

### Improving Community Health: Brownfields and Health Monitoring

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**This commentary highlights efforts to promote health monitoring in brownfields communities. Both the Agency for Toxic Substances and Disease Registry (ATSDR) and the United States Environmental Protection Agency (US EPA) recognize how public health may be improved by including a holistic approach to redevelopment that includes community health monitoring activities. Health monitoring goes beyond testing blood samples to address potentially toxic exposures and can be implemented to assess overall community health status throughout the course of community revitalization efforts. Examples of health monitoring activities include asthma or blood lead level screening, reviewing health statistics, environmental testing, and evaluation of community-specific health concerns. While health monitoring is encouraged as an activity within US EPA Brownfields funding, the number of communities that implement health monitoring programs is low. To encourage more communities to implement health monitoring activities, with or without Brownfields funding, this paper describes several projects by health agencies and communities to represent best practice examples. To facilitate more community health monitoring projects, the ATSDR has created and continues to create tools and resources to assist brownfield and land-reuse communities. In addition, the ATSDR and the US EPA are working together to build internal as well as community capacity to monitor community health through redevelopment activities.**

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**T**he United States Environmental Protection Agency (US EPA) created its Brownfields Program in 1995. Since then, brownfield redevelopment has evolved consid-

erably. The Brownfields Program supports the US EPA's overall land revitalization goals. Cleaning up and reusing such contaminated properties as brownfields can protect the environment, reinvigorate communities, jump-start local economies, preserve green space, and prevent sprawl. Revitalized land can be reused in ways that offer the greatest local benefit—from creating public parks and restoring local ecosystems to commercial and residential redevelopment projects (US EPA, 2008a).

Both the Agency for Toxic Substances and Disease Registry (ATSDR) and the US EPA recognize another aspect of land reuse: public health improvements. Such improvements can be achieved by moving beyond the site-specific contamination issues presented by brownfield sites to define the broader health impacts of revitalization and a sustainable environment. Integration of a holistic approach to redevelopment to include community health monitoring can produce healthier and sustainable communities as outcomes of redevelopment (see Figure 1).

#### Health Monitoring and the Brownfields Law

The 2002 Brownfields Law focuses on the health impacts of brownfields, particularly in disadvantaged communities and among sensitive populations by allowing a local government to spend up to 10% of a brownfield grant for (US EPA, 2006):

- (i) monitoring the health of populations exposed to one or more hazardous substances from a brownfield site; and
- (ii) monitoring and enforcement of any institutional control used to prevent human exposure to any hazardous

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**Figure 1.** Brownfield and health monitoring. Source: US EPA (2006).

substance from a brownfield site” [Section 104(k) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC 9604(k)].

Under a brownfield grant, health monitoring is envisioned as public health practice, which may be defined as “the collection and analysis of identifiable health data by a public health authority for the purpose of protecting the health of a particular community, where the benefits and risks accrue primarily to the participating community” (Hodge and Gostin, 2004, p. 16).

So what does this really mean for brownfield communities? To communities, the term *health monitoring* may conjure up images of doctors and needles to draw blood samples to check for toxic contaminants. While this is often the case for childhood blood lead-screening programs, health monitoring encompasses a much broader range of activities to protect and assess community health.

*In other words, health monitoring involves collecting and analyzing health data to protect community health.*

## Health Monitoring Activities

Health-monitoring activities include, but are not limited to, testing for asthma or blood lead levels by city and state health programs; reviewing health statistics in brownfield areas, such as birth weight or injuries; testing of air and water to prevent exposures during cleanup; and working

with the local health department to assess community health-status issues through surveys or focus-group discussions.

Health-monitoring activities can be tailored to specific communities. For example, in urban areas, addressing site-trespassing issues at brownfield sites with the potential for hazardous exposures may be a health-monitoring focus. In more rural areas, addressing the potential for contaminated runoff and infiltration from brownfield sites to impact groundwater used for drinking water may be a key health-monitoring activity.

## Health Monitoring and Health Agencies

Health agencies are uniquely qualified to perform health-monitoring activities. Environmental health staff may have training in risk assessment or risk communication and understand issues associated with hazardous waste, exposure pathways, and sites. At the local level, health agencies also may be viewed by the community as a trusted source of information.

