

CCR Groundwater Monitoring System



Omaha Public Power District

Nebraska City Station NC1 Ash Disposal Area

Nebraska City, Nebraska

June 2016





OPPD Nebraska City Station NC1 Ash Disposal Area CCR Groundwater Monitoring System

Table of Contents

Prof	fessional Engineer Certification	1
1.0	Introduction	2
2.0	Facility Background	2
3.0	Site Hydrogeology Summary	2
4.0	Groundwater Monitoring System	4
Figu	re 1 NC1 Ash Disposal Area. Groundwater Monitoring Well Locations	6

List of Tables

Table 1. NC1 Ash Disposal Area, Groundwater Monitoring Well System

Appendices

Appendix A Monitoring Well Documentation



Professional Engineer Certification

"I hereby certify that the groundwater monitoring system described in this report for the CCR landfill known as the NC1 Ash Disposal Area at the Nebraska City Generating Station, owned and operated by the Omaha Public Power District, has been designed and constructed to meet the requirements of the Coal Combustion Residual Rule 40 CFR 257.91. I am a duly licensed Professional Engineer under the laws of the State of Nebraska."

Print Name: Lara L. Syrocki

Signature:

Date: 6 23 2016

License #: <u>E-11855</u>

My license renewal date is December 31, 2016

1.0 Introduction

On April 17, 2015 the U.S. Environmental Protection Agency (EPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The rule – effective on October 19, 2015 – applies to Omaha Public Power District's (OPPD's) Nebraska City Generating Station. The Station, located southeast of Nebraska City, Nebraska has two coal-fired combustion units – Unit 1 and Unit 2. CCR from both units may be disposed in the NC1 Ash Disposal Area.

The CCR Rule, 40 CFR Subpart D-Standards for the Disposal of CCRs, Section §257.91 requires a groundwater monitoring system that consists of sufficient number of wells at appropriate locations and depths based on site-specific technical information, to yield groundwater samples from the uppermost aquifer that:

- Accurately represent the quality of both background groundwater, and groundwater passing the boundary of the CCR unit
- Monitor potential contaminant pathways

The groundwater monitoring system at the NC1 Ash Disposal Area meets those requirements. This report includes the following sections in support of the certification.

- Section 1.0 Introduction
- Section 2.0 Facility Background
- Section 3.0 Site Hydrogeology Summary
- Section 4.0 Groundwater Monitoring System

2.0 Facility Background

OPPD has a two-unit (Unit 1 and Unit 2) fossil fuel-fired generating plant at the Nebraska City Station (Station) southeast of Nebraska City, Nebraska. This Station has two existing CCR landfills that are permitted under the current NDEQ Title 132 regulations for fossil fuel combustion ash disposal (the NC1 Ash Disposal Area and NC2 Ash Disposal Area).

The NC1 Ash Disposal Area is an unlined CCR landfill of approximately 52 acres that has historically received CCR for disposal and is permitted with the State of Nebraska. NC1 Ash Disposal Area is an active, existing CCR landfill as defined by the CCR rule.

3.0 Site Hydrogeology Summary

Based on soil boring advanced at the Station in 2006, the bedrock, in the form of shale, was encountered at a depth of 89 feet below ground surface. The uppermost aquifer, Missouri River Alluvium, depth is anticipated to be from 2 feet to 89 feet below ground surface (bgs).

According to the hydrology assessment conducted at the site in 1995 by SCS Engineers titled *Hydrologic Investigations Report*. The broad upland areas of the Station are underlain by the unconsolidated wind-blown and glacial deposits of Pleistocene age. The surface of the site is generally overlain by fine-grained or cohesive deposits near the surface, based on a study conducted by D'Appolonia Consulting Engineers in 1975. These deposits consist of silty clays, clayey silts, silty sands and fine sands. The bedrock underlying the Station area is medium hard

red to gray shale. Several areas outside the Station area are underlain by a thin formation of limestone interbedded with shale.

Data from the boring logs for the monitoring wells and soil borings at the Station indicates that the subsurface geology at the ash disposal area consists of the following:

- 3 feet of light brown to dark grayish brown lean clay (CL) (Fill/Topsoil), overlying,
- Approximately 9 feet of alluvium consisting of light brown to grayish brown silty clayey sand (SM), poorly graded sand with silty sand (SP-SM), silt with very fine sand to silty very fine sand (ML/SM), and high plastic clay (CH), overlying,
- 28 to 77 feet of gray poorly graded sand (SP) to the boring completion depths varying from 40 to 89 feet.
- Some borings indicate that bedrock was encountered at a depth of 103.5 feet.

In the general vicinity of the Station, two primary sources of groundwater are present, Missouri River alluvium and glacial deposits in the upland area west of the Station property. Groundwater in the Missouri River alluvium is found at starting depths of approximately 2 to 17 feet bgs and is largely affected by the river stages. Based on recent monitoring well survey data and assessment of the existing groundwater monitoring wells installed at the site, groundwater flow direction is generally to the southeasterly direction towards the Missouri River.

Slug tests conducted in 1995 on three monitoring wells (MW-1, MW-4 and MW-6) indicate that the horizontal hydraulic conductivity values ranged from 5.7 x 10^{-4} cm/sec to 8.2 x 10^{-3} cm/sec. A pump test was conducted in 2003 by HDR on an 83-foot-deep, 16-inch-diameter well that was installed and pumped at a rate of 1225 gallons per minute for 72 hours. Water levels were monitored during the pumping period and recovery period in the pumped well and in three observation wells installed for the test. The results of the test indicated that hydraulic conductivity of the aquifer is approximately 2.0 x 10^{-1} cm/sec, which is in the upper end of the range of literature values for clean sands. It should be noted that the tested interval in the 2003 investigation is deeper (and the sediments coarser) than was tested during the slug tests that were conducted in 1995. The difference seen between the HDR data and the SCS data could be attributed to lateral and vertical heterogeneity common for alluvial deposits. The aquifer is known to become coarser and consequently more permeable with depth. Since the HDR pumping test was a measure of deeper sediments, the results are reasonably consistent with the geology.

Monitoring wells installed on the Station north of the NC1 Ash Disposal Area (near the NC2 Ash Disposal Area) have hydraulic conductivity values ranging from 1.39 x 10^{-2} cm/sec to 2.42 x 10^{-3} cm/sec as reported in the NC2 Hydrogeologic Characterization Report (HDR 2006). Groundwater flow velocity at NC1 is calculated based on hydraulic conductivity range of 5.7 x 10^{-4} cm/sec to 1.39 x 10^{-2} cm/sec (SCS 1995 and HDR 2006) and an effective porosity of 0.405 as reported in HDR 2006. Based on quarterly monitoring reports since 2006 for NC1, the gradient ranged from 0.0027 ft/ft to 0.0031 ft/ft with a velocity range of 3.5 to 108 ft/year.

From slug test data performed by Terracon (2016) on recently installed well MW-13, the hydraulic conductivity was reported as 3.38×10^{-3} cm/sec. This is within the range of previously recorded data.

4.0 Groundwater Monitoring System

Based on the site hydrogeology and groundwater flow to the southeasterly direction, the groundwater monitoring system for the NC1 Ash Disposal Area for the detection monitoring program consists of three (3) upgradient/background wells and four (4) downgradient wells. This exceeds the minimum number of monitoring wells required by 40 CFR 257.91(c) (i.e. one upgradient and three downgradient). Five (5) additional wells are included for water level measurements only and select wells to serve for future 'nature and extent determinations'. The groundwater monitoring system network for the NC1 Ash Disposal Area is summarized below in Table 1.

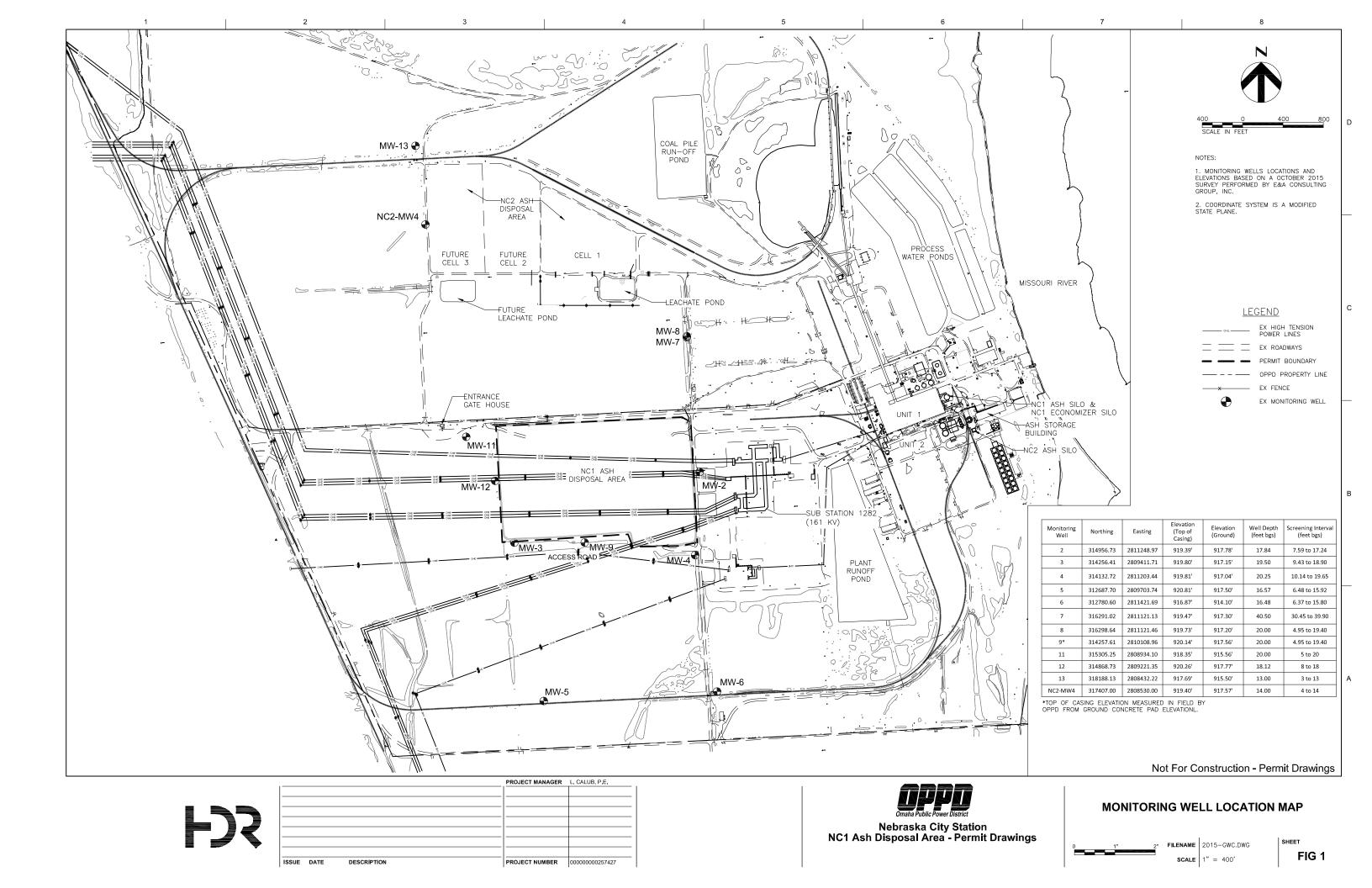
Table 1
OPPD NC1 Ash Disposal Area, Groundwater Monitoring Well System

Monitoring	Date	Well	Well	Gradient	Monitoring Program
Well	Installed	Depth	Depth		Use
		(feet bgs)1	(feet from		
			TOC) ²		
Detection Mo	nitoring Pro	ogram			
MW-13	1/26/16	13.0	15.19	Background/Up	Detection
MW-11	1/16/04	20.0	21.85	Background/Up	Detection
NC2MW-4	9/8/04	14.0	16.01	Background/Up	Detection
MW-2	3/14/95	17.8	20.38	Down	Detection
MW-3	3/14/95	19.5	22.42	Down/Crossgradient	Detection
MW-4	3/13/95	20.3	23.07	Down	Detection
MW-9	1/21/99	20.0	22.53	Down	Detection
Water Level I	Measuremer	its Only			
MW-5	3/17/95	16.6	19.99	Down/Crossgradient	Water Level/Nature &
					Extent Determinations ³
MW-6	3/15/95	16.5	19.24	Down	Water Level/Nature &
					Extent Determinations ³
MW-7	1/20/99	40.5	42.53	Crossgradient	Water Level Only
(deep well)					
MW-8	1/21/99	20.0	22.46	Crossgradient	Water Level Only
MW-12	3/26/04	18.1	20.78	Up/Crossgradient	Water Level Only
Abandoned V	Vells ⁴				
MW-1	3/14/95	20.8	23.64	NA	NA
(replaced with	(Abandoned				
MW-11)	1/16/04)				
MW-10	1/21/99	20.0	21.99	NA	NA
(replaced with	(Abandoned				
MW-12)	10/17/03)				

Notes:

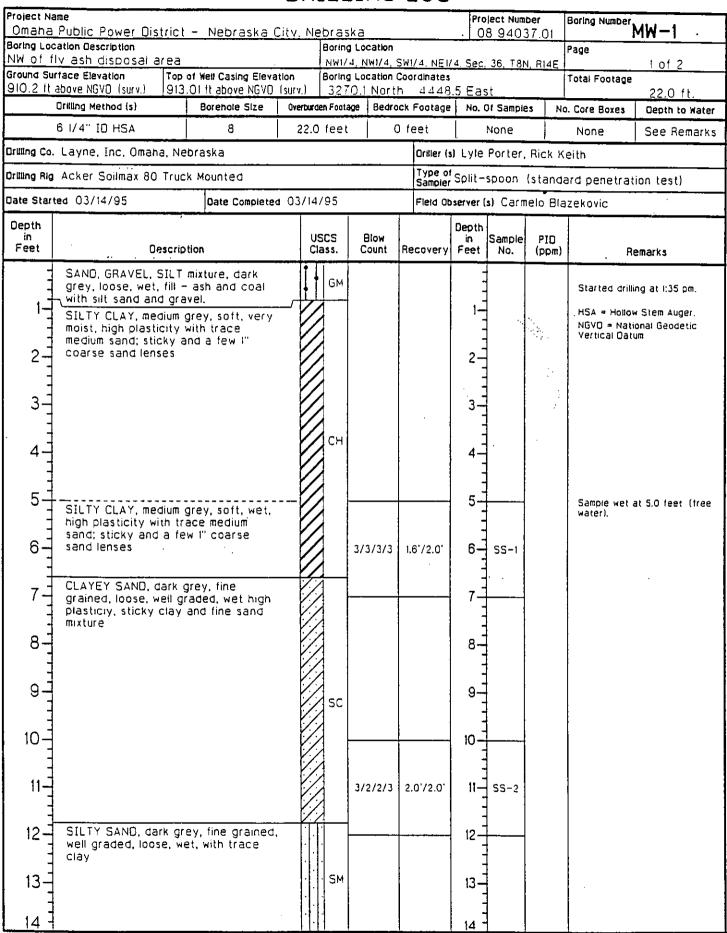
- 1. Depth from ground surface to bottom of installed well. Actual boring depth may be deeper.
- 2. Depth from top of casing to bottom of installed well.
- 3. Monitoring wells to be sampled for nature and extent determinations if an Appendix IV constituent is detected in one or more of the detection monitoring wells at statistically significant level above groundwater protection standard.
- 4. Abandoned in accordance with State of Nebraska regulations.

The monitoring well locations are shown in Figure 1 attached. The groundwater monitoring wells were constructed of 2-inch-diameter, schedule 40 PVC, flush threaded riser pipe, and machine slotted 10-slot (0.010 inch) screen. The surface completion for each well consists of a steel protective casing, concrete apron, and three bollards/posts. Monitoring well construction logs, registrations or abandonment forms for the groundwater monitoring wells are contained in Appendix A of this report.

