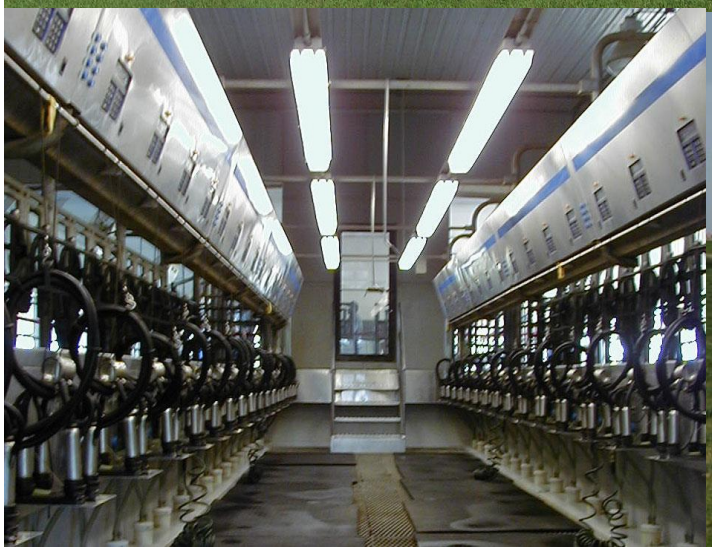
# Moody County Rural Development Site Analysis

**A Study by**
**First District Association of Local Governments**

**Funded by the South Dakota Value Added Agriculture Subfund**



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## Summary

### Program History

As part of the South Dakota Department of Agriculture's (SDDA) efforts to enhance economic development opportunities and better support local control of development, the County Site Analysis Program (Program) was developed in the summer of 2013. The Program assists participating counties in identifying potential rural properties with site development opportunities. The analysis and subsequent report will provide local leaders with information and research-based resources to foster well informed decisions regarding the future of their respective regions. It also helps identify and plan for potential challenges that may arise should those opportunities be pursued.

In implementing the Program, SDDA is working closely with South Dakota's Planning and Development Districts. The First District Association of Local Governments (First District) and Planning and Development District III (District III) developed a methodology for a feasibility analysis that focuses on identifying locations for rural economic development. The methodology addresses the feasibility of locations for the development of concentrated animal feeding operations, agricultural processing and storage facilities, and other agriculturally-related commercial/industrial development. The analysis takes into consideration local zoning and State permitting requirements along with the availability of infrastructure necessary to accommodate certain rural economic development projects.

The identification of each prospective site's relative advantages and constraints provides decision-makers with useful information for assessing the development potential of each site. The information contained herein has the potential to streamline the marketing process thereby reducing timelines, financial expenditures and labor costs. Local governments, landowners, economic development groups and State agencies such as the Department of Agriculture or Governor's Office of Economic Development all benefit from the rural site development analysis. These entities now have access to a marketing tool based on proactive planning efforts. In addition, the report may assist local governments in updating their comprehensive plans, zoning ordinances and permitting procedures while also increasing local awareness of potential development opportunities.

### Methodology

The methodology developed for this study utilized an established set of criteria deemed critical to further development of the subject properties while specifically addressing the suitability of a site for either a Concentrated Animal Feeding Operation (CAFO) or an Agriculturally-Related Industrial Development (AID). **Table 1** lists the site assessment criteria identified as being necessary to conduct analysis of the potential sites. Minimum thresholds for each criterion were utilized to establish a hierarchy classification of "Good", "Better" and "Best" sites. Those sites designated as "Best" sites were those not limited by any of the criteria considered. Sites not meeting the minimum criteria required of the "Best" sites were subsequently identified as "Better" or "Good".

Specific information regarding the site assessment criteria and methodology utilized for developing the "Good", "Better", and "Best" hierarchy may be found in **Appendices I and II**, respectively.

**Table 1: Site Assessment Criteria**

| CAFO/AID Criteria |
|---|
| Access to County and State Road Network |
| Proximity to Three-Phase Electricity Supply |
| Proximity to Rural Water System |
| Capacity of Rural Water System |
| Location of Shallow Aquifer |
| Existing Zoning Districts/Land Use Plans |
| Buildable Parcel |
| County CAFO Zoning Setback Requirements* |
| Proximity to Rural Residences* & Communities |
| Proximity to Rail** |

*****CAFO Assessment Criteria Only
** AID Assessment Criteria Only

## Limiting Factors

While this report focuses on the specific sites matching the site assessment criteria standards, it became apparent that each site also possesses its own unique set of site characteristics which present both advantages and constraints. For example, there were many sites in the County which complied with the County's zoning regulations but lacked the necessary infrastructure.

The analysis found that the primary limiting factor(s) in reviewing the development potential of properties within Moody County for a "Better" or "Best" CAFO site development is the availability of quality potable water. The same is true with AID developments which also require a reliable water source of not only high quality but also large quantities. Access to a centralized water source such as rural water was a key criterion in the site analysis process. While access to rural water quality water was identified as an impediment, the rural water systems noted that if a significant water user would locate in the county; they would explore ways to provide water to the proposed development. Therefore, the analysis does not conclude the only sites for CAFO/AID development in Moody County are relegated to the specific sites identified herein.

In addition to the availability of quality potable water, additional limiting factors such as access to County and State road networks, three phase power, rail, and the County's existing CAFO setback requirements limited the number of potential AID and CAFO sites.

The site assessment process was limited in scope to include undeveloped parcels and did not consider expansion of existing CAFOs or commercial/industrial uses. In addition to this limited scope, minimum values were utilized in ranking each site with regards to zoning requirements and infrastructure demands. No attempt was made to rank each site within the three identified classifications. The uniqueness of each criterion identified in Table 1 warrants a comprehensive review of the potential impact each may have upon a subject property. This study is intended as the first step of a multi-faceted development process potentially leading to more specific site evaluations such as Phase 1 Environmental Assessments, engineering plans and development cost analysis.

## Results

Identifying and evaluating potential sites for development is the first step in planning for economic development in rural Moody County. The findings of this report will assist in determining the potential role each site may play in supporting economic development and should be considered when planning for future projects within Moody County.

Utilizing Geographic Information System (GIS) technology, First District identified **188** sites within Moody County that met the minimum site assessment standards of the CAFO analysis, **Table 2**; and **124** sites that met the minimum standards of the AID analysis, **Table 3**. These sites complied with local zoning ordinances and were in close proximity to infrastructure necessary to support the previously identified economic development activities.

