

WATER PERMIT NO. 7028-3

Name of Applicant: **Roger Amdahl**

Address: **45364 157th St, South Shore SD 57263**

Phone: **605 882-1348**

Amount of Water Claimed: **2.77 cfs**

Total Acres: **223 acres**

Source of Water Supply: **groundwater (2 wells)**

Water to be used for: **irrigation**

County: **Codington**

Type of Waste Disposal System:

Location: **10 miles west of South Shore**

PRIORITY

Date Received: **4-16-08**

Application/License Fee: **\$325.00**

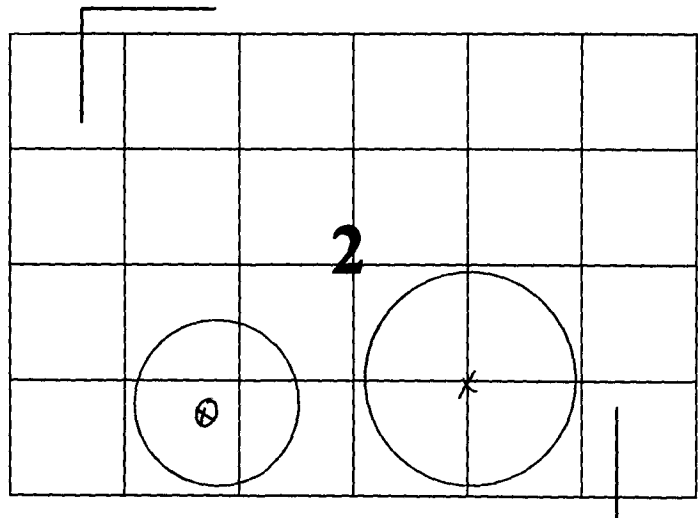
Corrected Application Received: **4-29-08**

Period of Annual Use: **March 1 – Oct 31**

Remarks:

Diversion Point: **SW ¼ SE ¼ and center of the SE ¼ Sec 2-T119N-R52W**

Land to be Irrigated: **S ½ Sec 2-T119N-R52W**



Depth of Well: **135 feet deep**

Well Driller:

Remarks:

Type of Map: **aerial**

Prepared by: **Cathy Delay, Codington Co FSA**

Reviewed and the Number Assigned on: **5-1-08**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

FORM 2: Application for irrigation in South Dakota
(type or print)

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>7028-3</u> (office use only)	Hydrologic Unit <u>10170202</u>
	Basin <u>Sioux River</u>	
	Newspaper <u>Public Opinion</u>	<u>PO Box 10</u>
	<u>605-886-6901</u>	<u>Watertown 57201</u>

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Application For Permit To Appropriate Water For Irrigation

Type of Application: ☒ New ☐ Vested Right ☐ Amendment/Correction to Permit No. _____
(Use predates Mar 2, 1955)

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) _____

- Name of Applicant Roger Amdahl Phone 605-882-1348
(check one) ☒ Owner ☐ Tenant/lessee
- Mailing Address 45364 157th street South Shore State SD 57263
(Street, RR, or Box and City) 1250 (Zip Code)
- Amount of water claimed 2.77 CFS or 1250 ~~***GPM~~ ***AF Total Acreage 223
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply Well (2)
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) S 1/2 2 119R-52R
County Codington
- County or counties where water will be used Codington
- Annual period during which water is to be used Spring summer fall Mar 1 - Oct. 31
- List below each forty acre division, or lot, or fraction thereof and show number of acres to be irrigated in each.
(Attach sheet if more space is needed)

Land Description	Acres	Land Description	Acres
SE 1/4 of S 1/2 2 119R-52R	139		
SW 1/4 of S 1/2 2 119R-52R	84		

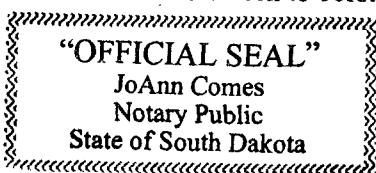
8. Give a description of the project. (Attach sheet if more space is needed)
Put up a center pivot irrigation system to irrigate crops.

STATE OF SOUTH DAKOTA)
County of Codington SS

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

I, Roger Amdahl, the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Applicant's signature Roger Amdahl
Subscribed and sworn to before me this 28th day of January 20 08



Commission Expires
12-28-2009

JoAnn Comes
Notary Public signature

SOUTH DAKOTA
WATER PERMIT NO. 7028-3

Date of first receipt of application April 16, 2008.

Date of return to applicant for corrections, amendments or changes April 17, 2008.

Date of receipt of corrected application April 29, 2008.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 7028-3 to Roger Amdahl, 45364 157th St, South Shore SD 57263 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 7028-3 appropriates 2.77 cubic feet of water per second from two wells to be completed into the Prairie Coteau Aquifer (approximately 135 feet deep) located in center of the SE 1/4 and the SW 1/4 SW 1/4 Section 2 to irrigate 223 acres located in the S 1/2 Section 2; all in T119N-R52W within the former boundaries of the Sisseton Wahpeton Indian Reservation.
2. The amount of the appropriation may not exceed 2 acre feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: March 1 – October 31.
3. The date from which applicant may claim right is April 16, 2008.
4. The date of approval of Permit No. 7028-3 is July 7, 2008.
5. One-fifth of the construction is to be completed on or before January 7, 2011.
6. All construction is to be completed on or before July 7, 2013.
7. Water is to be put to beneficial use on or before July 7, 2017.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The wells approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The wells authorized by Permit No. 7028-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. The wells approved under this Permit shall be valved and the flow reduced to the amount needed or to a minimum when not being used. If this well is abandoned or the Permit cancelled, the well must be plugged in accordance with Water Management Board Rules, Chapter 74:02:04.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

By: Garland Erbele
Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

JUL 28 2008
date



Supplemental Information

(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 8" Depth 140'
- b) Casing Type PVC Diameter 8" Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material _____
- f) Depth to Water (ground surface to water level) _____
- g) Distance to nearest existing domestic well:
On applicants property 1/4 mile On property owned by others 1/4 mile

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System _____

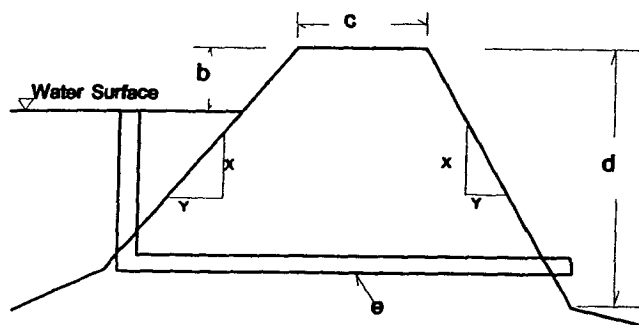
3. Dugout Information

- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:



- b) Freeboard _____
- c) Crest Width _____
Crest Length _____
- d) Height _____
- e) Primary Outlet Capacity _____
If pipe, diameter _____
- f) Secondary Spillway Capacity _____
Spillway Width _____
- g) X & Y Slope _____
Upstream _____
Downstream _____
- h) Surface Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres



USDA - Farm Service Agency

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2-119R-52R

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1:7,934
May 17, 2007

APR 29 2008

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Legend

- Tract Boundaries
- Section-Township-Range
- Easements
- CRP
- Common Land Units
- Rangeland

Wetland Determination Identifiers

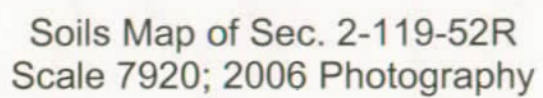
- Restricted Use
- Limited Restrictions
- Exempt from Conservation Compliance Provisions



USDA FSA maps are for FSA Program administration only. There is no guarantee or representation to the user as to the accuracy, currency, suitability or reliability of the data. FSA MAPS DO NOT REPRESENT A LEGAL SURVEY. The user accepts the data 'as is' and assumes all risks associated with its use. Wetland points reflect records available with NRCS and may or may not constitute a full inventory of the property. The USDA Farm Service Agency assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on this data. Disclaimer: Wetland identifiers do not represent the size, shape or specific determination of the area. Refer to your original determination (CPA-926 and attached maps) for exact wetland boundaries and determinations, or contact NRCS.

F#1126

2007



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CODINGTON COUNTY DETAILED SOIL MAP UNITS DESCRIPTIONS

The descriptions of each detailed map unit in Codington County are intended to serve a broad range of users of soil survey publications. The descriptions are intended to provide a general description of each map unit (soil type). A soil map unit may be composed of a single soil type (i.e. Tonka silt loam, 0 to 2 percent slopes) or two to three different soil types (i.e. Poinsett-Buse-Waubay complex, 1 to 6 percent slopes). The majority of the map units in Codington County will consist of more than one soil type because of the variability of soil in short distances or because of the complex landscape of the county. To keep it basic, the named soil types in each map unit will comprise 100 percent of the composition of each map unit. In reality the named components typically represent only 80 to 95 percent of the map unit. It is not practical to separate all the different soil types on the landscape because of the scale of the mapping (1:12000) and these soils are so intermingled.

The remainder of each map unit is comprised of different soils, which are referred to as inclusions. An example is the Poinsett-Buse-Waubay complex, 1 to 6 percent slope map unit. The Poinsett soil comprises 50 percent of the entire map unit while the Buse soil comprises 25 percent, and the Waubay soil comprises 15 percent. The remaining 10 percent will consist of a different soil type or an inclusion, like a Tonka in a small depression. To learn additional information about inclusions please refer to the detailed published map unit write-up.

The first line will consist of the map unit symbol, map unit name, land capability class (LCC) for each listed soil, and cropland productivity index (CPI) for the map unit.

Land Capability Classification (LCC) shows the suitability of soils for crop production. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The capability classification system is grouped into two levels, capability class and subclass. The capability class consists of 8 broad groups:

Class 1 - soils have few limitations that restrict their use

Class 2 - soils have moderate limitations that reduce the choice of crop or that require moderate conservation practices

Class 3 - soils have severe limitations that reduce the choice of crop or that requires special conservation practices or both

Class 4 - soils have very severe limitations that reduce the choice of crop or that requires very careful management or both

Class 5 - soils are not likely to erode but have other limitations, impractical to remove, that limit their use

Class 6 - soils that have severe limitations that make them generally unsuited for cultivation

Class 7 - soils that have very severe limitations that make them unsuited for cultivation

Class 8 - soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production

Capability subclasses are soil group within one class. They are designated by adding a small letter (e, w, s, or c) to the number. The small letters represent the following:

- e – shows that the main hazard is the risk of **erosion** unless close-growing plant cover is maintained.
- w – shows that **water** in or on the soil interferes with plant growth or cultivation.
- s – shows that the **soil** is limited mainly because it is shallow, droughty, or stony.
- c – shows that the main limitation is **climate**, either to cold or to dry.

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Cropland Productivity Index (CPI) is a rating assigned to each map unit to rate the soil for cropland production. The rating is based on a scale of 1 to 100, with 100 being the most productive soil in the county. The CPI assigned to each map unit is based on the physical and chemical properties of each soil type in the map unit. Physical properties such as organic matter levels, topsoil thickness, soil texture, available water capacity, etc and chemical properties such as pH and salinity levels will directly affect the productivity level of each soil type. The experience of soil scientists and university researchers is used to develop the ratings.

Codington County Detailed Soil Map Units Descriptions

Map Unit Symbol	Soil Map Unit	Descriptions
J108A	Badger-Tonka silty clay loams, 0 to 2 percent slopes. LCC = 2w & 4w; CPI = 72	This map unit is formed in clayey material in western Codington County. The Badger soil (65 % of the map unit) is a somewhat poorly drained clayey soil located in the drainageways and is rated fair for cropland productivity. The Tonka soil (35 % of the map unit) is a poorly drained clayey soil located in small depressions and is rated fair for cropland productivity. The main management concern is wetness. These soils are better suited to late planted crops and are very productive in dry years. Maintain existing drainage systems to remove excess water.
J109A	Barnes clay loam, 0 to 2 percent slopes. LCC = 1; CPI = 83	This map unit is formed in clay loam glacial till material in eastern Codington County. The Barnes soil is a well drained loamy soil on 0 to 2 percent slopes and is rated good for cropland production. The surface of the Barnes soil is typically scattered with small stones. The stones are not that abundant to limit crop production, but can be a concern. The other management concern is maintaining soil organic matter content.
J109B	Barnes clay loam, 2 to 6 percent slopes. LCC = 2e; CPI = 77	This map unit is formed in clay loam glacial till material in eastern Codington County. The Barnes soil is a well drained loamy soil on 2 to 6 percent slopes and is rated good for cropland production. The surface of the Barnes soil is typically scattered with small stones. The stones are not that abundant to limit crop production, but can be a concern. The other management concerns are water erosion and maintaining soil organic matter content.
J110C	Barnes-Buse loams, 6 to 9 percent slopes. LCC = 3e & 4e; CPI = 59	This map unit is formed in loamy glacial till material throughout Codington County. The Barnes soil (60 % of the map unit) is a well-drained soil located on the backslope position and is rated fair for cropland productivity. The Buse soil (40 % of the map unit) is a well-drained soil located on the eroded knobs of the landscape and is rated fair for cropland productivity. The main management concerns are water erosion, the moderately low organic matter content of the Buse soil, and a few surface stones.
J111B	Barnes-Buse-Svea loams, 1 to 6 percent slopes. LCC = 2e, 3e, & 1; CPI = 76	This map unit is formed in loamy glacial till material in eastern Codington County. The Barnes soil (50 % of the map unit) is a well drained soil located on backslope positions with 2 to 6 percent slopes and is rated good for cropland productivity. The Buse soil (30 % of the map unit) is a well drained soil located on the eroded knobs of the landscape with 2 to 6 percent slopes and is rated fair for cropland productivity. The Svea soil (20 % of the map unit) is a moderately well drained soil located in the swale position with 1 to 2 percent slopes and is rated very good for cropland productivity. The main management concerns are water erosion, the moderately low organic matter content of the Buse soil, and a few surface stones.
J111C	Barnes-Buse-Svea loams, 2 to 9 percent slopes. LCC = 3e, 4e, & 2e. CPI = 65	This map unit is formed in loamy glacial till material throughout Codington County. The Barnes soil (45 % of the map unit) is a well drained soil located on the backslope position with 6 to 9 percent slopes and is rated fair for cropland productivity. The Buse soil (35 % of the map unit) is a well drained soil located on the eroded knobs of the landscape with 6 to 9 percent slopes and is rated fair for cropland productivity. The Svea soil (20 % of the map unit) is a moderately well drained soil located in the swale position with 2 to 6 percent slopes and is rated good for cropland productivity. The main management concerns are water erosion, the moderately low organic matter content of the Buse soil, and a few surface stones.
J112A	Barnes-Svea loams, 0 to 2 percent slopes. LCC = 1 & 1; CPI = 89	This map unit is formed in loamy glacial till material in eastern Codington County. The Barnes soil (60 % of the map unit) is a well drained soil located on backslope positions and is rated good for cropland productivity. The Svea soil (40 % of the map unit) is a moderately well drained soil located in the swale position and is rated very good for cropland productivity. The only management concerns are to maintain soil organic matter content and a few surface stones.
J112B	Barnes-Svea loams, 1 to 6 percent slopes. LCC = 2e & 1; CPI = 83	This map unit is formed in loamy glacial till material in eastern Codington County. The Barnes soil (65 % of the map unit) is a well drained soil located on backslope positions with 2 to 6 percent slopes and is rated good for cropland productivity. The Svea soil (35 % of the map unit) is a moderately well drained soil located in the swale position with 1 to 2 percent slopes and is rated very good for cropland productivity. The main management concerns are controlling water erosion and a few surface stones.
J113A	Brookings silty clay loam, 0 to 2 percent slopes. LCC = 1; CPI=99	This map unit is formed in 20 to 40 inches of windblown silts (loess) over clay loam glacial till material in eastern Codington County. The Brookings soil is a moderately well drained soil located in swale position or broad flats and rated very good for cropland productivity. The only management concern is maintaining soil organic matter content.

