



1st Quarter 2003, Issue 19

South Bend in Line for Federal Loan Monies from IDEM for Abandoned Fredrickson Park Landfill

By taking advantage of federal loan funds through IDEM, the city of South Bend has been able to move forward with redevelopment of the Fredrickson Park Landfill into the Fredrickson Park Environmental Education Center. This project is a perfect example of how team effort in brownfields redevelopment spells success. The fruition of this project balances

redevelop such abandoned or idle properties, and South Bend was the successful applicant to receive these funds for the Fredrickson Park Landfill.

The history of the Fredrickson Park Landfill is typical of dumps established sometime in the 1930s—not much is known. What is known is that this site is 16 acres, privately owned and operated, and accepted waste from the 1930s to the early 1970s. The period of waste disposal was prior to governmental environmental controls regulating the operation and closure of a landfill. As a result, this site must be properly closed with environmental monitoring and controls established before any redevelopment efforts can go forward.

After successfully meeting the established criteria for financial assistance through the BCRLF low-interest loan, Fredrickson Park Landfill's next challenge becomes the technical issues involved with conducting closure activities and milestones necessary prior to redevelopment. These include:

(continued on page 2)



"Before": Fredrickson Park Landfill—current site conditions.

financial and economic realities, technical and environmental issues, and community involvement.

Since 1997, the U.S. Environmental Protection Agency has had available loan monies for removal activities at brownfield sites. Funded through the federal Brownfields Cleanup Revolving Loan Fund (BCRLF) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the loans are designed to encourage redevelopment of brownfield sites and have been available to any eligible public or private sector applicant. Fundable activities could include security fencing, drum removal, contaminated soil excavation, and capping, all of which can be important steps in revitalizing brownfield properties and facilitating their sustainable reuse. Up to \$1 million was available to help



"After": Proposed conceptual design of Fredrickson Park Environmental Education Center.

IDEM and U.S. EPA Sign Memorandum of Understanding Promoting Interagency Cooperation in Hazardous Waste Cleanup Efforts

In December 2001, IDEM Commissioner Lori F. Kaplan and U.S. Environmental Protection Agency Regional Administrator Thomas Skinner signed a Memorandum of Understanding (MOU) between the two agencies that allows for cooperation and recognition of cleanups of hazardous waste sites throughout Indiana. The MOU now removes duplicative cleanup regulations and liability and eases the barriers to redevelopment at a new class of brownfield sites.

Some brownfields are contaminated with "hazardous waste," a particular group of contaminants regulated under the federal Resource Conservation and Recovery Act (RCRA). The RCRA program regulates hazardous waste management facilities and requires corrective action to clean up hazardous wastes. In the past, the additional requirement to comply with these RCRA regulations has complicated

redevelopment at RCRA corrective action site.

The MOU states that U.S. EPA will generally recognize cleanups performed at RCRA hazardous waste sites if those cleanups are performed under the auspices of IDEM's Voluntary Remediation Program (VRP) or State Cleanup Program, consistent with IDEM's Risk Integrated System of Closure non-rule policy. Thus, if a stakeholder suspects a brownfield contains RCRA-regulated hazardous waste and applies to IDEM for oversight in a cleanup, that stakeholder faces drastically reduced liability from U.S. EPA.

"This agreement signals our continued commitment to ensure that all Hoosiers are provided a safe and healthy place to call home," said IDEM Commissioner Kaplan. "Our colleagues at U.S. EPA recognize

IDEM's hard work in cleaning up permitted hazardous waste sites throughout Indiana, and this agreement ensures that we will maintain an open line of communication while coordinating the cleanup of future sites."

"I applaud Indiana's initiative in developing this fresh approach to voluntary cleanup," said U.S. EPA Regional Administrator Skinner. "This partnership will further enhance our mutual goal of protecting public health and the environment."

IDEM and U.S. EPA already have an MOU, under which U.S. EPA agrees that cleanups performed under the direction of IDEM's VRP will generally fulfill a brownfields stakeholder's liability under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or "Superfund" law.

