THE CLEANUP AND REUSE OF BROWNFIELDS:

KEY ISSUES AND POLICY CHOICES

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EXECUTIVE SUMMARY

Policies set by federal and state governments can have important impacts on local land use. They affect the cleanup and revitalization of unused or under-used industrial and commercial sites with known or suspected contamination ("brownfields"), as well as the pace of development of outlying farmland and forests ("greenfields").

Cleanup and liability policies affecting brownfields are being examined at the federal and state levels as well as by local governments and private groups. Despite the attention brownfields are receiving, many hard questions remain — for example: To what extent should prevailing cleanup standards be modified for brownfields? With less than maximal cleanups, can institutional controls assure future health and safety by guaranteeing that the site will not be used inappropriately? How should liability be allocated between current and prospective site owners? How can limitations on financing and insurance for prospective site owners be overcome?

All of these issues focus on the cleanup aspects of brownfields. But even if they can be resolved, there remains an overriding question:

Is all this attention to brownfields worth the effort?

It is widely recognized that residual contamination is not the only reason why businesses are not flocking to the central city. Taxes, traffic congestion, crimes against property and employees — all these deter potential businesses. As one commentator on the Wichita, Kansas brownfields effort put it, "Even under the best of conditions, CBD [central business district] revitalization is a gamble because it runs counter to market trends."[1] Policies and programs addressing cleanup and liability issues help to level the playing field. But that may not be enough, nor are communities always receptive to brownfields initiatives.

UT Waste Management Research and Education Institute Study

The study summarized in this report consists of three parts. First, we have analyzed the approaches that various states are taking on a handful of key cleanup issues:

- how state programs to address brownfield cleanups should be structured, using what types of funding mechanisms;
- who should be permitted to initiate a voluntary cleanup, under what conditions;
- how cleanup liability should be allocated and liability relief made available upon completion of cleanup;

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[1] Mark Glaser, "Economic and Environmental Repair in the Shadow of Superfund: Local Government Leadership in Building Strategic Partnerships," Economic Development Quarterly, Vol. 8, No. 4 (Nov. 1994), p. 346.

- what cleanup standards should be employed, with what types of future use restrictions;

- how technical guidance and cleanup oversight and review should be conducted;

- what mechanisms for public notice and public participation should be required, under what circumstances; and

- what financial assistance, if any, should be provided to promote brownfields cleanup.

Second, we have undertaken a preliminary assessment of non-contamination considerations with brownfields. The focus of this survey was on reuse: specifically, on the problems and assets that arise with brownfields simply because of their urban character, not because of their contamination. The survey was targeted to Tennessee officials whose responsibilities include encouraging local economic redevelopment: it did not encompass other key parties in brownfields cleanup and reuse decisions, and it was limited to Tennessee municipalities that have urban sites with known or suspected contamination. The survey does, however, suggest a framework that could be employed for other types of key parties and in other states. Furthermore, its results give a preliminary indication of the relative significance of various barriers as well as incentives to using old, derelict industrial or commercial sites for new uses.

Third, we have held a small interactive workshop on the draft report, and, more generally, on brownfield issues (both cleanup and reuse) in Tennessee. This one-day workshop, which was held on July 31, 1996, included local community and economic development personnel from Tennessee cities and towns, other people from Tennessee and the surrounding region with a professional interest in brownfield cleanups, officials from the Tennessee state government and EPA's Region 4, and a few staff members of the UT Waste Management Research and Education Institute. While the workshop participants constitute only a fraction of the many and diverse people interested in Tennessee's brownfield concerns, the workshop did result in creative ideas about the nature of these concerns and how they might be addressed.

Part 1 — Cleanup Issues: Conclusions and Recommendations from the Study of State Programs

Program type and scope. To date, voluntary cleanup programs have been the main vehicle used by many states to address brownfield issues. VCPs continue to provide a useful, flexible framework for brownfield projects. They are not appropriate in all circumstances, however, nor do they meet all brownfield project needs. Some brownfield projects may include cleanups led by the state or by EPA, as well as PRP-led cleanups conducted under enforcement procedures. And many brownfield projects (regardless of whether the cleanup is voluntary, state-led, etc.) may need additional guidance and assistance in economic development issues such as marketing, employee training, and infrastructure development.

To address economic revitalization as well as cleanup concerns, "one-stop shopping" for brownfield projects is needed at the state level. This integration of state services and oversight could be done formally or informally. If done formally, through a single program, the state must have enough brownfield sites to justify the expense of setting up and staffing a specialized program. If done informally — e.g., through a single state contact who can direct those undertaking brownfield projects to appropriate state programs and personnel — the relevant state programs must be sufficiently coordinated to ensure that their guidance and regulations are compatible in content, timing, and paperwork.

In coordinating and refining a state's brownfields program, one place to start would be a working group with representatives from the relevant state programs, as well as representatives from municipal governments and from various members of the private sector — e.g., community groups and the environmental justice movement, business and industry, real estate and development, law, and environmental engineering.

At a minimum, states should provide a comprehensive listing (both in writing and on the Internet) of state and other resources available to brownfield project participants. This list help prevent frustration and duplication of effort, and it might help to expedite the cleanup and reuse of sites that would otherwise remain in limbo for lack of information.

Key recommendations:

- **"One-stop shopping" for brownfield projects, through a formal state program or a single state point of contact.**

- **A working group to provide advice and direction on brownfields issues, with representation from relevant state agencies, from municipal governments, and from different interest groups within the private sector.**

- **Complete, continually up-dated list of state and other resources for brownfield projects.**

State program funding. A variety of means are available to fund state brownfields programs. If the state has a number of brownfield sites that could make a significant difference to state or local economies and growth management efforts, a bond issue may be appropriate and politically feasible. Otherwise, the state may need to rely on more modest sources of funds, such as budget allocations and fees for program participation. Fees must be set sufficiently high to generate adequate revenue yet not so high as to deter program participation. Fees should be scaled to services; they might also be adjusted to the type of program participant (e.g., one set of fees for local government agencies and not-for-profit organizations; another set for for-profit participants).

Key recommendations:

- **Bond issues in states with a number of major brownfield sites.**

- **Program fees set to cover services, but adjusted to type of participant.**

Initiation of cleanup. A few states take a proactive role to promote brownfield projects, but as yet most do not. In addition, some states allow voluntary cleanups to be undertaken by parties who have caused the contamination, while other states do not. To get the fullest participation in VCPs and to avoid spending staff time making determinations of whether a VCP applicant qualifies, states might do well to take a liberal rather than restricted stance on initiation of voluntary cleanups, accompanied with a thorough state review of the cleanup performed. In contrast, states may wish to reserve special incentives such as low-interest loans and tax relief for program participants who can prove that they were not involved in a site's contamination, in order to avoid the appearance of rewarding those who pollute.

States and their local jurisdictions can also benefit in the long run by paying proactive attention to brownfield areas, even though doing so requires a short-term investment of government funds and staff time. If brownfield projects are carried out with careful regard for neighborhood interests and concerns, they can help to meet environmental justice goals, in addition to helping to promote local economic and growth management goals.

Key recommendations:

- **Liberal policy toward participation in state voluntary cleanup programs, with careful state review of cleanups.**

- **Proactive governmental attention (local or state) to key brownfield sites.**

Cleanup standards. All other things being equal, maximal cleanups (i.e., cleanups to background or non-detect levels) are desirable. They are not always technically or economically feasible, however, and the process of remediation may create risks of its own. Furthermore, other approaches — partial cleanups (i.e., cleaning up only part of the site) and/or risk-based cleanups (which typically involve a relaxation of background or non-detect standards) — may be needed to get sites back into productive use quickly, rather than allowing them to remain contaminated and unused. If these approaches are adopted, however, particular care must be taken to ensure that future exposure to contaminants by various people — including sensitive populations such as children, the elderly, and pregnant women — will be no greater than with a maximal cleanup, and that natural resource damages will not be significantly greater.

With risk-based cleanups, site-specific standards may be preferable because they can be tailored to the site's conditions, but they require a large investment of staff time. An intermediate approach — especially for states that have a number of brownfield sites — is to use categorical standards (e.g., standards by category of proposed use), as well as presumptive remedies for common types of contamination. Site-specific standards might be available as an alternative either to state oversight personnel, if they think the site needs special attention, or to those conducting the cleanup, if they are willing to pay for full risk assessments and for the additional state staff time required with

negotiated standards.

Key recommendations:

- **Selective use of partial and/or risk-based cleanups.**

- **Categorical standards and presumptive remedies to expedite cleanups of slightly contaminated sites.**

- **Site-specific risk-based standards on a special-case basis.**

Future use restrictions. Future use restrictions are often an important component of risk-based or partial cleanups, since they help to ensure that exposure will not exceed that anticipated in the cleanup. Future use restrictions may not always be completely reliable, however, especially in transitional areas where uses could easily change in the future. A combination of deed restrictions with specially tailored local zoning regulations may, in general, be the most effective mechanism for restricting future uses, but even these mechanisms cannot always be regarded as fully reliable: constraints on land use may be forgotten or ignored over time; zoning changes may occur; deed restrictions may not, under common law, be enforceable with successor property owners. For this reason, future use restrictions may need to be employed selectively, with attention to the severity and longevity of the residual contamination and the likelihood that other uses may be contemplated for the site at some point in the future.

Key recommendations:

- **Future use restrictions as part of remedy only for sites of low land-use volatility and limited long-term risk.**

- **Combination of institutional controls — e.g., deed restrictions and zoning regulations — to help ensure efficacy of future use restrictions.**

Public participation. Opportunities for public participation can be important determinants of how responsive a brownfield project is to people who live or work nearby and, by extension, of the project's success. Members of the public may be concerned about the proposed new use of the brownfield site as well as the proposed remediation standards. They may need to become familiar with both the benefits and the risks of the proposed project. Nevertheless, all projects do not require equivalent opportunities for public involvement, from the standpoint of both the public (who have many other concerns in their daily lives) and the project initiators (who have many other project matters to attend to).

Projects that are known to be controversial — because of the level of contamination, the proposed cleanup standard and remedy, or the proposed reuse — should have full-scale community involvement opportunities. So should all projects located in areas that, historically, have been burdened with disproportionate environmental burdens. These opportunities should include, at a minimum, early notice of the proposed project,

informal meetings for information exchange, and formal comment periods; they might also include forming a local citizens' committee to provide advice and consultation on the project. With less potentially controversial projects, widespread public notice of the proposed cleanup and reuse plan might be required (e.g., on local television and radio as well as in local newspapers; in more than one language where appropriate), but further opportunities for public involvement would be left to the discretion of the project initiators, in consultation with either state or local agency personnel and in response to voiced local concerns.

Key recommendations:

- **With potentially controversial brownfield projects or projects located in areas with disproportionate environmental burdens, extensive community involvement opportunities.**

- **With presumably routine, non-controversial brownfield projects, thorough and widespread public notice of proposed cleanup and reuse actions, together with the addition of public involvement opportunities if the need becomes apparent.**

Technical guidance. Technical guidance during site cleanups can be provided through a variety of means — e.g., by state staff, by state-certified professionals, or by other consultants chosen by those conducting the cleanup. Each approach has advantages and disadvantages. In particular, states need to balance between a time-consuming, extensive involvement prior to or during the cleanup and a time-consuming, extensive post-hoc review of the cleanup.

Unlike the cleanup aspects of a brownfield project, rigorous performance standards for the planned reuse are not usually imposed. Nevertheless, technical guidance concerning reuse issues may be equally important for the success of the brownfield project. The state economic development agency usually supplies this guidance, sometimes in conjunction with local agencies. It is important for this guidance to be integrated into the brownfield project coordinator's plans early on, rather than being treated as an afterthought or as an issue separate from cleanup concerns. Use might also be made of state university-based technical advisory services, especially when the initial project proponent is the local government. In addition, early and on-going consultation on site cleanup and reuse issues should occur with affected community-based organizations, who can provide important guidance and input on site plans as they develop.

Key recommendations:

- **Some technical guidance from state during cleanup, especially if post-cleanup review by state staff is minimal.**

- **Some technical guidance from state or local economic development agencies on key projects' reuse plans, coordinated with their cleanup plans.**

- **Use of state university-based technical advisory services, especially when the initial project proponent is the local government.**

- **Early and on-going consultation with affected community-based organizations.**

Cleanup review. Careful review is needed of cleanups, especially when the cleanup has been conducted with little state involvement. However, the extent of the review will vary depending upon the site. For sites with limited contamination where a straightforward, presumptive remedy has been used, the review may consist primarily of state review of reports on the site assessment, remediation, and post-cleanup data supplied by those who conducted the cleanup. In addition, thorough state audits of a random selection of sites and fines for inadequate or slow performance will help to ensure that cleanups are performed correctly and expeditiously.

For sites with major contamination problems and/or where a non-standard remedy has been used, a more extensive state review may be necessary, especially if state staff have not been closely involved in the remediation process. The state may require a thorough review of the site cleanup by state-certified technicians or a state project manager, including post-cleanup samples taken by state-approved personnel and a determination of the adequacy of any future monitoring required as part of the remedy.

Key recommendations:

- **For sites with limited contamination and straightforward remedies, state review of cleanup reports, together with more thorough audits of randomly selected sites.**

- **For sites with extensive contamination and/or non-standard remedies, thorough review by state-approved personnel of site cleanup and any monitoring arrangements.**

- **Fines for failure to perform cleanup adequately, and in a timely fashion.**

Liability. As at the federal level, a state's approach to liability is often one of the most contentious issues with contaminated site cleanups. Strict, retroactive, joint and several liability is still the approach used by many states, as by the federal government. Although politics inevitably will drive how liability is determined and allocated, consideration might be given to other approaches being used by some states — e.g., proportional liability instead of joint and several liability, or proportional liability as an alternative if a responsible party can prove by a preponderance of evidence that it should be responsible for only a share of the cleanup. In this case, however, the state will need to be prepared either to delay part of the site cleanup pending completion of enforcement actions or, alternatively, to pick up the "orphan's share" of the costs — i.e., the costs not otherwise covered.

Key recommendations:

- **Exploration of alternatives to joint and several liability, such as a proportional allocation of liability.**

- **Funding of "orphan's share" through state program.**

Liability relief for prospective purchasers and developers. To encourage the cleanup and productive reuse of brownfields, states need to provide a measure of relief from future cleanup liability for those conducting brownfields projects. If prospective purchasers and developers can demonstrate that they did not contribute to the contamination, "no association" letters may be appropriate. In addition, they may be provided "no further action" letters or "covenants not to sue" upon cleanup completion. While reopener clauses may be needed to cover emergency situations arising in the future from prior contamination, these clauses should be limited to clear and present dangers, in order to provide the maximum assurance possible that further cleanup costs will not emerge. Furthermore, known residual contamination needs to be clearly characterized and recorded to the extent practicable, so that it can be distinguished later on from contamination arising from future activities.

Key recommendations:

- **"No association" letters for prospective purchasers and developers who can prove they did not contribute to prior contamination.**

- **"Covenants not to sue" upon completion of cleanup, with limited reopener clauses.**

- **Full, recorded characterization of remaining contamination, so that it can be distinguished from future contamination.**

Liability relief for lenders. Liability relief for lenders is often essential for prospective purchasers and developers to get the capital needed to undertake a brownfield project. Secured creditor exemptions are being employed by a number of states and may be the most straightforward means of providing liability relief for lenders. However, safeguards may be needed to ensure that a recipient of a secured creditor exemption has merely an arms-length financial interest in the project, is not involved in its management, and did not contribute to the contamination.

Key recommendation:

- **Secured creditor exemptions, but only where the creditor's role is limited to project financing.**

Financial assistance. State financial assistance to encourage brownfield projects can be provided either to private organizations or to local governmental and quasi-governmental agencies. Direct grants are usually appropriate only for the latter, and then only if the local government did not contribute to the contamination. In contrast, low-interest loans for site assessment and remediation expenses may be appropriate for private corporations as well as local governmental entities, if the corporation's financial

solvency is assured. In addition, tax breaks may be needed to serve as an incentive for prospective brownfield site developers, and may be appropriate under restricted conditions — e.g., for a limited period of time, and only to developers with no record of major environmental violations.

Key recommendations:

- **Low-interest loans for brownfield site assessment and remediation to local governments and, selectively, to private organizations.**

- **Grants to local government for brownfield site assessment and remediation, if local government is not a responsible party.**

- **Financial incentives through limited-duration tax breaks to brownfield project developers with no record of major environmental violations.**

Part 2 — Reuse Issues: Conclusions from the Survey of Tennessee Officials

Barriers. Based on the average responses to the survey of local officials with economic development responsibilities, non-contamination barriers to productive reuse of Tennessee's brownfield sites can be summarized as follows:

high barriers —

existing structures unsuitable, not easily adapted
high costs to meet building codes and OSHA standards

medium to high barriers —

high costs to adapt for reuse
site not visible or attractive

medium barriers —

dirty and unattractive surroundings
site small for many uses, little room for expansion
uncompetitive sale price
limited financing and insurance available
narrow streets
difficult highway access
limited space for construction / renovation
limited space for parking, loading, etc.

low to medium barriers —

congested traffic
related businesses can't / won't locate nearby
community members object to proposed reuse
high municipal taxes — low to medium significance
local workforce lacks skills to serve as employees

low barriers —

uncertain title
crime record / concerns
zoning changes required
inconvenient for commuting
few amenities (stores, restaurants) nearby
utility infrastructure inadequate

Incentives. Based on the average of survey responses, incentives to productive reuse of brownfield sites in Tennessee — apart from incentives associated with site cleanups — can be summarized as follows:

high incentives —

already zoned industrial or commercial
utility infrastructure in place
police, fire protection nearby
skilled and / or low-wage workers available

medium to high incentives —

job training programs
low purchase price
easy commuting
state or local tax breaks
low-interest loans for site purchase and redevelopment
site cleanup and reuse conveys "good corporate citizen" image

medium incentives —

related businesses located nearby
marketing and other technical assistance
close to rail or river
amenities (stores, restaurants) nearby
access street and curb cuts in place

low to medium incentives —

convenient to public transportation
public parking nearby

low incentives —

[none]

Differences between average responses and responses for large cities. Taken as an average across all responses, it appears that site-related problems — e.g., problems with site adaptability, renovation costs, site visibility and attractiveness — weigh more importantly than locational factors concerning transportation or the surrounding neighborhood. Similarly, it appears that "nuts and bolts" assets such as zoning, utilities, nearby police and fire protection, a skilled labor pool, and a low purchase price are on average regarded as more significant than assets such as proximity to

public transportation, rail and river access, nearby public parking, and stores and restaurants. Nevertheless, in Tennessee's larger cities, especially those with 1990 populations of more than 100,000 (Memphis, Nashville, Knoxville, and Chattanooga), "nuts and bolts," site-related problems and assets remain important, but other factors — particularly factors concerning the surrounding neighborhood — are also seen as quite important.

In larger cities, locational factors appear to affect the prospects of brownfields sites (for better or for worse) far more than in Tennessee's smaller cities: location-related problems (e.g., crime concerns, dirty and unattractive surroundings, a lack of amenities such as shops and restaurants, the inability or unwillingness of related businesses to locate nearby) are seen as playing a significant role in deterring the productive reuse of brownfields. By the same token, location-related advantages such as proximity to commercial public parking, public transportation, river and rail access points, and downtown amenities are seen as more important to the productive reuse of brownfields in Tennessee's larger cities than in its smaller cities. Furthermore, it appears that in these larger cities, more weight is placed on the "good corporate citizen" image that may result from undertaking a brownfields cleanup and reuse.

