Get Ahead of Environmental Contamination with a Superior Mix/Load Pad

SCS ENGINEERS
Environmental Consultants and Contractors

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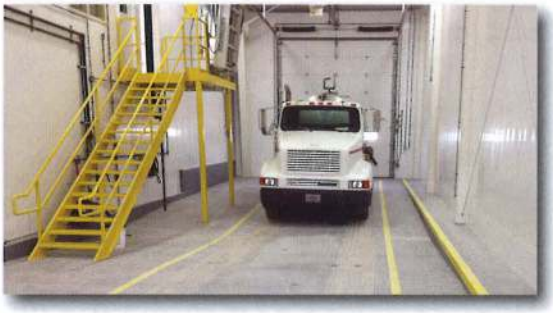
Managing environmental contamination is one of the last things you want to deal with. It costs you money, and takes time and resources away from your normal operations. A well designed and built mixing and loading pad, or mix/load pad for short, is critically important for preventing contamination in your liquid fertilizer and pesticide mixing and loading areas. Follow these five tips to achieve compliance, limit your environmental liability, and keep your operations running smoothly.

1. Plan Ahead

Mix/load pads are typically made of concrete, and while they may not look like much more than concrete floor slab, the slopes and design of the pad are critical to providing the containment needed to prevent harsh chemicals from entering the environment. The mix/load pad engineering process involves navigating the design standards and review process by the Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP). The steps involved in designing and constructing a mix/load pad include:

- Conceptual/preliminary design
- Site survey
- Geotechnical investigation
- Detailed design
- Permitting/agency review
- Construction

The entire process can take three to six months or longer. It may sound like a daunting task, but an experienced team – a contractor with previous installation experience and a design consultant with experience navigating the design and WDATCP review process – can help alleviate your burdens with the process. WDATCP publishes a list of designers who have completed mix/load pad designs (https://datcp.wi.gov/Documents/ConcreteDesigners.pdf). Plan for the construction to take place during your facility's slower operation months to minimize disruptions to your business. Plan ahead to make sure you have enough time to complete the design and permitting well before your target construction start date. It is a good idea to start the process at least six months prior to when you want to start using the new mix/load pad.



2. Provide a Functional Layout

Will your mix/load pad provide a functional design for your workers and drivers? How about 10 years from now? Good short and long-term planning is critical. The first step in developing your new mix/load pad is to determine where it is going to go, and how big it is going to be. Use the questions below as a guide when completing your conceptual/preliminary design.

- Will semi-tanker trucks and tractor sprayers use the mix/load pad? If your mix/load pad will be enclosed in a building, the difference may be whether you want to go with narrow overhead doors or wider overhead doors. Typical overhead door sizes range from 12 feet wide to 20 feet wide.
- Do you want to provide secondary containment for tanks or mini-bulk containers? Mix/load pads can be designed to include curbs and containment walls to provide code-required secondary containment for your aboveground storage tanks and mini-bulk containers.
- Will the vehicles using the mix/load pad be able to drive through the mix/load pad, or will they have to either pull straight in and back up when they leave, or back in to the mix/load pad so they can pull forward on the way out? Traffic patterns, types of delivery and pickup vehicles, and vehicle turning radius needs should be evaluated to help locate the mix/load pad on your site.
- Will you anchor equipment

to the floor of the mix/load pad? Since mix/load pads are designed to provide secondary containment, any intrusions into the floor slab need to be properly accounted for in the design so the concrete pad integrity is not compromised.

- What other equipment will be located on the mix/load pad? Typically extra space is allotted for piping, pumps, and controls equipment. Knowing the amount of equipment you plan to install helps determine the total size desired for the mix/load pad.

Another key step to providing a functional layout is to complete a site survey early in the project. This will help you evaluate the possible layouts and mix/load pad spatial needs. Design engineers use AutoCAD based programs such as AutoTURN, a vehicle turning simulation software, to evaluate your facility's vehicle turning movements to position your mix/load pad so it provides functional traffic flow.

3. Design with an Eye to the Future

Mix/load pads need to meet WDATCP's design requirements. Concrete eventually cracks, but your facility's design can take steps to minimize the potential for cracking and maximize its longevity. To achieve compliance, your design engineer will need to design the mix/load pad to meet the requirements in Wisconsin State Code Chapter ATCP 33 – Fertilizer and Pesticide Bulk Storage. New mix/load pads also need to meet the design standards of the Wisconsin Minimum Design and Construction Standards for Concrete Mixing and Loading Pads and Secondary Containment Structures.

In addition to the Code and the Design and Construction Standards, follow these steps to ensure your mix/load pad lasts as long as possible:

- Complete a geotechnical investigation to identify soft soils and provide guidance on proper subgrade preparation.
- Use a high strength concrete with additives, admixtures, and steel fibers.
- Plan for sufficient concrete curing time before you start placing heavy equipment or vehicles on the mix/load pad.

4. Understand the Review and Approval Process

Your design plans for each new mix/load pad must provide the necessary details to demonstrate compliance with the Code and the Design and Construction Standards. WDATCP carefully reviews each design. A team with experience working through the WDATCP review process helps to expedite your design's review and approval process.

Consider that your mix/load pad project may require other approvals and permits. New buildings or building expansions need Wisconsin Department of Safety and Professional Services (DSPS) Plan Review if they are over 25,000 cubic feet in volume. You may also need local building permits or erosion control permits, depending on the size of the project. If there is already contaminated soil, WDATCP will require that be addressed before the mix/load pad is installed.

5. Do Not Forget About Pumps

Did you know that pumps require secondary containment if you use them for liquid fertilizer and pesticides? Pump containment is not a new requirement; however, WDATCP is focusing more closely on whether facilities are providing secondary containment for their pumps that transfer liquid fertilizer or pesticides, and rightfully so. Leaks commonly occur at the connections and fittings around pumps.

If your pump is positioned within the footprint of a mix/load pad, then you have secondary containment covered. But, if your pump is not contained by a mix/load pad, you will need a separate secondary containment structure. The containment structure is required to meet the same secondary containment capacity requirements as a mix/load pad, which in the case of a pump system would be 1,000 gallons. Whereas mix/load pads typically provide their containment through a gently sloped floor large enough for semi-trucks to drive on, a large footprint is not desirable for a pump system. A pump may be located near a rail spur or located within a relatively small shed. In these cases, a

precast concrete or stainless steel containment unit can be a good option. These premade units can be installed around an existing pump system with minimal disturbance to the surrounding area.

Follow these steps to get ahead of environmental contamination so you achieve compliance, limit your environmental liability, and keep your operations running smoothly.

Jared Omernik has 9+ years of experience helping industrial, commercial, utility, state, municipal, and agricultural companies with environmental compliance and design services. For questions about how to design, permit, and construct your next mix/load pad or secondary containment project, contact Jared at jomernik@scsengineers.com or 608-216-7348.

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