

CCR Groundwater Monitoring System



Omaha Public Power District

North Omaha Station North Omaha Ash Landfill

Omaha, Nebraska

June 2016



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OPPD North Omaha Station North Omaha Ash Landfill CCR Groundwater Monitoring System

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Appendix A Monitoring Well Documentation

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Professional Engineer Certification

"I hereby certify that the groundwater monitoring system described in this report for the CCR landfill known as the North Omaha Ash Landfill at the North Omaha 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	Sonal Civil
Signature:	Jubl	
Date:	6/23/2014	SYROCKI E-11855
License #:	E-11855	The second state
My license renewa	al date is December 31, 2016.	OF NEBRISS

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) North Omaha Generating Station.

The purpose of this report is to assess the North Omaha Ash Landfill and the existing groundwater monitoring system for compliance with the. Hydrogeologic conditions of the North Omaha Ash Landfill and recommended locations and depths of new groundwater monitoring wells, including recommended well design, required for compliance with the CCR rule, are provided.

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 North Omaha Ash Landfill 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 five-unit, 663-megawatt (MW) fossil fuel-fired generating plant at the North Omaha Station (Station) in Omaha, Nebraska. Recently Units 1-3 were retired; Units 4 and 5 were retrofitted with air pollution control equipment and are still operating. The Station is located east of Pershing Drive and Craig Street, approximately 3.5 miles northwest of Eppley Airfield, along the west bank of the Missouri River at river mile 625.2. The first generating unit was placed in service in July 1954, and the fifth unit was placed in operation in 1968. Beneficial use and disposal of the fossil fuel combustion ash has occurred on the Station site since the 1950s.

The North Omaha Ash Landfill is an unlined CCR landfill of approximately 18 acres that has historically received CCR for disposal and is permitted with the State of Nebraska. The North Omaha Ash Landfill is an active, existing CCR landfill as defined by the CCR rule.

According to the Locational Criteria Report and Hydrogeologic Investigations Report (SCS Engineers, 1995) completed for the NDEQ Title 132 permit, the majority of the Station site is underlain by approximately 15 feet of fill consisting of low-to-medium plasticity clayey soils and a mixture of fly ash and bottom ash beneficially used as fill.

3.0 Site Hydrogeology Summary

Site geology and hydrogeology are described in a previous report entitled 'Hydrogeologic Investigations Report North Omaha Power Station Solid Waste Landfill Omaha Public Power District' (SCS Engineers, 1995). The site is composed of two primary types of geologic materials: 1) Quaternary age unconsolidated fill and alluvium, and 2) Pennsylvanian age limestone and shale bedrock. The majority of the site is underlain by approximately 15 to 18 feet of clayey and silty soils and a mixture of fly ash and bottom ash beneficially used as fill material. The ash fill texture ranges generally from silt to silty sand. Near the southeastern boundary of the site, deposits of fine sand are found, with thicknesses generally between 0.5 and 1.5 feet, occurring at depths of 6.5 to 14 feet. Directly underlying the fill material unconsolidated alluvium occurs, comprised of laterally and vertically discontinuous fine-grained, cohesive clayey sands and sandy clays, and non-cohesive silts and fine sands. In general, grain size increases with depth, and coarse sand and gravel are typically found in the lowermost portions of the alluvium. Coarser grained soils are generally found below elevations of approximately 970 and 980 feet above National Geodetic Vertical Datum (NGVD), and are comprised primarily of medium to coarse sand with minor gravel.

The Quaternary age Missouri River alluvium unconformably overlies the Pennsylvanian age limestone bedrock. The bedrock consists primarily of alternating layers of limestone and shale, which are collectively part of the Kansas City Group. The limestone unit at the site is tentatively has been identified as the Hertha Formation. The depth to bedrock ranges from approximately 35 feet, elevation 963 feet above NGVD, to approximately 77 feet, elevation 961 feet above NGVD. This is consistent with the elevation of the bedrock reported for the nearest NDNR test hole, located approximately 2.8 miles north of the study site. A production well located at the southeast corner of the site (off-site) has a depth to bedrock of approximately 103 feet. This is consistent with the general deepening of the bedrock near the center of the Valley across the River into Iowa.

One primary aquifer underlies the site, comprised of coarse-grained Missouri River alluvium. Thickness and permeability of this aquifer vary greatly by location because of the transient nature of the Missouri River flows during deposition of the sediments. Geologic materials described in the available well records do not support the existence of a continuous low-permeability confining layer within the alluvium that would separate upper from lower aquifers. Although, paired monitoring wells indicate that water levels are almost always higher in shallower monitoring wells than deeper monitoring wells. This is thought to be attributed to the screened interval of shallow wells being within the upper 15 to 18 feet of clays, silts, and silty sands of the fill and alluvium overlying the aquifer. Flows generally have a strong vertical component in materials of lower permeability.

Between December, 2001 and April, 2015, 14 monitoring wells were measured for water table depth twice annually. Depth to groundwater ranged across the site from approximately 2 to 37 feet below ground surface (bgs). The typical water level fluctuations recorded at the site ranged from approximately 5.3 to 12.9 feet. In June, 2013 the depth to water at MW-6 was 20.7 feet bgs which was larger than the typical range of 4 feet bgs to 12 feet bgs.

Groundwater flow direction in 1995 was reportedly to the easterly and northeasterly direction primarily toward the Missouri River, which forms the eastern boundary of the site. Between 2011 and 2015, groundwater flow direction is primarily easterly and northeasterly north of MW-15, located in the center of the site, and easterly and southeasterly south of MW-15.

According to analysis by SCS Engineers (1995), groundwater velocities calculated with hydraulic gradients from the four 1995 sampling dates ranged from 5.6 feet per day, to approximately 0.0001 feet per day. These velocities have a large range, of more than five orders of magnitude, primarily because of the large range of hydraulic conductivities determined at the site from slug tests. Hydraulic conductivity determined from slug tests were reportedly measured at MW-3 as 1.3×10^{-6} cm/sec and at MW-5 as 1.0×10^{-2} cm/sec. At MW-4, SCS Engineers (1995) determined a hydraulic conductivity of 1.5×10^{-5} cm/sec. The wide range of hydraulic conductivity may be due to the different lithologies the wells were screened in. MW-3 was screened in silty sand and in silt of high plasticity, MW-4 was screened in silty sand and in well-graded sand and fine to coarse sand, and MW-5 was screened in silty sand and in clay of high plasticity.

Groundwater flow velocity at North Omaha Station has been calculated based on hydraulic conductivity range of 1.3×10^{-6} cm/sec to 9.98×10^{-3} cm/sec as reported by SCS 1995 and an estimated porosity of 0.3. Based on monitoring reports since 2011, the gradient ranged from 0.01 ft/ft to 0.024 ft/ft with a velocity range of 0.1 to 835 ft/year.

From slug test data performed by Terracon (2016) on recently installed wells MW-18, MW-19 and MW-20, hydraulic conductivity ranged from 1.92×10^{-5} cm/sec to 1.33×10^{-3} cm/sec. This is within the range of previously recorded data.

4.0 Groundwater Monitoring System

Based on the site-specific specific hydrogeologic information and location of the existing CCR landfill, the groundwater monitoring system for the North Omaha Ash Landfill for detection monitoring program consists of three (3) upgradient/background wells and five (5) downgradient wells. This exceeds the minimum number of monitoring wells required by 40 CFR 257.91(c) (i.e. one upgradient and three downgradient). Nine (9) 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 North Omaha Ash Landfill is summarized below in Table 1.

Monitoring Well	Date Installed	Well Depth (feet bgs) ¹	Well Depth (feet from TOC) ²	Gradient	Monitoring Program Use
Detection M	onitoring Pr	ogram	· · ·		
MW-9 ³	5/4/96	63	61.72	Background/Upgradient	Detection
MW-18 ³	12/1/15	71	70.70	Background/Upgradient	Detection
MW-19 ³	1/20/16	76.5	76.30	Background/Upgradient	Detection
MW-2	3/6/95	30	32.98	Downgradient	Detection
MW-13	4/12/01	30	32.89	Down/Crossgradient	Detection
MW-15	4/12/01	15	17.59	Downgradient	Detection
MW-16	9/9/02	35	37.14	Downgradient	Detection
MW-17	5/10/07	30	32.94	Downgradient	Detection
Water Level	Measureme	ents Only			
MW-4	3/6/95	33	36.45	Downgradient	Water Level/Nature &
	. ,			_	Extent Determinations ⁴
MW-5	3/2/95	30	32.73	Downgradient	Water Level/Nature & Extent Determinations ⁴

 Table 1

 OPPD North Omaha Ash Landfill, Groundwater Monitoring Well System

Monitoring Well	Date Installed	Well Depth (feet bgs) ¹	Well Depth (feet from TOC) ²	Gradient	Monitoring Program Use
MW-6	3/8/95	31	34.01	Downgradient	Water Level/Nature & Extent Determinations ⁴
MW-7	3/8/95	30	33.04	Downgradient	Water Level/Nature & Extent Determinations ⁴
MW-8	3/7/95	30	32.94	Downgradient	Water Level/Nature & Extent Determinations ⁴
MW-10	4/11/01	15	17.35	Downgradient	Water Level Only
MW-11	4/11/01	15	17.50	Downgradient	Water Level Only
MW-12	4/11/01	15	17.43	Downgradient	Water Level Only
MW-20	11/9/15	35	37.57	Downgradient	Water Level/Nature & Extent Determinations ⁴
Abandoned	Wells		•		<u>.</u>
MW-1	3/6/95 (Abandoned 4/17/01)	29	32.07	NA	NA
MW-3	3/3/95 (Abandoned 4/15/03)	52	55.19	NA	NA
MW-14	4/12/01 (Abandoned 9/9/02)	33	35.59	NA	NA

Notes:

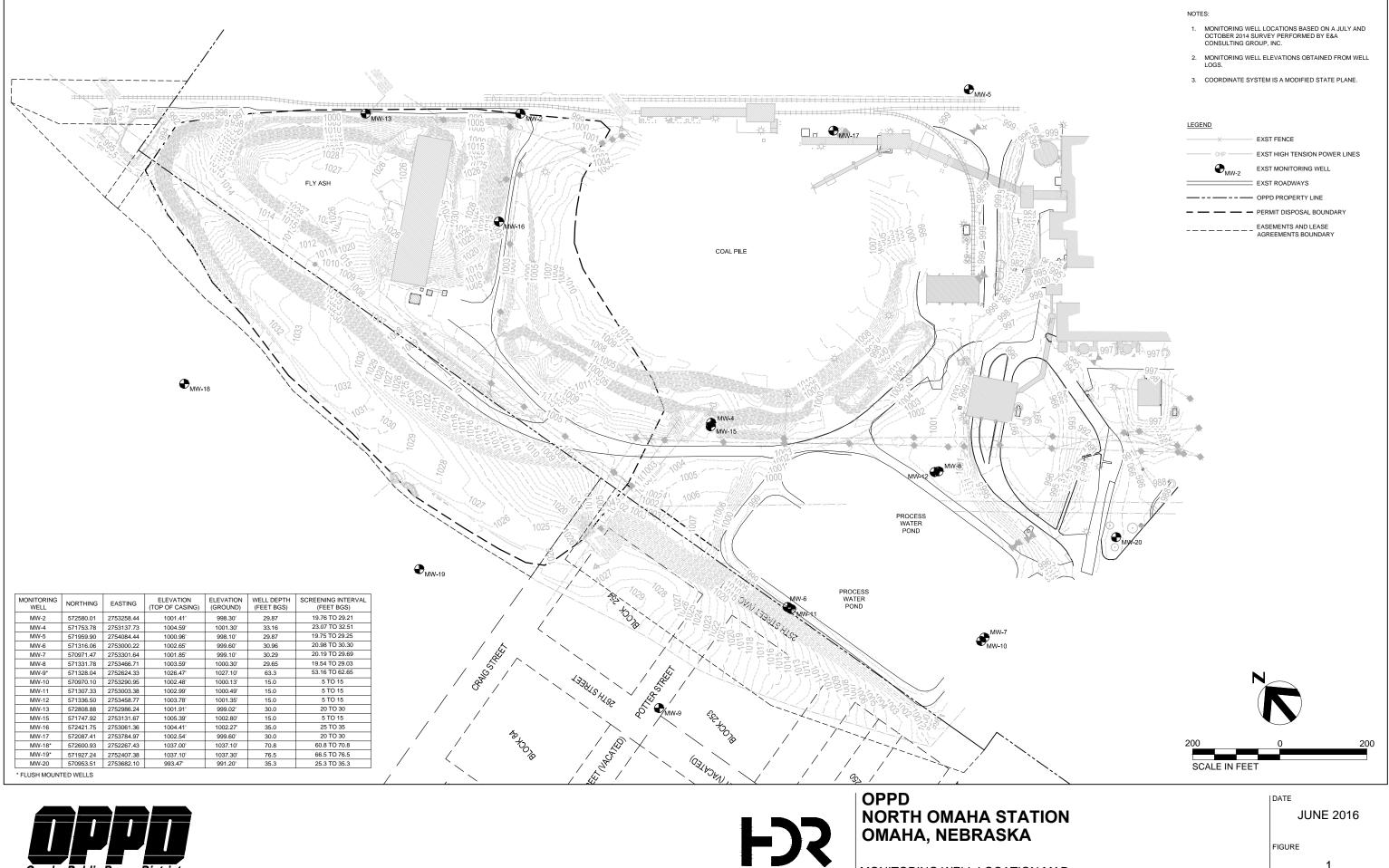
1. Depth from ground surface to bottom of installed well (screen depth). Actual boring depth may be deeper.

2. Depth from top of casing to bottom of installed well (screen depth).

3. Flush mounted wells. Ground surface in these locations are approximately 25 feet to 39 feet higher than most of Station site.

