MAXIMIZE LABOR EFFICIENCES AND MINIMIZE CHEMICAL USAGE

Continual Research

Expanded Use of Chemical Management Dilution Systems

Chemical Free Stripping Technologies

Expansion of Micrafiber Program

GREEN SUSTAINABLE CLEANING PROGRAM

Continual Training and Management Education

"Mandate Cleaning Products with the Lowest Health Hazard Rating and Toxicity Levels Possible"

Enhance Customer/Staff Safety

"Cleaning For Health"

Green Cleaning

Green is defined by the federal government as “products and services that reduce health and environmental impacts compared to similar products and services used for the same purpose.” Another definition of Green Cleaning is cleaning to safeguard human health while minimizing the impact to the environment. Its goal is to protect the health of building occupants, visitors and cleaning personnel, as well as reducing polluting effects on our air and water. Unlike traditional cleaning, it goes far beyond simple appearance, focusing on products and services that have fewer adverse health and environmental impacts as compared with others that might be used for the same purpose.

Basic principles of Green Care include:

- Focus on entryways inside and out. An important goal in green cleaning is to trap and remove dirt and pollutants before they enter the building by increasing entryway cleaning frequencies.
- Minimize particles and chemicals in the air by mechanically capturing dust and dirt and applying the cleaner to the cloth rather than spraying the surface.
- Use chemical management systems for accurate product dilution. It is critical to train employees to use chemicals properly to minimize waste and maximize cleaning efficiency.
- Prevent excessive moisture and minimize possible mold growth in carpets by ensuring proper vacuuming, extraction, rinsing and drying.
- Specify high performance equipment that meets or exceed CRI or other industry performance standards. Institute a comprehensive equipment maintenance program to ensure optimal equipment performance.
- Use as many green seal products as possible while purchasing products that meet or exceed EPA Guidelines for minimal levels of recycled content.
- Increase touch-point cleaning frequencies to minimize cross contamination and indirect exposure to pathogens. Touch-points include door handles, elevators buttons, and other areas where people come in contact with the facility or its fixtures.
- Use color-coded microfiber products to reduce the use of chemicals and minimize cross-contamination.
- All staff will be required to participate in education/training in best green cleaning practices and procedures.

Cleaning for Health

Cleaning for Health (Green Cleaning/Sustainability) is a practice that concentrates on an increased focus on touch points and areas where the spread of disease viruses etc. can be spread.

The only healthy way to clean is with green cleaning. Green cleaning is more than just using “green” products. To be effective, a green cleaning program is dependent on a comprehensive approach, including chemicals, tools and equipment, procedures, paper products, trash liners, soaps and detergents. Green cleaning removes the maximum amount of indoor air pollution, germs and dirt AND leaves nothing behind in terms of harmful chemical residues

Cleaning for Health (continued

Green cleaning also requires a change in cleaning practices and equipment; for example, floors in low-traffic areas are cleaned less frequently than those in high-traffic areas, or vacuums with high-performance filters are used to prevent dirt from reentering the atmosphere.

Cleaning for Health Program Components

- Training programs
  - New Employee Orientation
  - Advanced Custodial Training
  - On the job training
  - Blood-borne pathogen cleaning protocols / Safety

- Advanced technology equipment
  - Microfiber cloths, mops, and cleaning tools
  - Mop buckets or systems that separate clean and dirty water
  - Continued research into industry trends such as accelerated hydrogen peroxide based cleaning agents that enhance sustainability
  - Comprehensive entry matting systems
  - Improve indoor air quality by utilizing high-filtration/HEPA floor care equipment, and low VOC chemicals
  - Equipment certified by the Carpet and Rug Institute—CRI
  - Maximize the use of low moisture or waterless/chemical free technology
  - Touchless cleaning technology

- Disposable Products
  - Third-party certified/sustainable forestry practices
  - Touchless restroom dispensers
  - Add Hand Dryers in new building construction standards
  - Tissue and towels on large rolls
  - Specify consumable products with high post-consumer waste/renewable fiber content
  - Right size can liners/reduced microns/mils as much as possible

- Green Products
  - Mandate products with extensive recycled content
  - Utilize products with biodegradable characteristics or low toxicity
  - Phase out of all aerosol based products

What is Sustainability?

