DNR Guide to

Alluvial and Karst determinations for Animal Feeding Operations

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The Iowa Department of Natural Resources (DNR) can no longer offer geological reviews of karst and alluvial determinations for Animal Feeding Operations (AFO).

The following guidelines will help you successfully meet the DNR's standards for proposed construction of confinement (totally roofed) animal feeding operations, dry-bedded manure stockpiles in alluvial soils and karst terrain, and dry manure stockpiles in karst terrain. Unformed manure or egg washwater storage structures for confinement operations are prohibited in karst terrain.

Step 1. Find Out if Proposed site is in Karst Terrain or Alluvial Soils

Check the DNR Siting Atlas Map

For newly proposed AFO sites or sites that are expanding, the AFO Siting Atlas can help you determine if the proposed confinement construction, dry-bedded manure stockpile or dry manure stockpile location is in mapped alluvial soils, karst or potential karst.

Check for Existing alluvial or karst determinations

A karst or alluvial determination may have already been completed for expansion of existing sites or even new sites that were proposed in the past, but never constructed. Check the records of the facility or search for the facility in the AFO database and look for a record of the determination under the GeoReview tab.

Determinations are valid for the specific location outlined in the original determination regardless of the name or ownership of the facility. DNR staff members have completed more than 3,000 determinations. However, recent determinations may not be in the database. The AFO database will be updated with past determinations as time allows.

Sites located in mapped alluvial soils (shaded blue) or potential karst (shaded pink) according to the AFO Siting Atlas are assumed to be in alluvial soils or karst terrain.

NRCS

A qualified professional, USDA Natural Resources Conservation Service (NRCS)-qualified staff or a soils professional can submit documentation refuting the alluvial or karst classification.

To Refute Alluvial Soils or Karst Terrain

Alluvial Soils: Documentation to refute alluvial soils must include:

- Name and qualification of soils professional.
- Color NRCS soils map with soils description including parent material and flood frequency.
- Copy of topographic map indicating creek elevation and proposed site elevation.
- Copy of Federal Emergency Management Agency (FEMA) Flood Hazard or Flood Insurance Rate Map (FIRM) if available.
- Copy of AFO Siting Atlas showing locations of proposed structures.

Karst Terrain: A well record or boring may be sufficient to remove the karst designation unless the site drains directly to a known sinkhole. The well record or boring must meet the following three criteria:

- taken by a certified well driller, NRCS-qualified staff or soils professional,

- taken from within 200 feet of the site, and
- shows more than 25 feet of unconsolidated material (low permeability soil) between the bottom of the proposed structure and the bedrock surface.

Submit all documentation to the appropriate DNR field office if the proposed project is less than 1,000 animal units (AU) and uses formed storage. If the proposed project is 1,000 AU or greater or uses earthen (unformed) storage, then submit all documentation with the construction permit application.

Step 2. Meeting State Requirements for Confinement Structures

Alluvial Soils: If the AFO Siting Atlas shows the proposed confinement structure is in alluvial soils and no documentation can be found to refute the mapping, then the applicant must contact the DNR's Flood Plain Program for a flood plain determination.

Proposed confinements located in alluvial soils with less than 1,000 animal units must petition the Flood Plain Program for a declaratory order stating the location is not a prohibited site. For convenience and to speed the review process, use DNR form 542-8157. Flood Plain staff members have 30 days to respond from the date they receive the complete petition. They will send the declatory order and any documentation to the applicant and appropriate DNR field office.

Confinements in alluvial soils that require a construction permit (1,000 animal units or more, or earthen storage) must request a Flood Plain determination and send it in with the construction permit application (DNR form 542-1428).

For more information about the Flood Plain review process and to submit petitions or determination requests, please visit the Flood Plain website or call the toll free help line at 866-849-0321.

in Karst Terrain: If the proposed confinement structure is located in karst according to the AFO Siting Atlas and no documentation can be found to refute the mapping, then the applicant must conduct a soils investigation to meet the upgraded standards for proposed formed confinement structures located in karst terrain. The upgraded concrete standards require a soils investigation to verify vertical separation between the karst bedrock and the bottom of the structure. See the Iowa Administrative Code 567 — Chapter 65.15(14)"c."

An existing well record or boring may be sufficient to meet the upgraded standards. The soils investigation must include the following:

- a clear indication of the locations of the borings relative to the proposed structure,
- a description of the subsurface materials,
- clear documentation that a separation distance to bedrock will be met, including information about the depth of the proposed storage structure relative to the ground surface, and
- the name of the qualified individual who completed the investigation.

Send all soil boring data to the appropriate DNR field office if the facility is less than 1,000 AU. Send all soil boring data in with the construction permit application if the facility is 1,000 AU or more.

Dry Manure Stockpiles: Specific requirements for soils investigations and required separation from karst bedrock to dry manure stockpiles are listed in IAC — 567 Chapter 65.2(10). More information is also available in the Dry Manure Stockpiling Regulations fact sheet.

Dry-bedded Confinements and Stockpiles: Dry-bedded confinements and stockpiled manure from dry-bedded confinements located directly above alluvial aquifers have additional requirements. Alluvial aquifers are generally areas underlain by sand and gravel adjacent to rivers. Alluvial aquifers are a subset of the alluvial soils mapped on the AFO Siting Atlas. The DNR will be updating the AFO Siting Atlas to include an improved map of potential alluvial aquifer areas in the future.

Specific requirements for soils investigations and required separation from karst bedrock and alluvial aquifers for dry-bedded confinements and dry-bedded manure stockpiles are listed in IAC — 567 Chapter 65.15 (8) and 65.2(11). More information is also available in the Dry-Bedded Manure Stockpiling Regulations fact sheet.

For questions about how to interpret these rules or which rules apply, please contact Gene Tinker at 563-927-2640 or your local field office.

Information Resources

DNR Field Offices

Northeast • Manchester • 563-927-2640

North central • Mason City • 641-424-4073

Northwest • Spencer • 712-262-4177

Southwest • Atlantic • 712-243-1934

South central • Des Moines • 515-725-0268

Southest • Washington • 319-653-2135

DNR AFO Website • www.iowadnr.gov/afo

DNR Flood Plain Website

floodplain.iowadnr.gov • 866-849-0321