

Construction environmental guidelines

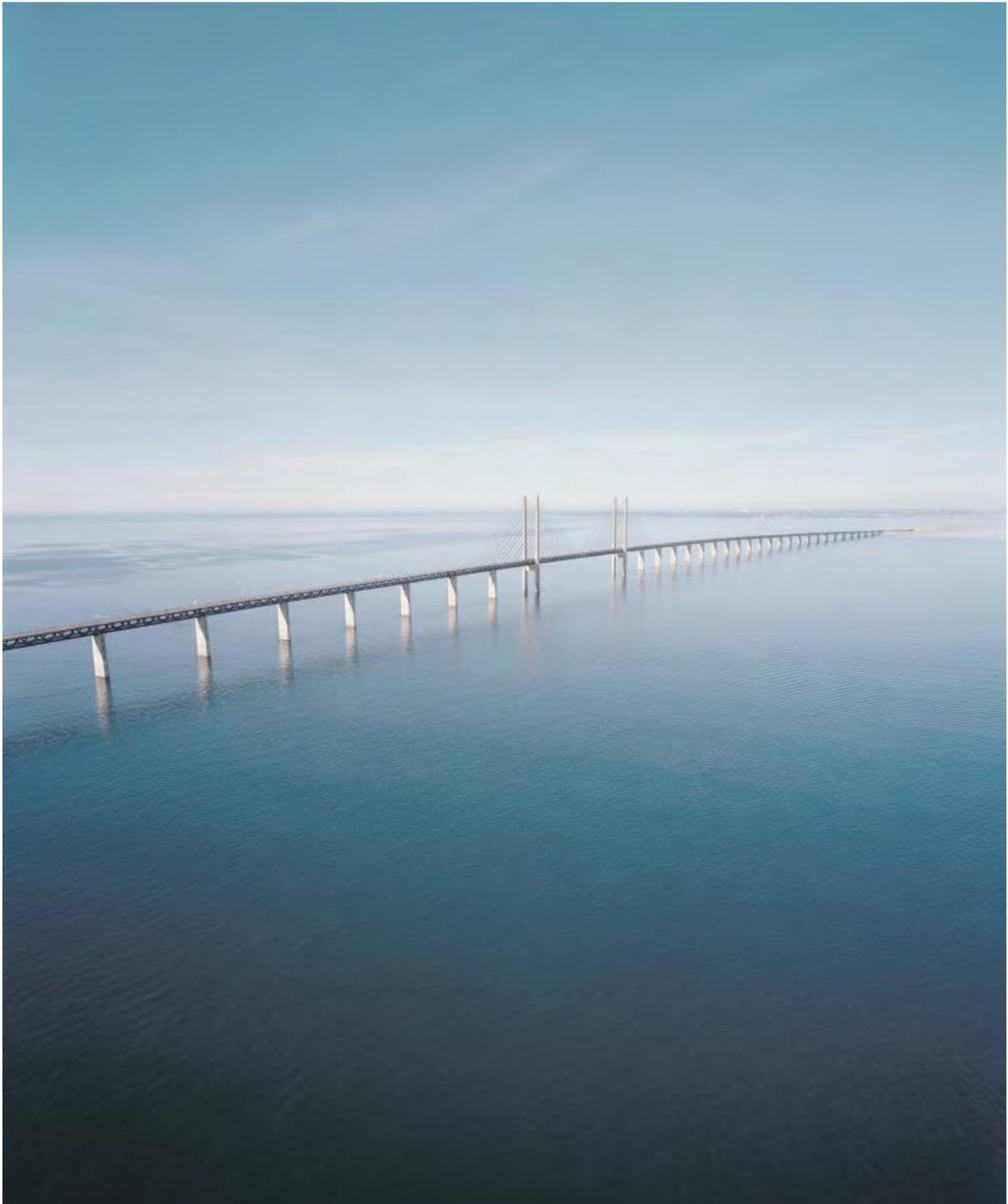


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Introduction



Photo by Zurich Risk Engineer Ken Hazelbaker

The construction industry continues to meet changing and challenging environmental standards of care and regulatory requirements. Aggressive enforcement and social awareness surrounding public health, environmental footprints and natural resource protection are a few of the factors prompting changes in environmental standards and regulations. Therefore, the risk is also increased and, if not well managed, these risks can develop into costly third-party claims, fines and penalties as well as reputational damage for contractors and their clients.

Federal environmental laws may affect both project design and construction and become the basis for project compliance requirements. In many states, there are parallel state and/or local regulations that may impose more stringent compliance requirements. As a result, it is important for each project to identify and comply with applicable environmental regulations.

This white paper does not cover all aspects of environmental exposures since each project is different. However, it does explore the fundamental components to consider when dealing with various aspects of project-specific environmental exposure. Ultimately, it is the responsibility of individual companies to determine the appropriate level of controls.

Environmental Controls – Importance of Early Input

Integration of environmental requirements into project design and construction is critical because it:

- Provides a more complete and accurate bid basis for subcontractors
- Reduces potential for environmental oversight that might affect construction cost, schedule or completion
- Encourages the development of positive agency relationships

Project Environmental Control Plan (PECP)

The primary sources of input to the development of a project's PECP are regulatory and permitting requirements. The environmental requirements found in permits and approvals for construction activities are intended to protect natural resources and the communities within close proximity of the project. Areas for consideration include:

- Air quality
- Surface and ground water quality
- Archeological and cultural resources
- Biological resources
- Public safety

Impact to natural resources and the surrounding community can result from construction site activities such as:

- Earthwork (e.g. cleaning, grading, excavation)
- Equipment operation
- Dewatering or other water discharge activities
- Use and storage of hazardous materials
- Handling and disposal of hazardous waste

Environmental Requirements

Environmental requirements relevant to a construction project are derived from various sources, including federal, state and local regulations. Some environmental control requirements come from laws and regulations that apply to all construction activities (i.e., not from a specific permit). Other requirements arise from project design commitments made by the customer (e.g., permit applications, project correspondence to agencies or environmental impact analysis).

Identifying applicable regulations, permits, and other environmental control requirements for a PECP requires a two-step review by knowledgeable project individuals. The first step is a review of project characteristics including construction materials, generated wastes and site construction activities. This is done to identify activities that trigger requirements specified in federal, state and local regulations, generally in the areas of hazardous materials and waste management. The second step requires a review of terms, conditions and stipulations in all federal, state, and local permits/approvals to identify project-specific environmental requirements.

General Environmental Site Practices

The general environmental site practices listed in this section were developed based upon the experience of major construction projects. Adoption of these practices should help maintain a safe and environmentally responsible jobsite.

1. Construction equipment and support vehicles must travel only on designated roads and highways and other approved access routes.
2. Do not exceed posted or designated speed limits. This is often specified for safety but may also minimize air emissions such as dust and/or protect sensitive wildlife.
3. Stay within the designated limits of work areas and do not disturb anything located outside delineated construction site boundaries. Use exclusion fencing, flagging, staking, or other appropriate markings to delineate environmentally sensitive areas required by project permits and approvals.
4. Keep construction equipment in good operating condition (e.g. hydraulic lines, emission control systems) to help minimize environmental impacts.
5. Refueling of vehicles should only be conducted in designated areas. Vehicle operators should remain with the vehicle during refueling operations.