Fredrickson Park Landfill

(continued from cover page)

- **Field grading and contouring the site** to maximize area drainage efficiency and to prepare it for future reuse.
- **Installing environmental controls** (including an active landfill gas system) to control any gas that is generated by the buried waste. Beyond the waste, perimeter gas probes and ground water monitoring wells are to be installed to monitor potential gas and ground water contaminant migration pathways.
- **Capping the waste with an impervious material** to reduce water infiltration and effectively reduce the amount of potential leachate that may be produced.
- **Establishing vegetative cover over the site** to minimize erosion and again reduce the influx of water upon the cap through plant root transpiration. After the site has been stabilized and certified as closed by IDEM, the landfill can progress from the closure/remediation phase to the "fun" phase—redevelopment.

One criterion especially important for approval of the loan monies was evidence of the applicant's intent to involve local residents and community organizations in the removal process. In addition to public meetings, local media coverage became an important means of providing community awareness for a project of such a large scope. Articles provided by the "South Bend Tribune" chronicled the Fredrickson Park Environmental Education Center's transformation.

The city of South Bend has a clear vision of where it

ultimately intends to take this site after landfill closure activities. (Refer to the photo of current site conditions and the site diagram that illustrates future plans for the Fredrickson Park Environmental Education Center.) This progressive community has accepted the challenge of closing the site, meeting U.S. EPA and IDEM standards, and having a future reuse clearly defined and planned. This redevelopment has been a cooperative effort among the city of South Bend, Notre Dame University (Schools of Architecture, Civil Engineering, and Geological Sciences), South Bend's Community School Corporation, and local neighborhood organizations (Northeast Neighborhood Revitalization Organization and Northeast Neighborhood Center), among others. Perhaps Mayor Stephen Luecke summed up the project best:

"We are excited about the potential that this brownfields revitalization project has for transforming the physical appearance of an old dump into the new Fredrickson Park Environmental Education Center. This is the first time South Bend has reclaimed a brownfield and developed a unique environmental laboratory for local students and residents to learn and to explore. This will enrich the environmental stewardship programs of the city of South Bend for generations to come."

For more information, contact Gabriele Hauer, IDEM Brownfields and Abandoned Landfill Programs, or visit the Brownfields Program's Web site or the city of South Bend's Web site at www.ci.south-bend.in.us/index1.htm.

Community Initiatives

Indianapolis Brownfields Grant and Loan Program

(Special thanks to Kyle Hendrix with the city of Indianapolis for providing the information for this article.)

Brownfields projects can come in small packages. Often neighborhood groups and community development corporations (CDC) take on these smaller sites. To assist neighborhood groups, CDCs, and other private entities with these properties, the city of Indianapolis, in partnership with the Local Initiative Support Corporation (LISC), launched the Indianapolis Brownfields Redevelopment Grant and Loan Program in May 2002.

“The city is committed to supporting community efforts to redevelop brownfields, which are not only eyesores, but also create health and safety concerns,” explained Mayor Bart Peterson. “These grant dollars will be put to great use, transforming blighted, unsafe land into locations that benefit our city.”

Subsidized by the U.S. Department of Housing and Urban Development, this initiative marks the first time the city has allocated funds specifically for a brownfields grant and loan program. Indianapolis has spent nearly \$1.2 million on brownfields redevelopment, with most funds going to large-scale sites. The new program targets smaller projects initiated by community development corporations (CDCs) or other not-for-profit organizations.

As a part of the program, the city will offer matching grants of up to \$20,000 for organizations interested in the redevelopment of brownfield sites. LISC will contribute grants to CDCs receiving city funds. The city also will offer loans of up to \$50,000 to for-profit and not-for-profit entities.

Awarded to seven recipients in 2002, program grants totaled \$82,282. The organizations and projects receiving funding were:

Cathedral Community Care, Inc. \$14,900

Proceeds will aid in the removal of hazardous chemicals and completion of Phase I and II Environmental Site Assessments at a former construction warehouse facility on the city’s east side. The site will become a youth/community center.

Southeast Neighborhood Development Corporation \$16,150

Funds will be used to complete Phase I and II Environmental Site Assessments at a former southeast side plating facility to make way for commercial development.

Concord Community Development Corporation \$800

Grant dollars will be used to complete a Phase I Environmental Site Assessment at former grocery, commercial, and multi-family residential properties located on Indianapolis’s near south side. The properties will be combined into one parcel for commercial use.



This abandoned building was demolished as part of the 38th Street Emerson Library project.

United Northwest Area Development Corporation \$13,432

Funds will aid in the completion of an environmental site assessment for eight parcels in a one-block area on the city’s near northwest side. These parcels will become part of a large commercial development.