Codington County Detailed Soil Map Units Descriptions

J114C	Buse-Barnes loams, 2 to 15 percent slopes, very stony. LCC = 7s & 7s; CPI = 0	This map unit is formed in loamy glacial till material throughout Codington County. This map unit has a large quantity of various size stones on or near the surface and thus can only be used for rangeland. The Buse soil (60 % of the map unit) is a well drained soil located on the eroded knobs of the landscape with 6 to 15 percent slopes and is rated very poor for cropland productivity. The Barnes soil (40 % of the map unit) is a well drained soil located on the backslope position with 2 to 9 percent slopes and is rated very poor for cropland productivity. The main management concerns are the excessive stones and water erosion. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J114E	Buse-Barnes loams, 9 to 40 percent slopes, very stony. LCC = 7s & 7s; CPI = 0	This map unit is formed in loamy glacial till material throughout Codington County. This map unit has a large quantity of various size stones on or near the surface and thus can only be used for rangeland. The Buse soil (60 % of the map unit) is a well drained soil located on the eroded knobs of the landscape with 9 to 40 percent slopes and is rated very poor for cropland productivity. The Barnes soil (40 % of the map unit) is a well drained soil located on the backslope position with 9 to 25 percent slopes and is rated very poor for cropland productivity. The main management concerns are the excessive stones and water erosion. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J115D	Buse-Barnes loams, 9 to 20 percent slopes. LCC = 6e & 4e; CPI = 40	This map unit is formed in loamy glacial till material throughout Codington County. The Buse soil (60 % of the map unit) is a well-drained soil located on the eroded knobs of the landscape with 9 to 20 percent slopes and is rated poor for cropland productivity. The Barnes soil (40 % of the map unit) is a well-drained soil located on the backslope position with 9 to 15 percent slopes and is rated fair for cropland productivity. The main management concerns are water erosion, the moderately low organic matter content of the Buse soil, and a few surface stones. The majority of these areas are better suited to grassland.
J116E	Buse-Lamoure complex, channeled, 0 to 40 percent slopes. LCC = 7e & 6w; CPI = 5	This map unit is formed in loamy glacial till and loamy alluvial material throughout Codington County. The Buse soil (65 % of the map unit) is a well drained loamy soil located on the backslopes of the landscape with 15 to 40 percent slopes and is rated very poor for cropland productivity. The Lamoure soil (35 % of the map unit) is a poorly drained loamy soil on low floodplains and is rated very poor for cropland productivity. The main management concerns are water erosion and a few scattered stones on the Buse soil and the channeled area with frequent flooding on the Lamoure soil. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J117E	Buse-Langhei complex, 15 to 40 percent slopes. LCC = 7e & 7e; CPI = 10	This map unit is formed in loamy glacial till material throughout Codington County. The Buse soil (60 % of the map unit) is a well drained soil located on the backslopes of the landscape and is rated very poor for cropland productivity. The Langhei soil (40 % of the map unit) is a well drained soil located on the shoulder position and is rated very poor for cropland productivity. The main management concerns are water erosion and moderately low organic matter content of both soils. This map unit is unsuited for cropland production because of the extreme slopes. A few scattered stones can be found in this map unit. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J118C	Buse-Poinsett complex, 6 to 9 percent slopes. LCC = 4e & 3e; CPI = 66	This map unit is formed in silty glacial material in western Codington County. The Buse soil (60 % of the map unit) is a well drained, loamy soil located on the eroded knobs of the landscape and is rated fair for cropland productivity. The Poinsett soil (60 % of the map unit) is a well-drained silty soil located on the backslopes and is rated good for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Buse soil.
J119E	Buse-Sioux complex, 9 to 40 percent slopes. LCC = 7e & 6s; CPI = 5	This map unit is formed in loamy glacial till with pockets of gravelly material throughout Codington County. The Buse soil (60 % of the map unit) is a well drained loamy soil located on the backslopes and is rated very poor for cropland productivity. The Sioux soil (40 % of the map unit) is an excessively drained soil with 6 to 10 inches of loamy material over gravelly material located on the knob positions and is rated very poor for cropland productivity. The main management concerns are water erosion and a few scattered stones on these soils. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J120A	Cavour-Ferney silt loams, 0 to 2 percent slopes. LCC = 4s & 6s; CPI = 30	This map unit is formed in clayey, sodium affected, glacial till material in north central Codington County. The Cavour soil (60 % of the map unit) is a moderately well drained soil with a claypan layer (sodium affected subsoil) at 6 to 12 inches and is rated poor for cropland productivity. The Ferney soil (40 % of the map unit) is a moderately well drained soil with a claypan layer (sodium affected subsoil) within 6 inches of the surface and is rated very poor for cropland productivity. The main management concern is improving the permeability of the dense clayey subsoil. Chiseling or subsoiling in a dry fall will help shatter the claypan layers and improve the permeability of the soil. This map unit is typically more productive in grass/range production than in crop production.
J121A	Colvin silty clay loam, 0 to 1 percent slopes. LCC = 4w; CPI = 40	This map unit is formed in silty material adjacent to deep depressions in western Codington County. The Colvin soil is a poorly drained, calcareous, soil and is rated poor for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and wetness. The majority of these areas are typically to wet or saline to sustain any crop production. Permanent vegetation of tall wheatgrass, western wheatgrass, or garrison creeping foxtail will correct the saline areas.

Codington County Detailed Soil Map Units Descriptions

J122A	Cubden silty clay loam, 0 to 2 percent slopes. LCC = 2s; CPI = 74	This map unit is formed in silty material in broad flats adjacent to small depressions in western Codington County. The Cubden soil is a somewhat poorly drained calcareous soil on the edge of depressions and is rated fair for cropland productivity. The main management concern is the high pH, which affects the availability of plant nutrients and possible high salinity. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas. These soils are better suited to late planted crops.
J123A	Cubden-Badger silty clay loams, 0 to 2 percent slopes. LCC = 2s & 2w; CPI = 72	This map unit is formed in silty and clayey material along upland drainageways in western Codington County. The Cubden soil (55 % of the map unit) is a somewhat poorly drained calcareous silty soil on the edge of the drainageways and is rated fair for cropland productivity. The Badger soil (45 % of the map unit) is a somewhat poorly drained clayey soil located in the drainageways and is rated fair for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and possible high salinity of the Cubden soil and wetness in the Badger soil. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas. These soils are better suited to late planted crops. Maintain existing drainage systems to remove excess water.
J124A	Cubden-Tonka silty clay loams, 0 to 2 percent slopes. LCC = 2s & 4w; CPI = 71	This map unit is formed in silty and clayey material in western Codington County. The Cubden soil (60 % of the map unit) is a somewhat poorly drained calcareous silty soil on the edge of the depressions and is rated fair for cropland productivity. The Tonka soil (40 % of the map unit) is a poorly drained clayey soil located in small depressions and is rated fair for cropland productivity. The main management concern is the high pH, which affects the availability of plant nutrients and possible high salinity of the Cubden soil and wetness in the Tonka soil. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas. These soils are better suited to late planted crops. Maintain existing drainage systems to remove excess water.
J125A	Divide loam, 0 to 2 percent slopes. LCC = 3s; CPI = 68	This map unit is formed in 20 to 40 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Divide soil is a somewhat poorly drained calcareous soil typically along drainageways or depressions and is rated fair for cropland productivity. The main management concern is the high pH, which affects the availability of plant nutrients. These soils are better suited to late-planted crops.
J126A	Doburg-Forestville loams, 0 to 2 percent slopes. LCC = 1 & 1; CPI = 85	This map unit is formed in 20 to 40 inches of windblown loamy material over clay loam glacial till material in central Codington County. The Doburg soil (70 % of the map unit) is a well-drained soil on backslopes positions and is rated good for cropland productivity. The Forestville soil (30 % of the map unit) is a moderately well drained soil in the swale position, and is rated very good for cropland production. The only management concern is maintaining soil organic matter content.
J126B	Doburg-Forestville loams, 1 to 6 percent slopes. LCC = 2e & 1; CPI = 81	This map unit is formed in 20 to 40 inches of windblown loamy material over clay loam glacial till material in central Codington County. The Doburg soil (75 % of the map unit) is a well-drained soil located on backslope position with 2 to 6 percent slopes and is rated good for cropland productivity. The Forestville soil (25 % of the map unit) is a moderately well drained soil located in the swale position, with 1 to 2 percent slopes and is rated very good for cropland production. The management concerns are water erosion and maintaining soil organic matter content.
J127A	Egeland-Embden complex, 0 to 2 percent slopes. LCC = 3s & 2s; CPI = 59	This map unit is formed in sandy loam material in eastern Codington County. The Egeland soil (60 % of the map unit) is a well drained sandy loam soil located on backslope positions and is rated fair for cropland productivity. The Embden soil (40 % of the map unit) is a moderately well drained sandy loam soil located in the swale position and is rated good for cropland productivity. The major management concerns are wind erosion and conserving moisture in these droughty soils. These soils are better suited to early maturing crops and work very well with no-till.
J127B	Egeland-Embden complex, 2 to 6 percent slopes. LCC = 3e & 3e; CPI = 55	This map unit is formed in sandy loam material in eastern Codington County. The Egeland soil (65 % of the map unit) is a well drained sandy loam soil on 2 to 6 % slopes located on backslope positions and is rated fair for cropland productivity. The Embden soil (35 % of the map unit) is a moderately well drained sandy loam soil on 2 to 6 % slopes located in the swale position and is rated fair for cropland productivity. The major management concerns are wind erosion and conserving moisture in these droughty soils. These soils are better suited to early maturing crops and work very well with no-till.
J128A	Estelline silt loam, 0 to 2 percent slopes. LCC = 2s; CPI = 66	This map unit is formed in 20 to 40 inches of silty material over gravelly glacial outwash material and is located throughout Codington County. The Estelline soil is a well drained soil with 20 to 40 inches (typically 30 to 40) of silty material over sands and gravels and is rated fair for cropland productivity. The main management concern is conserving moisture in this droughty soil. These soils are better suited to early maturing crops and work very well with no-till.
J128B	Estelline silt loam, 2 to 6 percent slopes. LCC = 2e; CPI = 58	This map unit is formed in 20 to 40 inches of silty material over gravelly glacial outwash material and is located throughout Codington County. The Estelline soil is a well drained soil with 20 to 40 inches (typically 30 to 40) of silty material over sands and gravels on 2 to 6 percent slopes and is rated fair for cropland productivity. The main management concern is conserving moisture in this droughty soil. These soils are better suited to early maturing crops and work very well with no-till.

