NATURAL RESOURCE CONSERVATION SERVICE
INTERIM STANDARD
for
AGROCHEMICAL MIXING FACILITY
(No.)
Code 702

DEFINITION

An environmentally safe permanent structure used for the filling of tanks and the mixing of chemicals (insecticides, herbicides, fungicides, fertilizer, etc.) for agricultural operations and for safe storage of chemicals used in these operations.

PURPOSE

To reduce pollution to surface water, ground water, and soil by providing a safe environment for the mixing and loading of chemicals, and to retain incidental spillage for proper handling and disposal.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where:

(1) the lack of adequate facilities for the mixing of chemicals creates significant potential for pollution of surface water, ground water, and soil;

(2) a water supply is adequate for filling the application equipment tanks and rinsing the application equipment and chemical container;

(3) soils and topography are suitable for construction,

(4) and the applicator has determined that a permanent impermeable mixing pad is required to properly manage chemical operations.

CRITERIA

Each agrochemical mixing facility shall be designed to meet the needs of the land user and shall be in conformance with this standard and all federal, state, and local laws.

The planning, design, and construction shall insure that the structure is sound and of durable materials commensurate with the anticipated service life, initial and replacement costs, and safety and environmental considerations.

System Components

The agrochemical mixing facility shall include those components necessary to properly manage the chemical materials and prevent pollution of the environment. Components of a complete agrochemical mixing facility shall include but not limited to the following:

1. A roofed building with concrete pad for chemical mixing and filling of equipment.
2. Chemical collection sump, pump, and safety devices.
3. Tanks for storage of rinse water for later use as a pesticide or diluent.
4. Adequate water supply for mixing chemicals, rinsing chemical containers and tanks, and rinsing the chemical mixing pad.
5. Water supply pipelines, back flow prevention devices and, where needed, a well and pump.
6. Water hoses and nozzles for filling tanks and rinsing of chemical containers and chemical mixing pad.
7. Emergency shower/eyewash station.
8. A storage space adequate for short-term storage of materials commonly used at the site.

9. Warning signs, fire extinguisher, first aid kit, protective clothing, and other appropriate safety devices.

Location

The agrochemical mixing facility shall be located as follows:

1. Adjacent to or as near the chemical storage building as practical if storage is not part of the mixing facility.
2. As far as practical from streams, ponds, lakes, wetlands, and wells with a minimum distance of 100 feet.
3. As far as practical from known sinkholes and subsurface anomalies with a minimum of 100 feet.
4. Isolated and, when possible, located downwind from residences and other buildings used to store feed, seed, petroleum products, and livestock. (A distance of 200 feet from residences or other occupied buildings is recommended.)
5. Located above the 100-year floodplain elevation. Elevated above the surrounding ground to prevent runoff from entering the facility.

Foundation Preparation
All topsoil, organic matter and debris shall be removed from the site. All loose and uncompacted earth shall be removed from the earth foundation surface.

Size and Capacity
The size of the concrete pad used for chemical mixing shall accommodate the length, width, and height of the largest sprayer used at the facility. The pad width shall be 5 feet wider than the widest piece of equipment including retracted booms. Minimum pad length shall be 5 feet longer than the maximum length of the spraying equipment used. Additional room shall be included as necessary to accommodate worker access, tanks, pumps, hoses, and other necessary equipment.

The chemical mixing pad shall be sloped to allow for drainage of water and pesticide spills to a collection sump. The chemical mixing pad shall be sloped a minimum of 2% (1/4 inch per foot) toward the sump.

The chemical mixing pad shall be curbed to prevent outside runoff water from entering and for providing storage of chemical spills. The chemical mixing pad including the sump shall have storage capacity of 1.25 times the largest storage or spray tank brought onto the pad. However, the storage capacity shall not be less than 250 gallons.

The entrance to the chemical mixing pad shall be graveled, paved, or otherwise treated to provide a suitable entrance for the equipment and to prevent erosion and tracking of sediment onto the chemical mixing pad.

Water Supply, Pump, and Pipe
A permanent water supply shall be provided for filling the sprayers, rinsing the chemical containers, spray tanks, and chemical mixing pad, and for emergency washing. A pipeline shall be installed for conveyance of water from the water supply to the agrochemical mixing facility. Back flow preventers, antisiphon devices, or a minimum 2-inch air gap shall be installed on all water supply lines. If a pump and well are installed, it shall be located outside of the chemical mixing pad and meet the

distance requirements listed under Location.

Enclosure
The agrochemical mixing facility shall be roofed to prevent rainfall from entering the system.

