

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

AGRICHEMICAL HANDLING FACILITY

(No.)

CODE 309

DEFINITION

A facility with an impervious surface to provide an environmentally safe area for the handling of on-farm agrichemicals.

PURPOSE

To provide an environmentally-safe facility to:

- Store, mix, load, and clean-up agrichemicals;
- Retain incidental spillage or leakage; and
- Reduce pollution to surface water, ground water, air, and/or soil.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where:

- The handling of agrichemicals creates significant potential for pollution of surface water, ground water, air and/, or soil, and a facility is needed to properly manage and handle the chemical;
- An adequate water supply is available for filling application equipment tanks, rinsing application equipment and chemical containers as needed for the operation;
- Soils and topography are suitable for construction.

This standard does not apply to the handling or storage of fuels. This standard does not apply to commercial or multi-landowner agrichemical handling operations.

CRITERIA

General Criteria Applicable to All Purposes

Plan, design and construct agrichemical handling facilities to meet all federal, tribal,

state and local regulations.

Base the size of the agrichemical storage on the maximum agrichemical use on the farm for a single growing season from any of the last 5 years.

Ensure the materials in the pad, hoses, pipes, valves, seals, connectors, filters, tanks, and related plumbing are compatible with the agrichemicals being handled and capable of withstanding the intended use.

Outlet drains are not permitted in the agrichemical collection, storage or handling areas.

Posts, pipes, hoses, discharge valves, or other features that may leak liquid chemicals will not pass through the floor, containment storage walls, or the sump.

Where the agrichemical handling facility is separate from the mixing/loading area and a hose is used to load the application equipment, provide secondary containment on the mixing/loading area equal to that in the handling facility.

Piping and pump(s) shall be designed to facilitate drainage for winter shutdown.

When a combined volume of more than 60 gallons of Class I, II, or III flammable or combustible liquids, or a single storage container larger than 5 gallons of Class I, II, or III flammable or combustible liquids are stored in an agrichemical handling facility, follow National Fire Protection Association (NFPA) 30, Flammable and Combustible Liquids Code, Chapter 4. Storage cabinets or other remedies must be installed.

When the agrichemical handling facility is also used for agrichemical storage, store the

agricultural chemicals in a room or area separated from the mixing and handling area.

Criteria for Permanent Facilities

Location. Locate the agricultural chemical handling facility as follows:

- Adjacent to or as near as practical to the existing agricultural chemical storage building;
- As far as practical from streams, ponds, lakes, wetlands, sinkholes, and water wells, with a minimum setback distance of 100 feet;
- Isolated and located downwind from residences and other buildings used to store feed, seed, petroleum products, or livestock with a minimum distance as required by local regulations;
- At sites that have not been previously used for stationary pesticide storage and/or mixing/loading sites that may have been contaminated in the past.
- Elevated above the surrounding ground or runoff shall be diverted to prevent runoff from entering the facility.

Locate the bottom of the facility a minimum of two feet above any seasonal high water table or bedrock.

Artificially lowering the seasonal water table would be acceptable under the following conditions:

- The artificial drainage system is at least 20 feet from any portion of the agricultural chemical handling facility including mix/load and transfer pads.
- The drawdown is analyzed using the ellipse equation or equivalent to illustrate the modified seasonal high water table.
- The artificial drainage system discharges to an observable sump with a shut off valve on the outlet pipe that may be closed in the event of an agricultural chemical spill in or around the agricultural chemical handling facility
- The design is approved by the State Conservation Engineer.

Locate the agricultural chemical handling facility above the 100-year floodplain elevation. However, if site restrictions require location within a floodplain, design to protect the facility from inundation and damage from the 25-year flood event, or larger if required by laws, rules, and regulations.

Agricultural Chemical Handling Pad. The agricultural chemical handling pad shall be surfaced with concrete.

Size the pad to accommodate the largest spraying equipment. Equipment access is allowed from more than one direction. Provide adequate space on the pad for maneuvering around equipment. Use a minimum of 2 feet for open facilities and 4 feet for enclosed facilities. When practical, base the minimum width of the mixing pad on the width of the spray equipment with the booms retracted.

Slope the pad to allow for drainage to a water-tight collection area or sump.

A suitable surface shall be provided at the entrance(s) to the agricultural chemical handling facility to prevent erosion and tracking of soil on to the pad.

Design Storage Capacity. Provide a minimum storage volume on the agricultural chemical handling pad of 250 gallons or 1.25 times the volume of the largest storage or spray tank on the pad, whichever is greater.

For unroofed facilities, provide storage on the pad as stated above or the volume of the 25-year, 24-hour storm, whichever is greater.

Provide a means of storing the accumulated rainfall or spilled agricultural chemical or field applying the collected volume according to the agricultural chemical label within 72-hours following the rain or spill event.