The CAFO and AID Analysis Maps further detail High Water Use (HWU) and Low Water Use (LWU) CAFO and AID sites. HWU CAFO sites are those locations which require 150,000 gallons of water per day. This amount of water is necessary to support, for example, a 3,000 head dairy. LWU CAFO sites are those locations which require 30,000 gallons of water per day, a volume necessary to support either a 600 head dairy or 5,000 head sow operation. HWU AID sites are those locations which require water at levels necessary to support high water uses such as food processing or ethanol production. The water requirement for a HWU AID site is 410,000 gallons of water per day. LWU AID sites are those locations which require water at levels necessary to support most agriculturally-related commercial/industrial development, 30,000 gallons per day. The analysis identified **188** sites which could be used for either a High Water Use or Low Water Use CAFO and **0** High Water Use and **124** Low Water Use AID sites. The following maps provide information at a township level regarding the number of "Good", "Better" and "Best" CAFO and AID sites.

**Table 2:**
**Moody County CAFO Sites by Hierarchy Classification**

| CAFO Site Classification | Good Sites | Better Sites | Best Sites |
|---|---|---|---|
| Low Water CAFO | 174 | 11 | 3 |
| High Water CAFO | 175 | 11 | 2 |

**Table 3:**
**Moody County AID Sites by Hierarchy Classification**

| AID Site Classification | Good Sites | Better Sites | Best Sites |
|---|---|---|---|
| Low Water AID | 113 | 0 | 11 |
| High Water AID | 0 | 0 | 0 |

## Moody County

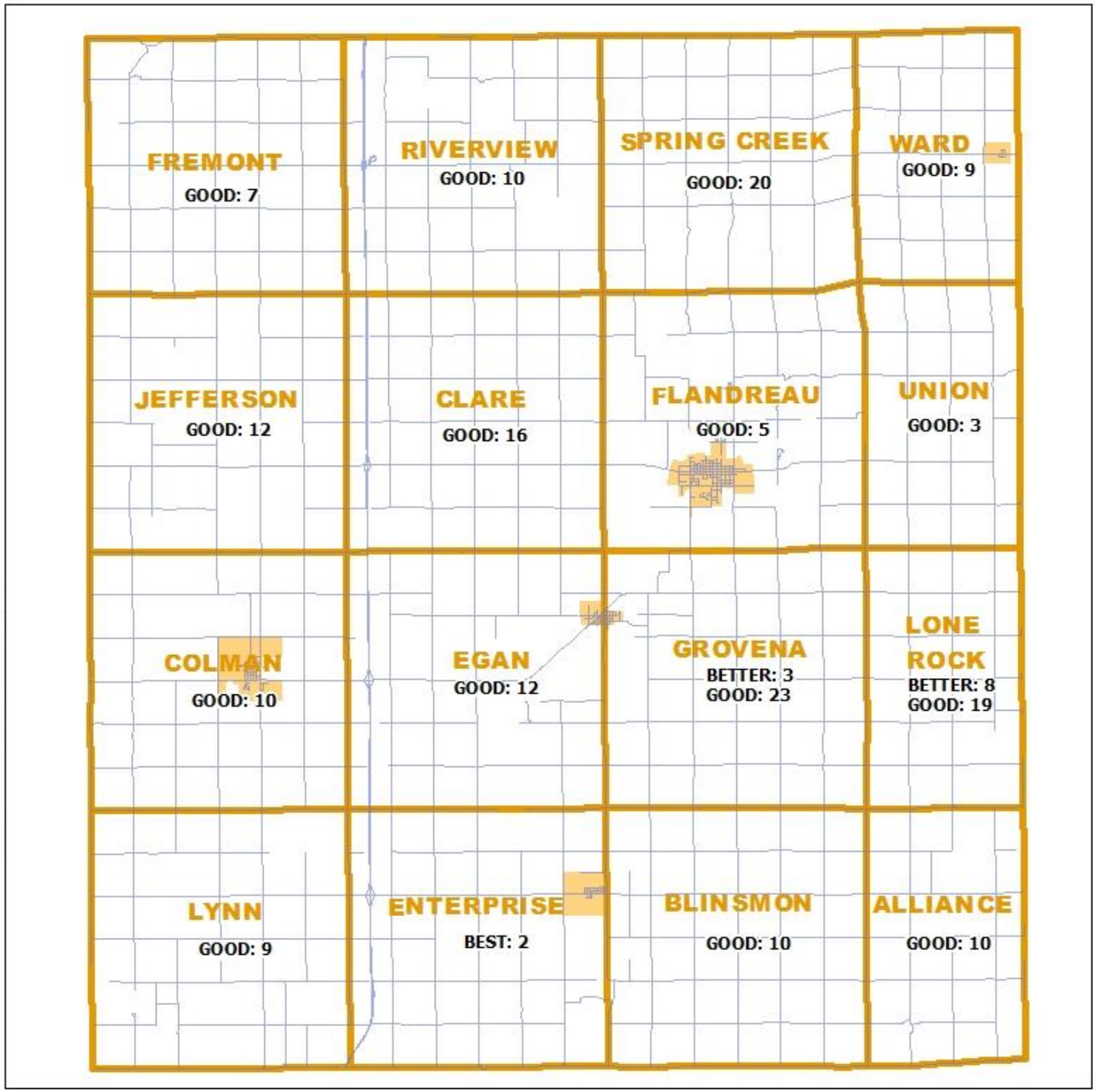
High Water Use
CAFO Development Sites
2015

Legend

Townships

City Limits

| TOWNSHIP | BEST | BETTER | GOOD |
|---|---|---|---|
| ALLIANCE | 0 | 0 | 10 |
| BLINSMON | 0 | 0 | 10 |
| CLARE | 0 | 0 | 16 |
| COLMAN | 0 | 0 | 10 |
| EGAN | 0 | 0 | 12 |
| ENTERPRISE | 0 | 0 | 2 |
| FLANDREAU | 0 | 0 | 5 |
| FREMONT | 0 | 0 | 7 |
| GROVENA | 0 | 3 | 23 |
| JEFFERSON | 0 | 0 | 12 |
| LONE ROCK | 0 | 8 | 19 |
| LYNN | 0 | 0 | 9 |
| RIVERVIEW | 0 | 0 | 10 |
| SPRING CREEK | 0 | 0 | 20 |
| UNION | 0 | 0 | 3 |
| WARD | 0 | 0 | 9 |



