



# Sustainable Remediation Practices & Ecological Revitalization

*By Marc Florian, Vice President, Site Assessment and Remediation*

## **BACKGROUND**

There has been a paradigm shift in the design of cleanup remedies in recent years. It is no longer sufficient to simply meet regulatory requirements; instead, the design is increasingly focused on approaches that incorporate a broader picture. As a result, companies are adopting green and sustainable practices as part of their overall remedy selection process.<sup>1</sup> As strange as it might have seemed only a decade ago, more and more companies are seeking conservation-oriented outcomes and opportunities for their remediation sites to create habitats and to revitalize the ecosystem.

## **DRIVERS**

Most regulatory programs and initiatives actively support site remediation and revitalization efforts

that result in a beneficial reuse. It is no longer enough to simply return a site to its original state; companies are now leveraging conservation practices to transform liabilities into ecological, community and corporate assets.<sup>1</sup>

Integrating conservation-oriented outcomes into the design of cleanup remedies is not a new concept. In fact, it's been more than nine years since the U.S. Environmental Protection Agency (EPA) published, "Ecological Revitalization: Turning Contaminated Properties Into Community Assets,"<sup>2</sup> and a decade since it issued the technology primer, "Green Remediation: Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites."<sup>3</sup> The Wildlife Habitat Council reports, "best practices show that incorporating conservation early in the remediation process produces the

strongest outcomes for the local ecosystem, community and business."<sup>1</sup>

Further, implementing conservation-oriented objectives can drive solution development and assist with negotiations and the permitting process. It can also help improve community acceptance and goodwill by 1) addressing the concerns and priorities of stakeholders, 2) motivating the inclusion of best management practices, and in many instances, 3) strengthening the case for cost-lowering remedies. According to EPA, cleanup sites with conservation-focused ecological outcomes typically yield increased tax revenues, improved tourism, and enhanced quality-of-life for nearby residents.<sup>2</sup>

## EXAMPLE

While the Interstate Technology and Regulatory Council, a state-led coalition working with the federal government, industry, and other stakeholders, has compiled a wealth of information on ecological revitalization, some of the best examples stem from the integration of phyto-technologies – processes that use plants to remediate, control, and/or sequester contaminants.

In the City of Flint, Michigan, Environmental Consulting & Technology, Inc. (ECT), demonstrated the effectiveness of phytoremediation to accelerate the treatment of soils and groundwater contaminated with light non-aqueous phase liquid (LNAPL) at a former General Motors manufacturing property once known as “Chevy in the Hole.” Located adjacent to the downtown business district and surrounded by residential neighborhoods, this 66-acre site offered little interest for near-term development, but strong potential for long-term social and economic opportunity to the surrounding community. Led by the city, ECT participated on a multidisciplinary team tasked with preparing a conceptual site plan to address not only viable remediation alternatives, but also matters of urban design, transportation, naturalization, sustainability, and other ecological issues associated with the public reuse of this brownfield site.

Now called “Chevy Commons,” the area is being redeveloped into a naturalized, park-like green space featuring open grasslands, woodlands, and wetlands interlaced with paths connecting to surrounding institutions, neighborhoods, and regional trails. As part of its transformation, more than 1,500 trees were planted to uptake shallow

### Wildlife Habitat Council Certification

The Wildlife Habitat Council (WHC) recently acknowledged five conservation programs that had successfully addressed business needs and achieved WHC recognition for having leveraged conservation and conservation education during one or more phases of the remediation process. Notable among these programs were efforts aimed at:

- Improving public perception.
- Using biodiversity restoration to reduce costs.
- Providing green spaces for education and recreation.
- Managing a restricted site with an event-based approach.
- Meeting community needs through site reuse.

Source: Wildlife Habitat Council. (2017, April). Transforming Remediation Sites into Conservation Assets: How Companies Leverage Business Needs for Positive Environmental Outcomes. Retrieved from: <http://www.wildlifehc.org/wp-content/uploads/2017/04/WHC-White-Paper-Transforming-Remediation-Sites-Into-Conservation-Assets.pdf>



groundwater contaminated with volatile organic compounds (VOCs) and to sequester metals prior to their reaching the adjoining Flint River. In addition to their phytohydraulic benefits, the plantings were designed to stimulate the biological destruction of VOCs and, in some cases, function in the presence of multiple feet of LNAPL.

From an ecological perspective, the trees served as a reforestation effort, providing shade and aesthetic appeal. They functioned as an important wildlife stopover and as a breeding, nesting, and sheltering area. The

design also incorporated a diverse mix of native wildflowers and grasses that increased the infiltration of stormwater and reduced pollution by nutrient uptake through their roots. Finally, the design included a variety of shrublands, woodland “sponge” zones, wet meadows, and wetlands that collected runoff and filtered contaminants. Together, the grasslands, woodlands, wetlands, and reforestation zones create a sustainable remediation landscape for Chevy Commons.

