

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WASTE TRANSFER

(No.)

CODE 634

DEFINITION

A system using structures, conduits, or equipment to convey by-products (wastes) from agricultural operations to points of usage.

PURPOSE

To transfer agricultural material associated with production, processing, and/or harvesting through a hopper or reception pit, a pump (if applicable), a conduit, and/or hauling equipment to:

- a storage/treatment facility,
- a loading area, and/or
- agricultural land for final utilization as a resource.

CONDITIONS WHERE PRACTICE APPLIES

The transfer component is a part of a planned waste management or comprehensive nutrient management system.

Material is generated by livestock production or agricultural product processing, and a conveyance system is necessary to transfer the by-products from the source to a storage/treatment facility and/or a loading area and/or from storage/treatment to an area for utilization. This includes hauling nutrients from 1 geographical area with excess nutrients to a geographical area that can utilize the nutrients in an acceptable manner.

CRITERIA

General Criteria Applicable to All Purposes

Structures. All structures, including those that provide a work area around pumps, shall be designed to withstand the anticipated static and dynamic loading. Structures shall be designed

to withstand earth and hydrostatic loading in accordance with [Conservation Practice Standard 313, Waste Storage Facility](#). Covers, when needed, shall be designed to support the anticipated dead and live loads.

Reception pits (i.e., collection basins) are for the temporary storage of waste to facilitate collection and transfer and shall be sized to contain a minimum of 1 full day's production. For reception pits receiving runoff, sufficient storage shall be provided to also contain the volume of runoff from the 25-year, 24-hour storm plus any required freeboard (0.5-foot minimum) and emergency storage.

Openings to structures to receive material from alley scrape collection shall be a minimum of 9 square feet with 1 dimension no smaller than 4 feet. The opening shall be equipped with a grate designed to support the anticipated loads.

When curbs are needed in conjunction with structures, they shall be constructed of either concrete or wood. Curbs shall be of sufficient height to ensure all materials flow into the structure and shall be adequately anchored.

Push-off ramps leading to a reception pit can be level or inclined toward the pit. The maximum slope of the ramp shall be 5 percent.

Picket dams may be constructed of wood, metal, concrete, or any other durable material. Wood material shall be treated to prolong its life. Metal material shall be painted or otherwise treated to resist corrosion. The picket dam shall be porous with a ½-inch minimum opening size.

Pipelines. Pipelines include conveyance pipelines, culverts, and inlets to waste storage facilities or waste treatment lagoons. Design of pipelines shall be in accordance with sound engineering principles considering the waste

material properties, management operations, exposure, etc. The minimum pipeline capacity from collection facilities to storage/treatment facilities shall be the maximum peak flow anticipated.

The minimum pipeline capacity from storage/treatment facilities to utilization areas shall ensure the storage/treatment facilities can be emptied within the time limits stated in the management plan for nutrient utilization.

Pipelines used for transferring material to an irrigation system shall meet the requirements of [Conservation Practice Standard 430, Irrigation Pipeline](#).

For minimum and maximum fill height over the pipeline, see Table 1 in [Conservation Practice Standard 620, Underground Outlet](#).

Aboveground pipelines used for transferring waste to a utilization area shall be designed to meet the demands of a harsh environment. The pipeline can be rigid pipe or flexible hose and shall be ultraviolet-resistant. The flexible hose can either have a flat cross section or retain its shape when empty and shall be intended by its manufacturer for agricultural uses. Couplings to connect lengths of hose shall be leakproof and attached to the hose during the manufacturing process. The design of the flexible hose shall take into account the elongation of the hose by pressurization and also include other design requirements of a pressurized pipeline. The flexible hose shall have a minimum pressure rating, as stated by the manufacturer, of 70 pounds per square inch (psi).

Reels used for storage and/or relocation of flexible hose shall be manufactured specifically for that purpose.

All pipes shall be designed to convey the required flow without plugging, based on the type of material and total solids content. Gravity flow pipelines shall have a 6-inch minimum diameter and a minimum slope of 0.5 percent. Drainpipes for water tank overflows can be of a less diameter but must be sized to handle the design flow. To minimize settling of solids in the pipeline, design velocities shall be between 3 to 6 feet per second. Fluid velocities shall not exceed 5 feet per second if pipe is not buried or securely tied down.

Clean-out access shall be provided for gravity pipelines at a maximum interval of 150 feet unless an alternative design is approved by the design engineer. Gravity pipelines shall not have horizontal curves or bends except minor deflections (less than 10 degrees) in the pipe joints unless special design considerations are used.

In a gravity flow pipe system, a minimum head is required, depending upon the consistency of the material: 4 feet for heavily bedded manure, 2 feet for slurry or semi-solid manure, and 1 foot for liquids and liquid manure.

Gravity discharge pipes used for emptying a storage/treatment facility shall have a minimum of 2 gates or valves, 1 of which shall be manually operated.

