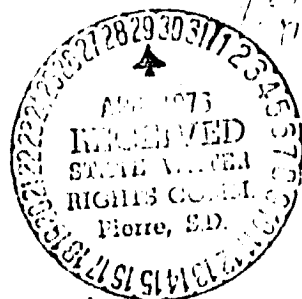


2751-3

1. Considered 7-21, 1976
2. Name of Applicant IRENE ZASTROW
3. Post Office Address GANN VALLEY
4. Amount of water claimed 2.00
5. Source of water supply 94' DEEP WELL
6. Water to be used for IRRIGATION
Acres to be irrigated 140
7. Water to be diverted and used in BUFFALO county
about 1E, 3N miles of GANN VALLEY
8. Proof of Publication Received 6-18-76
Not Received
9. Application Approved
Subject to
Not Approved
Action deferred
10. Remarks:

No. 2751-3Map No. 2108-3 Water Division No. 3 MISSOURI RIVER District
(Blanks to be Filled by the Engineer for the W. R. C.)

APPLICATION FOR PERMIT

To Appropriate Water within the State of South Dakota

(NOTE - Draw a line through items not applicable)

1. Name of Applicant Irene Zastrow
 Post-office address Gann Valley,, State South Dakota 57341
 If a corporation show date and place of incorporation _____
2. Method of accomplishing work (contract, employment of others, or by direct labor) direct labor
3. Name of diversion work Irene Zastrow Unit # 1
4. Amount of water claimed (cubic feet per second) 7.0
5. Source of water supply ground water
6. Location of point of diversion A POINT IN THE S.W. 1/4 SECTION 10, T107N, R. 68W
 _____ County Buffalo
7. Annual period or periods during which water is to be used March-November
8. Use to be made of water. (irrigation, industrial, municipal, commercial, recreation, etc.) irrigation
9. For irrigation use, Total number of acres to be irrigated 140

List below each forty acre subdivision, or lot, or fraction thereof and show number of acres to be irrigated in each.

Land Description	No. Acres Irr.	Land Description	No. Acres Irr.
S.W. 10-107-68	140		

Attach sheet if more space is needed

10. Time required to complete construction of water supply system 5 years. Additional time required to complete application of water to the proposed beneficial use 2 year.
11. Choice of newspaper for Notice of Intent to Appropriate Water publication Wessington Springs, Independent, Wessington Springs, So. Dak.
12. Principal Features of the Proposed Water Supply System.
- A. Works proposed to divert water from its natural source.

Pump Bowl

B. Works proposed to transport water to place of use.

Main Line

C. Works proposed to apply water to beneficial use.

Center Pivot

Estimated Total Cost \$ -----

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map.
 (See instructions concerning preparation.)

STATE OF SOUTH DAKOTA)
) ss.
 County of Buffalo)

I, Irene Zastrow the applicant, certify that I have read the foregoing application and have examined the attached map and that the matters therein stated are true and that I intend, and am able to complete the necessary construction.

Signed Irene Zastrow
 Subscribed and sworn to before me this 2 day of April, 1976
Barry R. Hoffmann
 Notary Public (or other qualified officer)

WATER RIGHT APPLICATION APPROVAL

The Water Rights Commission hereby approves Water Right Application No. 2751-3

IRENE ZASTROW
(Applicant)

GIANN VALLEY
(Post Office Address)

SOUTH DAKOTA 57341 With the following modifications
(State)

The irrigation well approved under this Permit is located near domestic wells which may obtain water from the same aquifer. The irrigation well owner, under this Permit, shall control his irrigation withdrawals so there is not a reduction of needed water supplies in existing domestic wells.

Date of first receipt of application APRIL 29, 1976

Date of return to applicant for correction, amendments or changes required _____, 19____

Date of receipt of corrected application _____, 19____

Approved JULY 21, 1976, Recorded in Book 15 Page 232

WATER RIGHT PERMIT NO. 2751-3

The Water Rights Commission hereby grants and issues this Water Right Permit No. 2751-3 authorizing the construction of the water use system and the putting of water to beneficial use as stated in the Application and as modified in the Water Right Application approval, subject, however, to the following limitations and conditions:

1. The date from which a applicant may claim right is APRIL 29, 1976
2. The equivalent of at least one-fifth of the work above specified is to be completed on or before JANUARY 21, 1979
3. The whole of said work is to be completed on or before JULY 21, 1981
4. The limit of time from onset of beneficial use of water appropriated in accordance herewith is JULY 21, 1983
5. The water appropriated shall be used for the purpose of IRRIGATION

6. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.

7. The amount of the appropriation herein granted shall not exceed 2.0 cubic feet per second; neither shall it exceed the capacity of the above described water supply system, nor shall it exceed the amount of water needed for beneficial uses served, and if for the irrigation purposes said appropriation must be limited to not more than 3 acre feet per acre per year and be limited to not more than one-seventieth (1/70) of one cubic foot of water per second of time for each acre of land to which water is

actually and beneficially applied for irrigation on or before JULY 21, 1983; said water to be used during the following described annual period: MARCH - NOVEMBER

Witness my hand this 28TH day of JULY, 1976

WATER RIGHTS COMMISSION

By:

John Hatch
Chief Engineer, Executive Officer

Certificate of Construction Issued _____, 19____

Water License Issued _____, 19____

HURON DRILLING INC. DRILLERS LOG

PAGE NO.

George Zastrow
JOB NAME.

S.W. 10-107-68 Buffalo Co.	LOCATION
----------------------------	----------

3/29/76
DATE

10
RIG NO.

Lloyd Peterson
FOREMAN Jr.

Jt No	DEPTH	TIME	Unit # 1	REMARKS	DESCRIPTION
1	20		0-2 Top Soil		
2	40		2-16 Gravel brownish		
3	60		16-20 Blue Clay		S... 10-107-68
4	80		20-40 Blue Clay		Buffalo County
5	100	TD	40-60 Blue Clay		
			60-65 Blue Clay		
			65-80 83 size to pea size gravel		
			80-96 Coarse Sand		
			96-100 Shale		
			Cased to 94 ft.		
			30 ft. Slotted 4" PVC		
			64 ft. Blank		
			Pumped 60		
			1500 # Concrete Sand		
			Waterhead 13 ft.		

27513

Dr. J. L. ...

