

WATER PERMIT NO. 7921-3

Name of Applicant: Owen & Lamont Peterson

Address: PO Box 97, Wendell MN 56595 Phone: 218 639-2931

Amount of Water Claimed: 2.44 cfs Total Acres: 315.48

Source of Water Supply: groundwater (one well)

Water to be used for: irrigation County: Hamlin

Type of Waste Disposal System:

Location: 3 miles southeast of Castlewood

PRIORITY Date Received: 11-5-13

Application/License Fee: \$ 1350.00

Corrected Application Received: 11-12-13

Period of Annual Use: May 1 – Sept 30

Remarks:

Diversion Point: SW 1/4 SE 1/4 Sec 8-T114N-R51W

Land to be Irrigated: E 1/2 Sec 8-T114N-R51W

Depth of Well: 228 feet deep

Well Driller: Thein Well

Remarks:

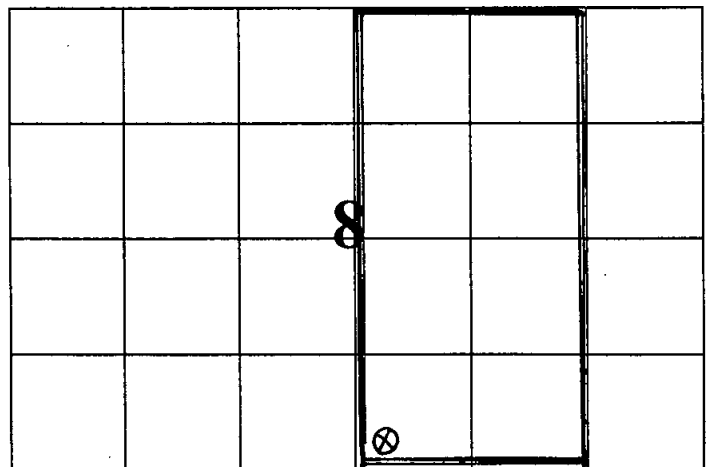
Type of Map: areail

Prepared by:

Reviewed and the Number Assigned on: 11-16-13

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____



FORM 2: Application for irrigation in South Dakota

(type or print)

Mail to: PMB 2020 DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	(office use only) No. <u>7921-3</u> Hydrologic Unit <u>10170202</u>
	Basin <u>Sioux River</u>
	Newspaper <u>Hamlin Co. Republican, Castlewood</u>
	<u>Public Opinion, Watertown</u>

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NOV - 5 2013

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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.)

1. Name to Appear on Irrigation Permit Owen E Lamont Peterson(check one) ☒ Owner ☐ Tenant/lessee ☐ Owner's Legal Agent

(name and complete address if different than above name)

Mailing Address 31760 Co Rd 11 P.O. Box 97 Wendell mn 56590

(Address)

(City)

(State)

(Zip Code)

Home Phone 218-639-2931 Cell Same Email OK Pete @ Runestone.net2. Amount of water claimed 2.44 *CFS or 1100 **GPM ***AF Total Acreage 316.48

(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply Irrigation Well Subsurface Aquifer4. Location of point of diversion 1 well E 1/2 of Section 8 T-114N R-51-W

(example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)

(SW1/4 SE1/4)County Hamline5. County or counties where water will be used Hamline6. Annual period during which water is to be used MAY 1 - Sept 30

7. 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
<u>Same As Above</u>	<u>316.48 Ac</u>		
<u>E 1/2 Sec 8 - T114N - R51W</u>			

8. Give a description of the project. (Attach sheet if more space is needed)

See mapI, Owen K. Peterson, the applicant, certify that I have read this application, have examined the attached map, and that the matters stated are true.

SOUTH DAKOTA
WATER PERMIT NO. 7921-3 FOR IRRIGATION

Date of first receipt of application November 5, 2013.

Date of return to applicant for corrections, amendments or changes November 5, 2013.

Date of receipt of corrected application November 12, 2013.

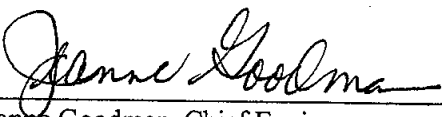
The Water Management Board approved Water Permit No. 7921-3 on October 22, 2014 for Owen & Lamont Peterson, PO Box 97, Wendell MN 56595 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 7921-3 appropriates 2.44 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (228 feet deep) located in the SW 1/4 SE 1/4 Section 8 for irrigation of 316.48 acres located in the E 1/2 Section 8; all in T114N-R51W.
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: May 1 – September 30.
3. The date from which applicant may claim right is November 5, 2013.
4. One-fifth of the construction is to be completed on or before May 22, 2017.
5. All construction is to be completed on or before October 22, 2019.
6. Water is to be put to beneficial use on or before October 22, 2023.
7. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

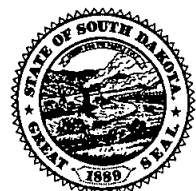
1. The well approved under Permit No. 7921-3 will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The well authorized by Permit No. 7921-3 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. This permit is approved subject to the irrigation water use questionnaire being submitted each year.
4. The permit holder for Water Permit Nos. 7921-3 and 7988-3 shall contract with a licensed well driller to construct an observation well that will become part of the South Dakota Department of Environment and Natural Resources Observation Well Network. The observation well must be completed into the same aquifer as the production wells and shall be located in the public right of way or a perpetual easement granted to the State for the purpose of maintaining an observation well on property owned by the permit holder. The observation well construction shall be coordinated with the DENR-Water Rights Program staff.

WATER MANAGEMENT BOARD

By: 
Jeanne Goodman, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

NOV 19 2014

date



Supplemental Information

(type or print)

1. Well Information

(check one or both as applicable) ☒ Drilling new well(s) ☐ Using existing well(s)

a) If new wells, how many 1 Have test holes been drilled ☒ Yes ☐ No Drilled by _____
(if yes, please provide copies of logs)

b) If existing wells, how many 0 Provide copy of log(s), if available. Drilled by _____

c) Well Depth 228 Depth to Top of Water Bearing Material 199' Depth to Water from Surface 24' 7"

d) Distance to nearest existing domestic well:

On applicant's property _____

On property owned by others 3/4 of a 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 (e.g. 3 to 1 is a typical slope)

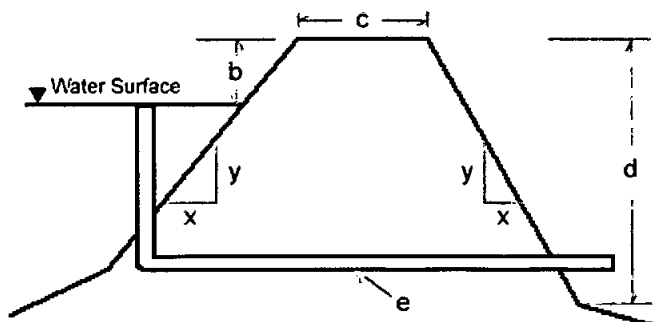
Upstream _____

Downstream _____

h) Surface Area of Impoundment _____

i) Storage _____ Acre Feet

j) Drainage Area Above Dam _____ Acres





USDA USDA - Farm Service Agency

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October 25, 2008

Hamlin County, SD

West 4 1/2

4101 - 3225

316.48

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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-026 and attached maps) for exact wetland boundaries and determinations, or contact NRCS.

Sec 6
T114N
R51W

Sec 5
T114N
R51W

Sec 4
T114N
R51W

Sec 7
T114N
R51W

Sec 8
T114N
R51W

Sec 9
T114N
R51W

Sec 18
T114N
R51W

Sec 17
T114N
R51W

Sec 16
T114N
R51W

X well



THEIN WELL

P.O. BOX 778, 11355 HWY. 71 NE (ACROSS FROM RINGO LAKE)
SPICER, MINNESOTA 56288 • (320) 796-2111
www.theinwell.com • E-mail: theinwell@tds.net

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Well Log for Owen Peterson

Date: 09/11/13

Well Size: test hole

Casing Length:

Screen Length:

Total Well Depth: 226'

SWL:

Geological Material	Color	Hardness or Formation	From	To
Top soil	Black		0	1
Clay/rocks	Brown		1	50
Clay	Blue		50	59
Gravel/sand	Brown		59	64
Clay/gravel	Brown/ yellow		64	71
Gravel/sand	Yellow/ Brown		71	86
Clay	Blue		86	190
Clay/gravel	Blue/ brown		190	199
Gravel/sand	Yellow/ brown/ gray/ white		199	226
Boulder			226	226

* NOTE

6" Test well installed and tested

Estimated yield is at about 45 Gal. Per Ft of Draw Down

Estimate yield on production well at 1000 GPM at 48' pumping level

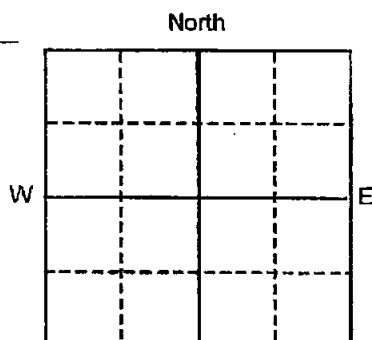
Spoke to Owen
Peterson on 2/6/14.
Mr Peterson Says
this well is in the
center of the NE 1/4
Section 8, T114N-
R51W.

-Bracken Capen.

SD EForm - 1621LD V1

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ SE ¼ Sec 8 Twp 114N Rg 51WCounty HamlinPlease mark well
location with an "X"

Well Completion Date

October 8, 2013Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
50.0 ft. from septic (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test holes
☒ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other
 If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	<u>6.00</u> IN	<u>0.0</u> FT	<u>200.0</u> FT	<u>9.88</u> IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Bentonite</u>	<u>18</u>	<u>Lb/gal</u>	<u>0.0</u> Ft	<u>196.0</u> Ft
		<u>Lb/gal</u>	<u>Ft</u>	<u>Ft</u>

Describe grouting procedure
ternie piped

SCREEN:

☒ Perforated pipe ☐ Manufactured
 Diameter 6.00 Inches Length 28.0 Feet
Material PVCSlot Size .030 Set From 200.0 Feet to 228.0 Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? chlorinated☐ No, Why Not?Lab to which water
quality sample sent for analysis

n/a

Well Owner: Owen Peterson

Business Name:

Address: PO Box 97City, State, Zip: Wendell MN 56590

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Black top soil	0	1
Brown clay & rocks	1	50
Blue clay	50	59
Brown gravel/sand	59	64
Brown yellow clay/gravel	64	71
Yellow brown gravel/sand	71	86
Blue clay	86	190
Blue brown clay/gravel	190	199
Mixed color gravel/sand	199	228

STATIC WATER LEVEL 25.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

26.4 Ft. After 4.0 Hrs. pumped 100.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

GPS: N 44 41.332

W 096 58.613

This well was drilled under license # 475 and this
report is true and accurate.Drilling firm: Thein Well Co., Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date: _____

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 11/5, 20 13

RECEIVED OF Peterson Farms 31760 CO RD 11 Box 97 Wendell MN 56590

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

Fee for Application for Permit No. <u>7921-3</u> to Appropriate Water, to construct and to put water to beneficial use	1150	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>7921-3</u>	200	00
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	1350 00

No. **06475**

By

James Goodman
Chief Engineer



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

denr.sd.gov

November 5, 2013

Owen & Lamont Peterson
PO Box 97
Wendell MN 56590

Dear Sirs:

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

- Enclosed is the aerial photo map submitted with the application. The map needs to reference a government section corner or quarter corner including section, township and range. For your use, I have enclosed a map with those designations. Please outline the acres to be irrigated and mark the proposed well location with an "X".
- On the application form, please complete Item No. 2, Amount of water claimed. State Statutes limit diversions to 1 cubic foot of water per second (cfs) for each 70 acres irrigated. This would mean that you are allowed approximately 4.51 cfs or 2031 gallons per minute to irrigate the total 316.48 acres.

If you have any questions, please contact me.

Sincerely,

Karen Schlaak

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

enclosures



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

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

denr.sd.gov



**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 7921-3, Owen and Lamont Peterson**

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. 7921-3, Owen and Lamont Peterson, PO Box 97, Wendell MN 56595.

The Chief Engineer is recommending DEFERRAL of Application No. 7921-3 for one year to allow an aquifer pump test to be completed by the applicant to allow evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued.

See report on application for additional information.

Jeanne Goodman, Chief Engineer
January 21, 2014

REPORT TO THE CHIEF ENGINEER

WATER PERMIT APPLICATION NO. 7921-3

OWEN AND LAMONT PETERSON

December 9, 2013

Water Permit Application No. 7921-3 proposes to divert groundwater at a maximum rate of 2.44 cubic feet per second (cfs) from a single well to be completed into the Prairie Coteau aquifer. The well is expected to reach a depth of approximately 226 feet and will be located in the SW ¼ SE ¼ of Sec 8, T114N-R51W approximately 250 feet north and 2,500 feet west of the southeast corner of Section 8. The water will be used to irrigate 316.5 acres in the E ½ of Section 8, T114N-R51W in Hamlin County.

AQUIFER: Prairie Coteau aquifer (PCO)

GEOLOGY AND AQUIFER CHARACTERISTICS

The Prairie Coteau aquifer consists of pockets of outwash buried in a thick layer of glacial drift. The Prairie Coteau aquifer includes the pockets of outwash that are too deep to be connected to the surface/near surface waters of the Big Sioux aquifer but are not so deep as to connect to the Altamont aquifer at the base of the glacial drift (Kume, 1985). The Prairie Coteau aquifer is largely non-continuous, and much of its area consists of small disconnected aquifers separated by layers of clayey till and enclosed within a thick section of till.

The Prairie Coteau aquifer varies in thickness between 4 and 144 feet with an average of about 47 feet and usually consists of several beds on top of one another rather than a continuous section of gravel and sand. The well log submitted with this application identifies sand and gravel from 199-226 feet below the ground surface. This portion of the Prairie Coteau aquifer is under confined conditions.

SDCL 46-2A-9

Pursuant to SDCL 46-2A-9, a permit to appropriate water may be issued only if there is a reasonable probability that there is unappropriated water available for the applicant's proposed use, that the proposed diversion can be developed without unlawful impairment of existing rights and that the proposed use is beneficial and in the public interest. This report will address the availability of unappropriated water and the effect on pertinent existing rights which appropriate water from this aquifer.

WATER AVAILABILITY

This application proposes to divert 2.44 cfs from the Prairie Coteau aquifer. The probability of unappropriated water available from an aquifer can be evaluated by considering SDCL 46-6-3.1, which states "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source." If the source of the water is older or lower than the greenhorn formation and a public water system has applied for a permit, the Board need not consider the recharge/withdrawal issue. Here, a public water system is not involved and the

aquifer is not older or lower than the greenhorn formation therefore withdrawal/recharge issue must be considered.

In interpreting 46-6-3.1, the First Judicial Circuit Court ruled in *Hanson County Dairy v. Bender* that evidence must show the average annual recharge exceeds the average annual discharge by at least the amount requested by the water permit application being considered (Memorandum Decision, April 11, 2012). This necessitates the identification and quantification of recharge and discharge of the individual outwash deposits of the Prairie Coteau aquifer from which the applicant proposes to withdraw water.

Since the Prairie Coteau aquifer consists of many small and often hydraulically disconnected aquifers, generalizations about the recharge characteristics or size of specific "pockets" of the aquifer are not useful in describing recharge characteristics of the portion associated with this application. Specific information regarding thickness and areal extent of this portion of the Prairie Coteau aquifer is required to make a technically defensible decision as to whether to recommend approval or deferral of this application.

Using a recharge rate of 0.15-0.60 inches per year (Hedges et al., 1985), and assuming an application rate of 10 inches per year, the areal extent of the aquifer would need to be between 8.2 (at 0.6 inches per year of recharge) and 33.0 (at 0.15 inches per year of recharge) square miles.

The Water Rights Program does not have any observation wells completed into this portion of the Prairie Coteau aquifer to evaluate recharge/discharge. The test hole drilled for this application was not cased and will not be available for use as an observation well. Lithological records in the area are extremely limited and most do not extend to the depth of interest (1,484 feet). Although two records, located approximately three miles to the east and three miles to the north do show water bearing material at the same depth as the test hole information submitted with this application, this data is insufficient to determine the areal extent of the formation in question. Other lithological records in the area, specifically those to the south and west (at a distance of approximately five miles in both instances) show uninterrupted clay at the depth of interest. Two records in close proximity to each other and approximately 2.5 miles to the northeast of the proposed diversion site show an interval of gravel extending down to 1,520 and 1,527 feet above sea level, but the records do not extend past 1,520 and 1,527 feet (respectively) to the depth of interest. Continuing north past the record which does indicate water bearing material at the depth of interest, the next record of sufficient depth is approximately six miles from the proposed diversion site and shows clay at the depth of interest. Similarly, continuing east, records also indicate clay at the depth of interest in a record located approximately seven miles from the proposed diversion site. The lithological records in the area show that any continuation of the deposit addressed in this application ceases within approximately a five to seven mile radius of the proposed diversion site. It is not clear how far the deposit extends within those five to seven miles.

No other applications have been submitted proposing to divert water from this formation. Consequently, no irrigation logs are available to show current or past use of water from this formation. Information is not available to delineate the areal extent of the outwash from which this application proposes to divert water. Consequently, it is not possible to evaluate recharge and withdrawal from this portion of the Prairie Coteau aquifer at this time.

EXISTING WATER RIGHTS

There is one existing water permit in Hamlin County which is diverting water from a sand and gravel deposit identified as the Prairie Coteau aquifer, although Water Permit No. 7673-3 (located in Clark County) diverts water from a portion of the Prairie Coteau aquifer that extends into Hamlin County (Water Rights, 2014b). As stated above, insufficient data is available to delineate the areal extent or the interconnectedness of that portion of the aquifer to the deposit in this application and other deposits in the area within the Prairie Coteau aquifer. Therefore, it is unknown as to whether this existing diversion is accessing the same deposit as this application. Consequently, the effects of pumping on existing water rights/permits cannot be determined.

Previous applications for water rights permits have been approved on the basis of known areal extents of the portions of the Prairie Coteau being applied for (primarily from lithological records) or from sufficient observation well data to observe recharge characteristics. In this case, further information to delineate the areal extent of the aquifer such as additional drilling (providing lithological records) or an aquifer test is required for an informed evaluation as to whether sufficient water is available for the proposed diversion.

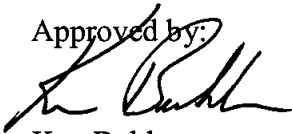
CONCLUSIONS

- 1) The application proposes to appropriate 2.44 cfs for irrigation.
- 2) From the best information reasonably available, the probability of unappropriated water available from the Prairie Coteau aquifer for the proposed appropriation cannot be determined.
- 3) Because a record of observation well measurements is not available, the probability of unappropriated water available from the Prairie Coteau aquifer from the proposed appropriation cannot be evaluated.
- 4) Since there are no other water rights/permits completed into this formation, adverse effects on existing diversions are not an issue when evaluating this application.
- 5) An aquifer pump test including monitoring wells should be conducted to aid in the evaluation of this portion of this aquifer.



Bracken Capen
SD DENR-Water Rights Program

Approved by:



Ken Buhler
SD DENR-Water Rights Program

REFERENCES

- Hedges, L.S., Allen, J., and Holly, D.E. 1985. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa. Task 7: Ground Water Recharge. South Dakota DENR-Geological Survey, Vermillion, SD.
- Kume, J. 1985. Water Resources of Deuel and Hamlin Counties, South Dakota. Water-Resources Investigations Report 84-4069. USGS, Huron SD.
- Geological Survey. 2014. Lithologic Logs Database, South Dakota Department of Environment & Natural Resources Geological Survey, Vermillion, South Dakota.
- Water Rights. 2014a. Observation Well Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2014b. Water Right/Permit Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

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JAN 31 2014

WATER RIGHTS
PROGRAM

Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)

County of Hamlin) SS

I, Lee Anne Dufek

certify that the attached printed Notice was taken

from the Hamlin County
Herald Enterprise

printed and published in Hayti

County of Hamlin and

state of South Dakota. The notice was published

in the newspaper on the following date:

Jan. 29, 2014

Cost of Printing \$ 56.10

Lee Anne Dufek
(Signature)

Published
(Title)

1-29-2014
(Date Signed)

NOTICE OF HEARING ON APPLICATION NO. 7921-3 TO APPROPRIATE WATER

Notice is given that Owen & Lamont Peterson, PO Box 97, Wendell MN 56590 have filed an application for a water permit to appropriate 2.44 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (228 feet deep) located in the SW 1/4 SE 1/4 Section 8 for irrigation of 316.48 acres located in the E 1/2 Section 8; all in T114N-R51W.

SDCL 46-2A-4(10) provides that "if the applicant does not contest the recommendation of the Chief Engineer and no petition to oppose the application is received, the Chief Engineer shall act on the application pursuant to the Chief Engineer's recommendation and no hearing may be held before the board, unless the Chief Engineer makes a finding that an application, even if uncontested, presents important issues of public policy or public interest that should be heard by the board." In this case, the Chief Engineer finds that this application presents important issues of public interest that should be heard by the Water Management Board.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends DEFERRAL of Application No. 7921-3 for one year to allow an aquifer pump test to be completed by the applicant to allow evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued.

The Water Management Board will consider this application at 9:30 a.m. on March 6, 2014 in the Matthew Training Center, Joe Foss Bldg, 523 E. Capitol Ave., Pierre, SD. The Chief Engineer's recommendation is ~~not final or binding upon the Board.~~ The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny the application based on the facts presented at the public hearing.

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be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised at the hearing and decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law.

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Contact Eric Gronlund by February 24, 2014 at the above Chief Engineer's address to request copies of the staff report, recommendation, application or other information. Notice is given to individuals with disabilities that this hearing is being held in a physically accessible place. Please notify the Department of Environment and Natural Resources at least 48 hours before the hearing if you have a disability for which special arrangements must be made at the hearing. The telephone number for making arrangements is (605) 773-3352.

Under SDCL 1-26-17(7) notices must state that "if the amount in controversy exceeds \$2,500.00 or if a property right may be terminated, any party to the contested case may require the agency to use the Office of Hearing Examiners by giving notice of the request to the agency no later than ten days after service of a notice of hearing issued pursuant to SDCL 1-26-17." This is a Notice of Hearing, service is being provided by publication, and the applicable date to give notice to the Chief Engineer is February 10, 2014. However, since this particular matter is a water permit application and not a monetary controversy in excess of \$2,500.00 or termination of a property right the Chief Engineer disputes the applicability of this provision and maintains that the hearing must be conducted by the Board.

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Steven M. Pimer,
Secretary
Department of Environment and
Natural Resources
Published Jan. 29, 2014, at total
cost of \$56.10.

RECEIVED

FEB - 3 2014

WATER RIGHTS
PROGRAM

Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
County of Codington)

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 date:

January 29th, 2014

Cost of Printing 118.73

Monica K. Saathoff
(Signature)

Bookkeeper

(Title)

January 29th, 2014

(Date Signed)

DEPARTMENT OF ENVIRON- MENT AND NATURAL RESOURCES

NOTICE OF HEARING
ON APPLICATION NO.
7921-3

TO APPROPRIATE WATER

Notice is given that Owen & Lamont Peterson, PO Box 97, Wendell MN 56590 have filed an application for a water permit to appropriate 2.44 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (228 feet deep) located in the SW 1/4 SE 1/4 Section 8 for irrigation of 316.48 acres located in the E 1/2 Section 8; all in T114N-R51W.

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74:02:01:35:01.

Steven M. Pirner,
Secretary, Department of
Environment and Natural
Resources.
Published once at the
approximate cost of \$130.75.
(January 29, 2014)

All legal notices in the Public
Opinion and other South
Dakota newspapers can be
found at
www.sdpublishnotices.com



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



January 21, 2014

Hamlin County Herald Enterprise
PO Box 207
Hayti SD 57241

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7921-3 to Appropriate Water. Please publish the notice once on January 29, 2014. 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 and arrange for payment. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Owen & Lamont Peterson, PO Box 97, Wendell MN 56590 (Ph # 218-639-2931).

Please send the Water Rights Program an affidavit or the enclosed Proof of Publication form immediately.

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



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



January 21, 2014

Public Opinion
PO Box 10
Watertown SD 57201

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enclosures



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



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

January 21, 2014

Owen & Lamont Peterson
PO Box 97
Wendell MN 56590

Dear Sirs:

Water Permit Application No. 7921-3 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 Hamlin County Herald Enterprise printed at Hayti SD (Ph # 605-793-3636) and the Public Opinion printed at Watertown SD (Ph # 605-886-6901). You will need to contact the newspaper(s) 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(s) to authorize publication of your Notice and to arrange for payment. Early contact with the paper(s) can eliminate delays. Upon receiving authorization from you, the publisher has been instructed to publish your notice. 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 the Notice on January 29, 2014. The applicant is responsible for payment. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352 or email: Karen.schlaak@state.sd.us.

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Steven M. Pirner, Secretary, Department of Environment and Natural Resources. Published once at an approximate cost of _____.



SENT VIA EMAIL

March 6, 2014

Mr. Ken Buhler
SD-DENR Water Rights Program
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

Subject: Water Permit Application No. 7921-3
Owen Peterson Property
Hamlin County, South Dakota

Dear Mr. Buhler:

This letter transmits preliminary data collected at the Owen Peterson property located southwest of the intersection of 185th Street and 462nd Avenue, which is southeast of Castlewood in Hamlin County, South Dakota (Figure 1 - attached). Summit Envirosolutions, Inc. (Summit) was retained to perform aquifer testing services at this site.

A test well (PW1) drilled by Thein Well Company (Thein) is located on the southwestern corner of the property (Figure 2 – attached). The well log is also attached. The test well was constructed of a 28-foot section of 6-inch diameter, 30 slot, PVC screen set between 200 and 228 feet below grade.

Summit compiled a Geographic Information System (GIS) platform for the project area and obtained information on area wells. Figure 2 presents information on wells that were identified through public records. Two wells, the Claremont Colony 4 well and the Wilbur Ching well were identified as having screened intervals similar to PW1. Summit contacted the owners of these wells and obtained permission to install a transducer in the Claremont Colony well (CC1 - well log attached) on February 19, 2014. We were informed that the Wilbur Ching well was abandoned and not available for monitoring. Therefore, we selected the Jeff Ching well (JC1), which is reportedly a shallow well (no well log available), to evaluate the vertical connection of buried sand and gravel aquifers beneath the area.

Prior to pumping, PW1, JC1, and CC1 were instrumented (Figure 3 - attached) with pressure transducers that were set to record water levels at one-minute intervals. On February 19 and 20, 2014, a step-drawdown test was performed by Summit and Thein by pumping at five different flow rates. The flow rates and duration are summarized below:

Step Number	Flow Rate (gpm)	Duration (minutes)
1	160	60
2	207	60
3	272	60
4	315	60
5	355	1,204

Pumping began at 11:30 a.m. on February 20, 2014 and lasted until 11:34 a.m. on February 21, 2014. A total of 484,660 gallons of water (1.5 acre feet) were removed from the aquifer. Recovery data were then collected until March 6, 2014. Hydrographs of the water level data collected at the three wells are attached.

The step-test data were analyzed using a method developed by Clark (1977), which uses the relationship between specific drawdown and flow rate to evaluate the aquifer loss and well loss components of total drawdown. The results of this analysis are shown in graphical and tabular form, attached.

In summary, the specific capacity of the well was calculated to be 36 gpm/foot at an initial flow rate of 160 gpm and decreased to a specific capacity of 24 gpm/foot at 355 gpm. Corresponding well efficiencies were calculated to range from 59% to 39% for 160 gpm and 355 gpm, respectively. In our opinion, the well diameter and slot size of the well screen likely contributed to the increased well loss at increased flow rates.

Based on review of the hydrographs for JC1 and CC1, drawdown was not observed at these locations. The review of the hydrograph for PW1 indicated that full recovery occurred on March 2, 2014, not accounting for water level changes due to barometric pressure. When the barometric pressure is compared to the water level at PW1, a change in atmospheric pressure of approximately 1 foot of water occurred from the beginning of pumping to February 24, 2014. Since the pressure transducers are vented to the atmosphere, it is likely that recovery from pumping likely occurred by February 24, 2014. Based on the sub-freezing temperatures over the recovery period, it appears likely that the recharge area for the aquifer in the area may be aerially extensive.

Based on the results of the step-drawdown test, we have recommended that a minimum 12-inch diameter well be installed at the site. Samples of aquifer material should be submitted for grain size analysis to properly size the packing material (if any) and screen slot size. Once this well is installed, we have recommended a second step-drawdown test, followed by a minimum of 72-hour constant rate test. The existing PW1 and CC1 will be used as

Mr. Ken Buhler
Water Permit Application 7921-3
March 6, 2014
Page 3

observation wells during this test. It would be our intent to evaluate the aquifer parameters (transmissivity and storativity) and recharge potential of this aquifer based on this aquifer test.

Please contact us if you have any questions regarding the contents of this letter or specific requirements that are different than the proposed aquifer testing for this site. You can contact me directly at (612) 750-4024 or jdustman@summite.com.

Sincerely,

Summit Envirosolutions, Inc.

