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# Upper Elkhorn Natural Resources District Cooperative Agreement, Field Summary Report 1998-1999

Susan Olafsen Lackey *University of Nebraska-Lincoln*, slackey1@unl.edu

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# Upper Elkhorn Natural Resources District Cooperative Agreement

Field Summary Report 1998-1999

February 2000

Conservation & Survey Division UN-L

Susan Olafsen Lackey



Institute of Agriculture and Natural Resources

Institute of Agriculture and Natural Resources Conservation and Survey Division 601 East Benjamin Avenue, Suite 104 Norfolk, NE 68701-0812 Telephone (402) 370-4007 FAX (402) 370-4010

Geological and Natural Resources Surveys



2/22/00

Upper Elkhorn NRD Dennis Schueth, Manager 301 North Harrison O'Neill, NE 68763

RE: Phase II Monitoring Well Network, of the November 1998 Cooperative Agreement between the NRD and CSD.

### Dear Sirs:

Attached is a copy of the Field Summary Report, 1998 to 1999, for the above referenced project. Three copies have been provided to the NRD, two bound copies and one in a 3-ring notebook for production of additional copies.

The report is organized with summary maps and tables in the front. Individual site information follows the summary data. Sites are organized by well number with a blue cover page for each site. Site data include; 7.5-minute Quad Map, Final Test-Hole Log, Geophysical Log, Aerial Photo, Well Registrations, and Well Completion Diagrams.

Six test-holes were drilled, sampled, and electric logged. The total test-hole footage was 2028 feet. Fifteen monitoring wells were drilled, constructed, and developed. Individual well depths ranged from 30-feet to 335-feet. Total well footage was 2070 feet.

We suggest that water level measurements and water samples be taken on a monthly basis for one year. After reviewing water level and water quality variations during that year, new monitoring schedules will be determined for each well.

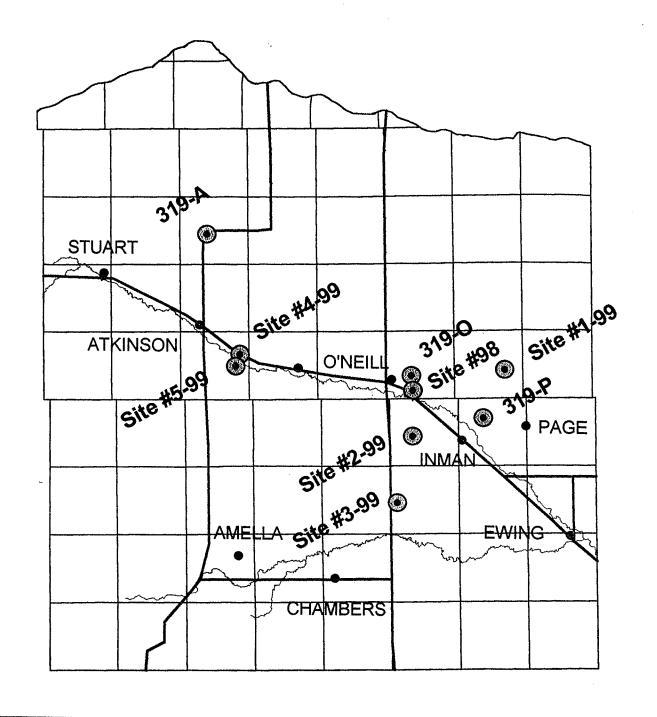
Sincerely,

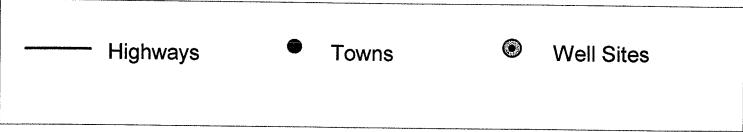
Susan Olafsen Lackey

Hydrogeologist

### TABLE OF CONTENTS

Map	p:	Holt	_		Location	·
Tal Mar Tal	ole: ble: p: ble: g:	1998 Holt 1998	and 199 and 199 County and 199	99 Test 99 Test Monito 99 Mon:	t-Hole ( t-Hole I oring We itoring	1998, & 1999 sites Correlation Data Oata Ell Locations, with 319 wells Well Data .es(2 pages)
Si	7.! Fin Geo Ae: We:	5-min nal Te ophys rial I	ute Quad est-Hole ical Log Photo gistrat:	d Map. e Log g		Number on Blue Cover Page .Site Location  .Well Locations .2 pages each Well .1 page each Wells
#1	Wells:	#1 M	iddle		Sec 34,	North
#2	Well:	#2 S	<b>T29N, I</b> hallow	R14W, \$	Sec 13,	NM
#3	Wells:	#3 SI #3 M	hallow. iddle		Sec 14,	West Center
#4	Wells:	#4 S #4 M	hallow.		Sec 21,	West
#5	Wells:	#5 M	hallow.		• • • • •	NW South Center North
#6	Wells:	#6 M	hallow. iddle			SW South Center North





Holt County Well Locations

# 1998 and 1999 Upper Elkhorn NRD Correlation Table

Conservation & Survey Division

2/8/00

Sol

Test Hole	Site #	Legal Description	Drill Date	Total Depth	7.5' Quad	Topo Elev	Well #
1-UE-98*	1-98	29N-11W-34-SW	6/11/98	328	Inman	1945	-
1-UE-99	4-99	29N-14W-13-NW	9/20/6	09	Emmet NW	202	2
2-UE-99	5-99	29N-14W-14-SE	9/21/99	400	Emmet NW	2055	3
3-UE-99	2-99	28N-11W-21-NW	9/23/69	440	Inman	1983	4
4-UE-99	3-99	27N-11W-19-NW	9/28/99	440	O'Neill SW	2053	2
5-UE-99	1-99	29N-10W-24-SW	66/08/6	360	Page	1937	9
* Field #1	-UE-98 =	* Field #1-UE-98 = Report #12-A-98					

1998 and 1999 Upper Elkhorn NRD Test-Hole Data

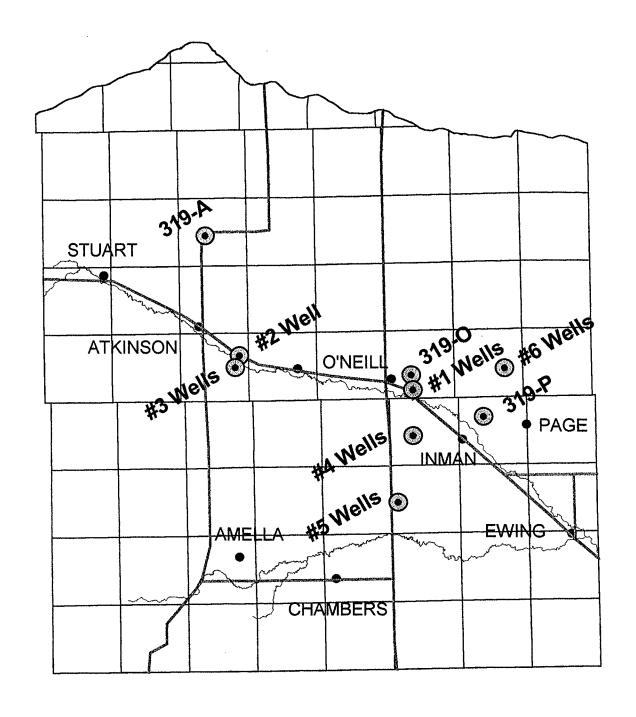
Conservation & Survey Division

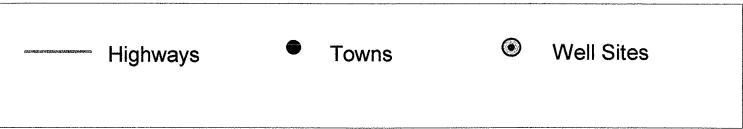
2/8/00

Sol

Test Hole	Legal Description	Qtrs	Foot N/S	Foot E/W	Topo Elev	7.5' Quad	Total Depth
1-UE-98*	29N-11W-34-SW	qpss	344	816	1945	Inman	328
1-UE-99	29N-14W-13-NW	၁၎၁၎	-1962	32	202	Emmet NW	09
2-UE-99	29N-14W-14-SE	daab	2639	-462	2055	Emmet NW	400
8-3-1E	28N-11W-21-NW	pppa	-86.5	540	1983	Inman	440
4-UE-99	27N-11W-19-NW	၁၁၁વ	-2602	180	2053	O'Neill SW	440
5-UE-99	29N-10W-24-SW	ລລລລ	147	27	1937	Page	360

\* Field #1-UE-98 = Report #12-A-98





Holt County Well Locations

# 1998 and 1999 Upper Elkhorn NRD Monitoring Well Network Well Data Table

# Holt County

Well # Setting	Total Depth	Screen Length	Gravel Pack Top	Water Depth	Top of Ogallala	Top of Bedrock	Water Source
1M (No)	70	10	55	3.26	19	316	P-P S&G
1D (So)	225	5	215	2.4		Kp	То
28	20.6	10	8.75	4.3	20		WT
3S (W)	25.6	10	12	5.25	30	380	WT
3M (Ctr)	100	10	79	4.0		Кр	P-P S&G
3D (E)	221	10	207.5	2.7			To
4S (W)	33	10	20	4.5	32.5	420	P-P S&G
4M (Ctr)	109	10	94	4.84		Kp	To
4D (E)	270	10	256.3	4.25			То
5S (So)	85	10	66.7	13.6	90	385	P-Þ S&G
5M (Ctr)	180	10	163.5	13.47		Кр	То
5D (No)	336	10	314	13.52			То
6S (So)	70	10	53	34.3	88	331	P-P S&G
6M (Ctr)	120	10	103.5	34.37		Кр	То
6D (No)	211	10	194.5	34.25		Sol	To 2/8/0

Conservation & Survey Division

Sol

2/8/00

# DAILY FIELD LOG (UPPER ELKHORN NRD - 1999)

SARGENT IRRIGATION;

Dale (Fred) Schindler, Travis, Tony, Richard, Ed, Nick.

and Roger Leegate

CONSERVATION & SURVEY DIVISION; Sue Lackey & Leonard Boryca

**UPPER ELKHORN NRD;** 

Bob Atkeson & Adam Ahlers

9/13/99 Monday Flagged Sites Atkeson, Boryca & Lackey

9/20/99 Monday

SITE #4

Test Hole # 1-UE-99 (60') (Bit 5-5/8-inches)

Well #2S—Screen 10-20', developed--.75 Hours (Bit 10-inches)

Site #5 set up for next test hole,

9/21/99 Tuesday

SITE #5

Test Hole #2-UE-99 (400'),

Deep monitoring well, set bottom plug, casing, filter pack. Make shift grout mixer plugged after 1.5 batches down hole. Borehole was caving(from 180 feet to 95 feet). Pulled casing and redrilled

hole, kept water in hole all night.

Site #4 Installed cover on well #2S

9/22/99 Wednesday

SITE #5

Well #3D (East)—Screen 210-220'

Well #3M(Center)—Screen 83.8-93.8' Well #3S(West)---Screen 15.3-25.3'

Rich from Broken Bow at site to teach grout machine operation, on deep well. Benseal poured too fast and tremie plugged. While clearing tremie, formation caved from 99 to 96 feet.

Site #2 set up for test hole

9/23/99 Thursday

SITE #2

Test Hole #3-UE-99 (440'),

Well #4D(East)—Screen 258-268'

Site #5 Developed wells and installed covers.

9/24/99 Friday

SITE #2

Well #4M(Center)—Screen 97.8-107.8'

Well #4S(West)—Screen 22.25-32.25'

Added additional grout to deep well

9/27/99 Monday

Site #2 Sargent Crew developed wells at and installed covers.

### 9/28/99 Tuesday

SITE #3

Test Hole #4-UE-99 (440'),

Well #5D(North)-Screen 320.8-330.8'

Travis out, Fred & Tony drilled

### 9/29/99 Wednesday

SITE #3

Well #5M(Center)—Screen 166-167'

Well #5S(South)—Screen 69-79'

Tried to develop #5D, but compressor didn't have enough lift

Site #1 Set up for test hole

### 9/30/99 Thursday

SITE #1

Test Hole #5-UE-99 (360'),

Well #6D(North)-Screen 199.2-209.2

Site #3 Developed shallow and medium monitoring wells
Travis back on site

### 10/1/99 Friday

SITE #1

Well #6M(Center)—Screen 106-116'

Well #6S(South)—Screen 55.75-65.75'

developed deep well

### 10/4/99 to 10/18/99

Site #1 Install covers

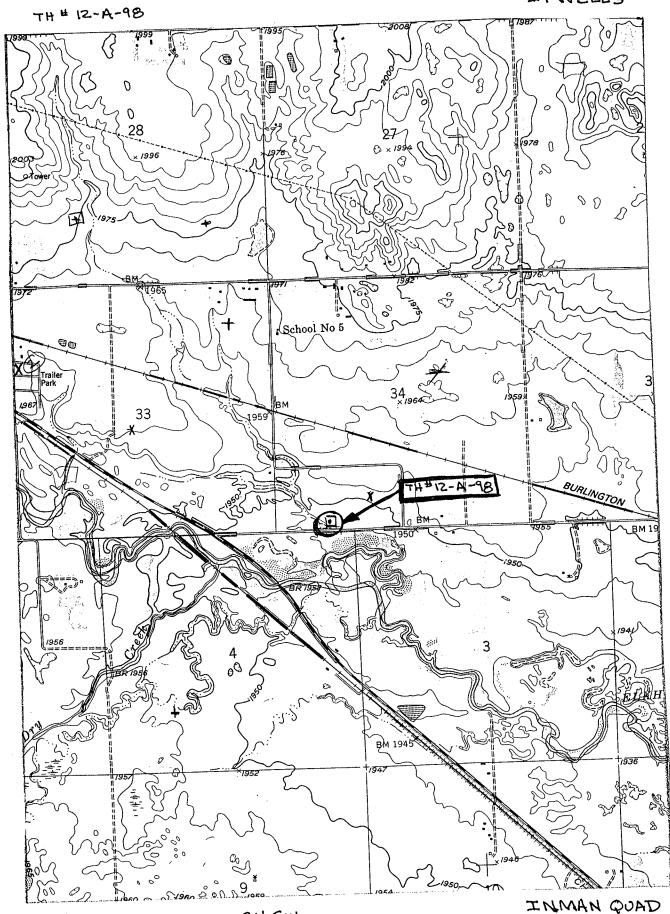
Site #1 Develop medium and shallow well

Site #1 Re-install fence

Site #3 Develop deep well

Site #3 Re-install fence

# Number 1 Wells



TZ9H, RIIW, SECTION 34 SW

# Test Hole #12-A-98 (29N-11W-34ccdb) Holt County

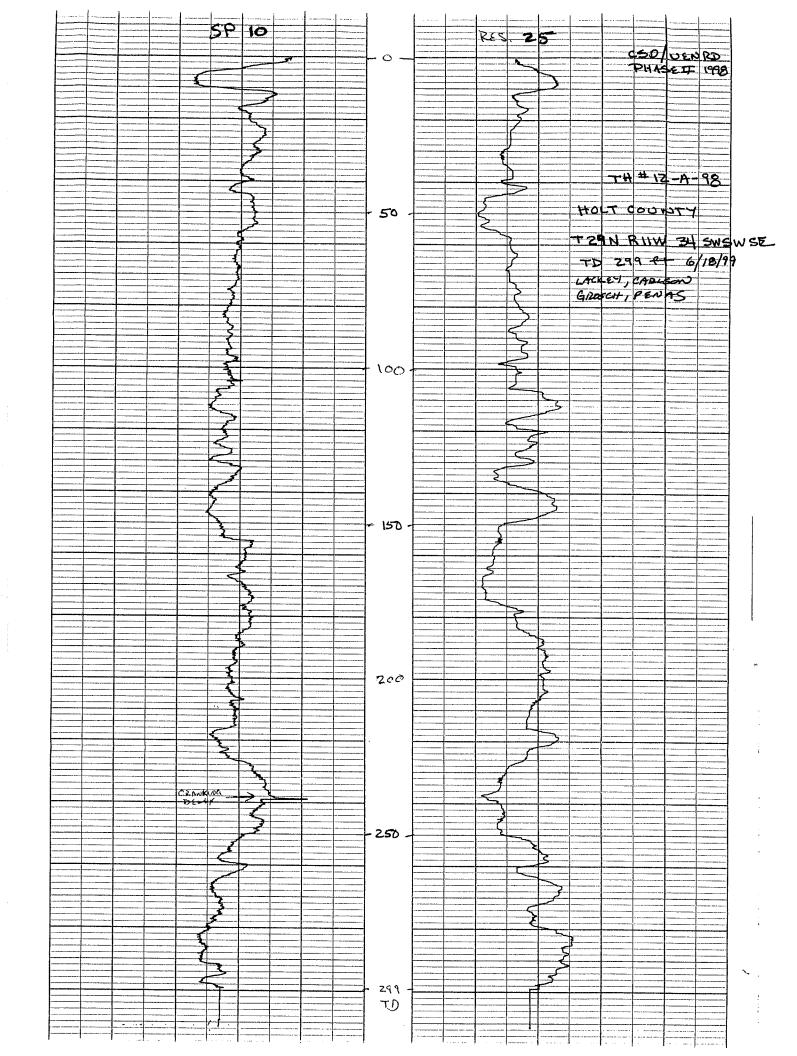
Location: NW SE SW SW Sec. 34, T. 29 N., R. 11 W., approximately 344 feet north and 816 east of the southwest corner.

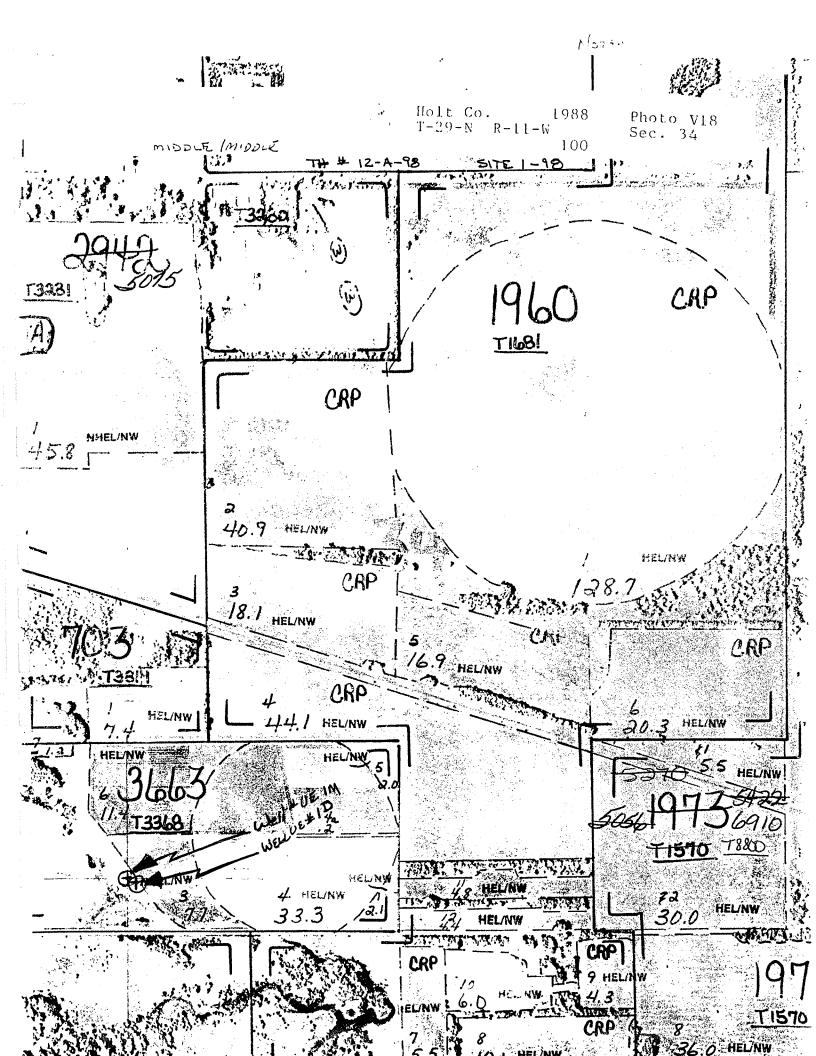
Ground elevation: 1,945 ft. (t). (Inman, 7.5 min. quadrangle)

Depth to water: 2.40 ft. (8-6-98) Well screened between 218-223 ft.

