Guidance and Training on Greening Your Janitorial Business

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Introduction

About This Manual

This manual provides basic information about preferred cleaning products and processes that can reduce health, safety, and environmental risks associated with janitorial services. It also outlines a way in which building managers can transition from traditional cleaning systems to "green" cleaning systems. It is intended to be used as a reference guide along with the text book, Protecting the Built Environment, by Michael Berry, to supplement the "Greening the Janitorial Business" course developed by the Department of the Interior (DOI).

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Chapter 1: Green Cleaning Basics

What is Green Cleaning?

Green cleaning is a holistic approach to janitorial services that takes into account:

1. the health, safety, and environmental risks of products and processes associated with cleaning;
2. the mission and use of the facility to be cleaned and the behavior of facility occupants; and
3. the cleaning, maintenance, and sanitation needs of the facility.

In other words, it is an approach to cleaning that involves the use of alternative products, applying those products in different ways, and evaluating and/or changing behaviors associated with how buildings are used to reduce risks while maintaining a satisfactory level of cleanliness and disinfection.

Example 1: Traditional glass cleaner-made of alcohol and ammonia, which are solvents-is typically applied by using a trigger spray, which creates a fine mist. Vapors created by this product and process have the following effects:

- Vapors can enter the breathing zone of cleaning personnel, causing respiratory irritation and triggering asthmatic attacks and other breathing disorders (especially when used repeatedly and over time).
- Because they can remain in the restroom, vapors can affect building occupants using the restroom.
- Vapors are circulated throughout the building by the ventilation system and can affect building occupants.
- When the vapors are exhausted to the outdoors, they can contribute to atmospheric smog and air pollution.

Green cleaning alternatives can include:

- Replacing the traditional glass cleaner with one that has no solvents-a detergent, or soap-based cleaner that produces fewer vapors.
- Applying the product in a stream rather than a mist to reduce the vapors.
- Applying the spray to a wiping cloth, rather than directly onto the glass, to reduce the vapors.

Example 2: If occupants eat in their individual offices, they are likely to produce crumbs, which could attract pests. This might require more frequent pesticide or rodenticide applications than if

all eating were centralized in a lunchroom or conference room. In addition, if employees clean up coffee or beverage spills at the time of a spill, rather than wait for the cleaning crew to do it (especially when it involves carpets or other fabrics), janitors can use fewer, and less-toxic, cleaning products than if spills dry or seep into carpet. Hence, green cleaning requires some involvement by building occupants.

Does Green Cleaning Work?

Green cleaning is a concept; it is a collection of new tools and practices that can be applied to traditional approaches. Green cleaning approaches vary from building to building. Green cleaning works if the products and processes used are targeted to the specific risks associated with each building, and if building managers, janitorial personnel, and building occupants all participate in the development of a green cleaning plan.

Why is Green Cleaning Important?

Green cleaning is all about reducing risk. Risk is the measure of the probability and severity of harm to human health or the environment. It is based on the type and toxicity of a hazard (that is, its potential effect on plants, animals, humans, and ecosystems) and the type and degree of exposure to that hazard (based on intensity, frequency, and duration). Risk is characterized by evaluating hazard and exposure together, along with the pathways by which people or the environment are likely to become exposed (e.g., through eyes, skin, lungs, or mouth and through contact with contaminated air, water, or soil).No matter what changes are made to traditional products and processes, cleaning buildings-like all other activities in life-will never be without risk. All risk, however, can be evaluated on a continuum that ranges from very high to very low. Current cleaning practices might pose very high risks or avoidable risks, and changing certain practices and products might reduce unnecessarily hazardous practices with alternatives that are equally effective. Keep in mind, however, that although hazards and exposures generally can be evaluated for humans or the environment, the specific risk to an individual person or individual waterway, for example, will be unique based on individual circumstances, such as pre-existing health conditions, and vulnerabilities (i.e., asthma, heart disease) (for example, children and the elderly are more vulnerable). There are also trade-offs to be considered-for example, using a less-toxic product that requires more scrubbing to be effective-might reduce the risk of inhalation or skin contact, but that might also increase the risk of arm or hand injuries brought on by additional scrubbing. Overall, however, the practice of green cleaning has many benefits. Green cleaning can:

- **Reduce health effects** to building occupants and janitorial staff, such as skin, eye, and respiratory irritation or burns; allergies; multiple-chemical sensitivity; headaches; nausea

or other gastrointestinal ailments; poisoning; cancer; reproductive hazards; and damage to liver, kidneys, and other internal organs.

- **Increase safety** by reducing the likelihood and frequency of fires, explosions, spills, and splashes.
- **Reduce environmental impacts**, including regional and global environmental issues such as air pollution, water pollution, raw materials resource use, bioaccumulation of chemicals in plants and animals, ozone depletion, and global climate change. Green cleaning also reduces the amount and toxicity of products and chemicals requiring disposal.
- **Reduce costs** to building management, tenants, and/or the janitorial company associated with sick leave, health care, productivity loss, and litigation.
- **Increase occupant and worker satisfaction**, including improved morale, productivity and efficiency, quality of life, and sense of well-being. This can result from decreased health effects and decreased annoyances such as malodor.

What Are the Federal Mandates for Green Cleaning?

Green cleaning is a new concept to many people in the cleaning industry, but one that is evolving into a professional standard. In fact, several federal mandates already exist that require federal agencies to consider environmentally preferable products and services in their acquisitions and procurements. Executive Order 13101Executive Order 13101 on Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition requires federal procurement officers to consider environmental factors in their purchasing and contracting decisions and directed the U.S. Environmental Protection Agency (EPA) to develop guidance to address environmentally preferable purchasing. EPA established the Environmentally Preferable Purchasing (EPP) program in response to the Executive Order and developed guiding principles for applying environmentally preferable purchasing in the federal government setting. EPP clauses are being included in many federal contracts. The application of these principles in specific acquisitions varies depending on a number of factors, such as: the type and complexity of the product or service being purchased; whether or not the product or service is commercially available; the type of procurement method used (e.g., negotiated contract, sealed bid); the time frame for the requirement; and the dollar amount of the requirement. For more information, see www.epa.gov/opptintr/epp.

Federal Acquisition Regulation

Section 23.703 of the Federal Acquisition Regulation (FAR) requires Executive agencies to consider environmental factors when purchasing products and services. Agencies must:

- Maximize the use of environmentally preferable products and services.
- Maximize the use of energy-efficient products.
- Eliminate or reduce the generation of hazardous waste.
- Promote the use of nonhazardous and recovered materials.
- Realize life-cycle cost savings.
- Promote cost effective waste reduction.
- Consider the use of biobased products.
- For more information, see https://www.acquisition.gov/

Comprehensive Procurement Guideline

Section 6002 of the Resources Conservation and Recovery Act (RCRA), along with Executive Order 13101, requires EPA to designate recycled-content products and to recommend to federal agencies practices for buying these products. Once a product is designated, procuring agencies are required to purchase it with the highest recovered material content practicable. In response to these directives, EPA developed the Comprehensive Procurement Guideline (CPG) program to research and designate products and provide guidance. Federal agencies are now required to purchase janitorial supplies, such as facial tissue, bathroom tissue, paper towels, industrial rags and wipes, and plastic trash bags, with recycled content. For more information on this program, visit www.epa.gov/cpg.

What Green Cleaning Standards Already Exist?

Several reputable standard-setting organizations have already developed voluntary standards and guidance for agencies, companies, and other organizations that want to adopt green cleaning practices. The American Society for Testing and Materials (ASTM), an independent consensus based standard-setting organization, has issued guidance on procedures for developing a green cleaning program. The "Standard Guide for Stewardship for the Cleaning of Commercial and Institutional Buildings" (ASTM E-1971) was issued in 1998 to help owners and operators of commercial and institutional buildings adopt green cleaning and housekeeping practices. The standard provides recommendations for developing a stewardship plan; provides guidance on evaluating cleaning processes and selecting, using, storing, and disposing of products; and discusses equipment, training, and communications activities for a green cleaning program. According to ASTM, following the principles set forth in this guide can lead to greater tenant/occupant satisfaction, reduced operational costs, and greater productivity of occupants and cleaning personnel. A copy of the ASTM standard is attached to this manual, with permission.

Green Seal is an independent, nonprofit organization dedicated to protecting the environment by promoting the manufacture and sale of environmentally responsible consumer products. It has developed a consensus-based standard for industrial and institutional cleaners. Green Seal standards set forth a list of product requirements that are based on an assessment of the environmental impacts of product manufacture, use, and disposal and reflect information and advice obtained from industry, trade associations, users, government officials, environmental and other public interest organizations, and others with relevant expertise.
Visit www.greenseal.org for a description of Green Seal and its certification process. Also, see the attached copy of the Green Seal Industrial and Institutional Cleaners standard.

Can Green Cleaning Help Reduce Regulatory Burdens?

Green cleaning can potentially help agencies, municipalities, or companies reduce the regulatory burdens associated with the use, storage, or disposal of chemicals used in traditional cleaning. Organizations should be familiar with the regulations governing the use of janitorial chemicals, but this manual provides an overview to demonstrate how switching to green cleaning can potentially reduce regulatory procedural and financial burdens. Most agencies, municipalities, or companies that use dangerous chemicals in the workplace are regulated by the U.S. Occupational Safety and Health Administration (OSHA). OSHA regulations require employers to protect the health and safety of their employees through training, use of certain procedures (including personal protection), development of emergency plans, and more. For information on OSHA regulations, visit www.osha.gov. In addition, the U.S. Environmental Protection Agency (EPA) has passed several regulations affecting the janitorial industry:

- If companies discharge dangerous chemicals directly or indirectly into the waters of the United States, they might be regulated under the Clean Water Act. The Clean Water Act specifies chemicals and chemical limits that can and cannot be discharged into the public sewer system, as this wastewater is eventually discharged into surface waters such as rivers or streams. Concerns for janitorial companies include chemicals or mixtures poured into the sink or toilets, such as floor finish containing zinc or toilet bowl cleaner containing hydrochloric acid. For more information about the Clean Water Act, visitwww4.law.cornell.edu/uscode/33/ch26.html.
- The Clean Air Act regulates air emissions from area, stationary, and mobile sources. Under this law, EPA establishes national ambient air quality standards to protect public health and the environment. The Clean Air Act also seeks to prevent accidental releases of certain hazardous chemicals and minimize the consequences of such releases. Janitorial companies should consider whether the volatile organic compound (VOC) emissions from certain chemical products such as aerosol cleaners, or methylene chloride

from graffiti removers exceed Clean Air Act limits. For more information about the Clean Air Act, visit http://www3.epa.gov/airquality/.

- If organizations create wastes that are hazardous (for example, rags that are soaked in solvents, unused cleaning chemicals that become waste, or residue from spills), they are regulated under the Resource Conservation and Recovery Act (RCRA). RCRA imposes certain rules upon the generator of hazardous waste (usually the building in which the wastes are created and/or the cleaning company itself), including recordkeeping, storage, disposal requirements, and emergency procedures. For more information about RCRA, call toll-free 800 424-9346 or TDD 800 553-7672.
- The Emergency Planning and Community Right-to-Know Act (EPCRA) requires organizations to report on the presence of certain hazardous chemicals on-site in quantities above a certain threshold, and also report annually on the location and hazards of these chemicals. In addition, facilities must report on certain waste management activities and the release of toxic chemicals. The data on toxic chemicals are compiled in a publicly available database known as the Toxics Release Inventory (TRI), which contains information on chemical emissions from almost 23,000 facilities in the United States. Under EPCRA, facilities also must develop chemical emergency plans. EPCRA is designed to provide local communities with information to protect public health, safety, and the environment. Some green cleaning programs restrict the use of chemicals that are reported through the TRI. Much of the EPCRA program is actually implemented through a local emergency planning agency such as a city or county. For more information about EPCRA, visithttp://www2.epa.gov/epcra.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) governs releases or threatened releases of hazardous substances that may endanger public health or the environment. It requires operators of facilities to report releases to the environment due to chemical spills or other accidents and criminal penalties can apply for failure to report. For more information on CERCLA, visitwww.epa.gov/superfund/index.htm.
- The Toxic Substances Control Act (TSCA) allows EPA to track the 75,000 industrial chemicals currently produced or imported into the United States. EPA repeatedly screens these chemicals for environmental or human-health hazards. EPA can ban the manufacture and import of chemicals that pose an unreasonable risk; prohibit or limit the amount of production or distribution of a substance in commerce; prohibit or limit the production or distribution of a substance for a particular use; limit the volume or concentration of the chemical produced; prohibit or regulate the manner or method of commercial use; require notification of the risk of injury to distributors and consumers; specify disposal methods; and require replacement or repurchase of products already

distributed. For more information about TSCA, call 202 554-1404 or TDD 202 554-0551, e-mail tsca-hotline@epamail.epa.gov, visit www4.law.cornell.edu/uscode/15/ch53.html.

- The Safe Drinking Water Act protects the quality of drinking water in the United States by imposing safe standards of purity and requiring all owners and operators of public water systems to comply with health-related and nuisance-related standards, which in turn affect those entities, such as cleaning companies, that discharge chemicals into the public water system. For more information about the Safe Drinking Water Act, visit www.epa.gov/safewater/sdwa/sdwa.html.
- The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) imposes requirements on the distribution, sale, and use of pesticides, including disinfectants and antimicrobial products. For example, FIFRA requires users to register with EPA when purchasing pesticides and prohibits users from altering the product labels or using the product in way that is inconsistent with the label. For example, disinfectants containing quaternary ammonium chloride are regulated under FIFRA. For more information on FIFRA, visitwww.epa.gov/pesticides/.
- Depending upon your exact location, you also might be regulated by state or regional laws, such as the following examples:
    - California South Coast Air Quality Management District (AQMD) standards. The AQMD is the air pollution control agency for the four-county region including Los Angeles and Orange counties and parts of Riverside and San Bernardino counties. Purchasers and janitorial managers in these counties must following stricter regulations set by the AQMD to reduce emissions and prevent pollution. For more information on AQMD, visit www.aqmd.gov.
    - State of California Safe Drinking Water and Toxic Enforcement Act, otherwise known as Proposition 65, requires California's governor to publish a list of chemicals that are known to the State of California to cause cancer, birth defects, or other reproductive harm. This list must be updated at least once a year. More than 550 chemicals have been listed as of April 1, 1996. Proposition 65 imposes certain controls that apply to chemicals that appear on this list. These controls, designed to protect California's drinking water sources from contamination by these chemicals, allow California consumers to make informed choices about the products they purchase, and enable residents or workers to take actions to protect themselves from exposures to these harmful chemicals. For more information, visithttp://oehha.ca.gov/prop65.html.
    - Chesapeake Bay Program Toxics of Concern. Based on ambient concentrations of chemical contaminants and aquatic toxicity data, this list identifies toxic pollutants that represent immediate or potential threats to the Chesapeake Bay

system. Clear evidence is lacking that the contaminants on the Chesapeake Bay list of Chemicals of Potential Concern actually cause or have reasonable potential to cause adverse effects in the environment, but the Chesapeake Bay Program believes these chemicals warrant enough concern to be carefully monitored and tracked. For example, a number of the chemicals listed as being a potential concern are either banned or restricted pesticides that have residues still remaining in the ecosystem at elevated levels but below thresholds of concern; others chemicals are of increasing concern due to use patterns or potential for toxicity to Bay resources. For more information, visit http://www.chesapeakebay.net/issues/issue/chemical_contaminants.

Some of these regulations primarily affect upper management in an agency, municipality, or company, while others directly impact janitorial management and staff. Changing cleaning practices and using less toxic products can reduce safety and health risks to workers and occupants and can reduce certain regulatory requirements, which can save organizations money. The next two chapters provide information on how to green cleaning practices and green cleaning products.

