 (Utah 1998) for the former. The split in jurisdictions on pure stigma is illustrated by *DeSario v. Indus. Excess Landfill*, 587 N.E.2d 454 (Ohio Ct. App. 1991), *overruled in part by*, *Ramirez v. Akzo Nobel Coatings*, 791 N.E.2d 1031 (Ohio Ct. App. 2003), where landowners claimed stigma damages from proximity to a Superfund landfill, versus *Twitty v. State*, 354 S.E.2d 296 (N.C. Ct. App. 1987), where location near a PCB landfill, without invasion or interference with plaintiff's property, is not actionable.

57. H. Marlow Green, *Common Law, Property Rights and the Environment: A Comparative Analysis of Historical Developments in the United States and England and a Model for the Future*, 30 CORNELL INT'L L.J. 541, 584 (1997).

58. One federal court attempting to interpret North Carolina law even went so far as to declare that if the pollution which formed the basis of the trespass did not exceed state standards—in that case the groundwater standards—a trespass could not be actionable, although even seasoned defense counsel have questioned the logic of the court *Grant v. E.I. du Pont de Nemours & Co.*, 4:91-CV-55-H (E.D.N.C. July 14, 1995), *aff'd sub nom.* *Stancill v. E.I. du Pont de Nemours & Co.*, 91 F. 3d 133 (4th Cir. 1996), criticized soundly at a recent CLE held by the NC Bar Association, *Litigating Toxic Torts and Environmental Claims – Not Just a Walk in the Park* (Oct. 1, 2004); *contra Ashcraft v. Conoco, Inc.*, 7-95-CV-187 (E.D.N.C. 1996).

cause of the Data Deficit (such as mercury, lead, asbestos, PVC, dioxin or fine particulates)?

Why property is entitled to absolute protection against visible invasions from a Frisbee, but odorless, colorless toxic pollutants are given free passage unless the receptor property owner (at its expense) can prove some "damage" *beyond* the loss of property value is difficult to comprehend. The courts were simply unwilling to halt pollution and this desired result dictated a rule without any scientific rationale at all. The Alabama Supreme Court candidly admitted that it simply sought to stem a floodtide of lawsuits to prevent pollution—ironic indeed since the right existed until the courts excised it in favor of the Industrial Revolution, "[w]hile at common law any trespass entitled a landowner to recover nominal or punitive damages . . . [n]o useful purpose would be served by sanctioning actions in trespass by every landowner within a hundred miles of a manufacturing plant. Manufacturers would be harassed and the litigious few would cause the escalation of costs to the detriment of many."⁵⁹

No useful purposes would be served except: (1) Sound science that is presently lacking would be required to gauge the effects of the trespass, (2) Internalization of offsite waste disposal costs would occur as the market economy demands (which is supposed to result in increased costs until generators become more efficient), and (3) protection of all other property owners (usually far more numerous than generators) would occur! One might expect that establishment of *any* new (in this case, renewed) right might result in more litigation until defendants realized the import of the rule, but that is the nature of the behavior modification process.

The Alabama court created a new defense of "*de minimis*," simply by asserting that there was a point (not grounded in science) where the trespass is "so lacking in substance" that the courts would refuse to recognize it⁶⁰. But even a minor trespass historically resulted in an injunction and damages *to preserve the rights of the receptor property*. The Washington court imposed a balancing defense based on "technological or economic justifications for trespassory invasions" in place of the strict liability for

59. *Bradley*, 709 P.2d at 791.

60. *Borland v. Sanders Lead Co.*, 369 So. 2d 523 (Ala. 1979). In *Borland*, the plaintiffs sued a battery recycling facility for damages resulting from emissions of lead particulates and sulfur dioxide gases into the air and onto plaintiffs' property. See *id.*

trespass which had always existed, citing only the, "historically harsh treatment of conduct interfering with another's possessory interests."⁶¹ What is so harsh about preventing invasion of receptors' space by generators, especially when the results may not be known for decades and the methodology to achieve redress so uncertain in result and expensive in transactional costs?

The Oregon Supreme Court rationalized its position by opining that since folks are generally more law-abiding nowadays (a questionable premise), there was little chance that the trespasses would result in breaches of the peace.⁶² One might question both the veracity and the logic of the conclusion.⁶³

In fact, these courts all employed result-oriented reasoning to avoid short-term consequences to the generator at the expense of the short- and long-term effects on all receptors. Each court was more willing radically to alter common law based on flawed science than it was: (1) to force the internalization of costs passed on to others via offsite disposal of waste, and (2) to protect the historic and investment-backed expectations of *receptors*. The law, like natural organisms, can correct growth in the wrong direction, and in this case it can be done by the highest court of any state because property law, including trespass and nuisance, is peculiarly a matter of state law.⁶⁴

If some interim protection were required to transition away from free waste disposal, the courts could supervise implementation over time. Moreover, a defense already exists at common law if the courts saw a need for extraordinary relief from true trespass in cases of real hardship. A common law school example of *necessity* is the boater who is on a lake when a sudden thunderstorm arises and who moors to a pier owned by another. A limited trespass to permit one to reach safety is protected by the defense.⁶⁵ A

61. *Bradley*, 709 P.2d at 787.

62. *Martin v. Reynolds Metals Co.*, 342 P.2d 790, 796 (Or. 1959).

63. The *Martin* court also held that even a seemingly *de minimis* trespass would still constitute a trespass if "an act on the part of the defendant in interfering with the plaintiffs possession, does, or is likely to result in arousing conflict between them." *Martin*, 342 P.2d at 796. An opportunistic plaintiff might even instigate conflict as a means to trigger the tort, however; hardly the intended result.

64. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1030-31 (1992); *Stevens v. City of Cannon Beach*, 854 P.2d 449, 450-51 (Or. 1993), *cert. denied*, 510 U.S. 1207 (1994) (Scalia, J., dissenting); see also *Kim v. City of New York*, 681 N.E.2d 312, 318 (N.Y. 1997); see also John A. Humbach, *Evolving Thresholds of Nuisance and the Takings Clause*, 18 COLUM. J. ENVT'L. L. 1 (1993).