6. Minimize surface disturbance to reduce erosion potential.
7. Inspect and keep water protection and erosion control devices in good working order.
8. Designate and position equipment wash down areas on site, and provide appropriate control of wash waters to avoid polluting streams, rivers and lakes.
9. Store overburden stockpile, spoil, soil, construction supplies and hazardous materials well away from surface waters, whenever possible, or provide alternative containment measures. Observe setback distances prescribed in project permits.
10. Do not blade or dump soil onto wetlands or stream banks, or into stream corridors or water bodies.
11. Handle and dispose of wastes in compliance with applicable regulations.
12. Recycle and reclaim wastes generated whenever feasible.
13. Minimize generation of wastes, to the extent feasible, through a waste minimization program that includes material procurement, use, handling, housekeeping, and recycling/reclamation.
14. Know what materials are hazardous. Clearly label all products.
15. Keep hazardous materials in their original container if possible.
16. Inventory and manifest all hazardous materials and hazardous wastes in accordance with regulatory requirements.
17. Use adequately sized containment systems (e.g. dikes, berms) as appropriate to avoid the spread of contamination should a spill occur.
18. Promptly respond to spills of hazardous materials.
19. Store incompatible chemicals in segregated areas or in cabinets to physically separate and minimize potential for mixing.
20. Periodically inspect areas where hazardous materials are handled or stored.
21. Provide protected storage areas for chemicals, paints, solvents, fertilizers and other potentially toxic materials.
22. Never feed wildlife.
23. Prohibit collection of artifacts or disturbance to historic or prehistoric sites in the project area, even if they are located outside an exclusion zone. Require all personnel to notify supervisors if any fossils are discovered.
24. Human remains have special protection under federal law. If human remains are discovered during construction, all work in that location must be suspended at once and supervisors are to be contacted.

Hazardous Substances and Hazardous Waste Management

All construction projects are subject to some degree of federal, state and local regulations with respect to the handling, storage and disposal of fuels, lubricants and wastes. The storage, spill reporting, transport, treatment, and disposal of hazardous wastes are subject to a variety of technical, record keeping and reporting requirements. Furthermore, the enforcement branches of agencies responsible for overseeing hazardous materials/hazardous regulation compliance will not accept or allow ignorance of the regulations to be used as an excuse for noncompliance.

Given the complexity of the regulations involved, increasing agency oversight and potential company and personal liabilities, this area requires focused attention and technical environmental assistance in developing and implementing the PECP.

Hazardous Waste Regulations Overview

Several regulations can guide the management and disposal of hazardous wastes and are typically complex. This section provides a brief overview of the major federal regulations that may apply to a construction project.

Resource Conservation and Recovery Act (RCRA)

RCRA gives Environmental Protection Agency (EPA) the authority to regulate hazardous waste. RCRA regulations define hazardous waste, set requirements for hazardous waste generators and transporters and define requirements for waste treatment, storage or disposal. The regulations also define treatment requirements that must be compliant before hazardous wastes can be placed in land disposal facilities.

Individual states are responsible for implementing the RCRA program provided the EPA has approved the state program. The majority of states are authorized to implement RCRA. The state programs can be and frequently are more stringent than the federal regulations. Even states that are not authorized by the EPA can have their own hazardous waste program under state law.

In general, the regulations require those generating hazardous waste to:

- Properly classify all wastes
- Properly identify the waste as hazardous
- Account for all hazardous waste generated
- Obtain an EPA identification number
- Use hazardous waste manifests and transporters with EPA identification numbers
- Obtain a permit for construction and operation of a hazardous waste treatment, storage and disposal facility (A permit is not required for storage by a generator if storage time is less than 90 days, and in some instances less than 180 or 270 days)
- Provide treatment of hazardous wastes prior to disposal, and restrict use of treatment involving placement of untreated waste on land
- Encourage source reduction, recycling and reuse over treatment and disposal

Compensation and Liability Act (CERCLA)

CERCLA gives the government the authority to require cleanup of sites where “hazardous substances” have been disposed of and thus may endanger human health or the environment. The definition of “hazardous substance” includes all RCRA hazardous wastes, but is much broader. The government can order a company to pay for the entire cleanup of a site regardless of the fact that the company’s disposal of waste was legal and regardless of how little waste the company disposed of at the site.

A company may become liable for cleanup of a problem site if it disposed of its wastes there or if it arranged for disposal of wastes at the site. A company that generates hazardous waste remains responsible for those wastes in perpetuity. Other companies may also become potentially liable for cleanup of sites if they were involved in arranging for transport, treatment or disposal of hazardous wastes.

CERCLA requires reporting of releases, suspected releases or threatened releases of hazardous wastes, chemical or petroleum products. A release is defined as any spilling, leaking, releasing, discharging, dumping or disposing of any hazardous materials into the environment. Release also is defined to include the threat of a release (i.e., finding a drum of hazardous material when excavating a site is considered a “release” and is reportable).

Notification to local authorities is required if there are greater than specified amounts of hazardous chemicals stored on site.

Toxic Substances Control Act (TSCA)

The TSCA is used to control the manufacture, use and distribution in commerce and disposal of three categories of substance likely to be found at construction sites:

- Polychlorinated biphenyls or PCBs
- Chlorofluorocarbons or CFCs (also frequently referred to by their most common trade name, Freon)
- Asbestos

PCBs and asbestos are frequently found where construction is on an old site or on sites where older structures are present.

Other Regulations (Used Oil)

Under RCRA, used oil in and of itself is not considered a hazardous waste at the federal level; however, it is subject to special management standards, and must be recycled (either for refining or for use as fuel). Under federal regulation, used oil can be hazardous waste if it is mixed with other hazardous wastes. There is a presumption in the federal rules that oil containing more than 1000 ppm total halogens (e.g. chlorine or fluorine) has been mixed with regulated solvents and must be managed as a hazardous waste. In addition, used oil is regulated in many states as a hazardous waste (e.g. California).

Determination of Hazardous Substances or Hazardous Wastes

It is important to correctly identify those substances used or generated by a project as either hazardous or non-hazardous. Improper determination can lead to either non-compliance with regulatory requirements, or can result in unnecessary and costly waste handling and disposal practices. The generator is responsible for

determining whether or not wastes are hazardous, and can use either knowledge or testing to make the determination.

Hazardous Wastes

The federal definition of a hazardous waste under the RCRA is complicated. In general, wastes are defined as hazardous in one of two ways: 1) If it contains an EPA-listed waste or 2) it demonstrates hazardous characteristics, which include ignitability, corrosivity, reactivity and toxicity.

Federal regulations defining hazardous waste are found at 40 CFR 261. States may also have lists and criteria that vary significantly from the federal lists and these must also be verified.

Listed hazardous wastes are wastes from specific processes or specific uses, such as spent solvents, wastewater treatment sludges from manufacturing or processing of explosives or off-specification commercial chemical products listed at 40 CFR 261.32 and 33.

It is important to note that if a listed waste is mixed with a non-hazardous waste, it increases the costs of management due to the volume increase.

