

1. Considered Sept. 13 19 78
2. Name of Applicant Elwin Vander Vorst
3. Post Office Address Mound City, S.D.
4. Amount of Water Claimed 2.55- ~~2.0 cfs~~ 2.7 cfs
5. Source of Water Supply 310' well
6. Water to be used for Irrigation
7. Acres to be Irrigated 320 maximum
acre feet
8. Water to be diverted and used in Campbell County
about 5 S, 3 miles east of Mound City
9. PROOF OF PUBLICATION Received 3-16-79

Not Received _____

APPLICATION

Approved 3-26-80Subject to WI & return of in questionNot Approved limit to 2.2 cfsAction deferred Sept 13, 1978

Priority

Date Received June 5, 1978 Application Complete yes _____ no _____ FEE 150⁰⁰Remarks additional diversion # 3803-3 and add'l cfsWATER
QUALITYDate information and/or
fee or corrected Application received _____
Period of Annual use _____Received yes July 13/78 no APPROVED/CONDITIONAL (Circle one)WI-1 Description same as application yes no Remarks _____

Disapproved _____

Returned _____

Diversion Point _____

SE¹ SW⁴ 10-125-76

Lands to be irrigated _____

SW⁴ and NE⁴10-125-76

Remarks _____

WELL
LOGDriller Harold Del Licensed yes noDepth 310' well

MAP 1517-3
Map No. 3519-3 Map located in Water Right X Map file _____
Type of Map Aerial Prepared by Co Agent

+++++

REVIEWED This Application was reviewed within 30 days of date received, accepted as complete, Number assigned and written up for advertisement before the Board on Sept 13, 1978. Billy W. Nelson
(Signed)

+++++

PROTESTS Letters/Petitions in File - yes _____ no _____ Remarks _____

REMARKS Date _____
F.F. & C Final Decision, including F.F. & C of Law were adopted _____
OF LAW, Date _____
FINAL Final Decision mailed to parties and/or parties notified that Final Decision
DECISIONS _____
ETC. was adopted _____
Remarks _____

No. 4310-3

Map No. 3519-3 Water Division No. 3 MISSOURI RIVER District
(Blanks to be Filled by the Engineer for the W. R. C.)

(3068-3)
(1517-3)

**ADDITIONAL DIVERSION
APPLICATION FOR PERMIT**



To Appropriate Water within the State of South Dakota

(NOTE-Draw a line through items not applicable)

1. Name of Applicant EDWIN DALE VANDER VORST
Postoffice address MOUND CITY, State S.D.
If a corporation show date and place of incorporation _____
2. Method of accomplishing work (contract, employment of others, or by direct labor) CONTRACT
3. Name of diversion work (ADDITION TO) VANDER VORST IRRIGATION UNIT #2
4. Amount of water claimed (cubic feet per second) 3.55 CFS 2.2 MAX. ALLOWABLE
5. Source of water supply IRRIGATION WELL
6. Location of point of diversion SE 1/4 OF SW 1/4 S. 10 T. 125 N, R 76 W

County CAMPBELL

7. Annual period or periods during which water is to be used MAY 1 - NOV. 1

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 320

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.
<u>ALL SW 1/4 - 10 - 125 - 76</u>	<u>160</u>		
<u>ALL NE 1/4 - 10 - 125 - 76</u>	<u>160</u>		

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 3 4 years.

11. Choice of newspaper for Notice of Intent to Appropriate Water publication POLLOCK PIONEER
PILLOCK, S.D. 57648

12. Principal Features of the Proposed Water Supply System.

A. Works proposed to divert water from its natural source

IRRIGATION WELL

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

IRRIGATION PIPE

C. Works proposed to apply water to beneficial use.

CENTER PIVOT

(Well only) 21,000.00
Estimated Total Cost \$

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

STATE OF SOUTH DAKOTA)

County of CAMPBELL) ss.

I, EDWIN D. VANDER VORST 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 Edwin D. Vander Vorst

Subscribed and sworn to before me this 1st day of JUNE 19 78

James Dale, Registrar of Deeds
Notary Public (or other qualified officer)

WATER RIGHT APPLICATION APPROVAL

The Water Rights Commission hereby approves Water Right Application No. 4310-3
EDWIN DALE VANDER VORSE MOUND CITY
 (Applicant) (Post Office Address)
SOUTH DAKOTA 57646 With the following modifications:
 (State)

The irrigation well approved under this Permit will be located near domestic wells and other irrigation 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 adequate domestic wells or in irrigation wells having prior water rights.

This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

THE IRRIGATION WELL APPROVED UNDER THIS PERMIT IS AUTHORIZED FOR 2.2 C.F.S. LANDS COVERED UNDER THIS PERMIT ARE ALSO COVERED UNDER PERMIT NO 3803-3.

Date of first receipt of application JUNE 5, 19 78
 Date of return to applicant for correction, amendments or changes required _____, 19 ____
 Date of receipt of corrected application _____, 19 ____
 Approved MARCH 26, 19 80, Recorded in Book 21 Page 138

WATER RIGHT PERMIT NO. 4310-3

The Water Rights Commission hereby grants and issues this Water Right Permit No. 4310-3 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 applicant may claim right is JUNE 5, 19 78
2. The equivalent of at least one-fifth of the work above specified is to be completed on or before SEPTEMBER 26, 19 82
3. The whole of said work is to be completed on or before MARCH 26, 19 85
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is MARCH 26, 19 89
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 2.2 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 MARCH 26, 19 89; said water to be used during the following described annual period: MAY 1ST to NOVEMBER 1ST

Witness my hand this 31ST day of MARCH, 19 80

WATER RIGHTS COMMISSION

By:

John H. Hartz
 Chief Engineer, Executive Officer

Certificate of Construction Issued _____, 19 ____

Water License Issued _____, 19 ____

HURON DRILLING INC. DRILLERS LOG

Mound City, South Dak.

PAGE NO.

Dale Vander Vorsta

SW 10-125-76-Campbell

5/23/78

19

David

JOB NAME

LOCATION Co.

DATE

RIG NO.

Foreman

Jl No	DEPTH	TIME	REMARKS
1	0-20		0-5 Top soil sandy
			5-15 Yellow clay
			15-20 Dark sand, water loss
2	20-35		20-30 Dark sand, water loss
			30-35 Soft blue clay
3	35-50		Soft blue clay
4	50-65		Blue clay, rock @ 61'
5	65-80		Blue clay
6	80-95		Blue clay
7	95-110		Blue clay
8	110-125		Blue clay
9	125-140		Blue clay
10	140-155		Blue clay
11	155-170		Blue clay
12	170-185		Blue clay
13	185-200		Blue clay
14	200-215		Blue clay, several streaks of gravel and sand-water loss, coal
15	215-230		Good sand, gravel, coal, some blue clay
16	230-250		230-233 Sand, gravel, coal-water loss
			233-250 Blue clay
17	250-270		Blue clay, few streaks sand, gravel, rock @ 269'
18	270-290		270-273 Blue clay
			273-290 Sand, gravel coal, Water loss
19	290-310		290-295 Sand gravel-water loss coal
			295-305 Slate
	TD 310		305-310 Shale
			Cased to 278 Ft.
			Pumped 100 GPM
			Waterhead 51' Pumped with air @ 140'

Mound City, South Dakota

WELL REPORT

Campbell County

HURON
DRILLING CO.
Huron, S. D.

Dale Vander Vorsta

S.W. -X-10-125-76

May 27, 1978

OWNER

DESCRIPTION

DATE

CASING LOG

Depth 278 ft.
 Flows 278 ft. 4" Sch. 40 Plastic pipe to 275 ft.
 Pumps 100 gpm ft. pipe to ft.
 Head 51 ft. ft. pipe to ft.
 80 Ft. Slotted & bottom ft. pipe to ft.
 Perforations ft. pipe to ft.