4. 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.

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 and registrations for the groundwater monitoring wells are contained in Appendix A of this report.





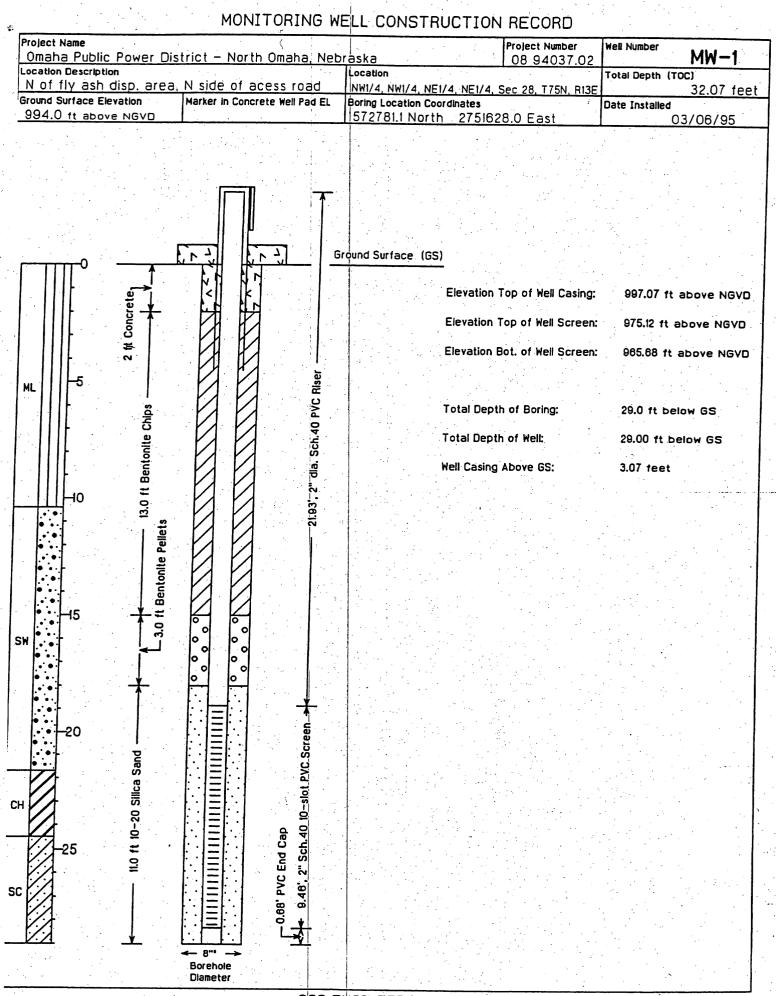
MONITORING WELL LOCATION MAP



Appendix A Monitoring Well Documentation



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SCS ENGINEERS

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DRILLING LOG

roject Name Omaha Pu	blic Power Dist	rict - N	lorth Omat	na. Ne	ebras	ska				oject Nur 08 940	nber 37.02	Boring Number	MW-1
oring Locatio	n Description				Bor	ing Local	1		**			Page	
	sh disp. area, M e Elevation		Casing Eleva		NW	ll/4, NWI. Ing Locat	/4. NE	1/4, NE	1/4, Se	<u>c 28, T75</u>	<u>5N, RI3E</u>		<u>1 of 2</u>
			t above NGVE			72781.1				0 East		Total Footage	29.0 ft.
Drill	ng Method (s)	Bor	ehole Size	Overbu	rden Fø			Footag		Of Sampl		o. Core Boxes	Depth to Wal
61,	4" ID HSA		8"	29.	.0 fe	et.	0 f	eet .	ter an	None		None	See Remar
Ning Co. La	yne, Inc, Omaha	, Nebrask	9					Oriller (s) Lyle	Porter	, Rick K	eith	
illing Rig Ac	ker Soilmax 80 1	Fruck Mou	nted					Type o	f Split-	-spoon	(standa	ard penetrat	ion test)
te Started	03/06/95	Da	te Completed	03/0	6/95							zekovic	
epth								1	Depth		· · ·		et en
in Feet	Des	cription			JSCS Class.	Biow Coun		covery	in	Sample	PID (ppm)	Re	emarks
	AYEY SILT, med												
_ mo	iist, nonplastic, 1 ains (fill).	with minor	tine	.								Start at II:20	am
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1												NGVD = Natio Vertical Datu	
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most	ly quartz with so some silt and cla	ome rock	grains,		· . '	4/5/7/10	2.0	/2.0'	11-1	SS-2			
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LS ENGINEER

Project						Pro	ject No. 8 9403	37.02	Boring Number MW-1
Boring L	ocation Description		Bori	ng Location		. :	· .	· ·	Page 2 of 2
<u>N of</u> Depth in Feet	fly ash disp. area, N side of acess r Description	oad	USCS Class.	Blow Count	Recovery	Depth in	Sample No.		
15-	SAND, blueish grey, fine grained, wel graded, medium density, very wet, mostly quartz with some rock grains, with some silt and clay.	1	• • • •			15-			
16-	SAND, medium grey, medium grained, well graded, very moist, with minor sil mostly quartz and rock grains.	t,		3/4/7/8	1.6'/2.0'	- 16-	SS-3		
17-						17-			
18-			SW			18- - -			
19-			• • •			19- 			
20-						20			
21-				3/3/2/5	2.0'/2.0'		SS-4		
22-	SILTY CLAY, dark grey, soft, very moist, high plasticity, with minor silt.					22			
23-			СН			23-			
24-	CLAYEY SAND, dark grey, loose, well					24			
25-	graded, wet, trace plasticity with minor silt.					25	CC E		
26-			sc	2/3/3/5	2.0'/2.0'	26- - 27-	55-5		Advanced augers to 29.0'
27-						28			
28-						29-			Monitoring well installed 2:00
29-	TOTAL DEPTH = 29.0 Feet					30-			pm
30- 31-						31 -			

SCS ENGINEERS

MONITORING WELL CONSTRUCTION RECORD

Project Name Omaha Public Power District - North Omaha, Neb	raska	Project Number 08 94037.02	Well Number MW-2
Location Description	Location		Total Depth (TOC)
NW of coal pile, NW corner of acess rd intersec.	NE1/4, SW1/4, NE1/4, NE1/	4. Sec 28, T75N, R13E	
Ground Surface Elevation Marker in Concrete Well Pad EL	Boring Location Coordinates		Date Installed
998.3 ft above NGVD	572361.1 North 2752	2199.2 East	03/06/95
	round Surface (GS)		
	Elevati	on Top of Well Casing	1001.41 1t above NGVD
	Elevati	on Top of Well Screen	: 978.54 ft above NGVD
5 U C	Elevatio	on Bot. of Well Screen	: 969.09 ft above NGVD
-5			
Chips VC RI	Total D	epth of Boring:	30.0 ft below GS
F - - - - - <th>Total D</th> <th>epth of Well:</th> <th>29.87 ft below GS</th>	Total D	epth of Well:	29.87 ft below GS
S.	Well Cas	sing Above GS:	3.11 feet
Bentonite Pellets			
S S S S S S S S S S S S S S S S S S S			
Si li			
SW ••••			
G2 1.97 ft 10-20 Silica Sand 1.11111111111111111111111111111111111			
33 52 52 1.97 ft 10-20 Silica Sand 52 0.086 PVC End Cap 0.081 0.866 PVC End Cap 0.081 0.867 2°. Sch. 40 10-slot PVC Screen V			
<u></u>			
Borehole Diameter			
DigiliG (G)			

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DRILLING LOG

Project N	lamo					J LOG		-11		10it 11	
Omaha	a Public Power District -	North Omah	na, N	ebras	ka			oject Nun 08 940		Boring Number	MW-2
loring Lo	cation Description coal pile, NW corner of a			Bort	ng Locatio		•			Page	
	urface Elevation Top of 1	ell Casing Eleval	tion	Bori		n Coordinates	4, Sec	<u>: 28, T75</u>	<u>N, R13E</u>	Total Footage	1 of 2
98.3 f	t above NGVD (surv.) 1001.4	1 ft above NGVD	(surv	.) 57	2361.1 N	lorth 275	2199.	2 East			30.0 ft.
	Drilling Method (s) E	Borehole Size	Overt	ourden Foo	tage Bec	frock Footage	No.	Of Sample	es N	o. Core Boxes	Depth to Wat
	6 1/4" ID HSA	8"	29	0.0 fee	et 🔰	0 feet		None		None	See Remark
rilling Co	. Layne, Inc, Omaha, Nebra	iska		· · ·		Driller (s)) Lyle	Porter,	Rick K	leith	
illing Rig	Acker Soilmax 80 Truck M	ounted		•		Type of Sampler	Split-	Spoon		······································	
ate Star	ted 03/06/95	Date Completed	03/	06/95	· · · ·				ielo Bla	zekovic	
)epth				•			Depth		• . •		•
in Feet	Description			USCS Class.	Blow Count	Recovery	in Feet	Sample No.	PID (ppm)	Re	marks
-	SILT, medium brown, soft,	, moist,					•				
<u> </u>	nonplastic, with minor clay (fill).	y and gravel								Start at 3:00	pm.
_ 1-]	(1111)			Π_{i}			1-	1	• •	HSA = Hollow	-
<u> </u>							-]. [NGVD = Natio Vertical Datu	
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- 1		and an ann an Airtean Airtean Airte Airtean Airtean A					. 1			weathered lime	stone cobble.
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	SILT, blueish gray, soft, no moist, with minor sand and s	nplastic,					<u> </u>	1.1			
.] -	size coal grains (fill).	June Sire					- 1				
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SCS ENGINEERS

Project Name Project No. Boring Number MW-2Omaha Public Power District - North Omaha, Nebraska 08 94037.02 Boring Location Description Boring Location Page NW of coal pile, NW corner of acess rd intersec. NE1/4, SW1/4, NE1/4, NE1/4, T75N, RI3E Sec 28 2 of 2 Depth Depth USCS in Feet PID Blow in Sample Description Class. Count Recovery Feet No. (ppm) Remarks SILT, blueish gray, soft, nonplastic, moist, with minor sand and some silt size coal grains (fill). 15 15 CLAYEY SILT, yellowish brown, soft, very moist, low plasticity, with minor fine sand. 16 2/3/4/5 1.6'/2.0' 16-SS-3 17 17 ML 18 18 19 19 20 20 SAND, medium gray, medium to fine grained, well graded, dense, very 21-1/5/19/20 1.7'/2.0' 21-1 SS-4 moist, with minor silt, mostly quartz and black rock grains. . 22 22 SW • 23 23 24 24 CLAYEY SAND, medium gray, fine grained, well graded, loose, wet, mostly quartz with rock grains in 25 clay. 25 26 1/3/5/3 2.0'/2.0' 26-.SS-5 27 27 Advanced augers to 30.0 SC 28 28 Quit drilling at 5:20 pm. Monitoring Well installed at 6:00 PM. 29 29-30 30-TOTAL DEPTH = 30.0 Feet 31 31

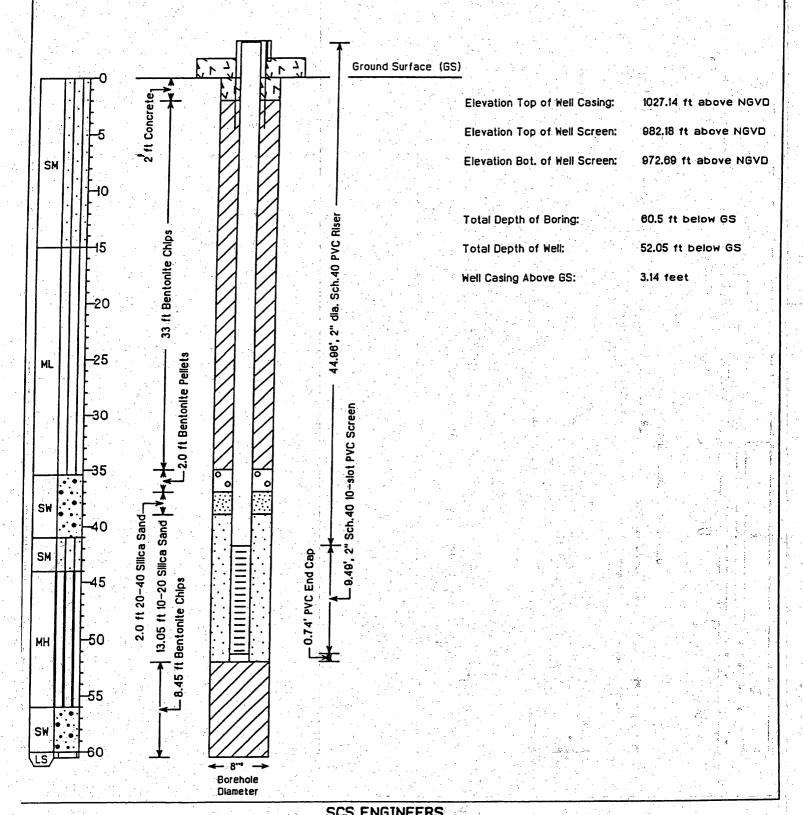
Drilling Log, continued

SCS ENGINEERS

Kanese City Missouri

MONITORING WELL CONSTRUCTION RECORD

	Project Name Omaha Public Power Distri	 aska		Project Numbe 08 94037		
.	Location Description W of fly ash disp. area, 20	Location NWI/4, SWI/4, NEI/4	NE1/4, 5	Sec 28, T75N,	. 4	Total Depth (TOC) 55.19 feet
- r	Ground Surface Elevation M	Boring Location Coord			I_{j} is	Date Installed
.	1024.0 ft above NGVD	 571609.5 North	275154	41.5 East		03/03/95



