

CONSTRUCTING AN ENVIRONMENTAL MANAGEMENT SYSTEM: *Guidelines and Templates for Contractors*

SECTION I: Guidelines



Building Your Quality of Life

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ABOUT THE GUIDE

The Associated General Contractors of America (AGC) intends these environmental management system (EMS) guidelines and corresponding templates to assist construction contractors who plan to develop an EMS for their company or are exploring that possibility. Section I of this document provides EMS guidelines and Section II contains templates in the form of a Sample EMS Manual and Sample EMS Records.

This publication, *Constructing an Environmental Management System: Guidelines and Templates for Contractors* (hereinafter called the *Guide*), will help your company develop an EMS that facilitates compliance with environmental laws and regulations, prevention of pollution, continual improvement of environmental performance, and communication. The goal is to help construction contractors integrate environmental decision making into their business practices.

The EMS Task Force of the AGC developed this *Guide* using the resources that the U.S. Environmental Protection Agency (EPA) has made available to the public (see Appendix A: EMS Resources, Section I, p. 49). The National Environmental Performance Track (PT) and Sector Strategies Programs in EPA's National Center for Environmental Innovation provided technical review and assistance. This *Guide* is intended to be consistent with the EMS criteria that EPA has developed for its PT Program, of which AGC is a Network Partner. This *Guide* also is intended to assist contractors interested in meeting the EMS standards set by the International Organization for Standardization (ISO) under ISO 14001 (see the Introduction of this section for more information on ISO 14001). As noted earlier, AGC does not, however, intend this document to provide specific or detailed guidance on either the PT Program or ISO 14001.

Section I of this publication provides guidelines for each of the generally accepted elements of an EMS and outlines steps that a company would take to fulfill the purpose of each element (see Elements of an EMS, Section I, p. 2). At the end of each element, this Section I provides a checklist summarizing the important concepts therein. This Section I provides additional information that might be helpful in its Appendixes (e.g., EMS resources, glossary, summary of federal environmental requirements applicable to construction, and a list of available resources to facilitate compliance with those legal requirements).

Section II presents a Sample EMS Manual for a hypothetical construction company, setting forth examples of how to develop, document, assess, refine, and communicate your EMS program and its results. Revising the Sample EMS Manual and examples/blank forms may provide a starting place for your company in developing your own EMS. Section II also provides samples of completed EMS forms, called EMS records. These completed forms are included in Section II under Sample EMS Records.

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INTRODUCTION

What Is an Environmental Management System?

An EMS is a structured management tool used to continually improve all construction operations that impact the environment. An EMS is a living, documented system with an organizational structure that assists a company and its staff to identify significant environmental impacts and to implement procedures to manage and reduce those impacts. It establishes goals and enlists the entire workforce in a coordinated effort to achieve them. As a result of comprehensive planning, rigorous implementation, regular inspections and monitoring, and effective corrective action, EMSs are helping companies worldwide to avoid the risks and penalties of noncompliance with environmental legal requirements, reduce pollution, and improve environmental performance. Many construction companies already have components of an EMS in place. This *Guide* encourages contractors to identify and build on those existing components.

Does Your Company Need an EMS?

Read and respond to the questions below. If you answer “Yes” to one or more of the questions, your company may need an EMS.

- Are you at significant risk of liability for environmental noncompliance (i.e., if inspected, would your company receive a penalty or fine for a violation of an environmental requirement)?
- Does a lack of time or resources prevent your company from effectively managing its environmental requirements and/or commitments?
- Is the relationship between your company’s environmental goals and its other goals unclear?
- Are you looking for ways to improve your environmental performance?
- Is your business growth potential limited due to unacceptable environmental performance?

Costs and Benefits of Implementing an EMS

The costs and benefits of implementing an EMS vary. Both internal and external costs must be considered. Employee time represents the bulk of the EMS resources expended by most companies. External costs could include outside training for employees and consulting assistance. This *Guide* should reduce the need for consultants.

The potential benefits of implementing an EMS are many, including—

- Prevented pollution and conserved resources
- Increased competitiveness (An EMS could result in a bidding advantage in some markets.)
- Improved environmental performance

Meeting the challenge to prevent pollution is one of the key themes of an EMS. This *Guide* encourages construction companies to strongly consider incorporating practices to reduce or recycle construction and demolition debris and waste into their businesses. Some examples are below:

- Reuse green waste to manage storm water runoff
- Reuse concrete as fill material
- Reuse wood pallets
- Recycle concrete, asphalt, steel, wood, plastics, cardboard, and paper

- Improved environmental compliance
- New customers and markets
- Increased efficiency and reduced costs
- Better workforce morale
- Enhanced image with the public, regulators, lenders, insurers, and investors
- Workforce awareness of environmental issues and responsibilities
- Reduced environmental risk

Keys to a Successful EMS

Top management commitment

Development and implementation of an EMS requires the commitment of top management. In addition to initiating the EMS and providing adequate financial and personnel resources for the system, management must—

- Make environmental performance a company priority
- Integrate the EMS into company operations
- Approach problems as opportunities to improve environmental performance

Flexibility and simplicity

An effective EMS should allow your company to adapt to quickly changing circumstances. For this reason, your EMS should be flexible and simple. Simplicity also helps make your EMS understandable for the persons who must implement it; namely, all levels of your company's workforce.

Workforce awareness and involvement

As you design and implement an EMS, some members of the workforce may view the management system as extra paperwork and expense. Others may be resistant to change or fear new responsibilities. Everyone should understand why your company decided to implement an EMS, what their roles and responsibilities will be, and how an EMS will help to control environmental impacts in a cost-effective manner. Workforce involvement is necessary to ensure that your EMS is realistic and practical.

Focus on continual improvement

No company is perfect. The concept of continual improvement recognizes that problems will occur. If committed, your company will learn from its mistakes and prevent similar problems from recurring—thereby increasing compliance with environmental legal requirements and reducing the risks and penalties associated with noncompliance. Your company's EMS is a living document that helps your company continually improve its environmental performance.

Elements of an EMS

Many types of EMSs exist. This *Guide* is based on the EMS standard (ISO 14001) outlined by the International Organization of Standardization, which is recognized worldwide. The *Guide* attempts to assist companies in adopting an EMS that will conform to the updated 2003 ISO 14001 draft international standards. Some companies are beginning to require their contractors and suppliers to adopt the 14001 ISO standard; if your company performs work outside the United States and conforms to ISO 14001, your company is likely to find wider acceptance. The choice to develop and implement an EMS that, if desired, could be ISO-certified may be appropriate for your company, depending on your business goals.

This *Guide* follows the ISO 14001 EMS plan/do/check and act organization of its elements, as shown in the listing below. Subsequent parts of Section I further describe each element.

PLAN

1. **Structure, Responsibility, Purpose, and Scope.** Establish roles and responsibilities for environmental management, provide appropriate resources, and define the scope of your company's EMS.
2. **Environmental Policy.** Develop a written statement of your company's commitment to the environment. Use this Environmental Policy as a guide for planning and action.
3. **Legal and Other Requirements.** Identify, have access to, and ensure compliance with applicable legal and other requirements.
4. **Environmental Aspects.** Identify the causes (inputs and outputs) of your company's overarching operations that impact the environment. Determine which of those causes have the most significant impacts on the environment.
5. **Objectives and Targets.** Establish environmental goals for your company in line with its Environmental Policy, legal and other requirements, environmental impacts, and the views of interested parties.
6. **Action Plans.** Plan actions necessary to achieve your company objectives and targets. Identify, plan, and manage company operations and activities in line with your Environmental Policy, objectives, and targets.

DO

7. **Training and Awareness.** Train the company workforce to carry out their environmental responsibilities and develop methods to document the training.
8. **Communication.** Establish processes for internal and external communications on environmental management issues.
9. **Emergency Preparedness and Response.** Identify potential emergencies, develop procedures for preventing and responding to them, and periodically test and revise these procedures.
10. **EMS Manual and Records.** Maintain information on your company's EMS and related documents. Ensure effective management of procedures and other system documents. Maintain and manage records of EMS performance.

CHECK AND ACT

11. **Correct and Prevent Problems.** Identify and correct problems and prevent their recurrence.
12. **Internal Audits.** Define an internal EMS audit program that periodically verifies that your company's EMS is operating as intended and that your company is in compliance with legal requirements.
13. **Management Review.** Develop a system for periodic review of your company's EMS to ensure continual improvement.

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ELEMENT 1: STRUCTURE, RESPONSIBILITY, PURPOSE, AND SCOPE

The first step in developing an EMS is to establish who will do what. Identify the leadership and a technical support team that will establish the scope of your EMS, prepare a plan and budget for the program, and provide ongoing oversight to ensure that your EMS has sufficient staff and resources to meet the Environmental Policy commitments provided therein (see Element 2, Section I, p. 9).

Staffing and Organization

The staffing and structure of EMS programs differ depending on the size and type of the construction company. Most EMS programs, however, require the following functional roles—

- Environmental Management Representative (EMR)
- EMS Coordinator
- Cross-Functional Team

All of these roles will play a part in developing and promoting your EMS. In defining (and assigning persons) to these roles, you will need to assess the job functions and skills required to support your EMS planning and implementation efforts and match them against the job functions and skills that make up your company. Following this review, you will select persons to dedicate a portion of their time to the EMS tasks; this is your EMS Team.

If you have a very small company, the same person may be responsible for all of these EMS roles. In small or large companies, it is always important to assign responsibility for various activities to a specific person or group. Your EMS Manual should include an EMS organization chart and a list of the responsible persons and their EMS-related activities (see EMS Roles and Responsibilities Chart, Section II, Sample EMS Manual, p. 13).

Obtain top management commitment

As stated in the Introduction, gaining top management's commitment to EMS development and implementation is one of the most critical steps in the planning process. To lead and support the effort, management must understand the benefits of an EMS as well as what it will take to put the program in place. Advocates can explain the strengths and limitations of your current approach to environmental issues and how adverse environmental impacts can affect the company's financial and business performance. Equally important, advocates should access and communicate to management the positive gains to be achieved by developing an EMS.

Management also has a role in ensuring that the goals of the EMS are clear and consistent with other organizational goals. To mobilize the entire company and build support for the project, management should develop a written statement that explains and endorses the management system and communicate it across the company (see Element 2, Section I, p. 9).

Select EMS leadership

Next, you should designate an EMR and the EMS Coordinator. Choose an EMR from the company's top management. The EMR is responsible for the functioning of the EMS (e.g., ensuring that tasks are identified and completed in a timely manner) and for regularly reporting to upper management on EMS

progress. Small companies may have only a single EMR, but larger companies may have two or more levels of EMS leadership within top management.

An EMS Coordinator must work closely with the EMR and other employees and subcontractors to identify, assign, schedule, support, and supervise all tasks relating to the EMS. The EMS Coordinator also is responsible for maintaining the EMS Manual (see Element 10, Section I, p. 35), under the leadership of the EMR. As noted, one person can possibly perform the functions of EMS Coordinator and EMR.

Build the implementation team

A Cross-Functional Team with representatives from key management functions can identify and assess issues, opportunities, and existing operations. Consider including external parties such as subcontractors and service providers in the Cross-Functional Team, where appropriate. The team should meet regularly, especially in the early stages of your EMS effort. A Cross-Functional Team can help ensure that procedures are practical and effective, which in turn builds commitment to the EMS.

Provide EMS team training

The efforts of the EMS Team (the EMR, the EMS Coordinator, and the Cross-Functional Team) will be crucial to the long-term success of the company's EMS. In-depth training on how to plan and implement an EMS and integrate the system into existing company operations will greatly facilitate the EMS effort. This training should precede other activities, such as drafting your Environmental Policy (see Element 2, Section I, p. 9), reviewing environmental compliance requirements (see Element 3, Section I, p. 11), identifying the causes of significant environmental impacts (see Element 4, Section I, p. 13), and other planning and implementation tasks.

Hold kick-off meeting

Once the EMS Team has been selected, hold a kick-off meeting to discuss the company's commitments and goals for implementing an EMS. The meeting participants will establish the scope of the EMS; plan the budget, schedule, and resources; discuss gaps in your current environmental program; and review the role of each team member. Top management should demonstrate its commitment to the EMS at this meeting. The kick-off meeting also is a good opportunity to provide or schedule some EMS training for Cross-Functional Team members. Follow this meeting with a communication to the entire workforce outlining the EMS goals, identifying the EMS Team, and reinforcing that each workforce member's actions are vital to the success of the initiative.

Involve workforce members

Employees and subcontractors are a primary source of knowledge on environmental, health, and safety issues related to their work areas, as well as on the effectiveness of current processes and procedures. They should also assist in drafting procedures. Meaningful workforce involvement in the EMS development process will greatly enhance EMS ownership.

Purpose and Scope

A first step in EMS planning is to review and clarify your reasons for pursuing the development of an EMS. Is your company trying to improve its environmental performance (e.g., by reducing risk of liability for environmental noncompliance or by increasing the prevention of pollution)? Are you trying to promote involvement throughout the company? Maybe you are trying to win new business by demonstrating your environmental commitments. Whatever your reasons, write down your goals and refer to them frequently as you move forward. As you design and implement an EMS, ask yourself how each task will help to achieve your stated EMS goals.

This also is a good time to define the scope of your EMS; specifically, you should identify the corporate entity, locations, and size of the initial effort. For example, if your company operates from multiple locations, will the EMS be implemented at all sites simultaneously? Or should you “pilot” the EMS at one location and implement the system at other locations later? Your company’s EMS should grow with the company and remain flexible. Define boundaries around your company’s activities and determine the areas that your management system can control and influence.

