



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Sustainable Remediation – FAQs

Introduction

The Commonwealth of Massachusetts and MassDEP hold as a high priority identifying opportunities to promote energy conservation and use of renewable energy sources such as wind power and solar energy. As part of achieving the Commonwealth's clean energy policy goals, BWSC is promoting the incorporation of sustainability considerations into remedy selection, implementation, and optimization at 21E sites.

This web page outlines the principles of Sustainable Remediation and the opportunities within the existing MCP process that are available to reduce the footprint of cleanup activities throughout the life of a project. MassDEP has developed this web page to identify emerging best practices and provide case examples to support PRPs and LSPs in their efforts to integrate sustainable approaches into their remedy selection and implementation.

Sustainable Remediation includes redeveloping Brownfields properties as a way to stimulate the economy and promote environmental protection goals. Brownfields properties are often abandoned, or for sale or lease; they typically have been used for commercial or industrial purposes; and may have been reported to MassDEP because contamination has been found. Many opportunities are presented by the restoration of Brownfields properties: redevelopment ensues in ways that are economically beneficial for the community and restorative for the environment over the long term.

"Best Practices" for Sustainable Remediation includes a framework for decision-making that considers trade-offs among remediation alternatives. For example: Is it better to dig and haul contaminated soil or manage waste in place? Consider the air and water impacts:

- Heavy equipment usage on site (and to/from site)
- Vehicle miles traveled
- Dust, volatilization and erosion management
- Transferring pollutants versus contaminant destruction

Site-specific data and an understanding of the intended site reuse are needed to make the most sustainable decision. Baseline data on the environmental impact of remedial options are also critical, but this type of information is generally difficult to quantify. Much more research, including pilot studies, will be necessary to effectively compare the sustainability of various remedial options. Some of this research

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.

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is underway by federal, state and private sector-led advisory groups involved in developing guidance and other tools, including Best Management Practices.

What is Sustainable Remediation?

The goal of remediation is to protect human health and the environment by reducing or eliminating the risks and deleterious impacts of chemical contamination through mitigation measures. In the past, most remediation systems were implemented without consideration of sustainable practices, and without considering their potential for transferring impacts to other media.

"Sustainability" is the balancing of economic growth, protection of the environment, and social responsibility, toward achievement of an improved quality of life for ourselves and future generations.¹ When applied to disposal site remediation, sustainable practices consider factors during the remedy selection phase that improve the overall environmental performance of a remedy. Sustainable Remediation maximizes the net environmental, societal and economic benefits of a cleanup.

Whether implementing a new remedy or optimizing an existing remedy, sustainable practices are those that build on environmental practices in use across business and public sectors to reduce:

- consumption of non-renewable energy
- the use of resources such as land and water
- ecosystem impacts
- material consumption and waste generation
- emissions of greenhouse gases

What is the difference between Green Remediation and Sustainable Remediation?

These two terms are often used interchangeably but Sustainable Remediation encompasses a broader approach. Green Remediation looks to maximize the net environmental benefit of a cleanup through consideration of remedy energy requirements, efficiency of on-site activities, and reduction of impacts on surrounding areas. Sustainable Remediation includes these benefits but also brings social and economic benefits into consideration.

Are there any MCP requirements regarding Sustainable Remediation?

There are no specific "sustainability" requirements in the MCP. The MCP recognizes energy consumption and other factors that are relevant to sustainability as considerations in remedy selection. In particular, 310 CMR 40.0858(4) requires an evaluation of

- "the relative consumption of energy resources in the operation of the alternatives, and the externalities associated with the use of those resources;" and
- the "costs of environmental restoration, potential damages to natural resources, including consideration of impacts to surface waters, wetlands, wildlife, fish and shellfish habitat".

MassDEP promotes the consideration of Sustainable Remediation within the framework of the current MCP. The MCP is flexible enough as written to incorporate sustainable practices into site remediation at 21E sites.

¹ United Nations General Assembly (1987) Report of the World Commission on Environment and Development: Our Common Future. Transmitted to the General Assembly as an Annex to document A/42/427 - Development and International Co-operation: Environment. Retrieved on: 2009-02-15.

How are sustainability considerations weighed against other MCP requirements to undertake remedial action?

