

**IMPLEMENTING AN
ENVIRONMENTAL MANAGEMENT
SYSTEM IN COMMUNITY-BASED
ORGANIZATIONS**

PART 1: PROJECT REPORT

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FOREWORD

About The Project Managers

NSF International

NSF International is an independent, not-for-profit, standards development and certification organization with its world headquarters in Ann Arbor, Michigan. Founded in 1944, NSF has 50 years of experience providing third-party conformity assessment services, which enhance the protection of public health and the environment.

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United States Environmental Protection Agency's Office of Wastewater

U. S. EPA has been active in the evaluation of EMS by making funds available for private and governmental (state and municipal) pilots to test the applicability of ISO 14001 to the environmental activities and challenges for organizations and governmental bodies. EPA's Office of Wastewater and Office of Compliance are currently working with a non-profit organization to provide training and ongoing technical assistance to counties and municipalities in implementing EMSs.

The EPA has also been working closely with the Multi-State Working Group for Environmental Management Systems to test benefits of an EMS in order to develop a coherent and uniform approach for state agencies to integrate ISO 14001 into state programs. The Multi-State Working Group is developing a publicly available database to store EMS performance information gained through pilot project initiatives (see Appendix B).

ACKNOWLEDGMENTS

This project was funded through a cooperative agreement between the U.S. Environmental Protection Agency, Office of Wastewater and NSF International. Many thanks to the EPA Project Manager Jim Horne, Special Assistant to the Director, Office of Wastewater for his guidance and support throughout this project.

Implementing an Environmental Management System in Community-Based Organizations was in many respects ahead of its time. Recruitment for the project was undertaken in mid-1996 before the ISO 14001 (1996) standard was finalized and at a time when even industry was still uncertain about what “an environmental management system” meant. Project participants deserve credit for their foresight and sustained efforts over the two-year course of the project. Participating organizations and their representative include:

- Saint Joseph Mercy Hospital, Pierre Gonyon, Hazardous Substance Specialist
- Washtenaw County Home Toxics Reduction Program, Jeff Krcmarjk, Coordinator
- Village of Chelsea, Steve Daut, Village Council Trustee
- Ann Arbor Public Schools, Randy Trent, Director of Environmental and Utility Services
- Pierce Lake Park Golf Course, Steve Southard, Superintendent
- City of Ann Arbor - Department of Parks and Recreation, Matt Warba, Golf Course Supervisor

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Last but most certainly not least, thanks to Anita Cooney of NTH Consultants, the original NSF Project Manager for the Community-Based Project, who had the original vision for this implementation project. She got the project off to a solid start and provided invaluable assistance as the project was turned over.

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EXECUTIVE SUMMARY

Introduction

The U.S. Environmental Protection Agency (EPA) funded project, *Implementing an Environmental Management System in Community-Based Organizations*, documents the environmental management system (EMS) implementation experiences of six community-based organizations in southeastern Michigan from January 1997 through December 1998. The EPA Office of Wastewater partnered with NSF International to determine if an environmental management system based on the ISO 14001 (1996)¹ standard, 1) could be applied to a community-based organization and 2) if so, would it result in improved environmental performance. For the purposes of this project, a “community-based” organization refers a public sector or public service organization whose mission is to provide a direct service to the public in a specific jurisdiction or localized geographical area.

Project results clearly show that the ISO 14001 (1996) standard does indeed apply to a wide variety of community-based organizations. The six Pilot Programs began the project with EMSs at low levels of conformance to standard requirements. By the end of the project, Program Leaders had either initiated or completed work nearly 90% of all standard requirements. Pilot Program Leaders found that these efforts improved the environmental performance of their organization through lowering their organizations’ risk profile, improving environmental programs, creating cultural changes within the organization, and improving efficiency.

This report is intended to assist other community-based organization with EMS development. Implementation advice and guidance is provided in Chapter 1 “Early Warning Signs,” Chapter 2 under “What Helps/Hinders Implementation?” and “Overcoming Implementation Challenges,” in the real-world examples in Chapter 3, and in the highlighted text boxes throughout the text.

Project Background

One unique feature of the Community-Based Project was the involvement of state and local regulators and environmental stewardship organizations. The Advisory Committee was established to assist in the areas of recruitment and training and to provide assistance with EMS implementation. A list of candidate organizations for the project was developed with input from the Advisory Committee.

In November 1996, ten organizations in the Ann Arbor, Michigan area volunteered as Pilot Programs for the project. Each participating organization appointed a Pilot Program Leader. Over the two-year timeframe, the project provided Pilot Program Leaders with guidance documents and copies of the standard, five EMS implementation workshops, site assistance visits, and special support upon request including clerical support, presentations to management, and site visits. During the second year of the implementation project, five of the six Pilot Program Leaders formed an EMS Audit Sub-Group to meet the challenge of conducting internal EMS audits (in conformance with the ISO 14001 (1996) standard). Each Program Leader acts as both auditor (of another Program Leader’s EMS) and auditee

¹ ISO 14001- 1996, Environmental Management Systems- Specification with guidance for use, ANSI/ISO Available at nsf-isr.org.

(having their EMS audited by another Program Leader). In response to this initiative, the project provided internal EMS auditor training and an EMS Audit Procedure, including audit process, schedule, plan, checklist questions, and final report template.

One year after the project started, four Pilot Program Leaders halted their EMS development and withdrew from the project. They were not able to make the progress they had hoped and did not see the situation changing. The reasons behind their decisions provide valuable “early warning signs” for all community-based organizations considering EMS development.

- *Passive management support:* In some Pilot Programs, management did not say “no” to EMS development but neither did they provide critical resources or make the EMS a priority. As a result, working on an EMS was a low priority and after a year, Program Leaders found that very little had been accomplished.
- *Expectation vs. reality:* Other Program Leaders found implementation more difficult and time consuming than expected. They were unsure whether or not an EMS was really applicable to their organization. Those who withdrew said that they did not see the potential benefit to their organization.
- *Cultural change required:* One Program Leader realized that an EMS may require more formality of processes and a tighter control structure than his small organization was willing to accept.
- *Why do we need this?:* The perspective “Why do we need an EMS when we are already in compliance” was a contributing factor to Pilot Program Leaders’ lack of progress. They did not see how an EMS would add to their existing systems to support regulatory compliance and voluntary environmental programs.
- *Selecting an EMS Champion:* The reservation with one Pilot Program was lack of a person with the right combination of skills and experience to lead EMS implementation.

Six of the ten original Pilot Programs completed the project in December 1998. There was no turnover of Pilot Program Leaders.

Implementation Progress

The primary quantitative mechanism to track EMS implementation progress was to compare the initial and final EMS assessments conducted using the NSF *EMS Self-Assessment Tool for ANSI/ISO 14001*. Quantitative data collected revealed significant progress in EMS development. Data indicated that the EMSs at the beginning of the project were in the early stages of development meeting only 15% of ISO 14001 (1996) standard requirements. By the end of the project, participants had fully met a total of 38% of standard requirements and had made substantial progress on an additional 35% of the requirements. The Policy and Planning sections of the standard showed the highest completion rates.

In terms of progress on individual ISO 14001 (1996) elements, most implementation progress was made in Monitoring and Measurement, Environmental Policy, and Objectives and Targets. At the beginning of the project, there were no existing management practices to meet requirements in five of the 17 standard elements: EMS Documentation, Document Control, Operational Control, EMS Audit, and Management Review. By the end of the

Community-Based Project, activity had been at least initiated for all 17 elements of the standard.

Benefits

Program Leaders began the project with general ideas of what improvements might be realized and found many benefits they had not anticipated. The following list summarizes the benefits of EMS implementation. Many were realized early in the implementation process.

- *Lowered organization's risk profile:* Environmental risks were most often discovered during the planning phase of EMS implementation. Lowering risk for the community-based organizations in this project meant improving the ability to address public inquiries quickly, improving worker safety, improving environmental compliance, and increasing efforts to protect the environment.
- *Enabled improvements in environmental programs:* Pilot Program Leaders used their EMS implementation to expand environmental programs and increase their effectiveness, save their organization money, and receive positive public recognition.
- *Fostered real cultural change:* Program Leaders were most surprised to see positive changes in how others in their organization viewed environmental management. Examples include, changing the mindset that environmental issues should only be addressed once and never revisited and improving cooperation among different department managing environmental programs.
- *Formalized processes improved efficiency:* Through EMS implementation, Program Leaders realized how even small efforts to document processes and practices (such as tracking training requirements) can dramatically improve the overall efficiency of their day-to-day operations.

The Advisory Committee provided an indirect benefit to the project. Efforts by the Committee to promote EMS concepts at a high level within city, county, and district management will help the participant's retain top management support for their EMS after project is completed.

Implementation Challenges

As in any implementation project, Pilot Program Leaders faced challenges including: 1) obtaining resources; 2) communicating with management and staff; 3) setting objectives and measuring progress; 4) integrating management systems; and 5) working with supporting departments that lack formal systems. Of these, lack of resources was the most universal limitation to EMS development. Program Leaders used the following strategies to overcome this limitation:

- *Build on existing systems:* Identify the specific, existing practices and processes on which to begin EMS development. Program Leaders found they often had many practices in place that met ISO 14001 (1996) requirements; they just had not thought of them in an EMS context.

- *Form a network:* Networking may take various forms including: forming an EMS networking implementation group; bartering EMS auditing services; or forming a cooperative with agencies with related environmental goals. Networking proved to be a powerful tool for resource-limited community-based organizations.
- *Identify local resources:* Program Leaders used related voluntary environmental programs offered by local regulators to obtain free technical support on EMS development.

This project demonstrates that for community-based organizations, size and resource limitations are not necessarily deterrents implementing an EMS.

Applying ISO 14001 In Community-based Organizations

In many areas, the Pilot Programs in this project faced the same EMS implementation challenges that an industrial facility would face such as communicating EMS requirements and benefits to management and staff, resistance to cultural change, lack of documentation, and lack of resources. However, industry and community-based organizations are fundamentally different in their organization, purpose, and accountability to the public and there are differences in the implementation challenges faced. The experiences of the participants in the Community-Based project highlight these differences.

- *Role of the public:* Project participants viewed the public as much less of an outsider to their EMS development than industry often does. Informing the public of the results of EMS development was never questioned. All participants intended to actively share their environmental policies with the public. There was never a discussion of the pros and cons of disclosure. In another example, the ISO 14001 (1996) standard communication requirement states that an organization need only *consider* processes for external communication on its significant environmental aspects, it does not *require* communication of the aspects. The Program Leaders did not really consider this as an option for them; communication with the public was expected.
- *Motivations:* The current industry drivers for EMS development, market forces and competitive advantage, in most cases do not apply to community-based organization. Some project participants cited their customer (the public) and their accountability to their customer as the primary motivations for EMS development. Others saw an EMS as a way to manage growth or improve environmental performance.

Lack of a clear “bottom-line” motivation for EMS development can make it more difficult for community-based organizations considering an EMS to see its benefits. As this project has demonstrated, benefits are substantial and first realized early in the implementation process.

- *Setting objectives and targets:* The public has a much larger role in setting objectives and targets in community-based organizations. In the case of Ann Arbor Public Schools, the public is represented on their Environmental Committee, which has responsibility for setting the environmental objectives each year and monitoring

progress in meeting those objectives. For other participants, the public was important in considering which aspects it could “control and over which it can be expected to have an influence.” For example, one Program Leader had to balance an environmental objective of reducing winter salt application to roads (to decrease salt in the runoff) with the public’s demand for clear streets.

- *Top management.* In a community-based organization, top management may be an elected official (e.g., mayor, board member). This could effect EMS funding and long-term maintenance of an EMS if a new administration does not support the programs and policies of the previous administration.

Structure Of This Report

The results of *Implementing an Environmental Management System in Community-Based Organizations* are presented in two separate reports. Part 1 is the Project Report and includes project description, quantitative and qualitative data on implementation results, implementation examples from the project participants, and ideas for managing future community-based projects.

Part 2 is the Environmental Management Systems Audit Tool developed to support the EMS Audit Sub-Group formed by the Pilot Program Leaders. The Audit Tool consists of an Audit Summary Sheet, EMS Audit Findings Form, ISO 14001 (1996) Standard Requirements (verbatim), Supplemental Checklist Questions, and Supplemental Questions Grouped by Function. Since it contains exact language from the ANSI/ISO 14001 (1996) standard and NSF must pay royalties to ANSI/ISO, the Audit Tool is available for minimal cost by calling 1-888-NSF-9000 or through www.nsf-isr.org. A sample of the Audit Tool is provided in Part 1, Chapter 3, Environmental Management Systems Audit.

Chapter 1 INTRODUCTION

Objectives

The U.S. Environmental Protection Agency (EPA) was an early leader in efforts to explore the potential benefits an ISO 14001 (1996)-based environmental management system (EMS). While the standard was in the final drafting stages, EPA funded two NSF International projects: 1) *Environmental Management Systems: An Implementation Guide for Small and Medium Sized Organizations*² developed to support and facilitate EMS development and 2) *Environmental Management Systems Demonstration Project*³ which documented the EMS implementation experiences of 18 organizations. In 1996, EPA Office of Wastewater expanded its EMS research to address the question, “Would an EMS be an effective means to meet specific water quality objectives in a particular watershed?” In March 1996, NSF received an EPA grant to demonstrate use of a voluntary ISO 14001 (1996)-based EMS to meet watershed protection goals in the Middle Huron River Watershed (in southeastern Michigan).

The project, originally entitled *Implementing Environmental Management Systems in the Middle Huron River Watershed*, sought to not only address water quality issues but to educate state and county agencies on the emerging environmental standard and assist participants to achieve their organization-specific environmental goals. Specific project objectives included:

- 1) Educate state and local regulators and watershed citizens about the ISO 14001 (1996) standard and EMS methods, actively involve them in EMS implementation, and demonstrate EMS implementation through state and county government participation.
- 2) Provide additional information about how an EMS can enhance regulatory compliance and encourage prevention of pollution.
- 3) Evaluate the effectiveness of an environmental management systems approach to addressing pollution control objectives in a watershed context.
- 4) Recruit and train participants to implement comprehensive environmental management systems with an emphasis on phosphorus reduction, while evaluating the need to address other significant impacts, and to provide them with an opportunity to improve their environmental performance.

Highlighted text boxes throughout this report provide additional EMS implementation tips and advice for community-based organizations.

²Stapleton, P. J., and Cooney A. M., *An Environmental Management Systems: An Implementation Guide for Small and Medium Sized Organizations*, NSF International, November 1996. Available free at www.nsf-isr.org.

³Diamond, C. P., *Environmental Management System Demonstration Project, Final Report*, NSF International, December 1996. Available free at www.nsf-isr.org.

Advisory Committee

One unique feature of the project was the involvement of state and local regulators and environmental stewardship organizations. The Advisory Committee was established to assist in the areas of recruitment and training and to provide assistance with EMS implementation. As the project continued, the Committee proved helpful in other areas as well:

- Provided detailed information on voluntary environmental protection programs being offered to the regulated community. The Committee provided information and made available technical expertise for related county and state environmental programs, such as Michigan's Pollution Prevention Program and the Washtenaw County Community Partners for Clean Streams Program.
- Served as an "inside contact" to promote EMS concepts at a high level within local district/city/ county management. Through formal presentations and informal meetings, Committee members helped to educate their upper management on EMS concepts and promote the project. These efforts will help participant's retain support for their EMS at a high level after project is completed and is a long-term benefit of the involvement of the Advisory Committee.

Committee members included:

- 1) Washtenaw County Drain Commissioner's Office
- 2) Michigan Department of Environmental Quality (MDEQ), Surface Water Quality District, Jackson District Office
- 3) Washtenaw County Department of Environment and Infrastructure Services
- 4) Huron River Watershed Council

Committee members, in turn, learned about ISO 14001 (1996) requirements and had the opportunity to see first-hand how organizations implement an EMS.

Community-based organizations should identify the technical assistance offered to businesses and governmental entities at the state and local levels. This will help locate free resources (guidance documents, program support, compliance assistance) to assist in EMS development and help an organization recognize the synergy between their existing environmental efforts (e.g., recycling, voluntary environmental programs) and EMS development.

Recruitment

Recruitment began in summer of 1996, before the ISO 14001 (1996) standard was finalized. Based on experience with previous ISO 14001 demonstration projects, the project wanted to recruit 10-15 participants. Initial targets for recruitment were the largest contributors of phosphorus loading to the Middle Huron River, farmers and wastewater treatment plants. Environmentally proactive farmers and area wastewater treatment plants were contacted first

to gauge their level of interest in participating in the project. Those contacted had either not heard of the standard and or had other environmental priorities and were not interested.

NSF continued to promote recruitment through community presentations (e.g., to local Chambers of Commerce) and worked closely with the Advisory Committee to develop a list of additional candidate organizations. The list was developed using the following sources:

- 1) MDEQ lists of point source contributors to the Middle Huron River based on individual and general permits issued under the National Pollutant Discharge Elimination System and industrial and construction stormwater permits.
- 2) Washtenaw County Drain Commissioner recommendations on large landowners that contribute to the nonpoint source loading of phosphorus to the river.
- 3) Washtenaw County Drain Commissioner recommendations based on their Community Partners for Clean Streams Program.

A participant interest form was sent to all candidate organizations. Of the organizations that returned the form, the ten Parent Organizations listed in Table 1-1 sent representatives to the orientation and training meeting in late October 1996 and became official project participants. Each Parent Organization appointed a Pilot Program Leader to head EMS implementation efforts.

Approximately halfway through the project, four of the ten participating organizations determined that they could not meet the project commitments. Their reasons for this decision are described later in this chapter (see Early Warning Signs). The remaining six organizations completed the project.

Scope

The Parent Organizations were given the option of implementing the 17 elements of an ISO 14001 (1996)-based EMS for either all or part of their organization or operation. All chose the pilot program approach, beginning implementation in one operation, department, or program. For example, the Washtenaw County Department of Environment and Infrastructure Services began EMS implementation with its Home Toxics Reduction Program while the Village of Chelsea began with its Wastewater Treatment Plant. The Pilot Program within each Parent Organization is listed in Table 1-1. During the course of the project, there was no turnover in the Pilot Program Leaders assigned by the Parent Organization.

The results of this project reflect efforts to implement (as opposed to maintenance) an ISO 14001 (1996)-based EMS. Implementation covers the development of procedures, processes, and other internal structures to meet standard requirements from policy through management review. Maintenance of the EMS is how it is sustained and evaluated over time. Given the time constraints of the project and the length of time it took the Pilot Programs to develop their EMSs, maintenance was beyond the scope of this project.

Table 1-1. Community-Based Project Participants

PARENT ORGANIZATION	PILOT PROGRAM	DESCRIPTION
Ann Arbor Public Schools	Integrated Pest Management Program, including phosphorus reduction	Ann Arbor Public schools serve over 15,000 students, employs approximately 3,000, and includes nearly 1,000 acres of property.
Briarwood Mall	Mall operations	Briarwood Mall is a regional shopping center, which houses 130 stores, and 4 major department stores in a 1 million square-foot facility. The mall is on 93 acres and mall management employs 45.
City of Ann Arbor, Department of Parks and Recreation	Leslie Golf Course	Leslie Golf Course is an 18-hole course covering 160 acres. The course has 5 full-time staff and 60 seasonal employees.
Eastern Michigan University	Physical Plant	The Physical Plant is home to the university's electrical, plumbing, HVAC, painting, carpentry, welding, landscaping and custodial departments, and a fleet of more than 80 trucks, tractors, mowers, and golf carts.
Edwards Brothers	All printing operations	Edwards Brothers has been printing and binding academic books and journals for over 100 years. It has 500 employees.
Saint Joseph Mercy Health System	All hospital operations	Saint Joseph's is an acute care hospital with over 450 beds. The hospital complex resides on 320 acres along the Huron River and includes 1.5 million sq. feet of building space.
Village of Chelsea	Department of Public Works (DPW)	The Village DPW has a staff of eight and serves 3,900 residents with zoning approved for 1,000 additional residential units. The Village covers about two square miles.
Washtenaw County Dept. of Environment and Infrastructure Services	Home Toxics Reduction Program	The Program seeks to collect hazardous materials from 115,000 households and educate citizens on the use, storage, and disposal of home toxics. Employs one full-time staff member and 10% of a full-time equivalent for collection assistance.
Washtenaw County Dept. of Parks and Recreation	Pierce Lake Golf Course	Pierce Lake Golf course is an 18-hole course on 230 acres and borders Pierce Lake (29 acres). The course has 3 full-time and 55 seasonal employees.
Washtenaw County Road Commission	Soil and Erosion Control Program	The Washtenaw County Road Commission is responsible for over 1500 miles of roads and must ensure that its construction and maintenance practices minimize soil erosion and prevent pollution of county waterways.

EMS implementation for an entire large, complex public service organization can be overwhelming. Consider starting with one program (soil and erosion control), a small department (Home Toxics Reduction Program) or one operation (wastewater treatment). Advantages of this approach include:

- effective use of limited resources.
- development of in-house EMS expertise.
- discovery of the implementation techniques that work best for a particular organization.
- demonstration of early success on which to build support for EMS within management throughout the organization.
- identification of state and local resources available to assist with implementation thereby reducing the cost of EMS development for other parts of the organization.

One caution of this pilot program approach to EMS development: Do not develop the pilot EMS in a vacuum. Be sure that top management is involved and supportive. The management system must fit in with the policy, goals, and direction of the larger organization. A successful pilot project is the best advertisement for the spread of EMS development throughout the organization.

Shift In Emphasis

In looking back on the progression of this project, the slow shift in the scope of the project began during the recruitment process. As noted in the "Recruitment" section, the project was not able to recruit the largest contributors of phosphorous loading to the Middle Huron River. Secondly, as Pilot Program Leaders began identifying aspects and impacts, they realized that their organization had already taken initiatives to reduce phosphorus loading of the Middle Huron River (e.g., use of low phosphorous fertilizer, contouring to minimize run-off). Therefore, the Program Leaders turned their attention to other environmental aspects as a better investment of time and resources. Lastly, with the departure of four participating organizations (see Chapter 1, Early Warning Signs), the project completed its shift in emphasis from, "Can an EMS address a water quality concern?" to:

- Does ISO 14001 (1996) apply to community-based organizations?
- If so, will overall environmental performance be improved?

Reducing phosphorus in run-off remained an objective for individual organizations. The official title of the project was changed from *Implementing Environmental Management Systems in the Middle Huron River Watershed* to *Implementing an Environmental Management System in Community-Based Organization*, in order to reflect the new emphasis.

Motivations

The primary motivations for the community-based organization to implement an EMS may be different than those for industry. The NSF *Environmental Management System Demonstration Project* listed five motivations for the largely private industries that participated

in the project. These included: competitive advantage; improved environmental performance; possible ISO 14001 (1996) registration; enhanced regulatory compliance, and; possible regulatory flexibility (in descending order of importance). The community-based organizations in this project joined the project and committed to building their EMSs for internal reasons. None of the organizations were interested in pursuing registration and competitive advantage was not an issue. Rather, most EMS drivers were based on the Pilot Program Leaders' keen awareness of the public accountability of their programs and operations. The following is a composite of quotes on the motivation for EMS development from the Program Leaders.

1) EMS to improve water quality

We have a lot of land along the river and I was interested in the original project goal of reducing non-point source pollution.

2) EMS as a way to manage growth

We needed a system to manage things that came up in a consistent way. Our area is growing and an EMS will help us handle developmental issues such as controlling soil erosion, maintaining natural features that may be outside of regulations (like landmark trees), and preserving the natural features of the area to maintain its character (e.g., we do not want all the trees cut down). An EMS is also a way to control environmental problems in a rapidly growing community.

3) EMS as a defensive tool

Our organization is often thought of as a primary polluter. An EMS will provide the programs, data, and track record of environmental performance I need to address challenges and questions raised by the public. Having the data on hand will save me a tremendous amount of time in responding to questions by the public. We will be in better position to address public criticism of our operation.

4) Consistent performance through an EMS

The driver for my EMS development was the question: if there was a problem, is there a system to back me up? One call from my boss can stop what I am doing for hours while I gather the data to address the question.

When I took over this position, there had been a 6-month gap since my predecessor left and nothing in place to tell me what to do, whom to contact, or what the history of the program was. Nothing about the job had been documented. I wanted to establish procedures and documentation for someone taking over my position.

5) EMS as the wave of the future

Ann Arbor is a progressive area and being near Detroit, we are influenced by the Big Three automakers. I knew that, just as with ISO 9000, I will be getting calls sooner or later on whether or not we have heard of ISO 14001 (1996) and what we are doing. I want my organization to be prepared.

Be clear on what your organization hopes to gain from EMS development and keep your focus on these benefits. EMS implementation takes careful thought and planning (What does this requirement mean? What do I already have in place that I can leverage?), creative approaches (I'm short on resources and time. Where else can I get help?), and time (often a year or more).

Project Structure

Over the two-year time frame for implementation, Pilot Program Leaders participated in five workshops to receive training on the standard, discuss implementation strategies, participate in EMS exercises to help focus their implementation, and learn from lectures on related state and local environmental stewardship programs. One of the more valuable parts of the workshops was the opportunity to build an EMS support network by sharing experiences in implementation, both positive and negative, and to help one another with implementation challenges.

In addition to the workshops, the project provided:

- Copies of the ISO 14001 (1996) and ISO 14004 Standards.
- Guidebooks: The NSF International *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations* and the *EMS Self-Assessment Tool for ANSI/ISO 14001*.
- Initial site visit to assist in completion of a baseline ISO 14001 audit using *the Self-Assessment Tool*.
- Scheduled site assistance visits to review all EMS requirements and offer advice.
- Clerical assistance to update training and customer survey databases.
- Development of a presentation to educate upper management on the project and benefits of an EMS.

Throughout the project, additional technical assistance was available upon request.

EMS Audit Sub-Group

During the second year of the implementation project, five of the six Pilot Program Leaders formed an EMS Audit Sub-Group to meet the challenge of conducting internal EMS audits in conformance with the ISO 14001 (1996) standard. The intent of the group is to perform peer-level EMS audits. Each Program Leader acts as both auditor (of another Program Leader's EMS) and auditee (having their EMS audited by another Program Leader). With

this new development came the need for additional tools and the project responded by providing the following additional support:

- Facilitated an organizational meeting for the EMS Audit-Sub Group.
- Provided Internal EMS Auditor Training.
- Developed an EMS Audit Procedure, including audit process, schedule, plan, checklist questions, and final report template.