65. 87 C.J.S. *Trespass* § 35 (1990).

limited right to pollute under certain circumstances might be excused.

If a cause of action utilizing historic principles were re-established, the usual remedies include (nominal) damages and the possibility of punitive damages. There is also authority for the issuance of injunctive relief to prevent future trespasses. While it is true that damages may lie, true protection of the legal estate would argue for preventative relief.⁶⁶ Moreover, the trespass could form the basis for additional claims for (1) nuisance, especially in those jurisdictions where the courts recognize that there is seldom a nuisance that does not involve a trespass of some type,⁶⁷ and (2) unfair business practices, such as California Business & Professions Code Section 17200 *et seq.*, since the pollution is usually related to a business that is attempting to gain competitive advantage by passing waste disposal costs on to others.⁶⁸ These theories provide the basis for an injunction to prevent the trespass at the *source*. What point is there in requiring a multiplicity of litigation for trespass any more than for other nuisances and unfair business practices? Nuisances and unfair business practices are abated at the source and the trespass should thus be eliminated by those in control of defendant, at a minimum at the property boundary of the generator.

The Washington Supreme Court in *Bradley* noted in *dicta* that absent substantial injury courts might be reluctant to exercise equitable jurisdiction to require expensive control measures. Why wait to prove injury any greater than invasion of a legal interest that also may constitute a taking of constitutional dimensions (see discussion, *infra*). Why permit externalization of the waste disposal costs of the generator, when market economics demands otherwise and the real harm may not be known for years? The burden ought to be on those who propose to trespass to demonstrate with substantial scientific evidence the true nature

66. *Bradley*, 709 P.2d at 789.

67. *Id.*

68. See, e.g., CAL. BUS. & PROF. CODE §§ 17200-209 (West 2001) (providing injunctive relief when a court finds unfair trade practices); 75 N.C. GEN. STAT. § 16 (1999); see also James Wheaton, *California's Unfair Competition Law: The Biggest Hammer in the Tool Box*, 9 ENVTL. L. NEWS (California State Bar), Summer 2000, available at <http://www.calbar.org/enviro/news/v09n2/hammer.htm>. (Mr. Cutting filed dozens of actions under this section as deputy in charge of the white collar crime unit of Santa Barbara County, CA and chair of the California District Attorneys Ass'n Consumer Protection Council (So. Sec.) for business practices ranging from environmental violations to auto repair schemes).

of the proposed invasion, and to accept responsibility for any future harms based on sound science. In fact, the courts prior to the "modernization" of nuisance law recognized that denial of an injunction for future harms meant that the burden fell on the *victim* rather than the perpetrator.⁶⁹

CURRENT POLICIES RESULT IN UNCONSTITUTIONAL TAKINGS OF RECEPTORS' PROPERTY RIGHTS

From another property rights perspective, courts have found that when a nuisance is imposed on another property, it constitutes a "taking" of the property rights of the receptor. If the invasion is enabled by government in some way, by issuing a permit or restricting the rights of receptors to sue, it is a taking without just compensation, in violation of the Fifth Amendment to the U.S. Constitution. In a recent landmark case, the Iowa Supreme Court declared that a permit to allow an intensive livestock facility to create an odor and health nuisance that affected adjoining farm properties constituted imposition of an "easement" over the receptors' properties, which unlawfully took their property rights without compensation⁷⁰ because the Iowa statute prevented receptors from suing the permit holder based on nuisance (the "state action").⁷¹

69. "Although the damage to the plaintiff may be slight as compared with the defendant's expense of abating the condition, that is not good reason for refusing an injunction. Neither courts of equity nor law can be guided by such a rule, for if followed to its logical conclusion it would deprive the poor litigant of his little property by giving it to those already rich. It is always to be remembered in such cases that 'denying the injunction puts the hardship on the party in whose favor the legal right exists, instead of on the wrongdoer.'" *Whalen v. Union Bag & Paper Co.*, 208 N.Y. 1 (1913), cited in, H. Marlow Green, *Common Law, Property Rights and the Environment: A Comparative Analysis of Historical Developments in the United States and England and a Model for the Future*, 30 CORNELL INT'L L.J. 541, 555 (1997).

70. *Bormann v. Bd. of Supervisors*, 584 N.W. 2d 309, 321-22 (Iowa 1998). Certiorari Denied February 22, 1999, Reported at: 1999 U.S. LEXIS 1509.

71. The Court drew from a line of cases beginning with *Richards v. Wash. Terminal Co.*, 233 U.S. 546 (1913). In *Richards*, a railroad constructed a tunnel immediately adjacent to plaintiff's property. Congress had both prescribed the route, then conveniently attempted to immunize itself from liability for claims from neighboring properties. The Supreme Court held that Congress could not thus deprive other property owners of their constitutional rights. *Id.* at 557. *Loretto v. Manhattan Teleprompter CATV Corp.*, 458 U.S. 419, 432 (1982) (permanent installation of cable wires constitutes a taking); *United States v. Causby*, 328 U.S. 256, 266-67 (1946) (low-flying airplanes constitute a nuisance); *United States v. Welch*, 217 U.S. 333, 339 (1910) (government flooding cutting off an easement requires compensation); *Brew-*

. . . generation of offensive odors, gases, smoke . . . may constitute a taking.

The commentator ascribes a name to the theory of these cases: condemnation by nuisance. And the commentator has formulated the theory this way:

"governmental activity by an entity having the power of eminent domain, which activity constitutes a nuisance according to the law of torts, is a taking of property for public use, even though such activity may be authorized by legislation."

Whether you flood the farmer's fields so that they cannot be cultivated, or pollute the bleacher's stream so that his fabrics are stained, or fill one's dwelling with smells and noise so that it cannot be occupied in comfort, you equally take away the owner's property. In neither instance has the owner any less of material things than he had before, but in each case the utility of his property has been impaired by a direct invasion of the bounds of his private dominion. This is the taking of his property in a constitutional sense.⁷²

The current U.S. Supreme Court declined to review the case, although: (1) the concepts are fundamental to environmental law, (2) nearly every state has a Right-to-Farm Act with similar provisions and (3) this Court has otherwise expressed great interest in protecting *generators'* property rights.⁷³ The Iowa Supreme Court recently reaffirmed *Bormann* and found that in addition to the "Takings" issue, where the plaintiffs' use pre-dated that of the defendant intensive livestock operation, the nuisance immunity

ster v. City of Forney, 223 S.W. 175, 178 (Tex. Comm'n App. 1920) (odor from sewage disposal plant constitutes a taking).