## Moody County

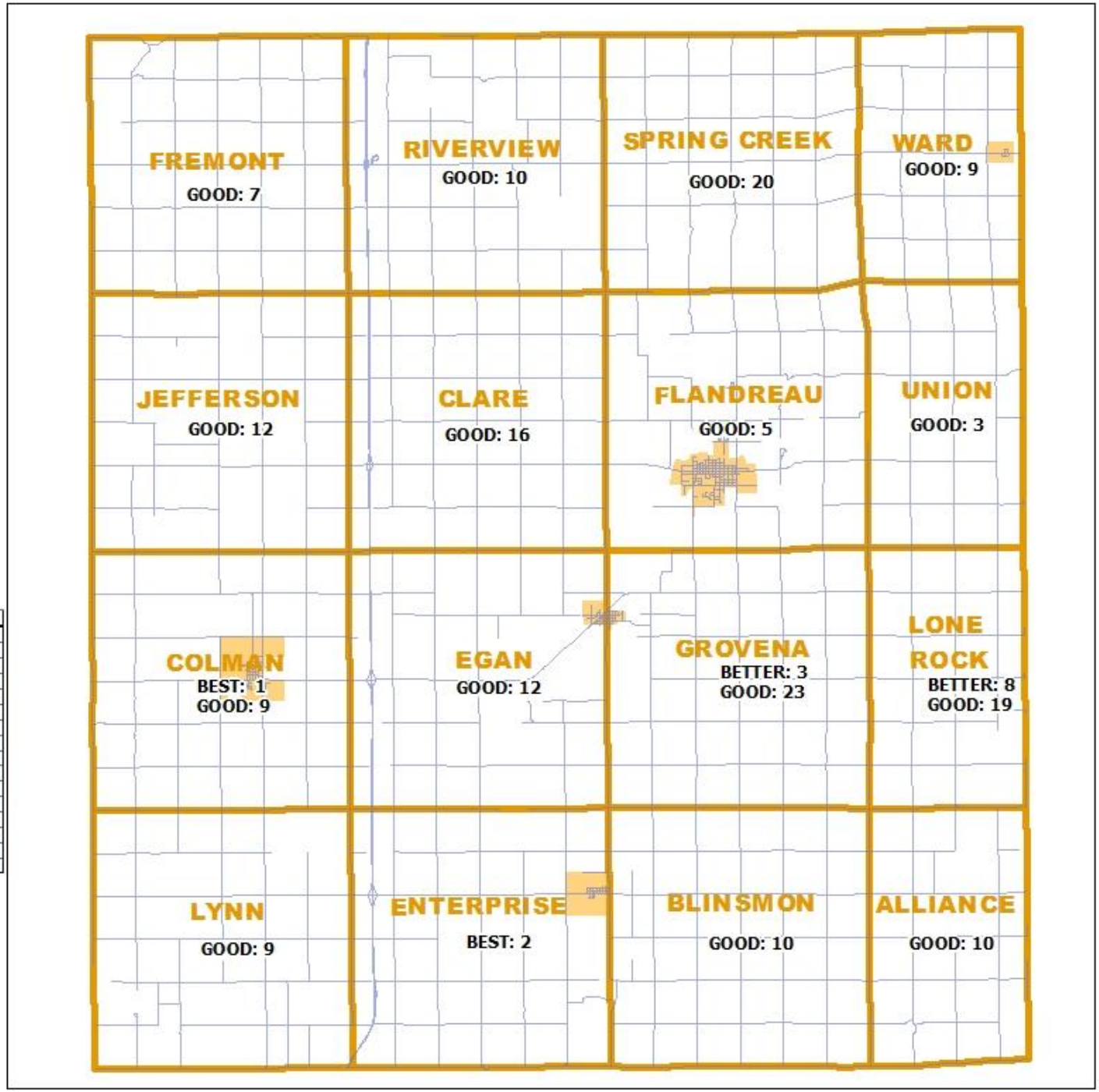
Low Water Use
CAFO Development Sites
2015

Legend

Townships

City Limits

| TOWNSHIP | BEST | BETTER | GOOD |
|---|---|---|---|
| ALLIANCE | 0 | 0 | 10 |
| BLINSMON | 0 | 0 | 10 |
| CLARE | 0 | 0 | 16 |
| COLMAN | 1 | 0 | 9 |
| EGAN | 0 | 0 | 12 |
| ENTERPRISE | 2 | 0 | 0 |
| FLANDREAU | 0 | 0 | 5 |
| FREMONT | 0 | 0 | 7 |
| GROVENA | 0 | 3 | 23 |
| JEFFERSON | 0 | 0 | 12 |
| LONE ROCK | 0 | 8 | 19 |
| LYNN | 0 | 0 | 9 |
| RIVERVIEW | 0 | 0 | 10 |
| SPRING CREEK | 0 | 0 | 20 |
| UNION | 0 | 0 | 3 |
| WARD | 0 | 0 | 9 |