12. Principal Features of the Proposed Water Supply System. (continued.)

D. Well Information or Estimates

- (1) Drill Hole, Diameter 28 Depth 94
- (2) Casing, Type Plastic Diameter 15½ Thickness .410
(wood, concrete, steel, etc.)
- (3) Perforated Screen
Type Plastic Diameter 15½ Length 94
- (4) Gravel Pack Thickness 6 Length of gravel pack 2½

E. Dugout Information or Estimates

- (1) Surface dimensions _____ Depth _____

F. Fill out for Either a Well or a Dugout. *Log will be furnished by driller.

- (1) Water Bearing Materials (Please attach a copy to test well log if available.)

Character of Water bearing materials _____

Depth to top of water bearing material 60 ft

Depth to bottom of water bearing material 96 ft

Thickness of water bearing material 36 ft

Depth to water (ground surface to water level) 14 ft

- (2) Distance to nearest existing household or livestock watering wells.

On same owner's property 80 rds. On property owned by others 400 rds.

G. Water Storage Dams.

If the proposed water use system contains one or more water storage dams, please show in the space below, the height, maximum water depth, surface area and storage capacity of each storage dam. The location of each water storage dam should be shown on the water right map.

Joene Zastrow
Signature of Applicant

Form 10.

No. 2751-3



NOTICE OF COMPLETION OF WORKS AND/OR
APPLICATION OF WATER TO BENEFICIAL USE

Post Office 2 James Valley

Date 2-22-77

TO: Water Rights Commission
Joe Foss Building
Pierre, South Dakota 57501

Dear Sirs:

This is to inform you that I have completed the construction of the water diversion system and/or that I have put the water to beneficial use to the maximum extent it is going to be used, not exceeding the amounts as specified in Water Right Permit No. 2751-3.

Water Right Permit No. 2751-3 states that the diversion system is to be constructed by July, 19 81 and that the water is to be put to beneficial use by July, 19 83.

The diversion system was completed on July, 19 76.
Applying the water to beneficial use was completed on July, 19 76.

You may schedule an inspection so that the Certificate of Construction and/or the Water License may be issued, thus completing my acquisition of a water right.

James Gustafson
(Signature)

Feb 22.



Water Rights Commission;

Sir:

When I rec'd the permit papers I fully intended to get them completed long before now. However, I did want to know some facts about the well before contacting you again. Then it slipped my mind!

The well at no time pulled down to the water bearing depth. And we checked every few days. At times it would remain at a constant level for days.

We were hoping some neighbor would get started to give some idea of the area of the water sources. Late in the fall we dug 5 test wells to the east of the present well and found water in each but only one the drilled figure would be good enough.

Dennis Gastrow
Gann Valley, S.D.

Form 6. - Notice of Intent to Appropriate Water

No. 2751-3

Publish first publication, on or before

July 8, 1976

NOTICE OF INTENT TO APPROPRIATE WATER

Pierre, South Dakota 57501

June 11, 1976

Notice is hereby given that Irene Zastrow
whose post office address is Gann Valley, South Dakota, has made an
application in accordance with the provisions of the water laws of South Dakota for
a permit to appropriate for beneficial use 2.0 cubic feet of water per
second of time from the ground water through the
Irene Zastrow Unit # 1, the point of diversion of which is to
be located in the _____

SW 1/4 SW 1/4

of Section 10, Twp. 107N, Range 68W. Said water to be used
for the purpose of providing irrigation on the following described land:
portions of

SW 1/4, Section 10, T107N, R68W

This application No. 2751-3 will be considered by the Water Rights
Commission at the Court House, at Winner, South Dakota
upon the 21st day of July, 1976 at 10:00 A.M. All
interested persons may appear and be heard.

WATER RIGHTS COMMISSION

By:

BURTON F. JONES, Water Rights Specialist

BFJ/bw
cc:

Irene Zastrow, Gann Valley, S.D. 57041

381 June 11, 1976

THE WESSINGTON SPRINGS INDEPENDENT

Affidavit of Publication

STATE OF SOUTH DAKOTA, COUNTY OF JERAULD, SS

A. L. Webb being first duly sworn, deposes and says: That he is a resident of the County of Jerauld and State of South Dakota; that THE WESSINGTON SPRINGS INDEPENDENT is a weekly newspaper of general circulation, printed and published in Wessington Springs, in said county and state by A. L. WEBB; and is now and has been such newspaper continuously, during all the times hereafter mentioned; that the affiant is, and was during all the times hereafter mentioned, the business manager of said newspaper, in charge of the advertising department thereof; and has personal knowledge of all the facts stated in this affidavit;

and that the notice and advertisement headed Notice of Intent to appropriate water a printed copy of which is hereunto attached and made a part hereof, was printed and published in said newspaper in two successive issues. That the first publication of said notice in said newspaper aforesaid was on Wednesday, the 16th day of June 19 76; and that the succeeding publications were: on Wednesday, the 23rd day of June 19 76 on Wednesday, the _____ day of _____ 19 _____ on Wednesday, the _____ day of _____ 19 _____ on Wednesday, the _____ day of _____ 19 _____ on Wednesday, the _____ day of _____ 19 _____ on Wednesday, the _____ day of _____ 19 _____ that the fee charged for the printing and publishing of said notice and advertise-

ment in said newspaper as aforesaid, was 8 Dollars and 97 Cents, and for this affidavit; twenty-five (25) cents, and that said fee for printing and publishing said notice and advertisement in said newspaper has been fully paid; that the full amount of fees charged for the publishing of the said attached and annexed notice and advertisement inures to the benefit of the publisher of the said WESSINGTON SPRINGS INDEPENDENT; that no agreement or understanding for the division thereof has been made with any person whomsoever; that the said news-

paper is a legal newspaper as provided by law

Subscribed and sworn to before me, this 16 day of June 19 76.

[Signature] Notary Public in and for
Jerauld County, South Dakota

NOTICE OF INTENT TO APPROPRIATE WATER

Pierre, South Dakota 57501

June 11, 1976

Notice is hereby given that Irene Zastrow whose post office address is Gann Valley, South Dakota, has made an application in accordance with the provisions of the water laws of South Dakota for a permit to appropriate for beneficial use 2.0 cubic feet of water per second of time from ground water through the Irene Zastrow Unit # 1, the point of diversion of which is to be located in the SW 1/4 SW 1/4 of section 10, Twp. 107N, Range 68W. Said water to be used for the purpose of providing irrigation on portions of the following described land: SW 1/4, Section 10, T107N, R68W.

This application No. 2751-3 will be considered by the Water Rights Commission at the Court House at Winner, South Dakota upon the 21st day of July, 1976 at 10:00 a.m. All interested persons may appear and be heard. —Water Rights Commission. By: —Burton F. Jones, Water Rights Specialist.