For the initial formation of your EMS, your company may find that it is easiest to focus on achieving and maintaining compliance with environmental laws and regulations. Your scope also may include pursuing opportunities for preventing pollution—voluntary improvements that are not legally required. This wider scope could help to attract the attention (and meet the demands) of project owners who are seeking “green construction” in both highway and building markets. Examples of green construction approaches include the following:

- Carpooling to reduce transportation to and from job sites
- Retrofitting your diesel-powered equipment
- Enhancing the efficiency of work practices and machinery with new technologies
- Recycling and reuse of construction materials, and other life-cycle considerations
- Purchasing “environmentally friendly” materials

Your company also may decide to certify its EMS (become ISO-14001–certified) or join a performance-recognition program, such as EPA’s National Environmental Performance Track, which focuses on compliance, prevention of pollution, continual improvement, and communication.

Conduct a gap analysis

The next step is for the Cross-Functional Team to conduct a gap analysis of your current compliance and other environmental programs and to compare these against the thirteen elements of an EMS described in this *Guide*.

It is also important to recognize what your company already is doing and to evaluate ways to improve and build on existing programs and activities. Your company may find that it already performs many of the activities covered by an EMS. Evaluate your company’s structure, procedures, policies, environmental impacts, training, and other factors to determine which parts of your current environmental program are in good shape and which parts need additional work. (See F11-1: Internal EMS Audit Checklist, Section II, Sample EMS Manual, p. 99, for help in performing a gap analysis. Use this same checklist during internal audits as outlined in Element 12 of this section, p. 43.)

A gap analysis should answer the following questions:

- How well do your company’s environmental programs perform?
- Has your company clearly defined the environmental goals it hopes to achieve?
- What do you need to develop a complete EMS?
- What existing programs and activities can serve as the best foundation for improved environmental performance?

Prepare budget, schedule, and resources

Based on the results of the gap analysis, prepare an EMS development plan, including a budget and schedule. The plan should identify key actions, responsible party(ies), needed resources, and a timeline for completion. Keep the plan flexible, but set some ambitious goals. Think about how you will maintain project focus and momentum over time. Look for potential “early successes” that can help to build momentum. Most likely, your top management will need to review and approve the plan and budget initially, and on a regular basis.

Consider EMS integration

Existing functions or programs—for example, quality management or your company’s safety and health program—that help you manage important company activities can probably help in environmental management as well. Does your company have a quality management system? Is it certified under ISO 9001? If so, you might consider integrating your EMS into your quality management system.

It also might improve compliance and save costs to integrate your current health and safety program with your EMS. The following questions can help you decide whether such integration makes sense:

- Does your company have a written environmental or health and safety policy?
- Does your company have specific environmental or health and safety policies or goals?
- Does your company have a process by which to identify all relevant environmental, health and safety legal requirements?
- How does your company evaluate risk to human health and safety and the environment caused by your business operations? How is this information incorporated into planning for company activities and processes?
- Is a process in place to review any changes in procedures for addressing environmental concerns?
- Do policies and procedures regarding procurement and contracting consider environmental issues?
- What existing training could be expanded to support environmental objectives?
- Does your company have a procedure for responding to suggestions regarding environmental concerns of project owners, neighbors, or the workforce?
- How does your company keep track of its documents?
- How does your company identify potential hazards or emergency situations? Is a process in place to remove these hazards from the workplace?
- Do job permits and plans require information from both environmental and safety areas?

Monitor and communicate progress

As you build your EMS, be sure to regularly monitor your progress and communicate this progress within the company. Highlight accomplishments and describe next steps. Always keep top management informed and engaged, especially if the EMS may require authorization for additional resources.

ELEMENT 1 CHECKLIST

- Define roles for the core EMS Team members, assign persons to those roles, and create a roles and responsibilities chart.
- Allocate sufficient financial, technical, and human resources to implement the EMS.
- Document what your EMS does and does not cover.
- Include a description of your EMS scope, an organization chart, and role/responsibility assignments in your EMS Manual.

ELEMENT 2: ENVIRONMENTAL POLICY

Once your company has established its EMS Team and laid the foundation for its EMS (see Element 1, Section I, p. 5), the next step is to create a working draft of your company's Environmental Policy (hereinafter called the Policy). As your EMS Team moves forward, the Policy should serve as the foundation for your EMS and provide a statement of environmental commitment that will guide the actions of workforce members and management. The Policy also should provide the framework for establishing and achieving your environmental goals (see Element 5, Section I, p. 17).

The four core commitments of a Policy are—

1. Compliance with applicable legal requirements and any voluntary commitments
2. Prevention of pollution
3. Continual improvement of environmental performance
4. Communication about environmental performance and the operation of your EMS with employees, project owners, subcontractors, service providers, and the community

Develop Your Policy

Your company probably has some type of Policy now, even if it's not written down. For example, your company probably is committed to complying with the law and avoiding major environmental problems, at a minimum. You will want to build on the existing Policy, keeping in mind the following suggestions—

- The Policy should define the scope of the EMS.
- The Policy can be a stand-alone document or it can be integrated into your health and safety or other organizational policies.
- The Policy should be explicit, active, and measurable enough to be audited (internally or externally). If you choose to use phrases such as “We are committed to excellence and leadership in protecting the environment,” consider how you would demonstrate that this commitment is being met.

Keep your Policy simple and understandable. The language should be sufficiently strong to be meaningful without promising the unattainable. Ask yourself: “What are we trying to achieve and how can we best communicate this to the rest of the company? Could our workforce members describe the intent of our Policy in less than 20 words?”

Communicate regularly with top management during the process of developing the Policy. Incorporate management suggestions into your draft and make sure the commitment of company leaders is solid. The company president or chief executive officer will probably need to sign and date the final Policy.

Communicate Your Policy

Internal and external communication of your Policy is essential to integrating the EMS into your business. The defined Policy must be posted in a public place and be communicated to all persons working for or on behalf of the company. On request it should be distributed to shareholders and other interested parties.

Ensure that your workforce members personally receive and understand the Policy. Options for communicating your Policy internally include posting it around work sites, using paycheck stuffers, incorporating the Policy into training classes and materials, and referring to the Policy at staff or operations meetings. You should test awareness and understanding from time to time by asking workforce members if they know of the Policy, what it means to them, and how it affects their work.

This *Guide* uses the term “workforce” to collectively refer to employees and subcontractors. Be sure to make not only employees but also subcontractors and service providers aware of your Policy and of any impacts that your company’s EMS may have on your joint operations. For this reason, disseminating your Policy externally makes sense—perhaps printing it on the back of business cards or including it in newspaper advertisements, annual reports, or on a company web site. This decision should be factored into your overall strategy for external communication (see Element 8, Section I, p. 27).

ELEMENT 2 CHECKLIST

- Develop an Environmental Policy to be endorsed by top management that is appropriate to the nature, scope, scale, and environmental impacts of your company’s activities.
- Include in the Policy commitments to comply with applicable environmental legal and other requirements, to reduce pollution, and to improve environmental performance.
- Communicate the contents of the Policy to all employees and the public.

ELEMENT 3: LEGAL AND OTHER REQUIREMENTS

Compliance with applicable legal requirements (along with preventing pollution, continual improvement, and communication) is a core commitment of your Policy. Costs of noncompliance can be very high (e.g., damage to the environment, impact on public image, fines, project delays, stop-work orders, cleanup fees, litigation costs, and loss of employee time). An effective EMS will build (and improve) on the compliance assurance procedures that you already have in place.

Identify Applicable Legal and Other Requirements

Most likely you have a procedure in place to identify, have access to, and ensure compliance with applicable environmental legal requirements related to the company's environmental aspects, including—

- Federal laws
- Regional, state, and local requirements
- Permit terms and conditions

Other requirements might include industry codes of practice, company policies and related commitments, and contractual requirements by a project owner.

If it does not already do so, your procedure should determine how these legal and other requirements apply to your environmental aspects. Identification of environmental aspects is described in Element 4 (see Section I, p. 13).

For a comprehensive overview of and information resources for federal legal requirements, see Appendix C: Summary of Applicable Legal and Other Requirements (Federal Only) and Appendix D: List of Resources for Applicable Legal and Other Requirements (Federal Only), Section I, pp. 53 and 61, respectively).

Integrate and Communicate Requirements

After you have identified applicable environmental legal requirements, you should integrate them into day-to-day operations. You should communicate these requirements and your compliance procedures to all employees, owners, subcontractors, and others, as needed. Communicating “other requirements” (i.e., industry codes and company policies) is an important, though often overlooked, step. Use the checklists provided in Section II to effectively manage your environmental requirements on each job site (see F1-3: Compliance Checklists for Applicable Legal and Other Requirements, Sample EMS Records, p. 121).

New or revised legal requirements may require modification of your EMS—for example, you may need to make changes in work instructions or in adoption of best

EPA encourages “systematic discovery” of legal violations, which means environmental audits or compliance management systems that show due diligence in preventing, detecting, and correcting violations. EPA has prepared guidance documents and protocols for conducting environmental compliance audits under a number of its regulatory programs. For more information, visit the EPA web site at www.epa.gov/compliance/.

management practices. You must ensure that you have access to and are working with the most up-to-date federal, regional, state, and local regulatory information.

Periodically Evaluate Compliance

Effective compliance evaluation is crucial to meeting your Policy commitments and ensuring the success of your EMS. Your company will need to establish and maintain a procedure to periodically evaluate compliance with applicable legal and other environmental requirements. (See Element 12, Section I, p. 43 for more information on internal audits.)

Start by reviewing the kinds of evaluation you currently undertake for legal compliance and other purposes (e.g., quality management or health and safety program). Ask how well this could serve your environmental compliance evaluation purposes and what improvements are indicated. Start with a comprehensive and simple evaluation process, then build on it as you gain experience with your EMS.

Effectiveness of the compliance evaluation process should be considered during your internal audits (see Element 12, Section I, p. 43) and EMS management review (see Element 13, Section I, p. 47). Note that if all your compliance requirements are built into your EMS, then compliance evaluation can occur simultaneously with internal EMS audits.

ELEMENT 3 CHECKLIST

- Establish and implement a procedure to identify and access applicable legal and other requirements to which the company subscribes.
- Secure a procedure or mechanism for the company to obtain the latest revisions to those requirements identified above.

ELEMENT 4: ENVIRONMENTAL ASPECTS

In Element 1, you created a foundation for your company’s EMS and assigned responsibility for making it function; in Element 2, you drafted your company’s Policy; and in Element 3, you identified the legal and other requirements that apply to your operations. In Element 4, you will use all that information and more to identify the environmental aspects associated with your company’s processes (overarching operations) that can be controlled by the company. You also should identify those aspects that your company can influence, taking into account planned or new developments, or new or modified processes. Next, you will determine which aspects have significant environmental impacts. This information must be documented and kept up to date. Although time-consuming, the effort you invest examining your company’s processes and determining the associated significant environmental aspects is essential for developing, implementing, and maintaining your EMS.

This *Guide* uses “process” and “activity” to distinguish between overarching and supporting construction operations. For example—

- “Processes” are the overarching operations (e.g., site clearing).
- “Activities” are supporting operations (e.g., soil disposal) associated with a process.

Discern Definitions and Relationships

An environmental aspect is an input or output of a company’s processes that interacts with the environment. These interactions may be continual, periodic, or associated only with occasional events, such as emergencies.

An environmental impact is any potential change to the environment (adverse or beneficial) that results from a company’s processes.

In short, the aspect is the cause and the impact is the effect. Your company’s EMS will focus on the causes (aspects). Figure 4-1 shows this relationship.

Figure 4-1: Cause and Effect—Environmental Aspects and Environmental Impacts

Environmental Aspect (Cause)	⇒	Environmental Impact (Effect)
Emissions of volatile organic compounds (VOCs)	⇒	Air pollution (smog)
Sediment runoff to streams and other bodies of water	⇒	Degradation of aquatic habitat and water supplies
Spills and leaks	⇒	Soil and water contamination
Energy use	⇒	Air pollution, depletion of fossil fuels
Virgin materials use	⇒	Depletion of natural resources
Materials reuse or recycling	⇒	Conservation of natural resources

Identify and Evaluate Environmental Aspects

A variety of techniques and data sources may assist you in identifying and evaluating environmental aspects and impacts at your company and project sites, including environmental impact assessments, compliance audits, or safety reviews. You already may have experience in using some of these techniques. In addition, any data that you currently collect may be useful in identifying environmental aspects and determining their significance. This *Guide* recommends systematically examining your company's process inputs and outputs, and their associated activities, to identify environmental aspects.

Select processes to evaluate

Your Cross-Functional Team will identify the aspects that are unique to your company and the type of construction it performs, as well as those that impact the environment in significant ways. To identify the significant aspects, make a list of overarching company processes (e.g., site clearing, mobilization, trenching, servicing equipment). You will choose the processes to evaluate from this list. (See F2-1: Company Processes Form, Section II, Sample EMS Records, p. 129, for an example list that identifies some processes common to both building and highway construction.) You might prioritize processes for review based on their relevance or importance to your company, prior assessments, environmental significance, or previous problems, among other things.

Evaluate your processes to identify environmental aspects

Use a focus team—such as a subset of your Cross-Functional Team—to evaluate each process to identify its environmental aspects. The focus team should include persons who are experienced in the process being evaluated.

The focus team identifies the aspects (inputs and outputs) of each activity associated with a process. The team should determine the level of detail needed to accurately evaluate the process. In some cases, the team may evaluate only the key activities of a process. Section II includes the F2-2: Process Evaluation Form, Section II, Sample EMS Manual, p. 40 to help you evaluate your company's processes.

Determine significant environmental aspects

One of the most crucial and challenging steps in EMS planning is to determine which environmental aspects are significant. Decisions you make at this point will affect many other EMS elements, such as setting objectives and targets (see Element 5, Section I, p. 17) and establishing action plans (see Element 6, Section I, p. 21).

Your Cross-Functional Team should carefully define the criteria that will be used to determine which environmental aspects are significant. The four criteria suggested below are intended to achieve a balance between structure and flexibility. You can use them as a starting point in establishing your own criteria.