West Indianapolis Development Corporation \$9,500

Contributions will finish a site investigation of a former salvage yard on the city’s west side. This property will be part of a large commercial development.

Indianapolis Marion County Public Library \$20,000

Funds will complete the cleanup of the new Emerson Library Branch site on the northeast side of the city.

Central 13 Redevelopment Corporation \$7,500

Grant funds will remove underground storage tanks at a former taxi maintenance facility located on the city’s north side. The property will be a part of a commercial development that may include artist lofts.

The Peterson administration targeted brownfields redevelopment as a key to neighborhood revitalization. Another city brownfields initiative is an update of the “Indianapolis Brownfields Redevelopment Toolbox,” a resource that provides lists of brownfields revitalization funding sources and explains the redevelopment process. The document is available on-line at indygov.org, as well as at local public library branches.

For more information about the city of Indianapolis, contact Kyle Hendrix, Brownfields Coordinator, city of Indianapolis at (317) 327-5845 or lhendrix@indygov.org.



Q: Will my community be held liable for contamination if it purchases a brownfield?

A: State and federal laws recognize broad liability exemptions for government entities, or “political subdivisions” as they are called in the law. The scope of the liability exemption depends upon the type of contamination (e.g., whether the contamination is petroleum or a hazardous substance) and how the political subdivision acquired the property (e.g., voluntarily, as through outright purchase, or involuntarily, as through a tax default, abandonment, or bankruptcy). These liability exemptions do not apply if the political subdivision caused or contributed to the contamination. For more information about particular liability exemptions, contact your attorney or IDEM Brownfields Program staff. You also may visit the Brownfields Program Web site for a liability fact sheet at: www.IN.gov/idem/land/brownfields/pdf/files/factsheets/bfliabilityfactsheet.pdf.



Phytoremediation: Planting a New Idea with Brownfields

One of the fastest growing technologies in site remediation today is a process known as phytoremediation. The process utilizes certain species of plants to clean up contaminants released at a site. This remediation technology has been found to be useful for treating a wide variety of environmental contaminants. However, despite the fact that phytoremediation has been successfully tested in many locations, full-scale applications are still limited.

The plants act as traps to break down organic pollutants or stabilize metal. Essentially, the pollutants are degraded into simpler molecules and are then incorporated into the plant tissues to help the plant grow faster. Plants contain enzymes, complex chemical substances (proteins) that cause rapid chemical reactions to occur. Some enzymes can break down and convert ammunition wastes, while others can degrade chlorinated solvents such as trichloroethylene (TCE). The soil microbes break down the contaminants while the plants accelerate the microbes' action in the soil. They stimulate microbes to degrade contaminants by getting more oxygen into the soil and by supplying nutrients through their roots. Since plants simply degrade contaminants, there may be no concern regarding the disposal and potential leaching of plants used on a site.

Before considering phytoremediation in the cleanup of a brownfields site, one needs to investigate the contamination levels. According to Dr. Cathy Banks, Purdue University, School of Engineering, this process of utilizing plants to clean contaminated soil is best for cleaning moderately contaminated soil that does not pose a high health hazard to the public. Other factors to consider when using this technology include whether the contaminated soil on the site is isolated and whether the soil is at a place on the site that will not need to be used immediately.

If a site seems to meet the criteria, then the main challenge for a phytoremediation project is finding the right plant for the particular phytoremediation design. A key to success is finding plants that can survive in contaminated areas and also promote microbial growth. In field tests by Purdue University, the researchers found that fescue and Bermuda grass work well. Clovers and alfalfa also look promising in certain situations because their root systems stimulate microbe growth.

Researchers also have discovered that the use of trees can provide an effective phytoremediation project because tree roots are deeper than plant roots and penetrate further into the ground to treat deep contamination. The poplar tree in particular works well when addressing ground water contamination. The effectiveness of poplar trees with ground water is due to the fact that the roots of the trees can reach 20 to 30 feet deep. Most plant species used in phytoremediation can only treat soil or water within a rather shallow depth.

Plants used in phytoremediation can also clean a site by rapidly taking up large volumes of water to help contain the migration of subsurface water off the site. The water consumption by the plants decreases the tendency of surface contaminants to move towards ground water and into drinking water. In some cases, plants or trees are actually being used to treat ground water that has been pumped up mechanically to the surface, thereby combining two different remedial alternatives.

