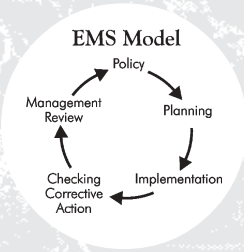


EMS CASE STUDY:



N.C. ZOOLOGICAL PARK - HORTICULTURE SECTION

Location:	Asheboro, N.C. (Randolph County)
Industry:	Zoological Park (SIC Code 8422)
Pollution Prevention Application:	EMS and ISO 14001
Water Reduction:	Not Calculated
Annual Savings:	Not Calculated
Contact:	Mary Joan Pugh, (336) 879-7110, maryjoan.pugh@ncmail.net

BACKGROUND

The N.C. Zoological Park Horticulture Section was the first North Carolina state agency, the first zoo in the nation, and the second zoo in the world to become ISO 14001 certified. The Horticulture Section implemented an Environmental Management System (EMS) as a step towards the Zoo's mission of becoming an environmental example to others. Plans are underway to expand the EMS to the entire Zoo.

Since 1989, the Zoo has actively promoted efforts to reduce, reuse and recycle materials and has continued to serve as a conservation-minded institution that uses strong environmental commitment to reduce its impact to the environment, or its "ecological footprint." In working towards this commitment, the Horticulture Section completed the EMS development course for state agencies hosted by the N.C. Division of Pollution Prevention and Environmental Assistance (DPPEA). Horticulture holds permits for composting, importing and holding rare plants, nursery certification and individual pesticide licenses. The section received ISO 14001 certification in December 2002 and was certified by a third-party registrar.

PLANNING AND IMPLEMENTATION

The Zoo adopted the "G.R.E.E.N." (Growth in knowledge and continued improvement, Reduction in use of resources and waste, Environmentally responsible and sustainable operation, Example to others, Necessary compliance with environmental laws and regulations) environmental policy. With

this policy as a framework, the Horticulture Section determined its aspects and impacts by listing every horticulture activity, and then using the below descriptions to group each item into categories and assigning a low, medium or high rating based on three criteria--quantity, frequency and severity.

	Low (1)	Medium (2)	High (3)
Severity	Little impact/ no danger	Danger non-life threatening short term reversible less than 1 year	Potentially threat to life long term effects reversible more than 1 year
Frequency	Less than monthly	Monthly to weekly	Weekly to daily
Quantity	Pounds per year	Tons per year	Tons per month

The Zoo initially identified 45 activities under its control, which had 130 aspects and impacts. Significance was determined by discussion of aspects/impacts that reached a certain threshold. The 10 significant aspects/impacts identified were: organic materials, pest management, gas/diesel use, water usage, chemical fertilizer runoff, burning/land preservation, electricity use, propane usage, runoff from grading/maintenance surfaces, and invasive plants. While not required, the Zoo chose to assign each aspect at least one measurable objective and target date for completion. In considering objectives and targets, factors such as whether the impact



was understood, what type of study was needed, and whether the objectives and targets were practical and feasible were taken into account.

Integrating environmental considerations into business decisions is determined by the cost of staff time and other resources required. The Zoo uses only a few materials (fuels, pesticides and paints) that have an environmental impact. The material flow and purchasing for these materials are tracked through budget and purchase records. Standard Operating Procedures (SOP) are in place to ensure materials are stored and used according to labeling. Staff are made aware of potential environmental impacts during training for each SOP. Vendors and contractors are additionally educated on the EMS as part of the procurement process at pre-construction meetings. The environmental policy is posted both at the Zoo and on its Web site at <http://www.nczoo.org/conserv/policy.html>. Legal requirements are listed near the location of use with the due date of reports and frequency of inspections posted.

The chief of staff/business officer doubles as the EMS coordinator, and the section head is also the management representative. The Management Review Team meets twice yearly to review EMS-related information.

The EMS was an outgrowth of the efforts by the Conservation Captains, formed in 1994, to look at ways the Zoo can reduce, reuse and recycle. In 2003, a water quality team was formed with representatives from applicable sections to address water quality issues.

CONTINUAL IMPROVEMENT

Continual improvement is fostered through progress on objectives and targets, management review, internal and external audits, training and corrective/preventive action reports. Legal requirements are identified, tracked and reviewed for compliance on a regular schedule. Programs for monitoring and measurement and corrective and preventive action were developed to establish a process for continual improvement. Under the corrective and preventive program, employees can raise issues that are reported to and addressed by top management. Environmental issues are embedded in individual evaluations as part of the employees' work plan. Improvement is evident in the increased productivity, efficiency, management, tracking and employee awareness of environmental impacts, and understanding of SOPs.

LESSONS LEARNED

The Zoo's implementation of an EMS resulted in better

management of resources, better understanding of environmental impacts, improved efficiency and productivity and better tracking, follow-up, corrective actions and objectives. Horticulture has turned to less conventional approaches that have less of an environmental impact such as using organic instead of chemical fertilizers and using biological controls to address pest management. Creating exhibits such as the backyard compost demonstration, where visitors can learn how to begin their own backyard compost, has heightened visitor awareness about the role each individual can play in reducing the ecological footprint. The Zoo's EMS provided a motivational tool that improved management of other organizational activities and forced accountability of employees. Knowledge was captured, recorded and communicated in consistent work instructions, increasing clarity of roles and responsibility.

The biggest constraints the Horticulture Section has experienced are staff time, resources and the state's constrained financial status. Additionally, staff resistance to change, the nervousness about upcoming audits, and time demands were hurdles. However, the Zoo concluded that leading by example and "walking the talk" does give credibility when advocating responsibility. Success of the Zoo's commitment to environmental stewardship is evident in being the recipient of many waste reduction awards. Among these awards are the 1999 Governor's Outstanding Waste Reduction Award, the 2001 Carolina Recycling Association's Outstanding Composting Award, the 1996 Outstanding Source Reduction Award by the N.C. Recycling Association, and the Department of Environment and Natural Resources (DENR) 2000 Environmental Sustainability Award, received by the Conservation Captains. In 2002, the Horticulture Section of the Zoo was accepted as a partner in the DENR Environmental Stewardship Initiative, signifying the Zoo's commitment to work towards exemplary environmental performance. For additional information regarding the Zoo's EMS see the EMS/ISO 14001 presentation slides at <http://www.p2pays.org/iso/govcourse/class7/class7d.ppt>.

COST INFORMATION

Staff Time:	\$35,000 (2,000 hrs)
Registration: (3 yr. contract)	\$11,000
Total Cost:	\$38,734.24

The N.C. Division of Pollution Prevention and Environmental Assistance provides free, non-regulatory technical assistance and education on methods to eliminate, reduce, or recycle wastes before they become pollutants or require disposal. Call DPPEA at (919) 715-6500 or (800) 763-0136 or e-mail nowaste@p2pays.org or visit DPPEA's Web site at www.p2pays.org for assistance with issues in this fact sheet or any of your waste reduction concerns.