- 1. Legal Requirements or Policy Commitments.** The initial criterion is whether the aspect is subject to environmental laws, regulations, or permit conditions. All aspects that are regulated are automatically considered significant. You also may want to consider significant any aspect that is the subject of voluntary commitments outlined in your company's Policy.
- 2. Community Impact.** A second criterion to consider is the views of interested parties. Examples of community concerns that might affect your designation of an aspect as significant include the noise level on your construction sites, increased traffic caused by your projects, and additional light needed for your operations. Keep in mind that these examples may be covered by the initial criterion of environmental regulations or permit conditions.

3. **Potential to Prevent Pollution.** A third possible criterion is the technical and financial potential to prevent pollution in carrying out the process—for example, the reduced use of water or energy. Your Cross-Functional team will base such judgments, in part, on your region’s specific circumstances. For example, water use would be of higher concern in an arid region than in a region where water is plentiful.
4. **Environmental Impact.** A final criterion is environmental impact—that is, the direct effect on the environment of inputs and outputs. A commonly used approach is to evaluate environmental aspects based on magnitude, frequency, toxicity, and duration.

Section II includes a form that lists the four criteria for significance, to help you determine significant environmental aspects (see F2-3: Aspects and Significance Determination Form, Sample EMS Manual, p. 41). For each process that you initially evaluate, you should prepare an Aspects Form and indicate which (if any) of the four criteria of significance it meets. If an aspect meets any one of the four criteria, then that aspect is significant. The F2-3: Aspects and Significance Determination Form also provides space to comment on your analysis and decision.

Companywide and Project-specific Aspects

“Companywide aspects” refer to those aspects that apply to virtually all projects that you undertake. For example, compliance with storm water regulations will be required on almost every project site; therefore, it should be a companywide concern. For each project site, identify, monitor, and measure the applicable companywide aspects, then report data back to the main office for incorporation into the company’s EMS monitoring process.

In addition to companywide aspects, the project owner or client may determine “project-specific aspects” (such as recycling or use of low VOC-emitting materials). You also should consider the processes associated with the subcontractors and service providers. The subcontractors for the project will need to review their activities or scope of work and identify environmental impacts. Subcontractors should focus on those activities that are environmentally regulated and any project-specific environmental objectives that were included in the contract. Section II contains a procedure and related form for briefing subcontractor and service providers (see P4: Environmental Briefing of Subcontractors and Service Providers Procedure and F4-1: Environmental Briefing Packet and Method Statement, Section II, Sample EMS Manual, pp. 61 and 63, respectively).

You must review aspects that subcontractors identify as significant to ensure that controls are in place to maintain compliance or reduce the likelihood of a negative environmental impact. Construction companies should keep informed of the actions of their subcontractors and advise them to act accordingly to ensure compliance with environmental regulations.

Note: See Element 1 of this section for more information on determining the scope of your company’s EMS (p. 5).

Regularly Review Environmental Aspects

Regularly revisiting your environmental aspects helps you meet your goal of continual improvement. The review of aspects can result in modification of priorities or reconsideration of processes that previously were set aside. Frequent use of a particular project-specific significant aspect may prompt you to incorporate it into your companywide significant aspects. In addition, you may decide to drop rarely used companywide aspects.

Your company's EMS will change as your company changes. Therefore, your company's EMS during the first year or two of its implementation will not be as comprehensive as a mature EMS of five or more years. For example, the first year's focus may be on compliance with regulations, whereas in subsequent years, you increasingly may address voluntary measures to prevent pollution. Make your company's EMS as basic, or as complex, as needed at this time.

Document Your Approach

Your company should document your process for identifying aspects and determining their significance. You should be able to retrace your steps as needed when you add or change aspects and environmental impacts. A written procedure is especially important to companies pursuing ISO certification or participating in EPA's National Environmental Performance Track. Section II contains a sample procedure for determining an aspect's significance, which you can modify to meet your company's needs (see P2: Environmental Aspects, Objective and Targets, and Action Plans Procedure, Sample EMS Manual, p. 35).

ELEMENT 4 CHECKLIST

- Establish and implement a procedure to identify the causes (inputs and outputs) of your company's overarching operations that impact the environment (i.e., environmental aspects).
- Determine which of those aspects have the most significant environmental impact.

ELEMENT 5: OBJECTIVES AND TARGETS

Objectives and targets help a company translate purpose into action. Factoring objectives and targets into your business plans will facilitate the integration of the EMS with your company’s other management programs, such as your safety and health program.

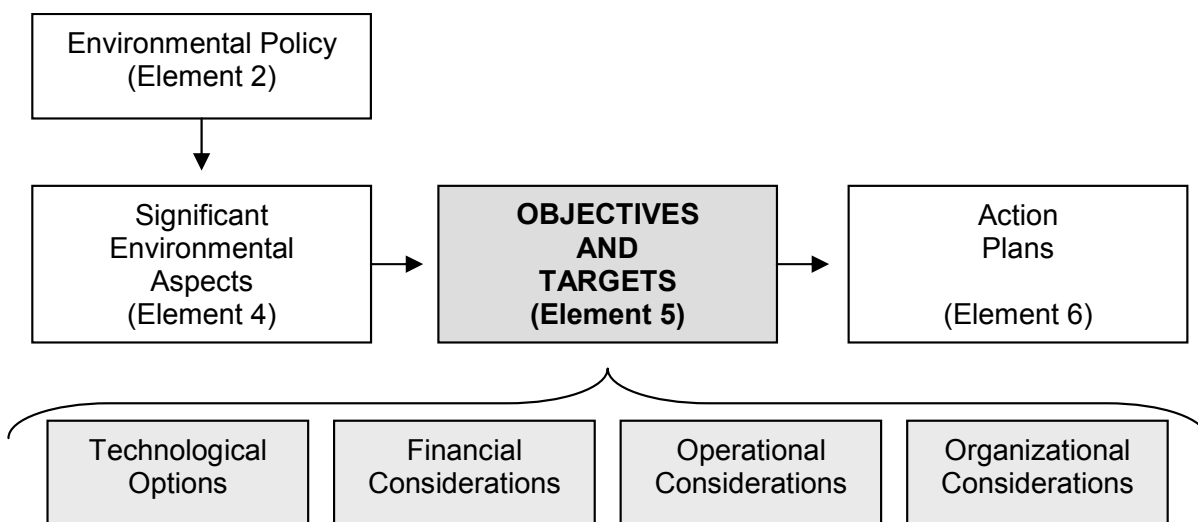
In Element 4, you identified the environmental aspects for each of your company’s processes. You then determined which aspects are significant, based on four suggested criteria—legal requirements or Policy commitments, community concern, potential to prevent pollution, and environmental impact. The F2-3: Aspects and Significance Determination Form created for each process includes all aspects, significant or not, as well as your rationale for determining significance. In setting objectives you will focus only on the significant environmental aspects. You do not need to establish objectives and targets for those aspects that are not determined to be significant.

Discern Definitions and Relationships

An environmental objective is an overall environmental goal that a company aims to achieve for each significant aspect. An environmental target is a measurable level of performance that you intend to achieve within a specific time frame. Each objective will have at least one target. Your company’s objectives and targets should be quantified where practicable to measure success.

Objectives should be consistent with your company’s Policy commitments (see Element 2, Section I, p. 9). When establishing and reviewing objectives and targets for your significant environmental aspects your company also must consider its technological options as well as its financial, operational, and organizational considerations. Figure 5-1 summarizes these considerations.

Figure 5-1: Considerations for Developing Objectives and Targets



Set Objectives and Targets

The Cross-Functional Team establishes and maintains the environmental objectives and targets for all significant aspects (see F2-4: Objectives and Targets Form, Section II, Sample EMS Manual, p. 45). In addition to the team, you should include those employees involved in the processes that are affected by your objectives and targets. These employees should be well positioned to establish, plan for, and achieve these goals. In addition, involving employees helps to build commitment. The buy-in of top management also is crucial and helps to ensure that adequate resources are provided and that the objectives are integrated with other company goals.

Gather and group significant environmental aspects

From this point forward, you will benefit from having one form that highlights all of your company's significant aspects, related objectives and targets, and action plans (see Element 6, Section I, p. 21). This form also should cross-reference the applicable processes to facilitate going back to the F2-3: Aspects and Significance Determination Forms should questions arise. Section II provides the F2-5: EMS Implementation Form for this purpose (see Sample EMS Manual, p. 46).

Designate type of objective

You will consider your overarching goals when setting objectives and targets. Three suggested approaches follow—

1. **Control or Maintain (C)** is an appropriate objective for significant environmental aspects that are the subject of legal and other requirements. The objective will be to maintain conformity with procedures and work instructions that apply to those significant aspects.
2. **Improve (I)** is appropriate for setting goals that exceed your current performance. An example is reduction in energy or water use that, while not required by law, supports a company's commitment to prevent pollution.
3. **Study or Investigate (S)** is appropriate in cases where the Cross-Functional Team decides improvement may be feasible and beneficial, but more information is needed to determine levels and time frames. The objective will be to study the alternatives by a target date in preparation for later setting an objective (or dropping the objective if the investigation reveals that the proposed objectives or targets are not financially, technologically, operationally, or organizationally feasible).

The F2-5: EMS Implementation Form provides space to record the type of objective identified for each significant environmental aspect. Use (C) for control or maintain, (I) for improve, and (S) for study or investigate to indicate which type applies to each significant environmental aspect.

Determine objectives and targets

When first developing your EMS, you may want to set objectives and targets that you are confident you can achieve. You want early successes on which to build. Incremental improvements can amount to great change over time and help build momentum and experience. It is acceptable to establish some objectives to maintain current levels of performance; however, keep in mind the EMS commitment to continual improvement.

You might set a mix of maintenance and improvement objectives for significant environmental aspects that have legal drivers. For example, a company may have compliance requirements as well as voluntary beyond-compliance goals for reducing storm water runoff from project sites. Thus, the objectives for the storm water significant aspect would be C and I, respectively.

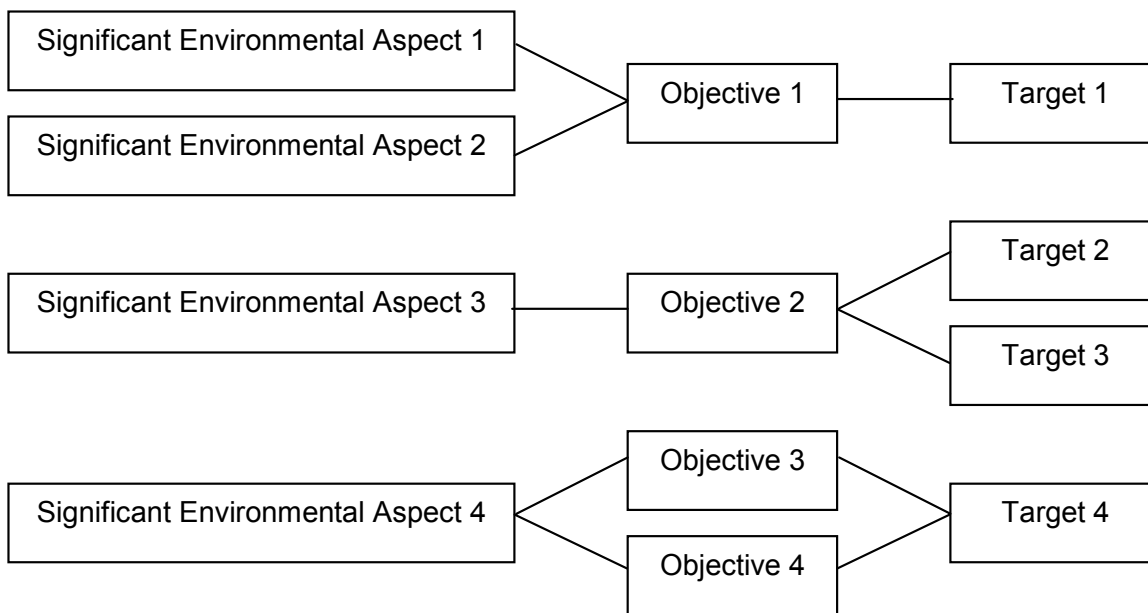
Your objectives and targets should reflect your company’s business, its level of performance, and its goals. No “standard” objectives and targets make sense for all companies. Ensure that your objectives are consistent with your company’s overall mission and the core commitments established in your Policy. Consider how you will measure progress toward achieving your objectives and targets.

The F2-5: EMS Implementation Form in Section II (see Sample EMS Manual, p. 46) includes space to record the objective and target for each significant environmental aspect.

Establish relationships between significant environmental aspects, objectives, and targets

Each significant aspect must have an objective and each objective a target. However, one objective may apply to many significant aspects and have many targets. There may not be a one-to-one relationship between objectives and aspects or between objectives and targets. For example, you may determine that petroleum-based fuels, natural gas, and emissions of volatile organic compounds, NO_x, SO_x, and CO₂ are all significant environmental aspects. One objective and target—to reduce air emissions by a specified amount in a specified time frame—may apply to all six significant aspects. Alternatively, you may decide to include several targets under the objective to reduce air emissions by setting different percentages and time frames for each of the six significant aspects. Figure 5-2 shows a few possible relationships.

Figure 5-2: Possible Relationships between Significant Environmental Aspects, Objectives, and Targets



Communicate Objectives and Targets

Communication with stakeholders (e.g., employees, project owners, and subcontractors) is essential during and after determining your company’s objectives and targets. Keep in mind that your suppliers (of services or materials) can help you meet your objectives and targets (e.g., by providing more “environmentally friendly” products). Sustain commitment and interest by communicating your progress in achieving objectives and targets throughout the company. You may decide to regularly report on progress at staff meetings or to post key targets and progress charts in employee gathering places.

Review and Improve

The Cross-Functional Team should gain top management endorsement of the company's environmental objectives and targets and review and report progress. The team also has responsibility for developing and recommending potential new environmental objectives to top management.

