Fact Sheet

LIVESTOCK FACILITY FACT SHEET FOR

Rolling Green Family Farms RE, LLP

Applicant:	Barry Kerkaert, Owner.
Location:	Quarter: SE NW; Section: 4; Township: 139N; Range: 54W; County: Cass; Latitude: 46.884275ºN; Longitude: -97.504774ºW 1.5 miles east, 2 miles south, 0.5 miles east of Buffalo, ND.
Planned:	The owner is planning to add clean water diversions and also collect the dirty water from the confinement barns to use it for fertilization of his crop land. The application indicates the facility will have a maximum of 800 nursery pigs with an average weight of 45 lbs, 1,120 farrowing sows with an average weight of 400 lbs, 5,312 gestation sows with an average weight of 400 lbs and 1,600 finish pigs with an average weight of 150 lbs for Phase I. For Phase II, the operation will be adding 224 farrowing sows with an average weight of 400 lbs. The facility will be in operation year around.

Groundwater and Surface Water

Geology:	Cass County is located in the western lake section of the Central Lowland physiographic province and occupies parts of the Drift Prairie and Red River Valley. The western part of the county is in the Drift Prairie. This area is a youthful glaciated plain, which is interrupted only by minor glacial landforms and stream valleys. The facility is located in the Drift Prairie area of the county. Pleistocene glacial drift covers the entire county. The known thickness of the drift, including the Lake Agassiz deposits, ranges from 132 to 447 feet. The major surficial features in the county are the ice-marginal drainage channels and the channel of the proglacial Maple River. Minor features include kames, eskers, terraces in the proglacial Maple River channel, ground moraine, and local recessional features referred to as washboard moraines. There are four major surface units in the county and they are ground moraine, lake plain, shore, and deltaic deposits (Klausing, 1968). Ground Moraine is believed to have formed at the base of the glacial in the western part of Cass County. The ground moraine is a nearly flat to gently rolling surface, with local relief not exceeding twenty feet.
Topography:	The land surface varies from strongly rolling to nearly flat. Local relief generally ranges from 10 to 20 feet per mile, but in some areas it may be as much as 40 feet.
Slope:	The slope ranges from 0% to 6%.
Runoff:	The proposed facility is an indoor confinement operation. Any clean water runoff from the land around the barns and from other~~the~~ buildings will be directed away from the site.
Elevation:	1,142 feet
Site drainage:	The facility drains south with the help of surface drains located within the field. The drains flow into the road ditch a half mile south of the site. The road ditch flows south under the road into other ditches into Buffalo Creek and eventually into the Maple River is located eighteen miles to the southeast.
Water bodies:	The Buffalo Creek is located about three quarters of a mile south of the site.
Soils:	The primary soils at the site, as indicated by NRCS soil survey, include Hamerly-Tonka complex, and Barnes-Buse loams. These soils consist mostly of Clay Loan (CL), Clay Loam to Silt Loam (CL- ML), Flat Clay (CH), and Silt Loam (ML) materials. (See Table 2 on page 12 the chart on page 10)

