RISK MANAGEMENT IN ENVIRONMENTAL COMPLIANCE: WHAT HAPPENS WHEN YOUR OPERATION IS BEING CONSTRUCTED?

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INTRODUCTION

Nearly forty years after the Clean Water Act (CWA) was passed, we've come a long way in our understanding of the strength and fragility of our water resources and the impact that our actions or inactions can have on them. Though regulatory systems are in place and best management practices (BMPs) are plentiful, successfully managing risk in environmental compliance remains a constant concern.

Fortunately, the rules to environmental compliance are simple: half of it is paperwork and the other half is maintenance. If you take an organized and balanced approach to compliance, you should be able to keep risk at bay and avoid enforcement action. However, remember that no matter how thoroughly you prepare for a construction project, you may still encounter unexpected situations requiring environmental knowledge and understanding.

As you start to plan your operation, you should take the time to stop and consider the risk associated with your project. The Environmental Protection Agency (EPA) considers risk to be "the chance of harmful effects to human health or to ecological systems resulting from exposure to the environmental stressor." The "stressors" are a variety of physical, chemical, or biological activities that can cause negative reactions to ecosystems and the environment.[1]

In order to limit, and hopefully prevent, risky situations, the key is to assess and target the problems that could arise and then implement a system of metrics that help with prevention.

KEYWORDS

environmental compliance, risk management, swppp, inspections, erosion control, ESC plans, dewatering, stockpiles, seeding, sediment control, erosion prevention

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WHAT'S AT STAKE?

Polluted Waters

As stormwater leaves a construction site, it can pick up sediment and other pollutants along the way before it enters our lakes, streams, and wetlands. Unfortunately, because stormwater runoff is a common occurrence, the EPA approximates that between 20 to 150 tons of soil per acre are lost each year to construction site stormwater runoff.[2] If we want our water resources to remain fishable and swimmable, we all need to work together to control erosion and reduce the amount of sedimentation and other pollutants leaving our construction sites.

FIGURE 1. Stabilization and cover are important aspects of an effective SWPPP, especially during frozen conditions.

The Bottom Line

If the environmental impacts aren't enough to encourage you to keep your site environmentally compliant, keep in mind that the EPA doesn't haphazardly hand out fines and lawsuits. When needed, the EPA utilizes three types of enforcement: administrative orders, civil actions, and criminal prosecutions. Depending on the violation, you could face project delays, significant fines, and/or criminal prosecution—all of which can negatively affect your bottom line.

Your Reputation

Did you hear what happened to *(fill in the blank with your company name here)?* Last year they pled guilty to six counts of violating the CWA by improperly handling and disposing hazardous materials, pesticides, and other materials at several locations throughout the United States. They are required to pay at least $82 million to resolve the violations of federal and state environmental laws. How would it affect your organization and its financial success if your company name and this headline were on the front page of the *New York Times*, or the *Wall Street Journal*? While this situation may be a little extreme, the consequences are very real. Consider the negatives of bad press and putting your reputation on the line if you don't carefully manage risk while building your operation.

FIGURE 2. Linear projects are often the most difficult to manage, especially perimeter controls.

THE "PAPERWORK"

Now that we've considered what's at stake, let's take a look at a few things you can do to minimize risk by getting organized and handling the "paperwork" associated with your operation.

Have a Plan

Your construction project requires a set of plans, and so does your stormwater management program. It's called a SWPPP, which stands for Storm Water Pollution Prevention Plan. Your SWPPP is your best defense in the environmental compliance game, because a well-designed SWPPP will help you to foresee some potential risk while your operation is being constructed.

FIGURE 3. Have a plan before land disturbance begins, it's the law.

A SWPPP is a tailored plan for your site that will describe pollution prevention practices and activities to be implemented on site. It also includes descriptions of the site and of each major phase of the planned activity, the roles and responsibilities of contractors and subcontractors, and the inspection schedules and logs.