BFJ/bw

cc: Irene Zastrow, Gann Valley, S.D. 57311. c-2839

AFFIDAVIT EX-REL. PUBLICATIONS FEES

STATE OF SOUTH DAKOTA, COUNTY OF JERAULD, SS.

_____ being first duly sworn on his oath, says that he is one of the authorized attorneys of the _____

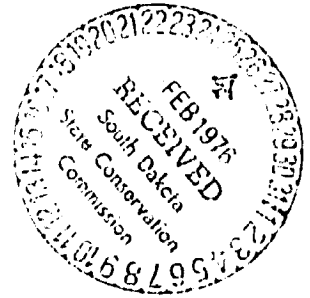
_____ In the action mentioned and described in the annexed notice; that the affiant directed the publication of the annexed notice, that no agreement or understanding for any division of the fees therefor has been made with any person whomsoever; and that no part thereof has been refunded or rebated by the party publishing said notice.

Subscribed and sworn to before me this _____ day of _____

19 _____

Notary Public, Jerauld County, South Dakota





February 24, 1976

Mr. George Zastrow
Gunn Valley, SD 57341

Dear Mr. Zastrow:

We have received the completed WI-1 form and the soils information, although not complete, will be adequate for the purposes of this interpretation. It appears that the soils are extremely permeable and very well drained to excessively drained. Under these circumstances, this water with a medium sodium content and high salinity, probably will be satisfactory. I would caution you, however, to keep the land primarily in forage crops and to irrigate with a sufficient amount of water to completely wet the whole soil profile each time you irrigate. Do not consciously, at least, strive for small, frequent applications of water. Since the water holding capacity of your soils might be different from place to place there is no way that you can ideally irrigate on all areas.

I am enclosing a copy of A&S publication #13 with some explanatory information on water and soil reactions with unfavorable irrigation waters. You may find it helpful in managing your irrigation operation.

A copy of the water analysis, and the application form, and this letter are being sent to the State Conservation Commission for their action.

Sincerely yours,

L. O. Fine

L. O. Fine
Water Quality Lab

LOF:ckb

Enclosures

cc: State Conservation Commission

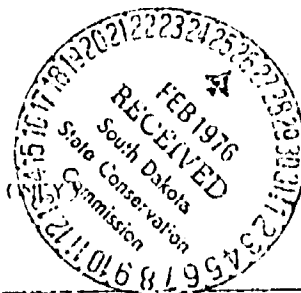
D. Pahl

Lawrence Carson, County Extension Agent



CONSERVATION
COMMISSION
FORM W1 #1

STATE CONSERVATION COMMISSION
SUPPORTING INFORMATION
FOR APPROPRIATION OF GROUND WATER IN ACCORDANCE
WITH SDCL 46-6-3 AS AMENDED
(THIS FORM REQUIRED FOR PROPOSED GROUND WATER IRRIGATION)



NAME George & Irene Zastrow
ADDRESS Bank Valley, S.D. 57341
COUNTY Buffalo

LEGAL DESCRIPTION

1. WELL LOCATION Div 5 Sec 10 Twp 107 Range 18
2. LOCATION OF AREA TO BE IRRIGATED Same

TYPE OF IRRIGATION

3. GRAVITY _____ TOWLINE _____ CENTER PIVOT ☒ GUN ☒
4. CROPS TO BE IRRIGATED Silage or alfalfa

WATER QUALITY

5. SAMPLE NUMBER 76-071
6. SALINITY (EC x 10⁶) 1453 (high)
7. SODIUM (SAR) 7.30 (medium)
8. RESIDUAL SODIUM CARBONATE (meq/l.) 0.80

I do hereby certify that a chemical analysis of the ground water representative of that used to irrigate shall be acquired from South Dakota State University and:
the soils information has been acquired from Soil Cons. Service Conservation District,
County Extension office or Soil Conservation Service.
and:
that the legal description for the location of the well and land to be irrigated is true
and correct.

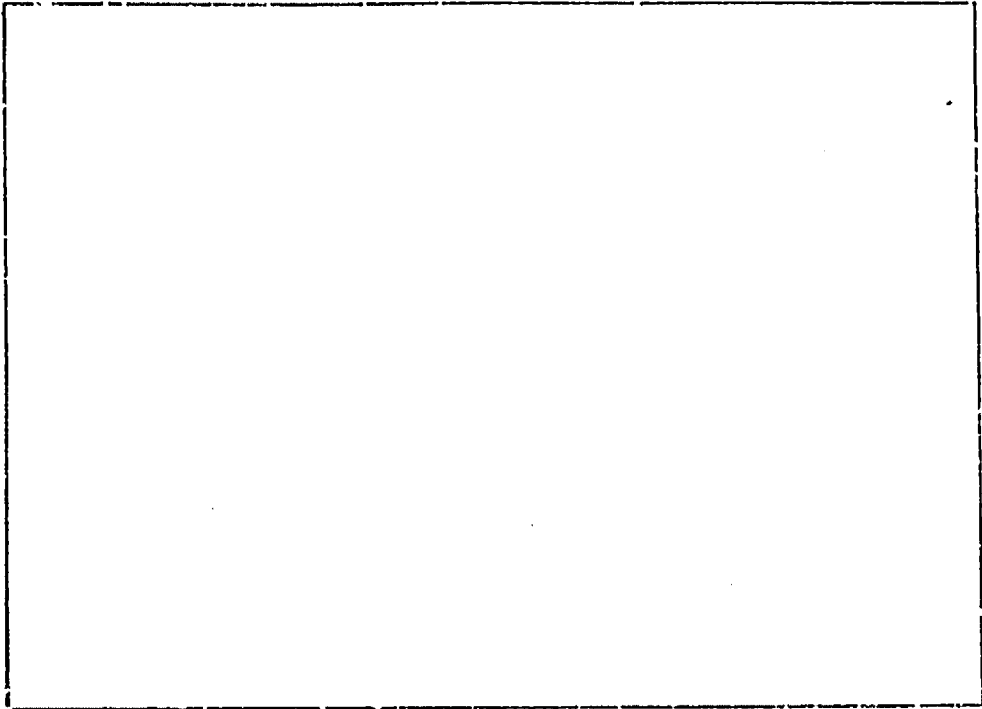
Irene Zastrow
APPLICANT'S SIGNATURE

SUBSCRIBED AND SWORN BEFORE ME THIS
20 DAY OF February 19 76.

Patricia A. Kelly - Notary Public Albert J. Hoff
(TITLE OR SEAL) APPROVED/NOTARY

(SOILS INFORMATION ON REVERSE SIDE)

MAP



NARRATIVE

Signed by Irene Zastrow half owner of land.
Necessary because George was not on hand at
the notary public's office. Notarized at SCS office
Chamberlain, S.D.

