Brownfields, Risk-Based Corrective Action, and Local Communities

Peter B. Meyer
The E.P. Systems Group, Inc.

Abstract

This article addresses the problems facing communities that suffer both environmental risks from past contamination and depressed economic activity. In such settings, redevelopment of contaminated sites and the associated economic development may require compromised standards for environmental mitigation. This potential conflict is often resolved through risk-based corrective action on sites cleaned only for their prospective use. But partial cleanups can be shown to face inevitable failure at some future date. Thus, in such an approach, communities face risks that they need to understand and should be capable of accepting or rejecting. The article considers these risks and assesses four alternative land use control strategies for assuring community participation in making decisions about both the cleanup process today and the response to risks of failure in the future.

Introduction

In 1980, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or the Superfund Act), which had a number of unexpected consequences. The act's draconian liability provisions improved general environmental conditions by raising the expected costs of future contamination to businesses and by discouraging the future use of toxins. The act's liability provisions, however, worsened environmental justice inequalities and undermined urban economic development prospects. CERCLA made urban regeneration in the United States more difficult and less likely to occur because of its clear public recognition of the environmental, and thus financial, risks posed by past pollution, regardless of cause or intent. CERCLA made urban land less competitive as a site for real estate investment relative to greenfield sprawl alternatives. As a result, all 50 states responded to CERCLA with new liability, cleanup, and development policies. The most immediate returns on remediation and redevelopment of brown-

field sites (those with real or perceived contamination), however, do not accrue to the states, but to local governments, which garner new tax revenues and may be able to remove tax-delinquent sites from their own property rolls (Meyer and VanLandingham, 2000).

Residents and property owners in local communities experience an inherent conflict between economic development and environmental protection objectives given that stronger environmental mitigation standards raise project costs and thus can slow the redevelopment process (Bullard, 2007). In considering communities' capacities to make rational and informed development choices, however, this article does not focus on the environmental justice issue that concerns Bullard and many others, but rather considers the generally limited capacity of community-based organizations of all types to address these brownfield tradeoffs effectively (Blair and Carroll, 2007; Leigh, 2000).

Although communities across the United States struggle to regenerate after economic declines produced by business closings and relocations, many confront land contamination issues that compound the problem of depressed property values. An issue of further concern, common to urban settings, is the clustering in an area of multiple nonadjacent contaminated parcels (scatter site brownfields) that undermine each other's economic attractiveness (Boyle and Kiel, 2001; Longo and Alberini, 2006). Such scattered brownfields pose special problems, but—ironically—they can provide a stimulus for organized, communitywide regeneration efforts: no one site can be addressed by itself in an economically efficient manner because the offsite effects of the environmental problems on nearby land would continue to pose exceptional investment risks. The interaction effects across the multiple scattered brownfields suggest a need for policymaking that transcends the developer's focus on a single project site and addresses the broader external effects on properties across communities.

The fact that a clear rationale for a collective community response exists, however, does not imply that it will be taken. The danger exists that a community-based response to economic distress may fail to address the full range of problematic exposures posed by the past contamination. One recently proposed agenda for community-led development, for example, mentions brownfields only in passing, although the agenda focuses on "America's older core cities" (Fox and Treuhaft, 2006). The real risk is that environmental problems associated with less costly site preparations may be overlooked in pursuit of short-term and purely economic returns, a risk that may increase with neighborhood or community desperation.

This article presents a review of some U.S. states' and municipalities' responses that avoid the sacrifice of environmental objectives to economic gains and suggests some lessons states and municipalities may learn from each other, once socioeconomic, political, and legal differences are taken into consideration. The discussion begins with a review of the real estate market and general economic conditions that shape the available financially viable remedial response options. Next, the article addresses risk factors that shape decisions and then discusses two major types of controls for environmental contaminants left in place. The article then considers the roles of time and project timing, examining first the role of the passage of time in emerging risks and then the issue of the time value of money in decisions about response costs to be incurred or expected. The article then examines the determinants of community roles in protecting local environments, explores how different patterns of land ownership affect the controls and risk management capacities of a project, and offers a brief conclusion.

Markets and Remedial Response Options

Even before property values declined from 2007 through 2009, U.S. real estate prices, in general, were not high enough to avoid the fundamental problem of mitigation costs that completely swamped land values on some brownfields. Urban sites that exhibited a land value that was lower than the cost to prepare the property for new construction were relatively common long before the 'credit crunch' and the market explosion of bankruptcies and foreclosures.

