13th Annual Governor's Pollution Prevention Awards

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The 1999 Governor's Pollution Prevention Awards are presented to honor businesses and other organizations in Illinois that have successfully reduced the generation of wastes and the use of toxic chemicals. These wastes include toxic air contaminants, wastewaters, infectious wastes, energy, plus hazardous and other industrial process wastes. By recognizing the outstanding achievements of these organizations in pollution prevention, it is our hope that others will be encouraged to do their share in preventing pollution at the source.

Since 1987, the Illinois Waste Management and Research Center has worked with the Governor's Office and the Illinois Environmental Protection Agency to recognize outstanding pollution prevention efforts in our state. By adopting pollution prevention strategies, it has been shown that businesses can increase the efficiency of their operations and reduce their impact on the environment. Categories in the Governor's Pollution Prevention Awards include small, medium, and large industries, trade organizations, vendors/suppliers, communities, educational institutions, service organizations and continous improvement in each of the above groups.

13th Annual Governor's Pollution Prevention Award Winners

1999 Governor's Pollution Prevention Award Winners

Vendor Category

Nalco Chemical Company

Nalco Chemical is the world's largest provider of water treatment products and services. Industrial water treatment is necessary for energy conservation and to ensure a sustainable global supply of freshwater. Far more chlorine is used to control microbial fouling in industrial water compared to any other chemical. An environmentally sensible chlorine alternative is needed because handling the gas is hazardous, the liquid is not stable, combined residuals are not effective, free residuals do not control biofilms, and disinfection by-products are toxic. STABREX ™ Microorganism Control Chemical is less toxic, less volatile, easier to handle, more compatible with other water treatment chemicals, more effective again biofilms, and generates less than half the disinfection by-products compared to other alternatives.

One hundred billion gallons of industrial water have been successfully treated since worldwide commercial introduction of this new product in May 1997. The product is the first biomimetic industrial biocide, having been designed to imitate the stabilized bromine antimicrobials produced in mammalian immune systems, and it is the only stabilized liquid bromine product in the world. Scientific validity and commercial significance have been recognized by industry observers and featured in the press.

Roscoe Company

The Roscoe Company, a commercial laundry on Chicago's west side created its Washroom Efficiency Initiative to analyze and improve the company's use of

water and energy resources while preventing environmental pollution. In the last year, three major projects have resulted in significant impacts. Reuse of washroom water, introduction of low-temperature washing and revised sludge-removal methods have all contributed to a large reduction in water and energy use and waste.

An analysis of Roscoe's mechanical shop showed that restructuring water flow to reclaim water used in cooling processes would yield a substantial drop in water disposal. Consumption was reduced by 8% annually, or approximately 1.7 million gallons.

Another energy and resource-conserving innovation is Roscoe's low-temperature washing system. Traditional laundry is washed at 160°. By using lower pH washroom chemicals, Roscoe was able to drop their wash temperatures to 140°. The temperature reduction results in lower water use, less wear on the garment, fewer surface wrinkles and the lower pH chemicals require less treatment.

The final project at Roscoe involved redesigning their method for sludge-handling – resulting in more efficient separation of the dry sludge and the reusable water. The new methods have shown a reduction of 34% in the volume of Roscoe's sludge disposal.

Service Organization Category

Murco Recycling Enterprises, Inc.

Murco Recycling Enteriprises, Inc., conducts one-day on-site demolition auctions at homes before they get demolished. Their purpose is to re-circulate all the building and landscaping materials to people who can use these goods to improve their own homes. This significantly reduces the amount of demolition materials sent to the landfills, helps the owner of a property offset his demolition costs, and opens up a new market for the reuse of building materials. Murco has established itself as a conduit between those who are in need of inexpensive materials and those who are looking to dispose of them. Auctions are open to everyone, with a strong following from the "HomeWreckers Club," composed of individuals on Murco's mailing list who get advanced notice of auctions with flyers detailing what will be available at each auction. Buyers remove the materials they have won in the auction themselves, building in sweat equity along with the 10 to 25 cents on the dollar they usually pay on the materials purchased.

Common building materials dispersed include hardwood flooring, doors, windows, appliances such as hot water heaters, furnaces, stoves, landscaping, etc. In 1998, the company diverted 7,488 square feet of carpeting, 270 doors, 5 clay time roofs, 191 bathrooms, 21,600 square feet of wooden floors, 126 windows, 87 sets of cabinets, and 405 appliances. Demolitions yield roughly 36 tons of wood and materials. The company estimates they diverted 2,320 cubic yards of usable materials from the landfills. Just as important, they have given people an unconventional way to help themselves by improving their living conditions in a highly cost-effective manner.