Again, it is important to bear in mind that the survey only had a small sample, only sought economic development officials as respondents, and only asked for their generalized perceptions about brownfields in their respective municipalities. Furthermore, a perceived lack of significance of a particular factor as a barrier or incentive to brownfields revitalization may simply mean that the factor has not yet been observed by a respondent with respect to brownfields in his or her municipality. As more brownfields become known, or as cities that are now fairly small begin to experience more urban problems, factors now regarded as fairly insignificant problems or assets may gain in importance.

Interaction. The survey sample size was too small to identify meaningful statistical interactions among various potential barriers or incentives to productive brownfields reuse. This is a research area that, if a large-sample survey were undertaken, could be extremely informative. Intuitively, it appears likely that there is a high degree of interaction among some of the factors: for example, job training programs can help to compensate for an inadequate pool of skilled workers; and a low purchase price, together with low-interest loans, technical assistance, and tax breaks, can help to compensate for high renovation costs.

In addition, intentionally excluded from consideration in this survey but equally important are interactions of development factors with cleanup factors: e.g., technical assistance for site investigations, low-interest loans and tax breaks for remedial action. This survey was focused on the "reuse" half of brownfields cleanup and reuse, because of a dearth of prior research on this aspect of brownfields issues. Nevertheless, reuse cannot in the final analysis be separated from cleanup issues: the two are inextricably related.

Part 3 — Conclusions and Recommendations from the Workshop

During the discussion period at the workshop, a number of comments and suggestions were made — some by several participants; others by only one person. These comments and suggestions are summarized very briefly below. None should be taken individually as "magic bullets"; instead, they imply the need for a multi-faceted strategy to further brownfields initiatives.

Problems. During the course of the workshop's discussion session, several persistent problems with brownfields were identified. These can be grouped into three clusters: negative perceptions and attendant stigma effects as well as lack of trust; liability issues; and other, non-contamination problems that arise because of undesirable characteristics associated with some brownfield sites and their surroundings.

Possible solutions. Many of the comments during the discussion session provided creative ideas about ways to get beyond obstacles and promote brownfields cleanup and reuse. Although the discussion ranged widely, suggestions are grouped into two clusters below: getting the right cleanup approach, and working with the market.

Getting the right cleanup approach. Comments addressed such topics as:

- The cost-effectiveness of risk-based standards.

- The need to be proactive rather than waiting for an enforcement action.
- The importance of a state voluntary cleanup program with regulatory flexibility, to help provide incentives for people to move forward with brownfield initiatives.

- The important role private firms continue to play in site assessments and cleanup.

- The difficulty with exposure-based standards of being confident of future site uses, especially if mixed uses are involved and precautionary measures (e.g., paving) are not taken to break potential exposure pathways.

- The need to avoid over-reliance on long-term monitoring, and to ensure that the reasons for monitoring, the thresholds, and the actions to be taken are specified upfront.

- The uncertain reliability of many of today's institutional controls over the long term.

Working with the market. During the workshop discussion, at least as much attention was directed to market-based obstacles as to cleanup issues. Comments addressed such topics as:

- The need for education and "image-changing" as an early part of brownfields initiatives.

- The importance of partnerships between, e.g., entrepreneurs and city officials.
- The incentive that favorable financial arrangements can provide, to help promote brownfields cleanup and reuse.
- The importance of aggressive city code enforcement, to help promote a better appearance that will invite brownfields cleanup and reuse.
- The need for cities to develop a plan of which sites to concentrate on first.

The larger view. While many of the comments and suggestions made during the workshop's discussion period were quite specific, others were directed toward the larger issues with which advocates of brownfields revitalization must contend. Three topics, in particular, arose frequently: how to compete with "greenfields" development, how to tackle difficult sites, and how to achieve a systems perspective, with brownfields seen as one piece of a larger puzzle. All three are consonant with the need, identified in the course of this study, for creative, interactive attention to brownfields.

The Need for Creative, Interactive Attention to Brownfields

In Tennessee, brownfields are still a much newer issue than in some other parts of the U.S., particularly the Northeast and upper Midwest, where concern for aging cities and urban sprawl have combined to focus attention on brownfields over the past few years. In Tennessee, the problem of brownfields has only recently attained prominence, and then, for the most part, only in the state's larger cities. But as one respondent to our survey noted in closing, "Reuse of these sites is going to become more important as communities are faced with fewer state and federal dollars to fund infrastructure extensions to greenfields on their perimeters."

At the end of the survey, respondents were asked to give their assessment of the prospects for cleanup and reuse of brownfield sites within their municipalities over the next five to ten years. Of the 37 respondents who answered this question, 30% said "poor," 49% said "moderate," and 22% said "good." Interestingly, respondents connected with Tennessee's largest cities gave, on average, slightly more optimistic responses to this question than did respondents from smaller cities.

The prospects for brownfields are not predetermined. There are many opportunities for revitalizing brownfields, in Tennessee as elsewhere. Now — while the issue is still relatively new — is the time for state government, local government, and the private sector to work together to craft innovative approaches to the cleanup and revitalization of these sites. But in doing so, close consultation with the people who live and work in areas near brownfields is essential. For in the final analysis, brownfields is not simply about cleanup and reuse: it is about creating healthy and sustainable communities.

INTRODUCTION

Brownfields are both an old and a new phenomenon in Tennessee. Although the state has a number of commercial and industrial sites with known or suspected hazardous waste contamination, these sites are only now becoming known as "brownfields," and they have only recently started to receive special attention. Most of Tennessee's cities are relatively small (only four have populations over 100,000), and most are not plagued by vast tracts of "urban blight." In the course of conducting this project, we were in contact with a number of local planning and economic development officials in Tennessee. Some commented:

> "We don't have any brownfield sites. There is an oil company that may move, but other than that, we don't have any."
>
> "Most of our industrial sites have been converted to warehousing space."
>
> "No brownfields [here]."
>
> "This isn't an issue for us — not yet, at least."

Yet Tennessee, like other states, has not escaped the problem of brownfields; the problem is simply less widespread and apparent than in the Detroits and Chicagos of the United States. The purpose of this study is to assist state and local officials in Tennessee, and other states, in their analysis of how brownfields can be cleaned up and returned to productive use.

The study has three parts. The first part addresses cleanup issues with brownfields. Many of these issues have been the focus of attention since the first comprehensive federal legislation on hazardous waste contamination was enacted in 1980 (the Comprehensive Environmental Response, Compensation, and Liability Act, better known as the Superfund law). Through the Superfund law, key sites were targeted for attention by the U.S. Environmental Protection Agency; the law also served as model for legislation in many states initiating state-level Superfund programs requiring cleanups of contaminated sites. In recent years, cleanup issues have received renewed scrutiny with the realization that rapid and complete cleanups of all contaminated sites may not be technically or economically feasible.

The second part of the study addresses reuse issues with brownfields. These issues have been overshadowed by the difficult cleanup and liability concerns that can arise with a contaminated site. Yet, to return to economically productive use, brownfield sites must not only be cleaned up; they also must be marketable. The decision may be reached to convert some brownfield sites, after cleanup, to public playgrounds and parking lots, but most are likely to used for industrial or commercial ventures. They must be attractive to these ventures if they are to get back into economic use.

The third part of the study concerns a small interactive workshop held on brownfield issues (both cleanup and reuse) in Tennessee. A one-day workshop was convened in July 1996 to discuss the findings of the draft report on the first two parts of the study and to get the workshop participants' independent perspectives on brownfields in

Tennessee. The views presented at the workshop reflected the backgrounds of the workshop participants, most of whom are professionals involved in either cleanup or economic development concerns.

Part 1 — Cleanup Issues

Part 1 provides a synopsis of the approaches that various states are taking on a handful of key policy issues concerning brownfields cleanup:

- how state programs to address brownfield cleanups should be structured, using what types of funding mechanisms;
- who should be permitted to initiate a voluntary cleanup, under what conditions;
- how cleanup liability should be allocated and liability relief made available upon completion of cleanup;
- what cleanup standards should be employed, with what types of future use restrictions;
- how technical guidance and cleanup oversight and review should be conducted;
- what mechanisms for public notice and public participation should be required, under what circumstances; and
- what financial assistance, if any, should be provided to promote brownfields cleanup.

The analytic basis for Part 1 is the background information on brownfields described further below, as well as program-specific information obtained from various states that are active on brownfields issues.

Part 2 — Reuse Issues

To assess non-contamination considerations in the reuse of brownfields, we conducted a survey of officials whose responsibilities include encouraging local economic redevelopment. In particular, we asked about potential barriers to the productive reuse of brownfields — e.g., congested traffic, small site size, difficulties adapting and renovating structures, community objections, difficulty of obtaining loans, etc. We also asked about potential incentives to reuse — e.g., central location, low purchase price, availability of skilled or low-wage workers, infrastructure in place, etc.

Our survey did not encompass other key parties in brownfields cleanup and reuse decisions apart from officials with economic development responsibilities, and it was limited to Tennessee municipalities that have urban sites with known or suspected contamination. The survey does, however, provide a framework that could be employed for other types of key parties and in other states. Furthermore, its results

give a preliminary indication of the relative significance of various problems as well as assets that arise when seeking to use old urban sites for new industrial or commercial business.

Part 3 — Workshop Results

As noted above, the workshop was small, limited by design mainly to participants from Tennessee who work on cleanup or economic development concerns at the local, state or regional level. As such, the comments and recommendations that are summarized in Part 3 are shaped by conditions in Tennessee and the surrounding region, and also should be regarded as only a slice of the perspectives that need to be considered in undertaking brownfields revitalization. Nevertheless, a number of the ideas put forth in the workshop are generalizable and worthy of careful consideration.

Background Information

Background information for this study was obtained from the following players in brownfield revitalization:

- local governments, where efforts typically are focused on site-specific projects and on problems associated with those sites;
- state governments, which typically are focused on policy issues, including setting up frameworks within which local programs can function;
- the federal government, where nationally applicable policies are developed and where, in some instances, state policies are reviewed and approved and local programs are promoted;
- organizations of state and local governments, whose functions include assessing and recommending policies to achieve particular aims; and
- research organizations, which conduct policy analysis to provide alternatives for government and business, as well as other non-governmental organizations focused on particular areas of concern, such as environmental, economic, or social issues.

These players in brownfield policy issues are described briefly below. In addition, the annotated bibliography provides short summaries of some key articles and other publications on brownfields revitalization.

Local government. For many years, cities have been concerned about companies settling in suburban areas, often outside city limits, instead of in older urban areas. Local governments hope that brownfield initiatives will provide incentives for productive reuse of urban sites. Motivating factors for local governmental brownfield initiatives include:

- creating jobs in urban areas,
- limiting suburban sprawl,
- revitalizing inner city areas,
- curbing urban crime,
- better utilizing current land, and
- increasing the local tax base.

Brownfield initiatives by local governments typically have a narrow, problem-oriented focus. This focus enables them to close in on the most important issues facing their communities. It also means that their solutions may or may not be directly applicable to other local initiatives around the nation. Many local problems are similar, however, and an approach developed by one municipality can be used by others as a source of ideas for overcoming similar problems.

State government. Much of the action on brownfield policies is taking place at the state level, with legislatures enacting measures aimed at voluntary cleanup programs and brownfield programs; new agencies, departments, or divisions being created to oversee these programs; and new regulations being promulgated on hazardous waste cleanups. Prompting this state-level activity is the specter of expensive cleanups, the desire to assist local governments to return contaminated urban land to productive use, and the desire to preserve undeveloped areas outside cities. States generally recognize, however, that expediency in the cleanup and reuse of contaminated urban land must be balanced with the need to minimize risks to public health and the environment.

Federal government. Both the executive and the legislative branches of the federal government have been working on brownfield cleanup and reuse issues. On the executive side, the U.S. Environmental Protection Agency (EPA) is the agency most prominently involved, prompted in part by an awareness of the many sites requiring remediation and the scant government resources to conduct cleanups. Currently, there are approximately 1300 sites on the National Priorities List (a list of contaminated sites to be addressed by EPA's Superfund program). Remediation of approximately one-third of these sites has been completed or nearly completed. In addition, however, thousands of other sites around the nation have known or suspected contamination. Some of these sites are being addressed by state cleanup programs, but again, resources are scarce. Furthermore, EPA and the states historically have approached these sites from a public health perspective, paying little attention to productive reuse issues.

Aware of the need for mechanisms to deal with contaminated urban sites, EPA initiated a brownfields pilot program in 1993. In January 1995, with its Brownfields Action Agenda, EPA expanded the pilot program from the initial 10 local governments receiving $200,000 grants to plan and conduct brownfield projects. Currently, there are 39 subnational governments (mainly municipalities) receiving grants under the national program, and 21 receiving grants from EPA's regional offices. As part of its Action Agenda, EPA also addressed liability issues, providing guidance that makes it easier for prospective purchasers of contaminated sites to evaluate their potential liability and obtain liability relief through Prospective Purchaser Agreements. In addition, the Action Agenda established mechanisms to promote job development and training and partnerships and outreach as part of brownfields cleanup and reuse.

The Department of Housing and Urban Development (HUD) is also interested in brownfield projects, since they can help to revitalize inner-city areas, reduce crime, improve job opportunities for inner-city residents, and perhaps eventually reduce reliance on government-subsidized housing. HUD has provided grants to the U.S. Conference of Mayors to study these facets of brownfield reuse. In addition, before the U.S. Congress's Office of Technology Assessment was defunded and ceased operation in September 1995, it had done preliminary research into brownfields resulting in its report, "State of the States on Brownfields" (July 1995).

In President Clinton's 1996 State of the Union address, he made mention of tax incentives to promote more private initiatives in the cleanup and reuse of brownfield sites. This statement was followed up in March 1996, when he outlined a proposal to offer $2 billion in tax breaks over seven years to brownfield site owners and purchasers who were not responsible for their site's contamination but undertake its cleanup. The proposal is to be incorporated into a legislative package that, unless it gets enmeshed in Superfund legislation, is likely to have bipartisan support.

On the legislative side, a number of brownfield bills have been introduced in Congress since early 1995. Most of these include provisions to encourage brownfields cleanup and reuse through a combination of liability relief and favorable financial arrangements. For example, H.R. 2919, a bipartisan bill introduced in January 1996, extends Superfund liability relief to lenders, local governments, and prospective purchasers if their actions have not caused the contamination of the site in question; provides for EPA certification of state cleanup and cleanup review programs and releases site owners and operators from federal liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly called Superfund) if the site has conformed to the requirements of an EPA-certified state program; allows that if the certified state program includes waivers from state permitting requirements, federal permitting requirements may be waived as well; allows site owners to establish industrial site remediation accounts, or IRAs, of up to $5 million on a tax-exempt basis to cover brownfield cleanup costs; and allows brownfield cleanup costs to be deducted from taxable income during the year in which the costs occur.

Organizations of governments. Groups such as the National Conference of State Legislatures (NCSL) and the U.S. Conference of Mayors are coming to the forefront on brownfields issues. The NCSL is a non-partisan policy institute whose missions include strengthening state legislatures, fostering cooperation among states, and conducting lobbying in Washington, DC on the behalf of the states. It is funded by dues paid by member states, as well as research grants from governmental and non-governmental organizations, and has become a research resource on brownfields issues.

The U.S. Conference of Mayors was founded in 1933. It is funded by membership dues and other sources, including grants such as the above-mentioned HUD grant to provide analysis on brownfields issues. These issues are one of the top priorities on its 1996 agenda. Currently, one main focus is on influencing federal legislation — e.g., to relax

cleanup standards, reduce purchaser liability, and provide redevelopment tax credits.

Non-governmental organizations. There are a number of non-governmental organizations that have become involved in brownfields issues over the past few years and are releasing information on this topic. Five examples mentioned below include the Northeast-Midwest Institute, the National Environmental Policy Institute, the Institute for Responsible Management, Stateside Associates, and the Sierra Club.

The Northeast-Midwest Institute is a non-profit policy research and public education organization based in Washington, D.C. and concerned with the environmental quality and economic status of the Northeast and Midwest regions. The organization works closely with the congressional delegations from these regions, which share a legacy of old industrial sites that are contaminated and have fallen into disuse as industries have downsized, closed, or moved elsewhere. The Institute organized the first national conference on brownfield reuse (Chicago, 1991); a later report, Coming Clean For Economic Development (1995), was prepared with a grant from the U.S. Department of Commerce's Economic Development Administration.

The National Environmental Policy Institute (NEPI) is a non-profit, Washington, DC-based organization founded in 1993. Its members include individuals from corporations, academic institutions, advocacy groups, labor unions, etc. According to a 1995 fact sheet released by NEPI, its objectives are to foster a national environmental policy debate over the most cost-effective and environmentally productive means of addressing America's environmental priorities; to improve the role of state and local governments in the environmental policymaking and implementation process; to enhance the role of science, risk assessment, and market-oriented approaches in the development of environmental policy; and to promote global competitiveness by lowering barriers to environmental innovation. It provides publications and educational seminars for policymakers, as well as providing information to the media and NEPI's constituent members. Policies concerning brownfields cleanup and reuse are one of its main initiatives.

The Institute for Responsible Management (IRM) is Boston-based organization that, under a 1994 Cooperative Agreement with EPA, obtained support to provide technical and other assistance to states and localities attempting to clean up and reuse contaminated brownfield sites. In June 1994, IRM held a conference for state officials which resulted in its report, "State Brownfields Policy and Practice" (January 1995), based on information prepared for and discussed at the conference. IRM currently is working with EPA to provide assistance to municipalities in EPA's brownfields pilot project.

Stateside Associates is a lobbying group and state government relations management firm. One of its projects, The Greenfields Group, publishes The Greenfields Report during state legislative sessions providing updates concerning environmental, voluntary cleanup, and brownfield issues.

In contrast with the above groups, the Sierra Club, a long-standing non-profit environmental advocacy organization, has expressed reservations about brownfields

initiatives. An April 1996 article by its Atlantic Chapter Legislative Director (John Stouffer, "Brownfields Ahead: Proceed with Caution," The Planet vol. 3, no. 3) comments that some state brownfield laws have resulted in the repeal of health-based cleanup standards and the weakening of cleanup programs.

Ground not Covered

Brownfields are only one among a number of critical issues facing the nation's cities and towns. And this study only examines some among a number of critical issues with brownfields. In particular, the study only touches on the fact that brownfields sites do not exist in isolation; they are situated within distinct human and environmental settings. Because each brownfields site is part of a larger urban web, each must be treated contextually, with particular attention to the needs and desires of people who live and work near to the site. As has been pointed out by the National Environmental Justice Advisory Council to EPA, which has worked with EPA on its brownfields initiative, brownfields revitalization is ultimately a holistic act of rejuvenation, not simply a redevelopment exercise: it must be community-based and must be directed toward the goal of creating healthy and sustainable communities.

Part 1

Cleanup Issues

INTRODUCTION: KEY STATE POLICY ISSUES WITH BROWNFIELDS CLEANUP

In Part 1, twelve major brownfield policy issues are discussed. The focus of this part of the study is on cleanup issues, and on the state level of policymaking. The roles of the federal government, local governments, and the private sector are not discussed in detail, although federal guidance and partnerships between local government and the private sector are often crucial.

