



CLEAN SWEEP

HOW A NEW APPROACH TO
CLEANING COMMERCIAL BUILDINGS
IN THE TWIN CITIES
CAN PROTECT OUR HEALTH
AND THE ENVIRONMENT
WHILE SECURING JOBS
AND SAVING MONEY



BLUEGREEN
A L L I A N C E

EXECUTIVE SUMMARY

Global warming and toxic chemical hazards are widely acknowledged to be the biggest environmental challenges of our time. Climate change is already affecting the Great Lakes region, with average annual temperatures rising, severe rainstorms becoming more frequent, winters getting shorter, and the duration of lake ice cover decreasing.¹

Meanwhile, toxic chemicals are prevalent in our world today. They can be found in tens of thousands of products, including common cleaners used in our homes and workplaces. Many of these products contain chemicals that can harm our health by causing a wide range of ailments, especially if used every day.

The good news is that a variety of solutions to the climate crisis and to toxic chemical exposure are available right now — and many of these solutions will be beneficial to our local, state and national economies.²

In fact, the quickest, easiest, and cheapest method to fight global warming is to reduce energy waste in large buildings. Commercial and residential buildings in the U.S. account for about 40 percent of national energy consumption,³ 70 percent of electricity consumption, and 38 percent of global warming pollution — the largest share among all sectors of the economy, and far exceeding all modes of transportation.

Reducing energy consumption in large commercial and residential buildings will not, in itself, make those buildings “green.” Why? Because cleaning products used in large building to scrub floors, walls, windows, bathrooms and other indoor and outdoor areas are often highly toxic. But there is more good news here. Safe chemical substitutes, green chemicals, exist for many of the most commonly used toxic cleaning products. And these less harmful products often cost no more than their toxic counterparts.

GREEN TRANSITION

This report shows that reducing energy and toxics in commercial buildings will lead to a green future in the Twin Cities simply by adjusting how buildings are maintained.

DAY SHIFT CLEANING. By transitioning cleaning crews from the night shift to the day shift, a strategy known as Day Shift Cleaning, energy use is significantly reduced. Keeping lights and heating or cooling systems turned on throughout the night while janitors clean adds to the environmental footprint of our buildings.

With the lights off for most of the night, energy costs can fall dramatically. According to industry estimates, energy cost savings range from 4-8 percent per year. Further energy and maintenance savings are achieved through reduced use of elevators and heating and cooling systems. As energy costs rise, so do the savings from such a transition to Day Shift Cleaning.

Using the average 4-8 percent rate of annual energy cost savings associated with Day Shift Cleaning, building owners in Minneapolis and Saint Paul could potentially save as much as \$10 million each year through such a transition.⁴

Day Shift Cleaning requires no major installations or large capital investments. The only requirement is a stable and well-trained workforce.

GREEN CLEANING. Green Cleaning refers to the elimination of toxic cleaning products in favor of substitutes that are less harmful to human health and the environment, or even harmless. Green Cleaning can reduce maintenance costs, protect the environment, safeguard the health of workers and building occupants, and improve indoor air quality.

Industrial green cleaning products can be surprisingly inexpensive, even comparable in price to traditional cleaners.⁵ Cost savings are also achieved because these products are usually sold in concentrated form, saving storage space used for cleaning products, and also reducing the frequency of purchase and the cost of shipping.

Green Cleaning is doubly important when buildings shift to Day Shift Cleaning because toxic cleaning products have the potential to sicken or otherwise harm both workers and building occupants.

Green buildings can be defined as those that are designed, operated and maintained in a manner that minimizes negative environmental impacts. Day Shift Cleaning and Green Cleaning address the environmental impact of two core components of commercial cleaning. Without Green Cleaning approaches, energy savings alone cannot create a truly “green” building. And use of Green Cleaning products in a building that is wasting energy is also not “green.”

We don’t need one approach or the other; we need both.

Transitioning to these green methods cannot happen without a stable and well-trained workforce and tenant engagement. Adequate staffing levels, worker education and informed building occupants are critical to the success of an effective Day Shift Cleaning and Green Cleaning strategy.