There are many misconceptions about SWPPPs and how they are supposed to be implemented. One of the biggest misconceptions is that the SWPPP cannot be changed, even if it is obvious that certain BMPs are not working. But, it's important to keep in mind that a SWPPP is a living document. Although it is not always possible to design the most perfect SWPPP, it is most important to be willing to make the necessary changes to the SWPPP to improve stormwater management throughout the life of the project.

When you are hiring a professional consultant or a contractor responsible for implementing a SWPPP, how do you examine whether or not they are indeed qualified? Consider your past 5 partnerships, did you qualify their work for environmental compliance? Was there time in the negotiation process set aside for assessing compliance with environmental rules? How was risk managed? Here are some qualifying questions you may consider integrating with your interview or hiring process:

1. Have you worked in this industry before, and if so, can you provide me with a few samples of SWPPP documents that your firm has completed recently? (Recently means within the past 6 months or less.)
2. How often has a SWPPP you designed been inspected or audited by a regulatory agency?
3. Who from you firm has state required qualifications (i.e., CPESC or CPSWQ) and will they be directly involved on this project or responsible from an oversight role?

SWPPP "templates" are documents that require a minimum of effort to complete. These templates are intended for projects that are simple, non-complicated projects that occur with frequency. For projects that are more dynamic—perhaps encountering natural

resources—more elaborate and detailed SWPPP's are needed. The following is an excerpt from the Environmental Protection Agency's SWPPP guidance document describing what minimum steps are required to develop a complete SWPPP.

Most construction general permits contain similar elements:

- *Applicability*—describes the geographic area covered and who is eligible to apply.
- *Authorization*—describes the types of stormwater (and non-stormwater) discharges that are covered.
- *SWPPP requirements*—outlines the elements that should to be addressed to prevent the contamination of stormwater runoff leaving the construction site.
- *Application*—includes instructions for obtaining permit coverage, usually by filing an application or Notice of Intent (NOI) form.
- *Implementation*—BMP installation, inspection, and maintenance requirements.
- *Other requirements*—may include additional requirements such as spill prevention.
- *Standard conditions*—list of conditions that are applicable to most NPDES permits.
- *Termination*—lists conditions for terminating permit coverage after construction is complete similar elements.

(Environmental Protection Agency, 2007)

A great exercise in auditing your SWPPP thoroughness is to cross-reference these above listed items with the last few projects you have managed. Did the SWPPP's you used integrate the use of BMPs and the long-term operations and maintenance elements? Have your SWPPP documents outlined the requirements for environmental BMPs along with spill prevention measures during the construction process? Did your last few SWPPPs contain standard conditions and the BMPs to manage these conditions, and if not, what measures have you put in place to deal with these requirements?

There is also an ugly secret in the SWPPP development business: inefficient, incapable people often cut and paste SWPPP documents together. To streamline efforts or meet budgets that have been under-bid, oftentimes professionals in this business will use old SWPPPs and paste them together to build a SWPPP for a new project. This remains a concern. Imagine the difference in soil types or the variability in topography. The problem with this process is that even if the construction project is similar, the site conditions never are. The best bet for creating a SWPPP document that is effective from the beginning is to make a site visit. A designer can discover the most interesting facts when you do this in the beginning. This site visit is also a dramatic tool to decrease risk for non-compliance for the project. Site visits highlight existing soil types and types of vegetation. They illuminate drainage patterns or areas where there may be additional need for protection. Site visits can illustrate concerns with neighboring property owners or emphasize patterns for existing wildlife.

FIGURE 4. An effective SWPPP turns secondary containment measures on a plan to action in the field.

FIGURE 5. Automated dewatering systems are an excellent way to manage risk; however, remember manual oversight and verification are also needed to ensure compliance.

All of these issues aren't something that a designer will be able to effectively extract from searching the property on Google Earth. They are variables only defined and discovered from making a site visit before you even start the design process.

To put it briefly, a SWPPP is not a document intended to sit on a shelf in someone's office. It is truly intended to be a document that clearly communicates to all involved in the construction process what elements are required to fully preserve and protect water quality during the construction process. If it isn't user friendly, logical, and laid out to communicate well, it is simply a waste of resources.