The issues considered include:

- type and scope of state program
- program funding
- initiation of cleanup
- cleanup standards
- future use restrictions
- public participation
- technical guidance
- cleanup review
- liability
- liability relief for developers
- liability relief for lenders
- financial assistance

For each, a synopsis is provided of the issue at hand, of various policy choices, and of their pros and cons. While summaries are given of all of the major policy choices known to be being tested or implemented by various states, the states pursuing these policy choices are listed only as examples. The brownfields topic is receiving a lot of attention and is evolving rapidly: a number of states are initiating new programs or making changes — minor and major — in existing programs.

Summaries of key state programs are provided in Appendix A and are accurate as of February 1996. As indicated in these summaries and as discussed immediately below, there are two types of programs that typically may be employed by states as part of their brownfield efforts: voluntary cleanup programs, which are general in scope; and brownfield programs, which are targeted to contaminated, underused urban sites.

1. TYPE AND SCOPE OF STATE PROGRAM

Types of programs. Two different, complementary types of programs are employed by various states: voluntary cleanup programs (VCPs) and brownfield programs. Many states have VCPs; some also have brownfield programs.

Voluntary cleanups typically are initiated by the current or prospective owner(s) of contaminated sites to avoid a forced, possibly more expensive cleanup. While voluntary cleanups may include contaminated urban sites, they also may include other sites in less developed areas and do not necessarily have site reuse or economic revitalization as a main aim.

In contrast, brownfield programs are directed specifically toward reuse of unused or under-used sites in economically distressed urban areas — in most cases, former industrial sites — not just toward site remediation. Within a brownfield program, site contamination may be addressed through a companion voluntary cleanup program, but typically, cleanup is only one of several barriers to productive reuse of the land.

Typically, brownfield programs and VCPs share a common goal of cleaning up contaminated sites, although brownfield programs are more limited in their scope of concern (to urban, underutilized sites) while having broader goals (economic revitalization as well as environmental remediation). Many states have VCPs. Of the growing number of states that also have brownfield programs, some are using their VCPs as the framework within which to establish brownfield programs, while others have separate programs just for brownfields (usually managed as a cooperative effort between the state environmental and economic development authorities).

Program scope. Some states restrict the kinds of sites that may enter into their VCPs. These restrictions typically take the form of excluding sites that fall under other programs, such as "corrective action" sites under the Resource Conservation and Recovery Act, sites falling under Underground Storage Tank cleanup programs, or sites that are on the National Priorities List and are thus part of the federal Superfund program.

Pros and cons of different approaches. Virtually all of the states examined seek to coordinate their VCPs and brownfield programs; the main question is whether the latter will be housed within the former or will be a related but separate state agency effort. efforts. Typically, VCPs present the following advantages and disadvantages to brownfields efforts:

Housing brownfield program within a VCP:

Advantages:

- Integrates state personnel's cleanup expertise into the brownfield program.
- Helps ensure consistent cleanup policies.

Disadvantages:

- VCP staff usually have limited experience in urban revitalization and labor market development.
- VCP not designed to provide assistance with infrastructure improvements. May not have sufficient VCP interface with state and local economic development agencies.

Housing brownfield program outside a VCP (e.g., within the state economic development agency):

Advantages:

- Brings to brownfield program the expertise of state personnel who can address "urban real estate" issues with brownfields to help ensure their economic success.
- More likely that the state will pull together other forms of urban development assistance to address non-contamination issues (e.g., infrastructure improvements needed to make brownfields property viable).
- More likely that state personnel will be familiar with local personnel who work to promote economic and community revitalization.

Disadvantages:

- May not have sufficient brownfield program interface with state agency staff responsible for ensuring contamination cleanup.
- Cleanup issues may be given short shrift because of lack of state expertise within brownfield program; cleanup issues may then be an insuperable hurdle to productive site reuse.
- Brownfield program staff may not be able to respond easily and quickly to questions that arise concerning how site contamination should be handled.

2. STATE PROGRAM FUNDING

The level of funding for state cleanup programs varies greatly from state to state. A number of states, because of a shortage of funds, are limited in their ability to fully address contaminated sites within their jurisdictions. These states, especially, need VCPs in order to encourage responsible parties or prospective purchasers to clean up sites. Paradoxically, though, states with more ample funds for cleanups are also more likely to have VCPs.

State brownfield and voluntary cleanup programs can be expensive but in the long run can provide significant cost savings to the state, the municipality, and the responsible parties. These programs typically are conducted either as a program within the state's environmental agency or as a separate or quasi-separate state program. Revenue can come from several standard sources — e.g., general state revenue, special corporate taxes or fees used to fund state cleanup programs, and EPA grants.

In addition, states may use other revenue sources to help pay for their VCPs or brownfield programs. Examples include special fees, revolving funds, and bond issues.

Special fees. Most VCPs include the requirement that, to participate in the program, the party initiating the voluntary cleanup must pay an up-front fee — usually around $5000. Additionally, this party is usually required to reimburse state funds spent on the project for staff services, oversight, etc. For example, Ohio charges fees not only for entrance into its VCP and for services provided, but also for certification and audits of professionals and laboratories and for liability assurances ("no further action" letters and covenants not to sue) provided by the state to the participants in the cleanup.

Revolving funds. If the current property owner is unable or unwilling to fund the cleanup effort, a state may take the property through foreclosure for unpaid taxes or by exercising eminent domain, use money from the state's revolving fund to remediate the contamination, then recover the costs and repay the fund when the property is sold. Connecticut, for example, uses this approach as part of its Urban Sites Remedial Action Program.

Bond issues. States may have bond issues to cover the cost of cleanup of "orphan" sites (sites without any viable potentially responsible parties). For example, Michigan had a voter-approved bond issue of approximately $400 million in 1988 to cover orphan site cleanups.

Pros and cons of different approaches.

Special fees:

Advantages:
- Covers state costs for services, certification, etc.; does not burden taxpayers with program costs.

Disadvantages:
- Difficult to set fee levels so that they are broadly applicable yet fair to different parties in different circumstances.
- May deter participation in program by some parties.
- Fees for some services — e.g., liability assurances — may give impression that parties are "buying" advantageous arrangements.

Revolving fund:

Advantages:
- Provides basis for program to help pay for itself over the long term.
- Alleviates burden on taxpayers.

Disadvantages:
- Start-up funds needed.
- Not likely to be able to cover full state program costs, even over the long term.

Bond issue:

Advantages:
- Can "kick-start" a program by providing substantial funding upfront.
- Spreads out payment for program over time.

Disadvantages:
- May only be appropriate for sites where there are no viable potentially responsible parties, and even then may violate some people's sense of the "polluter pays" principle.

3. INITIATION OF CLEANUP

Voluntary cleanup programs. With a voluntary cleanup, the project initiator is usually the current property owner or a prospective purchaser. In some cases (e.g., Illinois), state agency personnel may prompt voluntary cleanups by seeking out property owners and advising them that they have the option of a voluntary cleanup as well as the option of a state-led cleanup that may be more costly to them.

Under a VCP, the current or prospective property owner usually enters into a contractual agreement with the state that details procedures concerning such matters as the site investigation, cleanup standards, and choice of cleanup methods. As discussed in subsequent sections, states differ in their approaches to cleanup, especially concerning cleanup standards.

With voluntary cleanups that are also brownfield projects, the project initiator may (depending upon the state) work with the state's VCP personnel, brownfield program personnel, or a combination of the two.

Brownfield programs. With brownfield projects, the project initiator may be a private entity but is often a municipality or a quasi-governmental entity such as a local redevelopment authority. While local governments and quasi-governmental entities can promote brownfields revitalization without acquiring a contaminated site, acquisition may be necessary to prompt cleanup and reuse, and, in some cases, to assemble property that is large enough for the type of reuse desired by the municipality.

In some cases, the state government may prompt voluntary cleanups by private landowners within targeted brownfield areas. In Connecticut, for example, if a site within an identified redevelopment area has sufficient economic potential, state personnel may warn the site owners that if they do not clean up the site, it may be taken under the state's power of eminent domain (or foreclosed due to nonpayment of back taxes). Even if compensation is required (under a taking by eminent domain, the government must provide fair market value compensation), the property's market value may be very low because of the site's contaminated condition. The owners — if they have sufficient financial resources — may decide to voluntarily clean up the site in order to realize its economic potential themselves.

Restrictions on program participation. Some states (e.g., MA, VT, WI) exclude certain parties as initiators of voluntary cleanups or participants in brownfields programs — typically, the party(ies) who caused the contamination on the site.

Pros and cons of different approaches. While many different approaches to project initiation are possible, two key state policy issues are (1) whether the state proactively seeks projects for its VCP or brownfield program, and (2) whether culpable parties are allowed initiate voluntary cleanups or brownfield projects.

Proactive state role in VCP or brownfield program:

Advantages:
- Promotes program participation, especially in targeted areas.
- Helps to contain costs of state-led clean-ups.
- Encourages more rapid cleanup and productive reuse.

Disadvantages:
- May increase state costs over the short term, by requiring more personnel.
- State personnel may not be in a good position to judge which sites and property owners are well-suited to program participation.

Excluding culpable parties from participation in VCP or brownfield program:

Advantages:
- Sends the message that those who contaminate will not get advantageous arrangements.
- Avoids entering into relationships built partly on trust with suspect parties.

Disadvantages:
- Limits the number of program participants; gets fewer sites cleaned up quickly and back into economic use.
- Potentially increases state's long-term cleanup costs.

4. CLEANUP STANDARDS

Cleanups fall into two general categories:

(1) maximal cleanups (remediation to nondetect or background levels)
(2) risk-based cleanups (remediation to a specified risk or exposure standard)

With the latter type of cleanup, contaminants above background levels may remain, but measures are taken to ensure that they are not excessive for the planned use of the site and that they do not migrate off-site at significant levels. These measures may include engineered barriers (capping, paving, fences, etc.) and institutional controls such as monitoring (e.g., of surrounding groundwater) and future use restrictions (e.g., through deed restrictions). All of the states studied offer risk-based cleanups as part of their VCPs, although some states make clear that cleanups other than to pre-established standards remain the exception rather than the rule.

A relaxation in cleanup standards typically is tied to the planned use of the site. Some states (e.g., Michigan) have as many as eight cleanup categories. At a minimum, these usually include exposure-based standards for industrial, commercial, and residential use (with, respectively, a relatively high, medium, and low residual contamination permitted). In some states, the post-remediation risk allowed may be somewhat greater for industrial and commercial sites than for residential sites (e.g., excess cancer cases of one in 10,000 people for the former; one in one million people for the latter).

In addition, a number of states allow site-specific standards to be negotiated between the state and the VCP participant, and some states are willing in certain specified situations to modify the cleanup standards and procedures that would otherwise apply. Minnesota and New Jersey, for example, allow portions of sites to be cleaned up for reuse or resale, leaving the remainder to be addressed by a later cleanup. Pennsylvania imposes less strict standards in state-identified "enterprise zones" and for former industrial sites that have no viable potentially responsible parties.

Pros and cons of different approaches.

While a number of different approaches to cleanup standards are possible, two major distinctions are (1) whether maximal cleanups are required, or whether they can be risk-based; and (2) if risk-based standards are used, whether they are categorical standards or whether they are negotiated on a site-specific basis.

Maximal cleanups:

Advantages:

- Good assurance of no present or future risks to humans.
- No restrictions on future uses of the site.
- Limits ecological risks.

Disadvantages:

- Often expensive and time-consuming.
- May not be technically possible.
- May delay reuse of the site, if remediation is protracted.
  Cleanup process may create risks to humans and the environment.

Risk-based cleanups:

Advantages:
- Often cheaper and quicker than a maximal cleanup.
- Allows property to get back into economic use expeditiously.
- May be less likely to create risks through the cleanup process.

Disadvantages:
- May continue to pose some risk to humans, if flawed assumptions result in underestimates of exposure or dose-response.
- May require use restrictions, limiting the site's flexibility as a resource in the future.
- May pose risk to humans in the future, if institutional controls fail over time.
- To the extent that residual contaminants remain, may pose greater ecological risks.

Categorical risk-based standards:

Advantages:
- Easier and cheaper to administer than negotiated, site-specific standards.
- Easier to defend as equitable.
- Provide clear upfront guidance for responsible parties.

Disadvantages:
- Not taking into account subtle differences between seemingly similar sites may lead to less efficient and / or less protective cleanups.

Site-specific risk-based standards:

Advantages:
- May enable a more cost-effective and / or more protective cleanup than categorical standards would.

Disadvantages:
- Requires additional staff time to work out standards with those undertaking the cleanup.
- Requires that staff rely on information provided by those undertaking the cleanup, if staff do not have the time or funds to develop their own in-depth knowledge of the site.
- May be regarded as inequitable and / or subject to influence by special interests.

5. FUTURE USE RESTRICTIONS

As discussed above, risk-based cleanups are often accompanied with future use restrictions to ensure that human exposure to residual contaminants does not exceed that anticipated in the cleanup standards. There are several different forms of proprietary or governmental future use restrictions. Most common are deed restrictions (through easements, real covenants, or equitable servitudes); deed notices; zoning ordinances and local restrictions on, e.g., water well drilling; and state interventions.

Deed restrictions. Of the various forms of future use controls, deed restrictions are most often used: most of the states that allow risk-based cleanups also include reference to deed restrictions. These restrictions limit future site use to uses that would entail no more exposure than the use specified in the cleanup agreement. For example, a site cleaned up to industrial standards could not subsequently be used for residential purposes. Deed restrictions may have some legal limitations on their enforcement, especially over time: while deed restrictions bind the original, signatory property owners, it is less clear whether courts will interpret them as binding successor property owners, especially in states without explicit statutory provisions to that effect. (For a discussion of this complicated legal issue, see Susan C. Borinsky, "The Use of Institutional Controls in Superfund and Similar State Laws," Fordham Environmental Law Journal, Vol. VII, 1995. See also Mary R. English, David L. Feldman, Robert Inerfeld, and James Lumley, "Institutional Controls at Superfund Sites: A Preliminary Assessment of their Efficacy and Public Acceptability," forthcoming report, Knoxville, TN: Joint Institute for Energy and Environment.) As a complement to deed restrictions, another form of property right — an access easement — may be conferred by the property owner in order to allow the state or others to monitor the site's contamination and its subsequent uses.

Deed notices. Deed notices, unlike deed restrictions, have no "teeth" — they simply inform a potential purchaser of residual contamination on the site. However, they may be accompanied with periodic governmental verification that the use of the site complies with state-imposed restrictions set forth, for example, in the state's agreement granting liability relief (see section 10).

Locally-imposed restrictions. Local zoning ordinances guide the use of parcels of land within the jurisdiction by restricting those uses to certain categories, usually determined in conjunction with a comprehensive local plan. Although land use regulations such as zoning are enforced by the administrative arm of the local government, they are subject to change over time by the local governing body (e.g., the city council). Thus, for purposes of ensuring public health and safety with risk-based site cleanups, zoning regulations typically supplement other restrictions, such as deed restrictions or water well drilling restrictions, rather than serving as the sole assurance that the site will be used only as envisioned during the cleanup.

State interventions. Liability relief assurances such as covenants not to sue (see Section 10) may be contingent on continuation of the proposed use. If, after a risk-based cleanup, the site use is changed to one requiring more stringent standards (e.g., a

change from commercial to residential use), the covenant is then invalidated and the state may mandate further cleanup. Provisions such as these are grounded in the state's "police power" to protect the public's health, safety, and welfare; while some states (e.g., Oregon) use such interventions as a fall-back measure to restrict future site use, most states prefer to simply require deed restrictions.

Pros and cons of different approaches.

Deed restriction:

Advantages:
- Easy to implement.
- Permanent, insofar as it is attached to the deed and is interpreted as running with the deed.
- Enforcable by local government; also will be enforced by creditors holding mortgages.

Disadvantages:
- May not be widely recognized, especially as time passes; may be forgotten or ignored by the site owner and others.
- Awareness may be triggered only in the event of sale of the property, but (without explicit statutory provisions) may not be legally enforcable for successor property owners.

Deed notice:

Advantages:
- Easy to implement.
- Alerts prospective purchasers but does not unduly tie their hands.

Disadvantages:
- May be forgotten or ignored by the site owner and others.
- No enforceable provisions.

Local zoning restriction:

Advantages:
- Easy for local government to implement.

Disadvantages:
- The residual contamination may be forgotten over time by both successive site owners and/or successive governing bodies.
- Because of ignorance or special interest influence, may be changed to less restrictive use by governmental action at some point in the future.

State intervention:

Advantages:

- Easy for state to specify as a condition of a cleanup agreement or covenant not to sue.

Disadvantages:

- Vigilant enforcement will depend on agency staff and availability of funds.
- Because of ignorance or special interest influence, may be altered or revoked by governmental action at some point in the future.

6. PUBLIC PARTICIPATION

Typically, public participation plays a more important role in brownfield projects than in conventional voluntary cleanups. There are at least two reasons for this: (1) the initiative for the brownfield project is more likely to come from the local government, and community support may be politically essential to the project's success; and (2) EPA has promoted citizen participation as an important feature of brownfield projects. Nevertheless, VCPs as well as brownfield programs may include requirements concerning such standard public participation mechanisms as:

- **Public notices —** typically, a notice of the proposed cleanup published in a widely distributed local newspaper; may also be published in a state record or state-wide newspaper.

- **Mailing lists —** names and addresses of citizens and groups who have expressed interest in receiving site-related information; may be maintained by the state agency overseeing the cleanup or by the project initiator.

- **Public meetings —** typically conducted as informal question / answer sessions to provide information and address citizen concerns.

- **Public comment periods —** period (typically approximately 30 days) following public notice for individuals and groups to submit comments concerning a proposed action.

Voluntary cleanup programs. Various states' VCPs range from requiring all to none of the above mechanisms, but some programs gear the amount of public participation to the amount of expressed public interest. Minnesota, for example, has no fixed public participation requirements. Instead, the local government typically is notified about the cleanup, and a public meeting may be held if citizen interest warrants one. Rhode Island has a minimum requirement of public notice and distribution of reports to affected surrounding communities, while Oregon requires public notice and a 30-day comment period, as well as a public meeting if requested by 10 or more people.

Some states base the level of public involvement on the severity of contamination as well as the proposed cleanup standard and remedy. Michigan, for example, requires public notice if the proposed cleanup level falls into certain categories, while Pennsylvania requires only public notice if the cleanup is to background levels but requires a public comment period as well as public notice if the cleanup is to a risk-based standard. In addition, in Pennsylvania municipalities are invited to contact the state regarding whether a public involvement plan should be required. Similarly, in Wisconsin public participation requirements vary depending upon the level of contamination, the cleanup standard, and the remedy under consideration.

Brownfield programs. Typically, brownfield projects have more extensive public participation requirements than voluntary cleanups, since they include reuse strategies that are likely to affect people living and working in the surrounding area. In Wisconsin's combined voluntary cleanup / brownfield program, for example, significant

public participation is not required for voluntary cleanups with minor contamination but is required for brownfield projects, as well as for voluntary cleanups with more serious contamination.

The EPA has emphasized public participation as part of its Brownfields Action Agenda: for example, to obtain an EPA brownfields pilot project grant, one of the application requirements is a community involvement plan describing such issues as how two-way communication with community members will be conducted and how environmental justice concerns will be addressed.