VA Chicago Health Care System

The VA Chicago Health Care System has been committed to eliminating the presence of mercury and mercury compounds within their facilities. To meet their goal of being mercury-free they have: replaced all mercury sphygmomanometers with electronic or aneroid units; purchased only low mercury florescent lights; purchased only cadmium-free red biohazard waste liners; purchased only cleaning chemicals certified as mercury-free with disclosure statements required from the vendor prior to consideration for purchase; and, mercury spills have been eliminated.

All employees received training in waste awareness as part of the new employee orientation and annual refresher training as well. Even without much incentive economically for mercury reduction, the VA Chicago Health Care System sees their main reward as the benefit to the environment from eliminating mercury releases.

Small Facility Category

Ace Plating Company

Ace Plating Company is a small Chicago job shop offering a variety of decorative electroplating finishes including various types of brass, nickel, bronze and copper. The project they undertook was to reduce water discharge to the sewer and also to reduce metals loading in that discharge water. The project evolved to include zero process water discharge as an objective. After various laboratory, pilot lab and on-site testing, an electro-coagulation process was selected and installed.

This system went into operation in September 1997 and has greatly helped in recycling and cleaning rinse waters over long periods of time. The system consists of media filters which remove metals, ultraviolet light which kills bacteria and oxygenates the water to keep it fresh, carbon filtration which helps remove cyanide and organic contamination, and electro-coagulation. The unit removes metals and undissolved contaminants from the water. The media filters are backflushed and the contaminants settle and are removed from the backflush solution. Since September 1997, Ace has been close to achieving zero discharge, only batch discharging intermittently, as part of the analysis of the system's performance.

Ace has reduced annual water consumption from over 5 million gallons to 673,000 gallons in 1998. This

is an 87% reduction while maintaining compliance with discharge effluent limitations. Product quality has been maintained and the rinse tanks are cleaner. By the end of 1998, Ace achieved a 99% reduction in the amount of metals sent to sewer from 182.49 lbs in 1994 to .55 lbs for 1998. From 1994 through 1998, Ace reduced its annual water expense by $7,481 and also saw savings due to a reduction in the annual Extraordinary Monitoring and Enforcement user charge. A current annual savings of $15,412 (1998 compared to 1994) is now achieved.

Daubert Chemical Company, Inc.

Daubert Chemical Company's Governor's Award is the culmination of efforts begun in 1996 to agressively reduce the amount of waste generated at their facility in Chicago. Better use of materials, segregation of waste streams, recycling washes, upgrading equipment, educational programs and compatability assessment were all components of the company-wide initiative.

Company-wide involvement and dedication at all levels set the stage for Daubert's success. Full commitment from production management, including authorization of additional purchases, time for training and establishing awards for achieved goals was in place from the beginning of the program in 1996. Company employees are all involved directly with waste prevention efforts, from planning to training to actual practices. The results were, and continue to be dramatic.

Reductions of 63% were realized in waste drums shipped offsite over the 3 year period. The hazardous waste stream is down 90% over the same time. Total elimination of tote wash, metalworking line flush and Methylene Chloride standing losses from storage were achieved. The overall, direct economic savings of the programs are running at approximately $442,500/year.

SWD, Inc. Fastener Sorting Corporation

SWD, a metal finisher, built a new facility incorporating environmental innovations such as: exposed steel coated with foam and ceramics to prevent corrosion; sloped floor for containment in the plating area; a waste treatment plant 16 ft. below grade allowing for a gravity feed system that eliminates the pumping of liquids, thus conserving electrical energy and eliminating pump-related process failures; a ventilating system with scrubbers inside the building that prevents possible storm water contamination; the most efficient lighting and compressed air systems available; and a combination heating and make-up air system.

Hazardous waste is no longer produced as the company eliminated all red label products, all cyanide processes and products, and all chlorinated solvents. All sludges and waste streams are non-hazardous and the three air scrubbers eliminate 98% of all emissions. The use of recycled water reduces the water bill by 40%, resulting is savings of $32,200/year. The high efficiency air compressor and lighting systems reduce the electric bill by 20% for a savings of $28,400, and by eliminating the chemistries that produced hazardous waste, the company saves $179,000 annually in disposal costs.

Large Facility Category

Avon Products, Inc.

