

Date Application Received

Date RTE Sent to Engineering

Due Date (21 days for 1st NOD, 14 days for 2nd or 3rd)

327 IAC 19: Engineer's Design Review Checklist

Facility Name: Farm ID#:

County: Building/Unit #:

Permit Writer: Document VFC#:

Permit Section's Description of Construction:

CAFO-sized dairy farm proposing to expand the existing silage pad. The extension proposes to add 200' x 689' to the existing E9 silage pad.

Engineering Review Completion Date:

Assigned Engineer:

Peer Reviewing Engineer:

Engineering Section Chief's Approval:

This document reflects the opinions of technical staff based on information presented in the application or document under review. It is intended for use in agency decision making, and it does not contain final determinations regarding compliance with regulations, regulatory interpretation, technical adequacy, permit conditions and requirements, facility design, ground water monitoring, explosive gas monitoring, construction activities, enforcement actions, or potential remedial actions. Information in subsequent technical memos may diverge from information contained in this document based on discovery or receipt of additional relevant information.

Introduction:

E9/P31: 689' x 204' (3.2 acre) proposed expansion to existing silage pad

Brief Summary of Engineering Section's Review Findings:

Engineering has NOD comments.

Part 1 - Checklist of Items Reviewed by the Engineering Section:

If a checklist item listed below is acceptable for purposes of the engineering review, then the assigned engineer will place an "X" in the associated check box to the left of the check list item's description. However, if the check list item is missing from the application, or the engineer's review finds the included information insufficient to meet the requirements of the rule for that item, then the engineer will leave the associated check box empty (blank) and provide a written description of the insufficiency or concern regarding the item in the associated comments box provided below the item in the check list. Note: The following checklist items might truncate the rules to show only items specific to Engineering's review.

327 IAC 19-7 Application Requirements:

327 IAC 19-7-2 Plot Maps

- USDA Soil Survey Map
- USGS Topographic Map that includes identification of any public water supply wells and public water supply intake structures within 1,000 feet of the manure storage facilities.
- The above USDA and USGS Plot Maps are legible and clearly show, the location of waste management systems, the boundaries of the property and the CFO, and the boundaries of livestock and poultry production areas.
- Not Acceptable-Comments:

327 IAC 19-7-3 Farmstead plan

Must show the existing and proposed waste management systems and within 500 feet of the waste management system show these features known to exist at the time of the application:

- Surface waters of the state
- Public and private roads
- Water well locations
- Karst characteristics
- Surface Drainage Patterns
- Property Lines
- Outfalls of subsurface drains including perimeter drain outfalls
- Drainage inlets (water/sedimentation basins)
- Mortality Sites
- Type and number of animals per structure
- Residence/Public Buildings
- Portions of the CFO within 100-year floodplain
- Legible
- Scale/distances between waste management systems and features within 500 feet
- North arrow /Orientation

Not Acceptable-Comments:

327 IAC 19-7-4 Waste Management System Drawings/Information

Must show detailed views and necessary cross sections to define all dimensions and construction materials. Systems relying on gravity flow must provide elevations of the entire waste management system that relies on gravity.

- Cross Sections and/or accompanying text identify the bottom or base elevation of the waste management structures and depth of any associated perimeter drainage systems in relation to current and planned land surface elevations.
- Soil Borings/Seasonal High Water Table Information
- Plans and Supplemental Information
- Copies of waivers for reduction to setbacks

Not Acceptable-Comments:

- 327 IAC 19-7-1(c)(6), Soil and Water Table Information** from test holes for proposed manure storage facilities that are conducted by a soil scientist registered under the Indiana board of registration for soil scientists, a professional geologist certified in Indiana under IC 25-17.6, or a professional engineer registered in Indiana. The number of test holes must be sufficient to adequately characterize the seasonal water table and soil.

The number of test holes varies with the type and size of the storage structure as follows:

- (A) For earthen solid manure storage structures, at least 2 holes for a structure up to 1 acre in size, then an additional hole for each additional half acre.
- (B) For liquid manure storage structures, at least 2 holes for a structure up to one-half acre then an additional hole for each additional half acre.
- (C) For concrete solid manure storage structures, at least 2 holes regardless of size.