Bottom Line

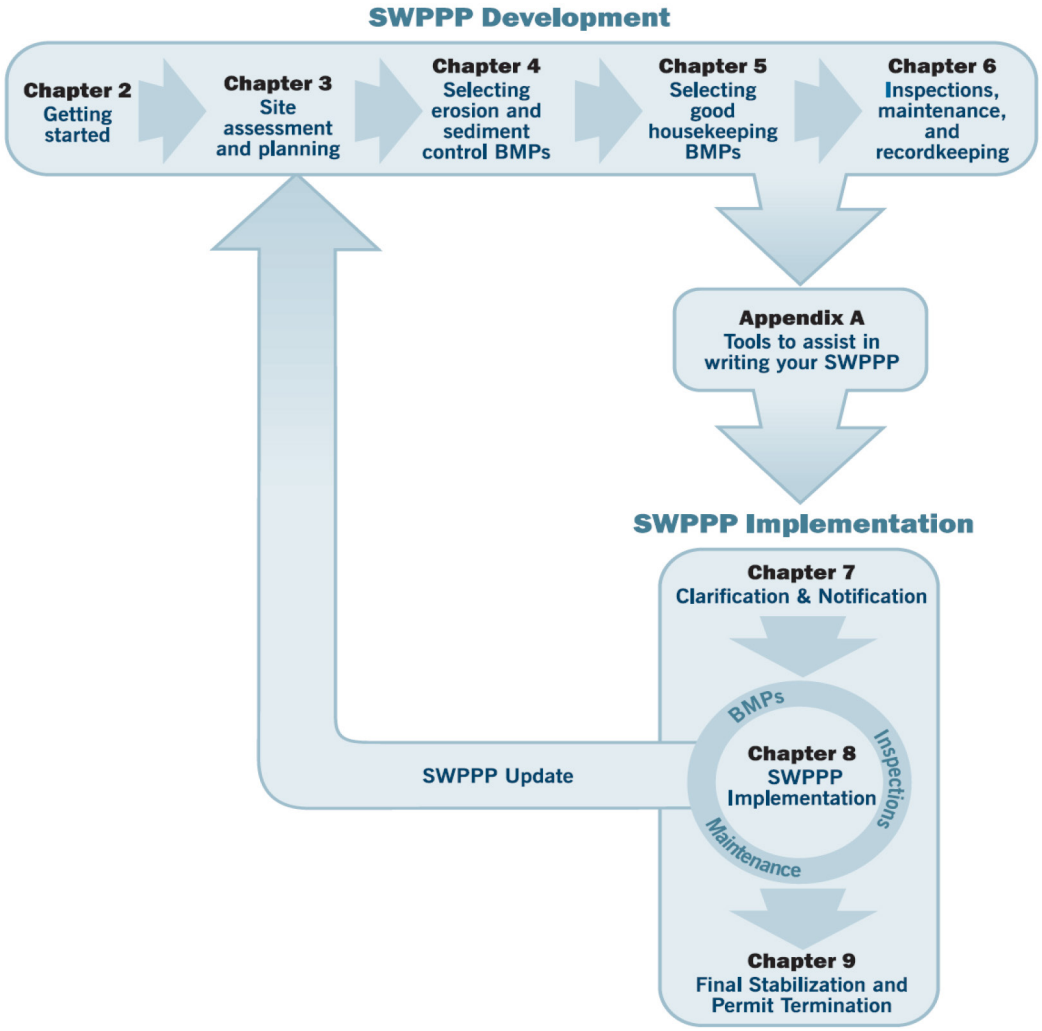
1. Make a site visit and decrease your site's environmental risk
2. Draft a proper SWPPP and decrease your site's environmental risk
3. Develop a strategy for proper documentation and decrease your site's environmental risk

The flow chart shown in Figure 6 is a pictorial representation of how the SWPPP process is designed to work most efficiently.