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DRILLING LOG

3

roject N Omaha	lame a Public Power District	– North Omal	ha, Nebr	aska		•		oject Num 08 940	n ber 37.02	Boring Number	MW-3
oring Lo	cation Description		E	loring Loc						Page	
	y ash disp. area, 20'E							<u>c 28, T75</u>	N. RI3E		1 of 4
		of Well Casing Eleva 7.14 ft above NGV		loring Loc 571609				.5 East		Total Footage	60.5 ft.
	Drilling Method (s)	Borehole Size	Overburden			k Footag		Of Sampl		o. Core Boxes	Depth to Wat
<u> </u>		8"	· · · · · · · · · · · · · · · · · · ·			_		· · · · · ·			<u> </u>
	6 1/4" ID HSA	8	60.0 1	eet	0.:	feet		None		None	See Remar
läng Co.	. Layne, Inc, Omaha, Ne	braska	1. S. S.	5	· ·	Driller (s) Lyle	e Porter,	, Rick K	eith	
ilina Ria	Acker Soilmax 80 Truc	k Mounted	. 1		· .	Type o	f Solit-	spoon	(stand	ard penetra	tion test)
	ted 03/02/95	Date Completed	03/03/	05						zekovic	
te stan			1 03/03/	90		Field U	D Server				
epth in			USC	e D	ow		Depth	Sample	PID		
eet	Descript	lon	Clas			lecovery		No.	(ppm)	R	emarks
	SILTY SAND, brownish	arev fine				·		-			
- 1	grained, well graded, r	noist, loose (fly						1	•	Start at 5:20	D PM
E,	ash fill).		· [·].]·]				1	1			Stem Augers
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1-				2/3/5	12 0	יח ב/יב	· "_	SS-1		internet i de ser en el ser el se Ser el ser el	
'-				2/3/5	0/2 0	3'/2.0'	11	33-1			
7							-				
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1	and the second secon				·		-				
3-]							13-				
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			11.11	_			14				

SCS ENGINEERS

3

Project	Name				UIII	P	rolect No.	,	Boring Number MW-3
	na Public Power District - North Omaha, 1 .ocation Description	Vet		(a Ing Location			08 940	37.02	MW-3 Page
	fly ash disp. area, 20'E of Pershing Drive				EI/4 NE1/4	Sec :	28, T75N, I		2 of 4
Depth in Feet			SCS lass.	Blow Count	Recovery	Dept in Fee	Sample	PID (ppm)	Remarks
15-	SILTY SAND, brownish grey, fine grained, well graded, moist, loose (fill).		SM			15			
16-	 SANDY SILT, light grey, loose, moist, with some fine sand, plant remains throughout. 			2/2/3/4	0.3'/2.0'	16	- - - - SS-2		
17-						17-			
18-						18-			
19-						19-			
20-						20-			
21-				2/3/3/2	1.0'/2.0'	21-	SS-3		
22-						22-			
23-			ML			23-			
24	SILT, yellowish brown, medium density, very moist, with minor clay, vertical, carbonized roots					24-			
25-	throughout,		-		· · · · · · · · · · · · · · · · · · ·	25-			
26- 27-			4	4/6/7/8		26- - - 27-	SS-4		
28						27 -			
29-	SILT, light grey, medium density, very moist with minor clay and fine sand.					29-		-	
30-						30-			Quit drilling at 6:40 pm.
31			5	/7/6/7 1	.0'/2.0'	31	SS-5		

SCS ENGINEERS

Kansas City, Missouri

B		3		- <u></u> , , ,	Until				
Project I Omah	name a Public Power District - North Omaha,	Net	orask	a			oject No. 08 940	37 02	
Boring L	ocation Description		Borin	g Location					Page
	ly ash disp. area, 20'E of Pershing Drive	2	NWI/	4. SWI/4. N	É1/4, NE1/4			R13E/	3 of 4
Depth		ŀ	SCS	Blow		Depth			
Feet	Description	12 C	lass.	Count	Recovery	in Feet	Sample No.	PID (ppm)	Remarks
	SILT, light grey, medium density, very	hΤ						(ppm/	
	moist, with minor clay and fine sand.			5/7/6/7	1.0'/2.0'		SS-5		
32-						32-	-		03/03/95 Start @ 830 am.
52						52-			03/03/95 Start @ 830 am.
-]	an a	
33-				A second		33-			
-			ML			•			
24							1		
34-						34-			
-						-		•. •	
35-			┝┝			35-			
1		<u> </u>				· •			
	Child, blocian grey, nile to medium				7	1			
36-	grained, well graded, medium density, very moist, mostly quartz with some			2/8/11/12	1.4'/2.0'	36-	SS-6		
	rock grains, minor silt and trace of	•				_			
37-		•		194		37-			
Ŭ 1						<u> </u>			
4						_			
38-			SW			38-			
			3						
39-						39-			
						287			
		•							
40-			·			40-			Auger cuttings wet at 40'
7	en e					- 1			
, T	e de la compañía de l					. 1			
41-	SILTY SAND, brownish grey, well	.11	4	/7/9/11 2	2.0.72.0	41-	SS-7		
- 7	graded, fine grained, medium density,	-				-	i tan		
42-	moist, trace of clay.	·				42-			
-		·[]				-			
, 1		· `	SM			<u> </u>			
43-		11				43			2. 2.
1		11				· 1			
44						44-			
1	CLAYEY SILT, blueish grey, high					<u></u>			
	plasticity, medium density, very moist, with some fine sand.					1			
45-						45			Auger cuttings wet at 45'
1			. .						
46-				/7/8/8 2	.0'/2.0'	46-	5S-8		
						-0-1 :	0-50		
	11 - El 1997 - El 19					7			
47-]		1			4	47			
]		.				1			
48 -						18 -			

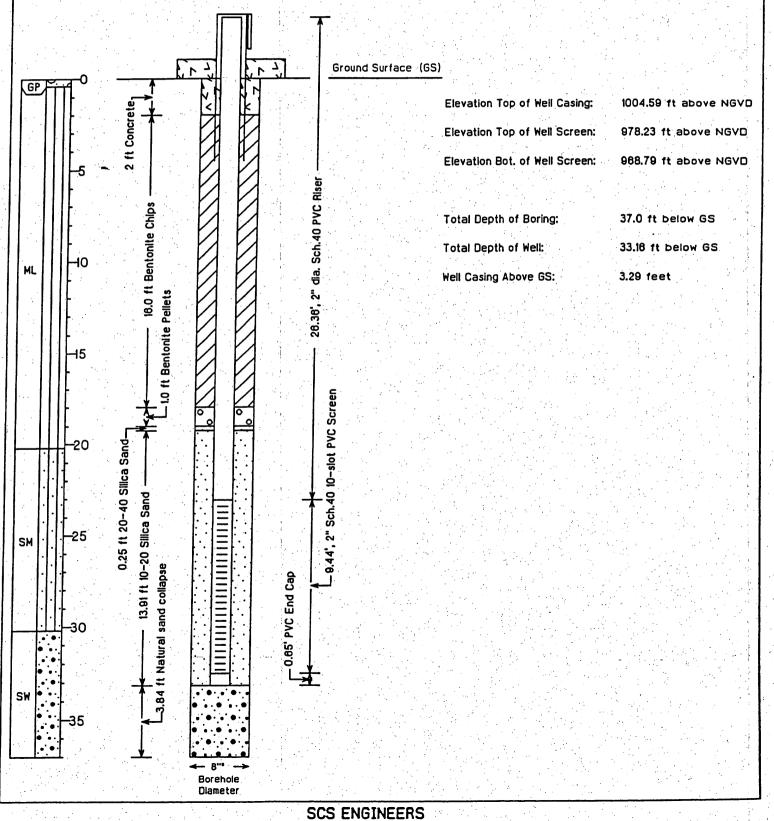
SCS ENGINEERS

Project Omah	Name a Public Power District – North Omaha	. Ne	brasl	ka. Sisis			oject No. 08 9403	37 02	Boring Number MW-3
Boring L	ocation Description fly ash disp. area, 20°E of Pershing Driv		Borir	ng Location /4, SW1/4, N		·		1. A.	Page
Depth in Feet	Description	1	USCS Class;	Blow Count	Recovery	Depth in Feet	1		A of 4 Remarks
49- 50- 51-	CLAYEY SILT, blueish grey, high plasticity, medium density, very moist, with some fine sand.			3/4/8/12	2.0'/2.0	49- 50- 51-	SS-9		
52- 53-	CLAYEY SILT, brownish grey, medium density, very moist, high plasticity.		мн			52-			
53	CLAYEY SILT, brownish grey, medium density, wet, high plasticity.					53- 54-			
55- 56-				0/9/26/27	2.0'/2.0'	55-	SS-10		
57-	SAND, blueish grey, dense, medium to fine grained, wet, well graded, with minor silt, mostly quartz with some rock grains.					50 - - - 57 - -	55-10		
58-		•	SW			58- - -			
59- 60-	LIMESTONE, light grey, extremly					59-			
61-1	weathered, very weak. LIMESTONE, light grey, weathered, weak.		LS	50/0.5 ().5'/0.5'	60	SS-11		Drilling hard at 60'. Auger refusal (with sampler)
62	TOTAL DEPTH = 60.5 Feet					62-			at 60.5. Pullled augers. Borehole open to 57.5'. Backfilled boring with bentonite chips to approx. 52'. Installed monitoring well 03/03/85.
63- 64-						63- 			
65						85 ⁻			
	e de la companya de l	00		CINEE	00				

SCS ENGINEERS Kansas City, Missouri

MONITORING WELL CONSTRUCTION RECORD

Project Name Omaha Public Power District - North Omaha, Nebr	raska Project Number 08 94037.02	Well Number MW-4
Location Description	Location NE1/4,NW1/4,SE1/4,NE1/4, Sec. 28, T75N, RI3E	Total Depth (TOC) 36.45 feet
	Boring Location Coordinates 571534.6 North 2752078.0 East	Date Installed 03/08/95



40117

DRILLING LOG

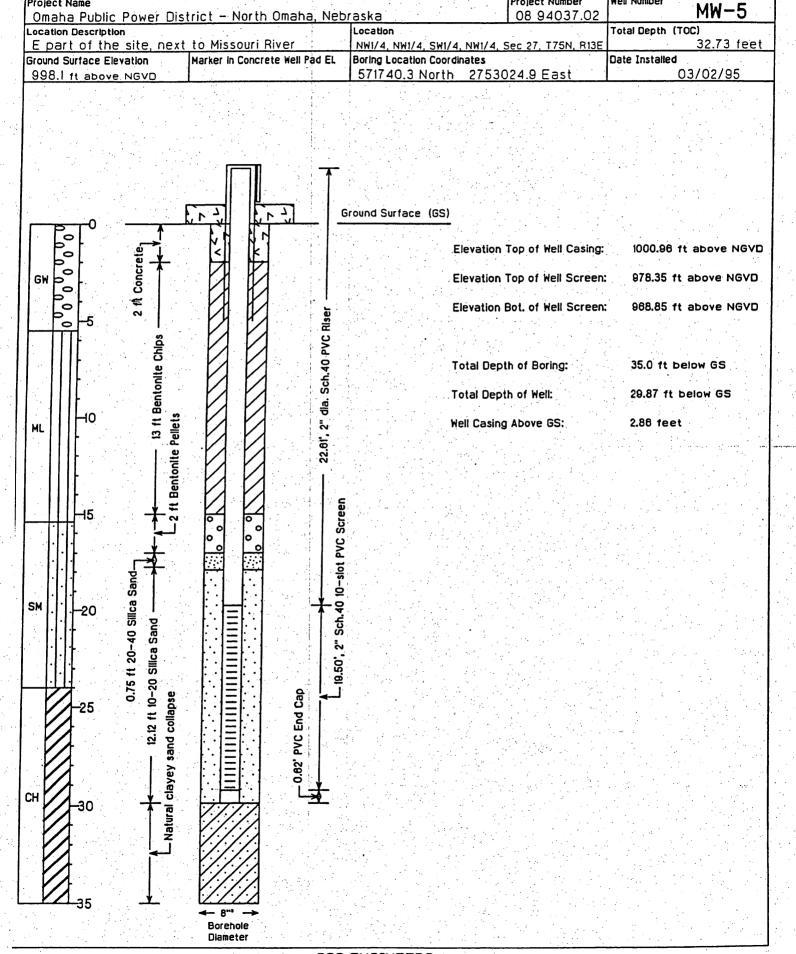
oject N	a me 9 Public Power Distric	t - North Oma	ha N		(a	·		ect Num 8 9403		Boring Number	MW-4
oring Lo	cation Description		<u>110, ľ</u>	Borin	ng Location					Page	
	coal pile, W of drainag	ge of Well Casing Eleva	ation			E1/4,NE1/4, Coordinates		<u>8 T75N,</u>	R13E	Total Footage	<u>1 of 3</u>
		04.59 ft above NG			1534.6 N	orth 27	<u>52078</u>	.0 <u>Eas</u>	ŧ		37.0 ft.
	Drilling Method (s)	Borehole Size	Over	burden Fool	lage Bedr	ock Footage	No.	Of Sample	s N	o. Core Boxes	Depth to Wat
	6 1/4" ID HSA	8"	3	7.0 fee	t	0 feet		None		None	See Remar
illing Co.	. Layne, Inc, Omaha, Ne	ebraska		•		Driller (s) Lyle	Porter,	Rick #	(eith	
illing Rig	Acker Soilmax 80 Truc	k Mounted		•		Type of Sampler	Split-	spoon	(stand	ard penetrat	ion test)
te Star	ted 03/08/95	Date Complete	d 03,	/08/95						azekovic	
epth							Depth				
in Feet	Descrip	tion		USCS Class.	Blow Count	Recovery	in Feet	Sample No.	PID (ppm)	Re	marks
	GRAVEL		-t	GP							
4	SANDY SILT, light gre	ey (fill), loose,					-		· ·	Start at 4:30	PM
1-	wet; ash with cinders grains of coal (fill).	and a few					1-		•	HSA = Hollow	Stem Augers
]											
2-							2_			NGVD = Natio	
_ 1		n an					-			Vertical Datu	m
3-							3-				
3											
			e 1			1 - J ¥.					
4-							4-				
1]				
5-]							5-				
<u> </u>							-		· . Vita i		
6-					2/7/7/5	2.0'/2.0'	6-	SS-1			
]		· · · · ·		
7]							7				
' †				ML			- 1				
<u> </u>							- 8				
8-]							°-		•••••••••••••••••••••••••••••••••••••••		
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9-							9-				
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o-] ·							10		en af an N		
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1-					1/1/1/2	2.0'/2.0'	11_	5S-2			د. این محک
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SCS ENGINEERS