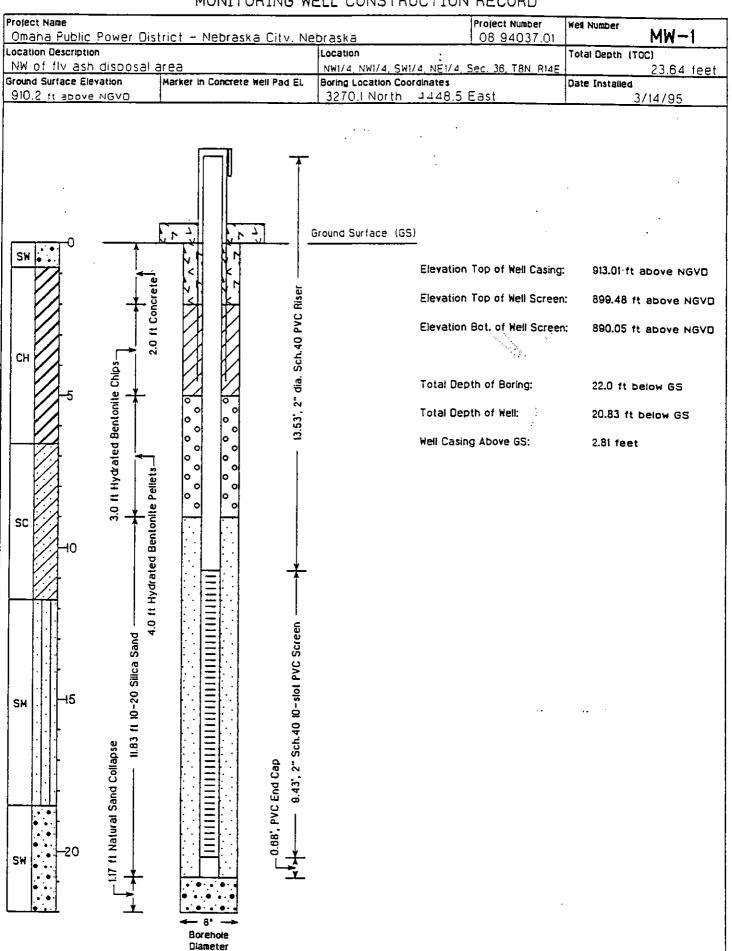


Appendix A Monitoring Well Documentation



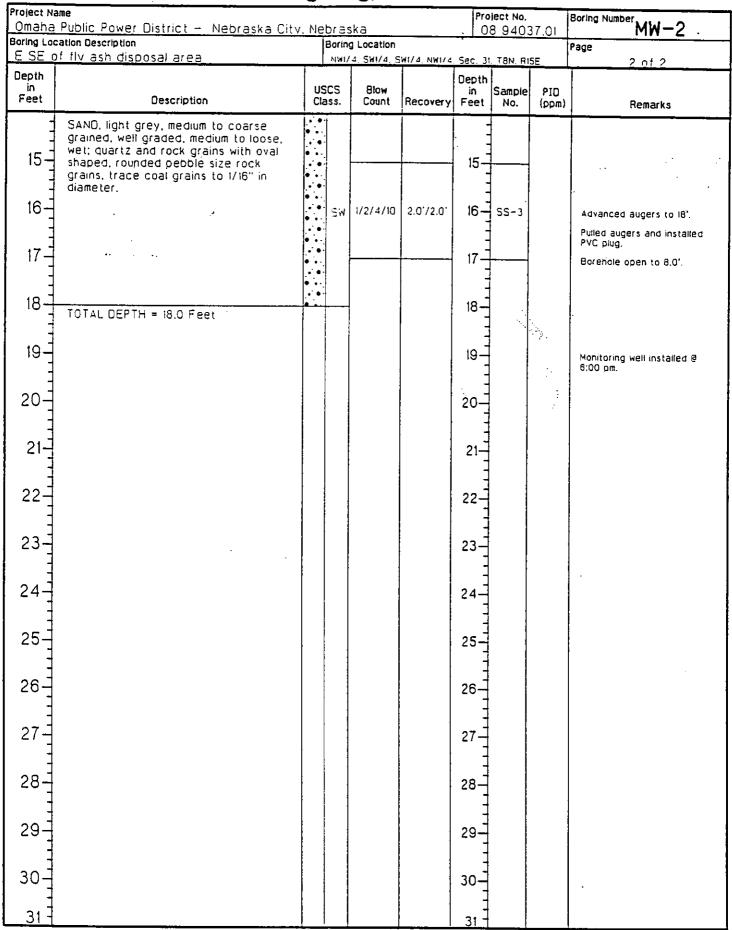


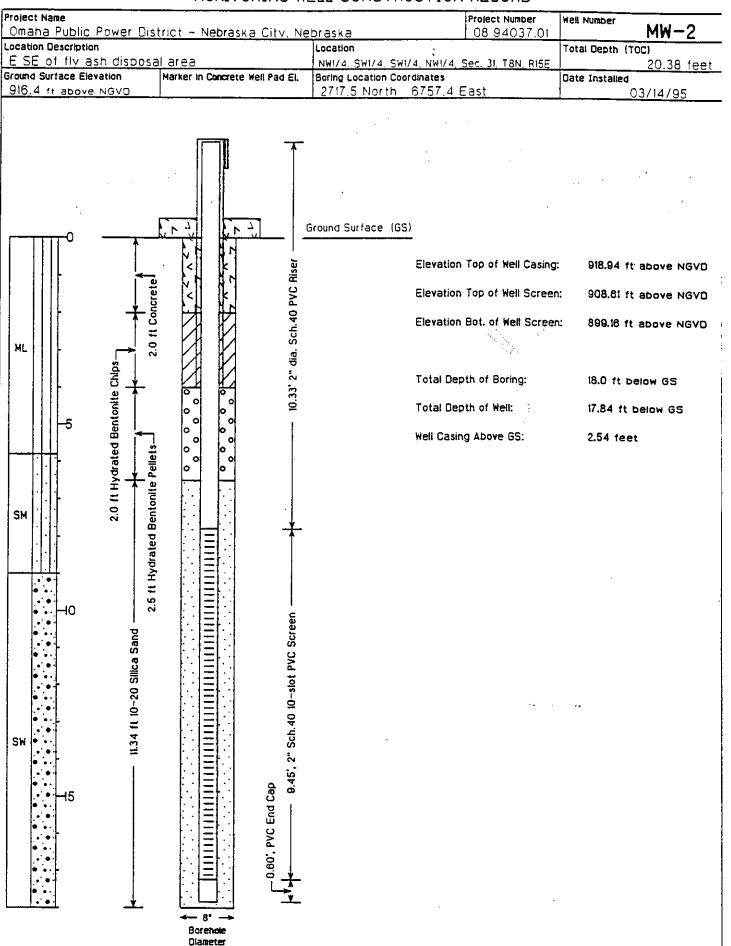
Project Na	ame				Ontir	Pro	ect No.		Boring Number MW-1
Boring Loc	Public Power District - Nebraska City ation Description	, Ne	Borin	g Location			8 940:		Page
NW Of Depth	fly ash disposal area	1	NW1/	4. NWI/4, S	W1/4, NE1/4			2 of 2	
in Feet	Description	US	CS ss.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks
15-	SILTY SAND, dark grey, fine grained, well graded, loose, wet, with trace clay					15-			
16-1			SM	3/3/4/3	0.6'/2.0'	16-	SS-3		
17-	· · · · · · · · · · · · · · · · · · ·					17			
18-						18-	Ŷ.		
19	SAND, medium grey, medium grained, well graded, medium density, wet; mostly quartz and rock grains; trace silt					19-			
20-	·		SW			20		÷	
21-		• •		5/5/7/6	2.0'/2.0'	21	SS-4		
22	TOTAL DEPTH = 22.0 Feet	. •				22			Monitoring well installed @ 3:30 pm.
23-						23-			
24-						24			
25-						25			
26-						26 <u>-</u>			
27-						27			
28-						28-			
29-						29-			
30-						30-			
31 -						31 -			





				<u>J</u> K	ΙL	$\overline{\Gamma 1 \nu}$	טו	LOG					
Project N Omaha	ame 3 Public Power Distr	ict - Nebra	aska Cil	v. Ne	ebra	iska				8 940		Boring Number	MW-2 .
Boring Lo	cation Description If fly ash disposal a				Borin	ng Loca						Page	
Ground Su	Irface Elevation 1	op of Well Casir	g Elevatio	n	Sorir	ng Loca	1/4, 5 tion C	WI/4, NWI/ oordinates	4. Sec	<u>. 31, T8N</u>	I <u>. R15E</u>	Total Footage	1 of 2
916.4 ft		918.94 ft abov				i		<u>6757.</u>					18.0 ft.
	Orilling Method (s)	Borehole	Size	Overburo		+		k Footage	} _	Of Sample	es N	o. Care Boxes	Depth to Water
	6 1/4" ID HSA	8		18.0) fee	t	0	feet	<u>.l.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	None		None	See Remark
	. Layne, Inc. Omana.	<u> </u>								Porter.			· ·
	Acker Soilmax 80 T											ard penetrat	ion test)
	ted 03/14/95	Date Co	mpleted	03/14	/95	i ·		Field Ob	server ((s) Carm	reto Bla	zekovic	<u> </u>
Depth in				U	SCS	Bio	w l		Depth in	Sample	PID		
Feet	Desc	cription		CI	lass.	Cou	int I	Recovery	Feet	No.	(ppm)	R	emarks
1-1	SANDY SILT, brow very moist, well-gr and silt.	nish grey, loc aded, fine sa	ese. Ind						1— 1—			. HSA = Hollov	at 4:05 p.m. r Stem Auger, onal Geodetic
3 4 5					ML				3-4-5-		3		
6 7 8	SILTY SAND, brown gravel, well graded density, quartz and	, moist, mediu	រា		SM	1/4/10	0/10	1.9*/2.0*	6 7 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SS-1		Auger cutting (free water)	is wet at 8 feet
9 1 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SAND, dark grey, well graded, medium mostly quartz with	n density, we	ained, t.						9 10 11				
12-11	SAND, light grey, m grained, well grade wet: quartz and ro shaped, rounded p grains, trace coal diameter.	d, medium to ck grains with ebble size ro	loose, noval ck		SW	1/4/11	/1/ (J.6'/2.0'	12 13 14 1	SS-2			

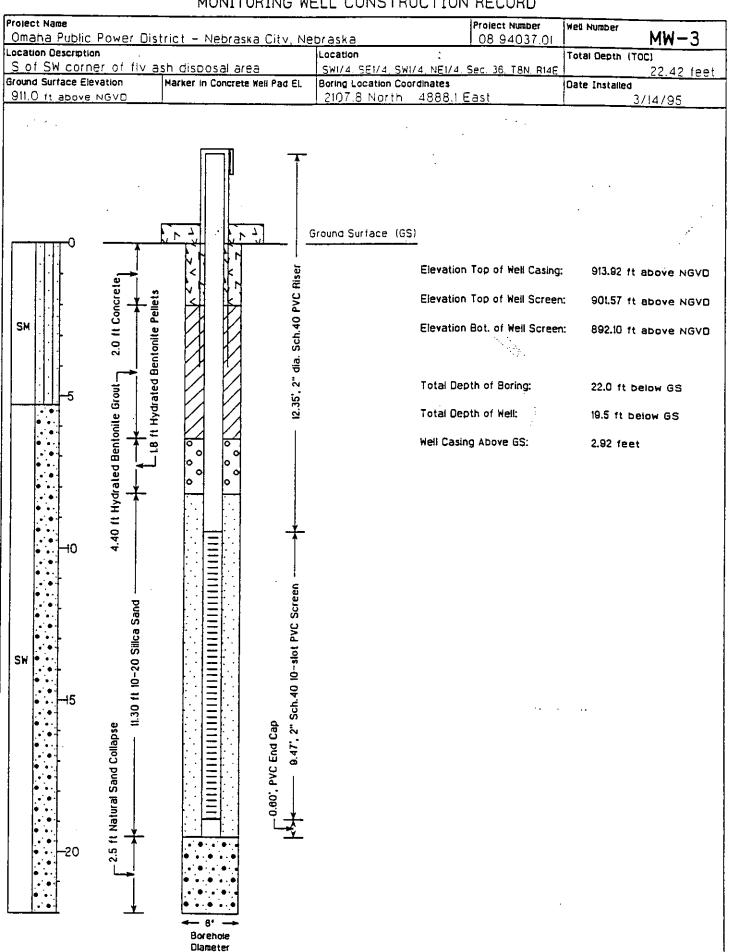






Project Na					100				, 	
Omaha	Public Power Distric	t - Nebraska (City, Nebra	aska			iect Num 8 9403	ber 37.01	Boring Number	MW-3
Boring Loc	Cation Description		Bor	loring Location Page						
Ground Su	Corner of fly ash c	iisposal area oof Well Casing Eleva	SW Ition Borl		SWI/4, NEI/ Coordinates		<u>36, T81</u>	N. R14E	Total Footage	1 of 2
	above NGVD (surv.) 91	3.92 It above NGVD	(surv.) 21	2107.8 North 4888.1			t			22.0 ft.
	Orilling Method (s)	Overburden Fo		ock Footage	No. (of Sample	25 N	o. Core Boxes	Depth to Wa	
	6 1/4" [D HSA	8	22.0 fee	et	t 0 feet				None	See Remar
Orlliling Co.	Layne Inc., Omaha, N	ebraska	· <u></u> -		Ordler (s	l Lyle	Porter,	Rick K	Ceith	
Orilling Rig	Acker Soilmax 80 Tru	ck Mounted			Type of Sampler	Split-	spoon	(stand	ard penetra	tion test)
Date Star	ted 03/14/95	Date Complete	03/14/95		Fleid Ob	server (s) Carm	ielo Bia	azekovic	
Depth in		*	11000			Depth		_		· · · · · · · · · · · · · · · · · · ·
Feet	Descri	ption	USCS Class.	Blow Count	Recovery	in Feet	Sample No.	PID (ppm)	. R	emarks .
1 2 3 4 5 6 7 8 9 10 11 12 13 13 13 13 13 13 13 13 13 13 13 13 13	SAND, light brownish fine grained, well gramoist, mostly quartz (salt and pepper apparall propers and pepper appearall pepper	grey, medium to ded, loose, and rock grains pearance). grey, medium to ded, loose, and rock grains pearance). grey, medium to ded, loose, wet, ck grains (salt	SM	2/3/3/4	1.7'/2.0'	1 2 3 4 5 6 7 8 9 10 11 12 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	SS-1		HSA = Hollo NGVD = Nat Vertical Dat	rat (0:20 am. w Stem Auger. ional Geodetic um at 6.2 feet (fre

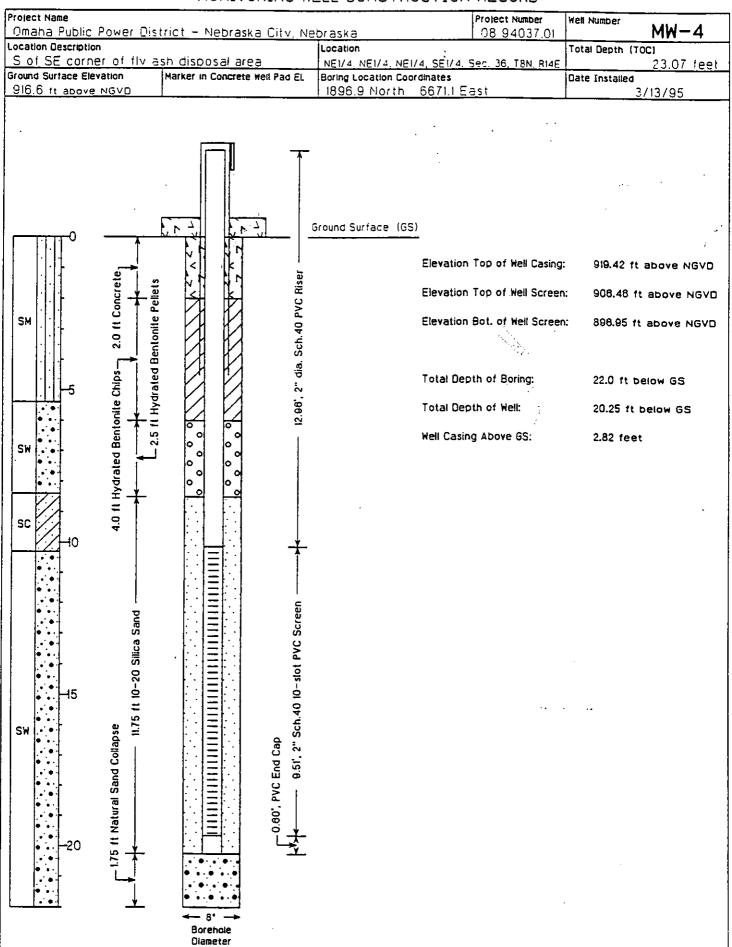
Project Na Omaha	ame Public Power District – Nebraska Cit		og, c		Pro	ject No. 8 9400	37,01	Boring Number MW-3 .
Boring Loc	cation Description Wicorner of fly ash disposal area	Bori	ng Location 1/4. SEI/4. S	SMI/A NEIZA		·		Page
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth			2 of 2 Remarks
15	SAND, light brownish grey, medium to fine grained, well graded, loose, wet, mostly quartz and rock grains (salt and pepper appearance).				15-			
16-			4/2/7/11	1.6'/2.0'	16-	SS-3		
17	SAND, light brownish grey, medium grained; well graded, medium density, wet; with some fine grained quartz	-			17-			
18	sand and trace oval shaped rock pebbles, trace coal to 1/8" inch in diameter.	SW			18-			
19-					19			
20-					20			
21-			4/4/4/3	1.8'/2.0'	21-	SS-4		Advanced augers to 22".
22					22-			There is 1.5' of sand in the
23-	TOTAL DEPTH = 22 Feet				23			hollow stem of the augers. Pulled augers and installed PVC plug. Borehole open to 7.0'. Free water in borehole 8 6.0'.
24-					24-	ŀ		Installed monitoring well @ 11:40 am.
25-					25-			
26-					26-			
27-					27-			
28-					28-	ļ		
29-					29			
30-					30-			
31					31			