Health agency involvement in brownfields can focus on community involvement, crime or injury prevention, and community health care and services. Activities may include developing inventories of and assessing site proximity to sensitive populations, participating in brownfield redevelopment planning teams or advisory boards, evaluating community awareness of brownfields or site contaminants, developing fact sheets and multilingual information about contaminants for nearby residents, or planning redevelopment to consider and improve public health.

In Baraboo, Wisconsin, the Sauk County Health Department is receiving a portion of the Brownfields funds from the City of Baraboo to support community health-monitoring activities. Some of these activities include strengthening partnerships with the City of Baraboo and the community that will be impacted by planned brownfield redevelopment and assessing the age and exterior condition of housing in the redevelopment area to determine the potential for lead and/or asbestos exposures.

In other efforts throughout the US, seven state and local health agencies are using cooperative agreement funding from the ATSDR to support projects that address community health related to brownfields/land reuse. The Cuyahoga (Ohio) County Board of Health is one such agency. The Cuyahoga County Board of Health is working with local government, school officials, a local hospital, county

development authorities, grassroots organizations, community members, and other stakeholders through the formation of the East Cleveland Health and Development Committee, which has a shared vision to achieve sustainable revitalization of the community through the promotion of healthy land use and development. Among many goals, the committee aims to increase the number of brownfield/vacant properties to be used for community gardens, play spaces, and green spaces; it will also integrate health considerations into brownfield assessment and redevelopment in East Cleveland. While these projects are not funded through US EPA Brownfields grants, they demonstrate health-monitoring activities that are led by health agencies whose work may serve as best practice models of health monitoring in general.

## Brownfields Grantees and Health Monitoring

The health-monitoring aspect of the Brownfields Law was enacted in January 2002, so it is relatively recent. Although the US EPA encourages communities to conduct health-monitoring activities through brownfield funding, the number of communities that implement health-monitoring programs, while growing, is still small. Through an assessment performed by the authors, a review of the fiscal year 2009 brownfield applicants indicated that 21 of the 585 applicants included health-monitoring activities in the proposals. In other words, less than 5% of the applicants proposed community health monitoring in their funding proposals. Whether these proposed activities will translate into actual work-plan activities if these proposals are funded is not known at this time.

Among the applicants who propose health monitoring, Brownfields grantees in the Region 5 states (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin) are leaders. Three recent pilots (implemented in 2006–2008) are under way in Baraboo (Wisconsin), Indianapolis (Indiana), and Blue Island (Illinois). Two of these pilots are presented as case examples that follow.

Region 5 may be a leader in health-monitoring activities because of the large number of brownfields in the Midwest. Region 5 typically accounts for about one-third of the Brownfields proposal applications throughout the country, a preponderance that likely corresponds to the industrial and manufacturing history of the Midwest—a history that leads to an increase in brownfield sites. Other areas of the country, however, are also active in health monitoring,

including Region 7, which proposed two health-monitoring pilots in Iowa during 2008. In Region 9, Saipan (Commonwealth of the Northern Mariana Islands) is continuing with health-monitoring activities to assess impacts of unexploded ordnance on redeveloping communities.

### Healthy Brownfield Redevelopment Exemplified: The City of Indianapolis

The City of Indianapolis initially received Brownfields funds from the US EPA in 1995. To date, the city has been awarded \$600,000 in assessment and cleanup funds and has leveraged private funding and created jobs. Indianapolis recognized that its abandoned and degraded industrial sites could delay neighborhood redevelopment unless the city developed a community-wide survey scheme, an Environmental Site Assessment Area Survey. Through the survey, 75 parcels were assessed, including full Phase I Environmental Site Assessment on 20 sites. Strong community involvement from both business and community groups helped identify locations for new or expanded businesses, residential areas, and nearby green spaces. Twenty-five new homes have been built in the eastern portion of the survey area (see Figure 2).

