



PREVENTION

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Aspects and Impacts: Pointers for an EMS

Organizations throughout Ohio are contemplating how to devise their own environmental management system (EMS). Much of the initial effort to develop an EMS is identifying the operation's aspects and assessing their impact.



An "aspect" for an organization is any element of their activities, products, or services that can interact with the environment. An aspect can be a part of the large overall

operations, or something as small as one individual worker or work station. Identifying an organization's aspects is important when creating the EMS because once identified, they will be rated on their impact to the environment. The aspects that have the most significant impact will be used to establish the organization's goal for improvement in the following years.

It's easy to visualize how identifying aspects in an organization can become cumbersome. Some organizations attempt to identify every aspect in the initial development of the plan. However, this may be too large an undertaking, especially if this is the first time these elements have been dealt with, or if there is an impending deadline. Since the EMS should be a continual improvement system, an organization can incorporate any missed aspects at a later time.

To identify what elements of an organization are actually aspects, four main areas may be reviewed: legislative and regulatory requirements, major processes or activities, existing environmental practices and procedures, and feedback from previous incidents. Aspects of an organization that stand out after reviewing these areas will likely be the ones with significant impact, and will probably be priorities when the organization selects the aspects to include in annual goals for improvement.

To help narrow the scope of identifying aspects, the ISO 14001 standard specifies that procedures be established to identify aspects:

- ① are within the control of the organization; and
- ② the organization can influence.

This eliminates such things as weather influences (an organization cannot control the cold weather which causes higher energy use in heating), the existence of regulations, or the transportation employees use to get to work. Organizations generally do not have a large influence on most regulatory requirements, and may have only limited influence on worker transportation.



The multitude of aspects identified in the first step directly relates to the complexity of the next step: evaluation of the significance of the environmental

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impact of those aspects. The impact of an aspect is any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

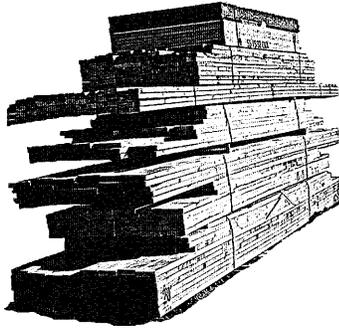
There are many possible things to consider when determining an impact's significance: emissions to air; releases to water or groundwater; wastewater effluent to sanitary lines or stream discharges; waste management, both hazardous and solid; land contamination; use of raw material; consumption of natural resources; and effect of the process on the local area, such as noise, traffic, odor and appearance. An organization needs to select or develop a rating structure that is appropriate. There are resources and tools available to structure a rating system, but an organization should realize that the documented procedure they establish should be unique to their needs. The best rule to use is to keep it as simple as possible.

Assistance with identifying aspects may be available from outside consultants, books, or other similar industries. For links to more information, visit our web site at www.epa.state.oh.us/opp/ems/emsinfo.html, or contact Debora Depweg at Ohio EPA's Office of Pollution Prevention at (614) 644-3257.

Association of Ohio Recyclers Plans Construction and Demolition Debris Workshop

Constructing the Future by Recycling the Past

Information on how to maximize recycling effort

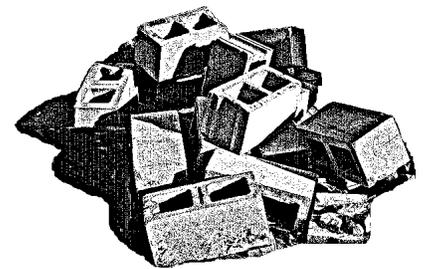


Maximizing the recovery of reusable materials generated during construction and demolition projects while minimizing the use of landfills for disposal is the subject of a one-day workshop to be conducted by the Association of Ohio Recyclers on January 24, 2001, in Columbus, Ohio.

The workshop, made possible by a grant from the Ohio Environmental Education Fund, brings together experts and legislators concerned with the efficient reuse of salvageable and recyclable materials from work sites. The scheduled keynote luncheon speaker is Representative Kirk Schuring of Ohio, sponsor of construction and demolition debris legislation, H.B. 540.

Featured speakers at the workshop include Robert Brickner with Gershman, Brickner & Bratton who will speak on recycling economics, Dave Neun of the National Association of Home Builders who will speak on the HUD-funded study addressing demolition recycling, and Michael R. Taylor who will address the future of construction and demolition debris recycling. Other topics to be addressed by experts are recycling, construction, government regulations and the law.

The Construction and Demolition Statewide Environmental Workshop will take place at the Athenaeum in downtown Columbus, from 8 a.m. to 4 p.m., and includes a continental breakfast and lunch. Registration is \$25. To register or for more information, call Diane Shew at (740) 397-7652, or send e-mail to [tryomex @ecr.net](mailto:tryomex@ecr.net).