The audit procedure is intended to be used by project participants both during and after the project and was designed to be as simple as possible. The process combines audit steps wherever practical and includes all the paperwork necessary to fully document the audit. The EMS Audit Subgroup scheduled their first audit for early 1999.

Project Data

Data collection for the Community-Based Project began soon after the project was initiated. Pilot Program Leaders completed the NSF *EMS Self-Assessment Tool for ANSI/ISO 14001 (1996)* to establish a baseline for their EMS and re-assessed their EMS at the end of the project. The results from the self-assessments provided a quantifiable comparison of relative progress for each Pilot Program. Reliable cost data was more difficult to collect. Efforts to collect data on track hours spent on implementation per month were not successful. Pilot Program Leaders completed a Project Summary Checklist during the last workshop, which provided estimates on costs. Qualitative data, including benefits, challenges, management indicators, and the examples in Chapter 3 were collected during workshop discussions and site visits.

Early Warning Signs

Chapter 1 previously noted that four of the original ten Pilot Programs halted their EMS development and withdrew from the project. None of the Pilot Program Leaders made this decision lightly; it was only after much thought and consideration. After efforts over the span of a year to develop an EMS, they were not able to make the progress they had hoped and did not see the situation changing. They in effect, became “stuck” in their EMS development. Each of the Program Leaders was interviewed for their perspective on why implementation efforts did not work in their organization. Their experiences are summarized below.

Passive Management Support

All EMS implementation advice emphasizes the need for top management support. Pilot Program Leaders found that passive management support was perhaps worse than an obvious lack of management support because they wasted a lot of time trying to develop a management system that management did not *really* support. Project participants found that with competing priorities, there was never enough time for their EMS initiative. Even with the best intentions, it was very difficult to achieve results on a project that top management did not view as supporting its objectives.

Table 1-2. A Snapshot of ISO 14001 EMS Elements

Environmental policy	Develop a statement of your organization's commitment to the environment. Use this policy as a framework for planning and action.
Environmental aspects	Identify environmental attributes of your products, activities and services. Determine those that could have significant impacts on the environment.
Legal and other requirements	Identify and ensure access to relevant laws and regulations (and other requirements to which your organization adheres).
Objectives and targets	Establish environmental goals for your organization, in line with your policy, environmental impacts, views of interested parties and other factors.
Environmental management program	Plan actions to achieve objectives and targets.
Structure and responsibility	Establish roles and responsibilities and provide resources.
Training, awareness and competence	Ensure that your employees are trained and capable of carrying out their environmental responsibilities.
Communication	Establish processes for internal and external communications on environmental management issues.
EMS documentation	Maintain information on your EMS and related documents.
Document control	Ensure effective management of procedures and other system documents.
Operational control	Identify, plan and manage your operations and activities in line with your policy, objectives and targets.
Emergency preparedness and response	Identify potential emergencies and develop procedures for preventing and responding to them.
Monitoring and measurement	Monitor key activities and track performance.
Nonconformance and corrective and preventive action	Identify and correct problems and prevent recurrences.
Records	Keep adequate records of EMS performance.
EMS audit	Periodically verify that your EMS is operating as intended.
Management review	Periodically review your EMS with an eye to continual improvement.

If in response to your request to work on an EMS for your organization, your manager says “Okay, but do it on your own time” or “Fine with me but don’t let it interfere with your other work,” you have a case of passive management support. Educate management on the benefits of an EMS (see *Overcoming Implementation Challenges*). Show how EMS objectives and targets (or other parts of the EMS) will help top management achieve its goals. Not only is top management support critical in terms of providing resources and allowing your time, but their involvement (e.g., receiving regular updates, appointing the EMS development team) is important to sustain implementation efforts. Be sure to gain the support of your direct manager or supervisor and the person authorized to allocate funds (if different from top management).

Expectations vs. Reality

The Community-Based Project began just as the ISO 14001 (1996) standard was finalized and the systems concepts behind the standard were new to the Pilot Program Leaders. Those who withdrew said that they the standard did not seem applicable to their organization and the potential benefits to their organization of an EMS were not apparent. In addition, implementation was much more difficult and time consuming than they had expected. These reservations rose to the surface and became “the last straw” when the first implementation stumbling block appeared; for some this was writing procedures, for others it was the identification of environmental aspects and impacts.

It is important to realize that implementation will take time and thought, but the management system described in ISO 14001 (1996) is actually very practical; it is not a theoretical system applicable to only large industrial organizations. Look beyond the “iso-ese”, the phrasing borne out of international consensus, and recognize the sound management concepts in the standard. Table 1-2, an excerpt from the *Implementation Guide for Small and Medium-Sized Organizations*, summarizes the standard requirements in simple language.

Cultural Change Required

One Program Leader who withdrew realized early in the implementation process that an EMS would require a change in their organizational culture towards more formality and a tighter control structure than they are used to. The Program Leader felt he could not overcome employee resistance to this cultural change without top management support.

Small community-based programs or operations often have informal and personnel-dependent processes and procedures. Written procedures and documented systems are often viewed as unnecessary. However, as this project has shown, personnel turnover without documented systems, can stall the development of all programs, not just the EMS (see *What Are the Benefits?*, Chapter 2).

Why Do We Need This?

The four Pilot Program Leaders and/or their managers voiced a variation of, *Why do we need an EMS anyway? We are already in compliance and doing a lot to protect the environment. What else do we need?* This perception became another reservation that over time, became a deciding factor against EMS implementation. These participants did not

realize that a compliance program and environmental initiatives emphasize the need for an EMS because it will help an organization achieve the desired result in a consistent manner. An EMS builds the capacity of an organization to meet its goals.

Implementing an EMS forces you to take a step back from the daily management of an individual project or program and take a “big picture” perspective of your operation. There is a tendency, as with most of the community-based participants, to look at your activities piecemeal and not as part of a process. Without a process perspective it is difficult to document your processes and successes, prioritize projects, manage your environmental interactions and obligations, identify cost savings, make most effective use of resources, and improve your overall environmental compliance and performance.

Selecting The EMS champion

The early warning sign here was not lack of people to implement the EMS (although this is a problem in community-based organization - see Chapter 2, Overcoming Implementation Challenges), it was lack of a person with the appropriate skills and experience to be the EMS champion within the organization.

The best person to take the EMS lead in an organization is someone with abilities to both understand detailed, technical work and management systems, who is a good communicator, who knows how to gain the cooperation of other departments.

Management's Fears

Management's fears were really fears of the unknown based on a lack of understanding the ISO 14001 (1996) standard. The fears fell in two categories;

- An EMS will commit us to doing things.
- What if the aspects evaluation uncovers something negative? We are better off not knowing about it.

Educating management on EMS concepts to counter these arguments is a necessary first step (see Chapter 2, Overcoming Implementation Challenges). If management support is still lacking, EMS development may still move forward by showing how the EMS will support other organizational program and goals.

While these warning signs are not exclusive to community-based organizations, they reflect the types of initial obstacles community-based organizations are likely to face when attempting to implement an EMS.

Chapter 2 EMS IMPLEMENTATION RESULTS

Introduction

The results in this chapter clearly show that the ISO 14001 (1996) standard does apply to community-based organizations. The six Pilot Programs began the project with EMSs showing low levels of conformance to standard requirements. By the end of the project, Program Leaders had either initiated or completed work on over 90% of all standard requirements. Program Leaders found that these efforts improved the environmental performance of their organization through lowering their organization's risk profile, improving environmental programs, creating cultural changes within the organization, and improving efficiency.

Over the two-year course of the implementation project, Program Leaders faced numerous implementation challenges, particularly lack of resources. The challenges they faced and their creative solutions to overcome them provide valuable lessons learned for other community-based organizations. While the standard is applicable to both industry and community-based organizations, the latter face some unique implementation challenges such as the very active and visible role of the public in EMS development, motivations for EMS development, and elected top management as a factor in EMS maintenance.

How Did Implementation Proceed?

Progress on EMS implementation over the course of the Community-Based Project was measured primarily by comparing the results of the initial and final self-assessments conducted using the NSF International *EMS Self-Assessment Tool for ANSI/ISO 14001 (1996)*. The initial self-assessments were conducted in January 1997, while the final self-assessments evaluated implementation through December 1998 (thus, the approximate time between self-assessments was 24 months). Of the 10 organizations in the project, 6 submitted data on self-assessments; therefore, 4 of the 10 organizations are not included in the aggregate data analysis.

The Self-Assessment Tool was used to determine: How mature were the environmental management systems at the beginning of this project? What was the overall progress in EMS implementation? In what areas were Pilot Programs able to make the most progress and why? Where was the least progress made?

EMS Self -Assessment Tool

The *EMS Self-Assessment Tool for ANSI/ISO 14001 (1996)* contains a checklist which breaks the 17 elements of ISO 14001 (1996) Standard down into 63 separate requirements. The checklist does not interpret the Standard, rather each requirement is taken verbatim from ISO 14001 (1996). The user evaluates their conformance to each requirement at various implementation levels as described below.

“No” Response

Implementation Levels

- **No Action (NA)**: No significant or formal actions have been taken by the organization to plan or implement activities that would meet this requirement.
- **Initiation (IN)**: The organization has begun to plan or undergo specific activities that would contribute to fulfilling this requirement. Activities might include one or more of the following:
 - general planning has begun or been assigned
 - a written action plan or outline is prepared, or being prepared
 - draft policies, procedures or initiatives are under development or review
 - responsibilities for specific planning or design activities have been assigned
 - pilot activities to assist in the design process are underway
- **Partial Implementation (PAR)**: Implementation of an action plan has begun, but major gaps in implementation exist in the organization. Specific activities that contribute to fulfillment of this requirement have been implemented in only *parts* of the organization; and/or some *but not all* of the necessary activities have been implemented; and/or activities are fully deployed but are *not implemented effectively*.

“Yes” Response

Implementation Levels

- **Complete Implementation (COM)**: All specific activities necessary to fulfill this requirement have been *effectively* implemented in *all* parts of the organization.
- **Evaluated & Sustained (ES)**: Specific policies, procedures, or activities that contribute to fulfillment of this requirement have been reviewed and evaluated, and improvements, where appropriate, have been introduced. Activities have been documented, sustained over time (e.g., one full business cycle), and have been fully integrated into routine business operations.

By the time the Pilot Program Leaders completed their final self-assessment, they had a better understanding of ISO 14001 (1996) requirements than when they performed the first self-assessments. For this reason, Program Leaders were given the option of adjusting their original responses if sufficient justification could be provided.

Overall Progress on ISO 14001 Implementation

The results in this section are based on the analysis of a total of 378 self-assessment responses (6 organizations x 63 requirements in each assessment tool = 378 total responses). Table 2-1 presents the number of responses by Program Leaders at each implementation level. The data show substantial progress in EMS development over a 24-month period. The number of requirements which had an overall “No” ranking dropped by

26% from 319 to 236 while the Pilot Programs increased their EMS conformance (number of COM plus ES) to ISO 14001 (1996) requirements two and a half times (57 to 142).

Table 2-1: EMS Implementation Level Ranking for Community-Based Pilot Programs Based on the EMS Self-Assessment Tool for ANSI-ISO 14001 (1996).

Implementation Level Ranking	Number of Responses per Implementation Level	
	Initial	Final
No Action (NA)	158	46
Initiation (IN)	54	57
Partial Implementation (PAR)	109	133
subtotal "No"	319	236
Complete Implementation (COM)	42	113
Evaluated & Sustained (ES)	15	29
subtotal "Yes"	57	142
Total Requirements	378	378

Figure 2-1 Percentages of Implementation Level Rankings for Initial and Final EMS Self Assessments.

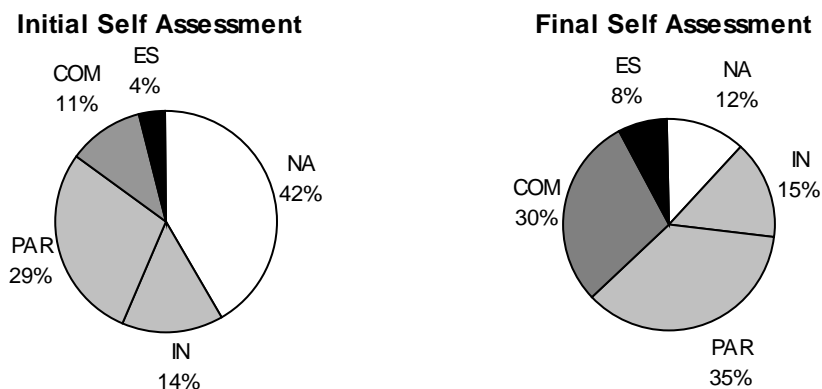


Figure 2-1 presents data from Table 2-1 in percentage pie charts. The charts indicate that at the start of this project, the Pilot Programs had existing management systems in the early stages of development. The Pilot Program Leaders had taken no action on 42% (NA) of ISO 14001 (1996) EMS requirements and had completed only 15% (11% COM plus 4% ES) of the collective standard requirements. By the end of the project, the Pilot Programs were solidly moving toward completing their EMSs. Program Leaders had collectively completed work on 38% (30% COM plus 8% ES) of the requirements in the ISO 14001 (1996) standard and at least begun work on an additional 50% (15% IN plus 35% PAR) of the collective requirements.

The two Pilot Programs that ended the project with the strongest EMSs accounted for the rise in evaluated and sustained (ES) status from 4 to 8 percent. These programs also had high individual rankings for Checking and Corrective Action and Management Review. The emphasis of Community-Based Project was EMS implementation (i.e., rankings from NA to COM). Therefore, growth in the evaluated and sustained status, which is more reflective of EMS maintenance, was not anticipated (See Appendix A for individual organization results).

The ISO 14001 (1996) standard contains five principal sections with a total of 17 elements:

1. Environmental Policy (1 element)
2. Planning (4 elements)
 - Environmental aspects
 - Legal and other requirements
 - Objectives and targets
 - Environmental management program(s)
3. Implementation and Operation (7 elements)
 - Structure and responsibility
 - Training, awareness, and competence
 - Communication
 - Environmental management system documentation
 - Document control
 - Operational control
 - Emergency preparedness and response
4. Corrective Action (4 elements)
 - Monitoring and measurement
 - Nonconformance and corrective and preventive action
 - Records
 - Environmental management system audit
5. Management Review (1 element).

Figures 2-2 and 2-3 depict implementation progress in the five principal sections. Initial rankings showed that Pilot Programs were in highest conformance with the requirements under Planning section and demonstrated limited conformance with requirements under

Figure 2-2. Results of the Initial EMS Self-Assessment Grouped by Principal Sections of ISO 14001 (1996)

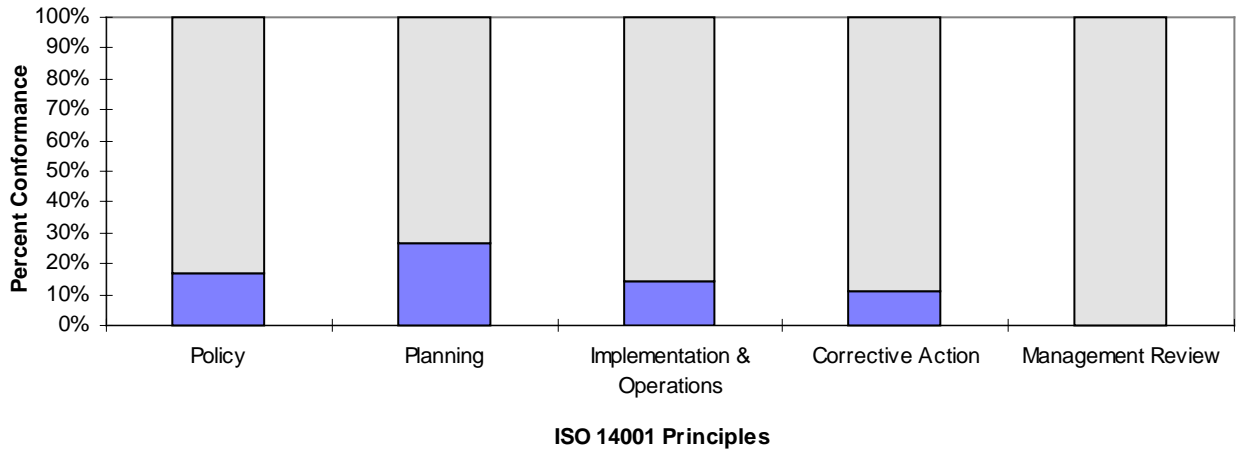
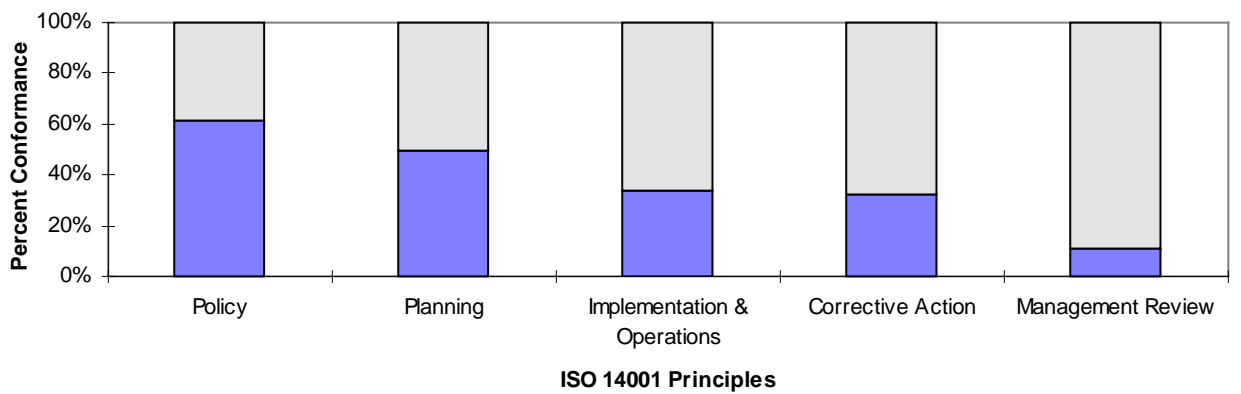


Figure 2-3. Results of the Final EMS Self-Assessment Grouped by Principal Sections of ISO 14001 (1996)



Corrective Action and Management Review. By the end of the Community-Based Project, the level of conformance (or %YES responses) was more evenly spread throughout all the sections. The Pilot Programs sought to first build their EMS on the existing management structures for Policy, Planning, and Implementation and Operation. Meeting requirements under Corrective Action and Management Review were undertaken after a foundation in the first three sections was established.

Progress on Individual Elements

Table 2-2 and Figure 2-4 display implementation progress for each element of the ISO 14001 (1996) standard. Table 2-2 shows how the elements ranked for both the initial and final self-assessments in terms of the % of “Yes” responses within each element. (Note: %Yes was calculated by dividing the total number of “Yes” responses in an element by the total number of requirements in the element for all organizations). The percent change between the initial and final self-assessment for each element is also provided. Figure 2-4 shows initial vs. final levels of conformance by the six Pilot Programs collectively for each element of ISO 14001 (1996).

Data in Table 2-2 show which element showed the greatest/least relative progress towards conformance. Based on percent change, most progress was made in Monitoring and measurement, Environmental policy, and Objectives and targets. At the beginning of the project, there were five elements for which no existing management practices were in place (a zero % yes ranking): EMS Documentation, Document control, Operational control, EMS audit, and Management review. By the end of the Community-Based Project, conformance activity had been initiated in all 17 elements of the standard.

Table 2-2 also shows that at the beginning of the project there was only one major element, Legal and other requirements, which met 50% of the standard requirements. By the end of the project, the six Pilot Program met 50% of the collective ISO 14001 (1996) requirements in seven elements; Emergency preparedness and response, Environmental policy, Objectives and targets, Environmental aspects, Legal and other requirements, Communications, and Monitoring and measurement. Most of these elements fall under either the Policy or Planning principal sections, highlighting that most implementation progress was made in these areas.

Emergency preparedness and response was evaluated as the highest in implementation in the final assessment (67%) and ranked sixth in progress based on a percent change calculation (see Table 2-2). It is not surprising that emergency preparedness and response was ranked high since many of the participants had emergency preparedness and response programs already established to meet environmental regulations. Environmental policy and objective and targets both ranked moderately low in the initial assessment (both at 17% conformance), but significant progress was made over the course of the project with ending percent conformances of 61% & 56%, respectively.

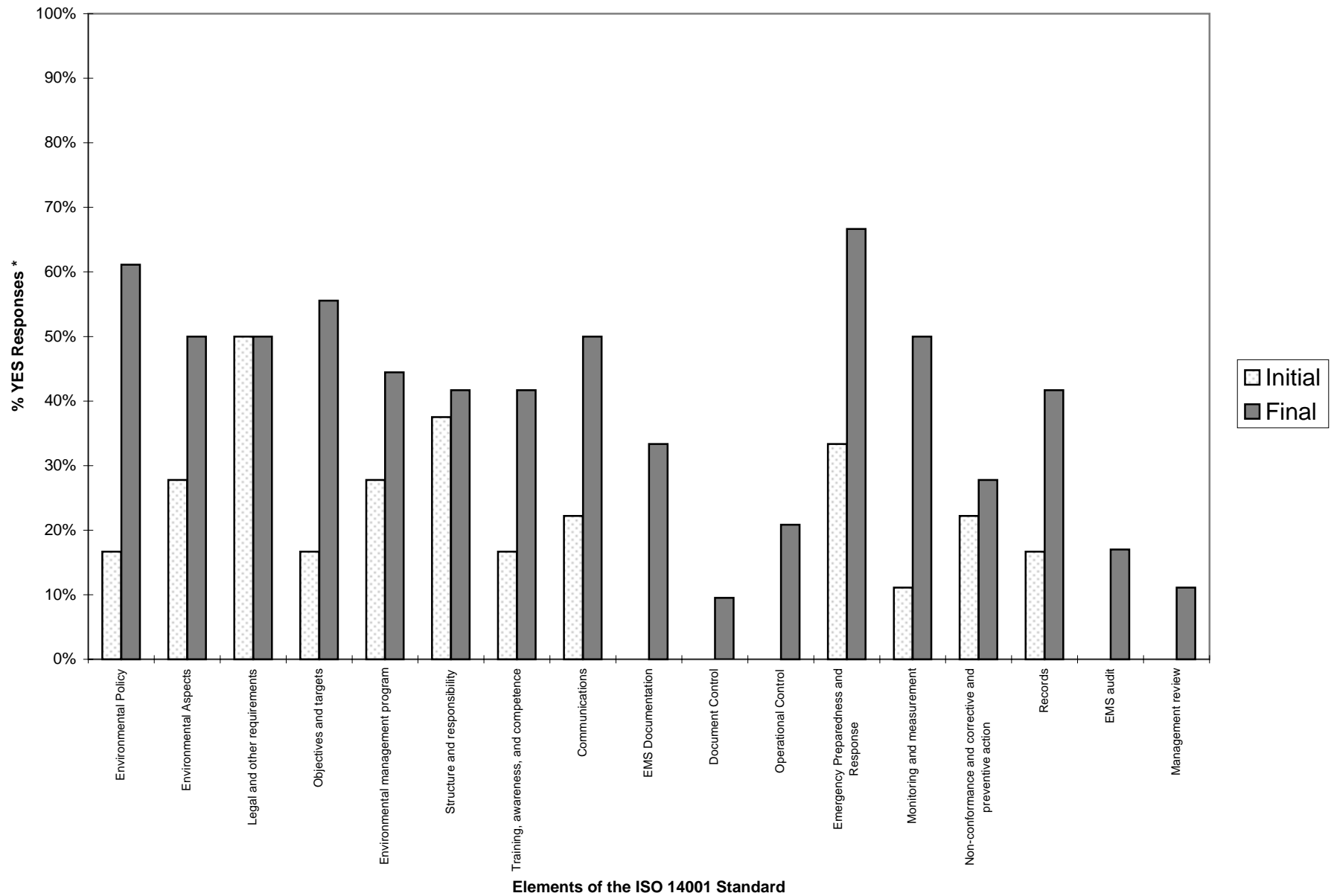
Although monitoring and measurement was evaluated relatively low in the initial assessment (11%), the greatest progress was made on this element (44%) with a % change of 350%. On the other hand, legal and other requirements, which received the highest evaluation initially (50%), had the lowest percent change (0%). There are two reasons for the low percent change. Three of the six organizations initially rated their conformance with legal and other requirements as “COM” and thus their “YES” ranking would not change.

Table 2-2: Implementation Progress on Individual ISO 14001 (1996) Elements

ISO 14001 Elements	% YES		% Change
	Initial	Final	
Environmental Policy	17%	61%	267%
Environmental Aspects	28%	50%	80%
Legal and other requirements	50%	50%	0%
Objectives and targets	17%	56%	233%
Environmental management program	28%	44%	60%
Structure and responsibility	38%	42%	11%
Training, awareness, and competence	17%	42%	150%
Communications	22%	50%	125%
EMS Documentation	0%	33%	N/A*
Document Control	0%	10%	N/A*
Operational Control	0%	21%	N/A*
Emergency Preparedness and Response	33%	67%	100%
Monitoring and measurement	11%	50%	350%
Non-conformance and corrective and preventive action	22%	28%	25%
Records	17%	42%	150%
EMS audit	0%	17%	N/A*
Management review	0%	11%	N/A*

* Percent change is not valid where the initial value is zero

Figure 2-4: Progress of Individual Elements of ISO 14001



* Percent of ISO 14001 requirements met by project participants taken collectively. For example, the six participants met 60% of the environmental policy requirements.

The three remaining Pilot Programs did make progress in implementing the requirements (from “IN” to “PAR”) but did not reach “COM” ranking under “YES.”

Cost

During the course of the project, the participants did not track costs associated with implementation nor did they track any cost reductions or benefits associated with EMS activities. The Pilot Program Leaders completed Project Summary Checklists during the final workshop and provided some cost information. Results indicated that many of the organizations do expect financial benefit in the future from efficiencies as a result of EMS implementation. Program Leaders also estimated that from \$1,000 to \$10,000 was spent on EMS implementation during the project. Although these figures do not consistently include the participant’s time, checklist results indicated that the largest expense incurred by these organizations was staff time.

The organizations responded that over the course of the project, approximately 100 to 300 hours were spent on the implementation of individual EMSs. This figure does not represent total time to completely implement an EMS for the following reasons; 1) the hour estimate included EMSs that were only partially developed (e.g., conducting EMS audits is not included), and 2) the time represents the hours of one dedicated individual and does not include training of other employees or time where EMS development was integrated into an existing program (the existing program was charged with the time).