The survey assessment work identified potential soil-vapor intrusion issues associated with a site. The former Flowers Dry Cleaners site needed cleanup before it could be reused. The site is located in the Fall Creek Place neighborhood (see Figure 2), which has been reborn with the reuse of vacant and abandoned houses into a mix of rehabilitated and new affordable homes. Over 300 homes have been developed and 46 rehabilitated. The redevelopment effort was recognized by the American Planning Association for implementation of *smart growth*, a sustainable development concept. While redevelopment has been well received, the former existence of a dry-cleaning business on the site and the corresponding contaminants raised concerns about the impact of soil vapor on surrounding homes. The cleanup grant work plan will allow \$20,000 for human health monitoring to address exposure risks to nearby residents. City officials will work closely with local health officials to ensure that the health of local residents is protected.

### Blue Island's Health Monitoring Pilot

The City of Blue Island in Illinois is integrating a community health focus into its brownfield assessment and redevelopment planning. Blue Island, an urban suburb of south Chicago, has received two US EPA Brownfields as-

## Before



## After



**Figure 2.** Indianapolis brownfield: before and after. Source: City of Indianapolis (2009).

assessment grants. The city has created an economic development plan to re-create its downtown and revitalize the economy. This plan includes Cargo- and Transit-Oriented Development Areas focused on the integrated development of homes, businesses, public transit, and other public amenities (US EPA, 2008b).

The City of Blue Island has allocated up to 10% of one 2008 assessment grant for community health-monitoring activities. Because brownfield sites are spread throughout the city, potential contamination associated with brownfields may have broad impacts on the surrounding community, as well as the Calumet River. Although still in the initial planning stages, the City of Blue Island has formed a *Development Community* comprised of social service agencies, law enforcement agencies, a local hospital, school officials, city agencies (e.g., Parks and Recreation), and many community representatives. The Development Community is using the ATSDR Brownfields/Land Revitalization Action Model<sup>1</sup> as a framework to address community concerns and assess the impacts of brownfield sites over the course of redevelopment. Preliminary issues include addressing worries about impacts of contaminants at sites, as well as identifying possible point sources that may generate contaminated runoff to the river, among other issues.

### **Health Monitoring and Redevelopment: Going Beyond the Ten Percent**

Many communities already perform health-monitoring activities through brownfields or other redevelopment planning mechanisms without allocating funding specifically for these activities. In these instances, community health is the driver for redevelopment plans, and public health prac-

tice is woven throughout the entire redevelopment process. This is exemplified by the involvement of the Sixteenth Street Community Health Center in the redevelopment of the Menomonee Valley of Milwaukee. The 1,500-acre Menomonee Valley at one time was an industrial area adjacent to downtown Milwaukee and Lake Michigan. The area served as an industrial center for the city for over a century, but, since the late 1970s, an exodus of industrial manufacturers from the area has resulted in job losses, and other factors have led to environmental impacts (McAvoy, Driscoll, and Gramling, 2004).

The Sixteenth Street Community Health Center moved beyond traditional health care services and worked to link the environment, the economy, and community health through urban brownfield redevelopment and sustainable land-use plans in the Menomonee Valley (McAvoy, Driscoll, and Gramling, 2004). One outcome of this project was a partnership with the City of Milwaukee and Menomonee Valley Partners, Inc., to develop a master plan and cleanup and redevelopment efforts in the Menomonee Valley. The health center also conducted a study with the University of Wisconsin–Milwaukee through the Menomonee Valley Benchmarking Initiative (MVBI), which established indicators, or benchmarks, of change in the three aspects of the project: environment, economy, and community (McAvoy, Driscoll, and Gramling, 2004). Through three Indicator Work Group meetings in 2001, community issues and corresponding indicators were developed for the purpose of establishing baseline conditions in the Menomonee Valley and surrounding neighborhoods. Two State of the Valley reports describing these efforts and assessing indicators were produced in 2003 and 2005. In total, 57 benchmarking indicators were selected to characterize the Menomonee Valley in terms of economic, environmental, and community conditions. The Web-based 2003 report provided base-



line conditions, and the 2005 report compared 2005 conditions to the 2003 baseline (MVBI, 2003, 2005).