	<u>a Public Power District – North Omaha, </u>	Neb	rask	а			8 9403	87.02	
	ocation Description coal pile, W of drainage	ч. н.		g Location (4,NWI/4,SE	1/4,NE1/4, 5	Sec. 28,	175N, R13		Page 2 of 3
Depth in Feet	Description	US	SCS ass.	Blow Count	Recovery	Depth in	Sample	PID (ppm)	
15-	SANDY SILT, light grey (fill), loose, wet, ash with cinders and a few grains of coal (fill).					15-			
-	SILT, olive grey, loose, moist, nonplastic.								
16- -				4/1/5/9	1.3'/2.0'	16	SS-3		
17-			ML			17-			Quit drilling at 5:45 pm. Started at 7:50 on 03/02/95
18-						18 18 1			
19-						19-			
20-						20-			
21-	SILTY SAND AND CLAYEY SAND, interbedded I"-2" layers. Silty sand is yellowish brown, wet, loose, with minor clay. Clayey sand is olive, wet, loose, well graded, with minor silt.			2/3/4/5	1.5'/2.0'		SS-4		
22-		•	-			22			
23						23-			
24-						24-			
25-		· S	5M			25			
26-			2	/3/4/6 1	.7'/2.0'	26- -	SS-5		
27-			-			27			
28-						28-			
29						29-1			
30-		•				30			
A 1 9	SAND, olive grey, fine grained, well graded, loose, wet, silty with some clay.	SI	W 1/	2/3/5 1.	3'/2.0'	= s 31 -	iS-6		
		NC .	CNI	GINEE	00				

Kansas City, Missouri

Project I		Boring Number MW-4						
	<u>a Public Power District – North Omaha</u> ocation Description	Nebrask	a Location		0	8 940	37.02	MW-4
	coal pile, W of drainage			1/4.NE1/4, S	Sec 28	T75N R1		Page 3 of 3
Depth			<u>,,,,,</u>		Depth			
in		USCS	Blow	· · · · · · · · · · · · · · · · · · ·	in :	Sample	PID	
Feet	Description	Class.	Count	Recovery	Feet	No.	(ppm)	Remarks
	SAND, olive grey, fine grained, loose,				-		: -	
-	wet, well graded, silty with some	••	1/2/3/5	1.3'/2.0'		SS-6	· · ·	
32-	clay.				32-		•	
-]							
	SAND, olive grey, medium to fine	• • •	an a					Withdrew augers to 32.5'. Tried to install the well, there
33-	grained, well graded, loose, wet,				33-	te na stare		is approximately 5' of sand in
-	mostly quartz with rock fragments,	••						the bottom of hollow stem of augers. Decided to pull
34-	trace of silt.							augers and install the plug.
		• SW			34-			
7		••			- 1			
35-			1		35-			10:30 Borehole open to 32.5'
					<u> </u>		1997	
		••			-			
36-			3/4/5/5	2.0'/2.0'	36-]	SS-7		"Heaving sand" 32.5' to 37.0'
<u> </u>	1				- 1			
37-		••	19					
31 - -					37-			
	TOTAL DEPTH = 37.0 Feet				1	· · · *	· · · ·	
38-					38-			
1					1			
					_			
39-					39-			
					: -] .			
40-								
FOT					40-			
7					4			
41-					41-			
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	S(CS ENC	SINEE	RS				



MONITORING WELL CONSTRUCTION RECORD

Project Name

Project Number

Well Number

SCS ENGINFERS

DRILLING LOG

Project I Omahi	Name a Public [®] Power District	- North Omal	na, Nebra	iska			ect Numbe 8-94037	r .02	Boring Number	MW-5
Boring L	ocation Description of the site, next to Mi		В	oring Loca	tion /4, SW1/4, NW	1/4, Sec	27. T75N.		Page	1 of 3
Ground S	urface Elevation Top of	of Well Casing Eleva 0.96 ft above NG	tion Bo	oring Loca	tion Coordinate	S .	.9 East		Total Footage	35.0 ft.
990.11	Dräling Method (s)	Borehole Size	Overburden i		edrock Footag		Of Samples	No	. Core Boxes	Depth to Water
	6 1/4" ID HSA	8"	35.0 f	eet	0 feet		None		None	See Remarks
Drilling Co	o. Layne, Inc, Omaha, Net	braska		-1			Porter, R			
Drilling Rig Acker Soilmax 80 Truck Mounted Type of Split-spoon (standard penetration test)									ion test)	
Date Sta	rted 03/02/95	Date Completed	03/02/9	5	Field 0	bserver (s) Carmel	lo Bla	zekovic	
Depth in Feet	Descripti	ion	USC: Class				Sample	PID (ppm)	Re	emarks
1	GRAVEL, COBBLES, SA (fill).	ND, AND SILT	0 0 0 0 0 0 0						Start at 11:20 HSA = Hollow NGVD = Natic Vertical Datu	Stem Augers onal Geodetic
2-			0 0 0 0 0	u		2-				
3-			0000	n		3-				
4-			00000			4				
5-	CLAYEY SILT, yellowish	brown	000			5				
6-	medium density, very mo 1/4" oval shaped light b silt mottles (fill).	oist, with up to				6- -				
7-						. 7-				
8-						8- - -				
9-						9- - -				
10-				•		10 - - -				
11-				5/11/14,	/15 1.5'/2.0'	11	SS-1			
12-						12-				
13-						13- 13-				
14 -						14				

SUS ENGINEERS Kansas Citv. Missouri

Project N Omaha		Nebra	ska		Pro	ject No. 8 9403	37.02	Boring Number MW-5
Boring Lo	cation Description of the site, next to Missouri River	Во	ring Location Wi/4, NWI/4, S		, Sec 27	, T75N, F	1.1	Page 2 of 3
Depth in Feet	Description	USCS Class	Blow	Recovery	Depth in			Remarks
15-	CLAYEY SILT, yellowish brown, medium density, very moist, with up tp 1/4" oval shaped light blueish grey silt mottles (fill).	м	Ļ		15-			
16-	SILTY SAND, blueish grey, fine grained, medium density, well graded, very moist, minor clay and trace wood and coal particles.		10/7/8/12	2.0'/2.0'	16-	SS-2		
17- 18-					17- - - 18-			
19- 19-					19			
20-		. . . SI	1		20-			
21- 22-		· · ·	2/2/5/2	1.8'/2.0'	21– 22–	SS-3		
23-		• • • •			23-			
24	SANDY CLAY, light grey, high plasticity, soft, very moist.				24			
25- 26-			3/4/5/6	2.0'/2.0'	25 26	SS-4		
27-					27-			
28-		CH			28-			
29-					29 30			
30- 31-			1/2/2/3 ENGINE	2.0'/2.0'	30	SS-5	¢*	

SCS ENGINEERS

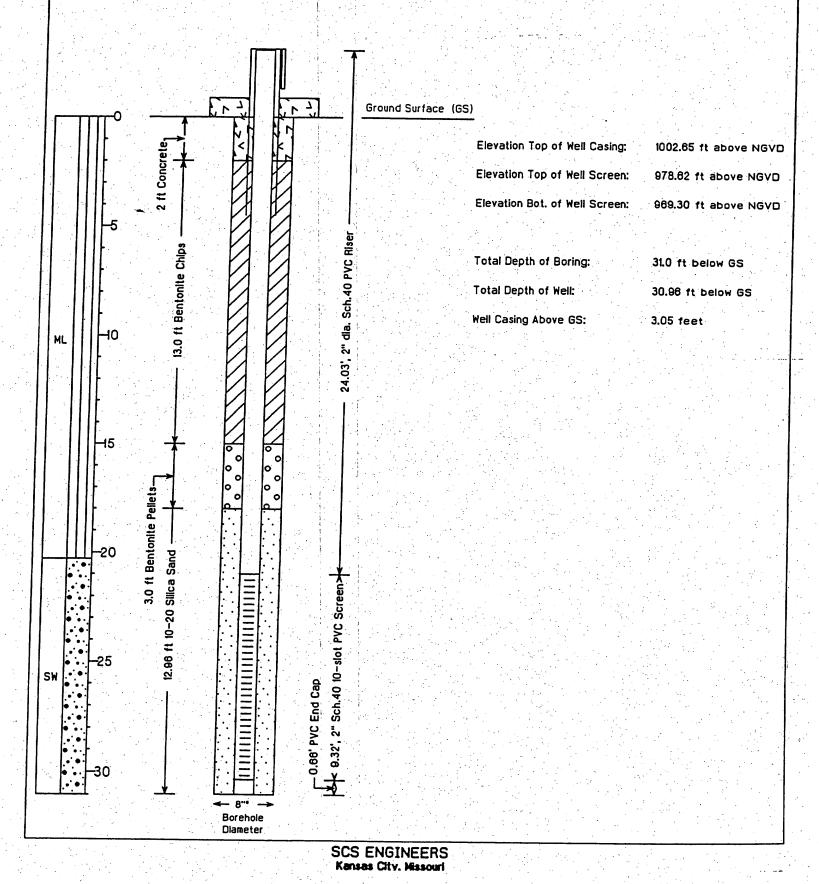
Project Na Omaha	ane Public Power District – North Omaha	, Nebrask	a			lect No. 8 9403	7.02	Boring Number MW-5
Boring Loo	cation Description of the site, next to Missouri River	Borin	g Location	WI/4, NWI/4	. Sec 27	, T75N, R		Page 3 of 3
Depth in Feet	Description	USCS Class.	Blow Count	Recovery		Sample No.	PID (ppm)	Remarks à
32-	SANDY CLAY, light grey , high plasticity, soft, very moist.		1/2/2/3	2.0'/2.0'	32-	SS-5		
33-		СН			- 33			Advanced augers to 35.
34-					34-			Pulled Augers. Borehole open to 34.5'. Backfilled borehole with sand to 30'. Well installed 3:00 PM.
35-					35-			
36-	TOTAL DEPTH = 35.0 Feet				36-			
37-					37-			
38-					38-			
39-					39- -			
40					40			
41-					41-			
42-					42-			
43-					43-			
44-					44-			
45-					45-			
46-					46-			
47-					47-			
48 -					48 -			

SUS ENGINEERS Kansas Citv. Missouri

MONITORING WELL CONSTRUCTION RECORD

ť,

Project Name Omaha Public Power District – North Omaha, Neb	raska	Project Number 08 94037.02	
Location Description NW of Western Bottom Ash Pond	Location NW1/4,SW1/4,SE1/4,NE1/4,Sec		Total Depth (TOC) 34.01 feet
Ground Surface Elevation Marker in Concrete Well Pad EL 999.6 ft above NGVD	Boring Location Coordinates 571097.1 North 275194		Date Installed 03/08/95



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Project N Omaha	l <mark>ame</mark> 3 Public Power Distric	t – North Omal	na, Ne	brasl	ka	·. ·			olect Nur		Boring Number	MW-6
Boring Lo	cation Description			Borir	ng Loca				· · ·		Page	
		of Well Casing Eleva		Borin	ng Local	tion Co	ordinates	i	3, T75N, R	an shi	Total Footage	<u> of 2</u>
	t above NGVD (surv.) 10	02.65 ft above NGV	D (surv.) 57	1097.1	Nort	h 275	<u>51940.</u>			1	31.0 ft.
	Drilling Method (s)	Borehole Size		den Fool			Footage	No.	Of Sampl	es N	lo. Core Boxes	Depth to Wate
	6 1/4" ID HSA	8"	31.0) feet	t	<u> 0 f</u>	eet	•	None		None	See Remark
rilling Co	. Layne, Inc, Omaha, N	ebraska					· · · · · · · · · · · · · · · · · · ·		Porter			
Irilling Rig	Acker Soilmax 80 True	ck Mounted		1		1. je	Type of Sampler	Split-	spoon	(stand	ard penetrati	ion test)
ate Star	ted 03/08/95	Date Completed	03/0	8/95	te i	· · ·	Field Ot	server	(s) Carn	nelo Bla	azekovic	1
Depth in Feet	Descrip	tion		SCS ass.	Blov Cour		covery	Depth In Feet	Sample	PID (ppm)	Re	marks
	SILT, medium brown, i	medium to loose,						-				-
	moist, non-plastic, wi (fill).	th minor clay									Start at 10:00	•
14								1-		· · ·	HSA = Hollow	
											NGVD = Natio Vertical Datu	
2-					- 1 ¹ ,			2-				
1					. *			-				
3-]					۰۰. 	· ·		3-				
- 1												
4-	SILT, medium brown, lo							4-				
: .]	non-plastic with minor fine sand (fill).	clay and trace			- - -			-				
5-	nne sand (m).							5-				
]				
6-					6/4/4/	2 1.6	'/2.0'	6-	SS-1			
								4				
7-				ML				7				
4								- 1				
8-								8_				\$
						 i.,		7 -				
9-								<u> </u>			•	
				1		s i s		3				2**
<u>,</u> †								<u> </u> 1				
10-				Ì				10				
]]				
11-					2/3/1/2	1.3'	/2.0'	11-	SS-2.			
1					na Na 2			-				
12-				⊢	n in			12				
1								1				
13–]								13–				
1]				
4 -							· •	14				