Aquifers:	The facility does not appear to be located over a delineated glacial drift aquifer as indicated by the County Ground Water studies 8 Part III. There is one well located in the Lake Agassiz deposits, a couple wells are located in the Glacial Drift not associated with a delineated aquifer, and most of the wells are located in the bedrock aquifers of the Dakota Sandstone. The two nearest glacial drift aquifers in Cass county is the Tower City Aquifer approximently five miles to the west of proposed site and the Page Aquifer located approximently six miles north of the proposed site. The Tower City aquifer is a surficial outwash deposit confined in a glacial melt-water channel. The channel passes through Tower City and extends southeast~~ward~~ to its ~~junction~~confluence with the Maple River. In most places the channel and deposits is about a quarter mile wide. Recharge is from snow melt and rainfall. (County Ground Water Studies 8, Part III) The Page Aquifer is located in the northwestern part of Cass County and extends into Steele County. The aquifer consists of two intervals of sand and gravel in the drift. The upper interval is a buried glaciofluvial deposit consisting of very fine to coarse sand ranging in thickness of zero to seventy feet. The lowers interval is a buried glaciofluvial deposit consisting of very fine to coarse sand ranging in thickness of zero to fifty feet. This aquifer is an artesian system confined at the top by deposits of glacial till the range in thickness from nine to eighty feet. (~~-~~County Ground Water Studies 8, Part III) Dakota Sandstone in this area includes all the Cretaceous rocks older than the Graneros Shale. It underlies this area of Cass County and the rest of the county except the eastern quarter of the county. The depth to the top of the Dakota Sandstone ranges from about three hundred feet in the eastern part of the county to seven hundred feet in western part. The Dakota Sandstone consists chiefly of interbedded and inter-lensed silt, shale, loose sand, and sandstone; with places it may consist solely of clay or shale. The water-bearing deposits range in texture from very fine to very coarse sand, but very fine to fine sand is predominant. The sand and sandstone range in thickness from zero to about fifty feet. The aquifer is confined by Graneros Shale and overlain by younger Cretaceous rocks and glacial drift. The recharge as indicated by the county groundwater study is from outside the county and possibly from the rocks underlying the Dakota Sandstone. Discharge from the aquifer by upward and lateral leakage into adjacent deposits. Probably the greatest natural discharge is in the eastern limit of the aquifer where the overlying deposits are thin. Artesian pressure and well yields began to decline as more wells drilled into the aquifer. The water quality is highly mineralized, but used extensively in some areas because adequate supplies of more suitable water are not available. (County Ground Water Studies 8, Part III)
Public wells:	There are no public wells indicated in the county groundwater studies. The facility ~~will~~proposes to use wells to obtained water for the hog barns.
Private wells:	Within two miles of the site there are wells and an observation well as shown in Table 1 page 11. Wells in the general area are from 29 feet to 900 feet deep.

Manure Handling and Disposal

Facility operation:	Sows will be confined on site year around. The gestation/breeding barns will house 5,312 sows with an average weight of 400 pounds, the farrowing barn will house 1,344 sows with an average weight of 400 pounds and the isolation barn will house 1,600 pigs at an average weight of 150 pounds and 800 pigs at an average weight of 45 pounds. Manure will be stored in deep pits under the gestation barn and the isolation barn and applied yearly to surrounding land as a fertilizer.
Manure handling description:	The farrowing barn utilizes a pull plug recharge pit under that slats that will drain into the gestation barn deep pit. The gestation barn and the isolation barn each have slatted floors over a 10 foot deep concrete pit ~~under the whole barn~~ to contain waste.
Expected manure quantities:	Confined barns - Gestating barn Manure quantities for the gestation barn from design plans: Manure generated : 300,456 cu ft or 2.25 Mgal Confined barns - Isolation Barn Manure quantities from design plans: Manure generated: 64,800 cu ft. or 0.48 Mgal Confined barns - Farrowing Barn Phase I Manure quantities from design plans: Manure generated: 169,344 cu ft. or 1.27 Mgal Confined barns - Farrowing Barn Phase II Manure quantities from design plans: Manure generated: 33,869 cu ft. or 0.25 Mgal Wastewater consists of Spillage, Wash water and Pit Recharge. Based on past performance, Pipestone operations generated approximately 0.36 ft^3/day per animal unit. Wastewater: 0.36 ft3/day x 2,938 AU x 270 days = 285,612 cu ft or 2.14 Mgal Total Capacity for 270 days storage Gestating barn + Farrowing barn + Isolation barn: 854,081 cu ft/year or 6.39 Mgal
Mortality disposal:	~~Dead animals will be composted.~~ Mortality will be composted in an enclosed concrete composting barn. The composting barn will contain nine stalls. Mortality on average for the facility will vary from 6 to 10%. Once mortality is completely broken down the byproduct will be spread on fields. The expected volume of animal loss during the composting period is 16,081 cu ft. The composting stalls have a storage volume of 20,968 cu ft.