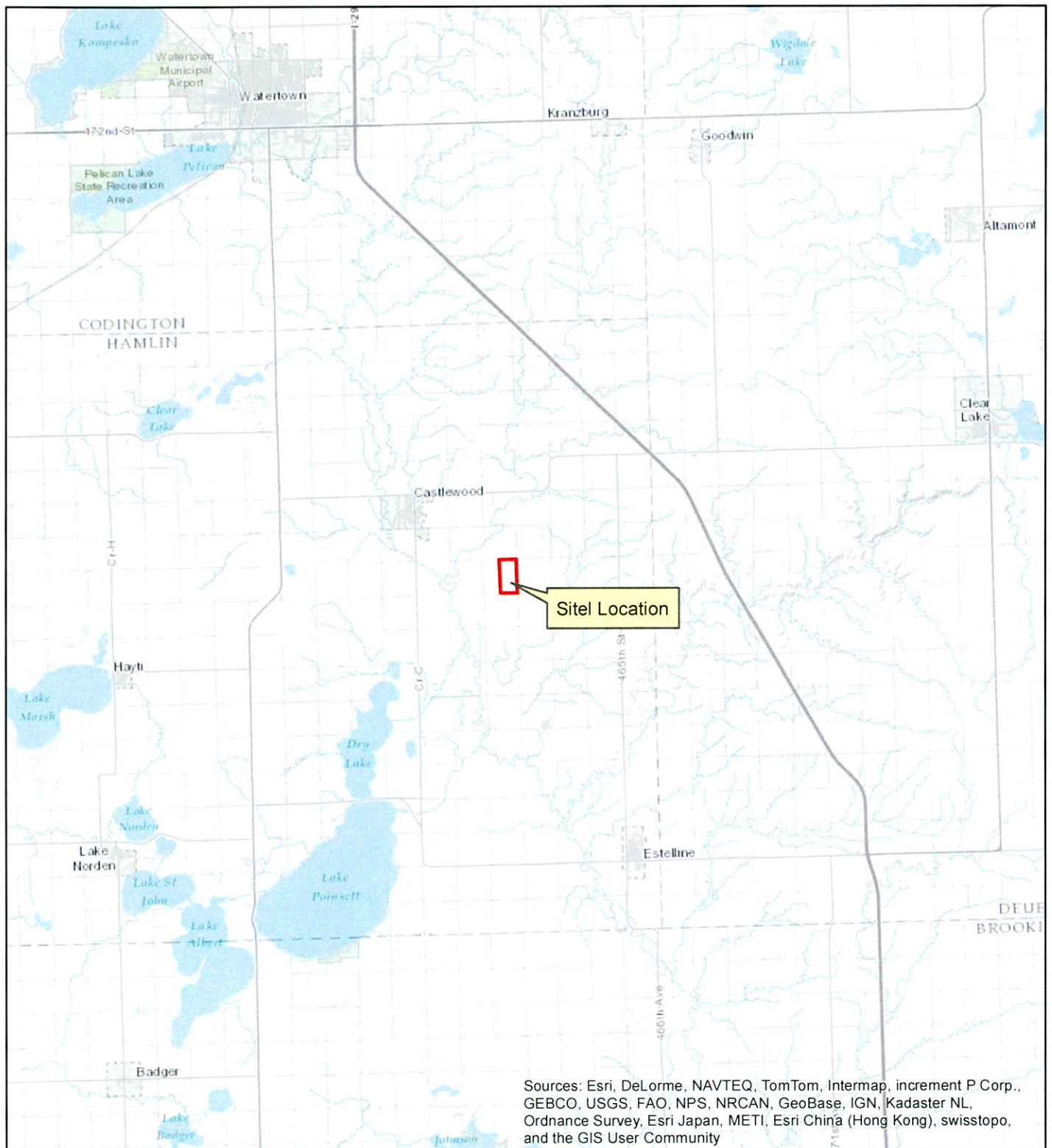


John E. Dustman
Principal

JED/

Attachments

cc: Mr. Robert Thein, Thein Well Company
Mr. Owen Peterson



Legend

 Owen Peterson Property



0  5 Miles

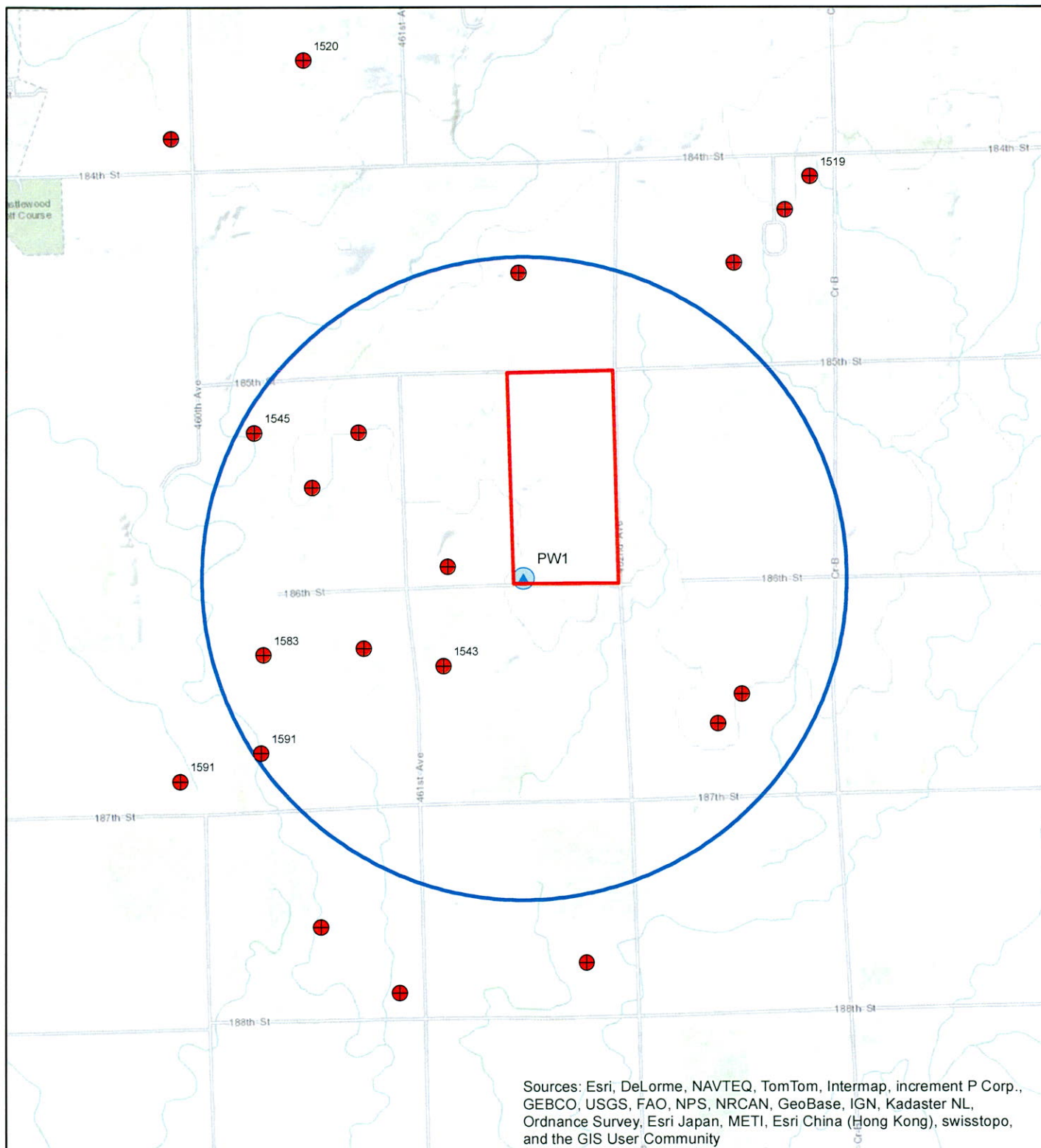
SITE LOCATION MAP

Owen Peterson Property
Hamlin County, South Dakota



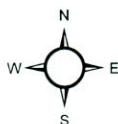
Figure 1

File: 20140306_hamlincounty
Summit Proj. No.: 2219-0001
Plot Date: 3-6-14
Arc Operator: JED
Reviewed by: GUB



Legend

- Owen Peterson Property
- ▲ Test Well
- ⊕ Area Well
- 1.5 Mile Radius



0 2,640 5,280 Feet

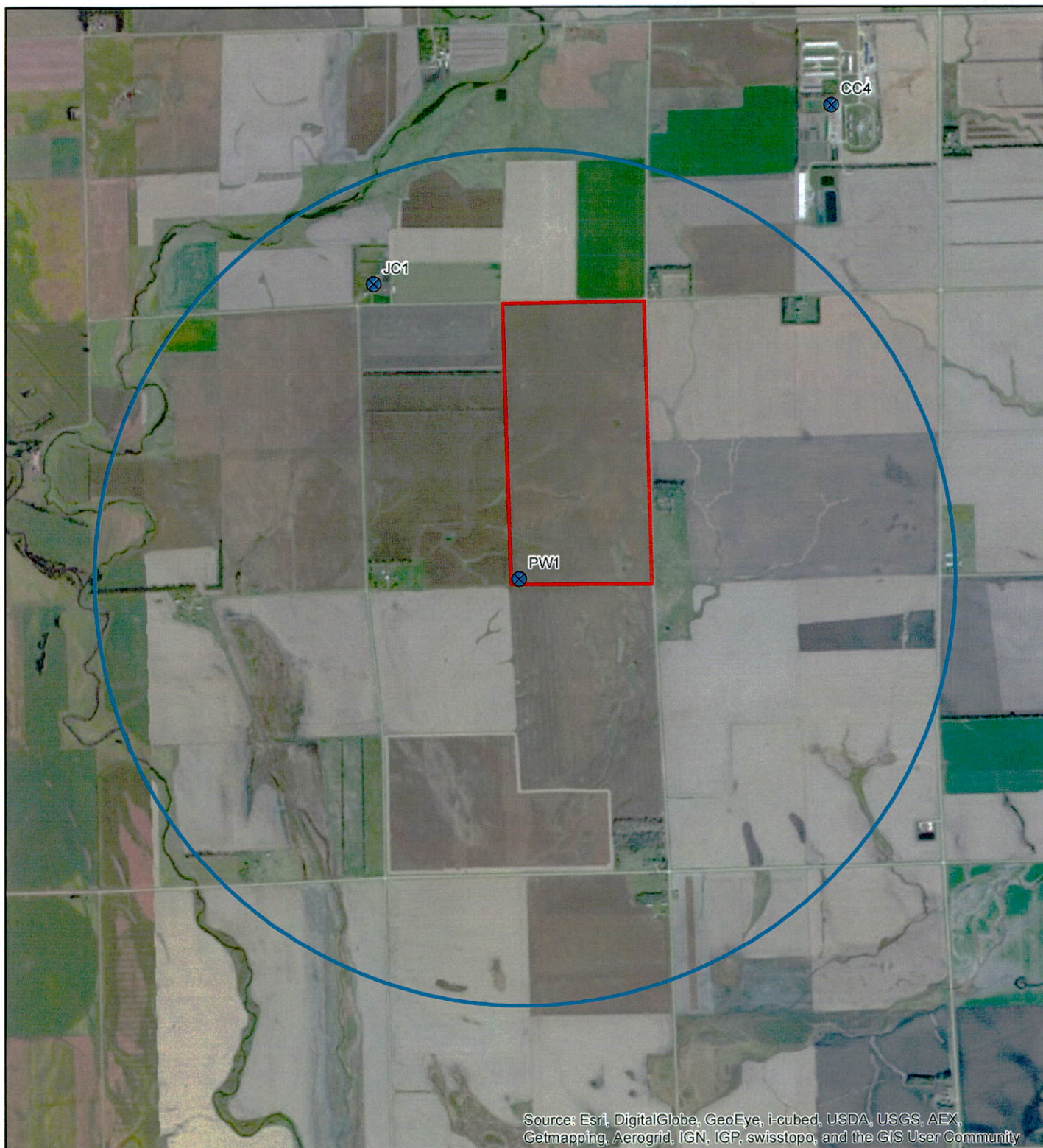
AREA WELLS

Owen Peterson Property
Hamlin County, South Dakota



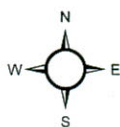
Figure 2

File: 20140306_hamlincounty
Summit Proj. No.: 2219-0001
Plot Date: 3-6-14
Arc Operator: JED
Reviewed by: GUB



Legend

-  Aquifer Test Well
-  Owen Peterson Property
-  1.5 Mile Radius



0 2,640 5,280 Feet

INSTRUMENTED WELLS

Owen Peterson Property
Hamlin County, South Dakota

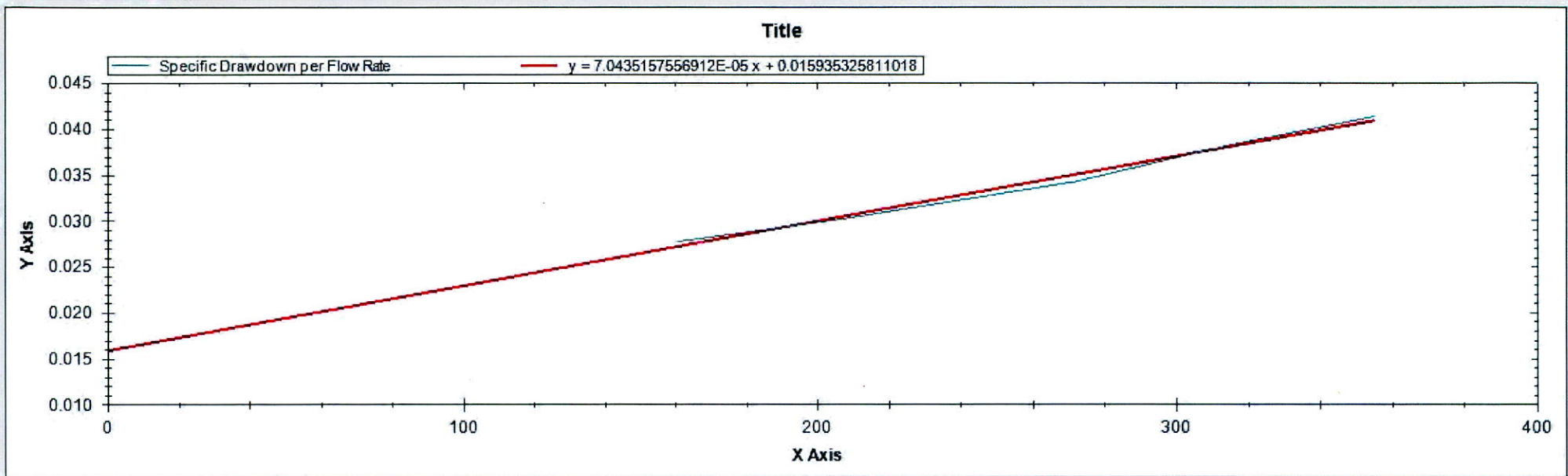


Figure 3

File: 20140306_hamlincounty
Summit Proj. No.: 2219-0001
Plot Date: 3-6-14
Arc Operator: JED
Reviewed by: GUB

Well Efficiency (Step Test)

Back



GW Elev Drawdown / Flow SC per Flow

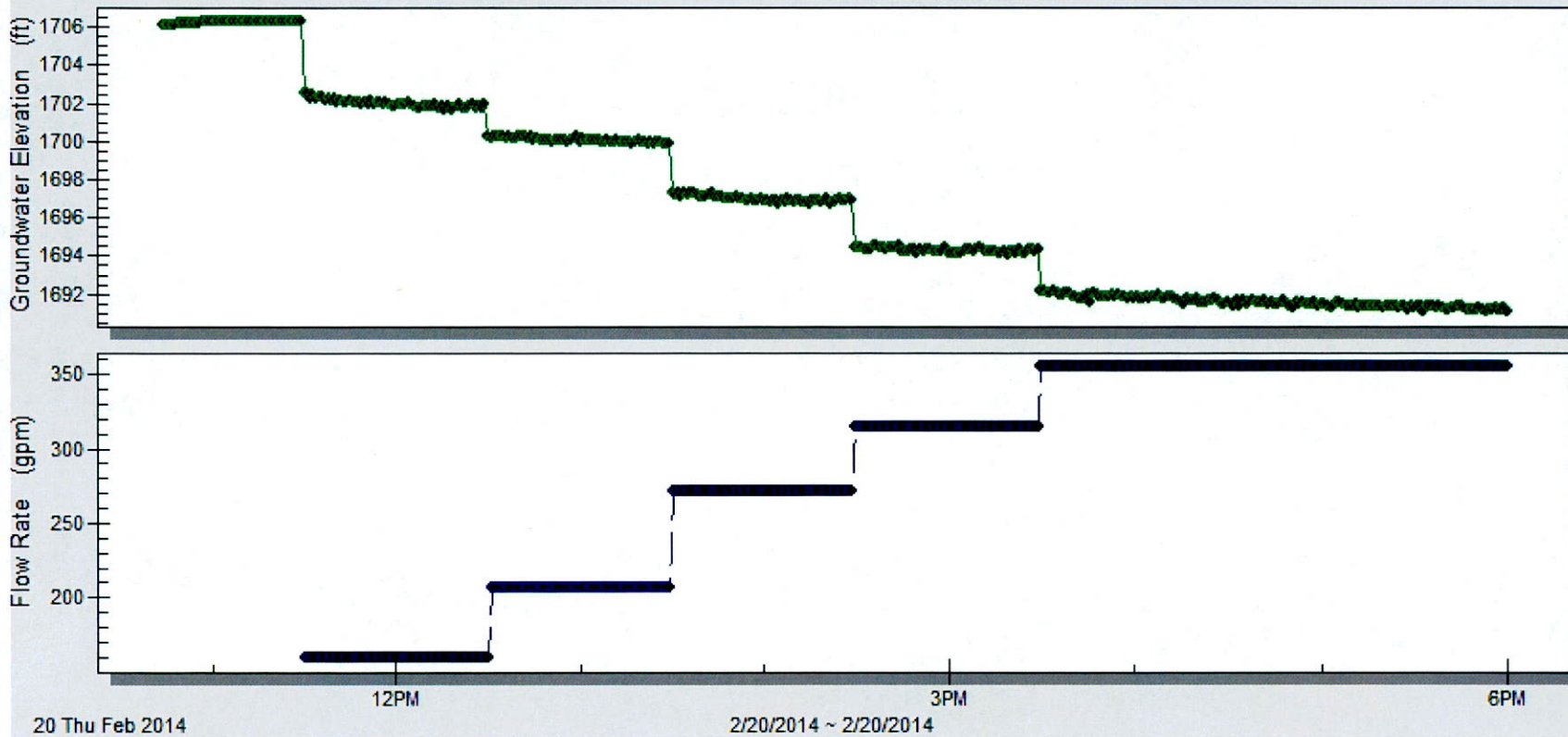
	Step Number	Flow Rate	Head at Beginning of Step	Head at End of Step	Total Drawdown	Incremental Drawdown	Specific Capacity	Specific Drawdown	Aquifer Loss (BQ)	Well Loss (CQ $\hat{p}$)	Efficiency
▶	1	160	1,706.284	1,701.848	4.437	4.437	36.062	0.028	2.550	1.803	58.580
	2	207	1,701.848	1,700.027	6.257	1.820	33.083	0.030	3.299	3.018	52.220
	3	272	1,700.027	1,696.956	9.329	3.072	29.157	0.034	4.334	5.211	45.410
	4	315	1,696.956	1,694.225	12.059	2.730	26.122	0.038	5.020	6.989	41.800
	5	355	1,694.225	1,691.609	14.676	2.617	24.190	0.041	5.657	8.877	38.920

Groundwater Elevation and Flow Rate

Owen Peterson Aquifer Test

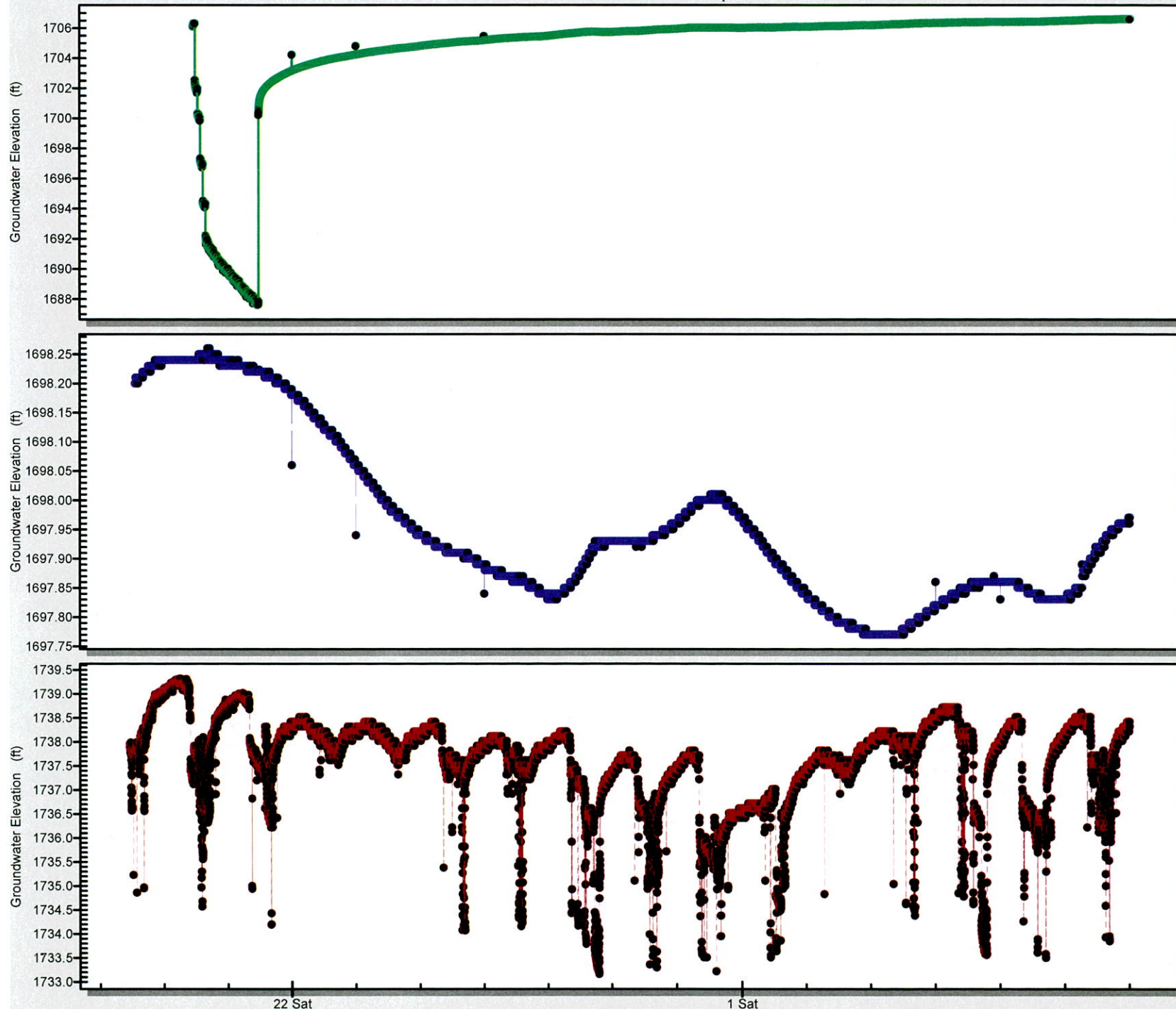
PW1 | Groundwater Elevation

PW1 | Flow Rate



Hydrographs of Instrumented Wells

Owen Peterson Aquifer Test



- Groundwater Elevation | PW1
- Groundwater Elevation | JC1
- Groundwater Elevation | CC4

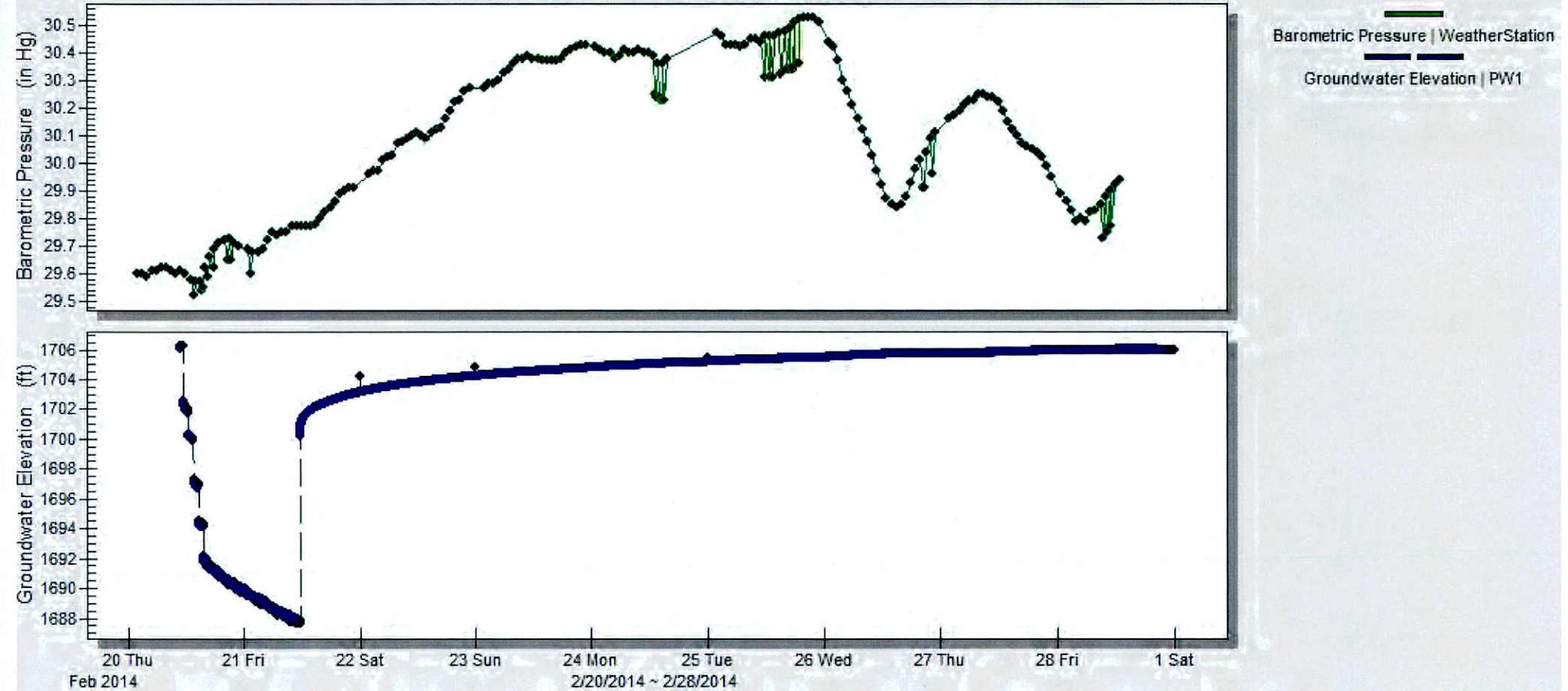
Feb 2014

2/18/2014 ~ 3/6/2014

1 Sat

Barometric Pressure and Groundwater Elevation

Owen Peterson Aquifer Test



SOUTH DAKOTA WATER WELL COMPLETION REPORT

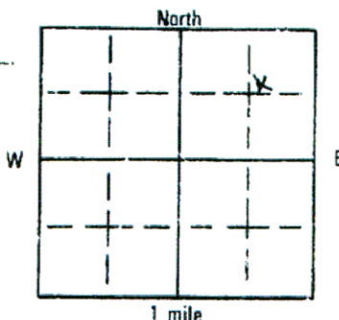
10-85

Location NE 1/4 Sec 4 Twp 114 N Rg 51 W

County

Hamlin

Please mark well location with an "X"

Well Completion Date 6-15-87

PROPOSED USE:

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

Method of Drilling:

forward Rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	0 FT	261 FT	18 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

 T: Was the well grouted? ☒ YES ☐ NO
To what depth? 20 FEET

What is grouting material?

If cement, number of sacks? 25

Describe grouting procedure _____

What was grout weight? _____ LB/GAL

SCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 8" IN Length 17 FEETMaterial SSSlot Size #50 Set From 261 Feet To 278 Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Other information _____

Was a packer or seal used? ☒ YES ☐ NOIf so, what material? Sand

Describe packer(s) and location? _____

Well Owner: ChapmanName South ColonyAddress Castlewood, S.D.Well Log: RR 2 Box 132ADepth 57223

Formation	From	To
<u>yellow clay</u>	<u>0</u>	<u>40</u>
<u>Blue Clay</u>	<u>40</u>	<u>120</u>
<u>Blue clay w sand</u>	<u>120</u>	<u>140</u>
<u>Blue Clay</u>	<u>140</u>	<u>180</u>
<u>yellow clay</u>	<u>180</u>	<u>240</u>
<u>Blue Clay</u>	<u>240</u>	<u>260</u>
<u>med sand</u>	<u>260</u>	<u>270</u>
<u>good sand & gravel</u>	<u>270</u>	<u>278</u>

STATIC WATER LEVEL 60 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? _____

WELL TEST DATA:

☒ Pumped☐ BailedDescribe: SUB☐ Other

Pumping Level Below Land Surface

73 ft. After _____ Hrs. pumped 287 GPM73 ft. After _____ Hrs. pumped 287 GPM73 ft. After _____ Hrs. pumped 287 GPM

REMARKS:

This well was drilled under license # 440

And this report is true and accurate.

Drilling firm

Pullman Well Drilling

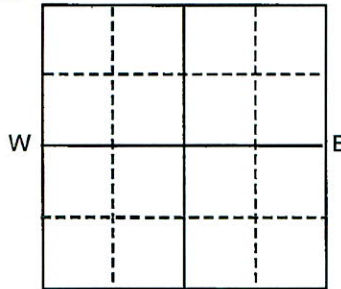
Signature of License Representative: _____

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW 1/4 SE 1/4 Sec 8 Twp 114N Rg 51WCounty Hamlin

North

Please mark well
location with an "X"

Well Completion Date

October 8, 2013

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
50.0 ft. from septic (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test holes
☒ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	<u>6.00</u> IN	<u>0.0</u> FT	<u>200.0</u> FT	<u>9.88</u> IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Bentonite</u>	<u>18</u>	<u>Lb/gal</u>	<u>0.0</u> Ft	<u>196.0</u> Ft
		<u>Lb/gal</u>	<u>Ft</u>	<u>Ft</u>

Describe grouting procedure
tremie piped

SCREEN:

☒ Perforated pipe ☐ Manufactured
Diameter 6.00 Inches Length 28.0 FeetMaterial PVCSlot Size .030 Set From 200.0 Feet to 228.0 Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? chlorinated
☐ No, Why Not?
Lab to which water
quality sample sent for analysisn/aWell Owner: Owen Peterson

Business Name:

Address: PO Box 97City, State, Zip: Wendell MN 56590

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Black top soil	0	1
Brown clay & rocks	1	50
Blue clay	50	59
Brown gravel/sand	59	64
Brown yellow clay/gravel	64	71
Yellow brown gravel/sand	71	86
Blue clay	86	190
Blue brown clay/gravel	190	199
Mixed color gravel/sand	199	228

STATIC WATER LEVEL 25.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

26.4 Ft. After 4.0 Hrs. pumped 100.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

GPS: N 44 41.332

W 096 58.613

This well was drilled under license # 475 and this report is true and accurate.Drilling firm: Thein Well Co., Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

7921-3

**AQUIFER TEST REPORT
OWEN PETERSON FARM
CASTLEWOOD, SOUTH DAKOTA**

SUMMIT PROJECT NO. 2219-0001

Prepared for:

Mr. Owen Peterson
P.O. Box 97
Wendell, Minnesota 56590

Prepared by:

Summit Envirosolutions, Inc.
1217 Bandana Boulevard North
St. Paul, Minnesota 55108

July, 2014

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**AQUIFER TEST REPORT
OWEN PETERSON FARM
CASTLEWOOD, SOUTH DAKOTA**

SUMMIT PROJECT NO. 2219-0001

EXECUTIVE SUMMARY

A seven-day aquifer test was performed between April 1, 2014 and April 8, 2014 by pumping over 7.4 million gallons of water at an average flow rate of 730 gallons per minute over 169 hours (10,140 minutes). Water levels were recorded continuously at four wells, including off-site domestic and farm wells located northwest and northeast of the Peterson Farm. The aquifer test resulted in the calculation of the following average aquifer parameters:

- Transmissivity = 8,892 feet²/day
- Hydraulic Conductivity = 244 feet per day
- Storativity = 0.0014

Based on analysis of the aquifer test, there appears to be an adequate groundwater supply for irrigation purposes. Alternate water supplies do not appear to be necessary. The aquifer testing data indicate that the source aquifer can provide the rate and volume of water needed for irrigation. Although the test was performed during a time period when no surface recharge was occurring, calculations using aquifer test data indicate that the yearly taking may account for 7% to 2% of the annual recharge to the confined aquifer within the area of influence.

Based on the aquifer test data, well interference with surrounding domestic wells should not occur in excess of that observed during the test. If observed in the future, well interference can be mitigated by lowering pumps in affected wells. Based on the aquifer test results and the depth of the aquifer, no adverse impacts to nearby surface water features are anticipated as a result of the future use of the pumping well for irrigation purposes.

AQUIFER TEST REPORT
OWEN PETERSON FARM
CASTLEWOOD, SOUTH DAKOTA
SUMMIT PROJECT NO. 2219-0001

1.0 INTRODUCTION

Mr. Owen Peterson owns farmland southeast of Castlewood, South Dakota (Figure 1) that would benefit from irrigation during portions of the growing season. Mr. Peterson submitted a Water Permit Application (#7921-3) and the Chief Engineer recommended a one-year deferral on the application to allow for aquifer testing (Appendix I). Summit Envirosolutions, Inc. (Summit) was retained to perform the necessary aquifer testing to calculate aquifer parameters and to evaluate the impacts to area wells and surface water resources. This report presents data and results of aquifer testing to evaluate potential impacts of operating the production well.

1.1 Area Geology and Hydrogeology

The well installed for the purpose of irrigating row crops at the Peterson Farm is installed in the Prairie Coteau Aquifer (PCO). The PCO is comprised of lenses of buried outwash within a matrix of glacial drift. These lenses reportedly have limited connection to the surface water or shallow groundwater of the Big Sioux aquifer or the deeper Altamont aquifer at the base of the glacial drift (Kume, 1985). The PCO is reportedly non-continuous and represents isolated buried lenses of sand and gravel separated by clayey till (Report to the Chief Engineer, December 9, 2013, page 1 – Appendix I). Summit also reviewed *Evaluation of Groundwater Resources, Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa (1982-1985)*. According to the study, the total area of the PCO in Deuel and Hamlin Counties is 757,800 acres and has 1,705,090 acre feet of total recoverable water. The study (Task 7, 1985) also concluded that confined aquifers in this area of South Dakota receive between 0.15 (minimum) and 0.6 (maximum) inches of recharge per year.

1.2 Area Wells and Test Borings

In preparation for aquifer testing, Summit conducted an inventory of existing test borings and wells using the databases and maps available online from the South Dakota Geological Survey and other published sources. Figure 2 shows the test borings and wells identified by this effort. A summary of test boring and well information for these locations is presented on Table 1. Drilling logs for the wells are included as Appendix II. In summary, relatively few wells were identified in the area that appeared to be completed in the PCO aquifer. A generalized geologic cross section based on the drilling log data is shown on Figure 3.

1.3 Preliminary Testing

Thein Well Company installed a test well (TW1) in October 2013 at the location shown on Figure 4. The well was drilled to a total depth of 228 feet and completed as a 6-inch well with a 28-foot long, 30-slot PVC screen. The drilling/well log for this well is presented in Appendix II.

Based on the well inventory and conversations with Mr. Peterson, Summit mobilized to the site on February 18, 2014 to install telemetric pressure transducers and data loggers at area wells. Initially, Summit had targeted the Claremont Colony Well 4 (Well No. 13 – Figure 2) and the Wilbur Ching well (Well No. 1 - Figure 2) as candidates that appeared to be screened at the same depth as the test well TW1. However, upon contacting the family of Wilbur Ching, it was determined that the well had been previously abandoned. Therefore, a transducer was installed at the Jeff Ching well (Well No. 19 - Figure 2), which is finished in sand and gravel deposits above the Prairie Coteau aquifer, however, would serve to evaluate the connection between buried sand and gravel deposits in the area. A pressure transducer was also installed at the Claremont Colony Well 4 (CC4) and TW1.

The next field effort included evaluating specific capacity at TW1 to design a production well and to choose a flow rate for the longer-duration aquifer test. An initial step-drawdown test was performed at TW1 beginning at 8:30 a.m. on February 20, 2014 by pumping at five different flow rates, ranging from 160 gpm to 355 gpm, for approximately one hour. The pump was left on after the 355 gpm step until 11:30 am on February 21, 2014, at which time the pump was shut

off. The drawdown observed at TW1 indicated a specific capacity of approximately 30 gpm per foot of drawdown. A hydrograph of data collected at TW1 during the step-drawdown test is shown on Graph 1 in Appendix III. Graph 2 in Appendix III shows hydrographs of TW1, JC1, and CC4 during the step test. As shown in the graph, drawdown was not observed at JC1 or CC4 during the 24-hour pumping event at TW1.