Hazardous Substances

Hazardous substances are those chemicals released or improperly disposed of that trigger Superfund liability resulting in site cleanup costs. The list, at 40 CFR 302.4, contains over 750 substances and, while it does include all RCRA Hazardous Wastes, is much broader than the definition of Hazardous Wastes as defined by RCRA. Spills and other releases of Hazardous Substances must be reported if they exceed the Reportable Quantity (RQ) as defined by regulations. The RQ for Hazardous Substances present on a construction site should be stated in the Construction Environmental Control Plan for the site.

“Hazardous substances” as used in the Superfund program is a broader term than “hazardous waste”. All hazardous wastes are hazardous substances, but the term hazardous substances also include all pollutants designated under the Federal Water Pollution Control Act (FWPCA), and other substances designated by EPA. Importantly, it does not contain petroleum including crude oil or any refined products, such as gasoline or diesel fuel, but rather covers waste such as used oil where CERCLA hazardous substances have been added in formulation or through contamination.

Example of Listed Hazardous Wastes

There are several hundred listed hazardous wastes, most of which are not likely to be found on construction sites except as contamination resulting from previous activity; however, any hazardous waste at a construction site derived from previous activity must still be handled in accordance with all applicable regulations. The regulated wastes most likely to be generated or otherwise be present on a construction site are:

Used Oil – Not a “hazardous waste” under federal regulations, but it is specially regulated by the federal government and considered hazardous waste under state regulation in many cases.

Spent solvents – Many solvents used on construction sites are regulated including tetrachloroethylene, trichloroethylene, 1,1,1-trichloroacetone, xylene, ether, methyl isobutyl ketone, cyclohexanone, methanol, nitrobenzene, toluene, benzene, carbon disulfide and others (about 25 total). Residues from these spent solvents are also hazardous wastes.

PCBs – PCBs are found in transformer and capacitor oil and in disposed transformers and capacitors, some old fluorescent light ballasts and other electrical equipment. PCBs are regulated under the TSCA if the concentration is greater than 50 ppm. Soil concentrations may be regulated at lower levels. Regulations are found in 40 CFR 761, not with Federal RCRA regulations.

Asbestos – Commonly used insulating material and also used in some cement products (pipe, shingle) and flooring/ceiling products (vinyl tile). Suspect material must be tested prior to removal, and special requirements include worker training, worker protection and disposal during removal.

Paint Wastes, Thinners – Both may be regulated by state laws and the thinners may be regulated under RCRA as spent solvents.

Pesticides – Excess pesticide products may be hazardous wastes under federal or state regulations. Check on the regulatory status before disposing of such wastes.

Other – Depending on the state, some discarded materials such as fuels, explosives, and adhesives, may be regulated as hazardous.

Determining if a Project Generates Hazardous Waste

Compliance with proper identification of hazardous wastes and the regulations is essential from an environmental protection and liability standpoint. Incorrect determination of the regulatory status of a waste can result in unnecessary and costly treatment and disposal (if the waste is not hazardous, but it is managed as if it were); or potential environmental impact, criminal penalties, fines and negative publicity (if it is a hazardous waste and it is not managed as such).

The determination of whether or not a project will generate hazardous waste requires a thorough review of materials to be used at the site and the processes that will produce waste streams. The following guidance is provided to assist project staff in determining if they are dealing with hazardous wastes.

1. Conduct an inventory of materials to be used at the site. Safety Data Sheets (SDSs) are a good source of information on the chemicals in products.
2. Review processes in which these materials will be used; identify and characterize expected waste streams.
3. Identify materials that will not be used, may become contaminated, have expiration dates, are off-specification or are surplus. Also consider potential for cross-contamination during use.
4. Determine the regulatory status of each waste if it does not fall within the definition of a hazardous waste (i.e. if a waste is a hazardous waste or non-hazardous waste). If non-hazardous under federal law, the waste nonetheless may contain hazardous constituents, which might trigger additional state requirements. This determination must be made for both:
 - The state in which the waste is generated (where project is located); and
 - The state(s) in which the waste is treated and/or disposed.
5. Document all waste determinations.

Inventory of Hazardous Substances

An inventory of hazardous materials to be stored and used on the project should be conducted. This is necessary because (1) when disposing of these materials they may be considered hazardous waste, and (2) depending on material quantities present on site, inventory submissions to local agencies may trigger the requirement for an emergency response plan. The following steps should be taken to identify all materials that will be present at the project site.

1. Determine what materials are present in bulk in RQ.
2. Identify material container sizes and determine if single containers contain RQs.

Responsibility for Proper Handling and Disposal

Arranging for disposal of hazardous substances may make one a Potentially Responsible Party (PRP) under Superfund and therefore liable for cleanup costs if the disposal site later becomes a Superfund site. A single PRP may become responsible for cleaning up a site in its entirety, regardless of the amount of waste actually disposed of at the site by that PRP.

Hazardous wastes on construction sites can generally be classified for the purpose of determining who has responsibility for treatment or disposal, unless the customer contract and/or subcontracts expressly provide otherwise.

Selecting a Hazardous Waste Transporter, Treatment or Disposal Contractor

It should be your company's practice to avoid, insofar as possible, playing any role in arranging for off-site disposal of hazardous substances or hazardous waste. There is a potential risk if hazardous substances are disposed of at a site that later leaks or threatens to leak, thereby causing your company to become a PRP and be liable for the cost of Superfund cleanup at that site. Careful selection of transporters and disposal sites is important to maximize the likelihood of a selection that will be properly managed and maintained by a technically competent and financially viable contractor, thus minimizing the likelihood that the site will ever end up a Superfund site.

GENERAL GUIDANCE

1. Contract directly with the treatment facility or disposal site (i.e. do not contract with the transporter and allow the transporter to subcontract with the treatment facility/disposal site.)
2. Contract separately with the transporter, or allow the treatment or disposal facility to arrange transportation as part of their contract.
3. If exporting waste, notify the EPA at least 60 days before the initial shipment.

Selecting Treatment, Storage or Disposal (TSD) Facilities

1. Confirm the receiving facility has current licenses or permits as required by regulatory agencies (e.g. DOT, state or federal EPA) to transport, recycle, treat or dispose of the waste(s). Contact the appropriate regulatory agencies to verify that the permits are current and that the facility is in good standing.

2. For large quantities of waste and for highly toxic waste, a site inspection should be conducted. A site inspection may evaluate and determine appropriateness of the site.
3. To the extent feasible, confirm the vendor's financial responsibility for closure and post closure care of the facility. Information to be evaluated includes:
 - Company ownership
 - Insurance
 - Adequate RCRA closure and post-closure care finances
 - Basis for closure and post-closure costs

Special Considerations for Selecting Waste Treatment Facilities

1. The facility should have the capacity to treat materials in a reasonable period of time as specified by contract.
2. Treatment residuals must meet legal requirements for treatment as outlined in 40CFR 268.
3. The contract should provide that the cost of any retreatment is borne by the facility if the waste does not meet the treatment requirement of 40CFR 268.
4. Determine where treatment residuals go. Review lower-tier vendor qualifications, licenses, permits, etc. to ensure treatment residuals are handled in compliance with regulations by qualified vendors.
5. Identify and comply with any special waste handling procedures or documentations required by the facility to handle residual waste.