As your company's EMS matures, you may consider additional improvement objectives and targets. When developing and recommending additional objectives, the team should refer to the F2-3: Aspects and Significance Determination Form for each of the company's processes. In addition, the team can choose those aspects that are present in most (if not every) company process. Even if an aspect does not stand out as significant for an individual process, the fact that it appears in many processes may make it a good candidate for improvement and prevention of pollution.

Document Your Approach

Your company should document your approach for setting objectives and targets. You should be able to retrace your steps as needed when you add or change objectives and targets. Those companies pursuing ISO certification or EPA's National Environmental Performance Track membership also should have a written procedure. Section II contains a sample procedure for setting objectives and targets that you can modify to meet your company's needs (see P2: Environmental Aspects, Objectives and Targets, and Action Plans Procedure, Sample EMS Manual, p. 35).

ELEMENT 5 CHECKLIST

- Establish and document environmental objectives and targets that identify responsibilities, completion dates, and procedures and methods for implementation.
- Objectives and targets should consider the company's Environmental Policy, legal and other requirements, and significant environmental aspects.
- Recognize the views of interested parties.

ELEMENT 6: ACTION PLANS

After your company has determined its legal requirements (see Element 3, Section I, p. 11), identified significant environmental aspects (see Element 4, Section I, p. 13), and established objectives and targets (see Element 5, Section I, p. 17), the next step is to prepare action plans for meeting your objectives and targets. Action plans define “who, what, how, and when.” Plans for achieving objectives are essential for “making good” on your company’s Policy commitments of compliance with regulations, prevention of pollution, continual improvement, and communication.

To ensure its effectiveness, each action plan should define—

- Those responsible for achieving objectives (who will do it?)
- The actions that will be taken (what will be done?)
- The means for achieving objectives (how will they do it?)
- The time frame for achieving those objectives and targets (when will it be completed?)

You also should identify how progress will be measured and reported (what quantitative measures will be used for evaluating and reporting targets?).

Set Action Plans to Achieve Objectives and Targets

Action plans are an extension of your objectives and targets, and it makes sense to group them the same way that you grouped your objectives: control or maintain, improve, and study or investigate.

Action plans to control or maintain

To ensure compliance or to maintain the current level of performance, your company must identify those processes that are associated with the identified significant environmental aspects. The company must plan these processes in order to ensure they are carried out under specified conditions by—

- Establishing and maintaining documented procedures to control situations where absence of documented procedures could lead to deviations from the Policy and the objectives and targets
- Stipulating operating criteria in the procedures
- Establishing and maintaining procedures related to the significant environmental aspects of goods and services used by the company and communicating applicable procedures and requirements to suppliers and subcontractors

Thus, your EMS Team should provide written instructions, best management practices (BMPs), standard operating procedures (SOPs), or instructional signs or placards to guide the workforce in meeting Policy commitments. In many cases, your new EMS approach will enhance effectiveness of the work instructions and BMPs that you already have. In other cases, your Cross-Functional Team will need to draft new work instructions and put new BMPs in place.

Objectives that might require action plans to control or maintain include the following—

- Controlling soil erosion and sedimentation
- Minimizing dust and noise
- Properly managing/disposing of wastes

- Regularly maintaining vehicles
- Efficiently operating and maintaining equipment
- Reviewing new processes and activities

Action plans to improve

For some of your significant aspects, you will have established improvement objectives and targets. Improvement action plans document the means and time frames for achieving those goals. Examples of such objectives follow:

- Recycling construction and demolition debris
- Reusing materials and/or waste products (e.g., pallets, soil, and silt fences)
- Implementing equipment idling restrictions

Action plans to study or investigate

In other cases, your significant aspects gave rise to a study objective. In these cases, you assume improvement will be a likely course of action, but you are not sure exactly how to proceed, what time frames are feasible, or how much can practically be accomplished. Therefore, you should conduct a study (or investigation) to prepare for subsequent decision making. For example, an action plan might require a study to assess the feasibility of retrofitting diesel engines.

Monitor and Measure Action Plans

Without effective monitoring and measurement, you will be unable to evaluate the success of your action plans and, ultimately, your company's EMS. Monitoring and measurement are necessary for you to assess compliance with legal requirements and to gauge environmental performance.

Key "performance indicators" can indicate how well your EMS is working overall and provide top management with the information they need to make decisions about the system.

Management performance indicators should provide information on your company's capabilities and efforts in—

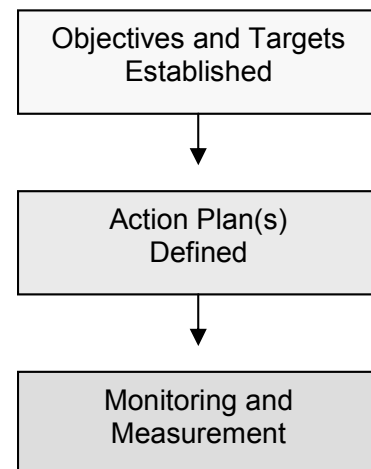
- Training
- Resource allocation
- Purchasing

Operational performance indicators should provide information on the environmental aspects of your processes such as inputs (quantity of materials processed vs. recycled, or energy or water used) and outputs (waste, emissions, noise, heat, light, radiation).

The performance indicators that you select should be—

- Simple and understandable
- Objective
- Measurable
- Relevant to your company's objectives and targets

These measures will become the basis for your future goals and for documenting continual improvement.



Monitoring and measurement hints

Consider the following when establishing a process for monitoring and measuring your company's action plans and, stipulated therein, key characteristics of your company's processes that can have a significant environmental impact.

- Put a procedure in place to systematically identify, correct, and prevent problems (see Element 11, Section I, p. 39).
- Evaluate your compliance status on a regular basis (see Element 12, Section I, p. 43).
- Consider the effectiveness of the compliance assessment process during the EMS management review (see Element 13, Section I, p. 47).
- Assess whether your company is responding to written instructions, BMPs, SOPs, and placards as intended.
- Select appropriate indicators of success and decide how to measure and collect the data.
- Measure progress toward achieving objectives and targets on a regular basis.
- Commit the necessary resources to measurement, evaluation, and reporting.
- Communicate progress to top management, employees, and others working on behalf of the company (see Element 8, Section I, p. 27).

Review and Improve

Keep in mind that your action plans should be flexible. For example, consider modifying an action plan when—

- Objectives and targets are changed or added
- Applicable legal or other requirements are introduced or changed
- Substantial progress in achieving your objectives and targets has been made (or has not been made)
- Your activities, processes, subcontractors, or suppliers change, or other issues arise

It is fine to start small and build as you gain experience in evaluating your performance. Keep in mind that no single measurement will tell your company how it is doing in the environmental area.

Convey environmental information in a way that is relevant to employees' functions to increase the likelihood that the workforce will act on the information. Be sure to link your measurement plan with your overall communications plan.

ELEMENT 6 CHECKLIST

- Develop and employ documented operational controls for those activities associated with significant environmental aspects.
- Establish a maintenance plan to ensure that operational controls remain in use.
- Monitor and measure operations associated with significant environmental aspects, as well as operational controls and performance necessary to achieve your company's Policy and objectives and targets.
- Establish and implement procedures for evaluating compliance (e.g., compliance audits, reviews, or inspections) with environmental legal requirements.

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ELEMENT 7: TRAINING AND AWARENESS

You should train persons working for or on behalf of your company (the workforce) about its EMS for three reasons:

1. Every member of the workforce has a potential impact on the environment.
2. Any workforce member can have good ideas about how to improve your company's EMS efforts.
3. The entire workforce shares in environmental responsibility and liability.

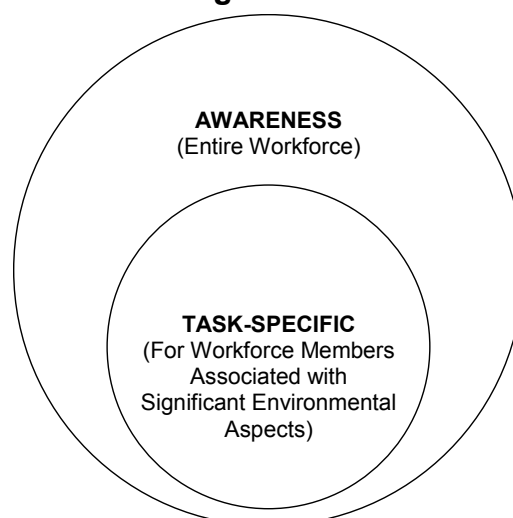
Each person and function can play a role in environmental management. For this reason, your training plan should cast a wide net. All persons working for or on behalf of your company must be aware of the following—

- The importance of conformity with the Policy and procedures and with requirements of the EMS
- The significant environmental aspects of their work and the environmental benefits of improved personal performance
- Their roles and responsibilities in achieving conformity with the Policy and procedures, including emergency preparedness and response procedures
- The potential consequences of departure from specified operating procedures

Your company must ensure that all persons who are performing tasks on its behalf and who have potential to cause significant environmental impacts have appropriate education, training, or experience.

It is highly desirable for your company to incorporate general environmental awareness into workforce orientation and continuing training. You should provide additional, task-specific training for those in the workforce directly responsible for environmentally significant aspects. Thus, as shown in Figure 7-1, the company will provide core environmental awareness training for the entire workforce and task-specific training for a subset.

Figure 7-1: Two Areas of EMS Training



Identify Training Needs

The steps below will help you to begin to identify your training plan requirements. Don't overlook the need for ongoing training when experiencing workforce turnover. Be sure that new employees and subcontractors are trained soon after they arrive, preferably before they start any position tasks. You also may need to add specific training needs as you proceed with the EMS.

- Identify all job functions that affect the environment. Small companies may wish to identify individuals.
- Identify those responsible for workforce health and safety.
- Determine the training these workforce members currently receive (and have received) that relates to environmental, health, and safety concerns. Consider EMS training for crew assigned to new projects.
- Investigate whether EMS education could be integrated into existing training or whether special EMS training is preferable, at least in the beginning.
- Identify training materials or plans available inside and outside your company.

Record Training Needs and Results

Your company should clearly document training needs and results. You may decide to have flowcharts for each position indicating the training needs applicable to that position. Section II includes the F5-1: Training Needs Analysis—Environmental Courses Form that may fit your company's needs (see Sample EMS Manual, p. 71).

Review and Update

Review and update the training needs analysis and training schedule at least quarterly. Make sure your training plan includes new, part-time, and transferred employees, as well as subcontractors. Also, update and maintain each individual's environmental training records.

Document Your Approach

For purposes of ISO certification and participation in EPA's National Environmental Performance Track, you need to describe your approach to identifying and evaluating your company's training needs in the form of a written procedure. Those companies not pursuing certification or participation in a voluntary program also should consider having a written procedure. You will benefit from having this procedure in place when adding or making changes to your training needs analysis or schedule. (See P5: Environmental Training and Awareness Procedure, Section II, Sample EMS Manual, p. 69 for a sample procedure, which your company could customize.)

ELEMENT 7 CHECKLIST

- Identify all environmental training needs.
- Ensure that all employees whose work involves significant environmental and health and safety aspects are competent by training, experience and/or education.
- Make all employees, subcontractors, and suppliers aware of the company's EMS requirements, their roles in it, and potential consequences of departure from operating procedures.

ELEMENT 8: COMMUNICATION

An EMS should contain a definition of the company's procedure for proactive internal and external communication. Internal communication must identify and explain environmental legal requirements and voluntary commitments to all employees, on-site service providers, and subcontractors whose work could affect your ability to meet those requirements and commitments. External communication should provide other stakeholders—anyone who has an interest in your company's environmental performance—with information on your environmental programs and accomplishments. Information about your EMS should include contact information for your company.

Your company also must decide whether to communicate externally about its significant environmental aspects and document its decision. If the decision is to communicate, the company must establish a method for this communication.

Identifying and Understanding Stakeholders

This element discusses two types of stakeholders—internal and external. You might think about the different kinds of stakeholders as forming ever-broader circles around your business. Begin with the innermost circle (employees) and work outward. Figure 8-1 provides a list of stakeholders in each group.

Figure 8-1: Internal and External Stakeholders

Internal Stakeholders	External Stakeholders
<ul style="list-style-type: none">• Employees and workforce• Shareholders• Project owners• Subcontractors• Service providers• Investors and insurers	<ul style="list-style-type: none">• Neighbors• Community organizations• Environmental groups• Other companies• The media• Trade associations and professional societies• Regulatory authorities

Internal and external stakeholders can play an important role in helping your company develop an EMS. Employees have a strong interest in your company and can provide support for EMS development. Project owners, subcontractors, and service providers also can provide useful inputs. In addition, establishing partnerships with trade associations, suppliers, professional societies, neighbors, and universities may be helpful in developing parts of your EMS.

Although involvement of employees and key subcontractors is critical to the success of your EMS, you must decide how far to proceed with including other stakeholders. In planning your outreach strategy, consider the points below.

- Participation by all types of stakeholders can add credibility and value to your EMS.
- Being an environmental leader can lead to recognition and loyalty.
- Involving project owners in your EMS can help them recognize your leadership.

- Forming partnerships with project owners and subcontractors can help to identify shared concerns and find ways to cooperate.
- Your company can help a project owner meet environmental needs.
- Forming partnerships with subcontractors can help your company obtain important information (e.g., significant environmental aspects or alternative techniques to reduce negative environmental impacts) and may help you meet your EMS goals.

How to Work with Your Stakeholders

Develop stakeholder participation in stages and learn as you go. You can start with employees and later add other internal stakeholders, if that suits your capabilities and needs. Next, communicate with those stakeholders who have expressed interest in your operations. Create and maintain a list of everyone you can think of who would be interested in your company's environmental activities, and determine how you can reach them. (If you already have established ways of communicating with certain groups, you might start with those.) It is helpful to make your communication list as complete as possible and then pare it down to a manageable size.

Communication Guidelines

The next step, communicating with stakeholders, provides an opportunity for you to develop an understanding of their interests and to ensure that communication is a two-way process. When working with either internal or external stakeholders, effective communication will facilitate smooth implementation of your EMS. You will want to consider the following five rules of communication:

1. Begin early in the process.
2. Set communication objectives.
3. Communicate regularly and integrate EMS communication with other efforts.
4. Ensure that stakeholder dialogue is a two-way process.
5. Track communication.