Pipelines shall be installed with appropriate connection devices to prevent contamination of private or public water supply distribution systems and groundwater.

Other conduits. Concrete-lined ditches shall be designed in accordance with [Conservation Practice Standard 468, Lined Waterway or Outlet](#). A minimum design velocity of 1.5 feet per second shall be used.

Pumps. Pumps installed for transfer shall meet the requirements of [Conservation Practice Standard 533, Pumping Plant](#). Pumps shall be sized to transfer material at the required system head and volume. Type of pump shall be based on the consistency of the material and the type of solids. Requirements for pump installations shall be based on manufacturer's recommendations.

Solid/liquid waste separation. A filtration or screening device, settling tank, settling basin, or settling channel used to separate a portion of solids from the manure or liquid waste stream will be designed in accordance with [Conservation Practice Standard 632, Solid/Liquid Waste Separation Facility](#).

Safety. The system design shall consider the safety of humans and animals during construction and operation.

Open structures shall be provided with covers or barriers such as gates, fences, etc. Ventilation and warning signs shall be provided for transfer systems as necessary to warn of the danger of

entry and to reduce the risk of explosion, poisoning, or asphyxiation.

Pipelines from enclosed buildings shall be provided with a water-sealed trap and vent or similar devices where necessary to control gas entry into buildings.

Barriers shall be placed on push-off ramps to prevent tractors or other equipment from slipping into waste collection, storage, or treatment facilities.

Biosecurity. Products from diseased animals shall be handled in accordance with the recommendations of the state veterinarian.

Equipment leaving the farm shall be sanitized as appropriate to prevent the spread of disease.

Additional Criteria in Support of Agricultural Land for Final Utilization

Waste utilization. Nutrients shall be applied to the utilization area in amounts, uniformity, rates, and at a time consistent with the requirements of Conservation Practice Standards [590, Nutrient Management](#), or [633, Waste Utilization](#), as appropriate.

Hauling equipment. Equipment used for hauling material from 1 geographical area to another area shall be capable of hauling the material without spillage, leakage, or wind-blown losses during transport.

CONSIDERATIONS

General. Consider economics (including design life), overall nutrient management system plans, and health and safety factors.

Consider the timing and location of agitation and transfer activities to minimize odor formation and transport and to minimize the breeding of insects within the material.

Consider covering and/or minimizing the amount or number of times the material is disturbed to reduce the likelihood of air emissions of particulate matter, volatile organic compounds, and ammonia air emissions formation and release.

Transfer operations. In locating structures, utilize existing topography to the greatest extent possible to generate head on structures and reduce pumping requirements.

Consider the operating space requirements of loading and unloading of equipment in the vicinity of the transfer components.

Consider the subsurface conditions (i.e., depth to bedrock, water table, etc.) when locating and designing structures.

When applicable and compatible, consider the joint use of waste transfer pipelines with irrigation system design requirements.

The pipe pressure rating required may need adjustment based on material temperature.

Consider corrosion resistance and water tightness in the selection of pipe material and joints.

Consider the potential for salt (struvite) deposits in smaller diameter pipes.

Consider the need for appropriate check valves, anti-siphon protection, and open air breaks in all pipelines.

Caution should be taken when crossing watercourses to prevent discharge of wastewater to the surface waters. Buried pipelines could be encased in another pipe to provide additional protection in case of exposure. Aboveground pipe will need to be supported when crossing watercourses either inside another pipe or by other means. [Chapter 52 in National Engineering Handbook Part 636, Structural Engineering](#), has guidance on design of supports for aboveground pipe.

Vehicles used to transfer waste material should be sized to reduce the danger of rollover.

Where material is to be spread on land not owned or controlled by the producer, a nutrient management plan is recommended, establishing environmentally acceptable utilization of the material.

PLANS AND SPECIFICATIONS

Plans and specifications for installing waste transfer systems shall be in accordance with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan must be prepared and reviewed with the landowner or operator responsible for the application of this practice. The O&M plan shall provide specific instructions for proper operation and maintenance of each component of this practice and shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.

The O&M plan shall describe what actions will be taken to minimize flies and other insects during the transfer of material.

Liquid or slurry material shall be adequately agitated prior to transfer for the purpose of land application both on and off the farm.

Pipelines used for transferring waste material should be flushed with clean water after use to reduce the risk of gas build-up and pipeline explosion.

Provisions should be made for removing solids during management operations from conveyance conduits such as concrete-lined ditches, etc.

For the hauling of material from one geographical area to another, recordkeeping by the producer or his/her designated representative will be required and may include such items as follows:

- The type, nutrient content, and amount of material transferred
- The solids percentage of the material
- The date of the transfer
- The name and address of the source and destination of the material
- The condition of the material as left at the destination (spread, stockpiled, covered, etc.)