Pressure

3 days

Drilling Time

REMARKS

1 - 5" Drag Bit 1 - Used 7 7/8" Bit

Rig No. 19

2 bags of bentonite

David Mendel

DM

Foreman

1/2 bag of revert

Form 2A - Wells, Dugouts or Water Storage Dams (Supplement to form 2)

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

D. Well Information or Estimates

- (1) Drill Hole, Diameter 27", Depth 310'
- (2) Casing, Type STEEL Diameter 15" Thickness APPROX. 1/4"
(wood, concrete, steel, etc)
- (3) Perforated Screen. (Two)
Type STAINLESS STEEL, Diameter 1.5", Length 50'
- (4) Gravel Pack. Thickness 6", Length of gravel pack 310'

E. Dugout Information or Estimates.

- (1) Surface dimensions _____, Depth _____

F. Fill out for Either a Well or a Dugout.

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

Character of Water bearing materials _____
SEE ATTACHED WELL LOG

Depth to top of water bearing material _____

Depth to bottom of water bearing material _____

Thickness of water bearing material _____

Depth to water (ground surface to water level) _____

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

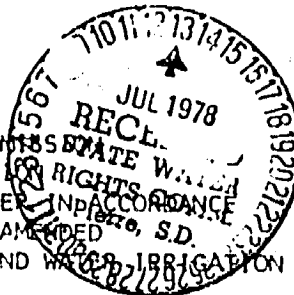
On same owner's property 150 rds. On property owned by others 240 rds.

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.

Steven R. Vander Voort
Signature of Applicant

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



NAME EDWIN DALE VANDER VORSTE
ADDRESS MOUND CITY, S.D.
COUNTY CAMPBELL

LEGAL DESCRIPTION

1. WELL LOCATION SE 1/4 OF SW 1/4 S. 10, T. 125, 76 W
2. LOCATION OF AREA TO BE IRRIGATED NE 1/4 + SW 1/4 S. 10, 125, 76 W

TYPE OF IRRIGATION

3. GRAVITY _____ TOWLINE _____ CENTER PIVOT X GUN _____
4. CROPS TO BE IRRIGATED CORN, ALFALFA

WATER QUALITY

5. SAMPLE NUMBER 110112131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100
6. SALINITY (EC x 10⁶) 994
7. SODIUM (SAR) 2.23 (prime - factor) 5.73, adjusted for bicarbonate
8. RESIDUAL SODIUM CARBONATE (meq/l.) 0

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 _____ 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.

Edwin Dale Vander Vorste
APPLICANT'S SIGNATURE

SUBSCRIBED AND SWORN BEFORE ME THIS
2 DAY OF JUNE 19 78.

Kenneth L. Register
(TITLE OR SEAL)

Albert J. Hoff
APPROVED/RECORDED

(SOILS INFORMATION ON REVERSE SIDE)

REPORT OF ANALYSIS
 Water Quality Laboratory
 Water Resources Research Institute
 South Dakota State University
 Brookings, South Dakota 57007

Submitted by: Dale Vander Vorst
 Address: Round City, SD 57646
Co: Huron Filling, Inc.
P.O. Box 1422
Huron, SD 57350

Date Rec'd: June 2, 1978
 Sample No. 78-423
 Identification Cell-295
SW, Sec. 10, T 125N, R 76W

WATER ANALYSIS

Calcium (Ca)	120	ppm*	6.00	me/l**
Magnesium (Mg)	48	ppm	3.94	me/l
Sodium (Na)	107	ppm	4.65	me/l
Potassium (K)	12	ppm	0.31	me/l
Sulfate (SO ₄)	159	ppm	3.30	me/l
Nitrate (as N)		ppm	0.13	me/l
Chloride (Cl)	4	ppm	8.56	me/l
Bicarbonate (HCO ₃)	522	ppm		me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)		ppm		me/l
Fluoride (F)		ppm		g.p.g.***
Hardness (EDTA as CaCO ₃)	428	ppm (as CaCO ₃)		
Alkalinity (Methyl Orange)	0	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	994	micromhos per cm at 25° C.		
Electrical Conductivity	2.09	adjusted 5.73		
Sodium Adsorption Ratio	31.21	% of cations		
Sodium	6.00	me/l		
Residual sodium carbonate	1.57			
pH				
Others:				

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

COMMENTS: Total cations 14.90 me/l
 Total anions 11.90 me/l

By: Shirley Kitten

Service Performed	Amount Due
Irrigation analysis	\$15.00

Make checks payable to: Water Quality Laboratory

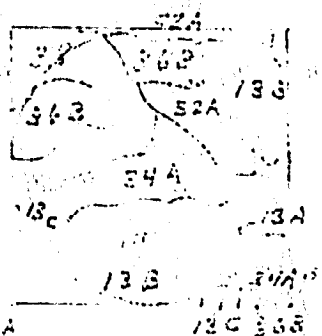
Cut along dotted line and return the lower portion with payment

Sample No. 78-423

Amount Enclosed \$

Signed

Herreid, Field Office
Edwin Dale Vander Vorste
NE 4 cor. SW 1 10-125-76



Map Symbol	Hopping Unit Name	Score	Capability Unit	Intake
1 A	Bentley's team	0-3	III C3	0.5
12 A	Bentley's team	0-3	III C7	1.5
13 B	Bentley's team	2-6	III C8	1.5
14 C	Bentley's team	6-9	IV C8	1.5
27 B	Bentley's team	0-6	IV C7	2.0
34 A	Bentley's team	0-2	III S2	1.0
35 B	Bentley's team	0-6	IV C6	2.0
52 A	Bentley's team	0-3	IV C1	2.0
57 B	Bentley's team	2-6	II C2	0.2
28	Bentley's team	1-1	IV W4	1.0

BEST IMAGE POSSIBLE FROM POOR ORIGINAL

(4-11-70)

Plain Soil under Forest

12. Lowville loam IIc3
Deep, loamy, well to moderately well drained soils in upland areas that receive beneficial moisture. However, moisture is still inadequate in most years.
- 13A. Tally fine sand loam IIc67
Deep and moderately deep, moderately sandy soils on nearly level (0 to 1%) uplands. They have a severe wind erosion hazard.
- 13V. Tally fine sandy loam IIc66
Deep and moderately deep, moderately sandy soils on gently undulating (2 to 6%) uplands and eroded areas of these soils on nearly level (0 to 1%) uplands. They have a severe wind erosion hazard.
- 13S. Tally fine sandy loam IVe8
Deep and moderately deep, moderately sandy soils on undulating or sloping (6 to 9%) uplands, and eroded soils on gently undulating or gently sloping (2 to 6%) uplands. These soils have severe wind and moderate water erosion hazards.
- 37E. Haddock loam, fine sand IVe7 IIc61
Deep, loamy, well to moderately well drained soils on undulating (6 to 9%) uplands. They have a severe wind erosion hazard and moderate water erosion hazard. They have a severe wind erosion hazard.
- 38A. Lowville loam IIc67
Soils with 60 to 80 inches of loam material over sand and gravel on nearly level (0 to 1%) uplands. The porous subsoil limits rooting and water storage capacity. These soils have a moderate wind erosion hazard.
- 38E. Lestr-Loam loam IIc66 VIc81
Soils with 4 to 16 inches of loam material over sand and gravel on nearly level (0 to 1%) uplands. The porous subsoil limits rooting and water storage capacity. These soils are not suited for cultivation.
- 52A. Lestr loam IIc62
Soils with 3 to 6 inches of loam material over sand and gravel on nearly level (0 to 1%) uplands. The porous subsoil limits rooting and water storage capacity. These soils have a moderate wind erosion hazard.
- 57E. Middlesex loam IIc64
Deep, loamy soils on gently undulating (2 to 6%) uplands. They have a severe wind and water erosion hazard.
58. Carroll silt loam IIc64
Very to moderately deep and to very shallow loamy silt loam soils in the uplands. These soils are eroded or have water tables at or near the surface. More than 50 percent of the area is eroded or has a water table at or near the surface.

SOUTH DAKOTA DEPARTMENT OF AGRICULTURE
DIVISION OF CONSERVATION

(RECOMMENDED MANAGEMENT)

NAME OF APPLICANT Edwin Dale VanderVorste, Mound City, SD

RECOMMENDED MANAGEMENT:

1. Water should not be applied more than 1, 2, 3, 4, 5. times during the irrigation season. NA
 2. Each uninterrupted application (one rotation of center pivot) should be of at least 1, 2, 3, 4, inches of water. NA
 3. ☒ Yes ☐ No Surface drainage suggested - on any area that tends to pond water from either natural precipitation or irrigation.
 4. ☐ Yes ☐ No Subsurface drainage suggested
 5. ☒ Yes ☐ No Specific land areas that ~~xxxxxx~~ need special management: Parnell silty clay loam (38) in NW 1/4 NE 1/4 Section 10 has a slow intake rate in comparison to your other lands, which are predominately sandy.
- Without management, these depressional soils will become unproductive to normal field crops.
6. ☒ Deep tillage (For the purpose of aiding movement of water through dense subsoils) See below (soils 38) (1A) and (57B)
 7. ☐ Heavy fall application of irrigation water

Most of your soils have a fast intake rate and will need frequent irrigations. The same rate and frequency of irrigation applications on your clayey soils will cause excessive wetness and/or ponding.