With green our consideration is about the direct exposure from products or service to our staff and occupants. Sustainability is a much broader term that talks about the implications of those products and services used over a much longer time, and that considers the environmental, social, and financial impacts as well. **Sustainability is meeting the needs of the present generation without compromising the ability of future generations to meet their needs.**

In essence, sustainability requires the custodial operation to look at a product's entire life cycle, from cradle to grave. This means considering how raw materials were extracted, how the product was made, how the products were shipped, what types of packaging was used and the recycling or disposal of the product.

As we move from just green cleaning to Sustainable Green Cleaning, we need to expand our view of the impact on not only the **environment** but also include **economic** and **social thinking**. This concept is called the "triple bottom line" (also known as profit, planet and people). A well-managed organization should have a balance between these elements in order to truly be sustainable.

Economic (profit) - companies must be profitable to stay in business but at the same time they must be aware of their environment and their social responsibilities. We should consider processes for source reduction, increased worker productivity and lower facility maintenance costs.

Environment (planet) - we should use more renewable resources, use products with lower VOCs, conserve water and other utilities and recycle or reuse as much as possible.

Social (people) - pertains to fair and beneficial business practices toward staff, customers and the local community. Things like using greener products to lessen the negative impact on employees, good training practices, paying a living wage, working with the community to promote sustainable practices and just using the Golden Rule when dealing with people.

Why should we be concerned with Sustainable Green Cleaning?

The world's population continues to grow at a rapid rate. The population is estimated to reach 7 billion by 2012 and over 9 billion by 2050. Most of the growth will come in developing countries which means an accelerated requirement for raw materials to manufacture finished goods.

Source reduction:

- The USA comprises about 5% of the world's population and annually produces 27% of the world's garbage.
- The USA uses 6 billion pounds of chemical products yearly.
- The USA uses 4.5 billion pounds of paper products yearly.
- The USA uses 35 billion pounds of plastic liners yearly.
- The USA disposes 500 million pounds of cleaning equipment yearly.
- The USA disposes of 100 million tons of construction waste yearly.
- 80% of our time is spent indoors.

Benefits of Sustainable Green Cleaning

The primary benefit of Sustainable Green Cleaning, with its emphasis on cleaning for health, not just appearance, is a cleaner, healthier building. A healthier indoor environment translates into many concrete, bottom-line benefits (Triple Bottom Line) for building owners, managers, service personnel and building occupants.

Some examples good sustainability practices include but are not limited to:

- Reduce water
- Reducing toxic chemicals
- Reducing Energy Usage
- Using products that are made from renewable fiber, a high percentage of post consumer waste.

Green Sustainable Accomplishments

The Operations Management Team has aggressively researched and expanded utilization of sustainable, green and environmentally friendly products, methods, technologies and equipment.

These initiatives include the following:

Fiscal Year 2009 Accomplishments

⇒ **Renew Program** - This is a low pressure exterior building cleaning process that uses a non-toxic cleaning product.

⇒ **Increased use of green custodial cleaning products** - Reduced our warehouse inventory of chemicals for restrooms/showers from 20 to 7 products of which 2 are green certified and the others considered environmentally friendly.

⇒ **Increased training for our custodial staff** - We have committed to providing formal custodial training twice a year for all staff.

Fiscal Year 2010 Accomplishments - Green/Sustainable

⇒ **Purchased scrubbers** with chemical free wax stripping technologies that resulted in significant savings in labor and decreased use of chemicals.

⇒ **Initiated the usage of post recycled paper towels** campus wide at a significant cost savings.

⇒ **Negotiated a new contract for foam hand/body soap that is green sealed certified**.

⇒ **Replaced most traditional cotton cleaning materials with microfiber products** to include dust mops, wet mops, wiping cloths, and dusters.