What Are The Benefits?

Pilot Program Leaders discussed the benefits of EMS implementation during workshops, phone conversations, and site visits and the results of these discussions have been grouped under the four general headings below. The benefits discussed all occurred during the implementation phase of EMS development. Many were realized early in the process. Program Leaders began the project with general ideas what improvements would be realized (see “Motivations”) and found many benefits they had not anticipated.

Lowered organization’s risk profile

Lowering risk for the community-based organizations in this project meant improving the ability to address public inquiries quickly, improving worker safety, improving environmental compliance, and increasing efforts to protect the environment. In addition, lowering environmental risk may lower other types of organizational risks such as financial or public trust. Examples from the Pilot Programs include the following:

- Developing process flow charts as part of aspect/impact identification helped one organization to identify environmental and safety risks that would have been overlooked. Based on the risks identified, the budget for improvement projects was re-prioritized and a pesticide/ herbicide storage building that had been under consideration for years was built within six months.
- As a result of aspect/impact identification, another organization recognized the need to upgrade emergency response equipment and purchased booms, sorbent materials, magnetic storm drain covers, and additional spill containment pallets, and formed agreements with a spill response contractor. When there was a subsequent leak of

- hydraulic fluid, the organization was able to quickly respond and prevent a release to the Huron River.
- As a result of the regulatory review process, local regulatory requirements, previously unknown, were identified.
 - As a result of aspect/impact identification, one Pilot Program Leader began to look at the disposal sub-contractors that his waste-handling contractor was using and ask the following questions: Where our the waste going? Were these subcontractors using the best disposal methods? Were the subcontractors using all of the recycle/reuse options available? These questions evolved into criteria for awarding disposal contracts. As a result, the organization was able to increase the amount of their collected waste being recycled/reused and decrease the amount going to the landfill.
 - Through the process of identifying aspects and impacts, potential impacts to the environment (in this case, neighboring properties) were discovered that had not been considered before.
 - wastewater treatment plant placed 'goosenecks' (offset pipes in stormwater drains on catch basin drains to collect oils) in stormwater drains.

Enabled improvements in environmental programs

Pilot Program Leaders used their EMS implementation to expand environmental programs and increase their effectiveness, save their organization money, and receive positive public recognition.

- One participating organization identified its use of mercury as a significant aspect. Mercury was in widespread use throughout the organization and they were in full compliance in its use and disposal. However, due to the toxicity of mercury, the organization had a contract with a professional environmental response company to clean and dispose of discarded equipment and contaminated waste resulting from spills. Each spill clean-up, even small ones cost at least \$1,000. Not only did the EMS help to identify mercury as an aspect but the fact that the organization was participating in an EMS pilot program helped the Program Leader to obtain the approvals he needed to implement a Mercury Reduction Initiative. When fully implemented, the Initiative is expected to save the organization as much as \$20,000 per year.
- One Program Leader now tracks operational information (e.g., fertilizer usage) that had previously been done informally. The need to track this information was realized as a result of their effort to develop an EMS. The operational information provided the Pilot Program Leader with the tools he needed to minimize impacts to the environment (fertilizer in run-off) and control costs.
- Another Program Leader noted EMS development fit well with his organization's existing culture of quality assurance and allowed the focus of continuous improvement to expand to include environmental programs without the perception (by management) that this was a major change.
- During the course of the project, one participating Pilot Program won four state and local environmental recognition awards for environmental excellence, waste reduction,

recycling, and watershed protection. The Program Leader stated that his efforts to implement an EMS were an important contributing factor in gaining this public recognition.

- Simply keeping an electronic calendar of education and outreach activities and events provided one participant the data to track progress toward meeting an environmental objective.
- The project demonstrated the effectiveness of the pilot program approach in promoting EMS concepts within an organization. As a direct result of the EMS efforts by Leslie Golf Course, the City of Ann Arbor Parks and Recreation Department began tracking chemical purchases for *all* Ann Arbor Parks facilities and operations such as swimming pools, maintenance equipment, and pesticide and herbicide application. Data being tracked includes the identification of the chemical, the purchaser, the quantity purchased, and location where the chemical is being used. Tracking this data allows for the future development of objectives and targets regarding chemical usage.

Fostered cultural change

Pilot Program Leaders had not anticipated that their EMS development efforts would help to change perceptions about environmental management, improve cooperation among departments, and increase employee interest in environmental protection. Changing an organization's culture is not an EMS benefit that can be quantified but its benefits are real and far-reaching. It is interesting to note that the cultural changes an EMS may require was one reason some early participants withdrew from the project (see Chapter 2, Early Warning Signs).

- In one Pilot Program, an environmental committee sets objectives and targets for the organization. Some committee members viewed environmental issues as discrete tasks that should be addressed once and never revisited. The Pilot Program Leader noted that an EMS greatly helped to re-enforce the reality that environmental issues need to be managed; they often do not go away once they have been cleaned up but may require ongoing monitoring (e.g., asbestos and lead-based paint).
- Prior to EMS development in one Pilot Program, environmental responsibilities were divided among various departments with little coordination on environmental programs. Engineering, for example, which managed the underground storage tanks did not routinely coordinate with Safety, which developed the site's Pollution Incident Prevention Plan. As EMS implementation progressed and the scattered responsibilities were recognized, the departments with environmental responsibilities began communicating with one another and coordinating on their environmental programs. As a Pilot Program Leader commented, *An EMS is a good way pull environmental processes and procedures under one umbrella. It provides a comprehensive program that ties a complex organization together.*
- Several Pilot Program Leaders noted that people in their organization were starting to look at what they do differently; they look at environmental effects, ways to improve their work, and make suggestions. The Program Leaders saw a real desire among employees to make program improvements that would benefit the environment.

Formalized processes to improve efficiency

Improving the efficiency of their day-to-day operations was a benefit the Program Leaders had not initially anticipated. Many of the community-based organization began the project comfortable with their informal processes and procedures. Through EMS implementation they saw that even small efforts to document processes (such as training) could dramatically improve efficiency.

- As a direct result of this project, one Pilot Program updated his environmental training database. Now the Pilot Program Leader informs supervisors in advance what training their staff needs rather than the former system where training came up as an issue only when an employee said they did not know how to perform a certain task. Managers are now informed regarding what training is necessary and who has completed appropriate training.
- Documentation of job responsibilities and the resources available to perform the job is an overlooked benefit. When one Program Leader assumed a new position in a relatively new environmental program, there was no documentation to guide him to job requirements, procedures, who to call for what service, or how to get things done. He had to reconstruct the position on his own, thereby delaying restart of his program. EMS implementation helped him document every part of his program so as to avoid this happening again.
- Documentation of responsibilities is valuable for even small organizations, as one Pilot Program Leader discovered. When a maintenance employee unexpectedly resigned, it was easier for the Program Leader to train his replacement and convey how serious the organization was about environmental protection because the environmental programs were documented.
- In the process of implementing an EMS, one organization developed procedures for their physical operation and handling of waste and as a result prepared a much needed safety plan for their operation. The documented processes were shared with local emergency responders.

As you work through the EMS implementation process, look for benefits, often where you would not expect them. Document each benefit, no matter how small it may seem at the time. As the list of benefits (including specific examples and cost figures if you have them) grows, you will have a powerful tool to enlist management's continued support. Remember the advice from Program Leaders to keep your EMS efforts in front of management by advertising your successes.

What Helps/Hinders Implementation?

All organizations have systems (a way of doing things) in place, formal or informal, whether or not they are recognized as a system. Before starting implementation, it is important to recognize what existing management systems will help or hinder EMS development. Participants were asked to list specific management practices, systems, or tools that were a factor in EMS development and rank each one as being a primary factor which helped/hindered implementation or a supporting factor. This ranking scheme was based on a May 19, 1997 draft *Project Evaluation Matrix* developed by the Multi-State Working Group

on Environmental Management Systems. (The Multi-State Working Group is a collection of 15 states, the U.S. EPA, and others working together to coordinate the implementation and data collection/analysis of their ISO 14001 (1996) pilot programs. See Appendix B).

Table 2-3. Management Indicators That Supported EMS Development

Management Indicator	Ranking
Long standing top management support for addressing environmental concerns	Primary
Customer (the public) support for and interest in environmental issues	Primary
Appointment of an EMS Champion	Primary
Existing procedures and programs for safety and health	Primary
Accreditation to another standard	Primary
Previous exposure to Total Quality Management Concepts	Supporting
Culture of self-auditing and being accountable for environmental performance	Supporting
Strong regulatory framework and corrective action process in place	Supporting
Business Improvement Process in place at a departmental level	Supporting

A helpful first step in EMS implementation for community-based organizations is to recognize which of their existing practices or business processes will assist them most. Management indicators with a "Primary" ranking already have management support and may point to a good building block for an EMS.

Table 2-4. Management Indicators That Hindered EMS Development

Management Indicator	Ranking
Our culture is that we do not audit ourselves; employees are wary of testing of any kind	Primary
Many organizations are under one roof but with several different managers	Supporting
Lack of support within various functions and levels in the organization	Supporting
EMS development takes time; cultural change may be required	Supporting
Lack of administrative procedures in supporting departments	Supporting
Managers are not used to thinking on a systems levels; they have a task-oriented approach	Supporting

Early recognition of the management indicators in your organization, which hinder EMS development, may prevent them from becoming roadblocks.

Overcoming Implementation Challenges

This section presents implementation challenges faced by the Pilot Program Leaders and strategies they used or plan to use to overcome these challenges including:

- 1) lack of resources
- 2) communicating with management and staff
- 3) setting objectives and measuring progress
- 4) integrating management systems
- 5) supporting departments lack formal systems

The challenges are listed in order from the most to the least difficult challenge.

Lack of Resources

The lack of resources, including time, technical resources, and administrative help to develop an EMS, was the major limiting factor for project participants. Resource options often used by industry, such as hiring a consultant, using administrative support for data entry or procedure development, or temporarily reassigning someone from another department, were not available for the groups in this project. For a community-based organization of only three or even just one employee (see Table 1-1), EMS development may seem like an overwhelming task; however, as project participants discovered, it can be done if you begin with;

- clear understanding of the requirements of the standard
- strong motivation based on the advantage an EMS will bring to your operations
- willingness to think creatively about how to locate the resources you need

The methods project participants used to marshal the resources they needed are explained under “Use existing systems,” “Develop an EMS network,” and “Identify local resources.”

Use existing systems

Do not approach EMS development as something new you have to build.

Build on what you already have in place. Do not re-invent the wheel.

These themes were often repeated by Pilot Program Leaders after they were well underway

with EMS development. Although identifying the systems, processes, and procedures already in place was an early implementation strategy, Program Leaders did not give themselves enough credit for what they already had in place. As their understanding of the standard matured, Program Leaders realized that one pre-existing practice might meet one or more standard requirements. For example, a department-wide Business Improvement Process made an ideal vehicle for Management Review; semi-annual compliance audits done by another department helped to meet the requirements under monitoring and measurement; and maintaining logs for pesticide/fertilizer application rates helped to track objectives and targets and meet requirements for monitoring and measurement.

For one Pilot Program, tying EMS development to existing health and safety programs was the key factor that led to the success of the EMS. Without linking each step of EMS development to a certification process, which was well established and had full management and staff support, no progress would have been made. By way of example, here is how this Program Leader described his organization's use of existing systems to support EMS development.

Our organization is required to have management plans in seven areas including hazardous materials and waste, safety, emergency preparedness, and utilities. As safety and other policies and procedures were revised, EMS components were added. Training in the seven areas is required for hospital certification and management would not have supported separate, additional EMS training. Therefore, EMS training will be included as part of the existing Safety Education program and will be documented in the personnel growth records required for all employees. EMS development was also folded into the function and focus of existing management and committee structures, which support certification.

The "don't re-invent the wheel" concept is a point overlooked time and time again by organizations implementing the standard. This tendency is important to realize because the first impression of ISO 14001 (1996) often is, *Oh no, I have to create an entirely new system*, and this can be a roadblock to implementation. Another advantage of using existing systems - environmental practices quickly become routine when they are tied to existing practices.

One caution: identifying and building on existing systems is a good starting point but may not result in a complete ISO 14001 (1996)-based system. The elements of ISO14001 (1996) that harmonize best with existing systems tend to be the most developed parts of the EMS (e.g., policy, training, emergency preparedness) while parts of the EMS that do not harmonize as well (e.g., document control) may remain weak for a long time.

Develop an EMS network

Networking as a tool for EMS development was a concept that evolved as project participants faced implementation stumbling blocks and resource limitations. Networking took on two variations: networking within a project group where all participants were working toward similar goals of EMS implementation and the networking of each Program Leader with the outside organizations that could assist in EMS development.

Group Networking for Implementation Strategies and Advice: As participants faced EMS related questions (How do I dispose of this radioactive material? What is the best way to

document training needs?), they began to turn to each other for advice between and during workshops. For example, one Pilot Program Leader had taken the initiative for EMS development for his organization but was not a permanent employee of the organization and had little authority as an individual to establish an EMS. Plans the organization had for additional staff to assume environmental responsibilities fell through. At one of the workshops, the other Program Leaders gave him the following advice:

- Select just one department (e.g., wastewater treatment) and perhaps just one program under that department (stormwater control) rather than try to tackle the whole organization.
- Gain support from the governing body for the organization. Emphasize that customers (the public) would support an EMS and that an EMS will help prepare for upcoming stormwater regulations.
- Try publicity on the project to re-inforce support for the EMS.
- A big need to make the EMS successful - find a champion.

The Pilot Program Leader took their advice and proceeded with EMS development.

Group Networking to Meet Standard Requirements: The networking idea was further developed as the Program Leaders contemplated how to meet the ISO 14001 (1996) standard requirement to *establish and maintain (a) program(s) and procedures for periodic environmental management systems audits*. The challenge was, how could a small organization (of, for example, 3 people) conduct an objective and impartial assessment if its EMS? A second challenge was that even in the larger Pilot Programs, EMS expertise was limited to the Pilot Program Leader. Five of the six the Program Leaders decided to form an EMS Audit-Sub Group to address this resource limitation by bartering auditing services. The project provided internal EMS auditor training and an EMS audit procedure (which includes a three-year schedule, audit plan, checklist questions, audit summary form, and findings form) provided in Chapter 3, EMS Audits.

Outside Networking: A second way networking can be used to facilitate EMS development is to find agencies with related environmental goals. One Program Leader actively sought out other county agencies to obtain technical advice and form partnerships to help him guide and advertise his program. Taking advantage of the expertise of the Huron River Watershed Council, League of Women Voters, Ann Arbor Solid Waste Coordinator, Co-op Extension Services and others, he formed an Advisory Committee to help guide the direction of his program. As a result of his connections, he was able to take advantage of a phone survey being conducted by the Huron River Watershed Council. The Council's survey included questions that helped the Program Leader collect important data to track the success of his program. As an unexpected result of this networking effort, the Program Leader learned that the county had contracted with an environmental, safety, and health consultant. He obtained much needed technical advice and safety and environmental issues at no direct cost to his program.

Form a networking group with other organizations that have a common goal of EMS implementation. Networking can facilitate implementation by sharing expertise, implementation advice, and encouragement, and addressing resource limitations with bartered services. Do not overlook networking with community-based service organizations outside of your implementation group that have related environmental objectives.

Identify local resources

This implementation project discovered, through the involvement of the Advisory Committee, that local city and county governmental agencies, local environmental stewardship groups, and colleges often provide additional resources to community-based organizations for EMS development. These resources may support EMS development directly (e.g., an intern or volunteer) or indirectly with the opportunity to become involved in related voluntary environmental programs. These resources are often overlooked because they are not EMS support *per se*. Below are examples of the local resources used by the Pilot Programs to develop their EMS. Look for similar offerings in your area.

- Several project participants also participated in Community Partners for Clean Streams. This program, sponsored by the Washtenaw County Drain Commissioner's Office, is designed to control non-point source run-off and protect the Huron River and local streams by encouraging businesses, institutional and multi-residential landowners to adopt voluntary stormwater control measures. Participants prepare a Water Quality Action Plan, documenting the effects their business practices have on water quality and outlining steps that they have taken to protect water quality. One-on-one technical assistance is provided throughout the process. This program can help an organization identify aspects and impacts, and develop their environmental management program.
- Participants took advantage of a courtesy compliance inspection offered by the Washtenaw County Pollution Prevention Program. The program provides a registered sanitarian to perform a general environmental compliance audit and pollution prevention review of a school, municipality, or other governmental entity. By using this service, one Pilot Program was able to replace a 250-gallon above ground oil tank located near a stormwater drain with 5-gallon containers of oil purchased as needed. Contact your state environmental health office to see if a similar program is offered in your area.

Be sure to talk to professors at nearby colleges and universities for graduate student that may be willing to help with some phase of EMS development (e.g., documentation of procedures) as part of a special project. Screen participants carefully. EMS development is best done by someone with some real-world environmental experience. Students can do the time-consuming but necessary tasks (e.g., research, draft procedures, memos, etc.) which would free up your resources and time to perform the more technical development. For interns with more work experience, some universities offer graduate programs for engineers and scientists with 3-5 years of work experience and have management systems internships as part of their program.⁴

⁴ For more information contact Dr. Edward Aqua, Director, Gordon Institute of Tufts University, Department of Civil and Environmental Engineering, 4 Colby Street, Medford, MA 02155, (617)-627-3111.

Communicating with Management and Staff

Communicating with management and staff includes education on standard requirements and communication on EMS progress and successes. The Pilot Program Leaders recognized the importance of communication early in the implementation process. Faced with competing priorities, Program Leaders found that even a supportive manager's interest decreased over time. This waning support placed a strain on already limited resources for EMS development. Participants found that the best way to renew management support and continue to build support throughout the organization was through ongoing education on the EMSs and reporting implementation successes. Mid-level management was identified as a prime target for this communication.

Community-Based Project results include the following ideas for promoting the EMS to management:

- Make a presentation to management on the benefits of an EMS. Do not go into the details of the standard but promote EMS as a tool for planning, reviewing, implementing, and improving what the organization does in the environmental area. Emphasize that an EMS can help managers to meet their goals.
- Consider an indirect route to management. Management support for the EMS often depends on how the environmental function is viewed within the organization. If the environmental work is viewed as a support function, it can be difficult to get management buy-in. If appealing to management directly does not work, identify the group to whom management does listen. Is it the legal department? The financial officer? Head of maintenance? Consider working through whoever has management's "ear." Use more than one route to educate management and gain their support.
- Publicize your organization's efforts. Insert a paragraph in a your organization's newsletter or publish an article in the local paper. Discuss your efforts at Chamber of Commerce meetings or present to local environmental groups.
- Educate in steps. The requirements in ISO 14001 (1996) are broad and it is easy for newcomers to the standard to become confused. Do not try to educate your organization on the whole standard at once but do it consistently and in small, easy to understand concepts. This approach can also help to sustain awareness of your EMS efforts.

Educating management and staff is not a one-time effort. As one Pilot Program Leader stated, *Promote benefits to management constantly.* Do this by building on your early successes. Identify and document the progress you have made and your successes. Present these results to management as a way to build support and gain momentum for your effort.

Periodically, even the EMS lead for the organization needs to step back and refocus on what they are trying to accomplish. Program Leaders noted that when involved in the day-to-day implementation of the EMS, it was easy for them to lose their "big picture" perspective.

Setting Objectives And Measuring Progress

Early in the implementation phase, participating organizations struggled with developing quantifiable measures of the success of an EMS, both as a way to measure progress and a metric to report to management. All participants faced difficulty in deciding what objectives and targets would truly reflect their EMS progress and how to cost-effectively gather the data. Existing internal accounting or purchasing systems were often not designed to give the Pilot Program Leader the performance measure information they needed and could not easily be modified to provide it. Some organizations felt they could not set objectives for the organization because individuals outside of the organization (and thus out of their control, such as customers or the public) had a direct effect on whether or not the target for that objective was met. For example, one Pilot Program considered setting an objective of reducing stormwater runoff from their site but discovered that a big contributor to their runoff was actually runoff from neighboring properties over which they had no control.

Participants became frustrated with developing objectives and quantifiable targets when they tried to think of measures before going through the planning process of identifying aspects and impacts and setting objectives and targets. When Program Leaders went back to the planning process, they found they could develop goals (objectives) and targets that were meaningful to management (e.g., collect 50,000 lbs. of household hazardous waste in 1998).

The targets selected by Program Leaders were not always quantifiable. One golf course determined that a chemical/fertilizer application target of “as low as possible” was the only target that made sense given the wide variation weather conditions and other factors that determine the amount of chemical and fertilizer needed. While this approach does not give data on progress made in reaching an objective, it provides a starting point from which data on weather variables and chemical/fertilizer usage rates can be collected in order to set future quantifiable targets.

Stick with the planning process until it is finished. The project found that participants tended to skip over the planning steps of an EMS and focus first on what they could more easily understand and readily implement. While this approach is understandable, it can ultimately lead to frustration with planning for the EMS and stall the implementation process.

A reference list of sources for ideas on environmental metrics is provided in Appendix B.

Integrating Management Systems

Guidance under “Lack of resources” encouraged the use of existing systems as a starting point for EMS development. Program Leaders discovered that their existing management systems in the areas of safety and health, document control, training, emergency response, waste management, and pollution prevention could be modified with little or no cost to meet ISO 14001 (1996) standard requirements. However, participants tended to focus on integration at the expense of planning the EMS.

Supporting Departments Lack Formal Systems

Community-based organizations, programs, or operations are often not autonomous but use the support services from other departments such as purchasing, accounting, maintenance, contracting, and others. When these supporting departments lacked formal processes and procedures, it influenced how the Pilot Program proceeded with EMS implementation. Two examples where project participants experienced this limitation follow:

- A Pilot Program Leader spent half a day going back and forth with the procurement department filling out forms to request bids from contractors. Procurement did not have written procedures for requesting contractor services and was dependent on one knowledgeable individual who was not available at the time.
- Another Program Leader wanted to track which vendors his organization sold what chemicals but the accounting process was not set up to track even simple environmental costs and did not have the flexibility (or management direction) to change.

Community-based EMS pilot programs should first recognize this limitation in EMS development, then take steps to work around it. In the first example above, the Program Leader found out what the proper procurement steps were and documented them for his own use. In the second case of tracking vendor cost, the Program Leader ruled that out as data input for a possible environmental target and moved on to one for which he did have data.

When developing an EMS, think about the functions that happen outside your immediate organization and form relationships with those departments with whom you will be interacting. Supporting department lacking an EMS should not prevent you from developing an EMS; the key is to recognize the limitation and use the processes over which you do have control (such a procedures or data collection as in the above examples).

Unique Implementation Challenges For Community-Based Organizations

In many areas, the Pilot Programs in this project faced the same EMS implementation challenges that an industrial facility would face such as communicating EMS requirements and benefits to management and staff, resistance to cultural change, lack of documentation, and lack of resources. However, industry and community-based organizations are fundamentally different in their organization, purpose, and accountability to the public and there are differences in the implementation challenges faced. The experiences of the participants in the Community-Based highlight these differences:

Role of the public: Project participants viewed the public as much less of an outsider to their EMS development than industry often does. Informing the public of the results of EMS development was never questioned. All participants intended to actively share their environmental policies with the public. There was never a discussion of the pros and cons of disclosure. In another example, the ISO 14001 (1996) standard communication requirement states that an organization need only consider processes for external communication on its significant environmental aspects, it does not require

communication of the aspects. The Program Leaders did not really consider this as an option for them; communication with the public was expected.

Motivations: The current industry drivers for EMS development, market forces and competitive advantage, in most cases do not apply to community-based organizations. Project participants cited their customer (the public) and their accountability to their customer as the primary motivation for EMS development. Others saw an EMS as a way to manage growth or improve environmental performance.

Lack of a clear “bottom-line” motivation for EMS development can make it more for community-based organizations to see the benefits of an EMS at first. As this project has demonstrated, benefits are substantial and first realized in the early stages of implementation.

Setting objectives and targets: The public has a much larger role in setting objectives and targets in community-based organization. In the case of Ann Arbor Public Schools, the public is represented on their Environmental Committee sets the environmental objectives each year and then monitors progress in meeting those objectives. For other participants, the public was important in considering which aspects it could “control and over which it can be expected to have an influence.” Once Program Leader had to balance an objective of reducing winter salt on the road (to decrease salt in the runoff) with the public’s demand for clear streets.

Top management: In a community-based organization, top management may be an elected official (e.g., mayor, board member). This could effect EMS funding and long-term maintenance of an EMS if a new administration does not support the programs and policies of the previous administration.

Views from Pilot Program Leaders:

Governmental divisions track revenues (if any) and hours but rarely their environmental performance across divisions. For an EMS effort involving several divisions within a governmental department to be successful, there must be direct accountability for environmental outcomes.

The government rarely “connects the dots” when it comes to the environment. Each division goes about its mission in the best way it can. Expenses and revenues (if any) and hours are tracked but rarely are other aspects counted. What an EMS needs to do to be effective is to raise concern for environmental management to a level of budget management. This is a difficult obstacle to overcome because most budget management processes are mandated and there is no direct accountability based on environmental outcomes.

Chapter 3

IMPLEMENTATION EXAMPLES

Introduction

This chapter is organized around the 17 elements of the ISO 14001 (1996) standard. Each section may include one or more of the following:

- 1) examples from the Pilot Program EMS manuals
- 2) specific implementation questions the participants asked during the project
- 3) implementation advice

The chapter is not intended to be an implementation guide but to provide a source of ideas for other community-based organizations.

The excerpts from the manuals represent an EMS in the early stages of implementation and do not represent a fully mature system. In some cases, the examples may not fully conform to standard requirements; however, it is the intention of the Pilot Program Leaders to refine their EMSs over time.

Examples are provided to give community-based organizations an idea of how to start. The examples repeatedly show that by combining documentation requirements of ISO 14001 (1996), your organization does not need a great deal of added paperwork. Shaded boxes indicate implementation advice given by or to Program Leaders.

Environmental Policy

While developing the environmental policy was one of the easier EMS implementation steps for the Program Leaders, obtaining formal management approval (signature) on the policy was often left until EMS development was well underway. Several of the Program Leaders planned to fulfill the ISO 14001 (1996) requirement to make the policy available to the public by posting it on their organization's website.

The policy examples which follow represent two different approaches based on the organizational structure of the Pilot Program and how the EMS was integrated into existing systems.