The MVBI has thus far successfully tracked changes associated with redevelopment activities in surrounding communities. For example, community indicators (MVBI, 2005) show an increase in housing property values close to the Menomonee Valley, despite proximity to an older industrial area; declining childhood lead-poisoning rates; ethnically diverse neighborhoods; and neighborhoods strong in culture with numerous community recreation opportunities and public art installations.

There have also been positive changes in the economic and environmental sectors. The MVBI intends to continue producing State of the Valley reports every five years to determine whether it is meeting the objectives of sustainability for the Menomonee Valley.

Many other communities across the country also monitor community health through redevelopment plans. One such effort was spearheaded by the San Francisco Department of Public Health (SFDPH) through its Program on Health, Equity, and Sustainability. In this project, the Eastern Neighborhoods Community Health Impact Assessment was conducted to assess the health benefits and burdens of development in several San Francisco neighborhoods (SFDPH, 2007, p 9). The project led to the creation of the Healthy Development Measurement Tool to evaluate land-use development, policies, and projects in the Eastern Neighborhoods area. This tool provides land-use planners, public agencies, and community stakeholders with a set of metrics to assess the impacts of urban development on community health (SFDPH, 2007, pp. 58–62).

Clearwater, Florida, has also implemented a community health focus through brownfield redevelopment. Among other projects to improve public health, the site of an abandoned gas station became a free health clinic. This project was funded by the US EPA and state Brownfields Program funds. Willa Carson, a retired nurse, had been operating a nonprofit health clinic out of two refurbished apartments for 30 years at a cost of \$1.00 per year (US EPA, 2008c). Community representatives voted unanimously for the City of Clearwater to lease the cleaned-up former gas station property to the clinic. The Willa Carson Health Resource Center opened in January 2001; it provides free health care, primarily to residents of surrounding communities (US EPA, 2008c).

## Conclusions and Recommendations

Despite a low number of applicants allocating brownfield funding for health monitoring, brownfield municipalities are encouraged to incorporate a community health focus in overall redevelopment plans through the US EPA Brownfields funding process. The US EPA proposal application process requires applicants to describe impacted communities and to identify environmental justice issues and sensitive populations, among other community aspects. The proposal application process typically has a strong emphasis on the protection of human health and the environment, as well. In the fiscal year 2008 *Proposal Guidelines for Brownfields Assessment, Revolving Loan Funds, and Cleanup Grants* (US EPA, 2007), the ranking criteria for assessment grants allocated a maximum of 26 points, the largest possible amount within the application that year for (1) reduction of threats to human health and the environment within the target area that may be associated with exposure to brownfield site contaminants; and (2) the extent to which the applicant is “working with your local, state, or tribal health agency to ensure protection of public health and the environment during the assessment, cleanup, and redevelopment process” (US EPA, 2007). The fiscal year 2009 assessment grant proposal guidelines allocate 25 points for the applicant’s description of project benefits, including how public health issues will be addressed during the project, the anticipated benefits of redevelopment, and the incorporation of sustainable practices (US EPA, 2008d).

To encourage more community health-monitoring projects, the ATSDR has created and continues to create tools and resources to assist brownfield and land-reuse communities. In addition to funding health agencies to support community health projects related to brownfields and providing technical assistance to brownfield communities, the ATSDR has developed the Brownfields/Land Reuse Site Tool, which enables rapid screening of sites to assess potential impacts on public health. The tool may be used to create a brownfield inventory in general. The ATSDR Brownfields/Land Revitalization Action Model is also a useful framework that is being piloted in several communities to characterize community health status and develop indicators of health outcomes to be tracked during redevelopment.<sup>2</sup>

In addition, the ATSDR and the US EPA are working together to build internal as well as community capacity to monitor community health through redevelopment activities. The authors hope this article will provide additional guidance and encouragement to brownfield communities

to further incorporate a community health focus or a health-monitoring component in redevelopment plans.

## Notes

1. For more information on the ATSDR Action Model, email [atsdr.landreuse@edc.gov](mailto:atsdr.landreuse@edc.gov) or e-mail Laurel Berman at [LABerman@cdc.gov](mailto:LABerman@cdc.gov).
2. For more information on these tools and other resources, email [atsdr.landreuse@cdc.gov](mailto:atsdr.landreuse@cdc.gov).