⇒ **Introduced dual reservoir mop buckets that separates dirty water from clean**, automated battery powered riding and walk behind burnishers, and 18 inch wide vacuums.

Fiscal Year 2010 Accomplishments - Green/Sustainable (Continued)

⇒ **Introduced paint which is a direct to metal latex paint that replaces most oil based paints**, provides less odor, and cleans up with warm water without the need for thinners or solvents.

⇒ **Implemented campus-wide touch-less green foam hand sanitizing stations** to help prevent the spread of H1N1 virus and other pathogens.

⇒ **Purchased an Window Cleaning System** that uses de-ionization water filtration that is chemical free for in house use to clean windows instead of contracting out this service.

Fiscal Year 2011 Accomplishments

⇒ **Procured stand-on style vacuums.** These self-propelled stand on units are capable of cleaning 28,600 square feet per hour and exceed the capacity of traditional large walk behind vacuum's and have Hepa Filtration Systems.

⇒ **Rider vacuums** have also been purchased and increase the number of square footage that can be vacuumed in a standard work day.

⇒ **Purchased an electric work van** for the downtown paint shop. This van has zero greenhouse gas emissions, 60 miles per charge at 120 volts.

⇒ **Completed an extensive study on the use of trash can liners by considering the following factors:** high density verses low density, percentage of virgin material verses post consumer recycled content, construction techniques such as star bottom, flat bottom, exact fit technology, we considered mil and micron (thickness) of material that could be used in each specific space type which decreased the amount of plastic going into the landfill.

⇒ **Color coding micro fiber mops and cloths**, have greatly reduced the chance of cross contamination. Through our research, we found micro fiber products that can be laundered and sanitized up 500 times.

⇒ **We purchased an Adenosine Triphosphate present (ATP) Meter** which measures the level of a medium that supports the growth of germs and/or bacteria. This meter gives a numerical value as to the amount of ATP present. By utilizing this device it has allowed us to benchmark our products and cleaning procedures and get a better idea of how effective our cleaning products and procedures are.

Suggested ATP Levels of Clean	
Ultra-Clean – Critical use of surfaces/food prep area	0-10
Very Clean – Critical touch points – WVU Cleaning Standard	11-30
Somewhat Dirty – Caution: Surface should be cleaned and has some risk of contamination from disease-causing bacteria (typical mopping practices perform in this range)	31-80
Dirty – Warning: Surface needs cleaning and has medium risk of contamination from disease-causing bacteria	81-200
Very Dirty – Danger: Surface needs cleaning and has medium to high risk of contamination from disease-causing bacteria	501-1000
Filty – Danger: Surface needs cleaning and has high risk of contamination from disease-causing bacteria	>1000

Fiscal Year 2011 Accomplishments - Green/Sustainable (continued)

⇒ **Eliminated paints with high volatile organic compounds (VOC) latex paints with zero VOC Eco-Friendly paints.** This is now our primary interior paint used on campus. We have replaced 95% of all interior oil base paints on campus with a Low VOC Acrylic Latex product which has proven to be highly sustainable.

⇒ **Custodial task cards and chemical cards** were designed and issued to help ensure concise and descriptive directions which ensure that our employees follow a green cleaning process.

⇒ **We have eliminated 88 stock items** from the Facilities Management warehouse

⇒ **Research and added 16+ green and/or environmentally friendly products** Examples of these products are: hydrogen peroxide based cleaners, hand soap, hand sanitizer, body wash, microfiber cloths, floor finish, air freshener and 0% VOC paint.

⇒ **Increased post consumer waste content in:** paper towels by 40%, toilet tissue by 20%, can liners by 20%- 70%.