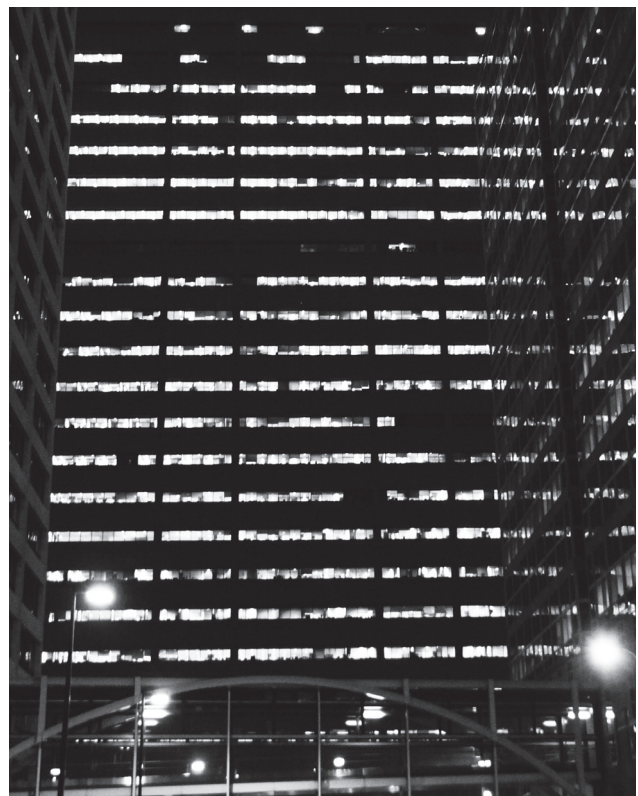
RECOMMENDATIONS

This report offers a series of recommendations that, taken together, form the basis of a plan that can simultaneously save energy and money while protecting public health and securing jobs. We believe the implementation of these recommendations will position commercial property owners and managers in the Twin Cities to become national leaders in the movement to create green buildings.

1. **Transition to Day Shift Cleaning** to reduce nighttime energy loads, global warming pollution, and cut costs. This transition should be phased in over several months, maintain staffing levels, and include an annual assessment of energy savings.
2. **Use Green Cleaning Products.** Twin Cities building owners and managers should only purchase cleaning products that are listed as the most protective in current versions of the following comprehensive green chemical certification systems:
 - Green Seal Environmental Standard for Industrial and Institutional Cleaners;⁶
 - Green Seal Environmental Standard for Industrial and Institutional Floor Care Products;
 - Terrachoice’s EcoLogo Program;

- U.S. Environmental Protection Agency (EPA) Design for the Environment Program; or
 - EPA-ACTOR database and Agency for Toxic Substances and Disease Registry (ATSDR).
3. **Train the Workforce** on the use of Green Cleaning products and methods — and to encourage and enable job-related communication with occupants.
 4. **Educate Building Occupants** about the benefits of Day Shift Cleaning and non-toxic cleaning products and engage them as partners — during the transition and for the long term.

Implementation of these recommendations can benefit all stakeholders — building owners, managers and occupants, and workers — by saving money, securing jobs and helping build a green future for the Twin Cities. The transition to energy-efficient and toxic-free buildings requires a relatively small investment when compared to the big payoff — in both economic and environmental benefits.



Hennepin County Government Center

INTRODUCTION

Today, scientists tell us that global warming will be devastating for our planet unless we can reduce greenhouse gas emissions by 80 percent by the year 2050. That's a tall order — but we ignore it at our own peril. Unmitigated global warming and the continued proliferation of toxic chemicals will have long-term social, environmental, and financial impacts for everyone — now and for generations to come.

Too often, businesses have viewed global warming pollution reduction measures as drags on economic growth. Yet economic growth and environmental protection are not mutually exclusive. This is particularly true in the world of commercial real estate, where energy inefficiency and the use of unsafe chemicals are not healthy for the bottom line.

The objective of any effort to make existing commercial real estate environmentally sustainable should therefore be to align the interests of owners, managers, and occupants — as well as the men and women who work to keep these buildings clean — in a way that achieves environmental progress, realizes significant cost savings, and improves the lives of working people.

Day Shift Cleaning can save energy simply by turning off the lights at night and integrating the cleaning of buildings into a daytime work schedule. And Green Cleaning — using the least toxic products possible — has the potential to improve indoor air quality and reduce injuries to workers using cleaning products.

These two programs should go hand-in-hand. Day Shift Cleaning conducted with hazardous products will simply substitute one environmental problem (toxic exposures) for another (energy waste). While it may still save money, it will hardly be green.

Done right, conversion to Day Shift Cleaning and utilization of green cleaning products makes good economic sense. Building owners and managers throughout the Twin Cities have the capacity to make these changes right now. Since many private and public sector buildings have already made this important change, commercial building owners and managers have clear examples to follow as they make this critical business decision.