	Depth,	<u>in feet</u>
	From	То
Quaternary System, undifferentiated:		
Topsoil, silt; organic, sandy, black; sand is		
very fine to fine; below 2 ft, slightly		
calcareous	0.0	3.0
Sand, slightly silty; sand is medium, some		
coarse	3.0	3.5
Silt, very sandy, slightly clayey, olive gray;		
sand is fine to medium	3.5	4.0
Sand, coarse to very coarse, trace fine	4 0	
gravel  Sand, very silty; sand is very fine to fine,	4.0	6.0
some medium; below 6.5 ft, less silt	6.0	10.0
Sand, silty; sand is very fine to fine, some	0.0	10.0
medium sand to coarse gravel	10.0	15.0
Soil, silty, clayey, sandy, medium dark gray;	10.0	13.0
sand is very fine to fine	15.0	18.0
Sand, fine to very coarse, some gravel	18.0	19.0
Tertiary System - Miocene Series - Ogallala Group:		17.0
Sandstone, sand is very fine, some fine; below		
23 ft, sand is very fine to fine; some		
interbedded silt lenses	19.0	28.0
Siltstone to sandstone; moderately calcareous		
grayish brown; sand is very fine, some		
fine	28.0	33.0
Sandstone to siltstone, moderately calcareous		
light brownish gray; sand is very fine,		
trace fine	33.0	38.0
Sandstone, moderately silty; sand is very fine		
to fine, some medium	38.0	45.0
Sand, sand is very fine to fine, some medium;		
contains some cemented zones	45.0	68.0
Sand, fine, some very fine to medium; from 73		
to 78 ft, trace of medium; below 78 ft,		
<pre>more medium sand, some cemented zones; below 98 ft, some rootlets</pre>	60.0	102.0
Sandstone, sand is very fine to fine, with	68.0	103.0
bandscone, sand is very time to time, with		

<pre>medium Sand, in part sandstone, silty; sand is very fine to fine, some medium; contains</pre>	103.0	104.0
<pre>volcanic ash Sandstone and siltstone, clayey; sand is very   fine, some fine; below 128 ft, some</pre>	104.0	123.0
cemented zones; contains volcanic ash  Sand to sandstone, sand is very fine to fine, some medium, trace of clay; contains	123.0	133.0
<pre>volcanic ash Sand, very fine to fine, some medium, trace   clay; contains volcanic ash; below 143 ft,   slightly silty; no ash overhead below 148</pre>	133.0	138.0
<pre>ft Sand, moderately silty; sand is very fine to   fine, some medium; below 163 ft, sand is</pre>	138.0	153.0
<pre>very fine, some fine Siltstone to sandstone, silty, moderately calcareous, olive; sand is very fine, some</pre>	153.0	168.0
fine Sandstone to siltstone; sand is very fine,	168.0	188.0
moderately consolidatedSandstone, sand is very fine to fine, much	188.0	193.0
medium; below 198, less medium sand Sand, fine, some very fine, trace of medium;	193.0	218.0
below 228 ft, some cemented zones Sand to sandstone, sand is very fine to fine, trace of medium; below 238 ft, sand is	218.0	233.0
slightly silty, very fine to fine	233.0	250.0
Sand to sandstone; sand is very fine to fine	250.0	258.0
Sandstone, sand is very fine to fine Sandstone, silty; sand is very fine, some	258.0	268.0
fine; below 273 ft, sand is very fine to		
fine; below 278 ft, some rootlets; from 298		
to 303 ft, some claystone fragments; below		
303 ft, rare bone fragment	268.0	308.0
No sample	308.0	315.0
Clay, weathered, gray, some sand grains	315.0	316.0
Cretaceous System - Upper Cretaceous Series - Montan		
Pierre Formation:	-	
Clay, light medium gray, some yellow orange		
with trace white, some sand grains	316.0	323.0
fragments	323.0	325.0
grains and limestone fragments	325.0	328.0
	J	220.0



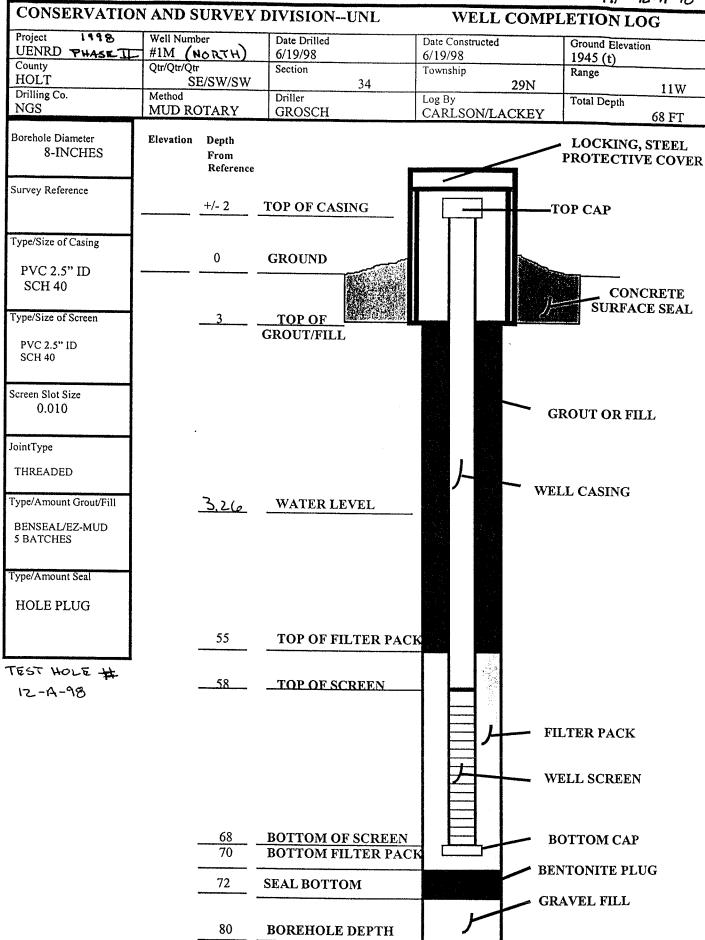


# STATE OF NEBRASKA DEPARTMENT OF WATER RESOURCES

WATER WELL REGISTRATION

Registration No.	Sequence No.	Registration Date:	
Owner Code No.	Receipt No.		NRD
1. Well Owner Upper Elk Address 310 N, Harr City O'Neill	horn NRD ison St State_NE	Telephone Number ( 402)  Zip Code 68763	
2. Drilling Firm Conserva	tion & Survey Division, UN-L  Contractor's License No.  State NE	TalanhamaNimi	
3. Permit Number(s) 1	I/A		
Other  Other  Think  Th	well information.  ent well?Yes No B. Ro  feet from abandoned well. D. A	Water Supply (without spacing)Recovery egistration number of abandoned well: bandoned well last operated	10
E. Original well pump co	lumn size:inches. F. A	bandoned well plugged	. 19, 19
D. Location of water use, if  E. If for irrigation, the land to	applicable (give legal descriptions):	and feet from the East (indicate	West section line.
Pump Information.  Is pump installed at this time If yes, complete items A th If no, complete items A an A. Actual pumping rate, if B. Pump column diameter D. Pumping equipmenting	d D with estimated information for those was applicable: 1 to 5 gallons inches.		ated ©fe

8. We	ll Constructi	on Information.	•		
A.	Total well d	lepth: 70 feet. B. Static water lev	el: 3.26 feet.	C. Pumping water level:	feet
D.	Construction	n began: 6/19 , 19 98 .	E. Construction co	mpleted: 6/19	. 19 98
F.	Bore hole d	iameter: 8 inches.			
G.	Casing: Di	ameter 2.5 ID 2.67 OD	inches. Type of mater	rial: PVC SCH 40	
	Wall thickn	ess: <u>203</u> inches. JointsWelded/Glue	xd Threaded Other:	Guides at	fi.
		nd placement(s) depth from 0 f			
H.		2.5 ID 2.67 OF			
		nings (slot size): 0.010 Trade n			
		nd placement(s) depth from 58 f			
_		c interval(s) from 55 ft. to 70 ft		NOTAL /F7 MID	DE-ICING
J.	Grouted/Se	aled from 3 ft. to 55		(IVDe)	
		fromft. to	ft., with	(lyne)	
ĸ	Drilling me	thod: Mud Rotary			
		opment technique (total time and method):			
		cals, fertilizer or antifreeze be injected or utiliz			
		t will be used:			
Geolo	ogic Materia	ls Logged			
DEPTH	IN FEET	DESCRIPTION	DEPTH IN FEE	T DESCRIPTION	ON
FROM	TO		FROM TO		
0	3	Topsoil; silty, sandy	45 70	Sand, very fine	to fine
3		Sand, very fine to coarse,			
<del></del>		some gravel			
13	16	Silt, clayey medium to dark			
<u> </u>	10				
		gray			
16		Sand, fine to very coarse,			
		some gravel			
19	45	Sandstone, very fine to fine			
		olive gray with interbedded			
		siltstone	-		
		(Additional shee	ets may be submitted)		
10. I an	n familiar wit	th the information submitted on this registration,	and to the best of my kr	nowledge it is true.	
				- A	1
		1 .	$\Omega$ .	mis Schned	7
7		7-21.9	التستسيسين سيشه		
	Water Wel	l Contractor's Signature Date	Water V	Vell Owner's Signature	Date



# STATE OF NEBRASKA DEPARTMENT OF WATER RESOURCES

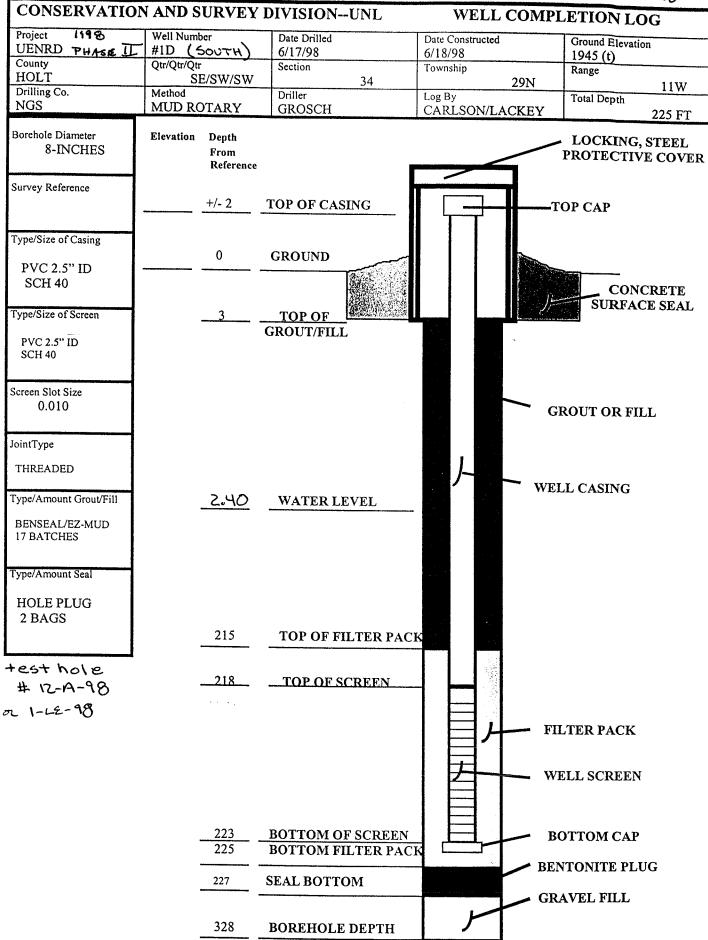
WATER WELL REGISTRATION

# FOR DEPARTMENT USE ONLY

	Sequence No.		
Owner Code No.	Receipt No		NRD
1. Well Owner Upper Elkho Address 310 N. Harr City O'Neill		Telephone Number (402 ) 336  Zip Code 68763 +	
2. Drilling Firm Conservation Address 113 Nebraska F	on & Survey Division, UN-L Hall Contractor's License No. 17 State NE	Telephone Number (402) 472 7003 Pump Installer License No	2-3471
3. Permit Number(s) N/A			
Ground Water Source Heat I  X Observation Public Wa Other (indica	ate use)	Irrigation Livestock x Monitorin	Exchanger ng
C. Replacement well is	vell information.  It well?Yesx_No B. Regis  feet from abandoned well. D. Aban  mn size: inches. F. Aban	idoned well last operated	. 19
B. The well is 344  C. Street address or block, lot	1/4 of Section 34 , Township 29 Nor feet from the North South section line and subdivision, if applicable:  oplicable (give legal descriptions):	th, Range 11 East West, Holt  d 816 feet from the East Windicate of	est section line.
E. If for irrigation, the land to	be irrigated isacres.	12-A-98	
'. Pump Information.  Is pump installed at this time?  If yes, complete items A thro  If no, complete items A and  A. Actual pumping rate, if a  B. Pump column diameter.  D. Pumping equipment installed.	D with estimated information for those well-applicable: 1 to 5 gallons per inches.	s in which pump will be installed. r minute. Measured  or Estimat C. Length of pump column: E. Brand/Type: REDI-F102 GRUND	fee

A.	Total well	depth: 255 feet.	B. Static water level:	2,40	feet.	C. Pumning was	er level:	4 4 2
D.	Construction	on began: 6/17	<b>. 19</b> 98 .	E. Constr	ruction com	pleted:	6/18	feet
F.	Bore hole	diameter: <u>8</u> in	ches.				V/10	_, 19_98
G.	Casing: D	iameter 2.5 ID	OD ir	nches. Type	e of materia	I: PVC SCH	40	
	Wall thick	ness: .203 inches.	JointsWelded/Glued/	Threaded	ther:		Guides et	ft
	Length(s) a	and placement(s) depth from	m <u> </u>	o 218	ft. fr	om	ft. to	
H.	Screen:	2.5 ID	2.67 OD ir	n.; Type o	of material_	PVC SCH 4	<u> </u>	
	Screen ope	nings (slot size): 0.01	.0 Trade nam	ne:			Guides at	fi
T	Length(s) a	and placement(s) depth from	m <u>218</u> ft. t	o <u>223</u>	ft. fr	om	ft. to	ft.
1. J.	Gravei pac	k interval(s) from 215	ft. to <u>225</u> ft. f	from	ft. to_	ft.	Grade size: 20/	40
٠.	Oronico	ealed from 0	n. to 215	n., w	vith_BENSI	EAL/EZ-MUD (I	ype)	
		from	_ft. to	ft., w	rith		,-	
K.	Drilling me	ethod: Rotary		T Deillie.	a Auide (	() 	ype)	
M.	Well develo	opment technique (total tin	ne and method): Air	Tift 30	Minutes	Zuick Gei		<del></del>
		cals, fertilizer or antifreeze						<del></del>
	If yes, wha	t will be used:				103110		
								والمعددة والمستدادي
. Geolo	gic Materia	ls Logged						
EPTH I	N FEET	DESCRIPTI	ON	DEPTH	IN FEET	DE	SCRIPTION	
FROM	TO			FROM	TO	2.	Seem How	
0	3	Topsoil: Silty, s	sandy	1 /. Ω	1 0 0	Ciltu con		
3	13			_140	100		d to sandy s	
		some gravel		100	215		in part	
13	16	Silt; clayey, med			313		sandstone, s	ome
						silty are		
16	19	Sand, fine to ver	ry coarse,			Clay, lig	<u>ht to dark g</u>	ray
		some gravel		316	328	Clay/shal	e	
19	45	Sandstone, very f	ine to fine,		-			
		olive gray w/ int	erbedded siltsto	ne				·
45	148	Sand to sandston	e, very fine	<del></del>				
		to fine, some cla	ay layers					
			(Additional sheets m	ist he eithmi	itted)			
			(	in oc subin	11100)			
0. I am	familiar with	h the information submitted	on this registration, and	to the best o	of my know!	edge it is true.		
	<i></i>				$\boldsymbol{\cap}$	0	1. 1	
A.	(5) 14		7-21-98	•	plenni	e Scho	rech	
<del></del>	Water Well	Contractor's Signature	Date	CONTRACTOR OF THE PARTY OF THE	Weter Well	Owner's Signatu		Date

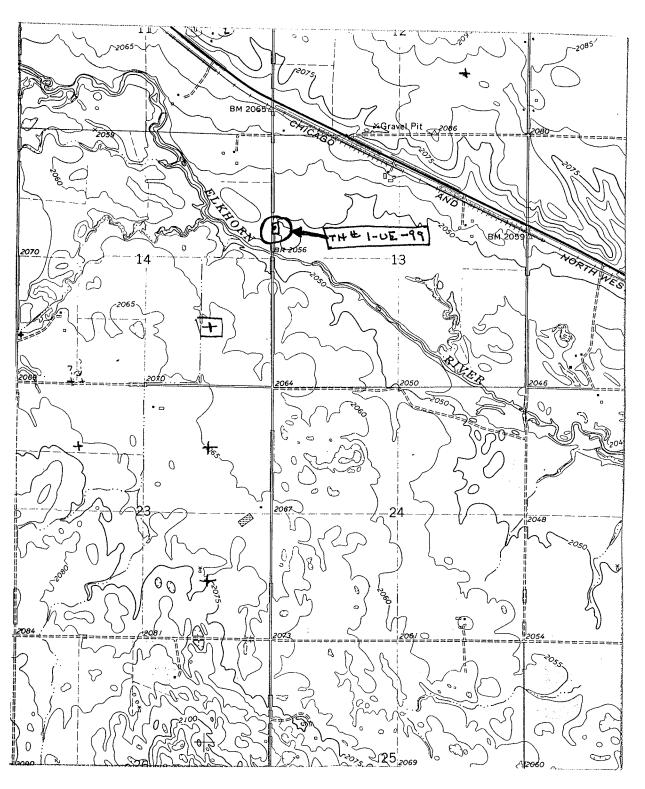
Water Well Owner's Signature



# Number 2 Well

TH # 1-UE-99

# 2 WELL



T 29H RIHW SECTION 13 HW

CAUD WN TAMMA

# Test Hole #1-UE-99 (29N-14W-13bcbc) Holt County

Location: SW NW SW NW Sec. 13, T. 29 N., R. 14 W., approximately 1,962 ft south and 32 ft east of the NW corner.

Ground elevation: 2,052 ft. (t) (Emmet NW, 7.5 min. quadrangle)

Depth to water: 4 ft (9-24-99)

	Depth,	<u>in feet</u>
	From	To
Quaternary System, undifferentiated:		
Top soil: silt, clayey, sandy, black; sand is		
very fine to medium, some coarser grains	0.0	2.0
Sandstone, very dark brown; sand is very fine		
to medium, few coarser grains	2.0	5.0
Sand, light gray; sand is very fine to medium,		
some coarse to very coarse	5.0	10.0
Sand, gravelly; very fine sand to fine gravel.	10.0	20.0
Tertiary System - Miocene Series - Ogallala Group:		
Sand, light gray; very fine to medium; con-		
tains few rootlets; contains some siltstone		
below 30 ft	20.0	35.0
Sand, olive green; very fine to fine, some		33.0
medium; contains some rootlets and sand-		
stone fragments; less medium sand below 40		
ft	35.0	45.0
Sand to sandstone, olive; sand is very fine to	33.0	45.0
medium; little coarse; much rootlet frag-		
ments	45.0	50.0
Sand, olive; sand is very fine to fine, little	13.0	50.0
medium to coarse; some rootlet fragments	50.0	55.0
Sand, olive; very fine to fine, little medium;	50.0	55.0
some rootlets	55.0	60.0
	J.J. U	00.0



OTHER SERVICES:

# 1-UE-99

COMPANY

: Sargent

WELL

: 1-UE-99

LOCATION/FIELD : Site 4

COUNTY

: HOLT

STATE

: NE

SECTION

: 13

TOWNSHIP

: 29

RANGE: 14w

DATE

: 09/20/99

PERMANENT DATUM : None

Down

None

None

KΒ

: None

DEPTH DRILLER LOG BOTTOM

: 60

: 47.50

LOG MEASURED FROM: grd=0

DF

: None

LOG TOP

0.58

DRL MEASURED FROM:

GL

: 2050

CASING DIAMETER: 0

CASING TYPE

: None

LOGGING UNIT

: 208A

CASING THICKNESS: 0

FIELD OFFICE

: Norfolk

RECORDED BY

: Sol

BIT SIZE

: 5

BOREHOLE FLUID

: 0

FILE

: PROCESSED

MAGNETIC DECL. : 0

RM

: 0

MATRIX DENSITY : 2.71

RM TEMPERATURE

: 0

TYPE : 8043A

NEUTRON MATRIX: Dolomite

MATRIX DELTA T

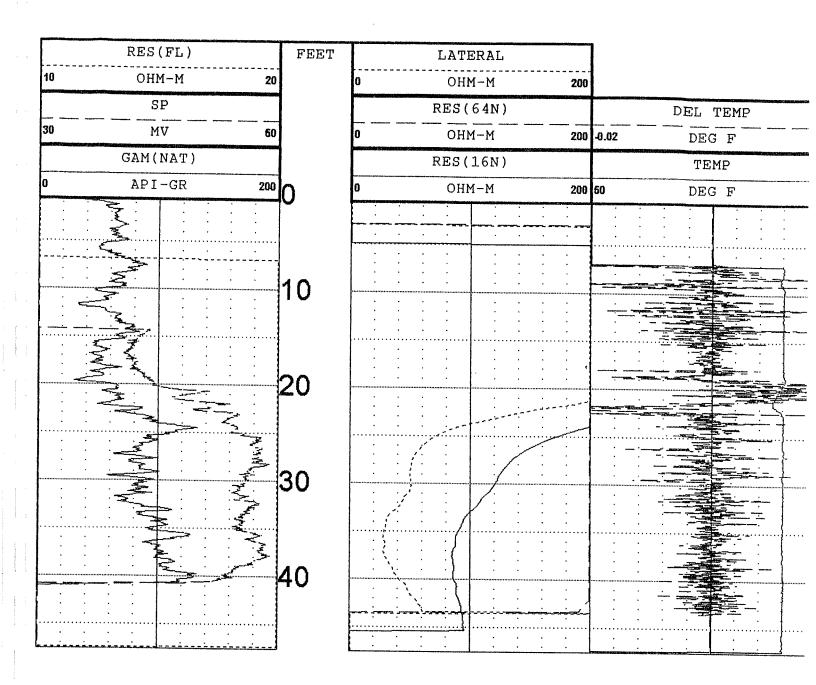
: 54

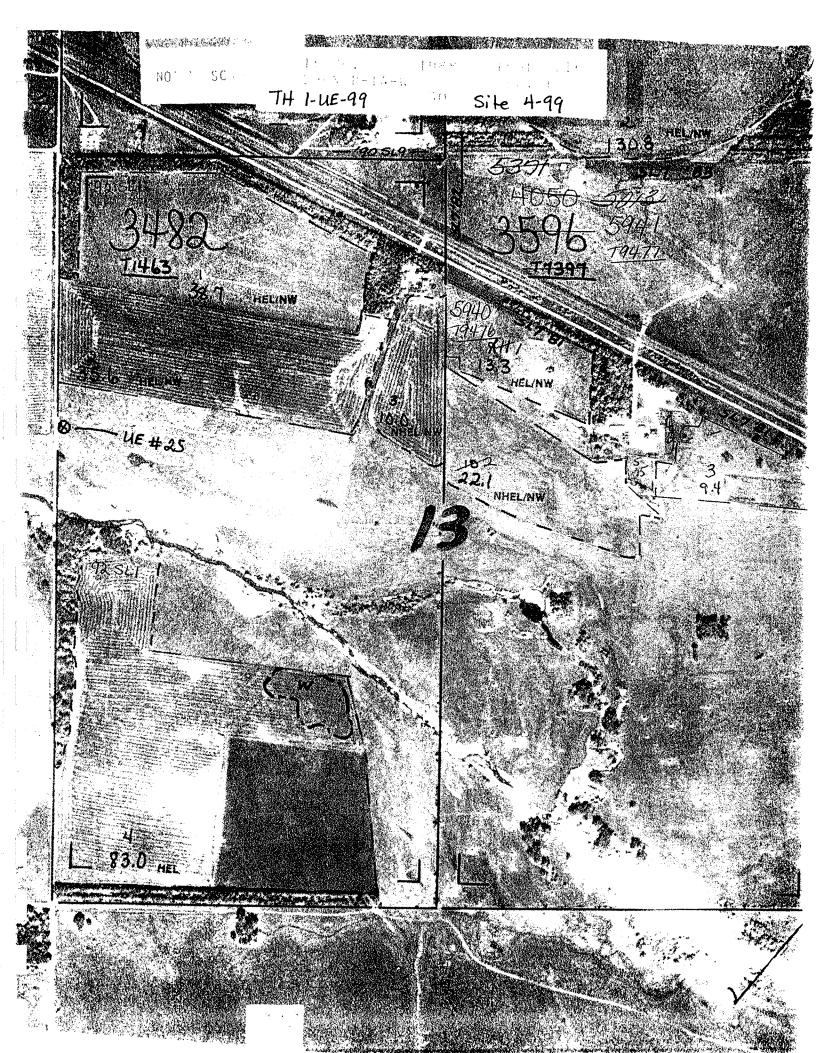
THRESH: 2500

Emmet NW Quad

Well 2S (UE)

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS





# STATE OF NEBRASKA DEPARTMENT OF WATER RESOURCES

WATER WELL REGISTRATION

		FOR DEPARTME	ENT USE ONLY	
	Registration Date:Owner Code No	Sequence No. Receipt No	Registration No	NRD
1.	. Well Owner <u>Upper Elkhorn Natural I</u> Address <u>301 North Harrison</u> City <u>O'Neill</u>	Resource District	Telephone Number ( <u>402</u> ) <u>336-3867</u> State <u>NE</u> Zip Code <u>68763</u> +	
2.	Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-4112</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +	
3.	Permit Number(s)		·	
4.	Ground Water Source Heat Pump	Industrial Inject by (with spacing (46-638) [	☐ Domestic ☐ Geothermal ☐ Ground tion ☐ Irrigation ☐ Livestock <u>X</u> ☐ Public Water Supply (without spacing) ☐ Re	Monitoring
5.	Replacement and abandoned well inform A. Is this well a replacement well?   C. Replacement well is feet from E. Original well pump column size: G. Location of water use of abandoned	Yes X No D. Am abandoned well F. inches.	Abandoned well last operated,  Completion of original well abandonment on	
).		forth or South section law ivision, if applicable: Site (give legal descriptions): ted is acres.	29 North, Range14 ☐ East ⊠West, Holt (ine and 32 feet from the ☐ East or ☑ West source UE 4-99; TH 1-UE-99	· ·
7.	Pump Information.  Is pump installed at this time?  Yes If yes, complete items A through F.  If no, complete items A and D with estin A. Actual pumping rate, if applicable:  B. Pump column diameter:  D. Pumping equipment-date installed:  F. Pump installed by: Contractor	mated information for those gallons per minches.	nute. Measured or Esti	mated [] leet.