Special Considerations for Selection of Landfills

Landfill cells to be used for disposal of wastes should meet minimum technology requirements for new units (double liner, leachate collection systems, etc.). Waste should be disposed of with compatible wastes, and in particular, in landfill cells that take only waste meeting Land Disposal Restriction treatment standards. This should be specified in the contract.

Other Land Disposal Units

There are several other types of disposal units that are defined by RCRA to be land disposal units, including surface impoundments, land treatment facilities (land farms), waste piles and injection wells. There are strict limits on uses for any land disposal unit other than landfills. In certain circumstances, surface impoundments can be used for treatment of hazardous wastes. For other land disposal units including landfills, wastes placed in the units must meet treatment standards specified by EPA under the Land Disposal Restrictions provisions of RCRA except in certain exceptional circumstances. Contemplation of other disposal units should not be considered without legal assistance.

Considerations for Selection of a Transporter

1. Determine that the hauler is qualified and licensed (i.e. DOT, State) to perform services in all states it will travel through.

2. Confirm that the transporter of hazardous waste has an EPA identification number.
3. Clearly state in the contract that the transporter bears the responsibility for cleanup in case of an accident during transport.
4. Verify that the transporter has adequate insurance based on pre-determined company requirements.
5. Contract only for the transportation of hazardous waste to a treatment or disposal facility identified on the Uniform Hazardous Waste Manifest or state equivalent.
6. Haulers should only be allowed to transport waste to an alternative facility in those cases where one is identified on the Manifest, and then only after contacting your company representative. If neither facility is available for receipt of the waste, the transporter should return the waste to the originating site.
7. Contractually require that the hauler must notify the generator and receive permission before disposing of material other than as provided in the contract.

Used Oil Management

The EPA assumes that used oil will be recycled and therefore, it is not as stringently regulated as RCRA hazardous wastes. However, used oil that contains total halogens (e.g., chloride, fluorine) at concentrations greater than 1000 ppm are presumed to be hazardous waste and cannot be recycled. Used oil with greater than 1000 ppm total halogens must be managed like any other hazardous waste under 40 CFR Parts 262-270 instead of under the more favorable used oil management standards of 40 CFR Part 279. On a construction site, used oil is not likely to contain greater than 1000 ppm total halogens unless it has been mixed with another waste stream, such as chlorinated solvent used for degreasing.

To avoid creating a hazardous waste on a jobsite:

1. Do not mix used oil with any other waste stream (e.g. chlorinated solvent used for degreasing) that may cause it to be categorized as a hazardous waste by virtue of EPA's mixture rule.
2. If contamination with chlorinated solvents is possible, use test kits to check used oil for chlorine before batching into bulk tanks.

Generator Standards

1. A generator of used oil that is not mixed with hazardous waste (i.e. is not a hazardous waste under the federal RCRA program) does not require an EPA ID number. However, a generator of used oil that is regulated as a hazardous waste by the EPA or state does require an EPA ID number.
2. Storage of used oil must be in tanks or containers that meet the requirements specified in 40CFR 265. Aboveground storage tanks must have a secondary containment system.
3. Containers and aboveground tanks must be clearly marked or labeled with the words "Used Oil".
4. Control access to used oil storage areas.
5. Evaluate used oil aggregation points for compliance with requirements. Generators may utilize used oil aggregation points to collect used oil from other sites owned by the generator, provided that

shipments are in quantities of 55 gallons or less. The aggregation point must comply with all applicable used oil storage requirements.

Transportation Requirements

1. Verify transporter has a current EPA ID number.
2. Transporters must comply with all applicable DOT regulations.
3. Retain copies of transporter records regarding shipment of used oil.
4. Quantities of less than 55 gallons may be transported by the generator without a transporter EPA ID number, provided that the used oil is transported in a company vehicle by a company employee to a company owned or operated aggregation point.

Recycling and Disposal

1. Verify that the used oil processing/re-refining facility receiving project shipments has an EPA ID number.
2. Dispose of any used oil that is hazardous waste at a RCRA-permitted hazardous waste treatment, storage and disposal facility.
3. Disposal of used oil as a dust suppressant is prohibited unless state-specific requirements exist that allow this practice. Consult state and local regulations for use and handling requirements.

Discovery of Contaminated Soil or Materials or Underground Storage Tanks

Laws and regulations require reporting discovered releases or suspected releases of hazardous substances, including past releases that have not already been reported. While the act of reporting a suspected release does not create liability for cleanup under Superfund or state law, EPA and state agencies have the authority to require cleanup of contaminated discoveries.

Identification of contamination present at a jobsite is necessary for the protection of both worker health and safety and prevention of site exposure. If a suspected release is discovered, notify the appropriate supervisor immediately.

1. When buried drums, stained soils or strong odors are encountered during excavation, discontinue operations in the vicinity immediately and notify the supervisor.
2. Site manager should notify the customer immediately. Document all actions and delays or other effects of the discovery.
3. Determine contractual responsibilities.
4. Reporting is required upon discovery and in any case within 24 hours. In some states, the report is required within 2 hours.
5. Determine whether or not there has been a release or a suspected release of a hazardous substance in a quantity greater than the RQ.

6. Report a suspected release if there is unknown material in a drum or other type of container that may have leaked out.
7. Do not automatically report if a drum, tank or other container has been found that appears to have been empty when placed in the location.

Underground Storage Tanks (USTs)

Different regulations apply to USTs. These regulations, 40CFR 280 and related state regulations, deal specifically with underground storage tanks and related piping and other ancillary equipment.

In most cases, the owners and operators of USTs should have notified the EPA or the state of the existence of the UST unless it was removed from the ground before 1974. As a result, it is unlikely there will be any unexpected UST discoveries but such discoveries do occasionally occur. More frequently, there will be the discovery of a release from such a tank during excavation and removal.

If an unknown tank or release from a tank is discovered, the following apply:

1. Stop work in the area. Notify the supervisor.
2. Notify the customer. Document all actions and delays or other effects of the discovery.
3. Verify the customer will report the discovery of the unknown tank or release to the appropriate authority.

Reporting Hazardous Substances or Hazardous Waste Releases

Reporting of release or suspected release of hazardous substances or hazardous wastes may be required under several regulations. These reporting requirements are not limited to release or suspected release of RCRA hazardous waste, but include all CERCLA and state hazardous waste substances.

1. Determine who is responsible for reporting obligations. This is often provided for in the contract. Please note, however, that even where the customer has reporting responsibility by contractual agreement, your company may still have an obligation to report if the customer fails to do so.
2. Report any release of hazardous substances in quantities greater than RQ (40CFR 302.4).
3. Report suspected releases of hazardous substances in quantities greater than RQ.
4. Report release or suspected release to the National Response Center (800) 424-8802 and the local state agency.
5. Report the release of a RQ of any Extremely Hazardous Substance (40CFR 355, Appendix A) that results in exposure to anyone off-site to the community emergency planning coordinator of the local emergency planning committee.