However, this transition must be done in a way that allows cleaning workers and building tenants time to adapt to the conversion. For thousands of cleaning workers in Minneapolis and Saint Paul, this transition means more than a change in shift. It means interacting with building occupants and addressing complaints and questions during the course of the workday. For occupants, it means sharing their workspace with cleaning workers as they empty trash, wash windows, dust work surfaces, and clean bathrooms.

Adequate time and training are the most critical aspects in a successful transition to Day Shift Cleaning. Taking the time needed to phase in these programs and maintaining staffing ensures that the transition leads not only to cost savings, but improved satisfaction for building tenants and cleaning workers alike.

The transition to Day Shift Cleaning and Green Cleaning offer the Twin Cities a chance to reduce global warming pollution and improve indoor air quality in our largest commercial buildings. This report illustrates the bold possibilities of a program to adjust commercial building maintenance for environmental sustainability and a stronger workforce.

“The money I save on lighting alone is huge.”

— Dave Burrill, Director of Management, Ryan Companies, Property Management for Midtown Exchange in Minneapolis

Minneapolis St. Paul Business Journal, August 7, 2009

DAY SHIFT CLEANING

WHAT IS DAY SHIFT CLEANING?

Day shift cleaning is an alternative to the traditional model of nighttime cleaning in commercial office buildings. For years, nighttime cleaning has been the norm in commercial buildings in the Twin Cities and across the U.S. With the need to save energy greater than ever before, many building owners and managers are switching to a cleaning model where janitors perform a variety of housekeeping tasks throughout the daytime hours. During these hours, work is focused on lighter duty, such as emptying wastebaskets and cleaning bathrooms. In the early morning or early evening, janitors use vacuums, floor scrubbers, and other loud equipment, or tend to duties in high-traffic areas before or after building occupants arrive.

While day cleaning has already begun to take flight, the U.S. is still roughly five years behind the trend in Canada and Europe, according to a story published in the July 2009 newsletter of the Greater Minneapolis Building Owners & Managers Association. The newsletter reports that approximately 40 percent of buildings in Italy are cleaned during the day; in the United Kingdom, about 75 to 80 percent are cleaned during business hours; and in the Netherlands and Sweden, nearly 100 percent of commercial buildings use day cleaning.⁷

ECONOMIC AND ENVIRONMENTAL BENEFITS

Commercial and residential buildings in the U.S. account for about 40 percent of overall national energy consumption and 38 percent of global warming pollution.⁸ In fact, the built environment pumps more greenhouse gases into the atmosphere than all modes of transportation.

That is an enormous impact on the environment and to climate change, and it is why buildings and construction are the focus of global warming pollution reduction efforts. Such a high rate of consumption also means enormous opportunity for energy conservation. Under a Day Shift Cleaning program, lights are off for most of the night, heating and cooling systems operate at lower levels, and energy costs can fall dramatically.

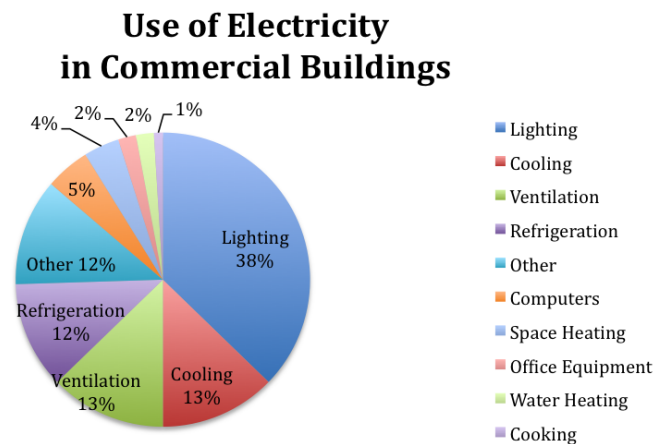
According to industry estimates, cost savings range from 4-8 percent per year when a Day Shift Cleaning program is implemented. And as energy costs rise, savings also rise.