The relationship between clean property values and site mitigation costs, which determines the remedial responses contemplated, is shaped in large part by the continuous pattern of expansion of the urban fabric that is generically referred to as *sprawl*. To date, the United States has perceived itself as boundless, with automobile-based commuting permitting extremely low densities of settlement, resulting in the nation's urbanized area expanding more rapidly than its population for decades, even in regions with depressed economies. In these sprawling settings, the urban centers are quite literally hollowed out, leaving sections of total land and property abandonment. Detroit, Michigan is the archetype on some level, with multistory office towers sitting empty for decades—but other older industrial centers such as Cleveland, Ohio, have seen the phenomenon of a doubling of urbanized land area over a 20- to 30-year period of decline of total county or metropolitan area population.

This pattern of abandonment and the subsequent low market demand for land at the center of urban areas drove down property values, thereby severely limiting the extent of market-driven pollution removal projects at older contaminated urban sites. Contamination removal efforts in the United States have been driven by the intensity (and density) of intended new land uses, but even relatively high densities could not assure a financial capacity for complete removal of all contaminants, even when such a response was technologically possible (which is not always the case).

A new concern in the United States for "densification"—a market shift driven initially by demographic factors and now amplified by the increasing costs of automobile commuting —implies a more intense focus on economically viable reuse of centrally located urban lands. The renewed emphasis by the Obama administration on finding ways to reduce emissions and general energy consumption is another factor promoting increased population density and reuse of existing buildings because of the high energy costs associated with demolition and new construction. Any growth in the intensity of land use could drive higher property sales and rental revenues, which would render the more expensive and complete cleanup options cost effective.

A limit exists, however, to which these revenue gains can lead to complete mitigations of past pollution. The costs of remedial responses rise at a more than proportional rate with extent of removal or treatment of contaminants; it generally costs less to remove the first 10 percent of the pollution (near the surface, for instance) than the last 10 percent (that which is buried deeper or more broadly spread around). At some point, removing the next marginal unit of pollution from the site increases costs to a level at which the developer's current costs and revenues, not the project total costs over time, may drive contamination eradication decisions, because businesses cannot sustain long periods of negative cash flow.

Some costs associated with past contamination may be deferrable for long periods of time. Fully monitored contaminants that may be left on site, under regulations or special exceptions, are still

likely to generate future costs. But the timing of those costs—and the lack of certainty of their timing and dollar value—varies with the extent to which past pollution is remediated. That timing can also be affected by the different exposure risks posed by the variety of pollutants on a site, which is the subject of the next section.

Contaminants, Risk Factors, and Controls on Residual Pollutants

Three interacting factors shape the risks to human health and the environment associated with residual pollutants left on site:

1. The pollution itself (types and volumes or quantities of contaminants).
2. The damage done from exposure to different quantities of these substances.
3. The means of exposure (or pathways) by which humans and/or the larger ecosystem are impacted.

The more diverse the mix of *different* contaminants on a site, the more complex the toxic soup and the more difficult it becomes to determine the damage and exposure pathways. All three risk factors, however, need to be understood to be able to derive any probability estimates of the extent of damage under different conditions of contaminant retention for a site. Yet all risk-based corrective action (RBCA) responses assume that these probabilities not only can be known but that they actually are known.

The RBCA logic assumes that some preventive barriers or other management tools can be used on the existing contamination that can keep it from causing harm. The calculation is generally based on taking actions to ensure that key risks of harm lie below some threshold, such as injuries or death per million people exposed. The problem with this approach is that the probabilities generally cannot be known. Given the uncertainties involved, especially with mixes of contaminants on site, the data required for such risk calculations may be logically impossible to determine with any reliability.

The starting point to any risk calculation is to recognize that limiting human and ecosystem exposure is a key concern if a site contains contaminants. Perhaps that is why RBCA focuses on limiting factor (3) above through the implementation of specific controls to limit human and ecosystem exposure to contaminants left in place. That process of constraining the likelihood of damage relies on two forms of controls intended to limit the pathways along which risk exposures could occur. In the United States, these controls are referred to in RBCA policies as—

- ***Engineering controls* (ECs)—**physical barriers instituted to contain pollution and keep it from surfacing or migrating to eliminate (or constrain) exposure pathways.
- ***Land use controls or institutional controls* (LUCs or ICs)—**implemented to constrain onsite human activities to limit any possible damage to ECs and the total time on site for human exposure to whatever substances continue to move along partially blocked pathways.

Two points of inadequacy in this approach to controls should be immediately obvious from this description. First is the issue of ecosystem damage, which is overlooked by controls that relate only to human exposure limitations. Second is the assumption that the controls can be maintained over time, when the control specifications lack any discussion of the costs of maintaining those controls.