Avon has a corporate policy in place that documents the company's responsibility to the environment. Management at the Morton Grove facility has supported every waste minimization initiative proposed. Some of the activities undertaken at this cosmetic production facility include retrofitting with energy-efficient lighting and ballasts in several areas of the plant resulting in replacement of 3,068 bulbs and 297 pounds of ballast that should save approximately

$3,000 per year in electricity costs. In 1998, there were 136,786 pounds of plastic trays used for holding empty mascara bottles returned to the vendor for reuse. Besides saving $4,894 in disposal costs by diverting 660 cubic yards of waste from the landfill, Avon also received over $40,000 in credits from the vendor.

The packaging material received with empty sample pouches is also returned to the vendor for reuse, saving another 150 cubic yards of landfill disposal. Hazardous waste generation will be cut by one-third with the material substitution to a solvent that is non-hazardous and can be washed down the drain. Sixteen drums of off-spec alcohol were reused through providing some of the materials to another company for their use and by using in-house rather than spending on new alcohol. This initiative equals a net savings of $2,667. In another reuse effort, three skids of obsolete cuticle gloves were used to replace cotton gloves used on the packaging floor, eliminating both the cost for disposal and $1,300 in purchasing new gloves.

In 1998, this Avon facility received $191,106 in credits for items that were recycled and reused, plus they avoided placing 24,730 cubic yards of material in the landfill and saved $176,402 in disposal costs.

Caterpillar Inc.—Mapleton Plant

Caterpillar's Mapleton Plant is a gray iron foundry, producing primarily engine blocks, heads, liners, and camshafts. The foundry operates both wet and dry dust collectors to remove particulates and pollutants from exhaust air. Dirty water discharged from wet dust collectors is treated at the main wastewater treatment facility, which can directly discharge treated water to the Illinois River.

This facility set a goal to successfully convert their Dust Collector Wastewater (DCWW) treatment from a once-through system, which treated and discharged all of the water to the Illinois River, to a recycle system

that would reduce the volume of water receiving full treatment, reuse most of the water, and discharge less than 5% of the total water volume to the Illinois River.

The move to the recycle system included conversion of existing equipment to new uses, upgrading the activated carbon filtration system to 3-stage operation, building two large new tanks, installing a large pump station, redesigning complex electronic control systems, and repiping portions of the plant. This was a capital intense project of $3.6 million.

Results from this conversion include a decrease in discharge from 1,230,000 gallons per day to 45,000 gallons per day. A filter press added to process sludge has effectively produced a very dry sludge, reducing disposal costs. The efficiency of all filtration equipment has increased by operating at lower flow rates and carbon usage shows a 61% reduction. The system has also improved compliance with discharge limits with no exceedances for the period of January 1997 to March 1999.

Economic benefits come from four specific areas including reduced activated carbon usage, reduced pumping as the river water pumping rate has decreased by 2,000 gallons per minute due to water recycling, reduced zebra mussel chlorination/dechlorination (chlorine is used to kill the Zebra mussels and most be removed from the water before discharge back to the river), and reduced lab costs due to no further need for specialized lab analysis. In total, these cost savings come to $241,000 annually.

Scott Air Force Base

Scott AFB and the 375th Airlift Wing provides "Help From Above" through the aeromedical airlift and transportation of government officials and cargo. The base also hosts five headquarters: U.S. Transportation Command; Air Mobility Command; Air Force Communications Agency; Defense Information Tech-

nology Contracting Office, and Air Force Office of Special Investigations 3rd Field Infestigations Region. "Team Scott" has implemented a wide array of environmental management efforts that cover the spectrum of issues facing any large corporation. Highlighted below are just a few of the efforts underway at Scott AFB.

Pollution Prevention: The Hazardous Materials Pharmacy (HAZMART) employs a 'cradle-to-grave' management system that has contributed significantly to the reduction of not only the use of hazardous materials but also their associated wastes.

The base implemented a test project in which truck bedding is replaced with plastic lumber for a cost of $183/truck. The plastic lumber has a life-cycle of 10 years with no required maintenance as opposed to the former use of lumber with a four year life-cycle and a yearly application of a chemical preservative.

Air Pollution Control: Processes that produce air pollutants at Scott include aircraft, automobiles, heavy equipment, boilers, a medical waste incinerator, and vehicle and aircraft painting operations. New efficient gas-burning boilers have been installed reducing natural gas consumption by 9 million kilocubic feet per year and have improved air quality by significantly reducing emissions of regulated pollutants.