Lighting is the main energy savings target of Day Shift Cleaning. It comprises 38 percent of a building's overall electricity consumption, according to the U.S. Department of Energy.⁹ [See Figure I, below]. Nationwide, lighting accounts for approximately \$55 billion worth of electricity each year, which is roughly equivalent to the output of 100 large power plants emitting 450 million tons of carbon dioxide.¹⁰

Moreover, the Building Owners and Managers Association (BOMA) claims that 25 percent of the weekly lighting used in a large facility, such as a high-rise office building, is used to illuminate the workplace solely for after-work and cleaning purposes.¹¹

By instituting a "lights out" policy after building occupants leave at night, significant energy savings can be achieved. Using a mid-range cost savings estimate of six percent, a large office building of 600,000 square feet with energy costs of \$2.50 per square foot could save more than \$120,000 per year on energy costs.¹²

FIGURE I



Source: U.S. Department of Energy, Energy Information Administration, Annual Energy Review, June 2008, Table 8.9.

While savings from Day Shift Cleaning are primarily attributed to lighting, they are also achieved through reduced use of elevators and Heating, Ventilation and Air Conditioning (HVAC) systems.

Energy efficiency in our country’s large cities is arguably the fastest and easiest way to help reduce global warming pollution. Across the globe, cities play an outsized role in contributing to climate change: they take up just two percent of the world’s land mass, yet are responsible for two-thirds of the world’s greenhouse gas emissions.¹³

Minneapolis and Saint Paul have nearly 50 million square feet of office space in their downtown commercial buildings alone,¹⁴ but only about two percent of it is currently cleaned during the day.¹⁵ According to Experience Exchange Reports released by the Building Owners and Managers Associations (BOMA) of Minneapolis and Saint Paul for 2008, electricity costs range from an average of \$2.44 per square foot per year in Saint Paul to \$2.60 in Minneapolis. With an average savings estimate of 4-8 percent of electrical energy costs, if Day Shift Cleaning were adopted throughout the two downtowns, ***Twin Cities building owners could save as much as \$10 million in energy costs each year*** [See Figures II & III].

FIGURE II

ESTIMATED COST SAVINGS FROM DAY SHIFT CLEANING FOR SELECTED TWIN CITIES OFFICE BUILDINGS	
BUILDING	ANNUAL SAVINGS BASED ON 4-8 PERCENT INDUSTRY AVERAGE
Normandale Lake Office Park	\$176,888 — \$353,775
IDS Center	\$145,790 — \$291,581
Capella Tower	\$145,238 — \$290,476
Wells Fargo Center	\$124,388 — \$248,775
US Bank Plaza	\$118,548 — \$237,097
33 South Sixth	\$112,491 — \$224,981
Ameriprise Financial	\$92,689 — \$185,378

Source: Building Owners and Managers Associations (BOMA) of Minneapolis and Saint Paul 2008 Experience Exchange Reports and 2009 Office Value Reports for Minneapolis and Saint Paul.

FIGURE III

ESTIMATED COST SAVINGS FROM DAY SHIFT CLEANING: DOWNTOWN MINNEAPOLIS AND SAINT PAUL					
DOWNTOWN	TOTAL OFFICE SQUARE FEET	HVAC ENERGY COST PER SQUARE FOOT	NON-HVAC ENERGY COST PER SQUARE FOOT	TOTAL ENERGY COST PER SQUARE FOOT	ANNUAL SAVINGS BASED ON 4-8 PERCENT INDUSTRY AVERAGE
MINNEAPOLIS	32,217,169	\$1.35	\$1.25	\$2.60	\$3,359,537 — \$7,055,027
SAINT PAUL	17,152,311	\$1.23	\$1.21	\$2.44	\$1,715,231 — \$3,258,939
TOTAL	49,369,480	—	—	—	\$5,074,768 — \$10,313,966

Source: Building Owners and Managers Associations (BOMA) of Minneapolis and Saint Paul: 2008 Experience Exchange Reports and 2009 Office Value Reports for Minneapolis and Saint Paul.

BENEFITS FOR BUILDING OCCUPANTS

Environmental and economic benefits are not the only benefits of Day Shift Cleaning. This strategy also creates opportunities for building occupants to address cleaning-related problems more expeditiously. With nighttime cleaning, it is all but standard to expect at least a 24-hour turnaround for the resolution of queries or complaints. Day Shift Cleaning allows for such matters to be resolved during business hours, while the cleaning staff is on site, resulting in improved communication and tenant satisfaction.