You may use the swing system back and forth against your NW 1/4 NE 1/4 Section 10 area or travel across without watering.

It may be feasible to surface grade or drain the 38 soil as the topography map indicates relief to the west. You would want to weigh those considerations in return for crop production from this area. The soils map indicates there are approximately 20 acres under the pivot in the NW 1/4 NE 1/4 Section 10. Another method of increasing the intake rate on your heavy soil is occasional deep shank tillage or ripping. The extent of such tillage as to depth, spacing, and frequency will be dictated by your experience. Generally, after harvest, is a good time for such operations.

Copy to Applicant - 1
Copies to Water Rights - 2
Copy to File - 1

Publish first publication, on or before August 18, 1978

NOTICE OF HEARING ON
APPLICATION TO APPROPRIATE WATER

Pierre, South Dakota 57501

August 7, 1978

Notice is hereby given that Edwin Dale Vander Vorst whose post office address is Mound City, South Dakota, has made an application in accordance with the provisions of SDCL 46-1-1 thru 46-1-8; 46-2-9 thru 46-2-11, 46-2-13; 46-5-1 thru 46-5-8, 46-5-10 thru 46-5-22, 46-5-41, 46-6-3, 46-6-5, 46-6-6.1, 46-6-10, 46-6-14 and Commission Rules ARSD 52:01:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use 3.55 cubic feet of water per second of time from ground water (one well) through the Vander Vorst Irrigation Unit #2, ~~xxx~~/point of diversion of which is to be located in the SE $\frac{1}{4}$ SW $\frac{1}{4}$

of Section 10, Twp. 125N Range 76W. Said water to be used for the purpose of providing irrigation on portions of the following described land:

SW $\frac{1}{4}$ and NE $\frac{1}{4}$ Section 10, T125N, R76W

This Application No. 4310-3 will be considered by the Water Rights Commission at the 4-H Fairground Meeting Hall, West Mitchell, SD, on Aug 16 upon the 13th day of September, 1978 at 10 A.M. The Commission is authorized to make a determination on this application at the hearing. All interested persons may appear and be heard. Any person who may be affected by a Commission decision who desires to present evidence or cross-examine witnesses according to SDCL 1-26 may notify the Commission in writing prior to the hearing or orally at the hearing.

NOTE: The final proof of publication must be received before the hearing date for the Commission to take action.

WATER RIGHTS COMMISSION

BETTY WESTLUND
Water Rights Specialist I

cc: Edwin Dale Vander Vorst, Mound City, SD 57646

No. 14310-3

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County Campbell) ss.

I, James E. Mackay hereby

certify that the annexed printed copy of Notice of Intent to Appropriate
Water was taken from the Pellock Pioneer

A newspaper which during the whole time of publication of said notice
herein after stated, has been and is printed and published in the

Town of Pellock

County of Campbell and State of South Dakota;
that the said notice was published in said newspaper on the following
two dates:

August 17, 1978

August 24, 1978

James E. Mackay
(Signature)

Publisher
(Title)

March 15, 1979
(Date Signed)

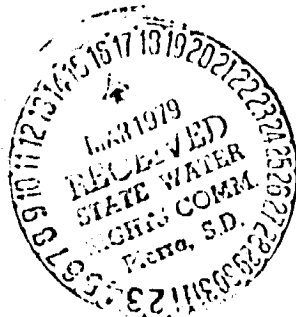
NOTICE OF HEARING
ON APPLICATION TO
APPROPRIATE WATER
Pierre, South Dakota 57501
August 7, 1978

Notice is hereby given that Edwin Dale Vander Vorst, whose post office address is Mound City, South Dakota, has made an application in accordance with the provisions of SDCL 46-1-1 thru 46-1-8; 46-2-9 thru 46-2-11, 46-2-13; 46-5-1 thru 46-5-8, 46-5-10 thru 46-5-22, 46-5-41, 46-6-3, 46-6-5, 46-6-6.1, 46-6-10, 46-6-14 and Commission Rules ARSD 52:01:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use 3.55 cubic feet of water per second of time from "ground water (one well) through the Vander Vorst Irrigation Unit #2, for an additional point of diversion of which is to be located in the SE 1/4 SW 1/4 of Section 10, Twp. 125N Range 76W, said water to be used for the purpose of providing irrigation on portions of the following described land: SW 1/4 and NE 1/4 Section 10, T125N, R76W.

This Application No. 4310-3 will be considered by the Water Rights Commission at the 4-H Fairground Meeting Hall, West on Hwy. 16, Mitchell, SD, upon the 13th day of September, 1978 at 10 A.M. The Commission is authorized to make a determination on this application at the hearing. All interested persons may appear and be heard. Any person who may be affected by a Commission decision who desires to present evidence or cross-examine witnesses according to SDCL 1-26 may notify the Commission in writing prior to the hearing or orally at the hearing.

WATER RIGHTS COMMISSION

By: Betty Westlund
2:8.4 Water Rights Specialist 1



RECEIPT

WATER RIGHTS COMMISSION

State of South Dakota

No 4 6459

PIERRE, June 5, 1978, 19____
FUND 290

RECEIVED OF Edwin Vander Voorst, Mound City SD
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit to Appropriate Water No. 4310-3 (examination, processing, recording and filing) -----	150	00
Fee for Inspecting Construction, and issuing Cert. of Construction No.-----		
Fee for Inspecting Beneficial Use, and issuing Water License No.-----		
Fee for issuing Location Certificate-Dry Draw, No.-----		
Fee for filing -----		
Fee for certified copy of -----		
Fee for Print copy of map -----		
Fee for Certifying -----		
Fee for ----- (any other work as provided by law)		
TOTAL	150	00

WATER RIGHTS COMMISSION

By John Hatch
Chief Engineer, Executive Officer
JOHN HATCH kjw

**South Dakota Department of
Water & Natural Resources**
Joe Foss Building Water Rights, Water Management Division
Pierre, South Dakota 57501 (605) 773-3352

March 12, 1980

TO: Persons Interested in Campbell County Deferred Applications
FROM: John Hatch, Chief Engineer, Water Rights
SUBJECT: Reconsideration of Deferred Applications

The Water Management Board will reconsider deferred water right applications in Campbell County at 2:00 p.m. on March 26, 1980 at the SDEA Auditorium, 411 East Capitol, Pierre SD.

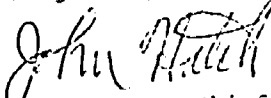
This reconsideration hearing will be conducted in accordance with the provisions of SDCL 46-1-1 thru 46-1-9; 46-1-14; 46-2-9 thru 46-2-11; 46-2-13; 46-5-1 thru 46-5-8; 46-5-10 thru 46-5-22; 46-5-41; 46-6-3; 46-6-5; 46-6-6.1; 46-6-10; 46-6-3.1; 46-6-14 and Board Rules ARSD 52:01:01:01 thru 52:01:01:13.

These applications were previously deferred by the Water Rights Commission, pending staff investigation.

After reconsideration of the deferred applications the Board can approve, conditionally approve, defer, or deny all or part of the Application.

This hearing is an adversary proceeding. Any person has the right to be present or to be represented by a lawyer. Those and other due process rights will be forfeited if they are not exercised at the hearing. Decisions of the Board may be appealed to the Courts as provided by law.

Very truly yours,



JOHN HATCH, Chief Engineer
Water Rights, WMD

JH:kw

Equal Opportunity Employer

REPORT ON DEFERRED APPLICATIONS IN CAMPBELL COUNTY DEEP-GLACIAL AQUIFER

March 10, 1980

A county ground water study was conducted in the middle and late 1960's to determine the geology and water resources of Campbell County. The water resources portion of the study was supervised by Neil Koch, U.S. Geological Survey and was published as S.D. Geological Survey Bulletin 20. Koch defines three major glacial aquifers (Spring Creek, Selby and Deep-glacial). The applications discussed within this report are for proposed diversions from the deep-glacial aquifer (see page 4).