Pros and cons of different approaches.

As indicated above, various states' approaches to public participation requirements are diverse. They can be roughly grouped into two categories, however: those that emphasize consistency — usually, a robust set of requirements applicable to all sites; and those that emphasize flexibility — usually, minimum widely applicable requirements with additional case-specific requirements determined by the level of public interest, the severity of contamination, or the type of cleanup standard and remedy proposed.

Approaches that emphasize robust standard requirements:

Advantages:

- Ensures that measures are taken to elicit interest; does not rely on citizens to take the initiative.
- State personnel, cleanup participants, and interested parties know upfront what steps to follow.
- Avoids charges of state bias regarding different sites.

Disadvantages:

- Requires that time and money of state staff and cleanup participant be spent in rote adherence to participation procedures, regardless of interest level and site characteristics.

Approaches that emphasize minimum standard requirements and site-specific flexibility:

Advantages:

- Directs time and money of state and cleanup participant toward situations that are more likely to be of citizen interest and concern.
- Allows the state to set very robust participation requirements for sites where citizen interest and concern are potentially high.

Disadvantages:

- If procedures are not be a "given," state personnel and cleanup participant may have to work them out, requiring time and negotiation.
- May be subject to charges of state bias from either citizens or cleanup

participants.

- In some situations, may require strong expressions of concern from a number of citizens to trigger more than perfunctory public participation requirements.

7. TECHNICAL GUIDANCE

Voluntary cleanup programs. Efficient and effective cleanups require technical expertise to determine how contaminants can best be eliminated from a site and how exposure to any residual contaminants can be minimized. Thus, technical guidance often is essential to a good VCP or brownfield program. Some states take measures to help ensure that voluntary cleanups have adequate technical expertise; others assume that those conducting the cleanup can bear the responsibility for finding technical experts.

States that provide technical guidance for voluntary cleanups typically do so in one of two ways:

- **State personnel.** In some states (e.g., Tennessee), the state supplies agency staff as technicians to help plan and oversee the cleanup effort, usually on a fee-for-service basis. Tennessee has also explored the possibility of using expertise available at the University of Tennessee to help with site sampling and review of proposed voluntary cleanup plans.

- **State certification.** In some states (e.g., California, Massachusetts, Ohio), the state certifies private-sector technical consultants who have met state requirements to plan, oversee, and sometimes certify cleanup work. (Among states that have certification programs, certification of technical consultants is mandatory in some states but optional in others; in the latter, however, it is generally recognized that using a certified consultant can facilitate certification of the cleanup work.)

Certification requirements may be extensive. In Ohio, for example, the state certification program has requirements concerning education (minimum of a bachelor's degree in an environmental, scientific, engineering, or related field); professional experience (at least eight years' experience, three in a supervisory capacity); competence (must be consistent with a certified professional); good moral character; and licensing fees ($2500 initial fee plus $2000 annual renewal fee). License renewal includes continuing education requirements, and certification can be suspended or revoked for various reasons, such as felony convictions or improperly certifying a site as clean.

Other states (e.g., Wisconsin) do not have certification programs but may maintain a list of professionals who perform brownfields and voluntary cleanup work. The Wisconsin Department of Natural Resources also has project managers who work closely with voluntary cleanup efforts.

Brownfield programs. In addition to requiring cleanup-related technical guidance, brownfield projects may require economic redevelopment assistance. States with brownfield programs typically provide this support through the state agency in charge of economic development.

Pros and cons of different approaches.

State personnel:

Advantages:

- Ensures regulatory compliance; less need for thorough review upon completion of cleanup, and liability relief more likely to be readily granted.
- No overhead for certification.
- State receives revenue from fees for services provided.

Disadvantages:

- State must keep large "stable" of staff technicians to meet changing demands for different kinds of expertise.
- Possibility that staff technicians will not remain technically up-to-date.

State certification:

Advantages:

- More flexible; allows market to meet changing demands for different kinds of expertise.
- Lower state personnel costs.
- Maintains a measure of state control over remediation professionals; less need for thorough review of cleanup, and liability relief more likely to be readily granted.
- State receives revenue from licensing fees.

Disadvantages:

- Costs of certification program.
- Difficulty of determining that some nonquantifiable criteria (e.g., competence) have been met; possibility that unqualified applicants will get certified.
- With pro forma license renewals, possibility that previously certified professionals will not remain technically up-to-date.
- Less direct state control of site cleanup; more need for review to ensure regulatory compliance.

No technical guidance from state:

Advantages:

- No extra state personnel needed for technical guidance or certification.
- No state responsibility assumed for adequacy of the cleanup process.

Disadvantages:

- Less opportunity for state to influence attainment of optimal cleanup.
- May require very thorough (time-consuming and staff-intensive) review of cleanup if little state involvement during the process.
- Liability relief less of a "sure thing."

8. CLEANUP REVIEW

Voluntary cleanup programs. All states with VCPs have oversight and review mechanisms, in order to assure that a site is remediated to the level identified in the voluntary cleanup agreement as protective of human health and the environment. Oversight and review also enables determination of whether the VCP participant qualifies for liability relief assurances, as well as for financial assistance such as tax breaks (see section 12).

Most of the states studied recover oversight and review costs from the VCP participant. Oversight and review roles vary from state to state, however:

Some states are directly involved in oversight and review activities. In Illinois, for example, the state Environmental Protection Agency approves both the work plan and the cleanup.

Some states use reports sent by state-certified technical experts. In Ohio, for example, VCP participants must use state-certified professionals for final review of the site cleanup, who then can recommend "no further action" determinations. State personnel conduct audits of 25% of the "no further action" determinations each year.

Some states review reports supplied by the VCP participants and their contractors. In Michigan, for example, state staff approve the proposed remediation plan and then review reports supplied by those conducting the voluntary cleanup.

Some states use an ad hoc approach — the type of oversight depends upon the site. In Massachusetts, for example, the kind and degree of state oversight is determined by kind and degree of contamination involved. With more severe contamination, there is more direct state involvement; with less severe contamination, oversight may be handled by a "licensed site professional."

Some states are exploring augmenting state personnel capabilities. For example, as noted in section 7, the Tennessee Department of Environment and Conservation has explored the possibility of using university faculty and students to provide assistance with site sampling and review of cleanup plans.

Brownfield programs. States may choose to use a different oversight and review approach in their brownfield programs. In Wisconsin, for example, a staff member of the state's Department of Natural Resources works closely with brownfield project leaders from start to finish. In contrast, if a site is not a brownfield project but is being handled as a voluntary cleanup, state personnel work closely with those performing the cleanup only if the site is severely contaminated; if it is not, the cleanup work is simply subject to state review.

Pros and cons of different approaches.

Direct state oversight and review:

Advantages:
- Allows state personnel to determine for themselves whether the cleanup meets prescribed standards; does not require trust.

Disadvantages:
- Necessitates maintaining a larger state technical staff than would otherwise be needed; even if oversight and review costs are reimbursed by VCP participant, this may entail additional indirect costs for the state.

Oversight and review by state-certified professionals:

Advantages:
- Allows VCP participant some discretion in choosing oversight personnel while retaining some state control.
- Does not require maintaining a large state technical staff.

Disadvantages:
- Costs of certification program.
- Difficulty of determining that some nonquantifiable criteria (e.g., competence) have been met; possibility that unqualified applicants will get certified.
- With pro forma license renewals, possibility that previously certified professionals will not remain technically up-to-date.

State review of reports supplied by VCP participant:

Advantages:
- No extra state personnel needed for certification; limited need for technical staff to review reports.
- Limited state responsibility assumed for adequacy of the cleanup.

Disadvantages:
- May not ensure adequate cleanups; relies to a greater extent on the honesty and capability of the VCP participant.
- Does not provide a good basis for liability relief.

Use of ad hoc approach:

Advantages:
- Flexible — can be tailored to the site conditions, the VCP participant, and the reputations of the contractors used by the participant.
- Uses state personnel where they are most needed.

Disadvantages:
- May not provide adequate oversight of some cleanups, especially where contamination is more extensive than has been recognized.
- State may be susceptible to charges of favoritism or capriciousness unless a good

case can be made for differential treatment of various VCP participants.

9. LIABILITY FOR CLEANUP COSTS

Under state as well as federal hazardous waste remediation laws, liability provisions determine who is responsible for covering the costs of a contaminated site cleanup. Liability for other costs — e.g., due to damage to the health or property of a neighbor — typically is not specified within these laws, but legal remedies for those damages are otherwise available. The discussion in this section and sections 10 and 11 concerns only liability for cleanup costs.

In establishing policies for cleanup liability, difficult questions arise concerning how liability should be (1) determined, and (2) apportioned.

(1) Determining liability. One key issue is whether liability should be "strict" or not. With strict liability, proof that a party has caused or contributed to the contamination is sufficient; otherwise, proof of negligence is also necessary. A second key issue concerns retroactivity of liability. If liability is retroactive, actions are not excused simply because they occurred in the past; the key question then is whether retroactivity will be limited to actions occurring after a specified date or whether it will extend indefinitely into the past.

(2) Apportioning liability. Whenever more than one party is potentially responsible, the issue arises of how liability should be apportioned — in other words, of who should pay how much. With "joint and several" liability, the government can recover full cleanup and related costs from one responsible party, who in turn may seek repayment from other responsible parties. In contrast, with proportional liability each party is liable only for its share of the costs, with the government picking up the cost of orphan shares — i.e., shares for whom there is no financially viable responsible party.

Most states (e.g., CT, KY, MI, NJ, OH, OR, PA) continue to use strict, joint and several, retroactive liability principles for determining cleanup responsibilities, as does the federal government (although liability has been a hotly debated issue at the federal level). A few states (e.g., IL, MA, MN) use a combination of joint and several and proportional liability. In these states, there is a presumption of strict, joint and several liability unless a party can establish conclusively the size of their contribution to the contamination. At least one state (TN) uses a strict liability principle in combination with a proportional method of allocating liability.

Pros and cons of different approaches.

While many different approaches to liability for cleanup costs are possible, arguments today center around whether liability should be (1) strict, (2) of indefinite retroactivity, and (3) joint and several.

Strict liability:

Advantages:

- Broadens the pool of potentially responsible parties.
- Lightens the government's burden of proof; do not need to show causation or negligence.

Disadvantages:
- May be seen as unfair, insofar as it implicates parties who neither knowingly nor negligently contributed to the contamination.
- May lead to litigation and cleanup delays.

Indefinite retroactivity:

Advantages:
- Broadens the pool of potentially responsible parties.
- Does not require determining precisely when an action occurred in order to determine liability; thus, may avoid extra costs, litigation, and cleanup delays.

Disadvantages:
- May contribute to cleanup delays and litigation, if contamination situation occurred long ago and potentially responsible parties cannot be readily identified.
- May be seen as unfair insofar as it helps to implicate successor corporations and individuals who did not themselves contribute to the contamination situation.

Joint and several liability:

Advantages:
- Allows full costs to be sought from a single "deep pockets."
- May expedite the state's cost recovery.
- Avoids the need for the government to determine "fair shares" and decreases the likelihood that the government will have to pick up "orphan shares."

Disadvantages:
- May be seen as unfair, by placing an undue burden on parties who were only partially responsible.
- May contribute to litigation and cleanup delays.

10. LIABILITY RELIEF FOR PROSPECTIVE PURCHASERS AND DEVELOPERS

Prospective purchasers and developers of contaminated urban sites and their financiers assume a double risk: first, that the planned use may not be economically successful; and second, that the contamination may eventually be found to be greater than expected, necessitating further cleanup at their expense. To alleviate the second type of risk and encourage brownfield cleanup and reuse as well as other voluntary cleanups, some states have introduced policies to provide a measure of relief from continuing cleanup liability. This section discusses liability relief for prospective purchasers and developers; section 11 discusses liability relief for lenders.

Relief from liability under state cleanup requirements. Various degrees of liability relief are offered by VCPs or brownfield programs in situations where parties have participated in state-monitored cleanups, including parties that have acquired contaminated property but have documentation that they were not connected with the contamination. (Corporations that acquire contaminated sites through purchase are usually referred to as "successor corporations.")

Some states have adopted the policy that, if a municipality forecloses on a contaminated site because of nonpayment of back taxes, the site acquisition will be considered involuntary and liability for cleanup will be accordingly limited. Other forms of liability relief are available to prospective purchasers and developers who come from the private sector. While the forms of relief vary, one or more of the following instruments may be used:

- **No further action (NFA) letters** — typically are used when known contamination has been cleaned up according to state standards and with state oversight. A NFA letter typically does not release the parties involved from cleanup liability if further contamination is found. "Certificates of completion" and "letters of completion" provide similar assurances to NFA letters.

- **Covenants not to sue** — are issued after a cleanup and provide stronger assurances than a NFA letter. Typically, a covenant not to sue provides that the state will not sue or take action against the party unless the situation changes in some meaningful way — e.g., unless cleanup standards become significantly more stringent, unless some extreme and unforeseen contamination is found on the site, or unless an emergency health or environmental situation arises. Some covenants not to sue do not have re-opener clauses, however. With those stronger covenants, the state cannot require further action even if standards change or additional contamination is found.

- **No association letters** — are provided under certain conditions to site owners who did not contribute to the site's contamination. Typically, these letters are granted to landowners who meet various "innocent landowner defense" criteria — e.g., that they did not contribute to the contamination, that they did not know of the contamination when they purchased the site, and that the property was purchased before a certain date or "due diligence" was taken in assessing the property. No association letters may also be granted to a prospective purchaser who is aware of the contamination but is willing to buy the property despite its contamination and needs a shield from future

liability.

No further action letters and their counterparts (certificates or letters of completion) are widely used: at least 20 states provide them. Covenants not to sue are used less extensively: about 10 of the states studied employ them, although one state (Delaware) restricts their use to new owners of remediated properties only. No association letters are even less commonly used: of the states studied, very few offer them.

Relief from liability under federal cleanup requirements. In addition to providing NFA letters, covenants not to sue, and no association letters for liability under state cleanup requirements, Minnesota has an innovative program in federal liability relief. The EPA Region V has entered into an agreement with Minnesota under which EPA will not "plan or anticipate any federal action under Superfund" at sites cleaned up under the Minnesota VCP, unless there is a severe hazard involved. While this does not provide formal relief from federal liability, it provides reassurance to parties involved. Other states are pursuing similar arrangements, often called a Superfund Memorandum of Agreement (SMOA), with EPA: for example, Illinois now has a similar agreement.

Pros and cons of different approaches.

No further action letters:

Advantages:
- Provides some reassurance to responsible parties.
- Leaves state's options open; allows state to insist upon further cleanup at its discretion if conditions change (e.g., if additional contamination becomes apparent or if remediation standards become more stringent).

Disadvantages:
- Provides relatively little legal security for responsible parties against further liability.

Covenants not to sue:

Advantages:
- Provides fairly strong assurance for responsible parties.
- Does not tie state's hands altogether; if an extreme situation occurs in the future, most covenants not to sue have "reopener" clauses that enable the state to require further cleanup under specified conditions.

Disadvantages:
- In most cases, does not provide complete legal security for responsible parties against further liability.
- May result in future litigation if the state and the recipient of a covenant not to sue do not agree on the conditions under which further cleanup is necessary.

No association letters:

Advantages:

- Under certain conditions, provides security against liability for parties that can demonstrate that they did not contribute to pre-existing contamination.
- Helps to promote cleanup and economic reuse of property by parties that might otherwise not want to become involved.

Disadvantages:

- Requires careful investigation by state to determine that a no association letter is merited; may increase state staffing requirements.
- Over time, may be difficult to distinguish between contamination that existed before site purchase and new contamination caused by the new site owner or operator.

11. LIABILITY RELIEF FOR LENDERS

Prospective purchasers and developers of brownfield sites may have difficulty obtaining financing because of lender concerns that (1) the project will not succeed economically and the lender's collateral will be impaired if cleanup costs are greater than expected; and (2) the lender will become a responsible party in the cleanup, due either to the property serving as loan collateral or to the need to foreclose if the borrower defaults on the loan.

A lender's concern about impaired collateral may be assuaged to some extent by the developer's receiving a measure of liability relief, as described in section 10. With loans to a successor corporation, a lender's concern can also be assuaged through provisions (e.g., through state property transfer law) that require disclosure of the environmental condition of the site, site investigations, or, in a few states, cleanups prior to property transfer. In contrast, lender concerns about collateral can be exacerbated if, as in a few states, cleanup obligations constitute first-priority liens (superliens) on the site owners' property — either all the site in question, or all of their property.

In addition to concerns about impairment of collateral, lenders often want assurance that they themselves will not be held responsible for cleanup costs. If a state uses **other than** strict liability principles for determining cleanup responsibility, lenders would be relieved of concern about cleanup liability so long as they did not contribute to the contamination. And even if a strict liability principle is used, lenders would have some protection if the liability allocation principle is proportional rather than joint and several. As noted in section 10, however, most states use strict, joint and several principles for cleanup liability.

To provide assurance to lenders that they will not be held responsible for cleanup costs, various states are using a **secured creditor exemption**. This provision, which may be enacted statutorily or by regulation, exempts secured creditors such as banks from cleanup liability. More than a dozen of the states studied have secured creditor exemptions, although a number (e.g., CO, DE, NH, NY, OH, OR) do not. Whether lenders are protected from liability often turns on the extent to which they have had an "arms-length" relationship with the owner: those who have an ownership interest in the site and/or participate in its management are more likely to incur liability.

A few states use hybrid approaches to provide some reassurance for lenders. Several of these hinge on property ownership: Connecticut, for example, provides that lenders are not liable so long as they do not take ownership of the property in question; Texas provides that lenders are not liable if they acquire the property through foreclosure; and Michigan, in addition to providing a secured creditor exemption, allows creditors to turn over the property to the state if they are unable to sell it after foreclosure. Rhode Island extends limited protection in the form of covenants not to sue to lenders as well as developers.

Pros and cons of different approaches.

With a brownfield site, possibly the most serious concern of a lender is the prospect of becoming a potentially responsible party and being called upon to pay for an expensive cleanup. The various possible approaches to address this concern fall between two poles of a spectrum: secured creditor exemptions and no secured creditor exemptions.

Secured creditor exemption:

Advantages:

- Encourages lending for private investment in cleanup and reuse; thereby generates income and reduces state or local costs for site cleanup and revitalization, freeing up public funds for other, less economically viable sites.
- May be regarded as fairer than expecting parties who didn't contribute to the contamination to pay for its remediation.

Disadvantages:

- If further cleanup is needed and there are no parties that are both legally responsible and economically viable, state may have to cover the additional cleanup costs.
- Requires state to determine whether the secured creditor actually has an "arms-length" relationship from the developer, or whether the loan arrangement is a covert way to provide liability relief for the developer.

No secured creditor exemption:

Advantages:

- Helps to ensure that state will not have to cover costs if additional cleanup becomes necessary.
- Liability more clear-cut, less open to interpretation and legal challenges.

Disadvantages:

- Discourages lending for private investment; property more likely to either remain in contaminated, under-used condition or require investment by state and local government.
- May be regarded as unfair.

12. FINANCIAL ASSISTANCE

While the promise of economic return favors brownfields cleanup and reuse, costs can be high and the specter of financial liability can loom over both prospective purchasers and developers and their potential creditors.