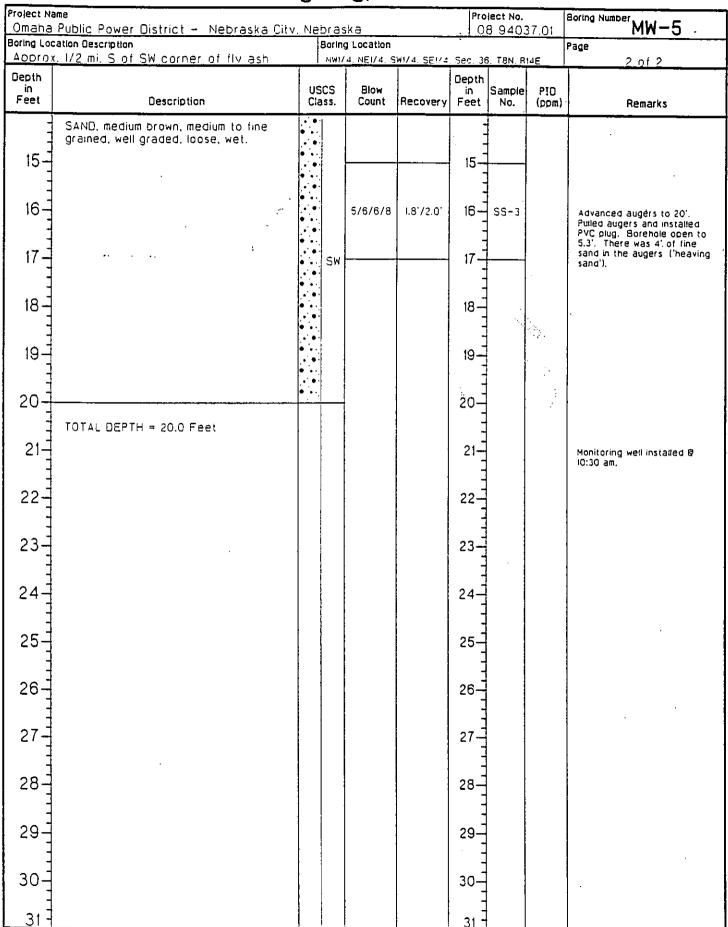
			DR:	ILLI	NG	LOG					
Project N	ame 3 Public Power District	- Nebraska (ity Ne	hraeka	3			lect Num 8 940.	ber	Boring Number	MW = 1
Boring Lo	cation Description		J:(V. IVE	Boring Lo			• 1.0	<u> 840.</u>	<u>37.01 </u>	Page	
S of St Ground St	Corner of fly ash di	SDOSAL area of Well Casing Eleva	<u> </u>	NEI/4	NE1/4, N	<u>IEI/4, SEI/</u>	'4. Sec.	36, T8			<u> 1 of 2</u>
		42 It above NGVD				coordinates n 6671.				Total Footage	22.0 ft.
	Orlling Method (s)	Borehole Size	Overburd	en Footage		ck Footage	_	01 Sampl	es No	o. Core Boxes	Depth to Water
	6 1/4" ID HSA	8	22.0	feet	0	feet		None		None	See Remarks
Orllling Co	. Layne, Inc. Omaha, Ne	braska				Oritler (s) Lyle	Porter.	Rick K	eith	·
Orilling Rig	Acker Soilmax 80 Truc	k Mounted				Type of Sampler	Split-	Spoon	(stand	ard penetra	tion test)
Date Star	ted 03/13/95	Date Completed	03/13	/95		Field Ob	server (s) Carn	ielo Bla	izekovic	
Depth						•	Depth	1			· · · · · · · · ·
in Feet	t Description				8low Count	Recovery	in Feet	Sample No.	PID (ppm)	R	emarks
-	SILTY SAND, dark gre	_					-				
, =	loose, well graded, ve traces of clay, mostly									Start drilling	
'-	some rock grains.	400112 111(1)					1-		·. (1	w Stem Auger. ional Geodetic
							_		().	Vertical Dati	
2-							2-		٠,		
-				SM			-				
3-							3-				
1											
4-							4-				
=			-			i	-				
5-							5-				
Ŭ .			11				3 1				
6-	SAND, light brownish of fine grained, well grad				10 10 10		_ =				
07	density, moist, mostly		• •		6/8/6	1.1'/2.0'	6-	SS-I			
	rock grains.		•		1					•	
/-			• •	SW			7-				
]											
8-							8-				
=	CLAYEY SAND, medium	brown, fine									
9-	grained, soft, very mo						9-			!	
-	plasticity, well graded	with silt.		sc			1				
10-				1 -			10-			Sample wet a	at 10 feet (free
3	SAND, brownish grey,	medium to fine	••	+-						water).	
11-	grained, well graded,	wet, loose.	. •	2/	4/5/7	1.5'/2.0'	11	SS-2		1	
. 4	mostly quartz with roc	k grains.	•								
12-							12				
12			•	SW			12-				
, 4				1							
13-							13-				
14							14				

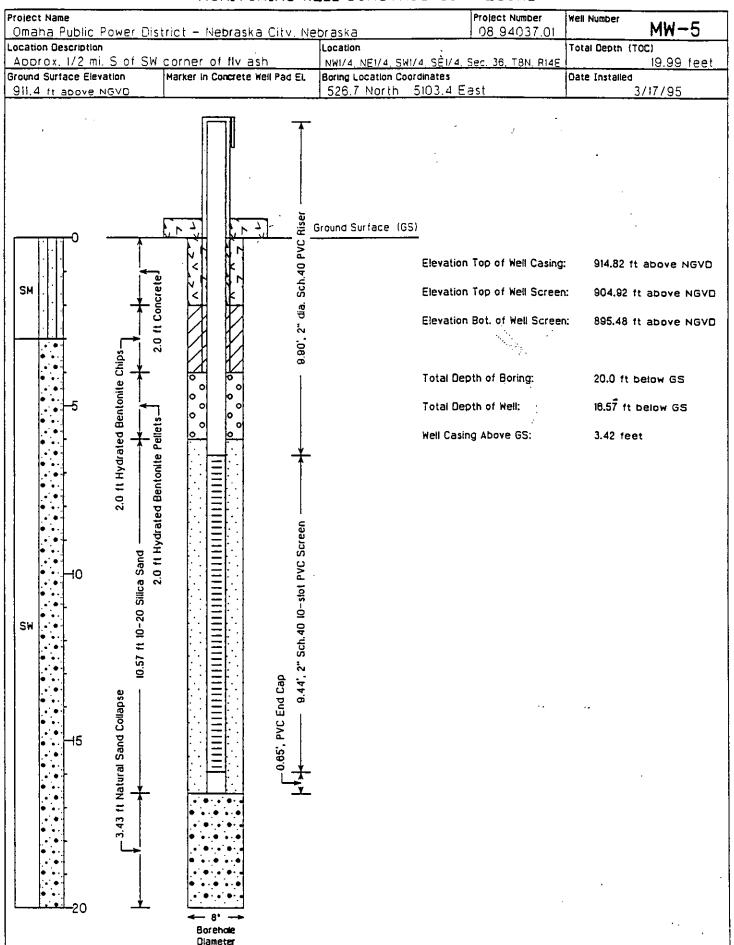
Project Na Omaha			eska		Pro	ject No. 8 940:	37 0!	Boring Number MW-4 .
Boring Loc	ation Description	Bori	ng Location					Page
S of St Depth	E corner of fly ash disposal area	NE	1/4, NE1/4, N	<u>IEI/4. SEI/4</u>	T		14E	2 of 2
in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Samole	(ppm)	Remarks
15-	SAND, brownish grey, medium to fine grained, well graded, wet, loose, mostly quartz with rock grains.				15-		-	
16-	SAND, medium grey, medium grained, well graded, loose, wet, quartz and some fine grained rock grains and trace coal (in situ):		4/4/6/8	1.01/2.01	16-	SS-3		
17-	riace coal (iii situ).				17-			,
18-		SW	!		18	٠.		
19-					19-		;÷	·
21-			1/1/7/10	t.8'/2.0'	21-	SS-4	<i>:</i>	
22					22			Advanced augers to 22°.
23-	TOTAL DEPTH = 22.0 Feet				23-			Pulled augers. Borehole open to 10.0'. Installed PVC plug.
24-					24-			Monitoring well installed @ 3:15 pm.
25-					25-			
26-					26			
27-					27-			
28-					28-			
29 					29 30			
31 -					30-			





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roject Na Omaha	ame I Public Power Distric	it – Nebraska (City Ne	braska	•			lect Num 8 9403	ber 37 Ot	Boring Number	MW-5
Boring Loc	cation Description	•	<u> </u>	Boring Lo	ocation					Page	<u> </u>
Ground Su	. 1/2 mi. S of SW cor	ner of fly ash p of Well Casing Eleva	tion			<u>SWI/4, SEI/</u> Coordinates		36, T8N	V. R14E	Total Footage	l of 2
911,4 11 (above NGVD (surv.) 91	4.82 ft above NGVD	(surv.)	526.7	North	5103.4	_East			·	20.0 ft.
	Orilling Method (s)	Borehole Size	\	en Footage		ck Footage	No. (Of Sample	≥s No	o. Core Boxes	Depth to Water
	6 1/4" ID HSA	8	20.0	feet	() feet		None		None	See Remarks
Orilling Co.	. Layne, Inc, Omaha, N	lebraska .						Porter,			
Orilling Rig	Acker Soilmax 80 Tru	ick Mounted				Type of Sampler	Split-	Spoon	(stand	ard penetra	tion test)
ate Star	ted 03/17/95	Date Complete	a 03/17/	95		Field Ob	server (s) Carm	ielo Bla	zekovic	
Depth in					O!		Depth	_			
Feet	Descr	iption '			Blow Count	Recovery		Sample No.	PID (ppm)	- R	emarks '
1 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	SILTY SAND, medium moist, non-plastic, to SAND, medium brown well graded, medium quartz and rock gramoist.	race clay. , fine grained, density, mostly		SM			2 3 4 4			Start driffing	at :0:30 am. « Stem Auger. onal Geodetic
5 6 7				9/8	8/9/20	1.1'/2.0'	5 6 7	SS-1			
8 1 9 1	SAND, medium brown well graded, medium quartz and rock gra	density, mostly		SW			8 9			Auger cuttin (free water)	gs wet at 8 feet I.
10							10				
11-	SAND, medium brown grained, well graded			3/	4/4/8	1.2'/2.0'	11-	SS-2			
13-			• •				13-		,		
14							14				

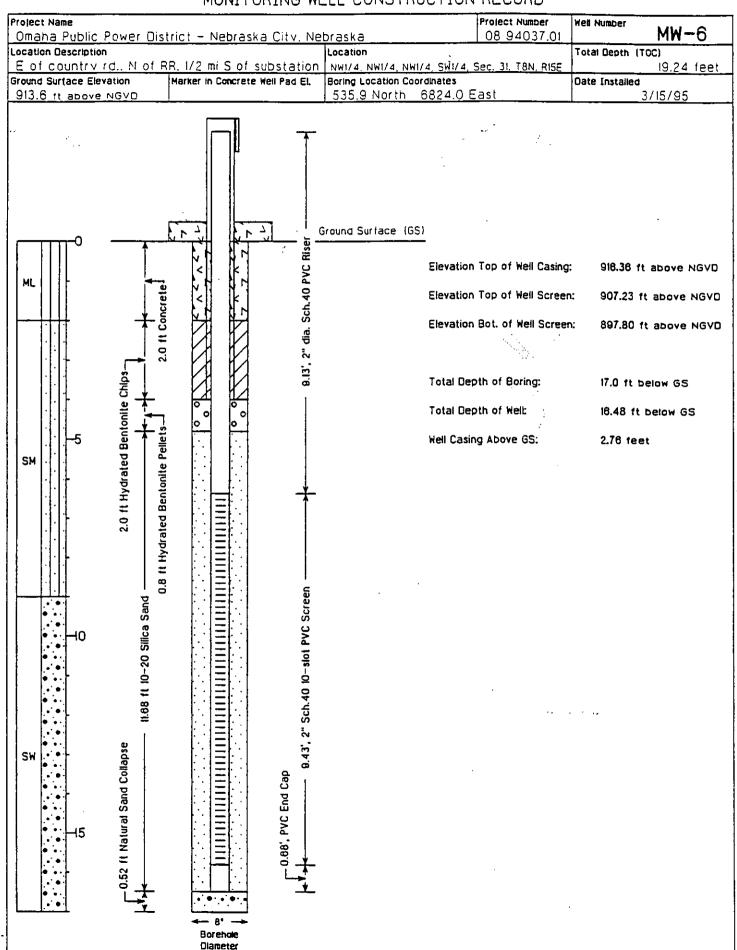






rolect na Omaha	sme Public Power Distric	ct – Nebraska (City.	Nebra:	ska			lect Num 8 9403	ber 37 O1	Boring Number	MW-6 .
oring Loc	ation Description untry rd., N of RR,			Borin	g Location	NW1/4. SW1/	•			Page	1 of 2
round Su	rface Elevation To	op of Well Casing Eleva 16.36 ft above NGVD	tion	Borin		Coordinates				Total Footage	
	Orilling Method (s)	Borehole Size		urden Foot		ock Footage	_	Of Sample	s N	o. Core Boxes	Depth to Wate
	6 1/4" ID HSA	8	17	.0 feet) feet		None		None	See Remark
rilling Co.	Layne, Inc, Omaha, I	Nebraska				Oriller (s) Lyle	Porter,	Rick #	(eith	···
rilling Rig	Acker Soilmax 80 Tr	uck Mounted				Type of Sampler	Split-	Spoon	(stanc	lard penetra	ition test)
ate Start	ted 03/15/95	Date Complete	a 03/	15/95		Field Ob	server (s) Carm	elo Bla	azekovic	· · · · · · · · · · · · · · · · · · ·
Depth in		•	,	USCS	Blow		Depth in	Sample	PID		
Feet	Desc	ription		Class.	Count	Recovery	l _		(ppm)		Remarks
2	SILT, dark grey, loo non-plastic with roo SILTY SAND, light t grained, well graded density.	ots. prownish grey, fine	9	ML			2-		8. - 2.	HSA ≈ Holic	g at 9:30 am. ow Stem Auger, tional Geodetic tum
5 6 7				SM	4/8/5/7	1.6*/2.0*	4- 5- 6-	SS-1			
8 9 10 11 12 13	SAND, medium brow grained, well grade wet, with some silt.]	SW	3/3/8/13	1.9'/2.0'	9 10 11 12	SS-2		Auger cutti (free wate	ngs wet at 9 feet r).

Project Na						Pro	iect No.		Boring Number MW-6 .
Omaha Boring Loc	Public Power District - Nebraska City	. Ne	bras	ka Location		108	9403	37.01	MW-6 .
	ountry rd N of RR. I/2 mi S of substati	on	оония <u>/м</u> и	<u>4. NW!/4. N</u>	W1/4, SW1/4	Sec. 31.	T8N, R1	5E	Page 2 of 2
Depth in Feet	Description	US	iCS ass.	Blow Count	Recovery	Depth	Sample No.		
15-	SAND, medium brownish grey, fine grained, well graded, medium to loose, wet, with some silt.					15			Advanced augers to 17.0'.
16 - 17 - 17 -	SAND, light grey, medium grained, well graded, medium density, wet; mostly quartz and rock grains with some pebble-size, oval shaped, rounded rock grains.	• •		4/6/8/13	2.0'/2.0'	16-	SS-3		Pulled augers and installed PVC plug. There was 3.5' of sand in the hollow stem of the augers ("heaving sand").
18	TOTAL DEPTH = 17.0 Feet					18-			Borehole open to 6.0°.
19- 20-						19	-		Monitoring well installed at II:00 am,
21-				:	:	21-		·	
22-					:	22-			
23-						23-			
24-						24-			
26-						26-			
27-						27-			
28						28			
29 30						29- 30-			
31 -				NICTAI		31			





DRILLING LOG

		DRILL	-1146	LUG					
Project N Omaha	iame 3 Public Power District — Nebraska C	ity Nebras	- k =			sject Num		Boring Number.	MW-7
Boring Lo	cation Description Fly ash disposal area	Borin	a Location	1'/4 Sec 3				Page 10f	
Ground Si	urface Elevation Top of Well Casing Elevat	ion Borin	g Location	Coordinates			<u> </u>	Total Footage	
14	above NGVD (surv.) 918-9 (Labove NGVD) Orilling Method (s) Borehole Size	Overburden Foot		h 6694.9 ock Footage	1	t Of Sampi	a . N	o. Core Boxes	42.0 ft.
	6 I/4" ID HSA 8	42.0 feet		0 feet	;	None	-	None	Depth to Water See Remarks
Drilling Co	. Layne, Inc. Omaha, Nebraska			Oriller (s)	!		Rick K		occ nemerka
Drilling Rig	Acker Soilmax 80 Truck Mounted			Type of Sampler					
Date Star	ted 01/20/99 Date Completed	01/20/0	79	- 1				CUCKLEY	
Depth in		HECE	01-		Depth				- <u>-</u>
Feet	Description	USCS Class.	Blow Count	Recovery	in Feet	Sample No.	PID (ppm)	Re	emarks
1 1 2	SANDY SILT, brownish grey loose, well graded, fine Sand and silt, moist	ML			1 2		Δ. 2.		
3	SILTY SAND, brownish				3		· ·		
4- 1 5-	grey, well graded, medium density quartz and rock grains, moist.	SM			4 T				
6	SAME AS ABOVE	SM			6				
7-					7-				
8-					8				
9-					9			AVGER C WET AT	
10 11 12 13 13 13	SAND. dark grey, med to fine grained, well graded, medium density, wet, mostly quartz with rock grains	SW			10 11 12 13 13 13				