Prevent outside runoff water from entering the facility for storms up to the 25-year, 24-hour event.

Equipment Wash Bay. An equipment wash bay may be included as part of the agricultural chemical handling facility. If included, separate the wash bay from any dry agricultural chemical storage area. A sump common to the mixing/handling area and the wash bay could be utilized.

Rinsate Tanks. Provide rinsate tanks of adequate number and size as needed for the type of operation, allowing for separation of non-compatible agrichemicals.

Manufactured Components. Manufactured tanks and components will be structurally sound, capable of withstanding all anticipated loads, and constructed of suitable materials for their intended use. Base the tank sizes on the farm owner or operator agrichemical needs.

Flexible Membrane Liners. All flexible membrane installations will meet the material and installation requirements of the plans and specifications provided for each installation.

Flexible membrane liners will be installed under the supervision of a qualified representative of the manufacturer and all field constructed seams shall be tested and repaired in accordance with the manufacturer’s recommendations.

The minimum thickness for various membranes is shown below:

Minimum Thickness for Membranes	
Type	Minimum Thickness
HDPE	40 mil thickness
LLDPE	40 mil thickness
PVC	30 mil thickness
FPP-R	45 mil thickness
EPDM	45 mil thickness

Concrete Exposed to Agrichemicals.

Concrete exposed to agrichemicals will meet the requirements of Wisconsin NRCS Construction Specification 4, Concrete. The specified concrete compressive strength shall be 5000 psi with a water to cementitious materials ratio (w/cm) less than or equal to 0.40. The concrete shall be continuously cured for a period of seven days.

Use Type II or V Portland cement meeting the requirements of ASTM C150. The concrete shall contain a supplementary cementitious material such as fly ash or natural pozzolan meeting the requirements of ASTM C618, silica fume meeting the requirements of ASTM C1240, ground blast furnace slag meeting the requirements of ASTM C989, or blended

supplementary cementitious materials meeting the requirements of ASTM C1697.

Any portion of the concrete that could potentially be subjected to continual exposure to caustic chemicals or the abrasive effects of prolonged spray, such as might occur from a leaking pressurized vessel, shall be sealed with a chemically resistant coating. The coating shall be a non-vapor barrier coating, unless measures are successfully implemented to prevent vapor formation. Coatings must be resistant to the agrichemicals that will be handled at the facility and be installed in accordance with manufacturer recommendations.

Agrichemical Collection. Provide a collection area or sump with adequate dimensions for sediment removal and pump operation. Use a manually activated pump to remove accumulated liquids.

The sump shall be constructed in a continuous pour with the concrete surface of the agrichemical handling pad.

Structural Design. For the structural design, address all items that will influence the performance of the structure, including loading assumptions, storage tanks, material properties, and construction quality. Indicate design assumptions and construction requirements on the plans.

When using a roof/building to cover the facility, use minimum snow and wind loads as specified in the current edition of ASCE 7, *Minimum Design Loads for Buildings and Other Structures*.

Locate footings below the anticipated frost depth unless measures are designed to accommodate frost/freeze conditions.

Permanent structures will be designed according to the criteria in the following references as appropriate:

- Timber - *National Design Specifications for Wood Construction*, American Forest and Paper Association;
- Steel – *Manual of Steel Construction*, AISC, American Institute of Steel Construction;
- Concrete - *Building Code Requirements for Reinforced Concrete*, ACI 318, American Concrete Institute;

- Masonry - *Building Code Requirements for Masonry Structures, ACI 530*, American Concrete Institute;
- Slabs – *American Concrete Institute, ACI 360, Design of Slabs-on-Grade*. Use a five (5) inch minimum concrete slab thickness. Use the required reinforcing in accordance with American Concrete Institute, ACI 360, *Design of Slabs-on-Grade*.

Water Supply. Provide an adequate water supply for mixing agrichemicals, rinsing tanks and containers, and for emergency health and safety needs as appropriate for the facility. Provide all pipelines and hoses with backflow prevention and other hardware, as needed.

Safety. Include appropriate safety features to minimize the hazards of the facility. Provide warning signs, emergency eyewash station, deluge shower, spill response kits, fire extinguishers and other devices as appropriate, to ensure the safety of humans. Provide adequate ventilation at all times for enclosed buildings using natural or mechanical means.

Vegetation. Stabilize disturbed areas, as necessary, to prevent erosion, in accordance with the conservation practice standards Wisconsin NRCS Conservation Practice Standard *Critical Area Planting, (Code 342)* and/or *Mulching, (Code 484)*. Vegetation used to stabilize areas adjacent to the facility must be resistant to herbicide drift and accidental runoff).

Criteria for Portable Facilities

A portable agrichemical handling facility is a manufactured portable device that can be easily moved from field to field and will meet the needs of the user.