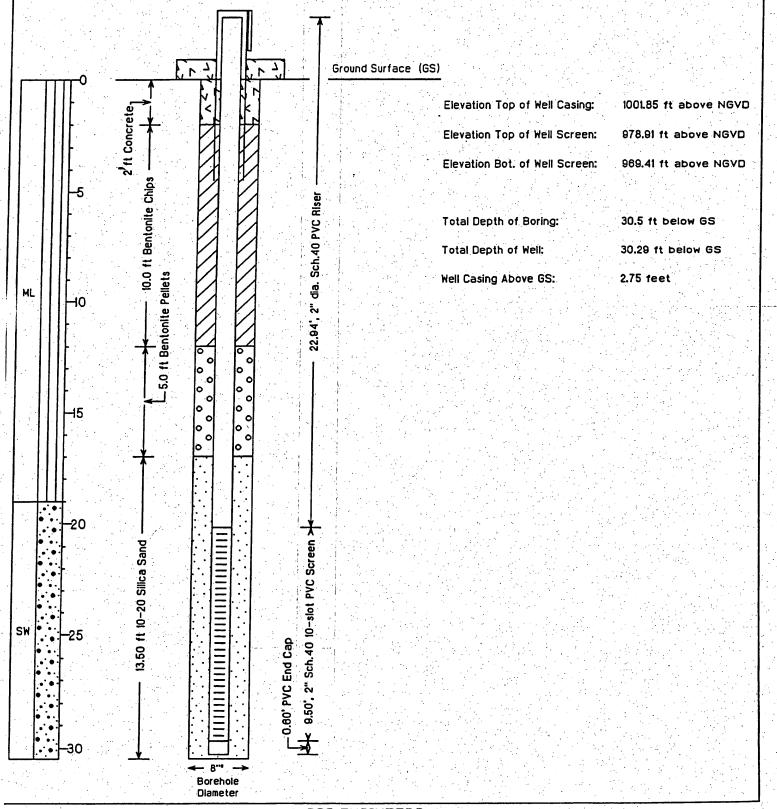
	<u>a Public Power District - North Omaha,</u>	Nebrasi	(a			ject No. 8 9403	7.02	Boring Number MW-6
	ocation Description f Western Bottom Ash Pond		Ig Location /4,5W1/4,5E	1/4,NE1/4,S				Page 2 of 2
Depth in Feet	Description	USCS Class.	Blow	Recovery	Depth in	Sample No.	PID (ppm)	
15-	SILT, medium brown, loose, wet. non-plastic with minor clay and trace fine sand (fill).				15			
16-			2/1/4/10	1.9'/2.0'	16- -	SS-3		
17-	CLAYEY SILT, brown, medium consistency, very moist, medium to low plasticity with minor fine sand.	ML			- 17			
18-					18- 1			
19-					19- - -			
20-					20			
21-	SAND, yellowish brown, fine grained, loose, wet, well graded, with minor silt, mostly quartz with rock grains.		2/2/5/6	2.0'/2.0'	21-	SS-4		
22-					22			
23-					23-			
24-					24-			
25-		•			25			
26-	SAND, bluish grey, fine grained, loose, wet, well graded, with silt and minor clay, mostly quartz and rock grains.	SW	2/2/1/2 2	.0'/2.0'	26- s	S-5		
27-					27			
28-				2	28-			
29-					29-			Installed monitoring well 12:00 pm.
30-				3	30-			
31 -	TOTAL DEPTH = 31.0 Feet				31 -			
	SC	S FN	GINEE	RS				

Kansas City, Missouri

2

7

Project Name		Well Number MW-7
<u> Omaha Public Power District - North Omaha, Neb</u>	raska 08 94037.02	
Location Description	Location	Total Depth (TOC)
Approximately 20' South of Bottom Ash Ponds	SWI/4,SEI/4,SEI/4,NEI/4,Sec.28,T75N,RI3E	33.04 feet
Ground Surface Elevation Marker in Concrete Well Pad EL	Boring Location Coordinates	Date Installed
999.1 ft above NGVD	570752.6 North 2752241.6 East	03/08/95

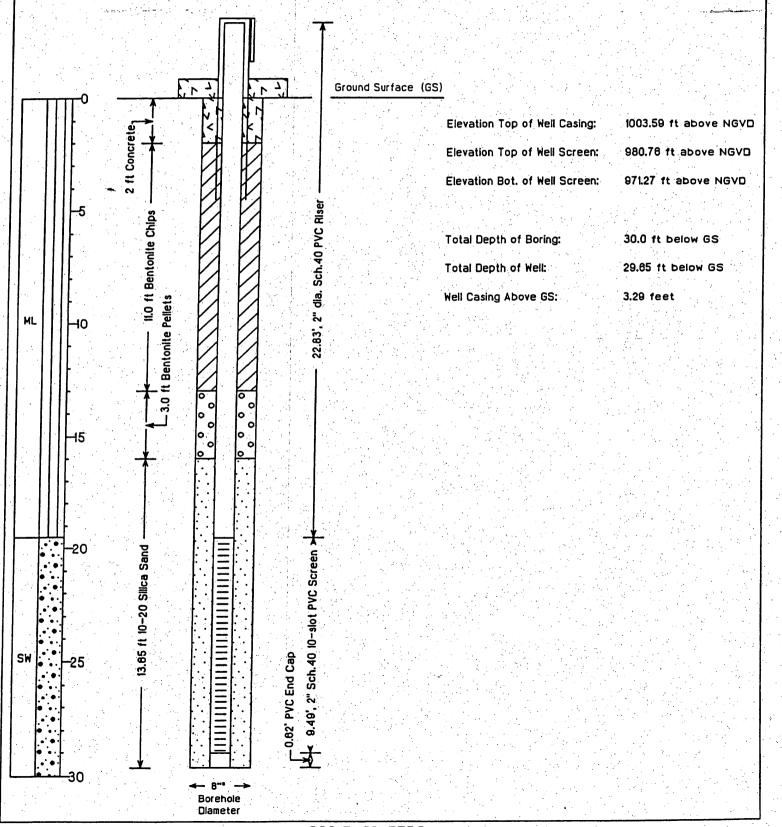


roject N							<u> </u>		Pr	oject Num	ber	Boring Number	MW-7
oring Lo	a Public Power Dist					(a ng Locati	on	<u> </u>		08 940:	20.10	Page	
pprox	imately 20' South									.T75N,RI	3E		1 of 2
	urface Elevation above NGVD (surv.)		l Well Casing Eleva 85 ft above NGV			ig Locati 0752.6				1.6 Eas	t.	Total Footage	30.5 ft.
<u></u>	Drilling Method (s)		Borehole Size	The second s	den Foo			Footage		Of Sample		o. Core Boxes	Depth to Wate
	6 1/4" ID HSA		8"	30.	5 fee	t	0	eet		None		None	See Remark
rilling Co	. Layne, Inc, Omaha	, Neb	raska		<u>.</u>			Orliler (s) Lyle	Porter,	Rick K	eith	
illing Rig	Acker Soilmax 80	Truck	Mounted					Type o Sample	Split-	spoon	(stand	ard penetrat	ion test)
ate Star	ted 03/08/95		Date Completed	03/0	8/95		·	Field Ot	server	(s) Carm	ielo Bla	zekovic	
epth in					SCS	Blow			Depth in	Sample	PID		
Feet		scriptio			lass.	Count	R	ecovery	Feet	No.	(pp m)		emarks
4	SILT, medium brow non-plastic with s	vn, loo some c	ose, moist, clay and trace]	•	Start at 1:00	pm
	fine sand_(fill).				·				1-			HSA = Hollow	r Stem Augers
							· .						onal Geodetic
													ли ,
2-]									2-				
										1			
3-									3-	1	t dividu Ali		
<u> </u>													
. <u>]</u>							· .		-				e de la construcción Construcción de la construcción de la construcción de la construcción de la construcción de
4-]	SILT, medium brow	n. 100	se. wet						4-				
· - 7	non-plastic with s	ome cl	lay and trace						-				
5-	fine sand (fill).	•							5				
27					[
7				·					-				
6-						4/1/2/4	1 2.	0'/2.0'	6-	SS-1			
7									-				
7		 1 •					1.		7_				
$' \exists$					ML				1				
]													
8-]							1		8-				
]													
9-									9_				
37													ente La stran de la seconda de
				.			·						
10-		· · · · ·			╞┊┠		+-		10-				
7													
1						1/2/7/4		0'/2.0'	11-	SS-2			
"7		er generie Tenerie L				1/6/1/4	^{2.}	.,					****
		i pp							3				
2-					-		+		12-				
1									1		a dar S		
<u>_</u> 1													
13-									13-				
1									-				
4		. • *		- 111	1. P	an ta ta j	1 1		14 -				ta a di

	Drill	ing	j.Lo	og, c	ontir	nue	d		
Project Omat	Name na Public Power District — North Omah	a, Ne	brask	ka			olect No. 8 940	37.02	Boring Number
Boring t	ocation Description oximately 20' South of Bottom Ash Poi		Borin	g Location	1/4,NEI/4,S		• • • • •		Page
Depth			<u>3</u> #0	/4, <u>5E1/4,5</u>	1/4,NE1/4,5	Depth	1		2 of 2
in Feet			USCS Class.	Blow Count	Recovery	in i	Sample	PID (ppm)	Remarks
15-	SILT, medium brown, loose, wet, non-plastic with some clay and trace fine sand (fill).					15-			
16-	 CLAYEY SILT, bluish grey, medium consistency, moist, medium plasticity with trace fine sand. 			4/2/4/7	0.4'/2.0'	16-	SS-3		
10			ML	-12/-1/1	0.4 72.0	10-	33-3		
18-						18			
19-	SAND, yellowish brown, fine grained, well graded, loose, wet with some silt, mostly quartz with rock grains.	•	•			19-			
20-						20			
21-				2/3/2/5	1.8'/2.0'	-	SS-4		
22-		•••				22-			
23-	SAND, dark grey, fine grained, well					23-			
24-	SAND, dark grey, fine grained, well graded, loose, wet, with silt, mostly quartz and rock grains.		SW			24-			
25-		•••	54		·	25-			
26-		•••	2	2/2/2/4	2.0'/2.0'	26-	SS-5		
27-		•••	-			27			
28-		•••				28-			Quit drilling at 3:00 pm. Installed monitoring well @
29-		•••				29-			3:30 pm
30-		•••				30-			
31 -	TOTAL DEPTH = 30.5 FEET					31			

SCS ENGINEERS Kansas City, Missouri

Project Name Omaha Public Power District - North Omaha, Nebr		Well Number MW-8
	Location NW1/4,SE1/4,SE1/4,NE1/4,Sec.28,T75N,R13E	Total Depth (TOC) 32.94 feet
		Date Installed 03/07/95



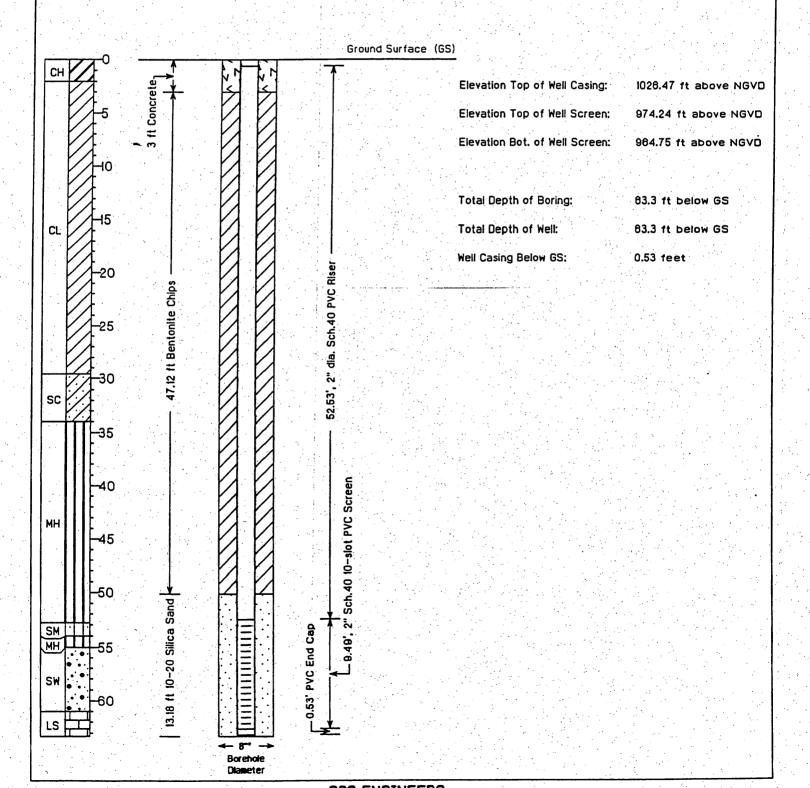
Oma	t Name ha Public Power District	– North Omar	a, Ne			1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			olect Nu 08 940		Boring Number	MW-8
	Location Description of Eastern Bottom Ash	Pond		1	Location	n SE1/4,NE	1/4 5	ec 29	T75N P	136	Page	1 of 2
Ground	Surface Elevation Top	of Well Casing Eleval	tion	Boring	I Locatio	n Coordin	ates				Total Footage	· · ·
.000.	.3 ft above NGVD (surv.) 100 Drilling Method (s)	3.59 It above NGV Borehole Size		<u> 5711</u> den Foota		orth 2 rock Foo						<u>30.0 ft.</u>
	6 1/4" ID HSA	8") feet		0 feet			Of Sampl	es N	o. Core Boxes	Depth to Wate
			30.0						None		None	See Remark
	Co. Layne, Inc, Omaha, Nel								Porter			
	Rig Acker Soilmax 80 Truck		·			San	pier S	iplit-	spoon	(stand	ard penetrati	on test)
ate St	arted 03/07/95	Date Completed	03/07	/95		Fiel	d Obse	erver (s) Carn	ielo Bla	zekovic	
Depth in Feet		on		SCS ass.	Blow Count	Recov		lepth in Teet	Sample No.	PID (ppm)	Re	marks
1- 2-	SANDY SILT, dark grewith minor clay, mostly coal particles with silt	cinders and									Start at 12:45	p.m.
3-								3				
4- 5-								4 1 5				
6-	SANDY SILT, dark grey, with minor clay, mostly c coal particles with silt (inders and		2/	/20/30	1.0'/1.3			SS-1		Hammer bounch	ng at 6.3'
7-				ML				7-				
9-1												
							- 10					
	SILT, brownish grey, loos some clay and minor coar (fill).	e, wet, with se sand		1/4	1/2/2	2.0'/2.0'	. 	- 1 s -	S-2			
2-1							12					
3-1							13					
1 -		No. 1 State of the		1 2 3			14	- I · ·				