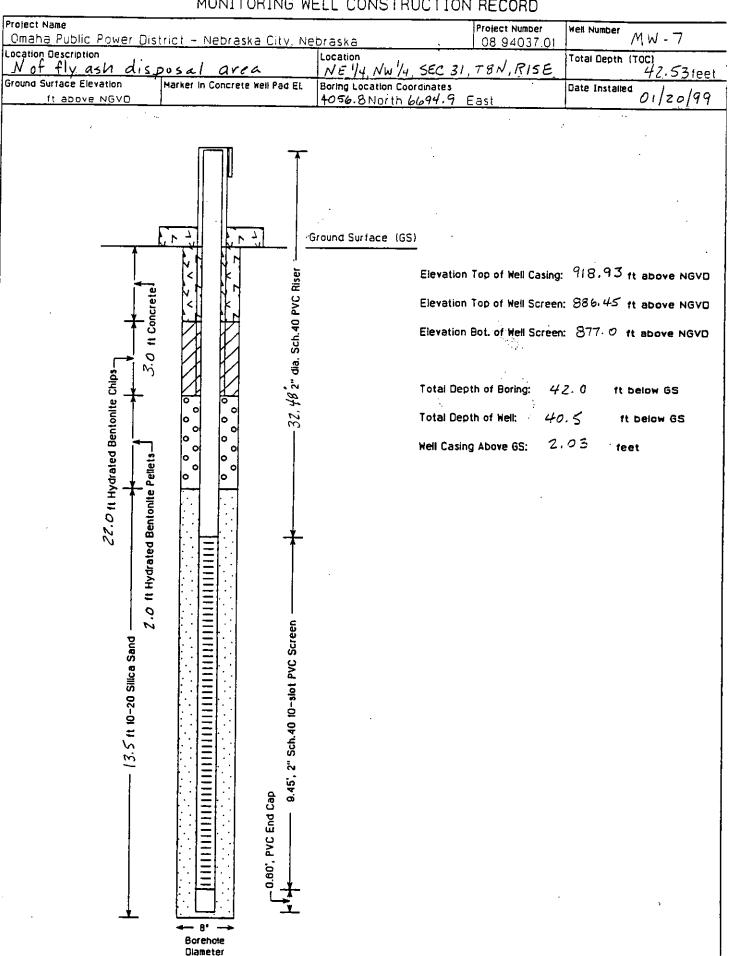
Drilling Log, continued

Boring Locati	ublic Power District - Nebraska City on Description ly ash disposal area	Borin	o Location	1/4 , SEC	<u> </u>	ject No. 8 940.	37.01	Boring Number MW-7 Page 2 of 3
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth	Sample No.		Remarks
15	SAME AS AROVE				15	,,,,,	(ppin)	remarks.
16 -					16			
18 -					18			
19-					19		•	
21-	SAME AS ABOVE				20-			
22-					22-			
23-					23			
25					24-			
26-	SAND. light grey, medium to coarse grained, well graded, medium to		·		26			
27-	well graded, medium to loose, wet, quartz and rock grains with oval				27			
.8- 1 	shaped, rounded pebble site rock grains				28-			
0 1					30-			
31 -	SAME AS ABOYE				3! -			

Drilling Log, continued

Project Name Omaha Pu	<u>ublic Power District - North Omaha,</u>	Borlo	a Location		: 0	ect No. 8 940		Boring Page	Number MW -	7
N o	ion Description Pfly as n disposal area	NE	1/4, NW 14	SEC 31			5 E	raye	3 of 3	
Depth in Feet	Description	USCS Class.	Blow Count	Recovery		Sample No.	PID (ppm)		Remarks	
32	SAME AS ABUVE	sw			32-					
33-					33-					
34		,			34-		∵	•		
35					35					
36-	SAME AS ABOVE	S₩			36-					
37-					37					
38-					38 -					
39-					39-					
40					40					
41-	SAME AS ABOVE	5W			41					
42	BOTTOM OF BORING				42-					
43	William C. Soleman				43-					
44-					44-					
45					45					
46					46	'				
47-					47		1			
48 -					48					

MONITORING WELL CONSTRUCTION RECORD



STATE OF NEBRASKA DEPARTMENT OF WATER RESOURCES WATER WELL REGISTRATION

		. <u>7-1-99</u> . <u>4022</u> (Sequence No. Reciept I	11872 No. 10203) کیج	egistration No		III A
1. Well Add City		Omaha Pr 444 South Omaha	ublic Power District 16th Street Mail		one Number NE Zip Code		636-2304	2247
Add	ling Firm_ tress	20450 Highwa	n Company y 275, P.O. Box 59 Str	7Contra	actor's Licens	68064	(402) 359-3 39266 + 059	
3. Perr	mit Numbe	er(s)						
G	Pround Water	r Source Heat Pump	Dewatering (over 90 c industrial in Supply (wan spang (48-83)	Jection Impa	tion Liv Water Supply (v		Ground Hee Monitoring Recovery	Aquiculture
A. C. E.	is this well a Replacement Original well	end ebandoned y a replacement well? nt well is I pump column size; water use of abando	Yes X N feet from abandoned w inches.	oll. D. Abando	qo test ilow benc	abandoned well: erated vell abandonment	0n	19
D. Loc E. If fo	cation of w	r block, lot and aubo rater use, if appli n, the land to be i	1/4 of Section 3/ North of South) section Melon, if applicable: cable (give legal de migated is licable: Monito	Omaha Pu Nebraski scriptions): N/A		ct	Otoe Count	у.
Is pur If You If No. A. Act B. Pum D. Pum	es, complet o, complet bual pumping up column d	d at this time? ete items A through the items A and D g rate, if applicable ismeter: ment installed:	gh F. with estimated info :inches.	X No Primation for the gallons pe , 19 Pump ins	r minute, C. Length o E. Brand/Ty	Measured f pump column:	Estmete	

	Construction otal well dep		ation. 40	feet D	. Static v						5 -		山人	j.
	40р		-, -	_1001. D	. Static V	voler ie	vel: 9	_ reet.	C. Pur			:	foet.	
D. W	/ell Construc	tion be	aan:	20-	Jan ,	1999	E MAN	^		stimated			Moasure	d
F. Bo	ore hole dian	neter:		8			E. Well	CONSIN	uction co	mpieted:		20-Jar	1999	
	lain casing:		ter —	2.1 ID			OD inches	T		3_1	-			
	Vall thicknes					Nolded	OD inches/Glued/Thre	TAbe	OT IMBROI	18I:	PVC	<u> </u>	·····	
	ength(s) and		nent(s)	denth fro	oonits	r voiueu.	30 feet.	e de avr	JOSE	 -				
	creen:	.		1 ID	2.4	_		T		feet	to_0		feet.	
	creen openir	gs (slo				e Nam	OD inches		oflex G		PVC			
Lo	ength(s) and	placen	nent(s)	depth fro	m 30 ft) teet	from	_	et to	·	feet.	
I. Gr	ravel pack in	terval(s) from	26 feet	to 40 fe			leet.	to				feet. 2040	
J. Gr	outed/Sealed	from	0	feet	to	-	feet	with		ement C		a 3rt &:	20-40	•
								******		(byp		•		
		from	4	feet	to	26	feet	with	a		-			
		_								entonite			• • • • • • • • • • • • • • • • • • • •	
K. Dr	illing method	l:		Hollow	Stem		L. Drilli	na fluir	t: N	(1) eno	rpe)			
M. W	eli developm	ent tec	euplnd	(total tim	e and me	thod):		Sum	a bail r		hours			_
N. Wi	ill chemicals,	, fortiliz	er or ar	ntifreeze t	be injecte	d or util	ized in the	vstem	?		_X		·····	
If y	yes, what wi	l be us	ed:					-				110		
Depti From 0 5 10 25 30	10 25 30 40	Fine Fine	soll bro Sand Sand	with grav		vel	Depth From	in Fee		C	ESCR	IPTIO	N	-
				(Add	litional si	neets	nay be sub	mitted						-
I am fa	amiliar with the	ne infor	mation	submitte	d on this	registra	ttion, and to	the be	est of my	knowleds	go it is t	rua.	e See e	•
Wal	ter well Cont	ractor's	Signal	III	_ <u>~ ~ ~ ~</u>			W/M	view	· ~ , ·	1454	. 4 F (SC)	75 (X)	U T
* (4)	OF THEIR COLL	・ロン・レント ち	RITUE								Signatui			

JULIAN QUADRANGLE NEBRASKA-MISSOURI-10WA G-101111 A-D 7.5 MINUTE SERIES (TOPOGRAPHIC) R 43 W. 3040 000 FEET (NEBR)] 1 370 000 FEET (IOWA) WASHINGTON (NEBR) POWEFPLA! Schemmel 530 000 EEEJ NWOIJ 21 28 27 VZÄTÄGLÖÄ FREMONT CO ATCHISON CO 35 D 10

JULIAN QUADRANGLE NEBRASKA-MISSOURI-IOWA G-101111A-D 7.5 MINUTE SERIES (TOPOGRAPH 47'30"-764 R 43 W 3040 000 FEET (NEBR.): 31 WASHINGTA 21 28 WASHINGTO:

34 FREMONT CO
ATCHISON CO

STATE OF NEBRASKA

G-101111 A-D





Mike Johanns Governor

June 10, 1999

IN REPLY REFER TO:

Omaha Public Power District 444 South 16th St. Mall Omaha, NE 68102-2247

LOCATION OF THE WELLS:

Otoe County

The following items were submitted to register the four wells but are being returned to you:

Water Well Registration Forms

• \$120.00 Fee (State Auditors require that checks be returned for all unregistered wells.)

Quadrangle map

The four wells have not been registered for the following reasons:

- · The Water Well Registration form is incomplete. Please complete items 6A and 6B.
- · Township 67 is not in Nebraska. The wells are either in Township 7 North or Township 8 North.
- · Please mark the location of the wells on the map.
- · The fee should be \$240.00. Please refer to the enclosed instruction sheet.

Please resubmit the enclosures along with the items requested by July 12, 1999. As required by law, we are obligated to inform you that failure to register the well is a Class IV misdemeanor. If not promptly resolved, matters involving unregistered wells may be sent to the county attorney for possible prosecution. If you have any questions, please call me.

Sincerely,

Stacey Evans

Accounting Clerk, Ground Water

(402) 471-4084

pjb

clrshare\ground water\returns

VOIDED RECEIPT NO.: 101750

301 Centennial Mail South, 4th Floor • P.O. Box 94676 • Lincoln, Nebraska 68509-4676 • Phone (402) 471-2363 • Telefax (402) 471-2900



June 29, 1999 99-EA-143

State of Nebraska Department of Water Resources P.O. Box 94676 Lincoln, NE 68509-4676

Please find enclosed Water Well Registration forms for four groundwater monitoring wells installed at our Nebraska City Station. Also enclosed are two checks, each for \$120 for the registration fees.

If you have any questions regarding the enclosed material, please contact John Buckley at (402)636-2318 or me directly at (402)636-2313.

Sincerely,

D. C. Hutchens

Manager - Environmental Affairs

Environmental & Governmental Affairs

JEB:dn

Encl.

WATER WELL REGISTRATION CORRECTION

FOR DEPARTMENT USE ONLY

Registration Number

G-101111A

Sequence Number

118729

Correction Date

September 13, 1999

Person Processing Correction

Wendy Evans

information regarding the water well referenced above has been changed in the Department's water well registration records. Please note the following changes and the reason changes were made:

Well Location (Item 6A) and Footage (Item 6B); According to the marking on the quadrangle map, the well is estimated to be located in Range 14E, Section 36 in the NE¼ of the NE¼, 475 feet from the North section line, and 10 feet from the East section line (475S 10W).

This correction has modified section(s) 6A and 6B of DWR Registration Form #145. If these changes are inaccurate, please contact the Department of Water Resources at P.O. Box 94676, Lincoln, NE, 68509-4676. Phone (402)471-3458.

I certify that this Correction Form has been forwarded to the owner of the referenced water well and is now a part of the registration records.

Department of Water Resources



DRILLING LOG

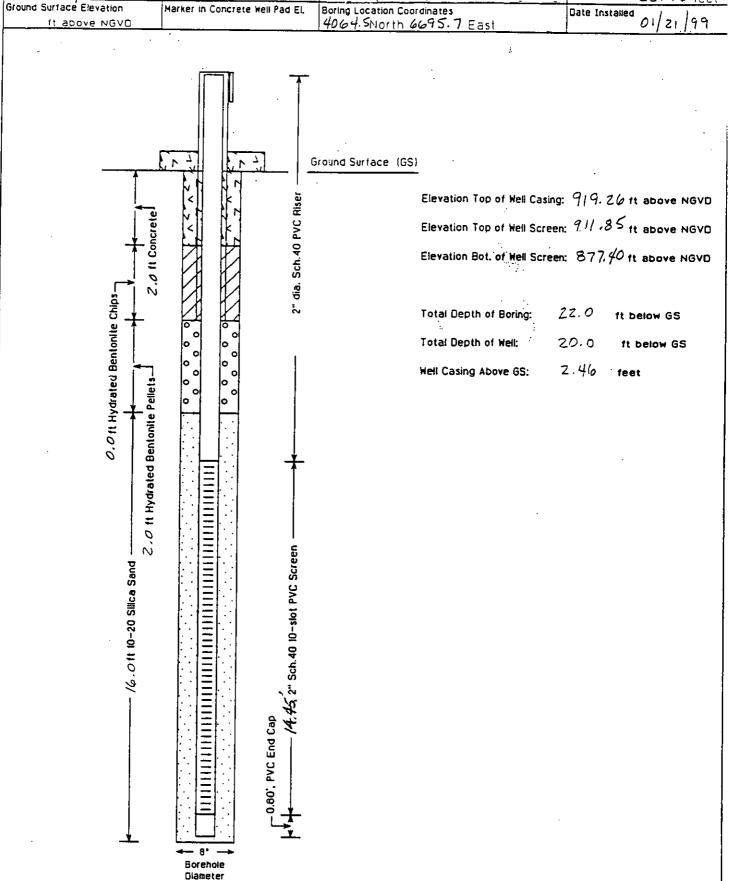
				LINC	LUG	7				
Project à Omaha	Name a Public Power District	– Nebraska C	ity Nebra	ck =			ject Num		Boring Number	MW-B
lBorina La	ocation Description of fly ash dispos		Boris	ng Location	n /w//4, SE		8 940		Page c	of Z
Ground S	ourface Élevation Top	of Well Casing Elevat	ion Borin	ng Location	n Coordinates			KIZE	Total Footage	
10.01	t above NGVD (surv.) 919 Drilling Method (s)	3 It above NGVD	(SULV.) (406 Overburden Foo	94.5Nor	th 6695. rock Footage	7 Eas	t Of Sampli	1 ,,		22.0 +1.
	6 1/4" ID HSA	8	22.0 fee		0 feet	NO.	None	25 N	o. Core Boxes None	Depth to Water
Orllling Co	. Layne, Inc. Omaha. Ne	<u>'. </u>			 	el I vie	Porter,	Rick K		See Remarks
	g Acker Soilmax 80 Truc				Type o		1 tinu			· · · · · · · · · · · · · · · · · · ·
Date Sta	rted 01/21/99	Date Completed	01/21/	79					3UCK LEY	,
Depth					<u> </u>	Depth	· -			
in Feet	Descrip	tion	USCS Class.	Blow Count	Recovery	in Feet	Sample No.	PID (ppm)	R	emarks
1-	SANDY SILT, loose, well gro sand and silt	ided, fine	1. ML			1		.		
3 - 4 - 5 - 1	SILTY SAND, grey, well gro density quart	aded, medium	SM			3 4 1 1 1 5		·		
6 7 8 9	SAME AS A	-Bo√E	SM			6 7 7 8 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				CUTTN 45 T 9.0 feet
10 - 11 - 12 - 13 - 14 - 14 - 1	SAND. dark to fine grains graded medium wet, mostly g with rock gra	ed well m density, juartz	SW			10 11 12 13 14 14 14 14 14 14 14 14 14 14 14 14 14			·	

Drilling Log, continued

Project Name Omaha Pu Boring Locatio	<u> Dlic Power District – Nebraska City</u> n Description	v. Nebra Borin	ska g Location		. 10	ject No. 8 940	37 Ot	Boring Number MW - 8
N of 1	n Description Fly ash disposal area	NE	1/4, NW	1/4 , SEC			15 E	2 of Z
in Feet	Oescription	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PIO (ppm)	Remarks
15-1	SAME AS ABOVE	SW			15			·
16-		,			16			
17 -					17			
18					18-		5. 24. 27.5	
19-					19	-	<i>:</i> ·	
20					20		; ;	
21-	SAME AS ABOVE	WZ			21-			
22	Permit of Parall				22			
23	BOTTOM OF BORING				23			
24				ļ	24			
25-					25			
26-					26-			
27-					27-			
28-					28			
29-					29-			
30-					30-			
31 -					31 -			