72. *Bormann*, 584 N.W.2d at 320 (citing *Pennsylvania R.R. v. Angel*, 7 A. 432, 433-34 (N.J. 1886)).

73. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1030-31 (1992). See also *Nollan v. Coastal Comm'n*, 483 U.S. 825 (1987) (there must be an essential nexus between the state interest and the permit condition); *Dolan v. City of Tigard*, 512 U.S. 374, 394-95 (1994) (a dedication of open space was invalidated because less restrictive alternatives to the dedication of a fee was available, hence there was no reasonable relationship between the required dedication and the projected impact of the project); *City of Monterey v. Del Monte Dunes*, 526 U.S. 687, 689 (1999) (a property developer claimed violation of his due process and equal protection rights because of the California judicial procedure for litigating a Takings claim). Significantly, the Court refused to hear an appeal from the Oregon Supreme Court in *Stevens v. City of Cannon Beach*, 854 P.2d 449, 450-51 (Or. 1993), cert. denied, 510 U.S. 1207 (1994) (Scalia, J., dissenting from denial of certiorari). Property owners contended that a claimed "new" interpretation of the Public Trust doctrine unconstitutionally deprived them of rights they thought they had to build a seawall. Justice Scalia dissented, notwithstanding that he had written in *Lucas* that property law was the province of state courts. *Stevens v. City of Cannon Beach*, 854 P.2d 449, 450-51 (Or. 1993).

statute also violated the "Inalienable Rights" provisions of the Iowa Constitution and the Right-to-Farm statute was therefore, an unreasonable use of the police power⁷⁴.

If a state permits or protects the imposition of a nuisance on receptor property, it follows that, since few nuisances are not also trespasses (and in fact odor would constitute a trespass), and many of the cited cases involved trespasses, imposition of a trespass would also constitute a taking. Of course, if the government creates or maintains the offensive activity, the action would sound in inverse condemnation.⁷⁵

If the invasion is not accompanied by state action, it is an unlawful usurpation of the power to condemn property by the generator. On this point, the courts pay lip service to the property rights of the receptors, but back away from historic protections. Plaintiff Oscar Boomer and his neighbors had complained that the dust, noise, and vibration from a Portland cement plant disturbed their peace and health and diminished property values. The New York Court of Appeals upheld the trial court finding that the noise, dust, and vibration were clearly "unreasonable" and, therefore, a nuisance, but expressly refused to follow the longstanding rule of New York courts that the nuisance must therefore be abated. Instead, a majority of the court held that a court could refuse an injunction if, (1) the economic cost to the defendant or the community (i.e. jobs and tax base) outweighed the imposition on the plaintiffs; and (2) a solution to the nuisance was not yet technologically feasible.⁷⁶ The dissent vigorously disagreed:

74. Joseph Gacke et al v. Pork Extra, L.L.C., 684 N.W.2d 168; 2004 Iowa Sup LEXIS 193 (2004). The Iowa legislature had re-drafted the statute at issue in Bormann, but failed to persuade the court either of any substantive difference or that Bormann should be overruled. See pp 173-174. On the other hand, the Court noted in *dicta* that remedies other than damages to property value, the standard Iowa measure of damage for a "takings" claim such as attorneys fees and costs *could* be limited (at 174-175). However, the court did require consideration of future damages where the nuisance was likely to continue (at 184-185). Other states, such as California, have attempted to limit injunctive relief for nuisance in areas zoned commercial or industrial (California Code of Civil Procedure Sec., 731a, for example), although California courts have held that activities authorized by zoning cannot deprive a plaintiff of the right to sue in nuisance because of the *manner* in which the activity is conducted. *Venuto v. Owens-Corning Fiberglas Corp.* (1971) 22 Cal.App.3d 116, interpreting California Civil Code Section 3482.

75. *Long v. City of Charlotte*, 293 S.E.2d 101 (N.C. 1982) (Supreme Court of North Carolina upholding inverse condemnation as basis for neighbors' suit for airport noise and vibration).

76. *Boomer*, 257 N.E.2d at 876 (Jasen, J., dissenting); *Borland*, 369 So. 2d at 526.

A private person or corporation for private gain or advantage may not invoke this kind of inverse condemnation. Inverse condemnation should only be permitted when the public is primarily served in the taking or impairment of property. The promotion of the interests of the polluting cement company has, in my opinion, no public use or benefit. . . Nor is it constitutionally permissible to impose a servitude on land, without consent of the owner, by payment of permanent damages where the continuing impairment of the land is for a private use. This is made clear by the State Constitution Art. I Sec.7(a) which provides that "private property shall not be taken for public use without just compensation." It is of course, significant that the section makes no mention of taking for a private use. In sum, then, by constitutional mandate as well as by judicial pronouncement, the permanent impairment of private property for private purposes is not authorized in the absence of clearly demonstrated public benefit and use.⁷⁷

The Alabama Supreme Court also held that simply allowing or requiring a private defendant effectively to buy out a plaintiff, ". . . would permit private condemnation, which, unquestionably, is impermissible."⁷⁸

Ironically, the defendant in another key case, *Bradley v. American Smelting & Refining Co.*,⁷⁹ urged that it had acquired a prescriptive easement over *plaintiffs'* property by polluting it for some time, so that a nuisance action could never arise because the defendant had acquired a *property right to pollute*. That claim was soundly rejected by the court.

It seems to us more difficult to ignore a trespass, regardless of technological feasibility. Moreover, from a policy standpoint, the Boomer majority position also discourages technological evolution by rewarding the polluter who claims inability to control discharges.

PROTECTION OF THE "COMMONS"

Whether the receptor property is private or public should make no difference. Nor should it matter whether the source is stationary (as with real property), or personal property which is

77. *Boomer*, 257 N.E.2d at 876 (Jasen, J., dissenting).