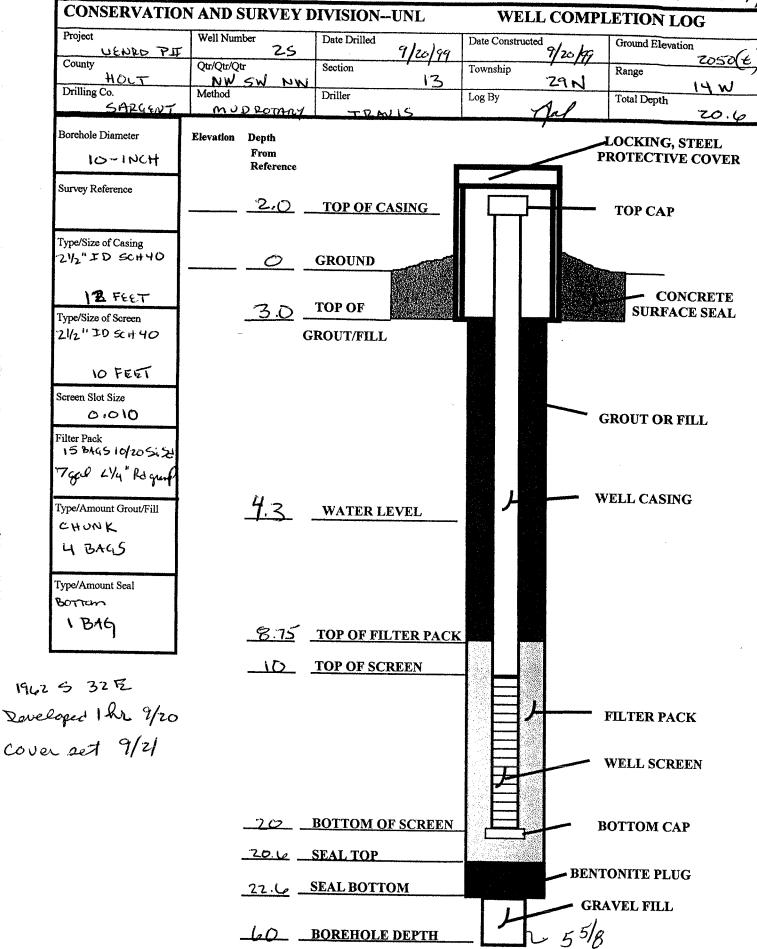
	Well Construction Information. Total well depth: <u>20.6</u> feet.	B. Static water level: 4	<u>4.3</u> feet.	C. Pumping water level:    Stimated or   Meast	feet.		
D.	Well Construction began: 9/20, 1999.	·	E. Well Construction	completed: <u>9/21, 1999</u> .	ırea		
F.	Bore hole diameter: <u>10</u> inches.			,			
G.	Plain Casing: Diameter 2.469 ID	2.875 OD inches.	Type of ma	terial: PVC Schedule 40.			
	Wall thickness: <u>0.203</u> inch(es).	Joints Welded (					
	Length(s) and placement(s) depth from	<u>+3</u> ft . to <u>10</u> f	ft.	from ft. to ft.			
H.	Screen: <u>2.469</u> ID <u>2.875</u> OD in:	type (	of material <u>PVC Sch</u>	redule 40			
	Screen Openings (slot size) <u>0.010</u>	Trade N	lame <u>Eagle</u>				
	Length(s) and placement(s) depth from	<u>10</u> ft to <u>20</u> ft	from	to ft. guides at <u>6</u> ft.			
I.	Gravel pack interval(s) from <u>8.75</u> ft.	to <u>20.6</u> ft.	from ft. t	to ft. Grade size: <u>10/2</u>	<u>20</u>		
J.	Grouted/Sealed from $\underline{\theta}$ ft. to $\underline{3}$ ft.	,	with <u>steel cover ir</u> (type)				
	from <u>3</u> ft. to <u>8.</u>	<u>75</u> ft.,	with <u>Hole Plug</u>				
K.	Drilling method: Mud Rotary		L. Drilling fluid: <u>F</u>	Premium Gel			
<ul> <li>M. Well development technique (total time and method): <u>Air (1 hr)</u></li> <li>N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system?  Yes No  If yes, what will be used:</li> <li>9. Geologic Materials Logged</li> <li>Depth in Feet From To Description  Q 2 Silt, Sandy, very dark brown 2 12 Sand, f-m, some coarse 12 20 Gravel, m-c, some medium sand 20 30 Sand, f-m, rootlets 30 60 Sand, vf-f, some sandstone &amp; siltstones.</li> </ul>							
30	Sand, f-m, rootlets Sand, vf-f, some sandstor olive	ne & siltstones,					
(Additional sheets may be submitted)							
10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.							

Date

Water Well Owner's Signature

Date

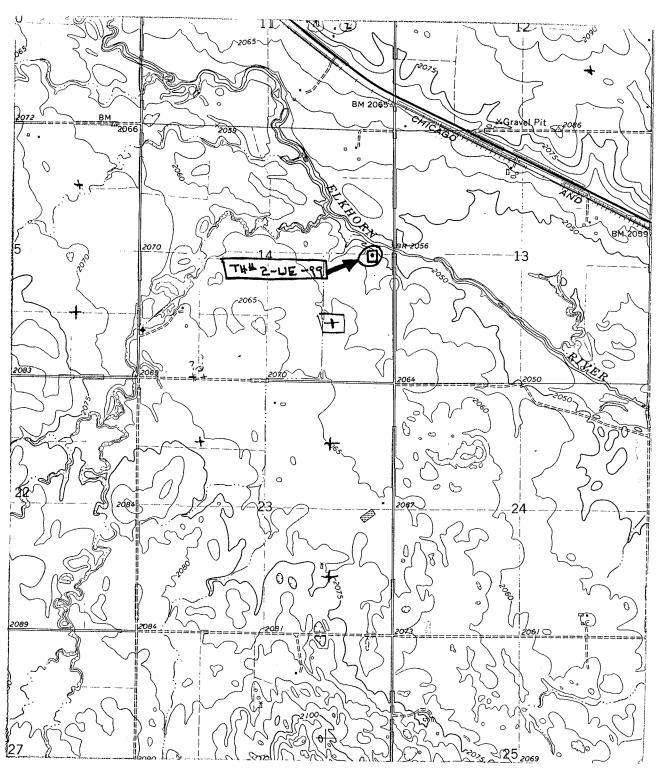
Water Well Contractor's Signature



# Number 3 Wells

TH # 2-LE-99

#3 WELLS



TZ9N RIYW SECTION IY SE

EMMET NW QUAD

## Test Hole #2-UE-99 (29N-14W-14daab) Holt County

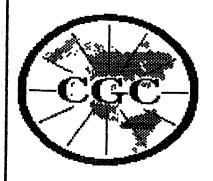
Location: NW NE NE SE Sec. 14, T. 29 N., R. 14 W., approximately 2,639 ft south and 462 ft west.

Ground elevation: 2,055 ft. (t) (Emmett NW, 7.5 min. quadrangle)

Depth to water: 4.8 ft (9-24-99)

	<u>Depth,</u> From	in feet To
Quaternary System, undifferentiated:		
Top soil: no sample	0.0	0.6
gravel below 15 ft	0.6	20.0
fine gravel; gray  Tertiary System - Miocene Series - Ogallala Group:	20.0	30.0
Silt, very clayey, bentonitic, light olive gray  Sandstone, silty, light olive; sand is very fine to fine, little medium; contains	30.0	40.0
rootletsSilt, very clayey, slightly sandy, light olive	40.0	45.0
gray; sand is very fine	45.0	50.0
with a trace of rootletsSand to sandstone, olive gray; sand is very	50.0	55.0
<pre>fine to fine; trace of rootlets Sand, light gray; very fine to fine; contains rootlets; olive gray below 70 ft; silty</pre>	55.0	60.0
<pre>below 95 ft Silt, very sandy, slightly clayey, light gray;</pre>	60.0	99.0
sand is very fine, some fine	99.0	100.0
very fineSilt, very sandy, slightly clayey, light	100.0	110.0
olive; sand is very fine	110.0	115.0
sand is very fine to fine	115.0	129.0
olive; sand is very fine	129.0	135.0
sand is very fine	135.0	145.0

light olive; sand is very fine  Sand to sandstone, slightly silty, light olive; sand is very fine, some fine; moderately silty below 175 ft; contains root-	145.0	165.0
lets Sand, slightly silty, light olive; sand is	165.0	185.0
very fine to fine; contains rootlets Sand, light olive; very fine to fine; contains rootlets; slightly silty from 195 to 200	185.0	190.0
ft; below 223 ft variably clayey Sand to sandstone, light olive; sand is very	190.0	250.0
fine; rootlets from 260 to 265 ft Sand to sandstone, light olive, in part lime	250.0	267.0
cemented	267.0	277.0
cemented	,277.0	287.0
fine to fine, some lime cement  Sand to sandstone, silty, light olive; sand is very fine to fine; contains claystone	287.0	298.0
fragments and limy material below 300 ft Sand to sandstone, slightly silty, light	298.0	310.0
olive; sand is very fine to fine  Sand to sandstone, moderately to very silty, light olive; sand is very fine to fine;	310.0	316.0
clayey below 325 ft	316.0	335.0
rare bone fragment below 340 ft  Sand to sandstone, olive gray to light gray;  sand is very fine to fine; contains benton-	335.0	344.0
itic claystone and siliceous fragments  Sand, slightly to moderately silty, olive gray; sand is very fine to fine; contains reworked claystone and siltstone fragments;	344.0	356.0
contains less silt below 362 ft	356.0 <b>a Group:</b>	380.0
Clay, shaley, pale olive, some yellow with gray Shale, clayey, moderately calcareous, black	380.0 386.5	386.5 400.0



OTHER SERVICES:

### 2-UE-99

COMPANY

: Sargent

WELL

: 2-UE-99

LOCATION/FIELD : Site 5

COUNTY

STATE

: HOLT

: NE

SECTION

: 14

TOWNSHIP

: 29

Down

None

None

RANGE: 14w

DATE

: 09/21/99

PERMANENT DATUM : None

: None

DEPTH DRILLER LOG BOTTOM

: 400

: 401.72

LOG MEASURED FROM: grd=0

KΒ

: None

LOG TOP

2.43

DRL MEASURED FROM:

DF GL

: 2055

CASING DIAMETER: 0

LOGGING UNIT

: 208A

CASING TYPE : None FIELD OFFICE

: Norfolk

CASING THICKNESS: 0

RECORDED BY

: Sol

BIT SIZE

: 5

BOREHOLE FLUID

FILE : ORIGINAL

MAGNETIC DECL. : 0

RM

: 0 : 0

TYPE : 8043A

MATRIX DENSITY : 2.71

NEUTRON MATRIX: Dolomite

RM TEMPERATURE MATRIX DELTA T

: 0

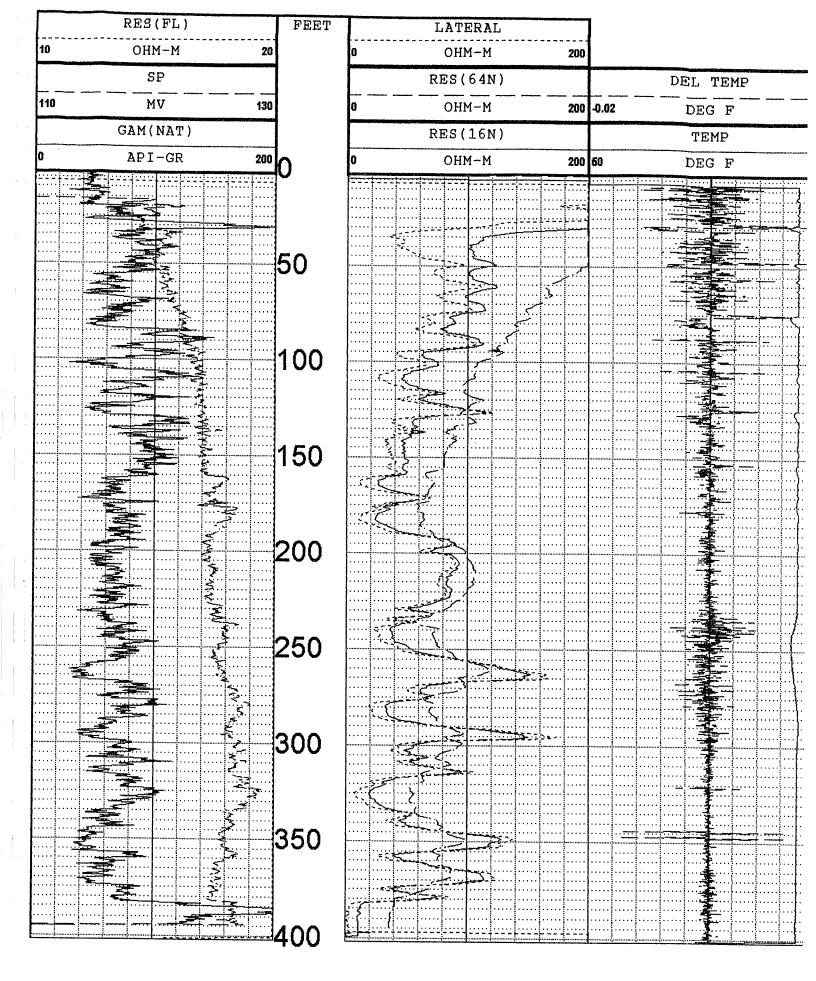
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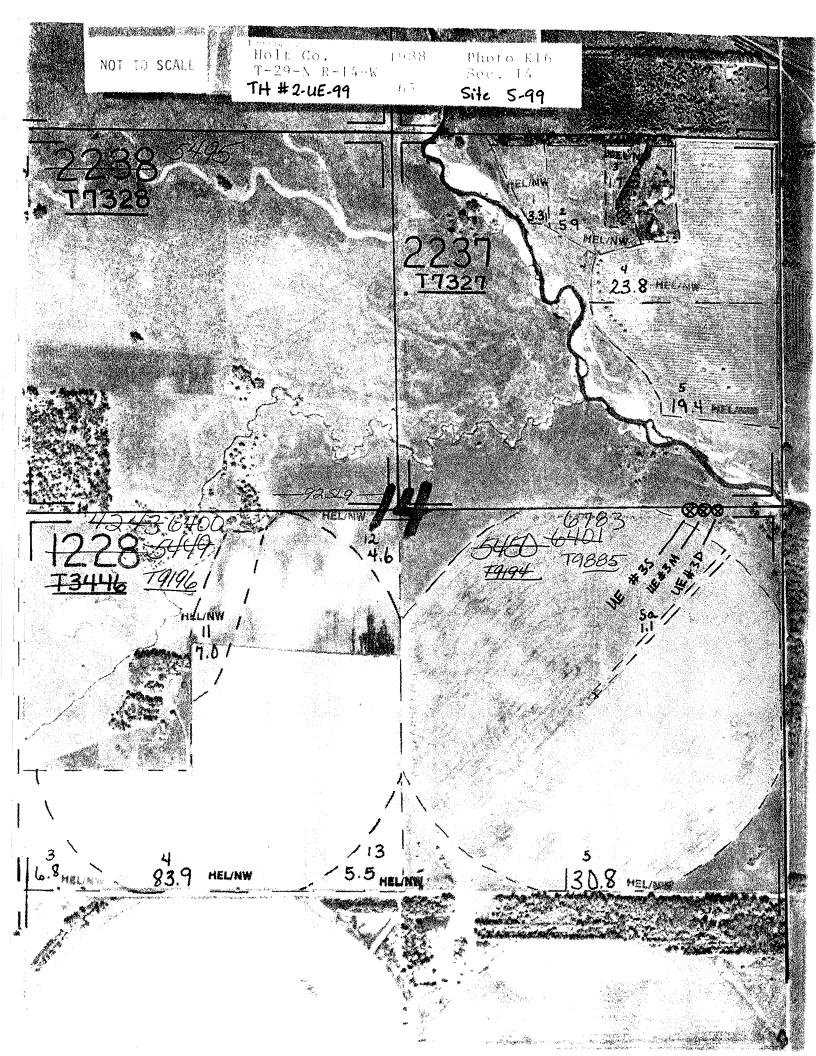
THRESH: 2500

Emmet NW Quad

Wells 3S, 3M, 3D (UE)

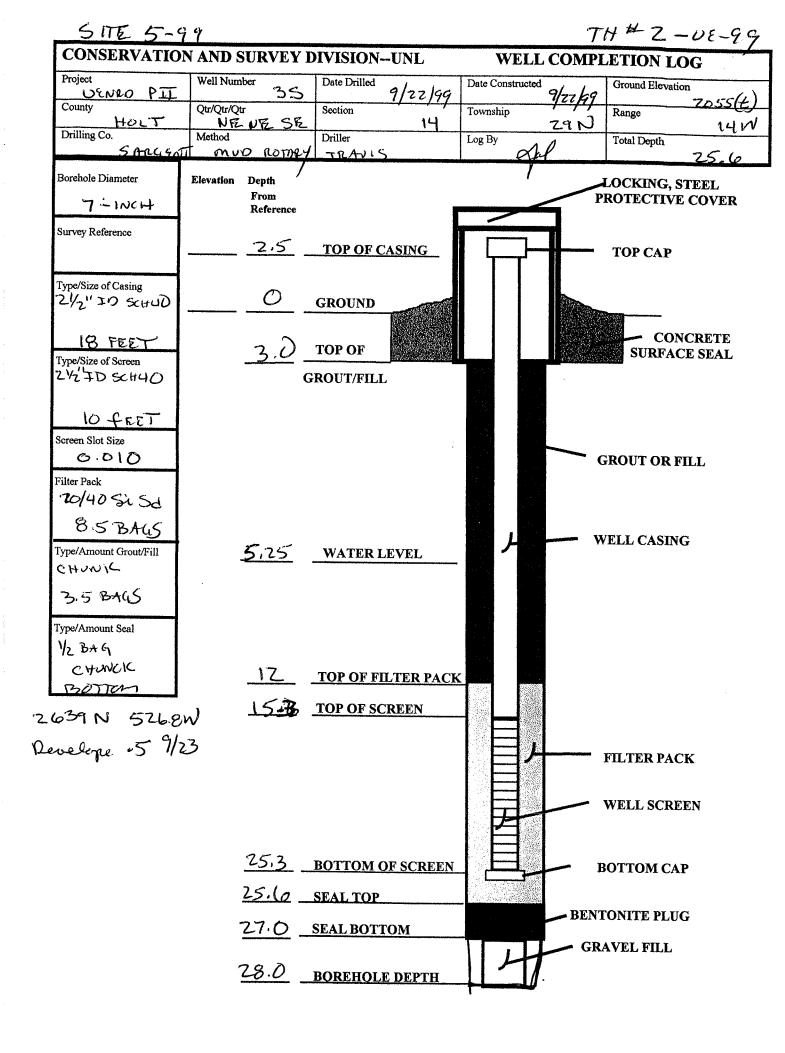
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS





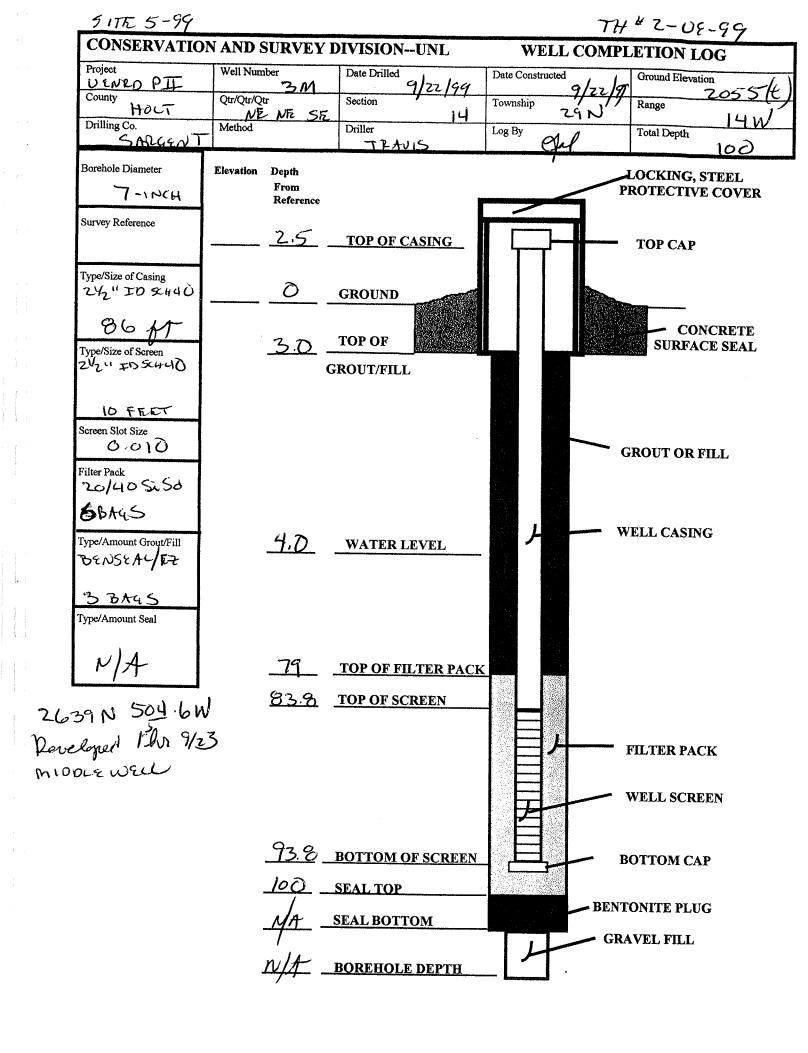
	FOR DEPARTMENT USE ONLY					
	Registration Date:Owner Code No	Sequence No Receipt No	Registration No	NRD		
1	. Well Owner <u>Upper Elkhorn Natural I</u> Address <u>301 North Harrison</u> City <u>O'Neill</u>	Resource District	Telephone Number ( <u>402</u> ) <u>336-38</u> State <u>NE</u> Zip Code <u>68763</u> +	<u>67</u>		
2.	. Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-411</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +	2		
3.	. Permit Number(s)					
4.	Ground water Source Heat Pump	Industrial Injecting (46-638)	☐ Domestic ☐ Geothermal ☐ Grou on ☐ Irrigation ☐ Livestock ] Public Water Supply (without spacing) ☐	Y Monitorina		
5.	Replacement and abandoned well inform A. Is this well a replacement well?   C. Replacement well is feet from E. Original well pump column size: G. Location of water use of abandoned	Yes XNo D. A m abandoned well F. C inches.	bandoned well last operated, Completion of original well abandonment on			
6.		orth or South section linivision, if applicable: Site U  (give legal descriptions): ed isacres.	9 North, Range 14 ☐ East ⊠West, Holt ne and 526.8 feet from the ⊠ East or ☐ VE 5-99; TH 2-UE-99			
7.	Pump Information.  Is pump installed at this time? Yes If yes, complete items A through F.  If no, complete items A and D with estir A. Actual pumping rate, if applicable:  B. Pump column diameter:  D. Pumping equipment-date installed:  F. Pump installed by: Contractor	mated information for those gallons per mininches.  C.	· · · · · · · · · · · · · · · · · · ·	Estimated [_] feet.		

