Addressing Water Contamination through Brownfields Cleanup and Redevelopment

Water-Related Cleanup

The cleanup and redevelopment of brownfields properties can be complicated by the presence of contamination in various forms. One type of media affected by contamination on brownfields is water, which includes ground water, surface water, and drinking water. Even brownfields not adjacent to waterfront areas or significant bodies of water can affect the quality of nearby ground water, which can then migrate to other areas causing further contamination. EPA's Brownfields Assessment, Cleanup, and Revolving Loan Funds grants can help identify and address water contamination issues at brownfields properties. Utilizing EPA grants to address water-related issues—such as stormwater runoff, watershed issues, or estuary restoration—has been in practice for years, but the manner in which these issues are dealt with is evolving as innovative practices and unique end uses are implemented. These types of brownfields projects provide a prime opportunity to incorporate sustainable practices—including bioremediation and green building elements—into the brownfields cleanup and redevelopment process. Several grantees in EPA's program are using their funding to affect change in and around brownfields and their surrounding communities near lakes, rivers, and estuaries.

Burlington, Vermont–Lake Champlain Waterfront Housing

For years, the City of Burlington has been grappling with the lack of affordable housing as well as a longstanding stormwater runoff problem affecting the water quality of Lake Champlain. The city has been making efforts to clean up and redevelop more than 60 acres of waterfront land into a mixed-use area. With assistance from an EPA Brownfields Assessment grant, Burlington was able to make significant progress on both affordable housing and stormwater mitigation through one project.

The area targeted for Waterfront Housing along the shores of Lake Champlain, was formerly used as rail siding, for liquefied gas storage, and as a scrap yard. Homeless encampments, litter, old foundations, and neglect characterized the property. Located at the base of Depot Street—a closed road with an extremely steep slope—stormwater events routinely caused flooding and release of unfiltered runoff into the lake. In 1999, the city used $35,000 in EPA Brownfields Assessment grant funds to conduct a Phase II environmental site assessment on more than 40 acres of the north waterfront area, which revealed underground storage

continued ▶▶

Lake Champlain's affordable waterfront housing.

JUST THE FACTS:

- With help from EPA Brownfields Assessment grant funds, Burlington, Vermont achieved its redevelopment goals of cleaning up past contamination, providing affordable housing, and protecting the water quality of Lake Champlain.
- Through the use of EPA Brownfields Cleanup funds, the Rhizome Collective used several innovative practices, such as a purification system that uses recycled materials, to clean up and purify the urban stormwater contaminated by a former landfill in Austin, Texas.
- With the help of an EPA Brownfields Cleanup grant to the Jamestown S'Klallam Tribe, the Sequim Bay estuary has been restored from contamination that resulted from creosote-treated pilings used during log-sorting operations, which caused sediment pollution and loss of estuarine mudflat and wetland habitats.

"The Tribe attributes the success of the project, in large part, to a unified vision and clear goals; working with landowners and the community; luck and a spirit of opportunism (and optimism); and perseverance. We hope it will continue to be a shining example of cooperation and a rejuvenated landscape."

*– **Hansi Hals,** Jamestown S'Klallam Tribe*

tanks (USTs), soils contaminated with polycyclic aromatic hydrocarbons (PAHs) and arsenic, and ground water tainted with petroleum compounds. Since that time, USTs and subsurface infrastructure have been removed, old buildings demolished, and clean soils placed as a cap on the north waterfront.

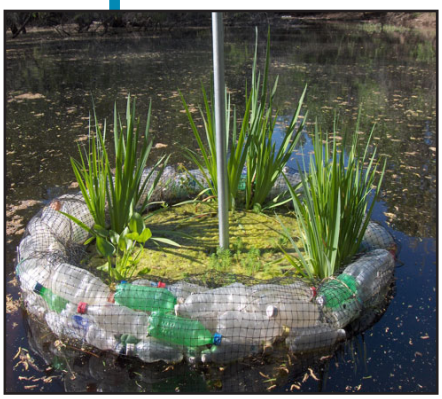
With financial assistance provided through an $800,000 Special Purpose Grant from the Department of Housing and Urban Development (HUD), federal HOME funds, and a City Housing Trust Fund Grant, the Burlington Community Land Trust/Housing Vermont team broke ground in July 2003 and completed construction of the 40-unit, mixed income apartments in October 2004. According to Diane Kelley of EPA Region 1, "Burlington, Vermont has established its brownfields program with an emphasis on reuse of brownfields properties as affordable housing. This project is just the latest effort to provide low cost housing that is sorely needed in the city."

