

# Manure Storage for Environmental Management Systems

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**Key: 1)Low Risk 2)Low-Moderate Risk 3)Moderate-High Risk 4)High Risk**

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## Location of Manure Storage

**Are the manure storage facilities in a location that allows for expansion?**

- 1- Yes, future expansion is possible
- 4- No

**The stored manure is located**

- 1- More than 250 feet down slope of the well.
- 2- More than 250 feet up slope of the well (violates Wisconsin law).
- 3- Less than 250 feet down slope of the well (violates Wisconsin law).
- 4- Less than 250 feet up slope of the well (violates Wisconsin law).

**A liquid tight (above ground or concrete storage) manure storage structure is located**

- 1- More than 100 feet down slope of the well
- 2- More than 100 feet up slope of the well (violates Wisconsin law).
- 3- Less than 100 feet down slope of the well (violates Wisconsin law).
- 4- Less than 100 feet up slope of the well (violates Wisconsin law).

**The setback or separation distance from the manure storage to a property line is**

- 1- More than 750 feet
- 2- 500-750 feet
- 3- 300-500 feet
- 4- Less than 300 feet

**The setback or separation distance from the manure storage to a residence not owned by the operator is**

- 1- Greater than 2,500 feet
- 2- 1,000-2500 feet
- 3- 500-1000 feet
- 4- Less than 500 feet

**The manure storage (measured from the bottom of the storage structure) setback or separation distance from a stream is**

- 1- More than 1,000 feet AND 4-5 ft above stream bank level.
- 2- 500-1,000 feet AND 2-3 feet above stream bank level
- 3- 300-500 feet AND 1-2 feet above stream bank level
- 4- Less than 300 feet AND at or below stream bank

**The manure storage is located outside the flood plain**

- 1-Yes – as shown on 100-year floodplain map.
- 4-No – as shown on floodplain maps(violates Federal law).

**The setback or separation distance of the manure storage from public facilities (schools, churches, hospitals) is:**

- 1-More than 1 mile
- 2-1/2mile to 1 mile
- 3-¼ mile to ½ mile
- 4-Less than ¼ mile

**The setback or separation distance of the manure storage from highways is:**

- 1-More than 750 feet
- 2-500-750 feet
- 3-300-500 feet
- 4-Less than 300 feet

**The setback or separation distance of the manure storage from the edge of sinkhole is:**

- 1-No sinkholes in the area
- 2-Greater than 1,000 feet
- 3-Greater than 400 feet
- 4-Less than 400 feet

## **Neighbors and Visibility**

**Neighbors are located**

- 1-Upwind for prevailing winds all year
- 2-Downwind for prevailing winter winds only
- 4-Downwind for prevailing spring, summer, and fall winds

**Neighbors are located at**

- 1-A much higher elevation than the manure storage.
- 2-About the same elevation of the manure storage and in open areas.
- 3-A lower elevation than the manure storage and in open areas.
- 4-A lower elevation than the manure storage and in same valley.

**The manure storage is:**

- 1-Not visible because of topography, vegetation, or is under the barn.
- 2-Partially screened, but neighbors are aware of the location.
- 3-Visible, but recessed from neighbors and the road / highway.
- 4-Very visible and close to the road / highway.

Do you have soils and geological information available for evaluating your site?

Yes- Proceed to group Site Characteristics

No- Proceed to group Manure Storage Construction

## Site Characteristics

### **The soils and geological information available to evaluate the site is:**

- 1-Soil borings that detail soil characteristics to at least 4 feet below the bottom of the proposed manure storage.
- 4-USDA county soil survey report

### **The characteristics of the soil or bedrock below the manure storage site is:**

- 1-Clay
- 2-Silt, clay, and sand-silt-clay mixes, organic mixes, organic silts, and organic clays, OR interbedded sandstone, siltstone and shale.
- 3-Fine sand, glacial till or silty sand and gravel mixes, OR limestone, dolomites, clean sandstone, and fractured igneous or metamorphic rock.
- 4-Clean gravel, cleans sands, or karst or fractured limestone

### **The vertical distance to high-risk geology is:**

- 1-More than 5 feet below the bottom of the manure storage AND separated by an impermeable layer of clay below the manure storage bottom.
- 2-More than 5 feet below the bottom of the manure storage
- 3-Less than 5 feet below the bottom of the manure storage
- 4-Less than 3 feet below the bottom of the manure storage, OR not known (violates the design standard requirements)

### **The water table is:**

- 1-Greater than 10 feet below the bottom of the manure storage
- 2-Greater than 5 feet below the bottom of the manure storage
- 3-Less than 4 feet below the bottom of the manure storage
- 4-Less than 3 feet below the bottom of the manure storage,(violates the design standard requirements)

## Manure Storage- Construction

### **There is, or was, evidence of seepage in test holes before or seepage into pit during construction of the manure storage ?**

- 1-No
- 4-Yes

Do you have a properly designed manure storage liner?