78. *Borland*, 369 So. 2d at 526.

79. *Bradley*, 709 P.2d at 791-92 .

mobile (such as an automobile), since the focus is on release into the property of others, rather than on the rights of the owners.⁸⁰

Thus, this approach also incorporates protections for public resources advanced by proponents of the "commons," which is embodied in U.S. law in part through the "public trust" concept.⁸¹ In the U.S., surface waters are held in the "public trust" for the use and benefit of all (though adjacent owners have some privileges). Although in other nations and eras dating back to Byzantine times, the notion included *air*, that is not the case in the U.S.⁸² Public trust property cannot be transferred without compensation, yet it has regularly been subjected to pollution of every sort.⁸³ Concepts of public trust property are also constantly evolving and are properly a matter of state law.⁸⁴ The prohibition of pollution of public waters also finds support in statutory law policies, notably the Clean Water Act's call for an end to discharges to surface waters (by 1985!).⁸⁵

THERE IS NO RIGHT TO POLLUTE:

In *Driscoll v. Adams*,⁸⁶ for example, an applicant for an NPDES permit to discharge waste to US surface waters challenged the agency refusal to issue a permit since the agency had

80. *Borland*, 369 So. 2d at 529; *Bradley*, 709 P.2d at 787, 791; *Martin*, 342 P.2d at 796.

81. BARRY COMMONER, *THE CLOSING CIRCLE: NATURE, MAN, AND TECHNOLOGY* 33-48 (1st ed. Random House 1971).

82. The public may pay dearly for bottled water, but it is difficult to imagine public acceptance of personal portable air tanks as a substitute for healthful air.

83. For example, the teaching of *Nat'l Audubon Soc'y v. Superior Court of Alpine County*, 658 P.2d 709 (Cal. 1983), has not been extended beyond surface waters. For a thorough discussion of the public trust concepts, see Harrison C. Dunning, *The Public Trust: A Fundamental Doctrine of American Property Law*, 19 ENVTL. L. 515 (1989); *Ill. Cent. R.R. v. Illinois*, 146 U.S. 397, 437 (1892); Sax, *Public Rights*, *supra* note 40, at 171 (stating that the advantage of the doctrine is to make competing interests—public and private—"doctrinally equal"); Byrne, *supra* note 40, at 242 (contending that the doctrine has "breathtaking potential" because it gives a state an overriding property interest even if land is privately held); Hunter, *supra* note 40, at 378 (allows ecological values to be protected in the public interest); Douglas L. Grant, *Western Water Rights and the Public Trust Doctrine: Some Realism About the Takings Issue*, 27 ARIZ. ST. L.J. 423, 457 (1995); Gaither v. Abermarle Hosp., 70 S.E.2d 680, 692 (N.C. 1952) (stating that obstructions need not interfere with navigation, only make it less convenient to constitute a nuisance).

84. *Stevens v. City of Cannon Beach*, 854 P.2d 449, 450-51 (Or. 1993).

85. 33 U.S.C. § 1285(a)(1).

86. 181 F.3d 1285, 1289 (11th Cir. 1999). See, e.g., *Hughey v. JMS Dev. Corp.*, 78 F.3d 1523, 1524-25 (11th Cir. 1996) (recognizing Congress's authority to impose a zero-discharge standard while developing a narrow exception where compliance is impossible).

not published discharge standards for the pollutant at issue. The court found that there was no right to pollute, hence if there is no standard which permits a discharge, there can be none. Even courts hostile to environmental regulation have provided a "rational basis" for a rule of "zero pollution" by conceding that the only demonstrably safe level of *any* pollutant is zero.⁸⁷ This rule is explicitly acknowledged, if widely ignored, in so-called "non-discharge" permits, e.g., those issued for agricultural operations and on-site human waste treatment systems (septic tanks). In fact, the right of government to declare and prohibit public nuisances in the area of public health and safety has been established literally for hundreds of years.⁸⁸ Recently, the U.S. Supreme Court has also refused to recognize a "Right to Develop," holding in *Palazzolo v. Rhode Island* that the "Takings" clause of the U.S. Constitution could be satisfied by allowing *any* beneficial economic use—which dissenters thought could be as little as one residence per twenty acres of waterfront property!⁸⁹

IMPLEMENTATION: THE COURTS ARE THE MOST LIKELY CANDIDATES:

Although the public awareness stirred by the Santa Barbara oil spill, the Cuyahoga River fires and *Silent Spring* galvanized Congress in the 1960's to create the grand statutory schemes that we know as modern environmental law, and we think that protection of the public's property rights and right to clean air and water are popular concepts, we recognize that neither the current Congress nor any state legislature is likely to translate our property rights analysis into law. On the other hand, even though the 105th Congress in the "Contract with America" vowed to repeal what the majority called onerous environmental laws (in part because a majority favored the rights of generators), it did not happen because these laws are popular.⁹⁰ Still, we believe that the

87. *Am. Trucking Ass'n v. Browner*, 175 F.3d 1027 (D.C. Cir. 1999), *rev'd in part*, 531 U.S. 457 (2001).

88. *See, e.g., People v. Lim*, 118 P.2d 472, 476 (Cal. 1941) (*citing State v. Ehrlich*, 64 S.E. 935, 940 (W. Va. 1909)).

89. *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001) (Ginsburg, J., Souter, J., & Breyer, J., dissenting).

90. "81% of voters support stronger environmental regulations or stricter enforcement of existing laws; 75% of Americans would like stronger federal environmental protections; 84% believe that government should enact tougher pollution and emission standards on industry; 82% said that they worry *personally* about pollution of drinking water, rivers, lakes and reservoirs; 78% worry *personally* about air pollution." League of Conservation Voters, *American Voters Place a High Priority On En-*

courts are the most likely avenue to translate a property analysis into environmental policy. The courts created this problem just about one hundred years ago, reversing several hundred years of prior law. They can certainly reverse course to ensure protection of the vast majority of Americans who are receptors.