Deep-glacial Aquifer

The deep-glacial aquifer underlies approximately 20% of Campbell County, has an average thickness of 100 feet and contains an estimated 2.5 million acre-feet of water in transient storage.

The recharge to the aquifer under existing conditions is from vertical leakage from the shallower aquifers and by inflow from McPherson County.

The discharge from the aquifer is mainly through outflow to the Missouri River and by withdrawals for domestic and irrigation use (see page 4).

Evapotranspiration is not an important consideration due to the depth of the aquifer below ground level. As the Oahe reservoir filled during the 1960's the water level in the aquifer rose between 10 and 20 feet in the Mound City area. The water level elevation in the reservoir is such that if the aquifer was pumped down, the hydraulic gradient of the water would reverse and recharge would come from the Missouri River (page 5).

A problem with an aquifer of this type is the spacing of high production wells to limit the amount of interference between wells. To predict the amount of drawdown the data collected by Koch (1970), Hedges (1970) and Water Rights was incorporated into an aquifer simulation model developed by the U.S. Geological Survey (reference: Book 7 Chapter C1 Finite-Difference Model for Aquifer Simulation in Two Dimensions with Results of Numerical Experiments by Trescott, Pinder and Larson).

The model simulates pumping wells, inflow, and predicts the drawdown within the study area. For this report a 130 square mile area of the county was considered. The presently approved permits were pumped at their authorized withdrawal rate for 30 days on a continuous basis. The deferred applications were then plugged into the model one at a time so that effects of the additional drawdowns could be calculated. Applications No. 4080-3 and 4310-3 were simulated at 2.0 cfs each (realistic value for high production wells in this area). The results of the model are in the following tables.

TABLE 1 RESULTS DEEP-GLACIAL AQUIFER SIMULATION

Permit Number	Diversion Rate (cfs)	Drawdown in Feet									Comments
		Number of Wells									
		9	15	16	17	18	19	20	(cfs)	20	
3684-3	3.0	66	90	90	92	92	92	92		92	Approved
4144-3	0.22	48	71	71	79	79	79	79		79	Permits
3170-3	2.0	90	96	104	104	106	120	135		120	Developed

From a water availability and well spacing standpoint the applications can be approved. There will be problems for prior permit holders who do not have their pumps into the aquifer. As the head declines the pumps will have to be lowered and additional power costs will be encountered due to the increased lift.

An estimate of the additional electrical energy cost due to 30 feet of additional lift is as follows:

Pumping rate = 900 gpm (2.0 cfs)
 Cost of electrical energy = \$0.04/kw-hr
 Wire to water efficiency = 50 percent
 Present head = 90 feet
 $\$ \text{ per month} = 1.38 \times 10^{-4} Q, h \text{ t/E}_0$
 $= \frac{1.38 \times 10^{-4} (900 \text{ gpm}) (90 \text{ ft}) (744 \text{ hrs})}{50} \$0.04/\text{kw hr.}$
 $= \$906.37$
 Additional 30 feet
 $\$ \text{ per month} = \frac{1.38 \times 10^{-4} (900) (110) (744 \text{ hrs})}{50} \$0.04/\text{kw hr.}$
 $= \$1107.79$

The above calculations were based on formulas presented in the March 1979 issue of Water Well Journal.

CONCLUSIONS

1. Unappropriated water is available. If all permits pump at authorized withdrawal rates for 90 days, less than 1/10 of 1% of the estimated water in storage would be utilized.
2. Additional costs will be encountered due to increased lifts and in some cases replacement of pumps and motors will be necessary.
3. Observation wells are installed to monitor water level fluctuations (see pages 5-10 for water levels).

RECOMMENDATIONS

1. Application No. 3993-3, Donald M. Grad be approved for 3.2 cfs.
2. Application No. 4012-3, Ernest & Lenore Fjeldheim be denied due to applicants letter stating that if application is approved applicant would not develop the permit.
3. Application No. 4080-3, Marvin Volske be approved for 2.1 cfs.
4. Application No. 4310-3, Edwin Dale VanderVorst be approved for 3.55 cfs.
5. Application No. 4448-3, John L. Kapfer be approved for 4.57 cfs.

GALE N. SELKEN
 Hydrologist III

RESULTS DEEP-GLACIAL AQUIFER SIMULATION (cont.)

RESULTS DEEP-GLACIAL AQUIFER SIMULATION (CONT.)											
Permit Number	Diversion Rate (cfs)	Drawdown in Feet									Comments
		Number of Wells									
		9	15	16	17	18	19	20	(cfs)	20	
3881-3	2.0	111	117	122	122	124	133	146		135	Approved Permits Developed
3368-3	2.0	64	71	78	78	80	92	110		95	
2119-3	2.1	50	57	66	67	69	80	95		82	
3882-3	2.0	102	107	112	112	113	122	135		124	
3367-3	2.0	65	71	79	79	80	92	112		95	
1990-3	2.0	55	61	69	69	71	81	98		84	
3684-3	3.0		84	84	87	87	87	87		87	Approved Permits Not Developed
3684-3	3.0		85	85	89	89	89	99		89	
3684-3	3.0		104	104	109	109	109	109		109	
2355-3	1.95		100	102	102	102	105	118		105	
3879-3	2.0		42	46	46	50	53	56	11	53	
2225-3	2.0		45	53	53	56	63	72		63	
3993-3	3.2			70	70	72	83	94		83	Deferred Appli.
4012-3	2.0				145	145	145	145		145	
4080-3	2.1					35	38	41		38	
4310-3	3.55						94	109	2.0	87	
4448-3	4.57							133	2.0	96	

TABLE 2

Permit Number	Drawdown (feet) Authorized Permits	Additional Drawdown If All Permits Approved (feet)	Static Water Level (feet)	Depth to Aquifer (feet)	Pumping Level All Permits Operating
3684-3	90	2	62	220	154
4114-3	71	8			
3170-3	96	39	50	265	185
3881-3	117	29	37	260	183
3368-3	71	39	50	220	160
2119-3	57	38	50	220	145
3882-3	107	28	30	260	165
3367-3	71	41	50	235	162
1990-3	61	37	50	235	148
3684-3	84	3			
3684-3	85	4			
3684-3	104	5			
2355-3	100	3		220	
3879-3	42	14	65	250	121
2225-3	45	27			
3993-3			20	263	
4012-3			65	250	
4080-3			51	273	
4310-3					
4448-3					