This latter point also reflects a failure to consider ecological interactions other than those involving humans: LUCs may constrain human digging to protect ECs, but they cannot control the behavior of pets, such as dogs, let alone the actions of rabbits, moles, or other wild animals that dig burrows for homes or foraging paths.

Both ECs and ICs limit the exposure pathways, but they do not fully eliminate them. In the event of failure of either ECs or LUCs, offsite neighborhood exposures can arise, with the resulting harm concentrated on those living, working, and owning property in the area, and the risk remains into the future (Rowan and Fridgen, 2003). Yet the real estate transactions underlying most regeneration efforts involve sellers, buyers, financial backers (including at times state or local government economic development agencies), and potentially one or more prospective end users, plus appropriate regulatory agencies, including financial and environmental regulators responsible for limiting aggregate risk. The site neighbors and their community, the parties most affected by the pollution risks—arguably those with the highest stake in assuring RBCA success—are rarely given legal standing in contaminated land site preparation and reuse decisions.

Time, Use, and Emerging Risks

Some current monetary costs can be avoided through a partial mitigation or by using a clean to intended use redevelopment strategy. There is, however, scant evidence that such approaches hold down total project costs over time. Strong logical and empirical grounds exist for claiming that RBCA failure is inevitable. Neither the engineering nor the land use controls currently available or installed in the past decade have been in place long enough to show that they will last the tests of time (Wernstedt et al., 2007).

The efficacy of ECs over time cannot be known, due both to limited past experience with the existing containment techniques and to an inability to forecast the future. The empirical finding that a barrier has lasted 10 years is not proof that it will last 20—or even 11—years. Consider the following:

- Accidental damage may result from actions of site visitors—or even by those of nominally informed occupants.
- Natural disasters—floods, windstorms, earthquakes, and the like may cause unexpected weakening of containments.
- Climate changes—in temperatures and humidity levels—can affect the viability of caps on pollution, such as those using clay and other natural impermeable layers.
- Some maintenance of barriers may be required and expected in plans (such as repairs of the surface of paved areas with asphalt or other such caps) but may eventually be ignored or forgotten over time.

ICs are even more vulnerable, because the limits on land uses and activities depend completely on the consistency and constancy of human behavior.

- Information on activity and use limits may be lost over the course of real estate ownership changes.
- Provisions for informing new owners are rarely codified, and even fewer regulations ensure that information about contamination is transmitted to future leaseholders and occupants.

- Informal occupancy changes and unauthorized site uses pose the risk of violating the preventive controls because such parties are likely to ignore any information that is available.
- The extent of this problem may vary, including across local authorities in those nations and states that delegate such regulatory enforcement to the local level.

Empirical evidence derived from U.S. environmental insurance market data reinforces the logical claims about the inevitability of RBCA failure over the longer term. Although pollution liability (PL) insurance policies covering a 20-year term were more readily available in 1999, by 2005 that market tightened terms to offering routine 5-year policies, with premiums on 10-year terms not just doubling but increasing to as much as four to five times what the shorter term coverage policies cost. Guaranteed renewals were available in 1999 but were not obtainable at any price in 2005, and underwriters were expressing a desire to push policy terms down toward the 1-year period, characteristic of U.S. homeowners and automobile insurance coverage terms. As might be expected from these findings, the overall supply of coverage—the total dollar limits of insurance available for PL policies—did not expand as quickly as the contaminated land market. Although the insurance companies do not report the total dollars of risk underwritten per product line, the availability of PL coverage may have decreased as demand increased (Yount, 1999; Yount and Meyer, 2005).

Insurers make money by underwriting risks. Their ability to do so is a function of their capacity to accurately predict losses and charge premiums for coverage appropriate to their level of claims. The tightening of term lengths in the PL policies available in the United States must be taken to reflect the insurers' inability to accurately predict claims and losses beyond a very limited period of time. The limited supply of PL insurance, in turn, may be read to reflect the overall lack of confidence of the insurance underwriters in their ability to develop better loss prediction algorithms in the future, and thus their reduced interest in maintaining a position in the PL insurance market. Thus, the insurers, on balance, reinforce the claim of inevitable RBCA failure through their market behaviors.

The Remedial Response Cost Issues

The inevitability of RBCA failure, in turn, poses questions for the private and public parties engaged in contaminated land redevelopment and area regeneration. These issues fall into the cost-benefit analysis framework and finally move the argument beyond simply monetary cost minimization for private real estate investors.