Α.	Well Construct Total well dep	oth: <u>25.6</u> feet.	B. Static water l	level: <u>5.3</u> feet.	C. Pumping water level:feet.
D.	Well Construc	ction began: <u>9/22</u> , <u>1999</u> .		E. Well Construction	Estimated or Measured completed: 9/23, 1999.
		neter: 7 inches.			2725, <u>1777</u> .
G.	Plain Casing:	Diameter <u>2.469</u> ID	<b>2.875</b> OD inche	s. Type of ma	terial: PVC Schedule 40.
	Wall thickness	ss: <u>0.203</u> inch(es).		ed Glued Threaded/C	• • • • • • • • • • • • • • • • • • • •
	Length(s) and	d placement(s) depth from		to <u>15.3</u> ft.	from ft. to ft.
Н.	Screen: 2.469	<u>9</u> ID <u>2.875</u> OD in:	<del></del>	type of material <b>PVC Sch</b>	
	Screen Openi	ings (slot size) <u>0.010</u>	Т	rade Name <i>Eagle</i>	
	Length(s) and	d placement(s) depth from		<del></del>	to ft. guides at <u>11.3</u> ft.
I.	Gravel pack i	nterval(s) from <u>12</u> ft.	to <u>25.6</u> ft.	from ft. t	
J.	Grouted/Seale	ed from $\underline{\boldsymbol{\theta}}$ ft. to ,	<u>3</u> ft.,	with steel cover in (type)	n concrete
•		from <u>3</u> ft. to	o <u>12</u> ft.,	with <i>Hole Plug</i> (type)	•
K.	Drilling meth	od: Mud Rotary		L. Drilling fluid: <u>I</u>	<u>Premium Gel</u>
<b>2</b> 775.a.	If yes, what w	rill be used:			
9.	Geologic Mate	erials Logged			
	epth in Feet	. 66			
Fro	-			Depth in Feet	
0		Description			Description
<u>~</u>		Sand, fine, some silt	.vol	From To 298 311	Description sandstone, fine sand, some silt
<u>6</u> 28		-		From To 298 311 311 316	sandstone, fine sand, some silt sand, vf-f
<u>6</u> 28 47		Sand, fine, some silt sand, coarse, some gra silt, sandy, olive, rootl sand, vf-f, some ceme	<u>ets</u> ntation	From To  298 311 311 316 316 345 345 357	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m
<u>6</u> 28 47 76 129		Sand, fine, some silt sand, coarse, some gra silt, sandy, olive, rootl sand, vf-f, some ceme sandstone, some sand,	<u>ets</u> ntation vf-f, tan	From To  298 311 311 316 316 345 345 357 357 381	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses
<u>6</u> 28 47 76 129 159		Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootl sand, vf-f, some cemesandstone, some sand, sand, silty, some clayers sandstone, vf-f, some sandstone, sand	ets ntation vf-f, tan	From To  298 311 311 316 316 345 345 357	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m
6 28 47 76 129 159 234 246		Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootl sand, vf-f, some cemes sandstone, some sand, sand, silty, some clayes sandstone, vf-f, some clay, silty, sandy	ets ntation vf-f, tan vy sand lenses	From To  298 311 311 316 316 345 345 357 357 381 381 386	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty
28 47 76 129 159 234 246 256		Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootl sand, vf-f, some cemesandstone, some sand, sand, silty, some clayers sandstone, vf-f, some sandstone, sand	ets ntation vf-f, tan vy sand lenses	From To  298 311 311 316 316 345 345 357 357 381 381 386	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty
0 6 28 47 76 129 159 234 246 256	6 28 47 76 129 159 234 246 256 267 291	Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootles sand, vf-f, some cemes sandstone, some sand, sand, silty, some clayes sandstone, vf-f, some clay, silty, sandy sandstone, vf-f, rootlet sand, vf-f sandstone, silty, some	ets ntation vf-f, tan ey sand lenses	From To  298 311 311 316 316 345 345 357 357 381 381 386	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty
28 47 76 129 159 234 246 256 267	6 28 47 76 129 159 234 246 256 267 291	Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootle sand, vf-f, some cemes sandstone, some sand, sand, silty, some clayer sandstone, vf-f, some clay, silty, sandy sandstone, vf-f, rootlet sand, vf-f	ets ntation vf-f, tan ey sand lenses	From To  298 311 311 316 316 345 345 357 357 381 381 386	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty
	6 28 47 76 129 159 234 246 256 267 291	Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootle sand, vf-f, some cemes sandstone, some sand, sand, silty, some clayer sandstone, vf-f, some clay, silty, sandy sandstone, vf-f, rootlet sand, vf-f sandstone, silty, some sand, fine	ets ntation vf-f, tan ey sand lenses	From To  298 311 311 316 316 345 345 357 357 381 381 386 386 400	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty
<u> 291</u>	6 28 47 76 129 159 234 246 256 267 291 298	Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootle sand, vf-f, some cemes sandstone, some sand, sand, silty, some clayer sandstone, vf-f, some clay, silty, sandy sandstone, vf-f, rootlet sand, vf-f sandstone, silty, some sand, fine	ets ntation vf-f, tan ey sand lenses silt lenses (Additional sheets ma	From To  298 311 311 316 316 345 345 357 357 381 381 386 386 400	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray
<u> 291</u>	6 28 47 76 129 159 234 246 256 267 291 298	Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootle sand, vf-f, some cemes sandstone, some sand, sand, silty, some clayer sandstone, vf-f, some clay, silty, sandy sandstone, vf-f, rootlet sand, vf-f sandstone, silty, some sand, fine	ets ntation vf-f, tan ey sand lenses silt lenses (Additional sheets ma	From To  298 311 311 316 316 345 345 357 357 381 381 386 386 400	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray
<u> 291</u>	6 28 47 76 129 159 234 246 256 267 291 298	Sand, fine, some silt sand, coarse, some grasilt, sandy, olive, rootle sand, vf-f, some cemes sandstone, some sand, sand, silty, some clayer sandstone, vf-f, some clay, silty, sandy sandstone, vf-f, rootlet sand, vf-f sandstone, silty, some sand, fine	ets ntation vf-f, tan ey sand lenses silt lenses (Additional sheets ma	From To  298 311 311 316 316 345 345 357 357 381 381 386 386 400	sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray



FOR DEPARTMENT USE ONLY						
Registration Da Owner Code	nte: No	Sequence No. Receipt No	Registrati	ion NoNRD		
1. Well Owner <u>Upper</u> Address <u>301 North</u> City <u>O'Neill</u>	Elkhorn Natural Res Harrison	ource District	Telephone Number ( <u>48</u> State <u>NE</u> Zip Code <u>68763</u> +			
2. Drilling Firm <u>Sarg</u> Address <u>Box 9</u> City <u>Nelig</u>			Telephone Number ( <u>40</u> Contractor's License N State <u>NE</u> Zip Code <u>68756</u> +			
3. Permit Number(s)						
Ground Water S	ource Heat Pump L Public Water Supply (	Industrial Inject	☐ Domestic ☐ Geothermation ☐ Irrigation ☐ Liv☐ Public Water Supply (without	l Ground Heat Exchanger restock X Monitoring spacing) Recovery		
A. Is this well a re C. Replacement w E. Original well p	pandoned well informated blacement well? [] velocities and the life of the lif	Yes X No D. A abandoned well F. of inches.	Abandoned well last operated _ Completion of original well abar	, ndonment on,		
<ul><li>B. The well is <u>2639</u></li><li>C. Street address on</li><li>D: Location of wate</li><li>E. If for irrigation,</li></ul>	er use, if applicable (githe land to be irrigated	th or South section sion, if applicable: Site 1 ve legal descriptions):	<b>29</b> North, Range <b>14</b> ☐ East ⊠ line and <b>504.6</b> feet from the ⊠ <u>UE 5-99; TH 2-UE-99</u>	•		
If yes, complete item If no, complete item	s A and D with estima rate, if applicable:ameter:ent-date installed:	ted information for those gallons per minches.	wells in which pump will be in nute. Measured [ Length of pump column: E. Brand/Type:  ump Installer [] Licen	or Estimated		

		ction Information. pth: <u>100</u> feet.	B. Static wa	ater level: ¿	<b>4.0</b> feet.		C. Pum	ping water level: ☐ Estimated or	feet.
D.	Well Constru	ection began: <u>9/22</u> , <u>1999</u> .		. 1	E. Well Co	onstruction	completed: 9	·	measured
F.	Bore hole dia	meter: <u>7</u> inches.							
G.	Plain Casing:	Diameter <u>2.469</u> ID	2.875 OD is	nches.	7	Гуре of mat	erial: <u>PVC S</u>	Schedule 40.	
	Wall thickne	ess: <u>0.203</u> inch(es).	Joints V	Welded 🔲	Glued 🔯	Threaded/O	ther:		
	Length(s) an	d placement(s) depth from	<u>+3</u> ft	. to <u>83.</u>	<u>8</u> ft.		from	ft. to	_ ft.
H.	Screen: <u>2.46</u>	<u>19</u> ID <u>2.875</u> OD in:		type	of material	PVC Sch	edule 40		
	Screen Open	ings (slot size) <u>0.010</u>		Trade N	Jame <u>Eag</u>	<u>le</u>			
	Length(s) an	d placement(s) depth from	<u><b>83.8</b></u> ft	to <b>93.8</b>	ft.	from	to	ft. guides at <u>79</u>	.8 ft.
I.	Gravel pack	interval(s) from <u>79</u> ft.	to <u>100</u> ft.		from	ft. to	) ft.	Grade size	
J.	Grouted/Seal	led from $\underline{\boldsymbol{\varrho}}$ ft. to .	<u>3</u> ft.,		with <u>ste</u>	<u>el cover in</u> (type)	<u>concrete</u>		
		from <u>3</u> ft. to	<u>79</u> ft.,		with <u>Ber</u>	iseal/EZ n	<u>ıud</u>		
						(type)	•		
K.	Drilling meth	nod: Mud Rotary			L. Drilli	ng fluid: P	<u>remium Gel</u>		
М.	Well develop	ment technique (total time	and method): <u>Ai</u>	<u>ir 1.5 hr</u>					
		ıls, fertilizer or antifreeze b			system?	Г	Yes N	0	
	If yes, what v	will be used:							
€.	Geologic Ma	terials Logged							
. D	epth in Feet			1	Dani	th in Feet			
	m To	Description			From		Descriptio	n	
0	<u>6</u>	Sand, fine, some silt			<u>298</u>	<u>311</u>		e, fine sand, some	silt
0 <u>6</u> <u>28</u> <u>47</u> <u>76</u> <u>129</u> <u>159</u> <u>234</u>	28 47 76	sand, coarse, some grasilt, sandy, olive, root			<u>311</u> 316	<u>316</u> 345	sand, vf-f	•	114
47	$\frac{7}{76}$	sand, vf-f, some ceme			345	357	sandstone sand, f-m	e, fine sand, some	SIIT
<u>76</u>	<u>129</u>	sandstone, some sand,	vf-f, tan		<u>357</u>	381		lstone, some silt l	<u>enses</u>
150	159 234	sand, silty, some clayer			<u>381</u>	<u>386</u>	clay, silty		· · · · · · · · · · · · · · · · · · ·
139 234	<u>234</u> <u>246</u>	sandstone, vf-f, some clay, silty, sandy	sand lenses		<u>386</u>	<u>400</u>	clay shale	e, dark gray	
<u>246</u>	<u>256</u>	sandstone, vf-f, rootle	ts						
<u> 256</u>	<u> 267</u>	sand, vf-f							
<u> 267</u>	<u>291</u>	sandstone, silty, some	silt lenses						
<u> 291</u>	<u>298</u>	sand, fine							
			(Additional shee	ts may be s	ubmitted)				
10	I am familiar	with the information submi	tted on this roci-	stration -	1 to the 1.	at a.C 1	1_ 1		
		are information submi	and on this regis	suation, and	i to the be	si oi my kn	owleage it is	true.	



FOR DEPARTMENT USE ONLY					
Registration Date: Owner Code No	Sequence No. Receipt No	Registration No	NRD		
<ol> <li>Well Owner <u>Upper Elkhorn Nata</u> Address <u>301 North Harrison</u> City <u>O'Neill</u></li> </ol>	ral Resource District	Telephone Number ( <u>402</u> ) <u>336-3867</u> State <u>NE</u> Zip Code <u>68763</u> +			
2. Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-4112</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +			
3. Permit Number(s)					
X Observation Public Water S Aquaculture Other	np   Industrial   Inject	☐ Domestic ☐ Geothermal ☐ Ground Heation ☐ Irrigation ☐ Livestock <u>X</u> Mon☐ Public Water Supply (without spacing) ☐ Recov			
<ul> <li>5. Replacement and abandoned well in A. Is this well a replacement well C. Replacement well is fee</li> <li>E. Original well pump column size G. Location of water use of abandone</li> </ul>	? $\square$ Yes $\underline{X}$ No D. A set from abandoned well F. (see: inches.	Abandoned well last operated,  Completion of original well abandonment on			
	North or South section lisubdivision, if applicable: Site Unable (give legal descriptions): rigated is acres.	<b>29</b> North, Range <u>14</u> ☐ East ⊠West, <u>Holt</u> Coun ine and <u>462</u> feet from the ⊠ East or ☐ West sect UE 5-99; TH 2-UE-99			
7. Pump Information.  Is pump installed at this time? If yes, complete items A through F. If no, complete items A and D with A. Actual pumping rate, if applical B. Pump column diameter:  D. Pumping equipment-date install F. Pump installed by: Contractor	estimated information for those ple: gallons per min inches. C.	wells in which pump will be installed. nute. Measured  or Estimate Length of pump column: feet. E. Brand/Type: ump Installer  License No.	ed 🔲		

Д.	Well Construction Information. Total well depth: <u>221</u> feet.	B. Static water	level: <u>2.7</u> feet.	C. Pumping water level: fe	
D.	Well Construction began: 9/21, 199	<b>9</b> .	E. Well Construc	tion completed: 9/22, 1999.	ed
	Bore hole diameter: 7 inches.	_			
G.	Plain Casing: Diameter 2.469 ID	<b>2.875</b> OD inche	s. Type of	material: <u>PVC Schedule 40</u> .	
	Wall thickness: <u>0.203</u> inch(es).		ed Glued Threade	·	
	Length(s) and placement(s) depth from		to <u>210.2</u> ft.	from ft. to ft.	
H.	Screen: <u>2.469</u> ID <u>2.875</u> OD in:		type of material <b>PVC</b>		
	Screen Openings (slot size) <u>0.010</u>	Т	rade Name <u>Eagle</u>		
	Length(s) and placement(s) depth from	om <u>210.2</u> ft to	220.2 ft. from	to ft. guides at <u>606.2</u> ft.	
I.	Gravel pack interval(s) from 207.5 f	ît. to <u>221</u> ft.	from ft.		
J.	Grouted/Sealed from $\underline{\boldsymbol{\varrho}}$ ft.	to <u>3</u> ft.,	with steel cove		
	from $\underline{3}$ ft.	to <u>207.5</u> ft.,	with <u><b>Benseal/H</b></u>	EZ mud ype)	
K.	Drilling method: <u>Mud Rotary</u>			d: <u>Premium Gel</u>	
M.	Well development technique (total tir	me and method): Air 1	<u>hr</u>		
N.	Will chemicals, fertilizer or antifreez	e be injected or utilized	in the system?	Yes No	
	If yes, what will be used:				
9.	Geologic Materials Logged				
٠.	Geologic Materials Loggett				
	4.4.				
De Fro	epth in Feet om To Description		Depth in Fe		
From 3	om To Description <u>6</u> <u>Sand, fine, some si</u>		From To 298 311	Description sand, some silt	
From 3	om To Description <u>6</u> <u>Sand, fine, some si</u>	gravel	From To 298 311 311 316	Description sandstone, fine sand, some silt sand, vf-f	
From 3	om To Description <u>6</u> <u>Sand, fine, some si</u>	gravel ootlets	From To 298 311 311 316 316 345	Description  sandstone, fine sand, some silt  sand, vf-f  sandstone, fine sand, some silt	
From 3	om To Description <u>6</u> <u>Sand, fine, some si</u>	gravel potlets mentation nd, vf-f, tan	From To 298 311 311 316 316 345 345 357 357 381	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses	
From 3	om To Description <u>6</u> <u>Sand, fine, some si</u>	gravel potlets mentation nd, vf-f, tan ayey	From To 298 311 311 316 316 345 345 357 357 381 381 386	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty	
From 3	om To Description <u>6</u> <u>Sand, fine, some si</u>	gravel potlets mentation nd, vf-f, tan ayey	From To 298 311 311 316 316 345 345 357 357 381	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty	
From 5 5 28 47 76 129 159 234 246	To Description  Sand, fine, some si  28 sand, coarse, some  47 silt, sandy, olive, ro  76 sand, vf-f, some cer  129 sandstone, some sa  159 sand, silty, some cl  234 sandstone, vf-f, son  246 clay, silty, sandy  256 sandstone, vf-f, roo	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses	From To 298 311 311 316 316 345 345 357 357 381 381 386	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty	
From 2 28 47 76 129 159 234 246 256	om         To         Description           6         Sand, fine, some si           28         sand, coarse, some           47         silt, sandy, olive, rome           76         sand, vf-f, some ce           129         sandstone, some same           159         sand, silty, some cl           234         sandstone, vf-f, some           246         clay, silty, sandy           256         sandstone, vf-f, roome           267         sand, vf-f	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses	From To 298 311 311 316 316 345 345 357 357 381 381 386	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty	
From 2 28 47 76 129 159 234 246 256 267	To Description  Sand, fine, some si  sand, coarse, some  47 silt, sandy, olive, ro  sand, vf-f, some cer  129 sandstone, some sar  159 sand, silty, some cla  234 sandstone, vf-f, son  246 clay, silty, sandy  256 sand, vf-f  sand, vf-f  291 sandstone, silty, son	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses	From To 298 311 311 316 316 345 345 357 357 381 381 386	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty	
From 2 28 47 76 129 159 234 246 256	To Description  Sand, fine, some si  sand, coarse, some  47 silt, sandy, olive, ro  sand, vf-f, some cer  129 sandstone, some sar  159 sand, silty, some cla  234 sandstone, vf-f, son  246 clay, silty, sandy  256 sand, vf-f  sand, vf-f  291 sandstone, silty, son	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses	From To 298 311 311 316 316 345 345 357 357 381 381 386	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty	
From 2 28 47 76 129 159 234 246 256 267	To Description  Sand, fine, some si  sand, coarse, some  47 silt, sandy, olive, ro  sand, vf-f, some cer  129 sandstone, some sar  159 sand, silty, some cla  234 sandstone, vf-f, son  246 clay, silty, sandy  256 sand, vf-f  sand, vf-f  291 sandstone, silty, son	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses tlets me silt lenses	From To 298 311 311 316 316 345 345 357 357 381 381 386	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray	
From 2 28 47 76 129 159 234 246 256 267	To Description  Sand, fine, some si  sand, coarse, some  47 silt, sandy, olive, ro  sand, vf-f, some cer  129 sandstone, some sar  159 sand, silty, some cla  234 sandstone, vf-f, son  246 clay, silty, sandy  256 sand, vf-f  sand, vf-f  291 sandstone, silty, son	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses tlets me silt lenses	From To 298 311 311 316 316 345 345 357 357 381 381 386 386 400	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray	
Fro. 0 5 28 47 76 129 159 234 246 256 267 291	To Description  Sand, fine, some si  sand, coarse, some  47 silt, sandy, olive, ro  sand, vf-f, some cer  129 sandstone, some sar  sand, silty, some clr  234 sandstone, vf-f, som  246 clay, silty, sandy  256 sandstone, vf-f, roo  267 sand, vf-f  291 sandstone, silty, son  298 sand, fine	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses tlets me silt lenses (Additional s	From To 298 311 311 316 316 345 345 357 357 381 381 386 386 400	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray	
Fro. 0 5 28 47 76 129 159 234 246 256 267 291	To Description  Sand, fine, some si  sand, coarse, some  47 silt, sandy, olive, ro  sand, vf-f, some cer  129 sandstone, some sar  159 sand, silty, some cla  234 sandstone, vf-f, son  246 clay, silty, sandy  256 sand, vf-f  sand, vf-f  291 sandstone, silty, son	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses tlets me silt lenses (Additional s	From To 298 311 311 316 316 345 345 357 357 381 381 386 386 400	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray	
Fro. 0 5 28 47 76 129 159 234 246 256 267 291	To Description  Sand, fine, some si  sand, coarse, some  47 silt, sandy, olive, ro  sand, vf-f, some cer  129 sandstone, some sar  sand, silty, some clr  234 sandstone, vf-f, som  246 clay, silty, sandy  256 sandstone, vf-f, roo  267 sand, vf-f  291 sandstone, silty, son  298 sand, fine	gravel potlets mentation nd, vf-f, tan ayey ne sand lenses tlets me silt lenses (Additional s	From To 298 311 311 316 316 345 345 357 357 381 381 386 386 400	Description sandstone, fine sand, some silt sand, vf-f sandstone, fine sand, some silt sand, f-m sand/sandstone, some silt lenses clay, silty clay shale, dark gray	

ZZ Θ <u>SEAL BOTTOM</u>

BOREHOLE DEPTH

**GRAVEL FILL** 

### Number 4 Wells

3-UE-99 #4 WELLS DAUD NAMNI T 28N, RIIW, SECTION ZI NW

### Test Hole #3-UE-99 (28N-11W-21bbba) Holt County

Location: NE NW NW NW Sec. 21, T. 28 N., R. 11 W., approximately 86.5 ft south and 540 ft east of northwest corner.