THE QUESTIONS

Large, unanswered questions remain, of course. For example, to what entity would a generator have to demonstrate that all costs had been internalized, and using what standard? Who pays for the science that would be necessary? The answer may be that it is really no different from the *Bormann* case, where the agency and the legislature had to recognize the common law property rights articulated by the courts—even though it meant re-writing the statutes to encompass those rights.⁹¹ The burden should be on the generator to demonstrate that no offsite effects would occur or in the alternative, why a trespass should be authorized given receptors' rights, so unless one of the public or private funding sources provided a grant, the cost of the science should also be a cost to internalize and should therefore be borne by the generator, just as pharmaceutical manufacturers must do under the Food Drug and Cosmetic Act.⁹²

Could a legislative body authorize compensation and condemn the property rights of receptors? While beyond the scope of this paper, there are several sub-issues. The laws of most jurisdictions require that the condemnation be for a "public purpose." Generally, this does not mean for private profit, except in the case of community redevelopment where a public entity condemns a blighted area, then after improvements, sells the property to the highest bidders to return it to the tax rolls. Would a discharge constitute a valid public purpose? At least the debate would be properly focused on the public value of allowing discharge. Would a condemnation for both private profit and increased tax revenue

Environmental Protections, Despite Concerns About Energy and the Economy, at <http://www.lcveducation.org/> (last visited Nov. 10, 2004) (citations omitted).

91. *Bormann*, 584 N.W.2d 309.

92. See Federal Food, Drug, and Cosmetic Act (FFDCA), 21 U.S.C. §§ 301-97 (1994 & Supp. III 1997) (statute provides for strict regulation of food, drugs, and cosmetics); see also 21 U.S.C. § 321(p) (1994) (defining "new drugs" as those not yet proven "safe and effective").

constitute a taking of the property owner's rights? The U.S. Supreme Court is currently tackling this question.⁹³

Could legislatures fashion an exception for discharges to public space? The laws of most if not all jurisdictions prohibit gifts of public funds. Fair compensation would have to be paid, just as courts require users of public trust waters (such as over-water restaurants) to pay.⁹⁴

Another question would be how to value the interests of the receptors, which also focuses the inquiry on the science and economics needed to make the decision. Concededly this will be difficult at first, given the Data Deficit, but presumably both science and economics will become better at the tasks and both camps would like to move more quickly. Given that both have underestimated the impacts of previous environmental risks, we recommend that some fund or insurance pool be created to manage risks that initial valuation may overlook. Another concept involves creating a market in pollution easements whereby generators could acquire the right to discharge into the air and water—but only if the receptors acting in the market receive acceptable compensation. Here, again, landowners and their representatives, scientists and economists must have the data. Perhaps there could be intervention by government to condemn rights of recalcitrant owners once a set percentage of approvals are secured.

Other issues include whether the concepts would apply only to point sources or also non-point sources. The answer would seem to be in the affirmative, since non-point sources are really only point sources that either have not been identified or which are dispersed throughout a property so that there is discharge but no pipe. In many of these cases, simple instrumentation, such as monitoring wells, can detect the actual flow. Would it affect power plants? Why not? Mobile sources? Mobile sources are property.⁹⁵

93. *Kelo v. City of New London*, 545 U.S. 511 (2005), cert. granted, 159 L. Ed. 2d 857 (2004).

94. See, e.g., N.C. ADMIN. CODE tit. 15A, r. 7M.0601 (July 2001) (prohibiting floating structures that infringe on the public trust rights); *Ill. Cent. R.R. v. Illinois*, 146 U.S. 397, 437 (1892); Douglas L. Grant, *Western Water Rights and the Public Trust Doctrine: Some Realism About the Takings Issue*, 27 ARIZ. ST. L.J. 423, 457 (1995); *Gaither v. Albemarle Hosp.*, 70 S.E.2d 680, 692 (N.C. 1952) (stating that obstructions need not interfere with navigation, only make it less convenient to constitute a nuisance).

95. *Borland*, 369 So. 2d at 530.

THE EXISTING REGULATORY FRAMEWORK DOES NOT ACCOMPLISH THESE GOALS.

The truth is that existing environmental statutes permit pollution and allow externalities. Politics and the budget deficits have limited critical data and limited enforcement efforts so that the resulting framework focuses on cost and feasibility to the generator rather than the impact on receptors. The first step is to quantify all the costs of pollution. This is difficult to do, given the Data Deficit, so there is much work for scientists and economists.

Technology-based and Risk-based systems do not completely internalize costs because they focus on *feasibility* and *cost to producers and generators*, and not on quantifying and internalizing externalities. At best, the systems attempt to weigh costs against benefits, which ignores the pivotal market requirement to internalize costs completely *before* weighing benefits of the economic activity. Of course, without adequate data, it is difficult to quantify true costs and without true costs the benefits cannot be accurately balanced in any event. Using "Available Technology" standards, which includes a number of variants, from "Best Available" to "Maximum Available" (and even the agricultural standard, "Best Management Practices"), (a) is subject to substantial discretion; (b) fails to force technological innovation (as the 1975-76 California auto emissions standards did); and (c) feasibility of technology or practices is related to the issue of the harm caused only to the extent that use of some form of BAT might result in partial internalization of costs.⁹⁶

Risk-based systems require data, which often do not exist, and depend ultimately on a judgment as to whose asthmatic child or grandparent should be sacrificed? The familiar formula for Risk Assessment is: Hazard Identification; Dose-response Assessment; Exposure Assessment; and Risk Characterization.⁹⁷ The final step

96. During the controversy over California's 1975-1976 new vehicle emissions standards, Honda proved that the standards could be met despite the protest of Detroit that they were unattainable. Richard Halloran, *New Honda Engine Can Meet U.S. Anti-Pollution Rules*, N.Y. TIMES, July 2, 1973, at 39. A new controversy has just erupted over California's new "greenhouse gas" motor vehicle emissions limitations, which manufacturers again contend they cannot meet. See also Cal. Air Res. Bd., *Regulatory Documents for the Greenhouse Gas Emissions from Motor Vehicles*, at <http://www.arb.ca.gov/regact/grnhsgas/grnhsgas.htm> (last updated Oct. 19, 2004); John DeCicco et al., *Environmental Defense, Automaker Carbon Burdens in California*, at <http://www.environmentaldefense.org/pdf.cfm?ContentID=3986&FileName=caautocarbonburden.pdf> (Sept. 17, 2004).