MONITORING WELL CONSTRUCTION RECORD

Project Name Omaha Public Power Di	strict – Nebraska City, Ni	ebraska .	Project Number 08 94037.01	Well Number NW-8
	iposal area	Location NE 14, NW 14, SEC 3.	I, TON, RISE	Total Depth (TOC) 22.46 feet
Ground Surface Elevation ft above NGVD	Marker in Concrete Well Pad El.	Boring Location Coordinates 4064. SNorth 6695.7		Date Installed 01/21/99
	· .			*





STATE OF NEBRASKA DEPARTMENT OF WATER RESOURCES WATER WELL REGISTRATION

	egistration Date 7-1-99 Sequence No. 18730 Registration No.G-101111B Nwner Code No. 40236 Reciept No.102038 Nema ha NRD
1.	Well Owner Omaha Public Power District Telephone Number (402) 636-2304 Address 444 South 16th Street Mail City Omaha State NE Zip Code 68102 + 2247
2.	Drilling Firm Layne-Western Company Telephone Number (402) 359-2042 Address 25450 Highway 275, P.O. Box 597 Contractor's License No. 39266 City Valley State NE Zip Code 68064 + 0597
3.	Permit Number(s)
4.	Purpose of well(indicate one): Dewatering (over 90 days) Domestic Geothermal Ground Heet Exchanger Ground Water Source Heat Pump Industrial Injection Irrigation Livestock X Monitoring Observation Public Water Supply (were specing (46-838)) Public Water Supply (wereut season) Recovery Aquacultum Other (Indicate use)
5.	Replacement and ebandoned well information. A. Is this well a replacement well?YesXNo B. Registration number of abandoned well: C. Replacement well is feet from abandoned well, D. Abandoned well last operated 19 E. Original well pump column size; inches. F. Completion of original well abandonment on 19 G. Location of water use of abandoned well:
E	Well location: NE 1/4 of the North and 3/ Township 8 North, Range 1/5 Cast West, Otos County. The west is 5/4.5 feet from the (North or South) section line and 1/9.50 feet from the (East or Well) section line. Street address or block, lot and subdivision, if applicable: Onsahs Public Power District Nebraska City Station Location of water use, if applicable (give legal descriptions): N/A If for irrigation, the land to be irrigated is N/A acres. Well reference letter(s), if applicable: Monitoring Well 2
B	Pump Information. If Yes, complete items A through F. If No, complete items A and D with estimated information for those wells in which pump will be installed. Actual pumping rate, if applicable: gallons per minute. Measured Estimated Pump column diameter: inches. C. Length of pump column: feet Pumping equipment installed: , 19 E. Brand/Type: Pump installed by: Contractor Owner Pump Installer License No.

8.	We	II Constru	action Ir	nform	ation.							(5-1	(V)	111	ヒ	
		Total we			20	feet B	. Static	water le	val·	9	font		(gniqmı				• .
			•								- 1001.		nnping :Estim			PI <u>:</u>	feet.
	D.	Well Cor	nstructi	on be	gan:	21-	Jan	,1999	E. V	Vell C	consta		comple			21. 15	Measured n 1999
		Bore hole				8		hes.		••••	•••••••	20(10) (ompro	100.		2100	11 1333
	G.	Plain car	sing: D)iemet	er —	2.1 ID			OD in	chac	Type	ما الم	ariat:		₽V	^	
		Wall thic	-			5 inches.		MahlaW	iGhadi	Thran	-TAba	What	enal.		7 V	<u>. </u>	
		Length(s	s) and p	lacen	nent(s)	depth fro	m O't	7701000 A	5 fee	TITE OF	NOU	ui o r.				_	
	H.	Screen:				1 ID	2.4		OD in		Time	-111-		e et	to		feet.
		Screen c	pening	s (slo		0.010		de Nam	- OD 11K	U1103.					PV	<u>. </u>	
		Length/s	n bna (a	lacen	nent/e)	depth fro	m 151		·	200			Gulde	-			feet.
	1.	Gravel na	ack inte	nval/e) from	4 feet to		eet.			feet	from		_	et to		_foot.
	J	Grouted/S	Sealed	form	0	feet	. —				feet.	10				da siza	20-40
						166(to		feet		with_		Ceme				
			F.	rom	2	fort.	4-							(type)		
			•			feet	to	4	feet		with_		Bento	nite	·		
	v	Dellion or				1.1-11									pe)		
	Λ. 14	Drilling m	ietnou;			Hollow	Stem A	nger	. L.				None				
	fvī.	VVOII GOV	elopme	nt tec	eupinn	(total tim	e and m	ethod):		·	Surg	e, bail	, pum	0-1	hour	S	
	Ħ.	VVIII CHON	nicers, i	rentiliz		ntifreeze l								63	<u>X</u>	No	
		If yes, wi	nat Will	De us	ed:												
_																	
	_				_												
9.	Geo	logic Mate	erials L	COLOR	1												
				aggio	,												
				-9800	•												
	D٤	pth in Fe		-9800		ESCRIP	MOIT	1	De	epth i	in Fee	et		D	ESC	RIPTK	ON
			eet To	9800		ESCRIP	MOIT	j	De Fron		in Fee	et 'o		D	ESC	RIPTK	ON
	De ror 0		eet	Tops	D soil		MOIT							D	ESC	RIPTK	ОИ
	De ror 0	m	eet To	Tops	D		MOIT							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	MOIT							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	TION							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	TION							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	MOIT							D	ESC	RIPTIO	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	PTION							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	PTION							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	PTION							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	PTION							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	 wn	PTION							D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	wn			From	m	T	· · · · · · · · · · · · · · · · · · ·		D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	wn	PTION	sheets	From	m	T	· · · · · · · · · · · · · · · · · · ·		D	ESC	RIPTK	ON
	De ror 0	n	eet To 5	Tops	D soil	wn		sheets	From	m	T	· · · · · · · · · · · · · · · · · · ·		D	ESC	RIPTK	DN
	De - ror 0 5 10	n	9et To 5 10 20	Tops	Soil bro Sand	(Add	ditional s		From	n 	T	o					DN
	De - ror 0 5 10	n	9et To 5 10 20	Tops	Soil bro Sand	(Add	ditional s		From	n 	T	o	ny know				ON
	De - ror 0 5 10	n	9et To 5 10 20	Tops	Soil bro Sand	wn	ditional s		From	n 	T	o	ny know				ON
	De - ror 0 5 10	n	9et To 5 10 20	Tops	Soil bro Sand	(Add	ditional s		From	n 	T	o	ny know				ON
	De - ror 0 5 10	n	9et To 5 10 20	Tops	Soil bro Sand	(Add	ditional s		From	n 	T	o	ny know				ON
	De - ror 0 5 10	n	9et To 5 10 20	Tops	Soil bro Sand	(Add	ditional s		From	n 	T	o	ny know				ON
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JULIAN QUADRANGLE NEBRASKA-MISSOURI-10WA G-101111 A-D 7.5 MINUTE SERIES (TOPOGRAPHIC) R 43 W. 3040 000 FEET (NEBR)] 1 370 000 FEET (IOWA) WASHINGTON (NEBR) POWEFPLA! Schemmel 530 000 EEEJ NWOIJ 21 28 27 VZÄTÄGLÖÄ FREMONT CO ATCHISON CO 35 D 10

JULIAN QUADRANGLE NEBRASKA-MISSOURI-IOWA G-101111A-D 7.5 MINUTE SERIES (TOPOGRAPH 47'30"-764 R 43 W 3040 000 FEET (NEBR.): 31 WASHINGTA 21 28 WASHINGTO:

34 FREMONT CO
ATCHISON CO

STATE OF NEBRASKA

G-101111 A-D





Mike Johanns Governor

June 10, 1999

IN REPLY REFER TO:

Omaha Public Power District 444 South 16th St. Mall Omaha, NE 68102-2247

LOCATION OF THE WELLS:

Otoe County

The following items were submitted to register the four wells but are being returned to you:

Water Well Registration Forms

• \$120.00 Fee (State Auditors require that checks be returned for all unregistered wells.)

Quadrangle map

The four wells have not been registered for the following reasons:

- · The Water Well Registration form is incomplete. Please complete items 6A and 6B.
- · Township 67 is not in Nebraska. The wells are either in Township 7 North or Township 8 North.
- · Please mark the location of the wells on the map.
- · The fee should be \$240.00. Please refer to the enclosed instruction sheet.

Please resubmit the enclosures along with the items requested by July 12, 1999. As required by law, we are obligated to inform you that failure to register the well is a Class IV misdemeanor. If not promptly resolved, matters involving unregistered wells may be sent to the county attorney for possible prosecution. If you have any questions, please call me.

Sincerely,

Stacey Evans

Accounting Clerk, Ground Water

(402) 471-4084

pjb

clrshare\ground water\returns

VOIDED RECEIPT NO.: 101750

301 Centennial Mail South, 4th Floor • P.O. Box 94676 • Lincoln, Nebraska 68509-4676 • Phone (402) 471-2363 • Telefax (402) 471-2900



June 29, 1999 99-EA-143

State of Nebraska Department of Water Resources P.O. Box 94676 Lincoln, NE 68509-4676

Please find enclosed Water Well Registration forms for four groundwater monitoring wells installed at our Nebraska City Station. Also enclosed are two checks, each for \$120 for the registration fees.

If you have any questions regarding the enclosed material, please contact John Buckley at (402)636-2318 or me directly at (402)636-2313.

Sincerely,

D. C. Hutchens

Manager - Environmental Affairs

Environmental & Governmental Affairs

JEB:dn

Encl.

WATER WELL REGISTRATION CORRECTION FOR DEPARTMENT USE ONLY

Registration Number

G-101111B

Sequence Number

118730

Correction Date

September 13, 1999

Person Processing Correction

Wendy Evans

information regarding the water well referenced above has been changed in the Department's water well registration records. Please note the following changes and the reason changes were made:

Well Location (Item 6A) and Footage (Item 6B): According to the marking on the quadrangle map, the well is estimated to be located in Range 14E, Section 36 in the NE¼ of the NE¼, 600 feet from the North section line, and 10 feet from the East section line (600S 10W).

Casing Length & Placement Depth (Item 8G): Based on the total well depth and the length and placement depth of the screen, the length and placement depth of the casing is estimated to be 0 feet to 15 feet,

This correction has modified section(s) 6A, 6B and 8G of DWR Registration Form #145. If these changes are inaccurate, please contact the Department of Water Resources at P.O. Box 94676, Lincoln, NE, 68509-4676, Phone (402)471-3458,

I certify that this Correction Form has been forwarded to the owner of the referenced water well and is now a part of the registration records.

Department of Water Resources



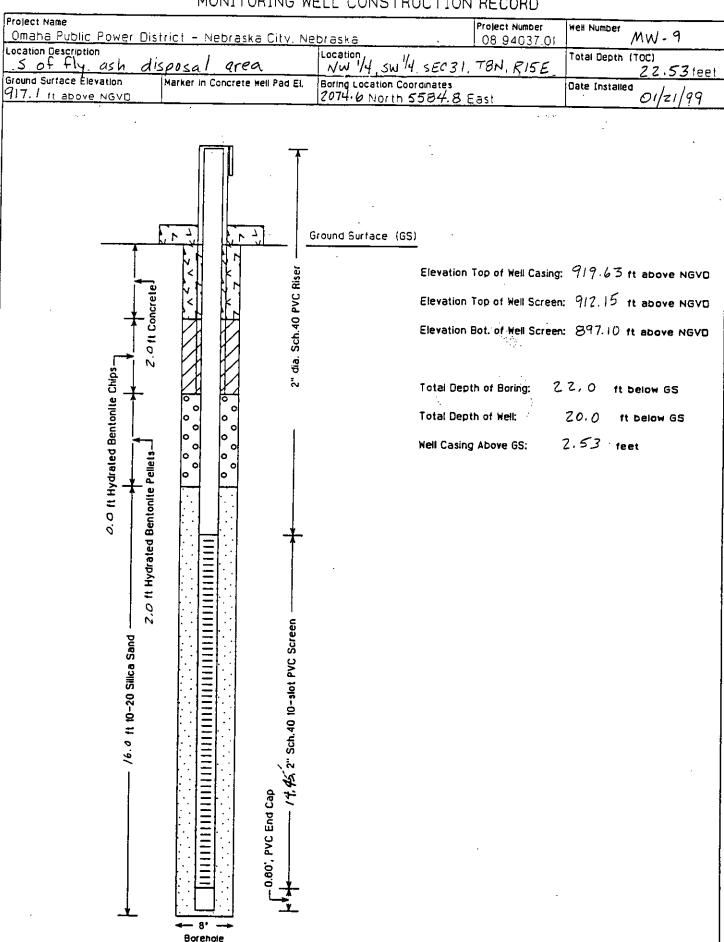
DRILLING LOG

Boring Location S of F Ground Surface 917.1 It above Drilling 6 1/4 Drilling Rig Ack Date Started (Depth in Feet	Fly ash disposal area e Elevation Top of Well Casing Elevation ve NGVD (surv.) 919. 6 It above NGVD ing Method (s) Borehole Size /4" ID HSA 8 yne. Inc. Omaha. Nebraska ker Soilmax 80 Truck Mounted	Borin Number 1 200 Overburden Foot 22.0 teet	ig Location /	Coordinates th 558 4. ock Footage Offeet Oriller Is Type of Sampler	8 Eas No. (t Of Sample None Porter,	37.01 15 E es Ne , Rick K	o. Core Boxes None	f Z
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Drilling Co. Lay Drilling Rig Ack Date Started (Depth in Feet	yne. Inc. Omana. Nebraska ker Soilmax 80 Truck Mounted O1/21/99 Date Completed Description SILTY SAND, brownish	O I / Z I USCS Class.	/99 Blow	Oritler (s Type of Sampler Field Ob	Co.	Porter. ntin	UOU	Keith	See Remarks
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Depth in Feet	Description Description SILTY SAND, brownish	USCS Class.	Blow	Fleid Ob	Depth				
Depth in Feet 2	Description 51 LT7 SAND, brownish	USCS Class.	Blow		Depth	3, 30,	774 201	00.1237	
2- 3- 3-	SILTY SAND, brownish	Class.		Recovery			1	T	
3 4 5		5 M		1.100000		Sample No.	PID (ppm)	R.	emarks
7 8 9 10 11 12 13 13 13 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	graded, quartz and rock grains with little clay. SAND, light brownish grey; medium to fine grained, well graded, loose, moist, mostly quartz and rock grains (salt and pepper appearance) SAME AS ABOVE	SW SW			3 4 5 6 7 8 9 10 11 12 13 13 13 14 17 17 17 17 17 17 17 17 17 17 17 17 17			AUGER C	eutanus 9.0 feet

Drilling Log, continued

Borina i ne:	Public Power District - Nebraska City.	Nebra	ska a Location		10	j ect No. 8 940:	37 กเป	Boring Number MW - 9
<u> </u>	fly ash disposal area	NV	J 1/4, SV	V 114 , SEC	31 T	BN R	15 E	Page ZofZ
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth	Sample No.	PID (ppm)	Remarks
15	SAME AS ABOVE	sw			15-			
16 - 17 - 1	SAND, light brownish grey, medium grained,	SW	,		16			
18 - 1	well graded , medium density, wet. with some fine grained quartz sand and				18-		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
20-	trace oval shaped rock pebbles.				19-		7	
21-					21-			
23-	BOTTOM OF BOKING				23			
24-					24-			·
26-					25			
27 -					27			
29					28-			
30-					30-			

MONITORING WELL CONSTRUCTION RECORD



Diameter



STATE OF NEBRASKA DEPARTMENT OF WATER RESOURCES WATER WELL REGISTRATION

R	egistration Dat wner Code N	e <u>7-1-99</u> • <u>40236</u>	Sequence No. Reclept N	11873 1020	Re 1	pristration No	7-10111 10 NR	
	Well Owner Address City		olic Power District 16th Street Mail	Teleph	none Number		636-2304	2247
2.	Addless	Lavne-Western 25450 Highway Valley	<u>275, P.O. Box 59</u>	7 Cont	ractor's Licens	e No. 68064	402) 359-20 39268 + 0597	42
3.	Permit Numb	er(s)						
4 .	Purpose of well Ground Wate Observation Other	r Source Heat Pump	Dowatering (over 90 o Industrial in Upply (win specing (48-83)	jection trrig	stion Live c Water Supply (w		Ground Heat I Ionitoring Recovery	Sichanger Aquaculture
5. i	A. Is this well C. Replaceme E. Original we	and ebandoned wall? a replacement well? ent well is [6 il pump column size; water use of sbandon	Yes X N pot from abundoned w inches,	ell. D. Aben	tration number of doned well last op lation of original w	erated	,1	
	Well location: The well is 2,1 Street address Location of v. If for irrigatio	1/4 of the 1 00 feet from the (0 or block, lot and subdiv water use, if applic n, the land to be in ce letter(s), if appli	om or south) section tsion, if applicable: able (give legal de tigated is	Omaha P	(2) fact from the	/East or/Outle or	Otoe County, ction line.	
A B.	If Yes, comple If No, comple	ed at this time? ete items A throug ete items A and D v ng rate, if applicable: diameter:	h F. with estimated info	X No primation for the gallons p	er minute.	hich pump will Measured f pump column:	Estimated	