Ground elevation: 1,983 ft (t) (Inman, 7.5 min. quadrangle)

Depth to water: 4.5 ft (9-29-99)

	Depth, From	in feet To
Quaternary System, undifferentiated:		
Top soil: no sample	0.0	0.6
coarse	0.6	5.0
gray; sand is very fine	5.0	12.0
coarse	12.0	15.0
sand is very fine	15.0	20.0
coarse, contains rare gravel below 30 ft  Tertiary System - Miocene Series - Ogallala Group:	20.0	32.5
Silt, very sandy, moderately clayey, light olive; sand is very fine; contains less clay below 40 ft	32.5	45.0
Sand, silty to silt, sandy, light olive; sand is very fine; contains rootlets and little sandstone; moderately calcareous; indurated from 57 to 58 ft; below 65 ft slightly	32.5	45.0
calcareousSilt, moderately sandy, moderately clayey,	45.0	67.0
light olive; sand is very fine Sand, clayey, silty, light olive; sand is very	67.0	70.0
fine  Silty sand to sandy silt, clayey, light olive; sand is very fine; contains trace of root-	70.0	75.0
lets; below 80 ft some sandstone Sand to sandstone; silty, light olive; sand is	75.0	90.0
<pre>very fine to fine; contains rootlets Sandstone, light olive; sand is very fine to   fine, contains rootlets; below 115 ft</pre>	90.0	95.0
slightly siltySandstone, light olive; sand is very fine to	95.0	125.0
fine; contains rootlets	125.0	139.0

olive; sand is very fine	139.0	145.0
Sand to sandstone, light olive; sand is very fine to fine; contains rootlets Silt, very sandy, slightly clayey, light	145.0	150.0
olive; sand is very fine to fine; below 154 ft slightly more clayey Sand to sandstone, light brown; sand is very fine to fine; below 160 ft moderately cal-	150.0	156.0
careous	156.0	169.0
light olive; sand is very fine to fine	169.0	182.0
Sandstone, slightly silty, light olive; sand is very fine to fine	182.0	189.0
sand is very fine to fine; slightly less clayey below 200 ft	.189.0	203.0
olive; sand is very fine to fine; below 205 ft contains some sandstone	203.0	209.0
olive; sand is very fine to fine; contains interbedded sandstone	209.0	225.0
Sand to sandstone, light olive; sand is very fine to fine	225.0	230.0
very sandy, light olive; sand is very fine to fine; below 235 ft slightly less clayey. Sand, light olive; very fine to fine; contains	230.0	245.0
sandstone and reworked clay fragments Silty sand and sandy silt, very clayey, pale	245.0	251.0
yellow; sand is very fine	251.0	257.0
269 to 275 ft trace of silt fragments; below 282 ft silty	257.0	285.0
sand is very fine, little fine Sand to sandstone, very silty, light brown	285.0	300.0
with olive tint; sand is very fine with some fine	300.0	308.0
Silt, very sandy, very clayey, pale yellow; sand is very fine, little fine	308.0	319.0
yellow; sand is very fine, little fine; below 329 ft moderately clayey	319.0	334.0
Sand to sandstone, pale yellow; very fine to fine; contains trace of rootlets	334.0	346.0

The second of th

Sand to sandstone, silty, pale yellow; sand		
is very fine to fine; contains rare root-		
lets	346.0	354.0
Silty sand to sandy silt, moderately clayey,		
pale olive; sand is very fine, little fine;		
below 363 ft less silty; trace claystones	354.0	375.0
Sand to sandstone, silty, pale olive; sand is		
very fine, some fine; below 395 ft contains		
reworked rootlets, green claystone frag-	255	
ments Silt, moderately sandy, moderately clayey,	375.0	402.0
brown; sand is very fine, little fine;		
below 410 ft contains reworked bentonitic		
clay and shale fragments	402 0	420.0
Cretaceous System - Upper Cretaceous Series - Montan		420.0
Pierre Formation:	a croap.	
Shale, clayey, gray with some yellow stain;		
from 425 to 435 ft gray to olive gray,		
little dark gray	420.0	435.0
Shale, clayey, olive gray to black	435.0	440.0



OTHER SERVICES:

### 3-UE-99

COMPANY

: Sargent

WELL

: 3-UE-99

LOCATION/FIELD : Site 2

COUNTY

: HOLT

STATE

: NE

SECTION

: 21

TOWNSHIP

: 28

up2

None

None

RANGE: 11w

DATE

: 09/23/99

DEPTH DRILLER : 440

: 440.77

KB

: None

LOG BOTTOM

LOG MEASURED FROM: grd=0

PERMANENT DATUM : None

: None

LOG TOP

2.65

DRL MEASURED FROM:

DF GL

: 1983

CASING DIAMETER: 0

CASING TYPE : None

CASING THICKNESS: 0

LOGGING UNIT

FIELD OFFICE

: Norfolk

: 208A

RECORDED BY : Sol

MAGNETIC DECL. : 0

BOREHOLE FLUID RM

: 0

FILE

: ORIGINAL

: 0

BIT SIZE

RM TEMPERATURE

TYPE

: 8043A

MATRIX DENSITY : 2.71

: 0

NEUTRON MATRIX: Dolomite

MATRIX DELTA T

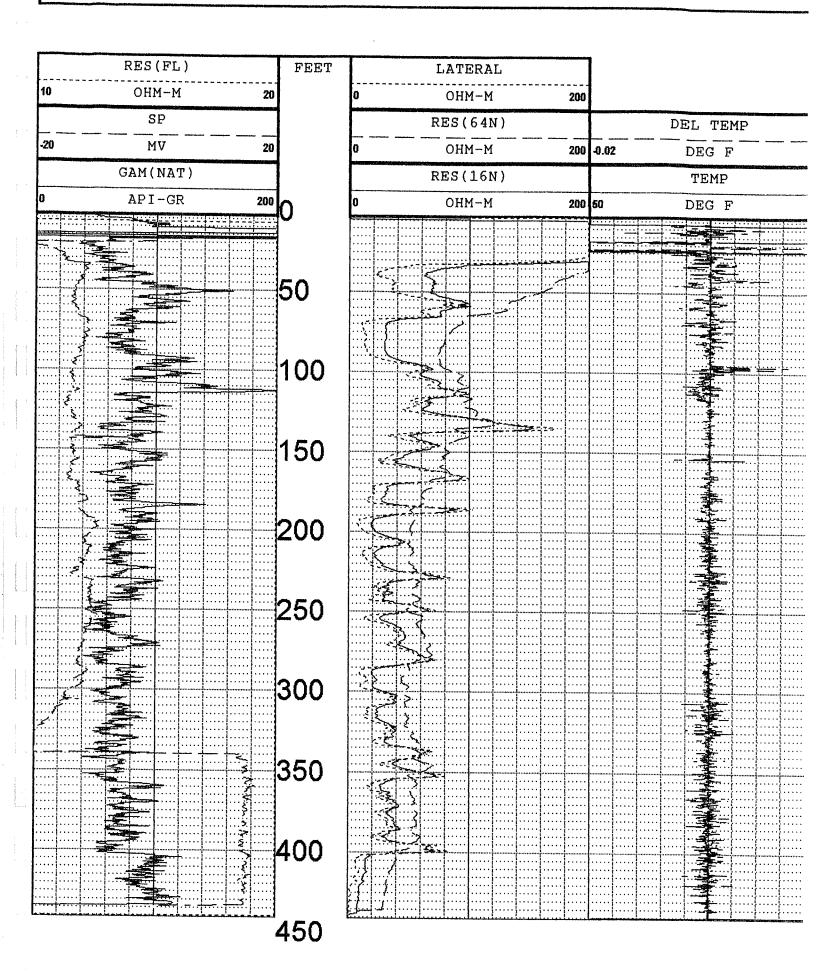
: 54

THRESH: 2500

Inman Quad

Wells 4S, 4M, 4D (UE)

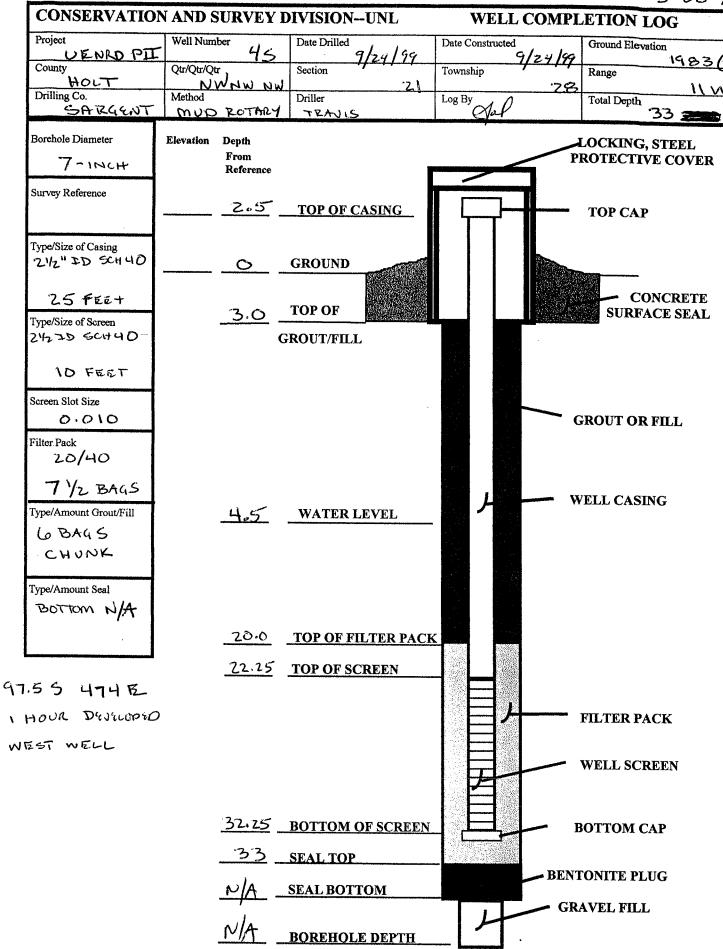
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



HOLT CO. 1988 NOT TO SCALE РНОТО U20 TH 3-4E-99 Site 2-99 T-28-N R-11-W 25 SEC. 21

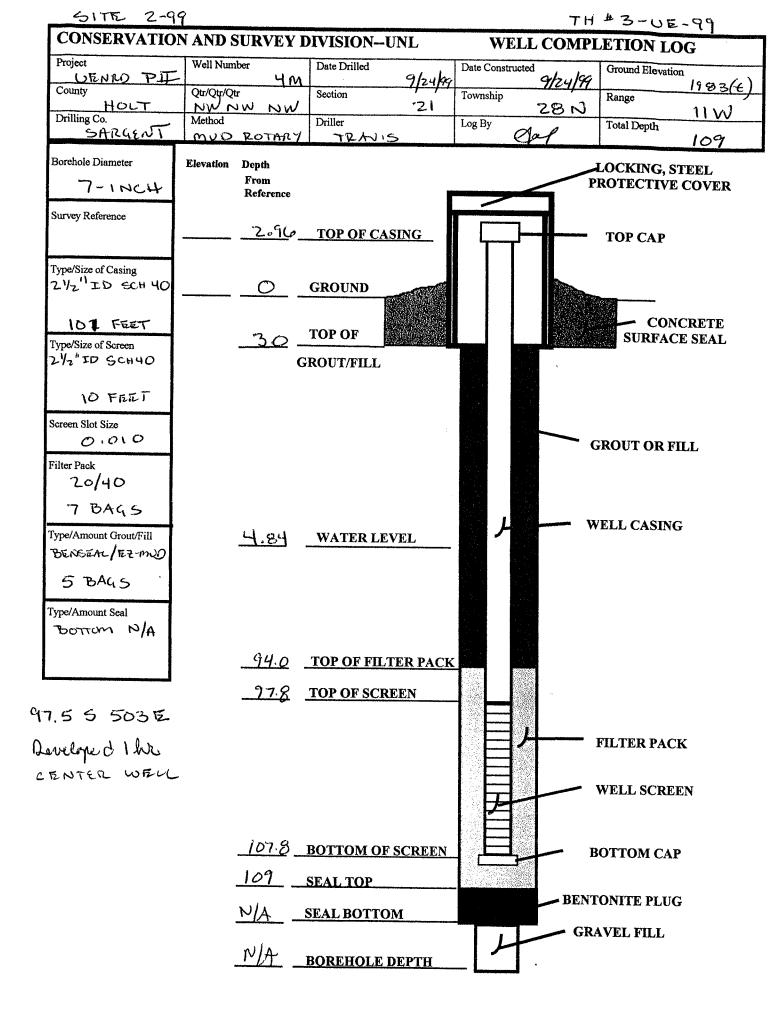
	FOR DEPARTMENT USE ONLY						
	Registration Date: Owner Code No.	Sequence No _ Receipt No	Regis	tration No	NRD		
1.	<ol> <li>Well Owner <u>Upper Elkhorn Natural Reso</u> Address <u>301 North Harrison</u> City <u>O'Neill</u></li> </ol>	ource District	Telephone Numb State <u>NE</u> Zip Code <u>68</u>	er ( <u>402</u> ) <u>336-3867</u> 763 +			
2.	2. Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Numb Contractor's Licer State <u>NE</u> Zip Code <u>687</u>				
3.	3. Permit Number(s)						
4.	4. Purpose of well (indicate one): Dew Ground Water Source Heat Pump X Observation Public Water Supply (v Aquaculture Other (indicate use)	Industrial   Inject	ion Irrigation	Livestock X Moni	itorina		
5.	6. Replacement and abandoned well informati A. Is this well a replacement well? Y C. Replacement well is feet from a E. Original well pump column size: G. Location of water use of abandoned we	tes X No D. A bandoned well F. C inches.	Abandoned well last operat Completion of original wel	ed, I abandonment on	.,		
6.	<ul> <li>A. Well location: <u>NW</u> 1/4 of the <u>NW</u> 1/4 o</li> <li>B. The well is <u>97.5</u> feet from the ⊠ North</li> <li>C. Street address or block, lot and subdivis</li> <li>D: Location of water use, if applicable (giv</li> <li>E. If for irrigation, the land to be irrigated i</li> <li>F. Well reference letter(s), if applicable: <u>W</u></li> </ul>	or South section line ion, if applicable: Site U e legal descriptions): s acres.	ne and 474 feet from the				
7.	. Pump Information.  Is pump installed at this time?  Yes XN If yes, complete items A through F. If no, complete items A and D with estimate A. Actual pumping rate, if applicable: B. Pump column diameter: D. Pumping equipment-date installed: F. Pump installed by: Contractor	ed information for those gallons per mininches. C.	nute. Measu Length of pump column: E. Brand/Type	red or Estimated feet.	1 🗌		

	Well Construction Information.  Total well depth: <u>33</u> feet.	B. Static water lev	rel: <u>4.5</u> feet.	C. Pumping water lev	
D.	Well Construction began: 9/24, 1999.	•	E. Well Construction	n completed: <u>9/27</u> , <u>1999</u> .	or Measured
	Bore hole diameter: <u>7</u> inches.			27.27, 1277.	
G.	Plain Casing: Diameter 2.469 ID	<u>2.875</u> OD inches.	Type of ma	aterial: <b>PVC Schedule 40</b> .	
	Wall thickness: <u>0.203</u> inch(es).		☐ Glued ☑Threaded/0		
	Length(s) and placement(s) depth from		<u>22.25</u> ft.		ft.
H.	Screen: <u>2.469</u> ID <u>2.875</u> OD in:		pe of material <b>PVC Sci</b>		
	Screen Openings (slot size) <u>0.010</u>		de Name <u>Eagle</u>		
	Length(s) and placement(s) depth from			to ft. guides	at 18.25 ft
I.	Gravel pack interval(s) from <u>20</u> ft.	to <u>33</u> ft.	from ft.		e size: <u>10/20</u>
J.	Grouted/Sealed from $\underline{\boldsymbol{\theta}}$ ft. to	<u>3</u> ft.,	with steel cover i	n concrete	
	from $\underline{3}$ ft.	o <u>20</u> ft.,	with <i>Hole Plug</i> (type)		
K.	Drilling method: Mud Rotary		L. Drilling fluid:		
	Well development technique (total time				
N.	Will chemicals, fertilizer or antifreeze b	be injected or utilized in	the system?	Yes No	
	If yes, what will be used:				
-					
9.	Geologic Materials Logged				
. D	epth in Feet		Depth in Feet		
Fro	om To Description		From To	Description	
<u>0</u> 5	<ul><li>Sand, vf-f, some med</li><li>clay, silty, light tan</li></ul>	<u>ium</u>	157 257 257 284	sandstone/sand, some sand, vf-f	siltstone & silt
5 12 15 20 33 51	15 sand, coarse, some fir		$\frac{237}{284}$ $\frac{284}{320}$	clay, silty, sandy, sand	l lenses
15 20	<ul> <li>sand, coarse, some fir</li> <li>clay, silty to sandy, li</li> <li>sand &amp; gravel, coarse</li> <li>silt, sandy, olive, root</li> <li>sand/sandstone, vf-f,</li> </ul>		$\frac{320}{402}$ $\frac{402}{420}$	sand/sandstone, silty,	
33	<ul><li>33 sand &amp; gravel, coarse</li><li>51 silt, sandy, olive, root</li></ul>		$\begin{array}{c c} 402 & 420 \\ 420 & 435 \end{array}$	siltstone, sandy, claye clay, shaley, yellow	<u>y, red-brown</u>
<u>51</u>	sand/sandstone, vf-f,	olive	$\frac{435}{440}$	shale, clayey, dark gra	ıy
<u>66</u>	91 silt, sandy, some sand				
91 137	sandstone/sand, vf-f, silt, sandy, very claye				
142		<del>1</del> .			
<u>154</u>	silt, sandy				
		(Additional she	ets may be submitted)		
10.	I am familiar with the information subm	itted on this registration	, and to the best of my k	nowledge it is true.	



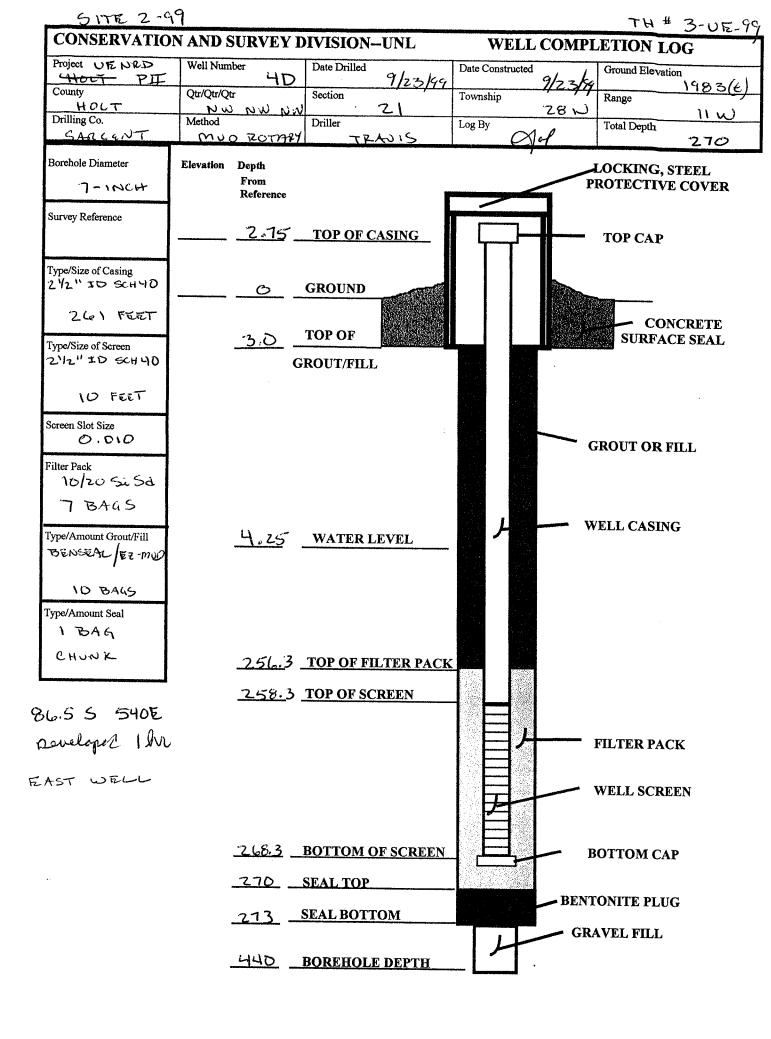
	FOR DEPARTMENT USE ONLY					
	Registration Date: Owner Code No.	Sequence No Receipt No	Registration No	 NRD		
1.	Well Owner <u>Upper Elkhorn Natural Re</u> Address <u>301 North Harrison</u> City <u>O'Neill</u>	source District	Telephone Number ( <u>402</u> ) <u>330</u> State <u>NE</u> Zip Code <u>68763</u> +	<u>6-3867</u>		
2.	Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-</u> Contractor's License No. <u>3919</u> State <u>NE</u> Zip Code <u>68756</u> +			
3. 	Permit Number(s)					
4.	Purpose of well (indicate one): De Ground Water Source Heat Pump   X Observation Public Water Supply Aquaculture Other	Industrial Injecti (with spacing (46-638)	on Irrigation Livestock	X Monitoring		
5.	Replacement and abandoned well informa A. Is this well a replacement well?  C. Replacement well is feet from E. Original well pump column size: G. Location of water use of abandoned v	Yes X No D. A abandoned well F. C	bandoned well last operated, Completion of original well abandonme	nt on,		
<b>5.</b>	A. Well location: <u>NW</u> 1/4 of the <u>NW</u> 1/4  B. The well is <u>97.5</u> feet from the ⊠ Nor C. Street address or block, lot and subdiv  D: Location of water use, if applicable (g E. If for irrigation, the land to be irrigated F. Well reference letter(s), if applicable:	th or South section line rision, if applicable: Site Usive legal descriptions):  d is acres.	te and <u>503</u> feet from the East or	•		
7.	Pump Information.  Is pump installed at this time? Yes XIf yes, complete items A through F.  If no, complete items A and D with estimated. Actual pumping rate, if applicable:  B. Pump column diameter:  D. Pumping equipment-date installed:  F. Pump installed by: Contractor	ated information for those gallons per mir inches. C,		or Estimated  feet.		