Chapter 2: Traditional Versus “Green” Cleaning Products

This section provides an overview of the health and environmental impacts of cleaning products, such as multipurpose cleaners, degreasers, and floor cleaners, as well as supplies, such as bathroom tissue, facial tissue, industrial wipes and rags, and plastic trash bags. Although environmental risks, building use, and occupant needs will vary from building to building, the recommended ingredients to avoid and alternative products to consider are applicable to all buildings. Each agency, municipality, and business must decide which environmental issues are most important locally, which heath and safety concerns are relevant, and which cleaning products and supplies make the most sense environmentally, practically, and economically.

What Are the Health and Safety Effects of Traditional Cleaning Products?

The professional cleaning industry strives to make the indoor environment clean, safe, and hygienic. Unfortunately, harmful side effects on human health and safety are associated with certain cleaning products and practices. For these reasons, environmental considerations should be a large part of janitorial management. Health impacts from traditional cleaning practices and products affect both product users and building occupants. Janitorial staff often have direct contact with high concentrations of cleaning chemicals and therefore may suffer serious and direct injury. Occupants might be exposed to lower levels but over longer periods of time (longer hours each day and more days per year).Both janitorial staff and building occupants can receive either "acute" or "chronic" exposure. Acute exposure means a single large exposure to a toxic substance, which may result in severe health problems or death. Acute exposures usually last no longer than a day, as compared to chronic exposures, which refer to many exposures over an extended period of time or over a significant fraction of a human's lifetime (7 years or more). Chronic exposure can cause long-term serious health effects. Detailed health and safety side effects associated with specific chemicals can be found in several tables at the end of this chapter.

Effects include:

Acute:

- ***Burns to eyes and skin***: Burns can be caused in several ways, including contact with fire from a chemical that has ignited or contact with an acid or alkalis.
- ***Blindness***: Eye contact with certain chemicals can lead to blindness or reduced eye functioning.
- ***Frostbite from cold aerosol temperatures***: Aerosols often project their contents quickly and at very low temperatures. Contact as the substance discharges can lead to frostbite.

- ***Poisoning***: Certain chemicals are toxic to humans. When they are absorbed by the body, they poison or contaminate human organs, leading to a range of health problems, including temporary illness, long-term injury, or death.
- ***Headaches***: Headaches can result from a number of exposures to cleaning chemicals, including inhalation.
- ***Nausea or other gastrointestinal ailments***: Gastrointestinal ailments can result from ingestion of harmful chemicals or as a side effect of chemical sensitivity or allergy.

Chronic:

- ***Reproductive disorders***: Certain substances can cause harmful reproductive disorders such as birth defects in unborn children, damage to the male or female reproductive system, or may impact the cognitive development of the fetus child.
- ***Cancer***: Substances that cause cancer, known as carcinogens, are found in solid, liquid and gaseous form, and several are ingredients in traditional cleaning products.
- ***Respiratory ailments***: Chemicals in cleaning products and the vapors they emit can cause respiratory ailments such as allergies, asthma, reduced lung capacity, and injury to internal organs when absorbed by the bloodstream.
- ***Endocrine disruption***: A variety of chemicals in cleaning products are endocrine disruptors-external agents that interfere with or mimic in some way natural hormones in the body. Endocrine disruption might result in cancer, harm to male and female reproductive systems, thyroid damage, or other adverse consequences.
- ***Chemical sensitization***: This is an allergic condition that usually affects the skin or lungs. Once exposure to a substance has caused a reaction, the individual may be sensitized to it, and further exposure may elicit an adverse reaction, even at low levels.
- ***Allergies***: Certain chemicals induce an allergic reaction in individuals who are sensitive to them. Reactions can be mild or severe, depending upon the amount and duration of exposure, as well as individual sensitivity. Reactions may include wheezing, skin irritation, and nausea, and can lead to serious harm or even death if not treated quickly and properly.

Acute and Chronic:

- ***Central nervous system disorders***: The central nervous system includes the brain, spinal cord, and their connecting nerves. Several chemicals have irreversible effects on the central nervous system.

- ***Mild or severe irritation of the skin and eyes***: This can occur when chemicals come into contact with the skin or eyes. Symptoms of irritation include swelling, itching, or reddening.
- ***Kidney and liver damage***: Several substances cause irreversible damage to the kidneys and liver as the body tries to detoxify itself after exposure.

Chemicals come in contact with the human body in several ways. Most contact results from improper handling and failure to follow directions (see Chapter 4 for more information on green cleaning practices), but indirect contact also occurs.

- ***Breathing or inhalation***: Some gases and airborne particles, created by the evaporation of cleaning products and the disturbance of small bits of solid material during and after cleaning, can seriously harm humans.
- ***Skin, dermal barrier***: Accidental spills and splashes and improper use of cleaning products can result in skin irritation or more serious internal injury. Dermatitis (inflammation of the skin), burns, sensitivity, and poisoning can occur when the skin is superficially irritated by harmful chemicals. Certain chemicals can also penetrate the skin, enter the bloodstream, and damage internal organs.
- ***Ingestion, eating, and drinking***: Improper storage and misuse of cleaning chemicals, especially around food service areas, can lead to accidental ingestion. Ingested chemicals enter the bloodstream through the gastrointestinal tract, causing injury to it and other internal organs.

What is Sick Building Syndrome?

Poor indoor air quality and improper cleaning techniques can lead to "sick building syndrome." "Sick" buildings exhibit undesirable indoor environments that cause a variety of unhealthy symptoms, including:

- Sensory irritation in the eyes, nose, and throat leading to pain, dryness, stinging, hoarseness, and voice problems. Skin irritation that manifests itself as pain or reddening, smarting, itching, or dry skin.
- Neurotoxic symptoms that are associated with headaches, sluggishness, mental and physical fatigue, memory loss, difficulty concentrating, dizziness, intoxication, and vomiting.
- Hypersensitivity reactions that include runny nose, teary eyes, asthma-like response, and hyperventilation.
- Odor and taste symptoms that include changed sensitivity in smelling and tasting as well as impressions of unpleasant odors and tastes.

It is important to note that in reality, there are no "sick buildings," only mismanaged or misguided maintenance practices that create an unhealthy environment.

What Are the Environmental Impacts of Traditional Cleaning Products?

Not only do many traditional cleaning products affect human health and safety, but many also contain ingredients that are harmful to the environment. A number of environmental impacts-including effects on fish, birds, other wildlife, and ecosystems-can result from these products, depending upon the specific chemical ingredients, manufacturing methods, use, and disposal practices. Janitorial products can contaminate the environment in many ways, from pouring chemicals and wastewater down the drain and into the local water supply, gas emissions into the air via circulation through the indoor ventilation system, and during the treatment and disposal of chemical wastes. These are known as "downstream" effects, as they happen during or after the use of the products. Many of the same environmental effects are also created "upstream," during the initial development and manufacture of the products in laboratories and factories. Thus, as janitors reduce their use of hazardous products, they can reduce the environmental effects at a number of different stages of the products' life cycle. The following are some of the environmental impacts associated with cleaning products:

- ***Bioaccumulation*** refers to the increase in concentration of toxic substances in living organisms. The toxins accumulate because contaminated air, water, or food, are consumed faster than the toxins can be metabolized and excreted. Similarly, the biological magnification of certain "persistent" substances, such as pesticides that do not readily biodegrade or heavy metals, describes their movement up the food chain, as they work their way into rivers or lakes, and are eaten by aquatic organisms such as fish, which in turn are eaten by large birds, animals, or humans. The substances become concentrated in tissues or internal organs as they move up the chain.
- ***Ozone depletion*** refers to the destruction of the stratospheric ozone layer, which shields the Earth from harmful amounts of ultraviolet radiation. Ozone depletion is caused by the breakdown of certain chlorine- and/or bromine-containing compounds (chlorofluorocarbons, or CFCs, and halons) when they reach the stratosphere and quickly destroy ozone molecules.
- ***Toxicity*** describes the degree to which a substance or mixture of substances can harm humans or animals.
- ***Eutrophication*** is the natural process by which a lake, estuary, or bay gradually ages and becomes more productive (i.e., more nutrients, more biological activity). Human-induced pollutants, such as cleaning products, that make their way into water bodies can aggravate the process by adding an abundance of nutrients, such as phosphorus and nitrogen, to a water body. The result is over-abundant plant life that steals precious

resources, such as oxygen and sunlight, from other aquatic organisms, causing accelerated aging of the water body.

- ***Endocrine disruption*** can cause hormonal imbalance in wildlife which may result in a failure to reproduce effectively.
- ***Water pollution*** results from the contamination of water through direct sources (e.g., factories) or indirect sources (e.g., pesticide runoff). Chemical factories and improper storage and disposal of cleaning products can contribute to water pollution. Weather patterns and human activities constantly circulate water and any pollution it contains throughout the environment, which creates local, regional, and global effects.
- ***Air pollution***: Some cleaning products contain volatile organic compounds (VOCs) that can escape during product use. VOCs have been linked to smog formation, which pollutes the air and causes a number of respiratory and other health problems.

What Attributes Should I Consider When Selecting Green Cleaning Products?

Using products that minimize negative human health and environmental impacts is an important and challenging step in greening janitorial services. Janitorial managers and contractors are faced with the daunting task of choosing products that produce effective, hygienic results while minimizing risk to employees, building occupants, and the environment. Janitorial staff are likely to use two main categories of products: general supplies and cleaning chemicals. These product categories have specific attributes that can be examined and adjusted to increase environmental performance. The following sections outline some of these attributes, including some of the standards that can be used to transition to a green cleaning program. Generally, the standards can be used in two ways: purchasers can buy products that are already certified by a particular standard (e.g., Green Seal), or managers can review the standards and use them as guidelines when selecting and purchasing cleaning products.

General Supplies

The manufacture of any product involves the use of raw materials and energy. These materials, such as petroleum for plastic and trees for paper, are often mined, extracted, or harvested from the Earth. Sometimes manufacturers can recycle used materials instead of extracting "virgin" materials, which can save energy and natural resources and prevent pollution. To encourage this process, building and janitorial managers should try to use products with recovered material (recycled) content whenever possible. In addition to conserving resources, using recycled-content products helps keep trash out of landfills and incinerators, each of which can pose environmental risks. Furthermore, federal agencies are required to purchase recycled-content

products designated in the Comprehensive Procurement Guidelines (see Chapter 1 for more information about CPG).In an effort to prevent waste in the first place (also called source reduction), janitorial or procurement managers can take steps to reduce the amount of product or packaging that must be throw away. Non-chemical janitorial supplies, such as paper towels, facial tissue, bathroom tissue, industrial wipes and rags, and plastic trash bags, all contribute to the solid waste stream. For example, roll paper towels perforated into small sheets are less wasteful than individual folded towels, as each individual uses less paper. In addition, purchasing janitorial supplies that have been manufactured and shipped with less packaging will help reduce the amount of waste they create when thrown away. In addition to recycled content, paper janitorial products can be made without traditional chlorine bleaching processes, which can be harmful to human health and the environment. Bleaching paper with chlorine-based compounds releases extremely toxic chemicals into the environment. The most dangerous is dioxin. Once released into the environment, dioxins are persistent because natural bacteria cannot effectively break it down. It also bioaccumulates and bio-magnifies. Paper products can remain unbleached or they can be bleached with hydrogen peroxide or other less-toxic alternatives, especially in the case of paper towels, bathroom and facial tissue. Bleaching options differ depending upon the raw material used.

Sample of Environmental Attributes for Janitorial Supplies

- ***Recovered materials***: These are materials that have been recovered or diverted from solid waste. This term does not include materials and byproducts generated from, and commonly reused within, an original manufacturing process.
- ***Post consumer materials***: These materials have served their intended use and have been diverted or recovered from waste destined for disposal, having completed life as a consumer item. Postconsumer materials are part of the broader category of recovered materials.
- ***Recycled content***: This term refers to the amount or percent of recovered material that a finished product contains.
- ***Recycled or recyclable packaging/returnable or refillable packaging***: Agencies procuring green cleaning can specify these waste prevention measures.
- ***Process chlorine free***: This term refers to recycled-content papers that were manufactured without the use of chlorine compounds to re-bleach the paper during the recycling process.
- ***Totally chlorine free***: This term applies to virgin papers and tissues (containing zero post-consumer recycled content) that were manufactured without the use of chlorine compounds to bleach the pulp during all parts of the papermaking process. Recycled-

content paper cannot be totally chlorine free unless all discarded paper used to manufacture the recycled paper was chlorine free, which is a highly unlikely occurrence.

Although federal agencies are required to purchase most paper products with recycled content, which would negate totally chlorine free bleaching processes as an option, they are allowed to purchase totally chlorine free paper if they determine that it is an important performance requirement. Nonfederal agencies, however, can choose which environmental impact is more relevant to their locality and environmental mission: eliminating toxic chlorine compounds from the environment or recycling paper recovered from solid waste. (See Appendix A for a list of environmentally preferable janitorial supplies)

Cleaning Products

Because so many different cleaning chemicals exist and because different janitorial crews can use different practices and quantities, it is important to note that hazards are best evaluated on a product-by-product or chemical-by-chemical basis. This type of evaluation provides users with complete information about the product, including the risks of individual ingredients and their combined effect in one product. Several standard-setting organizations develop guidance to assist in evaluating cleaning products. The Greenseal standard, which was developed recently with substantial industry and environmental stakeholder involvement is comprehensive in scope. DOI recommends following Green Seal standards, which are the best known and most widely accepted guidelines available. Janitorial mangers and purchasers should carefully review Green Seal standards and adapt or expand them to meet local needs and concerns. Green cleaning is still a relatively new concept, and managers who follow Green Seal standards will be on the cutting edge of green cleaning and have a head start on standards that will more than likely be mandatory in the future. See the attached Green Seal standard for more detailed information. Attributes differ for every green cleaning program depending upon a variety of factors, such as local and regional environmental issues; health, safety, or environmental priorities; state and local regulations; building characteristics; and availability of alternative products. The following environmental attributes are some examples of those that appear in Green Seal standards and other green janitorial specifications.

A Sampling of Environmental Attributes for Cleaning Products

- Must not contain any carcinogens, mutagens, or teratogens designated by federal law.
- Must not contain any ozone-depleting compounds, greenhouse gases, or substances that contribute to photochemical smog and poor indoor air quality.
- Must have a pH between 4 and 9.
- Must have a flash point higher than 200º F.

- Must not be corrosive or irritating to the skin or eyes.
- VOC levels must meet or be less volatile than the California Code of Regulations maximum allowable VOC levels for appropriate cleaning product categories.
- Must not be delivered in aerosol cans.
- Must not contain petrochemical-derived fragrances.
- Must not contain dyes.
- Must not contain ingredients included on the Chesapeake Bay Program's Toxics of Concern list.
- Must be dispensed through automatic systems in order to reduce employee contact with the concentrate and to ensure proper dilution ratios.
- Must not contain any chemicals under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA).
- Must not constitute hazardous wastes, as defined in 40 CFR (Code of Federal Regulations) Part 261, when offered for disposal.
- Must not be toxic to humans or aquatic life.
- Must not contain endocrine modifiers, alkyl phenyl ethoxylates, dibutyl phthalate, or heavy metals (e.g., arsenic, lead, cadmium, cobalt, chromium, mercury, nickel, selenium).
- Must be biodegradable.
- Must not contain petroleum distillates.
- Must not be combustible.
- Must not contain more than 0.5 percent by weight of phosphorous.
- Must be biobased (i.e., utilize biological products or renewable, domestic agricultural [plant, animal, or marine] or forestry materials).
- Must not contain chlorinated solvents.
- Must not contain persistent or bioaccumulative substances.