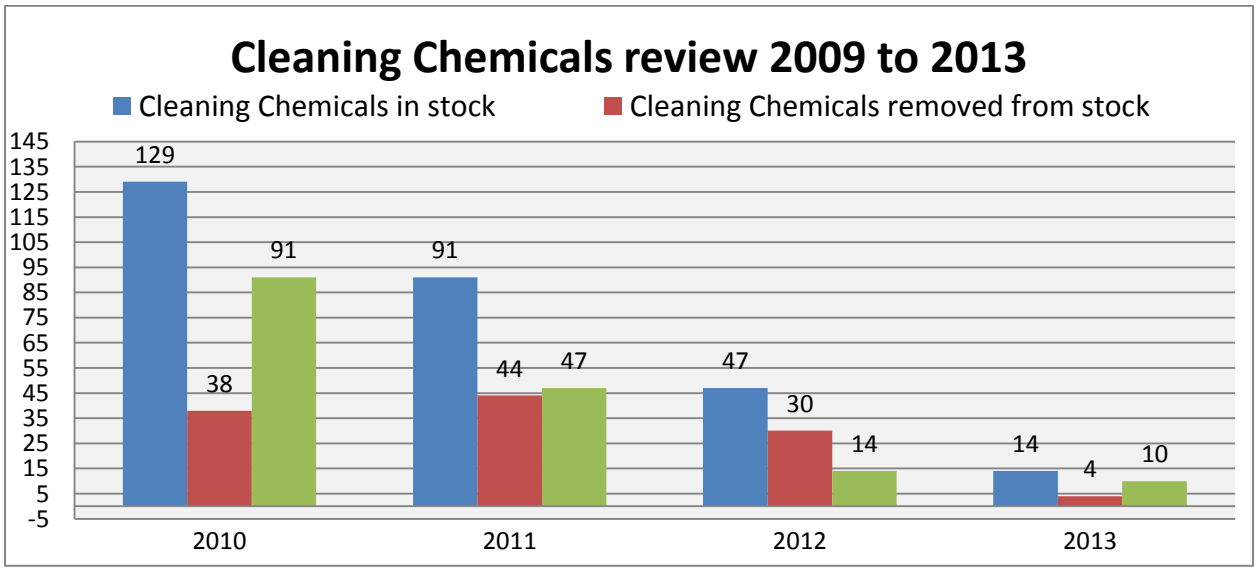
⇒ **Required floor strippers** to be free of ammonia and butyl.

⇒ **New Product - Green/Increase percentage of post-consumer content**

- Paper Towels - 40% post-consumer recycled fiber content
- Hand Sanitizer Green
- Toilet tissue - 20% post-consumer waste
- Hand Soap - Green
- Shower Soap - Green
- Can Liners - 20%-70% post-consumer waste
- Pro-Strip Stripper - Has a lower odor and has no ammonia or butyl in it

Warehouse Chemical Reduction Initiative 2009-2010-2011-2012

Since the start of our chemical reduction initiative we have went from a high of 129 chemicals in stock down to 38 today. A total reduction of 91 products



Selection and Procurement Guidelines of Green Products, Equipment, and Materials

This plan documents our commitment to purchase and use cleaning products and methods that reduce adverse impacts on public health and the environment. The goal is to minimize the amount of product used as well as the amount of waste that is created. Our paper and other green products will fall under the EPA guidelines for minimum levels of recycled content. All equipment will carry the Bronze and Silver certification by the Carpet and Rug Institute. The product recommendations included in this plan are meant to provide current examples of acceptable cleaning products; however, substitute products may be used, provided they meet the criteria set forth in this plan.

Selection Guidelines of Green Chemical Products

- Select the least toxic products that cleans a variety of surfaces.
- Use products with low VOC content (Volatile Organic Compound– the part of a product that evaporates during drying).
- Look for products with a moderate pH (a chemical scale which expresses the degree of acidity or alkalinity of water based solutions), 4 to 11.
- Avoid products containing known or suspected carcinogens.
- Ensure worker safety through extensive training and the mandated use of personal protective equipment.
- Products that leave little or no residue after cleaning.
- Products that are designed to work in cold water.
- Use single cleaning products for multiple applications.
- Choose products that are readily biodegradable. (the capability of organic matter to be decomposed by biological processes)
- Select products that are derived from renewable resources, feed stocks, such as detergents and solvents made from corn starch, coconut oil and orange peels. This will reduce the demand for petroleum.

