# United States Department of the Interior

Fish and Wildlife Service
Huron Wetland Management District
Room 309, Federal Bldg.
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Huron, SD 57350
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September 17, 2019

Zoning Board
% Assessor
415 West 1st Avenue, Suite 204
Miller, SD 57362
commissioners.handcounty@midconetwork.com
assessor.handcoem@midconetwork.com

Dear Hand County Commissioners:

Thank you for the opportunity to submit comments on the Concentrated Animal Feeding Operation (CAFO) being proposed by Ratio, LCC in Hand County, SD. According to materials posted to the Zoning Board's website; Ratio, LCC has proposed building a large (9,060 head of swine) CAFO facility on lands owned by Kirk Aughenbaugh in Sections 5,6,8-110N-67W and 31,31-111N-67W. The structures associated with the proposed CAFO will be in 5-110N-67W and land application of manure will occur in fields in the remaining locations.

These lands completely surround the lands held in public trust called the Cahalan Waterfowl Production Area (WPA) managed by the U.S. Fish and Wildlife Service (Service), National Wildlife Refuge System. The Cahalan WPA was purchased using funds from the sale of Federal Duck Stamps in 1963 for the purpose of providing important habitat for breeding waterfowl and other migratory birds. Nearly half of all ducks produced in the continental U.S. are hatched in the wetlands and grasslands within the Prairie Pothole Region; and this 355-acre WPA is part of a complex of WPAs managed by staff at the Huron Wetland Management District with the purpose of restoring and preserving high-quality wetlands and grasslands unique to the Prairie Pothole Region.

The Cahalan WPA is an open water lake and is one of the few WPAs within the Huron Wetland Management District that has consistent open water conditions year-round. Cahalan WPA has been surveyed annually for waterfowl use since 1987 as part of the Prairie Pothole Region Four Square Mile Waterfowl Survey (see http://ppjv.org/science/projects/four-square-mile-breeding-waterfowl-survey). This WPA hosts a high diversity of waterfowl species and some of the highest waterfowl counts within the Huron Wetland Management District. Due to this, the Cahalan WPA is also a popular waterfowl hunting location. Waterfowl hunting season in South Dakota typically runs from August or September into early January. In 2019 for the Cahalan WPA: Canada goose season will run Sept 7 through December 22; general waterfowl September

28 through December 10 (youth only on September 21-22); white-fronted goose Sept 28 through December 10; and light goose September 28 through January 10, 2020.

Ratio, LCC is proposing to build the CAFO approximately 750 feet (225 meters) north of the Cahalan WPA and the manure slurry produced by this facility is proposed to be spread via land application to fields that 100 percent surround the Cahalan WPA (Figure 1). Ratio LCC's Nutrient Management Plan (NMP) posted on the Hand County website identifies that all five fields they are proposing to utilize for the manure land application are classified as High Runoff Risk (Figure 2). Local topography indicates that runoff from all of these fields will end up in the Cahalan WPA (see attached digital elevation model, produced from ISFAR data; Figure 3). Ratio, LCC has indicated that their proposed facility will be a "zero discharge" facility. However, that designation is for the buildings and the pits beneath the buildings. It does not include the land application portion of the facility and does not include the runoff, seepage or spillage from the proposed facility. Furthermore, the South Dakota General CAFO permit may allow for a discharge from the Facility during a "25-year, 24-hour Storm Event", which is a 4-inch rain in Hand County (see Appendix E of South Dakota General CAFO permit). The Ratio LCC proposal does not analyze or discuss the potential for runoff from the proposed land application of slurry into the Cahalan WPA (lake) that the High Runoff Risk fields surround.

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) has several publically available reports and tools that discuss and make recommendations for soils and land application of animal waste slurry associated with CAFOs (see: NRCS 2018a; NRCS 2018b; https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm). Utilizing their tools, we produced a soil map of the Aughenbaugh site and the Cahalan WPA (Figure 4). Approximately 76 percent of the soils are considered "somewhat limited" and approximately 23 percent are considered "very limited" in their appropriateness for land application of animal waste slurry. This is based on the fact that their soil profile indicates that water will move very slowly through the soils – again increasing risk of surface runoff. Further, the soils have properties indicating water erosion risk is higher and pesticide and nutrient movement are such to limit the appropriateness of slurry application (NRCS 2018a; NRCS 2018b). It is unclear from the applicant's NMP if they applied the USDA NRCS SPAW Model and if they did if they removed all the buffer acres from the total field application acres (Figure 2). The buffer and exclusion acres should be subtracted from the total field acres to determine if there are enough field acres for land application under the SPAW model.