Well Construction Information. A Total well depth: 20 feet. B. Static water level: 9 feet. C. Pumping water level: feet. Estimated or Measure D. Well Construction began: 21-Jan ,1999 E. Well Construction completed: 21-Jan 1999 F. Bore hole diameter: 8 inches. G. Plain casing: Diameter 2.1 ID 2.4 OD inches. Type of Material: PVC Wall thickness: 0.15 inches. Joints-Welded/Glued/Tipreaded/Other: Length(s) and placement(s) depth from 0' to 5 feet. OD inches. Type of Material: PVC Screen: 2.1 ID 2.4 OD inches. Type of Material: PVC H. Screen: 2.1 ID 5.4 OD inches. Type of Material: PVC Screen openings (slot size): 0.010" Trade Name: Monoffex Guides at 160t. Length(s) and placement(s) depth from 15 ft. to 20 feet from feet to feet. Grade size: 20-40 I. Gravel pack interval(s) from 4 feet to 20 feet. feet. to feet. Grade size: 20-40 J. Grouted/Sealed from 0 feet to 3 feet with Cement Grout (type) from 3 feet to 4 feet with Bentonite K. Drilling method: Hollow Stem Auger L. Drilling fluid: None M. Well development technique (total time and method): Surge, ball, pump -1 hours W. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? Yes X No If yes, what will be used: Secologic Materials Logged Depth in Feet DESCRIPTION Depth in Feet From To 5 Topsoil 5 10 Clay - brown 10 20 Fine Sand Depth in Feet DESCRIPTION From To 5 Topsoil 5 10 Clay - brown 10 20 Fine Sand	<u> </u>						iation.		struction		
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G. Plain casing: Diameter			 -	inches.	8						
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Water well Contractor's Signature Date Water Well Owner's Signature Date	y knowledge it is true.	Island	itration, i	this regis	nitted on	n subm	بر المام	Leve	.	n familie	

JULIAN QUADRANGLE NEBRASKA-MISSOURI-10WA G-101111 A-D 7.5 MINUTE SERIES (TOPOGRAPHIC) R 43 W. 3040 000 FEET (NEBR)] 1 370 000 FEET (IOWA) WASHINGTON (NEBR) POWEFPLA! Schemmel 530 000 EEEJ NWOIJ 21 28 27 VZÄTÄGLÖÄ FREMONT CO ATCHISON CO 35 D 10

JULIAN QUADRANGLE NEBRASKA-MISSOURI-IOWA G-101111A-D 7.5 MINUTE SERIES (TOPOGRAPH 47'30"-764 R 43 W 3040 000 FEET (NEBR.): 31 WASHINGTA 21 28 WASHINGTO:

34 FREMONT CO
ATCHISON CO



June 29, 1999 99-EA-143

State of Nebraska Department of Water Resources P.O. Box 94676 Lincoln, NE 68509-4676

Please find enclosed Water Well Registration forms for four groundwater monitoring wells installed at our Nebraska City Station. Also enclosed are two checks, each for \$120 for the registration fees.

If you have any questions regarding the enclosed material, please contact John Buckley at (402)636-2318 or me directly at (402)636-2313.

Sincerely,

D. C. Hutchens

Manager - Environmental Affairs

Environmental & Governmental Affairs

JEB:dn

Encl.

STATE OF NEBRASKA

G-101111 A-D





Mike Johanns Governor

June 10, 1999

IN REPLY REFER TO:

Omaha Public Power District 444 South 16th St. Mall Omaha, NE 68102-2247

LOCATION OF THE WELLS:

Otoe County

The following items were submitted to register the four wells but are being returned to you:

Water Well Registration Forms

• \$120.00 Fee (State Auditors require that checks be returned for all unregistered wells.)

Quadrangle map

The four wells have not been registered for the following reasons:

- · The Water Well Registration form is incomplete. Please complete items 6A and 6B.
- · Township 67 is not in Nebraska. The wells are either in Township 7 North or Township 8 North.
- · Please mark the location of the wells on the map.
- · The fee should be \$240.00. Please refer to the enclosed instruction sheet.

Please resubmit the enclosures along with the items requested by July 12, 1999. As required by law, we are obligated to inform you that failure to register the well is a Class IV misdemeanor. If not promptly resolved, matters involving unregistered wells may be sent to the county attorney for possible prosecution. If you have any questions, please call me.

Sincerely,

Stacey Evans

Accounting Clerk, Ground Water

(402) 471-4084

pjb

clrshare\ground water\returns

VOIDED RECEIPT NO.: 101750

301 Centennial Mail South, 4th Floor • P.O. Box 94676 • Lincoln, Nebraska 68509-4676 • Phone (402) 471-2363 • Telefax (402) 471-2900

WATER WELL REGISTRATION CORRECTION

FOR DEPARTMENT USE ONLY

Registration Number

G-101111C

Sequence Number

118731

Correction Date

September 13, 1999

Person Processing Correction

Wendy Evans

Information regarding the water well referenced above has been changed in the Department's water well registration records. Please note the following changes and the reason changes were made:

Well Location (Item 6A) and Footage (Item 6B): According to the marking on the quadrangle map, the well is estimated to be located in Range 14E, Section 36 in the NE¼ of the SE¼, 2600 feet from the South section line, and 1100 feet from the East section line (2600N 1100W).

Casing Length & Placement Depth (Item 8G): Based on the total well depth and the length and placement depth of the screen, the length and placement depth of the casing is estimated to be 0 feet to 15 feet.

This correction has modified section(s) <u>6A, 6B and 8G</u> of DWR Registration Form #145, if these changes are inaccurate, please contact the Department of Water Resources at P.O. Box 94676, Lincoln, NE, 68509-4676. Phone (402)471-3458,

I certify that this Correction Form has been forwarded to the owner of the referenced water well and is now a part of the registration records.

Mondy Lunes

Department of Water Resources



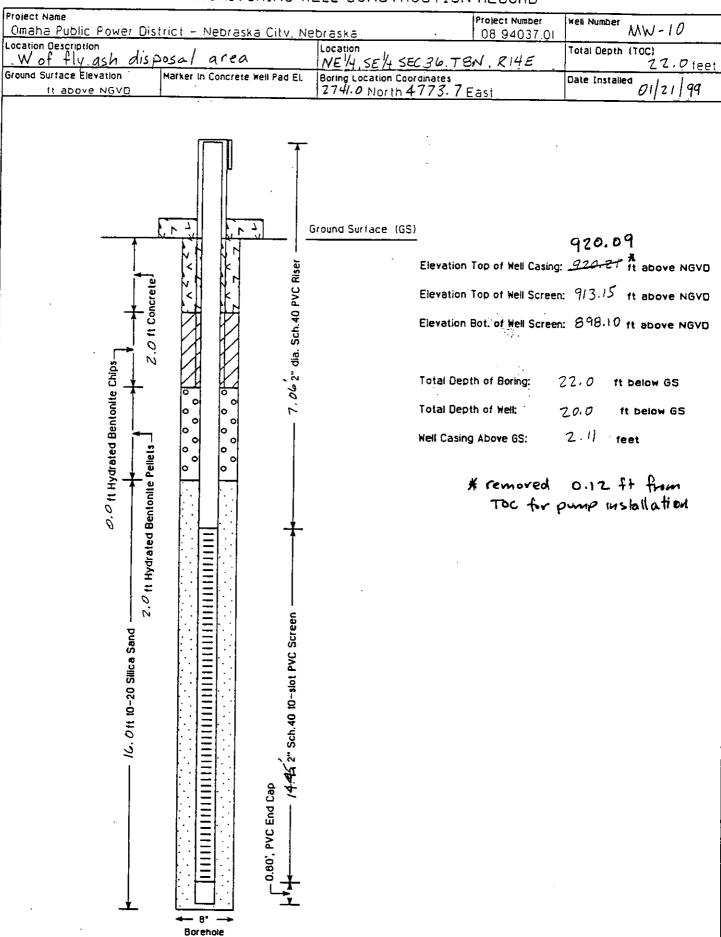
DRILLING LOG

Project N	······································			0 000	·						
Omana	Public Power District - Nebraska City	. Nebra	iska			940 8 940		Boring Number	MW-10		
Boring La	cation Description of fly ash disposal area	Bori	no Locat	ion SE1/4 SEC				Page / o	f Z		
Ground Sc	above NGVD (surv.) Top of Well Casing Elevation 920. Z ft above NGVD (su	Bori	ng Locat	ion Coordinates			<u> </u>	Total Footage	22.0		
		erburden Foo		orth 477 <i>3.</i> edrock Footage		t Of Sampi	es N	o. Core Boxes	Depth to Water		
	6 1/4" ID HSA 8 2	7.0 fee		0 feet		None	-	None	See Remarks		
Oriller (s) Lyle Porter, Rick Keith											
Drilling Rig Acker Soilmax 80 Truck Mounted Type of Sampler Continuous											
Oate Star	ted 01/21/99 Date Completed C	01/21	199					BUCKLE	Y		
Depth in					Depth				<u> </u>		
Feet	Description	USCS Class.	Blow		in Feet	Sample No.	(ppm)	Re	emarks		
3 4 5	SILTY CLAY, medium grey, Soft, moist high plasticity with trace medium sand	CH			2 3 4 5						
6-1	SICTY CLAY, medium grey, soft moist, high plasticity with trace medium same	СН			6-1						
8 9 <u>0</u>	CLAYEY SAND, dark grey, fine grained, loose, well graded very moist, high plasticity	SC			, 8 6 i			AUGER (CUTTINGS 3.5 fee+		
11-11-11-11-11-11-11-11-11-11-11-11-11-	silty sand, dark grey fine grained, well graded, loose, wet, with trace clay.	SM			10 11 12 13 14						

Drilling Log, continued

Project Nar Omaha	<u> Public Power District – Nebraska Citv</u>	. Nebra	ska		Pro	ject No. 8 940	37.01	Boring Number MW -10
W of	etion Description fly ash dis Dosal area	Borin	o Location	E 1/4 SEC				Page Zof Z
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks
15	SAME AS ABOVE	5M			15-			
16-	SAME AS ABOVE	SM	;		16-1			
17 -					17			
19-	SAND, medium grey, medium grained, well graded,	ŚW			19		A. W.	
20	medium density, wet, mostly quartz and rock grains, trace silt	ļ			20		÷	
21-	J				21-			
23-	BOTTOM OF BORING				23-			
24					24			
25 7					25-			
27-		į			26-			
28-					28-			
29-					29			
30-					30-			

MONITORING WELL CONSTRUCTION RECORD



Diameter



STATE OF NEBRASKA DEPARTMENT OF WATER RESOURCES

Registration Owner Cod		nce No. 18" Reciept No. 102(132 Re 038 039	gistration No. G	- IOIIID
1. Well Owner Address City	Omaha Public Pow 444 South 16th Stre Omaha		ephone Number	(402) 636 68102	-2304 2247
2. Drilling Fi Address_ City	25450 Highway 275, P.		elephone Number ontractor's License _Zip Code		2) 359-2042 39268 0597
3. Permit N	umber(s)				
Ground	of well(indicate one):	trial <u>Injection</u> inspection in space (46-635))	· · · · · · · ·	stock X Monit	ound Heet Exchanger oring coveryAquaculture
A. Is thic C. Repts E. Origin	nent and ebandoned well informs well a replacement well? second well is feet from a feet from size: tion of water use of abandoned well;	X No B. Rebandoned well, D. Al	egistration number of a bendoned well last ope ompletion of original we	rated	. 19 19
B. The well is C. Street add D. Location E. If for inti	tion: NE 1/4 of the Ne 1/4 of Sect 2000 feet from the (Northor Sodress or block, lot and subdivision, if an of water use, if applicable (ghigation, the land to be irrigated if erence letter(s), if applicable:	outh) section line and	leet from the (na Public Power District raska City Station): N/A	/ Ess West, Oto Ess or West) section t	e County, n line.
If Yes, co If No, co A. Actual po B. Pump colo	estalled at this time? complete items A through F. complete items A and D with esti umping rate, if applicable: fumn diameter: equipment installed:	gallor inches. , 19	s per minute. C. Length of E. Brand/Typ	Measured 🚞 pump column:	installed. Estimated — feet.

Wal Leng H. Scre	en:	placement	2.1 ID (a) depth fro 2.1 ID (b): 0.010"	Joints-We om 0' to 2.4		readed/Othe	r: feet Material:	to 0 PVC	lost.
Long I. Grav	jth(s) and	placement erval(s) fro	(s) depth from 4 feet to	om 15 ft. to	·				foot. foot. :e: 20-40
	ng method developm	ent techniq	ue (total tin	Stem Auge	od):	with illing fluid: Surge, i	Bentonite	rpe)	
N. Will d	hemicals,	fertilizer o	r antifreeze	ne injected c	a ntiirsed in tu	o system?		X No	
N. Will o	chemicals, s, what wil	be used:_	rantifreeze	De injected c	s utilized in thi	o system?		_X_ No	
N. Will of If yes Geologic Depth is	chemicals, s, what will Materials	be used:_	DESCRIF			th in Feet		_X_No	
Geologic Depth is	Materials To 5	Logged Topsoil Clay t	DESCRIF		Dep	th in Feet		-	
Geologic Depth is	Materials To 5	Logged Topsoil Clay t	DESCRIF	PTION	Dep	th in Feet To		-	

NEBRASKA DEPARTMENT OF NATURAL RESOURCES P.O. BOX 94676, LINCOLN, NEBRASKA 68509-4676 (402)471-2363

Instructions

County	Ofor		02202004 • 118732 · ARNF	
	T,	R,	Department of Natural Resources	TOBER 2003

NOTICE OF WATER WELL ABANDONMENT

if they did the actual decommissioning, or if the well no longer exists, and it decommissioned the well. Well Owner Name: Omaha Bublic Bower District	
1. Well Owner Name: Omaha Public Power District	FOR DEPARTMENT USE ONLY Filing Date Registration Number
Address: 444 S. 16th St. Mall, Attn: Jim Krajicek	12-11-2003 (5-101111D
City: Omaha State: NE Zip: 68102	Owner Code Sequence Number 118732
() (402) 636-2309	NEMAHA NRI
Home Phone Number Work Phone Number	4a. Actual Method for Decommissioning of Well. Use Sketch
Person Completing Decommissioning (if not owner) Name: Terracon	below (if appropriate), or illustrate method of decommissioning on a separate sheet.
Address: 2211 South 156th Circle	backEE granuid surface
City: Omaha State: NE Zip: 68130-2506	
(402) 330-2202 39325	
Business Phone Number Contractor's License Number	<u>]</u>
3a. Well Registration No. G-101111D	Entire screen and
3b. Purpose of Well Monitoring	casing grouted
3c. Date Well Last Operated Not Applicable	4h Tuna of Dook Sill II. 11 Y
3d. Date of Decommissioning 10/17/2003	4b. Type of Back Fill Used in Upper Plug (If excavated area is greater than three feet, indicate depth of excavation.)
	Grading was performed in the area of the well to lower the ground
3e. Location of Well: County Otoe Township 8N Range 14 E/W Section 36	surface elevation approximately six feet. The well was grouted before the grading occurred. The protector pipe and concrete pad were
SW '/4 of the NE '/4	removed during the grading, and later efforts to the locate the well to install a concrete cap below finished grade were unsuccessful.
3f. The well is 2,000 feet from the (North / South) section line	4c. Illustrate method to create upper plug.
and 2,000 feet from the (East / West) section line or	4d. Type, Amount, and Location of Materials Used in Lower Casing.
Latitude Degree Minutes Second	
Longitude Degree Minutes Second .	Bentonite Grout, 0.5 cubic feet, entire casing
3g. Street Address of Block, Lot and Subdivision (if applicable).	4e. Type and Thickness of Materials Used Between Confining
Nebraska City Station	Layers and at static water levels. Indictate plug depth(s) on left side of sketch.
3h. Location of Water Use: County NA	Bentonite Grout, entire casing
Township Range E W Section	4f. Well Casing Size Not Applicable FFR 2 0 200/
	4g. Well Diameter 2 inch DEPARTMENT OF MATURE SECOND CO.
I am familiar with the information submitted on this form and to the best of	TWAT OF THE COURCE
Daup M Sturen 12/8/03	Not Required
Water Well Contractor's Signature Date	Water Well Owner's Signature Date Date
	DEC 1 1 2003
	NATURAL RESOURCE