CS ENGINEERS

Project Omahi	lame a Public Power District <u>-/ North Omaha,</u>	Nebras	ska			ject No. 8 9403	37.02	Boring Number MW-8
Boring Lo	ocation Description of Eastern Bottom Ash Pond	Bor	Ing Location	1/4,NE1/4,S	ec.28,77	5N,R13E		Page 2 of 2
Depth in Feet	Description	USCS Class.	Blow	Recovery	Depth in		PID (ppm)	
15-	SILT, brownish grey, loose, wet, with some clay and minor coarse sand (fiil).				15-			
16- 17-	CLAYEY SILT (alluvium), dark grey, soft, moist, trace plasticity, with some fine sand.	ML	1/2/5/2	1.7'/2.0'	16- 17-	SS-3		
18-					18- -			
19- 1					19-			
20-	SAND, yellowish brown, fine grained, well graded, wet, mostly quartz with some rock grains, trace silt.	• • • •			20			
21-			2/3/2/8	1.2'/2.0'	21-	SS-4		
22-					22			
23-					23-			
24-					24-			
25-		SW			25			
26-			1/1/2/3	2.0'/2.0'	26	SS-5		
27-					27-			Installed monitoring well at 1:45 pm
28-					28-			
29-		•			29-			
30-	• TOTAL DEPTH = 30.0 Feet				30-			
31 -					31 -	·		

Kansas City, Missouri

Project Name	Project Number	Well Number
<u>Omaha Public Power District - North Omaha, Neb</u>	raska 08 94037.02	MW-9
Location Description	Location	Total Depth (TOC)
W of fly ash disp. area, 40'W of Pershing Drive	SW1/4, NW1/4, SE1/4, NE1/4, Sec 28, T75N, R13E	62.55 feet
Ground Surface Elevation Marker in Concrete Well Pad EL	Boring Location Coordinates	Date Installed
1027.1 ft above NGVD	571109.4 North 2751564.3 East	05/04/96



Project N	ane					Project Num	ber	Boring Number	
Omaha	Public Power Distric	t – North Omat				08 940;		Boring Number	MW-9
	cation Description y ash disp. area, 40%	v of Pershing D		g Location 4, NW1/4,		4, Sec 28, T75	N, R13E	Page	1 of 4
Ground Su	urface Elevation Top	of Well Casing Eleva 26.47 ft above NGV	tion Borin	g Location	Coordinates		-11 -11 -14	Total Footage	63.3 ft.
1027.11	t above NGVD (surv.) 102 Drilling Method (s)	Borehole Size	Overburden Foot		ock Footage		es N	o. Core Boxes	Depth to Water
. ·	6 1/4" ID HSA	8"	61.0 feet	2	.3 feet	None		None	See Remarks
Drilling Co	. Layne, Inc, Omaha, Ne	ebraska	4		Driller (s	Rick Keith	 		
Orilling Rig	Acker Soilmax 80 Truc	k Mounted			Type of Sampler	Continuous S	oil Sam	pler (CSS)	•
Date Star	ted 05/03/96	Date Completed	05/04/96			oserver (s) Carm			
Depth in Feet	Descrip	otion	USCS Class.	Blow Count	Recovery	Depth in Sample Feet No.	PID (ppm)	Re	emarks
	SILTY CLAY, dark gr high plasticity, some	ay, soft, moist, roots.	СН			1			ı Stem Augers.
2	CLAYEY SILT, orange moist, low plasticity.	e brown, soft,			4.2'/5.0'	2 		NGVD = Nati Vertical Datu	onal Geodetic m
4- 5- 6-						4			
7- 8-	CLAYEY SILT, grayisi soft, low plasticity, so	n brown, damp, ome roots.	c.		3.6'/5.0'	7- 			
9-						9-]			
10-						10			
11_						11-			
12-					5.0'/5.0	12 - css-3			
13-						13-			
14 -						14 -			

SCS ENGINEERS

Kansas City. Missouri

Project N	ame				Pro	ject No.		Boring Number MW-9
Boring Lo	a Public Power District – North Omaha, cation Description	Bor	ing Location		0	8 940	37.02	Page
	ly ash disp. area. 40'W of Pershing Driv. I	e sv	11/4, NW1/4, 5	SE1/4, NE1/4			R13E	2 of 4
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks
15-	CLAYEY SILT, grayish brown, damp, soft, low plasticity, some roots.			5.0'/5.0-	15-			
16-					16—			
17-				3.0'/5.0'	17_	CSS-4		
18- - 19-	SILT, readish brown, soft, very moist, low plasticity.				18 - - - 19 -			
20-					-	CSS-3		
21-					21-			
22-		CL		4.0'/5.0'	22	CSS-5		
23-					23-			
24-					24-			
25-	SILT, brownish gray, soft, very moist, low plasticity.				25-			
26-					26- 			
28-				5.0'/5.0'	28-	CSS-6		
29					29- -			
30-	CLAYEY SAND, reddish brown, medium grained sand and clay mixture, loose, very moist, poorly graded.	SC		5.0'/5.0'	30-	CSS-7		
<u> </u>					31 -			

SCS ENGINEERS Kansas City, Missouri

Project Na	ame Public Power District - North Omaha, I	Nehi	rask	a			lect No. 8 940	37.02	Boring Nu	mber MW-9	
Boring Loo	cation Description		Boring	Location			·		Page		
W of fl Depth	y ash disp. area, 40'W of Pershing Drive	<u>- </u>	<u>SWI/</u>	4, NW1/4, 5	5E1/4, NE1/4	Depth		-13E	<u> </u>	<u>3 of 4</u>	
in			SCS	Blow		in	Sample			0	1
Feet	Description		ass.	Count	Recovery	Feet	No.	(ppm)		Remarks	
-	CLAYEY SAND, reddish brown, medium grained sand and clay mixture, loose,	///									• • • . . • • •
32-	very moist, poorly graded.	///				32-					
J2 _		///	SC								• • •
			50		5.0'/5.0'	22	CSS-7				
33-		///			5.0 / 5.0	33-	1035-7				• •
]		///				-					• •
34-	SANDY CLAY, brownish gray, very	ΪÍ				34-					
-	moist, soft, high plasticity, fine and			•.		-					
35-	medium grained sand and clay		·	an a		35-					
]	mixture,					-		ini Ngangan			·
36-						36-					÷.
~~ T						-					
37	CANDY CLAY blueigh grou with			an a		37-					
37-	SANDY CLAY, blueish gray with reddish black laminae, soft, very				5.0'/5.0'	-	CSS-8				
	moist, high plasticity, fine to very fine				5.075.0	· · · _	633-0				::
38-	sand and clay mixture, some rootlets, foul odor.					38-					
						-					
39-						39-	an a si a				
4						-					
40-						40-					1999 - 19 19 19
-						-					
41-			мн			41-					
' '-						-					
						42-					
42-					5.0'/5.0'		CSS-9			•	
					5.0 / 5.0	· · · _	633-9				
43-						43-					
- 1											
44-]						44-	$\frac{1}{2} = \frac{1}{2} $				
-			12			-					
45-						45-					•
1											. '
						46-					
46-					5 01 (5 01						1
]					5.0'/5.0'	-	CSS-10				
47-			~			47-					
			. 23			40					
48 -		Ш				48 -	<u> </u>		<u> </u>		

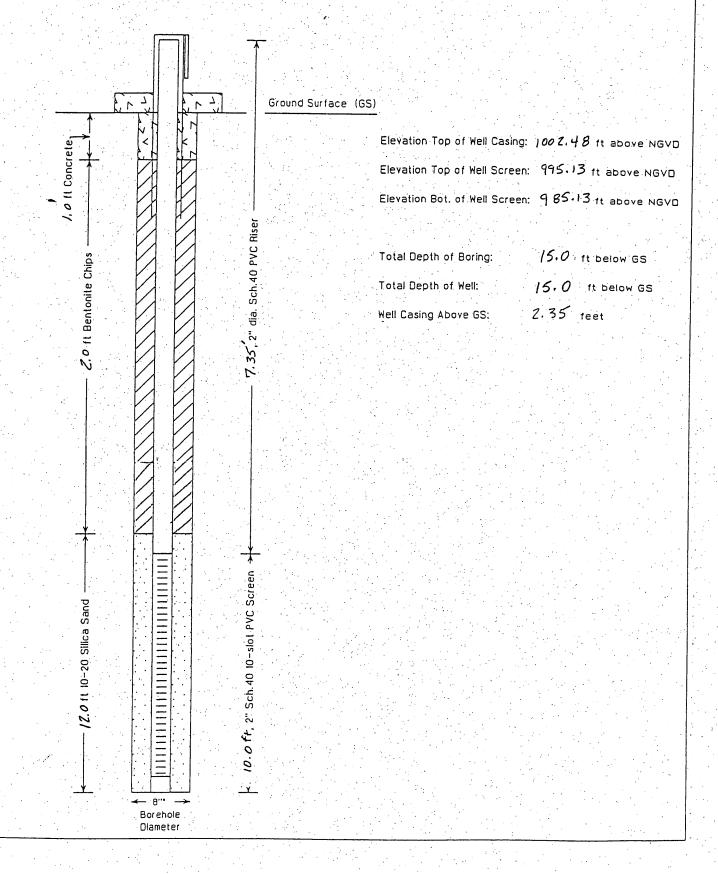
SCS ENGINEERS

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Omah	a Public Power District - North Omaha	, Nebr	Nebraska				8 940	37.02	Boring Number MW-9		
Boring Lo Woft	ocation Description fly ash disp. area, 40'W of Pershing Dri	· · · · · · · · · · · · · · · · · · ·			<u>EI/4, NEI/4</u>	500.20		-	Page		
Depth in Feet	Description	USI	cs	Blow Count	Recovery	Depth in			<u>4 of 4</u> Remarks		
49-	SANDY CLAY, blueish gray with reddish black laminae, soft, very moist, high plasticity, fine to very fine sand and clay mixture, some rootlets, foul odor.				5.0'/5.0'	49-	CSS-10				
50- 51-			мн			50					
52-					5.0'/5.0'	52-	CSS-11				
53- 54-	SAND, gray, fine grained, loose, wet, poorly graded.	· · · ·	SM			53- 54-					
55-	SANDY CLAY, gray, soft, wet, high plasticity.	M	ин			55					
56-	SAND, gray, medium grained, wet, loose, well graded.					56-					
57-	SAND, blueish gray, fine grained, loose, wet, well graded.	• • • • • • • • • • • • • • • • • • •			5.0'/5.0'	57-	:SS-12				
58- -	SAND, dark gray, medium grained, loose, wet, well graded.	• S	W			58-			Quit drilling at 6:40 pm. Will Install well tomorrow.		
59- - - -0-						59- - - 60			05/04/96 Start @ 830 am. Well installed 11:00 am.		
61 	LIMESTONE, light grey, weathered,	• • •				61					
;2- -	weak.		S			62-					
3-] -						63-					
4-	TOTAL DEPTH = 63.3 Feet					64					
65 T						65 -					

Kansas City, Missouri

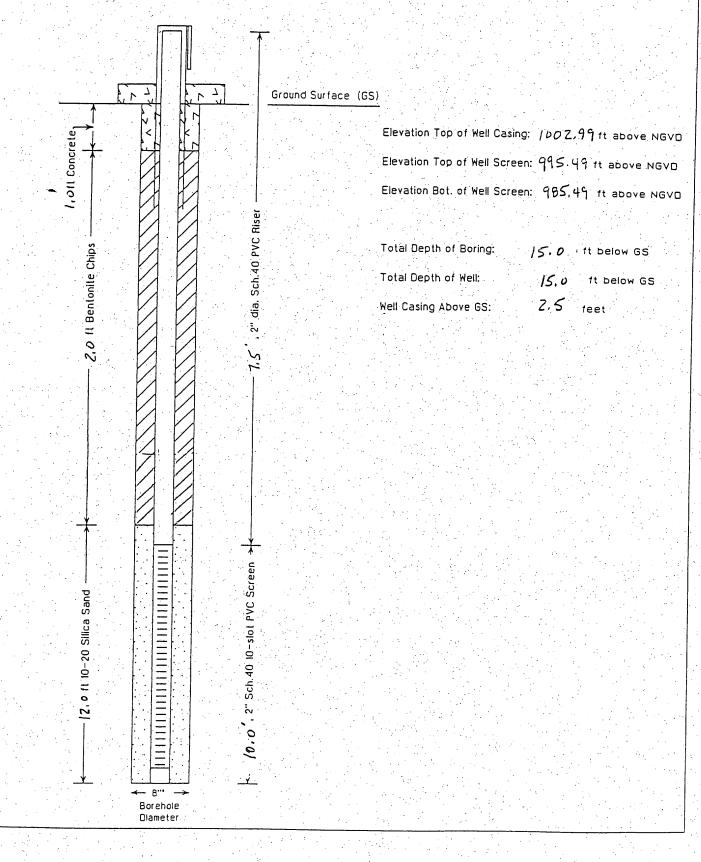
	Project Name Omaha Public Power District - North Omaha, Neb		Project Number 08 94037.02	Well Number	MW-10	
·	Approximately 20's of Bottom Ash Ponds	Location Sw14 SE14, SE14, N=14, SEC 28	TTSN. RIJE	Total Depth	(TOC) /5.0 feet	
	Joond Surface Elevation Marker in Concrete Well Pad El. 1000,13 ft above NGVD NA	Boring Location Coordinates 570970,19 N 2753290,	89 E	Date Installed		