Animal waste slurry is high in nitrogen and phosphorus, which contribute to eutrophication. There are numerous peer-reviewed scientific articles and reports that document specifically the connection of land based manure application and eutrophication of water bodies. Studies by the Service (Schwarz *et al.* 2004) and others (Burkholder *et al.* 2007; Bradford *et al.* 2008; Raff and Meyer 2019) report that pollutants from CAFOs contaminate surface waters and soils, leading to wildlife habitat degradation. Nutrients will leave the field application sites through runoff and soil leaching and nitrogen and phosphorus contribute to the eutrophication of water bodies and can be seen as algal blooms and fish die-offs. High nutrient loads increase risk of toxic cyanobacteria blooms, avian botulism outbreaks, as well as other waterfowl diseases (Briand *et al.* 2003; Burkholder *et al.* 2007; USGS 1999). The Service is also concerned about the potential effects of contaminants associated with animal slurry on aquatic invertebrates, which are the

waterfowl's food base in the Cahalan WPA. Furthermore, pig slurry is a source of zoonotic bacteria such as *Escherichia coli* and *Salmonella* spp. (Krog *et al.* 2017; Pappas *et al.* 2008; Thurston-Enriquez *et al.* 2005). These pathogens and others, may pose a public safety risk and waters can be closed to human contact.

The Ratio LCC proposal also outlines significant water usage needed for the operation. The application indicates that those water needs may be met through future wells (for which they would need to obtain water rights they do not currently have), through drawing down surface waters, rural water development, or a combination thereof. The Ratio LCC proposal does not analyze or discuss how those water needs and pulling that water from the water table could affect the water balance of the Cahalan WPA. Lowered water levels in a permanent wetland combined with increased nutrient loads may increase the risk of avian botulism by increasing water and sediment temperature and lowering dissolved oxygen (USGS 1999; Rocke and Samuel 1999)

Ratio, LCC is proposing to conduct their land based application of the swine manure slurry in the fall. This timing coincides with high public use of the Cahalan WPA as waterfowl hunting season typically runs from September through early January as discussed above. This office has received multiple calls and testimony from hunters expressing concern over the application of the swine manure slurry during hunting season. As stated previously, Ratio, LCC is proposing to completely surround the WPA with applications of swine manure slurry. Hunters are expressing concern about the odor, flies, and water quality degrading the public lands and hunting experience. I have also heard concern about the potential for and blue green algae (common name for cyanobacteria) affecting their hunting dogs. Recent (2019) blue-green algae outbreaks in South Dakota have been link to several dog deaths as well as entire lake closures (https://gfp.sd.gov/news/detail/1260/; https://www.onlyinyourstate.com/south-dakota/blue-green-algae-sd/; http://www.dailyleaderextra.com/news/top_stories/article_0df6f5bc-ba17-11e9-8b53-a761ca5a5c7a.html; https://www.epa.gov/nutrient-policy-data/lakes-presenting-risk-exposure-harmful-algal-toxins). Furthermore, likely increases in *Escherichia coli* could make the water unsafe for human contact.

Hunting and fishing on public lands adds significant economic value, as detailed in the Service's May of 2019 report "Banking on Nature – The Economic Contributions to Local Communities of National Wildlife Refuge Visitation" available at https://www.fws.gov/economics/divisionpublications/divisionpublications.asp. This report contains a May 2019 Analysis of Economic Contributions of the Madison Wetland Management District based out of Madison, SD. Visitor recreation expenditures in 2017 on WPAs in the Madison District were $4.6 million, with non-residents accounting for $2.9 million (63 percent) of total expenditures. Expenditures on hunting activities accounted for 59 percent of all expenditures. The report concluded that spending in the local area generates and supports economic activity and found the contribution of recreational spending in local communities was associated with about 57 jobs, $2.2 million in employment income, $351,000 in total tax revenue, and $7.0 million in economic output.