Selection Guidelines of Paper and Other Green Products

- **Selecting paper products**—Select products with maximum recycled content. (post-consumer fiber, recovered fiber, or renewable fiber)
- **Post-Consumer Fiber**—paper, paperboard and fibrous wastes.
- **Recovered Fiber**—post consumer content as well as manufacturing wastes from the paper-making process and repulped paper and paperboard from obsolete inventories. Selecting products with the highest amount of post-consumer fiber diverts the greatest amount of paper waste from landfills.
- **Bleaching Process**—do not use paper products that have been manufactured with de-inking solvents containing chlorine or any other chemicals listed in the EPA Toxic Release Inventory.
- **Select roll towels versus C-fold towels.** Use jumbo paper for toilet and towel usage with controlled dispensing systems.

Selection Guidelines of Paper and Other Green Products (continued)

♦ **EPA guidelines for minimum levels of recycled content—Comprehensive Procurement Guidelines (CPC)**

Product Category	Post Consumer	Recovered
Toilet Tissue	20—60%	20—100%
Paper Towels	40—60%	40—100%
Industrial Wipes	40%	40—100%
Plastic Liners	10—25%	—

♦ **Use high density trash bags** versus linear low density bags made from petroleum base raw materials.

♦ **Microfiber Mops and Cloths—**Microfiber pads can attract and retain 7 times their weight in dirt and liquids. Because the fabric is highly absorbent, it can deliver and remove far more liquid to and from the floor. Due to the properties of polyamide, microfiber fabric dries in one-third the time of cotton.

Selection of Equipment

- **Vacuums**—capable of capturing 96% of particulates, 0.3 microns in size and operate at less than 70 db sound levels. Carpet & Rug Institute (CRI)
- **Extractors**—capable of removing moisture so the carpet will be dry within 24 hours and have a solution metering device to limit the amount of liquid applied. Carpet & Rug Institute (CRI). Betco FP 8 and FP 20 are CRI certified.
- **Floor machine and burnishers**—should be equipped with vacuums for capturing fine particulate and operate at less than 70 db sound levels.
- **Propane machines**—have high efficiency, low emission engines. All Betco propane equipment meets this requirement.
- **Automatic scrubbing machines**—should be equipped with a solution metering device to control the amount of liquid applied and a properly vacuuming system.
- **Battery**—powered equipment should be equipped with environmentally preferable gel or AGM batteries.
- Powered equipment should be ergonomically designed to minimize vibration, noise and user fatigue.
- Powered equipment should be designed with safeguards, such as rollers or rubber bumpers, to reduce potential damage to building surfaces.
- Historical records should be kept for all powered equipment to document purchase dates, maintenance history and equipment information sheets.

Education/Training

WVU Operations has created and implemented a training program for all of our staff from the new employee to our seasoned employee up to our Managers and Supervisors. Training will be provided to all cleaning staff for all methods and products described within this plan. Training for proper use of specific products should be provided through the product manufacturer or distributor if offered.

These training programs include:

- NEO—New Employee Orientation
- Supervisor/Employee Orientation—Specific to the exact work area
- Basic Training— includes Green Cleaning Process
  - Chemistry of Cleaning / 7 Basic Types of Cleaning Agents
  - Green Cleaning / Sustainability
  - Safety
  - Right to Know Law/NSDS Sheets
  - Acidity and Alkalinity
  - Dilution Ratios
  - Sanitization / Disinfection
  - Basic Cleaning of Restrooms / Carpet / Hard Floors
  - Cleaning With Microfiber
- Advance Training— for our Management Team
  - Strategic Initiatives
  - Balance Scorecard
  - Green Cleaning/Sustainability
  - Green Cleaning Program
  - Cleaning for Health
  - Green Cleaning Procedures
  - Product Reviews
  - Equipment and Proper Use

The Operations Leadership attends high level training at APPA, ISSA and Nationwide Seminars to provide the Leadership and Direction for the Department to maintain up-to-date and cutting edge technology.