True Tales of Natural Capitalism

by Holly Harlan

Some businesses worry that implementing Natural Capitalism will require too much time and staff energy. However, two Cleveland, Ohio manufacturers have found that even small steps can lead to higher resource productivity and greater profitability.

Mike Wochna, president of Melin Tool, a family-owned machine shop with 50 employees, began by eliminating solvents from his processes - an application of the second principle of Natural Capitalism, which aims to close materials loops and eliminate waste and toxicity.

The solvents the company was using had special handling and disposal needs, and created air-quality issues on the shop floor. Wochna collaborated with Better Engineering Manufacturing of Baltimore to develop a water-based cleaning system that was strong enough to clean off oil residue without a chemical solvent.

The new system, which cost \$35,000, not only eliminated the use of solvents, but also doubled capacity, reduced labor costs, improved air quality, and reduced noise.

"I didn't make this investment based on cost savings," Wochna said. "I wanted to improve the air quality in my shop. However, because the new cleaning system runs unattended, I found that I save \$55,000 a year in labor costs and could move a worker to an opening in another part of the operation."

A resource-flow analysis of a product, process, or company can help both to eliminate waste (principle two) and increase resource productivity (principle one). The analysis can be a simple input/output diagram or a more in-depth lifecycle analysis that considers all the inputs needed to produce a

product and all the outputs created by the process including waste which we prefer to call "unsaleable production."

After conducting such an analysis this past summer, Pete Accorti, co-owner of Talan Products, a Cleveland-based stamping company with 45 employees and over \$9 million in sales, decided to start by looking at a primary input energy.

Talan was spending about \$12,000 a month on electricity, but the company had not seriously tried to control this cost; its focus had been on labor productivity and sales growth.

The first thing Accorti did was create an energy management committee. The committee contacted Talan's main vendors, starting with the company that provided and serviced the air compressors used in the manufacturing process.

"We discovered that it was costing our company \$6,000 a month—half of our electricity bill—just to run two compressors," Accorti said.

Now Talan is working with the compressor vendor to do a seven-day analysis of air usage and peak demand. Based on the outcome, the company may next install one high-efficiency compressor instead of two older ones.

The vendor took the older compressors back and credited them against the lease of the new compressor. Net savings are expected to be \$3,000 per month. Talan may also contract with an air-services supply company to eliminate buying or leasing compressors altogether. This is an example of principle three, shifting from selling (or buying) products to leasing services.

These examples show that putting Natural Capitalism into practice need not take on overwhelming proportions. Dramatic gains toward running an operation with greater resource efficiency can be found by taking simple and direct actions. What's

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more, the cost savings that are usually a byproduct of this more efficient approach can help companies implement the fourth principle of Natural Capitalism, reinvesting in natural capital, which is the basis of future prosperity and yet is in increasingly short supply.

Holly Harlan is the manufacturing assistance program leader at the Westside Industrial Retention and Expansion Network (www.wire-net.org) in Cleveland.

WIRE-Net's mission is to retain, grow, and attract industrial and related employers and to engage them as stakeholders in the community.

Reprinted with permission from RMI Solutions Newsletter, Fall/Winter 2000. Ms. Harlan may be contacted at (216) 631-7330, HKHarlan@aol.com.



THE FOUR PRINCIPLES OF NATURAL CAPITALISM

Natural Capitalism is a new business model that involves four interrelated shifts in business practices:

- 🌐 Radically increase the productivity of natural resources
- 🌐 Shift to biologically inspired production models
- 🌐 Move to a solutions-based business model
- 🌐 Reinvest in natural capital

More information is at www.naturalcapitalism.org.

Recycling your PC? IBM will take it for \$30



From IBM Press Release, November 14, 2000

Responding to what many see as one of the biggest solid waste issues in decades, IBM kicked off a computer recycling program for consumers and small businesses on Tuesday November 14, 2000. For a \$30 fee that includes shipping, buyers can keep their old equipment out of landfills whether IBM made them or not, and send them instead to a recycler. Environmentalists saw it as a step forward, but urged IBM and other companies to adopt free recycling.

Computers, monitors, printers and other hardware will either be recycled “in an environmentally responsible way” or donated to a worthy cause if the hardware still works, according to Wayne Balta, IBM’s director of corporate environmental affairs. IBM is billing the plan as a ‘no strings attached’ service because it will accept any brand of unwanted equipment, and no purchase of any type is required. Most recycling programs operated by smaller computer retailers are conditioned on so-called trade-in policies, under which unwanted equipment is removed only if the consumer buys new equipment. Consumers can sign up for IBM’s program at the time of purchase or by contacting IBM. Envirocycle, a Hallstead, PA., recycling firm will receive the equipment.