Odors

Potential sources:	The most significant source of potential odors is the barns with the deep pits located underneath. Land application may present a source of short term odor problems. The facility meets the required state setback of 1 mile as determined according to the North Dakota Century Code 23-25-11.7. The nearest residence is over a mile from the feedlot. AU Calculation NDCC 23-25-11 (7) >55 lbs 224+1120+5312+1600 = 8256 x 0.4 AU = 3,302.4 < 55 lbs 800 x 0.1 AU= 80 3,382.4 AU (Animal Units)

Specifications

Manure Storage Structures	
Required manure storage:	**Confined barns - Gestating barn** Capacity for the gestation barn: Dimensions of the pit: 758.3 ft Length 168.8 ft Width 9 ft Depth Columns (882 total): 12 in Length 12 in Width 9 ft Depth Pump out port (2 total): 6.66 ft Length 5.33 ft Width 9 ft Depth Sump (2 total): 5.83 ft Length 4.5 ft Width 2 ft Depth Storage volume = Pit - Columns + Pump out ports + Sump 365 days of storage: 1,145,594 cu ft/year or 8.57 Mgal **Confined barns - Isolation barn** Capacity for the isolation barn: Dimensions of the pit: 162 ft Length 96.2 ft Width 9 ft Depth Columns (96 total): 12 in Length 12 in Width 9 ft Depth Pump out port (4 total): 6.66 ft Length 5.33 ft Width 9 ft Depth Sump (4 total): 5.83 ft Length 4.5 ft Width 2 ft Depth Storage volume = Pit - Columns + Pump out ports + Sump 365 days of storage: 140,672 cu ft/year or 1.05 Mgal **Confined barns - Farrowing Barn Phase I** Capacity for the farrowing barn: Dimensions of the pit: 286.7 ft Length 159.2 ft Width 1.5 ft Depth 365 days of storage: 68,442 cu ft/year or 0.51 Mgal **Confined barns - Farrowing Barn Phase II** Capacity for the farrowing barn: Dimensions of the pit: 57.3 ft Length 159.2 ft Width 1.5 ft Depth 365 days of storage: 13,683 cu ft/year or 0.10 Mgal Total Capacity for 365 days storage Gestating barn + Farrowing barn + Isolation barn: 1,368,391 cu ft/year or 10.24 Mgal
Deep Pits:	Location: The proposed location appears suitable based on soil survey and ground water survey information. Soil borings were completed by Materials Testing Service. The borings indicate that the Unified classification for the subsoil at the site is generally CL, ML and SM to a depth of about 23.5 Feet. The soil was moist and a water table was encountered at relative elevations ranging from 1134.5 ft to 1139.1 ft. The bottoms of the pits are at a proposed relative elevation of 1138.8 ft. See the chart of the borings at the end of document. See Table 3 page 13.

Leak Detection Testing	Leak Detection: Drain tile will be placed under the deep pits of the gestating barn and the isolation barn that will serve a dual purpose: (1), it will collect any dirty water which may escape from the deep pits, thereby acting as a leak detection system, and (2), it will collect any clean water from outside water sources from applying pressure to the walls as well as premature deterioration of the concrete. Water collected in the drain tile will be collected in a shallow containment pond.
Manure transfer components: * pg 37	Manure Storage Structure Considerations: A pump out port with a sump will be located on the east and west sides of the gestation barn. The gilt development unit barn will have four pump out ports located on the south side of the barn. Transfer pipes will allow the farrowing barn pits to drain into the gestation barn through a 10-inch diameter pull-plug system.
Inlet lines and outlet structures:	Inlet Lines and Outlet Structures, Design considerations: -Transfer lines from the farrowing barn to the gestating barns will be 10 inches in diameter. -Pump out ports will be located on the east and west sides of the gestation barn. Pipe Considerations: - All pipe must be corrosion resistant - Pipe must be sloped to allow good drainage and minimize plugging - Clean out ports are provided at both ends of the farrowing facility
Diversions:	A clean water diversion will be located around the facility to keep clean water from entering the site. The diversion will have a 20 foot wide bottom with 4:1 and 6:1 side slopes. The diversion will convey the clean water from 17.8 acres north and west of the facility to the south away from the operation. During a 25 year, 24 hour storm event, the drainage will carry approximately 18.6 cfs at a velocity less than 1.34 fps. Two clean water diversions between the gestation barn and the farrowing barn will be used to remove clean water from within the site. A 15” CPP connects the two clean water diversions. An 18” CPP conveys the clean water to the south towards a 24” CPP that transfers the clean water away from the site. The 24” CPP will have a peak flow of 13.3 cfs.
Earth fill:	The design plans indicate vegetation and organic material will be stripped and removed from the footprint of the embankment. Organic materials or frozen soil will not be used in fill material. Class C compaction shall be used for earth fill unless otherwise noted. Appropriate topsoil as deemed by the Engineer will be used as cover material on the outside slopes of the embankment. The embankment will be seeded to a shallow rooted perennial grass.