Air Force staff have also reclaimed 98% of anti-freeze from base cooling units. This process has saved over $10,000 in disposal and purchase costs so far and has prompted Scott to retrofit equipment to use non-ozone depleting refrigerants wherever possible.

Waste Management and Resource Recovery: A combined effort with HAZMART resulted in savings of over $180,000 in hazardous waste disposal costs by redistributing materials with expired shelf life to other organizations with similar approved processes. This model reuse program involves many base functions

and saved $9,000 through avoiding purchases and disposal costs. An oil filter recycling program was developed for the Transportation Squadron and the base Auto Skills Center which recycled 5,250 pounds of filters in a 15-month period.

Warner Electric, Industrial Products Division

The Roscoe plant of Warner Electric designs, manufactures and assembles clutch and brake assemblies for use in the automotive, garden tractor, and industrial markets throughout the world. Their manufacturing processes include stamping, metalworking, grinding, welding, assembly and product testing. In their application, Warner presented highlights of their pollution prevention and waste minimization efforts over the last decade of operation.

Some of the projects implemented included eliminating trichloroethylene, 1,1,1 tirchloroethane, methylene chloride, freon, asbestos and lead-containing friction materials, and changing from using low solids laquer paint to high solids water reducible paints for half of their painting operations. Their results include elimination of over 95% of their hazardous waste output despite the fact that plant shipments set an all-time record in 1998. Hazardous waste streams were reduced from 11 to 3 and their hazardous waste reporting status changed from a Large Quantity Generator to Small Quantity Generator due to these efforts. The company has saved approximately $250,000 in disposal costs and acknowledge that the intangible costs of reduced liability of exposure to hazardous materials, reduced spill potential, improved plant environment and improved employee morale add significantly to the actual dollar cost savings.

Continuous Improvement—Service Organization

Madison County Transit District

Faced with growing problems from regional hydrocarbon emissions from motor vehicles in the St. Louis Metropolitan area, the Madison County Transit District introduced the RideFinders program. RideFinders is an innovative method to encourage individuals and employers to consider alternatives to driving alone in order to reduce the number of single-passenger vehicles on the road – and increase air quality in the region. Primary alternatives included carpooling, vanpooling and mass transit. RiderFinders works in two ways, assisting employers and matching individuals with rides.

One-to-one assistance is offered to employers in an 8-county region who wish to develop ride-sharing programs for their employees. Customized marketing programs are developed to sell the idea to employees; these include preferential parking, incentives and computerized ride-matching services. For individuals in the same area interested in participating, RideFinders developed and maintains a database of participants that can be used to match commuters by work schedules, travel routes and residency.

Benefits of the program to date include the elimination of approximately 53 million single-occupant-vehicle miles traveled. This reduction translates to the prevention of nearly 1,500 tons of hydrocarbon emissions to the air. The average cost savings for carpooling participants is $1,100/person, with vanpoolers and longer distance commuters saving even more.

American NTN Bearing Manufacturing Corporation

The Elgin plant of American NTN Bearing Manufacturing Corporation manufactures precision bearings and bearing components for the automotive industry and a wide range of industrial applications. The manufacturing wastestreams include VOC emissions, solid waste, and waste oil and water. The company targeted a number of waste streams for pollution prevention and process efficiency efforts.

Vacuum dryers were purchased to replace thermal dryers which provided benefits such as eliminating the practice of baking solvent and releasing it to the atmosphere; reducing solvent usage as the vacuum dryers provide a mechanism to recover the solvent; increasing floor space on very congested production lines; and, require less energy. The VOC emissions from the solvent degreasing operation were reduced by 95%, moving NTN from the major emitter category to the minor category. Energy requirements were reduced by 84% in total over the thermal dryers. Total savings in electrical costs were $18,920/year while total solvent was reduced by $10,000 per year.

Another project eliminated the use of intermediate rustproof oil, VCI paper, and plastic intermediate packaging through installation of a new aqueous wash system in a production unit. This new process, implemented with the assistance of an Illinois EPA Office of Pollution Prevention intern, not only eliminated the items listed above, but also better protected the bearings against corrosion. It eliminated 40 cubic yards of plastic bags costing $9,000/year, as well as $2,000 in industrial waste costs for disposal. The purchase cost of over $45,000 in rustproof oil was eliminated. The payback period for installation of the system is less than one year and subsequent annual cost savings is roughly $19,000 in material reduction alone per machine. This will total roughly $60,000/year after implementation of the three machines is complete.