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J129B	Estelline-Kampeska silt loams, 2 to 6 percent slopes. LCC = 2e & 4s; CPI = 55	This map unit is formed in 15 to 40 inches of silty material over gravelly glacial outwash material and is located throughout Codington County. The Estelline soil (60 % of the map unit) is a well drained soil with 20 to 40 inches (typically 30 to 40) of silty material over sands and gravels on 2 to 4 percent slopes and is rated fair for cropland productivity. The Kampeska soil (40 % of the map unit) is a well drained soil with 15 to 30 inches of silty material over sands and gravels on 3 to 6 percent slopes and is rated fair for cropland productivity. The main management concerns are conserving moisture in these droughty soils and the moderately low organic matter content of the Kampeska soil. These soils are better suited to early maturing crops and work very well with no-till.
J130B	Estelline-Sioux complex, 2 to 6 percent slopes. LCC = 2e & 6s; CPI = 41	This map unit is formed in 5 to 40 inches of silty material over gravelly glacial outwash material and is located throughout Codington County. The Estelline soil (65 % of the map unit) is a well drained soil with 20 to 40 inches (typically 30 to 40) of silty material over sands and gravels on 2 to 4 % slopes and is rated fair for cropland productivity. The Sioux soil (35 % of the map unit) is an excessively drained soil with gravels within 10 inches of the surface on 3 to 6 % slopes and is rated very poor for cropland productivity. The main management concern is conserving moisture in these droughty soils and improving the fertility of the Sioux soil. These soils are better suited to early maturing crops and work very well with no-till.
J131A	Fairdale loam, channeled, 0 to 2 percent slopes. LCC = 6w; CPI = 10	This map unit is formed in loamy alluvial material throughout Codington County. The Fairdale soil is a poorly drained soil on low floodplains and is rated very poor for cropland productivity. The main management concerns are wetness and the channeled area. This map unit is frequently flooded in the early spring and after heavy summer rains. Crop production is not practical because this map unit is channeled. The banks along the channel along with the wetness limit the ability to cross the channel. This map unit is most productive as rangeland.
J132A	Fordtown loam, 0 to 2 percent slopes. LCC = 2s; CPI = 58	This map unit is formed in 20 to 40 inches of loamy material over gravelly glacial outwash material along floodplains in Codington County. The well drained Fordtown soil is rated fair for cropland productivity. The main management concern is conserving moisture in these droughty soils and the rare flooding. These soils are better suited to early maturing crops and work very well with no-till. These soils will only flood under abnormally wet periods.
J133A	Forman-Aastad loams, 0 to 2 percent slopes. LCC = 1 & 1; CPI = 89	This map unit is formed in loamy glacial till material on uplands near Long Lake in western Codington County. The Forman soil (60 % of the map unit) is a well drained loamy soil located on backslope positions and is rated good for cropland productivity. The Aastad soil (40 % of the map unit) is a moderately well drained loamy soil located in the swale position and is rated very good for cropland productivity. The only management concern is to maintain soil organic matter content.
J133B	Forman-Aastad loams, 1 to 6 percent slopes. LCC = 2e & 1; CPI = 83	This map unit is formed in loamy glacial till material on uplands near Long Lake in western Codington County. The Forman soil (65 % of the map unit) is a well drained loamy soil located on backslope positions with 2 to 6 percent slopes and is rated good for cropland productivity. The Aastad soil (35 % of the map unit) is a moderately well drained loamy soil located in the swale position with 1 to 2 percent slopes and is rated very good for cropland productivity. The main management concerns are water erosion and maintaining soil organic matter.
J134C	Forman-Buse-Aastad loams, 2 to 9 percent slopes. LCC = 3e, 4e, & 2e; CPI = 65	This map unit is formed in loamy glacial till material in north central Codington County. The Forman soil (45 % of the map unit) is a well drained soil located on the backslope position with 6 to 9 percent slopes and is rated fair for cropland productivity. The Buse soil (35 % of the map unit) is a well drained soil located on the eroded knobs of the landscape with 6 to 9 percent slopes and is rated fair for cropland productivity. The Aastad soil (20 % of the map unit) is a moderately well drained soil located in the swale position with 2 to 6 percent slopes and is rated good for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Buse soil.
J135A	Goldsmith silty clay loam, 0 to 2 percent slopes. LCC = 1; CPI = 89	This map unit is formed in 40 to 60 inches of silty material over gravelly glacial outwash material and is located throughout Codington County. The Goldsmith soil is a moderately well drained soil with 40 to 60 inches (typically 50 to 60) of silty material over sands and gravels and is rated good for cropland productivity. The main management concern is conserving moisture as these soils will show drought symptoms during prolonged dry periods. No-till works very well on this soil.
J136A	Great Bend-Beotia silt loams, 0 to 2 percent slopes. LCC = 1 & 1; CPI = 89	This map unit is formed in silty lake plain material in northeast Codington County. The Great Bend soil (60 % of the map unit) is a well drained soil on backslopes and is rated good for cropland productivity. The Beotia soil (40 % of the map unit) is a moderately well drained soil in the swale position and is rated very good for cropland productivity. The only management concern is maintaining soil organic matter content.
J137B	Great Bend-Zell silt loams, 2 to 6 percent slopes. LCC = 2e & 3e; CPI = 77	This map unit is formed in silty lake plain material in northeast Codington County. The Great Bend soil (60 % of the map unit) is a well drained soil located on backslope positions and is rated good for cropland productivity. The Zell soil (40 % of the map unit) is a well drained soil located on the eroded knobs of the landscape and is rated fair for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Zell soil.

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J137C	Great Bend-Zell silt loams, 6 to 9 percent slopes. LCC = 3e & 4e; CPI = 68	This map unit is formed in silty lake plain material in northeast Codington County. The Great Bend soil (55 % of the map unit) is a well drained soil located on the backslope position and is rated fair for cropland productivity. The Zell soil (45 % of the map unit) is a well drained soil located on the eroded knobs of the landscape and is rated fair for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Zell soil.
J138A	Hamerly-Badger complex, 0 to 2 percent slopes. LCC = 2s & 2w; CPI = 69	This map unit is formed in loamy and clayey material in eastern Codington County. The Hamerly soil (70 % of the map unit) is a somewhat poorly drained, calcareous, loamy soil on the edge of the upland drainageways and is rated fair for cropland productivity. The Badger soil (30 % of the map unit) is a somewhat poorly drained clayey soil located in the drainageways and is rated fair for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and possible high salinity of the Hamerly soil and wetness in the Badger soil. These soils are better suited to late planted crops. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas.
J139A	Hamerly-Balaton loams, 0 to 2 percent slopes. LCC = 2s & 2s; CPI = 71	This map unit is formed in loamy glacial till material in eastern Codington County. The Hamerly soil (65 % of the map unit) is a somewhat poorly drained, calcareous soil on the edge of the depressions and is rated fair for cropland productivity. The Balaton soil (35 % of the map unit) is a moderately well drained, calcareous, soil located above the Hamerly soils and is rated fair for cropland productivity. The main management concern is the high pH, which affects the availability of plant nutrients and possible high salinity of these soils. These soils are better suited to late planted crops. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas.
J140A	Hamerly-Tonka complex, 0 to 2 percent slopes. LCC = 2s & 4w; CPI = 65	This map unit is formed in loamy and clayey material in eastern Codington County. The Hamerly soil (70 % of the map unit) is a somewhat poorly drained, calcareous, loamy soil on the edge of the depressions and is rated fair for cropland productivity. The Tonka soil (30 % of the map unit) is a poorly drained clayey soil located in small depressions and is rated fair for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and possible high salinity of the Hamerly soil and wetness in the Tonka soil. These soils are better suited to late planted crops. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas. Maintain existing drainage systems to remove excess water.
J141A	Hetland silty clay loam, 0 to 2 percent slopes. LCC = 1; CPI = 89	This map unit is formed in clayey lacustrine material in western Codington County. The Hetland soil is a moderately well-drained clayey soil and is rated good for cropland productivity. This is one of the most productive map units in Codington County. The only management concerns are maintaining soil organic matter content and compaction of the clayey subsoil.
J141B	Hetland silty clay loam, 2 to 6 percent slopes. LCC = 2e; CPI = 84	This map unit is formed in clayey lacustrine material in western Codington County. The Hetland soil is a moderately well-drained clayey soil on 2 to 6 percent slopes and is rated good for cropland productivity. The management concerns are water erosion, maintaining the soil organic matter content, and compaction of the clayey subsoil.
J142A	Hidewood silty clay loam, 0 to 1 percent slopes. LCC = 4w; CPI = 55	This map unit is formed in 40 to 60 inches of silty alluvial material over glacial till in upland drainageways throughout Codington County. The Hidewood soil is a poorly drained soil on low floodplains and is rated fair for cropland productivity. The main management concerns are wetness and the high pH, which affects the availability of plant nutrients. This map unit is better suited to late planted crops.
J143A	Kranzburg-Brookings silt clay loams, 0 to 2 percent slopes. LCC = 1 & 1; CPI = 96	This map unit is formed in 20 to 40 inches of windblown silts (loess) over clay loam glacial till material in eastern Codington County. The Kranzburg soil (70 % of the map unit) is a well-drained silty soil on backslopes positions and is rated very good for cropland productivity. The Brookings soil (30 % of the map unit) is a moderately well drained silty soil in the swale position, and is rated very good for cropland production. The only management concern is maintaining soil organic matter content.
J143B	Kranzburg-Brookings silty clay loams, 1 to 6 percent slopes. LCC=2e & 1; CPI=90	This map unit is formed in 20 to 40 inches of windblown silts (loess) over clay loam glacial till material in eastern Codington County. The Kranzburg soil (75 % of the map unit) is a well-drained silty soil located on the backslope position with 2 to 6 percent slopes and is rated good for cropland productivity. The Brookings soil (25 % of the map unit) is a moderately well drained silty soil located in the swale position, with 1 to 2 percent slopes and is rated very good for cropland productivity. The management concerns are water erosion and maintaining the soil organic matter content.
J144B	Kranzburg-Buse-Waubay complex, 1 to 6 percent slopes. LCC = 2e, 3e, & 1; CPI = 80	This map unit is formed in silty glacial material in western Codington County. The Kranzburg soil (50 % of the map unit) is a well-drained silty soil on 2 to 6 percent slope and is rated very good for cropland productivity. The Buse soil (30 % of the map unit) is a well drained, loamy soil located on the eroded knobs of the landscape with 2 to 6 percent slopes and is rated fair for cropland productivity. The Waubay soil (20 % of the map unit) is a moderately well drained silty soil located in the swale position, with 1 to 2 percent slopes and is rated very good for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Buse soil.

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J145A	Kranzburg-Cresbard silty clay loams, 0 to 2 percent slopes. LCC = 1 & 3s; CPI = 75	This map unit is formed in a silty mantle (loess) over clayey glacial till material in north central Codington County. The Kranzburg soil (60 % of the map unit) is a well drained, soil with 20 to 40 inches of silty material over clay loam glacial till located on the backslope position and is rated good for cropland productivity. The Cresbard soil (40 % of the map unit) is a moderately well drained soil with a fractured claypan layer (sodium affected subsoil) at 12 to 18 inches and is rated fair for cropland productivity. The main management concern is improving the permeability of the Cresbard soil, especially if it has been compacted. The depth to the claypan layer of the Cresbard soil will typically not cause a major management concern. The Cresbard component of this map unit will only noticeable affect crop production in abnormally dry or wet years. In dry years, drought symptoms will appear quickly as the dense subsoil limits root penetration in the Cresbard soil. In wet years, the slow subsoil permeability of the Cresbard soil will hinder water movement through the soil profile and the soil is slow to dry.
J146A	Lamoure-Rauville silty clay loams, channeled. LCC = 6w & 5w; CPI = 10	This map unit is formed in loamy and clayey alluvial material throughout Codington County. The Lamoure soil (70 % of the map unit) is a poorly drained loamy soil on low floodplains and is rated poor for cropland productivity. The Rauville soil (30 % of the map unit) is a very poorly drained clayey soil on low floodplains and is rated very poor for cropland productivity. The main management concerns are wetness and the channeled area. This map unit is frequently flooded in the early spring and after heavy summer rains. Crop production is not practical because this map unit is channeled. The banks along the channel along with the wetness limit the ability to cross the channel. This map unit is most productive as rangeland.
J147A	Lowe loam, 0 to 1 percent slopes. LCC = 4w; CPI = 49	This map unit is formed in loamy alluvial material along the Big Sioux River in Codington County. The Lowe soil is a poorly drained soil on low floodplains and is rated poor for cropland productivity. The main management concerns are wetness, the high pH, which affects the availability of plant nutrients, and flooding. This map unit is most productive as rangeland.
J148E	Maddock loamy fine sand, 9 to 25 percent slopes. LCC = 6s; CPI = 20	This map unit is formed in sandy material in eastern Codington County. The Maddock soil is a well drained sandy soil located on backslope positions and is rated very poor for cropland productivity. The major management concerns are wind erosion, slope, and conserving moisture. This map unit is most productive as rangeland. Use proper grazing techniques to control erosion.
J149B	Maddock-Egeland sandy loams, 2 to 6 percent slope. LCC = 3e & 3e; CPI = 44	This map unit is formed in sandy and sandy loam material in eastern Codington County. The Maddock soil (60 % of the map unit) is a well drained sandy soil on 2 to 6 percent slopes located on backslope positions and is rated poor for cropland productivity. The Egeland soil (40 % of the map unit) is a well drained sandy loam soil on 2 to 6 percent slopes located on backslope positions and is rated fair for cropland productivity. The major management concerns are wind erosion and conserving moisture in these droughty soils. These soils are better suited to early maturing crops and work well with no-till.
J149C	Maddock-Egeland sandy loams, 6 to 9 percent slopes. LCC = 4e & 4e; CPI = 36	This map unit is formed in sandy and sandy loam material in eastern Codington County. The Maddock soil (65 % of the map unit) is a well drained sandy soil located on knob positions and is rated poor for cropland productivity. The Egeland soil (35 % of the map unit) is a well drained sandy loam soil located on backslope positions and is rated fair for cropland productivity. The major management concerns are wind erosion and conserving moisture in these droughty soils. These soils are better suited to early maturing crops and work well with no-till.
J150A	Mahoney silt loam, 0 to 2 percent slopes. LCC = 3s; CPI = 70	This map unit is formed in 20 to 40 inches of silty material over gravelly glacial outwash material throughout Codington County. The Mahoney soil is a somewhat poorly drained, calcareous soil typically along drainageways or depressions and is rated fair for cropland productivity. The main management concern is the high pH, which affects the availability of plant nutrients. These soils are better suited to late planted crops.
J151A	Marysland loam, 0 to 1 percent slopes. LCC = 4w; CPI = 35	This map unit is formed in 20 to 40 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Marysland soil is a poorly drained calcareous soil typically along drainageways and is rated poor for cropland productivity. The main management concerns are wetness and the high pH, which affects the availability of plant nutrients. This map unit is most productive as rangeland.
J152A	Mauvais clay loam, 0 to 2 percent slopes. LCC = 3w; CPI = 24	This map unit is formed in clay loam glacial till along the shorelines of large glacial lakes or semipermanent wetlands in western Codington County. The Mauvais soil is a somewhat poorly drained soil that typically produces abundant forage but rates very poor for cropland productivity. During prolonged wet periods these soils will pond water for many years. The majority of the Mauvais soils have been under water since the mid to late 1990's.
J153B	Mauvais clay loam, 2 to 6 percent slopes, extremely stony. LCC = 7s; CPI = 0	This map unit is formed in clay loam glacial till along the shorelines of large glacial lakes or semipermanent wetlands in western Codington County. This map unit is extremely stony, as the wave action along the shoreline has removed the majority of the finer sediments, leaving these large stones scattered on the surface. The Mauvais soil is a somewhat poorly drained soil that typically produces abundant forage but rates very poor for cropland productivity. During prolonged wet periods these soils will pond water for many years. The majority of the Mauvais soils have been under water since the mid to late 1990's.