<ul><li>8. Well Construction Information.</li><li>A. Total well depth: <u>109</u> feet.</li></ul>	B. Static water level: 4.8 feet. C. Pumping water level: feet.			
D. Well Construction began: 9/24, 1999.	E. Well Construction completed: 9/27, 1999.			
F. Bore hole diameter: 7 inches.	A contract statement			
G. Plain Casing: Diameter <u>2.469</u> ID Wall thickness: <u>0.203</u> inch(es).	2.875 OD inches. Type of material: <u>PVC Schedule 40</u> .  Joints□ Welded □ Glued ⊠Threaded/Other:			
Length(s) and placement(s) depth from	<u>+3</u> ft . to <u>97.8</u> ft. from ft. to ft.			
H. Screen: <u>2.469</u> ID <u>2.875</u> OD in:	type of material <i>PVC Schedule 40</i>			
Screen Openings (slot size) 0.010	Trade Name <u>Eagle</u>			
Length(s) and placement(s) depth from	97.8 ft to 107.8 ft. from to ft. guides at 93.7 ft.			
I. Gravel pack interval(s) from <u>94</u> ft.	o <u>109</u> ft. from ft. to ft. Grade size: <u>10/20</u>			
J. Grouted/Sealed from $\underline{\theta}$ ft. to $\underline{3}$ ft.	with <u>steel cover in concrete</u> (type)			
from <u>3</u> ft. to <u>94</u>	ft., with <u>Benseal/EZ mud</u> (type)			
K. Drilling method: <u>Mud Rotary</u>	L. Drilling fluid: <u>Premium Gel</u>			
<ul> <li>M. Well development technique (total time and method): <u>Air 1 hr</u></li> <li>N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system?   ☐ Yes ☑ No</li> <li>If yes, what will be used:</li> </ul>				
9. Geologic Materials Logged				
Depth in Feet From To Description  0 5 Sand, vf-f, some medium  12 15 sand, coarse, some fine  15 20 clay, silty to sandy, light  20 33 sand & gravel, coarse san  33 51 silt, sandy, olive, rootlets  51 66 sand/sandstone, vf-f, oliv  66 91 silt, sandy, some sand len  91 137 sandstone/sand, vf-f, som  137 142 silt, sandy, very clayey  142 154 sandstone, vf-f  154 157 silt, sandy	d to fine gravel  402 420 siltstone, sandy, clayey, red-brown  420 435 clay, shaley, yellow  ses e silt lenses			
(Additional sheets may be submitted)				
10. I am familiar with the information submitted	on this registration, and to the best of my knowledge it is true.			

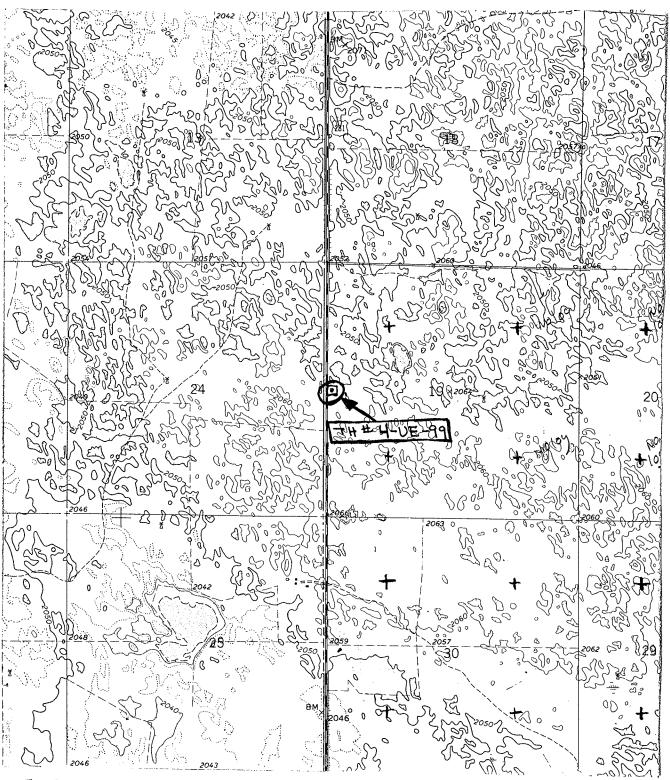


	FOR DEPARTMENT USE ONLY			
	Registration Date: Owner Code No	Sequence No Receipt No	Registration No.	NRD
1.	Well Owner <u>Upper Elkhorn Natura</u> Address <u>301 North Harrison</u> City <u>O'Neill</u>	ıl Resource District	Telephone Number ( <u>402</u> ) <u>336</u> . State <u>NE</u> Zip Code <u>68763</u> +	<u>-3867</u>
2.	Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-4</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +	<u>4112</u> !
3.	Permit Number(s)			
4.	☐ Ground Water Source Heat Pump X Observation ☐ Public Water Su ☐ Aquaculture ☐ Other	Industrial Injec	Domestic Geothermal Cotion Irrigation Livestock Public Water Supply (without spacing)	X Monitoring
5.		Yes X No D. from abandoned well F.	Abandoned well last operated, Completion of original well abandonmen	it on,
6.		North or South section labdivision, if applicable: <u>Site</u> ole (give legal descriptions): gated is acres.	p <u>28</u> North, Range <u>11</u> East West, ine and <u>540</u> feet from the East or UE-2-99; TH 3-UE-99	<del></del>
7.	Pump Information.  Is pump installed at this time? Y If yes, complete items A through F. If no, complete items A and D with e A. Actual pumping rate, if applicabl B. Pump column diameter: D. Pumping equipment-date installe F. Pump installed by: Contractor	estimated information for thos e: gallons per m inches. ( d:,	e wells in which pump will be installed. inute. Measured \( \begin{align*} C. Length of pump column: \( \begin{align*} E. Brand/Type: \\ \begin{align*} Oump Installer \( \begin{align*} \end{align*} License No.	or Estimated  feet.

	Well Construction Information. Total well depth: <u>270</u> feet.	B. Static water leve	l: <u>4.2</u> feet.	C. Pumping water le	
D.	Well Construction began: 9/23, 1999.		E. Well Construction	☐ Estimate on completed: <u>9/27, 1999</u> .	ed or Measured
	Bore hole diameter: 7 inches.		z. wen construction	m completed. <u>2727, 1777</u> .	
G.	Plain Casing: Diameter 2.469 ID	<b>2.875</b> OD inches.	Type of m	naterial: PVC Schedule 40	)
	Wall thickness: <u>0.203</u> inch(es).		☐ Glued ☑Threaded		<b>!•</b>
	Length(s) and placement(s) depth from	_	258.3 ft.	from ft. to	ft
Н.	Screen: <u>2.469</u> ID <u>2.875</u> OD in:	<del>-</del>	oe of material <i>PVC Sc</i>		It.
	Screen Openings (slot size) <u>0.010</u>		e Name <u>Eagle</u>	menue 40	
	Length(s) and placement(s) depth from			to ft. guide	o ot 25/2 0
I.	Gravel pack interval(s) from <u>256.3</u> ft.	to <u>270</u> ft.	from ft.		
J.	Grouted/Sealed from $\underline{\boldsymbol{\varrho}}$ ft. to $\underline{\boldsymbol{\vartheta}}$ f		with <u>steel cover</u>	in concrete	ade size: <u>10/20</u>
	from $\underline{3}$ ft. to $\underline{2}$	<u>56.3</u> ft.,	with <u>Benseal/EZ</u>	Mud	
K.	Drilling method: Mud Rotary		L. Drilling fluid:	<u>Premium Gel</u>	
9.	5 Sand, vf-f, some medium 12 clay, silty, light tan 15 sand, coarse, some fine 20 clay, silty to sandy, light 33 sand & gravel, coarse sat 51 silt, sandy, olive, rootlets 66 sand/sandstone, vf-f, oliv 91 silt, sandy, some sand let 137 sandstone/sand, vf-f, son 142 silt, sandy, very clayey	brown  nd to fine gravel  ve  nses	Depth in Feet From To 157 257 284 320 402 420 435 440	Description sandstone/sand, some sand, vf-f clay, silty, sandy, sar sand/sandstone, silty siltstone, sandy, clay clay, shaley, yellow shale, clayey, dark gr	nd lenses , vf- <u>f</u> ey, red-brown
<u>154</u>	157 <u>silt, sandy</u>				
	(A	dditional sheets may b	e submitted)		
.0.	I am familiar with the information submitte  Water Well Contractor's Signature	d on this registration, a		cnowledge it is true.	
	~		water v	on owner a bignature	Date



### Number 5 Wells



T 27 H , RIIW , SECTION 19 NW

O'NEILL SW QUAD

### Test Hole #4-UE-99 (27N-11W-19bccc) Holt County

Location: SW SW SW NW Sec. 19, T. 27 N., R. 11 W., approximately 2,602 ft south 180 ft east of the northwest corner.

Ground elevation: 2,053 ft (t). (O'Neill SW, 7.5 min. quadrangle)

Depth to water: 13.6 ft (10-1-99)

		in feet
Quaternary System, undifferentiated:	From	То
Sand, light gray; sand is very fine to fine	0 0	
Silt, moderately clayey, moderately sandy,	0.0	20.0
pale olive; sand is very fine to fine	20.0	25.0
Sand, slightly silty, pale olive; sand is very	•	
fine to fine, some medium	25.0	30.0
Sand, gravelly; very fine sand to fine gravel; below 35 ft contains trace of medium		
gravel	30.0	45.0
sand, tan; very fine to very coarse, little		
fine to medium gravel	45.0	50.0
Sand, gravelly; very fine sand to fine gravel.		
trace of medium gravel	50.0	55.0
sand, tan; very fine to very coarse, little		
fine gravel	55.0	60.0
Sand, gravelly; very fine sand to fine gravel.	60.0	70.0
Gravel, sandy; very fine sand to fine gravel.		,
trace of medium gravel, rare coarse gravel.	70.0	75.0
Sand, tan; very fine to medium, little coarse,	, 0.0	75.0
trace very coarse	75.0	80.0
Gravel, sandy; medium sand to fine gravel,	,3.0	00.0
rare medium gravel	80.0	90.0
Tertiary System - Miocene Series - Ogallala Group:	00.0	50.0
Sandstone, pale olive; sand is very fine,		
little fine; contains some lag from above;		
below 100 ft very fine to fine sand	90.0	105.5
Silt, very sandy, moderately clayey, light	20.0	105.5
gray; sand is very fine; contains rootlets.	105.5	111.0
Sand, light gray; sand is very fine; contains		
rootlets below 120 ft; contains sandstone		
below 125 ft, below 127 ft silty; pale		
olive below 130 ft	111.0	140.0
Silty sand to sandy silt with sandstone, mod-		140.0
erately silty, pale olive, sand is very		
fine to fine; less silty below 145 ft: con-		
tains rootlets below 160 ft	140.0	165.0
	- * • • •	TOD.0

Sand, little sandstone, slightly silty, light gray; sand is very fine to fine; more sandstone below 170 ft, contains white		•
siliceous fragments	165.0	177.0
stone  Sand to sandstone, pale olive; sand is very fine to fine; contains some rootlets below	177.0	181.0
185 ft, much rootlet material below 195 ft. Silty sand to sandy silt to sandstone, silty; sand is very fine to fine; contains rootlets from 220 to 224 ft; below 231 ft	181.0	205.0
slightly more silty  Silt, very sandy, slightly clayey, pale yellow; sand is very fine, some fine; con-		234.0
tains some sandstone		241.0
trace of sandstone		246.0
250 ft in part lime cemented Silt, very sandy, moderately clayey, pale yellow; sand is very fine, little fine; from 270 to 275 ft limy areas; contains	246.0	270.0
sandstone, silty below 290 ft Sand, silty, pale yellow; sand is very fine to fine; below 320 ft contains some silty	270.0	315.0
sandstone		325.0
area at 356 ftSand, olive, very fine to fine, below 371 ft	325.0	369.0
silty  Cretaceous System - Upper Cretaceous Series - Montan Pierre Formation:	369.0 a <b>Group:</b>	385.0
Shale, clayey, yellow; moderately calcareous;		
slightly calcareous from 385 to 420 ft	385.0	420.0
Shale, clayey, pale yellow	420.0	425.0
Shale, clayey, gray to dark gray	425.0	430.0
Shale, clayey, black	430.0	440.0

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Teach Special property of the Control of the Contro



OTHER SERVICES:

### 4-UE-99

COMPANY

: Sargent

WELL

: 4-UE-99

LOCATION/FIELD : Site 3

COUNTY

: HOLT

STATE

: NE

SECTION

: 19

TOWNSHIP

: 27

RANGE: 11w

DATE

: 09/28/99

PERMANENT DATUM : None

down

None

None

DEPTH DRILLER LOG BOTTOM

: 440

KB

: None

LOG TOP

: 417.80 : 3.38

LOG MEASURED FROM: grd=0 DRL MEASURED FROM:

DF GL : None : 2053

CASING DIAMETER: 0

CASING TYPE

: None

LOGGING UNIT FIELD OFFICE

: 208A

CASING THICKNESS: 0

: Norfolk

RECORDED BY

: Sol Maria Maria Andrews

> FILE : ORIGINAL

MAGNETIC DECL. : 0

BIT SIZE

: 5

RM

: 0 : 0

RM TEMPERATURE

BOREHOLE FLUID

TYPE : 8043A

MATRIX DENSITY : 2.71

: 0

NEUTRON MATRIX: Dolomite

MATRIX DELTA T

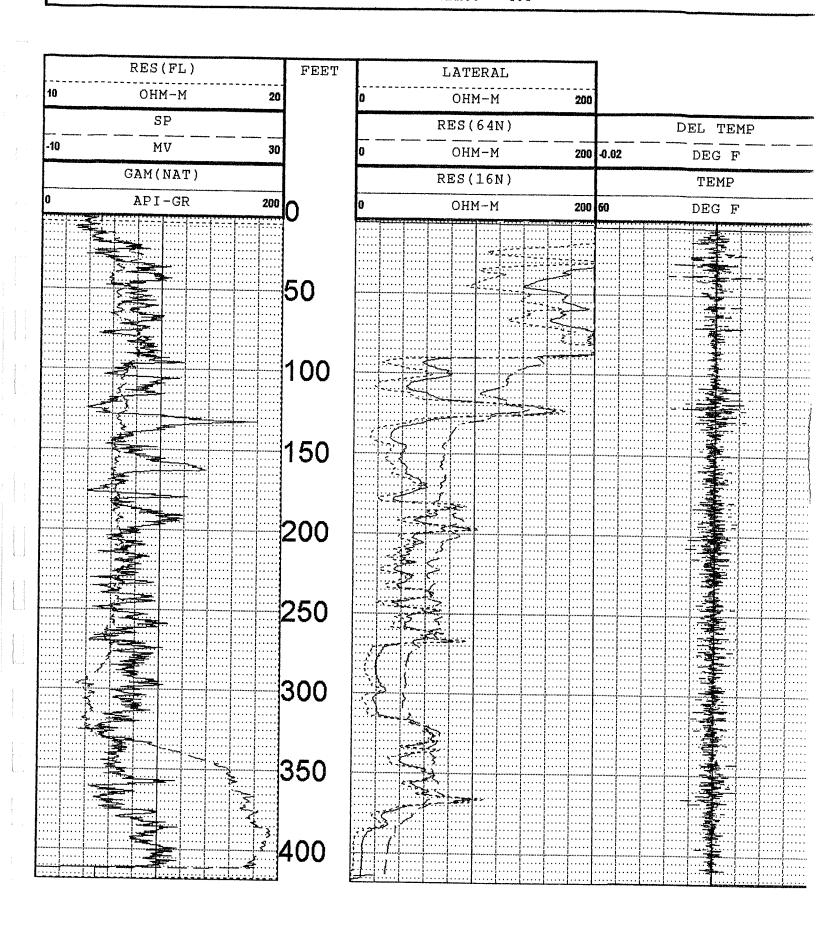
: 54

THRESH: 2500

O'Neill SW Quad

Wells 5S, 5M, 5D (UE)

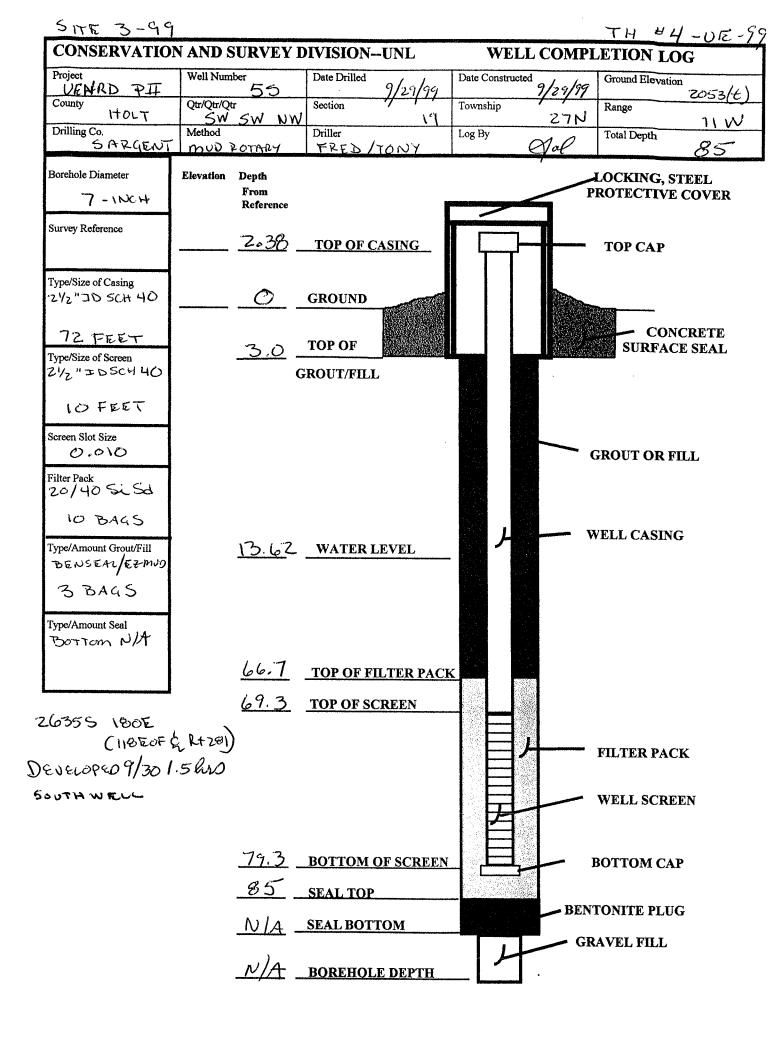
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



Site 3-99 H #4-UE-99 WE #50 M UE #58 -UE #58 CRP

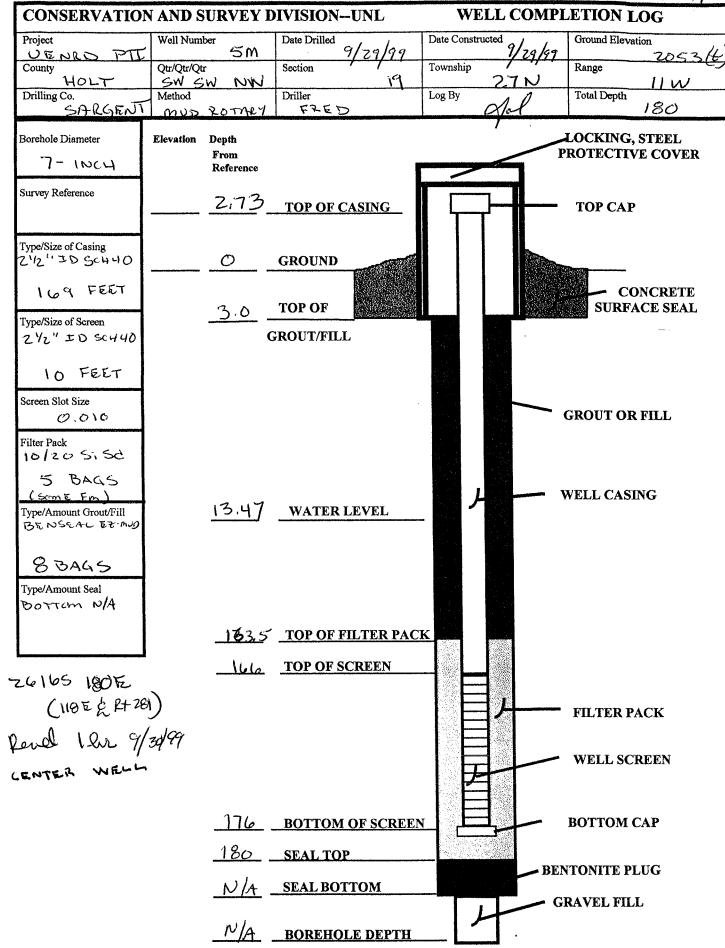
		FOR DEPARTME	NT USE ONLY	
	Registration Date:Owner Code No	Sequence No Receipt No	Registration No	NRD
-1	. Well Owner <u>Upper Elkhorn Natural K</u> Address <u>301 North Harrison</u> City <u>O'Neill</u>	Resource District	Telephone Number ( <u>402</u> ) <u>336-</u> State <u>NE</u> Zip Code <u>68763</u> +	<u>3867</u>
2	. Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-4</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +	<u>112</u>
3	. Permit Number(s)			
4.	Ground water Source Heat Pump	Industrial Injecting (with spacing (46-638)	☐ Domestic ☐ Geothermal ☐ Goon ☐ Irrigation ☐ Livestock ] Public Water Supply (without spacing)	V Monitorina
5.	Replacement and abandoned well inform A. Is this well a replacement well? C. Replacement well is feet from E. Original well pump column size: G. Location of water use of abandoned	Yes X No D. A n abandoned well F. C inches.	bandoned well last operated, Completion of original well abandonment	on,
6.	A. Well location: <u>SW</u> 1/4 of the <u>NW</u> 1/8. B. The well is <u>2635</u> feet from the ⊠ N C. Street address or block, lot and subditional D: Location of water use, if applicable (E. If for irrigation, the land to be irrigated F. Well reference letter(s), if applicables	orth or South section livision, if applicable: Site U  give legal descriptions): ed is acres.	ne and 180 feet from the East or	, <i>Holt</i> County.  ☑ West section line.
7.	Pump Information.  Is pump installed at this time? Yes If yes, complete items A through F.  If no, complete items A and D with estin A. Actual pumping rate, if applicable:  B. Pump column diameter:  D. Pumping equipment-date installed:  F. Pump installed by: Contractor	nated information for those gallons per mir inches. C.		r Estimated [] feet.