Another major challenge is the duration of a typical phytoremediation project. Some projects can last quite some time based on several different factors, such as plant type, contaminants involved, size of the site, etc. For this reason, phytoremediation may not be the most suitable remedy when dealing with a brownfields site that must be redeveloped quickly. This technology can work in certain planned situations where perhaps a site will eventually be redeveloped as green space.

An additional challenge is the environmental conditions of the site area. A drought or particularly dry season may destroy an entire project's plant population. This can be a case of using a high-risk technology on low-risk contaminated areas.

Another challenge to any phytoremediation project is proper site management. A designed plot on a site will need to be fertilized and maintained through critical stages of plant development. Poor judgment or management skills can be detrimental to any project.

Petroleum hydrocarbons are some of the most common contaminants found at brownfields throughout Indiana. Petroleum hydrocarbons are not very mobile because they adhere to components of the soil

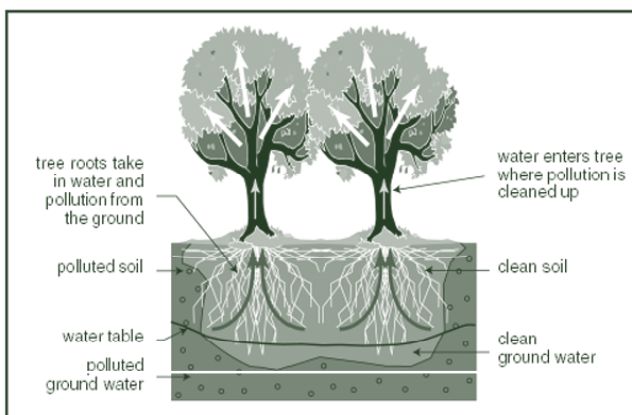


Diagram illustrating phytoremediation process.
Courtesy "A Citizen's Guide to
Phytoremediation." U.S. EPA, April 2001

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Phytoremediation

(continued from page 4)

and remain in the top six feet of the soil subsurface. Because of their lack of mobility, plant roots located in the shallow subsurface can play a major role in cleaning up petroleum contamination. Phytoremediation can then be very effective as the contaminants comes in direct contact with plant roots.

A research team at Purdue University, including Dr. Cathy Banks and Dr. Paul Schwab, has pioneered the use of plants to help clean up soil contaminated with petroleum products. The team has utilized their phytoremediation method to clean several petroleum spill sites across the United States with help from the U.S. EPA and the petroleum industry. The Purdue University team was the first to use grasses to clean up petroleum contaminated areas. Dr. Banks explained that the research team chose grasses because they are very fibrous and have an intense root-forming system, which provides the greatest amount of plant contact with the contaminated soil.

As with any remediation project, phytoremediation requires careful planning, sound project design, and management. The main challenges associated with phytoremediation as discussed include appropriate plant selection, the location of the site, and the remediation time. Other biological cleanup methods can treat a site much faster, as phytoremediation does not remove contaminants, but degrades them. Dissemination of information on how to appropriately utilize this method then becomes crucial to success.

The benefits of a sound phytoremediation project that is based in sound management and science can be numerous. Phytoremediation costs much less than other more common remediation technologies and leaves the soil structure intact on the site. This also decreases the amount of treated soil that would otherwise be sent to a landfill. According to the U.S. EPA, phytoremediation is an aesthetically

pleasing, passive technique that can be used to clean up sites with shallow, low to moderate levels of contamination. In addition, the process is entirely solar-powered.

For more information on phytoremediation, visit the following Web site: www.clu-in.org/products/roadmap/spotlights/phyto.htm

References:

- Dr. Cathy Banks, School of Civil Engineering, Purdue University
- U.S. Environmental Protection Agency
www.clu-in.org/download/citizens/citphyto.pdf

Reminder

February 7- Next Indiana Brownfields Site Assessment Grant Round Deadline. Check out IDFA's Web site for changes to the application and guidelines.



2002 Governor's Awards for Environmental Excellence: Brownfield Sites Take Top Honors in Land Use Category

The Governor's Awards for Environmental Excellence are offered to recognize outstanding environmental projects throughout Indiana. The 2002 awards included a new category to recognize innovations in land use such as brownfields redevelopment. The new Land Use category recognizes projects that incorporate innovative and effective methods or practices to preserve or improve land use. Qualifying projects needed to revitalize underutilized or contaminated land, preserve green space, and/or reduce sprawl. Nominations

were accepted through April and reviewed by a committee. The selection process was competitive.

