



Minnesota
Pollution
Control
Agency

Pollution Prevention & Sustainable Activities

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Policy and
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Introduction

The Minnesota Pollution Control Agency (MPCA) has published an Internet-based Toolkit to promote use of pollution prevention and sustainability (P2/S) concepts to enhance cleanup, business operations and site redevelopment.

Greener Practices for Business, Site Development and Site Cleanup: A Toolkit was developed with stakeholder assistance. It describes 18 P2/S options organized in three scenarios: cleanup remedy selection, existing and new business operations, and development and renovation. The Toolkit, along with records of its development and a List of Options, is located on the MPCA P2/S Remediation Web page: <http://www.pca.state.mn.us/programs/p2-s/toolkit/index.html>.

The Toolkit makes quick and easy work of identifying site-appropriate P2/S projects. By limiting the number of options related to the regulatory process and increasing access to existing expertise, it streamlines the process of evaluating and selecting site-appropriate options. It also refers the user to further resources for help with P2/S projects. The Toolkit was developed because the agency realized staff and customers were losing too many opportunities to incorporate P2/S into cleanup due to unfamiliarity with the concepts.

The Toolkit takes advantage of creative thinking by site owners, regulatory staff and communities about the possibilities at regulated sites. But it relies on existing expertise for technical and business

assistance. In other words, Toolkit users need not be P2/S experts.

The Toolkit complements existing regulatory tools and can link brownfield cleanup and development with regional economic and environmental strategies, such as community master planning and smart growth initiatives. Results of performance measurements proposed in the Toolkit can be recorded in the MPCA databases.

The Toolkit Idea

The Toolkit is designed to make it easy and fast to identify site-appropriate P2/S options and seek technical and business resources to help incorporate them in projects. It employs a decision tree, a system of 18 option detail sheets, an index of case studies and a resource referral. Used together, these elements help the Toolkit user through a process of elimination, focusing on options with the greatest potential feasibility for a specific site.

P2/S Options

MPCA staff and stakeholders identified 18 P2/S options and grouped them according to three scenarios (Table 1):

Cleanup Remedy Selection

Options 1-1 through 1-6 (Table 2) answer the question, "How can cleanup enhance the environment and avoid creating new pollution sources?" These options avoid cross-media transfer, enhance or restore habitat, encourage reuse of recovered product

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or demolition materials, and promote innovative and efficient remedies. Sustainable remedies that take advantage of natural systems theoretically will protect the environment indefinitely, even after cleanup is completed, and may not require the expense and oversight of traditional engineered remedies.

Ongoing or New Business

Options 2-1 through 2-5 (Table 2) answer the question, “How can business and technical assistance or other schemes help incorporate more P2/S into my operation?” These options help avoid future releases of contaminants. They include traditional P2 evaluation services offered through the Minnesota Technical Assistance Program (MnTAP) as well as more innovative approaches. The *Design for the Environment Toolkit*, developed by the Office of Environmental Assistance, promotes product design and manufacturing processes that use low-toxicity materials and conservative resources, or end-of-life take-back or materials reuse.

Implementing environmental management systems or ISO 14001 certification can ensure P2/S practices at a business. Environmentally preferred purchasing or procurement ensures best use of our non-renewable resources and reductions in toxic emissions and waste generation. These options also may reduce a company’s regulatory burden.

Redevelopment or Renovation Plan

Options 3-1 through 3-7 (Table 2) answer the question, “How can I enhance property value, the project’s bottom line or community livability with P2/S approaches?” Redevelopment plans designed in coordination with cleanup plans can often benefit from P2/S approaches. Demolition of abandoned buildings can incorporate deconstruction or salvage. A new building’s footprint might serve as a cap to contaminated soil left in place that has low or no risk to human health or the environment. New buildings and site layout can incorporate principles of sustainable design, including low- or no-discharge strategies for managing stormwater. New manufacturing processes can incorporate Design for the Environment principles. Habitat and green space can be restored, enhanced or replaced.

Which Sites Apply?

MPCA remediation programs included in this initiative are the Voluntary Investigation and Cleanup (VIC) Program, Superfund Program, and the Resource Conservation and

Recovery Act (RCRA) Corrective Action Program. Although this initiative was not developed with petroleum-tank release sites or closed landfills specifically in mind, some of the guidelines are still applicable. A majority of the options also apply to uncontaminated sites.

A Few Minnesota Examples

Cleanup Remedies

Sustainable Solutions Avoid Uncertainties

At Brooklyn Park Plating and Polishing, the MPCA and Minnesota Department of Health are collaborating on a precedent-setting pilot using potassium permanganate as a reagent to treat waste chlorinated solvents. The pilot offers a sustainable solution that avoids the uncertainties of engineered remedies like sparging or the high cost of soil-removal actions.