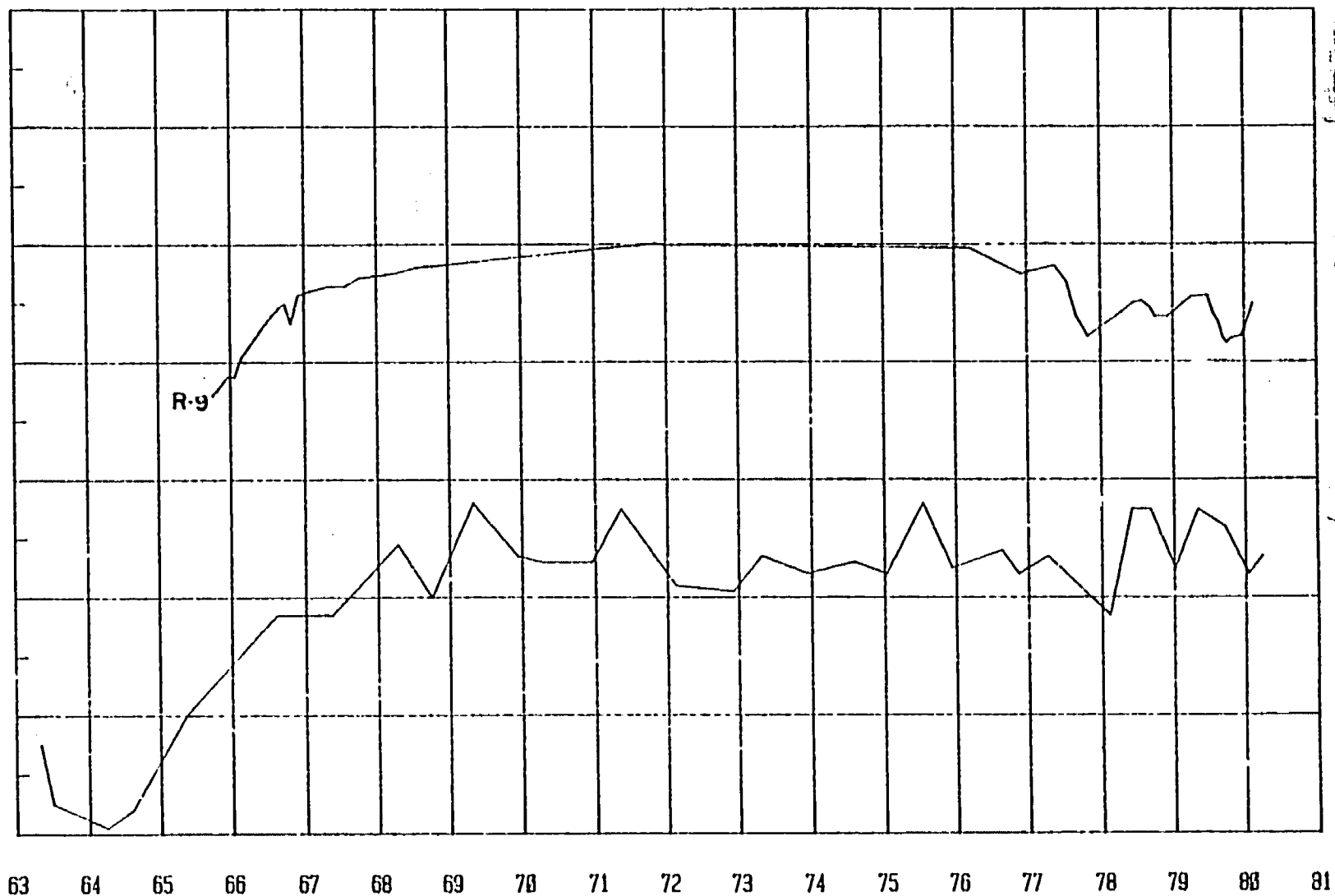
Table 1 shows the drawdown (feet) within each well which could be expected from a 60% efficient well.

Table 2 shows that in all cases the pumping water level would still be above the top of the aquifer. This means that all permits (if their wells are 60% efficient) would still be withdrawing water from head pressure and not dewatering the aquifer.