Concrete Specs:	The concrete and rebar specifications follow the guidelines of the publication MWPS-36, Rectangular Concrete Manure Storages. -The compressive strength of the concrete for the walls, floors, beams, footings and columns is 4,000 psi. -For the pit floors in all of the buildings, a 5 inch floor with #4 rebar @ 18" O.C. will be used for the main pit and the pump out pits. 3 inches of cover will be maintained on the earth side and 1 inch of cover will be maintained on the top side of the rebar. -For the vertical steel in the exterior pit walls of the gestation barn, a double mat #5 rebar @ 12 inches O.C. with 2 inches of clear cover will be used for the outside wall. A double mat #5 rebar @ 10 inches O.C. with 2 inches of clear cover will be used for the pumpout pit wall. For the horizontal steel in the exterior pit walls of the gestation barn, #5 rebar @ 15 inches O.C. with 2 inches of clear cover will be used for both the outside wall and the pump out pit wall. -For the vertical steel in the exterior pit walls of the farrowing barn, #4 rebar @ 18" O.C. with 2" of clear cover will be used. For the horizontal steel in the exterior pit walls of the farrowing barn, #4 rebar @16" O.C. with 2" of clear cover will be used. Below are the concrete specs and rebar details used in the facility. All concrete is to be air entrained. - Exterior wall footing: three runs of continuous #4 horizontal rebar - Column: six runs of #4 vertical rebar, horizontal #3 grade 40 square ties 10" O.C. - 14" Column: six runs of #7 vertical rebar, horizontal #3 grade 40 square ties 10" O.C. - Pit floors: #4 rebar, 18" O.C. both ways. - Exterior pit walls: #5 vertical rebar 12" O.C., #5 horizontal rebar 15" O.C. - Pumpout pit walls: #5 vertical rebar 7" O.C., #5 horizontal rebar 17" O.C.
Groundwater monitoring plan: * pg 51	The facility does not appear to be located over a glacial drift aquifer. ~~The facility does not appear to be located over an aquifer. Ground water monitoring wells will not be required at the site at this time, unless there is some indication that ground water is being impacted.~~ There is no indication that ground water will be impacted at this site. Monitoring wells will not be required. If the drain tile indicates impacts to ground water, monitoring wells will be required.
Operation & maintenance plan:	The operation and maintenance plan calls for liquid manure pits to be pumped down before the liquid reaches within one foot of the top of the pit. Manure from pull plug system will be drained approximately once a week or every ten days. Earth work must be inspected annually and repaired as needed. Manure shall be removed annually and applied in accordance with the nutrient management plan.

Nutrient Management Plan & Manure Application

General conditions:	Careful judgment must be exercised when managing and applying manure to ensure surface waters are not impacted and minimize nuisance concerns for nearby residents. Factors to consider when choosing methods of management and application include but are not limited to; the volume of manure, the topography, location of surface and ground water sources, and distance from neighboring residents.
Application rates:	Liquid manure will be land applied spring, summer, or fall by ~~either knifed or sweeped~~ injecting directly into the ground, by a custom applicator. Another option for ~~M~~manure application will be incorporated ~~immediately~~within 8 hours. Manure will be land applied at a rate not to exceed high phosphorus levels so it will be utilized for crop production and so manure will not get into waters of the state.