Based on the step-drawdown test, a new production well (PW1) was drilled and installed 100 feet north of TW1 (Figure 2) in March 2014. The drilling/well log for this well is included in Appendix II. Graph 3 in Appendix III shows hydrographs and barometric pressure data during the month of March, 2014. The drawdown observed at TW1 represents development efforts at PW1 on March 14 and 17, 2014. The barometric pressure data and the hydrograph at JC1 indicate a barometric efficiency of approximately 0.12 and a 10 to 14 hour lag, indicating potentially unconfined conditions at that location. The barometric pressure data and the hydrograph at TW1 indicate a barometric efficiency of approximately 0.19 and a relatively instantaneous effect, indicating confined conditions at that location.

2.0 AQUIFER TEST

2.1 Test Performance

Telemetric pressure transducers and dataloggers were used to collect continuous groundwater elevation data throughout the aquifer test. The top of casing elevation in feet AMSL at each well was estimated using a digital elevation model (DEM) and the stick up of the well casings. Pressure transducers manufactured by INW were installed and the depth of the sensor was calculated by adding the depth to water, as measured manually to the nearest 0.01 foot using an electronic water level indicator, to the sensor reading collected simultaneously with the manual water level. Subsequent groundwater level measurements collected at one- and five-minute intervals by the pressure transducers were then converted to feet AMSL for analysis of hydraulic head differences at the various monitoring wells. The pressure transducer cables were securely fastened to the well casing to avoid slippage during the test. An analog flow meter was used collect flow rate data throughout the testing.

An aquifer test with a duration of 169 hours (10,140 minutes) was performed at PW1 beginning on April 1, 2014. Data were recorded at the four wells shown on Figure 4. Pumping at PW1 was conducted at a rate of 730 gpm for 7 days until April 8, 2014. Although equilibrium conditions were not reached at the pumping well or the observation wells, the fact that the production well will not be used continuously for this length of time was considered to evaluate whether the aquifer was sufficiently stressed for testing purposes. Therefore, the pump was shut off and recovery data were collected until June 10, 2014. A total of 7,402,200 gallons of water were extracted during the aquifer test. Dataloggers were downloaded via telemetry throughout the testing. The data were imported into Summit's EPIPHINY[®] software, which is a data platform developed to enable an efficient method to reduce aquifer test data. Import routines for INW electronic files are available in EPIPHINY to populate a Microsoft[®] Access[®] database. The database is then linked to ESRI ArcGIS[®] and Aqua TrueVue[®] products for analysis and visualization.

2.2 Data Analysis/Results

Groundwater elevation and weather data collected during the aquifer test are presented in a Microsoft[®] Access[®] format on DVD in Appendix IV. The static water levels, water level prior to turning the pump off, and final recovery levels are presented below for each well:

Well	Static Water Level	Pumping Level	Final Recovery Level	Total Drawdown	Distance to PW1
	(feet MSL)	(feet MSL)	(feet MSL)	(feet)	(feet)
PW1	1706.83	1667.33	1708.93	39.50	0
TW1	1706.61	1674.00	1709.05	32.61	100
CC4	1739.02	1730.06	1737.32*	8.96	10,480
JC1	1698.45	1698.30	1699.50	0.15**	6,025

* Well was under pumping conditions at time of water level measurement

** Water level change most likely due to barometric pressure, not pumping at PW1

The maximum drawdown observed in the pumping well during the long term test was 39.5 feet, yielding a specific capacity of approximately 18 gpm per foot of drawdown after 169 hours of pumping at 730 gpm. The hydrographs of the pumping well (PW1) and each of the monitoring locations are presented on Graphs 4-8 in Appendix III. Graph 4 shows the response to pumping at PW1 at the three observation wells. Graph 5 and Graph 5A show the hydrograph at PW1 and depicts a classic response to pumping in a confined aquifer. While equilibrium conditions were not observed during the 7-day test, it is unlikely that the well will be pumped for this duration during the irrigation season.

Graph 6 shows the hydrograph at TW1, located approximately 100 feet south of PW1. The mirror image of drawdown and recovery at this location add validation to the data collected at PW1. Based on the data at TW1, the aquifer recharged approximately 50% within the first 50 hours of shutting off the pump, and over 75% within 7 days of ending the pumping phase of the test. While the remaining 25% of the recovery required an additional 2 weeks (not taking into account regional reduction in hydraulic head or barometric pressure changes), it is important to note that snow cover and frozen soils were present across the area during the recovery period. Moreover, less than 0.07 inches of precipitation fell prior to April 24, 2014, therefore, the recovery observed prior to this date likely represents rebounding pressure head within the confined system without significant recharge from connected shallower systems. The water level at TW1 on June 10, 2014 was 2.44 feet higher than at the start of the test, indicating significant recharge from the relatively late but wet spring conditions.

Graph 7 presents a hydrograph of the water levels at CC4, located approximately 2 miles northeast of PW1. The Claremont Colony graciously agreed to cease pumping at the well during the pumping phase of the aquifer test. The increase in water level prior/during the pumping start up on April 1, 2014 represents recovery in the well after turning off the pump. While the drawdown data are valuable in assessing the area of influence in the pumping well, the recovery data are less valuable because the pump at CC4 was restarted the day after the pump was shut off at PW1. The pump at this well is controlled by a variable frequency drive (VFD), which increases and decreases the pump speed based on demand. Therefore, the water levels shown on

Graph 7 represent recovery data as a result of turning the pump off at PW1 and, simultaneously, drawdown data from the pumping at CC4.

Graph 8 presents water level data collected at JC1, located approximately 1.1 mile to the northwest of PW1. The water level changes are indicative of changes in barometric pressure and the lack of impact from pumping at PW1 suggests that the shallower sand and gravel layers are not connected to the PCO aquifer in the immediate area.

Graph 9 presents both groundwater elevation and precipitation data for the time period between May 19, 2014 and June 10, 2014. These data document the increase in hydraulic head within both the shallower system (JC1) and the PCO in response to the precipitation in late May and early June, 2014. Graph 9a shows the same data at TW1 from May 26, 2014 to June 5, 2014. Groundwater elevations increased 0.2 feet over 5 days from May 26 to May 31, then increased an additional 0.3 feet over 2 days from May 31 to June 2, likely in response to the significant precipitation (2.17 inches) during that time. Based on the lack of a significant lag time between the precipitation event(s) and the increasing groundwater levels, it is likely that recharge may be occurring relatively close to the area of TW1.

Aquifer parameters were calculated using AquiferTest Pro 3.5 (Waterloo Hydrogeologic). The graphical calculations are included in Appendix V and are summarized below:

Well	Method	T ft ² /day	K ft/day	S unitless
PW1	Theis Recovery	8,190	228	NA
PW1	Cooper Jacob Time Drawdown	8,860	246	NA
TW1	Theis Recovery	8,710	242	NA
TW1	Cooper Jacob Time Drawdown	9,410	261	.0014
Average		8,892	244	0.0014

A saturated thickness (b) of 36 feet was used for the analysis, based on the drilling log at PW1. An average transmissivity value of 8,892 feet squared per day (ft²/day), an average hydraulic conductivity value of 244 feet per day (ft/day), and a storativity value of 0.0014 were calculated using the aquifer test data.

The planned use for the production well (PW1) involves intermittent pumping (assume 4 days per week) during the growing season (assume 16 weeks) per year and in most years would not be expected to reach a maximum of 67,276,800 gallons. Assuming a uniform aquifer thickness of 30 feet and a porosity of 30%, the maximum water required for one year of production would fit in a cylinder of the aquifer with a radius of approximately 535 feet (Figure 5). While it is not suggested that this is the only area contributing water to the production well, this graphic shows the relatively small storage area of the aquifer necessary to contain a year's worth of irrigation water.

A Cooper-Jacob Distance Drawdown method was used to estimate the distance to where drawdown would not be observed (r_0). Based on the drawdown observed at TW1 and CC4, the r_0 would be 60,000 feet or approximately 11.4 miles (See graph in Appendix V). Using a recharge rate between 0.15 (minimum) and 0.6 (maximum) inches of recharge per year, this would equate to approximately 1 to 4.2 billion gallons of water recharge within the area of influence for the proposed well. The total irrigation need should be less than 68 million gallons, which represents approximately 7% to 2% of the recharge within the radius of influence.

3.0 CONCLUSIONS

Based on analysis of the aquifer test, there appears to be an adequate groundwater supply for irrigation purposes, and the production well can produce more than 730 gallons per minute. Alternative water supplies do not appear to be necessary. The aquifer testing data indicate that the source aquifer can provide the rate and volume of water required by the irrigation system.

Well interference with domestic wells should not occur in excess of that observed during the test based on the aquifer test data. There appears to be over 180 feet of available drawdown at CC4, where almost 9 feet of drawdown (or 5% of the available drawdown) was observed during the test. If observed in the future, well interference can be mitigated by lowering pumps in affected wells.

Based on the aquifer test results and the depth of the aquifer, no adverse impacts to nearby surface water features are anticipated as a result of the future use of PW1 for irrigation purposes.

4.0 LIMITATIONS OF HYDROGEOLOGIC ASSESSMENT

4.1 Site Data and Related Records Review

Summit's opinions, conclusions and recommendations were based, in part, on information Summit obtained and evaluated from current sources including the client, property owners, former reports, and private, municipal, state and federal agencies. Verification of the authenticity or accuracy of this information is not warranted by Summit or included in Summit's scope of services.

4.2 Data Collection and Analysis

A scope of data collection and analysis was based primarily on information provided by the site data and related records review and reconnaissance, considering project time and budget restraints as determined in the scope of work. Parameters not included in the aforementioned scope of work were not identified or evaluated. The data obtained from discrete sample locations were used to infer conditions between sample locations, but no guarantee may be given that the inferred conditions exist because groundwater conditions between sample locations may vary significantly and because conditions at the time of data collection may also vary significantly with respect to groundwater elevations.

4.3 Final Report and Interpretation of Results

Summit's report was based upon Summit's observations made during the field activities, the information provided to Summit and the results of testing. This report was prepared in accordance with the proposal, scope of work, and Summit's General Conditions and Terms, and no other warranties, representations, or certifications are made.

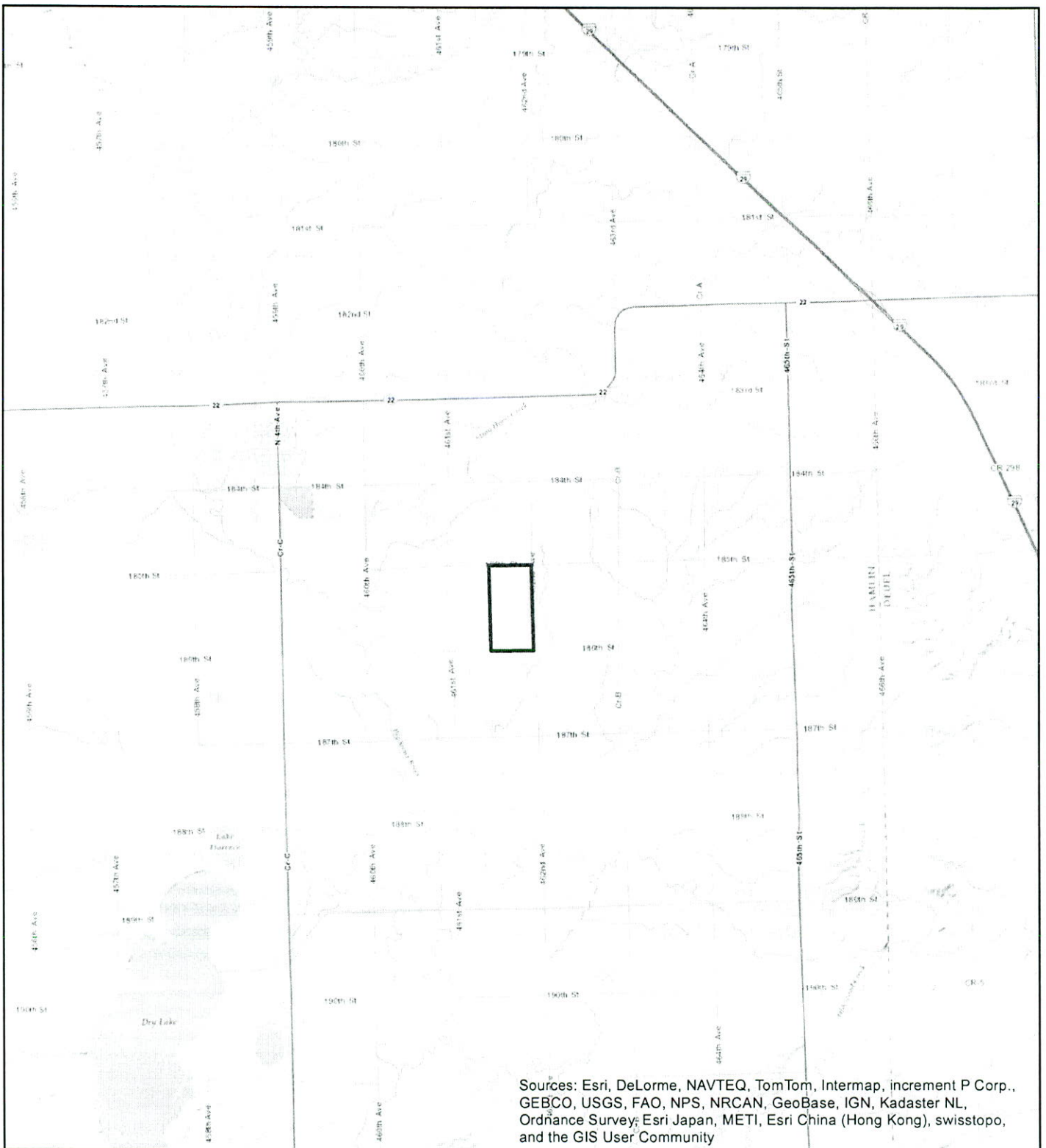
Summit Envirosolutions, Inc.

A handwritten signature in black ink, appearing to read "John E. Dustman". The signature is written in a cursive, flowing style with a large initial "J".

John E. Dustman

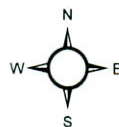
Principal Hydrogeologist

FIGURES



Legend

 Owen Peterson Property



0 1 2 Miles

SITE LOCATION

Owen Peterson Property
Hamlin County, South Dakota



Figure 1

File: 20140722_figure1
Summit Proj. No.: 2219-0001
Plot Date: 7-22-14
Arc Operator: JED
Reviewed by: BDJ



Legend

- Area Well < 101'
- ⊙ Area Well < 200'
- ⊕ Area Well > 200'
- Test Boring
- Cross Section Transect
- Owen Peterson Property



0 2,640 5,280 Feet

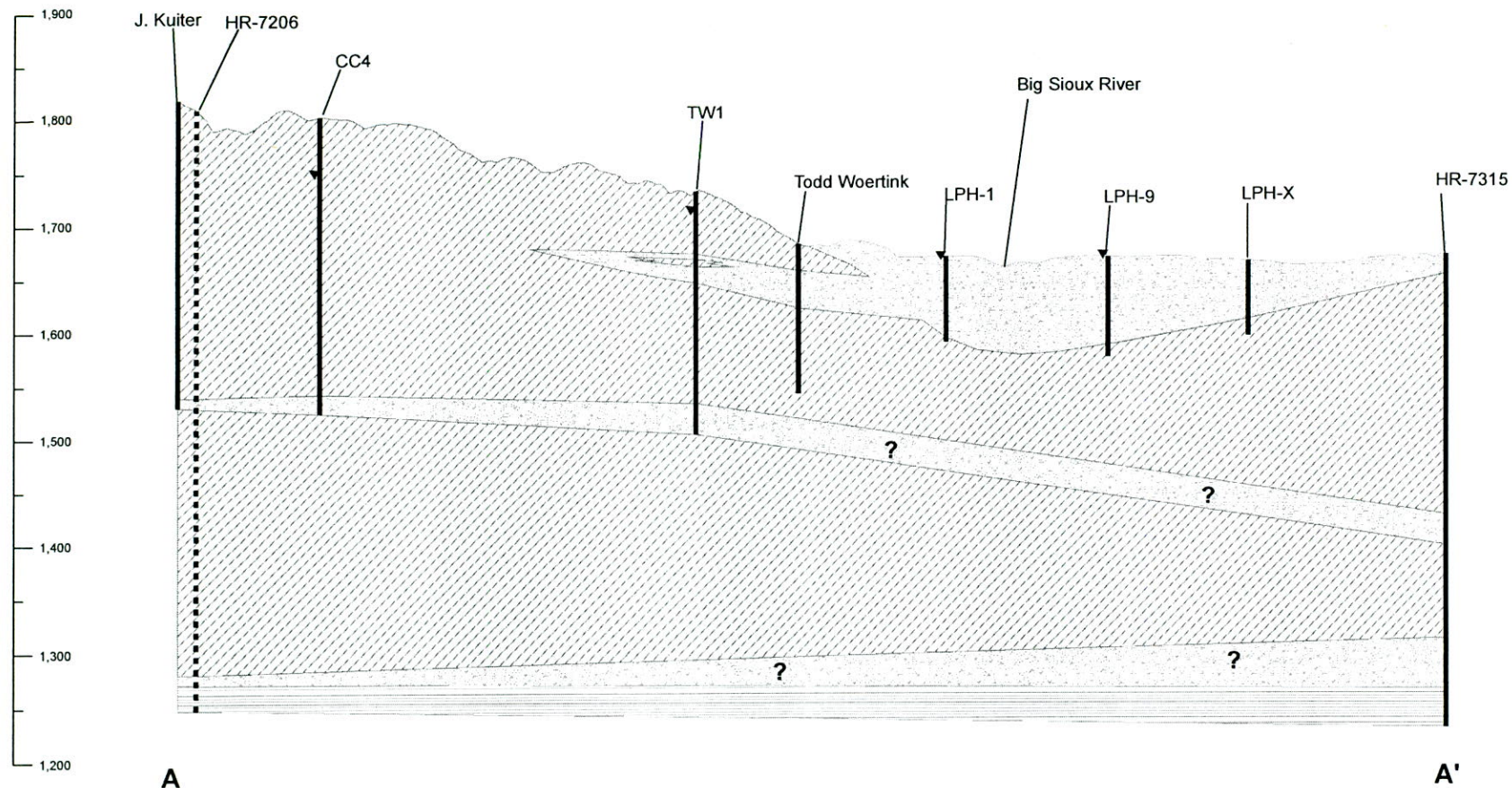
AREA WELLS/TEST BORINGS

Owen Peterson Property
Hamlin County, South Dakota



Figure 2

File: 20140722_figure2
Summit Proj. No.: 2219-0001
Plot Date: 7-22-14
Arc Operator: JED
Reviewed by: BDJ

NE
←SW
→Elevation
(ft amsl)

Elevations are based on 1/3 arc-second National Elevation Dataset Digital Elevation Model

Legend

- Borings and Wells
- - - Boring off Transect
- ▼ Water Levels

Lithology

- Clay/Till
- Sand and Gravel
- Shale

0 2 Miles

1 inch = 3,000 feet
Vertical Exaggeration = 30X

Figure 3

**CROSS-SECTION: A to A'**Owen Peterson Property
Hamlin County, South DakotaFile: Xsec.mxd
Summit Proj. No.: 2219-0001
Plot Date: 07/17/14
Arc Operator: RLA
Reviewed by: JED



Legend

- ⊗ Aquifer Test Well
- Owen Peterson Property



0 1,000 2,000 Feet

INSTRUMENTED WELLS

Owen Peterson Property
Hamlin County, South Dakota



Figure 4

File: 20140722_figure4
Summit Proj. No.: 2219-0001
Plot Date: 7-22-14
Arc Operator: JED
Reviewed by: BDJ



Legend

- ⊗ Aquifer Test Well
- Owen Peterson Property



0 500 1,000 Feet

AREA OF AQUIFER - 1 YEAR OF PUMPING

Owen Peterson Property
Hamlin County, South Dakota



Figure 5

File: 20140722_figure5
Summit Proj. No.: 2219-0001
Plot Date: 7-22-14
Arc Operator: JED
Reviewed by: BDJ

Table 1
Area Test Boring/Well Information
Owen Peterson Aquifer Test
Hamlin County, South Dakota

Map #	SiteID	X (m)	Y (m)	Elevation (ft amsl from DEM)	Depth (ft)	Screened Interval (ft)
1	Ching, Wilbur	658730	4954321	1777	257	Not reported
2	HA-72-58	657113	4953468	1719	26	N/A
3	Rasch, Robert	657738	4953730	1725	51	Not reported
4	R20-84-149	657894	4953527	1725	32	N/A
5	HA-X	657894	4953443	1723	21	N/A
6	HA-74-48	659482	4953866	1711	54	N/A
7	HN-77L	659495	4953501	1701	35	N/A
8	HA-73-42	659517	4953533	1702	35	N/A
9	HA-73-43	660680	4953548	1713	30	N/A
10	J. Kuiter	663143	4953660	1819	288	N/A
11	HA-X	657912	4952693	1707	27	N/A
12	Ching, Larry	660351	4952718	1761	100	N/A
13	CC4	662106	4953090	1802	278	261 - 278
14	Claremont Colony3	662337	4953194	1809	100	N/A
15	Claremont Colony2	661960	4952792	1793	100	N/A
16	HR-7206	664352	4952490	1750	500	N/A
17	HN-63A	658021	4951866	1681	25	Not recorded
18	Water Rights	658369	4951884	1681	12	N/A
19	HA-73-41	659457	4951936	1740	25	N/A
20	JC1	659540	4952081	1750	100	Not reported
21	R20-84-191	664174	4952056	1740	18	4 - 14
22	HA-73-36	657971	4951311	1673	27	N/A
23	Rhody, Virgil3	658365	4951518	1685	140	123 - 140
24	Rhody, Virgil2	658798	4951107	1731	66	58 - 63
25	Rhody, Virgil	659143	4951520	1726	125	N/A
26	V. Rhody	658624	4950399	1677	66	58 - 63
27	HA-72-62	658789	4950314	1680	27	N/A
28	Empire Irrigation	659235	4950249	1690	45	N/A
29	HA-73-40	659504	4950314	1693	25	N/A
30	Nolte, Reid	659817	4950510	1700	80	63.5 - 70.5
31	PW1	660313	4950414	1733	227	197 - 227
32	TW1	660313	4950383	1732	228	200 - 228
33	R20-84-194	661090	4950356	1728	27	N/A
34	HA-74-57	662163	4950418	1753	29	N/A
35	R20-84-195	663531	4950448	1713	23	9 - 19
36	V. Rohdy	658505	4950002	1672	20	N/A
37	Rhody, Virgil4	658435	4949848	1671	88	Not reported
38	Rhody, Virgil5	659183	4949897	1677	39	29 - 39
39	Woertink, Todd	659787	4949766	1683	140	N/A
40	Poinsett Colony	662023	4949555	1724	32	22 - 32
41	Claremont Colony	661845	4949336	1734	25	15 - 25

Table 1
Area Test Boring/Well Information
Owen Peterson Aquifer Test
Hamlin County, South Dakota

42	LPH-6	657179	4948628	1681	64	N/A
43	Pearson, Lynn	657809	4948902	1671	80	38 - 58
44	LPH-8	657994	4948594	1671	17	N/A
45	Janssen, Wayne	658418	4949114	1671	80	40 - 80
46	LPH1	659082	4948711	1671	78	N/A
47	LPH-2	659600	4948758	1689	14	N/A
48	L. Mennenga	660908	4948420	1685	40	N/A
49	HA-X	661221	4948730	1712	12	N/A
50	R20-84-193	661222	4948708	1710	27	N/A
51	R20-84-196	664392	4948858	1709	27	N/A
52	HA-74-47	664619	4948848	1704	29	N/A
53	LPH-7	657181	4947860	1675	94	N/A
54	LPH9	658026	4947824	1671	94	N/A
55	Poinsett Colony2	658863	4947807	1664	43	28 - 43
56	L. Mennenga	660872	4947685	1677	45	N/A
57	Mennenga, Lewis	660870	4947539	1673	40	N/A
58	L. Mennenga	660931	4947495	1674	40	N/A
59	R20-94-11	656947	4947024	1671	17	6.45 - 16.45
60	R20-94-12	656973	4947025	1671	18	9.2 - 19.52
61	R20-2009-03	656976	4947027	1671	22	8 - 18
62	LPHX	657213	4947010	1671	74	N/A
63	LPH-17	658021	4947006	1668	17	N/A
64	HA-19	658785	4947065	1661	19	N/A
65	Claremont Colony5	659456	4947313	1668	34	26 - 34
66	LPH-10	659657	4947158	1671	59	N/A
67	HA-72-64	661242	4947119	1681	17	N/A
68	LPH-11	661276	4947142	1682	69	N/A
69	R20-84-198	661976	4947150	1702	22	N/A
70	HR-7315	656422	4945395	1673	440	N/A
71	R20-84-197	664496	4947239	1681	22	N/A
72	R20-94-10	656988	4947025	1671	25	N/A

Notes: Coordinate system for wells is UTM Zone 14 North, NAD 83, meters
N/A = Not applicable (test borings)

APPENDICES

APPENDIX I

Report to the Chief Engineer and Chief Engineer's Recommendation



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



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

January 21, 2014

Owen & Lamont Peterson
PO Box 97
Wendell MN 56590

Dear Sirs:

Water Permit Application No. 7921-3 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 Hamlin County Herald Enterprise printed at Hayti SD (Ph # 605-793-3636) and the Public Opinion printed at Watertown SD (Ph # 605-886-6901). You will need to contact the newspaper(s) 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(s) to authorize publication of your Notice and to arrange for payment. Early contact with the paper(s) can eliminate delays. Upon receiving authorization from you, the publisher has been instructed to publish your notice. 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.



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



January 21, 2014

Hamlin County Herald Enterprise
PO Box 207
Hayti SD 57241

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7921-3 to Appropriate Water. Please publish the notice once on January 29, 2014. 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 and arrange for payment. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Owen & Lamont Peterson, PO Box 97, Wendell MN 56590 (Ph # 218-639-2931).

Please send the Water Rights Program an affidavit or the enclosed Proof of Publication form immediately.

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



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



January 21, 2014

Public Opinion
PO Box 10
Watertown SD 57201

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7921-3 to Appropriate Water. Please publish the notice once on January 29, 2014. 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 and arrange for payment. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Owen & Lamont Peterson, PO Box 97, Wendell MN 56590 (Ph # 218-639-2931).

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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

Instruction to Newspaper – Publish the Notice on January 29, 2014. The applicant is responsible for payment. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352 or email: Karen.schlaak@state.sd.us.

NOTICE OF HEARING on Application No. 7921-3 to Appropriate Water

Notice is given that Owen & Lamont Peterson, PO Box 97, Wendell MN 56590 have filed an application for a water permit to appropriate 2.44 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (228 feet deep) located in the SW 1/4 SE 1/4 Section 8 for irrigation of 316.48 acres located in the E 1/2 Section 8; all in T114N-R51W.

SDCL 46-2A-4(10) provides that "if the applicant does not contest the recommendation of the Chief Engineer and no petition to oppose the application is received, the Chief Engineer shall act on the application pursuant to the Chief Engineer's recommendation and no hearing may be held before the board, unless the Chief Engineer makes a finding that an application, even if uncontested, presents important issues of public policy or public interest that should be heard by the board." In this case, the Chief Engineer finds that this application presents important issues of public interest that should be heard by the Water Management Board.

X Pursuant to SDCL 46-2A-2, the Chief Engineer recommends DEFERRAL of Application No. 7921-3 for one year to allow an aquifer pump test to be completed by the applicant to allow evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued.

The Water Management Board will consider this application at 9:30 a.m. on March 6, 2014 in the Matthew Training Center, Joe Foss Bldg, 523 E. Capitol Ave. Pierre SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing.

Any interested person who intends to participate in the hearing shall file a petition to oppose or support the application and the petition shall be filed with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to 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 February 24, 2014. The petition may be informal, but shall be in writing and shall 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. The hearing is an adversary proceeding and any party has the right to be present at the hearing and to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised at the hearing and decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law.

The March 6, 2014 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any person who has filed a petition to oppose or support the application. The request for an automatic delay must be filed by February 24, 2014. If an automatic delay is requested, the hearing will be rescheduled for a future Board meeting and personal notice will be provided to all petitioners regarding the time, date and location.

Contact Eric Gronlund by February 24, 2014 at the above Chief Engineer's address to request copies of the staff report, recommendation, application or other information. Notice is given to individuals with disabilities that this hearing is being held in a physically accessible place. Please notify the Department of Environment and Natural Resources at least 48 hours before the hearing if you have a disability for which special arrangements must be made at the hearing. The telephone number for making arrangements is (605) 773-3352.

Under SDCL 1-26-17(7) notices must state that "if the amount in controversy exceeds \$2,500.00 or if a property right may be terminated, any party to the contested case may require the agency to use the Office of Hearing Examiners by giving notice of the request to the agency no later than ten days after service of a notice of hearing issued pursuant to SDCL 1-26-17." This is a Notice of Hearing, service is being provided by publication, and the applicable date to give notice to the Chief Engineer is February 10, 2014. However, since this particular matter is a water permit application and not a monetary controversy in excess of \$2,500.00 or termination of a property right the Chief Engineer disputes the applicability of this provision and maintains that the hearing must be conducted by the Board.

As applicable, the following provides the legal authority and jurisdiction under which the hearing will be held and the particular statutes and rules pertaining to this application: SDCL 1-26-16 thru 1-26-28; SDCL 46-1-1 thru 46-1-9, 46-1-13 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-17; 46-2A-1 thru 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21, 46-2A-23; 46-5-1.1, 46-5-2 thru 46-5-26, 46-5-30.2 thru 46-5-30.4, 46-5-31 46-5-32 thru 46-5-34.1, 46-5-38 thru 46-5-39, 46-5-46, 46-5-47, 46-5-49; 46-6-1 thru 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-21, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:25.02; 74:02:01:35.01.

Steven M. Pirner, Secretary, Department of Environment and Natural Resources. Published once at an approximate cost of _____.



**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 7921-3, Owen and Lamont Peterson**

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. 7921-3, Owen and Lamont Peterson, PO Box 97, Wendell MN 56595.

The Chief Engineer is recommending DEFERRAL of Application No. 7921-3 for one year to allow an aquifer pump test to be completed by the applicant to allow evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued.

See report on application for additional information.

Jeanne Goodman, Chief Engineer
January 21, 2014

REPORT TO THE CHIEF ENGINEER

WATER PERMIT APPLICATION NO. 7921-3

OWEN AND LAMONT PETERSON

December 9, 2013

Water Permit Application No. 7921-3 proposes to divert groundwater at a maximum rate of 2.44 cubic feet per second (cfs) from a single well to be completed into the Prairie Coteau aquifer. The well is expected to reach a depth of approximately 226 feet and will be located in the SW ¼ SE ¼ of Sec 8, T114N-R51W approximately 250 feet north and 2,500 feet west of the southeast corner of Section 8. The water will be used to irrigate 316.5 acres in the E ½ of Section 8, T114N-R51W in Hamlin County.

AQUIFER: Prairie Coteau aquifer (PCO)

GEOLOGY AND AQUIFER CHARACTERISTICS

The Prairie Coteau aquifer consists of pockets of outwash buried in a thick layer of glacial drift. The Prairie Coteau aquifer includes the pockets of outwash that are too deep to be connected to the surface/near surface waters of the Big Sioux aquifer but are not so deep as to connect to the Altamont aquifer at the base of the glacial drift (Kume, 1985). The Prairie Coteau aquifer is largely non-continuous, and much of its area consists of small disconnected aquifers separated by layers of clayey till and enclosed within a thick section of till.

The Prairie Coteau aquifer varies in thickness between 4 and 144 feet with an average of about 47 feet and usually consists of several beds on top of one another rather than a continuous section of gravel and sand. The well log submitted with this application identifies sand and gravel from 199-226 feet below the ground surface. This portion of the Prairie Coteau aquifer is under confined conditions.

SDCL 46-2A-9

Pursuant to SDCL 46-2A-9, a permit to appropriate water may be issued only if there is a reasonable probability that there is unappropriated water available for the applicant's proposed use, that the proposed diversion can be developed without unlawful impairment of existing rights and that the proposed use is beneficial and in the public interest. This report will address the availability of unappropriated water and the effect on pertinent existing rights which appropriate water from this aquifer.

WATER AVAILABILITY

This application proposes to divert 2.44 cfs from the Prairie Coteau aquifer. The probability of unappropriated water available from an aquifer can be evaluated by considering SDCL 46-6-3.1, which states "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source." If the source of the water is older or lower than the greenhorn formation and a public water system has applied for a permit, the Board need not consider the recharge/withdrawal issue. Here, a public water system is not involved and the

aquifer is not older or lower than the greenhorn formation therefore withdrawal/recharge issue must be considered.

In interpreting 46-6-3.1, the First Judicial Circuit Court ruled in *Hanson County Dairy v. Bender* that evidence must show the average annual recharge exceeds the average annual discharge by at least the amount requested by the water permit application being considered (Memorandum Decision, April 11, 2012). This necessitates the identification and quantification of recharge and discharge of the individual outwash deposits of the Prairie Coteau aquifer from which the applicant proposes to withdraw water.