Ongoing or New Businesses at Cleanup Sites

Closed Loop System Prevents Future Releases

Minnesota Superfund law includes a mandate to protect against threatened (future) releases. P2/S addresses this directly. In response to their ongoing Superfund liability, the Bell Pole Company in New Brighton installed a closed loop, state-of-the-art wood-treatment process, and consented to including it in the site’s MPCA-approved Response Action Plan. In similar cases, regulatory staff has been able to promote P2 planning to program customers by referring them to technical assistance providers listed in the Toolkit’s Resource Index.

Redevelopment at Cleanup Sites

Brownfield Cleanup Adds Value

Seeing the advantages of including P2/S in redevelopment plans for brownfields, a well-known Twin Cities developer recently contacted MPCA seeking guidance for how to incorporate P2/S into its upcoming projects and, ultimately, its development strategy. The company realized the ultimate value of its properties is affected by what happens in the remediation phase and wanted to make wise choices. The Toolkit provides concrete options around which the company, and the communities in which it builds, can tailor sustainability goals.



Who Uses the Toolkit?

The Toolkit is intended to assist interested regulatory staff, regulated parties, developers and community planners, officials and residents. Regulatory staff, communities and development agencies can promote opportunities presented in the Toolkit.

Incentives for using the Toolkit vary. The MPCA's strategic plans call for incorporating P2/S into our core functions. The Toolkit may help avoid overlooked P2/S opportunities and encourage holistic approaches that lead to enhanced environmental outcomes. The P2/S options that apply to cleanup remedies involve treatment efficiencies, preventing cross-media transfer, or replacing expensive operating and maintenance procedures with sustainable remedies. Applying P2/S approaches to cleanup sites provides a three-

fold return: a successful cleanup, future releases prevented, and holistic, multimedia solutions. The Toolkit gives much latitude for creativity.

Regulatory customers also can realize a competitive edge, public relations advantages, and bottom-line benefits from P2/S approaches, as well as reduced regulatory burdens.

Many of the options described in the Toolkit apply to uncontaminated sites. The resources and case studies could be used, for example, to help design P2/S into smart growth and community-based planning efforts, supplemental environmental projects, industrial stormwater pollution prevention plans and basin management strategies, or to help regulatory staff direct their customers to non-regulatory technical and business assistance.

Seeking Enhanced Environmental Outcomes

The Toolkit aims to reduce waste generated at the source of production. Pollution-prevention approaches promoted in the Toolkit also include recycling or reuse of waste or discarded material. Environmental performance, economic benefits, and social equity, now and for future generations, can be addressed in total or in part through activities that further sustainability. In some cases, these practices benefit a business's bottom line and marketing plans as well as the community's quality of life.

What is P2?

Historically, "pollution prevention" has referred to eliminating or reducing at the source the use, generation, or release of toxic pollutants, hazardous substances, and hazardous wastes. "Reducing" means lessening the quantity or toxicity of toxic pollutants, hazardous substances, and hazardous wastes used, generated, or released at the source. Decreases in quantity or toxicity that are solely the result of output reductions do not qualify as pollution prevention.

"At the source" means going far back into a production process or activity to eliminate waste of any kind. This contrasts with simply trying to control or treat pollutants at the point of discharge.

Today, P2 as a discipline encompasses more than just toxic or hazardous outputs. Now included in the P2 approach are nontoxic materials, recycled and reused materials, energy, water and many other inputs and outputs. This broadened approach ensures that almost any process can be made more efficient through pollution prevention, thereby reducing the cost of operating a business or organization.

What is Sustainability?

Sustainability is an approach to problem solving that acknowledges the interconnection of environmental, economic and social decisions, and helps ensure future generations can meet their needs. Pollution prevention, resource and energy conservation, and environmental restoration and enhancement are cornerstones of sustainability. Sustainable activities aim to:

- Minimize or eliminate the buildup of man-made and naturally-occurring substances which cannot be safely assimilated by ecosystems or humans;
- Avoid ecosystem manipulation or overuse of resources that undermines the ability of global, regional and local ecosystems to renew themselves;
- Dramatically increase the efficient use of natural resources so those resources are not further depleted;
- Shift to production models inspired by nature's ability to consume its own wastes; and
- Use energy and other resources fairly and efficiently in order to meet basic human needs.