<table>
<tr><td>Record keeping:</td><td>The CAFO must make the following records available to the department for review upon request for a minimum of 5 years from the date they are created:
Document routine visual inspections of the production area and containment structures.
Maintain a rain gauge at the production area and record measurable rainfall events.
How, when and where the manure, litter, or process wastewater was reused or disposed.
Weather conditions at the time and 24 hours prior to manure application.
Mortalities management and practices used.
The date, time and estimated volume of any overflow outside of the containment area.
Annual nutrient sampling of: manure, litter and/or process wastewater and soil samples where manure has been applied that year.
An explanation of how the manure application rates were determined with calculations of the planned and actual total nitrogen and phosphorus to be applied to each field.
The crops grown and crop yields.
Inspection of manure application equipment including method, frequency, dates and repairs made if leaks were found.
Setbacks, vegetated buffers or other alternative practices used when land applying manure near surface water or potential conduits to surface water.
If manure, litter or process wastewater is transferred to other persons or entities; the recipient’s name and address, approximate amount transferred, and the date of the transfer should be documented.
Any actions taken to correct deficiencies.</td></tr>
<tr><td>Expected manure volumes & nutrients:</td><td>Expected Manure Quantities:

<table>
<tr><th></th><th>Daily</th><th>365 Days</th></tr>
<tr><td>Volume of animal manure</td><td>~~14,312~~13,107 gal/day</td><td>4.8 Mgal</td></tr>
<tr><td>Nitrogen (N)</td><td>779~~37~~ lb/day</td><td>284,256 lb</td></tr>
<tr><td>Phosphorus (P_2O_5)</td><td>~~568~~ 599 lb/day</td><td>218,562 lb</td></tr>
<tr><td>Potassium (K_2O)</td><td>~~555~~ 588 lb/day</td><td>214,574 lb</td></tr>
</table>
* Values from USDA Ag Manure Management Field Hand Book, Chapter 4

Nitrogen losses anticipated:
Storage: 20% for liquid manure in anaerobic pit.
Land apply method: 1% for knifing in liquid manure.

Phosphorus available:
Land apply method: 80% available for crops.</td></tr>
</table>

<table>
<tr><td>Land application of manure:</td><td>
Estimate of land needed for manure application:
If the nutrient management plan's phosphorus risk assessment indicates a medium to low risk of movement of phosphorus, facilities are allowed to apply at agronomic nitrogen rates in accordance with the phosphorus index.
If the nutrient management plan's phosphorus risk assessment indicates a high potential for movement or if soil test show phosphorus levels in the high range, the facility is required to apply the manure at agronomic phosphorus rates.
Nutrient available for application with losses is N 225,131 lbs. and Phosphorus (P_2O_5) 174,850 lbs.
Anticipated crop grown: Corn(grain), Soybeans, and edible beans
Risk assessment for phosphorus : Low
Note: the estimated of land needed was done using the actual soil tests provide. The total acres were split in half for soybeans and corn in the table below. Some of the soil samples indicated edible beans as a possible crop, the option with half the acres planted to this crop is also in the table below .
<table>
<tr><td>Crop</td><td>Nitrogen needed</td><td>Phosphorus needed</td><td>Acres possible planted</td></tr>
<tr><td>Corn</td><td>~~210,783~~370,347 lbs.</td><td>~~113,490~~183,652 lbs.</td><td>~~1,654.21~~2,870</td></tr>
<tr><td>Soybean</td><td>Makes own nitrogen</td><td>~~75,477~~ 97,234lbs.</td><td>~~1,654.21~~2,015</td></tr>
<tr><td>Dry edible beans</td><td>~~75,371~~ 56,266lbs.</td><td>~~57,214~~42,990 lbs.</td><td>~~1,654.21~~840</td></tr>
</table>
Amount of land identified by applicant for land application: ~~3,312.40~~5,726 acres
Manure spreading agreements were received for all acres.
Any combination of these crop will use up the estimated nutrients produced by the facility.
The Department realizes that the nitrogen in manure is not all available to the crop the first year and therefore the manure will typically be applied at rates higher than the rates listed above. However the organic nitrogen becomes available the following years so the manure cannot be applied at the same rate subsequent years. These figures are used to estimate the total acres that would be needed over several years of application using proper rotation of crop-land and/or calculating nitrogen that is carried over to the following years.
*Average rates, actual rates depend upon crops grown and projected yield
</td></tr>
<tr><td>Permits:</td><td>The facility will require a~~n NDPDES CAFO~~Livestock Waste System Permit as well as an NDPDES Storm Water Permit.</td></tr>
<tr><td>Disclaimer:</td><td>This design review is intended to assess a livestock facility's ability to contain, divert, store and properly apply manure and/or runoff water to meet department requirements, to prevent detrimental impacts the quality of waters of the state, and to minimize the potential for odor concerns from livestock facilities. It does not include an assessment of the structural integrity of livestock facilities or manure handling structures such as those made of concrete, metal, wood, plastic, or other material.</td></tr>
</table>