Pad. The pad will be constructed of durable material that is chemically resistant for the intended agrichemicals. The minimum containment capacity of the pad is 1.25 times the volume of the largest individual agrichemical container or tank that will be located on the pad. Include a sump or other provisions for easy recovery of spilled liquid.

CONSIDERATIONS

For permanent facilities, the agrichemical handling facility may cause an increase in water use at the site from the mixing of agrichemicals

and rinsing of agrichemical sprayers, containers and agrichemical-handling pad.

Consider installing rinsing devices so that residual contents of agrichemical containers can be adequately rinsed. The rinse system could operate from the nurse tank discharge pump or a separate pump that provides adequate pressure. Verify with the manufacturer of the facility that any pump to be used in pressure rinsing is compatible with the rinse device. Dispose of clean, empty agrichemical containers in accordance with local and State requirements.

Consider providing a roof over permanent facilities.

Consider installing an apron at the facility entrance to minimize sediment transport onto the pad.

Consider providing a mixing platform for filling agrichemical sprayers.

For portable handling facilities, consider using a top/bottom-loading valve with built-in check valve in the hose from the nurse tank to the spray tank. This will enable the operator to remain on the ground while filling the sprayer.

PLANS AND SPECIFICATIONS

Plans and specifications shall describe the requirements for applying this practice. At a minimum, include the following:

1. A plan view of facility layout.
2. Pertinent elevations of the facility.
3. Location of water features.
4. Location of electrical lines, gas lines, and requirements for burial and quality of materials.
5. Structural details of all components.
6. Electrical details of all components.
7. Plumbing details of all components.
8. Locations and details of safety features.
9. Where a roof structure is used to protect the facility, include design data and building dimensions.
10. Ingress/egress to the facility
11. Vegetative requirements.
12. Quantities.
13. Drainage/grading plan if needed.
14. Soil and foundation findings, interpretations, and reports.
15. Temporary erosion control measures during construction.

Review plans and specifications of portable agrichemical handling facilities. Ensure that the information submitted by the manufacturer on the proposed facility meets the requirements of this standard.

OPERATION AND MAINTENANCE

Develop an operation and maintenance (O&M) plan that is consistent with the purpose of the practice, the intended design life, safety requirements, design criteria, and all local, state, and federal laws and regulations.

The O&M Plan is to address the following:

- Brief description of the facility. Define parameters used to size and design the facility such as storage tank and equipment sizes.
- The facility will not be used for purposes other than the storing, mixing, loading, cleaning, and maintenance of materials and equipment used for agrichemical application.
- An inventory of agrichemicals to be stored or handled at the facility. Material Safety Data Sheets must be available on site.
- The proposed method of handling and disposing of rinsate, washwater, and spills.
- A process for handling accumulated rainfall.
- A process for handling accumulated sediment.
- A strategy for cleaning surfaces between different agrichemical mixing operations.
- An inspection plan of structural components such as the condition of concrete, curbing, sump, access roads, building structure, etc. Note the timing of inspections, conditions that would cause concern, and required actions as appropriate.
- Any weekly, monthly, or annual maintenance that may be necessary for the proper functioning of the system components including, but not limited to, concrete surfaces, sumps, pumps, hoses, pipelines, building materials, electrical

equipment, and other materials and equipment.

- A schedule of any required written inspection and maintenance reports.
- Proper winterization of the facility.
- Required safety signage.
- An Emergency Response Plan with safety procedures in the event of an accidental spill, exposure, fire, or other hazardous incident. Provide a list of safety equipment, contact names, and phone numbers. A copy of the O&M Plan shall be located at the agrichemical handling facility and include the Wisconsin Department of Natural Resources telephone number for reporting spills (1-800-943-0003). These numbers shall be posted at an easily visible location near the agrichemical handling facility and next to the nearest telephone.

REFERENCES

40 CFR Part 165, Subpart E – Standards for Pesticide Containment Structures, 165.80 through 165.97

American Concrete Institute, *ACI codes*, Detroit, MI.

American Forest and Paper Association, *National Design Specifications for Wood Construction*, Washington, DC.

American Institute of Steel Construction, *AISC, Manual of Steel Construction*, Chicago, IL.

American Society of Civil Engineers, ASCE 7, *Minimum Design Loads for Buildings and Other Structures*, Reston, VA.

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Doane's Agricultural Report. *Chemical Containment Facilities*. Vol. 53, No 36-5.

Midwest Plan Service, 1995. *Designing Facilities for Pesticide and Fertilizer Containment MWPS-37*, Ames, IA.

Kammel, D. W., 1988. *Protective Treatment for Concrete*. Agricultural Engineering Department, University of Wisconsin.

Noyes, R. I., 1989. *Modular Farm Sized Concrete Agricultural Chemical Handling Pads*. Oklahoma State University, Agricultural Engineering Department.

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