We can posit a constant level of benefits from site redevelopment and associated urban or community regeneration, provided that the project offers some minimum level of protection of human health and the environment. (Logically, then, the future costs of the remedy failure have to include the expense incurred in reproducing that minimum level of protection and compensation for any harm caused by the temporary lapse in protection.) Thus, we can consider how the probability of RBCA failure shapes three facets of decisions involving project costs and a policy principle regarding environmental cost allocation.

First is the issue of minimizing the present value of total project costs, which involves the timing of costs, with the total dependent on the time value of money. RBCA reduces current project costs, but inevitable future failure means that total project costs will include required future expenditures.

If the future costs of failure and repair are sufficiently high, the discount rate sufficiently low, and the failure costs occur soon enough, then the present value of total project costs could well be greater under RBCA than under a clean-to-background approach.

But a regeneration strategy cannot rely on the present-value cost as a basis for decisions on which sites to address and how to address the cost of cleanup if it is completely dependent on private capital investment. The issue of cash flow is central to private investors who face debt service or other financial obligations over time, typically sooner rather than later. The present-value-cost criterion thus leads to the issue of the distribution of costs. The extent of public responsibility for current costs is not clear if the policy objective is total-cost minimization over time. No question exists, however, about the logic of some public involvement if a criterion other than private internal rate of return maximization is to be applied to remediation decisions.

Once the public sector—and public interest—enters into the decision and the potential resource base for regeneration, then the decision process has to pose the question of the types of costs to include. Monetary costs are what matter most to private investors (and may be all that matters to them), so ecosystem and social costs may not be relevant to their decisions. But which monetary costs do they face? Which social costs are internalized into the investment decision and which are excluded? How are collective monetary costs (driven by air quality, water quality, and ecosystem health effects on human health status for people living or working in an area) addressed as distinct from individual costs (such as changes in housing costs and the cost to access amenities)?

The distribution of the cost burdens gets more complex when nonmonetized costs are added to the mix, especially when such elements are social or collective, making it generally impossible to internalize these elements into the investment decision. Yet knowledge of the distribution—and opinions about its efficacy and equity—are likely to affect willingness to pay. The resulting attitude will then shape the political will to invest the public funds that may be needed to complement private investment in regeneration projects. Policymakers' ability to exercise political will, moreover, may be constrained by a locality's ability to pay and fiscal stress.

This discussion excludes the politically sensitive question of the capacity of a coherent regeneration policy intended to minimize aggregate costs to humans and ecosystems to adhere to the "polluter pays" principle. RBCA approaches that reduce current costs to private investors can provide the aura of adherence to the principle. If, however, the future costs swamp the current costs, whether or not those eventual costs are discounted, the reality may be that the broader economy and society pay, not just the putative polluter. The problem is unavoidable without some form of indefinite insurance coverage when the polluter—or the regeneration investor benefiting from reduced current project cost under RBCA—is no longer in business or is economically incapable of paying for the inevitable costs of remedial response failure.

Community Roles in Local Public Cost Minimization

The geographic effects of any future RBCA failures, damages, and response costs are concentrated in the areas around the sites that still retain some pollutants. Yet, unless a conscious effort is made by a developer—or required by some public regulation—local community representatives are not involved in contamination management decisions associated with urban regeneration efforts.

An exception arises when a community-based organization (CBO) is itself a party to the real estate transaction. Neighborhood residents generally want to see eyesores, abandoned buildings, and environmental exposures removed and welcome new investment, especially in economic activities that provide even short-term (construction) jobs. New real estate investment, by and large, is in the interest of all neighborhood property owners, especially if the development removes the factors that contribute to depressed property values. If the regeneration effort brings new jobs for local residents, neighborhoods receive an even broader benefit. But the costs of those new revitalizing investments may be higher than is desired for long-term environmental risk exposures associated with RBCA site mitigations, and those higher costs present a tradeoff problem for the CBOs.

The apparent conflict between economic development and environmental protection costs is not new to debates in the economics literature. Many analysts have claimed that protecting the environment carries a substantial price by slowing rates of economic growth or by making current growth unsustainable (for example, Jorgensen and Wilcoxen, 1990; Rees, 2003). Others have argued that the conflict is exaggerated and the overall effect of environmental regulations on the economy is minimal (for example, Daly and Townsend, 1993; Jaffe et al., 1995). Yet others have acknowledged a potential problem, but demonstrated that the conflict could be avoided or muted through judicious choice of regulatory methods (for example, Carraro and Galeotti, 1997; Hahn, 1989; Pagiola, Bishop, and Landell-Mills, 2002).