97. These four tests are from the National Academy of Sciences and are used extensively. See, e.g., EPA, EPA Pollution Prevention (P2) Framework, at <http://www>.

clearly involves a value judgment as to the relative severity of the risk, thus this is a subjective, not a purely "scientific" process or objective process. As now Justice Breyer wrote in 1993, there are widely differing perspectives on the nature and significance of even common risks.⁹⁸ Further, William Ruckelshaus, President Nixon's EPA Administrator, argues that risk assessment is often confused with risk *management*, where political judgments intercede⁹⁹. The Data Deficit also factors heavily: Graham, et al., note, "Our view is that risk assessment has become too formalized and mechanical in light of the limited data. Little is gained from sophisticated massaging of weak data."¹⁰⁰ Thus, the risk management process does not internalize costs completely because it relies upon value judgments as to acceptable levels of damage that are grounded on inadequate data.¹⁰¹ Moreover, there are seldom allowances made for the estimates and value judgments if they prove to be incorrect, such as a damage fund or dispute mecha-

epa.gov/oppt/p2framework/images/p2man0103001020intromodelsepi.pdf (Oct. 2003). EPA's *Risk & Decision Making* (1992) and *Guidance for Risk Characterization* (1995) both provide a description of the components of risk assessment. EPA's *Children's Health Valuation Handbook* (Oct. 2003), adds two factors for environmental economics studies:

"QUANTIFICATION OF WELFARE EFFECTS: Specifying the ways in which changes in children's health affect welfare. These may include impacts on school attendance, parents' attendance at work, medical expenditures, pain and suffering endured, etc. VALUATION OF THE WELFARE EFFECTS: Monetizing the expected changes in welfare using appropriate economic techniques. If monetization is impractical, alternatives including simple health effect inventories are considered. Generally, the first four steps of the process (hazard identification through risk characterization) fall under the realm of risk assessment. In the final two steps, quantification and valuation of the welfare effects, economists use estimates provided by risk assessors and produce monetary values of the expected changes in welfare."

Richard E. Just et al., *WELFARE ECONOMICS OF PUBLIC POLICY: A PRACTICAL APPROACH TO PROJECT AND POLICY EVALUATION* (Edward Elgar 2004).

98. Stephen Breyer, *BREAKING THE VICIOUS CYCLE: TOWARD EFFECTIVE RISK REGULATION* (Harvard Univ. Press 1993).

99. Ruckelshaus, "Risk, Science and Democracy", *Issues in Science and Technology*, Spring 1985, pp. 19-38.

100. Graham et al., *IN SEARCH OF SAFETY: CHEMICALS AND CANCER RISK* (Harvard Univ. Press 1998).

101. We recognize that even if all costs were completely internalized and there were no uncertainty, there would still be political/ethical/equity decisions to make—i.e., do you spend the last \$100 on cancer research or AIDS research? Economics will never enable us to avoid equity tradeoffs, it just tries to clarify the tradeoffs and to help us make the tradeoffs efficiently/without waste. However, until true costs are identified, internalization—or subsidization if that is the political choice—cannot occur accurately.

nism.¹⁰² As the courts have said, the only sure method to eliminate the risk inherent in externalities (and therefore internalize costs) is to have zero discharge.¹⁰³

Market-based strategies at present include, (1) emissions trading systems, although only the sulfur dioxide air market is in place; and (2) emissions charges.¹⁰⁴ While theoretically attractive, there are significant concerns. First, economic efficiency is not the only factor in any determination of the greatest good, especially if the analysis is based on deficient data and incomplete analysis. Equity must also be considered. *Emissions trading* requires a determination (utilizing traditional methods and existing deficient data) of some level of pollution acceptable to the regulatory agency, which then becomes a "cap". Then there must be a judgment call (as has been done by EPA in the SO₂ and NO_x market) as to which existing and future dischargers get what "rights" to pollute.¹⁰⁵ For example, the EPA recently issued a rule permitting trading of mercury emissions, which requires a nationwide "cap" on total emissions¹⁰⁶. Thus unless market participants other than generators purchase and retire the "rights", there is only a reduction in pollution below the cap if mandated by statutes or rule, and without a reduction, this system *sanctions* rather than eliminates externalities. EPA even admits that, ". . .eliminating localized concentrations of pollution is not [the] primary purpose [of cap and trade programs]¹⁰⁷."

Emissions charges require some determination of the actual costs of pollution to provide the correct incentive for generators to

102. An exception is the damage fund for cleaning up leaking underground gasoline storage tanks, and there is extensive theoretical work on the economics of assurance bonds and how these could be used as damage funds and to provide incentives to avoid/prevent spills/damages.

103. *Am. Trucking Ass'n.*, 175 F.3d at 1037.

104. C. William Simmons & Robert H. Cutting, Jr., *A Many-Layered Wonder: Non-Vehicular Air Pollution Control in California*, 26 HASTINGS L.J. 109, 113 (1975); J.H. DALES, *POLLUTION, PROPERTY & PRICES* 7-8 (Univ. of Toronto Press 1968).

105. The permits *could* be sold or auctioned off by the government, or the government could give them to the potential "victims," who could then decide whether to sell them to the potential polluters, thus financing movement of the victims "out of harm's way," or the victims could decide to keep the permits and not sell them to the polluters, which effectively would eliminate pollution in that area, either by disallowing the activity that causes pollution, or by indirectly forcing the potential polluters to find some alternative means of production/recycling that does not result in pollution.

106. 40 CFR Parts 60, 63, 72, and 75, [OAR-2002-0056; FRL-] RIN 2060-AJ65 (March 15, 2005); see also discussion by EPA at: <http://www.epa.gov/mercuryrule/rule.htm> (last visited April 22, 2005).

107. <http://www.epa.gov/airmarkets/capandtrade/ctessentials.pdf> (last visited April 22, 2005).

reduce pollution to the point where the incremental benefits of reduction equal the incremental costs, sometimes coupled with a method to redistribute the costs from generators to those receptors who are damaged (the "charges"). The Data Deficit makes this difficult, although assuming the mechanism for assessment and redistribution is accurate, it would address the externalities issue more completely than most solutions.