WATER LEVELS IN WELL AND OAHÉ RESERVOIR

CAMPBELL COUNTY WELL R-9

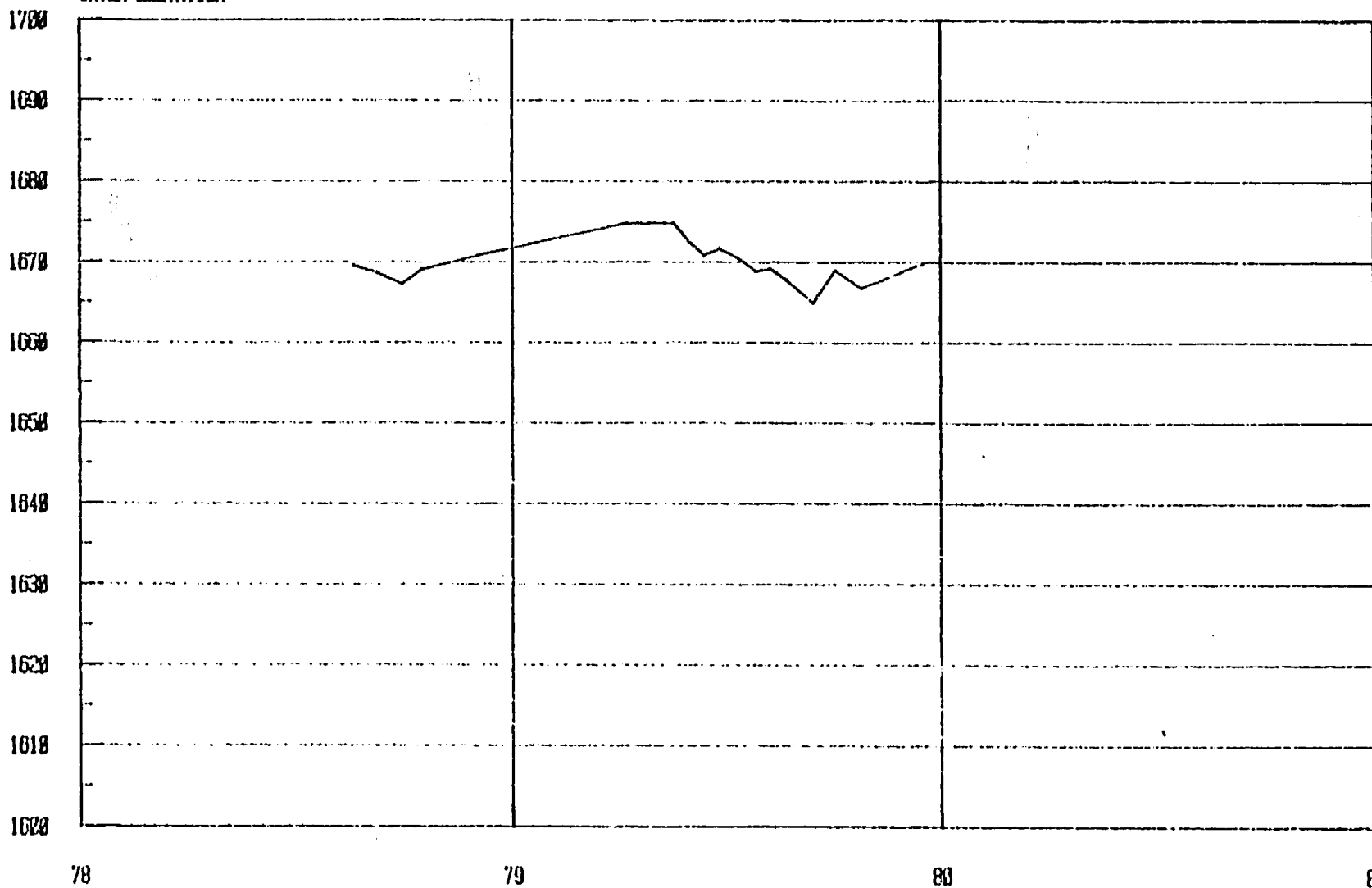
WATER ELEVATION



CAMPBELL COUNTY OBSERVATION WELLS

DEEP-GLACIAL WELL CA70-E

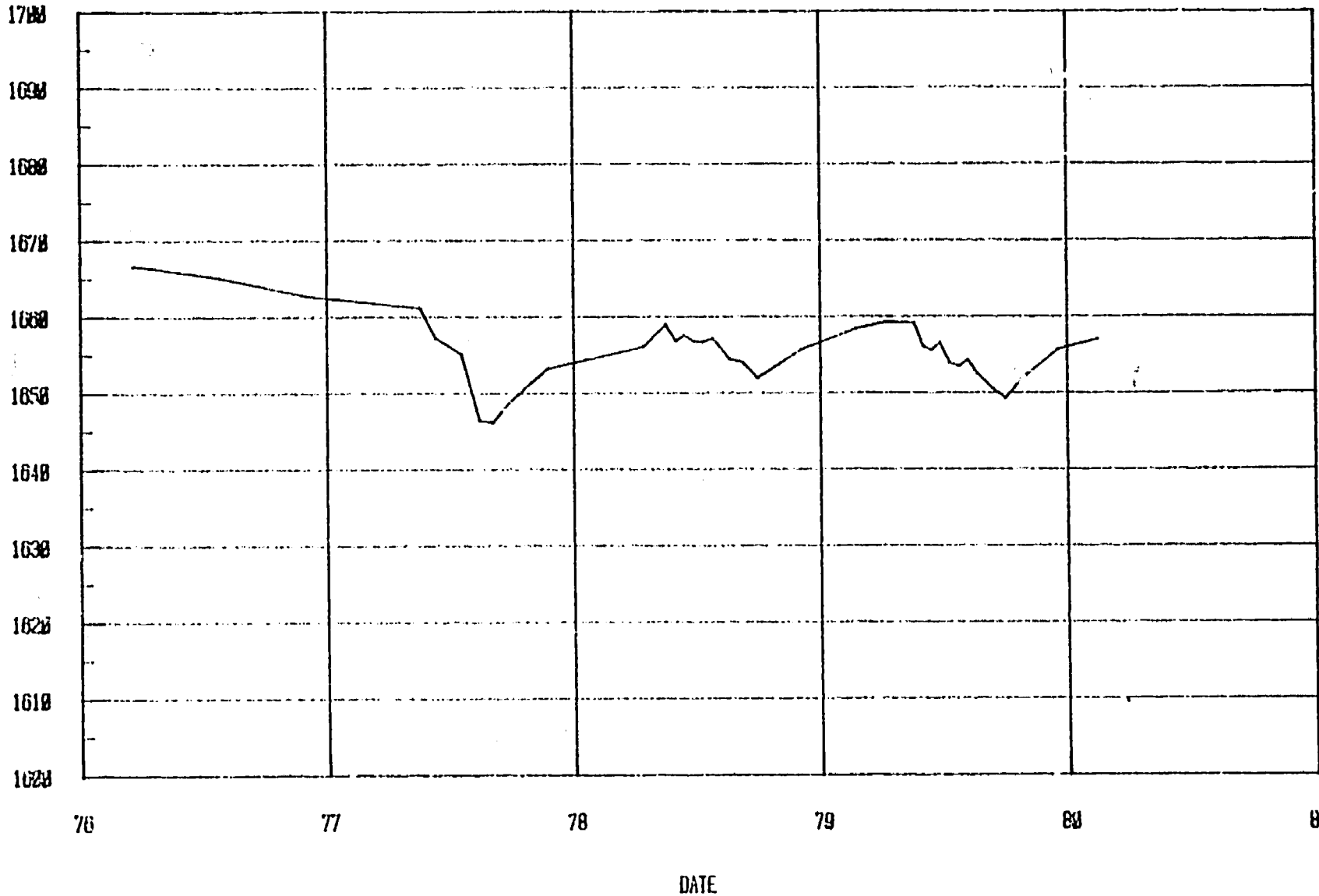
WATER ELEVATION



CAMPBELL COUNTY OBSERVATION WELLS