How to Evaluate Janitorial Products

Traditionally, standards of cleanliness focus on outward appearance-whether an area looks clean after the application of certain products and cleaning techniques. Green cleaning takes these traditional assessments one step further by considering additional standards, such as preventing indoor air pollution or reducing toxicity and packaging waste. Environmentally responsible

cleaning can be achieved in more than one way, just as there are many options when purchasing green cleaning products. An effective green cleaning program will be tailored to include issues of specific concern, such as local smog prevention or poor building ventilation. It should also include an evaluation of the chemicals currently in use as part of the determination of overall risk. Often, using quality environmentally friendly cleaners in place of harsh, toxic chemical products does not add extra time or effort to the cleaning routine. Building managers should talk to their cleaning product supplier about environmental cleaning alternatives. More detailed information on how to set up a green cleaning program can be found in Section IV: Management Approach. Here are a few useful ways to evaluate the environmental attributes of janitorial products:

- Research the health and safety issues associated with the ingredients of cleaning products. This can be done by evaluating the MSDS sheets for each product or by using outside sources.
- Evaluate federal, state, and local regulations for hazardous substances that might be found in cleaning products (see Chapter 1 for information on mandates and regulations).
- Contact the manufacturer for more detailed information on ingredients, use, disposal, and other topics.
- Review standards set by third-party testing and standard-setting organizations (e.g., Green Seal).
- Review selection criteria established by state governments (e.g., Massachusetts); local governments (e.g., Santa Monica); and other leaders in the green building industry. (See Chapter 5 for information on federal, state, and local approaches.)
- Contact other organizations with exemplary green cleaning programs or guidance on harmful substances. For example, for information about carcinogens, mutagens, and teratogens, contact:
    - National Toxicology Program (NTP), Annual Report on Carcinogens: http://ntp-server.niehs.nih.gov.
    - Known Human Carcinogens
    - Reasonably Anticipated to be Human Carcinogens
    - International Agency for Research on Cancer (IARC): http://www.iarc.fr.
    - California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): www.leginfo.ca.gov.
    - Occupational Safety and Health Administration (OSHA) regulated carcinogens: www.osha.gov.

Ingredients to Avoid

CAS Number	Ingredient Name	Health Effect from Full-Strength Ingredient					NFPA Rating
		Eye	Skin	Skin Absorb	Inhalation	Chronic	H F R
00100-51-6	Benzyl Alcohol	B/ BL	Sev Irr	Yes	Sev IRR	Carcinogen	2 1 0
00075-45-6	CFC-22; Chlorodifluoro Methane	FB	FB	No	FB		2 0 1
68603-42-9	Coconut Oil Diethanolamine	Irr	Irr	No	Slight	Suspected Carcinogen; Skin Allergy	1 1 0
00111-42-2	Diethanoloamine	Irr	Irr	No	Slight	Suspected Carcinogen; Skin Allergy	1 1 0
00075-68-3	HCFC-142b	FB	FB	No	FB		
00120-40-1	Lauric Acid Diethanoloamine					Some evidence of carcinogenic effects	
00071-55-6	Methyl Chloroform: 1,1,1-TCE	Irr	Irr	Yes	Irr	Damage to Liver, Kidney, Heart; CNS	3 1 0
00078-	Methyl Ethyl	B	Sev	Yes	Sev	CNS; GI	1 3 0

93-3	Ketone		Irr		IRR	Tract: Liver; Reprofetal	
00091-20-3	Napthalene	D/ BL	Irr	Yes	Irr	Potential Carcinogen; Damage to GI Tract; Blood; Liver; Kidney; Repro	2 2 0
186662-53-8	Nitrilotriacetic Acid					Carcinogenic - Prop. 65	
00106-46-7	Paradichloro Benzene	Irr	Irr		Yes	Cacinogen - Prop. 65; Liver & Kidney Damage from inhalation	2 2 0
00127-18-4	Tetrachloreoethylene; Perchloroethylene	B	Irr	Some	Yes	Carcinogenic; reproductive damage; liver & Kidney damage	2 0 0
00108-88-3	Toulene	D	Irr	Yes	Yes	CNS Impairment; Liver & Kidney Damage	2 3 0
00079-01-6	Trichloroethylene	D	Irr	No	Yes	Liver, Reproductive, & CNS damage;	2 1 0

						Prop. 65 Carcinogen	

Abbreviations

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B/BL: Burns eyes, in some cases causing blindness.

CAS: Chemical Abstract Service, who assigns a number to every chemical ingredient.

CNS: Central Nervous System

D: Causes damage to eyes or skin, which if not taken care of will be permanent.

FB: May cause frostbite from cold temperature of aerosol.Irr: Irritant (victim will usually only be temporarily inconvenienced).

NFPA: The National Fire Protection Association (NFPA) has developed a system for indicating the health, flammability and reactivity hazards of chemicals. H = Health Hazard; F = Flammability Hazard; R = Reactivity Hazard. Ratings of this sort are summaries, and therefore should be used with caution and some skepticism. Consider individual hazards to eyes, skin, etc. to determine the overall risk that each ingredient poses to the user.

PBT: Refers to chemicals that are persistent, that bioaccumulate, and that are toxic.

Prop. 65: Listed by California's Workers' Right-To-Know Legislation.

Sev Irr: Severe Irritant (victim will usually be temporarily incapacitated).Skin Absorb: This ingredient easily absorbs through skin and will poison the liver, kidneys, or other organs as the body tries to eliminate it.

Ingredients to Avoid if Possible/Otherwise Use With Extreme Care

CAS Number	Ingredient Name	Health Effects from full-strength Ingredient					NFPA Rating
		Eye	Skin	Skin Absorb	Inhalation	Chronic	H F R
00111-2-76-2	Butoxy Ethanol	Irr	Irr	Yes		Reproductive & Fetal Effects; Liver & Kidney Damage; Blood Damage	2 2 0
00090-2-43-7	Phenyl Phenol	B	B		Burns	IARC Group 3 Carcinogen (Insufficient Evidence)	1 1 0
00067-64-1	Acetone	B	Irr	Yes	Yes	Potential Reproductive Effects; Liver & Kidney Damage; CNS Depression	1 3 0
07664-41-7	Ammonia	B/BL	D		Sev Irr/ Burns	Kidneys/Liver/CNS	3 0 0
01341-49-7	Ammonium Bifluoride	BL	D	Yes	Burns		3
01336-21-6	Ammonium Hydroxide	BL	D		Yes; D	Cataracts; glaucoma	3 1 2

00628-63-7	Amyl Acetate	Irr	Irr	No	Irr	Kidney damage	2 3 1
00105-60-2	Caprolactam	Irr	Irr	Yes	Yes/ Irr	CNS/Neurological	
00124-07-2	Caprylic Acid	B/BL	D	Yes	Sev Irr	Blood	2 1 0
00108-93-0	Cyclohexanol	B	Irr	Yes	Irr	CNS/Liver/Kidney/Repro	1 2 0
00084-74-2	Dibutyl Phthalate	B	Sev Irr		Irr	Endocrine/Mutagen/Repro/Testes/Kidney	0 1 0
00112-34-5	Diethylene Glycol Monobutyl Ether	Irr	Irr	Yes	Slight	Kidney Damage;CNS Effects	1 2 0
07647-01-1	Hydrochloric Acid	BL	D	No			3 0 0
07722-84-1	Hydrogen Peroxide	BL	D	No	Burns; Fatal		2 0 3
00079-14-1	Hydroxyacetic Acid	BL	D	No	Yes	Burns; Damage	
00141-43-5	Monoethanolamine	D	B	Yes		Liver & Kidney Damage; Fetal Damage	2 2 0

00110-91-8	Morpholine	BL	D	Yes	Sev Irr		3 3 1
00123-86-4	Butyl Acetate	B	Irr	Yes	Irr	CNS/Mutagen	1 3 0
09016-45-9	Nonyl Phenol Ethoxylate	Irr	Irr			Endocrine PBT (Alkyl Phenol Ethoxyalate)	
09036-19-5	Octyl Phenol Ethoxylate	Sev Irr	Sev Irr			Endocrine PBT (Alkyl Phenol Ethoxyalate)	
07664-38-2	Phosphoric Acid	BL	D	No			3 0 0
26027-38-3	Polyethylene Monophenyl Ether	Irr/ B	Irr/ B		Irr	Endocrine Disruptor	1 1 1
02893-78-9	Bleach; Sodium Hypochlorite						
00102-71-6	Triethanolamine	D	B	Yes	Slight	Liver & Kidney Damage; IARC Group 3 Carcinogen (Insufficient Evidence)	2 1 1
00121-44-8	Triethylamine	B	Irr	Yes	Irr	Kidneys/Repro	3 3 0
08006-	Turpentine	B	Irr	Yes	Yes	Kidney, Bladder, CNS Damage;	3 0

64-2						Possibly Harms Fetus	
01330-20-7	Xylene	B	Irr	Yes	Yes;Irr	Liver, Kidney, CNS, Spleen; IARC Group 3 (Insufficient Evidence)	2 3 0

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Skin Absorb: This ingredient easily absorbs through skin and will poison the liver, kidneys, or other organs as the body tries to eliminate it.

Ingredients to Use with Extreme Care

CAS Number	Ingredient Name	Health Effects from Full-Strength					NFPA Rating
		Eye	Skin	Skin Absorb	Inhalation	Chronic	H F R
0087 2-50-4	Methyl Pyrolidinone	B	B		Sev Irr		2 1 0
0800 1-54-5	Alkyl Dimethyl Benzyl Ammonium Chloride	B	B		B		
0033 4-48-5	Capric Acid	Irr	Irr	Yes	Irr		1 1 0
0011 1-46-6	Diethylene Glycol	Irr	Irr	Yes	Yes	Liver/Kidney/CNS Toxicant	
0011 5-10-6	Dimethyl Ether	Sev Irr	Sev Irr		Sev Irr		2 4 1
2991 1-28-2	Dipropylene Glycol Butoxy Ether	Sev Irr	Sev Irr	Yes	Sev Irr	Unknown	
2515 5-30-	Dodecyl Benzene	B	Sev Irr		Sev Irr	Unknown	2 1 0

0	Sulfonate						
27176-87-0	Dodecylbenzne Sulfonic Acid	D	B	Possibly			
00064-17-5	Ethanol			Yes	Yes	Liver/Kidney/CNS/ Repro	
00122-99-6	Ethylene Glycol Phenyl Ether	B	B	No		Ingestion leads to Kidney, Lungs, Liver, Heart Damage & CNS effects	
00067-63-0	Isopropanol	B	Irr	Yes	Yes; Irr	Kidney; Repro; CNS	1 4 2
08008-20-6	Kerosene	B	Irr		Yes; Irr		1 2 1
00067-56-1	Methanol			No	Yes		
02809-21-4	Phosphonic Acid						
07320-34-5	Potassium Diphosphate	Irr/ B	Irr/ B		Irr/B		
01310-58-3	Potassium Hydroxide						

00107-98-2	Propylene Glycol Monornethyl Ether	Irr	Irr	No	Irr	CNS (Inhalation or Ingestion)	0 3 0
07681-38-1	Sodium Bisulfate	BL	D	No	Burns; Fatal		
00497-19-8	Sodium Carbonate	BL	D	No	Burns		
01310-73-2	Sodium Hydroxide	BL	D	No	Burns		2 0 1
06834-92-0	Sodium Metasilicate						D D
05329-14-6	Sulfamic Acid	B	B	No			
08052-41-3	Stoddard Solvent	Irr	Irr		Irr	CNS	0 2 0

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Ingredients to Use with Routine Care

CAS Number	Ingredient Name	Health Effects from Full-Strength Ingredient					NFPA Rating
		Eye	Skin	Skin Absorb	Inhalation	Chronic	H F R
00770-35-4	Phenoxy Propanol	Irr	Irr		Yes; Irr		
00064-19-7	Acetic Acid	B	B	No	Yes		
00120-32-1	Chlorophene						
05989-27-5	Limonene	Irr	Irr	No	Irr	Some people are allergic to smell	1 2 0
00111-90-0	Diethylene Glycol Monoethyl Ether	B	Irr	No	Low	Kidney damage; reproductive damage	1 1 0
00111-77-3	Diethylene Glycol Monomethyl Ether	Irr	Irr	No	Irr	Possible reproductive effects	2 2 0
02809-	Diphosphonic Acid					Inhibits bone formation	

21-4							
34590-94-8	Dipropylene Glcol Methyl Ether	Irr	Irr	Yes		Liver damage (from exposure to very high levels)	
17572-97-3	EDTA Tetrapotassium Salt	Irr	Irr	Irr			
00064-02-8	Ethylene Diamine Tetraacetic Acid	Irr	Irr	No			
00097-86-9	Isobutyl Methacrylate	Irr	Irr	Irr			
68131-39-5	Linear Alcohol Ethoxylate						
67741-65-7	Mineral Spirits		Irr		Slight		1 2 0
08030-30-6	Naphtha (Crude Coal Tar) Benzine	Irr	Irr		Irr	Kidney & CNS damage; repro damage	3
05324-84-5	Octane Sulfonic Acid	Irr	Irr	Yes			1 1 0
68441-17-8	Oxidized Polyethylene	Irr	Irr		Irr		

63148-62-9	Poly Dimethyl Siloxane	Irr		Irr	Irr		
07757-82-6	Sodium Sulfate	Irr	Irr	No	Irr		
07758-29-4	Sodium Tripoly Phosphate	Irr	Irr				
01300-72-7	Sodium Xylene Sulfonate	Irr	Irr	Yes			1 0 0
64742-88-7	Stoddard Solvent (Naphtha)	Irr	Irr			CNS effects	
00078-51-3	Tri Butoxy Ethyl Phosphate						
08042-47-5	White Mineral Oil	B	Irr	Irr		Lung damage at high concentrations	
119345-04-9	Disulfonate						
00093-83-4	Oleic Acid Diethanolamine						
10486-00-7	Sodium Perborate Tetrahydrate			Irr			1 1 0

00107-21-1	Ethylene Glycol	Irr	Irr		Slight		1 1 0

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Chapter 3: Green Cleaning Practices

Using environmentally friendly, less-toxic products is just one step in the process of setting up and implementing a successful green cleaning program. How the janitorial staff uses cleaning products and equipment also impacts the program's success. The following section reviews OSHA guidelines that address worker safety and other federal guidelines that address waste storage and disposal, outlines green cleaning practices and their impacts on worker safety and the environment, and examines issues that arise when janitors practice specific cleaning activities.

How are Cleaning Products Misused and What Injuries Can Result?

Many cleaning products contain chemicals and other ingredients that, when mishandled and misapplied, can adversely affect human health. Data from the State of Washington show that 6 out of every 100 janitors have lost-time injuries every year. Injuries common to janitorial workers break down into the following categories:

- 40 percent of janitorial worker injuries involve eye irritation or burns
- 36 percent involve skin irritation or burns
- 12 percent involve breathing chemical fumes

According to the Washington data, each reported worker's compensation incident requiring medical attention took the worker off the job for an average of 18 hours. Medical costs averaged $375 per claim, while lost time for the worker and his/her supervisor were estimated at $240 per claim, making the total cost equal to $615 for each workers' compensation claim. In addition, workers' compensation premiums might increase if accidents are frequent. Accidents can happen when workers are not properly taught how to complete their tasks safely or how to use equipment and products properly. Accidents also can happen when workers have been properly trained but are misusing equipment and cleaning products or hurrying to complete a job in the allotted time. To decrease worker injuries, janitorial managers should identify janitorial products that pose a risk to their workers and learn how to find and test products that are safer alternatives. Janitorial managers also can show staff how to reduce the amount of chemicals they use in cleaning or change the way chemicals are applied-which are some ways of practicing pollution prevention. Managers also must impress upon their staff the importance of wearing personal protective equipment such as gloves and goggles. Workers should be retrained periodically to re-emphasize the importance of proper procedure and safety practices. According to OSHA, if a worker is injured on the job, even if he/she has received proper training, the company or agency can still be liable for injuries and lost wage compensation.