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J154A	McKranz silty clay loam, 0 to 2 percent slopes. LCC = 2s; CPI = 74	This map unit is formed in 20 to 40 inches of windblown silts (loess) over clay loam glacial till material along drainageways in eastern Codington County. The McKranz soil is a somewhat poorly drained calcareous soil on the edge of drainageways and is rated fair for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients, and possible high salinity. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas. These soils are better suited to late planted crops.
J155A	McKranz silty clay loam, moderately saline, 0 to 1 percent slopes. LCC = 6s; CPI = 10	This map unit is formed in 20 to 40 inches of windblown silts (loess) over clay loam glacial till material in central Codington County. The McKranz soil is a somewhat poorly drained, calcareous, saline, soil on the edge of the drainageways and is rated very poor for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and high salinity. Permanent vegetation of tall wheatgrass or western wheatgrass will help correct some of the saline areas.
J156A	McKranz-Badger silty clay loams, 0 to 2 percent slopes. LCC = 2s & 2w; CPI = 72	This map unit is formed in silty and clayey material in upland drainageways in eastern Codington County. The McKranz soil (65 % of the map unit) is a somewhat poorly drained, calcareous, silty soil on the edge of the drainageways and is rated fair for cropland productivity. The Badger soil (35 % of the map unit) is a somewhat poorly drained clayey soil located in drainageways and is rated fair for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and possible high salinity of the McKranz soil and wetness in the Badger soil. These soils are better suited to late planted crops. Permanent vegetation of tall wheatgrass or western wheatgrass will correct the saline areas.
J157A	McKranz-Hidewood silty clay loams, 0 to 2 percent slopes. LCC = 2s & 4w; CPI = 61	This map unit is formed in silty material in upland drainageways in eastern Codington County. The McKranz soil (65 % of the map unit) is a somewhat poorly drained, calcareous, silty soil on the edge of the drainageways and is rated fair for cropland productivity. The Hidewood soil (35 % of the map unit) is a poorly drained silty soil located in the drainageways and is rated poor for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and possible high salinity of the McKranz soil and wetness in Hidewood soil. This map unit will not get farmed in wet years. This map unit is better suited to grass production. Permanent vegetation of tall wheatgrass, western wheatgrass or garrison creeping foxtail will correct the saline areas.
J158A	Minnewasta sandy loam, 0 to 2 percent slopes. LCC = 4w; CPI = 22	This map unit is formed in 10 to 20 inches of sandy material over loamy glacial till along the shorelines of large glacial lakes or semipermanent wetlands in western Codington County. The Minnewasta soil is a somewhat poorly drained soil that typically produces abundant forage but rates very poor for cropland productivity. During prolonged wet periods these soils will pond water for many years. The majority of the Minnewasta soils have been under water since the mid to late 1990's.
J158B	Minnewasta sandy loam, 2 to 6 percent slopes. LCC = 4w; CPI = 20	This map unit is formed in 10 to 20 inches of sandy material over loamy glacial till along the shorelines of large glacial lakes or semipermanent wetlands in western Codington County. The Minnewasta soil is a somewhat poorly drained soil that typically produces abundant forage but rates very poor for cropland productivity. During prolonged wet periods these soils will pond water for many years. The majority of the Minnewasta soils have been under water since the mid to late 1990's.
J159A	Minnewaukan loamy sand, 0 to 3 percent slopes. LCC = 4s; CPI = 20	This map unit is formed in sandy material along the shorelines of large glacial lakes or semipermanent wetlands in western Codington County. The Minnewaukan soil is a poorly drained soil that typically produces abundant forage but rates very poor for cropland productivity. During prolonged wet periods these soils will pond water for many years. The majority of the Minnewaukan soils have been under water since the mid to late 1990's.
J160A	Moritz-Lamoure complex, 0 to 2 percent slopes. LCC = 2w & 4w; CPI = 59	This map unit is formed in silty alluvial material in central Codington County. The Moritz soil (60 % of the map unit) is a somewhat poorly drained silty soil on high floodplains and is rated fair for cropland productivity. The Lamoure soil (40 % of the map unit) is a poorly drained silty soil on low floodplains in the old oxbows and is rated poor for cropland productivity. The main management concerns are wetness and the high pH, which affects the availability of plant nutrients. Some areas can be high in salinity. This map unit is better suited to late planted crops.
J161A	Parnell silty clay loam, 0 to 1 percent slopes. LCC = 5w; CPI = 34	This map unit is located throughout Codington County. The Parnell soil is a very poorly drained clayey soil located in depressions. These depressions are typically ponded throughout the spring and early summer. The main management concern is wetness. This soil will not get farmed in most years, but can be very productive in dry years when planted to late season crops. Maintain existing drainage systems to remove excess water.

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J162B	Poinsett-Buse-Waubay complex, 2 to 6 percent slopes. LCC= 2e, 3e, & 1: CPI=83	This map unit is formed in silty glacial material in western Codington County. The Poinsett soil (50 % of the map unit) is a well-drained silty soil located on backslope positions with 2 to 6 percent slopes and is rated very good for cropland productivity. The Buse soil (30 % of the map unit) is a well drained loamy soil located on the eroded knobs of the landscape with 2 to 6 percent slopes and is rated fair for cropland productivity. The Waubay soil (20 % of the map unit) is a moderately well drained silty soil located in the swale position, with 1 to 2 percent slopes and is rated very good for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Buse soil.
J162C	Poinsett-Buse-Waubay complex, 2 to 9 percent slopes. LCC = 3e, 4e, & 2e: CPI = 72	This map unit is formed in silty glacial material in western Codington County. The Poinsett soil (45% of the map unit) is a well-drained silty soil located on the backslope position with 6 to 9 percent slopes and is rated good for cropland productivity. The Buse soil (35 % of the map unit) is a well drained, loamy soil located on the eroded knobs of the landscape with 6 to 9 percent slopes and is rated fair for cropland productivity. The Waubay soil (20 % of the map unit) is a moderately well drained silty soil located in the swale position, with 2 to 6 percent slopes and is rated very good for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Buse soil.
J163B	Poinsett-Rusklyn-Waubay silty clay loams, 1 to 6 percent slopes. LCC = 2e, 3e, & 1: CPI = 85	This map unit is formed in silty glacial material in western Codington County. The Poinsett soil (55 % of the map unit) is a well-drained soil on 2 to 6 percent slope and is rated very good for cropland productivity. The Rusklyn soil (25 % of the map unit) is a well drained soil located on the eroded knobs of the landscape with 2 to 6 percent slopes and is rated fair for cropland productivity. The Waubay soil (20 % of the map unit) is a moderately well drained soil located in the swale position, with 1 to 2 percent slopes and is rated very good for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Rusklyn soil.
J164A	Poinsett-Waubay silty clay loams, 0 to 2 percent slopes. LCC= 1 & 1; CPI=96	This map unit is formed in silty glacial material in western Codington County. The Poinsett soil (65 % of the map unit) is a well-drained soil on backslopes and is rated very good for cropland productivity. The Waubay soil (35 % of the map unit) is a moderately well drained soil in the swale position and is rated very good for cropland productivity. This is one of the most productive map units in Codington County. The only management concern is maintaining soil organic matter content.
J164B	Poinsett-Waubay silty clay loams, 1 to 6 percent slopes. LCC= 2e & 1; CPI=91	This map unit is formed in silty glacial material in western Codington County. The Poinsett soil (70 % of the map unit) is a well-drained soil located on backslope positions with 2 to 6 percent slopes and is rated very good for cropland productivity. The Waubay soil (30 % of the map unit) is a moderately well drained soil located in the swale position with 1 to 2 percent slopes and is rated very good for cropland productivity. The management concerns are water erosion and maintaining the soil organic matter content.
J165A	Rauville mucky silty clay loam, 0 to 1 percent slopes. LCC = 8w; CPI = 5	This map unit is formed in clayey alluvial material in central and northeastern Codington County. The Rauville soil is a very poorly drained clayey soil on low floodplains and is rated very poor for cropland productivity. This map unit will typically pond water throughout the majority of the year. This map unit is typically dominated by cattail vegetation. The only practical use for this area is for wildlife.
J166A	Rauville silty clay loam, 0 to 1 percent slopes. LCC = 5w; CPI = 24	This map unit is formed in clayey alluvial material throughout Codington County. The Rauville soil is a very poorly drained clayey soil on low floodplains and is rated very poor for cropland productivity. This map unit is frequently flooded in the early spring and after heavy summer rains. This soil is unsuited for cropland productivity because of the wetness. This map unit is most productive as rangeland.
J167A	Renshaw loam, 0 to 2 percent slopes. LCC = 3s; CPI = 39	This map unit is formed in 14 to 20 inches of loamy material over gravelly glacial outwash material throughout Codington County. The somewhat excessively drained Renshaw soil is rated poor for cropland productivity. The main management concern is conserving moisture in this droughty soil. These soils are better suited to early maturing crops and work very well with no-till.
J167B	Renshaw loam, 2 to 6 percent slopes. LCC = 4s; CPI = 37	This map unit is formed in 14 to 20 inches of loamy material over gravelly glacial outwash material throughout Codington County. The somewhat poorly drained Renshaw soil is rated poor for cropland productivity. The main management concern is conserving moisture in this droughty soil. These soils are better suited to early maturing crops and work very well with no-till.
J168A	Renshaw-Fordville loams, 0 to 2 percent slopes. LCC = 3s & 2s; CPI = 47	This map unit is formed in 14 to 40 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Renshaw soil (60 % of the map unit) is a somewhat excessively drained soil with 14 to 20 inches of loamy material over gravelly material and is rated poor for cropland productivity. The Fordville soil (40 % of the map unit) is a well-drained soil with 20 to 40 inches of loamy material over gravelly material and is rated fair for cropland productivity. The main management concern is conserving moisture in these droughty soils. These soils are better suited to early maturing crops and work very well with no-till.

Codington County Detailed Soil Map Units Descriptions

J168B	Renshaw-Fordville loams, 2 to 6 percent slopes. LCC = 4s & 2e; CPI = 44	This map unit is formed in 14 to 40 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Renshaw soil (65 % of the map unit) is a somewhat excessively drained soil with 14 to 20 inches of loamy material over gravelly material and is rated poor for cropland productivity. The Fordville soil (35 % of the map unit) is a well-drained soil with 20 to 40 inches of loamy material over gravelly material and is rated fair for cropland productivity. The main management concern is conserving moisture in these droughty soils. These soils are better suited to early maturing crops and work very well with no-till.
J169B	Renshaw-Sioux loams, 2 to 6 percent slopes. LCC = 4s & 6s; CPI = 33	This map unit is formed in 6 to 20 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Renshaw soil (65 % of the map unit) is a somewhat excessively drained soil with 10 to 20 inches of loamy material over gravelly material on the backslopes and is rated poor for cropland productivity. The Sioux soil (35 % of the map unit) is an excessively drained soil with 6 to 10 inches of loamy material over gravelly material on the knob position and is rated very poor for cropland productivity. The main management concern is conserving moisture in these very droughty soils. These soils are better suited to early maturing crops and work very well with no-till.
J169C	Renshaw-Sioux complex, 6 to 9 percent slopes. LCC = 4e & 6s; CPI = 26	This map unit is formed in 6 to 20 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Renshaw soil (60 % of the map unit) is a somewhat excessively drained soil with 10 to 20 inches of loamy material over gravelly material on the back slopes and is rated poor for cropland productivity. The Sioux soil (40 % of the map unit) is an excessively drained soil with 6 to 10 inches of loamy material over gravelly material on the knob positions and is rated very poor for cropland productivity. The main management concerns are conserving moisture in these very droughty soils and water erosion because of the 6 to 9 percent slopes. These soils are better suited to early maturing crops and work very well with no-till. The majority of these areas are better suited to grassland production.
J170A	Rentill loam, 0 to 2 percent slopes. LCC = 2s; CPI = 55	This map unit is formed in a 12 to 18 inches of loamy material overlying a 10 to 20 inch layer of sands and gravels which overlay clay loam glacial till. This map unit is mapped predominantly in eastern Codington County. The well drained Rentill soil will start to show drought symptoms early than the surrounding soils because of the gravel layer at 10 to 20 inches and is rated fair for cropland productivity. The main management concern is conserving moisture in this droughty soil. These soils are better suited to early maturing crops and work very well with no-till.
J171A	Renwash loam, 0 to 2 percent slopes. LCC = 3s; CPI = 39	This map unit is formed in 10 to 20 inches of loamy material over gravelly glacial outwash material along floodplains in Codington County. The somewhat excessively drained Renwash soil is rated poor for cropland productivity. The main management concern is conserving moisture in these droughty soils and the rare flooding. These soils are better suited to early maturing crops and work very well with no-till. These soils will only flood under abnormally wet periods.
J172A	Sedgeville sandy loam, 0 to 1 percent slopes. LCC = 4w; CPI = 20	This map unit is formed in sandy alluvial material along the Big Sioux River in central Codington County. The Sedgeville soil is a poorly drained sandy soil on low floodplains that will frequently flood in early springs and after heavy summer rains. This map unit is rated very poorly for cropland productivity and is most productive as rangeland.
J173D	Sioux-Renshaw complex, 9 to 15 percent slopes. LCC = 6s & 6e; CPI = 17	This map unit is formed in 6 to 20 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Renshaw soil (60 % of the map unit) is a somewhat excessively drained soil with 10 to 20 inches of loamy material over gravelly material on 9 to 15 percent slopes on the back slopes and is rated poor for cropland productivity. The Sioux soil (40 % of the map unit) is an excessively drained soil with 6 to 10 inches of loamy material over gravelly material on 9 to 15 percent slopes on the knob positions and is rated very poor for cropland productivity. The main management concerns are conserving moisture in these very droughty soils and water erosion because of the 9 to 15 percent slopes. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J173E	Sioux-Renshaw complex, 15 to 40 percent slopes. LCC = 6s & 6e; CPI = 10	This map unit is formed in 6 to 20 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Renshaw soil (65 % of the map unit) is a somewhat excessively drained soil with 10 to 20 inches of loamy material over gravelly material on 15 to 25 percent slopes on the back slopes and is rated very poor for cropland productivity. The Sioux soil (35 % of the map unit) is an excessively drained soil with 6 to 10 inches of loamy material over gravelly material on 15 to 40 percent slopes on the knob positions and is rated very poor for cropland productivity. The main management concerns are conserving moisture in these very droughty soils and water erosion. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.