The analyses in this debate over possible conflicts, however, are generally relevant only to economic aggregates such as states or nations. The tradeoffs in depressed communities (sometimes very small sections of localities) are much starker, because the effects involve location decisions internal to a larger economy. The presence of contaminated sites, from a market perspective, may not be the primary deterrent to new investment, given localized social problems, locational disadvantages, and other factors (Walker et al., 1998). The pressure to limit the stringency of cleanups in such areas is driven by an exceptionally high, immediate short-term need for jobs and income but is confounded by the unequal exposure to environmental risks (see Bullard, 2007).

Disregarding the specific tactics that might be pursued, basically just two options exist for CBOs and others confronting the dual problem of economic need and environmental risks when partial site remediations are proposed under RBCA standards. The first option is opposition and the second is acceptance, with some effort to monitor environmental conditions over time to ensure the ICs and ECs are not breached and the remedy is working and preserved as long as possible. Which response is preferred or adopted is likely to be a function of both the community and its organizational capacities and the specifics of the particular regenerative project, including factors such as the following:

- The size of the project and expected local effects, especially the positive and negative externalities expected by the community and residents in the short term.
- Previous property ownership and the new owners, occupants, or facility users, especially if the new owners are perceived as more community-rooted or locally involved than the previous ones.
- The legal disclosure or hearing requirements for new land uses, planning permissions, and the like, especially to the extent that they provide any reductions in uncertainty and perceived risk to the community.

- The extent to which some community is organized and recognized as having legal standing, and especially its experience in successfully influencing redevelopment projects and protecting local interests in the past.
- The extent of unanimity of community voice, especially regarding agreement on the tradeoffs between local environmental protection and economic opportunities.

Community Land Ownership and Potential Control

The likelihood that a community facing such a project sees resistance as its only possible response to an externally driven regeneration effort based on partial site mitigation will depend on the extent to which local residents and landowners can affect or control remediation decisions. That control, in turn, can be provided through community land ownership, an approach that may contribute to the economic—not just the political and social—viability of the redevelopment effort.

We briefly examine four means by which such control might be transferred in whole or in part to communities, giving them a means for exercising voice, a stake in remediation and regeneration, and a capacity for monitoring and protecting themselves over time:

1. Leaseholds.
2. Community shares.
3. Social housing trusts and associations.
4. Transfer of risk ownership.

Arguably, all these forms of land ownership or control could be exercised by a CBO, but a previous organization with a broader mandate need not exist. Single-purpose entities, or even the actions of individuals, not of community institutions, may suffice to provide means of control. We examine each in turn.

Leaseholds

The separation of the ownership of land from title to the buildings on the land is common in many countries but rare in the United States. A relatively new but growing U.S. institution, the Community Land Trust (CLT), has pioneered the use of retained title to land as a means of ensuring that low-income housing in high-value or rapidly growing real estate markets does not become inaccessible when households that bought the lower cost homes capitalize on their rising home values over time. Cities have begun to recognize the value of CLTs to their regeneration and low-cost housing provision efforts, and the model is expanding in the United States (Davis and Jacobus, 2008).

Separation of the landholder from the owner of the premises built on the surface provides the trust with a source of income from the rising property values to use in financing new low- and moderate-income housing. That is the organization's rationale for the land ownership. The trust's continued title holding, however, also offers the following benefits in terms of a capacity to manage risk-based corrective actions on contaminated land:

- It provides a party—the trust—with a long-term economic self-interest in preserving land value, which does not arise in freeholds with recurrent and unpredictable changes in title.

- The trust's stable, longer term interest and control can reassure other parties in the transaction that are concerned with project uncertainties, potentially leading to both lower cleanup demands from regulators and improved access to (and lowered costs of) redevelopment capital from lenders and other financiers.
- By holding and leasing the land, the trust lowers the current capital costs for developers (since they do not need to purchase the land) at the precise point at which reducing current expenditures is most important to project economic viability.
- These combined effects may promote site reclamation and redevelopment in property markets that would not otherwise support remediation costs.

Community Shares

Most regeneration efforts involve some sort of public-private partnership. The most common form of this relationship involves a public subsidy for a private investment that, presumably, would not otherwise occur. The subsidy is justified in terms of public benefits from the private project; however, those benefits are the effects experienced across the entire political aggregate providing or sponsoring the support. The immediate neighborhood of the project may not gain from the investment and may even lose, as in the case of gentrification.

This matter of divergent public interests has led to an effort to incorporate community benefit agreements into development plans using large public subsidies or special planning provisions (Baxamusa, 2008; Gross, 2005; Salkin, 2007). The benefits pursued tend to be focused on provision of jobs and housing for area residents, and, more broadly, some protection from the negative effects of rising local property values on low- and fixed-income residents, but they may include some environmental provisions, or at least access to decisions on remediation plans.