According to a study conducted by the Building Owners and Managers Association of Greater Minneapolis, ***cleaning complaints are generally reduced by 70 percent following implementation of a Day Shift Cleaning program.***

WORKFORCE BENEFITS

Day Shift Cleaning can also have a positive impact for frontline cleaning staff. Three significant benefits for workers include:

- ***A safer and healthier job.*** Night shift workers have higher rates of injuries and illnesses. For example, cumulative trauma disorders, including many back injuries, are more than three times as frequent for night shift workers. And a wide variety of occupational illnesses are more likely to occur to shift workers than to other workers — everything from hearing loss and heart disease to stress and stroke. In addition, nightshift work has recently been classified by the International Agency for Research on Cancer (IARC) as a probable carcinogen.¹⁸
- ***Improved job satisfaction.*** Workers who switch from night to day shift are able to spend more time with their families. In a member survey conducted by Service Employees International Union (SEIU) Local 26, which represents 5,000 janitors, security officers, and window cleaners in the Twin Cities, half of all janitors said they would switch to a day shift position if they could.

GREEN JOBS SHOULD BE GOOD JOBS, TOO



Marie Flores works as a janitor for Marsden Building Maintenance at Travelers in downtown Saint Paul.

Marie has worked for Marsden for six

years, at Travelers for four of those years, and for nearly that entire time, Marie worked at night. She went to work at 5:00 p.m., just as most downtown workers are leaving for the day, and worked until 1:00 a.m.

Now, Marie works a daytime shift at Travelers, from 6:00 a.m. to 2:30 p.m. “I’m very happy to have a daytime shift now, so I can go to work at a normal time and come home when it is still light out. It has been good for me, but not everyone else has been so fortunate.”

When Marie started working at Travelers, all the janitors worked eight hours per night. In the change to Day Shift Cleaning, half of the crew had their hours cut back from eight to six each day, and two were laid off. “When Travelers said they were going to go green, everyone was happy. But then everything changed — they cut hours, and did not give us any training to help make this change.”

“I am happy to have the opportunity to make our jobs green, but we also want to make sure that they are stable, 8-hour full-time jobs that can support a family for everyone, not just for some. And we should have the time and training necessary to prepare for this transition so it can be successful.”

- **Better access to public transportation.** Less frequent bus and train travel at night can be a difficult obstacle for many workers. Day Shift Cleaning can make for an easier and less expensive commute, saving workers both time and money.

Day Shift Cleaning requires no major installations or large capital investments — only a stable and well-trained workforce.

SECURITY BENEFITS

Some commercial building owners have opted to convert from night to Day Shift Cleaning for another reason: to maintain more control over security by locking the building at night.¹⁹ Day Shift Cleaning can ease tenants' security concerns regarding theft and trade secrets, since tenants and cleaning workers are working alongside one another. And according to some cleaning companies, tenants report fewer security problems.²⁰

MAKING THE TRANSITION

For Day Shift Cleaning transitions to be accomplished in a manner that is most effective for building owners and managers, and is beneficial to both building tenants and cleaning workers, they should follow these principles:

- Phase in Day Shift Cleaning over a period of several months to ensure an adequate adjustment period for the workforce;
- Maintain overall staffing levels to ensure minimal disruption for building occupants and safe and efficient operations;
- Incorporate mandatory awareness training for cleaning workers to prepare them to work alongside and interact with building occupants, including both safety and "customer service" skills such as communicating with building occupants about their job duties;
- Educate building occupants about the benefits of Day Shift Cleaning; and

- Measure and assess energy savings, as well as environmental, economic and social benefits. Pay special attention to client and worker satisfaction. This assessment should be shared with building managers, workers, and building occupants, and be used to continue to refine operations.

DAY SHIFT CLEANING TRANSITION SUCCESS STORIES

JohnsonDiversey, Wisconsin

In March, 2009, custodial operations at the Wisconsin headquarters of JohnsonDiversey, a multinational manufacturer of chemical products, transitioned to Day Shift Cleaning. The building is 277,440 square feet, with 70 percent devoted to offices, and the remaining 30 percent used for research laboratories. Because the building was designed and built in 1997 with sustainability in mind — and was certified LEED EB GOLD in 2004 — the objective was to fine-tune its energy conservation practices. Energy savings during the first six months of the program were remarkable. Energy use decreased by an average of 62,888 Kilowatt-Hours (KWh) per month, or 5.64 percent, which equates to 754,652 KWh annually. That amounts to annual cost savings of \$35,178.

Shell Centre, Calgary, Alberta, CA

In 2004, Shell Canada embarked on a transition to Day Shift Cleaning at its headquarters in Calgary. The office tower, with 640,000 square feet, was built in 1980 with over half of the building occupied by Shell employees, and the balance occupied by multiple other tenants. As a result of their conversion to Day Shift Cleaning, average annual energy savings have been an impressive 7.8 percent since 2004. In addition, surveys of building occupants indicate a 68 percent increase in tenant satisfaction.