Codington County Detailed Soil Map Units Descriptions

J174E	Sioux-Renshaw complex, 15 to 40 percent slopes, very stony. LCC = 7s & 7s; CPI = 0	This map unit is formed in 6 to 20 inches of loamy material over gravelly glacial outwash material throughout Codington County. This map unit has a large quantity of various size stones on or near the surface and thus can only be used for rangeland. The Renshaw soil (65 % of the map unit) is a somewhat excessively drained soil with 10 to 20 inches of loamy material over gravelly material on 15 to 25 percent slopes on the back slopes and is rated very poor for cropland productivity. The Sioux soil (35 % of the map unit) is an excessively drained soil with 6 to 10 inches of loamy material over gravelly material on 15 to 40 percent slopes on the knob positions and is rated very poor for cropland productivity. The main management concerns are the excessive stones and water erosion. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J175A	Southam silty clay loam, 0 to 1 percent slopes. LCC = 8w; CPI = 5	This map unit is located throughout Codington County. The Southam soil is a very poorly drained clayey soil located in large depressions. These depressions are typically ponded throughout the year and will only go dry during abnormally dry periods. This map unit is typically dominated by cattail vegetation. The only practical use for this area is for wildlife.
J176A	Spottswood loam, 0 to 2 percent slopes. LCC = 2s; CPI = 76	This map unit is formed in 20 to 40 inches of loamy material over gravelly glacial outwash material throughout Codington County. The Spottswood soil is a moderately well drained soil in swale positions and is rated good for cropland productivity. The main management concern is conserving moisture. The Spottswood soil typically has a deep water table in normal years and a deep rooted crop can produce very well in these gravel soils. Alfalfa is an excellent crop for this soil type. No-till works very well on these soils.
J177A	Still Lake-Graceland silty clay loams, 0 to 2 percent slopes. LCC= 1 & 1; CPI = 96	This map unit is formed in 40 to 60 inches of windblown silts (loess) over clay loam glacial till material in central Codington County. The Still Lake soil (65 % of the map unit) is a well-drained soil on backslopes and is rated very good for cropland productivity. The Graceland soil (35 % of the map unit) is a moderately well drained soil in the swale positions and is rated very good for cropland productivity. This is one of the most productive map units in Codington County. The only management concern is maintaining soil organic matter content.
J177B	Still Lake-Graceland silty clay loams, 1 to 6 percent slopes. LCC= 2e & 1; CPI = 91	This map unit is formed in 40 to 60 inches of windblown silts (loess) over clay loam glacial till material in central Codington County. The Still Lake soil (70 % of the map unit) is a well-drained soil located on backslope positions with 2 to 6 percent slopes and is rated very good for cropland productivity. The Graceland soil (30 % of the map unit) is a moderately well drained soil in the swale position with 1 to 2 percent slopes and is rated very good for cropland productivity. This is one of the most productive map units in Codington County. The only management concerns are controlling water erosion and maintaining the soil organic matter content.
J178A	Swenoda fine sandy loam, 0 to 2 percent slopes. LCC = 2s; CPI = 75	This map unit is formed in 20 to 40 inches of sandy loam material over clay loam glacial till material in eastern Codington County. The Swenoda soil is a moderately well drained soil located in swale position or broad flats and is rated good for cropland productivity. The management concern are conserving moisture and maintaining soil organic matter content. No-till works very well on this soil.
J179A	Tonka silty clay loam, 0 to 1 percent slopes. LCC = 4w; CPI = 58	This map unit is formed in clayey material throughout Codington County. The Tonka soil is a poorly drained clayey soil located in small shallow depressions and is rated fair for cropland productivity. The small depressions are typically ponded early in the spring. The main management concern is wetness. This soil is better suited to late planted crops and is very productive in dry years. Maintain existing drainage systems to remove excess water.
J180	Orthents, gravelly. LCC = 8s; CPI = 0	This map unit consists of abandoned or active gravel pits. The majority of the gravel pits has had no reclamation and thus has little value for cropland production. Reclaimed areas may be suitable for grass production.
J181	Udorthents, loamy (Cut and fill land). LCC = 4e; CPI = 49	This map unit is for those small borrow areas. These areas typically have been top dressed with a thin layer of topsoil. This map unit is rated poor for cropland productivity because of the thin topsoil. The main management concern is the lack of topsoil and low organic matter content.
J182A	Vallers loam, 0 to 1 percent slopes. LCC = 4w; CPI = 40	This map unit is formed in loamy glacial till material adjacent to deep depressions throughout Codington County. The Vallers soil is a poorly drained, calcareous, soil and is rated poor for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and wetness. The majority of these areas are typically too wet or too saline to sustain any crop production. Permanent vegetation of tall wheatgrass, western wheatgrass, or garrison creeping foxtail will correct the saline areas.
J183A	Vallers-Hamerly loams, 0 to 2 percent slopes. LCC = 4w & 2s; CPI = 49	This map unit is formed in loamy glacial till material throughout Codington County. The Vallers soil (65 % of the map unit) is a poorly drained, calcareous soil on the edge of the depressions and is rated poor for cropland productivity. The Hamerly soil (35 % of the map unit) is a somewhat poorly drained, calcareous soil located above the Vallers soil and is rated fair for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and possible high salinity of both soils and wetness of the Vallers soil. These soils are better suited to late planted crops. In wet years these soils will not get planted. Permanent vegetation of tall wheatgrass, western wheatgrass or garrison creeping foxtail will correct the saline areas.

Codington County Detailed Soil Map Units Descriptions

J184A	Vallers-Parnell complex, 0 to 2 percent slopes. LCC = 4w & 5w; CPI = 40	This map unit is formed in loamy and clayey material in northeastern Codington County. The Vallers soil (60 % of the map unit) is a poorly drained, calcareous, loamy soil on the edge of the depressions and is rated poor for cropland productivity. The Parnell soil (40 % of the map unit) is a very poorly drained clayey soil located in depressions and is rated poor for cropland productivity. The main management concerns are the high pH, which affects the availability of plant nutrients and possible high salinity of the Vallers soil and wetness. These soils are better suited to late planted crops. Permanent vegetation of tall wheatgrass, western wheatgrass, or garrison creeping foxtail will correct the saline areas. Maintain existing drainage systems to remove excess water.
J185B	Vienna-Barnes-Forestville loams, 1 to 6 percent slopes. LCC = 2e, 2e, & 1; CPI = 79	This map unit is formed in 0 to 40 inches of windblown loamy material over clay loam glacial till material in eastern Codington County. The Vienna soil (50 % of the map unit) is a well-drained soil with 10 to 20 inches of loamy material over clay loam glacial till located on backslope position with 2 to 6 percent slopes and is rated good for cropland productivity. The Barnes soil (30 % of the map unit) is a well drained soil formed in loamy glacial till located on the upper backslope positions with 2 to 6 percent slopes and is rated good for cropland productivity. The Forestville soil (20 % of the map unit) is a moderately well drained soil with 20 to 40 inches of loamy material over clay loam glacial till located in the swale position, with 1 to 2 percent slopes and is rated very good for cropland production. The management concerns are water erosion and maintaining soil organic matter content.
J186A	Vienna-Brookings complex, 0 to 2 percent slopes. LCC 1 & 1; CPI = 88	This map unit is formed in 10 to 40 inches of windblown silts (loess) over clay loam glacial till material in eastern Codington County. The Vienna soil (70 % of the map unit) is a well-drained soil with 10 to 20 inches of silty material over clay loam glacial till located on backslopes and is rated good for cropland productivity. The Brookings soil (30 % of the map unit) is a moderately well drained soil with 20 to 40 inches of silty material over clay loam glacial till located in the swale position, and is rated very good for cropland production. The surface of the Vienna soil can be scattered with small stones. The stones are not that abundant to limit crop production, but can be a concern. The only other management concern is maintaining soil organic matter content.
J186B	Vienna-Brookings complex, 1 to 6 percent slopes. LCC = 2e & 1; CPI = 83	This map unit is formed in 10 to 40 inches of windblown silts (loess) over clay loam glacial till material in eastern Codington County. The Vienna soil (75 % of the map unit) is a well-drained soil with 10 to 20 inches of loess over clay loam glacial till located on backslope position with 2 to 6 percent slopes and is rated good for cropland productivity. The Brookings soil (25 % of the map unit) is a moderately well drained soil with 20 to 40 inches of loess over clay loam glacial till located in the swale position, with 1 to 2 percent slopes and is rated very good for cropland production. The surface of the Vienna soil can be scattered with small stones. The stones are not that abundant to limit crop production, but can be a concern. The other management concerns are water erosion and maintaining soil organic matter content.
J187C	Vienna-Buse complex, 6 to 9 percent slopes. LCC = 3e & 4e; CPI = 62	This map unit is formed in a thin mantle of windblown silts (loess) over clay loam glacial till material in eastern Codington County. The Vienna soil (70 % of the map unit) is a well-drained soil with 10 to 20 inches of loess over clay loam glacial till located on the backslope position and is rated fair for cropland productivity. The Buse soil (30 % of the map unit) is a well drained, loamy glacial till soil located on the eroded knobs of the landscape and is rated fair for cropland productivity. The main management concerns are water erosion, the moderately low organic matter content of the Buse soil, and a few surface stones.
J188A	Vienna-Forestville loams, 0 to 2 percent slopes. LCC = 1 & 1; CPI = 87	This map unit is formed in 10 to 40 inches of windblown loamy material over clay loam glacial till material in eastern Codington County. The Vienna soil (70 % of the map unit) is a well-drained soil with 10 to 20 inches of loamy material over clay loam glacial till on backslopes positions and is rated good for cropland productivity. The Forestville soil (30 % of the map unit) is a moderately well drained soil with 20 to 40 inches of loamy material over clay loam glacial till located in the swale position, and is rated very good for cropland production. The only management concern is maintaining soil organic matter content.
J189B	Wamduska gravelly coarse sand, 2 to 6 percent slopes. LCC = 6s; CPI = 10	This map unit is formed in sorted sandy and gravelly material along the shorelines of large glacial lakes or semipermanent wetlands in western Codington County. The Wamduska soil typically produces quality forage but rates very poor for cropland productivity. During prolonged wet periods these soils will pond water for many years. The majority of the Wamduska soils have been under water since the mid to late 1990's.
J190B	Wamduska gravelly coarse sand, 2 to 6 percent slopes, extremely stony. LCC = 7s; CPI = 0	This map unit is formed in sorted sandy and gravelly material along the shorelines of large glacial lakes or semipermanent wetlands in western Codington County. This map unit is extremely stony, as the wave action along the shoreline has removed the majority of the finer sediments, leaving these large stones scattered on the surface. During prolonged wet periods these soils will pond water for many years. The majority of the Wamduska soils have been under water since the mid to late 1990's.
J191A	Waubay silty clay loam, 0 to 2 percent slopes. LCC= 1; CPI=99	This map unit is formed in silty glacial material in western Codington County. The Waubay soil is a moderately well drained silty soil in upland swales and is rated very good for cropland productivity. This is one of the most productive soils in Codington County. The only management concern is maintaining soil organic matter content. Wetness may be a problem in abnormally wet years.

Codington County Detailed Soil Map Units Descriptions

J192A	Waubay-Badger silty clay loams, 0 to 1 percent slopes. LCC = 1 & 2w; CPI = 85	This map unit is formed in clayey alluvial material in upland drainageways in western Codington County. The Waubay soil (65 % of the map unit) is a moderately well drained silty soil in shallow drainageways and is rated very good for cropland productivity. The Badger soil (35 % of the map unit) is a somewhat poorly drained clayey soil located in the middle of the drainageways and is rated fair for cropland productivity. The main management concern is wetness. Maintaining existing drainage systems helps to remove excess water. These soils are better suited to late planted crops. These soils will be the very productive in dry years.
J193D	Zell-Great Bend silt loams, 9 to 15 percent slopes. LCC = 6e & 4e; CPI = 49	This map unit is formed in silty lake plain material in northeast Codington County. The Zell soil (70 % of the map unit) is a well drained soil located on the eroded knobs of the landscape with 9 to 15 percent slopes and is rated poor for cropland productivity. The Great Bend soil (30 % of the map unit) is a well-drained soil on 9 to 15 percent slope and is rated fair for cropland productivity. The main management concerns are water erosion and the moderately low organic matter content of the Zell soil. This map unit is most productive as rangeland. Use proper grazing techniques to control water erosion.
J194A	Oldham silty clay loam, 0 to 1 percent slopes. LCC = 5w; CPI = 29	This map unit is located throughout Codington County. The Oldham soil is a very poorly drained clayey soil located in large depressions. These depressions typically have a drainage ditch that removes the majority of the surface water. If the ditch can remove ample water these soils are productive for hayland or possible cropland. In abnormally wet periods these soils only practical use is for wildlife.
J239A	La Prairie loam, 0 to 2 percent slopes. LCC = 1; CPI = 90	This map unit is formed in loamy alluvial material along established drainageways in Codington County and will rarely flood. The La Prairie soil is a moderately well drained soil on high floodplains and is rated very good for cropland productivity. There is no major management concern except that it may flood in the early spring following heavy spring rains or rapid snowmelt.
J241A	Brandt silty clay loam, 0 to 2 percent slopes. LCC = 1; CPI = 84	This map unit is formed in 40 to 60 inches of silty material over gravely glacial outwash material and is located throughout Codington County. The Brandt soil is a well drained soil with 40 to 60 inches (typically 50 to 60) of silty material over sands and gravels and is rated good for cropland productivity. The main management concern is conserving moisture as these soils will show drought symptoms during prolonged dry periods. No-till works very well on this soil.
J241B	Brandt silty clay loam, 2 to 6 percent slopes. LCC = 2e; CPI = 77	This map unit is formed in 40 to 60 inches of silty material over gravely glacial outwash material and is located throughout Codington County. The Brandt soil is a well drained soil with 40 to 60 inches (typically 50 to 60) of silty material over sands and gravels on 2 to 6 percent slopes and is rated good for cropland productivity. The main management concern is conserving moisture as these soils will show drought symptoms during prolonged dry periods. No-till works very well on this soil.
J244A	Lamoure silty clay loam, 0 to 1 percent slopes. LCC = 3w; CPI = 65	This map unit is formed in silty alluvial material throughout Codington County. The Lamoure soil is a poorly drained silty soil on low floodplains and is rated fair for cropland productivity. The main management concerns are wetness and the high pH, which affects the availability of plant nutrients. This map unit is better suited to late planted crops.
J245A	Darnen loam, 0 to 2 percent slopes. LCC = 1; CPI 92	This map unit is formed in loamy stratified material throughout Codington County. The Darnen soil consists of stratified loamy material that has been deposited on this flat landscape from the adjacent steep hills. The Darnen soil typically has good topsoil depth and is rated very good for cropland productivity. The only management concern is to maintain soil organic matter content.
J246A	Fordville loam, 0 to 2 percent slopes. LCC 2s; CPI = 58	This map unit is formed in 20 to 40 inches of loamy material over gravely glacial outwash material throughout Codington County. The well drained Fordville soil is rated fair for cropland productivity. The main management concern is conserving moisture in these droughty soils. These soils are better suited to early maturing crops and work very well with no-till.
J247B	Lanona-Swenoda fine sandy loams, 2 to 6 percent slopes. LCC = 3e & 3e; CPI = 64	This map unit is formed in 20 to 40 inches of sandy loam material over clay loam glacial till material in eastern Codington County. The Lanona soil (60 % of the map unit) is a well drained soil located on backslope positions with 2 to 6 percent slopes and rated fair for cropland productivity. The Swenoda soil (40 % of the map unit) is a moderately well drained soil located in swale position or broad flats and rated good for cropland productivity. The management concern are conserving moisture and maintaining soil organic matter content. No-till works very well on this soil.
J257A	Graceland silty clay loam, 0 to 2 percent slopes. LCC = 1; CPI = 100	This map unit is formed in 40 to 60 inches of windblown silts (loess) over clay loam glacial till material in central Codington County. The Graceland soil is a moderately well drained silty soil in upland swales and is rated very good for cropland productivity. This is one of the most productive soils in Codington County. The only management concern is maintaining soil organic matter content. Wetness may be a problem in abnormally wet years.
J258B	Darnen loam, 2 to 6 percent slopes. LCC = 2e; CPI = 87	This map unit is formed in loamy stratified material throughout Codington County. The Darnen soil consists of stratified loamy material that has been deposited from the adjacent steep hills. The well drained Darnen soil is on 2 to 6 percent slopes and is rated good for cropland productivity. The only management concerns are to maintain soil organic matter content and water erosion.