The maps on Buffalo County are very old
but to date it is all they have to offer.



REPORT OF ANALYSIS
 Water Quality Laboratory
 Water Resources Research Institute
 South Dakota State University
 Brookings, South Dakota 57006



Submitted by: George Zastrow
 Address: Gann Valley, SD 57341

Date Rec'd February 4, 1976
 Sample No. 76-071
 Identification _____

WATER ANALYSIS

Calcium (Ca)	82	ppm*	4.10	me/l**
Magnesium (Mg)	22	ppm	1.80	me/l
Sodium (Na)	288	ppm	12.53	me/l
Potassium (K)	22	ppm	0.59	me/l
Sulfate (SO ₄)	460	ppm	9.57	me/l
Nitrate (as N)		ppm		me/l
Chloride (Cl)	32	ppm	0.91	me/l
Bicarbonate (HCO ₃)	409	ppm	6.70	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)		ppm		me/l
Fluoride (F)		ppm		me/l
Hardness (EDTA as CaCO ₃)		ppm		g.p.g.***
Alkalinity (Methyl Orange)	335	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	1453	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	7.30			
Sodium	65.91	% of cations		
Residual sodium carbonate	0.30	me/l		
pH	7.74			
Others:				

*ppm=parts per million
 **me/l=millequivalents per liter
 ***g.p.g.=grains per gallon

COMMENTS: Total cations 19.01 me/l
 Total anions 17.18 me/l

Please fill in the enclosed questionnaire and return with your payment.

By: Shirley Mitten

Service Performed	Amount Due
Water analysis	2.00
	- 1.00 paid
	1.00 due

Make check payable to: Water Quality Laboratory

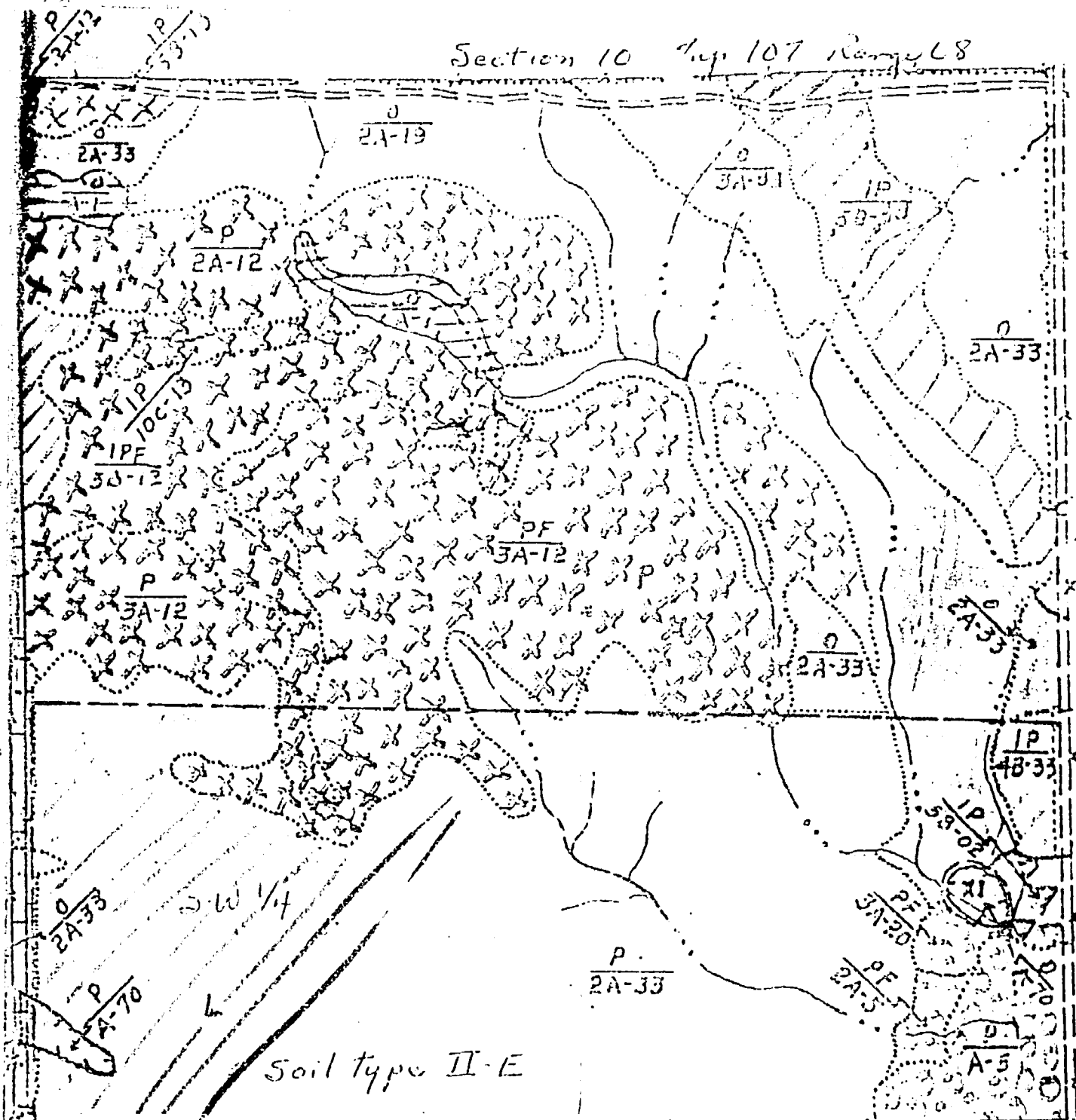
Cut along dotted line and return the lower portion with payment

Sample No. 76-071

Amount Enclosed \$ _____

Signed _____

Section 10 Twp. 107 Range 68



RANGE SITE DESCRIPTION
EAST CENTRAL SOUTH DAKOTA TECHNICAL GUIDE AREA
(Includes Land Resource Areas 55, 53, 66 and 63-8)

1. RANGE SITE NAME: SHALLOW TO GRAVEL

2. CLIMATE:

a) Precipitation averages 17 to 21 inches annually. Extreme variation in the amount of precipitation received must be anticipated. Most of the precipitation, approximately 80 percent, occurs during the period April through September. Snow cover is generally moderate. However, an occasional winter with four or five months of snow cover must be expected.

b) The average length of the growing season is 130 to 155 days. The last killing frost in spring occurs about April 30 in the south and May 15 in the north. The first killing frost in fall occurs about September 25 in the north and about October 5 in the south. Summer temperatures are very high during July and August and winter temperatures are very low.