How to Implement Green Cleaning Practices

One of the biggest roadblocks to setting up a green cleaning program may be human nature-it can be difficult to get people to change their fixed habits. Fortunately, implementing a green cleaning program does not have to mean a big change in how buildings are maintained and cleaned. In many cases, simple changes in products and practices can make a difference. Keeping dirt out of the building is a low-effort and low-budget way to support green cleaning efforts. Building management can place a durable welcome mat at all entryways so occupants and visitors do not track dirt from outside into the lobby area and throughout the building. Double-door entryways or foyers can serve the same purpose, although it may mean more effort and expense to reconfigure a building entryway. Less soil in the building means less frequent or intense cleaning is necessary, which means janitors use less chemicals. Daily or spot vacuuming also cleans up dirt before it gets ground in and becomes harder to remove. Janitorial managers should periodically reinforce initial staff training, to remind janitors about green cleaning practices. For example, janitors are taught, either in their training program or through reading the labels on cleaning products, how much cleaning product is needed to remove a particular stain. If training is not reinforced periodically, janitors may start to use more product than is necessary to clean a stain, thus wasting the product, or use products that are more hazardous or aggressive than is really required for the particular cleaning task at hand. Switching from products with highly toxic ingredients to ones that are less hazardous is a pollution prevention technique that also protects workers. Some cleaning tasks may necessitate the use of hazardous chemical cleaning products because there are no effective substitutes. In these instances, the best pollution prevention strategy is to properly handle and apply the cleaning product, while ensuring the employee is using adequate personal protective equipment.

Special Issues: Specific Cleaning Practices

The following are examples of how to apply green cleaning principles to some everyday cleaning issues.

How to Use Disinfectants

When using disinfectants, janitors must select a product that works on the specific germs they are trying to get rid of, or select a broad-spectrum product that works on all of the germs they may encounter. Because of potential health risks and impacts on the environment, it makes sense to minimize the amount of disinfectant used. There are four ways to do this:

- ***Select the right product***. Use a product that is registered by EPA and contains the specific ingredients needed to kill the germs with the efficiency required for the building room use (i.e., day care, bathroom, food service). Using the wrong disinfectant wastes time and money and does not remove the germs.
- ***Plan how often to disinfect***. Evaluate building traffic and identify the surfaces that people touch most often or that are most likely to be contaminated. An ultraviolet light can be used to reveal how soon germs reappear after cleaning and can help you schedule disinfection work accordingly. Also check disinfection guidelines published for each situation by EPA, the Centers for Disease Control, and other agencies.
- ***Control product mixing***. Using overly-concentrated product may be reassuring, but this practice is seldom warranted as it just wastes chemicals. In addition, using the full strength product is more dangerous to the user and is prohibited by EPA and OSHA. Therefore, janitors must dilute disinfectants according to the manufacturer's directions.
- ***Use correct methods***. Disinfectants need to be in contact with the germs they are intended to kill. That means the surface must be free of dirt, grease, and oil. Follow the label directions. Many disinfectants must be thoroughly applied and left in place for 10 minutes in order to be effective. Janitors may have to work in a new sequence to give cleaning products longer contact time with the surfaces. For example, the janitor can pre-clean the surfaces and apply the disinfectant throughout a restroom, empty the trash and refill paper dispensers, and then go back and rinse off the cleaner.

Restroom Cleaning Practices

The janitorial staff can keep restrooms clean and sanitary by following a two-level cleaning schedule-a combination of regular daily cleaning and weekly deep cleaning.

Regular Daily Cleaning:

Trash removal, surface cleaning, disinfection, and restocking supplies should occur daily in most commercial or office restrooms. Facilities in airports, restaurants, and other high-traffic sites may need more frequent touch-up cleaning and restocking of soap and paper supplies. Routine cleaning involves removing trash and replacing can liners; refilling dispensers; dusting high surfaces; cleaning toilets and urinals with a non-acid bowl cleaner; cleaning showers with a non-acid soap remover; cleaning mirrors and other glass surfaces; cleaning walls, ceiling, partitions, doors, and light switches; disinfecting all surfaces and fixtures; and vacuuming and wet mopping with a cleaner/disinfectant. Some products combine cleaning and disinfecting ingredients into one container. These combined products work well only on surfaces that are already relatively clean. For dirty surfaces, it is important to clean first, then apply a separate disinfectant. Fairly

mild products are available for daily restroom cleaning. Such products are reasonably safe to use and have little environmental impact. Check the supplier's directions, and mix the cleaning product with as much water as possible.

Deep Cleaning:

Deep cleaning in public restrooms usually needs to be done weekly. Deep cleaning also may be required when janitors are cleaning a restroom for the first time or when the restroom is particularly dirty. High-traffic restrooms, such as airport or restaurant restrooms, may need deep cleaning once a day, even if routine cleaning is done more frequently. Some deep cleaning tasks require stronger chemical products to remove stubborn deposits or stains. Examples include removing graffiti, cleaning stained toilet bowls, and removing shower tile deposits. In addition, janitors may need to spend more time removing soil with brushes and scrub pads.

Hard Floor Cleaning Strippers:

Hard floor care involves one of the most dangerous chemical products that janitors use-floor finish stripper. Stripper usually comes in two forms: a liquid concentrate for stripping large floor areas, and a ready-to-use aerosol for removing floor finish from baseboards. Both of these strippers contain chemicals that can seriously harm the user and also might affect building occupants and the environment. Reducing stripper use is a good idea, for safety and financial reasons. Floor stripping takes a great deal of time, so labor is expensive. Stripping should be performed only when needed, and should be performed correctly so no time or chemicals are wasted. Building occupants can cut back on the stripping the janitorial staff needs to do by keeping abrasive dirt particles from reaching the floor in the first place. Another way to reduce stripper use is to carefully monitor the floor refinishing work. Strip floor finish only when needed. Keep track of the floors and refinish only those areas where the surface is wearing out. With good records, a building manager will spot patterns in the way floors are wearing. Additional reduction in floor stripper use comes from training janitorial staff how to refinish floors correctly and how to refresh them with buffing and cleaning between refinish jobs. Following set procedures ensures that the stripper will work properly and reduce the amount of restripping required. Janitors also should not use the same mop to apply stripper and floor finish. It is a good idea to use some sort of method, perhaps painting the mop handles in two different colors, so that the mops are distinguishable from each other.

Carpet Cleaning

Most carpet care products are relatively safe to use and have only a small impact on the environment. However, some products contain toxic chemicals that are harmful both to the

janitor who uses them and to people who occupy the building. Janitors should use the mildest products available that work effectively. Stain prevention techniques, such as prohibiting occupants from eating or drinking in their individual offices, also will lessen the amount of stains resulting from food and beverage spills.

Minimizing Product Use

Using less of a cleaning product in the first place reduces both pollution and waste and is the hallmark of a green cleaning program. Activities such as diluting chemicals and using as little of a chemical cleaner as possible reduce the amount of product used, thereby minimizing emissions, spills, and health and safety hazards. For example, as overviewed in the previous subsection, using less floor stripper-one of the most toxic chemical products janitors use-is a good way to prevent pollution. Janitors can reduce the amount of floor stripper they use by 50 percent by:

- Scheduling floor renewal work according to wear patterns rather than following a strict cleaning calendar.
- Diluting stripper with as much water as possible while still maintaining the effectiveness of the product.
- Carefully and thoroughly applying the diluted stripper, by using a rotating pad scrubber wherever possible.
- Thoroughly rinsing the newly stripped floor to neutralize the surface before applying the new floor finish.

Janitors can reduce acid toilet bowl cleaner use by using two toilet bowl cleaners-a mild product for daily cleaning and then an acid cleaner only when necessary. Adopting this strategy could potentially decrease hazardous materials usage by 1.8 pounds per user per year. Building management also can help janitors reduce the amount of room deodorizers that they use in areas such as restrooms by making sure that the plumbing system is in good working condition. Improperly sealed toilet fixtures can be the source of malodors, rather than improper cleaning. In addition, as a general rule, the more fresh air that enters a building, the better the state of the air in that building. Fans can circulate air throughout the building and lessen reliance on chemical deodorizers. Janitors and office occupants also can minimize the use of carpet cleaners by reacting immediately to spills and spots before they have time to become permanent stains. Cleansing should start with blotting cold water on the spot, moving on to the chemical cleaning products only if necessary. In some cases, for example, when the stain is still "fresh," blotting the stain with plain water may be just as effective in removing the stain as applying a chemical cleaner. The building occupants, rather than janitor staff, might be best poised to clean up stains in this manner, because they are likely the ones who caused the stain and thus can attempt to

clean it before it dries. Building management should educate building occupants about their responsibility in this regard. When performing maintenance cleaning, janitors should use as little of the cleaning product as possible to effectively clean the area. When using deep-cleaning products, janitors should carefully apply a minimal amount of the product and give it time to work rather than adding more product. Teaching janitors the correct method of using the cleaning products can conserve products, reduce toxicity, and save money over the long term.

Match the Product with the Need

An important element of green cleaning programs is to make sure that janitors match the cleaner they are using to the job they are performing. Using an overly strong chemical product to clean a mild stain is overkill: it not only wastes the chemical cleaning product, but it also exposes the janitor to an unnecessary risk. Janitorial managers also should give guidance to their staff on conditions in which they should use less harsh or no chemical cleaners, at least initially. Janitorial staff also should be trained on the proper personal protective equipment and cleaning equipment to use in a specific job. The next two subsections address when and how janitorial employees should use personal protective safety equipment and cleaning tools.

Personal Protective Equipment

Compliance with relevant OSHA regulations is a key component of green cleaning programs. According to OSHA regulations, workers must use personal protective equipment (PPE) for the eyes, face, head, and extremities; protective clothing; respiratory devices; and protective shields and barriers, when they are using hazardous chemical materials. PPE used by janitors could include goggles or other types of face guards; gloves (made of a material appropriate for the task); long-sleeved shirts and long pants; hats; and respirators, among other equipment. Employers must assess the workplace to determine if hazards are present that necessitate the use of PPE. If such hazards are present, the employer must:

- Select and require employees to use the PPE that will protect them from the hazards
- Communicate these selection decisions to each employee
- Select PPE that properly fits each employee
- Monitor and enforce PPE use

Employers must train each employee how to use PPE. Each employee must learn when and what PPE is necessary for a particular job; how to properly wear PPE; the limitations of the PPE they are using; and the proper care and maintenance for the PPE. Employers must ensure that workers use appropriate PPE at all times in conditions where its use is warranted. Employers must

emphasize to employees that requirements specifying use of PPE are for their own safety. If a worker is not using PPE and is injured on the job, the employer will likely be held liable for any injuries. Therefore, managers must make sure workers are wearing the appropriate equipment and that those workers who fail to wear their PPE are reprimanded and corrected. If workers have complaints about PPE, such as the equipment does not fit properly or is hindering their ability to perform their jobs, management must address the complaint and either supply the worker with new, better-fitting equipment, or correct the workers' technique so PPE use is not a job hindrance.

Eye Protection

OSHA regulations state that employers must make sure that each employee uses appropriate eye or face protection, such as goggles, when exposed to eye or face hazards from liquid chemicals, acids or caustic liquids, chemical gases, or vapors. In case of accidental chemical spills into the eyes, eye-wash solution must be available within 10 seconds from where a janitor is located at any time. Because janitorial work involves moving around a whole office, and janitors may not always be located close to the eye wash station, janitors should keep a container filled with eye wash solution on their carts that is easily accessible in case of accidental exposure to toxic chemicals. The container should be instantly distinguishable from other liquid containers on the cart and must be equipped to dispense a constant stream of solution into the eye as the janitor moves toward the eye wash station. Managers should train their staff how to use eye wash solution, emphasizing that using the solution immediately after chemicals contaminate the eyes is the best way to prevent permanent damage from chemical exposure.

Respiratory Protection

OSHA requires employers to provide respirators when necessary to protect the employee's health. Employers must set up and maintain a respiratory protection program that includes worksite-specific procedures and training on how to properly use and maintain the respirator. If janitors need to use a respirator to complete a task, they need to undergo a medical evaluation.

Hand Protection

OSHA states that employers must require employees to use hand protection when employees' hands are exposed to hazards, such as those from skin absorption of harmful substances, chemical or thermal burns, and harmful temperature extremes. Employers must select hand protection equipment that is appropriate to the task, conditions present, duration of use, and the hazards and potential hazards identified. For example, nitrile gloves may be more appropriate to protect hands from liquid chemicals when the janitor is cleaning bathrooms, while plain latex or

rubber gloves may not provide an effective barrier due to the chemical properties of the product. Check with the cleaning product manufacturer to determine the appropriate type of glove to use (canvas or leather gloves may be more appropriate when the janitor is unloading materials from waste receptacles).Janitors should wear sturdy leather or canvas gloves whenever they are emptying garbage receptacles or otherwise handling waste materials. Gloves made from a heavy, durable material will protect the workers' hands from toxins if the garbage is contaminated with dangerous waste materials (such as broken glass and improperly discarded medical supplies and needles). Even in a seemingly benign office setting, janitorial workers should perform their jobs assuming that they have a chance of encountering hazardous materials in unexpected places.

Equipment

Under OSHA regulations, employers are responsible for maintaining the safe condition of all tools and equipment used by employees, including tools and equipment that employees furnish for themselves. OSHA standards do not apply specifically to other equipment frequently used by janitorial staff, such as mops and brooms, buckets, push carts, and other equipment, but OSHA requires that the employer make sure all of this equipment is in good working condition. Electrical equipment used by janitorial staff includes floor waxers and polishers, hard floor strippers, vacuum cleaners, and other equipment. OSHA requires that electrical equipment be free from recognized hazards that could cause serious physical harm or death to employees, such as frayed or exposed wires or faulty on/off switches. All electrical equipment must be durable and in good working condition and equipment should be used for purposes identified and recommended by the manufacturer or supplier. How the equipment is used on a daily basis affects green cleaning practices. For example, vacuuming and cleaning up dirt and particles as they appear can reduce the need for harsh cleaning products use over time. It also makes sense to purchase and use a vacuum cleaner that is strong enough to withstand frequent use. In general, janitorial managers should choose cleaning equipment that is:

- ***Durable-equipment*** that lasts longer and needs replacement less frequently will not be an additional burden on the waste stream.
- ***Energy efficient-using equipment*** that saves energy is another way of promoting conservation.
- ***Quiet-reducing*** noise pollution means a healthier environment for the janitorial staff.

New state-of-the-art-cleaning equipment can make janitorial cleaning tasks easier while also reducing indoor air pollutants. For example, the DOI green janitorial contract requires the selection and use of specific equipment, including vacuums with a high-efficiency particulate air (HEPA) filter, capable of trapping 99.97 percent of all airborne particles. This reduction in

airborne particles decreases the movement of allergens throughout the building. Vacuums also can replace dust mops, which often just move dust and dirt around rather than removing it. Another product that works well for deep cleaning in bathrooms or other areas of the office that have tile floors is a medium-pressure washer/vacuum. These products manufactured by Kaivak or Nobel, release a water and chemical mixture that can clean tile floors and then suction the chemical mixture to keep toxic products from being left on the floor. When selecting air freshener systems, managers should use the same criteria in selecting the product as any other cleaning product-environmentally preferable and chemically benign. The product should utilize either a battery-operated pump, or involve an automated drip or flush system. Janitors also should avoid using aerosol spray canisters. The CFCs released from these canisters are not resource-efficient because they are difficult to recycle. In addition, the propellants are flammable and can be harmful to the environment, and janitors also have little control over where the product is released. Foaming sprayers and trigger sprayers give janitors better control over where the product is released and also release less of the product than aerosol sprayers. In addition, there are some instances in which janitors should use a product apportioner or mixer that ensures that the proper amount of any given chemical is dispensed. Managers should determine what chemical products should be dispensed using such a mechanism to avoid problems with mixing incompatibility and spills. Janitorial managers also can contract with a company that will wash the cloth rags that the janitors use to apply cleaning solutions. That way, the janitors will not have to use disposable rags, and this will decrease the amount of hazardous waste that they have to handle. Because product suppliers might be involved in training management and janitorial staff on how to properly use the equipment, consideration should be given to their training ability and their expertise with green janitorial products and cleaning, in addition to price and other traditional considerations. Equipment maintenance also aids waste reduction efforts, as equipment that is properly cared for will break down less often and last longer. Janitors must heed manufacturers' directions when using equipment and tell supervisors when equipment shows signs of malfunctioning. Replacing equipment parts is less expensive-and less wasteful-than replacing an entire piece of equipment. Cleaning and storing equipment properly also will add to the equipment's life span.