Take Responsibility

Before your operation breaks ground, take a minute to define the roles and responsibilities of who's in charge of installing and maintaining the BMPs, who will oversee and organize good housekeeping programs, and who will be responsible for routine inspections, maintenance, etc.

FIGURE 6. SWPPP process (Environmental Protection Agency, 2007).



As you may recall, the ultimate goal of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[3] Accordingly, the CWA prohibits the discharge of pollutants by any *one person* from a point source. A "person" can be defined as any individual, corporation, association, state, etc. The EPA has initiated enforcement actions against various parties involved in construction projects, including owners, developers, general contractors and subcontractors, etc. Therefore, it is important to define—before the project begins—who will be responsible for complying with the stormwater requirements. Assuming another party is "handling" the situation does not pardon you from any liability and more than one party may be responsible.

Remember, anyone who signs the SWPPP or the Notice of Intent (NOI) agrees to the following statement:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information

submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

After you read that paragraph, and assume responsibility for the details contained within, consider your last few project SWPPPs. Would you assume this responsibility? Would you recommend it to your supervisor? If your answer isn't a definitive yes, then consider a revision to future SWPPPs. Putting extra effort into the planning stage compared to a field revision for something you may have overlooked is always less expensive. Planning thoroughly on a document that is ultimately used in the field for construction is a profitable effort.

Keep Your Eyes Peeled

Regular inspection and maintenance are essential to managing risk efficiently on your site. When you conduct routine inspections, develop and stick to a consistent inspection process to ensure that you inspect all areas. You can even utilize spot inspections for certain areas on your site that might need special attention, like construction site entrances, washout areas, etc.

Additionally, you might want to consider adding inspections before or even during rain events. If you can see how water is moving through your site, it can better inform your BMP selection and placement and identify potential areas of risk that you might not have otherwise noticed. Regardless of how you decide to inspect your site, don't forget to stay organized. Make sure your inspection records are always kept with your up-to-date SWPPP on site.

While we are discussing inspections, it is important to take a moment to properly address paperwork. It is interesting to note that of the 48 items on an EPA inspection document, 38 of the items reference documentation or "paperwork". Things that are required in the EPA general permit include:

- Keeping your site maps up to date to reflect site conditions.
- Recording your BMP maintenance activities to tell the story of your site compliance.
- Recording rainfall or precipitation data.
- Documenting spills or sediment releases, along with mitigation measures to prevent re-occurrence.
- Noting who conducts inspections and when.
- Detailing when there is a BMP not performing and when and how that BMP was repaired or corrected.
- Verifying who on site is trained and when their training certifications are expired or no longer valid.
- Posting and validation of permit coverage along with extensions or omissions for applicable site projects.
- Logging dewatering or water treatment activities for prolonged water discharges.

Again, a great exercise is to review your most recent SWPPPs. Did your sites include the above documentation? Did you take the time to ensure this documentation was kept for a period of three years (at a minimum) after the completion of the project? One item worth considering is taking this documentation when the project is complete and reviewing the process. Take some constructive time to look at the BMP corrections on your last project.

When you are doing this take time to consider profitability and how efficiently the BMPs were managed. Did you spend dollars on picking up discharged sediments or preventing the sediments from discharging in the first place? How long were you conducting inspections when you were waiting for a final stabilization of vegetation? Could time spent documenting inspections at the conclusion of the project been prevented by starting to establish vegetation sooner during the job?

Most importantly, be sure you properly file a Notice of Termination. This document ends your permit coverage and limits your liability for future activities on the project. Documentation is no one's favorite job; however, it can truly protect your liability of non-compliance on a project if it is managed efficiently and throughout the life of a project.

Communicate

Construction operations can be full of activity and keeping everyone on the same page as new changes arise can be a challenge. As a site supervisor, clear communication with those coming and going will be necessary to maintaining environmental compliance because not everyone will take the time to ask where the washout area is located or clean their vehicle tires before leaving the site—unless they're engaged. Unfortunately, you can't be everywhere at once to ensure everyone is following all of the rules, but you can utilize various signage to relay important information if you're not around. Additionally, consider holding weekly construction meetings on site to maintain direct and consistent communication with your staff regarding new changes to your SWPPP and other important information.