Since the Prairie Coteau aquifer consists of many small and often hydraulically disconnected aquifers, generalizations about the recharge characteristics or size of specific "pockets" of the aquifer are not useful in describing recharge characteristics of the portion associated with this application. Specific information regarding thickness and areal extent of this portion of the Prairie Coteau aquifer is required to make a technically defensible decision as to whether to recommend approval or deferral of this application.

Using a recharge rate of 0.15-0.60 inches per year (Hedges et al., 1985), and assuming an application rate of 10 inches per year, the areal extent of the aquifer would need to be between 8.2 (at 0.6 inches per year of recharge) and 33.0 (at 0.15 inches per year of recharge) square miles.

The Water Rights Program does not have any observation wells completed into this portion of the Prairie Coteau aquifer to evaluate recharge/discharge. The test hole drilled for this application was not cased and will not be available for use as an observation well. Lithological records in the area are extremely limited and most do not extend to the depth of interest (1,484 feet). Although two records, located approximately three miles to the east and three miles to the north do show water bearing material at the same depth as the test hole information submitted with this application, this data is insufficient to determine the areal extent of the formation in question. Other lithological records in the area, specifically those to the south and west (at a distance of approximately five miles in both instances) show uninterrupted clay at the depth of interest. Two records in close proximity to each other and approximately 2.5 miles to the northeast of the proposed diversion site show an interval of gravel extending down to 1,520 and 1,527 feet above sea level, but the records do not extend past 1,520 and 1,527 feet (respectively) to the depth of interest. Continuing north past the record which does indicate water bearing material at the depth of interest, the next record of sufficient depth is approximately six miles from the proposed diversion site and shows clay at the depth of interest. Similarly, continuing east, records also indicate clay at the depth of interest in a record located approximately seven miles from the proposed diversion site. The lithological records in the area show that any continuation of the deposit addressed in this application ceases within approximately a five to seven mile radius of the proposed diversion site. It is not clear how far the deposit extends within those five to seven miles.

No other applications have been submitted proposing to divert water from this formation. Consequently, no irrigation logs are available to show current or past use of water from this formation. Information is not available to delineate the areal extent of the outwash from which this application proposes to divert water. Consequently, it is not possible to evaluate recharge and withdrawal from this portion of the Prairie Coteau aquifer at this time.

EXISTING WATER RIGHTS

There is one existing water permit in Hamlin County which is diverting water from a sand and gravel deposit identified as the Prairie Coteau aquifer, although Water Permit No. 7673-3 (located in Clark County) diverts water from a portion of the Prairie Coteau aquifer that extends into Hamlin County (Water Rights, 2014b). As stated above, insufficient data is available to delineate the areal extent or the interconnectedness of that portion of the aquifer to the deposit in this application and other deposits in the area within the Prairie Coteau aquifer. Therefore, it is unknown as to whether this existing diversion is accessing the same deposit as this application. Consequently, the effects of pumping on existing water rights/permits cannot be determined.

Previous applications for water rights permits have been approved on the basis of known areal extents of the portions of the Prairie Coteau being applied for (primarily from lithological records) or from sufficient observation well data to observe recharge characteristics. In this case, further information to delineate the areal extent of the aquifer such as additional drilling (providing lithological records) or an aquifer test is required for an informed evaluation as to whether sufficient water is available for the proposed diversion.

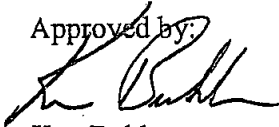
CONCLUSIONS

- 1) The application proposes to appropriate 2.44 cfs for irrigation.
- 2) From the best information reasonably available, the probability of unappropriated water available from the Prairie Coteau aquifer for the proposed appropriation cannot be determined.
- 3) Because a record of observation well measurements is not available, the probability of unappropriated water available from the Prairie Coteau aquifer from the proposed appropriation cannot be evaluated.
- 4) Since there are no other water rights/permits completed into this formation, adverse effects on existing diversions are not an issue when evaluating this application.
- 5) An aquifer pump test including monitoring wells should be conducted to aid in the evaluation of this portion of this aquifer.



Bracken Capen
SD DENR-Water Rights Program

Approved by:



Ken Buhler
SD DENR-Water Rights Program

REFERENCES

- Hedges, L.S., Allen, J., and Holly, D.E. 1985. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa. Task 7: Ground Water Recharge. South Dakota DENR-Geological Survey, Vermillion, SD.
- Kume, J. 1985. Water Resources of Deuel and Hamlin Counties, South Dakota. Water-Resources Investigations Report 84-4069. USGS, Huron SD.
- Geological Survey. 2014. Lithologic Logs Database, South Dakota Department of Environment & Natural Resources Geological Survey, Vermillion, South Dakota.
- Water Rights. 2014a. Observation Well Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.
- Water Rights. 2014b. Water Right/Permit Files, SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, South Dakota.

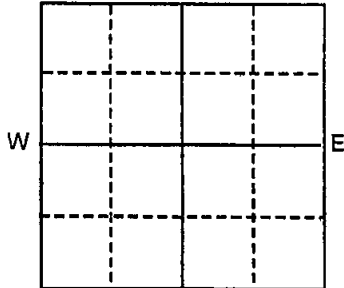
APPENDIX II

Area Drilling/Well Logs

SOUTH DAKOTA WATER WELL COMPLETION REPORT

Location SW ¼ SE ¼ Sec 8 Twp 114N Rg 51WCounty Hamlin

North

Please mark well
location with an "X"

Well Completion Date

October 8, 2013

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
50.0 ft. from septic (Identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test holes
☒ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	<u>6.00</u> IN	<u>0.0</u> FT	<u>200.0</u> FT	<u>9.88</u> IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Bentonite</u>	<u>18</u>	Lb/gal	<u>0.0</u> Ft	<u>196.0</u> Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
tremie piped

SCREEN:

☒ Perforated pipe ☐ Manufactured
 Diameter 6.00 Inches Length 28.0 Feet
Material PVCSlot Size .030 Set From 200.0 Feet to 228.0 Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? chlorinated
☐ No, Why Not?
Lab to which water
quality sample sent for analysis

n/a

Well Owner: Owen Peterson

Business Name:

Address: PO Box 97City, State, Zip: Wendell MN 56590

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Black top soil	0	1
Brown clay & rocks	1	50
Blue clay	50	59
Brown gravel/sand	59	64
Brown yellow clay/gravel	64	71
Yellow brown gravel/sand	71	86
Blue clay	86	190
Blue brown clay/gravel	190	199
Mixed color gravel/sand	199	228

STATIC WATER LEVEL 25.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: ☐ Bailed
☐ Other

Pumping Level Below Land Surface

26.4 Ft. After 4.0 Hrs. pumped 100.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

GPS: N 44 41.332
W 096 58.613This well was drilled under license # 475 and this report is true and accurate.Drilling firm: Thein Well Co., Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date: _____

Lithologic Logs Search for: *lithhead.location like 114N51W02CBCC*

Record 1 of 1

Location Information

Legal Location:	SW SW NW SW SEC. 02, T. 114 N., R. 51 W.		
County:	HAMLIN	Location:	114N51W02CBCC
Basin:	BIG SIOUX	Latitude:	44° 42' 25.00" N
Hydrologic Unit Code:	10170202	Longitude:	96° 55' 31.00" W
Land Owner:	Ground Surface Elev. (ft.): 1749 T		

Project Information

Project:	HAMLIN COUNTY STUDY		
Drill Date:	08/29/1972	Geologist:	D. BEISSEL
Company:	SDGS	Geologist's Log:	X
Drilling Method:	ROTARY	Driller:	
Test Hole Number:	HR-7206	Driller's Log:	

Total Drill Hole Depth (ft.): 500.0

Geophysical Information

Spontaneous X
Potential:
Single Point X
Resistance:

Lithologic Information

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1749.0 - 1747.0	0.0 - 2.0	TOPSOIL, BLACK
1747.0 - 1744.0	2.0 - 5.0	GRAVEL, COARSE
1744.0 - 1729.0	5.0 - 20.0	CLAY, YELLOW, SILTY, PEBBLY (TILL)
1729.0 - 1719.0	20.0 - 30.0	CLAY, GRAY, GRAVELLY (TILL)
1719.0 - 1701.0	30.0 - 48.0	CLAY, GRAY, PEBBLY (TILL)
1701.0 - 1681.0	48.0 - 68.0	CLAY, GRAY, SILTY (LAKE DEPOSIT)
1681.0 - 1659.0	68.0 - 90.0	CLAY, GRAY, PEBBLY (TILL)
1659.0 - 1570.0	90.0 - 179.0	CLAY, YELLOW; OXIDIZED (TILL)
1570.0 - 1557.0	179.0 - 192.0	SAND AND GRAVEL, MEDIUM TO COARSE
1557.0 - 1547.0	192.0 - 202.0	CLAY, YELLOW; SAND, PEBBLY (TILL)

1547.0 - 1507.0	202.0 - 242.0	CLAY, GRAY, PEBBLY, SHALEY; GRAVEL STRINGERS IN SPOTS (TILL)
1507.0 - 1495.0	242.0 - 254.0	GRAVEL
1495.0 - 1432.0	254.0 - 317.0	CLAY, GRAY, PEBBLY, SHALEY; GRAVEL STRINGER FROM 263 TO 266 FEET
1432.0 - 1282.0	317.0 - 467.0	CLAY, GRAY, ALSO ABOUT 50 PERCENT YELLOW, SOME WHITISH, GRAVELLY (MARL?)
1282.0 - 1273.0	467.0 - 476.0	SAND AND GRAVEL(?)
1273.0 - 1259.0	476.0 - 490.0	CLAY, GRAY, SILTY, MARLY, SHALEY (TILL)
1259.0 - 1249.0	490.0 - 500.0	SHALE

Lithologic Logs Search for: *lithhead.location like 114N51W04AA*

Record 1 of 1

Location Information

Legal Location:	NE NE SEC. 04, T. 114 N., R. 51 W.		
County:	HAMLIN	Location:	114N51W04AA
Basin:	BIG SIOUX	Latitude:	44° 42' 56.00" N
Hydrologic Unit Code:	10170202	Longitude:	96° 56' 52.00" W
Land Owner:	CLAREMONT COLONY	Ground Surface Elev. (ft.):	1798 T

Project Information

Project:			
Drill Date:	06/15/1987	Geologist:	
Company:	PULLMAN WELL DRILLING	Geologist's Log:	
Drilling Method:	ROTARY	Driller:	
Test Hole Number:		Driller's Log:	X
		Total Drill Hole Depth (ft.):	278.0

Well Information

SDGS Well Name:			
Water Rights Well:			
Other Well Name:	PRIVATE	Casing Top Elev. (ft.):	
Casing Type:	PVC	Casing Diameter (in.):	
Screen Type:	PVC, MFG.	Screen Length (ft.):	17.0
Total Casing and Screen (ft.):	278.0	Casing Stick-up (ft.):	
Well Maintenance Date:			

Geophysical Information

Notes

SCREEN FROM 261 TO 278, SLOT SIZE .050. STATIC WATER LEVEL 60 FEET.

Lithologic Information

<u>Elevation (ft.)</u>	<u>Depth (ft.)</u>	<u>Description</u>
1798.0 - 1758.0	0.0 - 40.0	CLAY, YELLOW
1758.0 - 1678.0	40.0 - 120.0	CLAY, BLUE
1678.0 - 1658.0	120.0 - 140.0	CLAY, BLUE; WITH SAND
1658.0 - 1618.0	140.0 - 180.0	CLAY, BLUE
1618.0 - 1558.0	180.0 - 240.0	CLAY, YELLOW
1558.0 - 1538.0	240.0 - 260.0	CLAY, BLUE
1538.0 - 1528.0	260.0 - 270.0	SAND, MEDIUM
1528.0 - 1520.0	270.0 - 278.0	SAND AND GRAVEL; GOOD

A. I. M. C. - 11

Well Owner:
Name William Ching
Address RR1 Cassbrook SD 57203

2 miles east
of Castlewood S.D.

County _____
 Twp. 115N Rg. 51W

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

☒ Forward Rotary ☐ Bored ☐ Jetted
☒ Reverse Rotary ☐ Cable ☐ Other

Diameter of Hole 5"
Depth 28.7
Casing ☐ Steel ☐ Concrete
☒ Plastic ☐ Other
If other, specify

Was casing end left open yes
Was a well screen installed yes
Describe Well Screen
Diameter 5" Material plastic
Slot size 0.015
Was well gravel packed yes
Was well grouted yes
Was water sample taken no

Static water level 80 below land surface
If flowing: closed in pressure _____ PSI
rate of flow _____ GPM

If other; specify _____

☒ Pumped 156AM
☐ Bailed Describe: _____
☐ Other _____

Pumping Level Below Land Surface					
ft. After		Hrs. pumped		GPM	
_____	" "	_____	" "	_____	" "
_____	" "	_____	" "	_____	" "

[illegible]

(Use Back if Necessary)

Date Completed: 6/17/81

Driller: Lee Well Drilling Inc. #63
Driller's or Firm's Name License NO.

RR2 Box 159A Millbank S.D.
Address

Signed By Daniel D. [Signature] Date 6/25/81

Remarks:

11-02

Date: 6-15-03

9-29-03

Date: 11-26-99

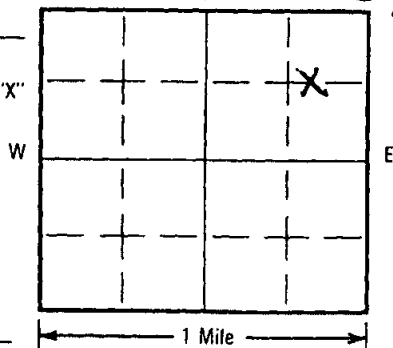
1-North

SOUTH DAKOTA WATER WELL COMPLETION REPORT

07-92

Location 1/4 1/4 Sec 4 Twp Demp Rg 114 S 51
County Hamlin

Please mark well location with an "X"



Well Completion Date

Oct = 13th - 99

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? 1000 ft. from Lagoon (identify source).PROPOSED USE: Geothermal Heating & Cooling

- ☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary Mud

CASING DATA: ☐ Steel ☐ Plastic ☐ OtherIf other describe Geothermal Pipe 3/4" SDR-11

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
____ LB/FT	____ IN	____ FT	____ FT	____ IN
____ LB/FT	____ IN	____ FT	____ FT	____ IN
____ LB/FT	____ IN	____ FT	____ FT	____ IN

GROUTING DATA

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Benseal</u>	<u>5</u>	<u>9.2</u> lb./gal	<u>0</u> ft	<u>100</u> ft

Describe grouting procedure Tremie Pipe from Bottom up.SCREEN: ☐ Perforated pipe ☐ ManufacturedDiameter _____ IN Length N/R FEET

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information _____

WAS A PACKER OR SEAL USED? ☐ YES ☐ NOIf so, what material? N/R

Describe packer(s) and location? _____

DISINFECTION: Was well disinfected upon completion?

____ YES, How: _____

____ NO, Why Not? _____

Laboratory sent to for water quality analysis

N/RWell Owner: Jonathon Wallman Jr.Business Name: Claremont ColonyAddress: RR #2 Box 132A
Castlewood, S.D. 57223

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top Soil, Black	0	2
Yellow Clay	2	6
Grey clay	6	20
Grey Clay - Sand & Gravel	20	100

STATIC WATER LEVEL N/R Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced Flowrate _____ GPM

Can well be completely shut in? _____

WELL TEST DATA:

☐ Pumped Describe: N/R☐ Bailed _____☐ Other _____

Pumping Level Below Land Surface

____ ft. After _____ Hrs. pumped _____

____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

6 Geothermal wells

This well was drilled under license # 672

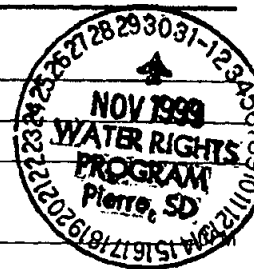
And this report is true and accurate.

Drilling firm Millbrook Industries

Signature of License Representative:

Conelin Waldner

Signature of Well Owner or Equitable Property Holder:

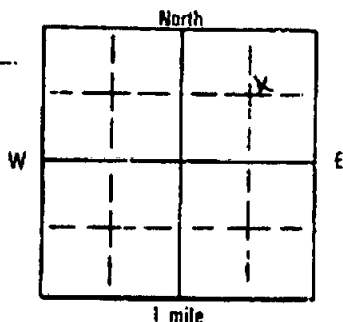
Jonathon WallmanDate: 11-26-99

SOUTH DAKOTA WATER WELL COMPLETION REPORT

10-85

Location NE 1/4 Sec 4 Twp 114 N Rg 51 WCounty Hamlin

Please mark well location with an "X"

Well Completion Date 6-15-87

PROPOSED USE:

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

Method of Drilling:

Forward Rotary

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	IN	0	FT 261	FT 18
LB/FT	IN		FT	FT
LB/FT	IN		FT	FT
LB/FT	IN		FT	FT

GROUT:

Was the well grouted? ☒ YES ☐ NOTo what depth? 20 FEET

What is grouting material?

If cement, number of sacks? 25

Describe grouting procedure _____

What was grout weight? _____ LB/GAL

SCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 8" IN Length 17 FEETMaterial SSSlot Size 2050 Set From 261 Feet To 278 Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Other information _____

Was a packer or seal used? ☒ YES ☐ NOIf so, what material? Sand

Describe packer(s) and location? _____

Well Owner: ChapmanName Chapman ColonyAddress Castlewood, S.D.Well Log: R.R. 2 Box 132ADepth 57223

Formation

Formation	From	To
yellow clay	0	40
Blue Clay	40	120
blue clay w sand	120	140
Blue Clay	140	180
yellow clay	180	240
Blue Clay	240	260
med sand	260	270
good sand & gravel	270	278

STATIC WATER LEVEL 60 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

If other: capacity _____

Can well be completely shut in? _____

WELL TEST DATA:

☒ Pumped☐ BailedDescribe: Sub☐ Other

Pumping Level Below Land Surface

73 ft. After _____ Hrs. pumped 287 GPM73 ft. After _____ Hrs. pumped 287 GPM73 ft. After _____ Hrs. pumped 287 GPM

REMARKS:

This well was drilled under license # 440

And this report is true and accurate.

Drilling firm Pullman Well Drilling

Signature of License Representative: _____

SOUTH DAKOTA WATER WELL COMPLETION REPORT

6606-3

11-02

Location SE 1/4 SE 1/4 Sec 19 Twp 114 Rg 51

County

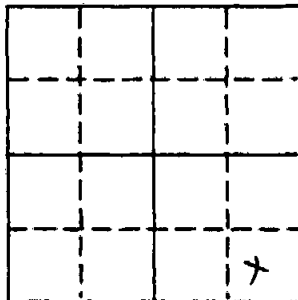
Hamlin

North

Please mark well
location with an "X"

W

E



Well Completion Date

4/26/2005

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? ft. from _____ (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☒ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Reverse

CASING DATA:

☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	16.00 IN	0.0 FT	26.0 FT	24.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Cement	54	Lb/gal	0.0 Ft	20.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
line

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 16.00 Inches Length 8.0 FeetMaterial Stainless SteelSlot Size .057 Set From 26.0 Feet to 34.0 Feet

Other information

WAS A PACKER OR SEAL USED?

☒ Yes ☐ NoIf so, what material? Pearock

Describe packer(s) and location

@26

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? Pellets☐ No, Why Not?Lab sample sent to for
water quality analysisWell Owner: Claremont Colony

Business Name: _____

Address: RR 2 Box 132ACity, State, Zip: Castlewood SD 57223

WELL LOG:

DEPTH

FORMATION	FROM	TO
Top Soil	0	2
Med Yellow Gravel	2	10
Coarse Yellow Gravel	10	30
Coarse White Gravel	30	34
Yellow Clay	34	

STATIC WATER LEVEL

12'

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: w/ Turbine☐ Bailed☐ Other

Pumping Level Below Land Surface

27.0 Ft. After 4.0 Hrs. pumped 600.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

This well was drilled under license # 440

And this report is true and accurate.

Drilling firm: Pullman Well Drilling Inc

Signature of License Representative:

Ken Pullman

Signature of Well Owner or Equitable Property Holder:

RECEIVED

JUN - 8 2005

WATER RIGHTS
PROGRAMDate: 6-6-05

NOTICE OF WELL CONSTRUCTION

(1) WELL CONSTRUCTION

Location of well: 1/4 1/4 SW Section 18 Township 114 Range 51
 Well owner: Wayne Jansson (Name) Christwood, S.D. (Address)
 Date well drilling completed: 6/8/76 Purpose of well: Irrigation
 (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	ft.
0-2	top soil	38	
2-20	sand & gravel	Depth to static water level	
20-35	clay	Name of producing aquifer (if known):	sand & gravel
35-55	yellow gravel	Total depth of drill hole	80
55-80	sand & gravel	Depth to bottom of casing	80
		Casing information: In the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.	
		0-16' 16" Fiberglass	
		Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.	
		10-80' 16" Fiberglass	
		If a flowing well, flow of completed well _____ U.P.M.	

Attach sheet if more space is needed

Empire Irrigation Drilling Co.
 Name of Drilling Contractor Inc.

(2) PUMP INSTALLATION

Company name and size of pump: Fairbank-Morse 6" HP 40
 Type of pump: turbine Capacity of installed pump: supposed 500 G.P.M.
 Depth of pump placement: 60 ft., Date of pump installation: 6/1/76

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____.

Empire Irrigation Drilling Co.
 Name of Pump Installation Contractor Inc.

DEPARTMENT OF WATER AND NATURAL RESOURCES

INSUFFICIENT LOCATION.

COUNTY HARRIS R. LAND OWNER

COMPANY _____ METHOD _____

GEOLOGIST _____ GEOLOGISTS LOG _____

BASIN _____ WELL _____

GROUND SURFACE ELEVATION 14.3 A/T/I CASING TOP ELEVATION 14.3 A/T/I

CASING TYPE _____ CASING DIAMETER _____

NOTES (1) _____

NOTES(2)

NOTES(3)

NOTES(4)

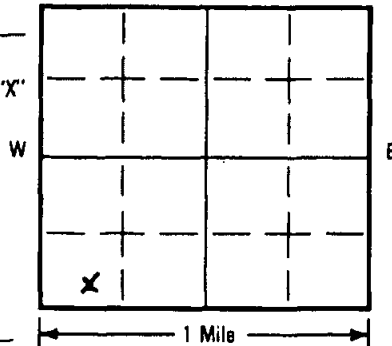
NOTES(5)

SOUTH DAKOTA WATER WELL COMPLETION REPORT

07-92

Location SW 1/4 SW 1/4 Sec 8 Twp 114N Rg 51W
 County Hamlin

Please mark well location with an "X"



Well Completion Date

8-16-02

LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? None ft. from None (identify source).

PROPOSED USE:

☒ Domestic/Stock ☐ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING: mud RotaryCASING DATA: ☐ Steel ☒ Plastic ☐ Other

If other describe _____

PIPEWEIGHT DIAMETER FROM TO HOLE DIAMETER
SPR2/LB/FT 5 IN 0 FT 63 1/2 FT 7 7/8 IN
 _____ LB/FT _____ IN _____ FT _____ FT _____ IN
 _____ LB/FT _____ IN _____ FT _____ FT _____ IN

GROUTING DATA

Grout Type No. of Sacks Grout Weight From To
Cement 8 _____ lb./gal 0 ft 55 ft
 _____ lb./gal _____ ft _____ ft

Describe grouting procedure _____

SCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 5 IN Length 7' FEETMaterial PLASTICSlot Size .040 Set From 63 1/2 Feet to 70 1/2 Feet

Other information _____

WAS A PACKER OR SEAL USED? ☐ YES ☒ NO

If so, what material? _____

Describe packer(s) and location? _____

DISINFECTION: Was well disinfected upon completion?

☒ YES, How: Chlorine
NO, Why Not? Circulated
before + during
gravel Packing

Laboratory sent to for water quality analysis _____

Well Owner: Reid Nolte

Business Name: _____

Address: 46106 186th ST.
Castlewood, S.D. 57223

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
<u>Top Soil</u>	<u>0</u>	<u>1 1/2</u>
<u>Gravel Tight</u>	<u>1 1/2</u>	<u>10 1/2</u>
<u>yellow Clay (Firm)</u>	<u>10 1/2</u>	<u>30</u>
<u>Blue Clay (Firm)</u>	<u>30</u>	<u>50</u>
<u>Red Gravel + Clay layers</u>	<u>50</u>	<u>61 1/2</u>
<u>Very Course yellow Tight Gravel</u>	<u>61 1/2</u>	<u>66</u>
<u>Course yellow + Grzy Sand</u>		
<u>+ Gravel</u>	<u>66</u>	<u>70</u>
<u>Blue Clay (Hrd)</u>	<u>70</u>	<u>80</u>

STATIC WATER LEVEL 45 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced Flowrate _____ GPM

Can well be completely shut in? _____

WELL TEST DATA:

☐ Pumped Describe: Developed
☐ Bailed W/Air Good
☐ Other _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate _____ GPM

REMARKS

RECEIVED

FEB 3 2003

This well was drilled under license # 4

And this report is true and accurate.

WATER RIGHTS PROGRAM

Drilling firm Bullis Bros

Signature of License Representative:

Se. Roy Bullis

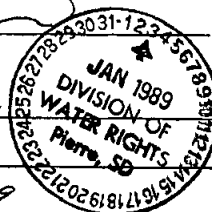
Signature of Well Owner or Equitable Property Holder:

Reid NolteDate: 8-16-02

10-85

1 mile

Date 12-30-80



GRIMSHAW DRILLING CO.

DRILLING
LOG

W. J. Grimshaw

924 South Melrose
Sioux Falls, S.D. 57108
Phone 605-332-6974

Name Bessette Colony Date 5/31/79
Address Estelline
County _____ Sec. _____ Twp. 114 Range 51

NO. FT.	DIA.	RATE	CASING	TOTAL
<u>30'</u>	<u>30"</u>	<u>25.00</u>	<u>DRILLING</u>	<u>750.00</u>
<u>10'</u>	<u>16"</u>	<u>132.00</u>	<u>50' R.O.P.</u>	<u>1320.00</u>
<u>21</u>	<u>16"</u>	<u>14.50</u>	<u>CASING</u>	<u>304.50</u>
			<u>5' R.O.P.</u>	<u>150.00</u>
				<u>2524.50</u>
			<u>TEST PUMPING</u>	<u>250.00</u>
BALANCE DUE:				<u>2774.50</u>

0 ft. to 2 ft. Topsoil _____ ft. to _____ ft.
2 ft. to 31 ft. GRAVEL _____ ft. to _____ ft.
31 ft. to 72 ft. SAND & GRAVEL _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.
____ ft. to _____ ft. _____ ft. to _____ ft.

STATIC WATER LEVEL _____ ft. 51' VAN WINE
CRILLER

REMARKS: * Johnson Springs Steel .080
TEST PUMPING = WITH PUMPED
AND TEST PUMPING.

Hamlin

NOTICE OF WELL CONSTRUCTION

#5 (1) WELL CONSTRUCTION
 Location of well: SW 1/4 NE 1/4 SW Section 17 Township 114 Range 51
 Well owner: Poinsett Colony (Name) ESTILLVILLE (Address)
 Date well drilling completed: 2-5-71 Purpose of well: Irrigation
 (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	ft.
0-4	Topsoil	Depth to static water level	ft.
4-8	clean sand	Name of producing aquifer (if known)	
8-10	Black Mud	Total depth of drill hole	<u>42' 1"</u> ft.
10-18	Grey Gravel	Depth to bottom of casing	<u>43</u> ft.
18-24	Grey Gravelly Silt	Casing information: In the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.	
24-33	Coarse Grey Gravel		
33-42' 6"	Coarse Rusty Gravel	Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.	
		<u>28' x 14" x 14" steel casing</u>	
		<u>15' x 14" x 125' Johnson</u>	
		If flowing well, flow of completed well	
		_____ G.P.M.	

Attach sheet if more space is needed

Ed H. Lacey & Sons
 Name of Drilling Contractor

(2) PUMP INSTALLATION:
 Company name and size of pump: WESTERN LAND ROLLER HP. 60
 Type of pump: Turbine Capacity of installed pump: 650 G.P.M.
 Depth of pump placement: 38 ft., Date of pump installation: _____

(3) WATER SURFACE MEASURING TUBE

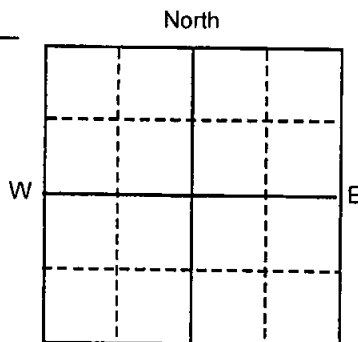
On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____.

Ed H. Lacey & Sons
 Name of Pump Installation Contractor

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 NW 1/4 Sec 17 Twp 114N Rg 51WCounty HamlinPlease mark well
location with an "X"

Well Completion Date

March 13, 2014

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
75.0 ft. from SEPTIC (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test holes
☒ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

ROTARY

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	12.00 IN	0.0 FT	197.0 FT	17.50 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
BENTONITE	72	Lb/gal	0.0 Ft	195.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
TREMIE PIPED

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12.00 Inches Length 30.0 Feet
 Material STAINLESS STEEL
 Slot Size .040 Set From 197.0 Feet to 227.0 Feet

Other information

WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? CHLORINATEDLab to which water
quality sample sent for analysis ☐ No, Why Not?Well Owner: OWEN PETERSON

Business Name:

Address: 661 CR 11City, State, Zip: WENDELL MN 56590

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
TOP SOIL	0	1
CLAY - YELLOW	1	21
CLAY - BLUE	21	60
COARSE SAND W/CLAY	60	75
HARD CLAY - BLUE	75	191
COARSE SAND	191	227
HARD CLAY - BLUE	227	

STATIC WATER LEVEL 25.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: _____
☐ Bailed
☐ Other

Pumping Level Below Land Surface

56.9 Ft. After 82.0 Hrs. pumped 730.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

GPS:
N 44 41.302
W 096 58.615

*File copy - mailed
to state & owner
6/5/14*

This well was drilled under license # 475 and this report is true and accurate.Drilling firm: THEIN WELL CO. INC.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

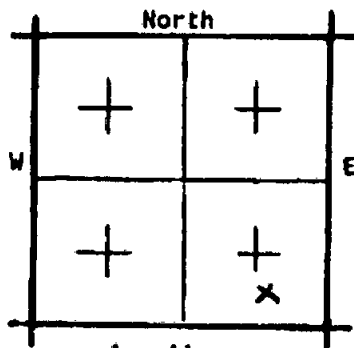
Date:

Well Owner: Robert P. Rasch
Name RR Castlemore S.D.
Address

Well Location:

North

Mark location
with an "X"



County Hamlin ¹/₂ mile ¹/₂ sec. 36 Twp. 15N R. 5W
Twp. 15N R. 5W

Proposed Use:

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

Method of Drilling:

☐ Forward Rotary ☒ Bored ☐ Jetted
☐ Reverse Rotary ☐ Cable ☐ Other

Well Construction:

Diameter of Hole 32"
Depth 51
Casing ☐ Steel ☒ Concrete
☐ Plastic ☐ Other
If other, specify

Was casing end left open yes
Was a well screen installed _____
Describe Well Screen 3 ft
Diameter 3 1/2" Material wood
Slot size 1/2" Drilled
Was well gravel packed yes
Was well grouted No
Was water sample taken NL

Remarks:

Water Level Information:

Static water level 26 below land surface
if flowing: closed in pressure _____ PSI
rate of flow _____ GPM

Controlled by: ☒ Valve ☒ Reducers ☒ Other

If other; specify

Well Test Data:

☐ Pumped _____
☒ Bailed Describe: _____
☐ Other _____

Pumping Level Below Land Surface

ft. After	Hrs. pumped	GPM
11 11	11 11	11
11 11	11 11	11

Well Log:

Depth

[illegible]

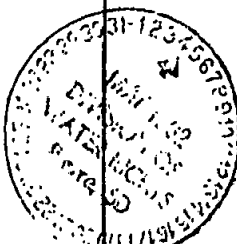
(Use Back if Necessary)

Date Completed: 5-11-81

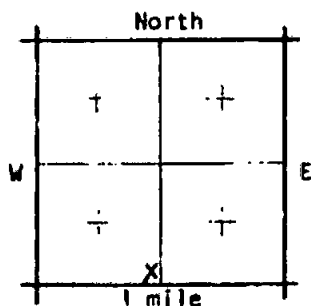
Driller: Bullis Bros 4
Driller's or Firm's Name License NO.