	OFWE		B #5	., ,								
	OF WEL									P	age 1 of 1	
CLIENT OPPD		Projec	t Mana	ager			Mik	e Reif				
SITE		PROJ	ECT		•		Wilk	11611			<u></u>	
Nebraska City, Nebraska				,	N			City S	tation			
1		WELL				SAN	MPLES		TESTS		STS	
DESCRIPTION		DETAIL		7			Ë					
BOREHOLE DIA.:	8.25 in:		لين	/MB(RY,	#	,%	\ <u>\</u> \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
DESCRIPTION BOREHOLE DIA.: WELL DIA.: CASING AND SCREEN: TOP OF CASING: GROUND SURFACE ELEV.:	2 in I slotted screen		ОЕРТН, 11.	SS	BER		OVE	NS/	띪) V (F)		
TOP OF CASING: GROUND SURFACE ELEV.:			DEP	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in	SPT - N BLOWS / ft	WATER CONTENT,	FIELD VAPOR TEST (PPM)*		
cornfield at surface						HS						
LEAN CLAY with organics dark brown			_									
LEAN TO FAT CLAY			_						;			
brown			_			00	- 2					
			_		1	SS	8					
5.5		目	5		2	SS	20		-			
6 SILTY VERY FINE TO FINE SAND, trad	ce		Ⅎ									
brown SILTY VERY FINE TO FINE SAND		目				нѕ						
brown							4.4					
					3	SS	11					
						HS						
			10			нѕ						
FOR TAIL 18 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							İ					
						ļ						
SILTY VERY FINE TO FINE SAND with	· · · · · · · · · · · · · · · · · · ·		-		4	SS	16					
mica	· •				7		,,					
light brown/light gray			15									
(Mn staining in stratified layers at 15')			'`			HS						
	:											
6314 3314	ľ	目										
			-	Ì	ļ					İ		
	,		\exists									
20			20									
BOTTOM OF BORING NOTE: Soil classifications were based	on								-7			
visual observations made by the field of	rew.											
									-	į		
The stratification lines represent the approximate boundary between soil and rock types: in-situ, the transition may be	y lines		(ED:)	ID inc	icates	a re	ading	of less t	han the	field d	etection limit	
WATER LEVEL OBSERVATIONS, ft	•	(LDF)	OF OU			_	RTED		equiva	lents (ppmi).		
								MPLET		<u> </u>	1-16-04 1-16-04	
Mr 🛣 🛣	Jerra	30		7	RIG			ME 55		LLER	D.Mather	
WL			-		GE					5027041A		



Mail To: DNR PO Box 94676 Lincoln, NE 68509-4676 Phone: (402) 471-2363

STATE OF NEBRASKA DEPARTMENT OF NATURAL RESOURCES

	FOR DEPARTMENT USE ONLY										
ļ	Registration Date Sequence No. Registration No. NRD										
1.	A. Well Owner's First Name Last Name Company Name Omaha Public Power District Correspondent Name Omaha Public Power District Address 444 South 16th Street Mall, 5E/EP5 City Omaha State NE Zip Code 68102 Telephone (402) 636-2309										
2.	a. Contractor's License No. 39325 Contractor's Name Terracon Contractor's E-mail Address lebazer@terracon.com b. Drilling Firm Name Terracon Address 2211 South 156th Circle City Omaha State NE Zip 68130 Telephone (402) 330-2202 Drilling Firm's E-mail Address lebazer@terracon.com										
3	Mell Location SW 1/4 of the NE 1/4 of Section 36 , Township 8 North, Range 14 East West, Otoe County, Natural Resources District Nemaha The well is 1,500 feet from the (North South) section line and 2,300 feet from the East West) section line or Latitude Degree Minute Second Longitude Degree Minute Second Street address and subdivision, if applicable Block Location of water use, if applicable (give legal descriptions) Not Applicable If for irrigation, the land to be irrigated is NA acres. Well reference letter(s), if applicable MW-11 HHSS PWSID										
4.	Permits Suface Water Permit Number Industrial Permit Number Geothermal Permit Number Transfer Out-Of-State Permit Number Conduct Permit Number Well Spacing Permit Number Other Permit Number HHSS NDEQ UG No.										
5.	Purpose of well (indicate one) Domestic Ground Heat Exchanger Livestock X Monitoring Public Water Supply (without spacing) Recovery Commercial/Industrial Dewatering (over 90 days) Irrigation Injection Public Water Supply (with spacing (46-638)) Recovery Other										
6.	Wells in a Series. a. Is this well a part of a series? Yes go to part b of this section X No, go to part 7 of this application b. If one or more of the wells in the series is currently registered, give the well registration number C. How many wells in the series are you registering at this time?										
7.	Replacement and abandoned well information. a. Is this well a replacement well? b. Registration number of abandoned well c. Replacement well is 85 feet from abandoned well. c. Original well pump column size inches. inches. f. Completion of original well abandonment on (m) 1 / (d) 16 / (y) 2004 c. Location of water use of abandoned well not applicable - monitoring well										

8.	Is pump If pump If pump In Pump In Pump In City Pump In C. Pumping d. Drop pip f. Pumping h. This wel Well Constru a. Total we c. Pumping	installed at this installed by we installed by pu staller's Licens staller's E-mail staller's Firm A Omaha staller's Firm E g rate be diameter g equipment ins il is designed a ction Informat	ell owner in Section imp installer, please e No. 3932 Address dmsvir lame Terracor Address 2211 S. G-mail Address 0.5 gallons 0.5 stalled (m) 2 ind constructed to put ion 20 feet NA feet.	fill out license 25 Pur ngen@terraco 1 156th Cir State NE lebazer@terra i per minute inches //d/ 27 //y) ump less than 5	Zip 68130 acon.com X Measured e. Length 2004 g. Pump F D gpm X b. Statt d. Wel	of drop pipe Brand QED Yes ic water level I construction	Telephone Estimat 15 Wizard (lov No 10 began (m	(402) ted fev flow sat	X Yes No 330-2202 et mpling pump) 1) 16 /(y) 04 5 Bottom 8.25
		and screen join	• • • • • • • • • • • • • • • • • • • •	Glued		d X		10p <u>8.2</u>	
10.	Well construc	ction (casing &	screen) - c, d, e, &	g measuremen	ts should be in inche	es to three dec	imal places		
		a	ь	С	d	e	f	g	h
From	Depth	ement in Feet	Casing or Screen	Inside Diameter	Outside Diameter	Wall Thickness	Screen Slot Size	Type of Material	Trade Name
110	0	5	Casing	1.970	2.350	0.190		PVC	Aurora
_	, 5	20	Screen	1.970	2.350	0.190	0.010	PVC	Aurora
Fro	(Placement D T			Grout or Gravel Pack Concrete Bentonite Gravel Pack		Co Bentoni	Description on the control of the co	
12	Geologic Ma Depth in Feet From To SEE	Descrip	otion DRING LOG	Additional she	Depth in Feet From To	o Des	cription		
13	DarpM	Jun Il Contractor's	Signature	on this registra 3/1/04 Date	if Con	of my knowle Owner's Signa stractor is unk	ture		Date

	LOG OF WEL				2					P	age 1 of 1
CL	ENT OPPD	Projec	t Mana	ager			Mika	e Reif			
SIT		PROJ	ECT				WIII				
	Nebraska City, Nebraska				N		ISKA	City S	tation	TES	TS
	Boring Location Coordinates: 2695.3 North 4727.5 East	WELL				321	,, ,,,,	<u> </u>		120	113
90	DESCRIPTION	DETAIL		BOL			ï.		%	S.	
일	BOREHOLE DIA.: 8.25 in WELL DIA.: 2 in		٦, ff.	SYM	8		VER	S/fi	ENT.	VAP PPM	
GRAPHIC LOG	CASING AND SCREEN: PVC (sch. 40); 0.01 slotted screen TOP OF CASING: 914.28 ft		DЕРТН, ft	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in	SPT - N BLOWS / ft.	WATER CONTENT, %	FIELD VAPOR TEST (PPM)*	
<u>ত</u> /////	GROUND SURFACE ELEV.: 911.62 ft comfield at surface	Ka Ka	a	<u>ס</u>	Z	HS	<u>α</u>	SIB	30		<u></u>
	LEAN CLAY (Topsoil)										
	brown		_								•
	3 908.5		_					4.4			
	VERY FINE TO FINE SILTY SAND light brown		_		1	SS	22	11			
			-								
			5 –			HS					
			_	•							
	8 903.5		_								
	brown, saturated at 8' to 13'		_		2	ss	14	4			
			_								
	₹		10			HS					
			_								
	. ₹		_								
	13 898.5 FINE SILTY SAND		_		3	SS	24	7	İ		
	gray/brown saturated		_		J		4 -7	,			
	Saturated		15			110					
			_			HS					
	118 893.5		_								
	19 892.5		_							<u> </u>	
5	BOTTOM OF BORING NOTE: Soil classifications were based on		_								
8	visual observations made by the field crew.	1									
2 N N N N N N N N N N N N N N N N N N N											
EKKKA											
	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										letection limit alents (ppmi).
9 W	ATER LEVEL OBSERVATIONS, ft			,		<u> </u>		ARTE			3-26-04
WI							G CO	MPLE	TED		3-26-04
		طل	U.		RIC			CME 7			
Į WI					LO	GGE	D_	KA	0 10	B# 0	5027041A



Mail To: DNR PO Box 94676 Lincoln, NE 68509-4676 Phone: (402) 471-2363

STATE OF NEBRASKA DEPARTMENT OF NATURAL RESOURCES

	FOR DEPARTMENT USE ONLY	
	Registration Date Sequence No Registration No.	
	Owner Code No. Receipt No. NRD)
1.	a. Well Owner's First Name Last Name	
	b. Company Name Omaha Public Power District	
	c. Correspondent Name Omaha Public Power District Attention Mr. Jim Krajicek Address 444 South 16th Street Mall, 5E/EP5	
	City Omaha State NE Zip Code 68102 Telephone (402) 636-2309	
2.	a. Contractor's License No. 39325 Contractor's Name Terracon	
	Contractor's E-mail Address lebazer@terracon.com	
	b. Drilling Firm Name Terracon Address 2211 South 156th Circle	
	City Omaha State NE Zip 68130 Telephone (402) 330-2202	
	Drilling Firm's E-mail Address lebazer@terracon.com	
3	3 a. Well Location SW 1/4 of the NE 1/4 of Section 36, Township 8 North, Range 14 (East) West, Otoe Cour	nty,
	b. Natural Resources District Nemaha c. The well is 2,000 feet from the (North South) section line and 1,950 feet from the (East West) section line	_
	(circle one) (circle one)	
	or Latitude Degree Minute Second Longitude Degree Minute Second	
	d. Street address and subdivision, if applicable	_
	Block Lot e. Location of water use, if applicable (give legal descriptions) Not Applicable	_
	f. If for irrigation, the land to be irrigated is NA acres.	_
_	g. Well reference letter(s), if applicable MW-12 HHSS PWSID	_
4.	Permits Suface Water Permit Number Management Area Permit Number Industrial Permit Number	
	Geothermal Permit Number Transfer Out-Of-State Permit Number	
	Municipal Permit Number Conduct Permit Number Well Spacing Permit Number Other Permit Number	
	HHSS NDEQ UG No.	
5.	Purpose of well (indicate one) Aquaculture Commercial/Industrial Dewatering (over 90 days))
	Domestic Ground Heat Exchanger Groundwater Source Heat Pump Irrigation Injection	•
	Livestock X Monitoring Observation Public Water Supply (with spacing (46-63) Public Water Supply (without spacing) Recovery Other	8))
	Wells in a Series.	_
6.	wells in a Series. a. Is this well a part of a series? X Yes go to part b of this section No. go to part 7 of this application	
	b. If one or more of the wells in the series is currently registered, give the well registration number G-126306	
	c. How many wells in the series are you registering at this time? One	_
7.	·	
	 a. Is this well a replacement well? b. Registration number of abandoned well If not registered, date abandoned well was constructed 	
	c. Replacement well is feet from abandoned well. d. Abandoned well last operated (m) /(d) /(y)	
	e. Original well pump column size inches. f. Completion of original well abandonment on g. Location of water use of abandoned well	
_	Terracon Project No.: 05027041 Terracon Job Name: OPPD Landfills - NE City	

8.	Pump Inform	ation								
		installed at this		Yes	No					
			ell owner in Section		X No Is pump ins	stalled by con-	tractor in Sec	tion 2?	X Yes No	
			mp installer, please				•			
	b. Pump In	staller's Licens	e No. 393		mp Installer's Name	David M. Sv	/ingen			
			Address dmsvi		on.com					
		istaller's Firm N	lame <u>Terraco</u> ddress 2211 S.							
	•	Omaha		State NE	Zip 68130		Telephone	(402)	330-2202	
		istaller's Firm E		lebazer@terr			relephone	(402)	000-2202	
	•	grate (_	s per minute			Estimat	ed		
		pe diameter	0.5	inches		of drop pipe	13	fe	et	
		g equipment ins		/(d) 31 /(y)	_			v flow sa	mpling pump)	
			nd constructed to p				No			
_	W-11 C	ection Informati				_				
9			ion 18 feet		h Stat	ic water level	12	feet		
		g water level	NA feet			Il construction			i) 26 /(y) 04	
	• •	nstruction com		/(d) 26 /(y)					5 Bottom 8.25	
		and screen joint		Glue		d X			<u> </u>	
10.	Well constru	ction (casing &	screen) - c, d, e, &	g measuremen	nts should be in inch	es to three dec	imal places			
		a	ь	С	d	e	f	g	h	
		cement h in Feet	Casing or	Inside	Outside	Wall	Screen Slot	Type of	T 1 N	
	Бери	Ĭ.	Screen	Diameter	Diameter	Thickness	Size	Material	Trade Name	
Fron	<u>n</u>	То				ļ-				
	0	8	Casing	1.970	2.350	0.190		PVC	Aurora	
							1	-		
	88	18	Screen	1.970	2.350	0.190	0.010	PVC	Aurora	
						l				
				L		<u> </u>			<u>!</u>	
11	Grout and G	ravel Pack		 		<u>-</u> . '				
	Grout tara C	Placement D	enth in Feet		Grout or				 	
Fro	om	Т			Gravel Pack		Material	Description	מס	
		0	1		Concrete		Co	ncrete		
		1	7		Bentonite			ite holeplug		
_		7	19		Gravel Pack		#20-	40 sand		
		<u></u>								
12.	Geologic Ma	aterials Logged			_					
	Depth in Feet				Depth in Feet	t				
	From To	Descrip			From T	o De	scription			
	SEE	ATTACHED BO	DRING LOG							
										
					_					
				(Additional she	eets may be submitte	d)				
-										
1.3	I am fami	liar with the inf	formation submitted	l on this registr	ation, and to the best	of my knowle	edge it is true) .		
	N. Z	IM VI.		and and	/					
	: Down	II Comment	Sivation	- 04/07/	<u> </u>	Owner's Signa	hture.		Date	
	Water We	Il Contractor's	Signature	· Date		tractor is unk		eased	Date	
T	erracon Proiect	No.: 05027041	Terracon Job N	lame: OPPD Lar		rell ID: MW-12				

		WELL LOG NO. MW-	-13	Р	age 1 of 1			
Р	ROJECT: OPPD Nebraska City Station	CLIENT: Omah	a Public Power Distr	ict				
S	TE: 7264 L RD Nebraska City, Nebraska							
GRAPHIC LOG	LOCATION - Latitude: 40.6286073° Longitude: -95.7921889° DEPTH MATERIAL DESCRIP		INSTALLATION DETAILS Top Casing Elev: 917.69 Well Completion: Aboveground	WATER LEVEL OBSERVATIONS SAMPLE TYPE	RECOVERY (In.) SPT N-VALUE			
	LEAN CLAY (CL), with organics, brown, Grass a		-Concrete → Seal hydrated → chip bentonite		10 2-2-2-3 N=4			
	LEAN CLAY (CL), light brown	3.55	-Riser Pipe 2" diameter schedule 40		12 3-4-4-4 N=8			
16	5.0 SILTY CLAY WITH SAND (CL-ML), fine	910.5	5		18 2-2-2-2 N=4			
V2012.GDT 2/4/16	7.0 SILTY SAND (SM), fine	908.5	Filter Material silica sand. 16/30 grade		20 1-2-2-5 N=4			
SMART LOG 05157663 LOGS.GPJ TERRACON2012.GDT			-Screen 2"		18 2-5-7-5 N=12			
5157663 LOGS.			diameter schedule 40 PVC slotted screen, 0.010" slot		20 2-1-2-2 N=3			
10G 0	13.0	902.5						
THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMAR	The stratification lines represent the approximate transition types; in-situ these transitions may be gradual or may occur		Hammer Type: Automatic					
SEPAI Adva	incement Method:	at amoretic depute than offewn.	Notes:					
Abai NOT VALID IF	ollow Stem Auger, 8.25-inch diameter borehole adonment Method: A - Well installed	See Appendices for explanation of symbols and abbreviations.	Soil descriptions are based on field crew. Actual conditions m		tions made by the			
S C C C C C C C C C C C C C C C C C C C	WATER LEVEL OBSERVATIONS	75	Well Started: 1/26/2016	Well Comple	eted: 1/26/2016			
BORIN T	5 ft while sampling 1 ft bgs on 2/4/16	llerracon	Drill Rig: 770	Driller: JM				
ᇎ	-	15080 A Circle Omaha, Nebraska	Project No.: 05157663	Exhibit:	1			



Well Reg	gistration or	Area I	Fee Paid: DNR Cash Fund:	·	e: <u>\$30.00</u> <u>21.50</u> D: <u>53636</u>		
Source:	Nebraska On Line	Import Status:	Accepted	Use:	Monitoring (Ground Water Quality)	Owner ID:	<u>49927</u>
Import ID:	14551191495806	Status:	Active Registered Well	Decommission Date:	_	Registration Number:	<u>G-178697</u>
Well ID:	<u>241806</u>	NRD:	<u>Nemaha</u>			Registration Date:	2/19/2016
Last Change User:	hmcpherson	Call Up Code:	_	Call Up Date:	_	Last Change Date:	2/19/2016

Owner:

Display 49927 Owner 1 2/19/2016 Omaha Public Power District, Contractor: Certificate ID FirstName LastName 39570 Michael B Reif Orilling Firm: EmployerID Employer
39570 Michael B Reif
rilling Firm: EmployerID Employer
159781 Terracon Consultants, Inc.