## NOT A PANACEA

Ecological revitalization and conservation-oriented outcomes aren't a shortcut for property cleanup. Regulatory authorities don't lower their standards or allow an ecological reuse scenario to reduce the effectiveness of a cleanup measure. The reuse option must always protect human health and the environment.

Under most state cleanup programs, contamination is either completely removed, cleaned up to acceptable levels, or managed using protective measures that reduce the possibility of exposure to the contamination. (At Chevy in the Hole, a soil and vegetative cap was installed to further isolate the contamination, to limit the movement of water, and to protect people and wildlife.)

However, the presence of certain contaminants (i.e., persistent pollutants that are readily bioavailable, such as metals and certain hydrocarbons) may preclude ecological revitalization efforts altogether. Accordingly, complex analyses are often required to confirm the protectiveness of a proposed remedy. And, while ecological revitalization can be considered at all contaminated properties, it may not be appropriate for all properties.

## FUNDING

The extent of federal or state involvement in supporting ecological revitalization at a contaminated property depends on the cleanup program involved, the operating legal authorities, and the specific property at issue. Under EPA's Brownfields Program, the agency will provide technical assistance regarding plans for incorporating ecological and other "green" elements into the cleanup and reuse of a site; however, they typically

## Other Considerations

When designing and implementing a cleanup action, it is important to consider:

- Physical and biological condition of the property and its location in relation to local and regional plant and animal species.
- Regulatory requirements governing cleanup and protection or creation of ecologically significant areas.
- Temporary and long-term ecological impacts.
- Types of habitats to be protected, restored, or created at the property.

view these as "enhancements" that are not critical to the actual revitalization or reuse activities themselves. Other federal programs, such as the Resource Conservation and Recovery Act, encourage and support ecological revitalization, but do so through state-delegated initiatives and similar collaborative efforts. Many state cleanup programs also limit funding for activities not directly needed for the protection of human health and the environment.

That said, ecological revitalization efforts are generally not considered enhancements if the activities are necessary for the anticipated future use of the property or to restore an ecological function. In these instances, such activities can be considered and incorporated into a cleanup plan and are typically funded as part of the overall remedy.

The cost of extensive revitalization efforts required to create or restore the function of an ecosystem can also be justified in many instances – even if the revitalization is required due to adverse impacts resulting from the cleanup itself. With Chevy Commons the grasses, shrubs, and other native plants improved the property's aesthetics and ecological function. The City of Flint also leveraged \$2 million in EPA Revolving Loan Cleanup Subgrants to help construct a landscaped cap that sealed off contamination from the aboveground environment and significantly reduced the migration of pollutants. Further, the U.S. Forest Service provided \$1.2 million to support the application of phyto-technologies,

which helped advance reforestation and habitat development, an important part of the conceptual site plan and overall ecological revitalization goal.

## CONCLUSION

Factors related to natural resources and ecological revitalization are becoming increasingly common in the design and implementation of cleanup actions at contaminated properties. Today, sustainable remediation practices are being used to confirm contaminated properties are managed in a manner that 1) protects human health and the environment; 2) complies with federal, state, and local cleanup requirements; and 3) allows for safe ecological revitalization. The use of phyto-technologies offers elements of source control, treatment, and containment. At sites like Chevy Commons, native grasslands, shrublands, wetlands, and reforestation zones are being used to create a sustainable remediation landscape; one that collects stormwater runoff, filters pollutants, uptakes, degrades and sequesters contaminants, and yields conservation-oriented outcomes centered on ecological revitalization.

### References:

1. Wildlife Habitat Council. (2017, April). Transforming Remediation Sites into Conservation Assets: How Companies Leverage Business Needs for Positive Environmental Outcomes.

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2. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. (2009, February). Ecological revitalization: Turning Contaminated Properties into Community Assets. Retrieved from: [https://www.epa.gov/sites/production/files/2015-04/documents/ecological\\_revitalization\\_turning\\_contaminated\\_properties\\_into\\_community\\_assets.pdf](https://www.epa.gov/sites/production/files/2015-04/documents/ecological_revitalization_turning_contaminated_properties_into_community_assets.pdf)
3. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. (2008, April). Green Remediation: Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites. Retrieved from: <https://www.epa.gov/sites/production/files/2015-04/documents/green-remediation-primer.pdf>

### **ABOUT ECT**

ECT supports clients in their environmental stewardship and community outreach initiatives, specializing in WHC conservation

certification programs. Our efforts help streamline stakeholder negotiations and strengthen cases for sustainable, cost-lowering remedies by incorporating conservation-oriented objectives into the overall selection and design process, thereby transforming blighted properties into valuable resources for wildlife and the surrounding communities where they are located. As a result, our clients benefit from positive public relations and are routinely recognized for their “beyond compliance” goodwill efforts.

Call 855-737-0444 for additional information or visit [www.ectinc.com](http://www.ectinc.com) for an office location and contact near you.