- 1) The Village of Chelsea environmental policy is part of their EMS manual. In addition to the requirements regarding compliance, prevention of pollution, and continuous improvement of the EMS, the policy includes two notable features:
 - A scope statement ("applies to all activities and employees"). The Village consists of residents with a relatively small governing and operating body. The policy clarifies that the only part the EMS has control over is Village employees and their activities.
 - EMS responsibilities ("The Village's Department Superintendents are the Village's Management Representatives who have the responsibility and authority to plan, enforce, and maintain the Village's Environmental Management System"): Describing responsibilities for the EMS in the policy eliminates any doubt as to who is accountable for not only developing but maintaining the EMS.
- 2) Saint Joseph Mercy Hospital demonstrated that the environmental policy does not need to be stand-alone but can be written in the form of a procedure. An advantage of this approach is that hospital staff can make a direct connection between the policy and their departmental responsibilities for implementing the policy. The hospital included their policy the Administrative Policy Manual because that manual was already well established and widely distributed. Weaving EMS requirements into existing manuals, procedures, training, and responsibilities was a key implementation strategy for the hospital.

Village Of Chelsea Statement Of Environmental Policy

The Village of Chelsea is committed to continual improvement of its Environmental Management System and is in compliance with all relevant federal, state, and local environmental legislation and regulations. The Village of Chelsea will meet and strive to exceed all environmental requirements and will seek to prevent pollution before it is produced. To sustain this commitment, the requirements of the Environmental Management System described in this Manual apply to all activities and employees. The Village's Department Superintendents are the Village's Management Representatives who have the responsibility and authority to plan, enforce, and maintain the Village's Environmental Management System. This responsibility also includes stoppage of activities that deviate from the requirements of this Manual. The EMS Management Representative may delegate some of this authority downward through the organization in order to effectively implement the system. We will continuously seek opportunities to improve our adherence to the principles of environmental management.

Policy adopted by Village Council March 11, 1997.

Village President

Village Clerk

[Signature included in original policy.]

Saint Joseph Mercy Hospital. Administrative Policy and Procedure

Subject: Environmental Compliance Policy

Effective Date: September 14, 1998

Revised Date:

Approved By: President and CEO

POLICY

It is the policy of St. Joseph Mercy Hospital (SJMH), which includes all SJMH owned and operated buildings and services, to conduct all of its operations in an environmentally responsible and sensitive manner. St. Joseph Mercy Hospital will fully comply with both the letter and the spirit of all applicable federal, state and local regulatory requirements governing hazardous materials and wastes, pollution prevention and environmental protection. It is recognized that the health and well being of the environment contributes to the health and well being of the communities and populations we serve. St. Joseph Mercy Hospital will strive to continuously improve its systems and procedures related to environmental protection and pollution prevention activities. St. Joseph Mercy Hospital will manage its facilities and properties in an environmentally responsible manner. St. Joseph Mercy Hospital will participate as appropriate in community, industry, and/or governmental sponsored groups addressing environmental issues affecting the communities we serve.

NARRATIVE

Environmental protection is the responsibility of all SJMH departments and employees. As a health care organization, SJMH must handle and manage a wide variety of potentially hazardous or polluting materials including: medical wastes, radioactive materials and hazardous chemicals and wastes. Many of our processes present potential water and air quality issues that demand continuous monitoring and control. Proper and responsible handling of these materials and processes is imperative to prevent pollution, reduce waste and protect our environment. A host of federal, state and local regulatory requirements are in place to guide this organization in achieving environmental compliance.

PROCEDURE

- I. Each department will continuously assess their operations to identify potential safety hazards and pollution risks. Each department is responsible for establishing and maintaining department specific policies and procedures designed to reduce or eliminate environmental hazards and minimize any negative environmental impact when applicable.
 - A. Potential risks will be minimized to the extent possible by seeking out less environmentally hazardous products, equipment or procedures.

- B. Appropriate engineering controls will be implemented when it is not possible to eliminate an environmentally hazardous material or procedure.
 - C. All departments and employees will strive to reduce all types of wastes through identifying and eliminating wasteful practices and products and participate in organizational recycling and waste reduction programs.
 - D. Departments will educate and communicate organizational and department specific environmental policies, goals and objectives to employees as required.
 - E. Departments will consider using products that have recycled content taking economic and quality factors into account.
- II. The Safety Steering Committee is responsible for monitoring environmental compliance issues recommending and assuring that corrective action is implemented as warranted to correct deficiencies.
- A. Objectives and targets will be established to assure continuous improvement in organizational environmental performance. Safety Committee structure is responsible for establishing goals and implementing programs to meet targets. The Safety Steering Committee is responsible for monitoring progress and reporting activities to Executive Management.

REFERENCES

- Safety Steering Committee
- Hazardous Material and Waste Committee
- Product Value Analysis Committee
- Safety Policy Manual Section III_300 – *“Hazardous Materials and Waste”*
- Departmental Specific Hazardous Material/Pollution Prevention Policies and Procedures

Environmental Aspects

This section on environmental aspects provides more samples from the participating organizations than other sections of Chapter 3 because this is the part of the standard that participants struggled with most. Examples are from the Village of Chelsea and Leslie Golf Course. The examples focus on the thought process (flowcharts, criteria ranking, impacts and alternatives) that lead up to the final determination of significant aspects.

The Village of Chelsea provided valuable insights into how they chose their two aspects, salting streets and catch basin spoils, as their basis for developing objectives and targets. The Pilot Program Leader stated that he used these criteria for determining which of the identified aspects were significant:

1. Are we already managing it?
2. What level of control or influence do we have over it?
(One aspect the Program Leader identified was the residential application of lawn chemicals, fertilizers and pesticides. He decided that although the Village could have an influence on residential usage through education, it would be better to first focus on aspects over which the Village had more direct control.)
3. What can we focus on where we will be most effective? Where can our results be most readily demonstrated?

Participants found the process of working through aspects/impacts identification difficult but ultimately valuable in realizing how activities relate to one another environmentally. Working through the aspects identification process forced Pilot Program Leaders to take a more process-oriented look at their everyday operation. As one Program Leader put it, *We were not used to thinking on this (EMS) level.*

Village of Chelsea EMS Procedures: Environmental Aspects Identification

Purpose

To identify the environmental aspects of the stormwater handling systems which may have a significant impact on the environment.

Scope

This procedure covers all activities, services, and products of the Village, and all activities of Village residents, visitors, developers, as well as users of Village facilities, which may affect the stormwater handling system of the Village.

Definitions

Environmental Aspects – Components of the activities, products and services which occur in the Village that are like to interact with the environment.

Environmental Impact – Any change to the environment, whether adverse or beneficial, wholly or partly resulting from activities, products, or services which occur in the Village.

General

This procedure covers the environmental aspects and impacts or activities, products and services that the organization can control or over which it can be expected to have an influence. Significant environmental aspects identified in this process are considered in the setting of environmental objectives and targets.

The procedure consists of an initial screening of activities, products, and services, based on available information and data, and on personal observation on an ongoing basis. The department head and Village Manager should then review the information and potential environmental impacts, and sets priorities for further analysis, as needed.

If any aspect is determined through this procedure to have a significant environmental impact, the EMS should be modified and revised to accommodate response to the aspect. These accommodations may include revised or new procedures, ordinance revision, changes in departmental policies, or other modifications as appropriate.

Procedure

1. The Department Head and Village Manager or designee will assemble a team to evaluate the identified aspect, and to determine whether the potential impacts are environmentally significant.
2. If the potential impacts are determined to be significant, the team will determine appropriate measures, targets and goals to minimize negative environmental impacts.

3. The team will determine appropriate measures to take which will result in achievement of the goals. These measures will be proposed through a written Environmental Aspect/Goal Implementation Plan to the Department Head.
4. The Department Head and Village manager or designee will determine the feasibility of the proposed Environmental Aspect/Goal Implementation Plan, or consider alternatives, and being implementation as described below in section 5) of this procedure.
5. The Aspect will be added to the Aspect/Goal sheet for future review if it is not selected for implementation. If it is selected for implementation, it will be added to the Aspect/Goal sheet, a tracking number will be assigned, which will consist of the year, month and date that the Aspect is selected for implementation, and the Aspect/Goal sheet will be filled out, thereby assigning responsibility and beginning implementation of the goals.
6. All aspects, impact, and Implementation Plans are reviewed as part of the Management Review process (Procedure #). Based on this review, the management determines the need to update any of the procedures or policies associated with this process, and reviews aspects identified in the past (but not yet implemented) for possible implementation. Factors such as improved assessment methodologies, or major changes to the Village's mission, product, and processes are considered in determining the need to update the assessment.

Figure 3-1 Village of Chelsea Waste Disposal System Process Flowchart

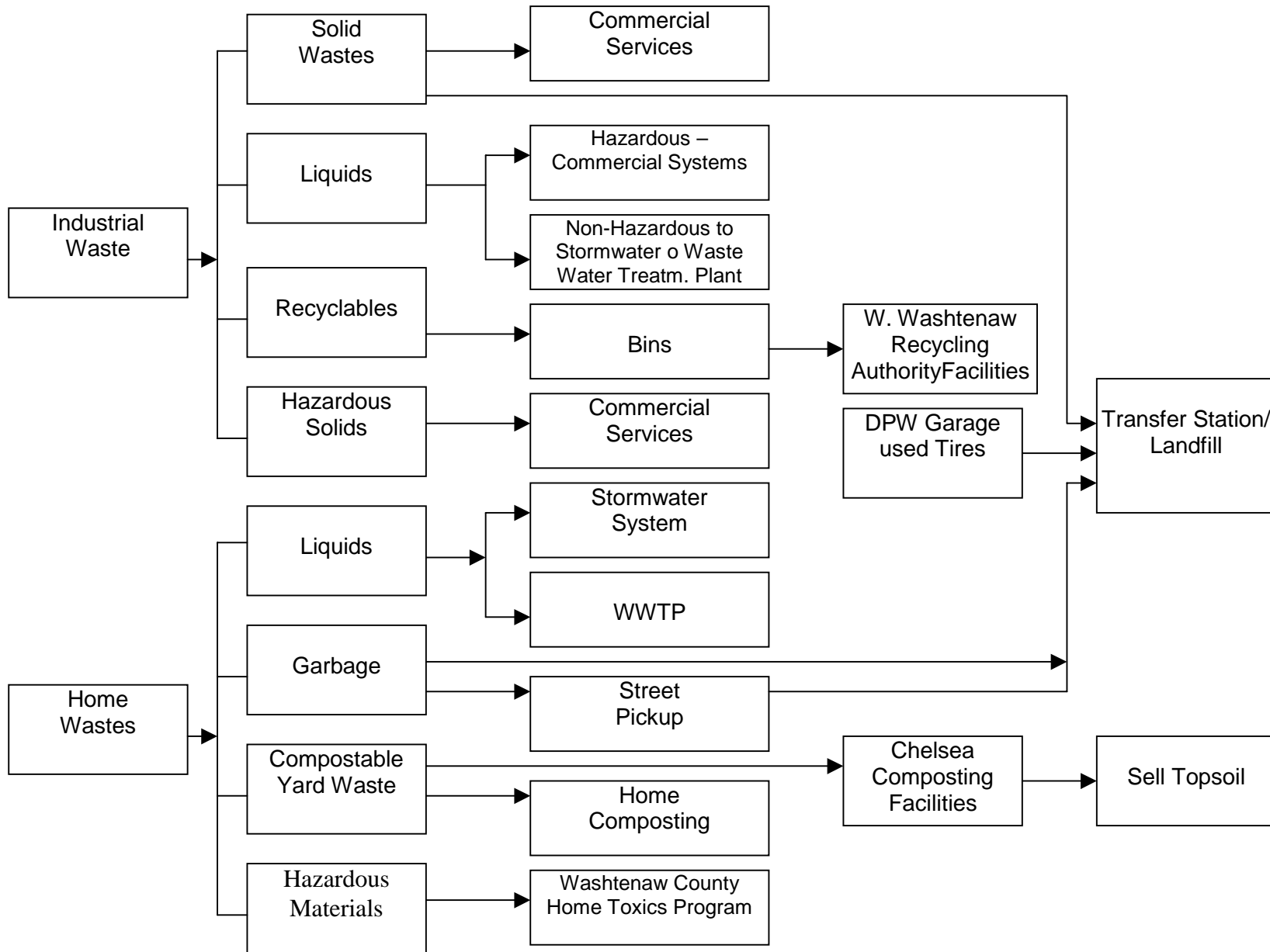


Figure 3-2 Village of Chelsea Stormwater System Process Flow Chart

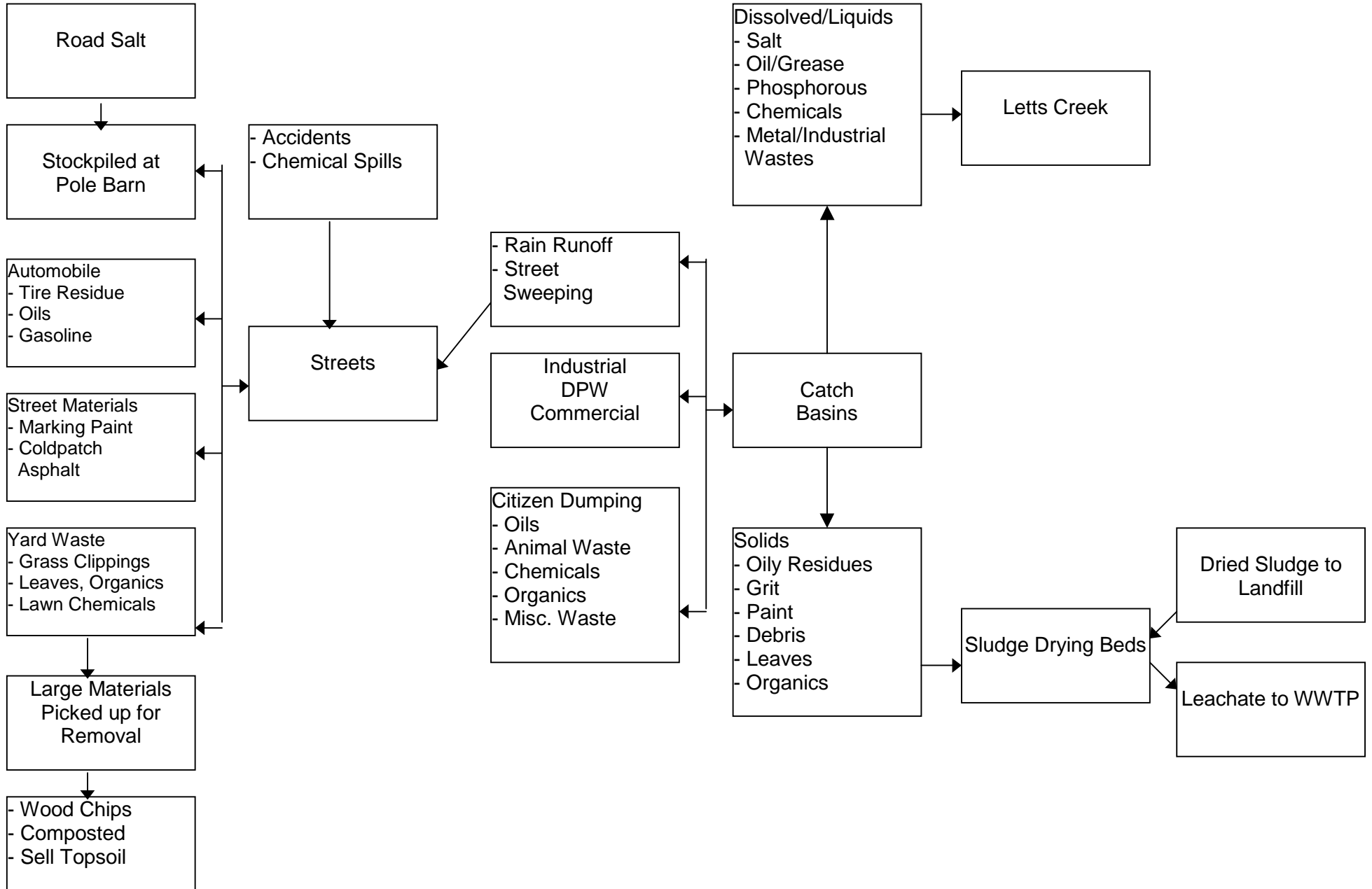
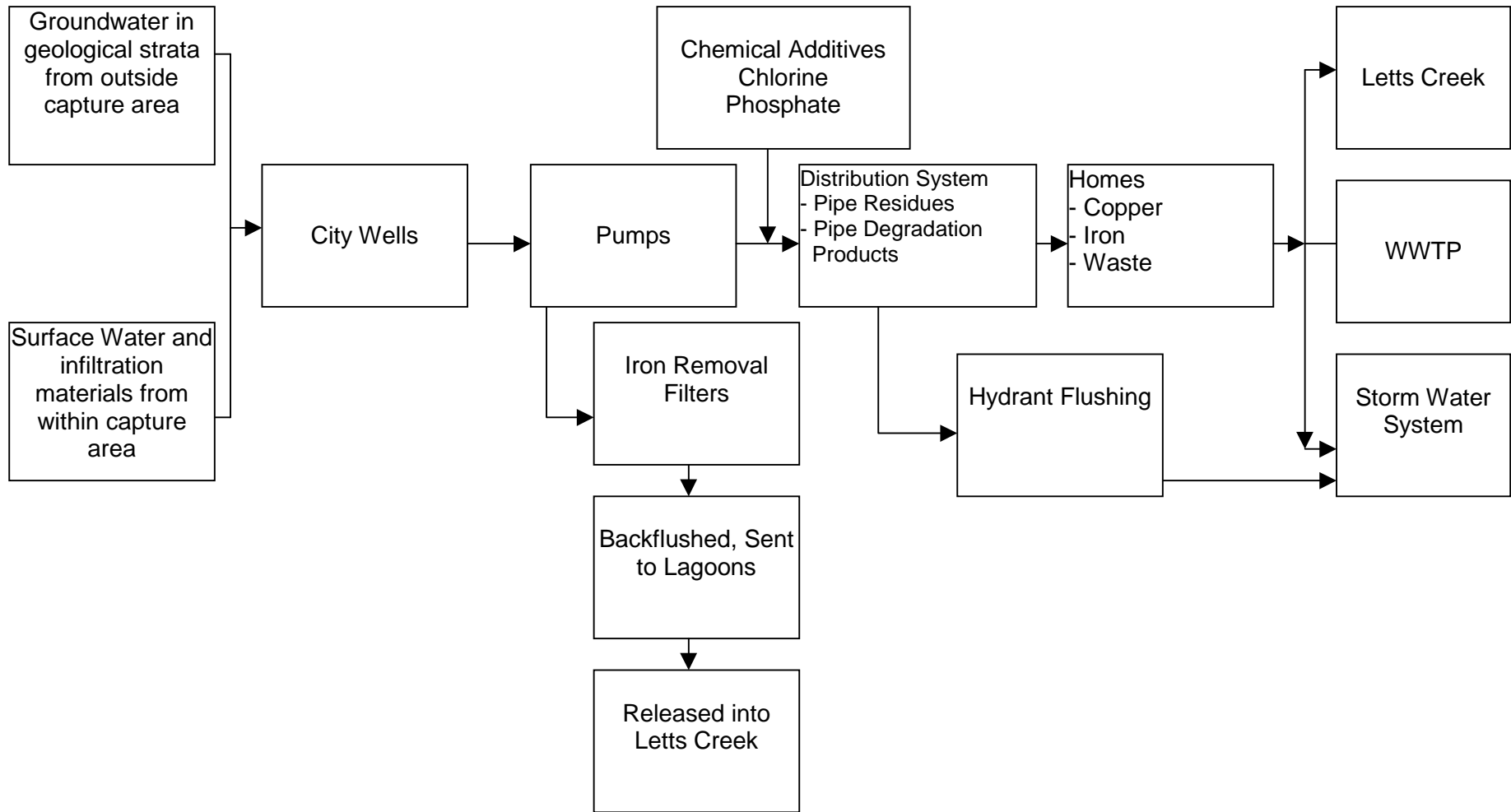


Figure 3-3. Village of Chelsea Water Distribution System



Village of Chelsea: Examples of Aspects, Impacts, and Alternatives

Environmental Aspects, Impacts, and Potential Alternatives identified are as follows. In order to develop targets, it was considered important to first identify alternatives to existing procedures to see if there were significant opportunities for improvements:

Aspect: *Salting Streets*

Impacts:

- Kills Vegetation
- Habitat Degradation
- Bioaccumulative Effects

Current Practices:

Minimize use, stockpile salt in covered pole barn with a concrete floor and containment structure.

Alternatives:

Corn kernel products - problems with fungus and organic residuals, cost very high.
Sand mixture - very expensive, cleaning cost much higher, causes deterioration of lines and sedimentation in streams.

Aspect: *Chemical Use*

Current Practices:

The Village uses minimal chemicals - does not exceed one and two gallons of pesticides/herbicides per year.

Aspect: *Handling of Catch Basin Spoils*

Impacts:

Leaves, debris, petroleum products, organic materials discharged into streams.

Current Practices:

Aggressive cleaning schedule. Sludge sucked out with truck, put on concrete drying beds. Leachate goes to WWTP, dried sludge goes to landfill.

Alternatives:

More frequent street sweeping. Filters in the catch basin system, re-routing to combined sewer system instead of direct discharge to Creek, may be mandated by Great Lakes Initiative (GLI) in the future. Frequent testing and response will be

required by GLI. Possibly can get ahead of GLI by purchasing land for detention and surface treatment. Possible implementation of a storm water utility to earmark funds for early implementation. Note: Village passed a storm water utility in July to begin this process.

Aspect: *Lawn Chemicals - Fertilizers, Pesticides, Herbicides*

Impacts:

Degradation of surface waters, habitat, recreational fishing. Phosphorous buildup and eutrophication of lakes and ponds.

Current Practices:

Solid waste pickup. Pickup large yard waste and brush, chip lumber, composting and selling of topsoil.

Alternatives:

Discourage lawn services. Public education and awareness. Encourage mulching mower, discourage use of lawn chemicals, dumping of grass clippings and animal waste. Implement Storm water Utility to increase awareness and get non-profits and schools to contribute to the solution. Increase enforcement of littering ordinance. Encourage use of home tub grinders and composting.

Aspect: *Street Marking Paint*

Current Practices:

We have switched from oil-based to latex. Seems to hold up all right.

Aspect: *Mechanics Garage*

Current Practices:

Storm drains go to WWTP
Used oil is recycled/reclaimed
Tires go to landfill - could they be reclaimed?
Used parts - signs, etc., sold to scrap yard for recycling

Aspect: *Wellhead Protection Program*

Impacts:

By setting up capture area, stringent controls can be set on environmental practices in order to protect the Village water supply. Regulated practices include pesticide use, animal waste, household wastes, farm wastes, industrial wastes, and commercial wastes. Includes regulation of use and storage practices.

Alternatives/Objectives:

Implement controls by establishing a well head protection ordinance. Educational initiative to establish the link between surface and groundwater quality and to set stage for good practices.

Aspect: *Washing of Iron Removal Filters*

Impact:

Potential release of solids, iron residue into creek. Also release of chemical additive to drinking water if mandated by MDEQ (e.g., chlorine, phosphate).

Current Practices:

Backflushed every five million gallons. Water discharged to settling lagoon, then released into creek after testing for solids. Results are reported to Michigan Department of Environmental Quality (MDEQ). Water is discharged to Creek before receiving test results.

Alternatives:

Test for additional selected chemicals, increase hold time if chlorine is used, wait to discharge until after test results are received.

Aspect: *Water Distribution to Homes*

Impacts:

Home pipe degradation adds copper to water. Chemical additives (chlorine, phosphates), eventually enter surface water system to create potential environmental impacts.

Alternatives:

Highly controlled and regulated. Avoid addition of chemicals as much as possible. Public education on home water pipes.