Wet, Town, S.O.K.
Address

Signed By Le Roy Dullie Date 5-11-81



STATE OF SOUTH DAKOTA WELL DRILLERS REPORT

Location SE 1/4 Sec 7 Twp 114 Rg 51County
HamlinPlease mark well
location with
an "X"Well Completion Date 12-18-84

PROPOSED USE:

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

Method of Drilling:

Rotary

WELL CONSTRUCTION:

Diameter of hole 5 inches Depth 63 feetCasing: ☐ Steel ☒ Plastic ☐ Other
Specify _____
 Pipe Weight Diameter From To
 _____ lb/ft 5" inches 0 feet 58 feet
 _____ lb/ft _____ inches _____ feet _____ feet
Was a well screen used? ☒ Yes ☐ No

If Not Specify _____

Screen Type Plastic Slot Size 20Length 5 ft Diameter 5"Was Casing left open end? ☐ Yes ☒ NoWas a Packer or seal used? ☐ Yes ☒ No

If so what material? _____

Was well gravel packed? ☒ Yes ☐ NoWas well grouted? ☒ Yes ☐ NoDescribe grouting procedure PumpedBentoniteTo what depth? 40 FeetWhat was grouting material? Bentonite

If cement, how many sacks? _____

Location of packer(s) and screen or perforated
pipe 58 ft To 63 ftWAS WELL PLUGGED OR ABANDONED ☐ Yes ☒ No

If so how and with what material? _____

Well Owner:

Name Virgil RbodyAddress RR 2 Box 117 Castlewood S.D.

Well Log:

Depth

Formation	From	To
<u>Black Soil</u>	<u>0</u>	<u>3 1/2</u>
<u>Yellow Gravel</u>	<u>3 1/2</u>	<u>11</u>
<u>Gray Gravel</u>	<u>11</u>	<u>16 1/2</u>
<u>Blue Clay</u>	<u>16 1/2</u>	<u>57</u>
<u>Gray Gravel</u>	<u>57</u>	<u>63</u>
<u>Blue Clay</u>	<u>63</u>	<u>65 1/2</u>

STATIC WATER LEVEL 6 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 off? _____

WELL TEST DATA:

☐ Pumped
☒ Bailed Describe: Developed w/
☐ Other air 60 gpm

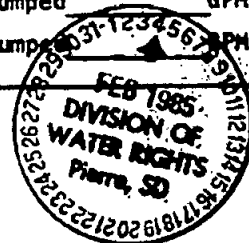
Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

Remarks:

This well was drilled under license 14

and this report is true and accurate.

Drilling Firm Bullis Bros Signed by LeRoy BullisDate 12-18-84mont
2-7-85

Virgil Rhody
JOB NAME

Sec. 7, N.E. Quarter
Ran 51-52, Twp 34-35, R. 15-16
LOCATION

4/15/76
DATE

15
RIG NO.

Everett
Lodmel
FOREMAN

DEPTH	TIME	REMARKS	DESCRIPTION
1 0-20		0-2 Top soil, 2-20 Sandy yellow clay, small yellow gravel streaks @ 18	
2 20-35		Sandy yellow clay with a few scattered gravel streaks	
3 35-50		35-43 Sandy yellow clay, 43 Rock, 44-50 Blue Clay	
4 50-65		50-54 Blue Clay 54-62 Yellow Gravel, 62-65 Blue Clay	
5 65-80		65-70 Blue Clay, 70-74 Yellow Sand, 74-77 Blue Clay	
		77 Rock, 77-80 Yellow Gravel	
6 80-95		80-86 Yellow BB Gravel & coarse sand, 86-95 Blue Clay	
7 95-110		95-102 Blue Clay, 102-110 BB and larger gravel, Rocks (good water loss)	
8 110-125		Good coarse sand & BB Gravel Rocks at 112 & 120 (Good water loss).	
9 125-140		125-135 Coarse sand and gravel (very good water loss) 135 Shale	
140 TD		Used 3/4 load to drill last 3 Rods No coal	
		Cased to 123 ft. 40 ft. Slotted @ bottom	
		83 ft. Blank	
		Pumped 60 G.P.M.	
		Used 2300# of Pea Rock	

DM

West Well

Location of well: 1/4 1/4 NW Section 18 Township 114 Range 31
Well owner Virgil Rhody Castlewood Sp. 57223
(Name) (Address)
Date well drilling completed 7/1/75 Purpose of well Irrigation
(domestic, irrigation, municipal, industrial, other)

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer _____ ft.
0-2	top soil	
2-18	sand & gravel	Depth to static water level _____ ft.
18-53	gray till	Name of producing aquifer (if known) <u>gravel</u>
53-87	sand & gravel	Total depth of drill hole _____ ft.
87-90	clay	Depth to bottom of casing _____ ft.
		Casing information: In the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.
		<u>0 - 16" ID Fiberglass</u>
		Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.
		<u>16" ID Fiberglass</u>
		If flowing well, flow at completed well _____ G.P.M.

Attach sheet if more space is needed

Company name and size of pump Fairbanks - Morse HP. 60
Type of pump turbine Capacity of installed pump 900 G.P.M.
Depth of pump placement 30 ft., Date of pump installation 7/1/75

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____.



Empire Investigation Drilling
Name of Pump Installation Contractor Co. Inc.

NOTICE OF WELL CONSTRUCTION

East Well

(1) WELL CONSTRUCTION

Location of well: 1/4 NE Section 18 Township 114 Range 51
 Well owner Virgil Rhody Castlewood, SD. 57223
 Date well drilling completed 7/1/75 Purpose of well Irrigation
(Name) (Address) (domestic, irrigation, municipal, industrial, other)

WELL LOG

Layers, top to top in feet	Description of layer	Depth to top of water producing aquifer	ft.
0-2	top soil	15	ft.
2-18	sand & gravel	12	ft.
18-39	clay	39	ft.
		39	ft.

Name of producing aquifer (if known) gravel
 Total depth of drill hole 39 ft.
 Depth to bottom of casing 39 ft.

Casing information: In the space below show kind, size, weight, lengths per diameter, etc., for production casing and surface casing, if used.

0-29 16" I.D. fiberglass

Screen information: In the space below show length of screen below bottom of casing, diameter and kind of screen or casing perforations.

29-39 16" I.D. fiberglass

If a flowing well, flow of completed well _____ G.P.M.

Attach sheet if more space is needed

Empire Irrigation Drilling Co. Inc.
Name of Drilling Contractor

(2) PUMP INSTALLATION

Company name and size of pump Fairbanks - Morse HP 100
 Type of pump turbine Capacity of installed pump 700 G.P.M.
 Depth of pump placement 20 ft., Date of pump installation 7/1/75

(3) WATER SURFACE MEASURING TUBE

On some wells an air-tight water surface measuring tube is required: See Section 46.408 of Chapter 46.4, MINIMUM WELL CONSTRUCTION STANDARDS.

Show exact vertical length of water surface measuring tube, when installed _____ ft., tube diameter _____, tube material _____.



Empire Irrigation Drilling Co. Inc.
Name of Pump Installation Contractor

Wald Voertink
JOHN NAME

Ca Lewood, S. B.
LOCATION

6/22/76
DATE

10
RIG NO.

Lloyd
Peterson Jr.
FOREMAN

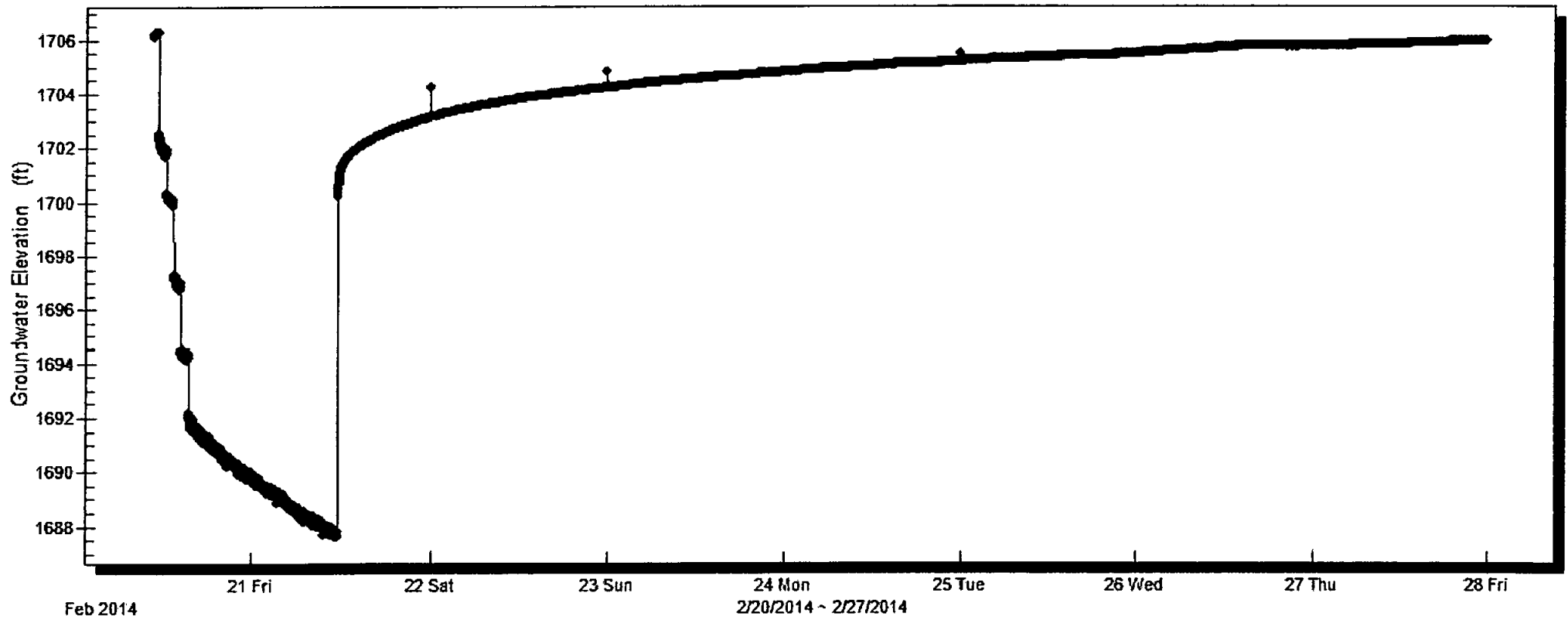
	DEPTH	TIME	Hole #1	REMARKS	Hamlin	
1	20		0-1 Top soil			
2	40		1-20 Yellow clay, gravel streaks @ 8		Sully NW 1/4	
3	60		20-25 Yellow clay		17-114 N-51W	
4	80		25-40 Coarse yellowish sand			
5	100		40-48 Real coarse gravel			
6	120		48-60 Blue clay			
7	140		60-80 Blue clay			
			80-100 Blue clay			
			100-120 Blue clay			
			120-140 Blue clay			
			Hole #2			
1	20		0-1 Topsoil			
2	40		1-20 coarse sand yellowish			
3	60		20-25 medium to coarse sand whitish			
4	80		35-40 Coarse gravel yellowish			
5	100		Blue clay @ 41-60			
			60-80 Blue clay rock @ 75			
			80-100 Blue clay			
			Cased to 43 Ft.			
			Pumped 15 GPM			
			Water Head 19 Ft.			
			1500 # Concrete sand			
			1 Used 5" Drag Bit - 1 Used 7 7/8" Roller Bit			
			Hole #3			
1	20		0-2 Topsoil			
2	40		2-10 Sand and gravel			
3	60		10-17 Yellow clay			
4	80		17-20 Sand and gravel			
5	100		20-25 Sand and gravel			
			25-35 Blue clay			
			35-40 Blue clay with yellow sand streaks			
			40-55 coarse yellow gravel			
			55-60 Blue clay			
			60-100 Blue clay.			

APPENDIX III

Hydrographs

Graph 1 - Hydrograph of Test Well During Step-Drawdown and 24-hour Test

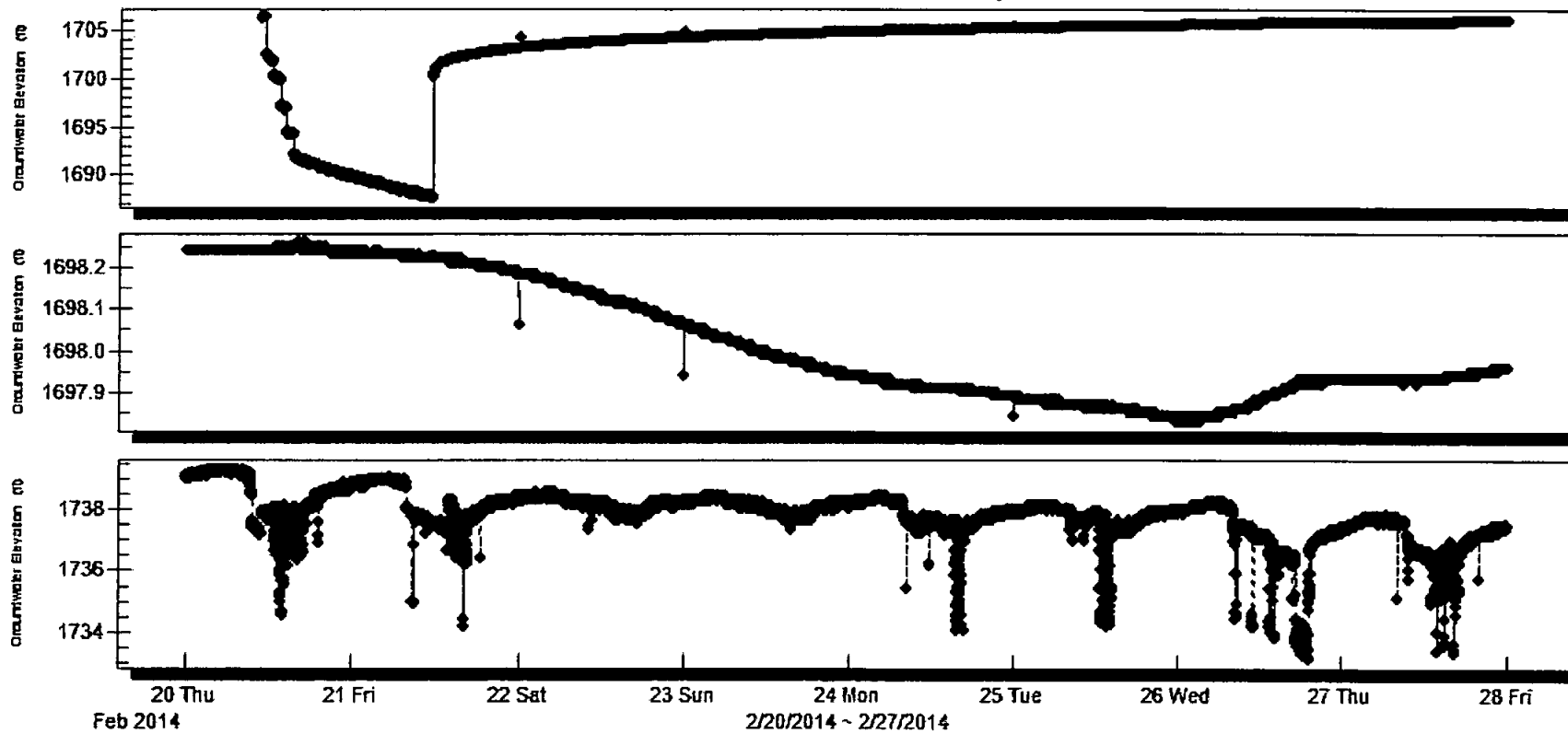
Owen Peterson Aquifer Test



Graph 2 - Hydrographs of Wells During Initial Aquifer Testing

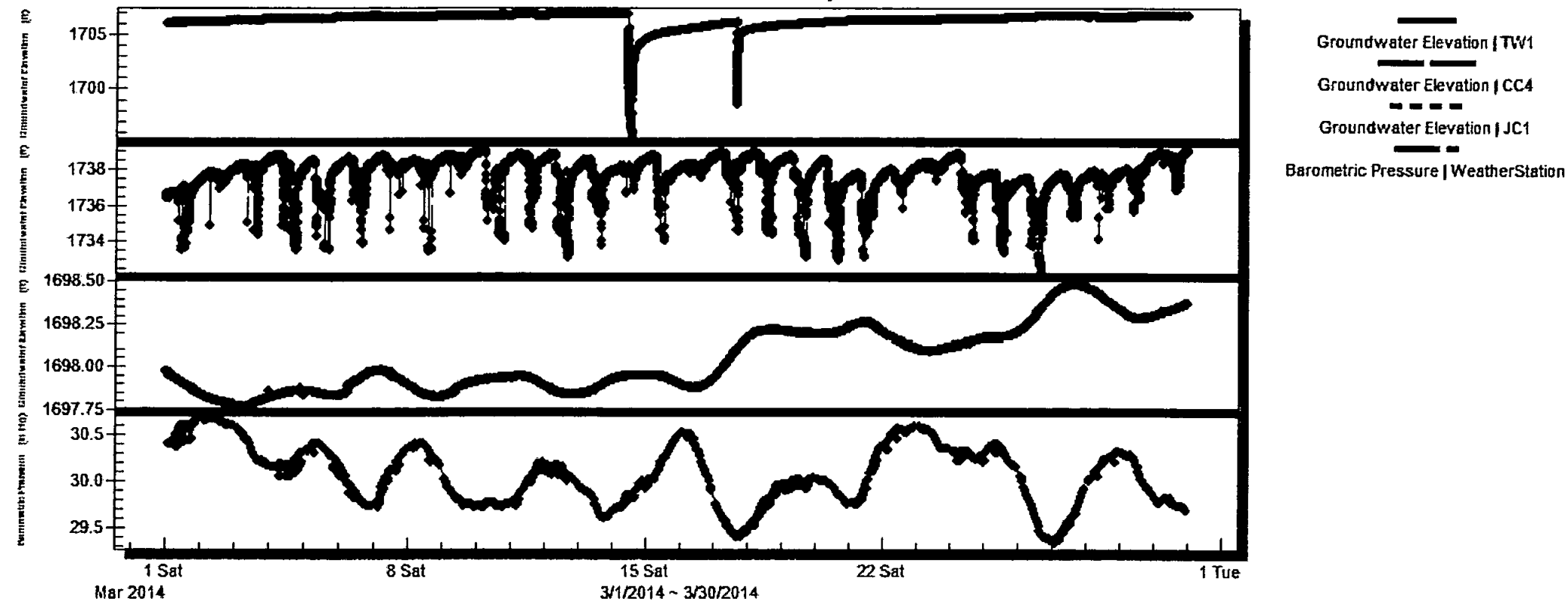
Owen Peterson Aquifer Test

Groundwater Elevation | TW1
Groundwater Elevation | JC1
Groundwater Elevation | CC4



Graph 3 - Hydrographs of Wells During March 2014 with Barometric Pressure

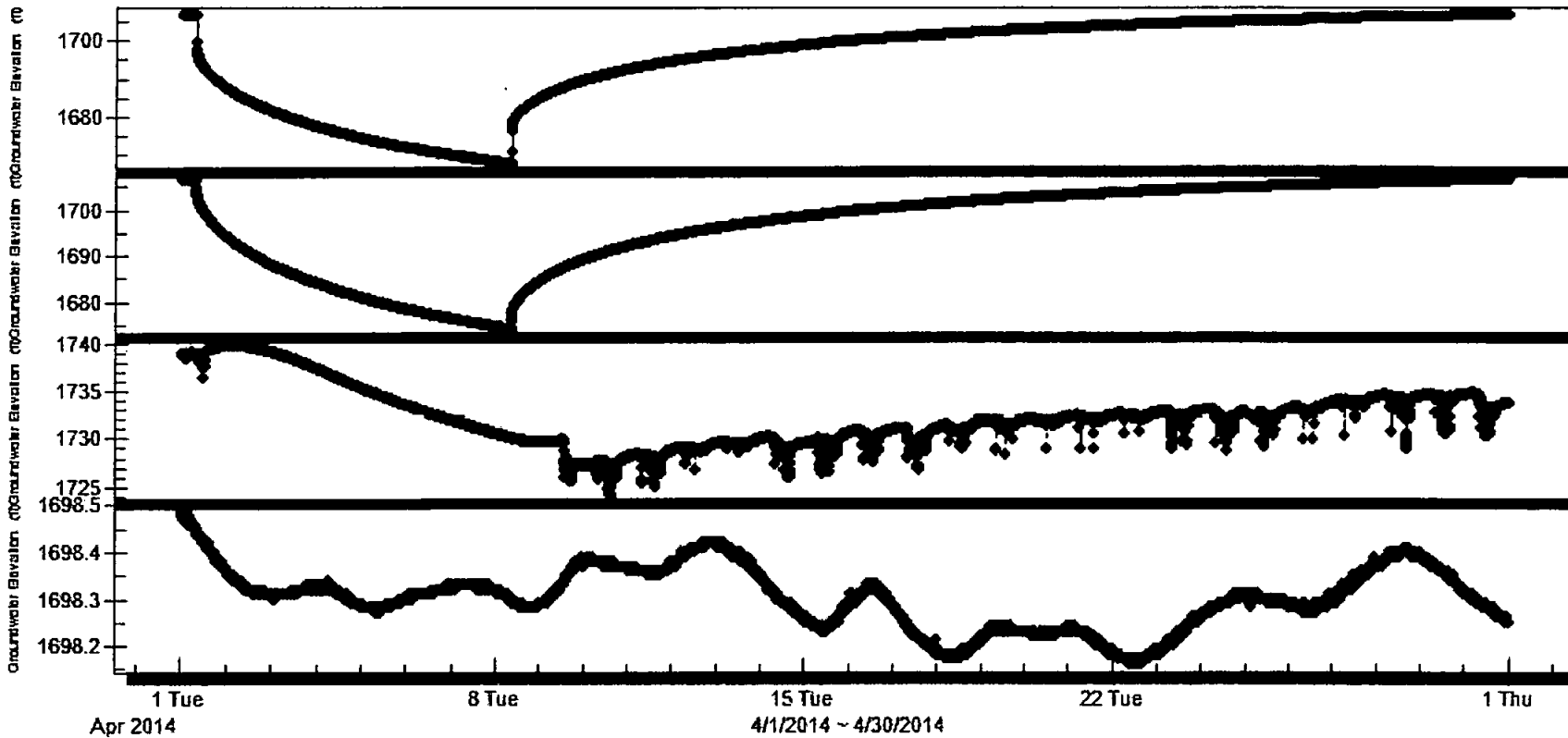
Owan Peterson Aquifer Test



Graph 4 - Hydrographs of Wells During 7-Day Aquifer Test

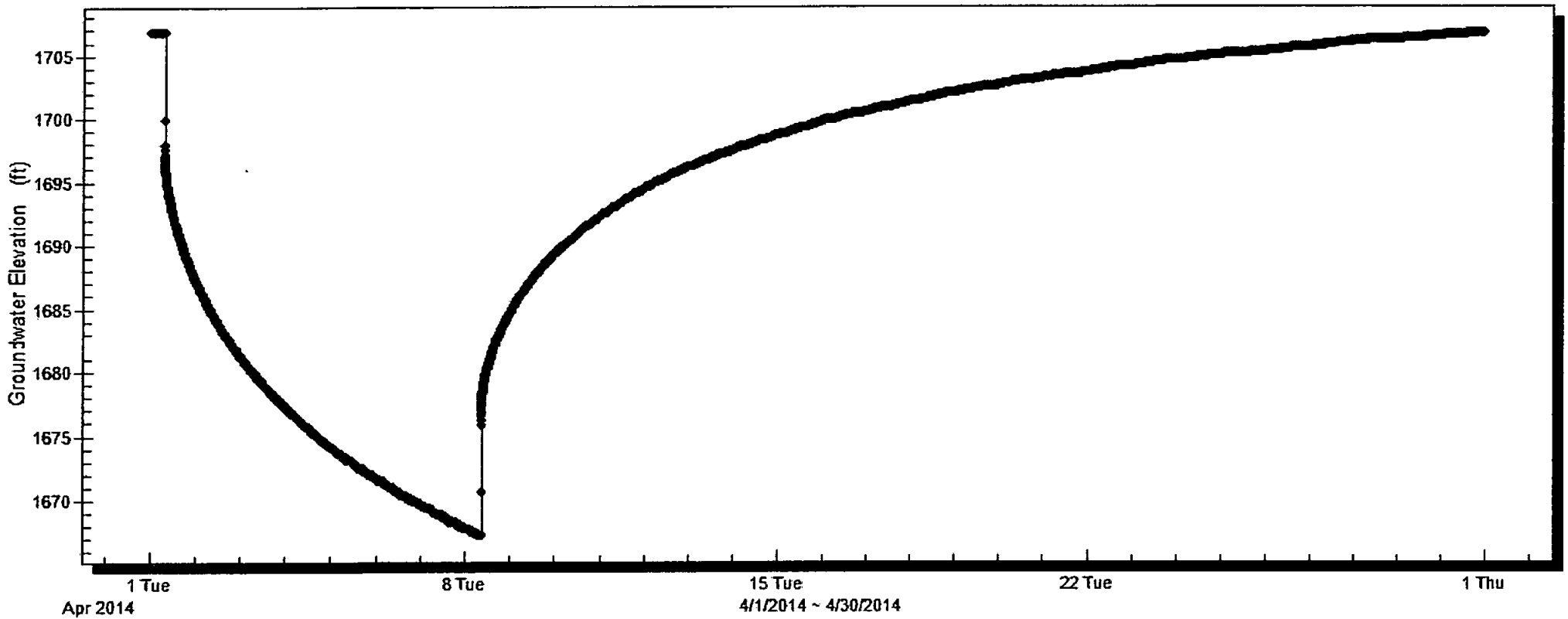
Owen Peterson Aquifer Test

Groundwater Elevation | PW1
Groundwater Elevation | TW1
Groundwater Elevation | CC4
Groundwater Elevation | JC1



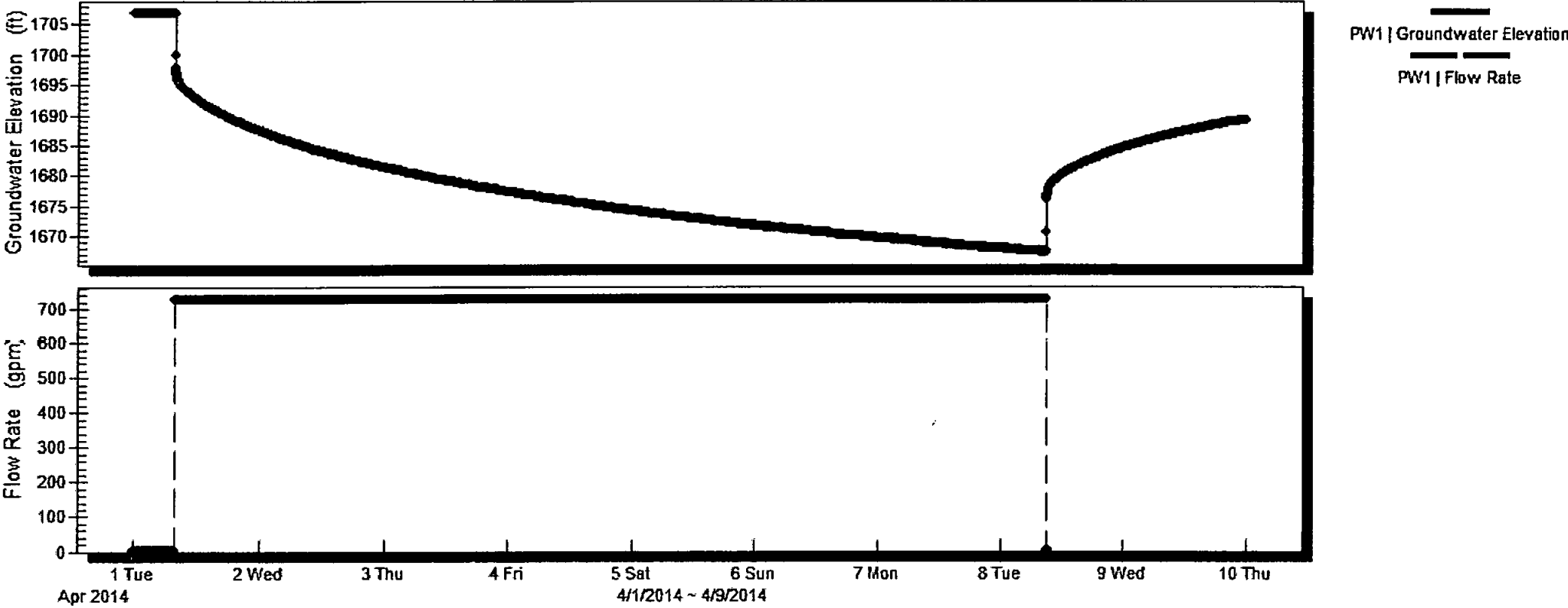
Graph 5 - Hydrograph of PW1 During 7-Day Aquifer Test