* Page reference for North Dakota Department of Health Guidelines for Approval of Livestock Manure Systems

Approval Conditions:

1. The application indicated the facility will house **800 nursery pigs, 1,344 farrowing sows, 5,312 Gestation sows, and 1,600 finishing pigs**. The Department must be notified in writing if there is an expansion in the number of livestock, change in ownership of the facility, significant changes in the physical operation of the facility or if the lot area where livestock are concentrated is expanded. Changes may require an update to the approval or issuance of a new approval.

2. Operation and Maintenance plans and standard operating procedures must be followed as submitted to the department. Changes to the Operation and Maintenance plan must be approved by the Department prior to being implemented. There must be regular and adequate maintenance and upkeep to prevent degradation of the structures, to ensure the system continues to operate as designed, to ensure the storage pond does not overflow, and to ensure manure or waste water does not discharge into waters of the state. Operation and maintenance plans mean description of the equipment, methods, and schedules for: inspection, monitoring, operation and maintenance of the animal feeding operation (manure storage structures, water pollution control structures, and the production area); and controlling water pollution and air pollution including odors to protect the environment and public health. (Design manual, 6.7, page 42)

3. Notice of Completion and all results of testing completed on the clay liner or the manure storage structures must be sent

to the Department when construction is complete.

4. All embankments must be constructed of relatively impervious materials and compacted sufficiently to form a stable structure. An appropriate liner material must be used to prevent excess seepage from the storage pond. Seepage from the storage pond shall not exceed 1/16 inch per day, and shall not detrimentally impact waters of the state.

5. Dead animals must be disposed of in accordance with NDCC section 36-14-19, in a manner acceptable to the North Dakota Board of Animal Health, and so they will not impact waters of the state

6. Land application of manure must be in accordance with the nutrient management plan. Manure must be applied in a manner so it will not be washed into waters of the state. The Department will require injection or incorporation of the manure with in 8 hours of land application. A buffer distance should be maintained to prevent impacts to waters of the state or impacts from odors.

~~6. Land application of manure must be in accordance with the nutrient management plan. Manure must be applied in a manner so it will not be washed into waters of the state. The Department may require immediately incorporating the manure into the soil or leaving a buffer distance to prevent impacts to waters of the state or impacts from odors.~~

7. The following records pertaining to nutrient management must be maintained for a minimum of 5 years. The crops grown and expected realistic crop yields; the date(s) manure, litter or process wastewater is applied to each field; weather conditions during application, 24 hours prior and following application; test methods used to sample and analyze manure, litter, wastewater and soil; results from annual testing of manure, litter, and process wastewater, and annual soil sample results for land where manure was applied that year; an explanation of how the application rates were determined in accordance with standards established by the department; calculations showing nutrients applied to each field, including other nutrient sources; total amount of nutrients actually applied to each field, including documentation of calculations for the total amount applied; method used to apply the manure, litter or process wastewater; inspection of manure application equipment including method, frequency, dates and repairs made if leaks were found; and setbacks, vegetated buffers or other alternative practices used when land applying manure near surface water or potential conduits to surface water. (Design manual, 7.7, number 2, page 49)