Begin early in the process

In most cases, you will need the cooperation of several persons within your company to gather information and develop an EMS that works. Early communication will pay off in greater acceptance of the resulting system.

Set communication objectives

Decide what you want to achieve. Setting goals will help you get the right message across without overwhelming persons with too much information, spending too much time, or missing the mark. It is helpful to create an EMS communication procedure for your company; an example is provided in Section II (see P6: Environmental Communication with Stakeholders Procedure, Sample EMS Manual, p. 73).

Communicate regularly and integrate EMS communication with other efforts

To build support for the EMS, communicate on a regular basis. Some simple means of regular communication can usually be accomplished without straining resources; for example, use existing channels of communication such as bulletin board postings, e-mail messages, or articles in the company newsletter. Talking directly with key individuals at regular intervals may be a good mechanism for ensuring effective communication.

Ensure that stakeholder dialogue is a two-way process

The stakeholders will want to know that their comments and concerns are being heard and taken into account. Convey that your company is genuinely interested in their input and explain how you will include their comments in your plan.

Track communication

Develop a procedure for documenting and responding to stakeholder communication. This procedure will help you track input from stakeholders and document your responses or efforts. Also, appoint a person to be responsible for carrying out your communication procedure.

ELEMENT 8 CHECKLIST

- Establish and implement internal communications procedures regarding the EMS.
- Considered procedures for external communication of your significant environmental aspects.
- Inform subcontractors and suppliers of any applicable EMS requirements.

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ELEMENT 9: EMERGENCY PREPAREDNESS AND RESPONSE

Despite a company’s best efforts, accidents and other emergency situations will occur. Effective emergency preparation and response can reduce injuries, prevent or minimize environmental impacts, protect employees and neighbors, reduce asset losses, and minimize downtime. From an EMS perspective, a good emergency preparedness and response (EP&R) program should include provisions for—

- Assessing the potential for accidents and emergencies that can impact the environment
- Preventing incidents and their associated environmental impacts
- Responding to emergency situations and accidents and preventing or mitigating associated environmental impacts
- Periodically testing emergency plans and procedures

Consistent with the focus on continual improvement, you will want to review your emergency response performance after an incident has occurred so that you can correct deficiencies in the procedure. Use this review to determine if more training is needed or if emergency plans and procedures should be revised, or both.

EP&R is another area where you should not have to start from scratch. Several environmental and health and safety legal programs require emergency plans and/or procedures. Figure 9-1 shows examples of requirements related to EP&R, which may apply to your company.

Figure 9-1: Pollution Prevention and Preparedness Plans

Legal Driver	Requirement
Resource Conservation and Recovery Act ⇒	Hazardous Waste Contingency Plan (large-quantity generators), Preparedness and Prevention Plan (large- and small-quantity generators)
Clean Water Act ⇒	Spill Prevention, Control and Countermeasure Plan and Storm Water Pollution Prevention Plan
Oil Pollution Act ⇒	Facility Response Plan
Clean Air Act ⇒	Clean Air Act Risk Management Plan
Occupational Safety and Health Act ⇒	Emergency Action Plan, Emergency Response Plan

Spill release and reporting requirements

A number of different environmental laws and regulations require companies to report release of toxic substances into the air or water. Whether and how a release must be reported depends on the type, amount, and location of release, among other things. The information below summarizes reporting requirements that may affect a construction job site, but the list is not intended to be exhaustive.

- **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).** Report to federal authorities releases of hazardous substances in an amount at or above “reportable quantities.”
- **Clean Water Act.** Report to federal authorities oil spills that cause a film, “sheen,” or discoloration on waters of the United States.
- **Emergency Planning and Community Right-to-Know Act (EPCRA).** Report releases of “extremely hazardous substances” or CERCLA hazardous substances at or above “reportable quantities” to state and local authorities, as well as to federal authorities.

Some companies are addressing these requirements through integrated contingency plans that combine the requirements of numerous regulatory programs. The federal government has issued guidance for such a plan (61 *Federal Register* 28641–28664, June 5, 1996). Electronic versions with corrections and updates are available at www.epa.gov/swercepp/p-tech.htm#one-plan. While reviewing your EP&R documents for your EMS, you may consider such a streamlined approach.

Develop Your EP&R Procedure

Many companies overlook two planning components: how they identify the potential for accidents and emergencies and how they prevent these occurrences or mitigate their impact. Your Cross-Functional Team (made up of representatives from engineering, maintenance, and environmental health and safety, for example) can identify most potential emergencies by asking a series of “what if” questions related to hazardous materials, activities, and processes employed. The team should also consider abnormal operating conditions.

When developing procedures, consider how everyone (including new employees and subcontractors) will know what to do in an emergency. For example, how would subcontractors or site visitors know what to do in an emergency situation? Communicate with local officials (fire department, hospital, etc.) about potential emergencies at your site and how they can support your response efforts.

Ensure that your EP&R procedure describes the following—

- Potential emergency situations (such as fires, explosions, spills or releases of hazardous materials, and natural disasters)
- The location and approximate quantity of hazardous materials used on site
- Key responsibilities, including those of the emergency coordinator and others on the emergency response team, if applicable”
- Arrangements with local emergency support providers

- Emergency communication procedures (internal and external “call tree”)
- Information on emergency response equipment, including location, type, instructions, and users
- Maintenance schedules of emergency response equipment
- Training/testing of personnel, including the on-site emergency response team, if applicable
- Testing of alarm/public address systems
- Maps of evacuation routes, including exits, from buildings, sites, and assembly points

Section II provides the P7: Environmental Emergency Preparedness and Response Procedure to help you get started (see Section II, Sample EMS Manual, p. 79).

Maintain and Communicate Your EP&R Procedure

The following suggestions will facilitate development and implementation of your company’s EP&R procedure.

- Conduct drills to reinforce training and get feedback on the effectiveness of your plans/procedures.
- Revise and improve your plans as you learn from drills, training, or actual emergencies.
- Post copies of your EP&R plans and procedures (or at least critical contact names and phone numbers) around your company and job sites, especially in areas where hazards exist. Include phone numbers for your on-site emergency coordinator, local fire department, local police, hospital, rescue squad, and others as appropriate.

ELEMENT 9 CHECKLIST

- Establish and implement emergency identification, preparedness and response procedures.
- Review and revise emergency preparedness and response procedures, particularly after an incident.
- Periodically test the above procedures.

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ELEMENT 10: EMS MANUAL AND RECORDS

Documentation is a necessary part of an EMS; however, it should not be the main emphasis. Limit your efforts to documenting only the essentials. The improvements that are made should be evident through your performance, without the need for a lot of paperwork.

Your company should develop an EMS Manual. Controlling and maintaining the EMS Manual online has the advantage of facilitating updates, but you may want to make available printed copies as well. The EMS Manual will serve as the road map to your EMS. At a minimum, it should describe the main elements of the EMS and their interaction and refer to related documentation.

Documentation of processes, targets, unusual occurrences, changes in procedure, and so forth should be ongoing. Each of the areas of your company that may have an environmental impact should contribute to EMS documentation. It would be helpful, however, for the EMS Coordinator to compile the information into a report or an environmental database.

EMS Manual

Your EMS Manual describes the core components of your EMS, demonstrates compliance with environmental regulations, and builds on the knowledge of key employees whose experience and institutional memory would be lost if they left the company.

Your company will need to define, document, and update EMS procedures as needed, but it is not always necessary to develop new procedures. If you already are required to have documents for certain regulations or permits, do not recreate them for the EMS.

Your EMS Manual can be in various formats, including electronic or hard copy. The EMS Manual must be legible and readily available in its most up-to-date version. On the job site, keep a site-specific EMS Manual with the site record keeping/filing system. Condense and report EMS information gathered on site for inclusion with the companywide EMS Manual.

What to include in your EMS Manual

Keep your EMS Manual simple. It does not need to include every detail of your EMS. Instead, the manual can refer to other documents or procedures. The EMS Manual should be updated as needed, based on any system improvements you put in place. If you put too much detail in your EMS Manual, you may find yourself needing to update it frequently.

- A description of the main EMS elements and their interaction and reference to related documents (see Description of EMS Requirements, Section II, Sample EMS Manual, p. 3.)
- Your Environmental Policy, objectives, and targets (see Environmental Policy and F2-5: EMS Implementation Form, Section II, Sample EMS Manual, pp. 11 and 17, respectively)
- Other documents and records determined by the company to be integral to the effective planning, operation, and control of processes that relate to its significant environmental aspects (see Integral Documents, Section II, Sample EMS Manual, p. 15)
- Documents and forms required by the ISO 14001 Standard (see Integral Procedures and Blank Forms, Section II, Sample EMS Manual, p. 27)

Your EMS Manual should include or reference—

- Action plans, work instructions, and best management practices (see F2-5: EMS Implementation Form, F9-1: Master Document List, and F10-1: Index of Environmental Records, Section II, Sample EMS Manual, pp. 17, 21, and 25, respectively)
- Other EMS-related documents or EMS records, such as emergency preparedness and response plans or training plans (see F10-1: Index of Environmental Records, Section II, Sample EMS Manual, p. 25).

Your EMS Manual is related to, but different from, EMS records. Your EMS Manual describes your system (i.e., what you do and how you do it). Your EMS records demonstrate that you are following the procedures identified in your EMS Manual.

Section II provides a Sample EMS Manual for XYZ Construction Co (see Sample EMS Manual, p. 3).

Records

The purpose of records management is to demonstrate that your company is actually implementing the EMS in conformance with ISO 14001 and as designed, including the evaluation of compliance with legal and other requirements, implementation of procedures, and results achieved. Although records have internal value, you may also need to provide evidence of EMS implementation to external parties (for ISO 14001 certification, etc.). It is difficult to verify consistent adherence to an EMS without accurate records.

What are “records”?

Records provide evidence that you are implementing the processes that make up your EMS.

The basics of records management are straightforward: You need to decide what records you will keep, how you will maintain them, and for how long. You should also think about how you will dispose of records once you no longer need them.

Tips for EMS records

- If your company has an ISO 9001 (or other) management system, you should have a process in place for managing records. This process could be adapted for EMS purposes.
- You may need to generate certain forms in order to implement your EMS. When these forms are filled out, they become records. Forms should be simple and understandable.
- Start by identifying the EMS records that are required. Review the procedures and work instructions you have developed for your EMS to determine what evidence is needed to demonstrate implementation. Also consider records that are required by various legal requirements.
- Focus on records that add value. Avoid having paperwork drive your EMS. The records you choose to keep should be accurate and complete.
- Establish a records retention policy and stick to it. Make sure that your policy takes into account records retention requirements specified in applicable environmental laws and permits.

Key questions—

- What records are kept?
- Who keeps them?
- Where are they kept?
- How are they kept?
- How long are they kept?
- How and when are they accessed?
- How do you handle disposal of records?

- Identify which records, if any, might require additional security. Do you need to restrict access to certain records? Should a backup copy of critical records be maintained at another location?
- If your company uses computers extensively, consider using an electronic EMS records management system. Maintaining records electronically can provide an excellent means for rapid retrieval of records as well as controlling access.

Types of records you might maintain

The following types of records are typical of EMS documentation:

- Legal, regulatory, and other code requirements
- Results of environmental aspects identification
- Reports of progress toward meeting objectives and targets
- Permits, licenses, and other approvals
- Job descriptions and performance evaluations
- Training records
- Internal audit and legal compliance audit reports
- Reports of corrective action and corrective action tracking data
- Hazardous material spill and other incident reports, including response actions taken
- Communications with customers, suppliers, contractors, and other external parties
- Results of management reviews
- Sampling and monitoring data
- Equipment maintenance and calibration records
- Emergency response drills, results, and changes to emergency preparedness and response plan
- Recycle and reuse annual tonnage

ELEMENT 10 CHECKLIST

- Document the core elements of your EMS, including all of the required procedures.
- Retain sufficient records to demonstrate that each element of the EMS, including all of the procedures, are documented and are being implemented.
- Establish and implement a procedure for managing documents and records to ensure that all paperwork is current, accurate, and readily retrievable.

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ELEMENT 11: CORRECT AND PREVENT PROBLEMS

Conditions change and accidents happen. No EMS is perfect, and the system you have should be adaptable to growth, accidents, and other changes as they occur. If you are properly checking your system, you inevitably will uncover systemic and operational problems (especially in the early phases of EMS implementation). Audits, monitoring, and employee suggestions are all useful in revealing problems.

Typical problems found on construction sites include the following—

- Poor communication
- Faulty or missing EMS procedures
- Equipment malfunction or lack of maintenance
- Lack of training
- Lack of understanding of requirements (legal or EMS)
- Failure to enforce rules
- Failure of corrective actions to address root causes of problems

To deal with deficiencies, your company should have a process to ensure that the following actions take place:

- Identification of problems
- Control of nonconformities
- Investigation of root causes
- Implementation of corrective and preventive actions
- Verification that resulting actions are effective and appropriate to the magnitude of the problems and the environmental impact encountered
- Review of the actions taken and documentation of changes resulting from corrective and preventive action

Have you—

- Identified the problem?
- Identified the cause?
- Come up with a solution for each?
- Implemented the solution?
- Documented the action?
- Documented the solution?
- Communicated the solution?
- Evaluated the effectiveness of the solution?

Although your EMS must both correct and prevent problems, keep in mind that preventing problems is generally cheaper than fixing them after they occur. You should continually review problems in your EMS, including legal noncompliance, to detect patterns or trends. Identifying trends allows you to anticipate and prevent future problems.