Asbestos

Asbestos fibers may be contained in many materials encountered during building renovation or demolition including:

- Cement products (piping and siding)
- Floor and ceiling tiles
- Pipe and equipment insulation
- Fireproofing
- Acoustic tiles
- Coatings and mastics
- Electric components
- Built-up roofing systems



Photo by Zurich Risk Engineer Frank Slama

When your company performs service on an existing structure, an asbestos survey should be performed prior to construction or demolition.

Regulations

The primary federal regulations regarding asbestos include:

- National Emission Standards for Hazardous Air Pollutants (NESHAPS) regulation for demolition and renovation of building containing asbestos (40 CFR 61)
- OSHA worker safety standards (29CFR 1910 and 1926)
- Toxic Substances Control Act (TSCA) ban on asbestos products (40 CFR 763, Subpart I) used to control the manufacture, use, and distribution in commerce and disposal of specific substances including asbestos
- Federal Asbestos Hazard Emergency Response Act of 1986 (AHERA) regulations for asbestos in schools (40 CFR 763, Subpart E)
- Federal Department of Transportation (DOT) requirements for transport of hazardous materials (49 CFR 172)

This section focuses on Federal NESHAPS requirements. Authority for enforcement of the asbestos NESHAPS lies with the EPA, however, the EPA has delegated enforcement to some states. Additionally, states may have more stringent regulations concerning management of asbestos.

Responsibility for compliance with asbestos regulations is imposed on the owner or operator of a demolition or renovation activity. The building owner is always responsible; however, a person or company that owns, leases, controls or supervises a demolition or renovation operation is also responsible.

Regulatory Requirements

The NESHAPS has four basic requirements related to renovation or demolition of buildings.

- Determination of whether threshold levels of asbestos are present
- Notification to EPA
- Work practice standards (to control asbestos emissions during construction)
- Standards for waste disposal

Prior to any demolition or renovation activity, the owner, tenant and/or contractor must thoroughly inspect the building for asbestos. The EPA requires that accredited asbestos inspectors conduct required surveys. In addition, some states may require use of state-certified asbestos consultants.

The building owner, tenant or contractor needs to notify EPA or the state agency with delegated authority in writing within 10 days before a demolition and certain renovation activities are initiated as described in 40 CFR 61.145(b). Notification must be given (postmarked) 10 working days prior to the activity. Faxes and telephone calls are not considered adequate legal notice.

For demolition work, notice is required even if the inspection revealed no asbestos. Work practice standards do not apply to demolitions below threshold amounts. For renovation work, notice is required only if asbestos was found to exceed prescribed threshold amounts (40CFR 61.145). As with demolition projects, certain threshold quantities apply which are used to determine notice and work practice requirements. The notification form may be found at 40 CFR 61.145.

Notice for demolition activities with asbestos below specified threshold amounts only needs to define the scheduled starting and completion dates and a description of the procedures to be followed if asbestos is found or becomes crumbled or friable.

The NESHAPS regulation establishes work practice requirements for removal of Asbestos Containing Material (ACM) to prevent exposure to airborne asbestos (i.e. control of asbestos emissions). The owner, tenant and contractor are legally responsible for ensuring compliance with these requirements.

Waste disposal standards (40 CFR 61.150) identify emission control and waste treatment methods for asbestos during collection, processing, packaging or transporting. They also identify disposal requirements, transport vehicle markings and requirements for record keeping.

Management Practices

1. Determine if the project involves any demolition or renovation of existing facilities.
2. Review contract for division of responsibility-related compliance with environmental, including compliance with asbestos regulations.
3. Determine who is responsible for conducting asbestos inspections.
4. Review and identify state inspection requirements.

5. Verify that inspection requirements are understood by responsible party(ies) and those persons conducting inspections are properly trained and/or certified.
6. Do not undertake work involving demolition or renovation without an asbestos survey.
7. Whenever possible, complete inspection well in advance so that the findings can be incorporated into bid documents.
8. Review the inspection report for specific findings.
9. Require a final clearance report from the asbestos removal consultant stating all required abatement work was completed.
10. If unexpected asbestos is discovered during demolition or renovation activities, all workers should be removed from the work area.
11. Waste handling and preparation for transport to disposal or treatment facility must be in accordance with work practices and requirements specified in 40 CFR 61.50.
12. Vehicles used to transport waste off site must have proper markings during loading and unloading operations.
13. Obtain a copy of each waste shipment record.
14. Waste generators must provide a copy of the waste shipment record to the disposal site owners or operators at the time of shipment delivery.
15. Waste generators must provide a written report to the NESHAP program office if the waste shipment record signed by the owner or operator of the disposal site is not received within 45 days of the date the waste was accepted.
16. Retain all waste shipment records for at least two years.

Waste Minimization and Recycling

This section provides general guidelines that may be used in developing either a required or voluntary waste minimization and/or recycling program. Waste minimization and recycling should be encouraged for a number of reasons. Well thought out waste minimization and recycling programs may help:

- Reduce project costs by minimizing over-purchasing and exceedance of product shelf life
- Reduce or eliminate inventories and possible releases of hazardous substances
- Reduce waste storage, treatment, transport, and disposal costs
- Reduce potential worker exposure to hazardous chemicals
- Minimize potential for environmental or human health impact
- Minimize spill prevention and control, and emergency response planning by reducing hazardous materials volumes

- Decrease potential for future Superfund and RCRA liabilities, and future toxic tort liabilities
- Reduce regulatory compliance costs (especially for hazardous wastes)
- Enhance organizational reputation and image

Federal and State Requirements

Congress has established a clear national priority for eliminating or reducing the generation of hazardous waste. In addition, RCRA Section 3002(b) requires generators of hazardous waste to provide hazardous waste manifests that certify a waste minimization program has been developed and is in place.

The EPA has established the following hierarchy of waste management options, in descending order of preference:

- Prevention
- Environmentally sound recycling
- Environmentally sound treatment
- Environmentally sound disposal

Chemical Selection

Selection of chemicals with consideration for disposal of residues or unused material is an effective way of reducing high costs associated with hazardous material disposal. Consideration should be given to materials selected for construction such as:

- Select non-hazardous materials when practical. The fewer the materials that will require disposal as hazardous waste, the lower the disposal cost.
- Use the minimum volume or concentrations required to accomplish a task. Careless use of materials that will ultimately require disposal will unnecessarily increase disposal costs.

Waste Reduction

By coordinating procurement and construction schedules, the volume of materials that may need to be disposed of could be reduced. Many materials, such as paints and coatings may be characterized as hazardous for disposal purposes. Several general guidelines can be followed:

- Schedule procurement activities and material delivery to match the schedule for use of the materials at the construction site. Materials purchased too far in advance may result in an expired shelf life and will require disposal.
- Manage excess materials to minimize disposal. Check material eligibility for use elsewhere on the project. If possible, return the material to the vendor.
- Segregate clean wastes from contaminated (hazardous) wastes. Do not mix hazardous wastes with non-hazardous waste; doing so may require handling and disposal of the mixed material as hazardous waste, and result in much more costly disposal.