8. If manure is transferred to other persons or entities not associated with the facility, the following conditions shall apply: owners/operators shall provide the recipient of the manure, litter or process wastewater with the most current nutrient analysis prior to transfer; the analysis provided shall be consistent with the requirements of section 7.4 in design manual; and the owners/operators of the CAFO shall retain records for five years after the transfer date documenting the recipient's name and address, the approximate amount of manure transferred, and the date the manure was transferred. (Design manual, 7.7, number 3, page 50)

9. The owner/operator of a CAFO shall conduct the following routine visual inspections of the production area: weekly inspections of all storm water diversion devices, runoff diversion structures and devices channeling runoff to the manure storage structure; daily inspection of water lines, including drinking water or cooling water lines; and weekly inspections of the manure storage structures noting the level of liquid in the structure as indicated by the depth marker. Also, weekly inspections of the drain tile sump.

10. All open storage structures shall: maintain a depth marker which clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation from a 25-year, 24-hour rainfall event.

11. Any deficiencies discovered during the inspections shall be corrected as soon as possible; chemicals or other contaminants handled on site shall not be disposed of in a structure used for storage or treatment of manure, process wastewater or stormwater unless it is specifically designed for that purpose; and the operator of a livestock facility requiring a permit should maintain a rain gauge at the production area and record measurable rainfall events. (Design manual, 6.2, page 40)

12. The owner/operator of a CAFO must make the following records available to the department for review upon request: records documenting the visual inspections; weekly records of the depth of the manure and process wastewater in the liquid manure storage structure as indicated by the depth gauge in storage structure; records documenting any actions taken to correct deficiencies; deficiencies not corrected within 30 days must be accompanied by an explanation of the factors preventing immediate correction; records of management and practices used; record documenting current design of any manure storage structures, including solids accumulation volume, design treatment volume, total design volume and the approximate number of days of storage capacity; records of the date, time and estimated volume of any overflow; and records documenting the land application of manure. (Design manual, 6.5, page 41)

13. The owner/operator of a CAFO shall submit an annual report which includes: the number and type of animals whether in open lots or confined under roof; estimated amount of total manure generated in the previous 12 months; estimated amount of total manure transferred to another party in the previous 12 months; total number of acres for land application covered by the Nutrient Management Plan; person who prepared the Nutrient Management Plan; total number of acres under the control of the facility that were used for land application of manure in the previous 12 months; summary of all manure discharges from the production area that have occurred including date, time, and approximate volume. (Design manual, 6.6, page 42)

14. This approval shall in no way permit or authorize the discharge of any objectionable odorous air contaminant which is in excess of the limits established in North Dakota Administrative Code Ch. 33-15-16 of the North Dakota Air Pollution Control Rules. If the Department determines odors from the facility exceed limits, appropriate steps will be required, within a reasonable time, to control and reduce odors from the facility site. This may include requiring the installation of a cover on the ponds or other odor control measures.

15. This approval shall in no way permit or authorize the maintenance of a public nuisance or danger to public health or safety.

16. There must be regular and adequate maintenance and upkeep to prevent degradation of the structures, to ensure the system continues to operate as designed, to ensure the containment system does not overflow, and to ensure manure or waste water does not discharge into waters of the state.

17. The Department must be notified if there is a change in address or other contact information for the facility.

18. The facility must maintain adequate storage capacity to contain a 100-year, 24 hour storm event.

19. Annual groundwater monitoring at the facility of the drain tile sump as specified by the Department. If groundwater monitoring indicates that the facility is detrimentally impacting groundwater, the facility will need to take corrective action to prevent groundwater impacts.