Owen Peterson Aquifer Test

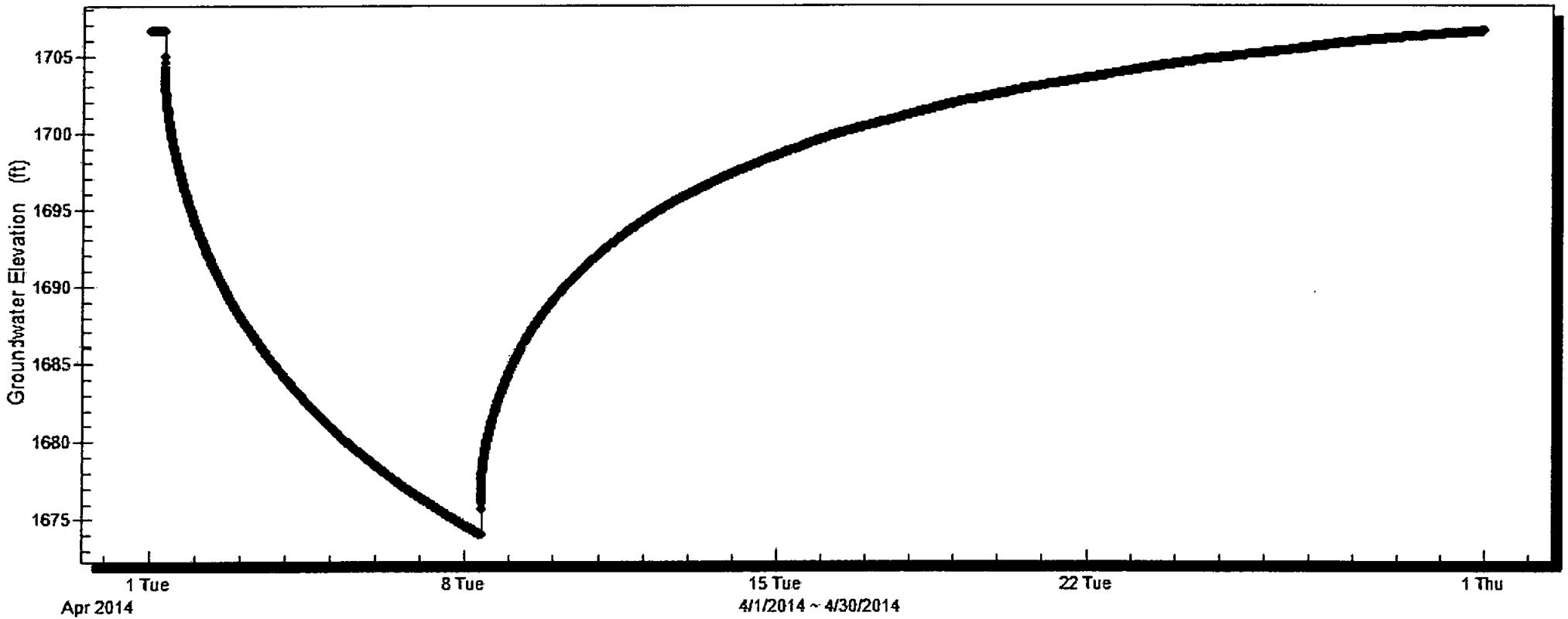


Graph 5a - Hydrograph of PW1 and Flow Rate

Owen Peterson Aquifer Test

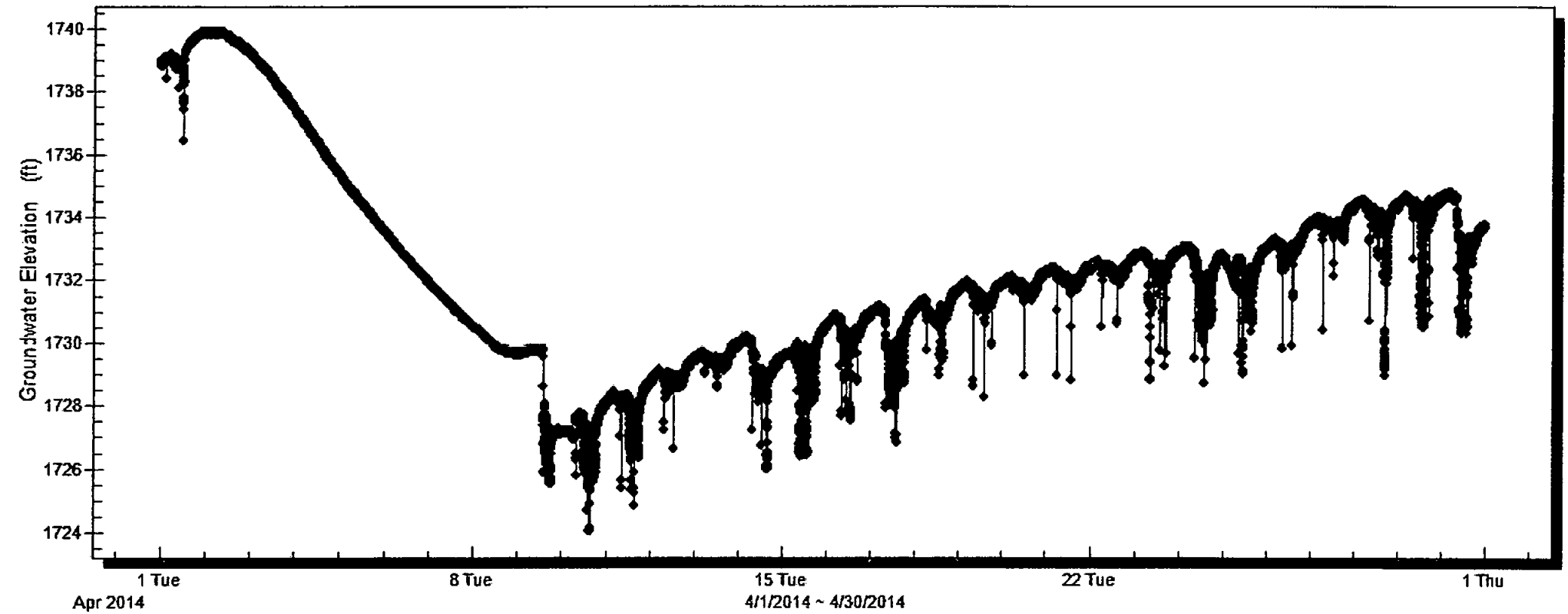


Graph 6 - Hydrograph of TW1 During 7-Day Aquifer Test
Owen Peterson Aquifer Test

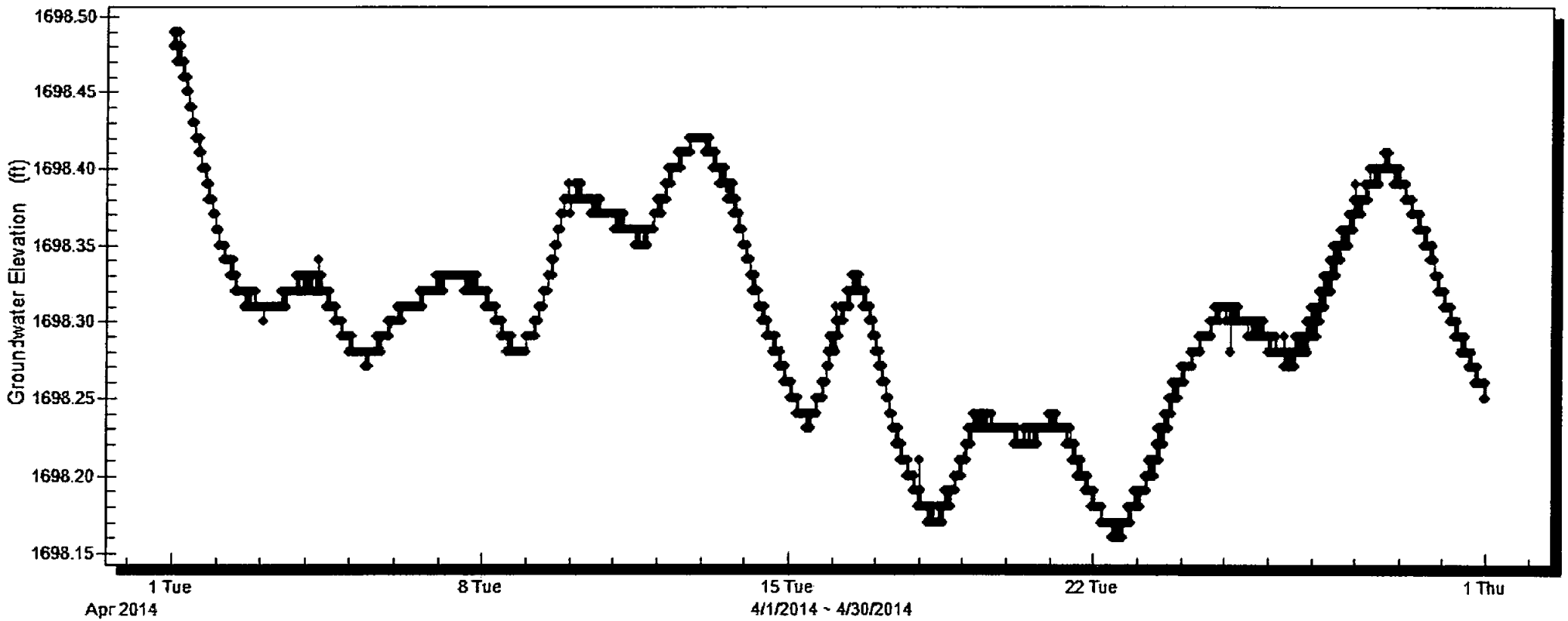


Graph 7 - Hydrograph of CC4 During 7-Day Aquifer Test

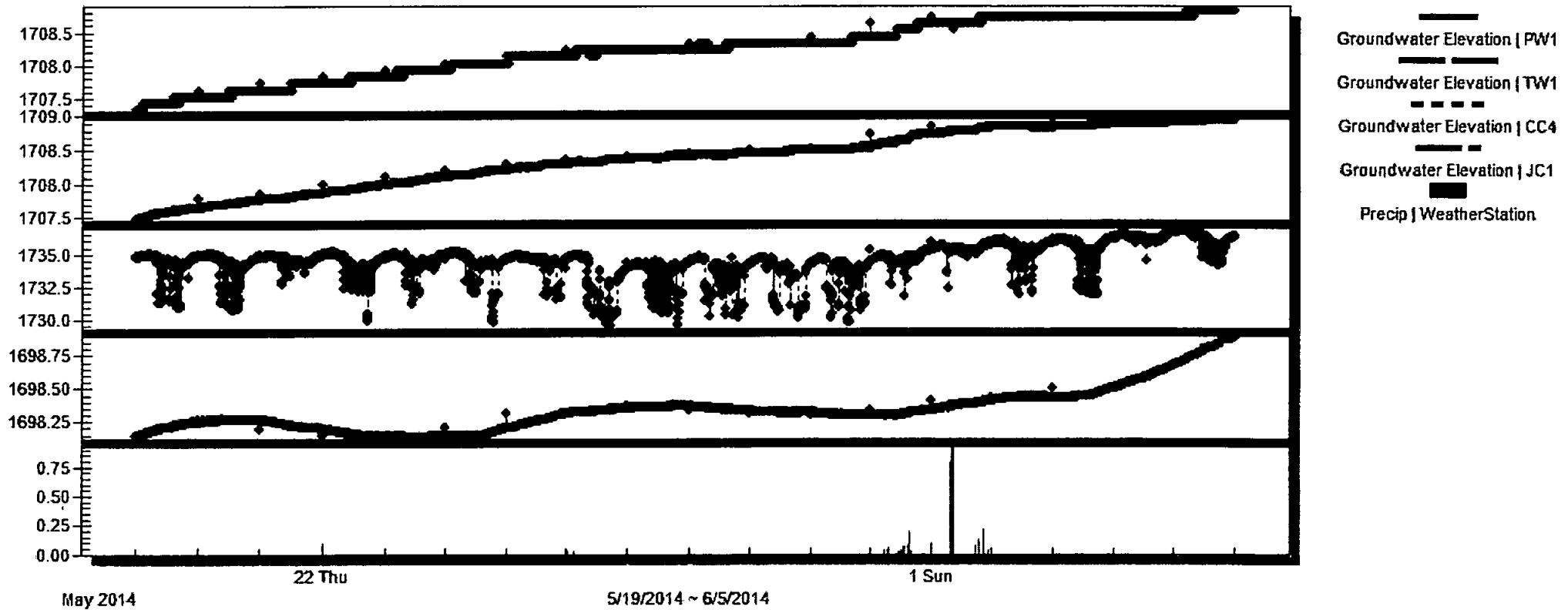
Owen Peterson Aquifer Test



Graph 8 - Hydrograph of JC1 During 7-Day Aquifer Test
Owen Peterson Aquifer Test

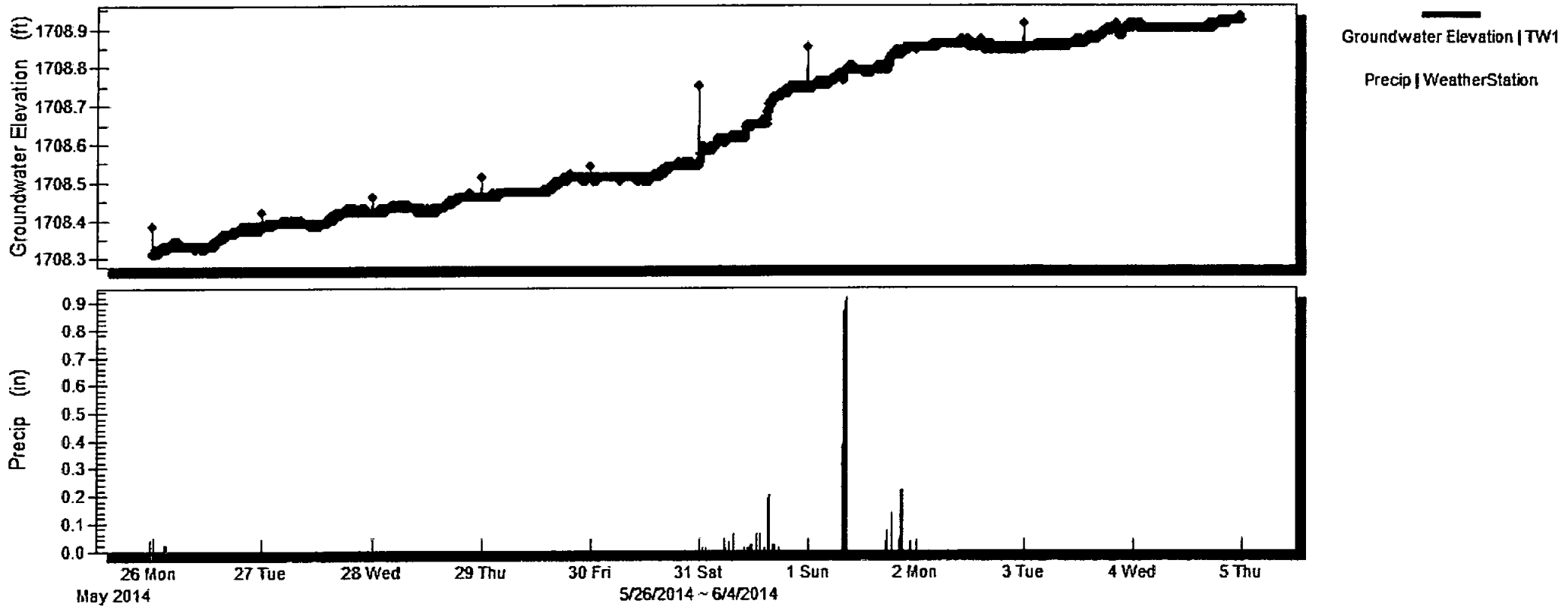


Graph 9 - Hydrographs of Wells 5/19-6/5/2014 With Precipitation Data
Owen Peterson Aquifer Test



Graph 10 - Hydrograph of TW1 With Precipitation - May 26, 2014 to June 5, 2015

Owen Peterson Aquifer Test



APPENDIX IV

Electronic Data

APPENDIX V

Aquifer Parameter Calculations

**Summit Envirosolutions, Inc.**

1217 Bandana Blvd N

St. Paul, Mn

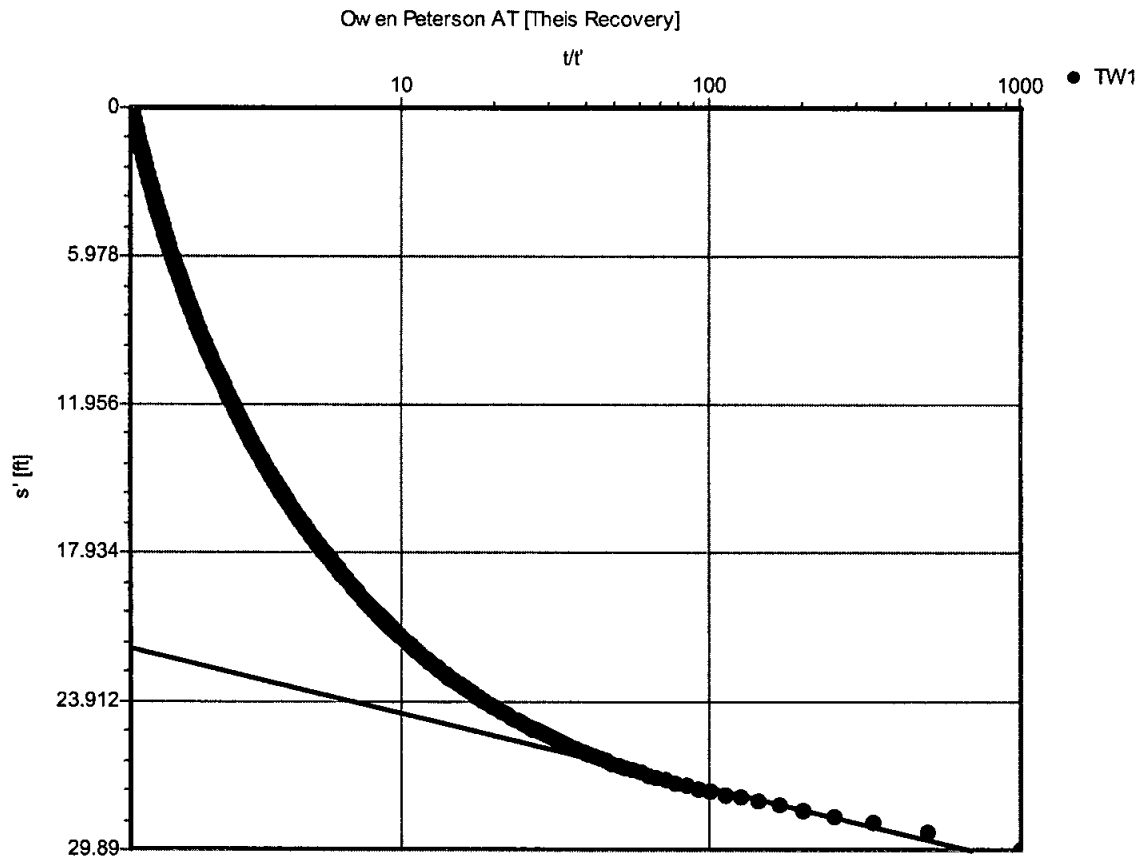
612-750-4024

Pumping Test Analysis Report

Project: Owen Peterson AT

Number: 2219-0001

Client: Owen Peterson



Pumping Test: Owen Peterson AT

Analysis Method: Theis Recovery

Analysis Results: Transmissivity: $8.71\text{E}+3 \text{ [ft}^2/\text{d]}$ Conductivity: $2.42\text{E}+2 \text{ [ft/d]}$

Test parameters:

Pumping Well:	PW1	Aquifer Thickness:	36 [ft]
Casing radius:	0.5 [ft]	Confined Aquifer	
Screen length:	30 [ft]		
Boring radius:	0.729 [ft]		
Discharge Rate:	730 [U.S. gal/min]		
Pumping Time	10137 [min]		

Comments:

Evaluated by:

Evaluation Date: 7/18/2014

**Summit Envirosolutions, Inc.**

1217 Bandana Blvd N

St. Paul, Mn

612-750-4024

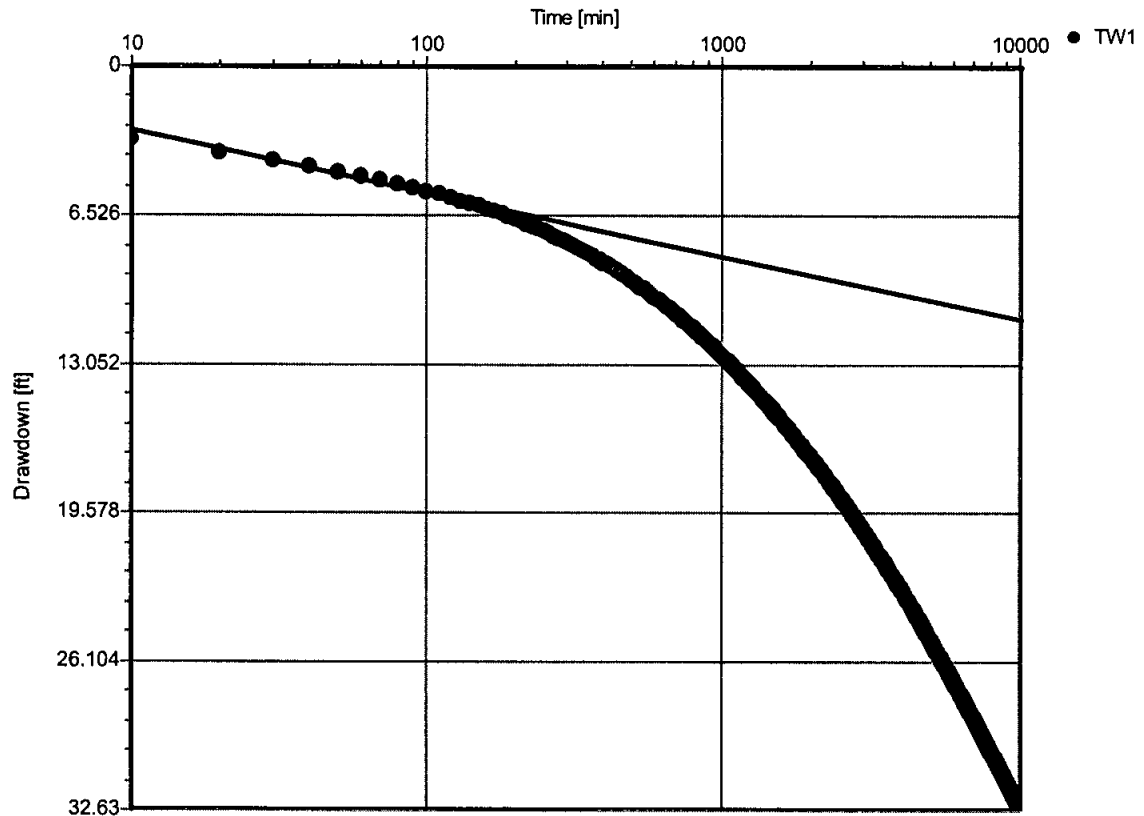
Pumping Test Analysis Report

Project: Owen Peterson AT

Number: 2219-0001

Client: Owen Peterson

Owen Peterson AT [Cooper-Jacob Time-Drawdown]



Pumping Test: Owen Peterson AT

Analysis Method: Cooper-Jacob Time-Drawdown

Analysis Results: Transmissivity: $9.41\text{E}+3$ [ft²/d] Conductivity: $2.61\text{E}+2$ [ft/d]
Storativity: $1.38\text{E}-3$

Test parameters: Pumping Well: PW1 Aquifer Thickness: 36 [ft]
Casing radius: 0.5 [ft] Confined Aquifer
Screen length: 30 [ft]
Boring radius: 0.729 [ft]
Discharge Rate: 730 [U.S. gal/min]

Comments:

Evaluated by:

Evaluation Date: 7/18/2014

**Summit Envirosolutions, Inc.**

1217 Bandana Blvd N

St. Paul, Mn

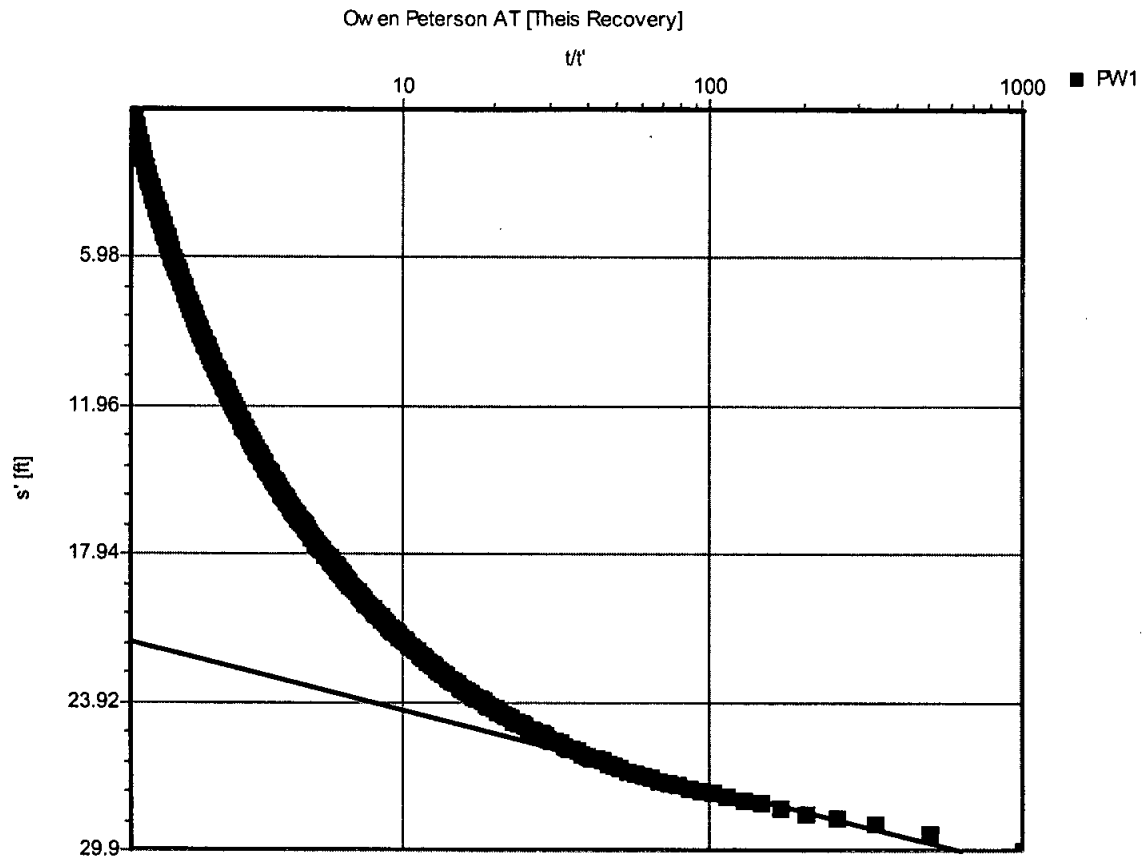
612-750-4024

Pumping Test Analysis Report

Project: Owen Peterson AT

Number: 2219-0001

Client: Owen Peterson



Pumping Test: Owen Peterson AT

Analysis Method: Theis Recovery

Analysis Results: Transmissivity: 8.19E+3 [ft²/d] Conductivity: 2.28E+2 [ft/d]

Test parameters:

Pumping Well:	PW1	Aquifer Thickness:	36 [ft]
Casing radius:	0.5 [ft]	Confined Aquifer	
Screen length:	30 [ft]		
Boring radius:	0.729 [ft]		
Discharge Rate:	730 [U.S. gal/min]		
Pumping Time	10137 [min]		

Comments:

Evaluated by:

Evaluation Date: 7/18/2014

**Summit Envirosolutions, Inc.**

1217 Bandana Blvd N

St. Paul, Mn

612-750-4024

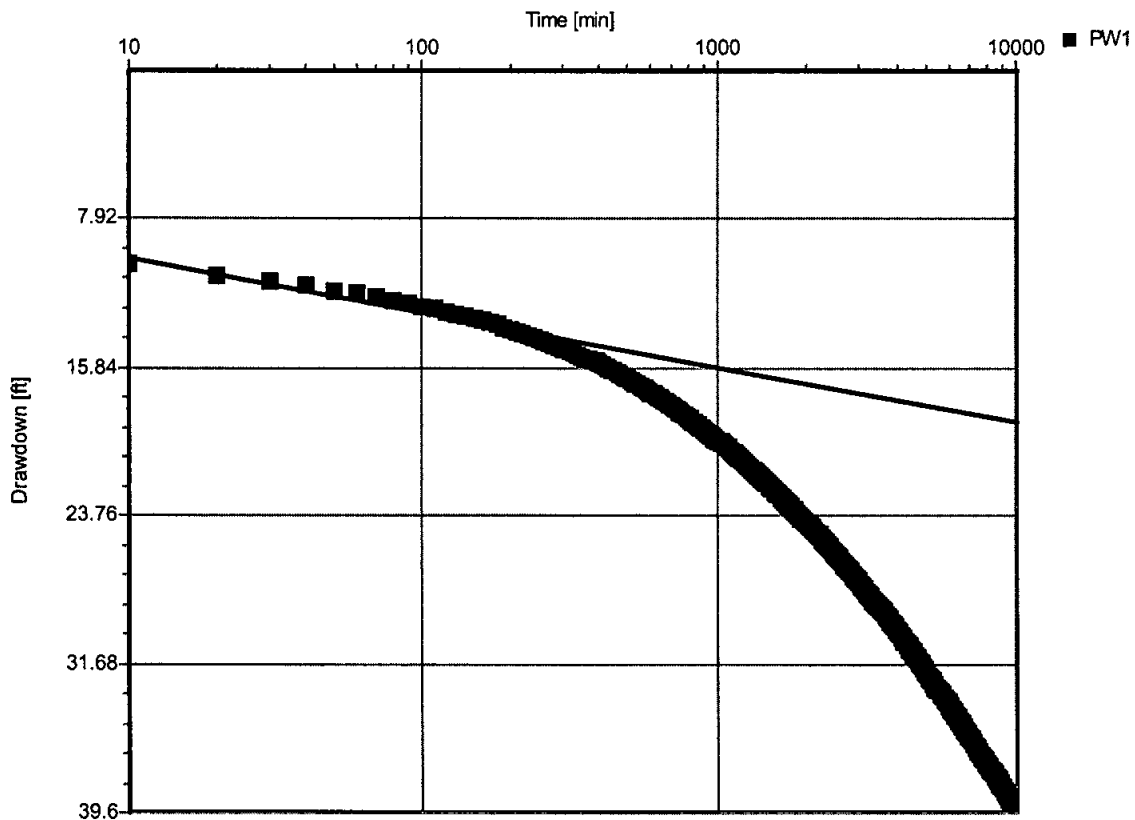
Pumping Test Analysis Report

Project: Owen Peterson AT

Number: 2219-0001

Client: Owen Peterson

Owen Peterson AT [Cooper-Jacob Time-Drawdown]

Pumping Test: Owen Peterson ATAnalysis Method: Cooper-Jacob Time-DrawdownAnalysis Results: Transmissivity: $8.86\text{E}+3$ [ft²/d] Conductivity: $2.46\text{E}+2$ [ft/d]

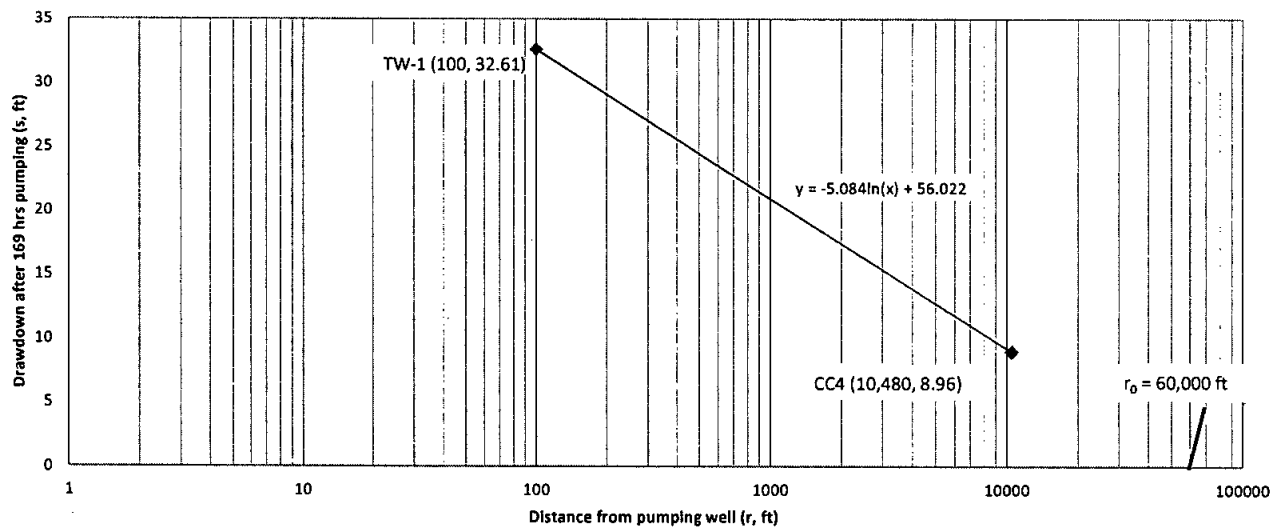
<u>Test parameters:</u>	Pumping Well:	PW1	Aquifer Thickness:	36 [ft]
	Casing radius:	0.5 [ft]	Confined Aquifer	
	Screen length:	30 [ft]		
	Boring radius:	0.729 [ft]		
	Discharge Rate:	730 [U.S. gal/min]		

Comments:

Evaluated by:

Evaluation Date: 7/18/2014

Owen Peterson Aquifer Test Distance Drawdown





**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



March 11, 2014

NOTICE

TO: Owen and Lamont Peterson
PO Box 97
Wendell MN 56595

FROM: Jeanne Goodman, Chief Engineer
Water Rights Program

SUBJECT: Deferral of Water Permit Application No. 7921-3, Owen and Lamont Peterson

On March 6, 2014, the Water Management Board deferred consideration of Water Permit Application No. 7921-3 to appropriate 2.44 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (228 feet deep) located in the SW 1/4 SE 1/4 Section 8 for irrigation of 316.48 acres located in the E 1/2 Section 8; all in T114N-R51W. Deferral of the application is to allow an aquifer pump test to be completed by the applicant. The pump test will allow for the evaluation of the potential aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued.

The applicant shall have one year to submit analysis of an aquifer pump test. Failure to complete an aquifer pump test and submit the analysis within one year will result in the application being brought before the Water Management Board with the potential for a denial recommendation.

Please contact Eric Gronlund at (605) 773-3352 if you have questions about the deferral of the application.

c: Ann Mines, Assistant Attorney General
Matt Naasz, Assistant Attorney General

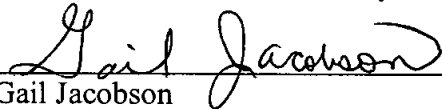
CERTIFICATION

I hereby certify that on March 11, 2014, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated March 11, 2014, regarding deferral of Water Permit Application No. 7921-3, Owen and Lamont Peterson, as set forth below:

Owen and Lamont Peterson
PO Box 97
Wendell MN 56595

Sent Notice Inter-Office mail to:

Ann Mines, Assistant Attorney General, 1302 E. Hwy 14, Suite 1, Pierre SD 57501-8501
Matt Naasz, Assistant Attorney General, 1302 E. Hwy 14, Suite 1, Pierre SD 57501-8501

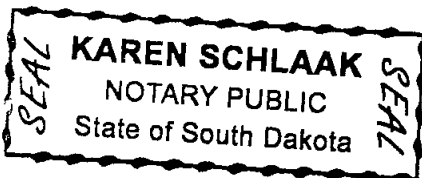

Gail Jacobson

Water Rights Program, DENR

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 11th day of March, 2014


Karen Schlaak
Notary Public
My Commission expires April 1, 2019





**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



October 2, 2014

NOTICE

TO: Owen and Lamont Peterson
PO Box 97
Wendell MN 56595

FROM: Jeanne Goodman, Chief Engineer
Water Rights Program

SUBJECT: Scheduling of Hearing to Consider Deferred Water Permit Application Nos. 7921-3
and 7988-3, Owen and Lamont Peterson

Water Permit Application No. 7921-3 to appropriate 2.44 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (228 feet deep) located in the SW 1/4 SE 1/4 Section 8 for irrigation of 316.48 acres located in the E 1/2 Section 8; all in T114N-R51W.

Water Permit Application No. 7988-3 to appropriate 1.78 cubic feet of water per second from one well to be completed into the Prairie Coteau Aquifer (240 feet deep) located in the center of the SE 1/4 Section 9 for irrigation of 290 acres located in the S 1/2 Section 9; all in T114N-R51W.

Both applications were deferred by the Water Management Board for an aquifer pump test to be completed in order to allow for evaluation of the aquifer including the availability of unappropriated water and potential impacts to existing users from the aquifer which are criteria set forth in SDCL 46-2A-9 for when a water right permit may be issued. An aquifer pump test was performed at the well site proposed by Application No. 7921-3. The Water Rights Program has determined this pump test to be sufficient for evaluation of both applications given the close proximity and similar depths.

Pursuant to SDCL 46-2A-2, the Chief Engineer has revised the recommendation to APPROVAL of Application Nos. 7921-3 and 7988-3 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. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application after it reaches a conclusion based on the facts presented at the public hearing. Applicable provisions of the public notice on each application in the Hamlin County Herald Enterprise and Public Opinion still apply at the hearing.

The Water Management Board will conduct a hearing to consider Application Nos. 7921-3 and 7988-3 at 11:00 AM (Central Time) on Wednesday, October 22, 2014, in the Floyd Matthew Training Center, Joe Foss Building, 523 E. Capitol Avenue, Pierre SD. Future notice will be provided to all parties if there is a change to the hearing time or date.

