

Manure Storage Maintenance and Safety

This fact sheet provides a checklist of common maintenance and safety issues found around existing manure storage facilities and promotes developing and reviewing a written safety plan focused on your manure waste management system.

The owner or farm operator is responsible for maintaining a safe environment for their family and all those working near their waste storage facility(s). Each year farm families suffer the loss of life, whether animals or, more tragically, humans that could be avoided with proper maintenance and safety training. Each farm operation should develop a written safety plan (Contact your local extension Agent for information or do an internet search). Review this plan with everyone working near the waste storage facility. Discuss potential hazards and the need to maintain safety devices and follow proper safety protocol. Consider upgrading older facilities with current safety signs and devices. Make repairs in a timely manner. Someone's life may depend upon it. Listed below are the more common safety issues and areas to check.

- Check to see if your safety fence is being properly maintained at the manure storage and loading hoppers.
 - o Replace fence/posts that have been damaged.
 - o Check the gates to verify they close properly and can be latched and locked.
 - o Tighten loose fence and repair damaged sections.
 - o The minimum height of fence should be 4.5 feet. Higher fence may be appropriate for some sites.
- Check to see if your warning signs are still in place and add as needed.
 - o One or more of the following signs should be posted at all appropriate locations. Examples include "DROWNING HAZARD," "DURING AGITATION, DEADLY GASES POSSIBLE," "NO DUMPING OVER FENCE," "DEADLY MANURE GASES POSSIBLE, DEATH MAY BE IMMEDIATE." See NRCS Fact Sheet #4 for additional information and sources.
 - o Appropriate locations include all manure storage access points and on each side or several spaced around the perimeter.
- Check your manure push-off/loading access areas for safety concerns.
 - o Verify that the safety bar or cage installed to keep equipment from falling in is still solid and properly anchored. If not, replace or repair. If none exists, install a safety device.
 - When not in use, there must be a separate gate that is in front of the equipment barrier that limits human and animal access. If there is none, install a gate.
 - o Verify that the gate can close and be latched when not in use. If it broken, or jammed, have it fixed and properly cleaned. Make sure that the maximum square opening does not exceed 6 inches by 6 inches or 4 inches between vertical members. Adjust gate and/or add coverings to reduce opening size or gap as needed.
 - o Verify that no one is using a skid loader or other equipment to dump manure directly over the safety fence around the storage. Typical safety fencing will not keep equipment out of the storage.
 - Loading is only to be done at the designated push-off locations.
 - Consider installing a new curb (at least 24-inches high) and top with a fence higher than the equipment can reach, or install a curb located 30-inches from the tank wall to eliminate the possibility of lifting manure over the fence. These measures will reduce the possibility of improper loading; however, they may not completely prevent access by moving equipment or animals.

- o Discuss your emergency manure loading plan for materials (waste feed, snowpack, or frozen manure) that can't be loaded or pushed in at your normal access points with all equipment operators.
 - Consider additional push-off structures that can accommodate these materials.
 - Add a safe access location(s) designed for lifting manure over the manure storage tank wall that is strong enough to hold a tipping loader. A chain link fence is not adequate.
 - Provide short-term storage location(s) elsewhere. Do not store in a watercourse or water flow path.
 - If you plan to load at the agitation or pumpout location, keep the load low going over the wall. Add an extra wheel barrier or swinging bar across opening to keep equipment from entering. Make sure animals are not in the area and the gate is closed and locked after the operation has been completed.
- Review your safety plan prior to agitating, transferring, and pumping manure out of a manure storage. This is especially critical when you have inexperienced personnel involved in the process.
 - o Make sure all animals are out of the area when the unloading access gates are opened or the lids are removed from an access hole.
 - o After placing the pump, secure gates or plates around equipment to minimize access to storage.
 - o If you use gypsum as a bedding additive or as an antiskid on cattle walkways, be aware that during agitation, extremely high levels of deadly Hydrogen Sulfide (H₂S) gas may be emitted. Keep everyone away from the area prior to start-up. Operator should be aware of setting and wind direction. Access points surrounded by buildings and/or no wind or wind blowing from agitation area can carry toxic H₂S. Wait for better conditions. Ventilate area with clean air. Consider using a self-contained breathing apparatus or having a meter to warn the operator that dangerous levels of manure gases are present. Always watch from a safe distance.
 - o If your pump controls require standing next to pump and/or behind the power unit, consider extending the controls to move them and the operator a safe distance away from the manure storage or access point.
 - o Fully remove the pump and move it away from the storage to make repairs or unclog the intake. Working on the pump while it is in the pit is extremely dangerous. Remember to close the gate or replace grates during this process.
 - o Replace grates over agitation openings if they become damaged. If grates are not practical, add safety fence and gates around the opening(s).
 - o Remind all manure haulers that your manure has gypsum and that excessive H₂S gas hazards must be considered.
- Review your safety plan prior to going inside the fence adjacent to an earthen or High Density Polyethylene (HDPE)-lined facility to do maintenance.
 - o HDPE-lined slopes are slippery and fallen individuals will require help getting out.
 - o Have someone outside the fence to get help. Have a rope and floatation device ready to toss over the fence to the fallen individual. The rescue person must stay outside of the fence to avoid the same situation.
- Review your safety plan before entering a plugged loading hopper or going down inside a covered underground storage or reception pit. These are "Confined Spaces" and entry without taking precautions has resulted in deaths.
 - o Never enter these spaces without prior ventilation and use of a self-contained breathing apparatus.
 - o Even with prior ventilation the air needs to be checked with a calibrated meter.
 - o Vertical access will require a harness, rope, and hoisting system to pull out a fallen person.
 - o Require a second person stationed outside to get help if a properly planned entry goes bad.
 - o Do not enter a storage to rescue a co-worker as this often results in multiple fatalities.
 - o Have a system to contact your local emergency response personal.