Private Rights of Action: Use of the courts results only in case-by-case internalization, which does not completely internalize costs. Huge transactional costs (attorneys, experts, time) often fall on those least able to pay, ensuring that not all claims are litigated.¹⁰⁸ The process is also fraught with uncertainty, given the jury system, and that the generator's conduct must often be found to be "unreasonable", hardly an objective standard.¹⁰⁹ Moreover, the rights of individuals to press legal claims for redress and damages are often limited by statute and court interpretations.¹¹⁰

Government has greatly hamstrung the market's ability to encourage pollution prevention and discourage polluting activities by permitting externalities. The famous "invisible hand" property of markets, the behavior that usually guides society toward efficiency, is short-circuited by externalities, with the result that the

108. See *A CIVIL ACTION* (Buena Vista Studios 1998) (depicting the infamous toxic pollution case in Woburn, Mass.); *ERIN BROCKOVICH* (Universal Pictures 2000) (depicting the Pacific Gas & Electric water pollution case in California). U.S. Gen. Accounting Office, *Siting of Hazardous Waste Landfills and their Correlation with Racial and Economic Status of Surrounding Communities*, Gao/Rced-83-168, B-211461 (June 1, 1983) available at <http://archive.gao.gov/d48t13/121648.pdf>; Comm'n For Racial Justice & United Church Of Christ, *Toxic Waste and Race in the United States: National Report on the Racial and Socioeconomic Characteristics of Communities with Hazardous Waste Sites* (Public Access Data 1987); JAY M. GOULD, *QUALITY OF LIFE IN AMERICAN NEIGHBORHOODS, LEVELS OF AFFLUENCE, TOXIC WASTE, AND CANCER MORTALITY IN RESIDENTIAL ZIP CODE AREAS* (1986); ROBERT D. BULLARD, *DUMPING IN DIXIE: RACE, CLASS, AND ENVIRONMENTAL QUALITY* (1990); BENJAMIN A. GOLDMAN, *THE TRUTH ABOUT WHERE YOU LIVE: AN ATLAS FOR ACTION ON TOXINS AND MORTALITY* (1991); Marianne Lavelle & Marcia Coyle, *Unequal Protection: The Racial Divide in Environmental Law: A Special Investigation*, NAT'L L.J., S1 (Sept. 21, 1992); Exec. Order No. 12,898, 60 Fed. Reg. 6381 (Jan. 30, 1995).

109. Zygmunt J.B. Plater, *Statutory Violations and Equitable Discretion*, 70 CAL. L. REV. 524, 527-28 (1982).

110. The North Carolina Court of Appeals recently held that the state's Clean Water Act limited the right to sue polluters for public nuisance only to the state government, not private individuals or organizations, even if they claimed specific harm. *Neuse River Found., Inc. v. Smithfield Foods, Inc.*, 574 S.E.2d 48 (NC. Ct. App. 2002); but see *Friends of the Earth v. Laidlaw Envtl. Serv.*, 528 U.S. 167 (2000) (taking a more relaxed approach to standing requirements, holding that environmental groups do not need to allege specific harm to the environment).

public is forced to subsidize the producers. If the market is to be ignored, the process should be far more transparent.

CONCLUSION: REACHING THE GOAL:

Simply, shift the burden to the polluter to demonstrate that all externalities have been internalized. Thus, each permit holder or applicant would start with a zero-based pollution budget, much as accountants utilize zero-based budgeting to force business or government to justify each expenditure in a budget cycle. This would require truly sound science, funded by the proposed generator, to justify the conclusion that pollution had been internalized. Steps could include:

1. Permit Review: All permits should be re-opened to include:
 - a. Shift of the Burden of Proof to the Polluter to demonstrate that all costs of waste disposal have been internalized, including any invasions of receptors' property rights;
 - b. Harm-based regulations for interim standards, including increased funding for basic scientific research and technical assistance;
 - c. Time to convert the system: but not the usual extensive time because the trespass to other properties is critical and should be paramount, and because to ignore those rights would expose the jurisdiction to a Takings claim by the receptor landowners and occupiers.
2. Enforcement: Given that there will never be enough resources for enforcement, initiate:
 - a. Remote Sensing: common for in-stack air monitoring, it eliminates the inherent untrustworthiness of self-reporting as on the DMR's (daily monitoring reports) required for dischargers to surface waters. Monitoring wells, for example, are often inexpensive means to gauge offsite transport—but in North Carolina, for example, the Department of Environment and Natural Resources will not require wells even for intensive livestock operations.¹¹¹ This technology is largely available now—and the science could be sped up.

111. See Lawrence B. Cahoon, et al., *Nitrogen and Phosphorus Imports to the Cape Fear and Neuse River Basins to Support Intensive Livestock Production*, 33 ENVTL. SCI. TECH. 410, 410 (1999) (discussing nutrient loading); see also Pat Stith & Joby Warrick, *Boss Hog*, RALEIGH NEWS & OBSERVER, Feb. 19-26, 1995, available at <http://www.pulitzer.org/year/1996/public-service/works/about.html> (last visited Nov. 10, 2004) (a Pulitzer-prize winning series on hog farm pollution, corporate farming, and politics).