In summary, the Service has concerns about water and wetland habitat degradation that will likely result from Ratio, LCC operations. We are concerned that pollutants will diminish the habitat value of the Cahalan WPA, which is completely surrounded by the proposed manure land

application sites and is less than 230 meters from the facility buildings. We are also concerned that the land application sites and timing will result in a loss of public services (e.g., wildlife watching, hunting, and photography). These impacts, if realized, would compromise the Government's interest in these lands and devalues the purpose for which these lands were purchased.

To protect wetlands, wildlife, and the public services provided by the Cahalan WPA we recommend the following actions:

- Revise the land application locations to minimize runoff risk into the Cahalan WPA. The Service is willing to work with project proponents to develop appropriate buffers.
- Require an analysis of the runoff risks, potential effects, and develop and implement a water quality assessment and long term water quality monitoring of the Cahalan WPA to include mitigation measures should water quality impacts be detected. The Service is willing to work with project proponents to develop a long term water quality monitoring plan. Monitoring results should be shared with the Service.
- Require an analysis of the water balance into Cahalan WPA to understand how their proposed water drawdowns will affect these public waters and develop mitigation measures to minimize risks.
- Relocate the buildings and pits further back from the Cahalan WPA, consider the higher elevation lands within the project footprint along the NW boundary. This location would reduce the risk of a catastrophic event at the facility discharging effluent into the Cahalan WPA or the West Pearl Game Production Area to the north.
- Review this application and associated Nutrient Management Plan under the USDA NRCS Soil-Plant-Air- Water Model (SPAW Model) and ensure that there are enough applicable acres for the land application once all the buffered acres are removed as there should not be and land application on buffered acres.

Thank you for the opportunity to provide comments on these zoning and permit actions. Should you have any questions regarding these comments, please contact me at 605-352-5894, extension 111.

Sincerely,

Deborah Williams
Project Leader
Huron Wetland Management District

Enclosed: Four referenced figures

## REFERENCES


Bradford SA, Segal E, Zheng W, Wang Q, Hutchins SR. 2008. Reuse of concentrated animal feeding operation wastewater on agricultural lands. *Journal of Environmental Quality* 37(5):97-115.

Briand, S.H., Jacquet S., Bernard C., and Humbert J.F. 2003. Health hazards for terrestrial vertebrates from toxic cyanobacteria in surface water ecosystems. Veterinary Research 34: 361-377.

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Schwarz MS, Echols KR, Wolcott MJ, Nelson KJ. 2004. Environmental contaminants associated with swine concentrated animal feeding operation and implications for McMurtrey National Wildlife Refuge. U.S. Fish and Wildlife Service Contaminant Report, Grand Island, Nebraska. 84 pp. https://www.fws.gov/mountain-prairie/contaminants/papers/Hastings%20Pork%20CAFO%2000%20final%20report.pdf

Thurston-Enriquez, J.A., J.E., Gilley, and B. Eghball. 2005. Microbial quality of runoff following land application of cattle manure and swine slurry. Journal of Water & Health. 3 (2): 157-171.

U.S. Geological Survey. 1999. Field manual of wildlife diseases: general field procedures and diseases in birds. Friend M, Franson JC, eds, Information and Technology Report 1999-01. 438 pp. https://pubs.usgs.gov/itr/1999/field_manual_of_wildlife_diseases.pdf