One area that is rather overlooked on a project is the ability to communicate through proper site signage. Often procedures and expectations are discussed at a preconstruction meeting but they are not communicated thoroughly to the individuals working on the site. This is further highlighted when sets of subcontractors are working at intermittent times on a project. The best way to highlight expectations of site compliance is to use site signage. Consider bilingual signage if that is appropriate to the project conditions. The other piece to consider is that signage must be direct and clear. Consider the message and the goal of aligning *adult* behavior. Convey the message in the most direct, thorough way possible without being offensive. Examples for areas where signage is very helpful include, but are not limited to:

1. Entrance and exit points
2. Hazardous materials storage areas
3. Refueling and maintenance areas
4. Concrete wash out areas
5. Vegetation protection/ preservation areas
6. Spill prevention and clean up stations
7. Dewatering and water treatment stations
8. Emergency contact posting boards

FIGURE 7. Signage is a critical piece in sharing environmental compliance expectations on each project.

Get Educated

Do your best to be an informed site supervisor. Consider reviewing local ordinances and state requirements before your project begins. Then, learn about the environmental requirements for your construction project and research the possible penalties associated with not following the environmental requirements. Additionally, be sure to attend relevant training on SWPPP development and implementation, as well as performing and supervising the installation, maintenance, and repair of BMPs, as needed.

FIGURE 8. Field training is always more effective than office training.

And the same goes for your staff. If you want erosion and sediment controls to be installed properly and maintained on your site, you need to ensure that your chosen contractor has the appropriate knowledge and experience to help you be successful. When possible, provide education and training opportunities for designers, developers and contractors. They also play a big part in managing your environmental compliance risk.

There are several education opportunities throughout the United States and Canada that address these stormwater-specific issues. The best advice is to ensure that education is designed for the needs of the employee. For example, if you expect an installation professional to manage the implementation of the SWPPP, a course designed only for inspection or installation is not sufficient. If you expect at SWPPP design professional to write a document and not conduct inspections, then make sure the person responsible for implementation is also educated in SWPPP design. Linking design and construction processes is one of the most critical elements of ensuring the SWPPP becomes a document that truly provides direction rather than remaining on the shelf in someone's office.

The Environmental Protection Agency has drafted suggestions on how to properly integrate staff and training. The following is an excerpt from their SWPPP development document. Your site's construction workers and subcontractors might not be familiar with stormwater BMPs and they might not understand their role in protecting local rivers, lakes, and coastal waters. Training your staff and subcontractors in the basics of erosion control, good housekeeping, and pollution prevention is one of the most effective BMPs you can institute at your site. Basic training should include:

- Spill prevention and cleanup measures, including the prohibition of dumping any material into storm drains or waterways.
- An understanding of the basic purpose of stormwater BMPs, including what common BMPs are on-site, what they should look like, and how to avoid damaging them.
- Potential penalties associated with stormwater noncompliance.

Staff directly responsible for implementing the SWPPP should receive comprehensive stormwater training, including:

- The location and type of BMPs being implemented.
- The installation requirements and water quality purpose for each BMP.
- Maintenance procedures for each of the BMPs being implemented.
- Spill prevention and cleanup measures.
- Inspection and maintenance recordkeeping requirements.

One piece to consider is that when you teach adult learners, it is imperative that you adapt the learning environment to meet their needs. For example, the worst thing you can do is bring a bunch of field professionals inside for a day of PowerPoint training. You will quickly lose their attention and they will associate the training message with one of negativity. Rather than that, set up a brief morning session and then bring them into the field to truly inspect and assess real world examples that further adapt to their project sites.