**No High Water AID Map – Page Left Blank**

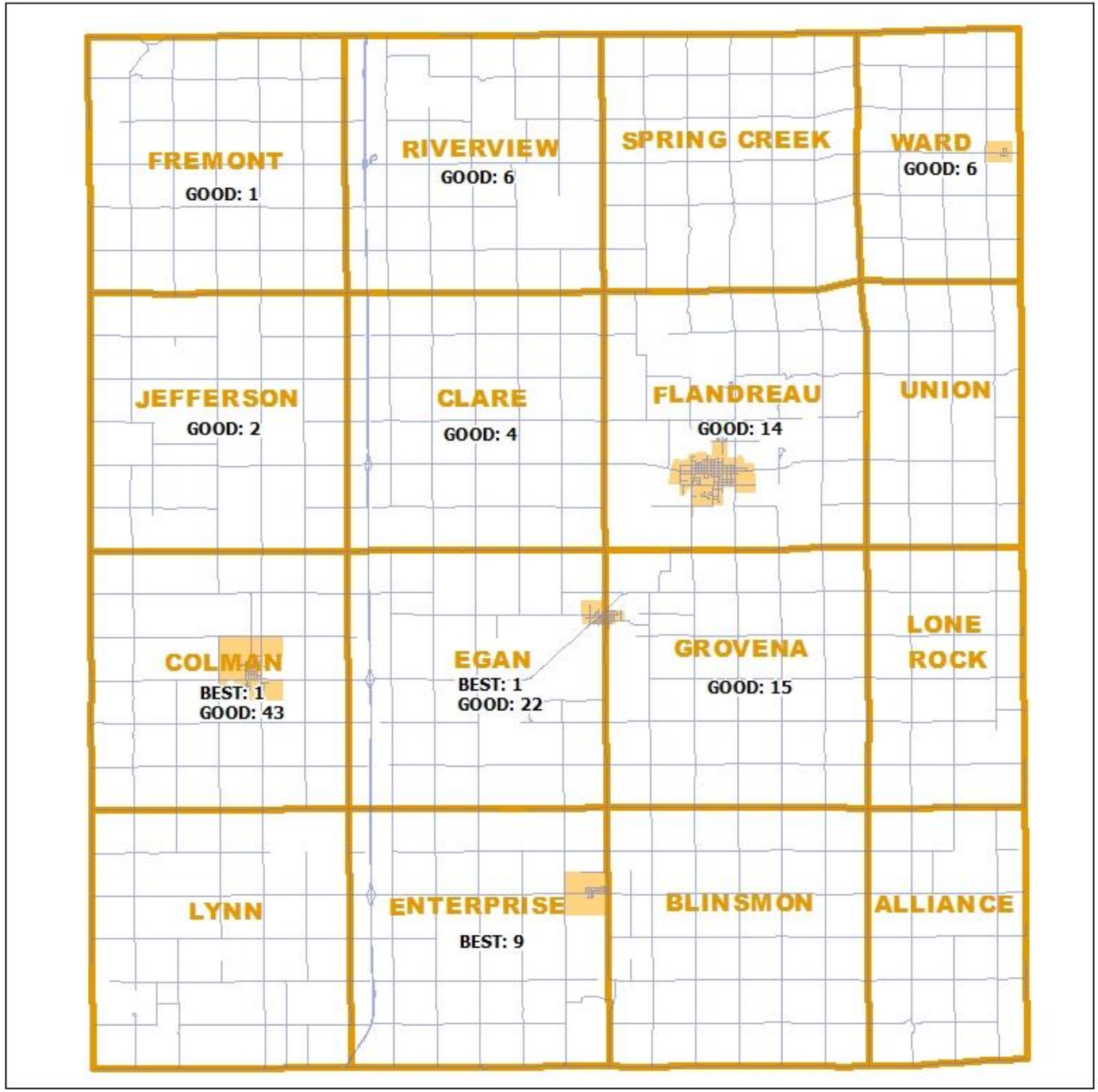
## Moody County

Low Water Use
AID Development Sites
2015

**Legend**

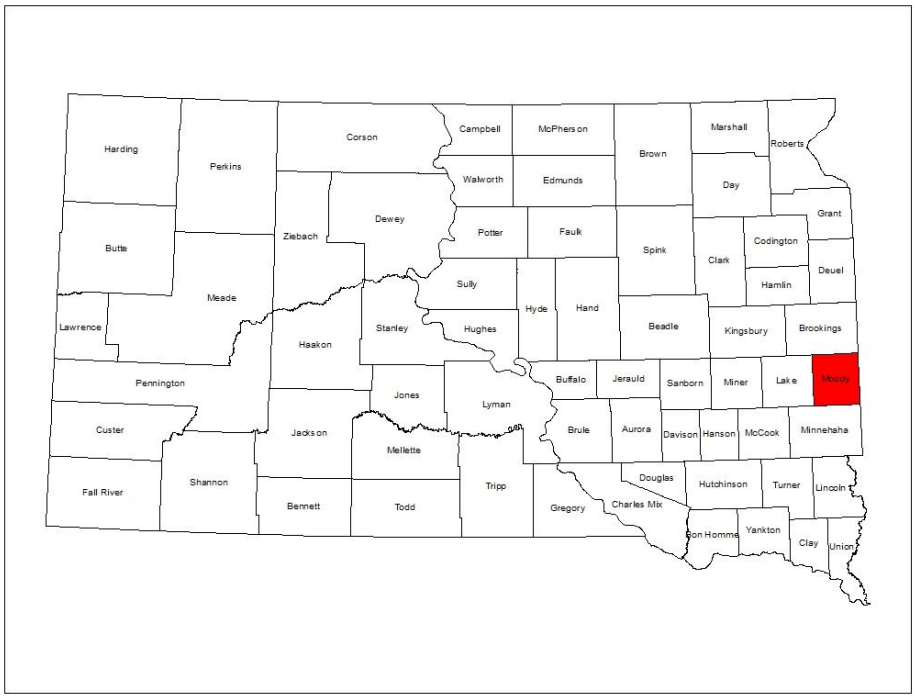
Townships
City Limits

| TOWNSHIP | BEST | BETTER | GOOD |
|---|---|---|---|
| ALLIANCE | 0 | 0 | 0 |
| BLINSMON | 0 | 0 | 0 |
| CLARE | 0 | 0 | 4 |
| COLMAN | 1 | 0 | 43 |
| EGAN | 1 | 0 | 22 |
| ENTERPRISE | 0 | 0 | 9 |
| FLANDREAU | 0 | 0 | 14 |
| FREMONT | 0 | 0 | 1 |
| GROVENA | 0 | 0 | 15 |
| JEFFERSON | 0 | 0 | 2 |
| LONE ROCK | 0 | 0 | 0 |
| LYNN | 0 | 0 | 1 |
| RIVERVIEW | 0 | 0 | 6 |
| SPRING CREEK | 0 | 0 | 0 |
| UNION | 0 | 0 | 0 |
| WARD | 0 | 0 | 6 |



## APPENDIX I: SITE ASSESSMENT CRITERIA

### Moody County Location Map




The methodology developed for this study utilized an established set of criteria deemed critical to further the development of the subject properties while specifically addressing the suitability of a site for either a CAFO or an AID.

Sites possessing all of the criteria identified as critical within the analysis will be those most sought by potential developers. The occurrence of these sites may be somewhat rare. Therefore, sites under consideration for either a CAFO or AID may meet the majority of criteria, but may also be lacking in several specific areas. Any sites not meeting all the criteria may be burdened with a limitation thus requiring more specific analysis. In these cases, the feasibility of developing the site is highly dependent upon the identified limitation(s).