Most of the unwanted personal computer equipment in this country has gathered dust in attics and garages, or ended up in landfills. A recent study by the National Safety Council’s (NSC) Environmental Health Center estimated that 20.6 million personal computers became obsolete in the U.S. in 1998, but only 11 percent, or 2.3 million, of those PCs were recycled. Moreover, the NSC estimates that 315 million additional computers will become outdated by 2004. On a larger scale, the industry’s solution has been to ship much of the unwanted and environmentally dangerous parts to China,

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where weak environmental laws allow for a cheap but hazardous method of disposal.

Environmentalists are concerned that more and more parts all of them laced with toxic chemicals will accidentally wind up in public landfills here and abroad that are not suited to the disposal of contaminated materials. Or worse, the equipment could wind up in illegal dumps. While the outside shell of a computer monitor and hard drive usually can be used again, most of the inner parts must be replaced because they're either worn out or outdated. It's those inner parts that contain most of the hazardous materials, including lead, mercury and cadmium.

Customers may purchase the PC Recycling Service when buying any new IBM PC system, including IBM NetVista desktops or ThinkPad notebook computers by going to www.ibm.com/shop, or purchase the service separately by calling (888) SHOP-IBM (746-7426 reference p/n 06P7513).

Additional information is available on the IBM Web site at www.ibm.com/environment.

Make Your Neighborhood Healthier, Safer and Friendlier While Making a Difference for Our World

by Mary Failey

Block by block, neighborhood by neighborhood, the Neighbor to Neighbor: Building a Healthy



Community

Campaign is working to improve the environment and strengthen communities. Sponsored by the Columbus Health Department, the campaign supports people in stewarding natural resources for their children's sake, creating healthier, safer neighborhoods, and getting to know their neighbors better.

Here's how it works: five or six households form an EcoTeam. With the help of a step-by-step workbook and a trained volunteer coach, each household chooses from a menu of practical actions. Team members then support one another to reduce waste, use less water and energy, learn earth-friendly shopping habits, improve transportation efficiency, and share their experience with others. EcoTeam members meet in each other's homes eight times over four months, and together they make a big impact on their local environmental quality.

On average, EcoTeam households send 42 percent less garbage into the waste stream, use 30 percent less water, 13 percent less household energy, 19 percent less fuel for transportation, and have annual savings of \$200-\$400. Best of all, however, is the greater sense of community that team members experience with their neighbors as a result of sharing with each other in a meaningful way. This helps create a healthier, friendlier, safer neighborhood for all. Many EcoTeam neighbors enjoy sharing potluck meals, books and tools, gardening together, carpooling, or sharing childcare.

"Being on an EcoTeam catapulted me into doing things that I had been thinking about doing but just hadn't gotten around to," reported Eric Davies, who initiated the program in this neighborhood, and is an EcoTeam coach. "Now my family and I ride COTA whenever we can, and walk or ride our bikes to get places instead of driving everywhere."

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Phyllis Fetzer was on an EcoTeam with her nine-year-old son and had this to say about her experience, “I consider myself a poster child because of all the changes I made in my life! I now hang almost all of my laundry out to dry—besides saving electricity, I feel happy because it reminds me of my childhood and the times I spent hanging out clothes with my sisters. Our team not only started recycling in our homes, but we started a recycling system at our church.”

“One of the most important parts of the program for me was the outreach in my neighborhood,” relates Tim Cooke. “I had felt somewhat isolated in my quest to lead a more sustainable lifestyle, and through the program was able to meet and get to know people right in my neighborhood who share my desire to reduce our impact on the earth.”

Neighbor to Neighbor: Building a Healthy Community Campaign is part of an international effort, created by Global Action Plan, to support people in living environmentally sustainable lifestyles and creating strong, healthy neighborhoods. Currently there are campaigns in 17 countries: Belgium, Denmark, Finland, Iceland, Ireland, Japan, Korea, the Netherlands, Norway, Poland, Russia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom, as well as here in the United States. The goal in Columbus is to reach critical mass, or 15 percent of the households in 15 percent of the neighborhoods, within the next four years.

So, if you would like to improve the environmental quality of your neighborhood, get to know your neighbors better, and really make a difference for Columbus, contact Mary Failey, EcoTeam Program Manager, at (614) 267-9982 or e-mail ecoteams@megsi.net. To listen to a three-minute recorded overview of the EcoTeam program, call (614) 823-4448.

Natural Wastewater Treatment System “Vital Thread” in Oberlin College’s Adam Joseph Lewis Center for Environmental Studies

Living Machine® Allows Award-Winning Center for Environmental Studies to Treat Wastewater



From Oberlin College News Services

OBERLIN, OH – “John Todd’s Living Machine is a vital thread in a larger tapestry of ideas in the Adam Joseph Lewis Center for Environmental Studies,” says David Orr, professor and chair of Oberlin’s environmental studies program. “Students are learning how to purify wastewater by mimicking how natural systems have done it for 3.8 billion years.”