Training

OSHA requires cleaning product suppliers to tell employers about any hazards associated with the chemical mixtures used in janitorial work under the so-called "Hazard Communication Standard" or "Worker Right-to-Know" regulations. Employers are responsible for educating their employees about these hazards. Information sharing can take place through container labeling and other forms of warning, Material Safety Data Sheets (MSDSs), and formal employee training programs. Janitors can carry their MSDSs in their supply carts and should be taught how

and when to consult them when the need arises. The MSDSs also should be kept in an on-site storage area that the janitors can access. For illiterate or foreign-language-speaking employees, the information in the MSDSs can be translated into pictoral format or the foreign language for easier comprehension. OSHA also outlines labeling requirements for hazardous materials. Labels must identify hazardous chemicals contained in mixtures and include written warnings, pictures, or symbols on the chemical hazards. Additionally, chemical suppliers or employers that find out any significant, new information on a chemical being used must revise the chemical's labels within 3 months, and employers must alert their employees of the new hazard. Labels also must include instructions on how to safely handle the chemical product, including appropriate hygienic practices, protective measures janitors should take when repairing contaminated equipment, and procedures for cleaning spills and leaks. Under OSHA's regulations, employers must educate employees about the hazardous chemicals and equipment they are using at the time of their initial assignment and also whenever they begin using a new, potentially hazardous, chemical or piece of equipment. Information and training can cover categories of hazards (e.g., flammability, carcinogenicity) or focus on specific chemicals. Chemical-specific information must always be available through labels on the products themselves and MSDSs. OSHA requires employee training to include at least the following:

- How to detect the presence or release of a hazardous chemical in the work area.
- The physical and health hazards of the chemicals in the work area.
- How employees can protect themselves from these hazards. This includes specific procedures that the employer has set up to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.
- The company's hazard communication program, including an explanation of the labeling system and the MSDS, and how employees can get and use the appropriate hazard educational information.

Janitor training should include information on how to minimize the amount of chemicals used for any cleaning job, how to safely mix and store the chemicals, and when product substitution and maintenance cleaning can reduce the amount of chemicals needed in a particular task. More detail on each of these ideas is included in previous sections of this chapter. Green Seal also requires that the product manufacturer, its distributor, or a third-party offer training or training materials on the proper use of the product. This training should include step-by-step instructions for the proper dilution, use, disposal, and the use of equipment. Manufacturers also should put in place product labeling systems to assist non-English-speaking or illiterate personnel and to aid employees with limited comprehension skills or mental disabilities. These labeling systems can include bilingual translations and the use of symbols, such as a "skull and crossbones" emblem to indicate that a product is toxic or hazardous, along with an explanation in the worker-training

program telling what the symbols mean. Green Seal also requires that the manufacturers' label states clearly and prominently that dilution with water from the cold tap is recommended and should also state the recommended level of dilution for each product. The manufacturer also should include detailed instructions for proper use and disposal and whether the janitorial staff should use PPE when using the product. Janitorial managers also must determine if their janitors need to receive training on how to handle bloodborne pathogens and medical supplies. OSHA does not generally consider maintenance personnel and janitorial staff employed in non-health care facilities to have occupational exposure; it is the employer's responsibility to determine which job classifications or specific tasks and procedures involve occupational exposure. For example, OSHA expects products such as discarded sanitary napkins to be discarded into waste containers lined in such a way as to prevent the janitor's contact with the contents. Overall, it is up to the management to determine what conditions the employees work under and the training they will need.

Select OSHA Training Requirements

OSHA Standard Summary of Training Required		**Frequency of Training**
Hazard Communication	Training requirements apply to all employees who may come in contact with hazardous materials at work. Employee must be trained on the potential health effects of the materials, the steps they can take to protect themselves (such as wearing PPE), and how to identify the hazard. Employees must also be trained on methods for safe handling of materials: • While using them (for example, by controlling sprays and not mixing incompatible products). • When storing them (for example, by properly sealing containers and separating incompatible products). • The procedure to follow in case of a spill (for example, who to call or what to use to clean up the spill and how to dispose of the waste). Additionally, employees must be trained on using MSDSs and product labels.	Before initial assignment, when a new hazardous material is introduced, and as frequently thereafter as required to ensure understanding.

Personal Protective Equipment (PPE)	Training requirements apply to all employees who wear personal protective gear. Employers must train employees to know which PPE to use and when to use it, how to correctly wear PPE, the limitations of the equipment, the proper care of PPE, and how to identify problems with the equipment (for example, checking for holes in a glove before putting it on). Training must be documented in writing.	The employer must provide training to any employee who wears PPE. Retraining is required when changes occur or if the employee does not retain adequate understanding.
Respiratory Protection	Training requirements apply only to employees who wear respirators (even if the use is voluntary). Employers must train any employees who wear respiratory protection on how to choose the correct respirator, the limitations of respirators, and how to clean, maintain and store respirators. Additionally, OSHA requires employees who wear respirators to be medically qualified to do so.	Training required at least annually.
Bloodborne Pathogens	Training requirements apply only to employees who are reasonably anticipated to come in contact with blood or other potentially infectious materials, primarily in medical facilities. OSHA does not generally consider discarded feminine hygiene products to fall within the definition of regulated waste. OSHA does expect such products to be discarded into waste containers, which are properly lined with plastic or wax paper bags. Such bags should protect the employees from physical contact with the contents. If employees can come in contact with blood or other potentially infectious materials at work, they must be trained on the transmission of bloodborne diseases, PPE, how to handle incidents, and signs and labels.	Employees must receive training initially. Employees that have been trained within the last year need only be trained on items not previously covered.

Asbestos	Training requirements apply to employees who perform housekeeping operations in an area containing materials made with asbestos. These employees must be trained on the health effects of asbestos, where asbestos is in the building and how to recognize it, and what to do if fibers are released. Employees must also be trained on special housekeeping requirements for cleaning if asbestos debris are present and on caring for floors that contain asbestos.	Training must be provided on initial assignment and at least annually thereafter.

OSHA does not specify required training time (hours) under these standards. OSHA does require that the training be effective and that the employees understand and retain information, and that employees are retrained as necessary when circumstances change and to ensure continued understanding.

Product Application, Handling, Storage, and Disposal

A green cleaning program can feature a host of alternative methods of applying and handling cleaning products and equipment. For example, in a green cleaning program, when floors and carpets need to be sprayed, buffed, or spot-cleaned, solutions should be applied from a sprayer in a stream, instead of a fine mist. This will minimize the amount of material atomized and potentially inhaled and reduce over-application. When floors and carpets need to be stripped, recoated, or extracted, management should notify the building occupants ahead of time. Janitorial staff should conduct major cleaning activities like these during the weekend or other extended times when the building is unoccupied. This provides enough time for the building to be ventilated prior to the return of the occupants. Building management also must determine if there is asbestos materials on the property that the janitors are cleaning and whether the janitors work in the same vicinity as the asbestos. Janitorial supervisors are required to tell their staff where any asbestos is located and its condition. Janitors should take precautions to avoid disturbing the asbestos so that it is not distributed into the air.

Product Storage Issues

OSHA limits the amount of flammable materials that can be stored in one location, though most janitorial storage cabinets probably would not exceed these limitations. OSHA's standards on container storage apply only to the storage of flammable or combustible liquids in drums or other

containers that do not exceed a 60 gallon individual capacity. OSHA also has issued the following requirements for storage rooms used to hold flammable or combustible materials:

- The room must be fire-resistant. The room must be separated from other areas of the building by walls, and the room must have a fire rating of at least 1 hour.
- Each storage room must include a ventilation system (passive or active). If an active or mechanical exhaust system is used, it must be controlled by a switch located outside of the door, and ventilating equipment and any lighting fixtures must operate from the same switch.
- If Class I flammable liquids are stored in the room, a pilot light must be installed next to the switch.
- There must be at least one clear aisle at least 3 feet wide in the room.
- Containers more than 30-gallon capacity may not be stacked upon each other.

Similar standards hold for flammable material storage cabinets or lockers as well. OSHA's standard limits the amount of materials that can be stored in one area and states that storage cabinets must be fire-resistant. The standard outlines requirements for both metal and wooden cabinets. The National Fire Prevention Association (NFPA) has a rating system for identifying hazardous chemical materials. The system is characterized by the "diamond shape" placard that identifies the hazards of a material and the degree of severity of the health, flammability, and instability hazards. Hazard severity is indicated by a numerical rating that ranges from zero, indicating a minimal hazard, to 4, indicating a severe hazard. The hazards are arranged as follows: health at nine o'clock position, flammability at twelve o'clock position, and instability at three o'clock position. In addition to the spatial orientation that can be used to distinguish the hazards, they also are color-coded as follows: blue for health, red for flammability, and yellow for instability. For more information, visit NFPA's Web site at www.nfpa.org. RCRA requires certain practices for storing and managing hazardous waste. First management needs to determine whether they may potentially "generate" a "hazardous waste" as it is defined by RCRA. Once an organization determines it may generate a regulated hazardous waste, the organization must determine its generator category (which is based on the amount of waste generated per month). Most office buildings would fall into the Conditionally Exempt Small Quantity Generator (CESQG) or Small Quantity Generator (SQG) categories. A CESQG generates no more than 220 pounds per month of hazardous waste. A SQG generates between 220 pounds and 2,200 pounds per month of hazardous waste. To remain exempt from full hazardous waste regulations that apply to Small and Large-Quantity Generators, CESQGs must accurately identify the hazardous wastes they are generating, comply with storage quantity limits, and ensure proper disposal and treatment of waste. Consider liquids to weigh comparable to water at 7.3 pounds per gallon. SQGs, and some CESQGs, need to obtain an EPA Identification Number. EPA and states use these 12-character numbers to monitor and track

hazardous waste activities. Organizations must use the identification number when they send waste off-site to be managed. To obtain an identification number, companies should contact their state hazardous waste management agency or EPA Regional Office and ask for a copy of EPA Form 8700-12, "Notification of Hazardous Waste Activity," and complete and return the form. The following techniques can make chemical storage safer, while also reducing the amounts of hazardous materials lost through discards and spills:

- Store products with incompatible ingredients separately from on another. For example, janitors should store glass cleaner containing ammonia apart from tub and tile cleaner, which contains bleach.
- If space is available, store products with acid or other strong ingredients in plastic tubs or containers so leaks will not harm the storage rack or janitor's closet or result in a discharge to the sewer system.
- Rotate the stock of stored products so the oldest ones are used first. Some janitorial products (i.e., bleach) have a specified shelf life. The purpose is to use up all products before their expiration date.

Cleaning products that are routinely stored in the office building must be kept in a well-ventilated area, and the storage containers themselves must be clearly marked to indicate their materials. The containers themselves should be in good condition, without any holes or tears, and lids should be tight fitting or sealed shut. Signage on the storage room door should indicate if the materials housed in the room are toxic or otherwise hazardous to human health and the environment. Building managers must make sure that they are complying with all local laws governing storage of potentially hazardous materials and should inform the building occupants in writing what and where materials are being stored.

Waste Disposal Issues

RCRA outlines management and disposal requirements for hazardous waste generators. To determine whether RCRA regulations are applicable, building managers first need to figure out whether the used cleaning products being disposed of by the janitorial staff are hazardous under the RCRA definition. EPA has published two handbooks for small businesses, "Understanding the Hazardous Waste Rules" and "RCRA: Reducing Risk from Waste," which provide detailed guidance on this issue. Copies can be ordered through the RCRA Hotline, at 800 424-9346 or TDD 800 533-7672.According to RCRA, waste is considered hazardous if it appears on one of four lists published by EPA. Currently, more than 400 wastes are on this list. If the waste being generated does not appear on this list, it might still be hazardous if it exhibits one of the following characteristics, which can be determined through testing or knowledge of the waste:

- ***It is an ignitable waste*** - It catches fire under certain conditions. In green cleaning programs, the preference is to use products that have a high flashpoint compared to those with a low flashpoint.
- ***It corrodes metals*** or has a very high or low pH. In green cleaning programs, the preference is to use products with a neutral pH (closer to 7) as compared to those with extreme pH (closer to 1 or 14).
- ***It is a reactive waste*** - It is unstable, explodes, or produces toxic fumes, gases, and vapors when mixed with water or under other conditions such as heat or pressure. Material Safety Data Sheets should list what chemicals in cleaning products react with other chemicals, or even non-chemicals such as water.
- ***It is a toxic waste*** - It is harmful or fatal when ingested or absorbed, or it leaches toxic chemicals into the soil.

Once a generator has determined that it generates hazardous waste as defined by RCRA, the company must follow a number of requirements, including:

- Keeping records on quantities and types of hazardous waste being generated.
- Labeling containers used to store, transport, or dispose of hazardous waste.
- Using appropriate containers for holding hazardous waste.
- Providing information on the chemicals in the hazardous waste to the waste hauler.
- Tracking hazardous waste generated to ensure it is disposed of safely.

RCRA also requires hazardous waste generators to develop a program to reduce the quantity and toxicity of the waste. The proposed method of treating, storing, or disposing of the waste must be the best method currently available to the generator to minimize the present and future threat to human health and the environment. For more information about hazardous waste management requirements, contact the RCRA Hotline, at 800 424-9346 or TDD 800 553-7672.

Chapter 4: Green Cleaning Management Approach

What is the Process for Transitioning to Green Cleaning?

The process for setting up a green cleaning program should include a number of important steps, which are briefly described in this chapter. This process can be used whether you are a building occupant, facility manager, or janitorial manager. DOI recommends the following:

- Refer to ASTM's "Standard Guide for Stewardship for the Cleaning of Commercial and Institutional Buildings" (attached).
- Learn from other agencies and municipalities who have transitioned to green cleaning (see Chapter 5 for information on federal, state, and local approaches).
- Review Appendix C of this report, which provides a checklist of items to remember when developing a stewardship plan.

Commitment

Before the program even begins, facility management must accept the leadership and stewardship role required of them to ensure a successful program. Unlike traditional janitorial programs, in which facility management's only responsibility is to ensure that the cleaning crew fulfills contractual obligations, facility management must actively participate in a green cleaning program. In fact, their lack of participation can prevent success.

Facility management commitment must not only include staff time and resources, but a commitment to invest funding, purchase new equipment and ensure its maintenance, deliver training programs, and facilitate ongoing communications with cleaning personnel. Facility management must also commit to enforcing occupant responsibilities, such as occupants abiding by policies relating to recycling, locked offices, eating, or smoking.

An initial meeting between facility management and the janitorial service providers should convey the value of green cleaning services in protecting health and safety, protecting the environment, saving money due to sick time, improving productivity, and other benefits to help facilitate buy-in for the program.

Team and Plan Development

Developing a stewardship task force is essential to the process. The task force should consist of representatives from all stakeholder groups, including the janitorial contractor and staff, facility management, environmental management personnel (if available), product suppliers, and

building occupants. Its primary role is to serve as the focal point for all greening activities, to conduct program communications, and to guide the transition.

The task force should oversee the development of a written stewardship plan, which should be reviewed and augmented throughout the process as new information, goals, priorities, and opportunities become evident.

Baseline Measures

The stewardship task force should conduct a facility survey to identify the existence of, or potential for, indoor environmental problems that are caused by or can be corrected by janitorial activities and to consider the preferability of cleaning products currently in use. This survey will set up a baseline that facility management can use to measure positive change toward the goals of improving the environment and worker and occupant health and safety.