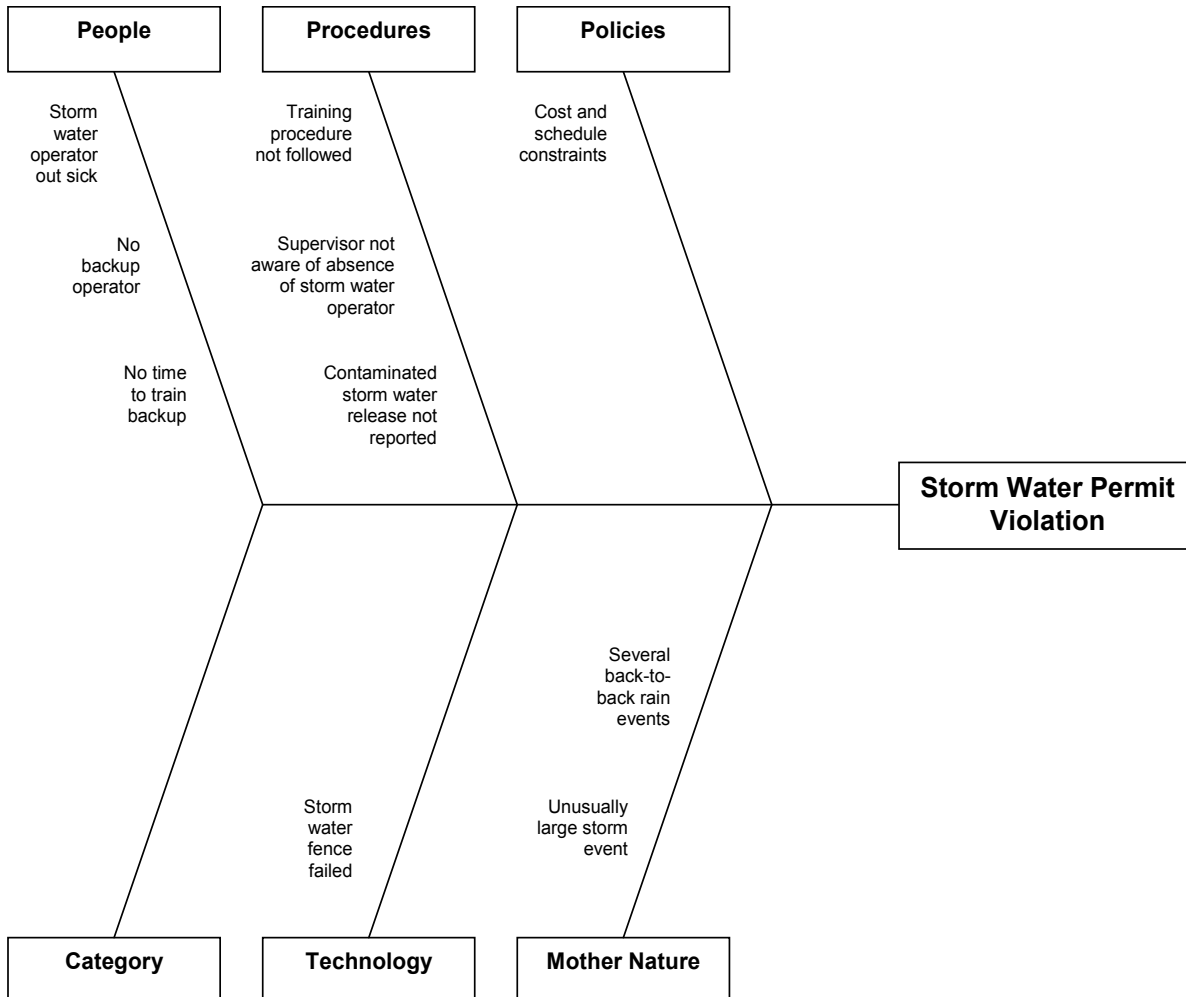
Determining Causes of Problems

You will need to establish a method to determine the causes of the problem. In some cases, the cause may be obvious, and in others, obscure.

“Root cause analysis” is a process by which you can identify causes and preventive actions. If a spill occurs several times in your equipment yard, you would attempt to identify the root cause so that you can address it and prevent the spill in the future.

Root cause analysis can be a very formal process; however, it also can mean something simpler—looking past the obvious or immediate reason for a problem to determine why it occurred. See Figure 11-1 for a sample root cause analysis diagram for a hypothetical storm water permit violation.

Figure 11-1: Sample Root Cause Analysis



Taking Corrective Action

Once you document a problem with your system or how it operates, you must resolve it. Take action as quickly as possible. Make sure to assign tasks and establish a schedule for completion.

Employees may recognize the need for corrective action and provide good ideas for solving problems. Find ways to get them involved in the improvement process. It's important to determine whether a lapse is temporary or due to some flaw in the procedures or controls. For this reason, communicate any findings to employees and subcontractors and provide any follow-up training for changes in the procedures that may result.

Section II provides the F8-1: Environmental Corrective and Preventive Action (CAR) Request Form and the F8-2: Environmental Corrective and Preventive Action Tracking Log for your company to use (see Sample EMS Manual, pp. 85 and 86, respectively).

Tips on taking corrective action

The following suggestions will facilitate planning and implementing your company's corrective and preventive action process:

- Combine some elements of your management review and corrective action processes if you can. You may decide to use a portion of your management review meetings to review problems, discuss causes and trends, identify corrective actions, and assign responsibilities.
- Simple methods often work quite effectively. The amount of documentation needed for corrective and preventive actions will vary with the severity of the problem and its potential environmental impact.
- Be sure that your corrective and preventive action process specifies responsibilities and schedules for completion. Once you document a problem, your company must be committed to resolving it in a timely manner. Review your progress regularly and follow up to ensure that actions taken are effective.
- Use the corrective and preventive action process for quality that is included in your ISO 9001 management system, if you have one, as a model for EMS purposes (or integrate the processes).

Section II provides a sample procedure for correcting and preventing environmental problems (see P8: Correcting and Preventing Environmental Problems Procedure, Sample EMS Manual, p. 83).

ELEMENT 11 CHECKLIST

- Establish and implement procedures for handling EMS nonconformances (including legal noncompliance).

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ELEMENT 12: INTERNAL AUDITS

Once your company has established its EMS, assessing its effectiveness is crucial. It is relatively easy to create a system that works well in the absence of change; the more difficult challenge is to have in place a system that meets its commitments when faced with dynamic business conditions. Internal EMS audits are pivotal to maintaining a viable system in the face of accidents, changing rules, staff turnover, technological change, or economic fluctuations.

Your internal EMS audit program needs to be effective in determining whether the EMS conforms to planned arrangements, such as those described in ISO 14001, and has been properly implemented and maintained. You should establish an internal audit procedure to address the responsibilities and requirements for—

- Planning and conducting audits
- Reporting results
- Determining audit criteria, scope, frequency, and methods

Your internal audits should be linked to the procedure for correcting and preventing problems (see Element 11, Section I, p. 39) and to management review (see Element 13, Section I, p. 47). Internal audits require time and effort, but they are crucial to—

- Ensuring compliance with environmental regulations
- Maintaining management and workforce focus on the environment
- Improving the EMS and its performance
- Ensuring the system's cost-effectiveness

Determine the Frequency of Your Audits

To determine an appropriate frequency for your internal audits, consider the following factors:

- The nature of your operations and activities (i.e., the environmental importance of the process(es) concerned)
- Your significant environmental aspects that you identified earlier
- The results of your monitoring processes
- The results of previous audits

As a rule of thumb, you should audit the EMS at least annually, either in its entirety at one time, or process by process over time.

Determine Who Will Perform the Audits

If feasible, you should select and train internal auditors, perhaps from your Cross-Functional Team. Selection of auditors and conduct of audits must ensure objectivity and the impartiality of the audit process, i.e., auditors should be independent of the processes being audited. Small companies may find assigning impartial auditors a challenge. Therefore, if members of a Cross-Functional Team act as auditors, they should recuse themselves from evaluating areas in which they are working.

Auditors should have both initial and ongoing training in auditing techniques and management system concepts. Familiarity with environmental regulations, company operations, and environmental science can be a big plus, and in some cases may be essential to adequately assess the EMS. Some auditor

training can be obtained on-the-job. Your company's first few internal audits can be considered part of auditor training, but make sure that an experienced auditor leads or takes part in those initial audits.

Manage Change Using Internal Audits

As part of your internal audit program, you should evaluate your system's effectiveness in managing change. Here are some items to include in your program:

- New process reviews: have any changes introduced new environmental aspects?
- Worksheets from the most recent environmental aspect identification and significance determination: have data changed?
- Communication received from external stakeholders: do any comments suggest a need to reevaluate your aspects?
- Environmental objectives and targets: what new goals will your company set for this time period? Which are now accomplished and can be closed out and which need to be maintained?
- Pollution prevention program: has information become available that would add aspects?
- Audit program: have your audits revealed areas of your EMS and environmental programs that could be improved? Would this information be useful in your aspect identification process or in redesigning your objectives?

Determine How Management Should Use Audit Results

Management should use internal audit results to identify trends or patterns in EMS deficiencies. The company also should ensure the timely identification, correction, and documentation of system gaps or deficiencies. Management should decide at what level of detail audit results are communicated to internal and external stakeholders.

Expedite Your Audit Program

Here are some points others have found helpful in developing and maintaining an effective internal audit program:

- Focus your internal audits on objective evidence of conformity.
- Ensure that auditors review deficiencies identified during the audit with persons who work with the relevant process(es). This review will help the auditors verify that their audit findings are correct and reinforce workforce awareness of EMS requirements.
- Train at least two persons as internal auditors, if possible, so that your auditors work as a team. Having two trained persons will also allow audits to take place when one auditor has a scheduling conflict, which is often unavoidable in a smaller company.

- Before you start an audit, communicate the audit scope, criteria, schedule, and other pertinent information to the persons associated with affected process(es). This notification helps avoid confusion and facilitates the audit process.
- Consider integrating your EMS and legal compliance audit programs, but keep in mind that these audits have different purposes.
- Judge audits on the quality, rather than the number, of findings. An internal audit is a check on how well your system meets your own established EMS requirements. An internal audit is not an audit of how well workforce members do their jobs.

ELEMENT 12 CHECKLIST

- Establish and implement a procedure for conducting EMS audits.
- Record the information from the various monitoring, measuring, and auditing programs and report the same to senior management.

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ELEMENT 13: MANAGEMENT REVIEW

A sustainable EMS includes periodic management reviews to improve the program and ensure that it continues to meet your company's needs over time. The scope and frequency of the review should depend upon the size and complexity of the company and other factors.

Establish a Senior Management Review Process

To maintain continual improvement, suitability, and effectiveness of your EMS, your company's top management should review and evaluate your EMS at defined intervals (e.g., annually).

The review should be comprehensive, although not all elements of your EMS need to be reviewed at once. The review process may take place over a period of time. Review of the Policy, objectives, and procedures should be carried out by the level of management that defines them. The input to management review should include, among other information, the following—

- Results of internal EMS audits
- Communication from external interested parties
- Performance of the EMS
- Extent to which objectives and targets have been met
- Status of corrective and preventive actions
- Follow-up actions from previous management reviews
- Changes in circumstances
- Recommendations for improvement

The outputs from the management review should include any decisions and actions related to possible changes to the Policy, objectives, and other elements of the EMS, consistent with the commitment to continual improvement.

Create a continual improvement plan and check progress. You should document all observations, conclusions, and recommendations for future action. Assign action items for follow-up and schedule the next regular review.

The following suggestions will facilitate the development of your company's management review process:

- Involve two categories of staff in the management review process: those who have information/knowledge about the EMS (technical experts); and those who can make decisions about the company and its resources (top management).

Questions for management—

- Is our environmental policy still relevant to what we do?
- Are roles and responsibilities clear and do they make sense?
- Are we applying resources appropriately?
- Are we meeting our regulatory obligations?
- Are the procedures clear and adequate? Do we need others? Should we eliminate some?
- What effects have changes in processes or materials had on our EMS and its effectiveness?
- How effective are our measurement and assessment systems?
- Should we set new measurable performance objectives?
- Do changes in laws or regulations require us to change some of our approaches?
- What stakeholder concerns have been raised since our last review?
- Is there a better way? What else can we do to improve?

- Determine a management review frequency that will work best for your company. Some companies combine these reviews with other activities. Other companies hold “stand-alone” reviews. At a minimum, consider conducting management reviews at least once each year.
- Document the management review meetings—note the issues discussed, decisions made, and action items identified.
- Assess how changing circumstances might influence the suitability, effectiveness, or adequacy of your EMS. Changing circumstances might be internal to your company (such as new raw materials, processes, new projects, etc.) or might be external factors (such as new laws or new information). Consider other organizational plans and goals as you assess potential changes to your EMS. In this way, environmental decision making can be integrated into your overall management and strategy.
- Designate staff to follow up on the action items arising from your management review. Progress on action items should be tracked to completion.

ELEMENT 13 CHECKLIST

- Is senior management reviewing the structure and performance of the EMS, on a regular basis, to determine the appropriateness and effectiveness of the EMS and identify potential opportunities for improvement?
- Is senior management provided sufficient information for this review, including the results of performance measurements and audits?

APPENDIXES

Appendix A: EMS Resources

Environmental Management Review (EMR) National Report: Lessons Learned in Conducting EMRs at Federal Facilities. November 1999.

This document, issued by the U.S. Environmental Protection Agency (EPA) Office of Enforcement and Compliance Assurance, presents lessons learned by EPA from its review of facility environmental protection programs and management systems. (EPA 315-R-99-003).

Environmental Management Systems Implementation Guide for the Shipbuilding and Ship Repair Industry. July 2003.

This document was developed by the EPA Sector Strategies Division, Office of Policy, Economics and Innovation, in partnership with the American Shipbuilding Association and the Shipbuilders Council of America.

Environmental Management Systems: An Implementation Guide for Small- and Medium-Sized Organizations, 2d ed. January 2001.

This document, published by NSF International and supported with funding from the EPA Office of Water, explains EMS concepts using the ISO 14001 standard guidance, tools, forms, and examples that are broadly applicable to many different types of businesses.