As discussed in sections 10 and 11, prospective purchasers and developers may be concerned about getting disadvantageous financing terms because of holding "impaired collateral," where a site with residual contamination may be seen by a lender as a poor financial risk; and both creditors as well as prospective purchasers and developers may be concerned about the costs of the cleanup and redevelopment, which may exceed original plans, deplete the developer's resources, and impede timely loan repayment. Creditors may also fear becoming implicated as responsible parties for the cleanup, either as a secured creditor with an interest in the site, or upon foreclosure in the instance of default on loan repayment.

A measure of relief from liability concerns is possible, as noted in sections 10 and 11. In addition, loans available to previously "red-lined" areas through the 1977 Community Reinvestment Act (CRA) can be a source of investment funds, especially since, as revised in 1995, CRA guidelines include loans for brownfields cleanup and redevelopment as a way for financial institutions to meet their CRA loans. Nevertheless, financial assistance from the state may be necessary to prompt the cleanup and reuse of some brownfield sites. Typically, this assistance is provided either to private participants in voluntary cleanups or to municipalities and local quasi-governmental entities (e.g., economic development agencies, port authorities, housing commissions).

Municipalities and their quasi-governmental counterparts can play a dual role, as developer and as landowner. As a developer, they must avoid becoming involved with a cleanup that could have serious cost overruns. As an entity that acquires property through various means — e.g., through eminent domain or nonpayment of taxes — the municipality may need financial assistance to assess and clean up contaminated sites in its possession.

State financial assistance typically can take two forms:

- **Direct state assistance —** usually as grants, low-interest loans from the state, or state-secured loans; usually limited to use for site assessment and remediation expenses.

Grants are usually given only to local governmental and quasi-governmental entities: for example, Michigan, Minnesota, and Pennsylvania provide grants to local governments for site assessment and remediation, but of the states studied, only California provides grants to private participants in a VCP. (Under California's pilot VCP program, the state will pick up the "orphan share" of cleanup costs for up to 10 sites.)

In contrast, state **loans** to help finance the costs of site assessment and remediation are sometimes available to private participants in VCPs as well as to local governmental

entities. For example, Connecticut, New Jersey, and Pennsylvania all provide loans for specified maximum amounts to private participants in VCPs who meet eligibility requirements, as well as to local governmental and quasi-governmental entities. In addition, some states such as Ohio provide loans from the state Department of Commerce to qualified applicants.

• **Indirect state assistance —** usually through **tax breaks** that allow the prior assessed value of the site (before cleanup and reuse) to be used as the basis for taxes for a specified time after it has been returned to economic use. Tax breaks are, of course, applicable only to private entities. Examples include Delaware, which provides tax credits that depend on the number of jobs created; and Ohio, where state property taxes for voluntary cleanup sites are to be based on pre- rather than post-remediation value for ten years after cleanup, with tax relief also potentially available from local government.

Pros and cons of different approaches.

Grants to local governmental and quasi-governmental entities for site assessment and remediation:

Advantages:
- Expedites the cleanup process.
- May enable some impoverished local governments to do projects that they couldn't otherwise undertake.

Disadvantages:
- Requires up-front cash outlays from states that may already be strapped for funds.
- Requires assurance that funds are actually used for intended purposes.
- No guarantee that the grant will "pay off" through the creation of jobs and tax revenue as well as cleanup of the site.

Loans to private entities and local governmental and quasi-governmental entities:

Advantages:
- State funds eventually repaid, making more loans possible than with grants.
- Can help to spur site cleanup and reuse by entities that couldn't afford the interest rates of conventional loan sources.
- Can help to spur cleanup and reuse in derelict urban areas that may be shunned by conventional loan sources.

Disadvantages:
- Requires assurance that funds are actually used for intended purposes.
- Loan defaults are possible, especially with high-risk ventures, and the only collateral may be the contaminated site.

Tax breaks for private entities:

Advantages:

- Provides incentive to potential investors in site cleanup / revitalization.
- May be more than compensated by tax revenue indirectly generated through the creation of jobs and new related businesses.

Disadvantages:

- Could be regarded as inequitable by other businesses.
- Could be regarded as inappropriate if the site reuse is unpalatable to nearby communities or the municipality, or if the company makes a profit but jobs and other local income generation do not materialize as promised.

PART 1: CONCLUSIONS AND RECOMMENDATIONS

Based on information available as of early 1996, we have reached the following tentative conclusions about the policy issues considered in Part 1.

Program Type and Scope

To date, voluntary cleanup programs have been the main vehicle used by many states to address brownfield issues. VCPs continue to provide a useful, flexible framework for brownfield projects. They are not appropriate in all circumstances, however, nor do they meet all brownfield project needs. Some brownfield projects may include cleanups led by the state or by EPA, as well as PRP-led cleanups conducted under enforcement procedures. And many brownfield projects (regardless of whether the cleanup is voluntary, state-led, etc.) may need additional guidance and assistance in economic development issues such as marketing, employee training, and infrastructure development.

To address economic revitalization as well as cleanup concerns, "one-stop shopping" for brownfield projects may be needed at the state level. This integration of state services and oversight could be done formally or informally. If done formally, through a single program, the state must have enough brownfield sites to justify the expense of setting up and staffing a specialized program. If done informally — e.g., through a state contact who can direct those undertaking brownfield projects to appropriate state programs and personnel — the relevant state programs must be sufficiently coordinated to ensure that their guidance and regulations are compatible in content, timing, and paperwork.

In coordinating and refining a state's brownfields program, one place to start would be a working group with representatives from the relevant state programs, as well as representatives from municipal governments and from various members of the private sector — e.g., community groups and the environmental justice movement, business and industry, real estate and development, law, and environmental engineering (as has been explored in states such as Massachusetts, with its Brownfields Advisory Group).

At a minimum, states should provide a comprehensive listing (both in writing and on the Internet) of state and other resources available to brownfield project participants. This list help prevent frustration and duplication of effort, and it might help to expedite the cleanup and reuse of sites that would otherwise remain in limbo for lack of information.

Key recommendations:

- **"One-stop shopping" for brownfield projects, through either a formal state program or a coordinated state point of contact.**
- **A working group to provide advice and direction on brownfields issues, with**

representation from relevant state agencies, from municipal governments, and from different interest groups within the private sector.

- **Complete, continually up-dated list of state and other resources for brownfield projects.**

State Program Funding

A variety of means are available to fund state brownfields programs. If the state has a number of brownfield sites that could make a significant difference to state or local economies and growth management efforts, a bond issue may be appropriate and politically feasible. Otherwise, the state may need to rely on more modest sources of funds, such as budget allocations and fees for program participation. Fees must be set sufficiently high to generate adequate revenue yet not so high as to deter program participation. Fees should be scaled to services; they might also be adjusted to the type of program participant (e.g., one set of fees for local government agencies and not-for-profit organizations; another set for for-profit participants).

Key recommendations:

- **Bond issues in states with a number of major brownfield sites.**

- **Program fees set to cover services, but adjusted to type of participant.**

Initiation of Cleanup

A few states take a proactive role to promote brownfield projects, but as yet most do not. In addition, some states allow voluntary cleanups to be undertaken by parties who have caused the contamination, while other states do not. To get the fullest participation in VCPs and to avoid spending staff time making determinations of whether a VCP applicant qualifies, states might do well to take a liberal rather than restricted stance on initiation of voluntary cleanups, accompanied with a thorough state review of the cleanup performed. In contrast, states may wish to provide special incentives (e.g., low-interest loans and tax relief) only to program participants who can prove that they were not involved in a site's contamination, in order to avoid the appearance of rewarding those who pollute.

States and their local jurisdictions can also benefit in the long run by paying proactive attention to brownfield areas, even though doing so requires a short-term investment of government funds and staff time. If brownfield projects are carried out with careful regard for neighborhood interests and concerns, they can help to meet environmental justice goals, in addition to helping to promote local economic and growth management goals.

Key recommendations:

- **Liberal policy toward participation in state voluntary cleanup programs, with careful state review of cleanups.**

- **Proactive governmental attention (local or state) to key brownfield sites.**

Cleanup Standards

All other things being equal, maximal cleanups (i.e., cleanups to background or non-detect levels) are desirable. They are not always technically or economically feasible, however, and the process of remediation may create risks of its own. Furthermore, other approaches — partial cleanups (i.e., cleaning up only part of the site) and/or risk-based cleanups (which typically involve a relaxation of background or non-detect standards) — may be needed to get sites remediated and back into productive use quickly, rather than allowing them to remain contaminated and unused. If these approaches are adopted, however, particular care must be taken to ensure that future exposure to contaminants by various people — including sensitive populations such as children, the elderly, and pregnant women — will be no greater than with a maximal cleanup, and that natural resource damages will not be significantly greater.

With risk-based cleanups, site-specific standards may be preferable because they can be tailored to the site's conditions, but they require a large investment of staff time. An intermediate approach — especially for states that have a number of brownfield sites — is to use categorical standards (e.g., standards by category of proposed use), as well as presumptive remedies for common types of contamination. Site-specific standards might be available as an alternative either to state oversight personnel, if they think the site needs special attention, or to those conducting the cleanup, if they are willing to pay for full risk assessments and for the additional state staff time required with negotiated standards.

Key recommendations:

- **Selective use of partial and/or risk-based cleanups.**

- **Categorical standards and presumptive remedies to expedite cleanups of slightly contaminated sites.**

- **Site-specific risk-based standards on a special-case basis.**

Future Use Restrictions

Future use restrictions are often an important component of risk-based or partial cleanups, since they help to ensure that exposure will not exceed that anticipated in the cleanup. Future use restrictions may not always be completely reliable, however, especially in transitional areas where site uses could easily change in the future. A combination of deed restrictions with specially tailored local zoning regulations may, in general, be the most effective mechanism for restricting future uses, but even these

mechanisms cannot always be regarded as fully reliable: constraints on land use may be forgotten or ignored over time; zoning changes may occur; deed restrictions may not, under common law, be enforcable with successor property owners. For this reason, future use restrictions may need to be employed selectively, with attention to the severity and longevity of the residual contamination and the likelihood that other uses may be contemplated for the site at some point in the future.

Key recommendations:

- **Future use restrictions as part of remedy only for sites of low land-use volatility and limited long-term risk.**

- **Combination of institutional controls — e.g., deed restrictions and zoning regulations — to help ensure efficacy of future use restrictions.**

Public Participation

Opportunities for public participation can be important determinants of how responsive a brownfield project is to people who live or work nearby and, by extension, of the project's success. Members of the public may be concerned about the proposed new use of the brownfield site as well as the proposed remediation standards. Nevertheless, all projects do not require equivalent opportunities for public involvement, from the standpoint of both the public (who have many other concerns in their daily lives) and the project initiators (who have many other project matters to attend to).

Projects that are known to be controversial — because of the level of contamination, the proposed cleanup standard and remedy, or the proposed reuse — should have full-scale community involvement opportunities. So should all projects located in areas that, historically, have been burdened with disproportionate environmental burdens. These opportunities should include, at a minimum, early notice of the proposed project, informal meetings for information exchange, and formal comment periods; they might also include forming a local citizens' committee to provide advice and consultation on the project. With less potentially controversial projects, widespread public notice of the proposed cleanup and reuse plan might be required (e.g., on local television and radio as well as in local newspapers; in more than one language where appropriate), but further opportunities for public involvement would be left to the discretion of the project initiators, in consultation with either state or local agency personnel and in response to voiced local concerns.

Key recommendations:

- **With potentially controversial brownfield projects or projects located in areas with disproportionate environmental burdens, extensive community involvement opportunities.**

- **With presumably routine, non-controversial brownfield projects, thorough and widespread public notice of proposed cleanup and reuse actions, together with the addition of public involvement opportunities if the need becomes apparent.**

Technical Guidance

Technical guidance during site cleanups can be provided through a variety of means — e.g., by state staff, by state-certified professionals, or by other consultants chosen by those conducting the cleanup. Each approach has advantages and disadvantages. In particular, states need to balance between a time-consuming, extensive involvement prior to or during the cleanup and a time-consuming, extensive post-hoc review of the cleanup.

Unlike the cleanup aspects of a brownfield project, rigorous performance standards for the planned reuse are not usually imposed. Nevertheless, technical guidance concerning reuse issues may be equally important for the success of the brownfield project. The state economic development agency usually supplies this guidance, sometimes in conjunction with local agencies. It is important for this guidance to be integrated into the brownfield project coordinator's plans early on, rather than being treated as an afterthought or as an issue separate from cleanup concerns. Use might also be made of state university-based technical advisory services, especially when the initial project proponent is the local government. In addition, early and on-going consultation on site cleanup and reuse issues should occur with affected community-based organizations, who can provide important guidance and input on site plans as they develop.

Key recommendations:

- **Some technical guidance from state during cleanup, especially if post-cleanup review by state staff is minimal.**

- **Some technical guidance from state or local economic development agencies on key projects' reuse plans, coordinated with their cleanup plans.**

- **Use of state university-based technical advisory services, especially when the initial project proponent is the local government.**

- **Early and on-going consultation with affected community-based organizations.**

Cleanup Review

Careful review is needed of cleanups, especially when the cleanup has been conducted with little state involvement. However, the extent of the review will vary depending

upon the site.

For sites with limited contamination where a straightforward, presumptive remedy has been used, the review may consist primarily of state review of reports on the site assessment, remediation, and post-cleanup data supplied by those who conducted the cleanup. In addition, thorough state audits of a random selection of sites and fines for inadequate or slow performance will help to ensure that cleanups are performed correctly.

For sites with major contamination problems and/or where a non-standard remedy has been used, a more extensive state review may be necessary, especially if state staff have not been closely involved in the remediation process. The state may require a thorough review of the site cleanup by state-certified technicians or a state project manager, including post-cleanup samples taken by state-approved personnel and a determination of the adequacy of any future monitoring required as part of the remedy.

Key recommendations:

- **For sites with limited contamination and straightforward remedies, state review of cleanup reports, together with more thorough audits of randomly selected sites.**

- **For sites with extensive contamination and/or non-standard remedies, thorough review by state-approved personnel of site cleanup and any monitoring arrangements.**

- **Fines for failure to perform cleanup adequately, and in a timely fashion.**

Liability

As at the federal level, a state's approach to liability is often one of the most contentious issues with contaminated site cleanups. Strict, retroactive, joint and several liability is still the approach used by many states, as by the federal government. Although politics inevitably will drive how liability is determined and allocated, consideration might be given to other approaches being used by some states — e.g., proportional liability instead of joint and several liability, or proportional liability as an alternative if a responsible party can prove by a preponderance of evidence that it should be responsible for only a share of the cleanup. In this case, however, the state will need to be prepared either to delay part of the site cleanup pending completion of enforcement activities or, alternatively, to pick up the "orphan's share" of the costs — i.e., the costs not otherwise covered.

Key recommendations:

- **Exploration of alternatives to joint and several liability, such as a proportional allocation of liability.**

- **Funding of "orphan's share" through state program.**

Liability Relief for Prospective Purchasers and Developers

To encourage the cleanup and productive reuse of brownfields, states need to provide a measure of relief from future cleanup liability for those conducting brownfields projects. If prospective purchasers and developers can demonstrate that they did not contribute to the contamination, "no association" letters may be appropriate. In addition, they may be provided "no further action" letters or "covenants not to sue" upon cleanup completion. While reopener clauses may be needed to cover emergency situations arising in the future from prior contamination, these clauses should be limited to clear and present dangers, in order to provide the maximum assurance possible to the developer that further cleanup costs will not emerge. Furthermore, known residual contamination needs to be clearly characterized and recorded to the extent practicable, so that it can be distinguished later on from contamination arising from future activities.

Key recommendations:

- **"No association" letters for prospective purchasers and developers who can prove they did not contribute to prior contamination.**

- **"Covenants not to sue" upon completion of cleanup, with limited reopener clauses.**

- **Full, recorded characterization of remaining contamination, so that it can be distinguished from future contamination.**

Liability Relief for Lenders

Liability relief for lenders is often essential for prospective purchasers and developers to get the capital needed to undertake a brownfield project. Secured creditor exemptions are being employed by a number of states and may be the most straightforward means of providing liability relief for lenders. However, safeguards may be needed to ensure that a recipient of a secured creditor exemption has merely an arms-length financial interest in the project, is not involved in its management, and did not contribute to the contamination.

Key recommendation:

- **Secured creditor exemptions, but only where the creditor's role is limited to project financing.**

Financial Assistance

State (and / or federal) financial assistance to encourage brownfield projects can be provided either to private organizations or to local governmental and quasi-governmental agencies. Direct grants are usually appropriate only for the latter, and then only if the local government did not contribute to the contamination. In contrast, low-interest loans for site assessment and remediation expenses may be appropriate for private corporations as well as local governmental entities, if the corporation's financial solvency is assured. In addition, tax breaks may be needed to serve as an incentive for prospective brownfield site developers, and may be appropriate under restricted conditions — e.g., for a limited period of time, and only to developers with no record of major environmental violations.

Key recommendations:

- **Low-interest loans for brownfield site assessment and remediation to local governments and, selectively, to private organizations.**
- **Grants to local government for brownfield site assessment and remediation, if local government is not a responsible party.**
- **Financial incentives through limited-duration tax breaks to brownfield project developers with no record of major environmental violations.**

Part 2

Reuse Issues

INTRODUCTION: NON-CONTAMINATION BARRIERS AND INCENTIVES

Is all the attention to brownfields worth the effort?

This question is rarely asked, yet it lurks behind every brownfields project. Policies and programs addressing the contamination aspects of brownfields help to level the playing field. But that may not be enough. Taxes, traffic congestion, crimes against property and employees — common urban problems can deter the productive reuse of brownfields, even if they are cleaned up. As one commentator on the Wichita, Kansas brownfields effort put it, "Even under the best of conditions, CBD [central business district] revitalization is a gamble because it runs counter to market trends."[2]

To date, most of the literature on brownfields (reports, articles, etc.) has focused on contamination issues such as the liability and cleanup concerns discussed in the prior section of this report. Non-contamination issues have been given much less attention: they typically are treated in passing, as a side bar or a brief case study, without extensive analysis. Nevertheless, the existing literature does point to a number of possible impediments to productive reuse, apart from the need for hazardous waste cleanup. For example:

> "Redevelopment of industrial land was difficult before Superfund and remains so for reasons having nothing to do with contamination."
>
> Schilling, p. 34

> "In some cases, the infrastructure is old and obsolete, and access to the property may be limited. In addition, other factors such as crime, high taxes, low-quality amenities, and racial tensions ultimately prevent redevelopment of brownfields sites."
>
> U.S. Office of Technology Assessment, pp. 19-20

> "Eight years ago, Craftsman Plating eliminated a night shift — and 30 jobs — when the neighbors complained. Today, the business is landlocked, and, zoned out of expansion room, will be forced to move or close down within five years."
>
> Chicago Brownfields Forum, p. 54

> "In addition to contamination resulting from activities during a site's previous use, once owners abandon a site, it may attract such illegal activities as additional dumping of materials, break-ins, or fires. These TOADS (temporarily obsolete abandoned derelict sites) often become centers of socioeconomic malaise and public health problems."
>
> Page and Rabinowitz, p. 353

In addition, the brownfields literature often includes discussion of special government programs to promote revitalization of formerly contaminated sites. At the federal level,

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1. Mark Glaser, "Economic and Environmental Repair in the Shadow of Superfund: Local Government Leadership in Building Strategic Partnerships," Economic Development Quarterly, Vol. 8, No. 4 (Nov. 1994), p. 346.

these programs have been spurred by recent legislation: for example, the Intermodal Surface Transportation Act of 1991, which enables funds to be used for developing river or rail access; and the Community Reinvestment Act (CRA), which, as amended in 1995, allows banks to meet CRA requirements by lending for brownfields redevelopment. In addition, the Community Development Block Grants offered by the Department of Housing and Urban Development can be used for a number of brownfields purposes — e.g., structural renovation or new construction, technical assistance, and loan guarantees. At the state level, various redevelopment incentives can include, for example, tax abatements, renovation loans and technical assistance made available through state economic development agencies, and job training at community colleges, often with urban branch campuses.

