

## Environmental Best Management Practices for Small Businesses

### Introduction

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An environmental best management practice (BMP) is an action or combination of actions implemented to reduce the environmental impacts of business operations. There are two types of pollution prevention: source reduction and recycling. Source reduction reduces or eliminates the generation of waste. Recycling takes used materials, modifies their form, and makes them available for future reuse. The BMPs provided in the fact sheets listed below are a combination of source reduction and recycling strategies, which provide economic as well as environmental and safety benefits.

Each BMP fact sheet focuses on a particular sector, and draws information from several sources, which are listed in the endnotes section of each fact sheet. The BMPs listed in each fact sheet may be used as a guide for your business. Depending on your business' individual needs and technical and financial capacities, the BMPs may require modification. When adapting a BMP to your business, it may be necessary to contact your local regulatory agency to determine permit requirements. It is important to note that the BMPs listed in these fact sheets are intended as a starting point for your business' environmental management plan, and are not all-inclusive. Further information is available through links at the end of each fact sheet. For additional information about regional specific BMPs, or BMPs not covered in these fact sheets, contact your local authorities and regulating agencies. It is not expected that each BMP will work in all situations; each small business must factor in their own needs, resources, and capacities to find the ones that work best for them.

The fact sheets are intended to work in conjunction with the Environmental Protection Agency's *Practical Guide to Environmental Management for Small Business* and its companion book, *Documenting Your Environmental Management Plan*. For copies of these guides, please refer to the links provided on this website.

Each fact sheet is divided into five sections:

- 1) **Sector Introduction:** Provides basic background information on environmental impacts associated with the sector.
- 2) **Best Management Practices:** Divided into two or more subsections. Each subsection consists of a paragraph describing a particular environmental impact, followed by a list of BMPs which address the problem.
- 3) **Investments in Technology:** Supplies additional information on technologies mentioned in the BMPs or provides information on new technologies to consider when making your choice of BMPs to use. Information about returns on investment is provided where possible, but the true payback period will vary greatly, dependent upon your situation. To determine if a particular technology is right for your operations contact a local vendor for more information.
- 4) **Case Study:** Demonstrates the effectiveness of a BMP used in a business.
- 5) **Other Sources:** Provides links to BMP information listed in the fact sheet. Also provides additional resources available to small businesses.



# Best Management Practice

## Health Care

### Sector Introduction

This fact sheet will focus on walk-in urgent care facilities and smaller hospitals, and will explain some of the environmental best management practices (BMPs) related to toxic chemicals or hazardous materials used as part of the diagnostic, treatment, and cleaning processes used in these facilities. The BMPs listed in this fact sheet are a starting point for your business. Additional suggestions for a wider range of activities can be found using the links in the “Other Sources” section.

### Best Management Practices

#### Heavy Metals

Heavy metals are a category of pollutants prominent in urgent care facilities. Wastewater treatment plants cannot remove them from wastewater. Heavy metals include mercury, silver, chromium, and zinc, each of which is discussed below.

Mercury is found in old thermometers, laboratory reagents, and catalysts. It is also used for calibration, scaling, and radioactive diagnosis.

- Do not wash solutions containing mercury down the drain. Collect mercury-containing solutions for proper disposal.<sup>7</sup>
- Do not place mercury-containing materials in infectious waste bags. Infectious waste is incinerated. Mercury is released into the atmosphere when incinerated.<sup>7</sup>
- Do not handle mercury-containing chemicals or equipment over sinks.<sup>10</sup>
- Increase the use of analytical instruments to decrease the amount of chemicals used.<sup>10</sup>
- Use calibrated solvent dispensers or unitized test kits to minimize waste from over-pouring.<sup>10</sup>
- Ensure that laboratory personnel know the constituents of each reagent and its proper disposal.<sup>7</sup>
- Use digital thermometers as an alternative to mercury-containing thermometers.<sup>1</sup>
- Make sure mercury spill cleanup kits are available in all areas where mercury-containing equipment is used.<sup>7</sup>

- Send digital thermometers home with patients instead of mercury thermometers.<sup>7</sup>
- Use fluorescent lighting tubes that have low mercury content.<sup>10</sup>

Silver and chromium are common pollutants in the radiology department. These metals are generated in the process of developing x-ray film, which has a high silver content that leaches out when it is being developed. Used x-ray fixer is considered hazardous waste because of the metals it contains. It must be disposed of as hazardous waste, which increases waste disposal expense.

- Find a company to collect and recycle silver wastes from used x-ray film.<sup>9</sup>
- Test expired photographic film for effectiveness prior to discarding it.<sup>10</sup>
- Store photochemicals according to instructions on their labels. This will reduce the amount of waste generated from chemicals that are no longer useful due to improper storage.<sup>10</sup>
- Use electrolytic disposition for silver recovery. Once the silver is removed, the fixing bath may be reused.<sup>10</sup>
- Do not mix used x-ray fixer and developer. If fixer and developer are mixed, then they both must be disposed of as hazardous waste.<sup>7</sup>
- Extend the life of fixing baths by adding ammonium thiosulfate.<sup>9</sup>

Zinc ointments are prescribed for dermatology applications and are rinsed down the drain when patients bathe.



- Prescribe medicines that do not contain heavy metals if alternatives are available.<sup>7</sup>

### Infectious Waste

Infectious or “red bag” waste disposal is expensive. This waste is frequently incinerated. If metals are present when the waste is incinerated, those metals are released and must be captured before they are released into the air. The metal-containing ash which results must also be properly handled and managed.