SOUTH DAKOTA WATER WELL COMPLETION REPORT

10-85

Location S & E Sec 2 Twp 119 Rg 52RCounty Codington

Please mark well location with an "X"

Well Completion Date 8-20-88

PROPOSED USE:

☒ Domestic ☐ Municipal ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Stock

Method of Drilling:

Rotary

CASING DATA

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
<u>200#</u> LB/FT	<u>5</u> IN	<u>0</u> FT	<u>130</u> FT	<u>7 1/2</u> IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

GROUT

Was the well grouted? ☒ YES ☐ NOTo what depth? 70 FEETWhat is grouting material? ConcreteIf casing, number of sacks? 5Describe grouting procedure Pump in Back of CasingWhat was grout weight? 7 Seal Water to LB/GALOne Bag CementSCREEN: ☒ Perforated pipe ☐ ManufacturedDiameter 5 IN Length 10 FEETMaterial PlasticSlot Size 25 Set From 120 Feet To 130 Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Other information Bottom openWas a packer or seal used? ☐ YES ☒ NO

If so, what material? _____

Describe packer(s) and location? _____

Was well disinfected upon completion? ☒ YES ☐ NOExplain NoneBacteriological analysis ☐ YES ☒ NO

Laboratory sent to _____

Well Owner:

Name Roy AmickAddress R-1 South Star

Well Log:

Depth

Formation	From	To
<u>Clay Wash</u>	<u>0</u>	<u>5</u>
<u>Fine Sand</u>	<u>5</u>	<u>15</u>
<u>Gray Clay</u>	<u>15</u>	<u>108</u>
<u>Carson P. Sand</u>	<u>108</u>	<u>130</u>
<u>Gray Clay</u>	<u>130</u>	<u>135</u>

STATIC WATER LEVEL 30 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

If other, specify _____

Can well be completely shut in? yes

WELL TEST DATA

☒ Pumped☒ Bailed☐ OtherDescribe: Pump after BailingRunning 110 Lbs. Min3 Hrs.

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

REMARKS:

Pumping with air to
Clear out SandThis well was drilled under license # 28

And this report is true and accurate.

Drilling firm: Boone Well Drilling

Signature of license Representative:

E. H. Boone

Signature of Well Owner:

Roy AmickDate 8-20-88

10-2-88

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 4/29, 20 08

RECEIVED OF ROGER ANDAH 45364 157TH ST SOUTH SIOUX SD 57263

The following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use	50	00
Fee for Application for Permit No. _____ to Appropriate Water for Future use		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>7000-3</u>		
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____	50	00
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	50 00

No. 3000

By Michael Erbelle

Chief Engineer

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 4/16, 20 08

RECEIVED OF Roger Andahl 45364 157th St South Shore SD 57263

The following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>7058-B</u> to Appropriate Water, to construct and to put water to beneficial use	275	00
Fee for Application for Permit No. _____ to Appropriate Water for Future use		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	275 00

No. 5

By [Signature]

Chief Engineer



April 17, 2008

Roger Amdahl
45364 157th St
South Shore SD 57263

Dear Mr. Amdahl:

Thank you for submitting the *Application for a Permit to Appropriate Water* for irrigation. In order to complete the application the following is required.

- Enclosed is the aerial photo map submitted with the application. Please mark the proposed well location with an "X".
- The application is also enclosed. Please complete Item No. 2, Amount of Water Claimed in gallons per minute (GPM).
- We have received the \$275 application filing fee. In addition to the application filing fee, the Water Rights Program collects the \$50 licensing fee at the time of filing. Please submit an additional \$50.

If you have any questions, please contact me.

Sincerely,

Karen Schlaak

Karen Schlaak
Water Rights Program
605 773-3352
karen.schlaak@state.sd.us

enclosure

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

RECEIVED

APR 23 2008

WATER RIGHTS
DIVISION

Water Rights Program - File Documentation

NAME: Roger Amdahl

ADDRESS: South Shore SD

DATE: 4-30-08 **COUNTY:** CD **TELEPHONE:** 605 882-1348

RE: Pending application

COMMENTS:

I called Roger Amdahl regarding his pending application. Mr. Amdahl stated he wasn't sure if they would need 2 wells but he would like the application amended to include 2 wells. The pivot located in the SE ¼ would require 800 gpm and the pivot in the SW ¼ would require 450 gpm (for a total of 1250 gpm).



Karen Schlaak
Environmental Scientist



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 7028-3, Roger Amdahl**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 7028-3, Roger Amdahl, 45364 157th Street, South Shore SD 57263.

The Chief Engineer is recommending APPROVAL of Application No. 7028-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. The wells approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The wells authorized by Permit No. 7028-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. The wells approved under this Permit shall be valved and the flow reduced to the amount needed or to a minimum when not being used. If this well is abandoned or the Permit cancelled, the well must be plugged in accordance with Water Management Board Rules, Chapter 74:02:04.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Garland Erbele, Chief Engineer
June 12, 2008

REPORT ON WATER PERMIT APPLICATION NO. 7028-3

For Roger Amdahl

June 10, 2008

Application No. 7028-3 proposes to appropriate 2.77 cfs (1,250 gpm) from two wells approximately 135 feet deep located in the center of the SE $\frac{1}{4}$ and the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of section 2 to irrigate 223 acres located in the S $\frac{1}{2}$ of section 2; all in T119 N R52W in Codington County and within the former boundaries of the Sisseton Wahpeton Indian Reservation.

AQUIFER – PRAIRIE COTEAU (PCO)

The Prairie Coteau is a buried outwash (sand and gravel) that is under artesian conditions in this area. The aquifer is relatively thin and significant drawdown does occur from existing irrigation wells in the area. The aquifer underlies 760 square miles and contains an estimated 1.5 million acre-feet of recoverable water in storage in Grant and Codington County (Hansen, 1990). There are free flowing wells just to the south and west of this site both irrigation and domestic from the Prairie Coteau aquifer. The applicant has not drilled holes and site specific geologic information is not available. The nearest well drilled in relation to this site is a domestic well drilled for Ray Amdahl drilled by Grewe Drilling in August of 1988. The log indicates that sand and gravel (aquifer) was encountered to a total depth of 108 to 130 feet below land surface and is physically located in the S $\frac{1}{2}$ of section 2. Without adequate test drilling it will be impossible to determine the “best well locations” for obtaining irrigation water from the Prairie Coteau aquifer. The county study, test drilling for observation wells and other irrigation and domestic wells in the area all indicate this site should be underlain by the Prairie Coteau aquifer.

The Water Rights Program monitors two observation wells completed into the Prairie Coteau aquifer within two miles of this application. These are CD-76D (located about two miles north of this application) and CD-76A (located about one mile south of this application). Water levels for these wells show good response to climatic conditions and to pumping. The amount of annual fluctuation due to pumping can exceed 55 feet in CD-76D and 45 feet in CD-76A under existing conditions. Overall however, the water levels recover and recharge does occur. In fact, the hydrographs for these two observation wells indicate that the aquifer is capable of sustaining additional withdrawals (Water Rights, 2007). Hydrographs for two observation wells are included with this report.

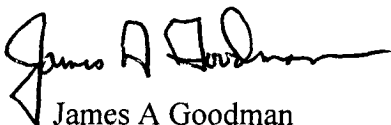
This area has been highly controversial in the past especially during the late 1970's and early 1980's. There were many domestic wells completed into the Prairie Coteau aquifer that were affected by irrigation pumping. In fact a domestic well just across the road to the west of this application was one of the wells most affected in the area. The most noticeable affects were on wells that were free flowing and would cease or diminish free flow during the irrigation season. In fact, the Water Management Board denied Water Permit application No. 5407-3 for public interest reasons in July of 1995. That application would have obtained water from the Prairie Coteau aquifer and was located about four miles north of this application.

REVIEW OF EXISTING WATER PERMITS/RIGHTS

There are two existing irrigation wells within a one and one-half mile radius of these proposed well locations. Existing Water Right No. 3229-3 (2.66 cfs, 224 acres) is located about one mile to the west of the western most proposed well for this application and Water Right No. 5165-3 (1.77 cfs, 132 acres) is located about one mile south of the eastern most proposed well. Interference will occur. This is shown by the drawdown created in observation well CD-76D that is located directly between the two existing irrigation wells. Even though the magnitude of the drawdown will increase this is not expected to cause adverse effects. This can not be ascertained for certain until production wells are completed and used during an irrigation season. Also all these factors will be dependent upon the aquifer thickness and distance from an existing production well at the actual final locations.

CONCLUSIONS

1. Water is available from the Prairie Coteau aquifer.
2. The aquifer is confined and under artesian conditions at this site. Interference will occur but is not expected to be adverse. Some pumps in domestic wells and irrigation wells may have to be lowered in order to maintain the amount of water needed.
3. This area has been very controversial in the past. Water Permit No. 5407-3 was denied by the Water Management Board (about four miles north of this application) for public interest reasons. The controversy concerned the amount of drawdown that occurred during the irrigation season and the fact that some free flowing wells ceased or diminished in flow.
4. The well(s) authorized by this application must be constructed in accordance with SD Well Construction Standards.
5. Wells at these sites may free flow at the land surface especially during wet years. Any well constructed must be controlled to prevent the waste of water.



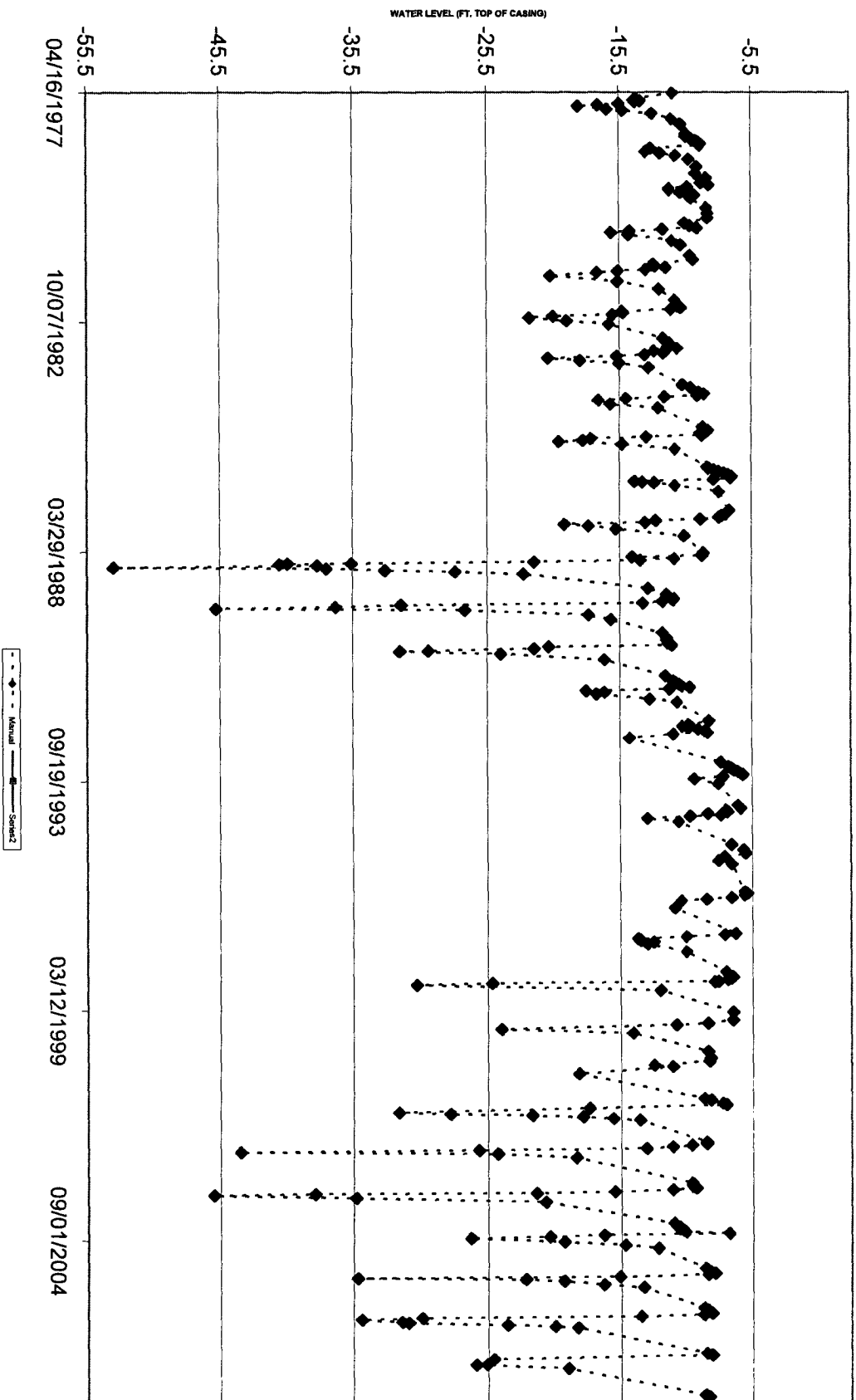
James A Goodman
Natural Resources Engineer