Table 3-1 Village of Chelsea Environmental Aspects/Goals Sheet

<u>ASPECT</u>	<u>TRACKING</u>	<u>GOAL</u>	<u>INDICATOR</u>	<u>TARGET</u>	<u>RESPONSIBLE</u>	<u>IMPLEMENT DATES</u>
Salting Streets	19980203	Minimize salt usage. Find viable alternatives that don't sacrifice safety.	Salt Usage Guide Information on alterns.	Set measurement procedures first	DPW for salt usage and wind speed, and coordination. WWTP for rainfall volumes, etc.	Initial set-up plus baseline information by May 1998. Full implement by October 1998.
Catch Basin Spoils	19980204	More frequent cleaning, reduce potential pollutants to Letts Creek. Alternative systems filtration, etc. Spoils handling. Leachate handling.	Dates cleaned, volume landfilled. Information	Reduce combined spoils – see street cleaning. Install baffles and/or filtration with new construction or rebuild of roads.	DPW – Dave	Procedure developed by July 1998. Look at street sweeping issues by December 1988.
Lawn Chemical Use						
Village Chemical Use						

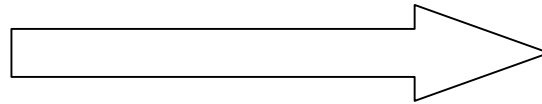
Table 3-1 (cont.) Village of Chelsea Environmental Aspects/Goals Sheet, February 5, 1998

<u>ASPECT</u>	<u>TRACKING</u>	<u>GOAL</u>	<u>INDICATOR</u>	<u>TARGET</u>	<u>RESPONSIBLE</u>	<u>IMPLEMENT DATES</u>
Street Marking Paint						
Mechanics Garage						
Impervious Surface						
Street Sweeping		Goal for these ties to catch basin cleaning. Need to set combined goal and indicators to reduce combined spoils. This will involve public education program.				
Leaf Composting						

Figure 3-4. Ann Arbor Parks and Recreation Dept., Leslie Golf Course, Process Flow Map, Inputs

EQUIPMENT

- Receiving Fuel/Oil
- Storage Fuel/Oil*
- Storage of Equipment
- Fueling*
- Repairs/Maintenance
- Washing*
- Operation



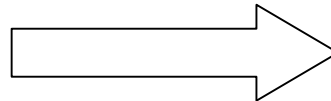
CHEMICALS

Pesticides

- Receiving
- Storage**
- Mixing*
- Loading*
- Application**
- Washing
- Disposal

Fertilizers

- Receiving
- Storage*
- Mixing
- Loading
- Application*
- Washing
- Disposal



IRRIGATION

- Water Source
- Electricity
- Application*

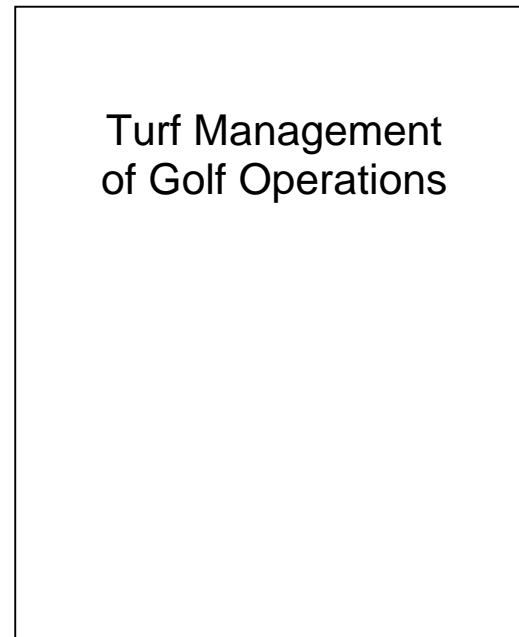
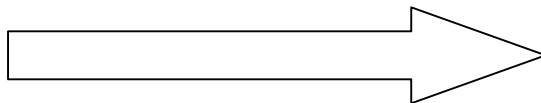


Figure 3-5. Ann Arbor Parks and Recreation Dept., Leslie Golf Course, Process Flow Map, Outputs

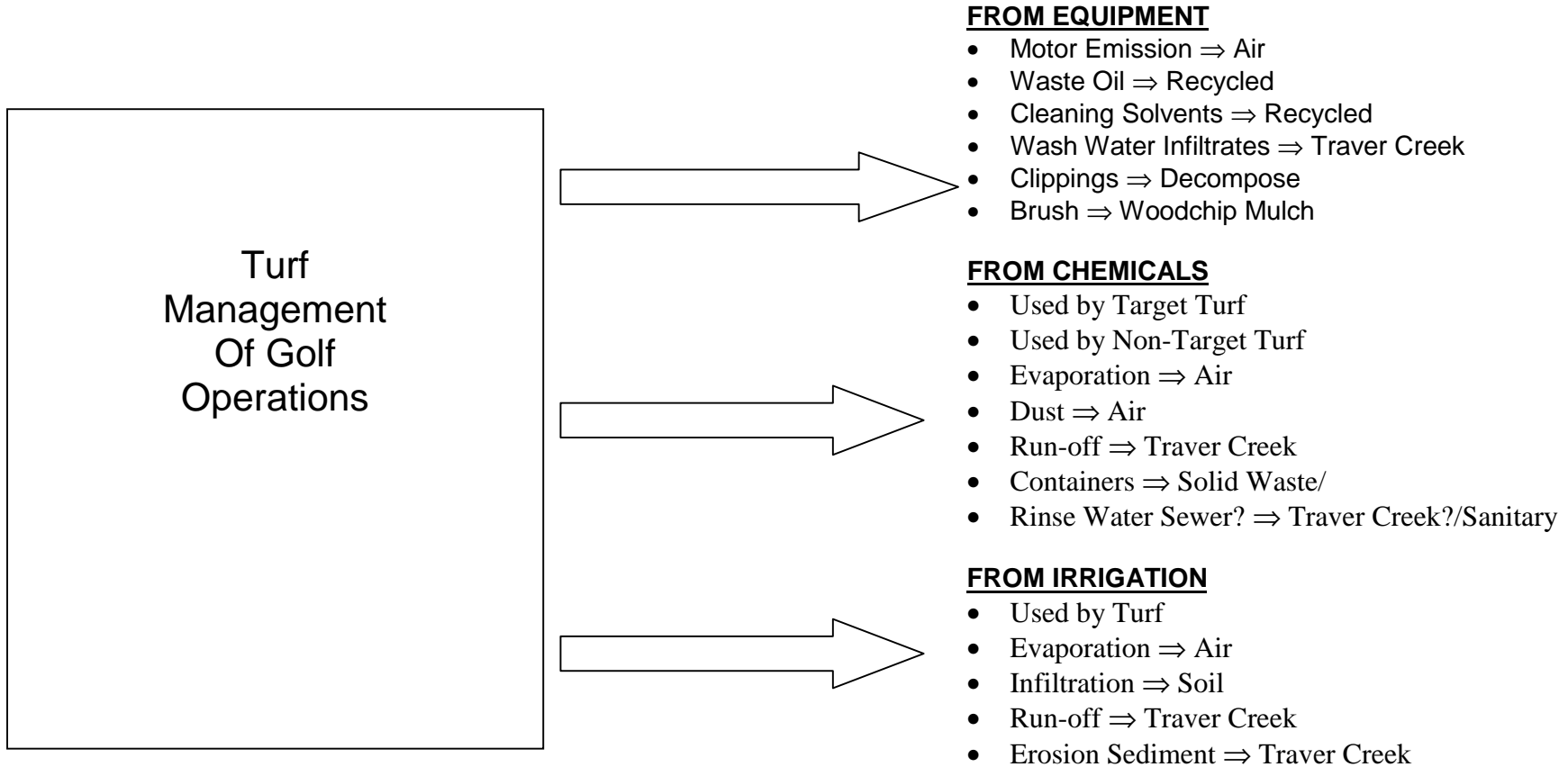


Table 3-2. City of Ann Arbor, Parks and Recreation Department: Leslie Golf Course Walk-Through

AREA	ASPECT	INDICATOR	NOTES
Receiving	Fuel	Spillage	
	Fertilizer	Free Material	
	Pesticides	Free Material	
	Soil Materials	Erosion in the piles	
	Lubricants	Spillage	
Storage/ Handling	Fuel	Proper storage container	
	Lubricants	Proper storage container	
	Fertilizer	Bagged and inside storage	
	Pesticides	Limit Storage – Purchase as needed. Compliance with regulations. Mix and fill on slab.	Slab for building in place.
Office	Records Storage	Updating and auditing	
	Solid Waste	Volume cubic yards	
Maintenance	Solvents/Oil	Excessive use/drips	
	Fuel	Gallons per equipment	
	Application Procedures	Follow label specifications	
	Calibrate Equipment	Proper use rate per specifications	Precise use of P
Emissions	Water Run-off	Water use	
	Small Engine Exhaust	Engine performance/ fuel consumption	Newer equipment
Disposal	Surplus Fertilizer/ Pesticides		
	Fertilizer/Pesticides Containers	Follow procedure for disposal	
	Solid Waste	Volume cubic yards	
All Areas	Irrigation	Gallons used/depth of pond	
	Irrigation System Failure	Erosion/Wash Out	
	Traver Flood Condition	Additional sedimentation	

Areas = 1) Receiving 2) Storage/Handling 3) Office 4) Maintenance 5) Emission 6) Disposal 7) All Areas 8) Other

Table 3-3 Leslie Park Golf Course: Significant Aspects

Aspect	Priority					Total	Performance Indicator	Target
	Big	Bad	Costly	Risky	Do-able			
<u>Equipment</u>								
Receiving	2	3	3	3	3	14*		
Storage Fuel/Oil	3	2	1	2	4	12	Use vs. Delivery	
Equipment Storage								
Fueling	1	4	3	4	4	16*	Use Vs. Delivery	
Repairs/Maintenance								
Washing	2	3	4	2	4	15*		
Operation								
<u>Fertilizer</u>								
Receiving	3	1	1	1	3	9		
Storage	3	2	2	2	4	13*		
Mixing	2	2	2	2	4	12		
Loading								
Application	5	2	2	2	5	16*	Lbs. N-P-K applied/year	
Washing	3	4	1	1	3	12		
Disposal								
<u>Pesticides</u>								
Receiving	2	3	1	2	4	12		
Storage	3	2	2	2	4	13*		
Mixing	3	2	2	2	4	13		
Loading								
Application	5	2	2	4	5	18*	Amounts/year	
Washing	5	5	1	1	5	17*		
Disposal	5	5	1	1	5	17*		
<u>Irrigation</u>								
Water Source	5	1	2	1	5	14*	Pond Level	
Electricity	3	1	4	1	5	14*		
Application	1	3	1	1	5	11	Gallons/year	

* Indicates higher priorities

Legal And Other Requirements

Examples for Legal and other requirements include:

1. Results of a regulatory review from Leslie Golf Course: Leslie Golf Course chose to list the results of their review for regulations applicable to their operation. This listing is not required by the ISO 14001 (1996) standard but is a good reference to maintain. Note also that the golf course legal review included local (city) ordinances.
2. A procedure from the Home Toxics Reduction Program: Note inclusion of the date as a document control feature.
3. A list of resources for regulatory updates from Saint Joseph Mercy Hospital.

Leslie Golf Course, Code of Ordinances, City of Ann Arbor

Disaster Preparedness	Chapter 15	1:325
Solid Waste Management	Chapter 26	2:1
Prohibited Discharges	Chapter 28	2:43.1
Parks and Public Grounds	Chapter 39	3:16
Trees and Other Vegetation	Chapter 40	3:17
Prohibited Land Uses	Chapter 56	5:116
Wetland Preservation Ordinance	Chapter 60	5:204
Landscape and Screening	Chapter 62	5:602
Soil Erosion and Sedimentation Control	Chapter 63	5:652
Littering and Distribution of Handbills	Chapter 82	7:99
Endangered Species	Chapter 91	7:362
Police Regulations	Chapter 106	9:1
Police Regulations	Special Rules Article 29 F290.1	
Animals	Chapter 107	9:35
Air Quality Control	Chapter 116	9:301
Noise Control	Chapter 119	9:360

MICHIGAN COMPILED LAWS ANNOTATED

Natural Resources and Environmental Protection Act – Chapter 324, Pollution Control – Article II, Non-Point Source Pollution in General – Chapter 2, Pesticide Control – Part 83.

MICHIGAN DEPARTMENT OF AGRICULTURE PESTICIDE AND PLANT PEST MANAGEMENT DIVISION

- Pesticide Applicators Regulation Number 636, As Amended
- Pesticide Use Regulation Number 637
- Natural Resources and Environmental Protection Act (Excerpts) Act 451 of 1994, Part 83 Pesticide Control

Home Toxics Reduction Program Regulatory Tracking Procedure

PURPOSE

To ensure the Home Toxics Reduction Program provides, identifies, has access to laws, regulations and organizational requirements that apply to storing, use and disposal of potentially polluting and hazardous substances.

The Household Hazardous Waste coordinator is responsible for tracking applicable laws and regulations, identifying those related to the organization's activities, products and services. The coordinator is also responsible for evaluation of the potential impacts of these laws and regulations on the program and its participants.

The County's Risk Management coordinator will review the operational aspects of the program to help assure conformance to federal, state, and local regulations on an annual basis.

The Household Hazardous Waste coordinator and program coordinator uses certain techniques and information sources to track, identify and evaluate applicable laws and regulations. These include, but are not limited to:

- Household Hazardous Waste Roundtable
- Michigan Department of Environmental Quality
- United States Environmental Protection Agency

As necessary, the County's Corporation Counsel or the Department of Environmental Quality Waste Management Division may be called upon to assist the Household Hazardous Waste coordinator in evaluating applicable laws and regulations or in developing programs in response to applicable laws and organizations. The Household Hazardous Waste coordinator coordinates such efforts.

7/98

Saint Joseph Mercy Hospital relies on the following sources of information for the latest on environmental requirements:

- Bureau of National Affairs Health care Facilities Guide: This guide is specific for hospitals and other health care facilities and covers environmental, safety, and health requirements. For more information contact, Bureau of National Affairs, 1231 25th St. NW, Washington, DC, 20037.
- Specialty Technical Publishers Complete Guide to Environmental Law: Provides routine updates for all environmental laws. State specific requirements are available. Call Environmental Health and Safety Publications at 1-800-933-3352 for more information.

Objectives and Targets and Environmental Management Program

Pierce Lake Golf Course established clear and concise programs to manage their two environmental objectives, minimize withdrawal of water from Pierce Lake and minimize the application of chemicals and pesticides to the golf course. Their Water Use and Fertilizer and Chemical Use Programs combine several ISO 14001 (1996) standard requirements (for an environmental management program, operational controls, and monitoring and measurement) under one program heading.

At least two types of environmental objectives can be considered: 1) objectives aimed at maintaining your current level of performance (such as maintaining compliance with regulations or permit conditions, and 2) objectives aimed at improving environmental performance in some area. For some environmental aspects, you might have both maintenance and improvement objectives. However, you do not need to have an objective for each significant aspect and a single objective can be used to address multiple aspects.

The Home Toxics Reduction Program (HTRP) developed a network of non-profit environmental organizations, other county agencies, and organizations with similar environmental objectives as a key strategy in its EMS development. These contacts assist HTRP in many areas: locating an environmental, safety, and health consultant for a program review; providing resources (volunteers, interns) for home toxics collections; offering guidance on the future direction of the program; and assisting in data collection and educational outreach that support HTRP EMS objectives. Here are two examples of how networking with external organizations helped HTRP meet its EMS objectives:

- The Huron River Watershed Council (a networking partner for HTRP) conducted a phone survey for its own purposes and several of the questions provided HTRP important data on the buying habits of Washtenaw County residents. This data helped the HTRP measure the progress of their objective to reduce the toxicity of the waste stream from county residents.
- When the Ann Arbor Utilities had to perform educational outreach as part of their stormwater permit, they partnered with the Huron River Watershed Council, which in turn contacted the HTRP for information. Because of their involvement, the HTRP was contacted to help with similar programs for other townships in the county. The HTRP was able to greatly expand their educational efforts and develop home toxics information specific to these new areas. This helped the HTRP meet their EMS target of increasing public education through city and community outreach.

Find local agencies or organizations that share similar values with yours. Find out how they collect data (e.g., surveys) or educate the public (e.g., workshops, sending out brochures) and discuss how to combine efforts to the benefit of both programs.

Pierce Lake Golf Course Water Use Program

INTRODUCTION

To understand the need for a water use program, you must understand the water problem the county faces at Pierce Lake Golf course. Obviously, a golf courses reputation depends upon its condition. Grass needs water to survive. The problem at Pierce Lake is larger than these obvious observations.

First, the golf course was constructed on a piece of land that has very little groundwater underneath its surface. We have drilled nine wells that range from 0 to 30 GPM. The total water supply available to us through groundwater is 95 GPM. This equates to 136,800 gallons per day.

Second, the golf course architect shrunk the size of the original proposed irrigation lake from five acres to about two acres. This act leaves the golf course with little storage area for irrigation water.

Third, the water of Pierce Lake is available to us, but this lake does not have a stream or river flowing into it. Consequently, as water is taken out of the lake, it is not replenished unless a rainfall and run-off occurs.

Normal 18-hole golf courses use from 200,000 to 260,000 gallons per night during a dry summer period. During these dry periods, the golf course must transfer water from Pierce Lake to the irrigation pond. Most seasons, the golf course will have almost no effect on Pierce Lake. During a prolonged, extremely dry period, the irrigation practices on the golf course will lower the level of Pierce Lake.

CORRECTIVE MEASURES

The county has addressed this problem by taking the following actions:

1. Drilled nine wells to try to eliminate the need to take any water from Pierce Lake. Of the nine wells, only five produced enough water to hook up a pump to. The drilling of any more wells is presumed to be a waste of money because the wells will be pulling from the same aquifer.
2. Purchased a computerized irrigation system that is flexible and allows the golf course superintendent to more efficiently water the golf course.
3. Purchased a rain shut-off device. This device will shut down the irrigation system if rain occurs after the employee who programs the irrigation system goes home for the night.
4. Attempted to purchase water from the Village of Chelsea. However, we run short of water at the same time the Village runs short of water. Consequently, they no longer allow us to purchase water from them.

5. Developed this Water Use Program to ensure water is used sparingly and efficiently throughout the year.

RESPONSIBILITY

The golf course superintendent is responsible to program the irrigation system and record all water use on the yearly water use log. The golf course superintendent will train any employee who will program the irrigation system in his absence.

Every month during summer, the golf course general manager will verify and audit the records and the water log to ensure accuracy.

TRAINING

The general manager, the golf course superintendent, and the assistant golf course superintendent will have a working knowledge of the computer software and the irrigation system. These individuals all must have a minimum of a two-year degree in turf-grass management.

AWARENESS

Every person who programs the irrigation system will have read and understands the Water Use Awareness Statement.

Water Use Awareness Statement

In order to adequately water the golf course, the golf course management will occasionally transfer water from Pierce Lake, the irrigation lake. The amount of water transferred has a limited supply and will be used as diligently as possible. Because the Pierce Lake has no inflows during dry periods, transferring water to the irrigation lake will slowly lower the level of Pierce Lake. Most years, we will have no effect on Pierce Lake. However, during a drought or a prolonged dry period, it is possible that the lake level will be lowered as much as 18 inches below its regular level. The area of the lake is very shallow (approximately three feet) where our transfer pumps inlet line is located. Therefore, when the lake is lowered 18 inches, the pump will begin to suck air and will no longer be operational. The danger to Pierce Lake is not in the lowering of the water level by 18 inches during a drought. The danger is the perception of an uninformed public that the golf course is not concerned about the lake level. Conformance to the water use program is an essential tool that will be needed to explain the park and recreation departments conservative and well thought out plan of using the water from Pierce Lake.

DOCUMENTATION

The main elements of the Water Use Program are the amount of water that is applied to the golf course, and the current level of the lake. The water log will be kept in the superintendent's office. The water log will contain all the daily nighttime water use totals for the entire year. The lake level will be measured in relation to the dam on the East Side of the lake.

OBJECTIVE

The objective of the water use program is to apply less water each night than the total gallons this program allows. We will determine the total gallons available by monitoring the level of the lake compared to the dam. The water availability is divided into the following three zones:

Green Zone – The green zone is defined as any water level between flowing over the dam to four inches below the dam. When the water level is within this zone, the superintendent may apply up to 240,000 gallons per night. The goal for irrigation in the green zone is to maintain the course in the best shape possible.

Yellow Zone – The yellow zone is defined as any water level between four inches to 12 inches below the dam. When the water level is within this zone, the superintendent may apply up to 225,000 gallons per night. The goal for irrigation in the yellow zone is to maintain the course in the best shape possible, except:

- the irrigation on the driveway, other than the flowerbed at the entrance, will be turned off.
- the irrigation in the parking lot will be turned off.
- reduction to the fairway irrigation on #6, #7, and #8 to the point that browning along the edge of the fairway is permissible.

Red Zone – The red zone is defined as any water level between 12 inches and 18 inches below the dam. When the water is within this zone, the superintendent may apply up to 210,000 gallons per night. The goal for irrigation in the red zone is to maintain the course in the best shape possible, except:

- the irrigation on the driveway, other than the flowerbed at the entrance, will be turned off.
- the irrigation in the parking lot will be turned off.
- the irrigation at the clubhouse will be turned off, except for the area inside the retaining wall.
- reduction of the fairway irrigation on #2, #4, #6, #7, and #8 to the point that browning along the edge of the fairway is permissible.

Dormant Zone – The dormant zone is defined as the water level when the transfer pump ceases to work and no more water will be transferred from Pierce Lake to the irrigation pond. The goal for irrigation in the dormant zone is to maintain the greens and tees in the best shape as possible. The fairways will be watered on an individual basis depending on the weather and the level in the irrigation pond.

Pierce Lake Golf Course, Fertilizer and Chemical Use Program

OBJECTIVES AND TARGETS

Our objective is to apply as few chemicals and fertilizers as possible, while provide our customers a satisfying golf experience. To assure this objective, all employees who apply chemicals to the golf course will be adequately trained in their task. All persons applying chemicals to the golf course will be knowledgeable and committed to the prevention of pollution, including the following objectives and targets:

1. Apply all fertilizers and chemicals to the intended areas only.
2. Do not apply any fertilizer if a rain event is anticipated to accumulate greater than four inches of precipitation.
3. Apply dormant fertilizer only to open areas of the course that become windblown. Do not apply dormant fertilizer to protected, moist wet areas of the golf course.
4. Apply fungicides to green and tee areas only, unless extreme conditions arise.
5. Establish and maintain a 10 to 15 foot buffer area along wetlands, lakes, and drainage ditches, where no fertilizer will be applied.
6. Apply herbicides only in the fall when they are most effective to the target plants.
7. Provide golf course playing areas (greens and tees) with a proper growing environment to promote healthy, dense grass. This includes large amounts of sunlight, adequate wind movement, proper cultural maintenance, and proper amounts of fertilizer.

RESPONSIBILITY

The golf course superintendent is responsible for the application of all fertilizer and chemicals. The superintendent will ensure that anyone applying chemicals to the golf course has a current Michigan Pesticide Applicators License and is properly trained to apply chemicals (Chemical Application Training Manual). He will also be responsible for training anyone who will apply fertilizers to the golf course (Fertilizer Application Training Manual).

The golf course general manager is responsible for ensuring that environmental management system requirements are established and maintained.

MONITORING AND MEASUREMENT

Each spring, the golf course superintendent will calibrate the three-point fertilizer spreader (with the current year's fairway fertilizer) and the sprayer (with each different style nozzle) and document the results. These results will be kept in the fertilizer and chemical application book. (See Equipment Calibration Worksheet)

Structure and Responsibility

Participants defined certain responsibilities for their EMS in environmental management programs (Pierce Lake Golf Course, see Objectives and Targets and Environmental Management Program) while others included responsibilities as part of their EMS documentation (see Village of Chelsea, Environmental management systems documentation). Saint Joseph Mercy Hospital followed their “build on existing systems” approach to EMS development. Their Program Leader noted that a separate list of EMS responsibilities would not have been accepted by management. As an alternative approach, the responsibilities were included as part of the hospital’s Hazardous Material and Waste Management Plan.

The following example from the plan includes EMS responsibilities but not the words “environmental management system” or language from the standard. EMS responsibilities often overlapped with hospital accreditation requirements and were added where they did not. The Program Leader updates the plan as needed.

Saint Joseph Mercy Hospital Hazardous Material and Waste Management Plan

I. Mission, Vision, Values

Building upon the tradition of the Sisters of Mercy, the purpose of St. Joseph Mercy Hospital (SJM) and its Community Health Board is to improve the health of the people it serves by caring for the whole person. St. Joseph Mercy Hospital's core values are Service, Justice, Mercy, Human Dignity, and Preferential Option for the Poor. To meet this commitment, a Hazardous Material and Waste Management program has been established as stated in this plan for all SJM owned buildings and grounds including ambulatory and clinic sites.

Definition

Hazardous materials and waste are materials whose handling, use, and storage are guided or defined by local, state, or federal regulation (Environmental Protection Agency's Resource conservation and Recovery Act requirements for hazardous wastes, Nuclear Regulatory commission's regulations for the handling and disposal of radioactive waste), hazardous vapors (for example: glutaraldehyde, ethylene oxide, nitrous oxide).

Federal regulations do not define infectious waste or medical waste as hazardous waste. For information on infectious waste and medical waste, refer to the St. Joseph Mercy Hospital Infection Control Manual.

II. Authority

The Community Health board of St. Joseph Mercy Hospital shall require and authorize the President and CEO of the organization to formulate an appropriate hazardous material and waste management (HMW) program to promote a safe and secure environment for patients, visitors, and staff.

The relationships, objectives, reporting, and procedures established by this program are operational commitments of this organization and shall be resourced and accomplished appropriately through executive leadership as directed by the President and CEO.

The Director of Environmental health, Safety, Security and Reception Services shall be designated by the President and CEO to provide administrative leadership, direction, and responsibility for management of the HMW program. The Director of Environmental Health, Safety, Security, and Reception Services, through the President and CEO, has the authority to take action when conditions exist involving hazardous materials or waste, which could result in injury to persons or damage to hospital property.

The Hazardous Substance Specialist (HSS)/Designee is authorized by the Director of Environmental Health, Safety, Security, and Reception Services to initiate immediate actions under emergency conditions.

III. Responsibilities

The Director of Environmental Health, Safety, Security, and Reception Services as Chair of the Safety Steering Committee (SSC) and its members, along with the HSS as Chair of the HMW Management Sub-Committee and its members are responsible for the development of the plan and be familiar with the following:

Community Health Board

The Community Health Board (CHB) shall receive and consider on a quarterly basis, a report of significant issues, trends, and actions of the HMW program. One of these reports shall be the annual evaluation of the HMW program's effectiveness. The CHB shall provide support for the HMW Management Program as would be considered responsible to provide for a hazard-free environment of care for patients, staff, and visitors to the hospital's property.

President and CEO

The President and CEO is responsible for assuring the existence and effectiveness of a comprehensive HMW Management Program. The President and CEO shall support implementation of the plan through the designation of a responsible person(s) for HMW Management who participates in the overall HMW program.

Vice President, Facility and Hospitality Services

The Vice President, Facility and Hospitality Services is appointed by the President and CEO, and is responsible for providing executive support to the Director of Environmental Health, Safety, Security, and Reception Services in the administration of an effective and comprehensive HMW Management Program. The Vice President, Facility and Hospitality Services is responsible for and accomplishes the following:

- Participates in the activities of the SSC as an ad hoc member.

Director of Environmental Health, Safety, Security, and Reception Services

The Director of Environmental Health, Safety, Security, and Reception Services reports to the Vice President, Facility and Hospitality Services and is responsible for providing administrative direction and coordination for the overall development, implementation, and on-going operation of the Environmental Health, Safety, Security, and Reception Services management programs at St. Joseph Mercy Hospital. The Director of Environmental Health, Safety, Security, and Reception

Services is responsible for and accomplishes the following:

- Chairs the St. Joseph Mercy Hospital Safety Steering Committee
- In consultation with executive leadership, develops HMW objectives and plans designed to attain agreed upon objectives.
- Reviews and recommends changes to policies and procedures as necessary to ensure compliance with regulations established by outside agencies.
- Receives and reviews incident and security reports, investigating causes and determining actions necessary to prevent recurrence.
- Conducts annual evaluation of Safety Management programs in concert with the St. Joseph Mercy Hospital Safety Steering Committee.

Safety Coordinator

The Safety Coordinator is appointed by the Director of Environmental Health, Safety, Security, and Reception Services and is designated as the organization's Safety Officer. The Safety Coordinator shall participate in a hospital-wide system to collect and evaluate facility and other environment of care data. Hazardous materials and waste data shall be gathered from a variety of sources, summarized, and reported to the Community Health Board. The reports shall summarize identified hazardous materials and waste issues, user errors, needs, and opportunities, and briefly state proposed resolutions, including measures of effectiveness.