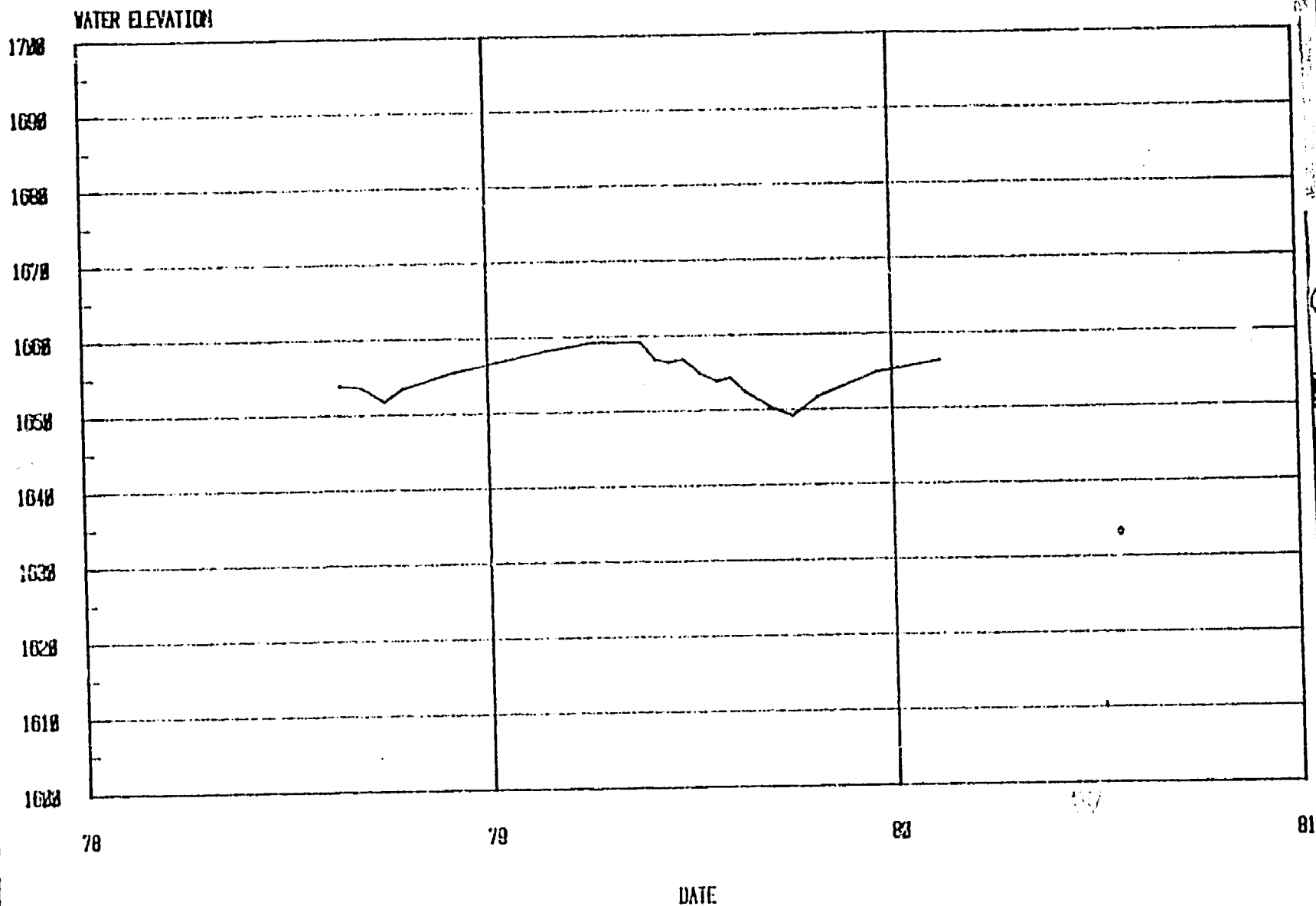
DEEP-GLACIAL WELL R-83

WATER ELEVATION



CAMPBELL COUNTY OBSERVATION WELLS

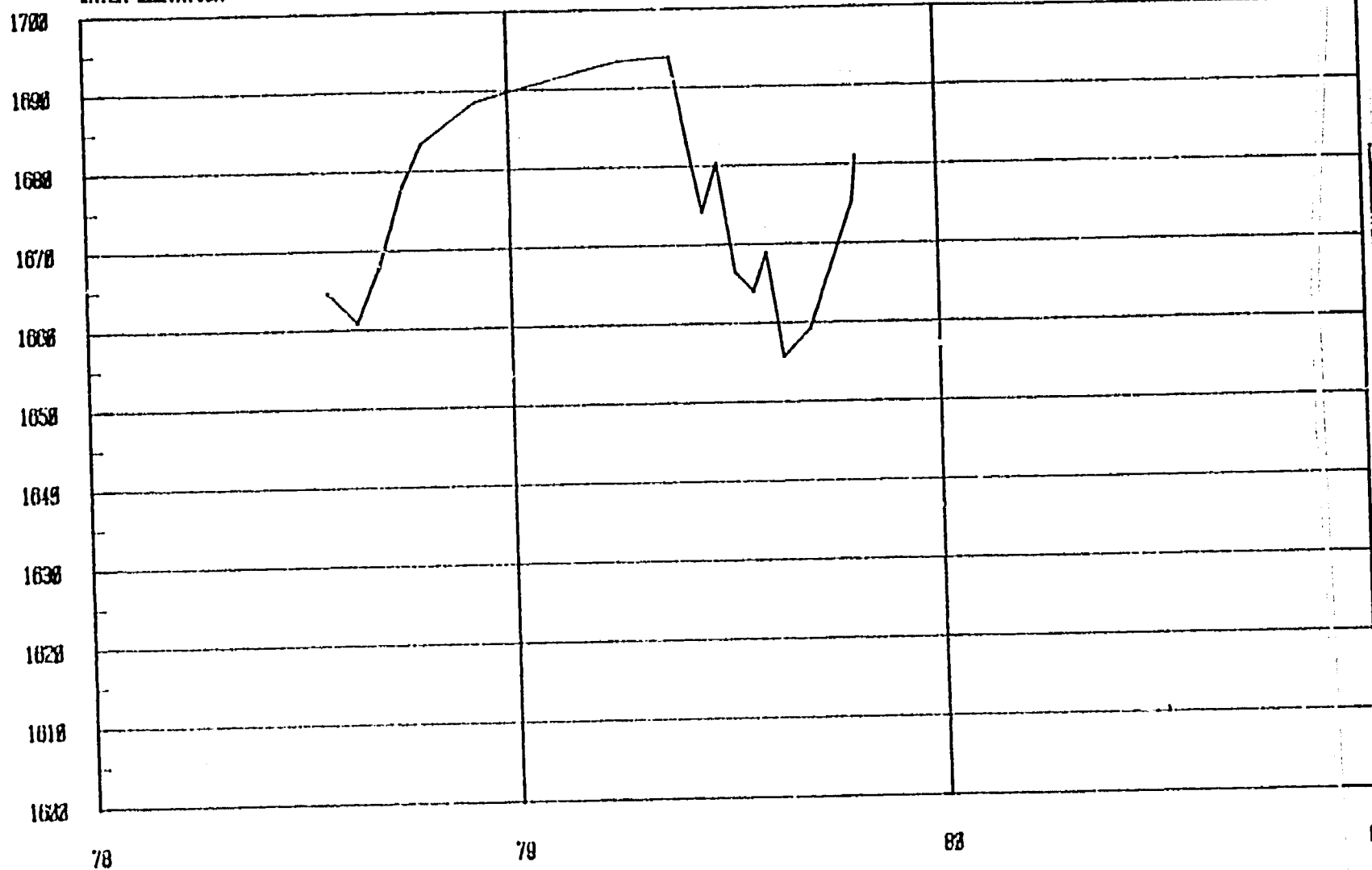
DEEP-GLACIAL WELL CA70-B



CAMPBELL COUNTY OBSERVATION WELLS

DEEP-GLACIAL WELL CA78-1

WATER ELEVATION



REPRODUCTION

REDUCTION

25-7

WELL NO.