BIBLIOGRAPHY

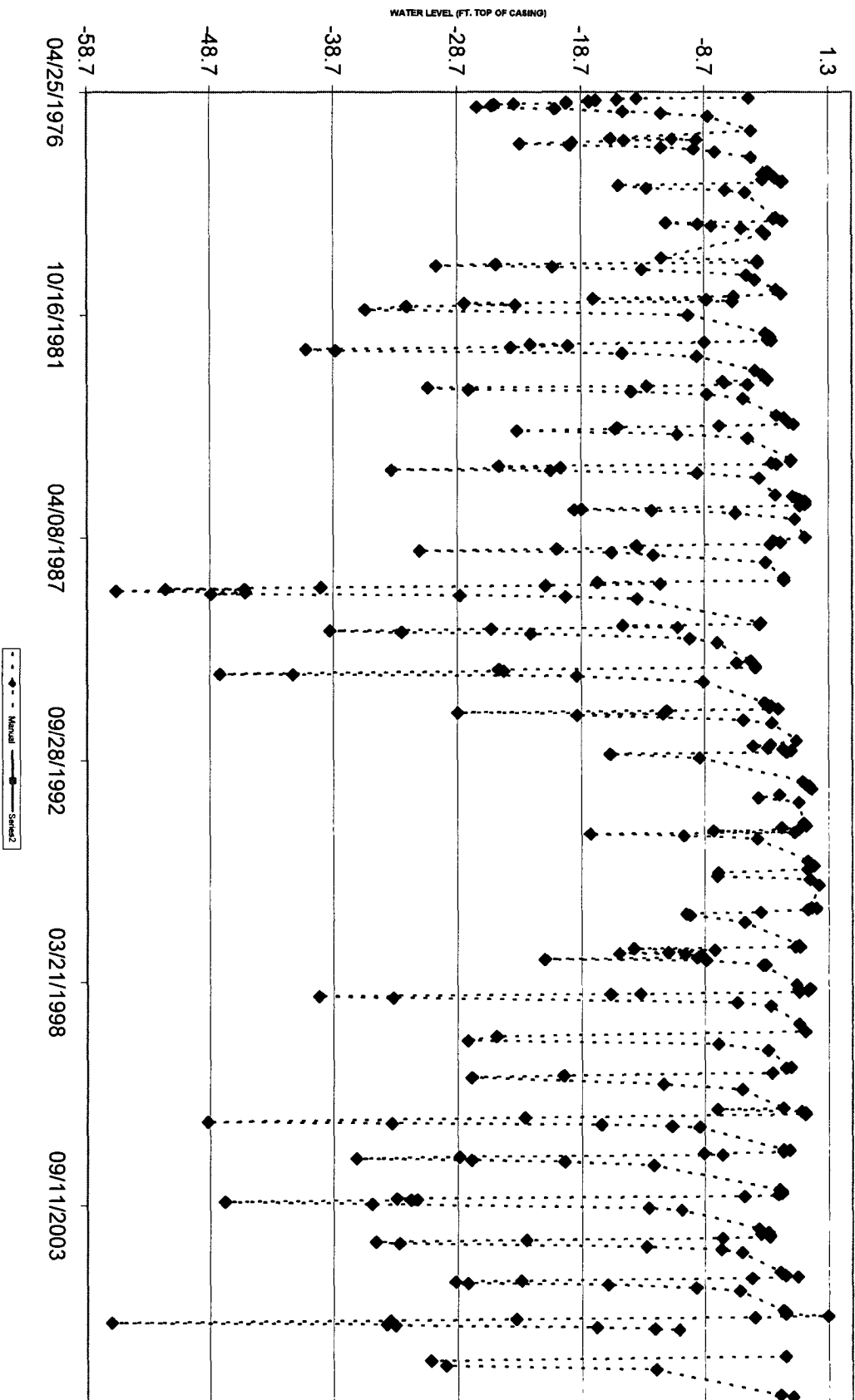
Hansen, D. S., 1990, Water Resources of Codington and Grant Counties, South Dakota, Water Resources Investigations Report 89-4147, USGS, Huron, SD, 57350.

Water Rights, 2008, Unpublished Observation Well Data for Codington and Grant Counties, SD DENR, DES, Water Rights Program, Pierre, SD, 57501.

WATER RIGHTS: OBSERVATION WELL
CD-76A



WATER RIGHTS' OBSERVATION WELL
CD-76D



RECEIVED

JUL - 1 2008

Form 8

WATER RIGHTS
PROGRAM

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of CODINGTON) SS

I, MONICA K. SAATHOFF

certify that the attached printed Notice was
taken

from the WATERTOWN PUBLIC OPINION

printed and published in WATERTOWN

County of CODINGTON and

state of South Dakota. The notice was
published

in the newspaper on the following two dates:

JUNE 20th, 2008

JUNE 27th, 2008

Cost of Printing 91.28

Monica Saathoff
(Signature)

BOOKKEEPER
(Title)

JUNE 27th, 2008
(Date Signed)

DENR

**NOTICE OF APPLICATION
NO. 7028-3 to Appropriate
Water**

Notice is given that Roger Amdahl, 45364 157th St, South Shore SD 57263 has filed an application for a water permit to appropriate 2.77 cubic feet of water per second from two wells to be completed into the Prairie Coteau Aquifer (approximately 135 feet deep) located in center of the SE 1/4 and the SW 1/4 SW 1/4 Section 2 to irrigate 223 acres located in the S 1/2 Section 2; all in T119N-R52W within the former boundaries of the Sisseton Wahpeton Indian Reservation.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7028-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by July 7, 2008.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pimer, Secretary, Department of Environment and Natural Resources.

(June 20 & 27, 2008)



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

June 13, 2008

Public Opinion
PO Box 10
Watertown SD 57201

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7028-3 to Appropriate Water to be published twice. Please publish the first notice on June 20, 2008 with the second publication 7 days later. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Roger Amdahl, 45364 157th St, South Shore SD 57263 (Ph # 605-882-1348).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

No. 7028-3

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of June 13, 2008 enclosing Notice to Appropriate Water by Application No. 7028-3 which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

**NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPER RIGHT AWAY.**

June 13, 2008

Roger Amdahl
45364 157th St
South Shore SD 57263

Dear Mr. Amdahl:

Water Permit Application No. 7028-3 for irrigation use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Publisher of the Public Opinion printed at Watertown SD (Ph # 605-886-6901). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization, the publisher has been instructed to publish your notice once each week for two consecutive weeks. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.

Instruction to Newspaper - Publish first Notice on June 20, 2008 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 7028-3 to Appropriate Water

Notice is given that Roger Amdahl, 45364 157th St, South Shore SD 57263 has filed an application for a water permit to appropriate 2.77 cubic feet of water per second from two wells to be completed into the Prairie Coteau Aquifer (approximately 135 feet deep) located in center of the SE ¼ and the SW ¼ SW ¼ Section 2 to irrigate 223 acres located in the S ½ Section 2; all in T119N-R52W within the former boundaries of the Sisseton Wahpeton Indian Reservation.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7028-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by July 7, 2008.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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www.state.sd.us/denr

JUL 28 2008

Roger Amdahl
45364 157th St
South Shore SD 57263

Dear Mr. Amdahl:

Enclosed is Water Permit No. 7028-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures



7028-3
DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
PMB 2020
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

January 16, 2015

NOTICE

TO: ROGER AMDAHL, 45364 157TH ST, SOUTH SHORE, SD 57263

FROM: Ron Duvall, Natural Resources Engineer
for Garland Erbele, Chief Engineer
Water Rights Program

SUBJECT: Reporting Requirement for 2014 Irrigation Questionnaire(s)

Our records indicate your 2014 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 7028-3. The request for the Questionnaire was dated October 17, 2014. The Water Management Board has directed that owners of water permits who have not submitted the 2014 Irrigation Questionnaire(s) be given notice of permit violation and a hearing to be held by the Board. The hearing is to determine what action is to be taken for violation of Water Permit No(s) 7028-3 qualification:

"This permit is approved subject to the Irrigation Water Use Questionnaire being submitted each year."

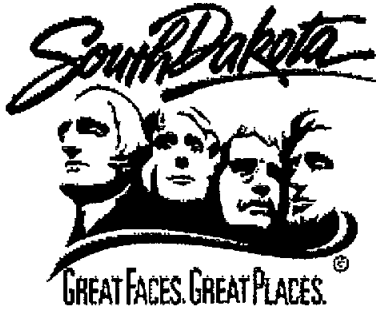
The hearing will be held at **10:00 am, March 4, 2015** in the Floyd Matthew Training Center, Joe Foss Building, 523 E Capitol Avenue, Pierre, SD and will be conducted pursuant to SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11 and 46-2-17. These are contested case hearings pursuant to Chapter 1-26. According to SDCL 46-1-12, the Board may suspend a permit for a period of up to one year for the first violation of a permit qualification or up to three years for a second violation, or cancel a permit for a third violation. Following the hearing, the Water Management Board can:

1. Suspend or cancel Permit No(s) 7028-3 in accordance with applicable provisions of SDCL 46-1-12;
2. Postpone any action; or
3. Take no action.

The hearing is an adversary proceeding. The permit owner has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised. Decisions of the Board may be appealed to the Circuit Court and the State Supreme Court as provided by law.

If the questionnaire(s) is (are) received in this office before the **March 4, 2015** hearing you will no longer be in violation of your permit and your name will be removed from the Board agenda. Enclosed are additional questionnaire(s) for your use. If you have questions or need assistance, please contact Genny McMath at (605) 773-3352 or email at genny.mcmath@state.sd.us. If you prefer, you can complete the questionnaire online at the following link: <http://denr.sd.gov/iq.aspx>

NOTE: Please contact the Water Rights Program, Joe Foss Building, 523 E Capitol, Pierre, SD (605-773-3352) to assure access to the meeting room for the handicapped or to obtain an interpreter for the hearing impaired.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
PMB 2020
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182

January 23, 2015

7028-3

Roger Amdahl
45364 157th St
South Shore SD 57263

Dear Mr. Amdahl:

I am writing to acknowledge receipt of your 2014 irrigation questionnaire.

You may disregard the January 16, 2015, "Notice" concerning reporting requirements for Water Permit No. 7028-3. The information was received in our office prior to the Water Management Board meeting and your name has been deleted from the agenda.

If you have any questions, please contact me.

Sincerely,

Genny McMath
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us



7028-3
DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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www.state.sd.us/denr

January 20, 2017

NOTICE

TO: ROGER AMDAHL, 45364 157TH ST, SOUTH SHORE, SD 57263
FROM: Ron Duvall, Natural Resources Engineer
for Jeanne Goodman, Chief Engineer
Water Rights Program

SUBJECT: Reporting Requirement for 2016 Irrigation Questionnaire(s)

Our records indicate your 2016 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 7028-3. The request for the Questionnaire was dated October 21, 2016. The Water Management Board has directed that owners of water permits who have not submitted the 2016 Irrigation Questionnaire(s) be given notice of permit violation and a hearing to be held by the Board. The hearing is to determine what action is to be taken for violation of Water Permit No(s) 7028-3 qualification:

"This permit is approved subject to the Irrigation Water Use Questionnaire being submitted each year."

The hearing will be held at **Wednesday, March 1, 2017 at 11:00 am (Central Time)** in the Floyd Matthew Training Center, Joe Foss Building, 523 E Capitol Avenue, Pierre, SD and will be conducted pursuant to SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11 and 46-2-17. These are contested case hearings pursuant to Chapter 1-26. According to SDCL 46-1-12, the Board may suspend a permit for a period of up to one year for the first violation of a permit qualification or up to three years for a second violation, or cancel a permit for a third violation. Following the hearing, the Water Management Board can:

1. Suspend or cancel Permit No(s) 7028-3 in accordance with applicable provisions of SDCL 46-1-12;
2. Postpone any action; or
3. Take no action.

The hearing is an adversary proceeding. The permit owner has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised. Decisions of the Board may be appealed to the Circuit Court and the State Supreme Court as provided by law.

If the questionnaire(s) is (are) received in this office before the **March 1, 2017** hearing you will no longer be in violation of your permit and your name will be removed from the Board agenda. Enclosed are additional questionnaire(s) for your use. If you have questions or need assistance, please contact Genny McMath at (605) 773-3352 or email at genny.mcmath@state.sd.us. If you prefer, you can complete the questionnaire online at the following link: <http://denr.sd.gov/iq.aspx>

NOTE: Please contact the Water Rights Program, Joe Foss Building, 523 E Capitol, Pierre, SD (605-773-3352) to assure access to the meeting room for the handicapped or to obtain an interpreter for the hearing impaired.



7028-3
DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

February 7, 2017

7028-3

Roger Amdahl
45364 157th St
South Shore SD 57263

Dear Mr. Amdahl:

I am writing to acknowledge receipt of your 2016 irrigation questionnaire.

You may disregard the January 20, 2017, "Notice" concerning reporting requirements for Water Permit No. 7028-3. The information was received in our office prior to the Water Management Board meeting and your name has been deleted from the agenda.

If you have any questions, please contact me.

Sincerely,

Genny McMath
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us



DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES
JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

January 20, 2022

NOTICE

TO: ROGER AMDAHL, 45364 157TH ST, SOUTH SHORE, SD 57263

FROM: Ron Duvall, Water Rights Permitting Administrator
for Eric Gronlund, Chief Engineer
Water Rights Program

SUBJECT: Reporting Requirement for 2021 Irrigation Questionnaire(s)

Our records indicate your 2021 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 7028-3. The request for the Questionnaire was dated October 22, 2021. The Water Management Board has directed that owners of water permits who have not submitted the 2021 Irrigation Questionnaire(s) be given notice of permit violation and a hearing to be held by the Board. The hearing is to determine what action is to be taken for violation of Water Permit No(s) 7028-3 qualification:

"This permit is approved subject to the Irrigation Water Use Questionnaire being submitted each year."