·				LUG				· · · · · · · · · · · · · · · · · · ·	
Project Omah	Name a Public Power District — North Omaha	Nebrask	а			9403		Boring Number	MW-10
ם P ב אכ	ocation Description oximately 20'S of Bottom Ash F	Borin Borin	g Location 4, SEI 4		1/4 SE	C 28 T75	N RBE		Z
	Surface Elevation Top of Well Casing Elevation Sit above NGVD (surv.) 1002,48 it above NGVD	(surv.) 570	9 Location	Coordinates J 27532	90 89	İΕ		Total Footage	15.0 ft
	Orilling Method (s) Borehole Size	Overburden Foot		ick Footage	No. Of	Sample	s No	. Core Boxes	Depth to Water
	6 1/4" ID HSA 8"	15.0 ft	0	feet	N	one		None	See Remarks
Orilling C	o. Layne, Inc. Omaha, Nebraska		· · · ·	Oriller (s)			·.		
Orilling R	ig Acker Soilmax 80 Truck Mounted		· · · · · · · · · · · · · · · · · · ·	Type of Sampler	Split-s	Doon	· · · · ·		
Date Sta	arted 4/11/01 Date Completed	4/11/01		Field Obs	server (s)	Carme	elo Bla	zekovic	
Depth in Feet	Description	USCS Class.	Blow Count		Depth in S Feet	Sample No.	PID (ppm)	R	emarks
1- 2- 3- 5- 6- 7-	SILT, medium brown, loose, moist, non-plastic with some clay and trace fine sand (fill) SILT, medium brown, loose wet i non -plastic with some clay and trace fine sand (fill) 3" layer of black-brown sillstone material at 6.5	ML			2			wet a	F 5 F+
8- 9- 10- 11- 12- 13- 14	SILT: medium brown; loose wet, some clay and med- coarce sand (fill)	ML			8 9 10 11 12 13 14				

Project Name Project Name Project No. Bc Omaha Public Power District - North Omaha, Nebraska 08 94037.02										10
Boring Los Approx	cation Description imately Zo's of Bottom Ash Ponds	Boring Sw1/	」 Location 4、SE 1/4、S	E 1/4, NE 1/4	SEC 28	, T75N	RIJE	Page Z	ot 2	
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)		Remarks	
15-	SILT and SAND Fine, It. brown, tan, black, wet, interbeded 1" layers (fill)	ML			15-					
16-	TOTAL DEPTH 15 FF				- 16-					
17-										
18-1										
19-					19- 					
20-					20_					•
21_					21-					
22-					22-					
23-					23-					
24-					24-					
25-					25-					
26					26-					
27-					27					
28-					28-					
29-					29					
30-1					- 					
31					31 -					

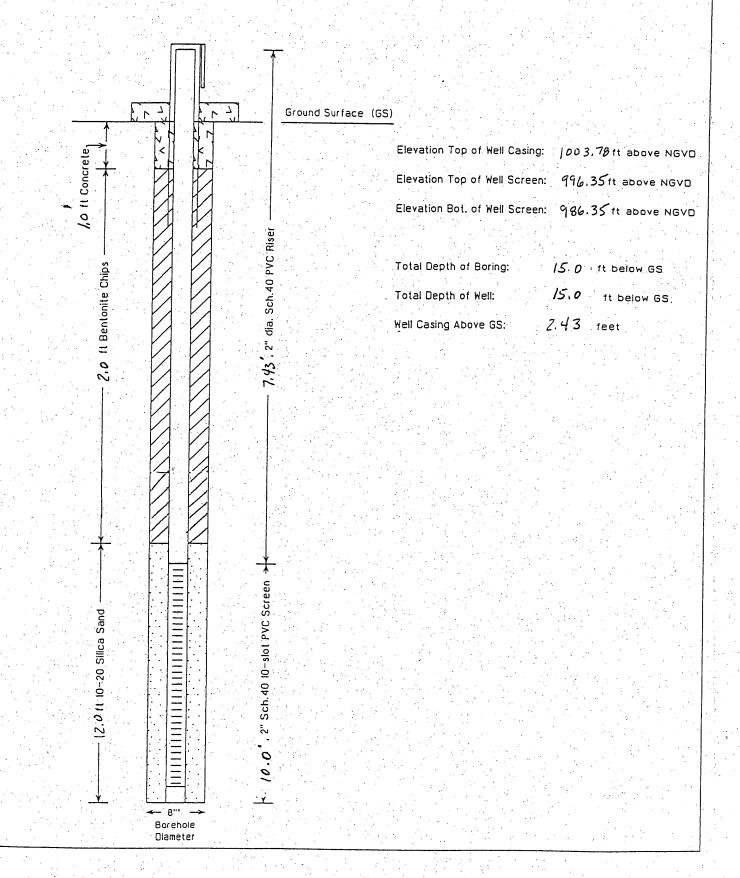
	Project Name Omaha Public Power District - North Omaha, Nebi	aska 08 94037.02	Well Number MW - 11
·		Location NW14 SW14, SE14, NE14 SEC 28 TISN RIBE	Total Depth (TOC) 15.0 feet
	Jround Surface Elevation Marker in Concrete Well Pad El. 1000-49 ft above NGVD NA	Boring Location Coordinates 571 307.49 N 275 3003.38 E	Date Installed 04/11 (01



	Public Power District - M	North Omaha					ject Num 8 940		Boring Number	MW-11
<u>.</u>	ation Description of Western Botton Ash		NW1		N4, NE 1/4, SE		15N, R	13E	Page 1 of	Z
1000.4911	above NGVD (surv.) 1002.99	I Casing Elevation	(surv.) 57	1307.49		3003.	38 E		Total Footage	15.0 ft
			Overburden Fool		ock Footage	· · · ·	Of Sample	es N	o. Core Boxes	Depth to Wate
	6 I/4" ID HSA	8"	15.0ft	(2 f+		None		None	See Remark
	Layne, Inc. Omaha, Nebras					s) Lyle				
	Acker Soilmax 80 Truck Mo	·····	a a lula		· · · · · · · · · · · · · · · · · · ·	Split-				
Depth			04/11/01		Field Of	1	s) carn		izekovic	
in Feet	Description		USCS Class.	Blow Count	Recovery		Sample No	PID (ppm)	Re	marks
	- SILT, medium br	own,					an tha an			
1-	medium to loose,	moist				1-1-				
	non-plastic, wit									
2-	clay (Fill)		1			2-				
ļ			ML							
3-						3_				
										`
4-		n de la service de la service Esta de la service de la service La service de la service de la service				4-				
						_				
5-]-						5-			wet a	5'
	SILT, light gray,					-		,		
6-	brown, loose, we					6				
	plastic, 1 inch lay									
	with some fin	e sana	ML			/				
8-						- 8-				
9_						9-1				
						1				
10-						10-				
	SILT, brown, loos	e, wet.				-				
. 11-	some medium - Coa					11				
	sand (fill)		ML							
12-						12				
										•
,3-						13-				
						-				
14 -						14 -				

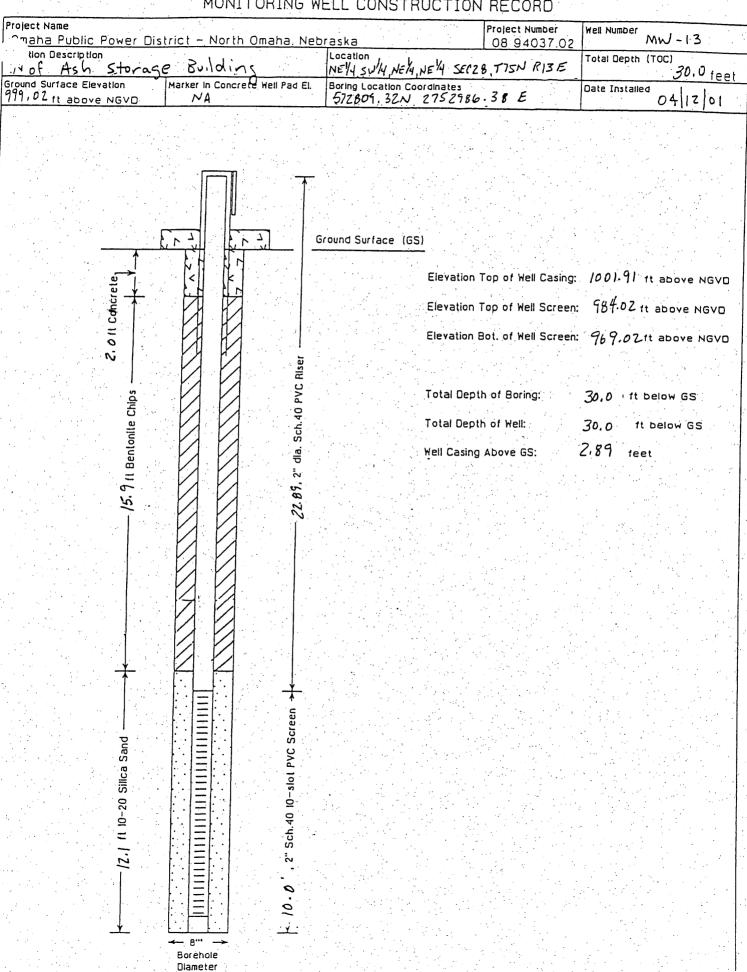
Project N	łame			<u> </u>	Pro	lect No.		Boring Number	4.1.1
	<u>ə Public Power District - North On</u> Dicatlon Description of Western Bottom Asb Pond	d Bori	ka ng Location 14 cially 44	1/4 ,NE1/4 , SE	028.TT	8 9403	37.02 3E	Page 1	MW-11 f 2
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth In	Sample No.	PID (ppm)		emarks
15-	SAND dark brown, wet w silt (fill)	sm			15				
16-	TOTAL DEPTH 15 ft				- 16-				
17-					- - 17				
18-					18 -				
19-					19 19 1				
20-					20-				
21-					21-				
23-					22-				
24-					24-				
25-					25				
26-					- 26				
27-					27				
28-					28				
29- 30-					29				
30-					30				

Project Name Omaha Public Power District - North Omaha, Net	praska Project Number 08 94037.02	Well Number MW-12
East of Eastern Bottom Ash Pond	NW14, SEX, NEX SEZB, TTSN RIJE	Total Depth (TOC) /5.0 feet
Jround Surface Elevation Marker in Concrete Well Pad El.	Boring Location Coordinates 571336,55N 2753458 40 E	



Project N Omaha	Name a Public Power District			•	ING			1	ect Num 8 940		Boring Number	MW-12
F :010	ocation Description of Eastern Bottor		5	Boring	Location	ε%.	I. SEC Z				Rase	f Z
Ground S	Urface Elevation	of Well Casing Elevations 3.78 It above NGVD		loring	Location (Coo	rdinates				Total Footage	15.0ft
	Drilling Method (s)	Borehole Size	Overburden	Footag			Footage		01 Sampl		lo. Core Boxes	Depth to Water
× .	6 1/4" ID HSA	8"	15.0	++		0	f+		None		None	See Remarks
	b. Layne, Inc. Omaha, Net		· · · · · · · · · · · · · · · · · · ·		·				Porter			
	g Acker Soilmax 80 Truck					. 1	Type of Sampler					
	rted 04/11/61	Date Completed	04[n	01			Field Ob		s) Carn T	nelo Bl	azekovic	····
Depth in Feet	Descript	ion	US(Clas		Blow Count	Re	covery	Depth in Feet	Sample No.	PID (ppm)	Re	emarks
1	SANDY SILT, loose, moist, mostly cinders	with minor clau and coal	1,									
2	particles wit	ט <i>א</i> וו (די די)						2				
4 5 5								4- - - - 5-			WET 0	₹ + 5 fi .
، 0 د 1111 د	SANDY SILT, do loose, wet, with mostly cinders particles with	h minor clay, and coal	•					5				
/ - - 8 -	6 inch layer of grey brown at	f clayey silt,						/ 				
9- 10-								9- - - - 10-				
11- 11- 12-	SILT, brownish wet, with some minor coarse	: clay and						11- 11- 12-				
13- 14 -								13 13 14				