- Educate employees on appropriate waste to be placed in the red bags. Non-infectious waste (i.e., batteries, x-ray film, hazardous waste, office paper) should not be placed in the red bags.<sup>7</sup>
- Use reusable containers instead of one-time use bags. Contracts can be negotiated with waste disposal companies to provide clean and reusable containers.<sup>9</sup>

### Phenolics

Medical facilities must stay clean and disinfected at all times. Some medical facilities use phenolics as a disinfectant. Phenolics are considered a hazardous material and

must not be discharged into the sewer system. Hospitals also use chemicals such as formaldehyde to sterilize equipment and rooms. Toxic cleaning chemicals can cause poor indoor air quality, and must be disposed of as hazardous waste.

- Eliminate the use of phenolics as a disinfectant when other disinfectants are suitable.<sup>7</sup>
- Keep waste streams separate. Any waste contaminated with hazardous materials becomes hazardous waste and must be disposed of as such.<sup>7</sup>
- Require each division or department to pay for their waste disposal costs. If each division or department pays, they are more likely to reduce waste generated.<sup>10</sup>
- Use sonic sterilization or steam cleaning for parts instead of alcohol-based disinfectants.<sup>7</sup>
- Buy cleaning chemicals in 55-gallon containers. Have suppliers refill the containers.<sup>9</sup>

### Investments in Technology

- Use sonic sterilization technologies. Sterilization solutions can be disposed of through the sewer system.<sup>7</sup>
- Invest in systems that will pre-measure and dispense the appropriate concentration of cleaning supplies. This will reduce the amount of excess cleaner used. Many of these systems use “multi-purpose” cleaners, reducing the number of different kinds of chemicals needed.<sup>13</sup>
- Invest in electronic thermometers with disposable sleeves to eliminate the use of mercury-containing thermometers. Most electronic thermometers have a faster read time than mercury-containing thermometers. Another option is to switch to alcohol-containing thermometers.<sup>2</sup>
- Install reverse osmosis (RO) water supply equipment to minimize formaldehyde wastes from cleaning of dialysis machines.<sup>6</sup>

### CASE STUDY F.F. Thompson Hospital

Thompson has eliminated almost all uses of mercury from the facility.

Thompson began its informal mercury pollution prevention program in 1990 because of the recognition that mercury products can be hazardous to employees and patients. Other incentives were the reduction of mercury disposal costs, the avoidance of mercury spill cleanups, and the difficulty of complying with Occupational Safety and Health Administration (OSHA) requirements for the use of mercury.

To achieve this, Thompson:

- Discontinued the use of mercury thermometers, except in isolation units, because the electronic thermometers were considered to be a better technology overall.
- Discontinued the use of mercury stains, in order to eliminate discharge of the stains to wastewater.
- Replaced or are replacing mercury gastrointestinal tubes with tungsten tubes.
- Eliminated the use of mercury batteries, because newer equipment came with mercury-free batteries.



Source: North Carolina Department of Environment and Natural Resources,  
[www.sustainablehospitals.org](http://www.sustainablehospitals.org)

## Other Sources

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- <sup>1</sup> North Carolina Division of Pollution Prevention and Environmental Assistance, *Waste Reduction and Disposal Options for Specific Hospital Wastes*, <http://www.p2pays.org/ref/01/00239.pdf>
- <sup>2</sup> U.S. EPA, Region 5, *Mercury Use Reduction & Waste Prevention in Medical Facilities*, <http://www.epa.gov/grtlakes/seahome/mercury/src/title.htm>
- <sup>3</sup> Health Care Without Harm, [www.noharm.org](http://www.noharm.org)
- <sup>4</sup> Sustainable Hospitals, Lowell Center for Sustainable Production, [www.sustainablehospitals.org](http://www.sustainablehospitals.org)
- <sup>5</sup> Canadian Centre for Pollution Prevention, [www.c2p2online.com](http://www.c2p2online.com)
- <sup>6</sup> University of Missouri, *Pollution Solutions Waste Reduction Solutions for Businesses: Health Care Facilities*, <http://outreach.Missouri.edu/polsol/health.htm>
- <sup>7</sup> City of Palo Alto, Regional Water Quality Control Plant, *Pollution Prevention for Hospitals and Medical Facilities*, <http://www.p2pays.org/ref/04/03259.pdf>
- <sup>8</sup> Palo Alto Regional Water Quality Control Plant, *Best Management Practices for Hospitals and Medical Facilities*, <http://www.p2pays.org/ref/02/01605.pdf>
- <sup>9</sup> Oregon Department of Environmental Quality, *Waste Reduction Tips for Health Care*, <http://www.deq.state.or.us/wmc/solwaste/cwrc/wrstrategy/healthcarestrategy.html>
- <sup>10</sup> California Environmental Protection Agency, *Pollution Prevention Guide for Hospitals*, <http://www.p2pays.org/ref/03/02116.pdf>
- <sup>11</sup> The Kentucky Pollution Prevention Center, *Medwaste On-line Movie Clips*, <http://www.kppc.org/Publications/Videos/healthcare.cfm>
- <sup>12</sup> The Kentucky Pollution Prevention Center, *Healthcare Provider Links*, <http://www.kppc.org/about/P2/links/healthcare.cfm>
- <sup>13</sup> New York State Department of Environmental Conservation Pollution Prevention Unit, *Environmental Self-Assessment for Health Care Facilities*, <http://www.dec.state.ny.us/website/ppu/esahcf.pdf>