Adult learners also adapt quickly to video applications, dramatically increasing their retention rate. Some experts say up to 38%. Consider video components and how they could integrate within your training. Combine this video interaction with examples and projects they can relate to, projects perhaps they have worked on. Further, using examples where we have seen opportunities for improvement are always a great resource. Consider too, using examples where someone has done something right. Showing positive examples and correct usage of devices can increase buy-in and open the participant's eyes to what they can accomplish with the resources they have.

Consistency Matters

Paperwork, often the most negative aspect of every construction professional's existence is perhaps one of the items we have the most control over. Frankly, we cannot control the site conditions. Often the schedule is something that other factors manipulate and change without our input. The importance and consistency of documentation is something the average person does have the ability to control. First a few fundamental items:

1. Make sure you have a standardized checklist for inspections. (Hint: The EPA has a free checklist available on their website www.epa.gov/npdes)
2. Make sure you inspect your projects at least one time every 7 days or within 24 hours of a ½ inch rain event. Consider inspections before and after rain events, or even during, to further document compliance.
3. Determine ahead of time who is conducting inspections and who is responsible for corrective actions. Make certain the documentation is done no later than 2 hours after the inspection—never wait to write something down.
4. Make sure to take pictures, along with written documentation of your inspection. This is the most effective way to relay messages about what happened on the project.

FIGURE 9. Keep track of precipitation on your project and be sure to document it.

Recording inspections is important. The data you record becomes a crucial part of the story your site tells. This reason, along with many legal reasons, is why you record facts—not your opinions. For example, rather than writing down that the silt fence on the southeast corner of the project needs to be repaired, it would be more efficient to indicate on the inspection form that the current BMP (which happens to be silt fence) used for perimeter

control on the southeast corner of the project needs maintenance. This takes the diagnosis away from the inspector and enables the most effective BMP to be replaced or repaired as designed. This type of documentation eliminates the inspector's opinion and further records factual documentation that could be helpful in a lawsuit.

EPA has provided guidance to the construction industry on documentation. They have indicated that project inspection and documentation records should include:

- A copy of the SWPPP, with any modifications.
- A copy of the NOI, Notice of Termination (NOT), and any stormwater-related correspondence with federal, state, and local regulatory authorities.
- Inspection forms, including the date, place, and time of BMP inspections.
- Names of inspector(s).
- The date, time, exact location, and a characterization of significant observations, including spills and leaks.
- Records of any non-stormwater discharges.
- BMP maintenance and corrective actions taken at the site (Corrective Action Log).
- Any documentation and correspondence related to endangered species and historic preservation requirements.
- Weather conditions (e.g., temperature, precipitation).
- Date(s) when major land-disturbing (e.g., clearing, grading, and excavating) activities occur in an area.
- Date(s) when construction activities are either temporarily or permanently ceased in an area.
- Date(s) when an area is either temporarily or permanently stabilized.

MAINTENANCE

If you can keep the paperwork straight, you've won half of the battle. The other half is keeping your site orderly. General maintenance and housekeeping practices will help to not only diminish costs, but they will also help to lower the risk of noncompliance. Think about it, would a clean, well-maintained site prompt a call to the EPA?

Prevention

By anticipating what could happen and being proactive, you can save yourself the headache of constantly being reactive to problems as they come up along the way. Pollution prevention BMPs are designed to prevent or minimize pollutants from entering stormwater runoff and/or reduce the volume of stormwater requiring management. Prevention BMPs may include regular cleanup, collection, and containment of debris in storage areas, and other housekeeping practices like spill control and training.

Keep in mind that it is usually easier and less expensive to prevent erosion than it is to control sediment from leaving a construction site. BMP's are most effective when they're used in combination. You will likely need to implement a combination, or suite, of BMPs to address stormwater runoff at your facility.

General Maintenance

If you notice an issue during an inspection, you or your staff should initiate action to resolve the issue immediately. Certain BMPs, like perimeter control devices, have repair and

maintenance deadlines, and the sooner your BMPs are functioning as designed, the lower the compliance risk.