A limiting condition could be the availability of water volume at an identified potential CAFO site. For example, the water demand for a 3,000 head dairy is approximately five times greater than the needs of a 5,000 head sow operation even though each operation could generally be subject to similar zoning regulations. In this situation, the lack of water at a volume necessary for a dairy may lend the site to be more likely identified as a possible location for a swine facility. It should be noted that neither this example nor the analysis explores potential alternatives to the absence of adequate rural water volume such as upsizing water distribution infrastructure or securing an alternative water source, all of which hold the potential to mitigate this constraint thereby facilitating the proposed development. Rather, the analysis recognizes upgrading infrastructure identified as necessary to support rural economic development projects may increase the number of developable sites within the County. In other cases, however, failure to meet certain criteria, such as access to a quality road network, may result in a situation where development of the site becomes economically unfeasible

The site assessment criteria, depending upon whether or not the site is for a CAFO or AID project, have been divided into the three major categories to include: **Land Use Regulations**, **Environmental Constraints** and **Infrastructure**.

## LAND USE REGULATIONS

Economic development planning in Moody County must be conducted in concert with the County's overall economic development goals. All development activities, including those specifically related to agriculture need to be accomplished within the parameters set forth in local and regional planning documents. Land use or development guidance is traditionally provided via local documents such as comprehensive plans, zoning ordinances, policies, mission statements and other local economic development plans and initiatives. The analysis reviewed said documents to determine compliance with potential CAFO and AID development. The following is a synopsis of Moody County's policies regarding CAFO and AID development.

### Comprehensive Land Use Plan

The 2002 Moody County Comprehensive Land Use Plan supports large scale animal agricultural development and agriculturally-related commercial and industrial development in order to ensure an adequate supply of sites are available for future development in the county. The need to plan for CAFO and AID development is supported by the 2002 plan, which states:

*Areas of Development Stability (Ag-zoned Property)*

This category represents the bulk of agricultural land (cropland, rangeland, and pasture) and sites that are not expected to experience any anticipated change during the planning period. This land use category should be regulated to prevent the encroachment by urban uses until such time development meets the established land use planning policies. There may be an occasional residence, or an agricultural-oriented commercial/industrial venture constructed, but the primary use or focus should remain agricultural. Major, land intensive projects such as a landfill, sewer lagoon, or concentrated animal feeding operation may dramatically alter the area and/or adjacent areas. However, these particular uses would involve mandatory public input, a comprehensive site plan review, and environmental assessment procedures.

Areas identified for development stability or agricultural uses shall be managed in such a way as to promote these uses and prevent premature intensification of other land uses. Land in this area shall be regulated so as to limit non-farm residential and urban density development through the use of minimum lot sizes, setbacks, and other regulations.

It should be noted that if agricultural lands are not protected through land use controls their optimum utilization will diminish in disproportion to the amount of area reverting to urban use. Thus, much of the remaining economic potential of the land, in terms of agricultural production, is lost.

*Agricultural Preservation Policies*

- Preserve agricultural lands and protect the rural area from uses which interfere with and are not compatible with general farming practices.

- When considering future land use decisions, the preservation of agricultural land should be of significance.

*Miscellaneous Policies*

- Regulate concentrated animal feeding, processing and related operations to protect environmental quality and minimize conflicts with existing and future development areas.

*Land Use Location and Design Criteria*

The following are specific location and design criteria that should be considered when siting an associated development request.

*Intensive Agricultural Uses*

- Includes feedlots, concentrated animal feeding operations
- Environmental impacts – aquifer protection, runoff, land application of animal waste
- Adequate separation from residences, churches, institutional uses, parks
- Prevention of construction of feedlots or Class A and B concentrated animal feeding operations in the floodplain, or over shallow aquifers
- Compliance with requirements for land application of animal wastes and for odor minimization
- Construction and land application to prevent runoff of animal wastes

Commercial/Industrial Land Use

Although the rural area may experience pressure to provide locations for both commercial and industrial development, it is the intent of Moody County to encourage commercial and industrial development to occur within municipalities, thereby preserving agricultural lands for agriculture production. The exception would be to consider commercial and industrial ventures that directly support agricultural production.

*Commercial and Industrial Development Goal*

- It is the goal of Moody County to encourage the continuation of agricultural production, while promoting cost effective, value added agricultural processing efforts.

*Commercial and Industrial Development Policies*

- Promotion or encouragement should be given to agricultural production and processing activities that benefit the agriculture industry.

- County regulations should protect the property rights and promote the economic opportunities of farm operators.

- Commercial and industrial development should take advantage of existing utility networks and transportation systems.

- The locations, capacities and relationships of public infrastructure systems should be reviewed as part of development proposals requiring county permission.

- Commercial and industrial development, such as value added ag industries should be compatible with adjacent land uses.

- Commercial and Industrial development projects should take place in designated industrial parks or already developed highway locations.

- Commercial and industrial developments which can be accommodated in an incorporated municipality shall be discouraged in the unincorporated areas of the county.

- Municipal commercial districts should be protected and should not be diluted by a scattered pattern of commercial uses developed at random throughout the unincorporated areas of the county.

- Discourage commercial and industrial development in the rural area unless the uses are directly supportive of agricultural operations.

- Discourage strip development along transportation arteries, particularly those which serve as gateways to the municipalities.

*Land Use Location and Design Criteria*

The following are specific location and design criteria that should be considered when siting an associated development request.

*Commercial/Industrial*

- Adjacent to county and state highways
- Rail access for industrial uses
- Controlled access onto major highways
- Adequate buffering from neighboring uses
- Hard surfaced driveways and parking areas

Zoning

Ideally, economic developers seek sites that are zoned and eligible for specific uses. The need to pursue a zoning change or conditional use permit introduces an additional step in the development process thus increasing development timeframes and costs. These steps or requirements also increase the uncertainty of approval given zoning changes are referable. Another issue is the super majority voting requirement necessary for a County's Board of Adjustment to approve a conditional use permit.

While the rural areas of Moody County are reserved for agricultural uses, certain agricultural uses may require a case by case review. Generally speaking, concentrated animal feeding operations are one of the aforementioned uses. It is important to emphasize agricultural producers must maintain flexibility in their operations. Grain farmers are now choosing to spread their expenses over more acres to generate a small return over more acres. Like grain farmers, numerous livestock producers are choosing to accept smaller gains over larger numbers of animals to remain solvent. Moody County's leadership recognizes a diverse agricultural industry, relying on cash crop and animal agriculture, promotes a sustainable, balanced agricultural economy. Concentrated animal feeding operations further these goals as they create a demand for crops grown in the area, provide fertilizer for surrounding land, and yield a raw product which is, in some cases, directly sold to local residents.