Safety Steering Committee (SSC)

The St. Joseph Mercy Hospital Safety Steering Committee (SJMHSSC) is appointed from a multi-disciplinary background and is responsible for directing the development, implementation, and the recommending of policy and standards for the maintenance of comprehensive organization-wide Environment of Care programs. The committee facilitates the exchange and documentation of appropriate information, recommendations, and follow-up required between administration, departments, the hospital, quality management, security, and infection control. With respect to HMW, the SSC is responsible for the following:

- Overseeing the activities of the HMW Management Sub-Committee receiving and reviewing reports on a quarterly basis.
- Review, endorse, support, and approve recommendations related to the HMW Management program from the HMW Management Sub-Committee.
- Receives, considers, and when necessary, acts upon reports from other hospital-wide functions, including, but not limited to risk management, employee health, infection control, quality management, engineering, and other sub-committees of the SSC, and to communicate as appropriate such issues to the HMW sub-committee.

- Annually receive and consider an Evaluation of the Effectiveness of the HMW Management program as provided by the HMW Management Sub-Committee.

HMW Management Sub-Committee

The HMW Management Sub-Committee is appointed from a multi-disciplinary background and meets regularly to monitor, review, analyze, and provide recommendations for the improvement of the effectiveness of the HMW Management program. The committee facilitates the exchange and documentation of appropriate information, recommendations, and follow-up required to the SSC. This sub-committee is responsible for:

- Monitoring organizational efforts to reduce hazardous material and waste.
- Monitors for effectiveness hazardous material and waste training to all new employees and to continuing employees on an ongoing basis.
- Receives, considers, and when necessary, acts upon reports including hazardous material incidents from other hospital-wide functions and various sub-committees and departments.
- Evaluates the effectiveness of the HMW Management program annually.

Hazard Substance Specialist

The Hazard Substance Specialist (HSS) is appointed by the Director of Environmental Health, Safety, Security, and Reception Services and is responsible for assisting in the overall planning, coordination and implementation of hazardous material and waste program. The HSS is responsible for and accomplishes the following:

- Submits completed reports at least quarterly to the SSC on findings, recommendations, actions, and monitoring conducted by the HMW Management Sub-Committee.
- Provides an annual evaluation of the effectiveness of the HMW program, along with members of the HMW Management Sub-Committee.
- Coordinates and/or participates in the development of departmental, as well as facility-wide HMW policies and procedures.
- Coordinates and/or participates in new employee orientation and continuing education programs for all employees.
- Ensures that departmental HMW policies and procedures are consistent with and integrated into the facility-wide HMW Management program, and reviews these policies and procedures at least every three years.
- Participates in an on-going hospital-wide Information, Collection and Evaluation

System (ICES) that collects and evaluates information about HMW, as well as other hazards and safety practices to identify deficiencies that are to be addressed by the HMW Management Sub-Committee.

- Ensures hazardous material incidents are reported to the appropriate committees/individuals/departments.

Department Directors/Managers

All department directors and managers are responsible and accountable for establishing and documenting appropriate internal policies and procedures, which establishes safety practices for their areas of operation. Duties include:

- Participate in the development of department-specific HMW policies and procedures as necessary.
- Development, provision, and documentation of department and job-specific HMW training as required.
- Maintains appropriate HMW management and procedure knowledge regarding HMW practices, policies, procedures, and emergency plans affecting their area of responsibility.
- Conduct annual review and update chemical inventories and forward to the Safety Office.

Individual Employee

All employees, while in the course of employment, are required to adhere to established HMW policies and procedures; be aware of and report hazardous material hazards to department directors and/or managers. Employees will receive HMW procedures as part of the hospital's general orientation and the department-specific training program. Employees are responsible for the following:

- Proper handling, use, storage, and disposal of hazardous material.
- Protective measures, including notification procedures, personal protective equipment, and engineering controls.
- Initiate notification procedure in the event of emergency involving hazardous material and waste.
- Report any hazards involving hazardous material and waste to the Safety Department.

VI Important Functions

The HMW program includes the following important functions:

- Assures compliance with all federal, state, and local regulatory environmental health and safety requirements through the establishment and application of policies and procedures. Identify, evaluate, and inventory hazardous materials as described in Safety Policy III-301 "Hazardous Materials and Wastes."
- Provides for the proper disposal of chemical, hazardous drug, radioactive, and regulated medical waste as described in Environmental Services Policy "SJM Waste Management Program," Safety Policies III-301 "Hazardous Materials and Wastes," and III-305 "Hazardous Drugs," Radiation Safety Policy Manual and Infection Control Policies 3-4.1 "Disposal of Medical Waste" and 3-4.2 "SJM Medical Waste Management Plan."
- Provides for the monitoring and disposal of hazardous gases and vapors as described in Anesthesiology policy "Waste Gas Policy."
- Assures that adequate and appropriate space and equipment is provided for the proper handling, storage, and disposal of hazardous materials and wastes through the identification and correction of deficiencies identified during hazard surveillance activities, capital purchase process, space allocation review and construction design process.
- Provides a mechanism for HMW incident reporting and investigation through the utilization of the incident report form, investigation by the Safety Office and incident review by the Hazardous Material and Waste and Safety Steering Committees.
- HMW training through new employee orientation and provision of the HMW section of the Safety Education Manual
- Provides for emergency notification and response to hazardous material spills and exposures as described in Safety Policy III-302 "Hazardous Materials and Waste Spill Response."
- Hazard Surveillance through the use of Safety Survey forms evaluating the ongoing compliance and effectiveness of the Hazardous Materials and Wastes program throughout the organization and requiring corrective action for any deficiencies.
- Liaison with community LEPC, Pollution Prevention, and emergency response entities by identifying reporting requirements and providing representation to appropriate community emergency response entities; Completion of the annual evaluation of the effectiveness of the HMW program by the Hazardous Materials and Waste committee and review by the Safety Steering Committee.

See Section IX for associated policies and procedures that support and implement these important functions.

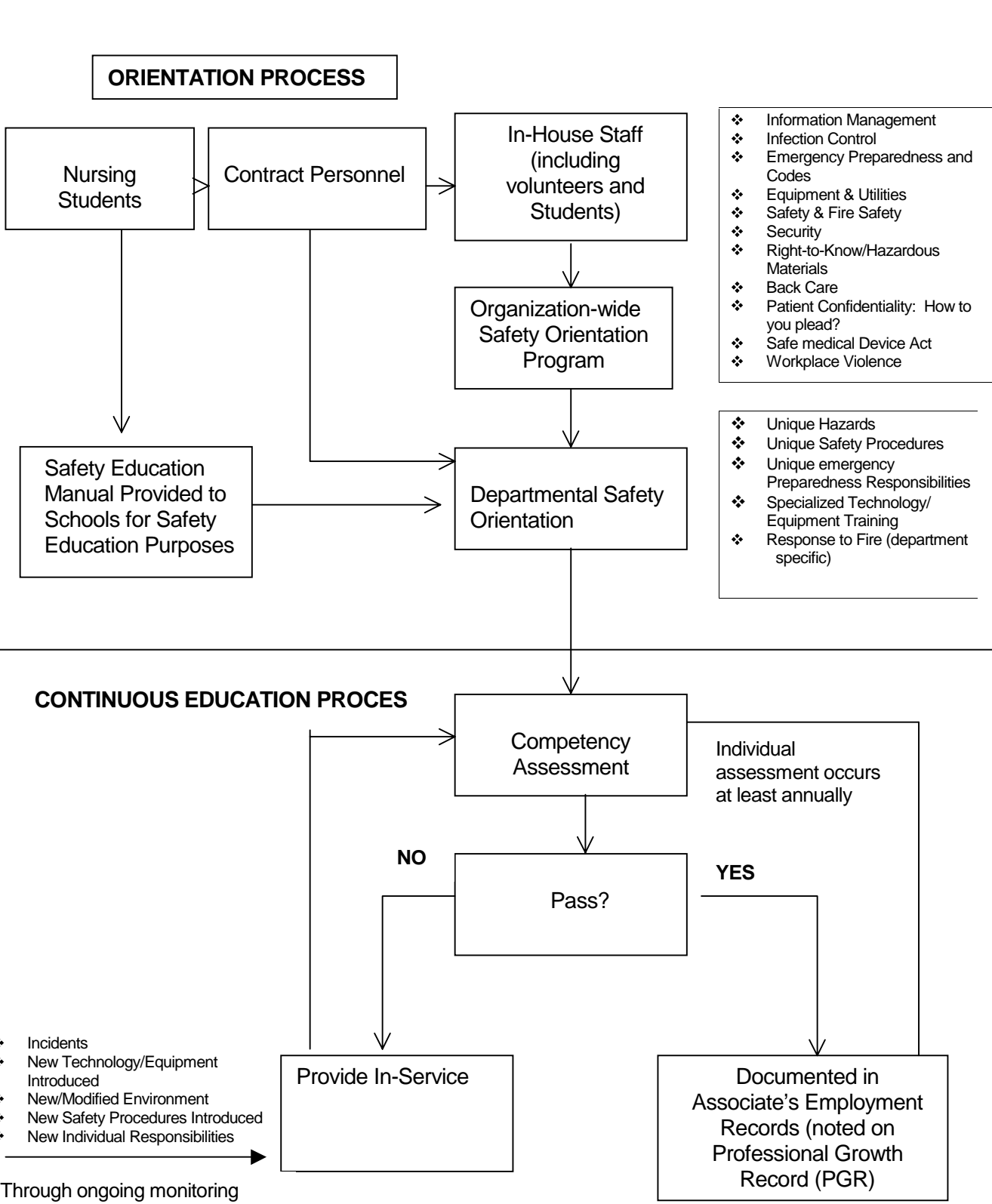
Training and Awareness

Saint Joseph Mercy Hospital's strategy for implementing this requirement of the ISO 14001 (1996) standard was to blend training requirements into their existing safety training program. This strategy was successful for the following reasons:

- Safety training is a requirement for accreditation and as such had strong management and staff support.
- Safety training cut across all divisions in the organization; all other training was by department.
- The training program changes every year so that as the EMS evolves, more EMS requirements may be added.

Training on EMS requirements is not given in one session or as separate EMS training but is included in existing training on environmental topics under the general header of Safety Education. The following flow chart shows how some EMS-related training is offered to all new employees during orientation (Emergency Preparedness and Codes, and Right-To-Know Hazardous Materials) and into ongoing safety training which each employee has to have at least annually. Ongoing training is documented in employees' employment record.

Figure 3-6. Saint Joseph Mercy Hospital: Safety Education Process



Environmental Management Systems Documentation

Developing EMS documentation was one of the last elements of the standard to be developed by the Community-Based Project participants. Some Pilot Program Leaders confused their compilation of EMS documentation in a binder, with the ISO 14001 (1996) standard requirement to:

- describe the core elements of the EMS and their interaction and
- provide direction to related documentation

The EMS documentation sample from the Village of Chelsea will likely be refined as the management system matures. The Village included descriptions of objectives and targets and the environmental management programs in their environmental aspects identification procedure (see Environmental Aspects).

Several of the sections of the EMS manual are also forms or records (e.g., Legal and other requirements, Emergency preparedness and response). This approach can be limiting. Since the EMS manual should be a controlled document, it would have to be re-issued each time environmental records were updated.

Village of Chelsea: EMS Manual

Document: EMS Manual – EMS Policy

Version: 1

Date: April 22, 1998

Page: 1 of 1

The EMS Policy of the Village of Chelsea was adopted by the Village Council on March 11, 1997. ISO 14000 requires this Policy be communicated to all employees and available to the public. To this end, the following should be implemented:

The Policy should be sent via memo to all department heads, who will post the policy in view of all employees in the department. Further, each department head should communicate to their employees that the Policy is to be read, understood, and followed.

Implementation Date: _____

Village Manager
Verification: _____

The Policy should be posted in the Village Offices in a place accessible and visible to the public. In addition, copies should be made available to members of the public who request it. Additional potential vehicles for public availability are to mention the Policy at Village council and other open meetings, publish the Policy in the local newspaper of record, and post the Policy on the Chelsea Cable Television channel.

Implementation Date(s): _____

Forms of
Communication: _____

Village Manager
Verification: _____

Environmental Management Systems Documentation (cont.)

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Environmental Aspects and Impacts

Version: 1

Date: April 22, 1998

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In addition to the EMS Procedure for Environmental Aspects Identification, the Village is involved in the following efforts which may result in identification of Environmental Aspects, as well as setting of goals and objectives for future improvement:

Update and enforcement of Chelsea Village Ordinance for discharges to the Village wastewater treatment plant from industries and commercial establishments within the Village. It is now an enforceable civil infraction to discharge certain types and levels of pollutants into the wastewater treatment plant.

Participation in the Huron River Initiative, a voluntary program designed to limit the amount of phosphorous and other non-point source pollutants, which as discharged into the Huron River and its tributaries. This program involves significant commitment above and beyond permit requirements and also will involve public outreach and educational efforts in an effort to minimize these discharges.

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Legal and Other Requirements

Version: 1

Date: April 22, 1998

Page: 1 of 1

Legal and other requirements are regularly communicated to the Village by the Federal Government, the State of Michigan, the MML, SEMCOG, and other agencies. These requirements are reviewed by the Village Manager and the appropriate department heads, as well as the public safety officer. In addition, where appropriate, the Village Attorney is asked to review legal requirements of the Village. Such requirements include, but are not limited to:

- Health and Safety Issues (OSHA)
- Confined Space Entry
- Emergency Preparedness and Response
- NPDES Permit Requirements
- Stormwater Discharges (GLI)

Record of Legal and other requirements:

Requirement:	_____
Reviewed By:	_____
Review Date:	_____
Disposition:	_____
Requirement:	_____
Reviewed By:	_____
Review Date:	_____
Disposition:	_____
Requirement:	_____
Reviewed By:	_____
Review Date:	_____
Disposition:	_____
Requirement:	_____
Reviewed By:	_____
Review Date:	_____
Disposition:	_____

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Training, Awareness and Competence

Version: 1

Date: April 22, 1998

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The Public Safety Officer is responsible to review training requirements and maintain training records for all employees. This training includes fulfillment of the legal and other training requirements, as well as training required to maintain licensure and certifications necessary for the smooth functioning of the Village.

Awareness of, and conformance with the EMS, should be an integral part of this training maintenance, and should include sections on the importance of conformance with the EMS, the significant environmental impacts associated with work activities, each employee's role and responsibilities in conforming with the EMS, and the potential consequences of departure from the specified operating procedures.

It is the responsibility of the Public Safety Officer to ensure that personnel performing tasks, which have the potential to cause significant environmental impacts are competent to perform such tasks on the basis of training, education, and/or experience.

Document: EMS Manual – Communication

Version: 1

Date: April 22, 1998

Page: 1 of 1

External communications are controlled through the open meetings act and the responsibilities of a village to communicate its actions and policies to the public which it serves. Various channels for external communications are open, from public meetings, to citizen communications with elected officials, to the Chelsea Cable Television network, to open telephone lines to the Village. Records are kept of such communications through correspondence files, telephone logs of call and complaints, and minutes and backup tapes of public meetings.

Internal communications are provided through periodic meetings between department heads, memos, and radio/television communication equipment.

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – EMS Documentation

Version: 1

Date: April 22, 1998

Page: 1 of 1

This Manual is to provide information on the basic elements of the Chelsea EMS and provides reference to related documentation. The Village Manager and/or appropriate department managers are responsible to ensure that this Manual is updated to reflect changes, additions, and potential gaps in documentation, and that the system is continually improved to establish and maintain conformance with ISO-14000 standards.

Document: EMS Manual – Document Control

Version: 1

Date: April 22, 1998

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All documents required by the ISO-14000 standard shall be controlled to ensure they can be located, are periodically reviewed, and are available at locations where they are needed for effective functioning of the EMS. Obsolete documents are promptly removed and replaced as updates are made. If obsolete, documents are retained for documentation or legal purposes. They should be marked on each individual page and stored in files clearly marked "Obsolete Documents – For Archival Purposes Only."

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Operational Controls

Version: 1

Date: April 22, 1998

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As new businesses come on stream and discharges into the wastewater treatment plant are encountered, the Village of Chelsea has implemented a policy of installing test manholes on commercial and industrial sites, which have the potential to discharge significant quantities of pollutants to the wastewater treatment plant. If, through ongoing testing procedures at the wastewater treatment plant, pollutants are discovered, the series of test manholes allows tracking back to the potential pollutant source. Chelsea Village ordinance allows civil infractions to be issued and fines to be levied against dischargers.

The Department of Public Works supervisor shall ensure that procedures are followed and documentation exists to track salt usage and for handling catch basin spoils in conformance with the goals and objectives as outlined in the Aspects and Impacts and the Structure and Responsibilities portion of this Manual. Maintenance of Operational Control Documents will be the responsibility of the Department of Public Works supervisor.

Bid documents and specifications are established as operational controls for contractors on projects. Some of the aspects associated with various projects include erosion control and sedimentation plans, stormwater detention, design of roadways, curb and gutter, and roadside swales.

Developers must be granted a Certificate of Occupancy before selling or occupying new development units. These ensure conformance with the Village standards before project completion.

A wellhead protection area has been established for the Village through a study by Walter Bolt, conducted through Michigan State University. Operational controls need to be established for this area through the Water Department supervisor in order to ensure that controls are established for businesses locating in this wellhead protection area.

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Emergency Preparedness and Response

Version: 1

Date: April 22, 1998

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The Public Safety Coordinator is responsible to ensure that all necessary personnel are trained and equipped for emergency response actions. Procedures are established and equipment is maintained through the Police and Fire Departments. The Police and Fire Chiefs are responsible for operation of these departments, and there are plans at both the County and Village offices, which outline the specified response to various types of emergency.

Potential Emergency: _____
Plan Document: _____
Location of Plan Document: _____
Responsible Party: _____
Telephone: _____

Potential Emergency: _____
Plan Document: _____
Location of Plan Document: _____
Responsible Party: _____
Telephone: _____

Potential Emergency: _____
Plan Document: _____
Location of Plan Document: _____
Responsible Party: _____
Telephone: _____

Potential Emergency: _____
Plan Document: _____
Location of Plan Document: _____
Responsible Party: _____
Telephone: _____

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Monitoring and Measurement

Version: 1

Date: April 22, 1998

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Monitoring and measurement of effluent is accomplished at the wastewater treatment plant through controls and testing procedures as prescribed by law and as implemented by the wastewater treatment plant supervisor. Documentation and implementation of this testing program is the responsibility of the wastewater treatment plant supervisor.

Implementation of monitoring and measurement methods are described in the procedure for identifying environmental aspects and impacts, and in the Environmental Aspects/Goals sheets included in the Structure/Responsibilities section of this Manual.

Document: EMS Manual – Nonconformance, Corrective and Preventative Action

Version: 1

Date: April 22, 1998

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It is the responsibility of each department head to establish procedures and policies for the detection of issues and problems associated with significant environmental aspects and impacts and to implement corrective and preventative action as necessary.

Any nonconformances are reported to the Village Manager as soon as possible after detection of the nonconformance as possible.

Document: EMS Manual – Records

Version: 1

Date: April 22, 1998

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Records associated with appropriate sections of the EMS will be kept within each department and will be clearly labeled “EMS Documents.” It is the responsibility of the department head to make sure that these records are properly labeled and stored, and are accessible for review. In addition to logs and other documentation, EMS records will include training records and the results of audits and reviews. Training and audit records may be maintained outside of the department, but a cross-reference must be maintained in each department, which clearly specifies the location of training and audit records for that department.

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Audits

Version: 1

Date: April 22, 1998

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Audits will be conducted at intervals no greater than once per year in order to determine whether the EMS conforms to the requirements of the ISO 14001 standard, is consistent with the policy and principles embodied in this Manual, and is properly implemented and maintained. The information from these periodic audits will be provided to the Village Manager, the Village President, and the Village Council.

Currently, the Village has enrolled in a cooperative audit program with other participants in the NSF-International group for Implementing EMS in Community-Based Organizations. A draft "Three Year Schedule" of that Audit Program is included in this Section.

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Audits

Version: 1

Date: April 22, 1998

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<u>YEAR</u>		
<u>1999</u>	<u>2000</u>	<u>2001</u>
Pierce Lake Golf Course <i>audits</i> Leslie Golf Course	Leslie Golf Course <i>audits</i> Home Toxics Program	Leslie Golf Course <i>audits</i> Home Toxics Program
Leslie Golf Course <i>audits</i> Home Toxics Program	Home Toxics Program <i>audits</i> St. Joe's Hospital	Home Toxics Program <i>audits</i> Pierce Lake Golf Course
Home Toxics Program <i>audits</i> St. Joe's Hospital	St. Joe's Hospital <i>audits</i> Village of Chelsea	St. Joe's Hospital <i>audits</i> Leslie Golf Course
St. Joe's Hospital <i>audits</i> Village of Chelsea	Village of Chelsea <i>audits</i> Pierce Lake Golf Course	Village of Chelsea <i>audits</i> St. Joe's Hospital
Village of Chelsea <i>audits</i> Pierce Lake Golf Course	Pierce Lake Golf Course <i>audits</i> Leslie Golf Course	Pierce Lake Golf Course <i>audits</i> Village of Chelsea

VILLAGE OF CHELSEA: ISO 14001

Document: EMS Manual – Management Review

Version: 1

Date: April 22, 1998

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The Village Manager, Village President and Village Council will review the EMS at intervals not to exceed one year to ensure its continuing applicability, suitability, adequacy and effectiveness. Ideally, these reviews will take place immediately, following yearly audits and will include a review of audit information. However, lack of audit information should not alter the minimum schedule for management review.

During this review, the need for modifications, updates, or other changes to any and all elements of the policy shall be considered, and such modifications, updates, or other changes shall be implemented as appropriate, with the goal of continual improvement of the EMS and in the performance of the Village in reducing the environmental impacts of its operations.

Document Control

For the project participants, document control was one of the last areas of their EMS to be developed. In community-based organizations, the need for document control was often not recognized and not supported by management. Views from Pilot Program Leaders-

- *Document control is a problem and will always be a problem. Every department is responsible for the document control of its own documents and procedures. The problem is that people have to put the updates in their manuals but they don't do it.*
- *This (document control) will continue to be a problem because our culture makes it difficult and electronic distribution is not practical. Document control is not viewed as important by management.*
- *Only policies are document controlled, procedures are not.*

Questions and Answers

Despite these obstacles, Program Leaders attempted to learn more about document control and how to try to make it work in their organizations. The following questions were posed by the Program Leaders during EMS implementation and the responses were provided by the project.

- Q. What is the difference between a document and a record and between document control and records management?
- A. To put it simply, a document describes how your EMS works (e.g., policy, procedure, work instructions, blank forms) and a record demonstrates that the procedures etc. have been implemented (e.g., a completed form).

Document control refers to review, revision, location, and maintenance of documents that are part of your active file. Records management is how you identify, maintain, and dispose of records. The documents are either recycled or stored for a specified period of time. Records management include records retention which specifies when to remove records from your active file.

- Q. How should bids for environmental services, such as disposing of waste, be controlled?
- A. The bid form itself could be controlled as part of a procedure or as a stand-alone document. Document control will help ensure that you are using the most current version. The bids you receive from vendors need a different, less formal method of control focusing on retrieval of the bids. The control may be as simple as a labeled folder with a sign out sheet so you know if one has been taken. If the bids are important or there may be liability involved with the procurement, you could have a simple log-in sheet and record each bid as it is received.

Q. How should surveys, literature received or reports be controlled?

A. The control process depends on how important the record is. A labeled folder may be all you need with a file key so you (or someone else) can find it. The most formal system would be to log the survey, report, etc. in. Include in your document control process how long you want to retain this information. It can pile up quickly!

Q. What control category would laws and regulations fall in: procedures or instructions/reports?

A. The categorization is up to you and what makes sense for your system. The key is to identify it as an external document by giving it a unique number. This lets you know at a glance that it is not a document that your organization updates. Note that community-based organization may deal with two types of laws and regulations: the ones they are required to meet and the ones they impose on others (such as ordinances). The latter would be an operational control.

Q. How do you institute a document control system in an organization that needs to ensure employees have the latest versions of at least two of its documents (both safety manuals) for accreditation purposes but faces the following challenges:

- There is no current organization-wide system of document control.
- Management does not view document control as a priority nor is it required for accreditation.
- The organizational culture does not support document control.
- Each individual department is responsible for the control of its documents, even if the distribution of those documents extends beyond that department.
- Whatever system is developed must be simple. Staff is not available for anything complicated or resource intensive and furthermore, the culture will not support it.

A. The following recommendations are aimed at simplicity and using existing systems. Although some of the recommendations may seem obvious, they are often overlooked in organizations and really do work.

1. Clearly label the manuals on the cover and spine so they can be quickly identified on a bookshelf or desk. When re-issuing the entire manual, make it look different from the previous version (e.g., use a different color binder or cover) so the old ones can be easily spotted and removed.
2. Consider having a clerk or volunteer retrieve the old manuals and deliver the new ones.
3. A simple distribution list with the names of individuals receiving the manuals is all you need.
4. If possible, conduct unannounced spot checks of various departments and facilities twice per year. Report on what you find and make recommendations to the managers of those departments. The spot checks can be done quickly and combined with other visits.

5. On the question of sending out updates of individual procedures: It is true that you cannot “make” someone replace an outdated procedure nor do you have the resources to personally update all the manuals. Consider sending the updates to the support person who assists the person(s) on your distribution list. There is often one support person for several individuals and they could update several manuals at once.
6. Add one question to the Safety Survey Checklist addressing whether or not the most recent version of the safety manual is available and if new procedures have been inserted.
7. Put new procedures on colored paper (use a new color each year) to allow for a quick spot check.
8. When sending out new manuals, include a memo that includes a description of the announced and unannounced document control audits and state that recommendations will be made to management.

Instituting a change like this will take time. The audits are a key part of reinforcing your message.

Emergency Preparedness

Emergency preparedness was the area of ISO 14001 (1996) requirements where the Pilot Program had the highest relative level of success (see Table 2-2). Parts of the standard that proved the most difficult to implement included identifying potential accidents and emergencies and describing actions to prevent and mitigate environmental impacts in an emergency situation.

Saint Joseph Mercy Hospital combined their Federal Spill Prevention Control and Countermeasures (SPCC) plan with their state-required Pollution Incident Prevention Plan. The hospital conducts periodic emergency response drills. Ann Arbor Public schools had a different approach. The grounds and transportation department has its own SPCC plan while the emergency response plan is on a district level. The emergency plan underwent a recent revision where the school's Environmental Services Department was asked to include likely emergency scenarios and develop response procedures.