Yes- Proceed to group Manure Storage Liner

No- Proceed to group Liner

## Manure Storage- Liner

### **The manure storage liner was designed by:**

- 1-A liner was not needed - original soil meets all requirements
- 2-An engineer with NRCS or DATCP, or a licensed professional engineer
- 3-Construction contractor

4-No design was involved.

**The manure storage liner was installed by:**

- 1-A contractor experienced in liner construction
- 4-A contractor with no experience in liner construction

**If you do not have a manure storage liner, is it because:**

- 1-A liner was not needed because the original soil met all design requirements
- 4-I am not sure if the original soils met design requirements but I did not install a liner

## **Manure Storage- Size and Volume**

**The manure storage is designed to store the:**

- 1-Manure, bedding, and milk house or parlor wastewater from the dairy herd; net precipitation (rainfall- evaporation) PLUS a 25-year, 24-hour rainfall event on the surface of the storage, and sludge accumulation on the storage bottom.
- 2-Manure, bedding, and milk house or parlor wastewater from the dairy herd PLUS net precipitation (rainfall- evaporation).
- 3-Manure, bedding, and milk house or parlor wastewater from the dairy herd
- 4-Method of determining volume not known.

**There is sufficient manure storage capacity to store the runoff from the contributing watershed (open lots, roofs, and other areas).**

- 1-No contributing watershed, OR storage capacity for a 25-year, 24-hour storm event and the runoff from an extended chronic wet period.
- 2-Storage for a 25-year, 24-hour storm event, OR for the runoff from an extended chronic wet period
- 3-Storage for less than a 25-year, 24-hour storm event.
- 4-Don't know OR No storage

**Is your manure storage volume limited to**

- 1-12 months or more storage capacity- The storage was designed to provide sufficient volume to land apply the manure according to provisions of a nutrient management plan
- 2-5-11 month storage capacity- Occasionally apply manure on steep slopes, or frozen or snow covered cropland, and/or at high rates (tons/acre) because the storage is full.
- 3-3-5 month storage capacity- Occasionally apply manure on steep slopes, or frozen or snow covered cropland, and/or at high rates (tons/acre) because the storage is full
- 4-3 month storage capacity- Often/usually apply manure on steep slopes, frozen or snow covered land, and/or at high rates (tons/acre) on any available land because the storage is full.

**For manure storage, the freeboard or specific allowance for depth above the maximum level to start pumping or spillway(s) is:**

- 1-1 foot or greater
- 3-Less than 1-foot
- 4-None

## **Manure Storage- Other Features**

**The manure storage has a marker (staff gage) indicating when to start emptying the storage**

1- Yes, a permanent staff gage or pole is clearly marked and visible.

4- No

**The manure storage has a marker (staff gage) indicating the current level or percent of total volume, such as 1/4, 1/2, 3/4, in the storage.**

1- Yes, a permanent staff gage or pole is clearly marked and visible

4- No

**There is sufficient access for complete removal of the manure from storage.**

1- Access for agitation and pumping equipment provided at 200-foot intervals (or less) around the storage.

3- Limited access for agitation and pumping equipment is available

4- No access locations for agitation and pumping equipment provided

**Manure inlets to the storage are located**

1- Below the liquid level for most of the filling period.

3- Above the liquid level for most of the filling period.

4- Above the liquid level

**Outlet pipes passing through a wall or dike for emptying the manure storage:**

1- Have no outlet pipes, manure is pumped out

2- Have two shutoff valves with locking mechanisms

3- Have two shutoff valves without locking mechanisms

4- Have one shutoff valve without a locking mechanism

**Fencing, locked covers, and appropriate signage to limit access to outdoor manure storage(s) is in place.**

1- Yes

3- No fence or locked covers, warning signs only

4- No

**An emergency egress ladder is available to individuals that fall into the manure storage.**

1- Yes, more than one ladder

3- Yes, one ladder

4- No

**Signs warning of the dangers from entering a below barn manure storage are in place.**

1- Yes, and the entry is locked.