One spinoff from this concept (actually dating back to the idea of community development corporations (CDCs), originally conceived during the U.S. War on Poverty of the Johnson Administration in the 1960s) is the sale of community shares in the project, with associated voting rights and voice (Robinson, 2005). Shares are offered at unit costs affordable to local residents and—

- May be sold to residents, existing property owners, or others interested in the neighborhood (and often get sold to previous residents who have moved away).
- Can enable the articulation of interests in the community that are longer term than those of for-profit project investors.
- May be structured as special shares that do not participate in all investment risks or proceeds.
- May mimic leaseholds, with even minority interest holdings in the total land or project values.
- May, by providing a basis for articulating local interests and ongoing capacity for public disclosure of project decisions and activities, lower community resistance and thus ease the project development and approval process.

Social Housing Trusts and Associations

Although some housing and land trusts have recently emerged in the United States, Europe has a long tradition and a varied practice of social housing, well articulated in the form of what are known in Britain as "housing associations" (Ball, 2005). In the United States, these associations may be at-arms-length local housing agencies with municipal support or more independent local nonprofit agencies providing housing at below-market rates. Many are real estate subsidiaries of CDCs. Analogous to the land trusts, associations—

- Are long-term property holders.
- Act on behalf of their members and residents, and they, in turn have direct voting rights, generally as members of a cooperative, which gives them more direct involvement and access than in the case of a separate land trust as landowner.
- Have an interest in protecting against contamination risks on behalf of the residents, as members with economic and human health concerns.
- Must maintain their financial viability and borrowing capacity over time and, thus, must protect the integrity and market value of their assets.
- Have the capacity and motivation to control environmental response decisions in reclamation and regeneration.

Transfer of Risk Ownership

In the context of the in-perpetuity liability risk that CERCLA imposed in the United States, a market has developed for parties willing to accept those low-probability but high-cost risks for extended periods of time (Calland, 2008; McCartney, 2008). A party with some or all responsibility for past contamination on a site can pay a fee to another organization that will accept the transfer of that legal obligation. In effect, the ownership of the risk, along with funds to manage the risk and to insure against remaining uncertainties, is transferred to a new party by the originally responsible party, that can then walk away from the problem (Wernstedt et al., 2006). This transfer creates a new legal interest in the site, that of the risk accepter, and that interest then—

- Generates a long-term interest by the new risk owner—an interest that, by legal design, does not dissipate or decline with the sale, change of occupancy, or new use of the property itself.
- Provides legal recourse and a new responsible party that can be held accountable by current and future property owners, community members, and site residents or occupants, provided the identity of the new responsible party is made known (which should be an element of the risk transfer agreement).
- Adds the cost of paying for the liability transfer to the initial project costs, requiring more upfront capitalization than would be required without the risk transfer.
- Remains vulnerable in the future to uncontrollable (and offsite) changes in the economic or financial condition of the new risk owner and its insurer(s).

In other words, even if the risk accepter is the local community and/or its agent, this fourth approach to providing for long-term stewardship of an RBCA site may remain inferior to the preceding options, if only because of its cost. The purer market solution, in this case, appears to be inferior when viewed from the community's perspective.

Neighborhood Power: The Value of True Devolution

The fourth option above is inferior to the three preceding it, in part, because it does not fully take advantage of the benefits from neighborhood power by not really devolving the control to the local level. We can summarize the derivation of this conclusion in the following simple logical progression:

1. Stewardship is needed over time for all sites that are cleaned for use and leave some contaminants in place.
2. Legally available ownership forms will vary across jurisdictions, but options always exist for providing some form of ownership shares and associated interests to residents and others with long-term stakes in the area, and thus the site.
3. Eyes on the ground are always needed to monitor ongoing and changing land uses and to identify activities or events than might threaten engineered controls, and to spot evidence of control failures.
4. Such local eyes always have the most self-interest, in their roles as residents, occupants, or property owners, but these individuals may not have access to property management data and decisions (nor, at times, the knowledge to act on that type of information).
5. Local eyes in the form of interested individuals or organizations are not sufficient in themselves; they must also have the necessary organizational capacities to fulfill stewardship roles.
6. Community involvement, when the local eyes have both the access to information and the knowledge and institutional capacity to use it, can lower the costs of both the regeneration project and the needed stewardship, thus enabling both private developers and public redevelopment bodies to avoid expenses and risks they would otherwise have to incur.

Providing greater capacity for communities and community members to act is a logical approach to ensuring long-term stewardship for RBCA sites and monitoring of residual contamination of any clean-to-use regeneration project. This approach requires the state to provide at least some residents or their agents the legal standing required to take action through ownership, noted in item (2) above. Using the residents as stewards, however, also requires that their capacity to act coherently is assured through public provision of needed tools, as noted in items (4) and (5).