Please contact Eric Gronlund at (605) 773-3352 if you have questions regarding the hearing.

c: Ann Mines, Assistant Attorney General
 Matt Naasz, Assistant Attorney General

CERTIFICATION

I hereby certify that on October 2, 2014, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated October 2, 2014, regarding scheduling hearing on Water Permit Application Nos. 7921-3 and 7988-3, Owen and Lamont Peterson, as set forth below:

Owen and Lamont Peterson
PO Box 97
Wendell MN 56595

Sent Notice Inter-Office mail to:

Ann Mines, Assistant Attorney General, 1302 E. Hwy 14, Suite 1, Pierre SD 57501-8501
Matt Naasz, Assistant Attorney General, 1302 E. Hwy 14, Suite 1, Pierre SD 57501-8501



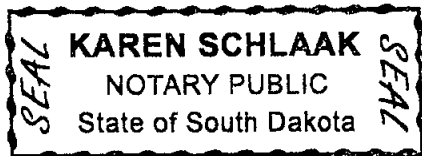
Gail Jacobson
Water Rights Program, DENR

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 2nd day of October, 2014



Karen Schlaak
Notary Public
My Commission expires April 1, 2019





**DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES**

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

denr.sd.gov



**REVISED RECOMMENDATION OF CHIEF ENGINEER FOR WATER
PERMIT APPLICATION NO. 7921-3, Owen and Lamont Peterson**

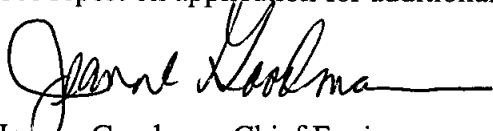
Pursuant to SDCL 46-2A-2, the following is the revised recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 7921-3, Owen and Lamont Peterson, PO Box 97, Wendell MN 56595.

The Chief Engineer is recommending APPROVAL of Application No. 7921-3 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 well approved under Permit No. 7921-3 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 well authorized by Permit No. 7921-3 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. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.
4. The Permit holder for Water Permit No. 7921-3 and 7988-3 shall contract with a license well driller to construct an observation well that will become part of the South Dakota Department of Environment and Natural Resources Observation Well Network. The observation well must be completed into the same aquifer as the production wells and shall be located in the public right of way or a perpetual easement granted to the State for the purpose of maintaining an observation well on property owned by the Permit holder. The observation well construction shall be coordinated with the DENR-Water Rights Program staff.

(continued)

See report on application for additional information.

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Jeanne Goodman, Chief Engineer

October 2, 2014

NOTE: For specific information regarding the requirement to complete an observation well, please contact Ken Buhler at (605) 773-3352.

DENR is willing to discuss suitable locations for the observation well. At this time the logical location is on the north-south road between Sections 8 and 9. This will locate the observation well between the two production wells to be authorized by Water Permit Application Nos. 7921-3 and 7988-3

**SUPPLEMENTAL REPORT TO THE CHIEF ENGINEER
DEFERRED WATER PERMIT APPLICATION NO. 7921-3
OWEN AND LAMONT PETERSON
OCTOBER 2, 2014**

BACKGROUND

Water Permit Application No. 7921-3 was submitted in November, 2013. The application proposed to divert water at a maximum rate of 2.44 cubic feet per second (cfs) from a single well completed into the Prairie Coteau aquifer at a depth of approximately 226 feet. This well will be located in SW ¼ SE ¼ Section 8, T114W-R51N in Hamlin County and will be used to irrigate 316.5 acres in the E ½ of the same section. The Water Management Board deferred the application to allow an aquifer pump test to be completed by the applicant in order to evaluate the availability of unappropriated water and potential impact to existing users.

South Dakota Codified Law (SDCL) 46-2A-9

Pursuant to SDCL 46-2A-9, a permit to appropriate water may be issued only if there is a reasonable probability that there is unappropriated water available for the applicant's proposed use, that the proposed diversion can be developed without unlawful impairment of existing rights, and that the proposed use is a beneficial use and in the public interest. This report will address the availability of unappropriated water and the effects on existing water rights completed into this portion of the Coteau Lakes aquifer.

SDCL 46-6-3.1

SDCL 46-6-3.1 states "No application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of water to the groundwater source."

In interpreting 46-6-3.1, the First Judicial Circuit Court ruled in *Hanson County Dairy v. Bender* that evidence must show the average annual recharge exceeds the average annual discharge by at least the amount requested by the water permit application being considered (Memorandum Decision, April 11, 2012). This may be interpreted to necessitate the identification and quantification of recharge and discharge of the individual outwash deposits of the Prairie Coteau aquifer from which the applicant proposes to withdraw water.

KNOWN GEOLOGY AND AQUIFER CHARACTERISTICS

The Prairie Coteau aquifer consists of many hydraulically disconnected outwash deposits. The water permit application submitted by the applicants proposes to divert from one of these outwash deposits identified as the Prairie Coteau aquifer. At the time that the application was submitted, there was insufficient information about the characteristics of the outwash deposit to make an informed decision for approval or denial of the application. Since this information was unavailable, the application was deferred until the applicants were able to provide more information about the formation. Although several options were given by which information could be obtained, the applicants chose to have an aquifer pump test performed which was then analyzed by Summit Envirosolutions, Inc.

At the time the initial report was written, it was unknown from the records available to the Water Rights Program whether any other wells were completed into the formation. Summit Envirosolutions, Inc. asserts that the Clairmont Colony maintains a well (CC4) completed into this portion of the aquifer located approximately two miles to the northeast (Summit, 2014) as shown on the map in Figure 1 and the geologic cross section in Figure 2. The Water Rights Program does not have a record of this well (Water Rights, 2014a). However, given that CC4 did experience measurable drawdown as a result of the pump test and recovery after the test, it is assumed the well is indeed completed into the same portion of the Prairie Coteau aquifer. Each lithological record in Figure 1 was assigned a number. In the original test report submitted by Summit, each of these numbers is used to display relevant data in a table that is not included in this report.

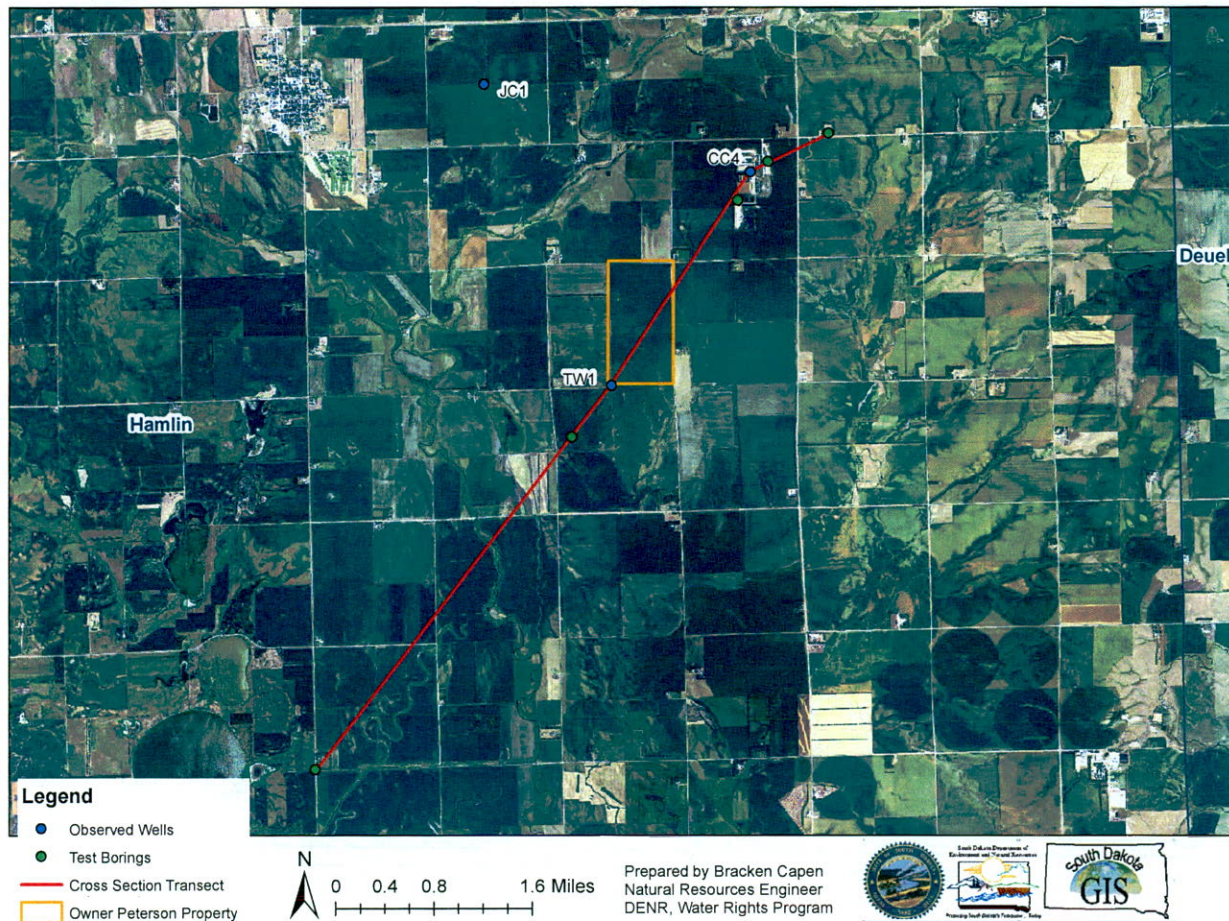


Figure 1: Map displaying the location of the geologic cross section shown in Figure 2 (Summit, 2014).

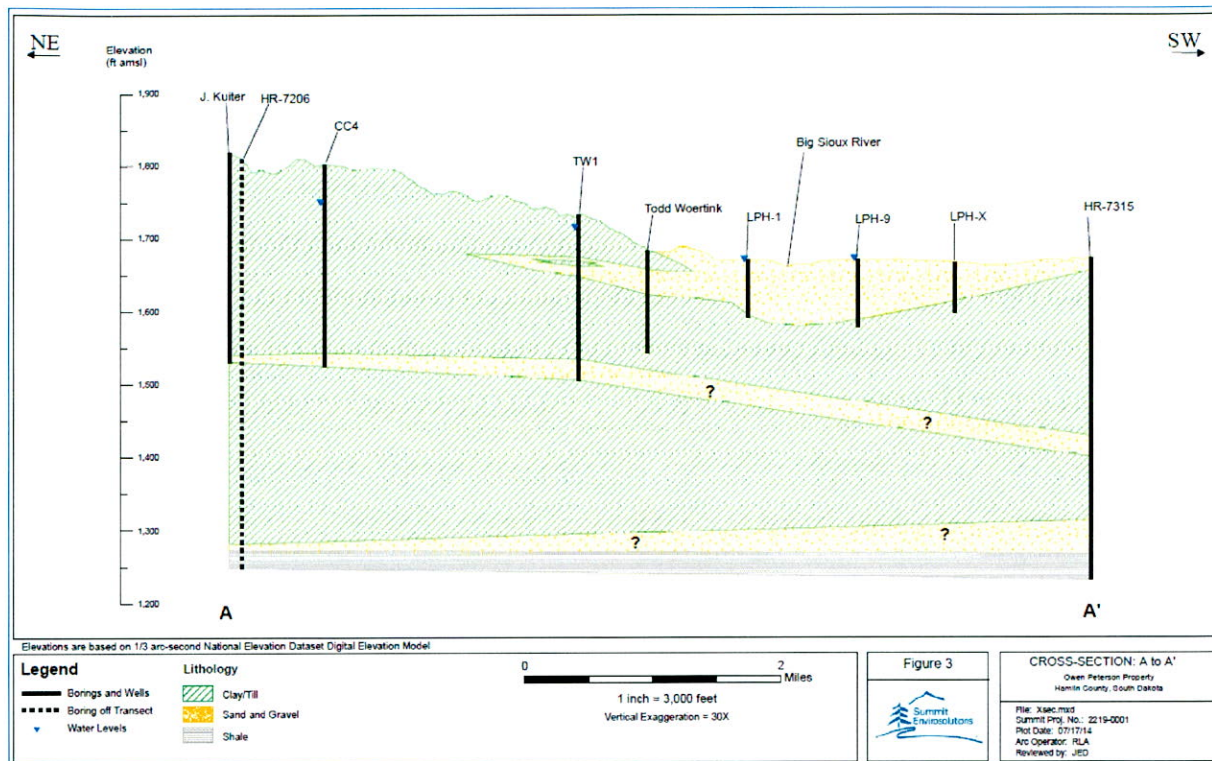


Figure 2: Geologic Cross Section of the area of interest in the Prairie Coteau aquifer, as submitted by Summit Envirosolutions, Inc. (2014).

AQUIFER PUMP TEST EVALUATION

Given a series of wells that Summit Envirosolutions, Inc. contends are completed into the same portion of the Prairie Coteau aquifer (see Figure 2), a seven day aquifer pump test was conducted at a continuous flow rate of 730 gallons per minute (gpm) with measurement of water levels in these wells. The wells used for drawdown observations were located 100, 6,025, and 10,480 feet from the proposed production well and are referred to in the text as TW1, JC1, and CC4, respectively. Figure 2 displays the cross section whose aerial view is displayed in Figure 1 as a red line. The well designated JC1 falls outside of the cross section and is therefore not displayed in Figure 2. The production well used for pumping is referred to as PW1 and is within 100 feet of TW1. Given the measured drawdown and recovery in each of these, Summit calculated the radius of the cone of depression or radius of influence to be approximately 11.4 miles. The aquifer pump test report that was submitted to the Water Rights Program, and the data included in it, support this value.

Values for the transmissivity, conductivity, and storativity were calculated in the report for the initial drawdown and the subsequent recovery using the Cooper-Jacob Drawdown and Theis Recovery methods. The values of these parameters are in general agreement in the two times that they were calculated for each method. Average transmissivity in the tests was found to be approximately $8,892 \frac{ft^2}{day}$, with hydraulic conductivity averaging 244 ft/day and storativity at 0.0014, respectively. The storativity was only calculated once using the Cooper Jacob Drawdown Method and is not an average. In calculating the values using the Cooper Jacob

Drawdown Method, Summit Envirosolutions, Inc. used the slope created in the first 200 minutes of drawdown data, commonly known as “early time data” (shown as a black trend line on Figure 3). Using the slope of the last of the drawdown data known as the “late time data” (shown as a red trend line on Figure 3) the calculated transmissivity drops to approximately $1,032 \frac{ft^2}{day}$, or less than one eighth of the originally calculated value. Early time data is typically considered to be less reliable than late time data due to the influence of water stored within the well bore. Early time data is generally reflective of the conditions within the well bore and the water being pumped directly from it. Late time data represents the conditions within the water bearing formation itself as at that point water is flowing directly from the aquifer in order to supply the desired flow rate (Walton, 1990).

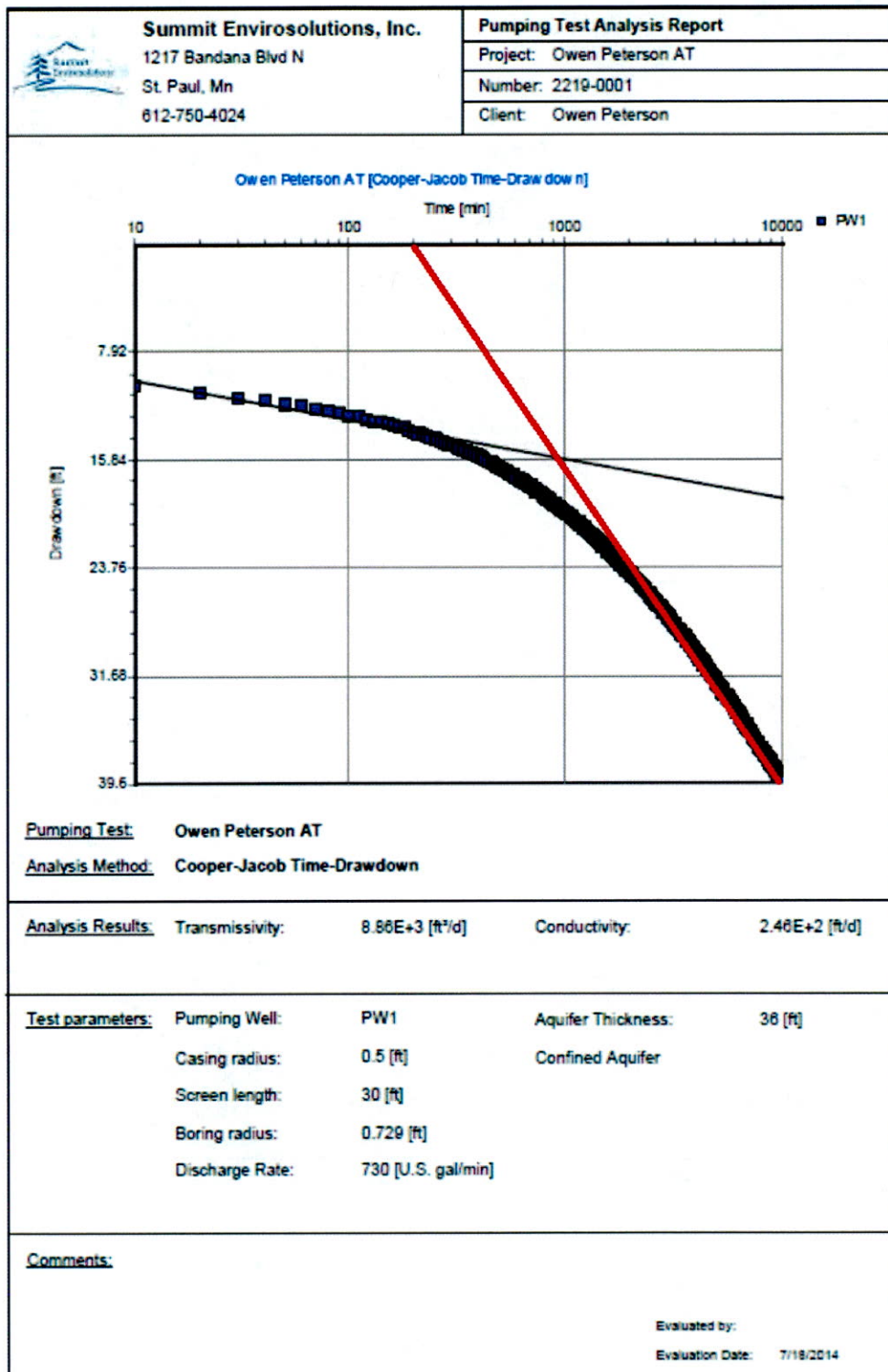


Figure 3: Drawdown curve and trend line chosen by Summit for PW1 (Summit, 2014).

Using the slope of the late time data, the hydraulic conductivity also drops by an order of magnitude to approximately 29 ft/day. Smaller values will result in a greater drawdown and a decreased radius of influence. However, given the level of head above the aquifer, it is unlikely that these changes will increase drawdown enough to cause impairment of other wells completed into the formation. See the Existing Water Rights section below.

From the observed drawdown at CC4, the radius of influence was estimated to be approximately 11.4 miles from PW1, at least in the direction of CC4. Using the Cooper-Jacob distance drawdown analysis of the data (see Figure 4), transmissivity and storativity were calculated to be $4,397 \frac{ft^2}{day}$ and $1.92E-5$, respectively. The storativity value is approximately two orders of magnitude smaller than that calculated by Summit Envirosolutions, Inc.

$$T = \frac{528 * Q}{\Delta S}$$

(Equation 1: Transmissivity)

$$T = 4,397 \frac{ft^2}{day} = \frac{528 * (730 \text{ gpm})}{11.72}$$

$$\text{Where } T = \text{Transmissivity} \left(\frac{\frac{gallons}{foot}}{day}, \text{ converted to } \frac{feet^2}{day} \right)$$

$$Q = \text{Discharge (gallons per minute)}$$

ΔS = Slope of drawdown per one log unit of distance, base 10 (see Figure 4)

$$s = \frac{2.25 * T * t}{r_0^2}$$

(Equation 2: Storativity)

$$s = 1.92E - 5 = \frac{2.25 * \left(4,397 \frac{ft^2}{day} \right) * (7 \text{ days})}{(60,000 \text{ ft})^2}$$

Where s = Storativity (unitless)

$$T = \text{Transmissivity} \left(\frac{feet^2}{day} \right)$$

t = Time (days)

r_0 = Radius of Influence (feet)

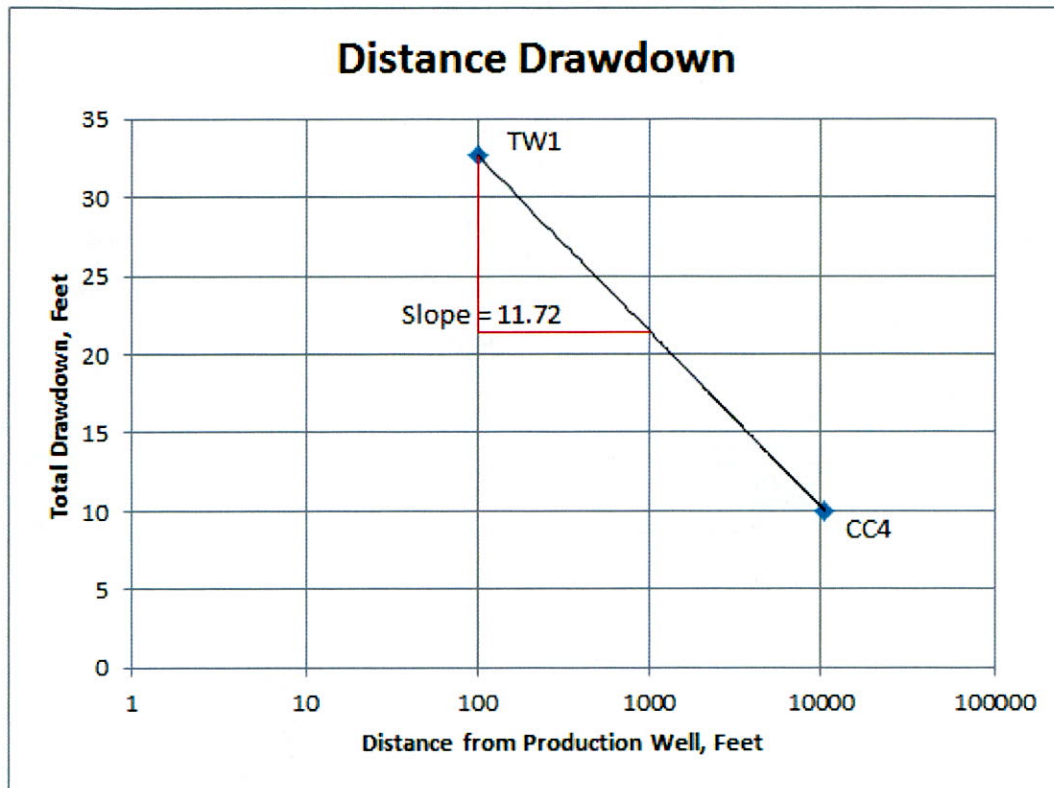


Figure 4: Distance versus Total Drawdown Between Wells TW1 and CC4 (Summit, 2014).

As shown in Figure 5, the lack of inflections in the drawdown curve during the pump test can be interpreted to mean no aquifer boundaries were encountered within the radius of influence during the test, as least in the direction of CC4. Combined with a full recovery of water levels in the production well (PW1) and adjacent test well (TW1) within three weeks of the end of the aquifer pump test, the lack of inflections in the drawdown curve can be used to conclude that this well is capable of producing the flow rate required for this project.

The other measured well completed into the formation, CC4, did not show a full recovery within the observed time period subsequent to pumping. However, CC4 did show increasing water levels over that time and it is very likely that full recovery was hampered by pumping from that well. Pump test data suggests JC1 is not affected by pumping from PW1 and instead responds primarily to local precipitation events and changes in atmospheric pressure.

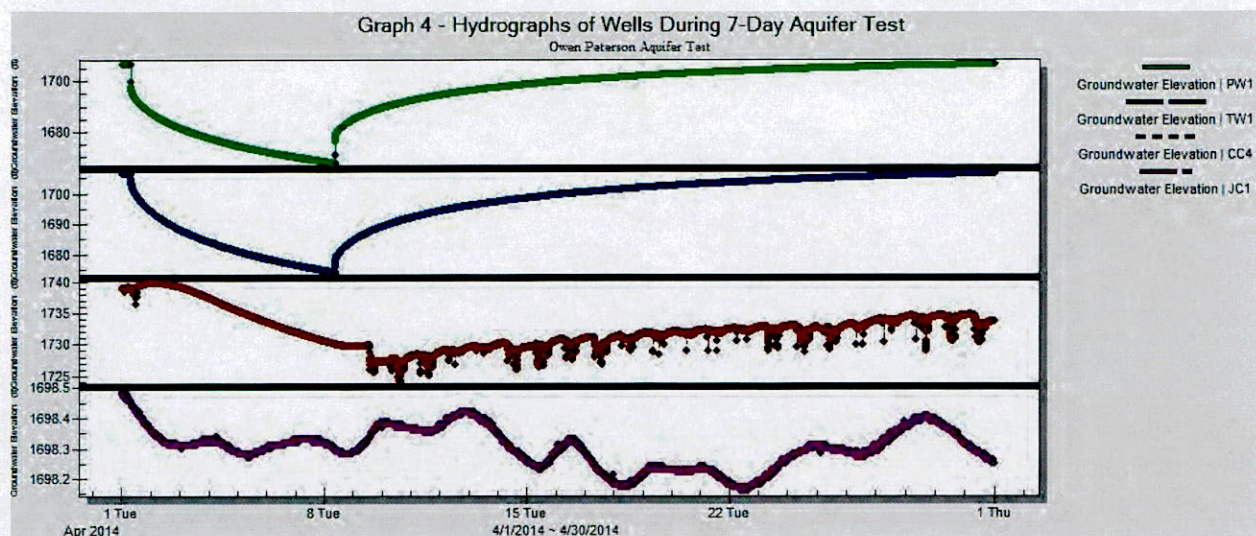


Figure 5: Drawdown and recharge curves for the water levels in the four wells observed (Summit, 2014).

During the test, water was pumped from this portion of the aquifer at a rate of 730 gallons per minute (gpm) for seven days, totaling approximately 7,358,400 gallons or 22.6 acre feet (ac-ft) of water. The initial water permit application proposes to divert water at a maximum rate of 1,100 gpm. Summit contends that under normal conditions, this pumping would not be expected to occur for more than four days of each week for the 16 week growing season. Under these conditions, total annual withdrawal would be approximately 311 acre feet per year (ac-ft/yr). This amount equates to 11.79 inches per acre applied annually over the entirety of the 316.5 acres to be irrigated.

In analyzing the irrigation questionnaires for the region, it is reasonable to assume that the amount of water applied per acre will be less than one ac-ft/yr (Water Rights, 1980-2014), making Summit's estimate of 311 ac-ft/yr for the entire 316.5 acres reasonable if not conservative. Given that the recovery time of three weeks was significantly longer than any period of non-pumping on an average year during the irrigation season, and that four days of continuous pumping at 1,100 gpm withdraws approximately 86% of the amount of water withdrawn during the test, it is possible that water levels will steadily decline in this portion of the aquifer during the growing season as a result of pumping. However, well logs submitted with the initial report show that artesian head is approximately 166 feet above the top of the water bearing formation. It is not expected that water levels will decline at this magnitude during a single growing season. Domestic use, including CC4 is expected to be negligible in terms of the volume of water withdrawn and the effect on overall drawdown.

Given the lack of inflections in the declining water level curve measured during the pump test, it was deduced above that the boundaries of the formation were not encountered during this test and that in the direction of CC4 the boundary lies more than 11.4 miles from the diversion site. Assuming the formation is at least as large as a circle with an 11.4 mile radius (261,300 acres) and using Hedges and others' (1985) recharge rate for confined aquifers of 0.15 to 0.6 inches per year, a range in recharge rates of 3,266 to 13,065 ac-ft/yr can be reasonably assumed. The amount of water the applicant can be expected to withdraw annually is significantly less than the lower end of this range. Because the minimum aerial extent of the aquifer lends itself to the

recharge range described above, and because expected withdrawals are easily eclipsed by the lowest end of that recharge rate, it can be reasonably deduced that unappropriated water is available for the proposed use in Water Permit Application No. 7921-3.

EXISTING WATER RIGHTS

At the time that the initial application was reviewed, the Water Rights Program had no record of any wells being completed into this portion of the Prairie Coteau aquifer. The aquifer pump test report completed by Summit, Envirosolutions Inc., makes known a domestic well (CC4) that is completed into the same formation as the applicants propose to divert from. With the exception of this well (CC4), which was brought to the attention of the Water Rights Program by Summit in the aquifer pump test report, the Water Rights Program has no record of any existing wells completed into this formation. The total drawdown in CC4 at the end of the aquifer pump test was approximately 11 feet. South Dakota Water Law does not protect artesian head as a means of delivery but does protect against interference in adequately constructed wells. An adequate well is defined by ARSD 74:02:04:20(7) as:

“a well in which the pump intake was set at least 20 feet below the top of the aquifer at the time of construction or, if the aquifer is less than 20 feet thick, is as near to the bottom of the aquifer as is practical and the water level has declined to a level that the pump will no longer deliver sufficient water for the well owner’s needs.”

Assuming adequate construction, and given that there is approximately 180 feet of artesian head above the water bearing formation, it is not expected that the applicant’s proposed diversion of water will unlawfully impair this existing well or any other domestic wells in the area.

OBSERVATION WELL DATA

Currently, The Water Rights Program does not maintain any observation wells completed into this portion of the Prairie Coteau aquifer. During a phone conversation between Eric Gronlund, Bracken Capen, and the applicant on September 25, 2014, the applicant agreed to construct an observation well completed into this portion of the aquifer during the construction of another well (thought to be completed into the same portion of the aquifer) proposed under Water Permit No. 7988-3 and located approximately 1.3 miles to the east of PW1. TW1 would also be suitable for an observation well but is located in close proximity to the production well (PW1) and is not readily accessible. Further discussion between the applicant and the Water Rights Program will be necessary in order to agree on an exact location for this new observation well. This observation well will be used to monitor water levels in this portion of the aquifer.

CONCLUSIONS

- 1) There is a reasonable probability that this outwash deposit of the Prairie Coteau aquifer contains unappropriated water to supply the proposed annual diversion of 2.44 cfs (1,100 gpm) for the irrigation of 316.5 acres.
- 2) Recharge to this portion of the aquifer is expected to be sufficient to adequately supply all diversions completed into the formation.

- 3) The South Dakota Water Rights Program does not currently have any observation wells completed into this portion of the aquifer. The applicant has agreed to construct an observation well completed into this portion of the aquifer as a condition for approval of Water Permit Application No. 7988-3. Water levels in this observation well will be regularly monitored by The Water Rights Program.
- 4) There is a reasonable probability that this proposed diversion can be made without adversely impacting existing water rights and domestic wells.

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Bracken Capen
SD DENR-Water Rights Program

Approved by:

A handwritten signature in black ink, appearing to read 'Ken Buhler', with a long horizontal line extending to the right.

Ken Buhler
SD DENR-Water Rights Program

REFERENCES

- Hedges, L.S., Allen, J., and Holly, D.E. 1985. Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa. Task 7: Ground Water Recharge. South Dakota DENR-Geological Survey, Vermillion, SD.
- Summit Envirosolutions, Inc., 2014. Aquifer Test Report, Owen Peterson Farm. Summit Project No. 2219-0001. Summit Envirosolutions, Inc., St. Paul, MN.
- Walton, W. C., 1990. Groundwater pumping tests. CRC Press.
- Water Rights. 1980-2014. "1979-2013 Irrigation Summaries by Aquifer": SD DENR-Water Rights Program, Joe Foss Building, Pierre, SD.
- Water Rights. 2014a. Well Completion Reports. SD DENR-Water Rights Program, Joe Foss Bldg., Pierre, SD.



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



NOV 19 2014

Owen and Lamont Peterson
PO Box 97
Wendell MN 56590

Dear Sirs:

Enclosed is Water Permit Nos. 7821-3 and 7988-3 authorizing construction of your water diversion systems and beneficial use of the water, not exceeding the limits as specified in the Water Permits.

Please contact Ken Buhler with the Water Rights Program at 605 773-3352 to discuss completion of the observation well as required by Qualification No. 4 on the permits.

Water Permit No. 7988-3 was submitted with a check for \$1,300.00. The application /license fee for Permit No. 7988-3 is \$1,250.00. Therefore, \$50.00 will be refunded to you. The refund check should be received within the next couple of weeks.

Form 10s, *Notice of Completion of Works and Application of Water to Beneficial Use*, are enclosed. Please return the completed forms after you have finished the systems 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,

Jeanne Goodman, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

May 12, 2015

7921-3

Owen and Lamont Peterson
PO Box 97
Wendell, MN 56590

Dear Sirs:

Water Permit No. 7921-3 appropriates 2.44 cubic foot per second (cfs) from one well completed into the Prairie Coteau aquifer to irrigate 316.5 acres in the E ½ of Section 8, T114N R51W in Hamlin County. The well was constructed in the SW ¼ SE ¼ of Sec 8, T114N R51W. The well currently serves two irrigation pivots in the NE ¼ and the SE ¼ of Section 8, T114N R51W but cannot supply water to both simultaneously. In addition to requiring a full aquifer test to be conducted and the constructing an observation well to be monitored by the Water Rights Program, the original permit was conditioned with the standard well interference, well completion, and irrigation questionnaire qualifications.