General CAFO Policies in the Moody County Zoning Ordinance:

- Moody County supports the creation and expansion of concentrated animal feeding operations in rural areas.
- All CAFOs are required to comply with applicable state and federal regulations.
- All manure spreading within Moody County requires appropriate separation from property lines, rights-of-way, specific water features, and various different land uses.
- CAFOs of greater than 1,000 animal units should meet minimum requirements of the South Dakota DENR General Permit.
- Moody County prohibits the location of certain CAFOs over the shallow aquifer within the ordinance.

Concentrated Animal Feeding Operation Setbacks

Moody County utilizes graduated setback requirements based upon the size of the CAFO. For example, a 3,000 head dairy is required to observe a minimum setback of **2,640 feet** from established residences, commercially-zoned properties, churches and schools. As for setbacks from municipalities, the same 3,000 head dairy can be no closer than **6,160 feet**. This analysis also used a 5,000 head sow operation for the purposes of a low water use CAFO. The setback requirements for the 5,000 head sow operation are identical to the 3,000 head dairy operation. Both the dairy and swine operations would also be required to be located at least **500 feet** from lakes, rivers and streams considered fisheries. Further all CAFO's are **prohibited in a designated 100 year flood plain**.

GIS point data for churches and schools was not readily available effectively removing them from the analysis. While it is possible that some of the sites identified in the analysis as "good", "better", or "best" may be impacted by the location of a church, school or commercially zoned area within one-half mile of a proposed CAFO site, it is believed this potential is minimal. All **188** CAFO sites in the analysis are currently zoned agricultural and either each of the individual identified parcels or a portion thereof meet setback and lot area requirements.

Commercial/Industrial Development

There is very little concentrated or clustered commercial/industrial activity at the county level. Moody County's commercial and industrial properties are generally singular and adjacent to County and State hard surface roads. Commercial and industrial activities located in rural areas are generally not conducive to municipal or populated locales.

Buildable Parcel

One criterion deemed necessary to facilitate development of either a CAFO or an AID was land area. A parcel of 40 buildable acres was set as the minimum for consideration within the analysis. In order to be considered, the property must have consisted of 40 contiguous acres and able to support development upon all 40 acres. Parcels without 40 buildable acres were not considered in the final analysis.

Proximity to Communities

The AID analysis also considered sites within one mile of a community or at specific locations identified by the County. This was done because many communities and counties have established growth plans for economic development within certain proximities of communities or at locations with existing infrastructure such as paved roads. Also since the parameters of the original AID analysis excluded all AID sites within counties without access to rail, the criterion of "proximity to a community" was defined as an adequate alternative for counties lacking rail facilities.

## ENVIRONMENTAL

The location of shallow aquifers in relation to potential development sites was included in the analysis. In reviewing shallow aquifers, it is critical to note that they are included in the analysis for two distinct and very different reasons. Shallow aquifers may be utilized as a potential water source to support development. These same aquifers are also vulnerable to pollution due to their proximity to the surface and may be required to be protected via setbacks and development limitations.

Based upon Moody County's existing aquifer protection regulations, no site will be considered eligible if located over a shallow aquifer. However, sites may be considered for development if the applicant can show by appropriate soil borings that a site is appropriate for development.

The analysis did consider local zoning setbacks from waters identified as fisheries by the State of South Dakota.

Prior to or contingent upon acquiring a parcel, it is assumed other environmental factors potentially affecting the property would be addressed via a Phase I Environmental Assessment or similar process. It is recommended that developers consider undertaking such an inquiry prior to executing a major commitment to a particular location.

## INFRASTRUCTURE

The term infrastructure is broad though in the context of property development the term includes essential services such as water, sewer, electrical, telecommunications and roads. With regards to the rural site analysis process; access to quality roads, electrical capacity and water supply were deemed essential and indentified as site selection criteria.

## Transportation

Access to quality roads was identified as critical to determining the development potential of a parcel. As such, the proximity of a potential development site to either a State or County road was established as one of the parameters in conducting the rural site analysis. In addition to utilizing the South Dakota Department of Transportation's road layer to identify roads and surface types, local experts were consulted to assist in identifying the road network. First District requested the Moody County Highway Superintendent to identify segments of the county road system inadequate to support a CAFO or AID. Sites accessed only by township roads that were located further than one mile from the intersection of a County or State hard surface road were eliminated from the analysis.

A potential development site's proximity to certain road types impacted its designation. Those parcels abutting hard surface roads were consistently ranked higher than those served by gravel roads. In reviewing CAFO and AID sites, parcels adjacent to a County or State hard surface roads were designated "Better" or "Best" for transportation resources. Parcels within one mile of an intersection with a County or State road were designated "Good" for CAFO sites. Parcels within one mile of an intersection with a County or State hard surface road were designated "Good" for CAFO sites.

Access to rail was also considered to be an important factor in locating an AID site. However, there are no rail facilities in Moody County. To compensate for lack of rail facilities the analysis removed the rail requirement and considered sites within one mile of a community or at locations identified by the County. Without rail, there are no "Best" sites. However, those parcels within one mile of a municipality or at locations identified by the County are designated as "Good" and "Better".

## Electric Supply

Access to three-phase power was designated as a site characteristics criterion for both CAFO and AID development. First District contacted the primary provider of electricity in the rural areas, Sioux Valley Energy, to obtain the location and capacity of the three-phase infrastructure within the county. All potential CAFO or AID developable parcels adjacent to a three-phase power line were designated "Best" for electricity resources. Whereas, parcels within one mile of a three-phase power line were designated "Better" and those within two miles of a three-phase power line were designated "Good".

## Water Supply

The ability to secure specific information regarding a rural water system's operations to include storage, distribution, and capacities proved to be the most complex and difficult component of the infrastructure analysis. Due to this, water resources were evaluated differently than transportation and electric infrastructure. While transportation and electric infrastructure were classified based primarily upon location and availability of three-phase power, the analysis of rural water systems first required the evaluation of the water system, specifically, each system's supply and distribution capacities.