Monitoring and Measurement

As implementation progressed, Pilot Program Leaders came to realize that they already had many established practices that helped to fulfill ISO 14001 (1996) requirements for monitoring and measurement; they just had not thought of them in an EMS context. Examples include:

- Compliance and safety inspections of chemical storage facilities.
- A consultant conducts annual environmental, safety, and health inspections of a collection facility.
- Maintaining water usage logs, pesticide/fertilizer application rates.
- Safety Surveys, conducted by each department once or twice per year, were expanded to include the identification of compliance and evaluate staff knowledge of appropriate procedures.

Advice from Saint Joseph Mercy Hospital: Using the data you already have to collect for regulatory bodies is a good way to monitor your operations. There is a lot of data in air permits, criteria pollutants in air quality potential to emit tally sheets, RCRA inspections, and solid waste generator reports. See the example below.

We noticed an increase in silver in our discharge to the local wastewater treatment plant. We asked the question - what has changed in our operations? After some research, we discovered that a new orthopedic office had opened. We did an inspection of the facility and found that did not have a silver recovery system in their x-ray processor. The office put in a recovery system and the discharge levels declined back to permitted levels.

One requirement under the monitoring and measurement requirements of the ISO 14001 (1996) standard is to track environmental objectives and targets. The Home Toxics Reduction Program was able to do this by tying its objectives and targets to the departmental Business Improvement Process (see Management Review).

Environmental Management Systems Audit

Forming an EMS Audit-Sub Group was not part of the Community-Based Project as originally scoped. The idea evolved as the group of participants sought to identify resources to fulfill the ISO 14001 (1996) requirement to, “establish and maintain (a) programme(s) and procedures for periodic environmental management systems audits.” The challenge was, how could a small organization (of, for example, 3 people) conduct an objective and impartial assessment if its EMS? Even in the larger Pilot Programs, EMS expertise was limited to the Pilot Program Leader. The answer was that meeting the EMS audit requirement could most effectively be done by bartering auditing services. The project provided the auditor training and the EMS audit procedure described below.

The objective of the sub-group is to conduct peer level EMS conformance audits of one another’s EMS. The following audit procedure defines responsibilities and the process for scheduling, planning, conducting, and reporting periodic internal EMS audits in order to satisfy the requirements Section 4.5.4 of the ISO 14001 (1996) standard and contains the following:

- 1) Three-year audit schedule (1999-2001)
- 2) Audit plan template
- 3) Environmental Management Systems Audit Tool⁵ consisting of;
 - Audit Summary Sheet
 - EMS Audit Findings Form
 - Standard Requirements
 - Supplemental Questions
 - Supplemental Questions Grouped by Function
- 4) Confidentiality statement

The procedure contains the basic structure for an internal EMS auditing program and was designed with the requirements of ISO 14011⁶. To integrate the procedure with their EMS, each participant should tie their training programs, corrective action process, records, and management review in with the EMS audit procedure.

⁵ Because the EMS Audit Tool contains exact language from the ISO 14001 (1996) standard, royalties must be paid to ANSI/ISO. The tool may be purchased. Call 1-888-NSF-9000 or see our website at www.nsf-isr.org

⁶ ISO 14011 –1996, Guidelines for environmental auditing – Audit procedures – Auditing of environmental management systems, ANSI/ISO. Available at www.nsf-isr.org.

Audit Procedure for the EMS Audit Sub Group

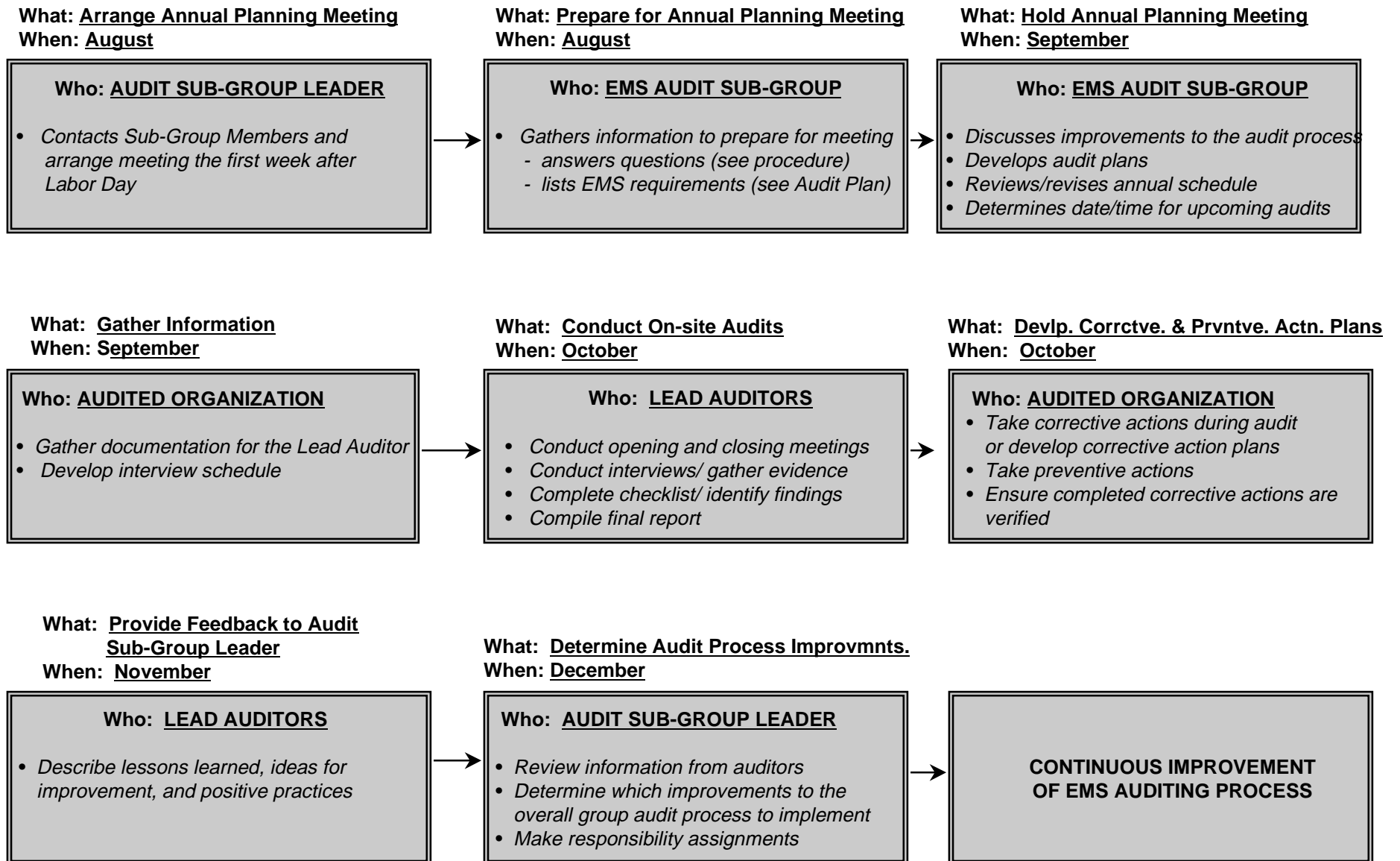
1.0 PURPOSE

- 1.1 Participants in the EMS Audit Sub-Group conduct peer level conformance audits of one another's EMS. This procedure defines the process for scheduling, planning, conducting, and reporting periodic internal EMS audits in order to satisfy the requirements Section 4.5.4 of the ISO 14001 (1996) standard. The procedure contains the basic structure for an internal EMS auditing program, including:
- A. Audit schedule (Attachment A)
 - B. Audit plan (Attachment B)
 - C. EMS Audit Tool (Attachment C), which consists of
 - 1. Audit Summary Sheet
 - 2. EMS Audit Findings Form
 - 3. Standard Requirements (*sample*)
 - 4. Supplemental Questions (*sample*)
 - 5. Supplemental Questions Grouped by Function (*sample*)
 - D. Confidentiality statement (Attachment D)
- 1.2 The procedure also describes the responsibilities of the EMS Audit Sub-Group. Sub-Group activities are summarized in Figure 1.

2.0 SCOPE

- 2.1 The procedure applies to all internal EMS audits performed by the organizations participating in the EMS Audit Sub-Group.
- 2.2 All 17 elements of the ISO 14001 (1996) standard (Sections 4.2 through 4.6) are audited at least once a year.
- NOTE:** If an element has not been fully implemented, the audit still proceeds and the status of implementation assessed.
- 2.3 The entire organization is subject to the EMS audit. The "organization" subject to EMS development was defined by each participant at the outset of the implementation project.

Figure 1. EMS Audit Sub-Group Activities and Responsibility Summary*



* See Section 4.0 Responsibilities of Audit Procedure for more details

3.0 **DEFINITIONS**

3.1 **Finding**: The results of the audit are called "Findings." The categories of findings are listed below. All audit findings must be documented (see EMS Audit Findings Form, Attachment C).

- A. **Major Nonconformance**: One or more of the numbered elements of the standard and/or EMS requirements set by project participants have not been addressed, implemented or maintained, or

Several similar minor nonconformances in documentation and/or implementation taken together lead a reasonable auditor to conclude that one or more of the numbered elements of the standard and/or EMS requirements have not been implemented or maintained.

A major nonconformance indicates a systemic breakdown, which will result in a serious failure of the EMS.

- B. **Minor Nonconformance**: A single observed nonconformance with the numbered elements of the standard and/or EMS requirements set by project participants. A minor nonconformance is often an isolated incident.
- C. **Positive Practice**: Good management practices which, in the opinion of the auditor, either address conformance to the standard in a particularly effective manner or goes beyond the EMS requirements set by the organization.
- D. **Recommendation**: Ideas for improving the management system based on the auditor's expertise. Recommendations are for the auditee's consideration only and do not require corrective action.

3.2 **Lead Auditor**: All Community-Based Project participants are qualified as Lead Auditors based on their EMS implementation experience with the Community-Based Project, EMS auditor training provided by the project, and/or professional experience.

3.3 **Final Audit Report**: The report consists of the following:

- A. Audit Plan
- B. Audit Summary Sheet
- C. EMS Audit Findings Form
- D. Standard Requirements
- E. Supplemental Questions

The audit report is completed by the Lead Auditor and given to the Audited Organization Point of Contact (POC) before leaving the site.

4.0 **RESPONSIBILITIES**

4.1 **Audit Sub-Group Leader**

- A. Arranges and Convenes the Annual Planning Meeting of the Sub-Group the first week after Labor Day.
- B. Leads the Annual Planning Meeting and initiates changes, as needed, to the audit process and procedure.
- C. Maintains the audit checklist.
- D. Acts as a **Lead Auditor** and conducts the EMS audit in accordance with this procedure.

4.2 **Sub-Group Members**

- A. Attend the Annual Planning Meeting.
- B. Act as a **Lead Auditor** and conducts the EMS audit in accordance with this Procedure.
- C. Contact the **Audit Sub-Group Leader** and convey lessons learned in the conduct of the audit, ideas for improvements in the process, and positive practices in the audited EMS that may help others with their EMS. This communication occurs no later than one week following the audit.

4.3 **Audited Organization Point of Contact (POC)**

- A. Prepares the answers to the following questions prior to the Annual Planning Meeting:
 - 1. What organizational, process, or operational changes have occurred since the last EMS audit (or if this is the first EMS audit, since the EMS was developed)?
 - 2. What changes in EMS personnel have occurred since the last EMS audit?
 - 3. To which environmental requirements, standards, codes of practice, accreditation criteria, county goals, etc. does the audited organization voluntarily subscribe? If there were any such requirements, provide a description of the requirement and the source document. Have the source document available during the audit.

The answers to the questions provide input to the audit plan (see Attachment B).

- B. Develops the audit plan in cooperation with the **Lead Auditor**.

- C. Develops a detailed interview schedule based on the results of the Annual Planning Meeting. Ensures the availability of key personnel.
- D. Provides a space where the **Lead Auditor** can work during the audit.
- E. Has key EMS documents ready for review by the **Lead Auditor** during the audit (See Section 8.2.1). A. Cooperates fully with the **Lead Auditor** and provides additional objective evidence as requested during the audit.
- F. Provides the results of the audit report to management and others as necessary.

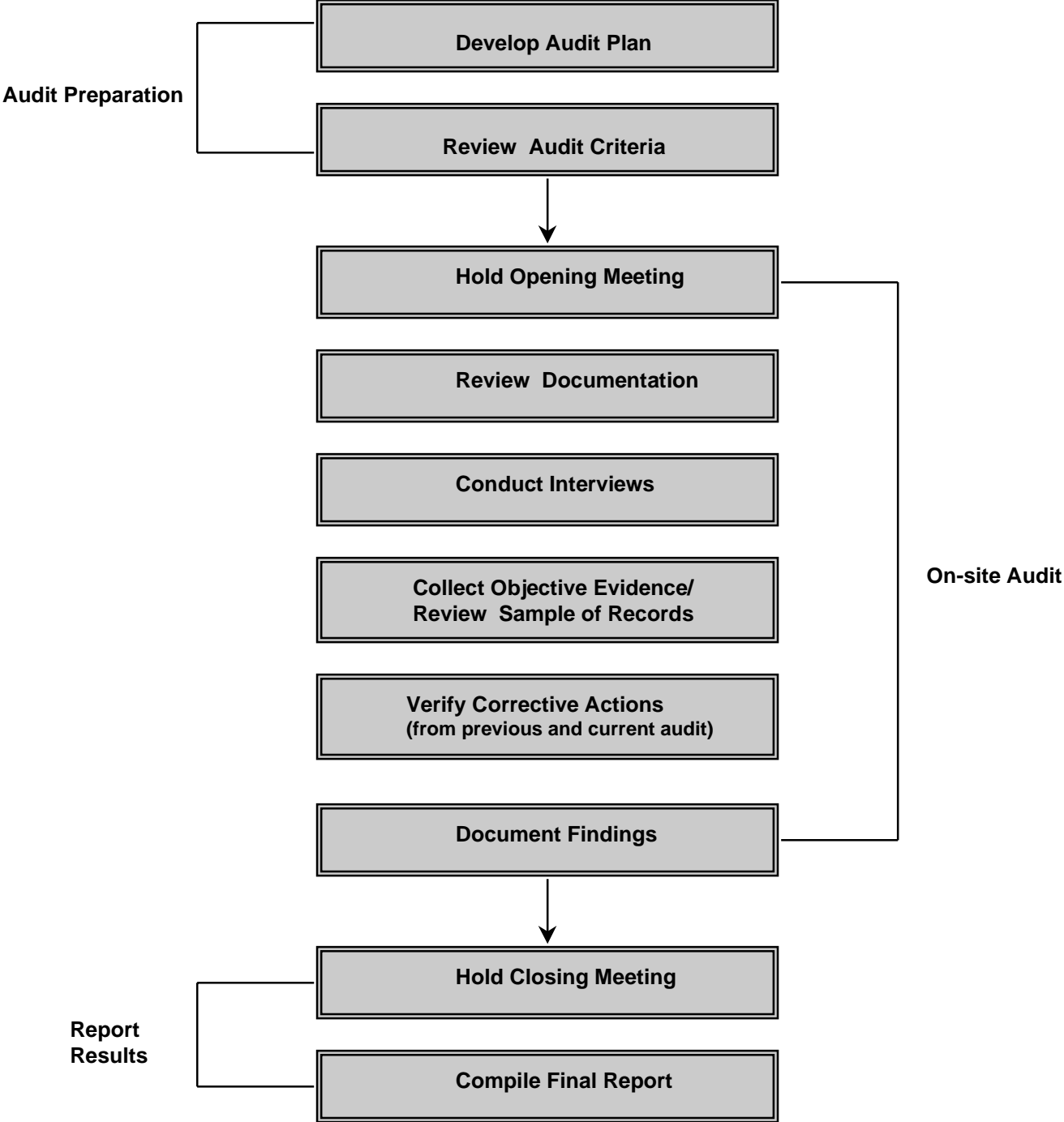
4.4 **Lead Auditor**

- A. Completes the Audit Plan with input from the **POC**.
- B. Conducts the audit according to this procedure (see Figure 2).
- C. Completes the Standards Requirements, EMS checklist, Audit Findings Form, and Audit Summary.
- D. Leaves the final report (checklist, findings, summary, plus audit plan) with the **POC**.
- E. Provides feedback to the **Audit Sub-Group Leader** on lessons learned in the conduct of an audit, ideas for improving the process, and positive practices in the audited organization's EMS.

5.0 **ANNUAL PLANNING MEETING**

- 5.1 The Annual Planning Meeting is essential to the auditing program outlined in this procedure. The meeting not only provides a mechanism for planning the upcoming audits but also is the primary vehicle to discuss and initiate improvements in the overall auditing process. The meeting is held the first week after Labor Day and has several objectives, including:
 - A. Confirm/revise the three-year audit schedule in Attachment A. As a starting point, the EMS audits are conducted (in October) per the schedule in Attachment A. At the Annual Planning Meeting, each organization states if they wish to be audited more than once per year. Changes in the frequency of the audits are based on:
 1. the environmental importance of the activities conducted at each audited organization and
 2. the results of the previous EMS audit for that organization.

Figure 2. Lead Auditor Steps in Conducting an EMS Audit



- The **EMS Audit Sub-Group** determines how to meet the request for additional EMS audits.
- B. Each **Lead Auditor** pairs with their respective **POC** for the organization they are to audit that year and:
1. Decide on specific dates and times for the upcoming audit. The **Lead Auditor** and **POC** may elect to review the EMS in one audit spaced over two non-contiguous days.
 2. Review **POC** answers regarding EMS changes and audit criteria (see 4. Responsibilities, Audited Organization Point of Contact).
 3. Consider changes to the auditing process or audit tool resulting from the previous EMS audit.
 4. Develop the audit plan.
- C. The **EMS Audit Sub-Group** determines the most effective means (e.g., a follow-up meeting, phone calls, faxes, e-mails, etc.) to exchange information from the audits (lessons learned in conducting an audit, recommendations for improvements to the process, and positive practices identified). Establishes time frames for communications.

6.0 **AUDIT PLAN**

- 6.1 An audit plan is prepared for each audit (see Attachment B). The **Lead Auditor** is responsible for ensuring the plan is developed. The **Lead Auditor** and **POC** develop the plan during the Annual Planning Meeting.

7.0. **AUDIT TEAM**

- 7.1 The team typically consists of one auditor. The **Lead Auditor** and **POC** may jointly agree that an additional auditor is needed. It is up to the **Lead Auditor** to identify a suitable auditor with EMS implementation experience, auditing experience, and/or EMS auditor training.

8.0. **ON-SITE AUDIT**

- 8.1 Opening Meeting: The **Lead Auditor** holds the opening meeting as the first action of the audit. The following topics should be covered:
- A. Introduction of the Audit Team
 - B. Confirmation of audit scope and criteria
 - C. Review and confirm interview schedule
 - D. Conduct of the audit and communication of results
 - E. Categories of nonconformance
 - F. Time of close-out meeting
 - G. Questions by the audited organization

8.2 Collect and review objective evidence

8.2.1 Review key EMS documents: The **Lead Auditor** spends some time before beginning the interviews to review, at a minimum, the following EMS documents and records:

- A. Environmental policy
- B. Procedure for aspects and impacts identification
- C. Procedure to identify objectives and targets
- D. Environmental management program(s)
- E. EMS manual
- F. Previous EMS Audit reports, if any
- G. Results of Management Reviews
- H. Requirements to which the Audited Organization voluntarily subscribes
- I. Other pertinent documents as requested by the Lead Auditor

NOTE: The Lead Auditor also requests documents and records for review during and after the interviews to verify EMS implementation.

8.2.2 Begin Interviews: The **Lead Auditor** documents responses and evidence gathered in the “Objective Evidence” column of the auditing checklist (or on separate note pages). The **POC** accompanies the **Lead Auditor** on interviews.

8.2.3 Communication with Audited Organization: When the **Lead Auditor** identifies a finding (i.e., a major or minor nonconformance, positive practice, or recommendation), he/she notifies the **POC** and documents the finding on the EMS Audit Findings Sheet (see Attachment C).

8.2.4 Corrective and Preventive Action: The **POC** is responsible for initiating action on the major and minor nonconformances and for taking action to prevent reoccurrence. The **POC** does not have to perform each corrective action and preventive but must ensure that an individual is assigned responsibility for completing the corrective and preventive actions.

- A. If the finding has a quick correction and is corrected during the audit, then the Lead Auditor will verify corrective action. If the finding requires a longer-term corrective action, that action can be verified by someone in the Audited Organization other than the individual responsible for the corrective action. The **Lead Auditor** will use the Findings Sheet to verify corrective action during the next EMS audit.

8.3 Report Results

8.3.1 Document Results: The **Lead Auditor** summarizes the results of the EMS audit on the Audit Summary Sheet (see Attachment C). All 17 elements of the EMS must be rated as “Acceptable” in order for the EMS to be in conformance with the ISO 14001 (1996) standard.

NOTE: An individual numbered section of the standard is rated as “Not Acceptable” if one or more major nonconformances are identified for this section during the audit. However, a section may have one or more minor nonconformances and still be rated as acceptable. There is no defined number of minor nonconformances against a section that cause it to automatically be ranked as “Not Acceptable.” This is a judgment call on the part of the **Lead Auditor**.

8.3.2 Closing Meeting: The **Lead Auditor** holds the closing meeting to discuss and clarify each finding (including positive practices and recommendations), review the objective evidence that supports it, and answer any questions by the audited organization. Changes are made to the findings, if needed, based on the results of the meeting.

8.3.3 Audit Report: The **Lead Auditor** completes the final report and leaves it with the **POC**.

8.3.4 Report Distribution and Record Keeping: The **POC** is responsible for distributing the audit findings, including corrective actions taken or planned, to key individuals in the organization. The **POC** ensures that the audit results are maintained for at least three years from the date of audit completion.

9.0 POST-AUDIT ACTIVITIES

9.1 Within a week after the audit, the **Lead Auditor** documents any lessons learned in the conduct of the audit, ideas for improvements in the process, and positive practices in the audited EMS that may help other group members with their EMS, and communicates this information to the **Audit Sub-Group Leader**. The **Audit Sub-Group Leader** reviews all the information from the auditors, determines which ones to act on, and makes responsibility assignments to the Sub-Group Members.

9.2 Once all the EMS audits are complete, the **Audit Sub-Group Leader** reviews all the comments provided and determines what changes, if any, should be made to the overall group auditing process. Makes responsibility assignments, if needed.

ATTACHMENT A

Three-Year EMS Audit Schedule

Year

1999	2000	2001*
Pierce Lake Golf Course audits Leslie Golf Course	Leslie Golf Course audits Pierce Lake Golf Course	Leslie Golf Course audits Home Toxics Program
Leslie Golf Course audits Home Toxics Program	Home Toxics Program audits St. Joe's Hospital	Home Toxics Program audits Pierce Lake Golf Course
Home Toxics Program audits St. Joe's Hospital	St. Joe's Hospital audits Village of Chelsea	St. Joe's Hospital audits Leslie Golf Course
St. Joe's Hospital audits Village of Chelsea	Village of Chelsea audits Home Toxics Program	Village of Chelsea audits St. Joe's Hospital
Village of Chelsea audits Pierce Lake Golf Course	Pierce Lake Golf Course audits Leslie Golf Course	Pierce Lake Golf Course audits Village of Chelsea

* After the year 2001, the EMS Audit Sub-Group may begin the three-year cycle again with the schedule from 1999 or may develop a new schedule.

ATTACHMENT B

EMS Audit Sub-Group Audit Plan

1.0 Audited Organization [including department(s)] _____

2.0 Audited Organization: Point of Contact (name and phone) _____

3.0 Lead Auditor (including team members, if any): _____

4.0 Scheduled Audit Date(s) and Time: _____

5.0 Audit Criteria

5.1 Sections of ISO 14001 to be audited (list with a check off) and any requirements internal to the audited organization

Standard Sections	To Be Assessed (x)	Functions to Interview
Environmental Policy		
Planning		
Environmental Aspects		
Legal and Other Requirements		
Objectives and Targets		
Environmental Management Program(s)		

ATTACHMENT B

Standard Section	To Be Assessed (x)	Functions to Interview
Implementation/Operation		
Structure and Responsibility		
Training, Awareness, Competence		
Communication		
EMS Documentation		
Document Control		
Operational Control		
Emergency Preparedness/Response		
Checking/Corrective Action		
Monitoring and Measurement		
Nonconform & Corrective & Prevent. Act.		
Records		
EMS Audit		
Management Review		

ATTACHMENT B

7.0 Individuals to interview (name and position). Add additional names under Special Instructions.

Name	Position

8.0 Special Instructions:

9.0 Signatures

Lead Auditor: _____ Date: _____

Point of Contact: _____ Date: _____

ATTACHMENT C

EMS Audit Tool

1.0 INTRODUCTION

- 1.1 This EMS audit tool is part of an EMS Audit procedure designed to assist participants in the EPA/NSF ISO 14001 (1996) implementation pilot project, *Implementing an EMS in Community Based Organizations* to meet the ISO 14001 (1996) requirements for conducting an EMS audit (Section 4.5.4). The three major parts of the tool are described in Section 2.0.

The tool was designed for those new to management systems auditing or who perform EMS audits infrequently.

2.0 AUDIT TOOL

- 2.1 **Audit Summary Sheet:** This sheet used by the auditor to summarize the results of the audit and to give the audited organization an overview of where EMS improvements should be made.

NOTE: An individual numbered section of the standard is rated as “Not Acceptable” if one or more major nonconformances are identified against this section during the audit. However, a section may have one or more minor nonconformances and still be rated as acceptable. There is no defined number of minor nonconformances against a section that cause it to automatically be ranked as “Not Acceptable” This is a judgment call on the part of the Lead Auditor.

- 2.2. **EMS Audit Findings Form:** The Lead Auditor uses this form to document details of the audit results and the POC uses this form to document corrective actions taken, corrective action plans, and preventive actions. The Finding Form provides details on the four categories of findings, Major Nonconformances, Minor Nonconformances, Positive Practices, and Recommendations (see EMS Audit Procedure, 3.0, Definitions)
- 2.3 **Audit Checklist:** The checklist was designed to assess all requirements of ISO 14001 (1996) in a day or less and consists of four parts:
- A. **Standard Requirements:** These tables, numbered from 4.2-4.6, always come in front of the Supplemental Questions. The standard requirements in these tables are taken from the ANSI/ISO 14001 (1996) standard (the verbatim American national adoption of ISO 14001 (1996): and are in a format similar to the NSF *Self-Assessment Tool for ANSI/ISO 14001 (1996)*. These tables serve as a reference to the requirements of the standard and a place to document the results of the audit of each numbered requirement of the standard. The auditor may also choose to audit directly from the table rather than using the supplemental questions.