While MassDEP encourages the selection of effective sustainable remedies that maximize the net environmental benefit of the cleanup, the MCP requires timely actions to eliminate and prevent certain conditions. These conditions include Imminent Hazards, Conditions of Substantial Release Migration, Substantial Hazards, and the elimination and control of Oil and Hazardous Material sources. Sustainability considerations may not be used to override the requirement to implement a remedy that results in the timely elimination or prevention of such conditions.

What are examples of sustainable remedies being implemented at 21E Sites?

MassDEP is reviewing site files to identify examples for inclusion on this web page. If you have examples of sustainable remedies being implemented at 21E sites that you are willing to share, we would like to hear from you. Please forward them (photos and videos are welcome) Tom Potter at Thomas.Potter@state.ma.us at 1 Winter Street, Boston, MA 02108.

Implementing Energy Efficiency Measures to Reduce Carbon Emissions

BAIRD AND McGUIRE SUPERFUND SITE - Holbrook, MA

In 2009, BWSC, with support from the EPA Office of Site Remediation and Technology Innovation, performed an assessment of energy use and carbon emissions from the groundwater treatment plant at the Baird & McGuire Superfund Site. The assessment confirmed the reductions of carbon emissions achieved through implementation of energy efficiency measures and further evaluated reductions that could be achieved through more efficient use of treatment agents and innovative use of combined heat and power and groundwater source heat pump technologies.

For more information, see the [Clu-in Web Site](#).

Using Solar Energy to Turn a Brownfield into a "Brightfield"

CITY OF BROCKTON BRIGHTFIELDS SITE - Brockton, MA

The City of Brockton has redeveloped a former manufactured gas plant site, or brownfield, into a brightfield - a solar energy generating station that converts sunlight to electricity. Clean electricity generated from the brightfield will result in a significant reduction of carbon dioxide (a greenhouse gas), sulfur dioxide and nitrogen oxide emitted into the atmosphere each year.

For more information, see the [Brockton Web Site](#).

Optimizing Groundwater Cleanup & Using Wind Power to Generate Clean On-Site Electricity

MASS MILITARY RESERVATION GROUNDWATER CLEANUP PROGRAM - Falmouth, MA

The Air Force Center for Engineering and the Environment has implemented optimization activities in all aspects of the groundwater cleanup program at the Massachusetts Military Reservation, including treatment plant operations and maintenance, drilling and sampling of environmental media, and plume management. A wind turbine has been constructed to generate clean, on-site electricity and reduce air emissions and electrical costs associated with the cleanup program.

For more information, see the [MMR Web Site](#).

How can I learn more about Sustainable Remediation?

Sustainability is an evolving topic. Many federal, state and private sector-led advisory groups are developing guidance and other tools, including Best Management Practices involved in identifying sustainability strategies. These strategies will complement the process used to evaluate and select remedial alternatives. Links to web pages containing this information are provided below.

[EPA's Office of Solid Waste and Emergency Response \(OSWER\)](#)

[ITRC Green and Sustainable Remediation Team](#)

[ASTM](#)

[Sustainable Remediation Forum](#)

Where can I find additional information on other sustainable initiatives, grants and assistance in Massachusetts?

The list below of links to tools and other MassDEP resources can help you support clean energy and promote energy efficiency. In addition, many clean energy programs and initiatives are underway within the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), the Division of Energy Resources (DOER), and the Massachusetts Technology Collaborative (see information and links below).

Clean Energy/Energy Efficiency

[Executive Office of Energy and Environmental Affairs](#)

[Department of Energy Resources](#)

[Massachusetts Technology Collaborative](#)

Brownfields

Brownfields program incentives are available to buyers, and sometimes sellers, of contaminated property provided there is a commitment to cleanup and redevelopment. Brownfields redevelopment in many respects embodies sustainability principles by ensuring the reuse of a property in lieu of new construction on undeveloped lands that serve as habitat and open space. Brownfields properties are often located where there is an existing infrastructure, workforce and other amenities. Incentives can help parties identify risk, limit liability, and fund the cleanup of brownfields sites, enabling their reuse for industry, housing and other purposes.

[MassDEP Brownfields](#)

[EEA Smart Growth Tool Kit](#)

[USEPA Sustainable Brownfields Pages](#)