3. TOPOGRAPHY:

Nearly level to sloping.

4. SOILS:

a) These are shallow soils underlain at depths of 10-20 inches by coarse sand or gravel. The surface soil may be a loam or sandy loam. Very little runoff occurs but moderately rapid to rapid permeability and low water holding capacity results in these soils being excessively drained and somewhat drouthy.

b) The significant soils in this site are:

Arvilla sandy loam
Delmont loam
Dix loam
Lehr loam
Renshaw loam

*These described
the land fairly
well.*

April 22, 1976

Mr. George Zastrow
Gann Valley, SD 57341



Dear Mr. & Mrs. Zastrow:

The water analysis on your sample submitted here March 31 has been completed. The original copy of the report of this analysis is enclosed for your keeping along with the receipt for payment. The analysis reveals that this water is very questionable indeed for irrigation purposes. The electrical conductivity of 1482 means that it is high in salinity and the sodium proportion of all salts is high, being about 74%, giving a sodium absorption ratio of 8.63. I would say this water would be satisfactory for use only if it is used on an occasional basis but not on a sustained basis. By this, I mean that if you use it more than once every growing season, you will notice a build-up in exchangeable sodium with a result that the soil will gradually become more and more difficult to manage and the structure will deteriorate to the point that eventually the infiltration rate of the soil will diminish and tillage will be difficult as well as the management of the crusting problems for emergence and germination of crops. For these reasons, I recommend that you do not proceed to develop this water supply. A further reinforcing reason for a negative recommendation on this water is the fact that it contains residual sodium carbonate to the extent of 3 milliequivalents/liter. We have not had very much experience in S.D. with waters of this nature and on soils that have moderately fine texture, so we cannot be positive about this, but we feel that there is very good reason to believe that a severe deterioration of the soil would occur within 6 to 8 years in using this kind of water.

Inasmuch as one cannot afford to develop the water supply and buy an irrigation system and only use it occasionally, this is the reason for a negative recommendation on this water sample. However, the final decision is not up to me to make, and I am sending your application materials, along with a copy of this letter and the soils and water information to the State Conservation Commission. You will be hearing from them directly as to their action.

Sincerely yours,

L. O. Fine

L. O. Fine
Water Quality Lab
LOT:ckb
Enclosures

cc>State Conservation Commission, D. Pahl, Delmar Moore, Huron Drilling

CONSERVATION
COMMISSION
FORM W1 #1

STATE CONSERVATION COMMISSION
SUPPORTING INFORMATION
FOR APPROPRIATION OF GROUND WATER IN ACCORDANCE
WITH SDCL 46-6-3 AS AMENDED
(THIS FORM REQUIRED FOR PROPOSED GROUND WATER IRRIGATION)



NAME Irene Zastrow

ADDRESS Gann Valley, South Dakota 57341

COUNTY Buffalo

LEGAL DESCRIPTION

1. WELL LOCATION: S.W. 1/4 of the S. 1/4 Sec. 10-107-68

2. LOCATION OF AREA TO BE IRRIGATED S.W. 10-107-68

TYPE OF IRRIGATION

3. GRAVITY _____ TOWLINE _____ CENTER PIVOT X GUN _____

4. CROPS TO BE IRRIGATED _____

WATER QUALITY

5. SAMPLE NUMBER 76-285

6. SALINITY (EC X 10⁶) 1482 - (high)

7. SODIUM (SAR) 8.63

8. RESIDUAL SODIUM CARBONATE (meq/l.) 3.01 me / L. 111

I do hereby certify that a chemical analysis of the ground water representative of that used to irrigate shall be acquired from South Dakota State University and:
the soils information has been acquired from Buffalo County Conservation District,
County Extension office or Soil Conservation Service.
and:
that the legal description for the location of the well and land to be irrigated is true
and correct.

Irene Zastrow
APPLICANT'S SIGNATURE

SUBSCRIBED AND SWORN BEFORE ME THIS
2 DAY OF May 19 76.

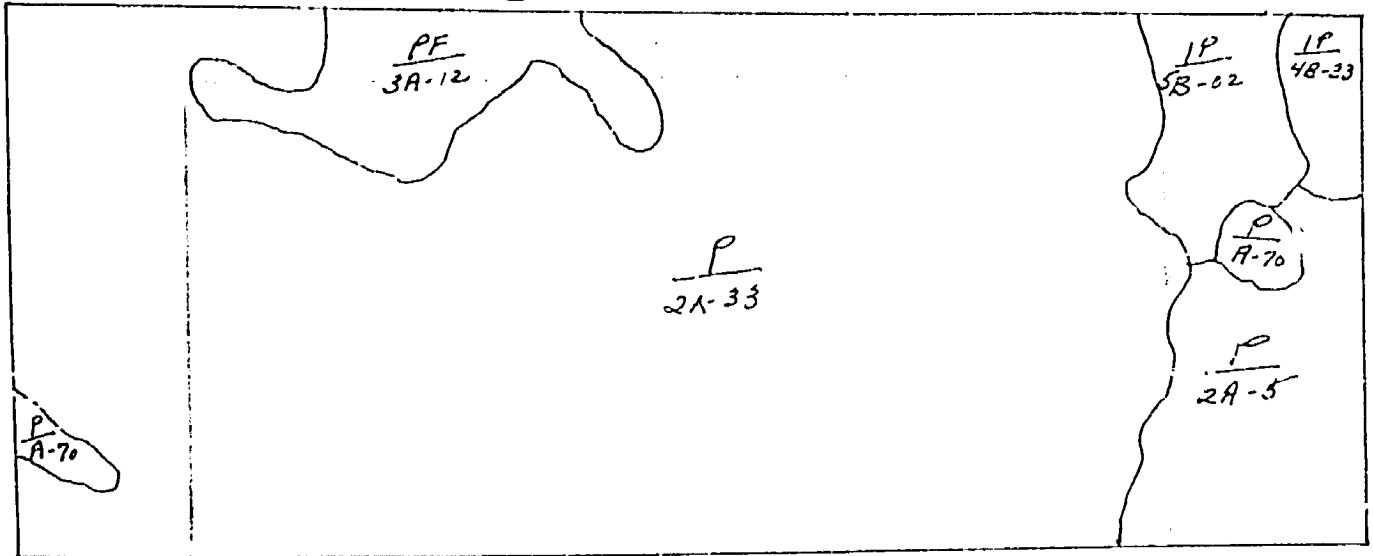
Karl-Heinz Hoyer
TITLE OR SEAL
COMMISSION EXPIRES
MARCH 4, 1984

Albert J. H. Bell
APPROVED/DISAPPROVED

(SOILS INFORMATION ON REVERSE SIDE)

George Zastrow

S-10-107-68



- $\frac{PF}{3A-12}$ - Very Shallow Soil - Shallow To Gravel - Very high infiltration rate
- $\frac{P}{A-70}$ - closed depression - slow infiltration rate
- $\frac{P}{2A-33}$ - Good Silty Soil - Good infiltration rate - Good irrigable soil - $\frac{IP}{4B-33}$ - same - more
- $\frac{IP}{5B-02}$ - Thin soil - Rapid infiltration rate -
- $\frac{P}{2A-5}$ - Silty Soil - Good infiltration rate.