3- Yes

4- No

**Earthen manure storage structures (banks and dikes) are free of trees, shrubs, bushes, and rodent activity.**

1- Yes

4- No

## **Frequency of Storage Facility Inspection**

### **Manure transfer and recycle systems are inspected:**

- 1-Daily, or sensor is installed to stop pump if blockage occurs
- 2-Weekly
- 3-Occasionally
- 4-Never

### **Storage liquid levels are inspected:**

- 1-Weekly
- 2-Monthly
- 3-Occasionally
- 4-Never

### **Inspection for tears in plastic liner or cracks in concrete walls and resulting seepage are conducted:**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

### **Dike sod cover and back slope erosion on earthen storage are inspected:**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

### **Trees, brush and large weed growth and burrowing animal damage are inspected:**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

### **Surface water drainage away from the storage are inspected**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

### **Seepage near the outside toe of dikes and around pipes through the dike are inspected.**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

## **Stacked Manure and Manure Solids**

Is manure or are manure solids stacked anywhere on your farmstead?

Yes- Proceed to group Soil Base Gateway

No- Proceed to group Odor

Is manure or are manure solids stacked either on a soil base or in the field?

Yes- Proceed to group Soil Base

No- Proceed to group Solids Gateway

**Manure that is stacked on a soil base or stacked in a field is:**

1- Stored less than 10 days

3- Stored 10-30 days

4- Stored more than 30 days

**Temporary storage of manure on a soil base or stacked in a field:**

1- Is done in remote locations away from neighbors and public roads

4- Often occurs near a public road or neighbors

**Temporary storage of manure on a soil base or stacked in a field is:**

1- On a new site each year with medium or fine textured soils, OR the water table is MORE THAN 20 feet from the surface.

2- On medium or fine textured soils, OR on soils with the water table MORE THAN 20 feet from the surface.

4- On coarse textured soils, OR on soils over fractured bedrock OR with the water table LESS THAN 20 feet from the surface.

**Up-slope water is diverted away from the site for a temporary storage of manure on a soil base or stacked in a field:**

1- Yes

4- No

Is solid manure or are manure solids stored in the Barnyard/Feedlot or other farmstead sites?

Yes- Proceed to group Solids

No- Proceed to group Inspection

**Storage of manure or manure solids in a feedlot or barnyard, or a permanent site is:**

1- Located on a well-maintained concrete surface with runoff control

3- Located on medium or fine textured soil, OR on soils over fractured bedrock AND a water table MORE THAN 20 feet from the surface.

4- Located on an earthen surface with coarse textured soils, OR on soils over fractured bedrock AND a water table LESS THAN 20 feet from the surface.

**Storage of manure or manure solids in a stack is covered with plastic which:**

1- Extends into a trench that is back-filled with soil.

3- Extends to the soil surface

4- Leaves portions of the pile exposed at the base.

**Condition of plastic and extent of coverage of manure/manure solids is inspected**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

**The manure solids storage site construction is**

- 1-Smooth and uniform in plan view and cross-section with no depressions
- 4-Irregular in plan view and cross-section and/or with depressions

**Stacked Manure- Inspection**

**Storage structure roof condition is inspected**

- 1-Quarterly
- 2-Yearly
- 3-Occasionally
- 4-Never

**Base and wall condition is inspected**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

**Changes in surface water runoff are inspected**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

**Ventilation of manure/manure solid structure is inspected**

- 1-Monthly
- 2-Quarterly
- 3-Occasionally
- 4-Never

**Odor Management**

**What is the condition of the manure surface?**

- 1-- Storage is a) loaded below liquid surface and stored manure forms undisturbed crust over the entire surface, OR b) Manure is held in enclosed manure storage tank or completely covered year round with plastic membrane or other type of cover.
- 2-Storage is a) loaded below liquid surface and crust forms over most of storage surface due to top loading, regular agitation, wind or other factors, OR b) Manure surface is mostly covered by plastic membrane or other type of cover.
- 3-Storage is a) loaded below liquid surface and crust forms over a little of storage surface due to top loading, regular agitation, wind or other factors, or b) Manure surface is slightly covered by plastic



membrane or other type of cover.

4-Manure surface is exposed and does not form a crust.

**What are your practices involving agitation during emptying tank?**

1-No agitation during storage or emptying

2-Storage aggressively agitated by stream of manure directed below manure surface

4-Storage aggressively agitated by stream of manure above surface of manure.

**Location of storage relative to confinement animal housing (dusting ventillation air moving across storage or lagoon surface will pick up and transport additional odors).**

1-Manure storage is remotely located from animal housing or prevailing winds OR ventillation fans do not direct building ventillation air across storage or lagoon surface

4-Prevailing winds or ventillation fans direct building ventillation air across storage surface.