- b. **Real-Time Reporting:** A system of web entry of the data for required reporting to agencies, for example that would with one simple and secure entry, transmit data that is public to the agency (or at least a clearinghouse), where it would be simultaneously posted to the web, sent to appropriate officials, and automatically acknowledged. Data reports and enforcement memos could automatically be generated. This, too, is available NOW through Cold Fusion and other database-to-web programs.¹¹²
 - c. **Accessible Public Records:** A national (and international) clearinghouse could easily be created that would be searchable by industry, company or product, and which would contain (1) information on current pollution, (2) information on cases, administrative actions and other enforcement procedures, as well as (3) information on participation in pollution reduction programs. A consumer or an investor could access the database even in stores and vote for those who demonstrate clean environmental records every time they shop. Clearly, people vote more often with their pocketbooks than at the polls, and the marketplace is supposed to include transactions between an informed seller and an informed buyer, so the impact would likely be far greater than any regulatory regime. Moreover, preliminary studies indicate that data have a demonstrable effect on both compliance by the regulated entity and on investors.¹¹³ The data are public record now, but difficult to manipulate unless an initial commitment of resources were made.
3. **GATT/NAFTA/CAFTA:** We join those who recommend modification of the trade pacts to establish that nations may limit

112. In fact, efforts are underway to form the National Environmental Information Exchange Network, through EPA and ECOS (the Environmental Council of States), but implementation will take some time given the current funding and even then the public may not easily be able to access the data. See R. Steven Brown and Valerie Green, Environmental Council of the States, *Report to Congress: State Environmental Contributions to Enforcement and Compliance* (2001), available at <http://www.sso.org/ecos/projects/Enforcement/ECOSFull%20Enf%20Report.pdf>. Mr. Cutting and an undergraduate student put such a generic program together using Cold Fusion as early as 2000.

113. See, e.g., Madhu Khanna et al., *Toxic Release Information: a Policy Tool for Environmental Protection*, 36 J. ENVTL. ECON. & MGMT. 243, 243-246 (1998); Shameek Konar & Mark A. Cohen, *Information as Regulation: The Effect of Community Right to Know Laws on Toxic Emissions*, 32 J. ENVTL. ECON. & MGMT. 109, 109-124 (1997); Jerome Foulon et al., *Incentives for Pollution Control: Regulation or Information?*, 44 J. ENVTL. ECON. & MGMT. 169, 169-187 (2002); James T. Hamilton, *Pollution as News: Media and Stock Market Reactions to the Toxics Release Inventory Data*, 28 J. ENVTL. ECON. & MGMT. 98, 98-113 (1995).

access to their markets for entities that operate under less stringent environmental regulations.¹¹⁴ Commonly, generators move from jurisdictions with more stringent pollution control laws to areas with few laws or lax enforcement and thereby achieve significant cost reductions, and thereby create market pressure to loosen laws even further. An example close to home is the U.S. border with Mexico, where U.S. companies have simply moved from the U.S. to the Mexican side of the Rio Grande, and where Mexican enforcement of environmental regulations has historically been lax (The *Maquiladora* phenomena).¹¹⁵ The pollutants are discharged to the same surface water body, thereby creating pollution problems in the U.S. over which the U.S. has little control. Why should entities that move offshore to avoid more stringent pollution control rules enjoy any advantage for evading measures intended to protect the planet's resources and environment? Such measures do not restrict the options of nations who choose to allow pollution. But other nations could agree that *business entities* that evade environmental rules are engaging in *unfair business practices*, which entitle nations to exclude products, services and even the companies themselves. Foreign entities have already charged that U.S. laws designed to provide environmental protection constitute barriers to trade. A nation that restricts products because of the manner in which they are produced is now accused of an unfair trade practice, as the World Trade Organization arbitrators held when tuna which was caught without dolphin-friendly gear was excluded from U.S. sale under the Marine Mammal Protection Act.¹¹⁶ Other nations have even chal-

114. See, e.g., PATRICK WOODALL, SIERRA CLUB, WHEN BAD THINGS HAPPEN TO GOOD LAWS: HOW INTERNATIONAL TRADE PACTS THREATEN CALIFORNIA'S ENVIRONMENTAL LAWS (2004), at <http://www.sierraclub.org/trade/California>; Sierra Club, *A Fair Trade Bill of Rights*, <http://www.sierraclub.org/trade/ftaa/rights.asp> (last visited Nov. 10, 2004).

115. See, e.g., Sierra Club, *Southern Plains Regional Issues: International Issues*, at <http://www.sierraclub.org/field/southernplains/issues/international.asp> (last visited Oct. 17, 2004) (and other materials linked to that site). The NAFTA included a side agreement on environment, but the results are still both unpredictable and unclear. See, e.g., MARY TIEMANN, U.S. DEPT. OF STATE, NAFTA: RELATED ENVIRONMENTAL ISSUES AND INITIATIVES, at <http://fpc.state.gov/fpc/6143.htm> (last updated Mar. 2000).

116. General Agreement on Tariffs and Trade (GATT), *Dispute Settlement Panel Report on United States Restrictions on Imports of Tuna*, 30 I.L.M. 1594 (1991); See also, e.g., Donald McRae, *Trade and the Environment: Competition, Cooperation or Confusion?*, 41 ALBERTA L. REV. 745, (2003); see also Woodall, *supra* note 104; GREG PALAST, *THE BEST DEMOCRACY MONEY CAN BUY* (2002); Paul Krugman, *Enemies of the WTO: Bogus arguments against the World Trade Organization*, MSN SLATE MAGAZINE, Nov. 24, 1999, at <http://slate.msn.com/id/56497>.

lenged “eco-labeling” requirements to provide consumers with *information* about products in the U.S. marketplace.¹¹⁷ Even so, it seems to us that any entity that imports materials manufactured offshore could easily be required to post real-time data on the environmental record of any facility used in its processes, so at very least the public could decide which entities deserve consumer support.

The “outsourcing” phenomenon is then used to convince states and local jurisdictions to swallow more pollution rather than risk job loss. Another method to reduce some of the pressure on domestic jurisdictions would be to eliminate the current tax breaks for the practice.

Someday, politicians may recognize that (1) receptors are far more numerous than generators — although receptors may not contribute as much to campaigns, knowledge of pollution practices may energize them to vote or buy differently if the information is available; (2) Keeping pollutants out of receptors’ property protects health, as well as property rights; and (3) these are popular concerns. We have a choice: do it now for future generations (a true “Family Value”), or let those generations judge us based on the waste from production and the wastes the transitory products become that we have left them.

117. See Margrete Strand, *Poisoned Workers, Poisoned Fields*, Sierra Club, at <http://www.sierraclub.org/trade/environment/poisoned.asp> (last visited Nov. 11, 2004); Sierra Club, *A Fair Trade Bill of Rights*, at <http://www.sierraclub.org/trade/ftaa/rights.asp> (last visited Oct. 17, 2004).