A clear need remains for a strong public role in contaminated land regeneration. First, the standards for site mitigation and control of contaminants need to be set at the national—if not transnational—level, where the application of scientific knowledge is not undermined by local economic desperation. Second, the tools for neighborhood action, as previously noted, need to be provided at the state or national level; the elected and appointed officials in many localities are likely to consider empowered community residents and organizations a threat to their powers, so requirements giving neighborhood representatives legal standing in RBCA decisionmaking processes will remain a necessity.

Acknowledgments

The author thanks the editorial reviewers for *Cityscape* for constructive comments and suggestions that definitely improved this argument. Remaining errors and omissions are the author's responsibility.

Author

Peter B. Meyer is the president and chief economist with The E.P. Systems Group, Inc., and professor emeritus of urban affairs and economics at the University of Louisville, where he ran the Center for Environmental Policy and Management. He has been engaged in research on brownfield issues for the Department of Housing and Urban Development, the Environmental Protection Agency, and the Economic Development Administration since the mid-1990s. His firm focuses on energy, climate change, and related environmental and economic policies.

References

Ball, Michael. 2005. *RICS European Housing Review 2005*. London, United Kingdom: Royal Institute of Chartered Surveyors.

Baxamusa, Murtaza H. 2008. "Empowering Communities Through Deliberation: The Model of Community Benefits Agreements," *Journal of Planning Education and Research* 27 (3): 261–276.

Blair, John P., and Michael C. Carroll. 2007. "Inner-City Neighborhoods and Metropolitan Development," *Economic Development Quarterly* 21 (3): 263–277.

Boyle, Melissa, and Katherine A. Kiel. 2001. "A Survey of House Price Hedonic Studies of the Impact of Environmental Externalities," *Journal of Real Estate Literature* 9 (2): 117–144.

Bullard, Robert D. 2007. "Smart Growth Meets Environmental Justice." In *Growing Smarter: Achieving Livable Communities, Environmental Justice, and Regional Equity,* edited by R.D. Bullard. Cambridge, MA: Massachusetts Institute of Technology Press: 23–50.

Calland, Dean A. 2008. "Environmental Liability Transfer Projects: A Seller's/Owner's Perspective," *Environmental Transactions and Brownfields Committee Newsletter* (American Bar Association) 10 (1): 1–5.

Carraro, Carlo, and Marzio Galeotti. 1997. "Economic Growth, International Competitiveness and Environmental Protection: R&D and Innovation Strategies With the WARM Model," *Energy Economics* 19 (1): 2–28.

Daly, Herman, and Kenneth N. Townsend, eds. 1993. *Valuing the Earth: Economics, Ecology, Ethics*. Boston, MA: Massachusetts Institute of Technology.

Davis, David E., and Rick Jacobus. 2008. *The City—CLT Partnership: Municipal Support for Community Land Trusts*. Policy Focus Report 17. Cambridge, MA: Lincoln Institute of Land Policy.

Fox, Radhika K., Sarah Treuhaft, and Regan Douglass. 2006. *Shared Prosperity, Stronger Regions: An Agenda for Rebuilding America's Older Core Cities.* Oakland, CA: PolicyLink. http://www.policylink.org/pdfs/CoreCities.pdf (accessed October 29, 2007).

Gross, Julian. 2005. *Community Benefits Agreements: Making Development Projects Accountable*. Washington, DC: Good Jobs First. http://www.goodjobsfirst.org/pdf/cba2005final.pdf (accessed September 13, 2010).

Hahn, Robert W. 1989. "Economic Prescriptions for Environmental Problems: How the Patient Followed the Doctor's Orders," *The Journal of Economic Perspectives* 3 (2): 95–114.

Jaffe, Adam B., Steven R. Peterson, Paul R. Portney, and Robert N. Stavins. 1995. "Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?" *Journal of Economic Literature* 33 (1): 132–163.

Jorgenson, Dale W., and Peter J. Wilcoxen. 1990. "Environmental Regulation and U.S. Economic Growth," *The RAND Journal of Economics* 21 (2): 314–340.

Leigh, Nancey G. 2000. *Promoting More Equitable Brownfield Redevelopment: Promising Approaches for Land Banks and Other Community Land Development Entities*. Cambridge, MA: Lincoln Institute of Land Policy.

Longo, Alberto, and Anna Alberini. 2006. "What Are the Effects of Contamination Risks on Commercial and Industrial Properties? Evidence From Baltimore, Maryland," *Journal of Environmental Policy and Management* 49 (5): 713–737.