You submitted a letter to the South Dakota DENR Water Rights Program requesting an additional diversion point in the SW ¼ NE ¼ of Section 8, T114N-R51W. The letter explains that the existing well cannot supply water to both pivots simultaneously and that an additional well would allow irrigation of both quarter sections (the NE ¼ and the SE ¼ of Section 8) independently.

Upon review of the request and pursuant to SDCL 46-5-13.1, the additional well location is authorized without application or publication of a notice of hearing pursuant to SDCL 46-2A-4. No increase in the authorized diversion rate of 2.44 cfs under Water Permit No. 7921-3 has been requested or approved. If the total diversion rate increases, a new water permit will need to be obtained from the SD DENR Water Rights Program.

Please note that Qualification No. 4 requires you to complete an observation well to monitor water levels in this portion of the Prairie Coteau aquifer. Please coordinate with the Water Rights Program by contacting Ken Buhler at (605) 773-3352.

If you have any questions, please contact Bracken Capen at (605) 773-3352.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeanne Goodman". The signature is written in a cursive, flowing style.

Jeanne Goodman
Chief Engineer
Water Rights Program

File No. 7921-3

Approval of Additional Diversion Point

NAME: Owen and Lamont Peterson **ADDRESS:** PO Box 97, Wendell, MN 56590

DATE: May 4, 2015 **COUNTY:** Hamlin **TELEPHONE:** (218) 639-2931

Water Permit No. 7921-3 appropriates 2.44 cubic foot per second (cfs) from one well completed into the Prairie Coteau aquifer to irrigate 316.5 acres in the E ½ of Section 8, T114N R51W in Hamlin County. The well was constructed in the SW ¼ SE ¼ of Sec 8, T114N R51W. The well currently serves two irrigation pivots in the NE ¼ and the SE ¼ of Section 8, T114N R51W but cannot supply water to both simultaneously. When Water Permit Application No. 7921-3 was originally submitted, there was insufficient information on the portion of the Prairie Coteau aquifer that the applicants proposed to divert from to make an informed decision to approve or deny the application. Consequently, the applicants had an aquifer test performed to evaluate the characteristics of this portion of the aquifer including the availability of unappropriated water and potential impact to existing users. Ultimately, tests showed that this portion of the Prairie Coteau has sufficient unappropriated water available and that existing water rights/permits will not be unlawfully impaired as a result of pumping. In addition to conducting a full aquifer test and constructing an observation well to be monitored by the Water Rights Program, the original permit was conditioned with the standard well interference, well completion, and irrigation questionnaire qualifications.

Owen and Lamont Peterson submitted a letter to the South Dakota DENR Water Rights Program (received on April 13, 2015) requesting an additional well located (according to a map submitted with the letter by Owen and Lamont Peterson) in the SW ¼ NE ¼ of Section 8, T114N R51W. The letter explains that the existing well cannot supply water to both pivots simultaneously and that an additional well would allow irrigation of both quarter sections independently. During a conversation on May 4, 2015 with Bracken Capen of the Water Rights Program, Bob Thein of Thein Well Co., Inc. (who will be constructing the new well) explained that the new well will be completed to a depth of 234 feet below ground surface. This depth is approximately the same as the existing well (228 feet) and is expected to be completed into the same aquifer, the Prairie Coteau.

AUTHORITY:

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

- **Developed water source is the same as licensed source and no additional water is appropriated.**

The water source authorized by Water Permit No. 7921-3 is the Prairie Coteau aquifer. The depth of the existing well as well as the depth of the new well which Owen and Lamont Peterson propose to construct is consistent with the known depth of this portion of the Prairie Coteau aquifer.

No additional appropriation of water is authorized. Water Permit No. 7921-3 appropriates 2.44 cfs and no additional diversion rate authority is being requested.

Review of Existing Diversions

There are no known water rights/permits or domestic wells completed into this portion of the Prairie Coteau aquifer. As stated above, at the time the original application was submitted, the size, characteristics, and suitability for development of this portion of the Prairie Coteau aquifer were all unknown. However, upon submission of the results of the aquifer test, the Water Rights Program was made aware of at least one other well completed into this portion of the aquifer. This well is located in the Claremont Colony, 1.6 miles to the northeast of the newly proposed well site. This distance is expected to be sufficient to avoid any impairment as a result of constructing the new well.

Observation Well Data

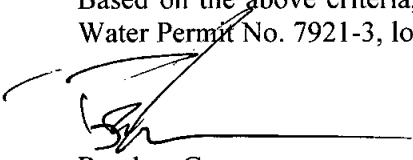
Although a condition in the approval of Water Permit Application No. 7921-3 was the construction of an observation well to be monitored by the Water Rights Program, there are currently no observation wells completed into this portion of the Prairie Coteau aquifer. At the time the original well was constructed a static water level of 25 feet below ground surface was reported.

CONCLUSION:

- The additional diversion point does not propose to appropriate additional water.
- The developed well is pumping water from the same portion of the Prairie Coteau aquifer as the proposed new well.
- Unlawful impairment of existing water rights/permits and domestic wells is not expected to occur.

RECOMMENDED ACTION:

Based on the above criteria, it is recommended that the request for an additional diversion point under Water Permit No. 7921-3, located in the SW ¼ NE ¼ of Section 8, T114N R51W be approved.



Bracken Capen
Natural Resources Engineer

The Chief Engineer makes a finding pursuant to SDCL 46-5-13.1 and ARSD 74:02:01:14:01 that: The additional diversion point does not increase the potential for adverse effects to existing diversions.



Jeanne Goodman, Chief Engineer
Water Rights Program

April 9, 2015

RECEIVED

APR 13 2015

WATER RIGHTS
PROGRAM

Department of Environment and Natural Resources

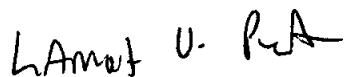
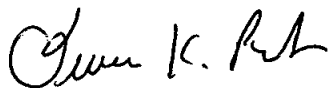
Joe Foss Building 523 E Capitol

Pierre SD 57501-3182

To Whom it May Concern:

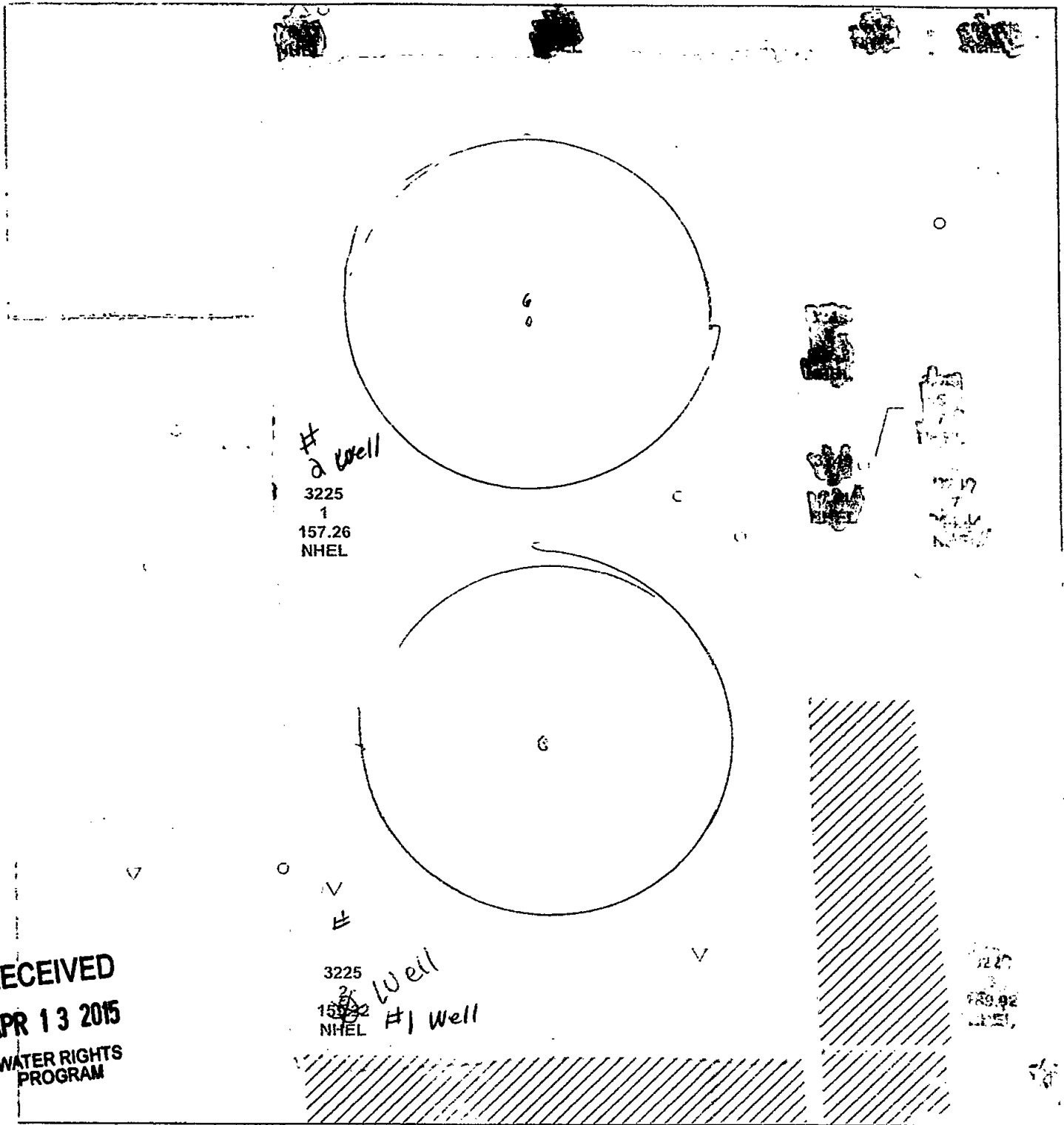
We have an existing permit number 7921-3 for irrigating 316.48 acres in the East half of section 8, all in T114N-15W. We are requesting a change by adding a second production well, (see map) but staying at the permitted gallons per acre and dividing between the two irrigators, allowing us to run both irrigators at the same time.

Sincerely,



Owen K. Peterson

Lamont V. Peterson



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159
311

RECEIVED
APR 13 2015
WATER RIGHTS
PROGRAM

USDA - Farm Service Agency

Hamlin County, SD

4101 - 3225

1:8,730

West 1/4

316.48

October 23, 2008

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. 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-026 and attached maps) for exact wetland boundaries and determinations, or contact NRCS.

Original Permit app.

Mail to: PMB 2020 DENR - Water Rights 523 E Capitol Ave Pierre, SD 57501-3182 ph. (605) 773-3352	(office use only) No. _____ Hydrologic Unit _____
	Basin _____
	Newspaper _____

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.)

1. Name to Appear on Irrigation Permit Owen & Lamont Peterson
 (check one) ☒ Owner ☐ Tenant/lessee ☐ Owner's Legal Agent _____
 (name and complete address if different than above name)
- Mailing Address 31760 Co Rd 11 P.O. Box 97 Wendell MN 56590
 (Address) (City) (State) (Zip Code)
- Home Phone 218-639-2931 Cell Same Email OK Pete @ Runestone.net
2. Amount of water claimed _____ *CFS or _____ **GPM _____ ***AF Total Acreage 316.48
 (*Cubic Feet per Second) (**Gallons per Minute) (***Acre Feet - storage capacity of dam/dugout or annual use if applicable)
3. Source of water supply Irrigation Well Subsurface aquifer
4. Location of point of diversion 1 well SW 1/4 of Section 8 T-114N R-51-W
 (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
- County Hamline
5. County or counties where water will be used Hamline
6. Annual period during which water is to be used MAY - Sept
7. 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
<u>Same as above</u>	<u>316.48 Ac</u>		

8. Give a description of the project. (Attach sheet if more space is needed)

See map

I, Owen K. Peterson, the applicant, certify that I have read this application, have examined the attached map, and that the matters stated are true.

SOUTH DAKOTA WATER WELL COMPLETION REPORT

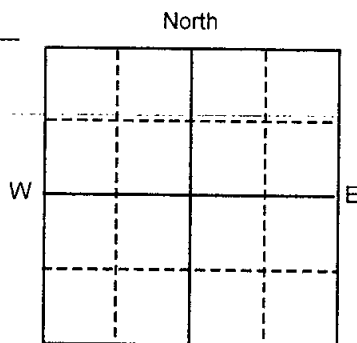
SD EForm - 1621LD V1

11-02

Location SE 1/4 NW 1/4 Sec 8 Twp 114N Rg 51W

County Hamlin

Please mark well location with an "X"



Well Completion Date

06-26-15

← 1 Mile →

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
75+ ft. from Septic (identify source)

PROPOSED USE:

☐ Domestic/Stock ☐ Municipal ☐ Business ☐ Test holes
☒ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Rotary

CASING DATA:

If other describe ☒ Steel ☐ Plastic ☐ Other

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT <u>12</u>	IN <u>0</u>	FT <u>209</u>	FT <u>17 1/2</u>	IN <u>17 1/2</u>
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
<u>Bentonite</u>	<u>47</u>	Lb/gal <u>0</u>	Ft <u>185</u>	Ft <u>185</u>
		Lb/gal	Ft	Ft

Describe grouting procedure

tremie piped

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12 Inches Length 20 Feet

Material Stainless Steel

Slot Size .070 Set From 209 Feet to 229 Feet

Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? Chlorinated

Lab to which water quality sample sent for analysis

n/a

Well Owner: Owen Peterson

Business Name:

Address: PO Box 97

City, State, Zip: Wendell MIN. 56590

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Top soil	0	6
Brown clay	6	32
Blue clay	32	124
Sandy brown clay	124	163
Blue clay	163	191
med - crs sand / gravel	191	227
Shale	227	229

STATIC WATER LEVEL

29

FEET

If flowing: closed in pressure

PSI

GPM flow through

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate

GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:
☐ Bailed
☐ Other

Pumping Level Below Land Surface

140 Ft. After 2 Hrs. pumped 600 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

GPS : N 44 41.810
 W 096 58.616

Alramon

This well was drilled under license # 475 and this report is true and accurate.

Drilling firm: Thein Well Co. Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date:

RECEIVED

SEP 14 2015

WATER RIGHTS PROGRAM



7921-3
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 15, 2016

NOTICE

TO: OWEN & LAMONT PETERSON, PO BOX 97, WENDELL, MN 56590
FROM: Ron Duvall, Natural Resources Engineer
for Jeanne Goodman, Chief Engineer
Water Rights Program

SUBJECT: Reporting Requirement for 2015 Irrigation Questionnaire(s)

Our records indicate your 2015 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 7921-3, 7946-3, 7984-3 & 7988-3. The request for the Questionnaire was dated October 23, 2015. The Water Management Board has directed that owners of water permits who have not submitted the 2015 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) 7921-3, 7946-3, 7984-3 & 7988-3 qualification:

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

The hearing will be held at **Thursday, March 3, 2016 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) 7921-3, 7946-3, 7984-3 & 7988-3 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 3, 2016** 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
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

February 9, 2016

7921-3
7946-3
7984-3
7988-3

Owen & Lamont Peterson
PO Box 97
Wendell MN 56590

Dear Sirs:

I am writing to acknowledge receipt of your 2015 irrigation questionnaires.

You may disregard the January 15, 2016, "Notice" concerning reporting requirements for Water Right Nos. 7921-3, 7946-3, 7984-3 and 7988-3. 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



7921-3
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 20, 2017

NOTICE

TO: OWEN & LAMONT PETERSON, PO BOX 97, WENDELL, MN 56590
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) 7921-3, 7946-3, 7984-3 & 7988-3. 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) 7921-3, 7946-3, 7984-3 & 7988-3 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) 7921-3, 7946-3, 7984-3 & 7988-3 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.



7921-3
DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

February 15, 2017

Owen & Lamont Peterson
PO Box 97
Wendell MN 56590

RE: Water Permit Nos. 7921-3, 7946-3, 7984-3 & 7988-3

Dear Sirs:

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

You may disregard the January 20, 2017, "Notice" concerning reporting requirements for Water Permit No. 7921-3, 7946-3, 7984-3 & 7988-3. 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



7921-3
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 26, 2018

NOTICE

TO: OWEN & LAMONT PETERSON, PO BOX 97, WENDELL, MN 56590
FROM: Ron Duvall, Natural Resources Engineer
for Jeanne Goodman, Chief Engineer
Water Rights Program

SUBJECT: Reporting Requirement for 2017 Irrigation Questionnaire(s)

Our records indicate your 2017 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 7921-3, 7946-3, 7984-3 & 7988-3. The request for the Questionnaire was dated October 20, 2017. The Water Management Board has directed that owners of water permits who have not submitted the 2017 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) 7921-3, 7946-3, 7984-3 & 7988-3 qualification:

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

The hearing will be held at **Wednesday, March 7, 2018 at 10:00 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) 7921-3, 7946-3, 7984-3 & 7988-3 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 7, 2018** 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.

7921-3



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
www.denr.sd.gov

February 23, 2018

Owen & Lamont Peterson
PO Box 97
Wendell MN 56590-0097

RE: Water Permit Nos. 7921-3, 7946-3, 7984-3 & 7988-3

Dear Sirs:

I am writing to acknowledge receipt of your 2017 irrigation questionnaires.

You may disregard the January 26, 2018, "Notice" concerning reporting requirements for Water Permit Nos. 7921-3, 7946-3, 7984-3 & 7988-3. 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



7921-3
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 25, 2019

NOTICE

TO: OWEN & LAMONT PETERSON, PO BOX 97, WENDELL, MN 56590
FROM: Ron Duvall, Natural Resources Engineer
for Jeanne Goodman, Chief Engineer
Water Rights Program

SUBJECT: Reporting Requirement for 2018 Irrigation Questionnaire(s)

Our records indicate your 2018 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 7921-3, 7946-3, 7984-3 & 7988-3. The request for the Questionnaire was dated October 30, 2018. The Water Management Board has directed that owners of water permits who have not submitted the 2018 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) 7921-3, 7946-3, 7984-3 & 7988-3 qualification:

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

The hearing will be held at **Wednesday, March 6, 2019 at 10:30 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) 7921-3, 7946-3, 7984-3 & 7988-3 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 6, 2019** 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.

7921-3



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
www.denr.sd.gov

February 27, 2019

Owen & Lamont Peterson
PO Box 97
Wendell MN 56590-0097

RE: Water Permit Nos. 7921-3, 7946-3, 7984-3 & 7988-3

Dear Sirs:

I am writing to acknowledge receipt of your 2018 irrigation questionnaires.

You may disregard the January 25, 2019, "Notice" concerning reporting requirements for Water Permit Nos. 7921-3, 7946-3, 7984-3 & 7988-3. The information was received in our office prior to the Water Management Board meeting and your names have been deleted from the agenda.

If you have any questions, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Genny McMath".

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



7921-3

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

JUN 06 2023

Owen and Lamont Peterson
PO Box 4
Wendell, MN 56595

7921-3

Dear Sirs:

Enclosed is Water License No. 7921-3. 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 the existing wells, constructs a replacement well and does not plan to use the old wells, the old wells are 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. 7921-3

(1) Owen and Lamont Peterson; PO Box 4, Wendell, MN 56595, made Application No. 7921-3, November 5, 2013 for a water permit to divert 2.44 cubic feet of water per second (cfs) from groundwater, one well (Prairie Coteau Aquifer), Hamlin County, South Dakota for irrigation purposes. Permit No. 7921-3, with a priority date of November 5, 2013 was approved October 22, 2014 and issued to the applicants for diversion of water with construction of the described water supply system to be completed on or before October 22, 2019 and for the application to beneficial use of water on or before October 22, 2023.

In April 2015, the permit holders submit a request to add an additional well so that irrigation could be provided by both center pivots, simultaneously, yet independently. In May of 2015 that request was approved. No increase in the authorized diversion rate or additional acres were approved.

(2) It is certified that the permit holders have complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and are entitled to divert 2.22 cubic feet of water per second for beneficial use. The locations of these diversion points are:

North Well: 3,095 ft N and 2,630 ft W of the SE corner of Section 8, T114N, R51W (SE $\frac{1}{4}$ NW $\frac{1}{4}$)
(Latitude 44.69691 Longitude -96.97683)

South Well: 285 ft N and 2,650 ft W of the SE corner of Section 8, T114N, R51W (SE $\frac{1}{4}$ SW $\frac{1}{4}$)
(Latitude: 44.68916 Longitude -96.97691)

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

Section 8, T114N, R51W			
NW $\frac{1}{4}$ NE $\frac{1}{4}$	39.0 acres	NW $\frac{1}{4}$ SE $\frac{1}{4}$	39.0 acres
NE $\frac{1}{4}$ NE $\frac{1}{4}$	28.5 acres	NE $\frac{1}{4}$ SE $\frac{1}{4}$	31.1 acres
SE $\frac{1}{4}$ NE $\frac{1}{4}$	27.0 acres	SE $\frac{1}{4}$ SE $\frac{1}{4}$	27.4 acres
SW $\frac{1}{4}$ NE $\frac{1}{4}$	37.0 acres	SW $\frac{1}{4}$ SE $\frac{1}{4}$	38.0 acres
TOTAL 267.0 acres			

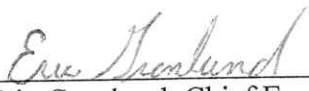
(4) Pursuant to South Dakota Water Law 46-5-30.1 Owen and Lamont Peterson the holders and/or owners of Water Permit No. 7921-3 are issued a license to appropriate water, the right to use 2.22 cubic feet of water per second from groundwater, 2 wells (Prairie Coteau Aquifer) with a priority date of November 5, 2013, from the locations 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. 7921-3 and subject to the following qualifications:

1. The wells approved under this water right will be located near domestic wells and other wells which may obtain water from the same aquifer. The owners under this water right shall control their 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 wells authorized by Permit No. 7921-3 shall be constructed by a licensed well driller and construction of the wells 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 South well was completed by Thein Well Co Inc. in 2013 and the North well was completed by the same company in 2015. A copy of each well completion report is on file with the Water Rights Program.)*
3. The water right holder for Water Right No. 7921-3 and Permit No. 7988-3 shall contract with a license well driller to construct an observation well that will become part of the South Dakota Department of Environment and Natural Resources Observation Well Network. The observation well must be completed into the same aquifer as the production well and shall be located in the public right of way or a perpetual easement granted to the State for the purpose of maintaining an observation well on property owned by the permit holder. The observation well construction shall be coordinated with the DANR – Water Rights Program staff. *(Observation well HN-2016A)*
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 06 2023

date



Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 7921-3

I have this day, May 1, 2023, made a thorough examination of the water use system constructed by Owen and Lamont Peterson PO Box 4, Wendell, MN 56595 of Permit No. 7921-3, bearing the priority of November 5, 2013 authorizing the diversion of 2.44 cu. ft. per second of the waters of the Prairie Coteau Aquifer for irrigation purposes, in Hamlin County.

A. Works used to divert the water:

Well Information:

- 1) Well Drilling Firm: Thein Well Co, Inc
- 2) No. of Wells 2
- 3) Depth(s) North- 229 South - 228 feet
- 4) Well log is available Y

Casing:

- 1) Diameter 6 - 12 inches
- 2) Length 209 feet
- 3) Type North - Steel South - PVC

Screen:

- 1) Type North - Stainless steel South - PVC
- 2) Length 20-28 feet
- 3) Static water level 29 feet

Pump:

- 1) Make 2- Layne (Turbine)
- 2) Model 10 RM
- 3) Size Unknown
- 4) Capacity 500 each - 1000 total GPM

Motor:

- 1) Make US Motors (S) & NIDEC (N)
- 2) Model No. BF4BA & Unknown
- 3) Horsepower rating 40 (S) & 60 (N) hp

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

- 1) Type Buried PVC 2) Size 8 inches 3) Length 1,845 (S) & 1,810 (N) feet

Comments:

C. Works used to apply water to beneficial use:

Center pivot:

- 1) Make 2- Zimmatic
2) Overall length 1300 feet
3) Number of towers 7 (North pivot) 8 (South pivot)
4) End gun Y
5) Capacity 500 each - 1000 total 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 LOCATIONS**
From the SE corner Sec 8 T114N R51W; WELL "S" 285 ft N & 2650 ft W, Lat 44.68916 Long -
96.97691 (SE ¼ SW ¼) WELL "N" 3,095 ft N & 2,630 ft W, Lat 44.69691 Long -96.97683 (SE ¼ NW
¼)

2. The works are capable of diverting and conveying to the place of use 2.22 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
Sec 8 T114N R51W
NW ¼ NE ¼ - 39.0 ACRES
NE ¼ NE ¼ - 28.5 ACRES
SE ¼ NE ¼ - 27.0 ACRES
SW ¼ NE ¼ - 37.0 ACRES

legal description/acreage
8 T114N R51W
NW ¼ SE ¼ - 39.0 ACRES
NE ¼ SE ¼ - 31.1 ACRES
SE ¼ SE ¼ - 27.4 ACRES
SW ¼ SE ¼ - 38.0 ACRES

comprising a total of 267 acres of land and the license should be issued for 2.22 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.

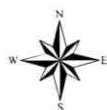
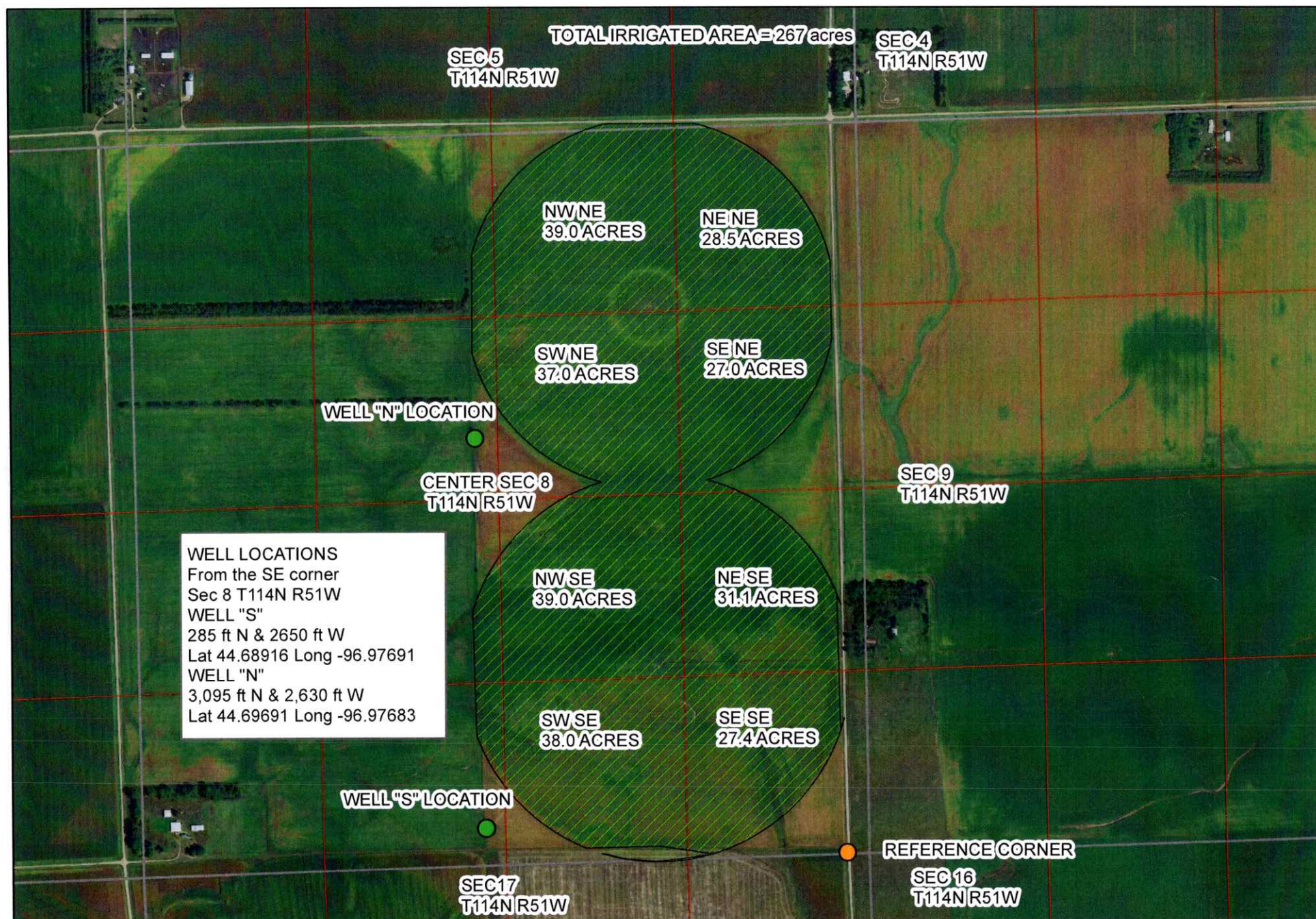
The Permittees have a Permit in an adjacent property: Sec 9, Permit 7988-3.

The mailing address in the permit materials is current; however, the phone number is not. A current contact phone number is 218/639-2931 for Owen Peterson who was contacted by phone.



Darrell W DeBoer
Water Rights Inspector
DANR, Water Rights Program

Date report completed: May 15, 2023



0 0.125 0.25 0.5 0.75 1 Miles



Darrell DeBoer
Water Right Inspector
DANR-Water Rights Program

Lithologic Logs Database

Lithologic Logs Search for: *water_rights_well like HN-2016A*

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New Search

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Record 1 of 1

Location Information

Legal Location: SW SW SW SE SEC. 08, T. 114 N., R. 51 W.
 County: HAMLIN Location: 114N51W08DCCC
 Latitude: 44.688870
 Hydrologic Unit Code: 10170202 Longitude: - 96.976840
 Land Owner: O. PETERSON Ground Surface Elev. (ft.): 1733 T

Test Hole Information

Project: WATER RIGHTS
 Drill Date: 10/08/2013 Geologist:
 Company: THEIN WELL CO., INC. Geologist's Log:
 Drilling Method: ROTARY Driller:
 Test Hole Number: Driller's Log: X
 Geophysical Log: NO Total Drill Hole Depth (ft.): 228.0

Well Information

SDGS Well Name: Aquifer: PRAIRIE COTEAU
 Water Rights Well: HN-2016A Water Level Data Management Unit:
 Other Well Name: Casing Top Elev. (ft.): 1734.52 T
 Casing Type: PVC Casing Diameter (in.): 6.0
 Screen Type: PVC Screen Length (ft.): 28.0
 Total Casing and Screen (ft.): 228.0 Casing Stick-up (ft.): 1.50

Lithologic Information

Elevation (ft.)	Depth (ft.)	Description
1733.0 - 1732.0	0.0 - 1.0	TOPSOIL, BLACK
1732.0 - 1683.0	1.0 - 50.0	CLAY AND ROCKS, BROWN CLAY
1683.0 - 1674.0	50.0 - 59.0	CLAY, BLUE
1674.0 - 1669.0	59.0 - 64.0	GRAVEL AND SAND, BROWN
1669.0 - 1662.0	64.0 - 71.0	CLAY AND GRAVEL, BROWN-YELLOW
1662.0 - 1647.0	71.0 - 86.0	GRAVEL AND SAND, YELLOW-BROWN
1647.0 - 1543.0	86.0 - 190.0	CLAY, BLUE
1543.0 - 1534.0	190.0 - 199.0	CLAY AND GRAVEL, BLUE-BROWN
1534.0 - 1505.0	199.0 - 228.0	GRAVEL AND SAND, MIXED COLOR

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**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

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

March 10, 2025

7921-3
7984-3
7988-3

Owen & Lamont Peterson
PO Box 4
Wendell MN 56590

Dear Mr. Peterson:

I write to you today in response to the 2024 Irrigation Questionnaire information submitted for Water Right Nos. 7921-3, 7984-3, and 7988-3.

Water Right No. 7921-3 (copy enclosed) authorized diversion of 2.22 cubic feet of water per second (1000 gpm) from two wells completed into the Prairie Coteau Aquifer for irrigation of 267 acres located within the E ½ Section 8-T114N-R51W.

Water Right No. 7984-3 (copy enclosed) authorized diversion of 1.11 cubic feet of water per second (500 gpm) from one well completed into the Big Sioux: Brookings Aquifer for irrigation of 115 acres located within the NW ¼ & N ½ SW ¼ Section 3-T114N-R52W.

Water Right No. 7988-3 (copy enclosed) authorized diversion of 1.11 cubic feet of water per second (500 gpm) from one well completed into the Prairie Coteau Aquifer for irrigation of 251 acres located within the S ½ Section 9-T114N-R51W.

On this year's questionnaire you reported the irrigation of 316.48 acres under 7921-3, 147.2 acres under 7984-3, and 290 acres under 7988-3. If an additional 120 acres have been developed for irrigation, additional permitting would be required.

Please contact me to either revise your 2024 Irrigation Questionnaires or discuss additional permitting.

Sincerely,

Amanda Dewell
Permitting Administrator
Water Rights Program
Amanda.Dewell@state.sd.us
(605) 773-3352

enclosures