This evaluation should review existing records such as documentation of indoor air quality complaints, Material Safety Data Sheets, safety records, heating/ventilation/air conditioning (HVAC) maintenance records, and more. It can also document cleaning needs/issues using a video camera. It should identify occupants with special needs who are affected by janitorial services, and it should investigate existing health and safety complaints or problems for both janitorial staff and occupants. It should evaluate how the building is used or should be used, and it also should include a thorough review of existing cleaning products, supplies, procedures, and equipment currently in use for their impacts on human health and the environment.

Using the information found by conducting the benchmarking study, facility managers can identify areas needing improvement or change. The stewardship plan should summarize the results of the benchmarking study.

An excellent tool to conduct this baseline study is the Indoor Air Quality Building Education and Assessment Model (I-BEAM), developed by EPA's Indoor Environments Division. This tool not only identifies issues related to janitorial services, but also provides information on the broader indoor air quality issue. Attached in Appendix C is a checklist

Find more information on EPA's Indoor Environmental Division, visit www.epa.gov/iaq.

Data Analysis

Analyzing the data collected by the stewardship task force is another key step in the process. This involves assessing health, safety, and environmental risks found by the survey, as well as cleanliness needs/problems, and building use issues.

The task force should develop a list of improvements or goals for future actions, and consider prioritizing these needs and opportunities. Options should be ranked using criteria such as:

worker safety, tenant and occupant requirements, costs, liability, regulatory compliance, implementation feasibility, time and staff limitations, appearance and performance requirements, environmental impacts, and staff experience.

Facility management should consider focusing on any findings that have an immediate threat to human health or the environment, and these issues should be addressed immediately. In addition, to encourage program buy-in from building occupants, the task force should identify some quick fixes. Occupants and visitors can readily observe these improvements and begin to appreciate the benefits of a green cleaning program.

Product Selection/Testing

The stewardship task force must evaluate products that meet the criteria, needs, and priorities outlined in the stewardship plan. By working with an existing supplier/contractor or by requesting bids or information from new suppliers/contractors, the team should consider a variety of products. The team should give special consideration or preference to products meeting Green Seal's certification standards (see Chapter 1 for more information). The task force might even want to implement a pilot study to allow the janitors to test certain products for performance. A pilot test can provide an opportunity for janitors, janitorial managers, and occupants to provide feedback. Involve the product manufacturer in these pilot tests to ensure products are being used for appropriate applications and are applied properly.

Training

Based on the specific information gathered during the survey process, building management should work with janitorial management to review and modify cleaning procedures to protect the health and safety of janitors, building occupants, and the environment. Building management also should train cleaning personnel on the proper use of the alternative products.

OSHA requires employers to provide employees with information and training on how to manage the hazardous chemicals they are using at the time of their initial assignment and whenever a new physical or health hazard is introduced into their work area. Training should emphasize the need to always follow the product manufacturer's or supplier's recommendations for use, storage, disposal, safety precautions, and first aid. (For more information on relevant OSHA standards, see Chapter 3.)

Communications

Effective communications are key to the success of a green cleaning program. Consistent, clear, persuasive messages must be directed to all stakeholders, especially during program launch.

Building occupants, in particular, must be educated about their role in ensuring a green indoor environment. They must be convinced that cleaning has a higher value beyond that of simply removing the daily trash.

Communications plans should provide opportunity for feedback, and building management should keep a log in which building occupants and cleaning personnel can register suggestions and track responses to problems and complaints. Building management also must keep occupants and cleaning personnel informed as to how they are addressing these complaints, and what role they may have in solving any problems.

Contracting for Green Cleaning

Based on the health, safety, and environmental conditions in the building or its local area, local or state requirements or priorities, cost considerations, performance considerations, or broader ideals, facility managers should be able to develop a list of attributes for cleaning products and processes. (See Chapter 2 on green cleaning products and ingredients to avoid.)

With a plan in place to transition to green cleaning, the stewardship task force should work with its contacts staff to incorporate green cleaning requirements into existing contracts or new solicitations and contracts. Building management should review and revise the existing janitorial contract to address the new environmental, health, and safety requirements identified in the stewardship plan. Building management, with the stewardship task force, will need to rework and redefine the statement of work, technical evaluation criteria, and independent government cost estimates. Because a new green cleaning contract will include new requirements, a pre-solicitation notice might be necessary to identify potential bidders with appropriate experience and expertise.

Several federal, state, and local government agencies, including DOI, the City of Santa Monica, California, and the Commonwealth of Massachusetts, have successfully awarded contracts for green cleaning. Information about how these agencies evaluated products and processes and developed a green cleaning or environmentally preferable purchasing program are outlined in Chapter 5, "Federal, State, and Local Approaches."

Tips for Transitioning to Green Cleaning

- Identify a time frame for the process of transitioning to green cleaning, usually up to 1 year.
- Do not do it all at once; consider selecting/testing a few products at a time.
- Solicit feedback from all people involved, including janitors and occupants.

- Recognize successes, including people, products, and processes.
- Consider using incentives to encourage success, for employees and/or occupants.
- Do not wait until the end of a contract to make changes-make ongoing changes throughout the life of a contract. Work with your existing contractor.
- Do not forget about recycling goal; set targets for solid waste diversion and report on results.
- Make sure janitors are using products correctly. Just because cleaning chemicals are green does not mean that they do not pose some risks.
- Write out your plan with brief and clear narrative that outlines exactly what you are doing, how it will be done, by whom, and by when (or how frequently).

Chapter 5: Federal, State, and Local Approaches

Several federal, state, and local government agencies have adopted green cleaning and/or environmentally preferable purchasing programs. This chapter provides brief summaries about these programs as examples of the various types of options that exist to reduce the health, safety, and environmental risks associated with cleaning. Visit the Web sites indicated throughout this section to learn more details about each program.

Department of Interior

In an effort to procure recycled-content products and address concerns about the indoor air quality in two headquarters buildings in downtown Washington, DC, the Department of the Interior (DOI) established a green cleaning contract for custodial services. This contract involved changing to environmentally preferable cleaning products and supplies. DOI made environmental preferability a significant factor in the selection of the new contractor and included "greening" language in the solicitation. The 5-year, $6.28 million contract (including option years) for cleaning 1.4 million square feet of office space was awarded in August 1999.

Prohibited characteristics of products to be used in cleaning include: no Chesapeake Bay Toxics of Concern, no carcinogens, and no hazardous wastes. Desirable characteristics include: minimal skin, eye, and respiratory irritation; biodegradability; avoidance of undesirable or unnecessary dyes and fragrances; and recyclable containers and minimization of non-recyclable waste.

National Park Service

The National Park Service (NPS), along with EPA Region 8 and the Wyoming Department of Environmental Quality, has established a green cleaning program at Yellowstone National Park and Grand Teton National Park. These parks significantly reduced the toxicity of janitorial products used in park operations with help from a Jackson, Wyoming, company. After evaluating the hazardous chemicals used, and some that were ordered but never used ¾ thereby requiring unnecessary storage and disposal ¾ NPS switched to products containing renewable resources, no Toxic Release Inventory chemicals; and those with VOC levels that meet or exceed California's VOC regulations for cleaning products.

Contact information:
Dianne Thiel
U.S. EPA Region 8 (8P-P3T)
999 18th St., Suite 300
Denver, CO 80202-2466
Phone: 303 312-6193 or 1-800-227-8917, Ext 6193

General Services Administration

The General Services Administration (GSA) initiated the Cleaning Products Pilot Project in 1993 to identify specific cleaning products with reduced human health and safety concerns for use in cleaning the more than 7,700 buildings overseen by GSA's Public Building Service. Officials at GSA wanted to develop a list of environmentally friendly products for daily-use cleaning, floor care systems, carpet cleaners, sweeping compounds, and de-icing compounds. Nineteen cleaning products were tested. Results of the project included the development of guiding principles to incorporate environmental preferability into procurement practices and a list of attributes that should be considered when evaluating the health, safety, and environmental friendliness of a product, including: irritation potential, chronic health risks, time to ultimate biodegradation, amount of product packaging, and presence of fragrances and dyes.

Contact information:
Mark Brady (GSA)
Phone: 817 978-3711
E-mail: mark.brady@gsa.gov

Conrad Flessner (EPA)
Phone: 202 260-3918
E-mail: flessner.conrad@epa.gov

Department of Defense

The Pentagon, headquarters of the Department of Defense (DOD), is in the process of developing performance-based specifications for three janitorial services contracts that will incorporate green cleaning standards. The Pentagon is drawing heavily from DOI's experience. One of the three contracts will be a NISH contract, and at least two will incorporate an incentive clause that will reward contractors based on good performance and innovative green cleaning ideas.

Contact Information:
Bob Cox
Chief of Technical Staff
Federal Facilities Division, Pentagon
Phone: 703 693-3765
E-mail: rcox@osd.pentagon.mil

In addition, Aberdeen Proving Ground, part of DOD, developed guidance that governs the procurement of cleaning and degreasing solvents, including using non-ozone-depleting substances, substances that are readily biodegradable, and those that have reduced toxicity.

Contact information:
Robert Solyan
Phone: 410 306-2275
E-mail: bsolyan@dshe.apg.army.mil

Commonwealth of Massachusetts

Funded by the Massachusetts Executive Office of Environmental Affairs and the Massachusetts Department of Environmental Protection, the Environmentally Preferable Product Procurement program works to establish statewide contracts for environmentally preferable products. The commonwealth focuses on products that contain recycled materials, minimize waste, conserve energy and/or water, and contain fewer toxic materials. A wide range of cleaning products, paper and plastic products, and janitorial supplies that are now available with environmentally preferable attributes. The commonwealth currently contracts for janitorial products and supplies with multiple environmental attributes, including: reduced toxicity or nontoxic formulations; recovered content and recyclability; lower concentrations of VOCs, ozone-depleting chemicals, and carcinogens; and reduced packaging.

For more information on the program, contracts, vendors, and more, visit http://www.mass.gov/anf/budget-taxes-and-procurement/procurement-info-and-res/procurement-prog-and-serv/epp-procurement-prog/.

City of Santa Monica, California

The City of Santa Monica, California, replaced its traditional cleaning products with less toxic or nontoxic alternatives in 15 of 17 cleaning product categories, which reduced the cost of custodial products by 5 percent citywide; eliminated 3,200 pounds annually of hazardous materials in products purchased; and increased morale of custodians who recognized the city's concern for their health and working conditions and who appreciate the opportunity to participate in making decisions about their work.

For a report prepared by Santa Monica on the program successes, obstacles, and plans for the future, order "The Sustainable City Progress Report" by contacting the person listed below.

Contact Information:
Dean Kubani
Phone: 310 458-2227
E-mail: dean-kubani@ci.santa-monica.ca.us

Other

Other state and local government agencies that have environmental purchasing policies include Pennsylvania; Minnesota; Bolder, Colorado; Seattle and King County, Washington; Cincinnati, Ohio; Jackson County and Kansas City, Missouri; Phoenix, Arizona; and a host of other locations.

Glossary/Acronyms

Refer also to the glossary presented in the attached ASTM standard as well as the comprehensive glossary on page 223 of the textbook, Protecting the Built Environment: Cleaning for Health.

- **ASTM (American Society for Testing and Materials)**
  ASTM is one of the largest voluntary standards development organizations in the world. ASTM is a not-for-profit organization that provides a forum for the development and publication of voluntary consensus standards for materials, products, systems, and services. ASTM develops standard test methods, specifications, practices, guides, classifications, and terminology in 130 areas covering subjects such as metals, paints, plastics, textiles, petroleum, construction, energy, the environment, consumer products, medical services and devices, computerized systems, electronics, and many others.
- **Environmentally Preferable**
  Refers to products or services having a reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. The product or service comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal.
- **EPA (U.S. Environmental Protection Agency)**
  EPA is a federal agency that implements the federal laws designed to promote public health by protecting our nation's air, water, and soil from harmful pollution. EPA also monitors the operations of other federal agencies with respect to their impact on the environment.
- **EPP (Environmentally Preferable Purchasing)**
  Refers to a federal-wide program administered by EPA that encourages and assists Executive agencies in the purchasing of environmentally preferable products and services.
- **CPG (Comprehensive Procurement Guidelines)**
  EPA's guidance to the federal government's "buy recycled" program. EPA developed lists of available recycled-content products and vendors and recommended recycled-content percentages.
- **Green Cleaning**
  A holistic approach that takes into account: (1) the health, safety, and environmental risks of products and processes associated with cleaning; (2) the mission and use of the facility to be cleaned and the behavior of facility occupants; and (3) the cleaning, maintenance, and sanitation needs of the facility.

- **IARC (International Agency for Research on Cancer)**
- **JWOD (Javits-Wagner-O'Day Act)**
  JWOD refers to the Javits-Wagner-O'Day Act, which established a mandatory source of supply for certain items for all federal government employees. Products available for sale through JWOD are manufactured by nonprofit agencies throughout the United States that employ people who are blind or have other severe disabilities.
- **MSDS (Material Safety Data Sheet)**
  Material Safety Data Sheets are designed to provide both workers and emergency personnel with the proper procedures for handling or working with certain hazardous substances. MSDS include information such as physical data (melting point, boiling point, flash point, etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill/leak procedures. These are of particular use if a spill or other accident occurs.
- **NFPA (National Fire Protection Association)**
- **NIB (National Industries for the Blind)**
  NIB is a private, not-for-profit corporation whose mission is to enhance the opportunities for economic and personal independence of persons who are blind. NIB accomplishes its mission by developing business opportunities in the federal, state, and commercial marketplaces for more than 80 nonprofit associated agencies across the United States. Items made by NIB can be purchased through JWOD.
- **NISH**
  NISH, formerly the National Industries for the Severely Handicapped, is the national nonprofit agency designated by the Committee for Purchase From People Who Are Blind Or Severely Disabled. Through JWOD, NISH develops and maintains employment and training opportunities for people with severe disabilities.
- **NTP (National Toxicology Program)**
- **OSHA (Occupational Safety and Health Administration)**
  Federal agency that requires employers to protect the health and safety of their employees, through training, use of certain procedures, development of emergency plants, and more.
- **RCRA (Resource Conservation and Recovery Act)**
  RCRA is a regulation that governs the safe management and disposal of municipal and industrial wastes generated nationwide. One part of RCRA regulates hazardous waste, from the time it is generated until its ultimate disposal. Another part of RCRA handles solid (primarily nonhazardous) waste, such as household garbage.

- **Risk**
  The measure of the probability and severity of harm to human health or the environment. It is based on the type and toxicity of the hazard in question (meaning its potential effect on plants, animals, humans, and ecosystems) and the type and degree of exposure to that hazard (based on the intensity, frequency, and duration).
- **Sick Building**
  A building in which occupants complain of health and comfort problems related to being in the building. Sick buildings are often those that have poorly managed cleaning systems. Initial poor building design or faulty furnishings can also cause problems. Five general symptoms signal that a person is spending time in an unsafe building: sensory irritation of the eyes, nose, and throat; skin irritations; neurotoxic symptoms; hypersensitivity; and odor and taste problems.
- **Toxicity**
  Describes the degree to which a substance or mixture of substances can harm humans or animals.

Appendix A: Cleaning Products and Vendors (Updated May 2003)

The following table presents a sample of cleaning products with environmental attributes. This information was compiled based on information from Green Seal, Scientific Certification Systems, the United Soy Board (for biobased products), the Committee for Purchase from People Who Are Blind or Severely Disabled, and U.S. EPA Region 9. Contact the manufacturer or vendor for complete environmental, health, and safety information.