Development sites were then selected upon the proximity to water service. The classifications with regards to water supply and their respective criteria are as follows:

1. "**Best" Classification**

   a. CAFO

      i. High Water Use CAFO Site - If the site was adjacent to or within an area where a rural water system had sufficient supply ***and*** distribution capacity to provide 150,000 gallons per day, the site area was designated as "Best" for water resources.

      ii. Low Water Use CAFO Site - If the site was adjacent to or within an area where a rural water system had sufficient supply ***and*** distribution capacity to provide 30,000 gallons per day, the site area was designated as "Best" for water resources.

   b. AID

      i. High Water Use AID Site- If the site was adjacent to or within an area where a rural water system had sufficient supply ***and*** distribution capacity to provide 410,000 gallons per day, the site area was designated as "Best" for water resources.

      ii. Low Water Use AID Site- If the site was adjacent to or within an area where a rural water system had sufficient supply ***and*** distribution capacity to capacity to provide 30,000 gallons per day, the site area was designated as "Best" for water resources.

2. "**Better" Classification**

   a. CAFO

      i. High Water Use CAFO Site - If the site was within an area where a rural water system had either a sufficient supply ***or*** distribution capacity to provide 150,000 gallons per day, the site area was designated as "Better" for water resources.

      ii. Low Water Use CAFO Site - If the site was within an area where a rural water system had either a sufficient supply ***or*** distribution capacity to provide 30,000 gallons per day, the site area was designated as "Better" for water resources.

   b. AID

      i. High Water Use AID Site - If the site was within an area where a rural water system had either a sufficient supply ***or*** distribution capacity to provide 410,000 gallons per day, the site was designated as "Better" for water resources.

      ii. Low Water Use AID Site - If the site was within an area where a rural water system had either a sufficient supply ***or*** distribution capacity to provide 30,000 gallons per day, the site area was designated as "Better" for water resources.

### 3. "Good" Classification

a. In the event the Rural Water System had **neither** supply **nor** distribution capacity to serve either a Low or High Water Use CAFO or a Low or High Water Use AID as defined above a "Good" designation was applied to those locations located within two miles but no closer than one-half mile of a shallow aquifer. The designation as "Good" for water resources was not applied to High Water Use AID sites due to the water volume requirements of High Water Use AID sites and the lack of available data regarding the capacity of shallow aquifers. Therefore High Water Use AID sites without a water resource designation of "Better" or "Best" were deemed unusable for the purpose of the analysis.

The site analysis sought to address whether the rural water system serving the region had excess water treatment capacity (supply) as well as their ability to serve potential properties (distribution). In order to address the issue of supply, First District requested location and capacity information from the Big Sioux Community Water System (Big Sioux) and Kingbrook Rural Water System (Kingbrook)`. Kingbrook provides water to a small portion of northwest Moody County while Big Sioux is the primary rural water system for the county. The two rural water systems were requested to provide information regarding their available treated water capacity. In addition, they were requested to notate, on maps, those geographic areas where distribution capacities of 30,000, 150,000, and 410,000 gallons per day were available.

Both rural water systems noted limitations with capacities whether supply of distribution; thereby, limiting their ability to meet the minimum requirements of the analysis. Only Big Sioux stated that it may have an adequate supply of water depending upon the actual location of a proposed CAFO or AID, and further noted that only portions of its system had the necessary distribution infrastructure to deliver the minimum volumes. Big Sioux identified two sites and where 150,000 gallons per day, the High Water Use CAFO "Best" requirement, could be provided. Further, Big Sioux identified eleven sites which could meet the "Best" requirement with improvements made to either or supply infrastructure. Big Sioux also identified three sites to which the minimum Low Water Use CAFO "Best" requirement of 30,000 gallons per day was available.

There were no locations within any of the rural water provider's distribution system that could accommodate the High Water Use AID site "Best" requirement of 410,000 gallons per day. However, Kingbrook and Moody-Deuel did identify numerous locations that could provide a source of water for Low Water AID sites requiring 30,000 gallons per day.

The rural water providers also identified areas within their respective systems that presently could not meet the CAFO or AID water requirements without further evaluation by their engineer and/or infrastructure upgrades.

## APPENDIX II: RESEARCH AND METHODOLOGY

This section describes the methodology utilized to evaluate the suitability of potential CAFO or AID development sites.

### Step 1: Identification of Site Assessment Criteria

**Table A1** lists the site assessment criteria identified as being necessary to conduct an analysis of potential sites. Utilizing these criteria as a guide, a variety of research methods were employed to compile the GIS data sets utilized within the analysis. Research efforts included the examination of local, regional, and state planning documents along with existing GIS data layers.

**Table A1: Site Assessment Criteria**

| CAFO Criteria | AID Criteria |
|---|---|
| Access to County and State Road Network | Access to County and State Road Network |
| Proximity to Three-Phase Electricity Supply | Proximity to Three-Phase Electricity Supply |
| Proximity to Rural Water System | Proximity to Rural Water System |
| Capacity of Rural Water System | Capacity of Rural Water System |
| Location of Shallow Aquifer | Location of Shallow Aquifer |
| Buildable Parcel | Buildable Parcel |
| Existing Zoning Districts/Land Use Plans | Existing Zoning Districts/Land Use Plans |
| Proximity to Rural Residences & Communities | Proximity to Communities |
| County CAFO Zoning Setback Requirements | Proximity to Rail |

### Step 2: Evaluation of Site Assessment Criteria

After developing the data sets in **Table A1**, the analysis identified those site locations that:

1. Complied with zoning guidelines; and
2. Were in close proximity to infrastructure necessary to support either CAFO or AID development.

**<u>Concentrated Animal Feeding Operation (CAFO) Analysis</u>**

The GIS analysis removed all parcels within the County from consideration that:

1. Were not within one mile of a County or State road.
2. Were not within two miles of three phase electric power;
3. Did not meet the (county specific i.e. half mile) setback from (county specific uses i.e. - existing residences, churches, businesses and commercially zoned areas);
4. Did not meet the (county specific i.e. half mile) setback from municipalities; and
5. Were situated over the shallow aquifer (if a county has aquifer protection regulations).
6. Did not meet the minimum standards for available water.
7. Did not contain a buildable footprint of at least forty acres.