SMALL-SCALE SURVEY: DESCRIPTION

As part of our study of brownfields issues and policy choices, we conducted a survey of non-contamination barriers and incentives to productive reuse posed by brownfields sites. As described further below, our survey was limited to economic development officials in Tennessee.

We undertook this survey because of the need for systematically-gathered information on non-contamination brownfield issues. While every site is unique, a deeper understanding of non-contamination barriers and assets can help in a number of ways: (1) policymakers will be better able to address key areas of concern and promote special attributes of brownfields sites; and (2) brownfield project investors and managers can anticipate potential pitfalls and areas of opportunity. The information gleaned from this survey is not meant to deter attempts to put brownfields back into productive reuse, but rather to make those attempts more effective. Addressing contamination issues is a necessary but not sufficient condition for effectiveness: other issues must be addressed as well.

Survey instrument. The survey instrument was developed by the researchers in the Spring of 1996, based upon their review of the literature and their familiarity with potential non-contamination redevelopment issues. The survey was pretested in early May 1996 and was subsequently refined. A copy of the final version of the survey is provided in Figure 2-1. It includes three sections:

- Section I consisted of a set of questions (mainly closed-ended) concerning non-contamination barriers to the reuse of brownfields sites. The possible barriers listed were grouped into four categories: those related to transportation, to the site, to the neighborhood, and to cost and financing problems. Respondents were asked to assess the significance of the barriers listed, basing their answers on a generalization about brownfields within their respective municipalities. A Likert scale from 0 (not a barrier) to 3 (very significant barrier) was used. In addition, respondents were given the opportunity to mention other barriers, both within the categories provided and on the back of the response sheet.

- Section II consisted of a similar set of questions concerning non-contamination

incentives to the reuse of brownfields sites. As in Section I, respondents were asked to generalize about brownfields within their respective municipalities; the questions were mainly closed-ended; a Likert scale from 0 (not an incentive) to 3 (very significant incentive) was used; and there was room for additional, open-ended comments. As in Section I, the questions were categorized by type of possible asset (transportation, site, neighborhood, cost/financing), with an additional category for government-sponsored incentives.

- Section III elicited background information concerning the respondent's municipality and its brownfield sites: the name of the municipality; the estimated number of known brownfield sites within the municipality; their location within the municipality (whether most of them are within built-up areas and within the same area of town); and their prospects for cleanup and reuse within the next 5-10 years, given the current real estate market and current policies and programs (poor, moderate, or good). Respondents were also invited to comment open-endedly on public- or private-sector policies and programs that they thought would promote the cleanup and reuse of brownfield sites.

Survey recipients. The survey was sent by mail to 101 individuals in mid May of 1996, accompanied with an explanatory cover letter (see Appendix B) and a pre-addressed, stamped return envelope. Surveys were sent only to economic development officials in Tennessee municipalities with (a) populations of 10,000 or more according to the 1990 U.S. census; and (b) sites listed on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) data base, as identified in a software package called "Landview II" available from the U.S. Bureau of the Census.[3] Sites listed on CERCLIS include both sites on the National Priorities List (the list of sites in EPA's Superfund program), as well as thousands of other sites with known or suspected contamination from hazardous wastes.

In all, 37 of Tennessee's 337 municipalities were targeted for the survey. Most of the 37 targeted municipalities had relatively small population sizes, according to the 1990 census: 17 were under 20,000; 12 had at least 20,000 but fewer than 40,000; four were between 40,000 and 100,000; and four had more than 100,000.

For each of the targeted municipalities, surveys were sent out using names and addresses obtained in part from a University of Tennessee Municipal Technical Advisory Service publication.[4] The following types of individuals were sought for each

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2. Landview II is a set of 11 CD-ROM disks that covers the United States and that integrates information from EPA data sets, such as CERCLIS, with demographic information from the 1990 Census and geographic information from the 1992 TIGER/Line files, displaying this information in a mapped format. It was prepared as a joint effort of the Bureau of the Census and the U.S. Environmental Protection Agency's Office of Solid Waste and Emergency Response and became available in 1995.

[4]3. 1996 Directory of Tennessee Municipal Officials, Municipal Technical Advisory Service, University of Tennessee. In addition, the Tennessee Government Officials Directory (Nashville: M. Lee Smith Publishers and Printers, 1996) was used as an information source for

of the targeted municipalities:

- **one or two local government officials** — in most cases, the municipality's local director of economic development and / or director of community development. If a municipality lacked both of these officials, the survey was sent to the municipality's planning director, its city manager, or its mayor.

- **a representative of the local chamber of commerce** — usually the executive director, although in some cases (with larger chambers), the survey was sent instead to the chamber member responsible for economic or community development.

- **where possible, a representative of the local industrial development association or economic development board or authority**. However, only 11 of the targeted municipalities had such associations, boards, or authorities.

Survey respondents were asked to supply the names of their municipalities but were given the option of completing the survey anonymously.

Survey response rate. Of the 101 surveys sent out, 46 responses were received in total (a 45.5% response rate). Because the initial mailing in May 1996 had resulted in a low response rate (under 30%), follow-up calls were made to survey recipients, asking them to complete and mail in the survey. When necessary, replacement copies of the survey and cover letter were faxed. This follow-up substantially increased the initially very low response rate.

Despite these efforts, however, the response rate remained fairly low. There are at least a couple of explanations for this, apart from the usual difficulty of persuading busy people to complete questionnaires. Based on comments made in some of the follow-up calls, it appears that some survey recipients thought that brownfields were not a problem in their vicinity, either because — given their area's economic growth — cleanup and reuse would occur naturally, or because they did not know of the existence of local brownfields. As one Chamber of Commerce respondent pointed out, "The only way I know about a brownfields site is if the site owner asks for my help in finding a buyer." In addition, although the term "brownfields" was defined in the cover letter, some recipients apparently thought that the term applied only to government-owned sites or to listed Superfund sites.

Characteristics of respondents' municipalities. Appendix C lists the municipalities represented through the 46 respondents to the survey. In all, at least one response was received from 33 of the 37 targeted municipalities. No responses were received from four relatively small municipalities with 1990 populations under 40,000. Using the population categories mentioned above, the respondent municipalities broke out as follows:

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chamber of commerce and industrial development representatives.

1990 population of 10,000 to 19,999:	16 municipalities
1990 population of 20,000 to 39,999:	9 municipalities
1990 population of 40,000 to 100,000:	4 municipalities
1990 population of greater than 100,000:	4 municipalities

In Section III of the survey, respondents were asked to estimate the number of known brownfield sites within their respective municipalities. "Brownfield" was defined in the question as including commercial or industrial sites that are un-used or under-used and are possibly contaminated. Of the 44 respondents who answered this question, 18% checked "none"; 48% checked "few" (e.g., 1-4); 18% checked "several" (e.g., 5-9); and 16% checked "many" (e.g., 10 or more).

In Section III, questions 3 and 4, respondents were asked whether most of their municipality's known brownfield sites were located in built-up areas, and within the same area of town. Of the 37 respondents who answered these questions, 76% indicated that most of their municipality's brownfield sites were located in built-up areas, while 60% indicated that most of the sites were located in the same area of town. One respondent indicated that brownfield sites in his or her municipality tended to be found along railroad tracks.

SURVEY RESULTS

Caveats. In considering the survey results summarized below, several cautions should be kept in mind:

- The survey results reflect the respondents' perceptions of problems and assets that can deter or promote the productive reuse of brownfield sites within their localities; they do not reflect an independent assessment of those problems and assets.

- Respondents were asked to generalize about brownfield sites within their respective municipalities; this generalization can mask important differences among sites, even within a single municipality.

- This is a small-sample survey limited to Tennessee municipalities; its findings are not necessarily applicable elsewhere.

- Because of limited time and funds, responses were sought only from economic development personnel; other important viewpoints, such of those of people living near brownfield sites, were not elicited.

The above factors are all limitations in the scope of the survey. In addition, another more intrinsic limitation of the survey should be pointed out. When a respondent indicated that a factor (e.g., location, site size) is a significant barrier or incentive to productive reuse of brownfield sites within the respondent's municipality, it can be assumed that the factor exists for those brownfields. In contrast, a response of "not a significant barrier" or "not a significant incentive" is inherently ambiguous: it can be

interpreted as (1) the factor in question does exist for brownfields in the respondent's municipality but is not a significant problem or asset; or (2) the factor does not exist for brownfields in the respondent's municipality (and if it did, it might or might not be significant).

This ambiguity is a flaw in the survey design that was not caught in the pretesting stage and did not become apparent until the results of the survey were analyzed. At the risk of complicating an already fairly complicated survey, the ambiguity could have been cleared up by asking respondents to indicate (a) whether a factor was present with brownfields in their respective municipalities, and (b) if present, how significant the factor was. As it stands, strong evidence that a factor is a significant barrier or incentive can be taken at face value, but strong evidence that a factor is not a significant barrier or incentive may simply mean that it has not yet been experienced within most of the municipalities included in the survey.

Nevertheless, taken as a whole the results summarized below should help to provide a indication of the potentially high hurdles, as well as the potentially exciting opportunities, posed by brownfields because of their urban characteristics, apart from their contamination. The survey instrument may also provide a springboard for other, larger scale efforts to assess the non-contamination side of getting brownfields back into productive use.

Method of analysis. Because of the small sample size, simple statistics were used to summarize responses received. For each question posed in Sections I and II of the survey, the mean of the responses is presented in the graphs below. For example:

> In response to the question of the significance of narrow streets as a barrier to the productive reuse of brownfields, four respondents circled 3 (very significant barrier); 13 respondents circled 2 (somewhat significant barrier); 15 respondents circled 1 (not a very significant barrier); five respondents circled 0 (not a barrier); and nine respondents either did not provide a response to this question or circled DK (don't know, no opinion). The mean, or average response, is 1.43, when the missing and DK responses are excluded.

In the summary of survey results below, the mean is used to determine whether, for the factor considered in the question at hand, the factor appears to be of high, medium, or low significance to productive reuse of brownfields. To convert the mean into an evaluation of the relative significance of the factor, the following formula was used, based on professional judgement:

Mean less than 1:	factor is of low significance
Mean 1.00 - 1.29:	factor is of low to medium significance
Mean 1.30 - 1.70:	factor is of medium significance
Mean 1.71 - 2.00:	factor is of medium to high significance
Mean greater than 2:	factor is of high significance

But, while the mean is useful as a measure of central tendency, it masks variation in responses. This variation can be communicated by providing the standard deviation,

or simply by displaying the range of responses. Given the small sample size, the latter method has been chosen. (For a summary of the range of responses to each question, please see Appendix D.)

As can be seen in Appendix D, many of the questions provoked a wide range of responses. The sample size is too small to reach reliable explanations for this variation through in-depth statistical analysis. Nevertheless, it did appear intuitively that differences in municipality population size (and thus in density of urbanization, traffic congestion, etc.) might be an important independent variable affecting the responses given. To test for this, cross-tabulations were run of responses compared with the population size of the respondent's municipality.

As described further below, it appears that population size is an important independent variable. Generally, when there was a wide range of responses, respondents from municipalities with populations under 40,000 had different ideas about barriers and incentives than did respondents from municipalities with larger populations, especially cities of greater than 100,000.

Transportation Barriers and Incentives

This category of questions in Sections I and II of the survey addressed transportation factors that can deter or promote brownfields reuse.

Narrow streets, congested traffic, and limited access to major highways (e.g, because of antiquated, poorly configured access ramps) can pose problems at all phases of a brownfields project, including construction and renovation as well as subsequent operation of a business. These factors can impede deliveries to and from the business, can discourage customer visits, and can complicate employee commuting by car. In contrast, a central location that is convenient to public transportation (buses, trolleys, etc.) can facilitate employee commuting and customer visits; proximity to railroad or river loading facilities can make the delivery and shipment of goods easier and cheaper; and having roads and "curb cuts" (street access) already in place can expedite site development.

When respondents were asked about the significance of these factors as barriers or incentives to productive brownfields reuse, their average responses were as follows. The factors are ordered by significance; the mean is given in parentheses.

transportation problems	**average perceived significance**
narrow streets	medium (1.43)
difficult highway access	medium (1.42)
congested traffic	low to medium (1.27)

transportation assets	**average perceived significance**
close to rail or river	medium (1.58)
access streets and curb cuts in place	medium (1.50)
convenient to public transportation	low to medium (1.16)

The mean responses for these factors are also displayed in Figure 2-2. Respondents did not have other suggestions about transportation problems or assets.

Large cities. Cross-tabulations of the responses with municipality population size indicate that narrow streets and congested traffic are seen as a more severe problem in large cities (those with populations over 100,000). In addition, convenient public transportation and proximity to a railroad and/or a river access point are seen as greater assets in such cities.

Site Barriers and Incentives

In Sections I and II of the survey, this category of questions addressed possible positive or negative attributes of brownfields sites themselves (apart from their contamination).

Barriers to productive reuse can be due to a variety of site-related problems or limitations. Several of these may concern space — insufficient space for staging construction and renovation activity; for on-site parking, loading docks, etc. when the enterprise is operational; and for site adaptation to a variety of uses or to accommodate future business expansion. Other site-related problems may have to do with legal considerations — an uncertain title, possibly because the owner(s) are difficult to locate; the possible need for a zoning change before the planned reuse is acceptable to local land use regulations. Still other problems can arise from such factors as the existing on-site structures (they may have limited suitability and adaptability for many uses), site esthetics (the site may not be visible or attractive enough to promote the prospective business's corporate image), utility infrastructure (water, sewer, power systems, etc. may not be adequate), commuting concerns (the site may be in an inconvenient location for many employees), and the proximity of correlative businesses and services (related businesses and services may be unable or disinclined to locate nearby).

Nevertheless, some of these sources of potential problems can, depending upon both the brownfields site and its prospective reuse, be potential assets. A location that causes inconvenient commuting for some businesses may enable easy commuting for others. The water, sewer, and power already in place may be sufficient for some uses; the site may already be zoned for the prospective use; it may already have related businesses and services located nearby. And a site that is seen by some corporations as detrimental to their images may be regarded by others as a plus, because it will convey the message that in the site cleanup and reuse, the corporation is serving as a "good citizen."

When respondents were asked about the significance of the above factors as potential barriers or incentives to productive brownfields reuse, their average responses (ordered by significance; mean given in parentheses) were as follows.

site problems	**average perceived significance**
existing structures unsuitable, not easily adapted	high (2.03)
site not visible or attractive	medium to high (1.85)
site small for many uses, little room for expansion	medium (1.57)
limited space for construction / renovation	medium (1.32)
limited space for parking, loading, etc.	medium (1.31)
related businesses can't / won't locate nearby	low to medium (1.14)
uncertain title	low (0.97)
zoning changes required	low (0.94)
inconvenient for commuting	low (0.86)
utility infrastructure inadequate	low (0.75)

site assets	average perceived significance
already zoned industrial or commercial	high (2.30)
utility infrastructure in place	high (2.24)
easy commuting	medium to high (1.92)
conveys "good corporate citizen" image	medium to high (1.72)
related businesses located nearby	medium (1.70)

The mean responses for these factors are also displayed in Figure 2-3. In response to open-ended questions about additional site problems and assets, most of the respondents did not have any comments. Although the survey concerned only non-contamination issues, one respondent did add that environmental problems are a very significant barrier to the productive reuse of brownfield sites.

Large cities. Cross-tabulations of the responses with municipality population size indicate that with large cities (those over 100,000), two problems are seen as a much more significant barrier than the above means would suggest: first, uncertain deed titles, and second, the inability or disinclination of related businesses to locate nearby. Similarly, conveying the image of a "good corporate citizen" through productive brownfields reuse appears to be seen as a somewhat more significant asset in large cities.

Neighborhood Barriers and Incentives

Sections I and II of the survey addressed factors affecting productive brownfields reuse that are attributable to the surrounding neighborhood. As with other sets of factors, each respondent was asked to generalize about brownfields sites within his or her municipality. Thus, it is important to recognize that this generalization can mask the fact that, even within a single municipality, there may be important differences among brownfield sites and their surrounding settings.

Possible problems posed by the vicinity in which a brownfields site is located may include physical problems and limitations (the surroundings may be dirty and unattractive; they may lack stores and restaurants for employees and customers). They may also include social concerns (nearby community members may object to the proposed reuse; management, employees, and customers may be concerned about crimes such as mugging or vandalism). And they may include labor concerns (the local workforce may lack the skills needed to serve as employees in the prospective business).

The neighborhood surrounding a brownfield site may also have assets, however. Some neighborhoods may have an abundance rather than a lack of favorable features such as stores and restaurants, commercial parking, and skilled or trainable workers. In addition, because brownfield sites typically are located near the center of municipalities, they may offer the advantage of close-by police and fire protection.

When respondents were asked about the significance of the above factors as potential barriers or incentives to productive brownfields reuse, their average responses (ordered by significance; mean given in parentheses) were as follows:

neighborhood problems	**average perceived significance**
dirty and unattractive surroundings	medium (1.62)
community members object to proposed reuse	low to medium (1.11)
local workforce lacks skills to serve as employees	low to medium (1.00)
crime record / concerns	low (0.97)
few amenities (stores, restaurants) nearby	low (0.84)

neighborhood assets	**average perceived significance**
police, fire protection nearby	high (2.19)
skilled and / or low-wage workers available	high (2.05)
amenities (stores, restaurants) nearby	medium (1.58)
public parking nearby	low to medium (1.00)

The mean responses for these factors are also displayed in Figure 2-4. In response to open-ended questions about additional neighborhood problems or assets, most of the

respondents did not have any comments. One respondent did add that residential neighbors demand a totally cleanup site and residential reuse, while another emphasized that the lack of a skilled labor force was a very significant barrier.

Large cities. Cross-tabulations of these factors with population size indicate that as municipality population size increases, a number of neighborhood problems are seen as significant barriers to brownfields reuse. The average responses from respondents connected with large cities (populations over 100,000) indicate that all of the potential neighborhood problems listed — crime, unskilled local workforce, community objections, lack of amenities, and dirty, unattractive surroundings — were seen as barriers of at least medium significance. In contrast, only one potential neighborhood asset — the availability of public parking — was seen as of greater importance in large cities than in the respondents' municipalities taken as a whole.

Cost and Financing Barriers and Incentives

Sections I and II of the survey posed questions about negative and positive cost and financing attributes of brownfield sites. As with the rest of the survey, these questions were focused on the urban, "preused" character of most brownfield sites, not on factors that would arise because of known or suspected site contamination.