McCartney, Mike. 2008. "Environmental Liability Transfer Projects: A Buyer's Perspective," *Environmental Transactions and Brownfields Committee Newsletter* (American Bar Association) 10 (1): 5–7.

Meyer, Peter B., and H. Wade VanLandingham. 2000. *Reclamation and Economic Regeneration of Brownfields*. Reviews of Economic Development Literature and Practice: No. 1. Washington, DC: U.S. Economic Development Administration.

Pagiola, Stefano, Joshua T. Bishop, and Natasha Landell-Mills. 2002. *Selling Forest Environmental Services: Market-Based Mechanisms for Conservation and Development.* London, United Kingdom: Earthscan.

Rees, William E. 2003. "Economic Development and Environmental Protection: An Ecological Economics Perspective," *Environmental Monitoring and Assessment* 86: 29–45.

Robinson, Lisa. 2005. *Market Creek Plaza: Toward Resident Ownership of Neighborhood Change*. Oakland, CA: PolicyLink. http://www.policylink.org/atf/cf/%7B97c6d565-bb43-406d-a6d5-eca3bbf35af0%7D/MARKETCREEKPLAZA_FINAL.PDF (accessed September 13, 2010).

Rowan, George T., and Cynthia Fridgen. 2003. "Brownfields and Environmental Justice: The Threats and Challenges of Contamination," *Environmental Practice* 5 (3): 58–61.

Salkin, Patricia E. 2007. *Understanding Community Benefit Agreements: Opportunities and Traps for Developers, Municipalities and Community Organizations.* Albany, NY: Albany Law School, Government Law Center. Social Science Research Network: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1025724 (accessed September 13, 2010).

Walker, Chris, Patrick Boxall, Charles Bartch, Elizabeth Collaton, Peter B. Meyer, and Kristen R. Yount. 1998. *The Effects of Environmental Hazards and Regulations on Urban Redevelopment.* Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. http://www.huduser.org/Publications/pdf/bfield.pdf (accessed September 13, 2010).

Wernstedt, Kris, Peter B. Meyer, Tom Dixon, Kristen R. Yount, and Poulomee Basu. 2007. "Liability and the Long Term: Effects on Sustainable Urban Regeneration in the UK and USA." In *Towards More Effective and Sustainable Brownfield Revitalisation Policies,* edited by Detlef Grimsky, et al. Dessau, Federal Republic of Germany: Federal Environment Agency Germany: 29–40.

Wernstedt, Kris R., Peter B. Meyer, Anna Alberini, and Lauren Heberle. 2006. "Incentives for Private Residential Brownfields Development in U.S. Urban Areas," *Journal of Environmental Policy and Management* 49 (1): 100–119.

Yount, Kristen R. 1999. *Environmental Insurance Products Available for Brownfields Redevelopment—1999.* Highland Heights, KY: Northern Kentucky University for the U.S. Environmental Protection Agency (EPA). http://www.epa.gov/brownfields/insurance/insrep99.pdf (accessed September 13, 2010).

Yount, Kristen R., and Peter B. Meyer. 2005. *Environmental Insurance Products Available for Brownfields Redevelopment—2005.* Highland Heights, KY: Northern Kentucky University for the U.S. Environmental Protection Agency (EPA). http://www.brownfieldstsc.org/pdfs/enviro_insurance_2006.pdf (accessed September 13, 2010).

Additional Reading

De Sousa, Christopher. 2004. "The Greening of Brownfields in American Cities," *Journal of Environmental Planning and Management* 37 (4): 579–600.

Dewar, Margaret. 2006. "Selling Tax-Reverted Land: Lessons from Cleveland and Detroit," *Journal of the American Planning Association* 72 (2):167–180.

Ewing, Reid, Keith Bartholomew, Steve Wilkelman, Jerry Walters, and Don Chen. 2007. *Growing Cooler: The Evidence on Urban Development and Climate Change.* Washington, DC: Urban Land Institute.

McCarthy, Linda. 2002. "The Brownfield Dual Land-Use Policy Challenge: Reducing Barriers to Private Redevelopment While Connecting Reuse to Broader Community Goals," *Land Use Policy* 19 (2): 287–296.

National Association of Local Government Environmental Professionals (NALGEP) and Northeast-Midwest Institute (NEMWI). 2004. *Unlocking Brownfields: Keys to Community Revitalization.* Washington, DC: National Association of Local Government Environmental Professionals and Northeast-Midwest Institute. http://www.resourcesaver.com/file/toolmanager/CustomO93C337F65023.pdf (accessed September 13, 2010).