GREEN CLEANING

Commercial buildings are cleaned not only to keep them in good repair and make them look attractive, but also to protect human health. However, janitors are often required to use products containing chemicals that are known to be hazardous to their health. Surveys of janitorial cleaning products indicate that many contain ingredients that cause harm, including cancer, reproductive disorders, skin and eye ailments, and respiratory illnesses. Hazardous products are sometimes used even when safer products are available at little or no additional cost. In addition, toxic cleaning products are one reason why indoor air is often found to be two to five times worse than outdoor air.²²

Green cleaning of commercial buildings offers a commonsense and cost-effective way to reduce toxics in the workplace and simultaneously safeguard janitorial workers and building occupants.

WHAT IS GREEN CLEANING?

Green Cleaning is defined as cleaning to protect health without harming the environment, using procedures and products to ensure cleaning is conducted for the health of building occupants, janitors, and the environment.

Green Cleaning focuses on the reduction of serious health and environmental impacts while maintaining effective cleaning practices.

While some commercial building owners and managers in the Twin Cities use green cleaning products, many do not. For this report, Material Safety Data Sheets were obtained for cleaning products now being used in commercial buildings in Minneapolis and Saint Paul. While an analysis of the MSDS sheets showed that at least some of the products could be considered “green” by third-party standard-setting organizations like Green Seal, many others contain highly hazardous chemicals and are in wide use today.²⁵ [See Figure IV.]

HEALTH AND ECONOMIC BENEFITS

The primary reason to implement a Green Cleaning program is to minimize negative health impacts on

building occupants and janitors. Much research has been conducted documenting on-the-job health hazards faced by janitors. And while front line janitorial staff are the “first and worst” exposed to hazardous chemicals in cleaning products, building tenants are also at risk.

Janitors are exposed to greater chemical hazards than many other workers because of the nature of their work. The average janitor cleaning an office building handles an estimated 28 gallons of chemicals per year, while the cleaning industry overall uses an estimated 5 billion pounds of chemicals per year.²³

Six out of every 100 janitors are injured by chemicals every year. Most are burns to the eyes and skin, in addition to respiratory and other ailments. Nationally, these injuries cost about \$75 million per year in payment for workers’ compensation claims combined with lost time from work.²⁴

COST OF GREEN CLEANING PRODUCTS

Green cleaning does not cost more than traditional cleaning methods. In fact, growing demand for these products continues to drive costs down. Environmentally friendly cleaners have come down in price and are now similar in cost to hazardous, petroleum-based chemicals. In addition, most green cleaning products come in concentrated form, thereby reducing shipping and storage costs.

According to BOMA, many of the association’s members report that a single green cleaning product will often take the place of several traditional products, reducing the need to store a variety of cleaning products and the need to educate staff on each one.³⁹

“In the past, green cleaning products were more expensive, but that is not the case anymore. At minimum the decision to use green cleaning products will be cost neutral.”

— Jason Luke, Associate Director, Custodial Support Services, Harvard Medical Center