Like other previously-developed sites, possibly located in somewhat dilapidated settings, brownfield sites may pose cost and financing problems apart from those arising from cleanup requirements. These problems may include high site preparation and renovation costs — the expense of adapting the site and its structures to the proposed reuse; the additional expense of taking an old, possibly unused building and meeting today's building codes and OSHA (Occupational Health and Safety Administration) standards. These high costs may be exacerbated both by limited financing and insurance available due to the nature of the site and its location, and by the expectation of higher taxes within the municipality than in outlying areas. The sale price may also impede getting the site back into productive reuse quickly: it may be set uncompetitively, possibly because the owner is prepared to hold on to the site indefinitely, until a large profit can be realized. Alternatively, a low price for the site and its structures may prompt a rapid purchase and reuse. Together with the government-sponsored incentives discussed below, a low price tag on the site may help to compensate for other cost and financing problems.

cost and financing problems	**average perceived significance**
high costs to meet building codes and OSHA stds.	high (2.03)
high costs to adapt for reuse	medium to high (1.97)
uncompetitive sale price	medium (1.55)
limited financing and insurance available	medium (1.44)
high municipal taxes	low to medium (1.08)

cost and financing assets	**average perceived significance**
low purchase price	medium to high (2.00)

The mean responses for these factors are also displayed in Figure 2-5. In response to open-ended questions about additional cost/financing problems and assets, most of the respondents did not have any comments. One did add that the inability to finance brownfields redevelopment locally is a very significant barrier, while another commented that "all of these are potential problems — do not know the degree of barrier."

Large cities. Cross-tabulations of these factors with municipality population size indicate that with large cities (those over 100,000), two problems are seen as a much more significant barrier than the above means would suggest: first, limited financing

and insurance availability due to both site and location; and second, higher taxes within the municipality than in outlying areas.

Government-Sponsored Incentives

Section II of the survey also asked about additional, government-sponsored incentives to increase the likelihood that brownfields will get back into productive use. Whereas the possible problems and assets discussed above are intrinsic to brownfield sites and their vicinities, government-sponsored incentives are sometimes used as external "policy fixes" to help tip the marketplace toward brownfields revitalization.

Government-sponsored incentives can cover a number of different types of state, local, or federal initiatives. With brownfields, many of these address cleanup and liability issues, as discussed earlier in this report. In addition, however, a variety of initiatives may be undertaken to address revitalization issues, apart from contamination concerns. These initiatives may be in the form of funds or tax relief (low-interest loans for site purchase and redevelopment; state or local tax breaks), or they may be through various kinds of assistance (e.g., marketing and other technical assistance; government-sponsored job training programs). In Section II of the survey, the only forms of incentives addressed were redevelopment incentives, not cleanup-related incentives.

redevelopment incentives	**average perceived significance**
job training programs	medium to high (2.00)
state or local tax breaks	medium to high (1.86)
low-interest loans for site purchase / redevelopment	medium to high (1.82)
marketing and other technical assistance	medium (1.62)

The mean responses for these factors are also displayed in Figure 2-6. When asked about additional government-sponsored incentives, one respondent commented that getting assistance with financing and insurance would be a very significant asset. (This respondent also commented about the importance of obtaining cleanup assistance.)

Large cities. Cross-tabulations of these responses with municipal population size indicate few differences among the respondents, except that marketing and other technical assistance are seen as a somewhat less significant asset by respondents connected with large cities (populations over 100,000).

PART 2: SUMMARY AND CONCLUSIONS

Barriers. Based on the average responses to this survey, non-contamination barriers to productive reuse of brownfield sites in Tennessee can be summarized as follows:

high barriers:

existing structures unsuitable, not easily adapted
high costs to meet building codes and OSHA standards

medium to high barriers:

high costs to adapt for reuse
site not visible or attractive

medium barriers:

dirty and unattractive surroundings
site small for many uses, little room for expansion
uncompetitive sale price
limited financing and insurance available
narrow streets
difficult highway access
limited space for construction / renovation
limited space for parking, loading, etc.

low to medium barriers:

congested traffic
related businesses can't / won't locate nearby
community members object to proposed reuse
high municipal taxes — low to medium significance
local workforce lacks skills to serve as employees

low barriers:

uncertain title
crime record / concerns
zoning changes required
inconvenient for commuting
few amenities (stores, restaurants) nearby
utility infrastructure inadequate

Incentives. Based on the average of survey responses, incentives to productive reuse of brownfield sites in Tennessee — apart from incentives associated with site cleanups — can be summarized as follows:

high incentives:

already zoned industrial or commercial

utility infrastructure in place
police, fire protection nearby
skilled and/or low-wage workers available

medium to high incentives:
job training programs
low purchase price
easy commuting
state or local tax breaks
low-interest loans for site purchase and redevelopment
site cleanup and reuse conveys "good corporate citizen" image

medium incentives:
related businesses located nearby
marketing and other technical assistance
close to rail or river
amenities (stores, restaurants) nearby
access street and curb cuts in place

low to medium incentives:
convenient to public transportation
public parking nearby

low incentives:
[none]

Differences between average responses and responses for large cities. Taken as an average across all responses, it appears that site-related problems — e.g., problems with site adaptability, renovation costs, site visibility and attractiveness — weigh more importantly than locational factors concerning transportation or the surrounding neighborhood. Similarly, it appears that "nuts and bolts" assets such as zoning, utilities, nearby police and fire protection, a skilled labor pool, and a low purchase price are on average regarded as more significant than assets such as proximity to public transportation, rail and river access, nearby public parking, and stores and restaurants.

In contrast, in Tennessee's larger cities, especially those with populations of greater than 100,000, locational factors appear to affect the prospects of brownfields sites (for better or for worse) far more than in Tennessee's smaller cities. In Tennessee's large cities (Memphis, Nashville, Knoxville, and Chattanooga), "nuts and bolts," site-related problems and assets remain important, but in these cities, other factors — particularly factors concerning the surrounding neighborhood — are also seen as quite important.

In Tennessee's larger cities, location-related problems (e.g., crime concerns, dirty and unattractive surroundings, a lack of amenities such as shops and restaurants, the inability or unwillingness of related businesses to locate nearby) are seen as playing a significant role in deterring the productive reuse of brownfields. By the same token,

location-related advantages such as proximity to commercial public parking, public transportation, river and rail access points, and downtown amenities are seen as more important to the productive reuse of brownfields in Tennessee's larger cities than in its smaller cities. Furthermore, it appears that in these larger cities, more weight is placed on the "good corporate citizen" image that may result from undertaking a brownfields cleanup and reuse.

Again, it is important to bear in mind that the survey only had a small sample, only sought economic development officials as respondents, and only asked for their generalized perceptions about brownfields in their respective municipalities. Furthermore, as noted above, a perceived lack of significance of a particular factor as a barrier or incentive to brownfields revitalization may simply mean that the factor has not yet been observed by a respondent with respect to brownfields in his or her municipality. As more brownfields become known, or as cities that are now fairly small begin to experience more urban problems, factors now regarded as fairly insignificant problems or assets may gain in importance.

Differences in responses to "parallel" factors. In the survey, eight factors were posed as both potential barriers and potential incentives. These factors concerned (1) ease of commuting, (2) suitability of zoning, (3) adequacy of utility infrastructure, (4) location of related businesses and services nearby, (5) availability of a skilled and/or low-wage workforce, (6) proximity to downtown amenities (stores, restaurants), (7) price of site and buildings, and (8) local and state taxes.

Interestingly, most of these factors, when cast as potential negatives (e.g., high purchase price), were not regarded as very significant barriers by the respondents taken as a whole. Respondents from larger cities placed at least a medium significance on high taxes, a lack of nearby amenities, an inadequate local workforce, and an uncompetitive purchase price; all of the other eight "parallel" factors were regarded by virtually all respondents as unimportant barriers. In contrast, these eight factors, when cast as potential positives (e.g., low purchase price), were regarded as significant incentives by virtually all of the respondents.

There are two alternative explanations for this seeming anomaly. First, it could be that while these eight factors exist as problems in the targeted municipalities, they for the most part are not regarded as major barriers to productive brownfields reuse. Or second, it could be that in most of the targeted municipalities, these factors simply are not present as problems. Either way, the positive versions of these factors could operate independently, as strong pluses ... in other words, although the need for zoning changes might act as only a slight deterrent to getting a brownfields site back into productive reuse, avoiding the uncertainty and delay associated with getting a zoning change might serve as an important asset, especially when taken in concert with other assets.

Interaction among variables. The survey sample size was too small to identify meaningful statistical interactions among various potential barriers or incentives to productive brownfields reuse. This is a research area that, if a large-sample survey were undertaken, could be extremely informative. Intuitively, it appears likely that

there is a high degree of interaction among some of the factors: for example, job training programs can help to compensate for an inadequate pool of skilled workers; and a low purchase price, together with low-interest loans, technical assistance, and tax breaks, can help to compensate for high renovation costs.

Importance of cleanup-related factors. Intentionally excluded from consideration in this survey but equally important are interactions of development factors with cleanup factors: e.g., technical assistance for site investigations, low-interest loans and tax breaks for remedial action. This survey was focused on the "reuse" half of brownfields cleanup and reuse, because of a dearth of prior research on this aspect of brownfields issues. Nevertheless, reuse cannot in the final analysis be separated from cleanup issues: the two are inextricably related.

Brownfields: prospects in Tennessee. At the conclusion of the survey, respondents were asked to give their assessment of the prospects for cleanup and reuse of brownfield sites within their municipalities over the next five to ten years. Of the 37 respondents who answered this question, 22% said "good," 30% said "poor," and 49% said "moderate." Interestingly, respondents connected with Tennessee's largest cities gave, on average, slightly more optimistic responses to this question than did respondents from smaller cities.

Respondents' suggestions for brownfields policies and programs. Respondents were also invited at the conclusion of the survey to comment on policies and programs that would help promote the cleanup and reuse of brownfields sites. Of the six respondents who took the opportunity to comment, several mentioned tax breaks (e.g., similar to historic tax credits, or through abatement/enterprise zones, etc.) or direct state and federal funds, including such possibilities as asbestos remediation cost recovery. Others mentioned liability issues — e.g.: "The most significant disincentive for companies or developers is the liability issues associated with contaminated sites. If regulations regarding responsibility were altered to hold new owners harmless beyond an established baseline, more would be willing to assume the lower level of risk." "State TDEC [Tennessee Department of Environment and Conservation] and USEPA need to expedite the cleanup process and then, when completed, clearly declare the site clean so that lenders and buyers are not afraid to invest in the site." Still others mentioned training programs and targeted local public assistance.

The growing prominence of brownfields. In Tennessee, brownfields are still a much newer issue than in some other parts of the U.S., particularly the Northeast and upper Midwest, where concern for aging cities and urban sprawl have combined to focus attention on brownfields over the past few years. In Tennessee, the problem of brownfields has only recently attained prominence, and then, for the most part, only in the state's larger cities. But as one respondent to the survey noted in closing, "Reuse of these sites is going to become more important as communities are faced with fewer state and federal dollars to fund infrastructure extensions to greenfields on their perimeters." Now — while the issue is still relatively new in Tennessee — is the time for state government, local government, affected communities, and the private sector to work together to develop new approaches to the cleanup and revitalization of these sites.

Part 3

Workshop Results

SUMMARY OF THE JULY 1996 WORKSHOP

On July 31, 1996, a small, interactive workshop was held as a culmination of the brownfields study of the Waste Management Research and Education Institute. The workshop focus was on brownfield issues in Tennessee. Participants included local community and economic development personnel from Tennessee cities and towns, other people from Tennessee and the surrounding region with a professional interest in brownfield cleanups, officials from the Tennessee state government and EPA's Region 4, and a few staff members of the UT Waste Management Research and Education Institute. A list of the workshop participants is appended to the report.

The morning of the workshop was devoted to a review of the draft study report by the project leader, Mary English; a synopsis of new federal initiatives by Matthew Robbins, EPA Region 4; a synopsis of Tennessee's new Voluntary Cleanup Oversight and Assistance Program by Andrew Shivas, Tennessee Department of Environment and Conservation; and a discussion of Knoxville's brownfields pilot project (one of the pilot projects sponsored by EPA) by Charles Barker, City of Knoxville. Questions and comments from other participants were interspersed with these presentations, and included an information exchange about what is going on in Tennessee and other states.

The afternoon of the workshop was devoted to a roundtable "brainstorming," with each participant suggesting ways to identify, assess, clean up, and revitalize brownfields in Tennessee. The point of this discussion was to articulate ideas, not to reach consensus. Nevertheless, some strands of widespread agreement (as well as some points of disagreement) did become clear during the course of the workshop. These are summarized below.

The workshop intentionally brought together participants that for the most part share a strong interest and professional background in local economic development issues; in the workshop, they thus could start from a common base in considering brownfield issues. In addition, we wanted to use the workshop to explore further the reuse factors considered in our survey (see Part 2). In all likelihood, a group composed of other types of participants would have had different comments. Clearly, this workshop, taken by itself, is inadequate. Instead, it should be regarded as one part of a larger, more inclusive national dialogue about how brownfields can and should be addressed.

Problems

During the course of the brainstorming session, several persistent problems with brownfields were identified. These can be grouped into three clusters: negative perceptions and attendant stigma effects as well as lack of trust; liability issues; and other, non-contamination problems that arise because of undesirable characteristics associated with some brownfield sites and their surroundings.

Negative perceptions, stigma effects, and a lack of trust. Several workshop participants indicated that a major problem with brownfields concerns negative perceptions of these sites. One participant commented that voluntary risks are often much larger than involuntary risks, yet people often fail to recognize this. These

perceptions have contributed to problems with community acceptance of brownfields initiatives: for example, there may be fear that new industries will bring more contamination. In addition, city officials, including administrative as well as elected officials, may be wary of brownfield initiatives. A participant cited as one example a brownfields effort that was thwarted by a lack of trust on the part of both an environmental group and city officials. Another participant pointed out that with small communities especially, the stigma of hazardous waste impedes the reuse of brownfield sites.

Liability. At least one participant pointed out that fear of liability can impede brownfields reuse. This fear may be felt on the part of prospective purchasers and developers, and it also may be an obstacle for financiers and insurers.

"**Urban**" **problems.** Despite concern about negative perceptions and liability due to residual contamination, several participants noted that brownfield problems are not mainly contamination problems; instead their biggest difficulties involve other undesirable characteristics — e.g., vagrant populations; weeds and other eyesores; locations that often are close to but not part of the central business district. From this standpoint, the key problems with brownfields may have more to do with the market than with contamination, and the main need is to remove disincentives and enhance incentives.

Possible Solutions

Although some of the comments during the discussion period concerned problems with brownfields, many of the comments provided creative ideas about ways to get beyond obstacles and promote brownfields cleanup and reuse. These are very briefly summarized below. None should be taken individually as "magic bullets"; instead, they suggest the need for a multi-faceted strategy to further brownfields initiatives. Some of these suggestions were mentioned by several participants; others were made by only one person. Although the discussion ranged widely, suggestions are grouped into two clusters below: getting the right cleanup approach, and working with the market.

Getting the right cleanup approach. If there was one overriding suggestion regarding brownfields cleanups, it was "Forget background; use risk-based standards!" That said, however, there was a good deal of comment about how brownfield cleanups can best be carried out. The following summarizes comments and suggestions concerning preferred cleanup approaches.

- For a brownfields cleanup, it is best to be proactive, rather than waiting for an enforcement action. If cleanup is required, those who caused the contamination should be sought.

- A state voluntary cleanup program can help provide incentives for people to move forward with brownfield initiatives. Regulations should be flexible; in addition, voluntary cleanups done in conjunction with the local as well as the

state government can help get brownfields back into use.

- As a complement to the involvement of state and local government, private firms continue to play an important role in site assessments and cleanup.

- Risk-based standards are preferable to standards based on background or non-detect levels, partly because they are more cost-effective. At least one participant commented, however, that while the risk-based approach is good, its workability depends on future site use.

- Future uses that involve mixed use may pose problems of unanticipated exposure to residual contaminants, according to one participant; in contrast, another argued that mixed use might not be a problem if exposure pathways are broken through such means as paving and the use of alternative water supplies.

- Although EPA has been exhibiting some preference for monitoring rather than enforcement, long-term monitoring should not be overused. Annual monitoring may reveal very little, especially with slow migration of contaminants. The reasons for monitoring need to be clear, and the thresholds and actions to be taken should be specified upfront. Safeguards for unknowns also need to be instituted.

- Long-term institutional controls are not necessarily fully reliable; how well they will perform two decades or more after being implemented is difficult to predict. One participant noted, however, that institutional controls may be improved by, for example, legislation that makes them more feasible and effective (e.g., proposed federal legislation to allow the federal government to acquire negative easements on residually contaminated sites).

Working with the market. During the workshop discussion, at least as much attention was directed to market-based obstacles as to cleanup issues. The following summarizes key suggestions made.

- Education and "image-changing" are needed as an early part of brownfields initiatives, to address the problems of stigma and negative perceptions. Education is needed not only for citizens, but also for city officials and the prospective developers.

- Partnerships are key to brownfields. For example, a risk-taking entrepreneur may spearhead a brownfields initiative, working with someone in the city administration as a "broker" or focal point for getting a site. A local redevelopment authority can also help by assembling larger tracts of land from small parcels.

- Favorable financial arrangements can help promote brownfields cleanup and reuse; for example, using Community Development Block Grant funds for cleanup as well as development purposes, or allowing monitoring costs as well as cleanup costs to be "written off" for tax purposes. One participant noted,

however, that tax incentives legislation can constitute an unfunded mandate.

- Cities need aggressive code enforcement, partly in order to help promote a better appearance that will invite brownfields cleanup and reuse.

- Cities should have a plan of which sites to concentrate on first. An "anchor" area may be needed for a comprehensive brownfields initiative, with certain sites serving as catalysts for the redevelopment of others. In addition, industrial and commercial development that relies heavily on infrastructure may be especially attracted by the access to existing infrastructure that brownfield sites often can offer; this type of development should be a prime target in efforts to market brownfields.

Lingering Questions and the Larger View

While many comments were quite specific, others were directed toward the larger issues with which advocates of brownfields revitalization must contend. Three topics, in particular, arose frequently: how to compete with "greenfields" development, how to tackle difficult sites, and the need for a systems view. Comments on these topics are summarized below.

The tension between brownfields and greenfields. "Greenfields" — fields and forests located at the urban periphery — can draw off development initiatives that might otherwise go to brownfields. There is a need to get clearer on the relative costs of greenfields versus brownfields development and to learn how to work within the context of the greenfields draw. This learning process, which should include the local chamber of commerce as well as economic development agency personnel, will take time and communication, including communication about balancing economic and environmental considerations. In the meantime, however, there remains the question of how to take quick actions on brownfields. For example, one participant mentioned that his city's economic base has expanded greatly in recent years, but most development has occurred on greenfields.

The tension between "hard core" and "easy" sites. As at least one participant noted, the entrepreneurial risk-taker is most likely to go after "low-hanging fruit" — minimally contaminated brownfields that have few problems and numerous favorable features. While one participant said that we don't have any truly poor brownfields sites in the United States, several people commented that there are major differences among sites: in Maryland, for example, brownfield sites are categorized according to their ease of development, according to one workshop participant. Several participants indicated that to get the more contaminated and/or less attractive sites cleaned up and back into productive use, government intervention may be needed, using some of the strategies listed above.