After applying the local zoning and buildable footprint requirements to each site, the availability of necessary infrastructure was incorporated into the analysis. The general location of available water, electric and road infrastructure was applied to the remaining sites to establish "Good", "Better" and "Best" hierarchy of potential development sites. **Table A2** exhibits the minimum requirements necessary for a site to be classified as "Good", "Better" or "Best" for **CAFO development**.

**Table A2: CAFO Hierarchy Classification Requirements**

| Location Criteria | Description | Good | Better | Best |
|---|---|---|---|---|
| **Roads** | Site is adjacent to County/State hard surface road | | X | X |
| | Site is within one (1) mile of an intersection with a County/State road | X | | |
| | | | | |
| **Water** | Site is adjacent to rural water system area that has both supply and distribution capacity to provide 150,000 gallons per day or 30,000 gallons per day | | | X |
| | Site is adjacent to or within rural water system area that has either supply or distribution capacity to serve either 150,000 gallons per day or 30,000 gallons per day | | X | |
| | Site is within two (2) miles but no closer than ½ mile of shallow aquifer in those counties with aquifer protection regulations<br>or<br>Site is within two (2) miles of shallow aquifer and may be located over shallow aquifer in those counties without aquifer protection regulations | X | | |
| | | | | |
| **Electricity** | Site is adjacent to three phase power | | | X |
| | Site is within one (1) mile of three phase power | | X | |
| | Site is within two (2) miles of three phase power | X | | |
| | | | | |
| **Zoning** | Site meets county zoning setback requirements | X | X | X |
| | | | | |
| **Aquifer** | Site meets county aquifer protection regulations (if applicable) | X | X | X |
| | | | | |
| **Buildable Parcel** | Site contains buildable area of at least forty (40) acres | X | X | X |

## Agriculturally-related Industrial Development (AID)

The GIS analysis removed all parcels within the County from consideration that:

1. Were not within one mile of a County or State hard surface road.
2. Were not within two miles of three phase electric power;
3. Were not within one mile of rail, if applicable;
4. Were not within one mile of a community or at locations identified by the county
5. Were situated over the shallow aquifer (if a county has aquifer protection regulations).
6. Did not meet the minimum standards for available water.
7. Did not contain a buildable footprint of at least forty acres.

After applying the required location based site assessment criteria to each site, the availability of necessary infrastructure was incorporated into the analysis. The general location of available water, electric, rail and road infrastructure was applied to the remaining sites to establish "Good", "Better" and "Best" hierarchy of potential development sites. **Table A3** exhibits the minimum requirements necessary for a site to be classified as "Good", "Better" or "Best" for **AID Development**.

**Table A3: AID Hierarchy Classification Requirements**

| Location Criteria | Description | Good | Better | Best |
|---|---|---|---|---|
| **Roads** | Site is adjacent to County/State hard surface road | | X | X |
| | Site is within one (1) mile of an intersection with a County/State hard surface road | X | | |
| | | | | |
| **Rail** | Site is adjacent to rail facility | | | X |
| | Site is within one half ½ mile of rail facility | | X | |
| | Site is within one (1) mile of rail facility | X | | |
| | | | | |
| **Water** | Site is adjacent to or within rural water system area that has either supply or distribution capacity to serve 410,000 gallons per day or 30,000 gallons per day | | | X |
| | Site is adjacent to or within one (1) mile of rural water system area that has either supply or distribution capacity to serve 410,000 gallons per day or 30,000 gallons per day | | X | |
| | Site is within two (2) miles but no closer than one half (½) mile of shallow aquifer in those counties with aquifer protection regulations<br>or<br>Site is within two (2) miles of shallow aquifer and may be located over shallow aquifer in those counties without aquifer protection regulations | X | | |
| | | | | |
| **Electricity** | Site is adjacent to three phase power | | | X |
| | Site is within one (1) mile of three phase power | | X | |
| | Site is within two (2) miles of three phase power | X | | |
| | | | | |
| **Zoning** | Site is zoned for commercial/industrial development | | | X |
| | Site is identified in land use plan for commercial/industrial development | | X | |
| | Site is neither identified or zoned for commercial/industrial development | X | | |
| | | | | |
| **Proximity** | Site is within one (1) mile of community | X | X | |
| | | | | |
| **Aquifer** | Site meets county aquifer protection regulations (if applicable) | X | X | X |
| | | | | |
| **Buildable** | Site contains buildable area of at least forty (40) acres | X | X | X |

**Step 3: Site Development Recommendations**

Based on the analysis, **188** sites were classified as Good, Better, or Best for CAFO development (**Table A4**) and **124** sites were classified as Good, Better, or Best for AID development (**Table A5**).

While this study only identifies those sites that met the required criteria for the analysis, it should be noted that other sites within the county may be satisfactory for CAFO and AID development. Sites not within the specified distance of a hard surfaced county or state road or does not have desired infrastructure (rail, water, power) within close proximity does not necessarily negate its development potential.

**Table A4:**
**Moody County CAFO Sites by Hierarchy Classification**

| CAFO Site Classification | Good Sites | Better Sites | Best Sites |
|---|---|---|---|
| Low Water CAFO | 174 | 11 | 3 |
| High Water CAFO | 175 | 11 | 2 |

**Table A5:**
**Moody County AID Sites by Hierarchy Classification**

| AID Site Classification | Good Sites | Better Sites | Best Sites |
|---|---|---|---|
| Low Water AID | 113 | 0 | 11 |
| High Water AID | 0 | 0 | 0 |

## APPENDIX III: CONTACT INFORMATION

**First District Association of Local Governments**

Executive Director: Todd Kays
GIS Coordinator: Ryan Hartley
Phone: 605-882-5115

**Moody County**

Zoning Officer: Brenda Duncan
Phone: 605-997-3101

Highway Superintendent: Marc Blum
Phone: 605-997-2832

**Rural Water Systems**

Big Sioux Rural Water System
Martin Jarrett
Phone: (605) 997-2098

Kingbrook Rural Water System
Randy Jencks
Phone: (605) 983-5074

**Electric Providers**

Sioux Valley Energy
Tim McCarthy
Phone: (605) 256-1690

**Other Resources - Aquifer**

First Occurrence of Aquifer Materials in Moody County, South Dakota
Department of Environment and Natural Resources
Division of Financial and Technical Assistance
Geological Survey Aquifer Materials Map 10
Anne R. Jensen, 2002
http://www.sdgs.usd.edu/pubs/pdf/AM-10_20150205.pdf