Green Seal

Products certified by Green Seal against GS 37 Standard for Industrial and Institutional Cleaners. The standard is applicable for all-purpose, bathroom and glass cleaners. The standard establishes criteria in the following areas:

- Toxic compounds (LD50 <2,000 mg/kg, LC50 <20 mg/l)
- No carcinogens or reproductive toxins
- Skin and Eye Irritation
- Skin Sensitization
- Combustibility
- Photochemical smog, tropospheric ozone production, and indoor air quality
- Toxicity to aquatic life for algae, daphnia or fish (LC <100mg/l)
- Eutrophication
- Packaging
- Concentrate
- Fragrances
- Prohibited Ingredients (alkylphenol ethoxylates, dibutyl phthalate, heavy metals including arsenic, lead, cadmium, cobalt, chromium, mercury, nickel, or selenium, and ozone-depleting compounds)
- Training
- Animal testing

For more detailed information, visit www.greenseal.org.

Scientific Certification Systems

"The products listed as certified by SCS in the table below are biodegradable. Certifications are consistent with international standards (ISO-14021). SCS consults with the U.S. Federal Trade

Commission (FTC) to clarify claims questions, and ensures that its claims comply with the FTC's Guides for the Use of Environmental Marketing Claims under Section 5 of the FTC Act and relevant state environmental marketing guidelines. For more detailed information, visit the SCS Web site at www.scs1.com or read the FTC Guides for the Use of Environmental Marketing Claims athttps://www.ftc.gov/enforcement/rules/rulemaking-regulatory-reform-proceedings/guides-use-environmental-marketing-claims.

Biobased Product

"Biobased product" refers to a commercial or industrial product (other than food or feed) that utilizes biological or renewable domestic agricultural (plant, animal, and marine) or forestry materials. Executive Order 13101 directs US Department of Agriculture (USDA) to create a list of biobased products for acquisition by federal agencies. The draft list includes cleaning products. Until specific criteria are developed and approved by USDA, the United Soy Board list of products is proffered for consideration by federal acquisitioners. Other biobased materials are also used in cleaners, including citrus and corn. This list will be expanded as product inventories are found to cover these other types of products. Fore more information about biobased products, visit http://www.biopreferred.gov/BioPreferred/faces/catalog/Catalog.xhtml

Javits-Wagner- O'Day Act (JWOD) Product

"Federal Acquisition Regulations direct federal agencies to purchase products manufactured and sold by non-profit agencies affiliated with the National Industries for the Blind and NISH, a non-profit agency serving disabled persons. Depending on the product category, these sources may be mandatory sources for federal agencies. Often, JWOD-affiliated affiliated agencies team with commercial vendors to services, such as packaging product from bulk to retail containers, which employ blind and disabled persons. That is why some of the products may be listed as being sold both by a private company and a JWOD-affiliated agency. For more information about the JWOD products, visitwww.JWOD.gov. To access JWODs e-commerce site, visit www.JWOD.gov.

U.S. EPA Region 9 Janitorial Pollution Prevention Project

Products included in this category were reviewed for safe chemical content based on toxicology data and information from material safety data sheets. Numerous cleaning professionals also have proved them effective in on-the-job trials.

Product and Vendor List

Product	Vendor	Green Seal Cert	SCS Cert	Biobased Product	JWOD Product	Assessed by EPA Region 9
Clean-Rite Purple Power All Purpose Cleaner/Degreaser	Aiken Chemical Co., Inc. Box 1904 Greenville, SC 29602 864 968-1250 clean-rite@mindspring.com		Y			
Soy Blaster Graffiti Remover	AllChem Specialty Products, Inc. 3735 South Racine Chicago IL, 60609 Tel: 800-523-0450 Fax: 954-757-9189			Y		
noBee-300 Degreaser	American Coatings Corporation 3037 N.W. 60th St. Ft. Lauderdale FL, 33309 Tel: 800-533-0151			Y		
Archer Kleenease	Archer Petroleum 10101 J St.			Y		

	Omaha, NE 68127-1133 (402) 597-8889 (402) 597-9866 fax www.archeroil.com					
Chlor-Rid (industrial cleaner and descaler)	Chlor-Rid International P.O. Box 908 Chandler, AZ 85244 (800) 422-3217 www.chlor-rid.com		Y			
All-Purpose Cleaner (N1); Basin, Tub, and Tile Cleaner (N7) Clinging Toilet Bowl Cleaner (N8) Glass and Hard Surface Cleaner (N13) Heavy Duty Degreaser/ Cleaner (N14) Cycle Graffiti Remover (C54)	The Clean Environment Company P.O. Box 4444 Lincoln, NE 68504 800 266-2353 402 464-0988 402 464-1175 (fax) contactus@ safegreenclean.com					Y
Descale-It Bathroom Cleaner Lime-Eater	Descale-it Products 4357 S. Santa Rita Ave. Tucson, AZ 85714		Y			

Bathroom Cleaner	(520) 294-5676 www.descale-it.com					
H2Orange Concentrate 117 H2Orange2 Grout-Safe Concentrate 130	EnvirOx (Alphen) P.O. Box 19 Maple Grove Road Georgetown, IL 61846 800 281-9604 217 662-2837 (fax) http://www.enviroxclean.com/healthy-cleaning-products/h2orange2-cleaning-system/ SOLD BY: Blind Industries and Services of Maryland Kevin Vedyt (888)322-4567 www.bism.org	Y			Y	
Cleaner, Detergent	ETech Inc. Orange, CA 92867 (714) 289-2348 www.etechusa.com		Y			
Soy30 BioSolvent	Fluid Sciences, LLC 910 Harding St. Lafayette LA, 70503 Tel: 337-291-2778			Y		

	www.fluidsciences.com					
Ickee Stickee Unstuck - removes tar, grease, oil Mastic Remover Kernal Clean - glass/surface	Franmar Chemical Inc P.O. Box 97 Normal, IL 61761 (309) 452-7526 (309) 862-1005 www.franmar.com			Y		
All Purpose Cleaner Carpet and Upholstery Shampoo Mold and Mildew Cleaner AC-1000 Aqueous Cleaner Actisolv Safety Solvent Stainless Steel Cleaner Graffitti, Tar & Gum Remover Grease Trap & Drain Cleaner More Than Glass Cleaner	Gemtek* 4747 N. 12th Street Phoenix, AZ 85017 800.331.7022 Fax: 602.265.7241 http://www.gemtek.com/ Recognized by the US EPA Design for the Environment partnership program.				Y	

Safe-T Solve Concrete Cleaner Toilet Bowl Cleaner						
Patriot Power Plus 300	Hampel Oil Distributors 3727 S. West St. Wichita KS, 67217 Tel: 800-530-5848 www.hampeloil.com			Y		
Harvest Bright: All purpose cleaner Pine cleaner Tub & Tile cleaner Wood oil soap	Henneberry Marketing P.O. Box 83 El Paso, ILL 61738 (309) 527-2231 (309) 427-2230 www.newuseproducts.com			Y		
Drain-Free Buildup Remover	Heartland Labs Sussex, WI (800) 833-2334 www.heartlandlabs.com			Y		
Hilyard	Hillyard, Inc. 302 North 4th Street St. Joseph, Missouri 64501 1-800-365-1555 www.hillyard.com	Y				
Soy-Based Cleaners	IMET Corp.			Y		

and Solvents	520 S. Main St., Ste. 2519 Akron OH, 44311 Tel: 330-535-7478 http://www.imet.net					
Driveway, Sidewalk & Patio Clearner	Interchem Environmental Inc. P.O. Box 15183 Shawnee Mission, KS 66285 (913) 422-0769 (913) 422-0795 fax			Y		
Green Unikleen Degreaser	Ipax Cleanogel, Inc. 310 532-0353 www.ipax.com	Y	Y			
Safe-T-Solve	Iosso Products 1485 Lively Blvd. Elk Grove, IL 60007 (888) 747-4332 (847)437-8478 www.iosso.com			Y		
KC's Citrus; KC 2000 Multiuse Degreaser/Cleaner ECO 2000 Cleaner/Degreaser Concentrate	KC Products 707 NE Broadway, #210 Portland, OR 97232 (503) 287-4608 www. KC Products.com 800 927-9442	Y	Y			

De-Stain Carpet & Fabric Stain Remover, Tile Aid Tile and Grout Cleaner	Marinize Products Corp. 14211 N.E. 18 Ave. North Miami, FL 33181 (800) 842-4380		Y			
Soy-based Grafitti Remover	Mr. Good Chem 4609 Highland Ave. Downers Grove, IL 60515 (800) 505-5176 (630) 852-2955 www.mrgoodchem.com			Y		
Simple Soy - Cleaner/Degreaser/ w/rust inhibitor	McMaster-Carr Supply Company 6100 Fulton Industrial Atlanta, GA 30336 (404) 346-7000 (404) 349-9091 fax www.mcmaster.com			Y		
All Purpose Cleaner (NY2); Enz-Away; Cleaner Degreaser (NY3); Basin, Tub, and Tile Cleaner (NY4); Glass and Window Cleaner (NY6);	Naturally Yours 888 801-7347					Y

Clinging Toilet Bowl Cleaner (NY7)						
Eliminiator degreaser Speed Release solvent	Phase III, Inc. 916 E. Baseline Rd., Ste. 101 Mesa AZ, 85204 Tel: 480-503-2847 http://www.phaseiii.com				Y	
Planet All Purpose Cleaner	Planet Inc. 2676 Wilfert Rd., Suite 201 Victoria, B.C. V9B 5Z3 Canada(250) 478-8171 Planet@islandnet.com		Y			
Safe and Clean, a commercial, institutional product line	Restore Products 5170 St. Albans St., N Shoreview, MN 55126 (651) 765-0137 (651) 765-0029 fax www.restoreproducts.com			Y		
Enviro-Care All Purpose Cleaner Enviro-Care Tough Job Cleaner Enviro-Care Neutral	Rochester Midland 800 762-4448 www.rochestermidland.com Rich Gray Sold by: Lighthouse for the Blind,	Y			Y	Y

Disinfectant Enviro-Care Washroom and Fixture Cleaner Enviro-Care Glass Cleaner	St. Louis Rex Osborn (314) 423-4333 (413) 423-0139 (Other R-M products: Carpet/upolstery cleaner; Liqui-bac enzyme Food service cleaner Hand soap					
SOYsolv II- all purpose Graffiti Remover	Soysolv 6154 N CR 33 Tiffin, OH 44883 (800) 231-4274 (800) 992-4595 fax www.soysolv.com				Y	
Soy Green Solvent SG-1000 (grafitti, tar, mastics remover)	Soy Technologies, Inc. 2601 Webb Ave. Delray Beach, FL 33444 (561) 266-8868 www.soytek.com			Y		
Various cleaning products	Susquehanna Association for the Blind 244 North Queen St. Lancaster, PA 17603717 291-595 1717 291-9183 (fax)				Y	

Trewax Clean Multi-Purpose Cleaner/Degreaser	Trewax Consumer Products 11641 Pike St. Santa Fe Springs, CA 90670 http://www.beaumontproducts.com (562)908-0405		Y			
Eliminate Multisurface Cleaner Shower, Tub, Tile Cleaner	Unelko Corp. 14641 N. 74th St. Scottsdale, AZ 85260 www.unelko.com (480) 483-7674		Y			
777 General Purpose Cleaner	United Laboratories, Inc. 320 37th Avenue St. Charles, IL 60174 800-323-2594 Fax:630-443-2087 Web: www.beearthsmart.com					Y
VERTEC Gold Solvent	Vertec BioSolvents, Inc. 411 Business Center Dr., Ste. 111 Mt. Prospect IL, 60056 Tel: 847-803-0575 www.vertecbiosolvents.com			Y		
Brass polish	J A Wright www.jawright.com					Y

	(603) 352-2625					
Twist 'n Fill #1 Glass Cleaner Twist 'n Fill #3 Neutral Cleaner Twist 'n Fill #4 Bathroom Cleaner Twist 'n Fill #8 General Purpose Cleaner Twist 'n Fill #24 3-in-1 Floor Cleaner	3M http://www.3m.com/ SOLD BY: Blind Industries and Services of Maryland Kevin Vedyt (888)322-4567 www.bism.org	Y		Y		
20/10 Cleaner/DegreaserZ	20/10 Products Inc. P.O. Box 7609 Salem, OR 97303 503 371-0007 503 363-4296 (fax)		Y			

Appendix C: Checklist Guidance for Developing a Green Cleaning Stewardship Plan

Building managers can use the following list of questions as a guide to assess the status of their office building and cleaning efforts and to determine where to start transitioning to green cleaning activities. This checklist does not actually tell a building manager how to set up a green cleaning program, but it serves as a starting point for educating all entities involved in a green cleaning program—management, occupants, and janitors—about what they need to do to make it a successful program.

Building Considerations

- How are various areas within the building used? Determine which require the most cleaning, and why (e.g., public restrooms, kitchen areas).
- Where do people eat? (e.g., individual offices throughout the building, designated areas)
- Are there any special considerations related to the building itself (e.g., it is an historical building that has special preservation requirements or security issues)?
- Do any office furnishing have special cleaning requirements (e.g., thick carpets, antique furniture)?
- Are there any known at-risk populations who may be more adversely affected by the use of some chemicals (e.g., children, asthmatics, persons with weakened immune systems, or pregnant women)?
- Does the building have an adequate ventilation system to circulate air throughout the building?
- Does the building have any plumbing or moisture problems?
- Is there a method in place to keep dirt from entering the building in the first place (e.g., mats at the front door, double-door entryways)?

Adequacy of Current Cleaning Program

- What are issues of concern to management, cleaning personnel, and building occupants? Conduct interviews on a representative basis.
- Review the log of tenant complaints over the last year. What are the items that come up consistently?

- How is the quality of cleaning currently being evaluated/measured? How often are inspections performed? Are there trends in the deficiencies cited?

Cleaning Materials Usage

- List the janitorial products that are currently in use for each of the following applications and identify how often the cleaning task is performed and how much of the product is used per month
- Are there any reasons to change the procedure or frequency for these cleaning applications?

Environmentally Preferable Attributes of Chemical Cleaners

Use the table on the following page to evaluate each product currently in use. This chart summarizes the attributes included in the Green Seal, Inc. Standard (GS-37) on Industrial and Institutional Cleaners. Please refer to the standard for a definition of each attribute.

Product Name_____

Attribute Name	Attribute Definition
Toxic Compounds	Oral LD50 <2,000 mg/kg Inhalation LC50 <20 mg/L
Carcinogens/ Reproductive Toxins	Not listed as known, probable or possible carcinogen by IARC, NTP, U.S. EPA or OSHA. Not listed as a reproductive toxin by State of California under Safe Drinking Water and Toxic Enforcement Act.
Skin and Eye Irritation	Not corrosive to skin as tested using the Human Skin Construct systems. Not corrosive to eyes using the bovine opacity and permeability test after a 10-minute exposure.
Skin Sensitization	Not a skin sensitizer as tested by the OECD Guidelines for Testing Chemicals, Section 406.

Combustibility	Flashpoint >150°F
Photochemical/ Smog/Ozone/	Protection/Indoor Air Quality VOC content of product <1% by weight for general purpose and bathroom cleaners and <3% by weight for glass cleaners.
Toxicity to Aquatic Life	Acute LC50 for algae, daphnia or fish >100 mg/l
Aquatic Biodegradability	Each of the organic ingredients exhibits ready biodegradability in accord. with OECD definition exc. FIFRA-registered bathroom cleaner ingredient
Eutrophication	Shall not contain more than 0.5% by weight of total phosphorus.
Packaging	Package is recyclable, or can be returned and refilled.
Concentrates	Distributed in concentrate form (exc. For FIFRA-registered bathroom cleaners.
Fragrances	Fragrances are identified on MSDS and follows Code of Practice of International Fragrance Association.
Prohibited Ingredients	Does not contain: alkylphenol ethoxylates; dibutyl phthalate; heavy metals (arsenic, lead, cadmium, cobalt, chromium, mercury, nickel, or selenium); or ozone-depleting compounds.
Training	Product supported with training or training materials on proper use of product (step-by-step instructions, etc.)