Test holes must be

- (A) Evenly distributed throughout the storage structure
- (B) At least two (2) feet below the base of the structure for concrete manure storage facilities.
- (C) At least five (5) feet below the base of the structure for non-karst areas; or
- (D) In accordance with 327 IAC 19-12-2(b)(3) in areas of karst terrain, which requires at least one (1) of the soil borings or test holes to the shallower of either: bedrock or ten (10) feet below the lowest point of the proposed waste management system.

- Adequate number of soil borings
- Borings evenly distributed throughout the structure
- Borings sufficiently deep (e.g., 2', 5', 10') below the bottom of the base of the structure
- Borings conducted by a soil scientist, professional geologist, or Indiana PE
- Borings provide information on the soil types using the Unified Soil Classification System
- The seasonal high-water table (SHWT) information provided in the borings.

Not Acceptable-Comments:

- 327 IAC 19-7-1(c)(7), Proposed Alternatives** (ACAs) - A description of any proposed alternative to a specific requirement of 327 IAC 19 to demonstrate equivalent environmental and human health protection in accordance with 327 IAC 19-5.
- 327 IAC 19-7-1(c)(7), and 327 IAC 19-5 Proposed Alternatives** (ACAs) Include the list of ACAs in the summary. If ACAs are required or not sufficiently justified include in the comments below.

Rule/Standard	ACA/Comment
327 IAC 19-3-1	Use of soil borings outside of the footprint of the proposed structure.

Not Acceptable-Comments:

- 327 IAC 19-7-1(c)(10), Other Plans or Supplemental Information** that may be required by the commissioner to ensure compliance with 327 IAC 19.

Not Acceptable-Comments:

327 IAC 19-12-2 Site Restrictions

Waste management systems **must not be constructed:**

- N/A Except for 19-12-2(b), in Karst terrain based on information compiled by IDEM and from Karst and bedrock maps from Indiana Geologic and Water Survey dated 1997.
- In a floodway.
- N/A In a 100-year flood plain, unless all waste management system access is at least 2 feet above the 100-year flood elevation and structurally sound without lowering flood waters or the seasonal water table below the bottom of the waste management system.
- N/A Over mines. Over Surface Mines Over Underground Mines
- In soil expected to be in the seasonal high water table, unless the water table is lowered below the bottom of the structure.
- Review the requirements listed in 3276 IAC 19-12-2(b) to determine if structures proposed in karst terrain may be allowed.
- Not Acceptable-Comments:

327 IAC 19-12-3 Setbacks

Waste management systems must be located to maintain the minimum setback distances from the following features known and identifiable at the time an application is submitted for approval:

- 1. 1,000 feet from a public water supply well or public water supply surface intake structure.
- 2. Except for subsection 5 (below) **300 feet from:**
 - Surface waters of the state.
 - Drainage inlets, including water and sediment control basins.
 - Sinkholes as measured from the surficial opening or the lowest point to the feature.
 - Off-site water wells.
- 3. 100 feet from:
 - On-site water wells.
 - Property lines.
 - Public roads.
- 4. 400 feet from existing off-site residential and public buildings.
- 5. A manure storage structure that contains solid manure must have a minimum setback of 100 feet from the features in subsection 2 (above).
- Not Acceptable-Comments:



IAC 19-12-4 Storage Capacity and Design Requirements

- 19-12-4(c) 180 days storage capacity is required (all material entering the storage facilities, including expected 25-year, 24-hour rainfall and runoff).
- 19-12-4(d) All liquid manure storages must be constructed to NRCS 313 (Waste Storage Facility, October 2016**).
- 19-12-4(e) Concrete manure storages must be constructed to MWP Service 36 (rectangular tanks) (Second Edition, 2005) or TR-9 (circular tanks) (March 1998).
- 19-12-4(e) All concrete structures must be constructed according to NRCS Concrete Construction Specification (May 2015).
- 19-12-4(f) Earthen **treatment** lagoons must be constructed to NRCS 359. (Waste Treatment Lagoon, September 2005)
- 19-12-4(g) Solid manure storages may not be constructed in Pt, GW, GP, GM, GC, SW, SP, SM unless an approved liner is installed in accordance with 327 IAC 19-12-5.
- 19-12-4(h) Waste management systems not specifically listed in this section must be designed and constructed in accordance with the requirements of IC 13-18-10-4(b). Requires an ACA showing equivalent protection.
- 19-12-4(i) Pipelines must be constructed according to NRCS 634 (Waste Transfer, October 2010).
- 19-12-4(k) Plastic and fiberglass tanks and above ground steel tanks (installation of underground steel storage tanks for manure is prohibited) **must:**
 - Have sufficient strength to withstand design loads.
 - Be watertight.