Implementation Guide for the Code of Environmental Management Principles (CEMP) for Federal Agencies. March 1997.

The EPA Office of Enforcement and Compliance Assurance issued this document (EPA 315-B-97-001) to help federal agencies move toward responsible and proactive environmental management.

Improving Environmental Performance and Compliance, 10 Elements of Effective Environmental Management Systems, Guidance Document. June 2000.

Prepared by the Enforcement Cooperation Program of the Commission for Environmental Cooperation, this document assists EMS users in making responsible decisions and taking actions to achieve better environmental performance by maintaining and moving beyond compliance with environmental laws. It provides a list of 10 elements to ensure that what needs to be done is being done to meet environmental goals. It is intended as guidance for those companies in the public and private sectors that seek to apply EMS in a way that will work effectively and build better relationships with customers, suppliers, lenders, investors, the local communities, and the government.

Integrated Environmental Management Systems Implementation Guide. October 2000.

Prepared for the EPA Office of Pollution Prevention and Toxics, this document (EPA 744-R-00-011) represents efforts by EPA to show how Design for the Environment (DfE) technical work can be used to support the development of an EMS. It unites the EMS plan-do-check-act model with DfE approaches, such as the agency's Cleaner Technologies Substitutes Assessment Methodology. It contains useful EMS guidance, tools, forms, and examples and has material especially relevant to facilities with intensive chemical use.

Integrated Environmental Management Systems, A Company Manual Template for Small Business. December 2000.

This document (EPA 744-R-00-012) represents an EMS template, including cover page, table of contents, and complete documentation for a fictional corporation. The manual, prepared by EPA's Office of Pollution Prevention and Toxics, contains procedures and associated forms for an EMS that are designed according to the principles of the *Integrated Environmental Management Systems Implementation Guide*, noted above.

The EPA Environmental Management System Pilot Program for Local Government Entities. January 2000.

Prepared by the Global Environment & Technology Foundation (under Assistance Agreement No. X 825557- 01-0), this document represents a final report to EPA on a multiyear pilot program to implement EMS for local government entities. It presents lessons learned and examples that can be useful to businesses and other organizations.

Appendix B: Glossary

Action Plan: The steps necessary to achieve the company's objectives and targets. Defines who, what, when, and how will be measured to determine success.

Alternatives Evaluation Process: Process for evaluating alternative methods for completing a particular function using business and environmental criteria.

Cross-Functional Team (CFT): Members of a company who are responsible for representing their area or department in several facets of the EMS (e.g., establishing environmental aspects, determining significant aspects, setting objectives and targets, implementing environmental management programs, reviewing and tracking results of EMS internal audits, and serving as information resources). Each CFT meets to discuss the EMS on a regular basis.

EMS Coordinator: A member of the company whose responsibility is to identify, assign, schedule, provide the necessary support for, and ensure completion of all tasks relating to the EMS. The EMS Coordinator works closely with the Environmental Management Representative (EMR) and with the CFT. The EMS Coordinator is also responsible for maintaining the EMS Manual, under the leadership of the EMR. It is possible for the functions of EMS Coordinator and EMR to be performed by the same person.

EMS Document: Written communication that presents a company's Policy, procedures, and requirements. Documents describe the EMS, provide a basis for auditing, provide continuity of the EMS and its requirements during changing circumstances, support training of personnel in EMS requirements, present the EMS for external purposes, demonstrate the conformity of the EMS in contractual situations, and facilitate improvement in the control of practices and environmental management activities.

EMS Objective: An overall environmental goal of the Policy, which is quantified where practicable.

EMS Performance Indicators: Measures that allow a company to evaluate the success of the overall EMS program.

EMS Record: Written evidence compiled and maintained to track performance of an EMS and to demonstrate conformity with EMS requirements.

EMS Team: The team includes the EMR, the EMS Coordinator, and the CFT.

Environmental Aspect: An element (input or output) of a company's processes that can or does interact with the environment (create an environmental impact).

Environmental Impact: Any change to the environment, whether adverse or beneficial, resulting from a company's activities, products, or services.

Environmental Management Representative (EMR): A member of the company's top management who is responsible for the functioning of the EMS. An EMR ensures that all tasks relating to the EMS are identified and completed in a timely manner. An EMR is responsible for reporting periodically to top management on the progress and results of the EMS.

Nonconformity: Discrepancy between a company's actual EMS activities and the procedures laid out in its EMS Manual and associated documentation.

Root Cause Analysis: Systematic process to uncover underlying causes of a particular problem. For example, if a drum had not been labeled, a member of the EMS Team would conduct a root cause analysis to determine the cause of the lapse. This analysis could reveal, for instance, that a new employee did not know the labeling procedure, which would indicate that inadequate entry training was a root cause of the problem.

Significant Environmental Aspect: An environmental aspect believed by a company to have, or potentially have, a significant impact on the environment.

Stakeholder: Anyone who has a stake in your company's environmental performance. Internal stakeholders may include employees, shareholders, customers, suppliers, investors, and insurers. External stakeholders may include neighbors, community organizations, environmental groups, regulatory authorities, larger companies, the media, and the general public.

Target: Detailed performance requirement arising from the environmental objectives that needs to be set and met to achieve those objectives. Make the target quantified where practicable and applicable to the company or parts thereof.

Appendix C: Summary of Applicable Legal and Other Requirements (Federal Only)

EPA delegates authority to implement certain environmental programs to some states. A state may have legal requirements that are more stringent than the federal requirements. Therefore, be sure to check with your state and local agencies before starting a construction project.

WATER

Clean Water Act (CWA) – 33 USC § 1251 et seq.

STORM WATER RUNOFF (40 CFR Part 122)

If your project disturbs one or more acres (or less than one acre but is part of a larger common plan of development or sale that will disturb one or more acres), you may need a storm water permit. Storm water general permits are issued through the U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) program or an authorized state NPDES permitting authority. To obtain permit coverage, you will need to consider—

- Developing and implementing a storm water pollution prevention plan (SWPPP) that describes the physical characteristics of the site; lists potential sources of pollutants; and identifies erosion prevention, sediment control, and storm water management practices that you will implement at the site.
- Submitting a Notice of Intent (NOI) or permit application as required by your permitting authority. The NOI may require you to certify that you will not harm federally listed endangered species or impact any historic places.
- Submitting a Notice of Termination (NOT), if required by your permitting authority, when you complete your construction activities or when someone else assumes control of the site.

Note that some municipalities also are required to implement storm water control programs. Check with your municipality for additional local requirements. Additional information on the requirements is available at <http://www.epa.gov/npdes/stormwater>. You also can obtain information about county and state storm water requirements through the Storm Water Resource Locator at <http://www.envcap.org/swrl/>.

OIL SPILL PREVENTION AND RESPONSE (40 CFR Parts 110, 112)

If you use, consume, store, transfer, or otherwise handle oil at your construction site, you may need to follow EPA's Spill Prevention Control and Countermeasure (SPCC) Plan requirements. EPA requires the owner or operator of a construction site to prepare and implement a detailed SPCC plan if (1) the total *capacity* of your oil storage containers in tanks of 55 gallons or greater—including fuel and hydraulic fluid tanks on your mobile equipment and asphalt tanks—is more than 1,320 gallons and (2) there is a reasonable expectation of a discharge into or upon waters of the United States. These thresholds apply to storage capacity at a construction site (or equipment yard, etc.), not to the quantities of oil actually present at the site.

Although each SPCC plan is unique, all plans must address the following: (1) operating procedures that prevent oil spills; (2) control measures installed to prevent a spill from reaching navigable waters; and (3) countermeasures to contain, clean up, and mitigate the effects of an oil spill that reaches navigable waters.

Note that completely buried storage tanks that are subject to all the technical requirements of the underground storage tank (UST) rule AND permanently closed USTs are not subject to the SPCC rule. For more information, log on to <http://www.epa.gov/oilspill>.

**DREDGE AND FILL
ACTIVITIES
(33 CFR Parts 320-331 &
40 CFR Parts 230, 233)**

Does your construction project result in a discharge of dredged material (i.e., material excavated from waters) or fill material (i.e., material that replaces an aquatic area with dry land or changes the bottom elevation of a water body) to a water of the United States? If so, you may need a Clean Water Act (CWA) Section 404 permit prior to starting work. Section 404 permits are issued by either the U.S. Army Corps of Engineers or, for certain waters, a state with an approved Section 404 permitting program. Permit decisions are made using environmental criteria developed by EPA, and, in certain circumstances, EPA can prohibit or restrict the use of a site for the disposal of dredged or fill material. Certain activities with minimal adverse effects may qualify for coverage under a general 404 permit (e.g., a Nationwide Permit).

Note that waters of the United States include wetlands. For more information, including information on wetlands, go to <http://www.epa.gov/owow/wetlands/regs/index.html>.

WASTE

**Resource Conservation and Recovery Act (RCRA) – 42 USC § 6901 et seq.
Comprehensive Environmental Response Compensation & Liability Act (CERCLA) – 42 USC § 9601 et seq.
Toxic Substances Control Act (TSCA) – 15 USC § 2601 et seq.**

**HAZARDOUS SOLID
WASTE**

At your construction (and/or demolition) project, will you generate, remove, or discover solid waste that meets the federal definition of hazardous wastes (i.e., waste that poses potential harm to human health and the environment)? If so, you are required to handle, store, transport, and dispose of that hazardous waste according to the federal requirements of the Resource Conservation and Recovery Act (RCRA). Typical construction materials that are classified as hazardous include spent cleaners (e.g., organic solvents), paints (including lead-based paint), used oil, solvents, sealers, thinners, resins, roofing cement, adhesives, caulk, soil contaminated with toxic or hazardous waste, and drums containing hazardous waste. A complete list of hazardous wastes and their allowed concentrations is in the regulations that implement RCRA.

RCRA regulations contain requirements for—

- Generators of hazardous wastes. The requirements for generators of hazardous wastes are based on the amount of hazardous wastes generated. Generators of large amounts of hazardous wastes are subject to more regulatory requirements than are generators of small

amounts of hazardous wastes. The RCRA regulations list quantities of hazardous wastes that determine whether a generator is large or small.

- Storage of hazardous wastes. The RCRA regulations specify the time hazardous wastes can be stored at a site. If the storage time is exceeded, a RCRA permit is required.
- Transport, treatment, and disposal of hazardous wastes. To transport hazardous wastes, a transporter must be registered with either EPA or a state as a hazardous waste transporter. A generator is responsible for ensuring that a transporter is a registered hazardous waste transporter and that the hazardous waste is delivered to a RCRA-permitted treatment or disposal facility. The generator also must sign the hazardous wastes manifest used to track the transport of a hazardous waste to a permitted treatment or disposal facility.

For more information on RCRA hazardous wastes and the hazardous waste requirements, contact EPA's Office of Solid Waste Call Center at 800-424-9346 (TDD 800-553-7672), Monday–Friday, between 9:00 a.m. and 5:00 p.m. EST. You also can go to <http://www.epa.gov/epaoswer/hotline/>.

NONHAZARDOUS SOLID WASTE

Do you generate construction/demolition (C&D) wastes such as scrap wood, dry wall, bricks, concrete, plaster, asphalt, or metal scraps at your site? EPA does not regulate this type of nonhazardous waste at the federal level, unless it contains hazardous components. Nonhazardous C&D waste is regulated at the state and local level.

For more information, go to <http://www.epa.gov/epaoswer/non-hw/debris/index.htm> or <http://www.cicacenter.org/solidregs.html>.

LEAD-BASED PAINT WASTE

During your construction project, you may generate, remove, or discover lead-based paint (LBP) waste. In most cases, LBP waste is considered to be a hazardous waste under RCRA; however, certain activities are exempt. If you generate LBP waste from construction in homes and other residences (e.g., during the remodeling, abatement, or renovation), you can treat the debris as “household waste.” You can dispose of the waste as household garbage—in municipal waste landfills, construction and demolitions debris landfills, or municipal solid waste combustion units—unless other state requirements apply.

Contractors must notify residents about lead before renovating pre-1978 housing. In addition, contractors who are involved in lead-abatement projects or who perform certain LBP activities have to be certified to do the work under Toxic Substances Control Act (TSCA) regulations or an authorized state or tribal program, and the work has to be done in accordance with federal work practice standards.

For more information about LBP wastes, contact the RCRA Hotline weekdays at 800-424-9346 (TDD 800-553-7672) between 9:00 a.m. and 6:00 p.m. EST or go to <http://www.epa.gov/lead/fslbp.htm>.

UNIVERSAL WASTES

The RCRA regulations streamline the hazardous waste management requirements for certain federal universal wastes (i.e., batteries, pesticides, mercury-containing thermostats, and certain lamps). These items are treated as universal waste because they are commonly thrown into the trash by households and small businesses. Universal waste rules are less stringent than are hazardous waste rules with respect to collecting, storing, and transporting the wastes as long as the RCRA requirements for recycling, treatment, or disposal of the wastes are met. For more information, call the RCRA Hotline weekdays at 800-424-9346 (TDD 800-553-7672) between 9:00 a.m. and 5:00 p.m. EST. You also can go to <http://www.epa.gov/epaoswer/hotline/>.

Mercury-containing equipment (e.g., meters, temperature gauges, pressure gauges, and sprinkler system contacts) has been proposed as a new universal waste category.

UNDERGROUND STORAGE TANKS

Do you have storage tanks (either aboveground or underground) for petroleum products such as gas or diesel fuel? If so, you may be subject to the requirements of RCRA; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); or the Oil Pollution Act (OPA), which dictate how you store, label, and dispose of these materials, and plan for spill prevention. For more information on the requirements for underground storage tanks, go to <http://www.epa.gov/epaoswer/hotline/>.