Governor Frank O'Bannon presented the Land Use awards at the Governor's Conference on the Environment on September 27, 2002. Two brownfield projects took top honors.

The Brownfield Development Group, LLC (BDG) was presented an award for revitalizing a former civil defense building on the near northwest side of Indianapolis. The building is now home to BDG and mainstream businesses, minority start-up businesses, and training

schools that offer job training and placement assistance.

The Hammond Redevelopment Commission was presented an award for revitalizing a former industrial slag dump in the city of Hammond. The site incorporates a youth life-skills training center and an 18-hole golf course.

Both projects received financial and technical assistance through the Indiana Brownfields Program. By publicizing these projects, the governor hopes that others throughout the state will emulate them and thereby improve the quality of the environment.

In Brief

August 2002 Indiana Brownfields Site Assessment Grant Round Awards

In September and October 2002, nine communities, including eight small cities and towns with a population less than 22,000, were awarded Indiana Brownfields Site Assessment Grants available through the Environmental Remediation Revolving Loan Fund (ERRLF). For this round of grants, 12 grant applications (15 sites) were received, with the amount requested totaling approximately \$250,000, which is the maximum amount available. A total of \$211,061 was awarded. The decision to award funding was a cooperative effort by the Indiana Development Finance Authority (IDFA), the Indiana Department of Commerce (IDOC) and IDEM.

Following is a list of those communities (five of which previously have received grants) and sites with their respective grant award amounts:

<u>POLITICAL SUBDIVISION</u>	<u>AMOUNT AWARDED</u>
*1) City of Indianapolis (Keystone Enterprise Park)	\$50,000
2) Town of Bloomfield (Russ Tire Center)	\$17,739
3) Town of Dugger (Swan Service & Tire and Stringer Welding & Machine, Inc.)	\$29,639
*4) City of Franklin (229-251 S. Main St. site)	\$17,770
5) Town of Hope (Hope Community Center)	\$ 2,700
6) City of Jasonville (Castle Property)	\$ 8,924
*7) City of Washington (Former Auto Sales Lot - gas station)	\$24,838
*8) Town of Winona Lake (Gatke Corp. Dump site)	\$32,879
*9) City of Wabash (Mafcote Property)	\$26,572

* Denotes communities that previously have received assistance.

EPA and EDA Renew Agreement to Support Brownfields Redevelopment



The U.S. Environmental Protection Agency and the U.S. Economic Development Administration (EDA) recently renewed a 1995 Memorandum of Understanding (MOU) that established a general working agreement between the two agencies. The renewed agreement helps them coordinate their policies and activities in support of brownfields assessment and cleanup, community revitalization, and economic redevelopment efforts. The objective is to enhance interagency cooperation and collaboration in keeping with the respective agencies' environmental protection and economic development objectives. The agreement, signed by U.S. EPA's Marianne Horinko and EDA's David Sampson, states that the two agencies will work together on strategy, linking assessment with redevelopment opportunities, and redevelopment research.

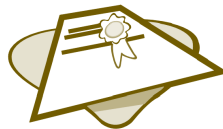
BROWNFIELDS *Score Card* PROGRAM

37



Assessments completed or referred

121



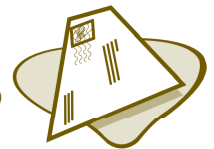
Grants awarded

18



Loans approved

65



Comfort and Site Status Letters issued*

*Site Status Letters have been developed to replace No Further Action Letters formerly issued by IDEM's Brownfields Program.



Chemical of Concern

Trichloroethylene (TCE)

Trichloroethylene (TCE) is a man-made volatile organic compound. It is a colorless, non-flammable liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it can be found in other products as well. The main industrial groups that use TCE in vapor or cold degreasing operations include: furniture and fixtures, fabricated metal products, electrical and electronic equipment, transport equipment, and miscellaneous manufacturing industries.

TCE evaporates easily into the air from surface water. It also may stick to particles in the water, causing it to settle to the bottom sediment. Since it dissolves only slightly in water, TCE can remain in groundwater for long periods. TCE in the soil does not evaporate easily and can remain for an extended time. Upon combustion, TCE produces irritants and toxic gases, which may include hydrogen chloride. In the presence of moisture and light, it decomposes by forming hydrochloric acid.