NARRATIVE

REPORT OF ANALYSIS
 Water Quality Laboratory
 Water Resources Research Institute
 South Dakota State University
 Brookings, South Dakota 57006

Submitted by: George Zastrow Date Rec'd March 31, 1976
 Address Gann Valley, SD 57341 Sample No. 76-235
cc: Huron Drilling, Inc. Identification #1 well
P.O. Box 1422 SW 1/4, Sec. 10, T-107N, R-68W
Huron, SD 57350

WATER ANALYSIS

Calcium (Ca)	56	ppm*	2.90	me/l**
Magnesium (Mg)	13	ppm	1.07	me/l
Sodium (Na)	276	ppm	12.01	me/l
Potassium (K)	14	ppm	0.38	me/l
Sulfate (SO ₄)	390	ppm	8.11	me/l
Nitrate (as N)		ppm		me/l
Chloride (Cl)	30	ppm	0.34	me/l
Bicarbonate (HCO ₃)	420	ppm	6.88	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)		ppm		me/l
Fluoride (F)		ppm		me/l
Hardness (EDTA as CaCO ₃)		ppm		g.p.g.***
Alkalinity (Methyl Orange)	344	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	1482	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	8.63			
Sodium	73.86	% of cations		
Residual sodium carbonate	3.51	me/l		
pH	7.30			
Others:				

*ppm=parts per million

**me/l=millequivalents per liter

***g.p.g.=grains per gallon

COMMENTS: Total cations 16.26 me/l
 Total anions 15.83 me/l

By: Shirley Mitten

Service Performed	Amount Due
Irrigation analysis	\$8.00 PAID

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 76-235

Amount Enclosed \$

Signed

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

P. O. Box 287, Chamberlain, South Dakota 57325

April 5, 1976

Huron Drilling, Inc.
Box 1422
Huron, South Dakota 57350

Re: Soil Map for S4-10-107-68 - George Zastrow, Owner

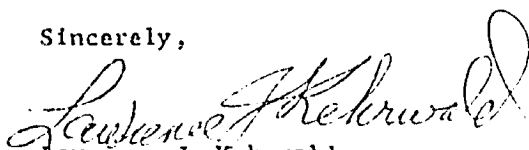
Gentlemen:

We do not have a very recent or a very detailed Soil Survey of this area. The survey we have was done thirty years ago for conservation planning use only. However, they do give a general picture of what the soils are.

The larger part of this half section appears very good for irrigation. Good infiltration rate and good underground drainage. Soils should, for the most part, have a good water holding capacity also.

If more detailed information is needed perhaps we may be able to arrange for a special Irrigation Feasibility Soil Survey.

Sincerely,


Lawrence J. Kehrwald
District Conservationist

Attach/



196.7

TRACT NO.

OPERATOR

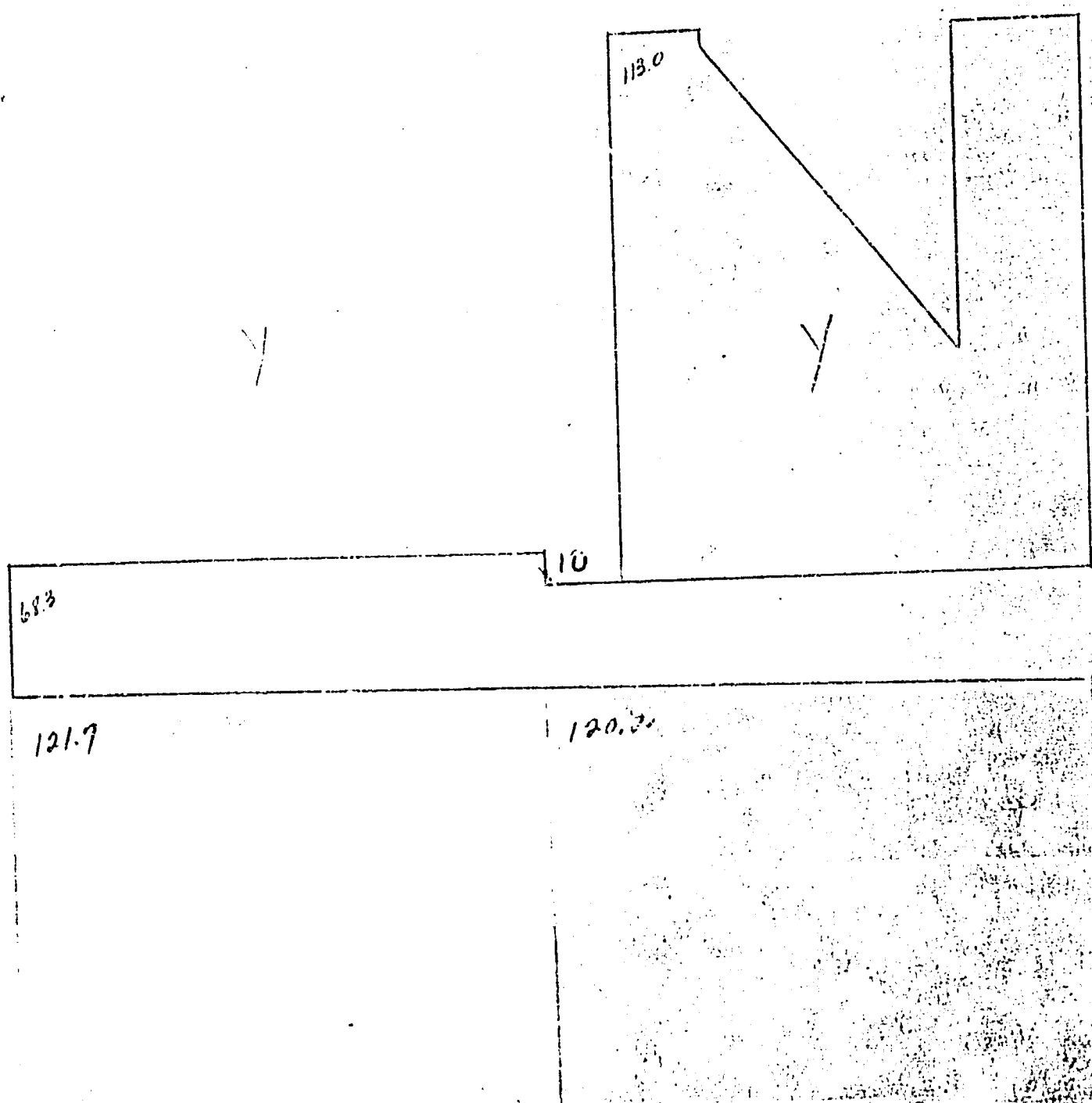
PHOTO NO.