Nevertheless, the question lingered for some people of whether truly hard core sites should be the focus, especially in a fledgling brownfields program. On the one hand, if a site is viable it will get redeveloped without government intervention, so perhaps

government attention should be reserved for the more difficult sites. On the other hand, the private redevelopment of viable sites may be sub-optimal, making government attention to these sites at least as necessary and important as attention to more intractable sites. As a separate category, federal facilities (e.g., facilities such as K-25 on the Oak Ridge Reservation) were mentioned by several people as a "difficult ball of wax" requiring careful attention by both the public and private sectors.

The need for a systems approach. An overriding theme of the workshop was that, from the standpoint of officials trying to promote brownfields cleanup and reuse, a piecemeal approach should be avoided. Instead, several people noted that a systems view is needed, with brownfields seen as one piece of a larger puzzle. The systems view can be promoted by the government programs under which brownfields are handled — for example, one participant commented that the Resource Conservation and Recovery Act has a much better feel for comprehensive approaches than does other legislation concerning hazardous waste sites. In addition, however, several participants commented that each city needs first, a vision in which certain sites, industries, and types of development are targeted; and second, leadership to move beyond the prevalent fear of contamination and liability.

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Appendix A

Summaries of State Programs

STATE BROWNFIELD AND VOLUNTARY CLEANUP PROGRAMS

The following summaries are based on information compiled by James B. Rice during the Winter and Spring of 1996. This compilation of state programs should be regarded as indicative rather than exhaustive; other states may have formal or informal programs.

CALIFORNIA

The California Voluntary Cleanup Program was established by the Department of Toxic Substances Control, part of the California Environmental Protection Agency, in 1993. Since then, the program has overseen the completion of nearly 100 projects, with another 100 underway. Federal and state Superfund sites are not admitted to the program. The state allows potentially responsible parties (PRPs), including site owners and operators, as well as prospective purchasers to initiate cleanup. Additionally, the state has another pilot program, called 'SB923', which will pay for 'orphan shares' of voluntary cleanups, using a proportional liability scheme. Site-specific cleanup standards are used.

Contact: Barbara Coler, Statewide Cleanup Operations,
California Department of Toxic Substances Control
(510) 540-3827

COLORADO

Colorado's Voluntary Cleanup Program was established under the state Department of Public Health and Environment in 1994. Funds appropriated to the program have been quite limited. Furthermore, the program has operated under a provision requiring that if less than the $2000 application fee is used for oversight of a voluntary cleanup, the remainder is returned, whereas if a site's oversight costs exceed $2000, the program covers the difference. Either the site owner or a prospective purchaser of a site may initiate cleanup. Site-specific cleanup standards are used.

Contact: Jeff Deckler, Colorado Voluntary Cleanup Program
(303) 692-3387

CONNECTICUT

Connecticut's Urban Sites Remedial Action Program was established in 1992 to provide a mechanism for redevelopment in cities and towns designated as 'economically distressed.' The program is run by the state Department of Economic Protection with the assistance of the Department of Economic Development. General appropriated funds are used for staff expenses; in

addition, a revolving fund (established with a bond issue) provides funding for cleanup costs. The state or any interested party may initiate cleanup. (The program also operates as a voluntary cleanup program.) Site-specific cleanup standards are used.

Contact: Betsy Wingfield, Connecticut Dept. of Environmental Protection
(860) 424-3791
Richard Hathaway, Connecticut Dept. of Environmental Protection
(860) 424-3780

DELAWARE

Delaware's voluntary cleanup program was established in 1993, under the oversight of the Department of Natural Resources and Environmental Control. Any interested party, including PRPs, may initiate a voluntary cleanup; the state often offers PRPs the option of entering the voluntary cleanup program before initiating an enforcement action. Sites falling under the Underground Storage Tank Program (UST) or the Resource Conservation and Recovery Act (RCRA) are not allowed to participate. Site-specific cleanup standards are available, but the cleanup must attain a risk level of no greater than 10^{-5}.

Contact: Karl Kalbacher,
Delaware Dept. of Natural Resources and Environmental Control
(302) 323-4540

ILLINOIS

Illinois established its voluntary cleanup program, called the 'Pre-Notice Program', in 1989. Since then, many state superfund cleanups have been done through this program, which is administered by the state Environmental Protection Agency. Either prospective purchasers or PRPs may initiate a voluntary cleanup. UST and RCRA sites and sites on the National Priorities List (NPL) are not allowed. Illinois as a State Memorandum of Understanding (SMOA) with the U.S. Environmental Protection Agency precluding subsequent federal action on sites in the Illinois program except in cases of an imminent threat to public health and the environment.

Contact: Larry Estep, Division of Remedial Management,
Illinois Environmental Protection Agency
(217) 782-9802

INDIANA

Created through legislation enacted in 1992, the Indiana voluntary cleanup program began operation in 1993 using a special environmental fund. Its goal is

to address sites that might be passed over for mandated cleanup. Voluntary cleanups may be initiated by current site owners and operators as well as prospective purchasers. The state does not specifically disallow, but reserves the right to reject, sites under NPL, RCRA, or UST programs.

Contact: Karla Gill, Indiana Department of Environmental Management
(317) 233-6352

MAINE

The Maine Voluntary Response Program was established in 1993. Since then, more than 20 sites have participated in the program, and at least 40 more are currently in the application stage. Cleanups may be initiated by either PRPs or prospective purchasers. No NPL, LUST, or RCRA sites are allowed.

Contact: Maine Department of Environmental Protection
(207) 287-2651

MASSACHUSETTS

Massachusetts currently has two programs of interest. The Clean Sites Initiative (CSI) is specifically for brownfields in state-designated "economic target areas." Prospective purchasers are eligible to participate in this program, but PRPs are not. The Waste Sites Cleanup Program (WSCP) is a voluntary cleanup program for sites with less redevelopment potential. PRPs as well as prospective purchasers can initiate cleanups under this program. Either numerical or site-specific cleanup standards are available but must attain an aggregate risk level of no greater than 10^{-5}. Cleanup review depends on the nature of the site: the most severely contaminated sites receive extensive state oversight; moderately contaminated sites are handled by permit requests from licensed site professionals (LSPs); minimally contaminated sites are handled by an LSP without direct state involvement.

Contact: Clean Sites Initiative
(617) 727-3206
Massachusetts Department of Environmental Protection
(617) 292-5820

MICHIGAN

Michigan has one of the oldest state environmental cleanup programs in the country. As early as 1982, a law was enacted establishing guidelines for remediation of orphaned or underutilized sites. During the 1990s, amendments to this law brought a new approach to liability and to cleanup standards (liability now applies only to persons who caused or contributed to the

contamination; site-specific use-based standards are now available). The program is now known as the 'Part 201' program, for its section in the Natural Resources and Environmental Protection Act of 1994.

Contact: Jim Linton, Michigan Department of Environmental Quality
(517) 373-8450

MINNESOTA

Minnesota's Voluntary Investigation and Cleanup program was initiated in 1988. It is operated under the Minnesota Pollution Control Agency, working in conjunction with the Department of Trade and Economic Development. The latter agency can recommend sites for voluntary cleanup, and it also provides grants to municipalities for cleanup. Any interested party may initiate a voluntary cleanup, but the program does not admit UST, RCRA, or landfill sites. Under specified circumstances, the state offers site-specific cleanup standards and proportional liability.

Contact: Larry Quandt, Minnesota Pollution Control Agency
(612) 297-1808

MISSOURI

Missouri's Voluntary Cleanup Program was begun in 1994. It is handled by the Missouri Department of Natural Resources. Any interested party may initiate a voluntary cleanup under the program, but the program does not admit RCRA sites or sites on or being considered for the NPL. Site-specific cleanup standards are available.

Contact: Tim Chibnall, Missouri Department of Natural Resources
(573) 526-2738

NEW HAMPSHIRE

The New Hampshire Site Management Program was established in 1992. Since it's beginning, around 300 sites have entered. Any interested party (including the state) may seek to initiate a voluntary cleanup under the program, but the program does not admit NPL or UST sites. As of early 1996, cleanup standards were under discussion and were being handled on a case-by-case basis, with new regulations to include site-specific standards. Legislation for a brownfield program was enacted in 1995; the program had a target start date of August 1, 1996.

Contact: Jim Hewitt, New Hampshire Department of Environmental Services
(603) 271-2942

NEW JERSEY

New Jersey's voluntary cleanup program is operated by the state's Department of Environmental Protection and Energy under the 1993 Industrial Sites Recovery Act. This act is a successor to the state's Environmental Cleanup Responsibility Act (ECRA) of 1983, which has been used as a model state law for industrial site remediation. Any interested party (PRPs and others) may initiate a voluntary cleanup, but no UST sites or landfills are admitted to the program. The program includes site-specific standards; it also has a Hazardous Waste Discharge Fund, which can provide up to $2 million in grants and low-interest loans for municipalities and up to $1 million in loans for private parties.

Contact: Steve Mayberry,
New Jersey Dept. of Environmental Protection and Energy
(609) 984-1351

NEW YORK

Under New York's voluntary cleanup program, which is administered by the New York Department of Environmental Conservation, interested parties other than PRPs may initiate cleanup. No NPL or RCRA sites allowed. Site-specific cleanup standards are available. Program participants pay for state oversight costs.

Contact: Chris Costopoulos, New York Dept. of Environmental Conservation
(518) 457-3811

OHIO

Established in 1994, the Ohio Real Estate Cleanup and Reuse Program is administered by the Ohio Environmental Protection Agency. Any interested party, including PRPs, may initiate a voluntary cleanup, but no NPL, RCRA, or UST sites are allowed under the program. Site-specific cleanup standards based on future site use were being developed as of early 1996. Certified professionals are used to 'sign off' on cleanups, and then the Ohio EPA audits 25% of the cleanups. Loans to facilitate cleanup are available through the state Department of Commerce. In addition, qualified program participants can receive 10-year state tax abatements on the increased site value and can petition municipalities for similar abatements.

Contact: Jennifer Kwasniewski, Ohio Environmental Protection Agency
(614) 644-2279

OREGON

Oregon's Volunteer Cleanup Program was established in 1991 and is administered by the state's Department of Environmental Quality (DEQ). Any interested party may initiate a voluntary cleanup under the program, but NPL and RCRA sites are not admitted to the program, nor are any sites that have a high priority with the DEQ. Site-specific cleanup standards are available, but the state generally prefers cleanup to background levels.

Contact: Alan Kiphut, Oregon Department of Environmental Quality
(503) 229-6834

PENNSYLVANIA

Pennsylvania's voluntary cleanup program, called the Land Recycling Program, was established through 1995 legislation. The program is managed by the state Department of Environmental Protection. Any interested party may initiate a voluntary cleanup under the program, but no NPL, UST, or state superfund sites are admitted. Categorical and site-specific cleanup standards are available. Program application fees are $250 for cleanup to background or statewide standards, whereas they are $500 for cleanup to site-specific standards with an additional $250 fee for each required document submission (remedial investigation, risk assessment, and cleanup plan). Technical assistance is provided through a technical reference manual, information on the Internet, one-on-one consultation with regional offices, and review of reports and work documents (no charge for review of documents when cleanup is to background or statewide standards). The state Department of Commerce makes available grants and low-interest loans for municipalities and low-interest loans for private developers.

Contact: Dave Hess, Land Recycling Section,
Pennsylvania Department of Environmental Protection
(717) 783-7816
Pennsylvania Dept. of Environmental Protection Web Server
http://www.dep.state.pa.us/

RHODE ISLAND

Rhode Island's Industrial Property Recycling and Reuse Program, a voluntary cleanup program, was established in 1993 and is administered by the state Department of Environmental Management. Any interested party may initiate a cleanup under the program, but no NPL, RCRA, or UST sites are admitted. As of 1996, the Department was rewriting regulations, including cleanup standards, to take advantage of brownfield legislation passed July 1995.

Contact: Rhode Island Department of Environmental Management
(401) 277-3872

TENNESSEE

The Tennessee Voluntary Cleanup Oversight and Assistance Program was established by a 1994 amendment to Part 2 of the Tennessee Hazardous Waste Management Act and actively got underway in 1995. The program is administered by the Division of Superfund within the state's Department of Environment and Conservation. All interested parties (PRPs as well as prospective purchasers and developers) are potentially eligible to initiate voluntary cleanups under the program. Sites with leaking underground or aboveground petroleum storage sites are not admitted to the program, nor are sites where disposal of hazardous substances is an ongoing activity (e.g., RCRA sites). Eligibility to participate is also limited by the complexity of the site and the availability of state staff to oversee the investigation and cleanup. A $5000 participation fee is required, and oversight costs of the state are reimbursed by the participant, as are any funds expended for the site from the state's Remedial Action Fund prior to the party's participation in the voluntary cleanup program. A consent order establishes mutually agreed-upon steps for investigation, cleanup, monitoring, maintenance, and oversight cost reimbursement. Cleanup standards are negotiable and can take into account future use of the site.

Contact: Andrew Shivas, Voluntary Cleanup Oversight and Assistance Program,
Div. of Superfund, Tennessee Dept. of Environment and Conservation
(615) 532-0912

TEXAS

Texas's voluntary cleanup program was established in 1994 and is administered by the Texas Natural Resources Conservation Commission. Any interested party may initiate a cleanup under the program, but the program does not accept sites operating under a state permit (e.g., landfills and waste storage facilities) or sites under a federal or state enforcement action. Cleanup standards, which include site-specific standards, were under revision as of 1996. For a cleanup to background levels, the party conducting the cleanup is simply required to notify the state of the cleanup and submit a final report upon cleanup completion for state review, but typically, the party will request additional oversight to ensure compliance and acceptance of cleanup procedures used. For a cleanup to site-specific standards, the state must pre-approve the project and must also review the investigation work plan, baseline assessment, and corrective action study.

Contact: Chuck Epperson, Texas Natural Resources Conservation Commission
(512) 239-2498

VERMONT

Vermont's Contaminated Properties Redevelopment Program was established through 1995 legislation to handle lower-priority sites than the state currently deals with. Prospective purchasers and interested third parties may initiate a voluntary cleanup under the program, but NPL, RCRA, and UST sites are not admitted. Site-specific cleanup standards are available; the cleanup review typically includes work plan reviews and on-site sampling.

Contact: Chuck Schwear, Vermont Department of Environmental Conservation
(802) 241-3876

WASHINGTON

Washington's Independent Remedial Action Program is administered by the states' Department of Ecology. Under the program, any interested party may seek to initiate a voluntary cleanup. If a cleanup is conducted by a PRP, the department is paid up-front for its oversight costs. If a cleanup is conducted by another party such as a prospective purchaser, the department will help recover costs from the PRPs. Site-specific cleanup standards are available; as of 1996, the department was developing regulations concerning standards based on future use.

Contact: Curtis Dahlgren, Washington Department of Ecology
(360) 407-7187

WISCONSIN

Under Wisconsin's 1994 Land Recycling Act, the state operates a combination voluntary cleanup and brownfield program. The program is run jointly by the state Department of Natural Resources (DNR), which handles the cleanup side, and the state Department of Economic Development, which supplies assistance in funding some of the cleanups. Program participants are limited to innocent landowners and prospective purchasers; PRPs are excluded. Site-specific cleanup standards are available, but a DNR project manager is involved throughout, and the cleanup work plans, sampling protocols, and final report must receive DNR approval.

Contact: Cara Norland, Wisconsin Department of Natural Resources
(608) 267-0540

Appendix B

Letter to Survey Recipients

May 14, 1996

[address]

Dear _____:

Articles on local government and economic development are full of stories about "brownfields": old industrial or commercial sites that may have some hazardous waste contamination and are now unused or under-used. The Waste Management Institute at the University of Tennessee is doing a study of brownfields in Tennessee. **We would like your help.**

Brownfields can be an eyesore and an economic drain. Getting them cleaned up and back into productive use can help restore economic vitality to urban areas and allow more orderly development of outlying farmland and forests ("greenfields"). Reuse of brownfields may also mean that a municipality's infrastructure is used more efficiently and that new job opportunities open up for local residents.

Removing chemical contaminants from the soil, water, and buildings on a brownfield site is often a huge hurdle. Questions arise about cleanup standards and remedies, about who will pay for the cleanup, and about whether the owners will have lingering liability for past contamination. Cleanup issues can make it difficult to find developers and investors willing to take on a brownfield site. And because cleanup issues loom large, they tend to be the focus of attention in most discussions of brownfields. Policies and programs addressing the cleanup aspects of brownfields help to level the playing field. But that may not be enough.

Apart from contamination, there are other possible barriers to the productive reuse of brownfields: for example, their urban locations and the cost of adapting old sites and structures to new uses. **The enclosed survey asks you to draw upon your knowledge of brownfield sites in your own municipality.** It asks you to estimate how significant these non-contamination barriers are, and also how significant the incentives to brownfields redevelopment might be, in the eyes of a prospective developer.

We would appreciate your completing the survey and returning it in the enclosed envelope by **May 30, 1996.** The results will be included in a report on brownfield policies and will be discussed at a workshop to be held this summer in Knoxville, where you will be invited to participate. But even if you are uncertain whether you will be able to attend the workshop, please complete the survey. It should take only a few minutes.

Thank you very much for your help.

Sincerely,

Mary R. English, Ph.D. James B. Rice

Appendix C

Municipalities Included in Survey

Survey responses were received concerning the following municipalities:

Athens
Bartlett
Brentwood
Bristol
Brownsville
Chattanooga
Clarksville
Cleveland
Columbia
Cookeville
Dyersburg
Elizabethton
Franklin
Gallatin
Greeneville
Hendersonville
Jackson
Johnson City
Kingsport
Knoxville
Lawrenceburg
Lebanon
Maryville
Memphis
McMinnville
Millington
Morristown
Murfreesboro
Nashville
Oak Ridge
Springfield
Tullahoma
Union City

Appendix D

Range of Responses

[Appendix D is not included in electronic version]

Appendix E

Workshop Participants

July 31, 1996 Workshop Participants

Rick Arnseth
SAIC
Oak Ridge, TN

Fred Ayers
Urban Engineers
Knoxville, TN

Charles Barker
Department of Economic Development
City of Knoxville, TN

Michelle Bell
Oak Ridge National Laboratory

Chris Craig
1st Tennessee Economic Development District
Johnson City, TN

Jim Culbert
Environmental Auditor
City of Johnson City, TN

Mike Farrell
Oak Ridge National Laboratory

Jessika Gil-Pineda
Oak Ridge National Laboratory

Wayne Goode
Superfund Division
Tennessee Department of Environment and Conservation

Mark Hairr
Department of Economic Development
City of Knoxville, TN

Robert James
U.S. Department of Energy,
Oak Ridge Office

Chuck McPherson
Kiber Environmental Services
Atlanta, GA

David Ornduff
Planning and Development
City of Elizabethton, TN

Matt Robbins
Waste Management Division
U.S. Environmental Protection Agency, Region 4

Mark Shipley
Town Planner
Greeneville, TN

Andrew Shivas
Superfund Division
Tennessee Department of Environment and Conservation

Steve Stout
Office of General Counsel
Tennessee Department of Environment and Conservation

Dan Tiller
Knoxville Community Development Corporation

Kevin Varian
Law Engineering and Environmental Services

Scott Walkup
City of Memphis, TN

Clint Willer
SAIC
Oak Ridge, TN

In addition, the following persons from the University of Tennessee participated:

Jack Barkenbus
Mary English
Tim Gangaware
Jean Peretz
Jim Rice
Kelly Rose