FIGURE IV

HAZARDOUS CHEMICALS CURRENTLY USED BY CLEANING WORKERS IN COMMERCIAL BUILDINGS IN MINNEAPOLIS AND SAINT PAUL		
PRODUCT NAME	CHEMICAL	HAZARDS OF CHEMICAL
AFFLAB Get-A-Way Stripper	2-butoxyethanol	Confirmed animal carcinogen with unknown relevance to humans. ²⁶ Suspected Cardiovascular or Blood Toxicity Hazard, Suspected Developmental Toxicant, Suspected Endocrine Toxicant, Suspected Gastrointestinal or Liver Toxicant, Suspected Kidney Toxicant, Suspected Neurotoxicant, Suspected Reproductive Toxicant, Suspected Respiratory Toxicant, Suspected Skin or Sense Organ Toxicant. ²⁷
Ecolab Quick Fill 310	Ethoxylated nonylphenol	Suspected endocrine disruptor. ²⁸
	Nonylphenol ethoxylates	An example of a surfactant class that does not meet the definition of a “safer surfactant.” ²⁹
Betco Fiber Pro Red and Brown Out	Ammonium bifluoride	Causes burns by all exposure routes. May cause skeletal effects and bone destruction. ³⁰
Betco Ultra 2000	2-butoxyethanol	See AFFLAB Get-A-Way Stripper.
Ecolab Airkem Low & Behold	Heavy naphtha	Irritating to the eyes and skin, affects the central nervous system. The most likely exposure route is vapor inhalation. Adverse effects on humans include impaired balance, reaction time, speed, and memory. ³¹
Ecolab Airkem Thickened Non-Acid Bowl/Bathroom Cleaner	2-(2-butoxyethoxy) ethanol	See under Airkem Quick Fill 910.
Ecolab Quik Fill 520	2-aminoethanol	Suspected human immune and respiratory toxicant, suspected human skin toxicant, possible carcinogen, persistent, bioaccumulative hazard, suspected endocrine disruptor, asthmagen sensitizer. ³²
Betco pH7	“Nonionic surfactant”—same as ethoxylated nonylphenol	See under Ecolab Quick Fill 310.
Ecolab Quick Fill 910	2-(2-butoxyethoxy) ethanol	Suspected cardiovascular or blood toxicity hazard, suspected kidney toxicant, suspected neurotoxicant, and suspected reproductive toxicant. ³³ Causes eye irritation. May cause transient corneal injury. Causes skin irritation. May be absorbed through the skin. May cause kidney injury. Repeated exposure may cause central nervous system damage. ³⁴
	Methanesulfonic acid	A strong acid, effects probably similar to sulfuric acid (burning of skin, respiratory tract, etc.). ³⁵
	Nonylphenol surfactant	See under Ecolab Quick Fill 310.
Claire Mfg Vandalism Mark & Stain Remover	Dichloromethane	Same as methylene chloride. Cancer, acute, short-term, sub-chronic, chronic, and developmental toxic effects. Toxic by all exposure routes. ³⁶
	Tetrachloroethylene	Potential carcinogen, neurotoxicant, affects kidneys, liver, eyes, and reproductive toxicant. Suspected respiratory toxicant, suspected skin toxicant. Exposure to liquid or vapor would be problematic. ³⁷
	Toluene	Component of gasoline. Affects respiratory system, nervous system, liver, kidneys, and reproductive system. Suspected blood toxicant, gastrointestinal toxicant, immunotoxicant, skin toxicant. ³⁸

PUBLIC SECTOR LEADERS

A number of municipalities are leading the way in the implementation of green cleaning programs. For example, the City of Minneapolis adopted a Low Environmental Impact Cleaning Policy in 2007. The city reports significant cost savings in its three-year pilot test of green cleaning products. It has cited the following benefits from its green cleaning program:⁴⁰

- fewer sick days for janitors and building workers;
- increased cost savings;
- reduced liabilities;
- waste reduction;
- reduced pollution; and
- improved indoor air quality.

Long-term cost savings are projected to occur as a result of using fewer products and from the use of a metered chemical dilution system instead of dilution by hand.

The health benefits of this program go well beyond those flowing from use of safer cleaning products. In addition to the direct health benefit of decreased exposure to toxics, it has also resulted in decreased toxicity in the city's waste stream — an important improvement for anyone living downstream, especially for potential drinking water sources.⁴¹

Improved indoor air quality by decreased volatile organic compounds (VOCs) have shown to improve productivity and reduce sick time for building tenants.⁴²

MAKING THE TRANSITION

In order for Green Cleaning transitions to be most effective for building owners, managers, tenants, and cleaning workers, the process should include:

- ***Toxicity Review of Existing Cleaning Products.*** Commercial building owners and managers — in consultation with workers — should review the toxicity of cleaning products currently in use.⁴³ MSDS forms for each cleaning product should be available for review on-site.

A SAFER WORKPLACE FOR JANITORS



Blanca Pineda works as a janitor in Roseville, and has been at her building for almost five years.

Three months ago, Blanca was assigned to clean restrooms, using different chemical cleaners than she had used in the past.

Since then, Blanca has lost her sense of smell, and has felt sick when using these chemicals.

Buildings should use green cleaning products that are not only safer for janitors, but also safer for tenants and the public.

- ***Implement a Toxic Exposure Reduction Program.***

A comprehensive program should be based on the widely-accepted “hierarchy of controls,” which ranks the following strategies from most effective to least effective:

1. eliminate toxic products;
2. substitute safer products for those that are less safe;
3. engineer controls (such as local exhaust systems or enclosures);
4. limit the time workers are exposed to hazards; and
5. provide personal protective equipment, which is the strategy of last resort.⁴⁴

The program should also include comprehensive worker training about indoor air quality and green chemistry.⁴⁵

PURCHASE OF GREEN CLEANING PRODUCTS

Some owners and managers in the Twin Cities are already using green cleaning products for all or some of their work. But green cleaning products should become the industry standard, and all Twin Cities building owners and managers should use the following comprehensive green chemical certification programs to identify and buy only the safest possible products:

- Green Seal Environmental Standard for Industrial and Institutional Cleaners;⁴⁶
- Green Seal Environmental Standard for Industrial and Institutional Floor Care Products;
- Terrachoice’s EcoLogo Program;
- U.S. Environmental Protection Agency (EPA) Design for the Environment Program; or
- EPA-ACTOR database and Agency for Toxic Substances and Disease Registry (ATSDR).