Enclosure supports shall be located outside the chemical mixing pad. The enclosure shall have adequate clearance between the lowest chord of the roof and the highest area of the pad for the equipment used or 10 feet, whichever is higher. On open buildings, the enclosure shall have a minimum roof overhand of 30 degrees vertical from the edge of the concrete pad in all directions or 2 feet, whichever is greater to reduce rain from blowing in on the chemical mixing pad. Sidewalls may be constructed on one or more sides to reduce the amount of overhang required. Fully enclosed building shall be adequately ventilated when occupied.

Emergency Shower/Eyewash Station
The emergency wash area shall include an overhead shower/eyewash and wash basin for washing when the applicator's skin is exposed to chemicals. The emergency washing area shall be conveniently located on the pad and easily accessible to the applicator.

Loading Platform
Raised platforms where needed to facilitate the filling of the spray equipment shall be of sufficient height and size so as to provide a safe working area.

Rinsate Storage Tanks
Rinsate storage tanks shall be provided to temporarily hold rinsates resulting from cleaning of the chemical mixing pad or sprayer. Tanks shall be fiberglass, polyethylene, or other durable material and have the capacity to meet the requirements of the operation plan. The rinsate tanks shall be located so that any spillage or overflow drains to the sump. Consider mounting tanks high enough to provide gravity flow into mix tanks or sprayers.

Electrical Components
Electrical systems (lights, switches, receptacles, circuit breakers, fans, pumps, etc.) shall meet the requirements of the National Electric Code (NEC) for the hazard classification of the area in which they are installed.

Sump
The sump size shall be of sufficient size that it will easily accommodate the pump and provide easy access for the removal of accumulated sediment. Load pad sumps should be covered with a metal grate sufficient to support the application equipment. The sump may be concrete or stainless steel.

Sump Pump
The sump pump shall be a chemical resistant submersible pump permanently located in the sump and should create a minimum of turbulence within the sump. A filter shall be installed between the sump pump and sprayer or rinsate tanks. The pump shall be equipped for both manual and automatic operation.

Plumbing
No appurtenances, discharge outlets, drains, or other piping shall be installed through the pad, curb, or sump in areas subject to contamination. All plumbing shall be designed to allow for easy drainage to prevent freezing. All parts of the plumbing system shall be corrosion resistant.

Structural Design
Minimum structural requirements for agrochemical mixing facility are specified as follows:

1. Steel construction shall conform to AISC specifications for the design, fabrication, and erection of structural steel for buildings.

2. Structural timber components shall conform to National Forest Products Association (NFPA) national design specifications for wood construction.
3. Reinforcing steel shall conform to ASTM A-615, grade 60.
4. Enclosure. Building shall be designed for applicable wind dead loads in conformance with local building codes. Where no local building codes govern, the loadings shall be as specified in ASAE EP 288.
5. Concrete. A watertight concrete design shall be used to avoid leakage from the sump and chemical mixing pad. Pad and sump thickness and reinforcement shall be designed based on the wheel loads of existing or anticipated equipment when loaded, the loads anticipated by storage tanks and other equipment, or temperature and shrinkage reinforcement whichever is greater. However, the minimum concrete thickness of slabs and sump shall be 6 inches and 8 inches, respectively. The minimum reinforcement for 6 inch slabs shall be equal to that #4 bars on 12 inch centers. Concrete mix design shall meet the following requirements:

    a. A minimum design 28-day compressive strength of 4000 psi and maximum water/cement ratio of 0.5 (minimum of 6 bags of cement per cubic yard).

    b. Portland cement Type I or II shall be used.

    c. The maximum size aggregate used shall be 1 inch.

    d. Air entrainment shall be 5% to 7.5% by volume.

    e. Slump of the concrete shall be 3 $\pm$ 1 inches. Super plasticizer may be used to increase the slump to facilitate placement.

    f. Wet curing shall be for a minimum of 7 days (14 days when pozzolan is used), or the application of a liquid membrane forming curing compound (ASTM C-309) shall be used.

    g. The slab and sump shall be placed in one continuous placement and without construction joints or openings if possible. Where construction joints are unavoidable, a PVC waterstop shall be installed. No opening for pipes, post, structural members, etc. will be allowed and no concrete shall be poured around such items so they penetrate the slab.

    h. Control joints spaced at a maximum spacing of 30 feet on center in both directions should be used to control cracking. All control joints shall be filled with flexible sealant (elastomeric sealers) to prevent leakage.

    i. Polypropylene fiber reinforcing shall be used in the concrete mix to reduce shrinkage cracking.

The concrete sump shall be coated with a sealant for protection from chemicals.