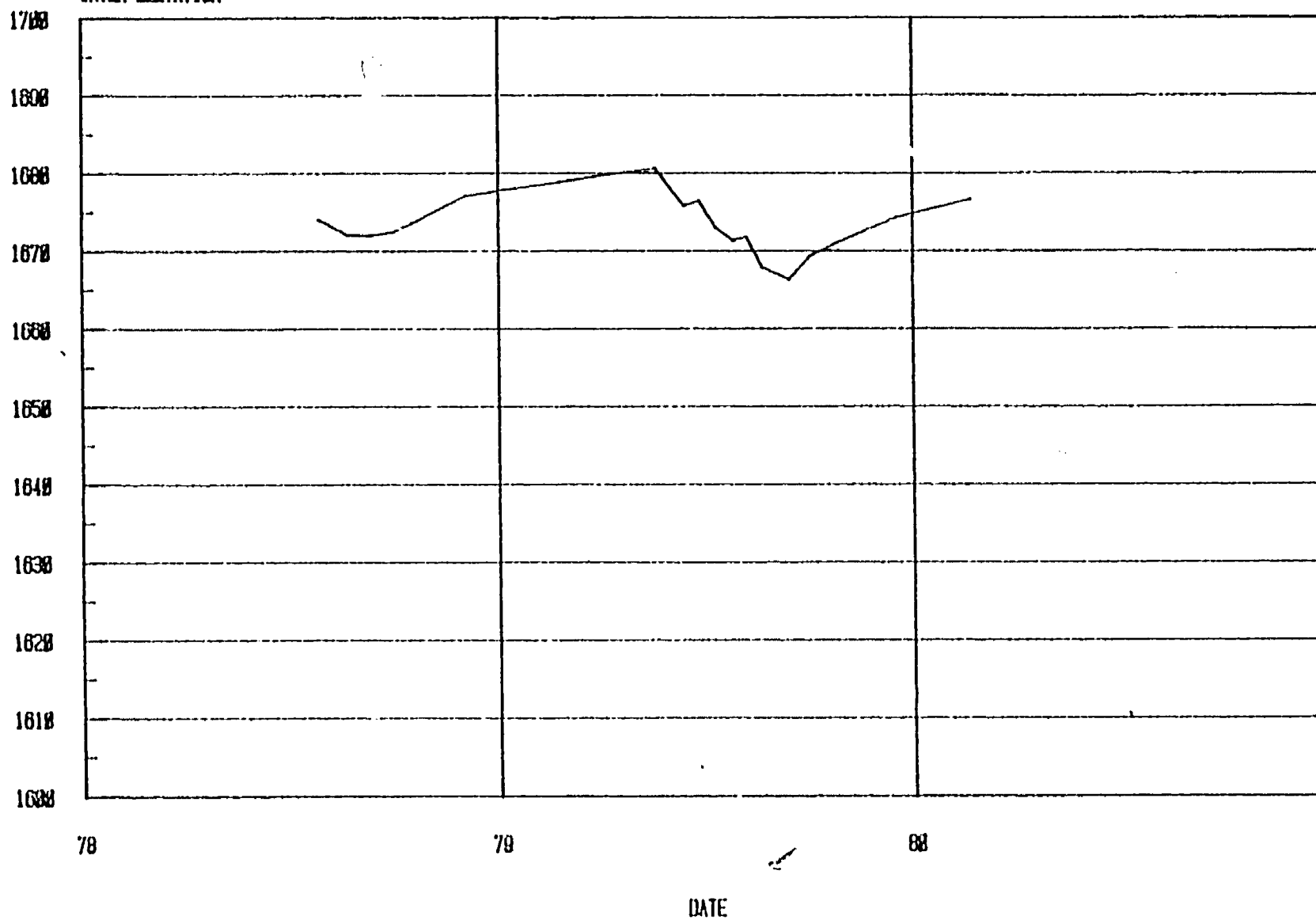
DATE

81

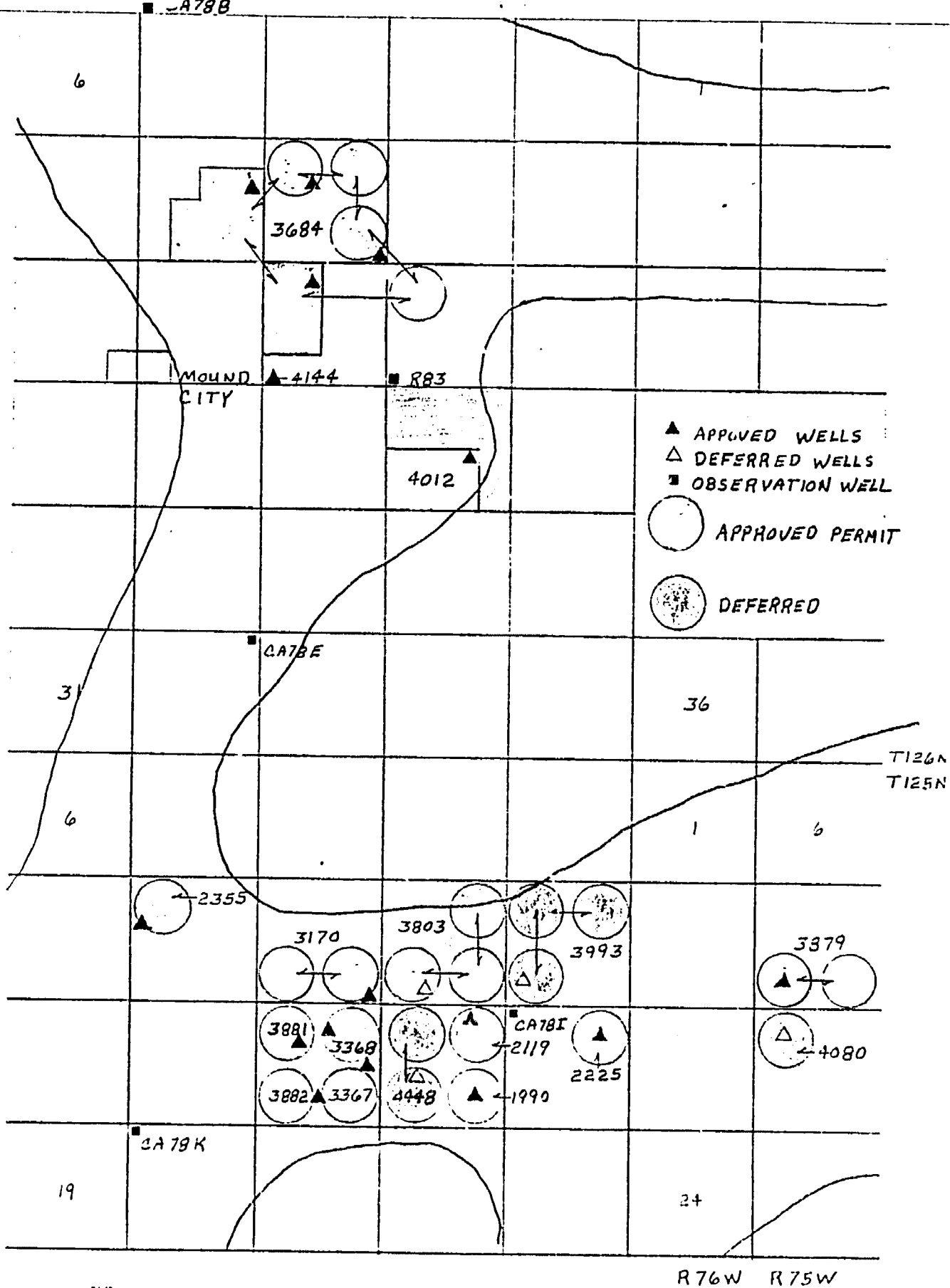
CAMPBELL COUNTY OBSERVATION WELLS

DEEP-GLACIAL WELL CA78-K

WATER ELEVATION

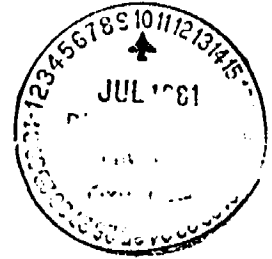


CAMPBELL COUNTY DEEP-ACIAL AQUIFER



Form 10.

No. _____



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

Post Office Mound City, SD
Date June 25 1981

TO: Water Rights [REDACTED]
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. _____.

Water Right Permit No. 4310-3 states that the diversion system is to be constructed by _____, 19____ and that the water is to be put to beneficial use by _____, 19____.

The diversion system was completed on June 15, 1981.
Applying the water to beneficial use was completed on June 20, 1981.

Water being applied to North 1/4 of Sec 10 125-76 under this permit.
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.

[Signature]
(Signature)



Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

March 23, 1987

EDWIN DALE VANDERVORST
BOX 70
MOUND CITY, SD 57646

NOTICE

Re: Violation of Water Permit(s). 4310-3, 4705-3 and 1986
Irrigation
Questionnaire Requirements.

Our records indicate that the 1986 Irrigation Questionnaire has not been submitted for Permit No(s). 4310-3, 4705-3. The request for the questionnaire was dated November 3, 1986. The Water Management Board has directed that owners of water permits who have not submitted 1986 Irrigation Questionnaires be given notice of permit violation and of hearing(s) before the Board. The hearing(s) will be held to determine action to be taken by the Board for violation of Water Permit No(s). 4310-3, 4705-3 qualification:

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

The hearing will also be to determine if Permit No(s). 2119-3 and 3803-3 should be amended with the qualification to require the Questionnaire to be submitted each year.

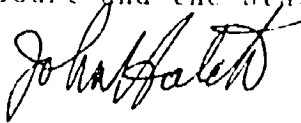
The hearing(s) will be at 2:00 pm, May 6, 1987, in Room 216, Joe Foss Building, 523 E Capitol, Pierre SD.

The hearing(s) will be conducted pursuant to the provisions of SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11, and 46-2-17. These are contested case hearings pursuant to procedures contained in SDCL 1-26.

Following the hearings(s), the Water Management Board can:

1. Suspend Permit No(s). 4310-3, 4705-3 until either the 1986 Questionnaire is submitted or for the period of up to one year;
2. Amend Permit No(s). 2119-3 and 3803-3 to require the Irrigation Water Use Questionnaire to be submitted each year;
3. Postpone any action;
4. Take no action.

The hearing(s) 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.

A handwritten signature in cursive script, appearing to read "John Hatch", written in dark ink.

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

NOTE: If the questionnaire(s) are received in this office before the hearing date, you will no longer be in violation of your permit(s) and your name will be deleted from the agenda pertaining to these hearings.

SOUTH DAKOTA
Department of
Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

April 24, 1987

2119-3
3803-3
4310-3
4705-3

Edwin Dale Vander Vorst
Box 70
Mound City, SD 57646

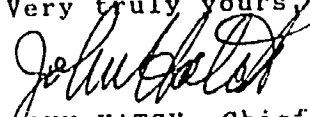
Dear Mr. Vander Vorst:

This will acknowledge receipt of and thank you for the return of your 1986 Irrigation Questionnaires. A notice was sent to you March 23, 1987 regarding the Irrigation Questionnaire submittal violation of Water Permit Nos. 2119-3, 3803-3, 4310-3 and 4705-3 and the date hearings were to be held before the Water Management Board to determine any action to be taken concerning the violation.

Please disregard the notice sent to you dated March 23, 1987. Your name has been deleted from the agenda pertaining to these hearings.

If you have any questions, please contact us.

Very truly yours,



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



Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181
January 29, 1988

EDWIN DALE VANDERVORST
BOX 70
MOUND CITY, SD 57646

NOTICE

Re: Violation of Water Permit No(s). 4310-3, 4705-3 and 1987
Irrigation Questionnaire Requirements

Our records indicate that the 1987 Irrigation Questionnaire has not been submitted for Permit No(s). 4310-3, 4705-3. The request for the questionnaire was dated October 8, 1987. The Water Management Board has directed that owners of water permits who have not submitted 1987 Irrigation Questionnaires be given notice of permit violation and of hearing(s) before the Board. The hearing(s) will be held to determine action to be taken by the Board for violation of Water Permit No(s). 4310-3, 4705-3 qualification:

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

The hearing will also be to determine if Permit No(s) 3803-3, 2119-3 should be amended with the qualification to require the Questionnaire to be submitted each year.

The hearing(s) will be at 9:00 am, March 2, 1988, in Room 216, Joe Foss Building, 523 E Capitol, Pierre, South Dakota.

The hearing(s) will be conducted pursuant to the provisions of SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11, and 46-2-17. These are contested case hearings pursuant to procedures contained in SDCL 1-26.

Following the hearing(s), the Water Management Board can:

1. Suspend Permit No(s). 4310-3, 4705-3 until either the 1987 Questionnaire is submitted or for the period of up to one year;
2. Amend Permit No(s) 3803-3, 2119-3 also held by EDWIN DALE VANDERVORST to require the Irrigation Water Use Questionnaire to be submitted each year;
3. Postpone any action;
4. Take no action.

The hearing(s) 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.

Sincerely,

A handwritten signature in cursive script, appearing to read "John Hatch", with a long horizontal flourish extending to the right.

John Hatch, Chief Engineer
Water Rights Division

Note: If the questionnaire(s) are received in this office before the March 2 hearing date, you will no longer be in violation of your permit(s) and your name will be deleted from the agenda pertaining to these hearings.

 **Department of
Water & Natural Resources**

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

February 10, 1988

2119-3
3803-3
4310-3
4705-3

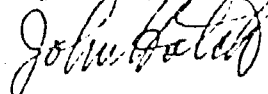
Edwin Dale Vandervorst
Box 70
Mound City SD 57646

Dear Mr. Vandervorst:

I am writing to acknowledge receipt of your 1987 Irrigation Questionnaire(s). A notice was sent to you January 29, 1988 regarding the requirement to submit the Irrigation Questionnaire(s) for Water Permit No. 2119-3, 3803-3, 4310-3, 4705-3 and the hearing date before the Water Management Board.

Since your questionnaire was received prior to the March 2, 1988 Water Management Board Meeting, your name has been deleted from the Board Meeting agenda. If you have any questions, please contact us.

Very truly yours,



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

4310-3

 **Department of
Water & Natural Resources**

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

DEC 21 1988

Edwin Dale Vander Vorst
Box 70
Mound City, South Dakota 57646

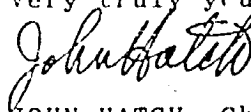
Dear Mr. Vander Vorst:

Enclosed is Water License No. 4705-3. This is the final water right document completing your process of obtaining a Water Right.

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. 4705-3, 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

enclosures

NOTE: Applicable portions of Water Permit No. 4310-3 have been incorporated into this Water License No. 4705-3.