Animal Testing	Non-animal test results from peer-reviewed or standard tests are acceptable to demonstrate compliance with criterion #1, 3 and 8.

* Refer to Green Seal's Standard (GS-37) for complete text of attribute definition.

Paper and Other Consumable Products

- Are the paper towels used in the bathrooms made with at least 40 percent or more postconsumer recovered fiber? Are the paper towels deinked and bleached without the use of chlorine or chlorine derivatives?
- Is the bathroom tissue made with at least 20 percent or more postconsumer recovered fiber? Is the bathroom tissue deinked and bleached without the use of chlorine or chlorine derivatives?
- Are the industrial wipers made with at least 40 percent or more postconsumer recovered fiber? Are wipers deinked and bleached without the use of chlorine or chlorine derivatives? Could reusable cloth wipers be used instead through a laundry service?
- Are the plastic trash bags made with at least 10 percent or more postconsumer plastic?
- Are there other products used in the janitorial services that are or could be made with recycled content?

Chemical Storage and Dispensing

- Where are the cleaning products stored (e.g., storage room, storage locker)?
- Do these storage areas meet OSHA requirements for the storage of hazardous materials?
- How are incompatible products identified and separated?
- Are there NFPA placards outside the storage rooms, indicating the nature of the hazards of the chemicals stored?
- How are dilution protocols established? How do you ensure the ready-to-use dilutions of each product are being mixed correctly (i.e., products are not being under diluted or over diluted)?
- Can/are dedicated dispensers or portioners being used?
- Is there an eye wash station within a 10-second walk from the chemical mixing area?

- What measures are employed to prevent and contain spills? Is there a berm or some type of secondary containment around the storage and dispensing area? Is there a cover over any drain in the room to prevent discharge of spilled material?
- Is there a spill kit containing absorbent, personnel protection equipment and other cleanup materials?
- Are emergency spill response procedures posted on the wall? Is there an emergency contact number indicated?

Worker Health and Safety Considerations

- Review worker injury records. What is the history and nature of injuries to janitors?
- Do tenants or cleaning staff have any concerns about the health effects of the products being used?
- Do any cleaning staff members have asthma or other conditions that would make them more chemically sensitive?
- Do cleaning staff know:
    -
    - Where the MSDSs are maintained?
    - How to find health effects and recommended personnel protection information on an MSDS?
    - How to handle chemical spills?
    - How to handle blood and other bodily fluids safely?
    - Where hazardous materials are stored in the building?
    - Where asbestos-containing materials are present in the building and that they are not to be disturbed?
- Are cleaning staff issued personnel protective equipment? For what cleaning applications is it issued? Do staff comply with using Personal Protective Equipment (PPE)?

Equipment Considerations

- What equipment is currently used (e.g., HEPA vacuum cleaners, hard floor strippers) and how frequently?

- What type of carpet cleaning system is used?
- Is the equipment in good condition (e.g., no frayed cords) and performing adequately?
- Is any additional equipment needed?
- Are there any places where equipment substitution is possible or advisable to improve indoor air quality (e.g., using a vacuum or wet mop instead of a broom to make sure all dust particles are picked up)?
- How could the performance of the equipment be improved?

Hazardous Waste Management

- Have you identified any routinely generated hazardous wastes? Possible hazardous wastes associated with janitorial work include: NiCad batteries, pressurized spray cans with unused product, waste solvent, and spill residues from floor stripper and or floor finish. What are the EPA waste codes for these wastes?
- Do you qualify as a conditionally-exempt small quantity generator? For more information, visit EPA's Web site athttp://www2.epa.gov/learn-issues/learn-about-waste.
- If you need one, have you obtained an EPA hazardous waste generator identification number? (If not, start by calling EPA's RCRA Hotline at 800 424-9348 or find the appropriate state office to contact at http://www2.epa.gov/home/epa-hotlines#r5-accordion-title).
- Do you have containers in good condition to hold these hazardous wastes?
- Do you have hazardous waste labels for shipment with your wastes?
- In case of you should generate hazardous waste or have a spill, have you identified an EPA-registered hazardous waste management/transporter contractor who can ship your waste to a permitted disposal/treatment facility?

Training Considerations

- Do all new janitors undergo a training program before they start working? Does the training program thoroughly address all of the possible issues janitors may face in their specific job? Is this training curriculum periodically reviewed and updated?
- Are employees getting OSHA-mandated training on:
    -
    - Hazard Communications (HAZCOM) training?

    - Hazardous Waste Operations and Emergency Response (HAZWOPER) First Response Awareness Training?
    - Bloodborne pathogens (for employees who may come in contact with blood or other infectious materials)?
    - Asbestos awareness training (for employees who perform housekeeping operations in an area containing materials made with asbestos)?
    - Personnel protective equipment?
    - Respiratory protection?
- Who does the training? Are they appropriately certified trainers?
- Are the cleaning personnel given guides depicting proper use of cleaning products and equipment? Do they understand and employ these guidelines?
- Do cleaning personnel know how and when to use personal protective equipment?
- Are janitors trained about the types of chemicals they use and health and safety issues related to these chemicals?
- Are janitors aware of the type of information provided through Material Safety Data Sheets, and do they have access to this information?
- Is bilingual training information available?
- Are janitors aware of storage and disposal issues for all the chemicals they use?
- Are janitors aware of which chemicals can and cannot mix safety with other chemicals?
- Are cleaning personnel involved with the green cleaning transition?
- How are training records maintained to ensure all personnel are up-to-date with training requirements?

Appendix D: Transition Planning, Building Management commitment, and Writing a Cleaning Stewardship Plan

The three charts in this appendix contain suggested planning prompts and action items to plan and take your initial steps after completing a Baseline Survey. You will want to create a brief Transition Plan that you can take to management to get support for changing over your operation to green cleaning. Analyze your Baseline Survey data using the "Transition Planning Prompts" below. Explain what you want to do, by when, how it should work and why your managers will be happy with the results.

The second chart will lead you through steps to build management commitment. Your change over to 'green cleaning' practices will begin in earnest when you have secured your management's understanding of and commitment to this effort. "Management" includes the property management, management of the tenant organization, the cleaning contractor's management, and that of the product vendor.

Writing your Cleaning Stewardship Plan is the subject of the last chart in this appendix, which includes a suggested outline. Documenting your green cleaning procedures in a Cleaning Stewardship Plan is important in maintaining operational continuity. The outline presented below suggests that the Plan include a policy statement, management goals, and chapters that document your environmental criteria, product selections, health and safety program, and operating procedures (addressing product use, hazardous materials management, and waste minimization).

Transition Planning Prompts	Action Items
What are the top concerns voiced by tenants, cleaning staff, and building management? Pick three priority issues in each of the following three areas: safety, cleaning quality, and environmental performance.	• Identify ways to address these issues within the first 60 days of transition, if possible. Figure out how to achieve success quickly on the items that mean the most to everyone. • Make longer term plans and identify resource needs to address issues that cannot be solved in the first 60 days. • Consider what issues remain on the table after the top

	five are taken care of. Can any of them be addressed with a quick fix? Prioritize those concerns/deficiencies remaining as part of the transition plan.
Green product substitution. Which products do you want to try switching first?	• Identify one or two cleaners to find a green substitute for first, considering the environmental/health safety analysis of your current cleaners. Don't switch them all at the same time. • Also identify a paper product to consider substituting (paper towel, bathroom tissue, wiper, etc). When looking at alternatives, remember to consider dispenser compatibility. Will the new product fit in your current dispensers? If not, will the new product vendor give you new dispensers? • Order samples from a few different vendors for each of the products you will consider switching. Try working with your current distributor.
Plan your product pilot tests.	• Choose experienced cleaning staff to test the products. • Review the MSDS with them. Point out the reduced health and safety risks with the alternative products. • Ensure that you know how to mix the products for proper dilution and that they are appropriate for the cleaning task selected. Provide the testers with use instructions. • Survey the cleaning staff after a week or so about

	how they like the product's performance and how they feel about using a safer product. Does the different smell bother them or is it less irritating? • Get samples of paper products under consideration to show building management and tenant representatives. Discuss the environmental benefits associated with these alternatives. Do they have any concerns with color and texture?
Define your training needs.	• Draft your training plan. Determine who needs which classes, for how much time, how often and taught by whom. • Budget for a qualified trainer, as appropriate, to meet your needs and get your staff prepared. • Develop a training records management system to maintain documentation, to track which employees should have what training, and to schedule class sessions so that all employees stay current with training requirements.
What OSHA plans do you need to draft or obtain from the building manager?	• Hazard Communication? • Personnel Protective Equipment? • Respiratory Protection? • Bloodborne Pathogens? • Asbestos Management?
What changes could be made	• Develop a recycling guide to help employees better

to enhance recycling efforts in the building? What diversion rate have you achieved?	understand what can and cannot be recycled in the building, where the recycling bins can be found, the goals of the recycling program, how well the building currently performs against these goals, and how each employee's contribution is important toward meeting these goals . • Promote recycling on America Recycles Day, November 15. For more information, visit http://www.americarecyclesday.org.
Building Management Commitment Prompts	**Action Items**
Are the building owner/operator and other managers interested in and committed to setting up a green cleaning program?	• Brief managers on how they can benefit from green cleaning. Include case study examples from other organizations that are doing green cleaning. • Cite any tenant or worker complaints that might be remedied through a more health-sensitive approach to cleaning. • Present your Transition Plan, highlighting the short term actions and longer term projects that would be taken to move the operation to green cleaning (based on the results and analysis of the Baseline Survey). • Identify the importance of a participatory, stewardship approach involving all stakeholders. • Ask for their support in this worthwhile endeavor, including financial (if necessary). • Promise to report back regularly on successes,

	decisions needed/made, milestones, and results.
Is there someone who has or can act as a Stewardship Coordinator?	• Identify a Stewardship Coordinator. Select someone who will have time to devote to product research and evaluation, and who can coordinate the administrative aspects of writing a Stewardship Plan and coordinating a Building Stewardship Council. If possible, this person should have or receive additional training in hazardous materials management. • Summarize roles and responsibilities for the Stewardship Coordinator. • Empower this person with sufficient time to complete the task and with decision-making authority. Ensure they have access to the Internet for research.
Is building management/contractor willing to invest financial resources to start a green cleaning program? Draft a budget for any anticipated transition costs. Possible expenditures include: new recycling bins, chemical product portioners, eye wash stations, HEPA filtered vacuums, tenant	• Draft a budget for any anticipated transition costs. Possible expenditures include: new recycling bins, chemical product portioners, eye wash stations, HEPA filtered vacuums, tenant communications/posters, etc. • Identify financial benefits that may accrue from these investments. For example, chemical portioner may prevent waste of chemical concentrate and help avoid cleanup costs. Green cleaning also may reduce workers compensation costs from injuries. • Get financial commitment to make transition a success.

Are the tenants/occupants currently involved in any aspect of building cleaning and maintenance?	• Recruit tenant representatives to participate in a Building Stewardship Council. Be sure to seek out representatives from areas of the building or offices with frequent complaints or concerns about cleaning issues. Consider asking for formal nominations from each subdivision in the building.
Are the janitorial managers and janitorial staff involved in setting up and maintaining the program?	• Involve cleaning staff. Meet with staff as part of baseline survey to identify any health or cleaning issues of concern. Assure them that they will not be penalized for participating and stating an opinion. Get them involved in testing products and providing feedback. Seek out their expertise. • Identify cleaning staff representatives to the Building Stewardship Council. Involve supervisors and staff who do different types of cleaning tasks.
Does either the cleaning contractor or building manager have a policy that states their commitment to quality service, environmentally-sensitive operations and employee health and safety?	• Draft a building and/or cleaning contractor policy that references the building's primary mission, and relates this to goals and policies toward cleaning stewardship. Policy could include commitment to establish a Building Stewardship Council involving building management, building environmental and/or safety specialists (if available), cleaning management, cleaning staff, and cleaning product suppliers.

Cleaning Stewardship Plan Outline	Contents
Building Policy	• Brief statement of commitment to support the mission of the office by ensuring a clean, healthy building, while protecting cleaning staff and operating with environmental sensitivity.
Management Goal	• Identify cleaning quality goals (i.e., no more than a minimum number of complaints or a target result in the quality assurance inspection program). • Identify waste diversion goal (i.e., target percentage of waste managed by recycling and/or recycling of specific list of commodities). • Identify worker safety goals (i.e., specific target number of injury/loss days). • Identify product goals (transition a certain number of products to environmentally preferable alternatives each year).

	• List of Personnel Organized by Labor Category, with description of roles and responsibilities, shift hours, and geographic /territory assignment.
	• Detailed statement of Stewardship Coordinator responsibilities, including:
	  o emergency preparedness and response;
	  o training development and document management;

	- monitoring of hazardous materials storage and waste management; - tracking/reporting on waste generation/recycling; - recycling education/promotion; - chemical cleaning product evaluation for environmental preferability; - issuance of personnel protection equipment and product use guidelines; - management of hazard communication and other OSHA program requirements; - development of cleaning procedures and schedule; and - coordination of Building Stewardship Committee.
Building Stewardship Committee	- Charter Building Stewardship Committee to consider and advise on environmental and cleaning issues related to the building operation. - Committee membership and recruiting, including - Building management representatives - Environmental management staff - Cleaning staff - Cleaning contractor management - Tenant representatives - Product manufacturers. - Scope of issues to be considered by Committee: - cleaning quality - indoor air quality

	○ environmental aspects of cleaning/consumable products ○ recycling efforts.. • Frequency of meeting and committee facilitation (chair, agendas, notifications, minutes, voting, etc.).
Environmental Criteria and Review of Products Selected for Use	• Define criteria used to screen both chemical cleaning and other consumable products used in the building. • Review of products selected and how they meet criteria. • Attach MSDSs and relevant product literature as appendix.
Cleaning Guidelines	• Summary table showing cleaning task, assigned product to be used, and appropriate use dilution. • Cleaning task procedure guides, including stepwise instructions to perform task, product assignment, proper dilution of product, personnel protection equipment requirements, and quality assurance criteria. • Product mixing procedures, including dilution and spill prevention methods. • Cleaning schedule, including summary of task frequency, task/rotation and inspection schedule for routine and high cleaning events, as well as equipment maintenance. • Deployment and management of cleaning use guides. How are these to be distributed and used by cleaning

	staff?

Safety and Health Program	• Summary of accident prevention program and OSHA requirements.
	• Detailed OSHA mandated plans attached as appendices, including:
	  o Hazard Communication
	  o Personnel Protective Equipment
	  o Respiratory Protection
	  o Bloodborne Pathogens
	  o Asbestos Management.

Hazardous Materials Management	• Description and maps of storage areas in use in the building. • Itemization of materials routinely stored in each area. • Identification of incompatible chemicals requiring segregation. • Description of required area standards: ventilation; secondary containment; fire rating; placarding; emergency spill procedures posting; eye wash; spill kit. • Emergency spill response procedures, including: building and local agency notification; evacuation procedures; small spill cleanup; and major spill cleanup contractor.
Hazardous Waste Management	• Identification of the types of hazardous waste

	generated • Description of proper containment, labeling • Disposal contractor to be contacted when waste is generated
Waste Minimization and Recycling	• Identification of commodities recycled. • Diagram of recycling collection bin locations and collection frequencies. • Procedures for minimization of commodity contamination. • Contractors who pick up commodities and their pick-up schedules. • Volume and participation measurement procedures. • Waste generation trends (amount generated per month). • Recycling volume and participation trends (by commodity and revenues). • Comparison of waste diversion achieved with goal. • Other waste minimization operations.
Communications	• Definition of Tenant Guidelines, including: o Eating in office space o Clean up of spills o Emergency contact numbers o Storage and use of chemicals in the building o Recycling • Promotion of recycling with incentives

Goal Measurements	• Identify tracking and reporting methods that will be used to evaluate progress towards goals set in this Stewardship Plan.