Table 1: Goals & Examples of Pollution Prevention and Sustainable Activities (P2/S) at Remediation Sites

Remediation Scenario	Goals of Related P2/S Options	Examples
<p><u>Cleanup Remedy Selection</u></p> <p>Options 1-1 through 1-6</p> <p>“How can cleanup enhance the environment and avoid creating new pollution sources?”</p>	<ul style="list-style-type: none"> • Avoid cross-media transfer. • Enhance, restore, replace habitat. • Encourage reuse of recovered product or salvage construction materials. • “Sustainable” remedies that take advantage of natural systems. 	<ul style="list-style-type: none"> • In-situ treatment of chlorinated solvents with potassium permanganate (pilot) • Sandhill Crane habitat at landfill • Diminished efficacy of groundwater sparging: irrigation polishing pilot • Twin Cities Army Ammunitions Plant: deconstruction of buildings • Constructed wetlands at landfill and restored wetlands elsewhere.
<p><u>Ongoing or New Business</u></p> <p>Options 2-2 through 2-5</p> <p>“How can P2/S approaches bring regulatory and economic benefits to my business?”</p>	<ul style="list-style-type: none"> • Help avoid future releases of contaminants. • Reduce regulatory burden. • Design manufacturing processes and products that contain the least toxic materials or enable end-of-life take-back. • Environmental management systems. • Purchase environmentally friendly products. 	<ul style="list-style-type: none"> • Several metal plating operators have improved their processes with help from MnTAP • Companies use Minnesota Office of Environmental Assistance’s “Design for Environment Workbook” • MPCA EMS Pilot Programs • Minnesota materials exchange
<p><u>Redevelopment/Renovation</u></p> <p>Options 3-1 through 3-7</p> <p>“How can I enhance property value, my bottom line, or community livability by incorporating P2/S principles?”</p>	<ul style="list-style-type: none"> • Early planning: acknowledge links between cleanup and redevelopment plans so greatest economic flexibility and innovation can be realized. • Apply environmental valuation and long-term return-on-investment models unique to sustainable designs and low impact development. • Treat brownfield risk management as a design asset. • Enhance, restore, replace habitats. 	<ul style="list-style-type: none"> • St. Paul Port Authority’s Maxson Steel site: Design remedial investigation data collection with details of development in mind. • Green Institute: on-site stormwater management and smart building design. • Building footprints as caps. • Natural Resource Damages provisions of Superfund: Grey Cloud Dunes Prairie • Greenways along river corridor: Lower Phalen Creek Site



Table 2: List of Options for P2 & Sustainable Activities

Scenario	Option
<p>Cleanup Remedy Selection Sites at which a “no action” remedy is not adequate. These sites may be vacant or undeveloped. Examples of P2 or sustainable activities include energy-efficient alternatives to groundwater pumpout systems that avoid discharge to WWTPs, such as constructed wetlands; treatment to avoid cross-media transfer; and deconstruction of buildings to salvage materials for reuse.</p>	Option 1-1: In-Situ Treatment
	Option 1-2: Innovative and More Efficient Remedies
	Option 1-3: Constructed Wetland Treatment Systems
	Option 1-4: Natural Habitat Restoration, Enhancement or Replacement - Green Space Development
	Option 1-5: Deconstruction
	Option 1-6: Recyclable or Recovered Environmental Material
<p>Ongoing or New Business Operation Including cleanup sites at which a known or threatened (potential) release can be attributed to an operating business or a site at which a new business is subject to environmental regulations. If necessary, sites are referred to MPCA compliance programs or the MPCA small business assistance program or ombudsmen for assistance with implementation of P2 or sustainable activities.</p>	Option 2-1: Pollution Prevention Evaluation
	Option 2-2: Materials Exchange
	Option 2-3: Reduce Regulatory Burden
	Option 2-4: Environmental Management System Approaches
	Option 2-5: Design for the Environment
<p>Development & Renovation At cleanup sites, including brownfields, at which redevelopment or renovation is planned, remediation staff can make appropriate referrals. Opportunities for P2/S activities for this scenario that are within MPCA’s direct jurisdiction include preventing threatened releases of hazardous substances, stormwater management, and management of air emissions and hazardous waste. MPCA staff must be sensitive to timelines required by real estate transactions at some brownfields or be willing to forego plans to pursue voluntary P2/S activities. P2/S opportunities outside the agency’s regulatory jurisdiction should be promoted only in appropriate circumstances and when the regulatory customer or client is interested. Options 2-1, 2-3, 2-4 and 2-5 may also be applicable in redevelopment scenarios.</p>	Option 3-1: Deconstruction
	Option 3-2: Cleanup Remedy Incorporates Development Plan
	Option 3-3: Environmentally Friendly Building & Site Design
	Option 3-4: Environmentally Friendly Office & Property Management
	Option 3-5: Low/No Discharge Stormwater Management Strategies
	Option 3-6: Natural Habitat Restoration, Enhancement or Replacement - Green Space Development
	Option 3-7: Design for the Environment