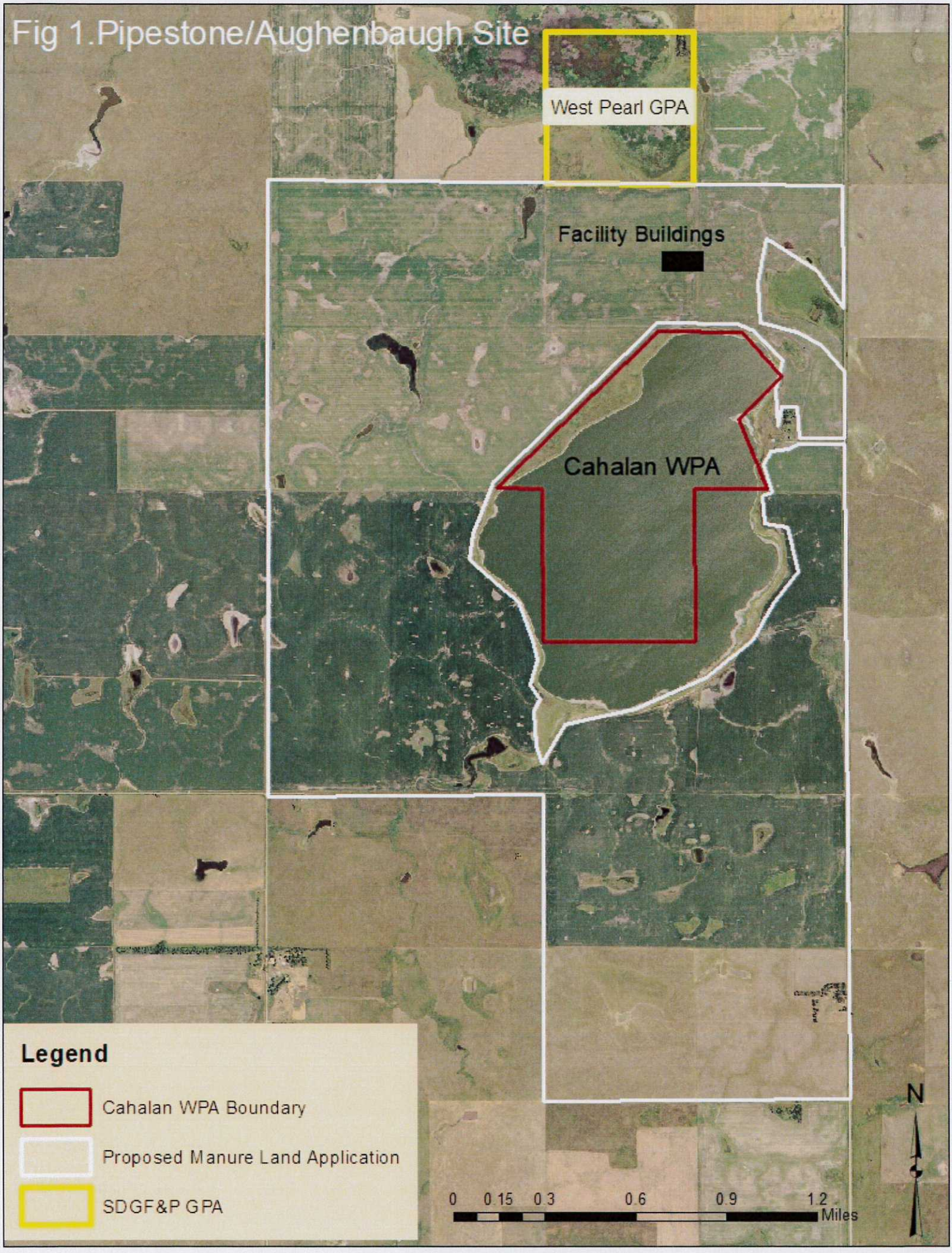


Fig 1.Pipestone/Aughenbaugh Site
West Pearl GPA
Facility Buildings
Cahalan WPA
Legend
Cahalan WPA Boundary
Proposed Manure Land Application
SDGF&P GPA
0 0.15 0.3 0.6 0.9 1.2
Miles
N

Figure 2.

# Water Quality Risk Assessment Map
# Frozen and Snow Covered Ground
# Aughenbaugh Site
# 5,6,8-110N-67W & 31,32-111N-67W