OWNER

Farmland

Cropland

NCOP



Legal Description

Soil-water permits will be recorded by the Department of Agriculture, with the County Register of Deeds.

Zastrow Irrigation Management Plan

2 April, 1991

In 1977 my father and I initiated irrigation. At that time we were made aware of the possibilities for sodium and salinity problems by Dr. Larry Fine. Because the irrigation water that I use is of marginal quality, I understand the importance of the use of good management for the maintenance of productivity.

The irrigation water that I am using on the South 1/2 of section 10, T107, R68W has an SAR of between 8 and 20 depending upon the leaching fraction that is assumed. Recent Soil tests have shown ESP's within the surface soil of, from as low as 5 to as much as about 10. There are higher ESP's deeper within the soil profile.

The following are specific management practices, some of which I have used in the past and some are planned for the future. I am hopeful that these practices will assure the maintenance of productivity on the land in question.

1). Water management

In the past, because of a shortage of water, I have been applying as little as .5 to .75 inches of water per revolution. After considerable discussion with Gregg Carlson, it is clear that to assure adequate leaching (and to keep the SAR's of the water low) I need to apply at least 1.5 inches (if possible, without getting stuck or having excess runoff) of water each revolution. To do this I plan on only planting 1/2 of each of the 2 pivots or the south 1/2 of section 10 to corn, leaving the other 1/2 of each pivot in small grain. This will assure adequate water to facilitate relatively deep percolation within the root zone and the continued leaching of soil water through the root zone.

2). Tillage

The maintenance of high concentrations of organic matter at the soil surface is an important part of maintaining surface soil structure and reducing the sodium impact. There is evidence to suggest that tillage can break the transmitting macropore structure at the bottom of the plow layer, keeping soil water close to the surface and reducing the leaching fraction. No-till farming should eliminate water from being held within the plow layer. To forgo some of these problems, in 1989 I began no-till / ridge-till farming practices. I have a Haybuster drill and a modified John Deer planter. I plan to rotate small grain and corn, no-tilling the small grain into the corn stubble and no-tilling the corn into the small grain stubble. I will cultivate the corn one time with a ridge-till cultivator. The haybuster drill can plant into the slight ridges made by this rotation with little difficulty. On those fields that I grow corn, I will leave the corn stalks in the field every other year. Cattle traffic can act like tillage and exaggerate the sodium problem. I will try to avoid pasturing livestock on this land when the soil is too moist for tillage operations.

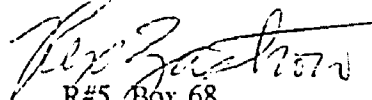
3). Manure

Manure is also an important part of my organic matter management plan. I have a Dual 800 manure spreader (540 ft³/load ~ 10 ton/load) that I use to spread manure with. It spreads a 6 row swath and I unload within about 1/2 the way across the field. I try to cover all irrigated lands every 4 years (38 inch/row * 6 rows * 1ft/12 inch * 1320 ft * 1acre/43560 ft) with about 10 ton/.57 acre which is about 17 ton/acre.

4). Future work

It is my intention to work with SDSU, and the Department of Agriculture to continue to monitor the problems that we have and to look at alternative solutions. Several years ago John Bischoff did some salinity research work to reduce the sodium problems that were occurring. Results indicate that Gypsum did an effective job of reducing the sodium problem. My crop consultant, Neal Boss, and I are discussing the use of a Calcium ammendment called Cal-Sol. If things work out, I will put out some Cal-Sol test strips this year to evaluate the effect. I would like to first try the practices mentioned above but it may be necessary to use amendments in the future. I plan to stay abreast of and to take advantage of any new breakthroughs in Sodium management that are developed in the future.

Rex Zastrow

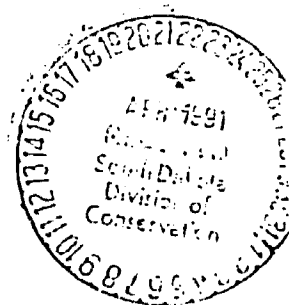


R#5, Box 68

Miller, South Dakota

57362

605-293-3237



Conversation or File Documentation

NAME OF PERSON OR FILE: Irene ZastrowADDRESS: HCR 5 Box 68 Miller, SD 57362 COUNTY BuffaloDATE: 10-19-92 TELEPHONE: _____RE: Well log for Water Permit No. 2751-3

COMMENTS:

Called Pullman Drilling for two well logs. One for Irene or Rev Zastrow in Buffalo Co. and the other one for Carpenter Cafe in Clark Co.

Mrs. Pullman found a log for Carpenter Cafe, but not the one for Zastrow.

I then called Huron Drilling for the Zastrow loc. Huron Drilling said that was the only well that they didn't drill for Rev Zastrow.

File in Permit or other file as necessary. Use to document conversations and what the other party was told; why action or decision was made.

NAME: Norma C. Tob

RECEIPT

413875

Division of Water Rights

South Dakota Department of Environment and Natural Resources

Pierre, August 30, 19 95

RECEIVED OF Susan Hoarty, HCR 5 Box 68, Miller, SD 57362

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 _____		
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 _____ Water Permit No. 2751-3		2.50
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	2.50

By John Hatchford
Chief Engineer

NOTICE OF TRANSFER OF OWNERSHIP

To: Chief Engineer
Water Rights Division, DENR
523 E. Capitol
Pierre, SD 57501-3181



No. 2751-3

Date: _____

I/We request that Water Permit No. 2751-3

formerly owned by: Irene Zastrow

be transferred to: (name & address) Rex Zastrow, HCR 5, Box 66, Miller SD 57362

(Telephone No)

Title to the following described land(s)/property has been transferred as described above:

SW 1/4 Section 10-T107N-R68W

I/We understand that the validity of Water Permit No. 2751-3 has not been determined by this transfer action. If I/We have any questions on validity, I/We understand that only the Water Management Board has the authority to determine if a water permit/right is valid (see note).