The Living Machine treats wastewater using a system of engineered ecologies that include microbes, plants, snails and insects, and is designed to treat up to 2,000 gallons of the building’s wastewater daily in a beautiful, garden-like atmosphere. Upon completion of a water pressurization system, the treated wastewater will be recycled back through the building for non-potable reuse.

Invented by Dr. John Todd of Living Machines, Inc., the Living Machine is one of many innovative ecological design features in the Lewis Center, a highly visible model of ecological design and the focus of considerable national and international attention. Even prior to completion of Phase I construction last January, the building—designed by the architectural firm William McDonough and Partners—was honored with awards from the American Institute of Architects Committee on Architecture for Education and from the Chicago Athenaeum’s Museum of Architecture and Design. Oberlin College President Nancy S. Dye has called the Lewis Center “the College’s centerpiece in our efforts to provide the best possible laboratory for environmental education today.”

More than a building where teaching takes place, the Lewis Center is a building that teaches; by virtue of its design concepts, students are learning

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the latest in environmental technologies, ecological competence and mindfulness of place. Along with its primary function of treating wastewater and its identification as a model for sustainability and ecological design, the Living Machine is a teaching tool for present and future Oberlin students. Selected students have assisted in the system's installation and have been monitoring the early stages of its operation as it stabilizes.

“Oberlin students have been involved in every aspect of building their Living Machine,” says Dr. Todd. “A Living Machine has been part of the building's design since the very beginning of the project and will continue to teach students. It is a working classroom for sustainability and ecological design as well as other science and environmental course work,” he says.

Numerous Oberlin students were instrumental in the Lewis Center's planning and design phases in the mid-1990s, guided by the vision of David Orr, an internationally noted environmental educator and campus ecology advocate. In addition to its biological wastewater treatment system, the 13,600 square-foot facility meets advanced criteria for energy and materials efficiency, use of recycled materials, solar energy and ecological landscaping. “The integration of architecture, ecology and landscape ensures that students come away with the understanding that materials and design can be handled much more intelligently,” says Todd. “The bottom line is that resources are saved for future generations in a way that teaches the generations of today.”

The main part of the Living Machine is located in a solarium adjacent to an atrium and a 100-seat auditorium featuring wood from certified sustainable forests. Wastewater is cleaned through a series of environments populated by different biological communities that help reduce levels of organic substances along with nitrogen and phosphorus in the effluent.

Wastewater flows from the building into two underground reactors located just outside. In these reactors an anaerobic biological process begins digestion of the wastes. Following the anaerobic

reactors, wastewater flows through two closed aerobic reactors—also buried outside—where the remaining organic compounds are further degraded.



The Living Machine solarium

After flowing through the closed anaerobic and aerobic reactors, wastewater enters the Living Machine solarium and flows through three open aerobic reactors.

Tropical, sub-tropical and native plants such as papyrus, calla lilies and willows root into the planted aerobic reactors and assist in the treatment process.

Following the open aerobic reactors, biosolids are settled out of the wastewater in a clarifier. Wastewater then flows through a constructed wetland surrounding the open aerobic tanks for final ‘polishing.’ Ultraviolet disinfection is the final step prior to the treated wastewater's reuse in the buildings' toilets.

For more information about the Adam Joseph Lewis Center for Environmental Studies at Oberlin College, please call Cheryl Wolfe-Cragin at (440) 775-8747 or visit www.oberlin.edu/newserv/esc/Default.html.

About Living Machines

Living Machines are on-site wastewater treatment systems that incorporate and accelerate natural processes to purify water. With the help of sunlight and a managed environment, a diversity of organisms – including bacteria, plants, zooplankton, and other invertebrates – break down and digest organic pollutants. Depending on the climate, Living Machines can be housed in a protective greenhouse, under light shelter, or in the open air. With effluent polishing, Living Machines produce a high quality effluent that is suitable for reuse or a number of disposal alternatives, a very attractive feature for facilities unable to connect to municipal sewage treatment systems or where water is scarce.

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Living Machines, Inc., is a leader in the field of ecologically-based wastewater treatment. It has built more than 20 commercial-scale wastewater treatment facilities in six countries for such clients as M&M Mars, Master Foods, the Body Shop, National Audubon, the State of Vermont, Battelle Foundation and U.S. EPA, ranging in size from 4,000 to 1,000,000 gallons per day.

↻ The National Pollution Prevention Roundtable (NPPR) Spring 2001 Conference will focus on the latest in pollution prevention (P2) policy, regulatory and technical assistance initiatives. The conference titled “Expanding Our Reach: P2 Tools and Technology for a Greener Globe” will be held February 27 - March 2, 2001, in Chicago, Illinois, at the Hyatt Regency Chicago on the Riverwalk. For more information see www.p2.org or call NPPR at (202) 466-7272.

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