## Legend

Aughenbaugh Borders

Frozen Snow Covered Exclusions

Manure Application Field

R Runoff High Risk

L Leaching High Risk

0 0.15 0.3 0.6 0.9 1.2 Miles

N

CENTROL
CROP CONSULTING

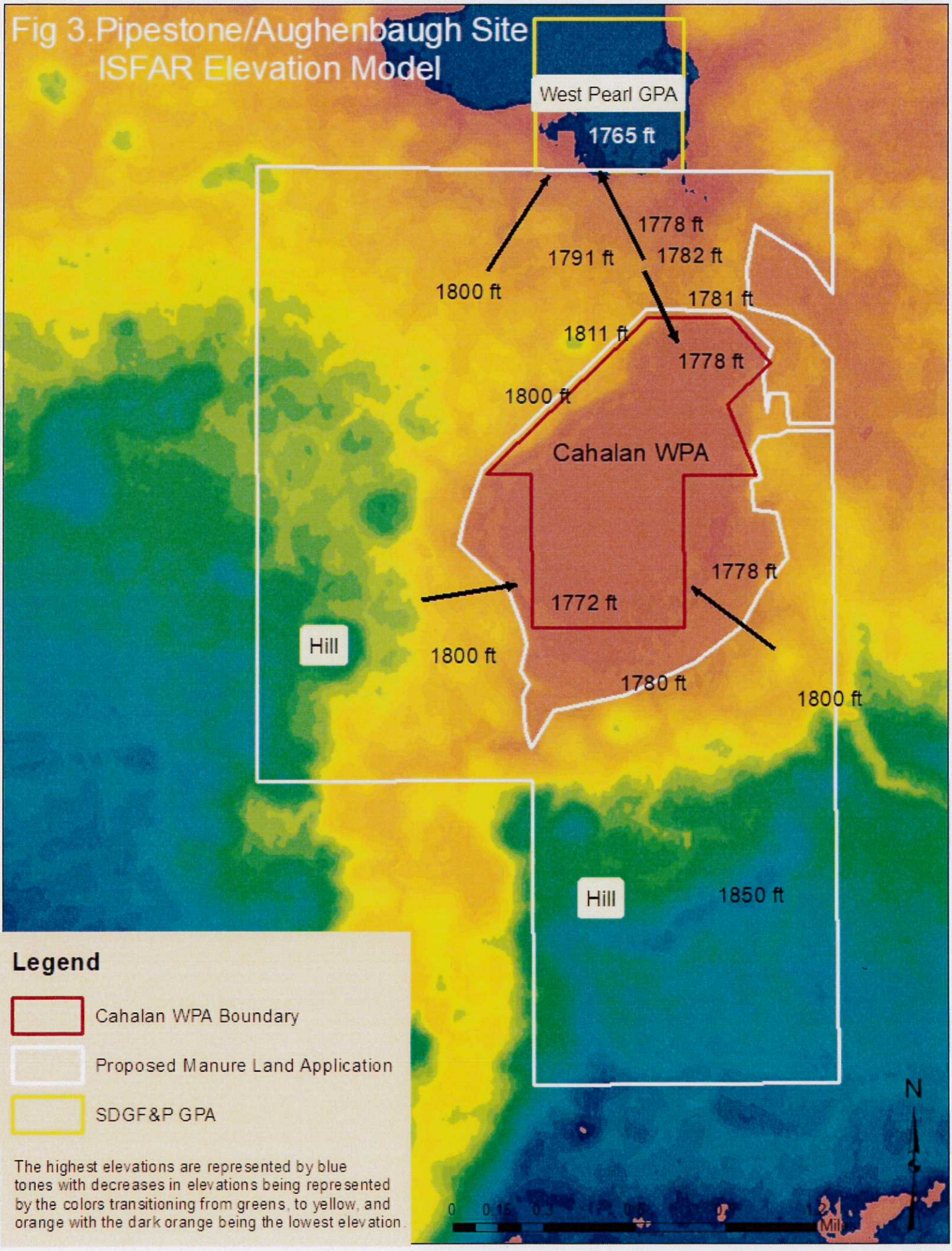
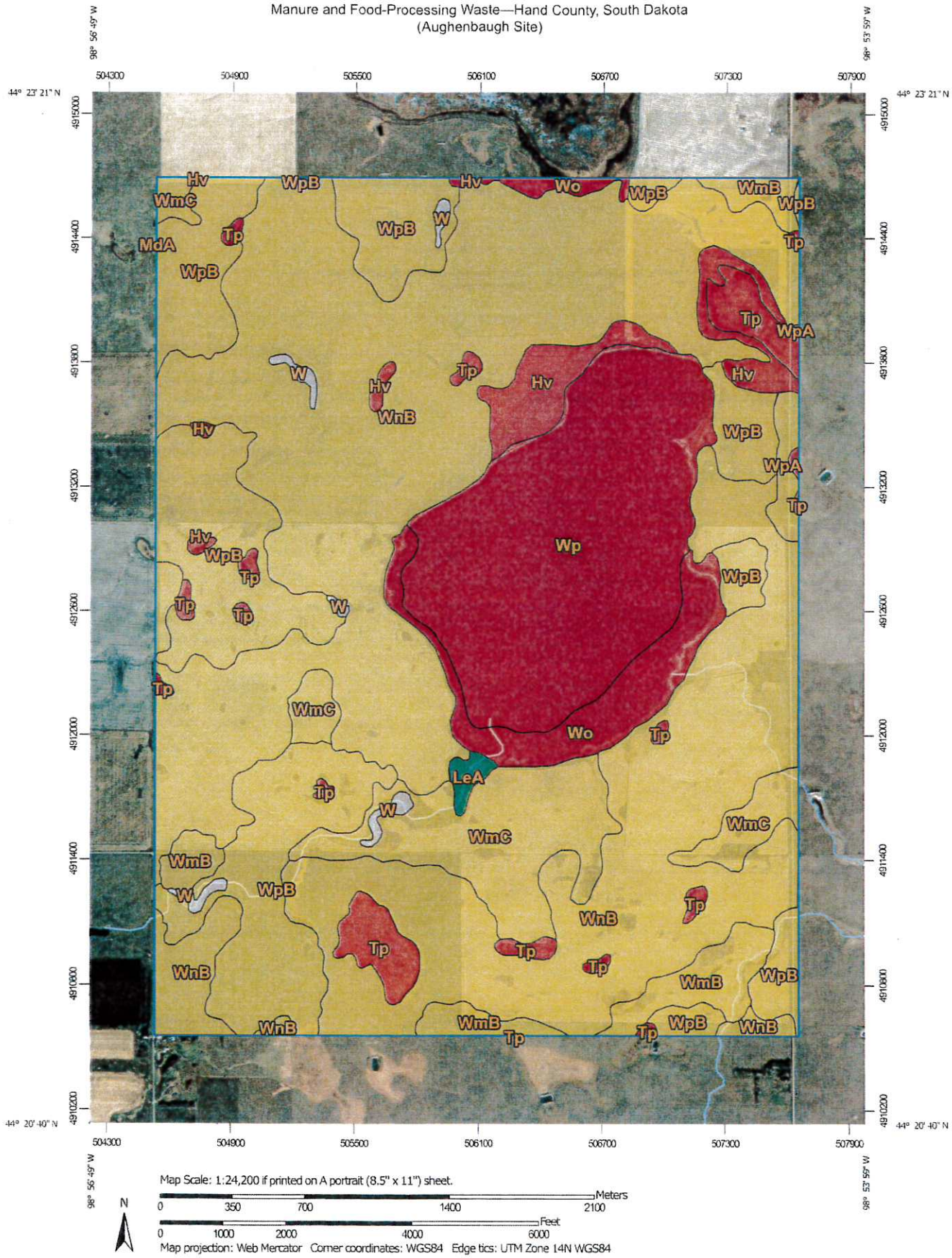