Synonyms and trade names for TCE include: 1,1,2-Trichloroethylene, Acetylene trichloroethylene, Algylene, Anameth, Benzinol, Chlorilen, CirCosolv, Germalgene, Lethurin, Perm-a-chlor, Petzinol, TRI-Plus M, and Vitran.

TCE has been found by the U.S. Environmental Protection Agency in at least 852 of the 1,430 National Priorities List (NPL) sites. The NPL is intended to guide U.S. EPA in determining which sites require cleanup.

For sources and further information contact:

- www.epa.gov/safewater/dwh/t-voc/trichlor.html
- www.atsdr.cdc.gov/tfacts19.html
- www.cla.sc.edu/geog/hrl/sctrap/toxfaqs/trichlor.htm
- <http://ehp.niehs.nih.gov/roc/ninth/rahc/trichloroethylene.pdf>



Products/Wastes Containing TCE

- TCE can be found in degreasing products and wastes, wastewater from metal finishing, paint and ink formulation, electrical/electronic components, and rubber processing industries.
- TCE also can be found in adhesives, paint removers and strippers, typewriter correction fluids, spot removers, rug cleaning fluids, pesticides, and cold metal cleaners.
- Former uses of TCE as an extraction solvent for cosmetic and drug products, and as a dry cleaning agent, have been discontinued.



Regulatory Levels/ Requirements

U.S. EPA Maximum Contaminant Level: 0.005 parts per million (ppm) or milligrams per liter (mg/l) in drinking water.

U.S. EPA Reporting Requirements: spills or accidental releases of 1 pound or more must be reported to U.S. EPA.

IDEM RISC Guidance: default closure level residential soil (0.057 ppm), default closure level residential groundwater (0.005 ppm), default closure level industrial soil (3.0 ppm), default closure level industrial groundwater (0.26 ppm).

OSHA: Maximum allowable level of TCE in workroom air during 8-hour workday in a 40-hour week is 100 ppm.



Health Effects

•The effects of drinking large amounts of TCE include nausea, liver damage, unconsciousness, impaired heart function, or death. Drinking small amounts for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear. Breathing large amounts of TCE may cause impaired heart function, unconsciousness, and death. Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty in concentrating. Breathing TCE for long periods may cause nerve, kidney, and liver damage. TCE has the potential to cause vomiting and abdominal pain from acute exposures at levels above the Maximum Contaminant Level. Skin contact with TCE for short periods may cause skin rashes.

•There is some evidence from studies of mice and rats that TCE may have the potential to cause liver or lung cancer. Studies of people exposed over long periods to high levels of TCE in drinking water or in workplace air have found evidence of increased cancer; however, the results are inconclusive because the cancer could have been caused by other chemicals.



Possible Routes of Exposure to TCE

•Inhalation of air in and around the home that has been contaminated with TCE vapors from shower water or household products, such as spot removers or typewriter fluids.

- Drinking, swimming or showering in water that has been contaminated with TCE.
- Contact with soil contaminated with TCE, such as near a hazardous waste site.
- Contact with the skin or inhalation of contaminated air while manufacturing TCE or using it at work to wash paint or grease from skin or equipment.



Brownfields Program Staff

Brownfields Bulletin is published quarterly by the Indiana Department of Environmental Management to inform local government officials, business representatives, and interest groups about brownfields redevelopment initiatives and success stories from within and beyond the state. A brownfield site is an industrial or commercial property that is abandoned, inactive or underutilized due to actual or perceived environmental contamination. IDEM's overall mission is to make Indiana a cleaner, healthier place to live. IDEM's brownfields initiative helps communities remove barriers for sustainable growth.

Please contact Dan Chesterson of the IDEM Brownfields Program to inform IDEM of address changes, to be added or deleted from the mailing list or e-mail list serve, or to share your comments and ideas about this publication.

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IDEM's toll-free number: (800) 451-6027, press 0 and ask for a person by name or number, or dial direct.

Who Can Help

Technical and educational assistance

Indiana Department of Environmental Management
Brownfields Program Staff (listed top right)
100 N. Senate Ave., Suite 1101
P.O. Box 6015
Indianapolis, IN 46206-6015
www.IN.gov/idem/land/brownfields

Financial assistance

Indiana Development Finance Authority
Calvin Kelly, Deputy Director
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