The hearing will be held at **Wednesday, March 2, 2022 at 9:30 am (Central Time)** in the Floyd Matthew Training Center, Joe Foss Building, 523 E Capitol Avenue, Pierre, SD and will be conducted pursuant to SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11 and 46-2-17. These are contested case hearings pursuant to Chapter 1-26. According to SDCL 46-1-12, the Board may suspend a permit for a period of up to one year for the first violation of a permit qualification or up to three years for a second violation or cancel a permit for a third violation. Following the hearing, the Water Management Board can:

1. Suspend or cancel Permit No(s) 7028-3 in accordance with applicable provisions of SDCL 46-1-12;
2. Postpone any action; or
3. Take no action.

The hearing is an adversary proceeding. The permit owner has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised. Decisions of the Board may be appealed to the Circuit Court and the State Supreme Court as provided by law.

If the questionnaire(s) is (are) received in this office before the **March 2, 2022** hearing you will no longer be in violation of your permit and your name will be removed from the Board agenda. Enclosed are additional questionnaire(s) for your use. If you have questions or need assistance, please contact Genny McMath at (605) 773-3352 or email at genny.mcmath@state.sd.us. **If you prefer, you can complete the questionnaire online at the following link: <https://danr.sd.gov/iq> using this password: WAXSTD**

NOTE: Please contact the Water Rights Program, Joe Foss Building, 523 E Capitol, Pierre, SD (605-773-3352) to assure access to the meeting room for the handicapped or to obtain an interpreter for the hearing impaired.



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

February 1, 2022

7028-3

Roger Amdahl
45364 157th St
South Shore SD 57263

Dear Mr. Amdahl:

I am writing to acknowledge receipt of your 2021 irrigation questionnaire.

You may disregard the January 20, 2022, "Notice" concerning reporting requirements for Water Permit No. 7028-3. The information was received in our office prior to the Water Management Board meeting and your name has been deleted from the agenda.

If you have any questions, please contact me.

Sincerely,

Genny McMath
Water Rights Program
605 773-3352
Genny.mcmath@state.sd.us



7028-3

**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

JUN 26 2023

Roger Amdahl
45364 157th St
South Shore SD 57263

7028-3

Dear Mr. Amdahl:

Enclosed is Water License No. 7028-3. This is the final water right document completing your process of obtaining a Water Right. Included with your license is a map prepared by the staff engineer who conducted the field investigation.

For your information SDCL 46-6-27 requires that if in the future, the owner of an existing well, constructs a replacement well and does not plan to use the old well, the old well is considered abandoned and must be plugged. Also, any well that is being used or is not considered abandoned must be valved and controlled, if flowing, or sealed and capped so that no leaking occurs either underground or at the surface.

As long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Sincerely,

Eric Gronlund, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

STATE OF SOUTH DAKOTA
WATER LICENSE NO. 7028-3

(1) Roger Amdahl; 45364 157th St, South Shore, SD 57263, made Application No. 7028-3, April 16, 2008, for a water permit to divert 2.77 cubic feet of water per second from groundwater, 2 wells (Prairie Coteau Aquifer), Grant County, South Dakota for irrigation purposes. Permit No. 7028-3, with a priority date of April 16, 2008, was approved July 7, 2008, and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before July 7, 2013, and for the application to beneficial use of water on or before July 17, 2017.

An investigation conducted for licensing purposes found the diversion point developed outside of the permitted area. Pursuant to SDCL 46-5-13.1 and ARSD 74:02:01:14.01, the Chief Engineer made a finding that the change in the diversion point location did not increase the potential for adverse effects to existing diversions.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and is entitled to divert 1.89 cubic feet of water per second for beneficial use. The location of the diversion point is:

- 1,570 ft N & 2,635 ft E of the SW corner of Section 2, T119N, R52W (NW ¼ SE ¼)
(Latitude 45.11255 Longitude -97.13390)

(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use to irrigate the following land:

Section 2, T119N, R52W			
(within former Sisseton Wahpeton Indian Reservation boundaries)			
NW ¼ SW ¼	14.8 acres	NW ¼ SE ¼	32.8 acres
NE ¼ SW ¼	2.8 acres	NE ¼ SE ¼	34.4 acres
SE ¼ SW ¼	8.1 acres	SE ¼ SE ¼	30.9 acres
SW ¼ SW ¼	29.5 acres	SW ¼ SE ¼	29.7 acres
TOTAL: 183.0 acres			

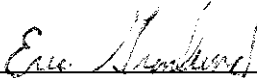
(4) Pursuant to South Dakota Water Law 46-5-30.1 Roger Amdahl, the holder and/or owner of Water Right No. 7028-3 is issued a license to appropriate water, the right to use 1.89 cubic feet of water per second from groundwater, 1 well (Prairie Coteau Aquifer) with a priority date of April 16, 2008, from the location specified in (2) of this license for irrigation purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 7028-3 and subject to the following qualifications:

1. The well approved under this water right will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this water right shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.

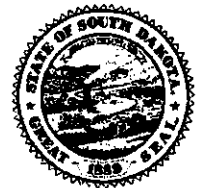
continued

2. The well authorized by Permit No. 7028-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with the Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28. *(The well was drilled by Wieber Well Drilling in 2011. A copy of the well completion report is on file with the Water Rights Program)*
3. The well approved under this water right shall be valved and the flow reduced to the amount needed or to a minimum when not being used. If this well is abandoned of the water right cancelled, the well must be plugged in accordance with the Water Management Board Rules, Chapter 74:02:04.
4. This Water Right is approved subject to the irrigation water use questionnaire being submitted each year.


Eric Gronlund, Chief Engineer
Water Rights Program
Department of Agriculture and Natural Resources

JUN 26 2023

date



Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 7028-3

I have this day, May 17, 2023, made a thorough examination of the water use system constructed by Roger Amdahl; 45364 157th St, South Shore, SD 57263 of Permit No. 7028-3, bearing the priority of April 16, 2008 authorizing the diversion of 2.77 cu. ft. per second of the waters of the Prairie Coteau Aquifer for irrigation purposes, in Codington County.

A. Works used to divert the water:

Well Information:

- 1) Well Drilling Firm: Weber Well Drilling
- 2) No. of Wells 1
- 3) Depth(s) 134 feet
- 4) Well log is available Y

Casing:

- 1) Diameter 12 inches
- 2) Length 124 feet
- 3) Type Plastic

Screen:

- 1) Type PVC
- 2) Length 20 feet
- 3) Static water level NA feet

Pump:

- 1) Make Submersible
- 2) Model Submersible
- 3) Size Submersible
- 4) Capacity 850 GPM

Motor:

- 1) Make Unknown
- 2) Model No. Unknown
- 3) Horsepower rating Unknown hp

B. Works used to transport water to place of use:

- 1) Type Buried PVC
- 2) Size 8 inches
- 3) Length 1400 & 1830 feet

C. Works used to apply water to beneficial use:

Center pivot:

- 1) Make 2 - Valleys
- 2) Overall length 820 & 1300 feet
- 3) Number of towers 4 & 7
- 4) End gun Y
- 5) Capacity 850 GPM

Chemigation Equipment:

- 1) Does chemigate N

D. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Y
- 2) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period Y
- 3) Exceptions to compliance are: None

E. Condition and Location:

1. The system is in good condition with the point(s) of diversion located as follows: **WELL LOCATION**
From the SW corner Sec 2 T119N R52W, 1,570 ft N & 2,635 ft E, Lat 45.11255 Long -97.13390
(NW ¼ SE ¼)
2. The works are capable of diverting and conveying to the place of use 1.89 cu. ft. per second of water which is to be used for irrigation. Water has been put to beneficial use to the maximum extent as follows:

legal description/acreage

All land in Sec 2 T119N R52W
NW ¼ SW ¼ – 14.8 acres
NE ¼ SW ¼ – 2.8 acres
SE ¼ SW ¼ – 8.1 acres
SW ¼ SW ¼ – 29.5 acres

legal description/acreage

(within former reservation boundaries)
NW ¼ SE ¼ – 32.8 acres
NE ¼ SE ¼ – 34.4 acres
SE ¼ SE ¼ – 30.9 acres
SW ¼ SE ¼ – 29.7 acres

comprising a total of 183.0 acres of land and the license should be issued for 1.89 cfs

3. All structures, wells and lands on map Y

F. Comments or other permit(s) associated with the project:

The irrigated acreage was determined with the aid of FSA imagery and ArcMAPS software.

The pump rate reported in a recent Irrigation Questionnaire was used to establish the system flow capacity.

One well is used to supply water to two (2) pivots but not at the same time. There are two (2) well logs in the permit materials dated 1988 & 2012. It appears that both are for a common location.

The mailing address and the telephone number in the permit materials are current

I talked to Mr. Amdahl during the field inspection visit.



Darrell W DeBoer
Water Rights Inspector
DANR, Water Rights Program

Date report completed: May 19, 2023

Approval of Location Change and/or Additional Diversion Point(s)

NAME: Roger Amdahl

ADDRESS: 45364 157th St, South Shore SD 57263

DATE: June 22, 2023

COUNTY: Codington

GENERAL DESCRIPTION OF AUTHORIZED PROJECT:

The permit holder is authorized to construct two wells approximately 135 foot deep well into the Prairie Coteau Aquifer in the center of the SE ¼ and the SW1/4 SW1/4 of Section 2 T119N-R52W(res) for irrigation of 223 acres in the S1/2 of Section 2 T119N-R52W(res).

AUTHORITY:

Pursuant to SDCL 46-5-13.1, the location of a diversion point may be changed or additional diversion points may be licensed provided the following conditions are met and the potential for interference with other existing diversions is not increased:

- **Developed water source same as permitted source and no additional water appropriated**

The permit holder constructed a single 134 foot well into the Prairie Coteau Aquifer in the NE1/4 SW1/4 of Section 2 T119N-R52W(res).

- **If irrigation, no new land is irrigated**

The permit holder developed 183 acres in the S1/2 of Section 2 T119N-R52W(res).

- **Review of Existing Diversions**

There are nine existing water permits/rights approximately two miles from where the this well was developed. Five of the nine were existing permits/rights when this permit was issued, it was determined that there was reasonable probability any well interference due to pumping of this well would not adversely or unlawfully impair existing rights. The same would be expected for the well constructed in the new location.

RECOMMENDED ACTION

Based on the above criteria, it is recommended that the diversion point(s) be licensed as developed.



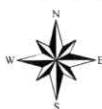
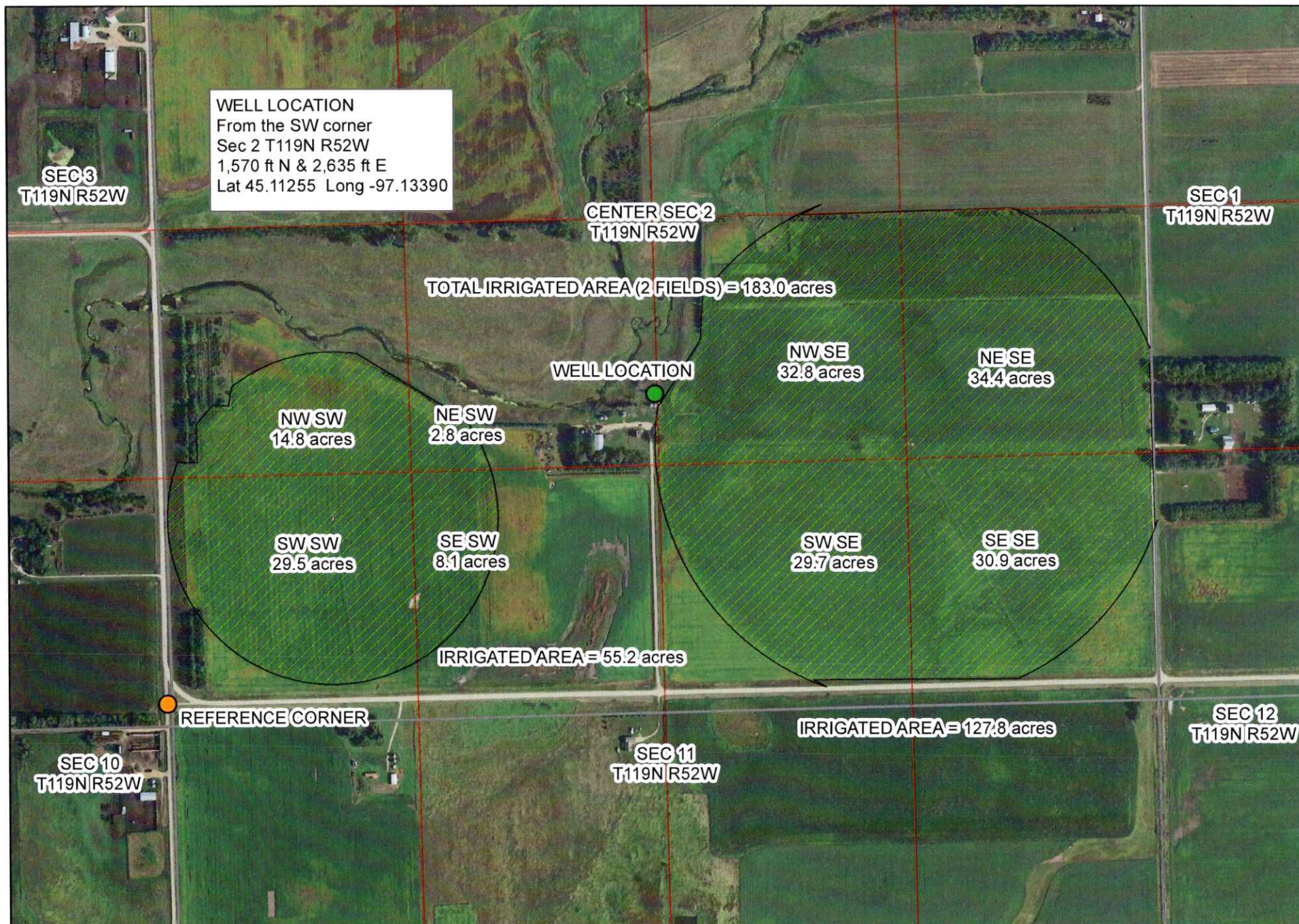
Mark D. Rath, Natural Resources Engineer
Water Rights Program

The Chief Engineer makes a finding pursuant SDCL 46-5-13.1 and ARSD 74:02:01:14.01 that:

This change in location and/or additional diversion point(s) does not increase the potential for adverse effects to existing diversions.



Eric Gronlund, Chief Engineer
Water Rights Program



0 0.075 0.15 0.3 0.45 0.6 Miles



Darrell DeBoer
Water Right Inspector
DANR-Water Rights Program