	Vell Construction of the Vell Construction of	on Information. n: <u>85</u> feet.	B. Static water	level: <u>1</u>	3.6 feet.		C. Pu	imping water level; feet.  Estimated or Measured
D. V	Well Constructi	ion began: <u>9/29</u> , <u>1999</u> .		E	. Well Co	onstructio	n completed:	<u>9/30</u> , <u>1999</u> .
F. B	ore hole diame	eter: 7 inches.						
G. F	Plain Casing: I	Diameter <u><b>2.469</b></u> ID	2.875 OD inch	ies.	7	Гуре of m	aterial: <u>PVC</u>	<u>C Schedule 40</u> .
	Wall thickness	: <u>0.203</u> inch(es).	Joints Wel	lded 🔲 (	Glued 🔲	Threaded/	Other:	
	Length(s) and	placement(s) depth from	<u>+3</u> ft	. to <u><b>69.</b>3</u>	<u>I</u> ft.		from _	ft. to ft.
Н. S	Screen: 2.469	ID <u>2.875</u> OD in:		type o	f materia	l <u>PVC Sc</u>	chedule 40	
	Screen Openin	gs (slot size) <u>0.010</u>		Trade N	ame <u>Eag</u>	<u>le</u>		
	Length(s) and	placement(s) depth from	<u><b>69.3</b></u> ft	to <u>79.3</u>	_ft.	from	to	ft. guides at <u>65</u> ft.
I.	Gravel pack in	terval(s) from 66.7 ft.	to <u><b>85</b></u> ft.		from	ft.	to ft.	. Grade size: <u>20/40</u>
	Grouted/Sealed		ì.,		with ste	el cover	<u>in concrete</u>	
					1.1 <b>70</b> .	(type	•	
	100	from $\underline{3}$ ft. to $\underline{6}$	<u>66.7</u> ft.,		with <u><b>Be</b></u>	<i>nseal/EZ</i> (typ	a contract of the contract of	
K.	Drilling metho	od: Mud Rotary			L. Drill	ing fluid:	Premium (	<u>Gel</u>
M.	Well developm	nent technique (total time ar	nd method): Air	<u>1.5hr</u>		•		
N.	Will chemicals	s, fertilizer or antifreeze be	injected or utilize	ed in the	system?		☐ Yes 🏻	No
	If yes, what w							
	<b>3</b> ,							
0	C 1 : M+	1- T J		11.1.2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		<del> </del>	Karaman Al-Maraman	All Angelies will also the proper sections of the property of
9.	Geologic Mate	eriais Logged						
5	epth in Feet					pth in Fee		ntion
Fro		Description	( hara		From		Descrij clay, s	_
0	<u>21</u>	sand, fine, trace gravel	(w, base		$\frac{301}{212}$	<u>313</u>		sandstone, vf-f, some silty clay
21	<u>26</u>	clay, sandy, silty, red	1 42 22222		<u>313</u>	370		vf-f, silty, red-brown
<u>26</u>	<u>90</u>	sand & gravel, medium gravel	sand to coarse		<u>370</u>	<u>387</u>	sand,	v1-1, sitty, 10d-010wii
<u>90</u>	<u>105</u>	sandstone/sand, vf-f			<u>387</u>	<u>420</u>		yellow-orange, trace shale @
105	117	silt, clayey, olive brow	n		420	<u>440</u>	<u>base</u> shale,	clayey, dark gray with some
100	<u> </u>					***		v streaks
117	<u>133</u>	sand/sandstone, vf-f, ro	<u>ootlets</u>	ŀ				
<u>133</u>	<u>158</u>	sandstone, sand is vf, r	<u>ootlets</u>					
158	163	silt, sandy						
163		sandstone, sand is vf-f.	<u>olive</u>					
177		silt, clayey, sandy						
181		sandstone/sand, vf-f, so	ome silt lenses					
		silt, interbedded with s						
269	<u>, 201</u>		Additional sheet	s may be	submitte	d)		
					<u> </u>			
	T 0 11	with the information submi	ttad on this regist	ration a	nd to the	hest of m	v knowledge	it is true



l,		FUR DEPARTME	INT USE ONLY	
	Registration Date:Owner Code No	Sequence No. Receipt No	Registration No	DNRD
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3.	Permit Number(s)			
4.	Purpose of well (indicate one): D Ground Water Source Heat Pump X Observation Public Water Supply Aquaculture Other (indicate use	Industrial Inject (with spacing (46-638)	tion 🔲 Irrigation 🔲 Livestock	X Monitoring
5.	Replacement and abandoned well inform  A. Is this well a replacement well?  C. Replacement well is feet from  E. Original well pump column size:  G. Location of water use of abandoned	Yes X No D. And abandoned well F. Gorinches.	Abandoned well last operated, Completion of original well abandonm	ent on,
j.	A. Well location: <u>SW</u> 1/4 of the <u>NW</u> 1/8. The well is <u>2616</u> feet from the ⊠ N C. Street address or block, lot and subdition D: Location of water use, if applicable (E. If for irrigation, the land to be irrigate F. Well reference letter(s), if applicable:	orth or South section vision, if applicable: Site I give legal descriptions): ed is acres.	line and <u>180</u> feet from the East or	· · · · · · · · · · · · · · · · · · ·
7.	Pump Information.  Is pump installed at this time? Yes Yes If yes, complete items A through F.  If no, complete items A and D with estin A. Actual pumping rate, if applicable:  B. Pump column diameter:  D. Pumping equipment-date installed:  F. Pump installed by: Contractor	nated information for those gallons per mi inches. C		or Estimated  feet.

8. Well Constr	uction Information. depth: <u>180</u> feet.	B. Static water level: 13.5 f	eet.		Pumping water level: feet.   Estimated or   Measured  1.0/20 1999
		E. We	ell Construct	ion complet	ted: <u>9/30</u> , <u>1999</u> .
D. Well Cons	ruction began: 9/29, 1999.				
F Rore hole	liameter: Z inches.		Type of	material: 1	PVC Schedule 40.
G. Dloin Casi	ng: Diameter 2.469 ID	2.875 OD inches.  Joints□ Welded □ Glue		ed/Other:	
G. Plani Casa	kness: <u>0.203</u> inch(es).		(I N I I I I	fro	om ft. to ft.
wan unc	) and placement(s) depth from	1 <u>+3</u> ft . to <u>166</u> ft.	. 777.6		
Length(s	) and pracontent(-)	V) P	aterial <u>PVC</u>	Scheune	<del>10</del>
H. Screen:	2.469 ID 2.875 OD in:	Trade Nam	e <u>Eagle</u>		ft. guides at <u>162</u> ft.
Screen (	Openings (slot size) <u>0.010</u>	m 166 ft to 176 ft.	fron	nto	10/00
Length(	s) and placement(s) depth from	fr fr	om f	t. to	^*
	pack interval(s) from <u>163.5</u> ft	w	ith <u>steel co</u>	over in con	<u>icrete</u>
J. Grouted	${f l}/{ m Sealed}$ from ${m arrho}$ ft.	o <u>3</u> π.,		(type)	
	from <u>3</u> ft.	to <u>163.5</u> ft.,	vith <u>Bensea</u>	(type)	
	110111 2 111		L. Drilling f	fluid: <u>Pren</u>	<u>iium Gel</u>
v Drillin	g method: Mud Rotary	,	L. DIII		
777-11	levelopment technique (total t	ime and method): Air 1hr		П	Yes 🛭 No
M. Wen c	hamicals fertilizer or antifree	eze be injected or utilized in the s	ystem?	1	
V. Will o	nemicais, formed:				10 m
If yes	, what will be used:				
9. Geol	ogic Materials Logged	1	Deptl	n in Feet	
Depth	in Feet		From	То	Description clay, sandy
From	To Description	gravel @ base	<u>301</u>	<u>313</u> 370	gand/sandstone, vf-f, some snry cray
<u>0</u>			313 370	387	sand, vf-f, silty, red-brown
0 21 26	26 clay, sandy, sind 90 sand & gravel,	medium sand to coarse	310		clay, yellow-orange, trace shale @
26	grave1		<u>387</u>	<u>420</u>	
<u> 20</u>	105 sandstone/sand	<u>, VI-I</u>	120	<u>440</u>	shale, clayey, dark gray with some
	117 <u>silt, clayey, oli</u>	ve brown	420	770	yellow streaks
<u>105</u>					
117	133 sand/sandston	e, vf-f, rootlets			
133	158 sandstone, san	ad is vf. rootlets			
158	163 silt, sandy	nd is vf-f, olive			
163		andst			
<u>177</u>	181 silt, clayey, sa	of what some sin ichiscs			
181	13. · +	ded with silty sandstone	1	ال	
269	301 silt, interbede	<u>led with silty sandstone</u> (Additional sheets may	be submitte	eu)	
					1 amiledge it is true.
		ation submitted on this registratio	n, and to the	e best of my	Knowicugo it is a ac-
	om familiar with the informa	andi succession			

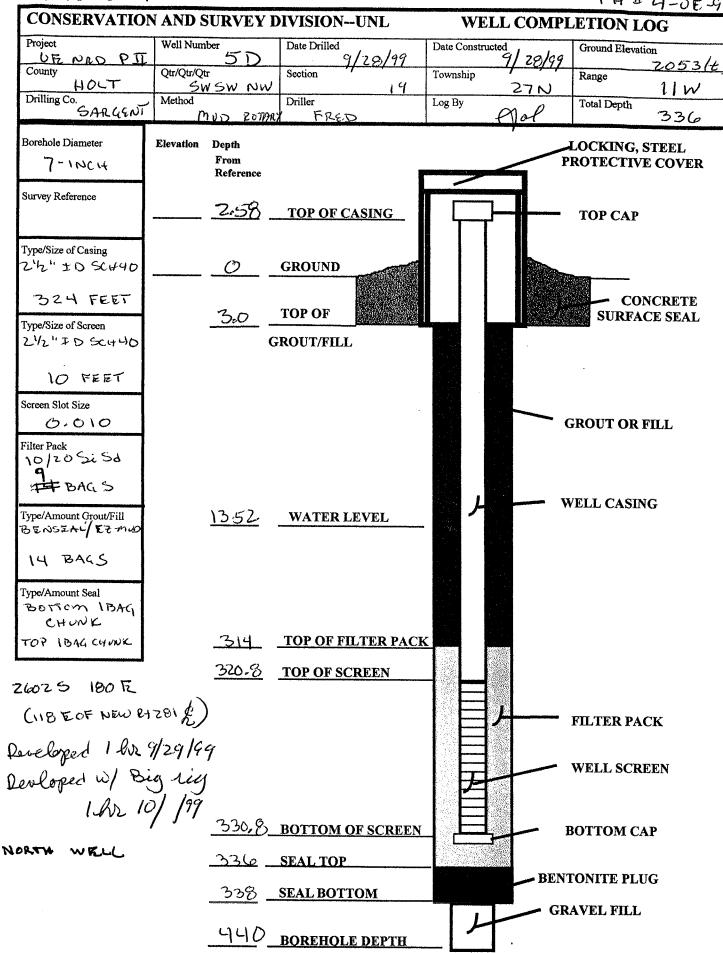


DE	PARTMENT OF WAT WATER WELL REGI		
	TOP DEPARTMEN	T USE ONLY	
Registration Date:	Sequence NoReceipt No	Registration No	NRD
Owner Code No  1. Well Owner <u>Upper Elkhorn Natura</u> Address <u>301 North Harrison</u>		Telephone Number ( <u>402</u> ) <u>336-3867</u> State <u>NE</u> Zip Code <u>68763</u> +	
City <u>O'Neill</u> 2. Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u>		Telephone Number ( <u>402</u> ) <u>887-4112</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +	
City <u>Nettgr</u> 3. Permit Number(s)	☐ Dewatering (over 90 days) mp ☐ Industrial ☐ Inje Supply (with spacing (46-638)	) ☐ Domestic ☐ Geothermal ☐ Groun ection ☐ Irrigation ☐ Livestock ☐ ☐ Public Water Supply (without spacing) ☐	nd Heat Exchanger Monitoring Recovery
Aquaculture Other  Aquaculture Other  5. Replacement and abandoned well A. Is this well a replacement well C. Replacement well is E. Original well pump column G. Location of water use of aba	l information. ell? Yes X No feet from abandoned well size:inches. andoned well:	<ul><li>Abandoned well last operated,</li><li>Completion of original well abandonment o</li></ul>	n,
	ne <u>NW</u> 1/4 of Section <u>19</u> , Tow the ⊠ North or ☐ South sec and subdivision, if applicable: pplicable (give legal description	110)*	Holt County.  West section line.
Laformation	e? Yes X No  ough F.  D with estimated information applicable: gallo:  inches.	for those wells in which pump will be installed. ns per minute. Measured   C. Length of pump column:  E. Brand/Type:  Pump Installer   License No	

<ul> <li>8. Well Construction Information.</li> <li>A. Total well depth: 336 feet.</li> <li>D. Well Construction began: 9/28, 1999.</li> </ul>	B. Static water level: <u>13.5</u> E. We			Pumping water level:feet.  Estimated or Measured  eted: 10/11, 1999.
F. Bore hole diameter: 7 inches.  G. Plain Casing: Diameter 2.469 ID  Wall thickness: 0.203 inch(es).  Length(s) and placement(s) depth from  H. Screen: 2.469 ID 2.875 OD in:  Screen Openings (slot size) 0.010  Length(s) and placement(s) depth from  I. Gravel pack interval(s) from 314 ft.  J. Grouted/Sealed from 0 ft. to 3  from 3 ft. to  K. Drilling method: Mud Rotary  M. Well development technique (total time of the street of the	Trade Nam  320.83 ft to 330.83  to 336 ft. fr.  ft., w  314 ft., w  and method): Air 2 hrs	d ⊠Threaded ft.  aterial PVC  e Eagle ft. from ft.  om ft. ith steel convith Benseal (ty)  ∴ Drilling ft.	to	ft. guides at <u>316.83</u> ft. ft. Grade size: <u>10/20</u> crete
269 301 silt, interbedded w	d num sand to coarse  f. rootlets  vf. rootlets  vf-f, olive  f. some silt lenses  vith silty sandstone  (Additional sheets may leading to the same side of the same same same same same same same sam		To 313 370 387 420 440	Description clay, sandy sand/sandstone, vf-f, some silty clay sand, vf-f, silty, red-brown  clay, yellow-orange, trace shale @ base shale, clayey, dark gray with some yellow streaks
	submitted on this registration,	and to the be	est of my k	mowledge it is true.

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true

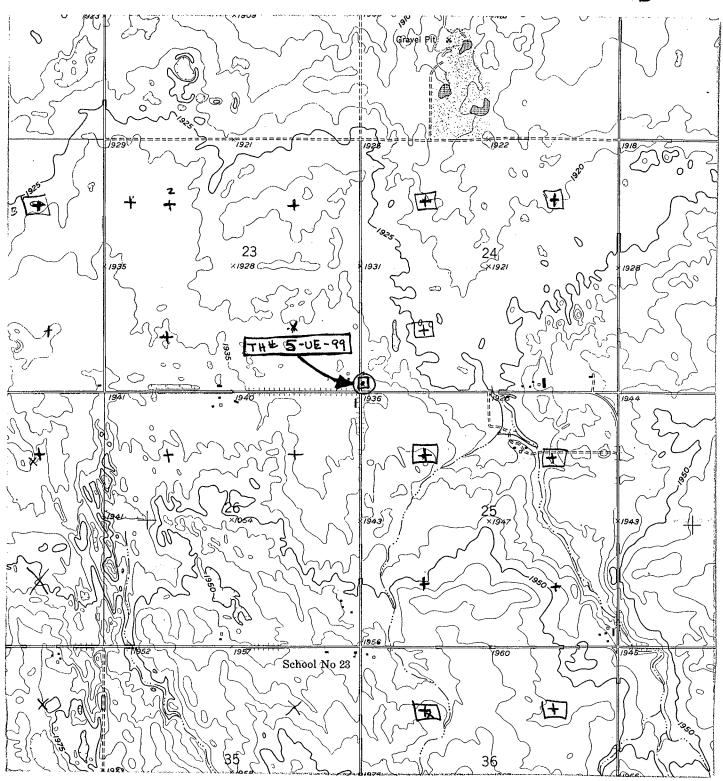
Date



### Number 6 Wells

TH # 5-UE-99

#6 WELLS



TZ9N, RIOW, SECTION ZH SW

PAGE QUAD

### Test Hole #5-UE-99 (29N-10W-24ccc) Holt County

Location: SW SW SW SW Sec. 24, T. 29 N., R. 10 W., approximately 147 feet north and 27 feet east of the southwest corner.

Ground elevation: 1,937 ft. (t). (Page, 7.5 min. quadrangle)

Depth to water: 34.29 ft (10-12-99).

	<u>Depth,</u> From	in feet To
Quaternary System, undifferentiated:		
Top soil: silt, very sandy, slightly clayey,		
dark brown; sand is very fine to fine	0.0	1.5
Silt, very sandy, slightly clayey, light		
brown; sand is very fine to fine; below 5	•	
ft light brown	1.5	12.5
Sand, light brown; very fine to medium; from		
15 to 20 ft medium to coarse, little very		
coarse; below 20 ft medium to very coarse,		
trace of fine gravel	12.5	25.0
Sand, gravelly; medium sand to fine gravel,		
trace of medium gravel; rare pebbles from		
30 to 35 ft; medium sand to medium gravel,		
trace of coarse gravel below 35 ft	25.0	40.0
Sand, gravelly; medium sand to medium gravel,		
little coarse gravel with silt lens	40.0	45.0
Sand, very fine to very coarse, little very		
fine gravel; contains silt lens	45.0	50.0
Sand, gravelly; fine sand to fine gravel,		
little medium to coarse gravel; contains		
silt lens	50.0	55.0
Gravel, sandy; medium sand to medium gravel,		
rare pebbles; contains clay lens	55.0	60.0
Sand, gravelly; medium sand to medium gravel,		
little coarse gravel	60.0	65.0
Sand, very fine to very coarse, little very		
fine to fine gravel, trace of medium		
gravel; silt lens below 68 ft	65.0	70.0
Sand, very fine to coarse, little very coarse.	70.0	75.0
Sand, gravelly; very fine sand to fine gravel,		
little medium gravel; rare coarse gravel		
below 85 ft	75.0	88.0
Tertiary System - Miocene Series - Ogallala Group:		
Silt, very sandy, slightly clayey, pale olive;		
sand is very fine to fine	88.0	98.5
Clay, silty, olive; contains some fine sand	98.5	101.0

Sand, light gray, sand is very fine to fine;		
contains reworked claystone fragments Clay, silty, sandy, light olive; sand is very	101.0	112.0
fine to fine	112.0	115.0
reworked claystones	115.0	119.0
fine  Sand to sandstone, white, lime cemented; very	119.0	123.0
fine to fine sand	123.0	134.0
sand is very fine to fine	134.0	144.0
very fine to fine	144.0	147.0
very fine to fine	147.0	169.0
174 ftSilty sand with sandstone, pale olive, very	169.0	183.0
calcareous; sand is very fine Silt, very sandy, moderately clayey, very calcareous, olive; sand is very fine to	183.0	185.0
fine  Sand to sandstone, silty, lime cemented, olive; sand is very fine to fine; contains	185.0	193.0
rootlets below 200 ft	193.0	205.0
ments; below 265 ft no clay fragments  Silt, very sandy, slightly clayey, olive; sand is very fine to fine; below 278 ft slightly	205.0	267.0
more clayey	267.0	281.0
fine to fine	281.0	290.0
below 320 ft	290.0	331.0
Pierre Formation:	_ c_cap.	
Shale, clayey, slightly calcareous, yellowish		
brownShale, clayey, slightly calcareous, dark	331.0	345.0

olive;	below	350	ft	dark	olive	to	dark		
olive	gray			· • • • •				345.0	360.0



OTHER SERVICES:

### 5-UE-99

COMPANY

: Sargent

WELL

: 5-UE-99

LOCATION/FIELD : Site 1

COUNTY

: HOLT

STATE

: NE

SECTION

: 24

TOWNSHIP

: 29

up2

None

None

RANGE: 10w

: None

: None

: 1937

DATE

: 09/30/99

DEPTH DRILLER : 360

: None

LOG BOTTOM

CASING TYPE

: 357.11

LOG TOP : 2.05

CASING DIAMETER: 0

CASING THICKNESS: 0

LOGGING UNIT

: 208A

FIELD OFFICE

: Norfolk

RECORDED BY

: Sol

BIT SIZE

: 5

MAGNETIC DECL. : 0

MATRIX DENSITY : 2.71

NEUTRON MATRIX: Dolomite

BOREHOLE FLUID

RM

PERMANENT DATUM: None

LOG MEASURED FROM: grd=0

DRL MEASURED FROM:

: 0 : 0

FILE

KB

DF

GL

: ORIGINAL

TYPE : 8043A

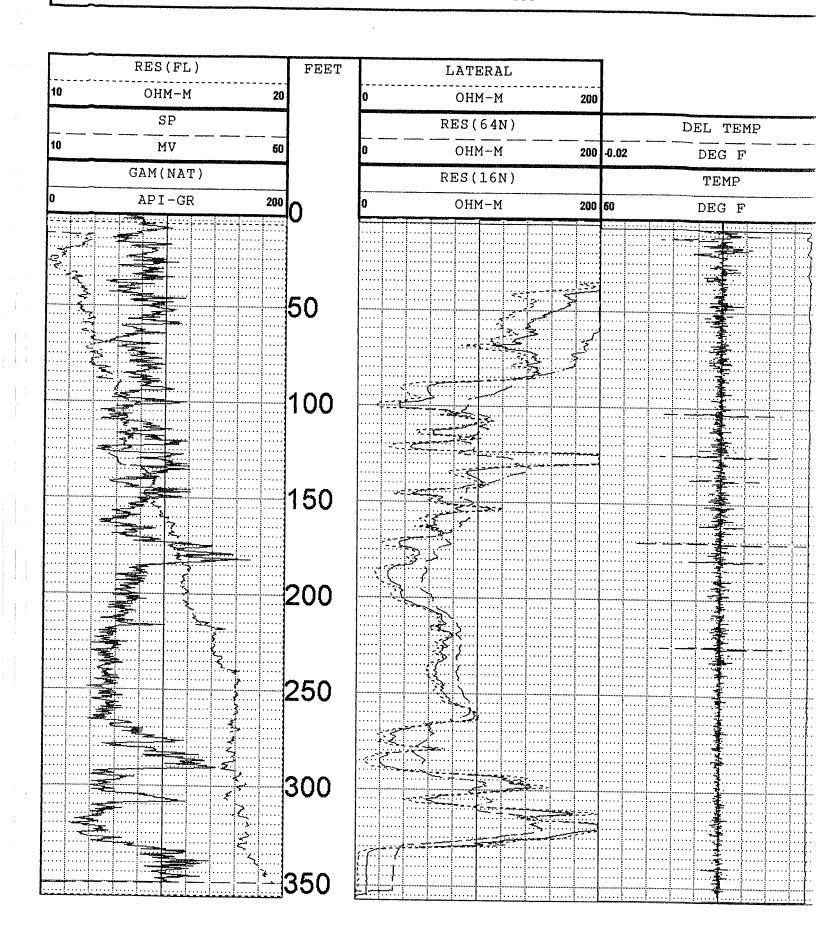
RM TEMPERATURE : 0

MATRIX DELTA T

: 54

THRESH: 2500

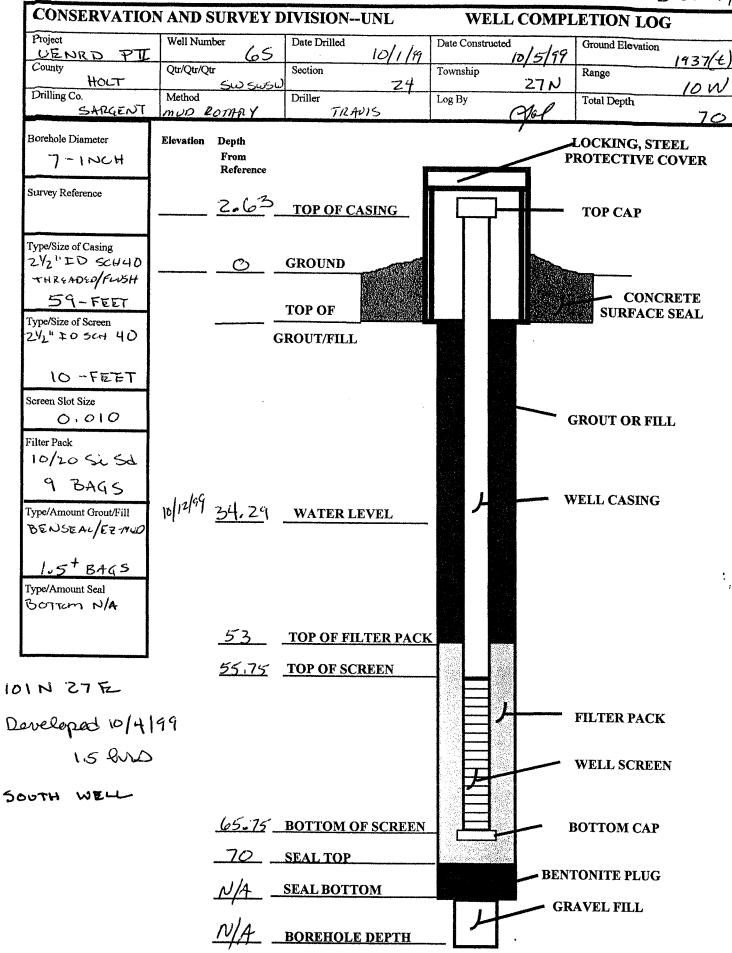
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



Holt Co. 1988 Photo AA17 T-29-N R-10-W 50 Sec. 24 NOT THE SCALE Site 1-99 117.5

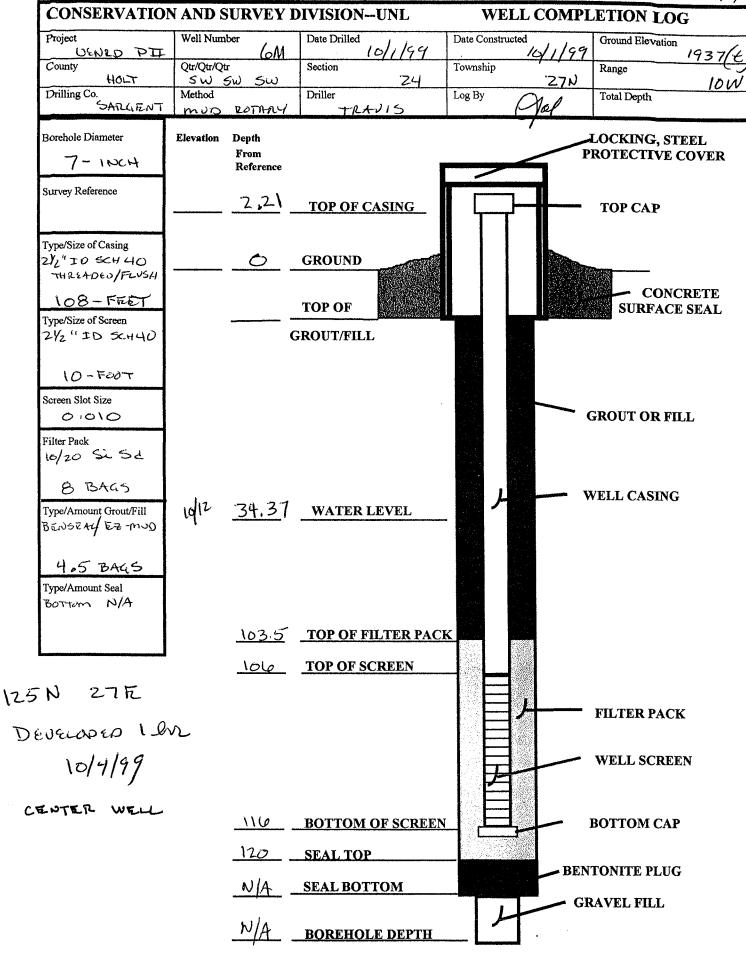
		FOR DEPARTM	ENT USE ONLY	
	Registration Date:Owner Code No	Sequence No Receipt No	Registration	n NoNRD
1	. Well Owner <u>Upper Elkhorn Natural Re</u> Address <u>301 North Harrison</u> City <u>O'Neill</u>	source District	Telephone Number ( <u>402</u> State <u>NE</u> Zip Code <u>68763</u> +	) <u>336-3867</u>
2.	Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) Contractor's License No. , State <u>NE</u> Zip Code <u>68756</u> +	
3.	Permit Number(s)			
4.	Purpose of well (indicate one): De Ground Water Source Heat Pump [  X Observation Public Water Supply Aquaculture Other  (indicate use)	☐ Industrial ☐ Injection [ ] Industrial ☐ Injection [ ] I	ction Irrigation I Lives	tock X Monitoring
5.	Replacement and abandoned well information.  A. Is this well a replacement well?  C. Replacement well is feet from E. Original well pump column size:  G. Location of water use of abandoned very service.	Yes X No D. abandoned well F. inches.	Abandoned well last operated Completion of original well abando	
6.	A. Well location: <u>SW</u> 1/4 of the <u>SW</u> 1/4  B. The well is <u>101</u> feet from the ☐ Nort C. Street address or block, lot and subdiv  D: Location of water use, if applicable (g E. If for irrigation, the land to be irrigated F. Well reference letter(s), if applicable:	h or South section livision, if applicable: <i>Site</i> give legal descriptions): d is acres.	ine and 27 feet from the East or	•
7.	Pump Information.  Is pump installed at this time? Yes X If yes, complete items A through F. If no, complete items A and D with estim A. Actual pumping rate, if applicable: B. Pump column diameter: D. Pumping equipment-date installed: F. Pump installed by: Contractor	ated information for thos gallons per n inches. (		or Estimated feet.

	Well Construct Total well dep	ction Information. oth: <u>70</u> feet.	B. Static wat	ter level: <u>3</u>	34.3 feet.		C. Pumping water level:feetfeet.
D.	Well Construc	ction began: 10/1, 1999.		· · · F	E. Well Co	nstruction	completed: <u>10/4</u> , <u>1999</u> .
		meter: 7 inches.		_	. ,, ,,,		
		Diameter <u>2.469</u> ID	2.875 OD in	chec	т	vne of mot	terial: <u>PVC Schedule 40</u> .
		ss: <u>0.203</u> inch(es).	Joints□ W				
		• •				nreaded/O	
		d placement(s) depth from	<u>+3</u> ft	. to <u>55.</u>	<u>75</u> ft.		from ft. to ft.
Н.		<b>9</b> ID <b>2.875</b> OD in:		type o	of material	<u>PVC Sch</u>	<u>edule 40</u>
		ings (slot size) <u><b>0.010</b></u>		Trade N	lame <i>Eagl</i>	<u>e</u>	
	Length(s) and	d placement(s) depth from	<u>55.75</u> ft	to <u>65.7</u>	<u>75</u> ft.	from	to ft. guides at <u>51.75</u> ft.
I.	Gravel pack i	interval(s) from <u>53</u> ft.	to <u>70</u> ft.		from	ft. t	o ft. Grade size: <u>10/20</u>
J.	Grouted/Seal	ed from $\underline{\theta}$ ft. to $\underline{3}$	ft.,		with stee	el cover in (type)	<u>concrete</u>
		from $\underline{3}$ ft. to	<u>53</u> ft.,		with <u>Ben</u>	seal/EZ n (type)	<u>nud</u>
K.	Drilling meth	od: Mud Rotary			L. Drillin	ng fluid: <u>P</u>	<u>remium Gel</u>
Tanaka	If yes, what v				sy decim.	L	Yes No
Fro	epth in Feet om To	Description			Dept From	h in Feet To	Description
0	<u>12</u>	Silt, v.sandy, light brow	<u>vn</u>		<u>308</u>	<u>331</u>	sand/sandstone, vf-f, olive
<u>12</u>	<u>88</u>	Gravel, coarse, some n			<u>331</u>	<u>342</u>	clay, shaley, yellow-red
<u>88</u>	<u>101</u>	sand with silty clay len Silt, clayey, olive, sligh			<u>342</u>	<u>360</u>	Shale, clayey, light to dark gray
<u>101</u>	124	interbedded sand, fine			<u> </u>	200	Silato, Stayoy, fight to dail, gray
124		sand, fine					
131		sandstone/sand, olive					
143		clay & silt, olive	*1.1				
151		sandstone, vf-f, some s					
<u>183</u>	<u>267</u>	sand/sandstone, vf-f, so lenses	ome claystone				
<u> 267</u>	<u>291</u>	silt, sandy, clayey, som	e vf-f sand				
<u> 291</u>		sand/sandstone, vf-f					
<u>303</u>	<u>308</u>	clay, silty, with claysto	<u>ne</u>				
		· (	Additional sheets	s may be s	submitted)		



		FOR DEPARTMEN	T USE ONLY	
	Registration Date: Owner Code No.	Sequence No Receipt No	Registration No	NRD
1.	Well Owner <u>Upper Elkhorn Natural</u> Address <u>301 North Harrison</u> City <u>O'Neill</u>	Resource District	Telephone Number ( <u>402</u> ) <u>336-3867</u> State <u>NE</u> Zip Code <u>68763</u> +	,
2.	Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-4112</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +	
3.	Permit Number(s)			
4.	Ground Water Source Heat Pump	Industrial Injection Injection Industrial Injection Inje	☐ Domestic ☐ Geothermal ☐ Ground  n ☐ Irrigation ☐ Livestock <u>X</u> Public Water Supply (without spacing) ☐ R	Monitoring
5.	Replacement and abandoned well information.  A. Is this well a replacement well?  C. Replacement well is feet from the fe	Yes X No D. Abom abandoned well F. Conniches.	oandoned well last operated, ompletion of original well abandonment on _	<b></b> ,
6.		forth or South section line division, if applicable: Site U.  c (give legal descriptions): ated is acres.	PNorth, Range <u>10</u> ☐ East ⊠West, <u>Holt</u> of and <u>27</u> feet from the ☐ East or ⊠ West set 1-99; TH #5-UE-99	•
7.	Pump Information.  Is pump installed at this time?  Yes If yes, complete items A through F.  If no, complete items A and D with est A. Actual pumping rate, if applicable:  B. Pump column diameter:  D. Pumping equipment-date installed:  F. Pump installed by: Contractor	imated information for those we gallons per minu inches. C.	ite. Measured or Est	timated 🔲 feet.

	B. Static water level: 34.4 feet.  C. Pumping water level: fee					
D. Well Construction began: 10/1, 1999.	E. We	E. Well Construction completed: 10/4, 1999.				
F. Bore hole diameter: 7 inches.			Ferrance, minutes,			
G. Plain Casing: Diameter 2.469 ID	2 875 OD inches	Trus of material	. DVC Calcadada 40			
	2.875 OD inches.		: <u>PVC Schedule 40</u> .			
Wall thickness: <u>0.203</u> inch(es).	Joints Welded Glued					
Length(s) and placement(s) depth from	+3  ft . to $106  ft$ .		from ft. to ft.			
H. Screen: <u>2.469</u> ID <u>2.875</u> OD in:	type of material <i>PVC Schedule 40</i>					
Screen Openings (slot size) <u>0.010</u>	Trade Name <u>Eagle</u>					
Length(s) and placement(s) depth from	<u>106</u> ft to <u>116</u> ft.	fromt	o ft. guides at <i>102</i> ft.			
I. Gravel pack interval(s) from 103.5 ft.	to <u>120</u> ft. from	ft. to	ft. Grade size: 10/20			
J. Grouted/Sealed from $\underline{\theta}$ ft. to $\underline{3}$ ft		steel cover in cor				
from <u>3</u> ft. to <u>10</u>	<i>93.5</i> ft., with					
K. Drilling method: <u>Mud Rotary</u>	L. D	rilling fluid: Prem	ium Gel			
If yes, what will be used:		40				
9. Geologic Materials Logged						
- 60	1					
Depth in Feet	l _	Depth in Feet	Description			
- 60	Fre	om To I	Description and/sandstone, vf-f, olive			
Depth in Feet From To Description 0 12 Silt, v.sandy, light brown 12 88 Gravel, coarse, some me	Fro 30 dium to coarse 33	om To I 8 <u>331</u> <u>s</u>	Description and/sandstone, vf-f, olive lay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense	From 30 dium to coarse 23 des @ 42' & 68'	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl	From 300 330 330 330 330 330 330 330 330 33	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense	From 300 330 330 330 330 330 330 330 330 33	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl  101 124 interbedded sand, fine &	From 300 330 330 330 330 330 330 330 330 33	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl  101 124 interbedded sand, fine & sand, fine	From 300 330 330 330 330 330 330 330 330 33	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl  101 124 interbedded sand, fine & sand, fine  124 131 sand, fine  131 143 sandstone/sand, olive	1 30 dium to coarse es @ 42' & 68' ly sandy silt, clayey	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl  101 124 interbedded sand, fine & sand, fine  124 131 sand, fine  131 143 sandstone/sand, olive  143 151 clay & silt, olive	From 300 dium to coarse 232 es @ 42' & 68' ly sandy 34 es silt, clayey 24 lenses	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl  101 124 interbedded sand, fine & sand, fine  124 131 sand, fine  131 143 sandstone/sand, olive  143 151 clay & silt, olive  151 183 sandstone, vf-f, some silt  183 267 sand/sandstone, vf-f, son  lenses	t lenses ne claystone	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl  101 124 interbedded sand, fine &  124 131 sand, fine  131 143 sandstone/sand, olive  143 151 clay & silt, olive  151 183 sandstone, vf-f, some silt  183 267 sand/sandstone, vf-f, son  lenses  267 291 silt, sandy, clayey, some	t lenses ne claystone	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet From To Description  0 12 Silt, v.sandy, light brown  12 88 Gravel, coarse, some me sand with silty clay lense  88 101 Silt, clayey, olive, slightl  101 124 interbedded sand, fine &  124 131 sand, fine  131 143 sandstone/sand, olive  143 151 clay & silt, olive  151 183 sandstone, vf-f, some silt  183 267 sand/sandstone, vf-f, some  lenses  267 291 silt, sandy, clayey, some  291 303 sand/sandstone, vf-f	t lenses ne claystone  vf-f sand	om To I 8 331 s 1 342 c	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet   From   To   Description	t lenses ne claystone  vf-f sand	om To I S S S S S S S S S S S S S S S S S S	and/sandstone, vf-f, olive clay, shaley, yellow-red			
Depth in Feet   From   To   Description	t lenses ne claystone  vf-f sand	om To I S S S S S S S S S S S S S S S S S S	and/sandstone, vf-f, olive clay, shaley, yellow-red			



FOR DEPARTMENT USE ONLY							
Registration Date: Owner Code No	Sequence NoReceipt No	Registration No	NRD				
<ol> <li>Well Owner <u>Upper Elkhorn Nata</u> Address <u>301 North Harrison</u> City <u>O'Neill</u></li> </ol>	ural Resource District	Telephone Number ( <u>402</u> ) <u>336-3867</u> State <u>NE</u> Zip Code <u>68763</u> +					
2. Drilling Firm <u>Sargent Irrigation</u> Address <u>Box 9</u> City <u>Neligh</u>		Telephone Number ( <u>402</u> ) <u>887-4112</u> Contractor's License No. <u>39194</u> State <u>NE</u> Zip Code <u>68756</u> +					
3. Permit Number(s)							
Ground Water Source Heat Pu  X Observation Public Water  Aquaculture Other	mp Industrial Injec	☐ Domestic ☐ Geothermal ☐ Ground stion ☐ Irrigation ☐ Livestock <u>X</u> ☐ Public Water Supply (without spacing) ☐ R	Monitoring				
<ul> <li>5. Replacement and abandoned well</li> <li>A. Is this well a replacement well</li> <li>C. Replacement well is for</li> <li>E. Original well pump column s</li> <li>G. Location of water use of aban</li> </ul>	1? Yes X No D. eet from abandoned well F. ize:inches.	Abandoned well last operated,  Completion of original well abandonment on _	<b></b> ;				
	North or South section lid subdivision, if applicable: <u>Site</u> cable (give legal descriptions): irrigated is acres.	o <u>29</u> North, Range <u>10</u> ☐ East ⊠West, <u>Holt</u> ine and <u>27</u> feet from the ☐ East or ⊠ West so <u>UE 1-99; TH 5-UE-99</u>					
7. Pump Information.  Is pump installed at this time?  If yes, complete items A through If no, complete items A and D wi A. Actual pumping rate, if applic B. Pump column diameter:  D. Pumping equipment-date insta F. Pump installed by: Contractor	F. th estimated information for thosable: gallons per n inches	se wells in which pump will be installed. ninute. Measured  or Es C. Length of pump column: E. Brand/Type: Pump Installer  License No.	stimated  feet.				

		ction Information. pth: <u>211</u> feet.	B. Static water level: 34.25 feet.		C. Pumpir	ng water level:feet. Estimated orMeasured	
Э.	Well Constru	ction began: <u>9/30, 1999</u> .		E. Well Co	nstruction	n completed: <u>10/</u>	
		meter: 7 inches.				roomprotod. 107	<u> </u>
Ĵ.	Plain Casing:	Diameter <u>2.469</u> ID	<u>2.875</u> OD inches.	Т	ype of ma	nterial: <u>PVC Scl</u>	redule 40
	Wall thickne	ess: <u>0.203</u> inch(es).	Joints Welded				70.
	Length(s) an	d placement(s) depth from	_	<i>199.2</i> ft.			_ ft ft.
H.	Screen: 2.46	<u>9</u> ID <u>2.875</u> OD in:		pe of material	PVC Sch		
	Screen Open	ings (slot size) <u><b>0.010</b></u>		le Name <i>Eagl</i>			
	Length(s) and	d placement(s) depth from	<u>199.2</u> ft to <u>2</u>	209.2 ft.	from	to ft.	guides at <u>195.2</u> ft.
•	Gravel pack	interval(s) from 194.5 ft.	to <u>211</u> ft.			to ft.	Grade size: <u>10/20</u>
j.	Grouted/Seal	led from $\underline{\theta}$ ft. to $\underline{3}$ f	t.,	with stee	el cover i	n concrete	
		from <u>3</u> ft. to <u>1</u>	<b>94.5</b> ft.,	with <u><b>Ben</b></u>	seal/EZ (type)		
K.	Drilling meth	nod: Mud Rotary		L. Drillin	ng fluid: 1	<u>Premium Gel</u>	
		ment technique (total time an			•		
۷.	Will chemica	lls, fertilizer or antifreeze be i	njected or utilized in t	he system?	İ	Yes 🛛 No	
	If yes, what v	vill be used:					
9.	Geologic Ma	terials Logged			3, 5 33,	<u> </u>	
D	epth in Feet			Dent	h in Feet		
Fro	m To	Description		From	To	Description	
0 <u>2</u>	<u>12</u> 88	Silt, v.sandy, light brow	<del></del>	308	<u>331</u>		one, vf-f, olive
4	<u>00</u>	Gravel, coarse, some me sand with silty clay lens		331	<u>342</u>	clay, shaley	, yellow-red
<u>88</u>	<u>101</u>	Silt, clayey, olive, slight		342	<u>360</u>	Shale, clave	y, light to dark gray
01	<u>124</u>	interbedded sand, fine &	silt, clayey		<del></del>		/ I I I I I I I I I I I I I I I I I I I
.24	<u>131</u>	sand, fine					
131	<u>143</u>	sandstone/sand, olive					
43 151	151	clay & silt, olive	. •				
183		sandstone, vf-f, some sil					
		<u>lenses</u>	· · · · · · · · · · · · · · · · · · ·				
<u> 267</u>	<u>291</u>	silt, sandy, clayey, some	vf-f sand				
<u>291</u>	<u>303</u>	sand/sandstone, vf-f					
03	<u>308</u>	clay, silty, with clayston	<u>e</u>				
		(A	dditional sheets may l	oe submitted)			
10.	I am familiar v	with the information submitte	ed on this registration,	and to the bes	t of my kı	nowledge it is tru	e.