Handling Spills

If you are using, consuming, storing, transferring, or otherwise handling toxic or hazardous materials at your construction site, you will need to take the necessary measures to avoid spills and be prepared to take action in the event a spill occurs. By having a spill prevention plan in place and a clean-up kit readily available on site, you'll be ready for almost anything that comes your way.

Oftentimes on construction sites we are typically used to safety protocols and we tend to tie together safety and handling spills. This is important for communication purposes; however, the need for response and documentation is also a vital piece of a SWPPP document that is functional. The EPA has outlined six steps for typically managing waste and hazardous materials on a project.

Construction projects generate large amounts of building-related waste that can end up polluting stormwater runoff if not properly managed. The suite of BMPs that are described in your SWPPP must include pollution prevention (P2) or good housekeeping practices that are designed to prevent contamination of stormwater from a wide range of materials and wastes at your site. The six principles described below are designed to help you identify the pollution prevention practices that should be described in your SWPPP and implemented at your site.

1. Provide for waste management.
2. Establish proper building material staging areas.
3. Designate paint and concrete washout areas.
4. Establish proper equipment/vehicle fueling and maintenance practices.
5. Control equipment/vehicle washing and allowable non-stormwater discharges.
6. Develop a spill prevention and response plan.

(Environmental Protection Agency, 2007)

Working with Hazardous Waste

Typically, construction projects tend to generate more non-hazardous waste than hazardous waste; however, you should familiarize yourself with the requirements for both types of waste to guarantee proper handling and disposal. Always check with your state agencies for the applicable waste requirements.

Typically, hazardous wastes are produced in one of two ways: they are discovered (e.g., grading or digging) or they are produced. If hazardous wastes are discovered, the owner should be notified, as well as local, state, and federal authorities. These hazardous materials may include uncovering asbestos pipe abandoned

FIGURE 10. Spills, hazardous materials, secondary containment are all crucial pieces in decreasing environmental risk.

years previous or current waste products such as abandoned barrels of mysterious substances. Because the material was present at the site prior to construction activity, the owners are typically required to ensure that the wastes are handled and disposed of appropriately.

If hazardous wastes are produced on site, the contractor or subcontractor who generates the waste is usually required to ensure that the wastes are handled and disposed of appropriately. If you do not meet the hazardous waste requirements on site, you could face enforcement action from your state agency ranging from administrative order to criminal actions. In addition to fines, you could face legal fees and encounter project delays. You could also be required to clean up any contamination that was caused by the violation. It should also be noted that if you have more than 1,320 gallons of above-ground storage of hazardous materials on a project, you will need to synthesize your activities with a required SPCC (Spill Prevention Containment and Countermeasure) Plan. For more information on SPCC planning please see: http://www.epa.gov/OEM/content/spcc/

CONCLUSION

Risk management in environmental compliance does not need to be complex. Just remember, as long as you adopt an organized and balanced approach to compliance, which includes simple rules for paperwork and maintenance, you'll be well on your way to a stressor-free, compliant site. Follow these steps and your site's environmental risk will dramatically decrease on every project.

Bottom Line

1. Make a site visit and decrease your site's environmental risk.
2. Draft a proper SWPPP and decrease your site's environmental risk.
3. Develop a strategy for proper documentation and decrease your site's environmental risk.
4. Communicate effectively what the rules are on each project and decrease your site's environmental risk.
5. Readily educate and inform workers and decrease your site's environmental risk.
6. Keep your site functioning and get the vegetation growing as soon as possible and decrease your site's environmental risk.
7. Record facts, not opinions, and decrease your site's environmental risk.
8. Maintain good records of what is being done, be consistent, and tell your story of compliance. This will ultimately decrease your site's environmental risk.
9. Anticipate spills and hazardous materials, plan ahead, and decrease your site's environmental risk.
10. File your Notice of Termination in a timely manner and decrease your site's environmental risk.

NOTES

1. http://epa.gov/riskassessment/basicinformation.htm#risk
2. http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/construction-stormwater/index.html
3. http://water.epa.gov/action/cleanwater40/cwa101.cfm