- Do not mix types of waste. Keeping types of wastes separated can reduce potential chemical reactions, allow the waste to be more easily characterized, and enhance recycling or reuse opportunities.
- Drain and crush equipment filters. Draining of equipment filter (e.g. oil filters) may allow handling and disposal as non-hazardous waste.
- Use waste containers suitable for both accumulation and disposal of hazardous wastes whenever practical. Transferring and repackaging of wastes for disposal requires additional containers, and either disposal or decontamination of the original containers, increasing disposal volume and cost.
- Recycle and/or exchange materials whenever possible. These practices reduce both excess material acquisition and the volume of wastes requiring off-site disposal. Examples of commonly generated wastes that may be recycled include used oil (e.g., crankcase oil, transmission fluid, and hydraulic fluid), antifreeze (ethylene glycol solution) and lead acid batteries.
- Compact waste materials when feasible. When the cost of waste disposal is determined by volume (e.g., barrel, dumpster), compacting wastes prior to shipment off-site may greatly reduce costs.

Although many of the practices listed above apply to both hazardous and non-hazardous wastes, on-site segregation and recycling of non-hazardous waste at jobsites is becoming more common. Depending on local recycling programs and availability, materials such as newspaper, waste paper and cardboard, glass, metals (e.g. aluminum), and some plastics can easily be separated from jobsite solid wastes requiring disposal at local landfills. These types of programs not only reduce the cost of material disposal, but also are often positive from a community relation's standpoint. The following should be considered:

- Contact the local government agencies and waste disposal companies to identify recycling programs available in the project area.
- Provide adequate, well-marked containers (e.g. dumpsters, barrels) at the jobsite for collection of recyclable materials.
- Arrange for material collection and hauling to a recycling facility to occur on a regular basis, with the frequency depending on the volume of material generated.

Developing a Waste Minimization Program

If hazardous waste is generated and requires Manifest preparation, a waste minimization program must be developed pursuant to Section 3002(b) of RCRA. Beyond simply complying with regulatory mandates, a waste minimization plan can create a positive environmental impact and save your company money. Better managing chemical inventory and chemical lifecycle can reduce the costs associated with purchasing; inventory control; and waste.

Environmental Inspection and Monitoring

Inspections

Inspections are typically conducted to determine whether field activities are being directed in compliance with applicable regulations, project commitments and specifications, construction plans and/or permit conditions. For large construction projects involving extensive ground disturbance, or work in close proximity to sensitive

environmental resources, a formalized environmental inspection program may be mandated by conditions attached to permits or governmental agencies.

Source of Inspection Requirements

Inspections are conducted to verify that a project is being constructed in compliance with applicable regulatory requirements and contract/subcontract specifications. Sources of environmental inspection requirements include project permits and other regulatory agency approvals, environmental regulations and other project plans.

All sources of environmental compliance requirements must be reviewed to identify inspection requirements that will be included in the PECP. Examples of project activities that may require inspection include, but are not limited to:

- Storage and handling of hazardous materials/waste
 1. Material specifications (e.g. coating/paint VOC content)
 2. Installation and maintenance of erosion control structures
 3. Spill response equipment readiness
 4. Fire prevention/response readiness
 5. Resource mitigation implementation (e.g., exclusion fencing)
 6. Implementation of site restoration/revegetation requirements

Define each identified inspection requirement based on specific items/ actions to be inspected (i.e. develop a checklist), documentation requirements, and inspector qualifications.

Schedule

Inspections are typically performed on a set schedule or at the completion of specific tasks.

1. Develop a schedule for each of the inspection requirements identified in the PECP.
2. Identify and develop appropriate management and tracking tools for implementation of inspection requirements.
3. Clearly define responsibility for scheduling coordinating, overseeing and documenting inspection activities.

Corrective Action and Follow-up

Develop a procedure to document non-compliance issues and corrective measures. Include components such as the non-compliance source with corrective actions, transmittal of information to responsible party; and a method to confirm that corrective actions have been properly implemented within the specified time period.

Documentation and Record Keeping

Environmental inspections should be documented and records retained in project files. Documentation examples include telephone conversation logs, written correspondence, inspection logs and reports, and non-conformance reports with corrective actions.

Develop appropriate field inspection checklists, forms or other documentation and incorporate into the PECP. Checklists and forms generally should contain the following:

- Date and time
- Location
- Activity being inspected
- Inspector's observations and relevant data
- Need, if any, for corrective action
- Name, title and signature of inspector

Notification and Reporting Requirements

Identify all agency notification and reporting requirements that are required for inspection activities.

Definition of Monitoring

Monitoring varies from inspection in that the intent of monitoring is to identify potential resource impacts prior to, during or after construction, thus allowing modification of construction practices or implementations of mitigation, as appropriate, to avoid significant resource (i.e., to protect resources). Monitoring activities are typically resource-specific (e.g., biological resources, cultural resources) and localized.

Monitoring requirements are often identified in project permits or approvals, or as a component of environmental mitigation and resource protection plans that a project is required to prepare and agencies must approve.

Sources of Monitoring Requirements

Monitoring requirements are typically specified in environmental analysis documents, project permits and approvals. Agency required resource protection plans or mitigation plans may also trigger monitoring requirements. Monitoring of resources is often required where specific development plans or resource information was not available during the permitting process, and therefore, impacts to a resource could not be pre-determined. Project permits also can require monitoring to demonstrate that specific criteria or environmental protection standards are not exceeded during construction activity.

1. All sources of environmental compliance requirements must be reviewed to identify any monitoring requirements and incorporated into the PECP. Examples of resources that may require some type of monitoring activity include, but are not limited to:
 - Air quality or air emissions
 - Water quality parameters

- Biological resources
 - Archaeological and cultural resources
 - Noise levels
 - Site restorations/revegetation activities and success criteria
 - Erosion control structures
2. Define each monitoring requirement identified based on the specific resource or construction activity to be monitored. Also identify documentation requirements and qualifications or expertise needed by a monitor.

Schedules

Monitoring may be required during different project phases including: 1) pre-construction: 2) throughout project construction or during specific construction activities; and 3) post construction. Develop a schedule for each of the monitoring requirements and incorporate it into the PECP.

A brief discussion of each potential phase of monitoring is provided below.

Pre-construction Monitoring – Pre-construction monitoring is conducted to identify sensitive environmental resources that may be affected by construction and may be used to develop resource protection or mitigation measures.

Construction Monitoring – Monitoring during construction is generally conducted to detect adverse impacts on a sensitive resource early enough to enable suspension of the activity causing the impact. It is also performed to allow identification of sensitive resources not expected or known to occur at or near the site. The resource can then be evaluated and appropriate actions or mitigation identified and implemented. For most resources, monitoring during construction is focused on earth disturbing activities. In some cases, off site wildlife monitoring may be required when there is equipment activity at a nearby construction site.

Post-Construction Monitoring – Post-construction monitoring is typically done to evaluate residual impacts and resource restoration and recovery. For example, post-construction monitoring is often required to assess the progress or success of site restoration and revegetation efforts.

Management Tools

Data management tools should be developed to address project-specific monitoring and documentation requirements. Depending on the complexity of the project's monitoring requirements, such management tools can include matrices or computerized databases, schedules and maps annotated with monitoring requirements and information.