On-Site Chemical Storage
Provide separate storage areas for pesticides, fertilizer, and other chemicals stored in the facility. The storage area should be secured for safety. The storage area should be accessible to the emergency washing area and include appropriate safety devices including ventilation, lighting, fire extinguisher (rating not less than 20-B), and smoke detector with audible alarm.

Equipment
The sump pump, hoses, pipes, valves, seals, connectors, filters, tanks, waterstops, and related plumbing material must be compatible with the chemicals being handled. Suction hoses must be reinforced to withstand negative pressures. All piping and controls should be installed such that

leaks can be readily detected and repairs or maintenance can be easily performed.

CONSIDERATIONS

Water Quantity
The agrochemical mixing facility should not cause a significant change in water use at the site.

Water Quality
The quality of surface runoff and ground water will be improved due to the capture and reuse of agricultural chemicals during mixing and rinsing operations and from the proper storage of materials.

Safety
The designer is cautioned to consider the potential hazard of chemicals mixed and stored in the specific facility being planned. Where potential hazards exists due to concentrations of vapors or dusts, adequate ventilation should be considered. This is of particular importance in the planning and design of enclosed structures. The environmental hazard due to volatile vapors or dusts should be evaluated on a case by case basis. Where significant potential environmental hazards exists, special ventilation and spark arresting precautions may be necessary. In extremely hazardous environments explosion proof electrical components may be required. Definitions of hazardous location terms can be found at the following web address : `http://www.lawquip.com`. For further guidance consult the National Electrical Code (NEC) Chapter 5.

PLANS AND SPECIFICATIONS
Plans and specifications for agrochemical mixing facilities shall be in keeping with this standard. They shall be site specific and shall describe the requirements for applying this practice to achieve its intended purpose. Plans and specifications shall include construction plans, drawings, job sheets, or other similar documents. These documents are to specify the requirements for installing the practice, such as the kind, amount and quality of materials to be used, or the timing or sequence of installation activities.

OPERATION AND MAINTENANCE
Operation and maintenance (O & M) shall be in accordance with the requirements of this standard and shall be described in the conservation plan. A copy of the O & M plan should be located at the agrochemical mixing facility.

The following O & M requirements shall be addressed:

Start-up
Before the first use of the agrochemical mixing facility and at the beginning of each application season and after repair or replacement of system components, the plumbing should be tested for leakage and proper functioning of valves and pumps using clean water.

General
Keep the agrochemical mixing facility clean at all times. The pad should be kept free of items not necessary for storing, mixing, loading, and clean-up operations. The facility should not be used for purposes other than storing, mixing, cleaning, and maintenance of materials and equipment used for chemical application.

Do not drain rinse water or rinsate from the sprayer onto the pad as a standard practice due to the probability of contamination by dirt, trash, and other pesticides.

Cross mixing of chemicals, chemical contaminated water, or chemical contaminated sediment must be avoided except where allowed by the chemical label.

Sump Operation
The sump should be thoroughly cleaned between discharge of different chemicals mixed at the facility. Sediment from the sump shall be removed with precautions taken to reduce exposure of the worker to any potential contaminants in the sediment. This chemical laden sediment should be land applied to the target crop at a rate

estimated to be below the label recommendation. The sump shall be pumped dry at the end of each day of operation.

Rinsate Tank Operation
The rinsate tanks used as holding tanks for sump discharge water should be emptied as soon as possible. The rinsate can be applied as a dilute pesticide or used as dilution water for subsequent batches of pesticides that are labeled for the same crop. The agrochemical mixing facility should not be used for mixing and loading if the rinsate tank(s) are full.

Inspection
Thoroughly inspect the agrochemical mixing facility at the beginning of each application season and on a regular basis throughout the season. The inspection should include, but is not limited to:

1. cracks in the concrete pad and sump
2. sealer on the interior surfaces of the pad, sump, and sidewalls
3. operation of back flow prevention devices
4. hoses, pipes, valves, connectors, filters, tanks, and related plumbing materials
5. safety equipment
6. electrical systems
7. roof & structural integrity of facility
8. access roads and ramps
9. drainage around building
10. labeling of rinsate storage tanks will insure proper methods for applying rinsate back to the land
11. chemical inventory

Safety
To reduce the potential for exposure to pesticides and damage to the agrochemical mixing facility, restrict access by children, pets, livestock, and unauthorized people. Follow chemical label directions when mixing chemicals.

Emergency Response Plan
Any spills, leaks, or accidents shall receive immediate attention. An emergency response plan shall be in place in the event of an emergency spill. Include poison control center telephone numbers.

Laws & Regulations
Operation and maintenance shall be in conformance with all local, state, and federal laws and regulations. Not only chemicals themselves, but all materials which come in contact with chemicals and chemical contaminated material shall be handled as required by applicable regulations.