## References

City of Indianapolis, Division of Economic Development, Brownfield Redevelopment Coordinator. Photos taken 11-7-2008 and provided for this manuscript on 6-22-2009.

Hodge, J.G., and L.O. Gostin. 2004. *Public Health Practice vs. Research: A Report for Public Health Practitioners Including Cases and Guidance for Making Distinctions*. Council of State and Territorial Epidemiologists (CSTE), Atlanta, GA, 61 pp. Available at <http://www.cste.org/pdffiles/newpdffiles/CSTEPHResRptHodgeFinal.5.24.04.pdf> (Accessed 6/26/2009).

McAvoy, P.V., M.B. Driscoll, and B.J. Gramling. 2004. Integrating the Environment, the Economy, and Community Health: A Community Health Center's Initiative to Link Health Benefits to Smart Growth. *American Journal of Public Health* 94(2):525-527.

[MVBI] Menomonee Valley Benchmarking Initiative. 2003. *Menomonee Valley Benchmarking Initiative State of the Valley Report*. MVBI, Milwaukee, WI. Available at <http://www.mvbi.org> (Accessed 6/26/2009).

[MVBI] Menomonee Valley Benchmarking Initiative. 2005. *State of the Valley: Evaluating Change in Milwaukee's Menomonee Valley*. MVBI, Milwaukee, WI. Available at [www.mvbi.org](http://www.mvbi.org).

[SFDPH] San Francisco Department of Public Health. 2007. *Eastern Neighborhoods Community Health Impact Assessment Final Report*, September 2007. SFDPH Program on Health, Equity, and Sustainability, San Francisco, 79 pp. Available at [http://www.sfphes.org/enchia/2007\\_09\\_05\\_ENCHIA\\_Final\\_Report.pdf](http://www.sfphes.org/enchia/2007_09_05_ENCHIA_Final_Report.pdf).

[US EPA] US Environmental Protection Agency. 2006. *Brownfields: Public Health and Health Monitoring*. Brownfields Fact Sheet: Public Health, Solid Waste and Emergency Response (5105T), EPA-560-F-06-210, July. US EPA, Washington, DC. Available at <http://www.epa.gov/brownfields/tools/finalphandbfact.pdf>.

[US EPA] US Environmental Protection Agency. 2007. *2008 Proposal Guidelines for Brownfields Assessment, Revolving Loan Funds, and Cleanup Grants*. EPA-OSWER-OBCR-07-09. US EPA, Washington, DC, 91 pp. Available at <http://www.epa.gov/oswer/docs/grants/epa-oswer-obcr-07-09.pdf>.

[US EPA] US Environmental Protection Agency. 2008a. *Brownfields/Land Revitalization General Brochure*. Solid Waste and Emergency Response (5105T), EPA-560-F-08-241, April. US EPA, Washington, DC. Available at <http://epa.gov/brownfields/pubs/08brochure.pdf>.

[US EPA] US Environmental Protection Agency. 2008b. *Brownfields 2008 Grant Fact Sheet: Blue Island, IL*. Solid Waste and Emergency Response (5105T), EPA 560-F-08-092, April. US EPA, Washington, DC. Available at [http://biplanning.files.wordpress.com/2008/03/ro5\\_il\\_blueisland\\_2008.pdf](http://biplanning.files.wordpress.com/2008/03/ro5_il_blueisland_2008.pdf).

[US EPA] US Environmental Protection Agency. 2008c. *Improving Public Health in Brownfields Communities*. Brownfields Success Story Improving Public Health in Brownfields Communities, Solid Waste and Emergency Response (5105T), EPA 560-F-07-253, January. US EPA, Washington, DC, 4 pp. Available at [http://www.epa.gov/brownfields/success/public\\_health08.pdf](http://www.epa.gov/brownfields/success/public_health08.pdf).

[US EPA] US Environmental Protection Agency. 2008d. *Proposal Guidelines for Brownfields Assessment Grants*. EPA-OSWER-OBCR-08-07. US EPA, Washington, DC, 49 pp. Available at <http://www.epa.gov/oswer/docs/grants/epa-oswer-oblr-08-07.pdf>.

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