Matrices and Databases – Development of a matrix that identifies all agency-specified monitoring requirements can be helpful in planning, executing, documenting and reporting monitoring activities. Identification of monitoring requirements by resource, the nature of each requirement, special technical expertise required, relevant construction activity, monitoring location, type of documentation that will provide adequate record of compliance and any agency reporting requirements can be incorporated.

Schedules – Monitoring schedules are important for planning specific staffing needs. They should be tied to construction schedules and are critical when there are specific pre-construction requirements. Required field monitoring, reporting of results to agencies and contingency or mitigation planning and agency review/approval must be completed within appropriate time frames to prevent delays in construction activities.

Maps – Site maps annotated with general construction activity areas requiring resource monitoring, type of required monitoring or resource and sampling locations are useful tools for field reference. Accurate, up-to-date monitoring maps provide a quick reference for field personnel to know which resources are potentially present and during what construction phase monitoring is required.

1. Identify and develop appropriate management and tracking tools for implementation of monitoring requirements
2. Clearly define responsibility for scheduling, coordinating, overseeing and documenting monitoring activities.

Mitigation Requirements

For each monitoring requirement, identify the actions that are necessary if conditions are found that do not meet permit conditions or that trigger mitigation. This may include suspension of specific construction activities, implementation of specific mitigation requirements and/or agency notification and consultation.

Mitigation requirements that may be triggered by monitoring results should be clearly defined and feasible. Unresolved mitigation requirements typically require some agency negotiation and can lead to substantial project delays.

Documentation and Record Keeping

Environmental monitoring should be documented and retained in project files. Examples of documentation are telephone conversation logs, written correspondence, monitoring logs, observation, and monitoring reports. Develop appropriate field monitoring checklists, forms, logs, etc., for each type of monitoring requirements and incorporate into the PECP including the following:

- Date and time
- Location
- Resources being monitored
- Monitor's observation and relevant data (e.g., presence/absence of resource, number of individuals, behavioral reactions to construction, analytical data)
- Name, title and signature of monitor

Notification and Reporting Requirements

Identify all agency notification and reporting requirements that are required for monitoring activities.

Regulatory Reporting Requirements

Routine regulatory reporting to agencies is often an environmental requirement specified in agency permits and approvals, as well as in some regulations. Reporting requirements must be understood so that any required reporting actions are conducted within specified timeframes and so that appropriate documentation and information can be collected to satisfy requirements.

Understanding the type of reporting required and expected by the regulatory agencies should be determined prior to the start of construction. There are steps that can be taken to ensure appropriate information is reported, including:

1. Review all project permits and approvals, as well as regulatory requirements that may be applicable to project activities (e.g., hazardous waste compliance) for specific reporting and record keeping requirements. If necessary, clarify these requirements with the appropriate agency.
2. For each reporting requirement, specify the source (e.g., permit, regulation), agency and/or contact person, type of reporting, schedule and project staff responsibility (i.e., person that will prepare and/or make the report).
3. Incorporate into the PECP all reporting requirements identified. Identify any special forms (e.g., monitoring data forms, inspection checklists) necessary to develop an adequate record.
4. Identify in the PECP the individuals responsible for:
 - Developing data to be included in report
 - Agency contacts
 - Determining when reporting is necessary
 - Preparation of agency reports
 - Review and sign-off for reports
5. Identify report tracking requirements. Depending on the size or complexity of a project, development of a tracking database may be helpful. Information that may be useful in a database or matrix includes:
 - Specific requirements (cross reference to requirement)
 - Type of reporting
 - Data required
 - Data acquisition
 - Technical analysis or special preparation requirements
 - Staff/team responsibilities

Storm water pollution prevention plan (SWPPP)

Section 402(P) of the Clean Water Act specifies that storm water discharges associated with construction activity to U.S. waters must be authorized by a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permitting is administered either by the Environmental Protection Agency (EPA) or state agency to which EPA has delegated authority. The requirements presented in this section are based on EPA requirements. State agency requirements may vary and must be identified on a project-specific basis.

NPDES Storm Water Compliance

Construction projects that involve clearing and grading must be reviewed to determine if an NPDES construction storm water permit is required. Construction activities (clearing, grading and excavation) that result in the disturbance of five or more acres, including areas that are part of a larger common plan of development or sale, must obtain a NPDES storm water permit.

If the project is subject to NPDES storm water regulations, the discharger must file a Notice of Intent (NOI) and comply with the NPDES construction storm water general permit requirements, including non-storm water discharge prohibitions, requirements for release of hazardous materials as well as development and implementation of a project SWPPP and site implementation.

Dischargers who submit a complete NOI are not required to submit an individual permit application unless the EPA or state agency specifically notifies the discharger that an individual permit application must be submitted. Authorization to discharge storm water from the construction site will vary depending on the administering agency. For permits administered by EPA, unless otherwise notified by EPA, dischargers who submit a complete NOI are authorized to discharge storm water from the construction site two days after the date that the NOI is postmarked, provided the project complies with NPDES storm water general permit requirements. Note: Some states require submittal of the entire plan to the state's water quality management agency and formal approval before any ground disturbance can occur.

Preparing a NOI

Information required in the NOI should be confirmed with the EPA and/or state agency as appropriate. In general, the NOI will contain the following information.

- Construction site mailing address or location (latitude/longitude, township/range)
- Site owner's name, address and telephone
- Name, address and telephone of the operator(s)
- Name of the receiving water location or municipal storm sewer; and the ultimate receiving water location
- Permit number of any other NPDES permits for discharge(s) from the site (e.g. NPDES permit for operational discharges)
- Indication of availability of data on pollutant concentrations in storm water discharges
- Project schedule
- Area of disturbance

- Certification that a SWPPP has been prepared and complies with additional applicable state or local requirements.

If the project is operating under, or is subject to, other state or local sediment and erosion control or storm water management plans, the discharger must submit signed copies of the NOI to the appropriate state or local agency.

Developing a SWPPP

Under the general permit requirements, the discharger must develop a SWPPP. This plan has several crucial elements.

- Site description and description of construction activities
- Control measures
 - Erosion and sediment controls
 - Storm water management
 - State and local controls
 - Other controls and Best Management Practices (BMPs)
- Inspection
- Maintenance
- Non-storm water controls

Note: Any applicable procedures and requirements of state and local sediment and erosion plans or storm water management plans must also be incorporated into the SWPPP.

The SWPPP must be completed prior to submittal of an NOI and updated as appropriate. All provisions of the SWPPP are effective at the start of construction.

SWPPP Certification and Review

CERTIFICATION

1. All contractors and subcontractors implementing measures of the SWPPP need to sign a copy of the certification statement.
2. All certifications must be included in the SWPPP.
3. The SWPPP must be retained on site at the facility that generates the storm water discharge.
4. The permittee/discharger must make the SWPPP available to agencies upon request.
5. The EPA, or delegated state authority, may notify the permittee at any time that the SWPPP does not meet minimum requirements. If this occurs, the permittee must make revisions and re-certify in writing within seven (7) days.