- Be cleaned prior to addition of the manure to tank.
- Have the seasonal high water table maintained below the tank.
- Above ground tanks must have protected shutoff valves for all inlet and outlet pipes.
- 19-12-4(l) Vegetative management systems must be constructed according to the Indiana NRCS Conservation Practice Standard Code 635 (Vegetated Treatment Area, October 2008)
- 19-12-4(m) Constructed wetlands must be constructed according to the Indiana NRCS Conservation Practice Standard Code 656 (Constructed Wetland, November 2012)
- 19-12-4(n) Any drainage system to lower a seasonal water table needs an access point for sampling within 50 feet of the structure.
- 19-12-4-(o) Any drainage system to lower a seasonal water table **must be designed and installed to:**
 - Effectively collect and drain the ground water.
 - Have adequate size and slope and be at the proper distance from the structure.
 - If applicable, have sumps, pumps (and spare pump) and an electricity supply.
 - If applicable, have a surface outlet at least 50 feet from the structure and at least:**
 - 50 feet from the property line if soils have a perm of ½ inch or less per hour.
 - 20 feet from the property line if soils have a perm greater than ½ inch per hour.
 - Have a shut-off valve or equivalent.
- 19-12-4-(q) Conditions may be incorporated into the approval requiring testing to verify the manure storage facility is consistent with the design and performance standards.
- Not Acceptable-Comments:

327 IAC 19-12-5 Design Requirements for Liners

- The soil or foundation of a manure storage pond or manure treatment lagoon must have a maximum specific discharge of $1/16 \text{ inch}^3$ per inch^2 per day. This may be satisfied with in-situ soils that meet this requirement and are at least 3 feet thick.

- If in-situ soils are not present a liner must be used and may be either a:**
 - Clay liner at least 1 foot thick with a maximum specific discharge of $1/16 \text{ inch}^3$ per inch^2 per day following Indiana NRCS 520 design standards (Pond Sealing or Lining-Compacted Soil Treatment, October 2016)

 - Flexible membrane liner following NRCS 521A design standards (October 2013).

 - Concrete Lining following Indiana NRCS 522 design standard (October 2016)

- Not Acceptable-Comments:

Part 2 - The Site Location's other Environmental Factors.

Brief Summary of the Project and other factors:

The facility is not located in karst/floodplain/floodway/mines.

Concluding Recommendations:

- Engineering recommends approval based on the above review.
- Engineering has NOD comments

327 IAC 19-7-1(c)(6), Soil and Water Table Information

- The soil boring logs for borings B1-B8 performed by SME have been submitted. However, the locations of these borings are not shown on the farmstead plan on page 113 of 116 of the application. Provide an updated plan showing the location of these borings.

327 IAC 19-7-1(c)(7), and 327 IAC 19-5 Proposed Alternatives

- Based on the size of 3.2 acres, P31 would require 8 soil borings. Please update the ACA to reflect this.

IAC 19-12-4 Storage Capacity and Design Requirements

- The calculations provided with the silage pad application dated May 12, 2016 (VFC #[80292316](#), p. 243 of 245) have the manure storage calculations split into “Liquid Manure Volume” and “Stormwater Runoff Pond Annual,” but only the “Stormwater Runoff Pond Annual” calculations were provided with the expansion. These calculations only show 142 days of storage. Provide both sets of calculations to show the facility has at least 180 days of storage with the expansion.
- Submit vehicular loading calculations for the silage pad per ACI 360.
- Page 115 of 116 indicates removal of the existing curb is optional. Clarify if the existing curb will be removed. If the curb remains, describe how surface flow will occur over the curb.