HAZARDOUS SUBSTANCES (Superfund Liability)

During your construction activity, do you excavate soil? If the excavated soils contain a hazardous substance (e.g., pesticides or petroleum), you may be responsible under CERCLA as an operator, arranger, or transporter. For example:

- You may be an operator if you spread soil that contains a hazardous substance on the land.
- You may be an arranger if you dispose of a hazardous substance or arrange to have it removed from a construction site. For example, if you excavate and spread soil that contains pollutants buried by a previous owner, you may be liable for disposal of a hazardous substance.
- You may be a transporter if you move a hazardous substance from one location to another. For example, you may be liable if you transport dioxin-contaminated soil even if you did not know the soil contained dioxin.

CERCLA requirements dictate how you handle material that contains a hazardous substance (e.g., treat the material to remove the substance or remove the material from the site). Be careful to prevent contaminated soil or water from contact with storm water.

For more information, refer to EPA's Superfund web site at <http://www.epa.gov/superfund/index.htm>.

**POLYCHLORINATED
BIPHENYL (PCB)
WASTES**

Before beginning any construction activities on existing buildings, you should evaluate the potential for PCB-laden waste. The PCB regulations under the Toxics Substances Control Act (TSCA) apply to both PCB waste materials and PCBs still in use. The general requirements for handling PCB materials and equipment identified on site (prior to demolition or remodeling) include identify and label the material, notify EPA, properly store the material, and properly dispose of the material.

EPA's PCB Homepage is at <http://www.epa.gov/opptintr/pcb/>.

AIR

Clean Air Act (CAA) – 42 USC § 7401 et seq.

DIESEL RETROFIT

To reduce emissions of pollutants from the old, in-use diesel fleet (including construction equipment), EPA has developed a Voluntary Diesel Retrofit Program. This voluntary incentive-based program complements the Agency's regulatory program to further reduce emissions from new nonroad diesel equipment (including construction equipment); those rules do not address emissions from old, in-use engines. The Voluntary Diesel Retrofit Program can bring immediate emission reductions by promoting cleaner fuels, including lower sulfur diesel, innovative retrofit technologies, idle reduction, and cleaner engines. For more information on this program, go to <http://www.epa.gov/otaq/retrofit/>.

ASBESTOS

Is there a release of a regulated asbestos-containing material (RACM) when you demolish or renovate a facility? If the combined amount of RACM (i.e., a material that contains greater than 1 percent asbestos) in the facility is at least 260 linear feet of pipe, 160 square feet of other facility components, or 35 cubic feet of facility components when the length or area cannot be measured, the National Emission Standard for Hazardous Air Pollutants (NESHAP) for asbestos has to be met. The asbestos NESHAP is a workplace standard established under the CAA. It requires, among other things, that EPA be notified when a facility is demolished if the facility contains any combined amount of a RACM. When a facility is renovated, EPA only has to be notified if the renovated facility contains the above combined amount of RACM. Find additional asbestos NESHAP information at <http://www.epa.gov/opptintr/asbestos/help.htm>.

Asbestos also is a hazardous substance when it is in a form that can be reduced to dust by hand pressure (i.e., it is friable). If friable asbestos is present at your construction site, you may be subject to requirements under CERCLA. For more information, contact EPA's Office of Solid Waste Call Center on 800-424-9346 (TDD 800-553-7672) Monday–Friday, between 9:00 a.m. and 5:00 p.m. EST. You also can go to <http://www.epa.gov/epaoswer/hotline/>.

The Asbestos Hazard Emergency Response Act (AHERA) regulations require the use of accredited personnel and air clearance monitoring for renovation projects in school buildings. For more information, call the Asbestos and Lead Programs Hotline (1-800-462-6706).

AIR POLLUTION PERMITS

Under federal and state law, the owner of a hot-mix asphalt plant, cement plant, or rock crushing plant may need to obtain a construction and/or operating permit because these sources emit significant levels of particulate matter, combustion gases, and hazardous air pollutants. Usually, the permit is issued by the state or local air pollution control agency responsible for the area where the source is located. In some cases, EPA is the permitting authority. Overall, the permit conditions establish limits on the types and amounts of air pollution allowed, operating requirements for pollution control devices or pollution prevention activities, and monitoring and record keeping requirements. In addition, state agencies may further regulate these sources through nuisance laws.

ENDANGERED SPECIES

Endangered Species Act (ESA) – 16 USC 1531 et seq.

THREATENED OR ENDANGERED SPECIES

Could your construction activities impact endangered or threatened species or their critical habitat? The Endangered Species Act (ESA) requires that federally listed species and habitat not be adversely affected during any activity with federal involvement or subject to federal oversight (e.g., projects that require a NPDES storm water permit for construction). If your activities could impact these species or habitats, you may be required to develop mitigation strategies to minimize the impacts. Prior to construction, you should consult with the local office of the U.S. Fish and Wildlife Service (<http://endangered.fws.gov>), the National Marine Fisheries Service (<http://www.nmfs.noaa.gov>), as well as your local conservation agency, to determine if your project could harm endangered or threatened species, and if so, what to do about it.

For information on the Endangered Species Act, go to <http://endangered.fws.gov/policies/index.html>. Absent any federal involvement or oversight, private landowners must still ensure that their proposed development activities will not result in a “take” of any listed species and may need to develop a habitat conservation plan.

SPILL AND RELEASE REPORTING

Clean Water Act (CWA) – 33 USC §1251 et seq.

Oil Pollution Act (OPA) – 33 USC § 2701 et seq.

Comprehensive Environmental Response Compensation & Liability Act (CERCLA) – 42 USC § 9601 et seq.

Emergency Planning and Community Right-To-Know Act (EPCRA) – 42 USC § 11001 et seq.

OIL SPILL REPORTING

Owners and operators of construction sites that discharge oil in significant quantities to waters of the United States must report the spill. EPA has determined that reportable spills include those that—

- Violate water quality standards
- Cause a sheen upon, or discoloration of, the water surface or shoreline
- Cause a sludge or emulsion to be deposited beneath the water or on the shoreline

To report an oil spill, you must contact the 24-hour National Response Center at 800-424-8802.

HAZARDOUS SUBSTANCE RELEASE REPORTING

For releases of hazardous substances, the federal government has established Superfund Reportable Quantities (RQ). RQs trigger the reporting requirements under CERCLA. If a hazardous substance is released to the environment in an amount that equals or exceeds its RQ, the person “in charge” of the construction site must report the release to federal authorities (the National Response Center at 1-800-424-8802) so that emergency response personnel can evaluate whether a response action is needed. The RQ value is not the only factor used to determine whether federal notification requirements apply. Determining who is the person in charge depends on a number of variables, including the specific operations involved, the management structure, and other case-specific considerations.

Note that CERCLA specifically excludes oil from its reporting requirements. A separate set of oil spill reporting requirements apply (see section above).

Under EPCRA, the federal government has designated several hundred substances as “extremely hazardous substances” based on their acute lethal toxicity. Releases of these extremely hazardous substances trigger reporting requirements to state and local authorities, as well as the federal authorities. Specifically, EPA requires that the owner or operator of a facility that releases an extremely hazardous substance (EHS) in an amount greater than its established RQ (or a CERCLA hazardous substance) notify the state emergency response commission (SERC) and the local emergency planning committee (LEPC) established for the location where the incident occurs.

There are more than 100 chemicals that are designated as both CERCLA hazardous substance and an EPCRA EHS. In the event of a release of any of these substances, the person responsible for the release is required to contact all of the appropriate federal, state, and local authorities. Owners and operators may make their own arrangement concerning which party is to provide release notifications; however, under EPCRA both the owner and operator are responsible if no notification is provided. There is an EPCRA Hotline at 800-424-9346.

OTHER CONSIDERATIONS

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) 42 USC §§ 4321-4347

Are you involved with a federal construction project? If so, the National Environmental Policy Act of 1969 (NEPA), as amended, may affect the project. Under NEPA, an environmental assessment (EA), an environmental impact statement (EIS), or both, may be required. While construction contractors are not legally responsible for preparing an EA and EIS, they should note that a federal construction project may be delayed or interrupted if an EA or an EIS is not prepared by the lead agency. An EIS may not be needed if results of an EA indicate the project has no significant impacts.

For more information on NEPA, go to <http://ceq.eh.doe.gov/nepa/agencies.htm>.

HISTORIC PROPERTIES

Could your construction project impact historic properties? Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to protect historic properties through their activities and oversight. Many states have similar requirements. Your construction project may be subject to these requirements, so contact your local historic preservation office to determine if your construction activity impacts historic properties. For more information on the NHPA, go to <http://www.achp.gov/regs.html>.

GREEN BUILDING

As the environmental impact of buildings becomes more apparent, a new field called green building is arising to reduce the impact at the source. Green or sustainable building is the practice of creating healthier and more resource-efficient methods for construction, renovation, operation, maintenance, and demolition. The elements of the green building program address energy use, water use, construction materials, waste reduction, and the indoor environment. For more information on EPA's green building program, go to <http://www.epa.gov/greenbuilding/>. EPA's Pollution Prevention Resource Exchange Network runs a "topic hub" for residential construction, which includes green building and compliance issues. Go to <http://www.p2rx.org/P2InfoNexpert/construction.cfm>.

BROWNFIELDS

Brownfields are abandoned, idled, or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination. EPA's Brownfield Program provides funding for the assessment, cleanup, and redevelopment of brownfield sites, and leverages public and private investments to help in these efforts. For more information on the Brownfield Program and on how you can use that program for your construction activity, go to <http://www.epa.gov/swerosps/bf/>.

Appendix D: List of Resources for Applicable Legal and Other Requirements (Federal Only)

AGC COMPLIANCE ASSISTANCE RESOURCES

The Associated General Contractors of America's Environmental Services Webpage

Up-to-date information on environmental rules and compliance strategies for contractors provided online at <http://www.constructionenvironment.org>.

EPA COMPLIANCE ASSISTANCE RESOURCES

Construction Industry Compliance Assistance (CICA) Center

The new Construction Industry Compliance Assistance (CICA) Center web site contains plain language explanations of the major environmental laws affecting contractors, along with links to sources of detailed information. The CICA Center is online at <http://www.cicacenter.org/>.

Federal Environmental Requirements for Construction Brochure

EPA and its partners developed a brochure of federal environmental requirements applicable to construction projects. The brochure is primarily written for general contractors. The brochure is online at <http://www.epa.gov/compliance/resources/publications/assistance/sectors/constpub.html>.

Electronic Compendium of Compliance Assistance Tools (ECCAT) for the Construction Industry

EPA and its partners have compiled a list of compliance assistance tools for the construction industry. This information can be accessed at <http://www.epa.gov/compliance/resources/publications/assistance/sectors/constpub.html>.

EPA Web Site

Find a variety of information on federal environmental laws and regulations on EPA's web site. The following links are for contractors' reference only:

- Storm water permits; refer to EPA's Office of Wastewater Management, NPDES Storm Water Program: <http://www.epa.gov/npdes/stormwater>.
- Oil spill requirements for construction activities; refer to EPA's Oil Program web site: <http://www.epa.gov/oilspill/>
- Dredge and fill (Section 404) permits; refer to EPA's Office of Wetlands, Oceans, and Watersheds: <http://www.epa.gov/owow/wetlands/guidance/>
- RCRA hazardous and nonhazardous solid waste requirements; refer to EPA's Office of Solid Waste and Emergency Response: <http://www.epa.gov/epaoswer/osw/laws-reg.htm>

- Hazardous substances (Superfund Liability) requirements for construction activities; refer to EPA's Superfund web site: <http://www.epa.gov/superfund/index.htm>
- Polychlorinated Biphenyl (PCB) waste requirements; refer to EPA's PCB Homepage: <http://www.epa.gov/pcb/>
- Air quality requirements for construction activities; refer to EPA's Air Program Mobile Sources Page: <http://www.epa.gov/ebtpages/airmobilesources.html>
- Asbestos requirements for construction activities; refer to EPA's Asbestos Management and Regulatory Requirements web site: <http://www.epa.gov/fedsite/cd/asbestos.html>
- Endangered Species Act; refer to the U.S. Fish and Wildlife Service's Endangered Species Program: <http://endangered.fws.gov/>

EPA Hotlines and Clearinghouses

EPA's toll-free information "Hotlines and Clearinghouses" provide answer to factual questions about EPA regulations and programs. Check out a listing online at <http://www.epa.gov/epahome/hotline.htm>.

Resource Directory of Small Business Environmental Assistance Providers

An EPA publication, provided in PDF format, that is an easy-to-use guide of key environmental assistance providers for small businesses, online at <http://www.epa.gov/sbo/sba-directory.pdf>.

Small Business Environmental Compliance Homepage

This web site provides links to several compliance assistance resources geared towards small businesses, online at <http://www.smallbiz-enviroweb.org/>.

EPA ADVOCACY & OUTREACH RESOURCES

EPA Federal Register Documents

The *Federal Register*, the government's legal newspaper, is published daily with all federal proposed and final rules. Check out EPA notices online at <http://www.epa.gov/fedrgstr/>.

How to Comment on Federal Rules

"Regulations.gov" is a web site that makes it easier for you to participate in federal rulemaking, online at <http://www.regulations.gov/>. Find, review, and submit comments on federal documents that are open for comment and published in the *Federal Register*.

Introduction to Laws and Regulations

Find a basic description of how laws and regulations come to be, what they are, and where to find them, with an emphasis on environmental laws and regulations, online at <http://www.epa.gov/epahome/lawintro.htm>.

**EPA Guide to the
Development and
Implementation of
Environmental
Regulations**

Learn more about how EPA writes regulations and how your voice can influence the policies that shape our environmental future, online at <http://www.epa.gov/opei/regulatory/booklet/>.

**Environmental Laws—
Full Text**

More than a dozen major laws form the legal basis for the programs of EPA. The text of these laws is online at <http://www.epa.gov/epahome/laws.htm>.

**EPA Organizational
Structure**

<http://www.epa.gov/epahome/organization.htm>.

EPA Employee Directory

Log on to <http://www.epa.gov/epahome/locator.htm> for an electronic EPA Employee Directory.