REVIEW

1. The SWPPP must be amended whenever there is a change in design, construction plan, operation or maintenance that has a significant effect on the potential discharge of pollutants.
2. The SWPPP must be amended if it is ineffective in eliminating or significantly minimizing pollutants in storm water discharges.
3. The SWPPP must be amended to identify any new contractor and/or subcontractor that will implement a measure of the SWPPP.

Notice of Termination

A notice of termination must be submitted to the EPA or state authority when:

- Final stabilization of the site is complete; or
- When the permittee transfers operational control to another permittee.

Note: Final stabilization is defined as when 70% perennial cover has been established, or equivalent stabilization (rip-rap, gabions, and/or geo-textiles) has been achieved.

Retention of Records

All data, records, reports (including SWPPP and NOI) must be retained in project files for three years after the date of final stabilization.

Hazardous Materials Release

In the event of a release of a Reportable Quantity of hazardous substances and oil (i.e. release of a Reportable Quantity per 40CFR 110, 117 or 302) the following actions should be taken:

- Notify the National Response Center or appropriate state agency in accordance with requirements
- Modify the SWPPP within 14 calendar days from knowledge of release. Information should reflect a description of the release, date of the release and circumstances leading to the release. It should also include appropriate measures to prevent reoccurrence.
- Within 14 calendar days of knowledge of a release, provide EPA with a written description of the release (type and amount of material), the date of release, circumstances leading to the release and steps taken to modify the SWPPP.

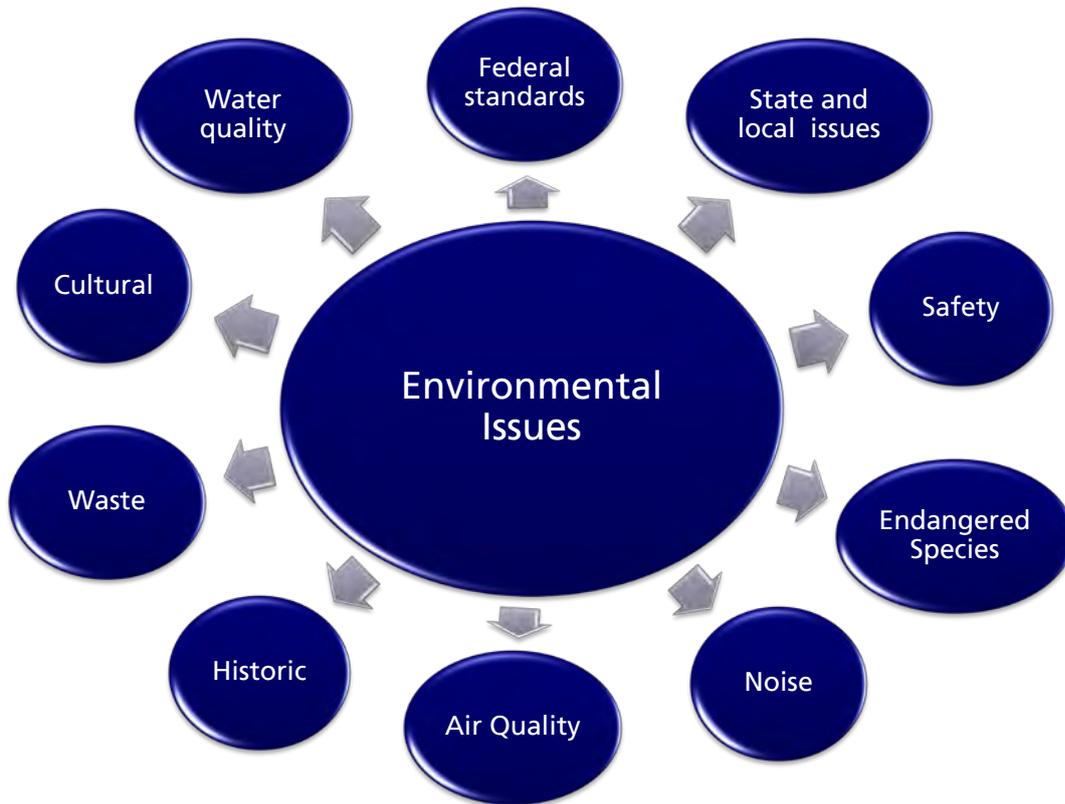
Conclusion

Over the past few years, the construction industry has been required to meet new and challenging environmental standards of care and regulatory requirements. Just being aware of your environmental obligations does not relieve you of liability.

The success of any given project depends on how well you identify, analyze and manage your environmental risk. Evaluation of potential environmental exposure is a key focus to help develop a written plan to mitigate

potential impacts. Measures should be defined to address controlling potential significant environmental aspects. Additionally, it is imperative that a formal system is in place to ensure appropriate permits and licenses are obtained. Once potential risks are identified, the fundamental groundwork is in place to incorporate best practices in a formal plan that addresses your organization's overall mitigation measures and risk management strategy.

Environmental Issues



References

Title 40, Code of Federal Regulations (40 CFR)

Regulations are codified annually in the U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment is the section of the CFR that deals with EPA's mission of protecting human health and the environment.

http://www.ecfr.gov/cgi-bin/text-idx?SID=07f8fcf445fc83edac42f8c3b69f78ab&tpl=/ecfrbrowse/Title40/40tab_02.tpl

Title 1910 or 1926, Code of Federal Regulations (1910 CFR – General Industry; 1926 CFR - Construction Industry)

Regulations are codified in the U.S. Code of Federal Regulations (CFR), Title 1910 – General Industry or Title 1926 Construction Industry. Under the OSH Act, employers are responsible for providing a safe and healthful workplace. OSHA's mission is to assure safe and healthful workplaces by setting and enforcing standards, and by providing training, outreach, education and assistance. Employers must comply with all applicable OSHA standards. Employers must also comply with the General Duty Clause of the OSH Act, which requires employers to keep their workplace free of serious recognized hazards. <http://www.osha.gov/law-regs.html>

TITLE 49, Code of Federal Regulations (49 CFR)

Regulations related to Transportation, including transportation of hazardous waste are addressed in 49 CFR including, but not limited to:

Subtitle B--OTHER REGULATIONS RELATING TO TRANSPORTATION

CHAPTER I--PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

SUBCHAPTER C--HAZARDOUS MATERIALS REGULATIONS

PART 172--HAZARDOUS MATERIALS TABLE, SPECIAL PROVISIONS, HAZARDOUS MATERIALS COMMUNICATIONS, EMERGENCY RESPONSE INFORMATION, TRAINING REQUIREMENTS, AND SECURITY PLANS

http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title49/49cfr172_main_02.tpl

WASTE MINIMIZATION REQUIREMENTS OF SECTION 3002(B) OF RCRA FOR HAZARDOUS WASTE DISPOSAL FACILITIES

The 3005(h) waste minimization and certification requirements apply to an owner of a landfill that generates and has a RCRA Subtitle C treatment permit for F039 leachate. If the owner is a large quantity generator (LQG) and sends the waste off-site, the owner is also subject to the 3002(b) waste minimization requirements. There is no statutory exemption from waste minimization certification for facilities generating remedial waste.

<http://yosemite.epa.gov/osw/rcra.nsf/23e68e459512b15f85256bf000632213/67218f4dad4d682d8525670f006beff7!OpenDocument>

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