This is the first multi-unit residential building in Vermont to earn the Leadership in Energy and Environmental Design (LEED)® certification. The 40,000-square foot building also incorporates several "green" elements through its design, such as the use of local, recycled materials; reduced flow plumbing; energy efficient heating and cooling; installation of ENERGY STAR appliances; and the maximization of greenspace through the use of an underground parking garage instead of a surface parking lot. As a result of these and other design elements, the building exceeds all EPA ENERGY STAR standards for efficiency.

The property's stormwater system was designed with capacity to handle flows from adjacent properties, which will further protect Lake Champlain and minimize local flooding problems. It mitigates flows created by Depot Street, which drains a significant portion of the Old North End neighborhood. The system is comprised of USTs used for pre-treatment, temporary storage, and filtration, thereby removing contaminants before releasing the stormwater into the lake. The system is one of the first in the state to follow Vermont's Stormwater Management Best Practices Guidelines, which are typically used for environmentally impaired watersheds.

The EPA Brownfields Assessment grant funds used for this $7.15 million redevelopment project helped Burlington achieve its goals of providing affordable housing and protecting the water quality of Lake Champlain. Not only was the city able to meet its goals, but they were achieved in a manner that will reduce future impact on the environment through the implementation of sustainable practices and innovative cleanup methods.

Austin, Texas–Rhizome Collective Environmental Education Center



A "floating island" constructed out of plastic soda bottles and native plants used as a stormwater management system in Austin, Texas.

In Austin, Texas, the Rhizome Collective—a nonprofit organization that encourages the development of locally based systems that reduce the impact on the environment—is making great strides in promoting environmental education and sustainable practices on a former brownfields property. The 9.8-acre former Grove Landfill is adjacent to the 360-acre Roy G. Guerrero Colorado River Park in Austin. 3.6 acres of the property were in operation from 1967 to 1970 as a municipal household solid waste landfill that was capped in the early 1970s. The property was further contaminated by 15 years of illegal dumping, which resulted in 5,000 cubic yards of debris comprised of old appliances, tires, and construction debris. Another issue was the collection of polluted urban stormwater runoff in retention ponds on the property. In 2004, the property was donated by a private owner to the

continued ▶▶

Rhizome Collective to clean up the property and transform it into an environmental education center and ecological justice park.

EPA awarded the Rhizome Collective a $200,000 Brownfields Cleanup grant in 2004 to assist with cleanup activities—including debris collection and removal—which was completed in summer 2006. The Rhizome Collective recycled and reused as much of the illegally dumped debris as possible. Some examples of the sustainable practices include: salvaged wood scraps and concrete for erosion control; chipped or shredded wood to create mulch for recreational trails; recycled 31.6 tons of metal; salvaged concrete for later use as fill for building infrastructure; powered equipment through use of biofuel generators and photovoltaic panels due to lack of electricity; extracted 680 tires through use of vegetable-oil powered tractor; inoculated chainsaws with fungi spore-laden oil to aid in degradation of residual contaminants; constructed floating islands (of recovered soda bottles) to create habitat for life forms capable of bioremediating residual toxins in onsite retention pond; and planted native grasses, wildflowers, and trees. Information kiosks highlight and explain information on the environment and sustainable practices including recycling; brownfield cleanup; "green" building techniques; native wildlife; and the functions of wetlands.

One of the featured water systems in use on the property involves the use of constructed wetlands in a retention pond to purify urban stormwater runoff before it reaches the Colorado River. Plastic soda bottles pulled out of the pond were used to create circular rafts called "floating islands." Native wetland plants known for their abilities to remove contaminants from water were attached to the floating islands, which rise and fall as water levels fluctuate in the pond. The floating islands serve as a low-cost model of a stormwater runoff purification system that uses recycled materials.