ATTACHMENT C

- B. Supplemental Questions by Function: The intent of the supplemental questions is to check for conformance to the standard and other requirements the organization elects to follow (e.g., hospital accreditation criteria, county environmental initiatives, codes of practice or program from professional organizations) by asking practical, focused questions. By asking all the supplemental questions in each section, the auditor will have determined if the EMS meets all standard requirements and EMS project requirements.

To make the process of conducting periodic EMS audits as straightforward as possible, the questions are broken down by the function within the organization likely to be interviewed. The functions listed, described in further detail below, attempt to reflect the diverse organizational structures of the project participants (from 3 to 5,000 employees).

In determining who to interview as part of the EMS audit, note that the functions listed are not job titles but *who performs that function in the audited organization*. For example, for a project participant with three employees, top management and EMS representative functions may rest with the same individual. A large organization may have mid-level management that should be interviewed, though that position is not specifically listed (it would be included under "EH&S and Other Staff"). Also note that if one person in the organization performs several EMS functions, it is not necessary to ask the all the questions for each function since some of the questions are redundant.

The generic functions in the Supplemental Questions include:

- Top Management (may include a governing council or board)
- EMS Representative (this may include cross-functional teams)
- EH&S and Other Staff (may include management, operations, purchasing, administration, human resources, finance, etc., throughout the organization)
- Personnel with Environmental Management Program Responsibilities
- Training
- Operations Management
- Document Control
- Operations Personnel
- Maintenance
- Contractor Management
- Contractors
- Emergency Response Coordinator

Auditor notes inserted throughout the questions provide guidance on how to interpret audit responses and standard requirements, and clarification on what functions within the organization to consider interviewing.

ATTACHMENT C

NOTE: Any checklist in a management system audit should be used as a guide only. It is not intended that the auditor blindly ask each supplemental question and fill in the blanks. The auditor is the judge of when enough objective evidence (interviews and documents) have been gathered to move on to the next series of questions.

- 2.4 Documents: In contrast to the supplemental questions, not all of the documents listed should be viewed as requirements. The documents which are required as part of the EMS (either through a requirement of the standard or EMS requirements) are underlined. Other documents are listed because they reflect the types of documentation commonly found during EMS audits and may provide the auditor objective evidence of conformance. "Records" is a separate category included in this section.
- 2.5 EMS Links: When conducting an EMS audit, it can be difficult to remember how all of the parts interrelate. The intention of the major EMS links is to assist the auditor in knowing what other areas of an EMS may be affected by a change in one area. Recognizing and assessing the EMS linkages is essential to maintain the integrity of the system.
- 2.6 Appendix A: The checklist questions are reorganized by function to accommodate the preferences of some auditors. All the questions for a particular function are grouped together. The questions have not been changed and the standard requirements are not included.

3.0 EMS PROJECT REQUIREMENTS

- 3.1 The project participants have determined that their individual EMSs will go beyond a strict adherence to the requirements of ISO 14001 (1996) in the following areas:
- A. Written procedures will be developed for each numbered element of the standard that requires a procedure. (Note that in ISO terminology a "procedure" does not mean a written procedure but can be an informal process.)
 - B. An environmental compliance auditing program will meet the requirement in Section 4.5.1 to, "periodically evaluate compliance with relevant legislation and regulation."

The supplemental questions incorporate these EMS requirements that Deviations from these requirements carry equal weight to deviations from a specific standard requirement.

4.0 MAINTENANCE OF THE AUDIT TOOL

- 4.1 The head of the EMS Audit Sub-Group for the project is responsible for initiating changes to this audit tool.

ATTACHMENT C

AUDIT SUMMARY

Organization Audited: _____

Lead Auditor: _____ Date: _____

ELEMENT NUMBER AND DESCRIPTION		AUDIT RESULTS	
		No. of Majors / No. of Minors	A, N, or X*
4.2	Environmental Policy		
4.3	Planning		
4.3.1	Environmental Aspects		
4.3.2	Legal and Other Requirements		
4.3.3	Objectives and Targets		
4.3.4	Environmental Management Program(s)		
4.4	Implementation/Operation		
4.4.1	Structure and Responsibility		
4.4.2	Training, Awareness, Competence		
4.4.3	Communication		
4.4.4	EMS Documentation		
4.4.5	Document Control		
4.4.6	Operation Control		
4.4.7	Emergency Preparedness/Response		
4.5	Checking/Corrective Action		
4.5.1	Monitoring and Measurement		
4.5.2	Nonconform & Corrective & Prevent. Act.		
4.5.3	Records		
4.5.4	EMS Audit		
4.6	Management Review		
TOTAL			
Legend: A = Acceptable: Interviews and objective evidence indicates that the EMS meets all the requirements of that section of the standard		N = Not Acceptable: The auditor has made the judgment that, based on the number and type of nonconformances, the requirements of that the section of the standard are not being met. X = Not Audited	

ATTACHMENT C

EMS AUDIT FINDINGS FORM

Type of Finding (circle one): Nonconformance: Major Minor Positive Practice Recommendation		
Description (include where in the organization it was found): _____ _____ _____ _____ _____ _____ _____		
ISO 14001 Reference: _____	Date: _____	Finding Number: _____
Auditor: _____	Auditee's Rep.: _____	
Corrective Action Plan (including time frames): _____ _____ _____ _____ _____ _____ _____		
Preventive Action Taken _____ _____ _____		
Individual Responsible for Completion of the Corrective Action: _____	Date Corrective Action Completed: _____	
Corrective Action Verified By (verification may be the EMS auditor or someone internal to the organization): _____ Date: _____		

ATTACHMENT C

ISO 14001 EMS Auditing Checklist

**STANDARD REQUIREMENTS FOR
4.4.6 OPERATIONAL CONTROL
(Implementation and Operation)**

AUDITOR NAME AND DATE: _____

ORGANIZATION AND DEPARTMENT AUDITED: _____

PERSONNEL INTERVIEWED: _____

REQUIREMENTS	CONFORMS (Y/N)
<p>4.4.6.1 The organization shall identify those operations and activities that are associated with the identified significant environmental aspects in line with its policy, objectives and targets.</p>	
<p>The organization shall plan these activities, including maintenance, in order to ensure that they are carried out under specified conditions by:</p>	
<p>4.4.6.2 establishing and maintaining documented procedures to cover situations where their absence could lead to deviations from the environmental policy and the objectives and targets;</p>	
<p>4.4.6.3 stipulating operating criteria in the procedures;</p>	
<p>4.4.6.4 establishing and maintaining procedures related to the identifiable significant environmental aspects of goods and services used by the organization and communicating relevant procedures and requirements to suppliers and contractors.</p>	

OVERALL CONFORMANCE: YES NO

Notes:

ATTACHMENT C

4.4.6 Operational control: Supplemental Questions by Function	
EMS Representative	Objective Evidence
<p>a. Which operations or activities are associated with the identified significant aspects?</p> <p>How are these operations and activities identified?</p>	
<p>b. Are operational controls in place for each situation where their absence could lead to departure from the environmental policy or objectives and targets? Provide examples.</p> <p>How does the organization determine what controls are appropriate?</p>	
Operations Personnel and Others*	Objective Evidence
<p>a. In the job you do everyday, what procedures or work instructions ensure that your operations are carried out under planned conditions?</p> <p><i>[Auditor Note: Check to be sure that current versions of operations procedures are available.]</i></p>	
<p>b. What is your role in an emergency? How do you know what to do in an emergency?</p>	
<p>c. Are emergency drills held? When was the most recent drill?</p>	
<p>* <i>[Auditor Note: Others include those positions linked to the organization's significant environmental aspects or objectives and targets. Functions may include purchasing, compliance, operations, engineering, safety, and health.]</i></p>	

Notes:

ATTACHMENT C

4.4.6 Operational control: Supplemental Questions by Function	
Maintenance	Objective Evidence
<p>a. What operations/activities require a maintenance plan or procedure? Who makes this determination?</p> <p>Do you have a Preventive or Predictive Maintenance Program? If so, how are environmental issues integrated into this program?</p>	
<p>b. When new operations/activities are added or an existing one changed, how are the maintenance plans modified? Who is responsible for changing the plan/procedure?</p>	
<p>c. How do you ensure that the procedure/plan is implemented?</p> <p><i>[Auditor Note: Check to be sure that current versions of maintenance procedure/plans are available.]</i></p>	

4.4.6 Operational control: Supplemental Questions by Function (cont.)	
Contractor Management	Objective Evidence
<p>a. What changes have been made to the list of suppliers and contractors since the last EMS audit?</p>	
<p>b. Who is responsible for informing suppliers and contractors of pertinent environmental procedures? Is this responsibility documented?</p>	
<p>c. What controls are in place to ensure that suppliers and contractors are aware of the environmental requirements of the organization?</p> <p>How do you ensure that suppliers and contractors follow the environmental requirements?</p>	
<p>d. How do the environmental requirements placed on suppliers and contractors help you satisfy the environmental policy and achieve objectives?</p>	
<p>e. Are there currently contractors working on site? May we briefly talk to them?</p>	

ATTACHMENT C

4.4.6 Operational control: Supplemental Questions by Function (cont.)	
<i>Contractors (if applicable and allowed by the auditee)</i>	<i>Objective Evidence</i>
a. Who within the client's organization is your point of contact for environmental matters?	
b. How are your client's environmental requirements communicated to you?	
c. What controls do you have in place to ensure that your client's environmental requirements are met?	

Documents

- Operating procedures for activities where their absence could lead to deviations from the environmental policy and objectives and targets. Check these procedures to be sure they contain operating criteria, where appropriate.

[Auditor Note: The term "operating criteria" is not defined by the standard. It can be thought of as specifications for equipment maintenance, pollution control equipment, or production equipment that must be managed within specified parameters to achieve some result. Examples include flow rates, application rates, residence times, etc.]

- Procedures related to the significant aspects of the goods and services used by the organization.
- Maintenance procedures/plans.
- Procedures related to communicating pertinent procedures to suppliers and contractors.
- List of suppliers and contractors.
- Evidence that pertinent operational control procedures or other requirements were communicated to suppliers and contractors.
- Records: maintenance records, log books, inspection forms, contracts with environmental performance criteria and requirements.

EMS Links

- Policy
- Environmental aspects
- Objectives and target
- Training, awareness, and competence
- Monitoring and measurement

ATTACHMENT C

Sample of Supplemental Questions Sorted by Function

TOP MANAGEMENT

4.2 Environmental Policy	
<i>Top Management</i>	<i>Objective Evidence</i>
a. Describe your role in the development of the environmental policy.	
b. How do you know that your policy is appropriate for your activities, products, and services?	
c. What is management's role in the review and revision of the policy?	
d. How does management ensure continued adherence to the policy throughout the company?	
e. How does the policy help guide business decisions?	
f. How are employees made aware of the environmental policy?	
g. How is the policy made available to the public?	
<i>[Auditor Note: Is there evidence that the policy was issued by top management? (e.g., Is the policy signed? By whom? At what level in the organization are they?)]</i>	

Notes:

ATTACHMENT C

TOP MANAGEMENT

4.3.3 Objectives and targets	
<i>Top Management</i>	<i>Objective Evidence</i>
<p>a. What are the environmental objectives and targets for your organization? What is your role in approving them?</p> <p>What are the relevant functions and levels within your organization that support the attainment each of the objectives and targets?</p>	
b. How are the environmental objectives linked to other business goals (and vice versa)?	
c. Are the objectives/targets consistent with the goals of the environmental policy for prevention of pollution and continual improvement?	
d. How were the objectives and targets developed by or communicated to management?	
e. How does management keep up with progress in meeting their objectives and targets throughout the year?	
f. How often are you informed of the status of the objectives and targets?	
g. On what basis are the objectives and targets reviewed and modified?	

Notes:

ATTACHMENT C

TOP MANAGEMENT

4.4.1 Structure and responsibility	
<i>Top Management</i>	<i>Objective Evidence</i>
<p>a. At what level within the organization is the designated EMS representative placed?</p> <p><i>Auditor Note: Is the EMS representative at a level within the organization to effectively implement an EMS for his/her organization?]</i></p>	
b. What authority does the EMS representative have to carry out his/her responsibilities?	
c. How does the organization assess its resource needs for environmental management? How are these factored in to operating and strategic plans (and vice-versa)?	
d. What resources (financial, technical) has management provided to develop or maintain the EMS?	
e. How are you informed on the performance of the EMS? Do you receive routine reports?	
<p>f. Are responsibilities for the environmental management of the organization documented? If so, where?</p> <p>Is an integrated structure in place in which accountability and responsibility are defined, understood, and carried out?</p>	
g. How are these responsibilities communicated to all employees (including managers)?	

Notes:

ATTACHMENT C

TOP MANAGEMENT

4.4.3 Communication	
<i>Top Management</i>	<i>Objective Evidence</i>
a. How are you informed of the environmental issues within your organization? How often does this take place? Does this include compliance issues?	
b. How are you kept up to date with progress in meeting your organization's environmental objectives and targets? How is this information passed on to your managers?	
c. How do you communicate with the organization on environmental issues? How is this done? How frequently?	
d. How does the organization handle inquiries from interested parties (e.g., the public, regulators, other organizations) on environmental matters? Who has responsibility for responding to such inquiries?	
4.6 Management review	
<i>Top Management</i>	<i>Objective Evidence</i>
a. Describe the organization's management review process.	
b. How often are management reviews performed? How was this frequency determined?	
c. Who is involved in the management review process? What are their roles in this process?	
d. What changes have been made to the EMS as a result of the last review?	

NOTES:

ATTACHMENT D

IMPLEMENTING AN ENVIRONMENTAL MANAGEMENT SYSTEM IN COMMUNITY-BASED ORGANIZATIONS: EMS AUDIT SUB-GROUP

- EMS AUDIT RESULTS CONFIDENTIALITY AGREEMENT-

The participating organizations represented below, agree not to disclose and to keep confidential any information supplied to the Lead Auditor and Audit Team by the Audited Organization. It is the responsibility of the organization's representative signing below to ensure that all members of the Audit Team are aware of and uphold this agreement.

Confidentiality does not apply to any information known to the auditors independently, generally available to the public, or obtained by the auditor from a third-party under no obligation to the Audited Organization not to disclose said information.

[Note: Signatures included in the original report]

Signature _____ Date _____
Pierre Gonyon, Hazardous Substance Specialist/Safety Department, St. Joseph's Mercy Hospital

Signature _____ Date _____
Steve Daut, Village Council Member Village of Chelsea

Signature _____ Date _____
Jeff Krcmarik, Coordinator, Washtenaw County Home Toxics Reduction Program

Signature _____ Date _____
Steve Southard, Superintendent, Pierce Lake Golf Course, County Recreation Center

Signature _____ Date _____
Matt Warba, Golf Course Supervisor, City of Ann Arbor, Department of Parks and

Management Review

The Management Review process for environmental concerns is new for the two Pilot Programs cited in the following examples and is successful only because it was tied to an existing management review.

- Saint Joseph Hospital provides an example that management is not always a person. Within the hospital's organizational structure, the Safety Steering Committee represents management for environmental issues. The Committee is authorized by the Saint Joseph governing board to develop, implement, and monitor safety programs (which includes environmental programs) and reports to the board on a quarterly basis. Annually, the Committee prepares and approves a reports (Evaluation of the Effectiveness of the Hazardous Material/Waste Management), which reviews of the overall performance of the hazardous material/ waste management program. The hospital's governing board is the top management within the organization.
- The Home Toxics Reduction Program (HTRP) has successfully linked the standard requirement to conduct management reviews with a new and evolving Business Improvement Process (BIP). The HTRP included one of its objectives (reduce toxicity of waste stream) under " Purpose" as its input to the BIP. The progress made is reviewed once a year by the top management to determine what worked, what did not work, and to make adjustments. The BIP, an initiative of the county Board of Commissioners, will eventually feed into the budget process for the county (see following table).

Table 3-4. Department of Public Works, Home Toxics Reduction Program, Business Improvement Process

May 7, 1998

	Customer(s) • Citizens and Community • Home Toxics Reduction Center Staff	Measurements	Targets	Data (Sources)	Important Assumptions
Purpose (Overall Objective)	1. Reduce toxicity of waste stream (city and community)	1. Pounds of HHW collected avoiding disposal in solid waste stream	1. 50,000 lbs./year	1. Disposal receipts/manifests from contractor	1. Manifest accurately reflect final disposal method
Outcomes (Specific Objectives)	1. Change in purchasing behavior (city and community) 2. Safe disposal of HHW (city and community) 3. Safer working environment (HTRC staff)	1. Surveyed participants who reveal change in purchasing behavior 2. Number of satellite and regular schedule of collections 3. Number of incidents	1. Increasing the amount of participants that change purchasing behavior by 10% 2. Scheduling satellite collections every two years for communities 3. No injuries or accidents during collections	1. Survey Data 2. Annual Report 3. Incident Report Log	1. Participants receiving information that change behavior and are not surveyed 2. All injuries are reported at the time of the incident or shortly after
Outputs (Processes)	1. Education through outreach (city and community) 2. Increased opportunities for safe disposal of HHW (city and community) 3. Safety training for staff members (HTRC staff)	1. Number of educational events and contacts with citizens to promote HHW reduction 2. Number of routine collections and appointments 3. Number of staff receiving training	1. Four educational events/month 2. Every municipality invited to a satellite collection once every two years 3. 100% of staff receives safety training	1. Phone Log Book, Activity Calendar 2. Activity Calendar 3. Training Log Book	
Inputs (Human Resources, Budget, etc.)	1. Time (city and community, staff) 2. Staff 3. Money (city and community, staff)	1. Time spent collecting HHW 2. 2% of time in outreach/education 3. Disposal costs	1. 25% fewer appointments for drop offs 2. 50% increase in time spent for educational activities 3. No increase in segregation packing time	1. Daily Activity Reports, Activity Calendar 2. Annual Budget	

Other Areas

Communication

Regarding external communication, several participants have or plan to put their environmental policy on their organizational web page. Documentation of questions or complaints from the public was inconsistent among the organizations and none had a formal process for responding to inquiries and documenting the action taken.

Operational Control

Pierce Lake Golf Course provided a good example of how simple operational control can be for a small community-based organization (see Objectives and Targets, and Environmental Management Program). The golf course combined its operational controls (e.g., if the water levels is in this zones, apply this much water to the course) as part of the description of its environmental management program.

Nonconformance And Corrective And Preventive Action

Project organization had informal processes in place to correct regulatory noncompliances. Addressing nonconformances within the EMS will be developed as the EMS Audit Sub-Group starts to perform audits.

Records

Participants had undocumented processes for retaining records required by regulations but had not developed written procedures at the time of this report.

CHAPTER 4 MANAGING A COMMUNITY-BASED PROJECT

Lessons Learned

When this project began in mid-1996, there was no model for how to structure and manage an EMS implementation project for community-based organizations. The structure adopted for this project was based on the approach successfully used in the *Environmental Management System Demonstration Project*. In some cases that structure worked well for the community-based organizations and in others it did not. In order to assist future implementation projects, what follows are lessons learned from the management of *Implementing an Environmental Management System in Community-Based Organizations*.

- 1) Consider your audience when setting up the training workshops. How the standard is presented initially is critical to the success of the project. When presenting information on ISO 14001 to an audience that has little or no previous exposure to the standard or EMS concepts, avoid a technical, line by line review of standard requirements. Present basic EMS concepts, avoiding “iso-ese” where possible; present what they should do step-by-step and give them the tools to do it. Make the presentation practical and emphasize the importance of identifying existing systems that would support EMS development.
- 2) As part of the recruitment process, make your expectations clear (in writing) to the recruited organization’s top management, the financial decision-maker, and the direct manager of the person who will lead EMS implementation. At a minimum, document the estimated level of effort required for implementation, timeframes, and other expectations. Top and mid-level management must understand the commitment of time and resources involved. As noted under, “Early Warning Signs,” there is a tendency to underestimate the scope of effort required for EMS development.
- 3) An Advisory Committee made up of regulators and environmental stewardship organizations can make a valuable contribution to the project. Their role and the specific type of support they can bring to the project should be clearly outlined at the outset. Ensure their continued commitment through periodic meetings and involve them in workshop planning. A note of caution, however; community-based participants found a large presence of regulators at workshops intimidating.
- 4) Although EMS development takes time, particularly in community-based organizations, participants would probably have benefited from more structure to the project. The guiding principle of this project was “Develop an EMS at your own pace.” While this approach sounds appealing during the recruitment phase, it prolongs the implementation process and taxes the persistence of even the most dedicated Pilot Program Leader. For an organization committed to EMS development, it is better to clearly establish a time frame for EMS development from the beginning of the project (e.g., two years) and develop implementation milestones for each phase of development.
- 5) Participants also need frequent (and routine) hands-on support. With four or five months between workshops, it is easy to become “stuck” on one step of EMS development and halt the entire process for weeks.

- 6) Here are more options for the Project manager to consider:
- Structure the project so that participants send you documentation of their progress before the workshop so that you can provide them with better direction.
 - If the community based organizations are far apart, consider a “correspondence course” approach to EMS development where guidance and tools are provided (during and between workshops) and specific work products (evidence of implementation) are required back by a certain time.
 - Consider a commitment of money to participate in the project, refundable when the project ends.
- 7) If you want organizations to track cost data, you must make this a priority. Define what will be included (the participants time at work? During workshops? Does it include others in the organization? What about time spent on integrating EMS with other systems? Does it include training? What if EMS training is part of an existing training program?) and give them some training on how to do this. Community-based organizations are often not used to tracking cost and hours.

The overall lesson learned is that to get the highest level of results in a set period of time, the design of an implementation project must consider the motivations, level of management support, knowledge of environmental management systems, and the supporting resources of its participants.

CHAPTER 5 APPENDICES

Appendix A: Data from EMS Self-Assessment

Appendix B: Environmental Performance Evaluation and Indicators

Appendix A

Data from EMS Self-Assessment Tool for ANSI/ISO 14001 Conducted by the Community-Based Project Pilot Programs

Organization 1			Organization 2			Organization 3		
Total Percent Responses			Total Percent Responses			Total Percent Responses		
	INITIAL	FINAL		INITIAL	FINAL		INITIAL	FINAL
Yes	29%	59%	Yes	21%	60%	Yes	16%	41%
No	71%	41%	No	79%	40%	No	84%	59%
Responses per category			Responses per category			Responses per category		
	INITIAL	FINAL		INITIAL	FINAL		INITIAL	FINAL
NA	13	0	NA	9	2	NA	28	0
IN	13	2	IN	12	2	IN	6	21
PAR	19	24	PAR	29	21	PAR	19	16
COM	13	31	COM	8	32	COM	9	14
ES	5	6	ES	5	6	ES	1	12

Organization 4			Organization 5			Organization 6		
Total Percent Responses			Total Percent Responses			Total Percent Responses		
	INITIAL	FINAL		INITIAL	FINAL		INITIAL	FINAL
Yes	10%	11%	Yes	6%	32%	Yes	10%	14%
No	90%	89%	No	94%	68%	No	90%	86%
Responses per category			Responses per category			Responses per category		
	INITIAL	FINAL		INITIAL	FINAL		INITIAL	FINAL
NA	30	23	NA	44	7	NA	34	20
IN	8	13	IN	8	16	IN	7	12
PAR	19	20	PAR	7	20	PAR	16	22
COM	6	7	COM	4	20	COM	2	4
ES	0	0	ES	0	0	ES	4	5

Appendix B

Environmental Performance Evaluation and Indicators

For an organization involved in developing an EMS, performance of the management system is of extreme interest. How do you measure its effectiveness? One way is picking environmental performance indicators (EPI) based on objectives and targets which the organization has determined. These EPIs could target materials use, energy consumption, non-product output, and pollutant releases. These measures can be both quantitative and qualitative. Difficulties arise because there is no clear guidance for a company to measure its effectiveness or performance. Every organization has different objectives, targets and needs which they will want to measure. Performance improvements in one organization are not predictive of performance improvements in other organizations. There is no one way to benchmark performance between organizations.

The two most active efforts for development and evaluation of environmental performance are development of the ISO guidelines for environmental performance evaluation and the evaluation of EMS pilot projects done by the Multi-State Working Group.

ISO 14031 Environmental management - Environmental performance evaluation – Guidelines ISO/TC 207/SC 4 N 207. International Organization for Standardization: Geneva, Switzerland.

ISO 14031 provides guidance on the design and use of environmental performance evaluation, and on identification and selection of environmental performance indicators, for use by all organizations, regardless of type, size, location and complexity. This document does not establish environmental performance levels, does not provide a methodology to compare absolute performance of organizations, and is not intended for use as a specification standard for certification/registration purposes. However, this document does support Section 4.5.1 of ISO 14001, which calls for an organization to establish and maintain procedures for “recording of information to track performance, relevant operational controls and conformance with the organization’s environmental objectives and targets.” It should be noted that ISO 14001 does not require that ISO 14031 be the document used to accomplish this, and ISO 14031 is intended for use by organizations with or without an EMS in place. ISO 14031 currently is being voted on as an final draft international standard. The standard is expected to be published in the second quarter of 1999.

Multi-State Working Group on Environmental Management Systems

The Multi-State Working Group on EMS has organized a study to determine how beneficial an ISO 14001-based EMS is for the environment and the economy. Fifteen states (Arizona, California, Illinois, Indiana, Iowa, Massachusetts, Minnesota, Missouri, New Jersey, North Carolina, Oregon, Pennsylvania, Texas, Vermont and Wisconsin), the U.S. EPA, and others are participating in the group. Each state has five to ten EMS implementing pilot projects. The project organizations studied will range from military bases to farms to manufacturing industries. The group has developed peer-reviewed criteria to measure a broad spectrum of benefits of ISO 14001 to the pilot organizations.

Three types of indicators will be considered: environmental, management process, and stakeholder confidence. Environmental indicators include facility's emissions and compliance records, and local environmental quality measures. Examples of some management process indicators are cost-benefit results, pollution prevention efforts, and the use of management frameworks (Total Quality Management and ISO 9000). Stakeholder confidence indicators will also be considered by studying the involvement of third-parties in defining successful outcomes.

The following are the two guidance documents for the pilot projects.

- *Multi-State Working Group on Environmental Management Systems' Project Evaluation Guidance*
- *Data Collection Protocols for ISO 14001 Pilot Project Research.*

These documents can be downloaded from <http://sunsite.unc.edu/villani/isoprojects.htm> or you can email John Villani at John_Villani@unc.edu to get more information.

Other References

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