The Steel Ball Department began shipping 10-15% of final goods to its customers in returnable totes to reduce cardboard waste at customers' plants. This has eliminated the use of roughly 9,790 cardboard shipping cartons or 6,460 pounds of cardboard each year. Annual cost savings in material alone is over $4,400 and is shared with the customer.

In the past, bearings were washed in #1 fuel oil which was a cheap and effective solvent, yet produced a very strong odor. In an effort to eliminate the odor, reduce impact on urban ozone, and improve worker health and safety, the plant tested a solvent with a less offensive but equally effective degreasing properties—odorless mineral spirits (OMS). While the workers were exceedingly happy to have the smell of fuel gone, some issues dealing with machine cleanliness surfaced. The OMS did not carry away the metalworking grit as efficiently, so additional testing occurred using Odorless 190 Solvent. This solvent, though somewhat more expensive than OMS, was chosen to replace the fuel oil.

Eagle Wings Industries, Inc.

Eagle Wings Industries (EWi) is a high quality manufacturer of steel stampings and weldments to the automotive industry. Operations include stamping, welding, electrocoat painting, and assembly. The company implemented a study to determine the efficiency of adding an ultrafiltration system to recycle the cleaner bath on the paint line. Through collaboration with the Illinois Manufacturing Extension Center and the University of Illinois, engineering students performed a feasibility study on-site at EWi.

Based upon the results in the reduction of cleaner used on a daily basis, the amount of surfactant to be replenished, the reduction in waste volume through the treatment plant, and project cost savings, the decision

to purchase a unit was an easy one. Once in operation, the system reduced chemical cleaner usage by 51% in the first four months and is projected to maintain this level of reduction over the year. The quarterly dumping and recharging of the system has been eliminated as the bath no longer becomes saturated with dirt and oil. This equates to 28,000 gallons of wastewater reduction annually. Another benefit is eliminating the need to descale the tank. This eliminates another 14,000 gallons of wastewater annually and eliminates 715 gallons of hydrochloric acid from the wastestream. The cost of the system will be paid back within the first year of operation.

Continuous Improvement—Large Category

Argonne National Laboratory

Argonne National Laboratory is a multi-program laboratory operated by the University of Chicago for the U.S. Department of Energy (DOE). Argonne's mission is basic research and technology development to meet national goals in energy technology, environmental quality, scientific leadership, and educational infrastructure. Argonne's established P2 Program includes a Strategic P2 Plan, a three-year Pollution Prevention Program Plan, and a Current Year Work Plan. The Laboratory's size and nature of business operations has generated a number of waste streams over time including radioactive waste, mixed waste, hazardous waste, state-regulated special waste, and sanitary nonhazardous waste. The projects highlighted here are examples of the multiple ongoing pollution prevention and waste minimization efforts occurring at Argonne.

Phytoremediation: Solid and liquid waste were disposed during the 1950s that contained volatile organic compounds and tritium. These wastes have been released into the soil and groundwater.

Approximately 800 hybrid and poplar trees will be planted on the contaminated site. Through phytoremediation—the engineered use of green plants to remove groundwater from subsurface and destroy the VOCs in the soil and groundwater—contaminant control should be achieved in four years. The overall remediation costs have been reduced by $500,000 compared with the conventional groundwater containment and treatment methodology. Savings attributable to minimized operation and maintenance activities are estimated at $90,000 annually.

Zero-Valent Iron Addition Technology: Argonne implemented an innovative technology that improves the efficiency and cost-effectiveness of removing VOCs from contaminated soil. This technology allows in-place treatment of the contaminated soil, eliminating the need for excavation for treatment. On the contaminated site, the addition of zero-valent iron to soil previously treated with the conventional removal methodology reduced residual concentrations of carbon tetrachloride, chloroform, 1,2-dichloroethene, and trichloroethane below analytical detection limits. This project eliminated the need to excavate over 20,000 cubic yards of highly contaminated soil, with projected cost savings of $9,000,000 attributable not only to eliminating the excavation but also to costs associated with handling, transport and disposal.

Sanitary Waste Reduction Projects: Argonne continued to improve and implement various recycling, waste reduction, and assessment programs. They reduced the generation of sanitary waste from routine operations by over 50% in 1998, when compared to their 1993 baseline. The Laboratory also recycled 68% (4,939 metric tons) of sanitary waste from all operations in 1998. Other activities included recycling 300,000 pounds of scrap metal; diverting and recycling 2,389 metric tons of coal fines and fly ash from coal burning activities; and, recycling 1.5 tons of fluorescent lightbulbs. Savings estimates and revenues for all the projects in this area are estimated at over $350,000.