Through the use of its EPA Brownfields Cleanup funds, the Rhizome Collective was able to remove this former eyesore from the community, and promote and educate the public on sustainable practices that help preserve the environment. According to Scott Kellogg with the Rhizome Collective, the EPA funding helped enormously. He stated, "We were prepared to do the cleanup if we didn't have the grant, but it would have taken us 10 years or more if we didn't get it. Because of grant, we were able to finish the cleanup in two years." The Rhizome Collective leveraged approximately seven jobs and a six-person crew as well as the time and labor of hundreds of volunteers from the local area.

Sequim, Washington–Sequim Bay Estuary

Located in Sequim, Washington, the 82.31-acre Sequim Bay Estuary was a prosperous home for a wide variety of marine life and vegetation. From 1892 to 2001, a 7.3-acre portion of the estuary was utilized for timber log sorting and transportation. During this time, former wetlands and mudflats were filled, and a pier and multiple creosote-treated pilings were installed to aid in handling and sorting logs. The creosote-treated pilings caused sediment pollution and loss of estuarine mudflat and wetland habitats in the intertidal and subtidal area that supported an ecosystem of shellfish, eelgrass, migratory waterfowl and salmon habitat. Creosote contains PAHs and tars that leached into the water and sediments. As a result, the property was identified as one of the most significant sources of pollution into Sequim Bay.

Removal of pilings during Sequim Bay Restoration.

continued ▶▶

In 2003, EPA awarded a $156,000 Brownfields Cleanup grant to the Jamestown S'Klallam Tribe to assist with the restoration project. These funds were used to remove 99 creosote treated pilings from intertidal areas of the estuary and conduct a study testing the contamination level of sediments and shellfish in the vicinity of the pilings both before and after the removal to determine the health risk to tribal shellfish harvesters and consumers. A total of $64,000 in State and Federal funds—including Washington State Department of Natural Resources Aquatic Lands Enhancement Account funds and an EPA 319 competitive grant directed at estuary wetland restoration—was leveraged for additional cleanup activities including the removal of 350 tons of contaminated soil and 600 tons of solid waste on the adjacent shoreline and riparian wetlands. This cleanup was part of a larger effort to restore the entire estuary and two creeks, which suffered from frequent flooding and degraded habitat for summer chum salmon. Overall, the 10-year, $6 million restoration project involved more than 20 partners, 29 major funding sources, and 61 grant matches to restore the entire estuary. Lyn Muench, of the Jamestown S'Klallam Tribe, stated that the EPA Brownfields funding was "the finishing touch to the restoration, as it was the last major component to be completed."

CONTACTS:

For more information about EPA's Brownfields Program, visit: www.epa.gov/brownfields/

By August 2005, the larger 82-acre area of the intertidal portion of the estuary was fully restored and now provides clean sediment and habitat for shellfish, salmon, and other natural species to repopulate the area. Extensive monitoring measures of the entire estuary are in place, including annual monitoring of eel grass and shellfish populations, which are expected to naturally migrate into the former piling area. Since the completion of the restoration, the positive effects have been apparent; the estuary has been restored to its former beauty, flooding in the surrounding communities has been reduced, and summer chum are using the restored creek channel. Summer chum have rebounded remarkably from a 1999 run of seven fish, to over 1,600 in years since 2005. As the natural species increase over time, so will the economic benefits to the Jamestown S'Klallam Tribe; seafood such as finfish and shellfish are important food and revenue sources. The restored estuary will also provide an expanded area for kayaking and bird watching, which benefits the local tourist-dependent economy.

Without the funding assistance from EPA's Brownfields Cleanup grant, the estuary restoration project would not have been completed. The environmental and economic consequences on the Sequim Bay Estuary would have left the surrounding communities subject to a permanent loss of shellfish and other marine life. This project provides a unique opportunity to return a natural water habitat back to its original beauty and productivity.

As demonstrated by these three brownfields projects, addressing water contamination issues goes beyond the assessment and cleanup of contamination on a particular property; the effects can be felt in the surrounding community as well. They have provided their local communities with a unique opportunity to address longstanding water issues such as flooding and stormwater runoff by cleaning up and redeveloping the contaminated properties. By addressing the issues at the brownfields properties, these projects have had a greater impact on the water quality of nearby water sources. Not only have these properties been cleaned up through these projects, but they were done so in a manner that minimizes the future impact on the surrounding environment by promoting and incorporating sustainable practices.