You are requested to file this "Notice of Transfer" in the appropriate file at the Division of Water Rights, as evidence of the change of ownership.

A fee of Two Dollars and Fifty Cents (\$2.50) is attached to cover the filing fees as required under SDCL 46-2-13.

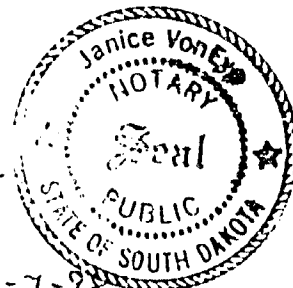
STATE OF SOUTH DAKOTA)
County of Buffalo)

I/We Rex Zastrow being first duly sworn on my oath depose and say that my relation to the above described undertaking is that of Owner, that I have read the above foregoing statement, and that I know of my own personal knowledge that the information herein stated is true.

Rex Zastrow
(Signed)

Subscribed and sworn to before me this 27 day of August, 19 93.

Janice VonEck
(Notary Public)



My Comm Exp 11-7-98

NOTE: Water permits may be cancelled for nonconstruction within the five year construction period. Once a water permit is developed and the water used, the permit becomes a right. A water right may be lost for three reasons:

1. Abandonment - no intent to use water and use is abandoned.
2. Forfeiture - no use of water for three year period without legal excuse.
3. For a third violation of a condition of a water permit/right.



2751-3

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

AUG 18 1994

2751A-3

Rex Zastrow
HCR 5, Box 68
Miller, SD 57362

Dear Mr. Zastrow:

Enclosed is Water License No. 2751A-3. This is the final water right document completing your process of obtaining a Water Right. Enclosed is Receipt No. 413979 in the amount of \$50.00 which you paid for the inspection and issuance of the Water License.

For your information SDCL 46-6-27 requires that if the owner of an existing well, such as the well authorized by Water Right No. 2751A-3, 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, the State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Division
(605) 773-3352

rd
enclosures

NOTE: The applicable portions of Water Permit No. 2751-3 have been incorporated into this Water License No. 2751A-3.

HURON DRILLING INC.
WELL LOCATION MAP

NAME Irene Zastrow

DATE April 2, 19 76

WELL NO. 1

S.W.

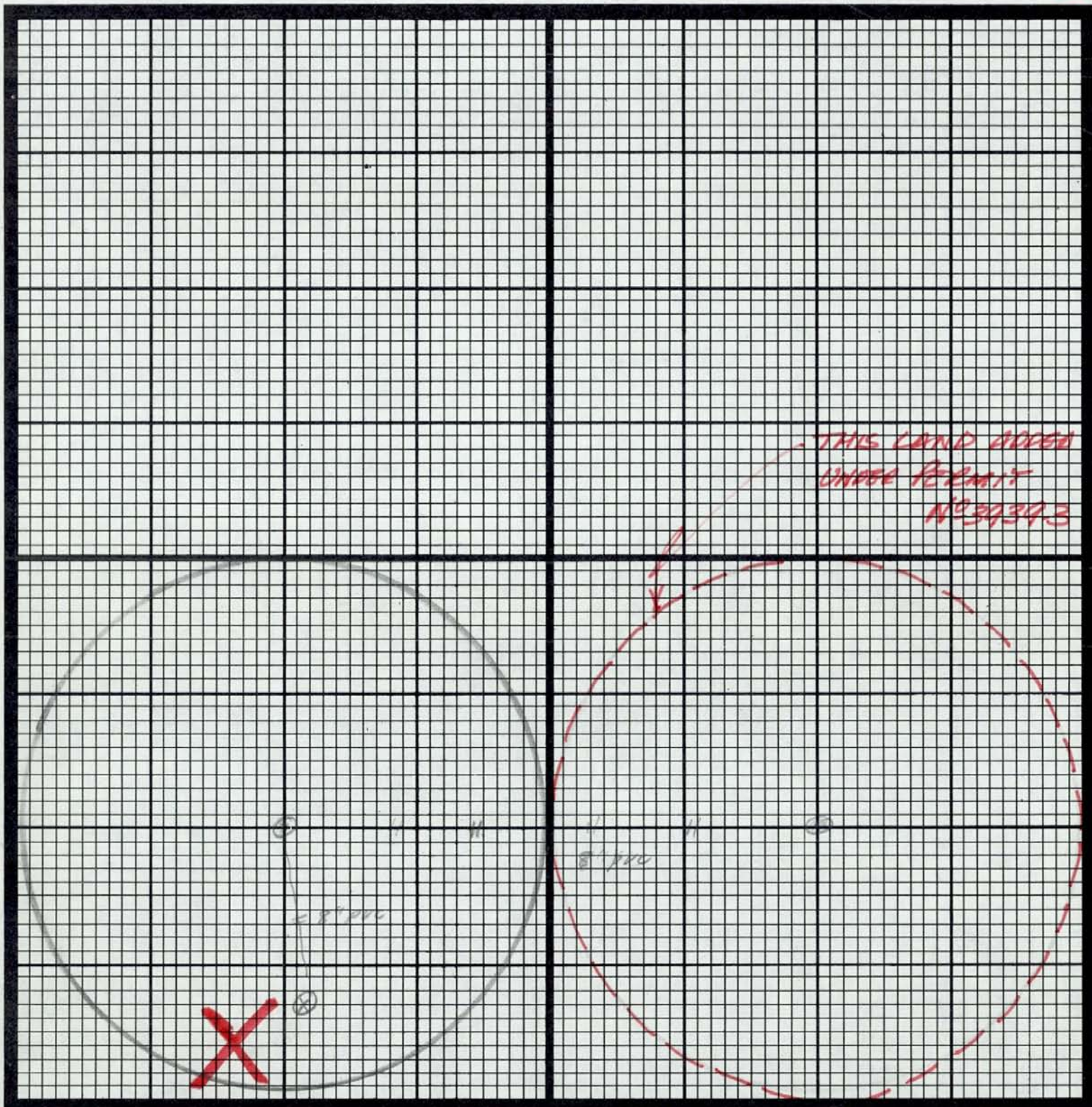
QUARTER, SECTION 10

TWP. 107 RANGE 68

IN

Buffalo

COUNTY



X — PROPOSED LOCATION

Prepared By Dick Fadgen
Dick Fadgen
Beadle County Extension Agent

NOT TO SCALE