. Natural Resource District: <u>Nemaha</u>

Latitude Longitude

Well GPS Coordinates: <u>40° 37' 42.99"</u> <u>-095° 47' 31.88"</u>

Lat/Long DD <u>40.62861</u> <u>-95.79219</u>

C. The well is: __ feet from the __ Section line and __ feet from the __ section line.

D. Street address or block, lot and subdivision: Addr/Sub Div 7264 L Road Block No ___ Lot ___

E. Location of water use, if applicable (give legal description): $\,$ NWSE S25 T8 R14E $\,$

G. Well reference letter(s) if applicable: $\underline{\text{MW-}13}$

Well In A Series												
Well Part of a Se	eries with Site Plan: Yes											
Series # of Well	s Reg Total # Wells Acre	s Acres Ce	rt NRD App	r StartDate	EndDate Comment Series Reg	Num (External Source) Code	Description	Wells in	the Ser	ies	
244881 1	2	No	No	1/26/2016	G-126717		DEQ	Part of a DEQ site plan for spill or undergroun storage	158167 (241806 (G- 126717	StartDate 2/19/2016 1/26/2016	EndDate
Permits												
			Aprvd I	Date(s)		Aprvd Date(s)						
Area Permit GeoPermit MWF WSP HHSS HHSS PWS ID NDEQ		<u>204421</u>	_ _ _		SWater App Code Industrial Transfer Swater Conduct Code Other ITN							
5. Purpose of We	ell <u>Monitoring (Ground W</u>	/ater Quali	ty)									
	Other Use Notes	_										
7. Replacement	well information.				Well Considered a replaceme RegCD)	ent by NRD(WellID,						
A. Is this well a	Replacement well? <u>No</u> R	epl No	NRD Appro	oval Date	_ Well Replacement Reg CD							
B. Registration r	number of abandoned we	ell:	If not regi	stered, date	abandoned well was construc	ted						
	ell last operated		D. Replace	ement well is	s feet from abandoned wel	l.						
E. Original well p	oump column size: in	iches.										
[] I hereby the replacer [] I hereby	ment water well. certify that the original days after such construct	al water wal	ell will be	modified a	ioned within 180 days after nd equipped to pump 50 gai r well.							

GPS Required

[] Observation [] Nonconsumptive or de minimus use approved by the applicable natural resources district [] Decommission/Modification certification form is submitted by landowner (Must be submitted before registering well)								
G. Location of water use of original well:								
Decommission Information Decommission Date: By								
3. Pump Information.								
A. Is Pump installed at this time? No	Pump present but Well Inactive: No							
Free Flowing Well: No	Well active, no pump installed: <u>Yes</u>							
B. License No.								
C. Pumping Rate gallons per minute.	D. Pumping water level feet.							
E. Drop pipe diameter inches.	F. Length of pipe in feet.							
G. Pump equipment installed:	H. Pump Brand/Type							
I. Will this well be used to pump 50 gpm or less? \underline{Ye}	<u>s</u>							
9. Well Construction Information								
A. Total well depth: 13 feet.	B. Static water level <u>1</u> feet.							
C. Well Construction began: 1/26/2016	D. Well Construction Completed: 1/26/2016							
E. Bore hole diameter in inches. Top 8.25 Bottom	<u>8.25</u>							
F. Casing and Screen Joints are: <u>Threaded</u>	Other Joints description:							
H. Total Estimate Capacity of Well gallons per m	inute. I. Pumping water level at capacity: feet.							

10. Well Construction (Casing & Screen) - c, d, e & f measurements should be in inches to three decimal places

Record Count = 2

WellID FromDepth	* ToDepth*	Case/Screen	InsideDiam	OutsideDiam	CaseThickness	ScrnSlotSize	Material	ScreenTname
241806 0	3	casing	2.07	2.38	0.154		PVC	EMI
241806 3	13	screen	2.07	2.38	0.154	0.01	PVC	EMI

^{*} are in Feet, all else is in inches

11. Grout and Gravel Pack

Record Count = 3

WellID	FromDepth	ToDepth	Grout/Gravel	Material Description ¹	Quantity Gravel ²	Volume &Type Grout ³
241806	0	0.5	grout	Concrete and well vault		Concrete and well vault
241806	0.5	2	grout	non-slurry bentonite		1.5 bags
241806	2	13	gravel	#16-30 Silica sand	5 bags	

^{*} are in Feet, all else is in inches

12. Well Geologic Materials Logged

	. 000.09.0					
WellID	FromDepth*	ToDepth*	Туре	Hardness	Color	Other/Drilling Action
241806	0	5	Other		Brown	Lean Clay
241806	5	7	Other		Brown	Sily Clay w/sand
241806	7	13	Other	<u> </u>	Brown	Silty Sand

^{*} are in Feet.

 $^{^{1}}$ Description of gravel pack, i.e. engineered gravel pack, or gravel pit description (1/4 down) or brand name (best sand) natural formation, drilling cuttings, soil backfill

 $^{^{2}}$ Quantity #cubic yards, #Tons, #Sacks - (for drilling cuttings and soil backfill estimate quantity) Calculation assistance available on web

³Volume & Type: #gallons of a slurry, #Barrels of a slurry, #sacks used in the slurry, #Bags of non-slurry bentonite (chip-pellet-granular)

				- 2/=	SC NO.			LOG	OF	BO	RING NO. MW-4	Page 1 of 1
BOREHOLE LOCATION ELEVATION DATUM									- 7- 1 	DRILLER LOGGER		
Sec	See Boring Location Plan USGS						SGS)	3/ #/ AF		Abel Monnarez Bruce Birge	
	ING S1		ם			BORI	4G COI	MPLETE	D		DRILL RIG DRILLING METHOD	
9	-9-1	94-		la		9-	10-0	4			CM E-75 4.25" HSA	
l			E.			, P					SURFACE TYPE TOTAL DEPTH (FT.)	,
			PENETRATION RESISTANCE - BLOWS/FT	15	 25		_				Weedy, Grassy Shoulder of Gisvel Road	
			9	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSP	MOSSTURE CONTENT	DRY DENSITY - PCF				WATER LEVEL OBSERVATIONS (FT.)	
	딾	.ii	Z.	ZIE Z	aŠ	3	ا بر		2		▼ 8.0 ATD	
Š	E	χ̈́	βŞ	M	Z	1 2			3	;:	and at any contrast to the con	g
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	NA.	ĦĔ	累			Ħ	GRAPHIC LOG	DEPTH, FT.	₹ 6.1 @ 1 Day AD	9165
3	N	8	Z	ğ	N N	SS	5-	OTHER	3	EFI		
ಭ	හි	2	ER	XE	50	Z	ā		6	ā	DESCRIPTION Surface Elevation:	916.5
1	28	16		3.0							Very Stiff, Moist, Light Brown to Grayish Brown, Low Plastic Silty Clay to Silt (CL) (Roadbed Fill)	<i>(</i> 2)
2	2S	5		2,1								
				3.0					1] :	5.0	911.5 (A)=
3	28	18		2.6 4.5÷						5-	Hard, Slightly Moist, Dark Brownish	
	-										Gray, Low Plastic Silty Clay (CL)	910.5
4	28	24		0.5				*		1 :	(Buried Soil) Firm to Soft, Well Completed Using 3'	
										-	Stick Up and Concrete Padery Moist.	
							- 1				Gravish Brown, Silt with Very Fine	907.5
										[:	Sand to Silty Very Fine Sand (ML/SM) (Alluvium)	
\neg			\vdash							10-	Becomes Wet	
5	28	24		ĺ						-	Loose, Wet, Grayish Brown, Poorly	
		į									Graded Sand with Some Silt, Very Fine-Grained (SP/SP-SM) (Alluvium)	
										-	Ture-Oranies (at tar -and (whistian)	
										-	14.0	902.5
									2 8. 224 48	1 1	Bottom of Boring @ 14' in Sandy	No. Physics are 18 at 18
		i									Alluvium	
9000											Well Completed Using 3' Stick Up and Concrete Pad	
										[
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1		İ	ĺ									
-												
N. C. Williams	j						ĺ					

	The st	ralific	ation li	nes reț	neseni	the an	proxit	nate bon	indary l	ines bet	ween soil and rock types. In situ the transition may be gradual.	
											PROJECT NAME OPPD Flyash Monofill	7/0
	Y	ŀ	L	E I	N F	E	L D	E R			LOCATION Nebraska City, Nebraska	
	PROJECT NUMBER											
9312	312 G Court, Omaha, Nebraska 68127 (402) 331-2260 47962											



Mail to DNR PO Box 94676 Lincoln, NE 68509-4676

Phone (402)471-2363

10262004-162827-WWRF Department of Natural Resources (3) October 2001 DNR Form 1/15

STATE OF NEBRASKA DEPARTMENT OF NATURAL RESOURCES

	Registration Date 10-26-2004 Sequence No. 162827 Registration No. 9-	130442D NRD
1	a. Well Owner's First Name	ek
2	a. Contractor's License No 19245 Contractor's Name Kleinfelder Contractor's Email Address locoabel@cox.net b. Drilling Firm Name Kleinfelder Address 9312 G Court City Omaha State NE Zip 68127 Telephone Drilling Firm's Email Address bhavens@kleinfelder.com	
3.	a. Well locationSW 1/4 of the SE 1/4 of Section _25_, Township _8 North, Range14_ East/West,	ast/West) section line (circle one)
4.	Permits Management Area Permit Number Geothermal Permit Number Municipal Permit Number Well Spacing Permit Number Other Permit Number Other Permit Number Other Permit Number	,
5.	Purpose of well (indicate one)AquacultureCommercial/IndustrialDewatering (DomesticGround Heat ExchangerGroundwater Source Heat PumpIrrigationLivestockX_MonitoringObservationPublic Water Supply (with spacing (46Public Water Supply (without spacing)RecoveryOther(indicate use)	nInjection
6.	Wells in a Series. a. Is this well a part of a series?yes _ Yes go to part b of this sectionNo go to part 7 of this application b. If one or more of the wells in the series is currently registered, give the well registration numberNA c. How many wells in the series are you registering at this time?6	
7.	Replacement and abandoned well information. a. Is this well a replacement well?Yes X No b. Registration number of abandoned well If not registered, date abandoned well was constructed. Replacement well is feet from abandoned well. d. Abandoned well last operated (m) e. Original well pump column size inches. f. Completion of original well abandonment g. Location of water use of abandoned well	/ _(d) / _(y)

\mathbb{G}_{+}	130	4	4	2	$\hat{\mathbb{C}}$
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2							<u> </u>	ロコマン		
-	Information.						. "			
a. Is	pump installed	at this time	YesX	Νο				•		
Is pum	ip installed by w	ell owner in sec	tion 1?Y	čes _{i "No}	ls pump installe	ed by contractor i	n section 2?	YesNo		
n pum	ip mstaned by pr	ump installer, pl	ease fill out lic	ense number.	below					
b. Pu	ımp İnstaller's I	License No.		ump Installer	's Name					
b. Pump Installer's License No Pump Installer's Name Pump Installer's Email Address Pump Installer's Firm Name										
CI	.ш		State	Zip		Te	lephone			
Pu	ımp Installer's F	`irm Email Addı	css.							
c. Pu	mping rate	gallo	ns per minute ,	M	feasured	Estimated				
d. Dr	op pipe diamete	er	inches		e. Length of a	lrop pipe	fee	;t		
f. Pu	mping equipme:	nt installed (m)_	/ _{(d/(y)}			d				
h. Th	is well will be u	ised to pump les	s than 50 gpm	Yes						
9. Well Cor	nstruction Infor	mation.						·		
a. Tota	al well depth	14 ,	feet.		b. Static water	er level~ 6	1 feet			
c. Pun	nping water leve	i NA	feet		d. Well Cons	struction began _{(m}	onth) /days	/ _{(vene} 2004		
c. Wel	ll Construction o	completed (month)	/ _(day)	/ _{(yent.} 2004_	f. Bore hole	diameter in inche	s Top 6.5	Bottom 6.5		
g. Cas	ing and Screen .	Joints are Weld	ed Gli	ied	_ Threaded	X Oth	cr			
IO Wall Ca	meterioline (Ci	0 11.	T 13							
	a	ng & Screen)- c		isurements she	1	s to three decima		· · · · · · · · · · · · · · · · · · ·		
<u>Y</u>			C	d	e	f	g	h		
	ement	Casing or	Inside	Outside	Wall	Type of	Screen Slot	Trade Name		
	Depth in Feet		Diameter	Diameter	Thickness	Material	Size			
From	То			1						
0	4	Casing	2.047	2.375	0.328	PVC	N/A	Johnson Screens		
4	14	Screen	2.000	2.560	0.560	PVC	0.010	Johnson Screens		
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11 Grout on	d Gravel Pack				• • •			10.0		
		<u></u>		· -						
	cement Depth in	Feet	Gre	out or	Material Description					
From To			Grav	el Pack						
0 2		2	Benton	ite	3/8" Bentonite Holeplug					
2	2 14		Grave	l Pack	12-20 Sand					
										
						<u> </u>				
- 12. Geo	logic Materials	T 3						U-10-		
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Water Well Contractor's Signature

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<u>G130442 D</u>

								LOC) OF	во	RING NO. I	MW-4		Page I	of 1
BO	BOREHOLE LOCATION ELEVATION DATUM						UATUN	1		DRILLER		LOGGER	<u></u>		
See Boring Location Plan					I	JSGS	3			Abel Monn:	arez	Bruce Birge			
BORING STARTED				BORING COMPLETED					DRILL RIG DRILLING METHOD 4.25" HSA			<u>-</u>	_		
			7		Τ΄ ΄	%				ŀ	SURFACE TYPE	··	TOTAL DEPTH (FT)		
			/SA	· TSF	اا	1 -					Weedy, Gra	assy Shoulder	of Gardvel Road		
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S.A.I	SAB	RECOVERY, in.	PENETRATION RESISTANCE • BLOWS/PT	POCKET PENETROMETER	UNCONFINED COMPRESSION - TSF	MOI	DRY	OTHER	GRAPHIC LOG	DEPTH, FT.	DESCRIPTION	n S	urface Elevation:	916.5	WELL LOG
I	2S	16	-	3.0						- - -	Very Stift Brown		Brown to Grayish		
2	2S	5		2.1						_				:	
	···						-				6.0				
3	28	18		2.6 4.5+					+1	5 -	5.0 Hard, Slig	htly Moist, Da	rk Brownish	911.5 910.5	Ħ
4	28	24		0.5				· <u></u>			(Buried	oft. Well Comp	leted Using 3'	910.3	
1							\dashv				Stick U	lp and Concrete i Brown, Silt w	Padery Moist,		H
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5	28	24					Ì			-	Loose, Wo	et, Grayish Brov Sand with Som	wn, Poorly	ļ:	
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The stratification lines represent the approximate boundary lines between											PROJECT NAME				
											LOCATION O	PPD Flyash M	onofill		
KLEINFELDER							D	E R			Nebraska City, Nebraska				
112 C C											PROJECT NUMBER				
312 G Court, Omaha, Nebrasku 68127 (402) 331-2260								260			_147	962			. }

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Nebraska City NE US

Notes:	
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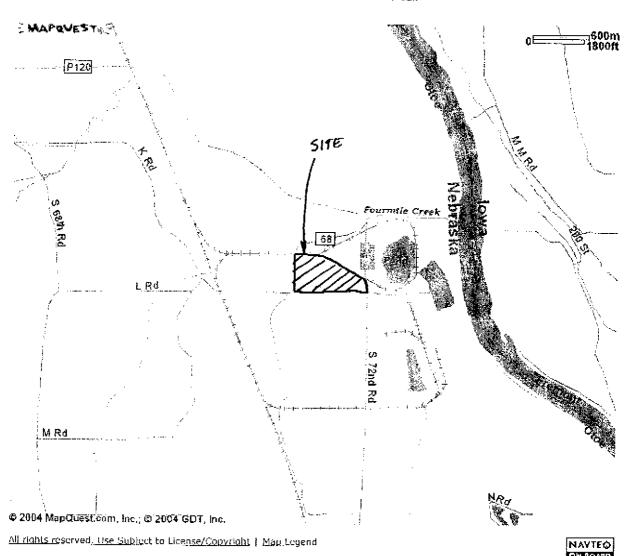
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SITE LOCATION PLAN

130442 7/15/04 560-1 WELL LOCATION PLAY CPPD Mebraska City Station Unit 2 .051 Soil Borings HX ,007 478