Table 1: Water Commission Well Data~~:~~

Location	Use	Depth	Diameter	Aquifer
13905402CCC	Domestic, Stock	60	18	Lake Agassiz Deposits
13905402CCD	Domestic, Stock	500	2	Dakota Sandstone
13905403DDD	Stock	450	3	Dakota Sandstone
13905406AAA	Stock	500	4	Dakota Sandstone
13905406DAD	Stock	800	3	Dakota Sandstone
13905407DDA	Domestic, Stock	760	3	-
13905408BBB1	Stock	670	4	Dakota Sandstone
13905408BBB2	Domestic	50	-	Glacial Drift
13905409CCC	Domestic, Stock	718	4	Dakota Sandstone
13905411 DDD	Observation Well-Destroyed	467		-
13905414DAD1	Domestic, Stock	222	2	-
13905414DAD2	Stock	60	36	Glacial Drift
13905416DDD	Domestic, Stock	900	4	Dakota Sandstone
14005426DAD	Domestic, Stock	425	3	Dakota Sandstone
14005427BBA	Domestic, Stock	750	3	Dakota Sandstone
14005429CAA	Unused	730	3	Dakota Sandstone
14005430ABC	Domestic, Stock	29	36	Glacial Drift
14005431AAA	Domestic, Stock	900	4	Dakota Sandstone

14005434BBB	Domestic, Stock	560	4	Dakota Sandstone
14005435CCB	Stock	460	3	Dakota Sandstone

Table 2: Soil Survey Data~~:~~

Map unit	Name	Description	Bedrock depth	Seasonal water table	Unified soil class*	Perm in/hr	Lagoon Restrictions
G100A	Hamerly-Tonka complex, 0-3% slopes.	The Hamerly series consists of very deep, somewhat poorly drained soils that formed in calcareous loamy till. Permeability is moderate in the upper horizons and moderate or moderately slow in the lower horizons. These soils are on flats on lake plains and on convex slopes surrounding shallow depressions and on slight rises on till plains. The Tonka series consists of very deep, poorly drained, slowly permeable soils that formed in local alluvium over till or glaciolacustrine deposits. These soils are in closed basins and depressions on till and glacial lake plains.	0 -60"	2.0 -4.0 +0.5 -1.0	CL, CL-ML, CH	0.6 - 2.0 0.6 - 2.0 0.2 – 2.0 0.06 – 0.2 0.2 – 0.6	Severe: wetness, ponding.
G144B	Barnes-Buse loams, 3-6% slopes.	The Barnes series consists of very deep, well drained soils that formed in loamy till. These soils are on till plains and moraines. The Buse series consists of very deep, well drained soils that formed in loamy glacial till on moraines.	0- 60"	> 6'	CL-ML, CL, ML, CH	0.6 - 2.0 0.6 - 2.0 0.2 – 0.6 0.2 - 2.0	Moderate: seepage, slope.

Table 3: Soil Boring Information:

	SB 1	SB 2	SB 3	SB 4	SB 5	SB 6	SB 7
Elevation	1148.4	1145.8	1145.5	1143.8	1146	1146.2	1145
0 to 1	TS/CL	TS	TS/CL	TS/CL	TS/CL	TS/CL	TS/CL
1 to 2	CL	CL	CL	CL	CL	CL	CL
2 to 3	CL	ML	CL	CL	SC	CL	CL
3 to 4	CL	CL	CL	CL	SC	CL	CL
4 to 5	CL	CL	CL	CL	ML	CL	CL
5 to 6	CL	CL	CL	CL	ML	CL	CL
6 to 7	CL	CL	CL	CL	ML	CL	CL
7 to 8	CL	CL	CL	CL	ML	CL	CL
8 to 9	CL	CL	CL	CL	ML	CL	CL
9 to 10	SM	CL	SC	CL	CL	CL	CL
10 to 11	SM	CL	SC	CL	CL	CL	CL
11 to 12	SM	CL	SC	CL	CL	CL	CL
12 to 13	ML	CL	CL	SM	SM	CL	CL
13 to 14	ML	CL	CL	SM	SM	CL	CL
14 to 15	ML	SP	CL	SM	SM	CL	SM
15 to 16	ML	ML	CL	SM	SM	CL	SM
16 to 17	ML	ML	CL	SM	SM	CL	ML
17 to 18	ML	ML	CL	SM	SM	CL	ML
18 to 19	ML	ML	ML	SM	SM	CL	ML
19 to 20	ML	ML	ML		SM	CL	
20 to 21	ML	ML	ML		SM	CL	
21 to 22	ML	ML	ML		SM	CL	
22 to 23	ML	ML	ML		SM	CL	
23 to 24	ML	ML	ML			CL	