These chemical standards help ensure use of the least toxic products available. By evaluating products and purchasing the least toxic cleaner available, institutions can reduce the risk to workers and the protect environment while maintaining high-quality cleaning standards.

BUILT-IN SAFETY

Green Seal and **Terrachoice’s EcoLogo** program are national organizations that set standards and perform third-party certification of chemical products and processes to reduce toxic pollution and exposures. **EPA’s Design for the Environment** program is similar, but is a government-run venture. All three initiatives independently analyze chemicals and certify them as “green” only if the products prove to have a reduced impact on workers, building occupants, and the environment.

It is worth noting that even “green” chemicals can be harmful if not used properly. For example, most of the exposure limits included in the Green Seal standard are based on an assumption that products will be diluted properly. But if they are not, then some of the Green Seal certified products can certainly be hazardous. And the same is true for products certified by the other rating organizations.

For this reason, the safest alternative in some cases may be a non-chemical process or strategy. Two widely-used examples include:

- Chemical-free floor scrubbing machines that ionize water molecules, and the positive and negative charge attracts dirt and dust; and
- Microfiber mops made of tiny fibers, which makes the fabric very absorbent, so the mop holds plenty of water for cleaning, but doesn’t drip. As with the floor scrubbers, the mop’s microfibers have a positive charge that attracts dirt and dust.

RECOMMENDATIONS

1. **Transition to Day Shift Cleaning** to reduce nighttime energy loads, reduce global warming pollution, and cut costs. This transition should:

- Phase in over a period of several months to ensure an adequate adjustment period for the workforce;
- Maintain overall staffing levels to ensure minimal disruption for building occupants and safe, efficient operations; and
- Measure energy savings realized by building owners, as well as environmental, economic and social benefits. Include a focus on client and worker satisfaction, such as improved communication, access to public transportation, and family-friendly work hours. This assessment should be shared with building managers, workers, building occupants and the public.

2. **Switch to Green Cleaning Products.** Commercial building owners and managers — in consultation with workers — should evaluate health risks of cleaning products and make findings available to workers and to building occupants.⁴⁷ They should also develop and implement a comprehensive hazard prevention program based on the widely-accepted “hierarchy of controls.”

Green cleaning products should become the industry standard, and all Twin Cities building owners and managers should use the following comprehensive green chemical certification programs to identify and buy only the safest possible products: Green Seal Environmental Standard for Industrial and Institutional Cleaners;⁴⁸ Green Seal Environmental Standard for Industrial and Institutional Floor Care Products; Terrachoice’s EcoLogo Program; U.S. Environmental Protection Agency (EPA) Design for the Environment Program; or EPA-ACTOR database and Agency for Toxic Substances and Disease Registry (ATSDR).

3. **Train the Workforce.** To ensure that buildings are cleaned safely, workers should receive employer-paid training about lighting, electricity and energy conservation, indoor air quality, and the use of green cleaning products.⁴⁹ In addition, the transition to

daytime work will require more interaction between cleaning crews and building occupants, so for those workers with limited English language proficiency, employers should provide training in language and communication skills specific to their jobs.

4. **Educate Building Occupants.** Day cleaning saves energy, but it also means that maintenance staff works during the day — and will therefore be working alongside building occupants. Building owners and managers should keep occupants informed about the transition and implementation of day cleaning and green cleaning plans so they can become partners in the process of making their workplaces green. Overall, the transition to Day Shift Cleaning should result in improved communication between cleaning teams and building tenants, and improved satisfaction by clients.

By implementing Day Shift Cleaning and Green Cleaning strategies, building owners and managers in the Twin Cities have an opportunity reduce global warming pollution and toxic exposure, save money, and operate sustainable, high-performance properties. These low-cost practices require virtually no capital investment — only a stable and well-trained workforce. The result will not only be significant cost-savings, but also improved health and satisfaction for both workers and tenants.

ENDNOTES

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