Fig 3. Pipestone/Aughenbaugh Site
ISFAR Elevation Model
West Pearl GPA
1765 ft
1778 ft
1791 ft
1782 ft
1800 ft
1781 ft
1811 ft
1778 ft
1800 ft
Cahalan WPA
1778 ft
1772 ft
Hill
1800 ft
1780 ft
1800 ft
Hill
1850 ft
Legend
Cahalan WPA Boundary
Proposed Manure Land Application
SDGF&P GPA
The highest elevations are represented by blue tones with decreases in elevations being represented by the colors transitioning from greens, to yellow, and orange with the dark orange being the lowest elevation.
N
0
0.15
Mi

# Fig.4


Manure and Food-Processing Waste—Hand County, South Dakota
(Aughenbaugh Site)
98° 56' 49" W
98° 53' 59" W
44° 23' 21" N
44° 20' 40" N
504300
504900
505500
506100
506700
507300
507900
4915000
4914400
4913800
4913200
4912600
4912000
4911400
4910800
4910200
Hv
WmC
WpB
MdA
Tp
W
Wo
WmB
WpA
Wp
LeA
Map Scale: 1:24,200 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0
350
700
1400
2100
Feet
0
1000
2000
4000
6000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Lines**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Soil Rating Points**
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hand County, South Dakota
Survey Area Data: Version 20, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 16, 2010—Feb 6, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.