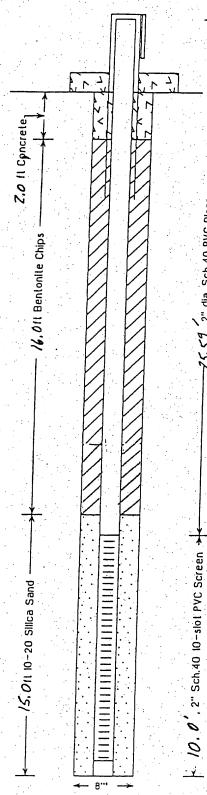
Project Name Omaha Public Power District - North Omaha, Nebraska MW-12										
Declar Las	of Eastern Bottom Ash Pond			e 1/4, NE 1/4	SEC ZE	3, T75N,	RIJE	Pagé Z	ofZ	
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	T	PID (ppm)		Remarks	
15-	SILT, brownish grey, loose, net with some clay and minor coarse sand (fill)				15-					
16	Total DEPTH 15 ft				- 16					
17 -					- 17					
18-					- - 18					
19-					- 19					
20-					20-					
21-					21					
22-					22					
23-					23-					
24-					24					
25-					25					
26-					26					
27-					27-					
28-					28-					
29-					29_					
30-					30					
317			*		31 -					



	Namo							10-			In sets a blue			
oject)r	Public Power Distric	t - North Omal	na, Net	braska					plect Num 18 940		Boring Nu	moer .	MW - 1	3
		Building			sw'l4,	NE		SEC Z	8,T751	,RI3E	Page	of	2	
	Surface Elevation Top It above NGVD (surv.) 100	ot Well Casing Eleva 27.91 It above NGV	tion /D (surv	Boring L	ocation	C00 Z A	rdinates 2752	.986 .	38.E		Total Foo	tage	30.0-	fł
	Drilling Method (s)	Borehole Size		ien Footage			Footage	1	Of Sampli		to. Core Bo	xes	Depth t	o Water
	6 1/4" ID HSA	8"	30	o ft		0 1	² †		None		None		See Re	emarks -
IIIng C	o. Layne, Inc, Omaha, Ne	ebraska	· .	• • •			Oriller (s)	Lyle	Porter				•	
illing Ri	g Acker Soilmax 80 Truc	k Mounted					Type of Sampler	Split-	spoon			1	······	
te Sta	rted 04/12 01	Date Completed	04/1	201			Field Obs	server (s) Carm	ielo Bl	azekovic	•	· · ·	
epth						<u> </u>		Depth				- 	·	
in Feet	Descrip	tion			Blow Count	Re	covery	in Feet	Sample No.	PID (ppm)		Rer	narks	
-	SILT, medium t	nun soft.	M					-						
1-	moist, non plas							1-						
-	minor clay and		N		•	- * s		-				· ·		
2-	(q						2_				·		
31								3_						
Ĭ														
् ।						· .	•	4-						
						• - 2 • 2						•		
5-								5-		· · · · ·		tan er		
		- 14	ML			• •								
6-	SILT, blueich g	1		· .				6-					· · · · · ·	
	nonplastic mon sand and some					•••								
7	sand when some	5115 (+11)				·		7		· · .				
								1		•				
- 8						• •		8-						
9-						•		9-						
						-							· · · · ·	
10-						• • • •		10						
	SILT, greenish Sr	ay, soft.	ML											
11-1	non plastic, mois					÷				n in the Fritter Alter				
	minor sand and											· · · · · · · · · · · · · · · · · · ·		
12-1														
17-1								12					1	
13-								13-				• •		
14						. •		14				А. 4		
<u> </u>				<u>· [· · · ·</u>	<u> </u>			14	<u> </u>					

	Name Na Public Power District - North Omaha,	Nebrask	. P.		Pro	ect No.		Boring Number MW-13
	ocation Description of Ash Storage Building	Borin	o Location 14,5 w ¹¹ 4,	NE ^V 4, NE				Page ZofZ
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks
15-					15-			
16-	CLAYEY SILT, light brown, soft, very moist low	ML			- - -			
	plasticity, trace fine sand				16 			
17-					17			
18-		en la			- 18			
19					19-			
20-					20			
- 21-	SAND. fine-nedium, grey black, well graded, wet,	SW			21-			WET AT ZO FF.
	with minor silt							
22-					22			
23-					23-			
24-					24			
25-					25-			
26-								
					26-			
27-					27-			
28-					28-			
29-]-					29			
- - 		NL						
<u>31 -</u>	TOTAL DEPTH 30,0 ft				30			
					31 -			

Project Name <u>Omaha Public Power District - North Omaha, Neb</u>	raska 08 94037.02	Well Number NW-14
W of Gal File	NEW SWITH NE 4, NEW SEC ZB, TTSN, RISE	Total Depth (TOC) 35.0feet
Ground Surface Elevation Marker in Concrete Well Pad El. 1004.85 It above NGVD NA	Boring Location Coordinates 572277、うらい 2753149.82 E	



Ground	Surface	(GS)
	-	

25.57 , 2" dia. Sch.40 PVC Riser

Elevation Top of Well Casing: 1007.44 It above NGVD Elevation Top of Well Screen: 981.85 It above NGVD Elevation Bot. of Well Screen: 971. 85 It above NGVD

Total Depth of Boring:	35.0	ft below GS
Total Depth of Well:	33.0	1t below GS
Well Casing Above GS:	2.59	feet

Borehole Dlameter

•,							•					
<u>ب</u> ۱			DF	RILL	ING	LOG	;					
bject N	ame Public Power District	- North Oma		brask		<u></u>		08 940		Boring Numb	per MW-14	
	cation Description.		10, 110	Borin	a Location	NEYA JEY	1			Page 1	of 3	
	urface Elevation Top	of Well Casing Eleva	tion	Borin	NEV4 SWHANEY4 NE4 S					Total Footage 35.0 ft		
24.85	It above NGVD (surv.) /00 Drilling Method (s)	7. 4 9 It above NG		rden Fool		ock Footage		No. 01 Samples		o. Core Boxe		
	6 1/4" ID HSA	8"	35	5.0 ft	-	o f+		None		None	See Remarks	
IIIng Co	o. Layne, Inc, Omaha, Ne	braska	· .	· · .		Driller (s) Lyi	e Porter				
lling Rig	g Acker Soilmax 80 Truc	k Mounted				Type o Sample	f Split	-spoon	÷.,			
te Star	ted 04/12/01	Date Completed		+/-12	01	Field O	bserve	r(s) Carm	nelo Bla	zekovic		
epth in Feet	Descrip	lion		USCS Class.	Blow Count	Recovery	Dept in Fee	Sample	P10 (ppm)		Remarks	
1 1 2 3 7 5 6 7 8	- SILT, medium Non plushic will and gravel (f SILT, light t with fly ash	th minor clu nll) prown - tan	1				-1 2- 3- 4- 5- 6- 7- 8-					
9 10 11 11 13 13 14	SILT, blueish gr moist, with m and silt (fi	inor sand	6				9- 10- 11- 12- 13-					

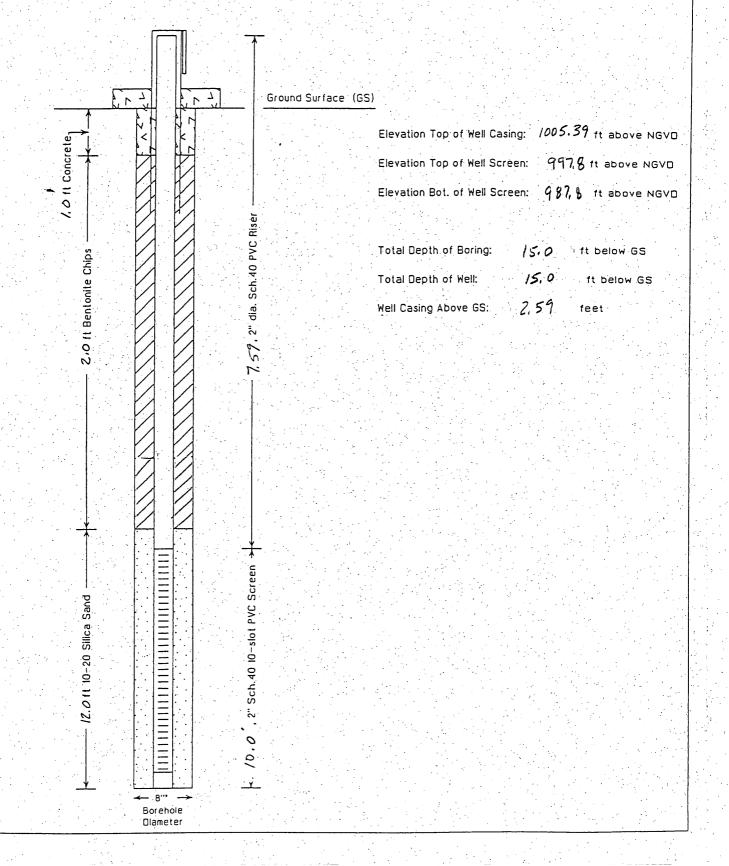
	a Public Power District - North Omaha,	37.02	Boring Number MW-14						
Jring L	of Coal Rile	Borin NE 14	g Location Swly, yEly	ε	Page 2 of 3				
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks	
15-			u		- - - 15				
	SILT. light brown - tan								
16-	-				16-				
17 -	gravel and some fine sand (fill)				- 17				
18-					- 				
19-	SILT, black, wet with some coal particles				19			WET AT 19 ft	
20-					20-				
21-	SILTY CLAY, Srey-tan mothed stiff moist				21-				
22-					22				
23-					23-				
24-					24-				
25	SILTY CLAY, grey-tan-black layered very moist				25				
26-					26-				
27					27_				
28-	SAND, fine grey-yelling. brown wet. dense, with some			2	28-				
29-	<il></il>			2	29				
- - - - -				3					
317					31 -				

•											
Drilling Log, continued Prr Name C Ia Public Power District - North Omaha, Nebraska Project No. 08 94037.02 Boring Number MW - 14											4
Boring Loc	Eatlon Description + Coal Pite	Barin	0 1 00 000	- Ху нс Уу							
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in	Sample No.	PID (ppm)			marks	
32-	SAND, fine grey-yellow -brown wet, dense, with some				32-						
33-	silt				- 33- -						
34-					34						
35	TOTAL DEPTH 35.0 ft				35-						
36-					36-						
37-					37-						
38-					38-						
39-					39						
40-					40-						
41-					41						
43-					43-						
44					44						
45-					45-						
4					46						
47-					47-						
48]					⊿я 7						

· · · · ·

MONITORING WELL CONSTRUCTION RECORD.

Project Name Omaha Public Power District - North Omaha, Neb		Project Number 08 94037.02	Well Number MW-15
sw of Coal Pile W of aringse	Location NEA, NWA, SEA, NEASER	28, TTSN RIJE	Total Depth (TOC) /5,0 feet
Ground Surface Elevation Marker in Concrete Well Pad El.	Boring Location Coordinates らフリワイフ、 86 ~ 2753		Date Installed



F

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DRILLING LOG

<i>4</i>		DRIFL	-TING	LUG			· .		
Project Name Omaha Public Power Distric	t – North Omahi	a. Nebrask	а			ect Number		Boring Number	MW-15
J of coal pile, Wof		Borin	a Location	14, NE /4	SEC 28	TISN, R	BE	Page o	f.Z
Ground Surface Elevation Tor	o of Well Casing Elevati 05.39 ft above NGV[on Borin) (surv.) 57	g Location (1747. 86	Coordinates $N 275$	3131.9	91 E		Total Footage	15.0 ft
Drilling Method (s)	Borehole Size	Overburden Fool		ck Footage	No. O	f Samples	No	o. Core Boxes	Depth to Water
6 1/4" ID HSA	8"	15.0 ft		0 ft	<u>.</u>	lone		None	See Remarks
Drilling Co. Layne, Inc, Omana, N	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·) Lyle F				
Drilling Rig Acker Soilmax 80 Tru					Split-s				· · · · · · · · · · · · · · · · · · ·
Date Started 04/16/01	Date Completed	04/16/	0/	Field Ob) Carme		zekovic	
Depth in Feet Descri	ption	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	R	emarks
- GRHVEL		_ GP			-				
1- SANDY SILT. loose, moist	- ·	ML		9					
	a few grains				2_				
of coal (fill	5								
3-]					3-				
4-					4				
- 5					- 5				
and a state of the second s	, light grey,	ML			Ĭ			wet at	5 ft.
6- wet, ash w	0 0				6-				
and a few c									
7- Coal (fill)	•				7-				
					-				
8-					8-				
							· · ·		
9-					9-				
10-					10-				
					11-1				
12-					12-				
					-				
13-					13-				
					-		а 20		
14 -					14 -				

Destast b	Drillin		Jy, L	Until					
Project N Omaha	a Public Power District – North Omaha,	Nebrask	8			lect No. <u>8 940</u> 3	37.02	Boring Number MW-15	
Boring Lo جرک	of Coal pile, wot drainage	Borin NE 1/4	g Location {,バジリイ, SE	14, NE 4 5	5EC 28, 7	175N,1	RIJE	Page Zot Z	
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks	
15-	SANDY SILT, light grey, loose, wet, ash with cinders and a few grains of coal (fill)	ML			15-				
16	TOTAL DEPTH 15.0 ft				- 16				
17 - - - 18 -					17				
19-					18				
20-					20				
21-					21-				
22- 23-					22-				
24-					24				
25-					25-				
26-					26-				
27- 28-					27				

29-

30-

31

illin

tz

29-

30

31-

DRILLING LOG

ect Na	ame Public Power District	- North Omah	a Ne	braska			Pro	lect Numh	er	Boring Numbe	" MW-16
rii -	ation Description of Coal Pile		,	Borina	Location	EY4 NEY	SEC ZE	K. T 75N.	RIJE	Page 1	of 3
and Su	rtace Elevation Top	of Well Casing Eleva 4 1 It above NGV	tion	Boring	Location C	oordinates		:		Total Footag	^e 35.0 ft
12.41	t above NGVD (surv.) /007 Drilling Method (s)	Borehole Size		den Foolag		k Footage)1 Sample	s No	. Core Boxes	Depth to Water
	6 1/4" ID HSA	8"	35	:0 f+	0	f+		None		None	See Remarks
iling Co.	. Layne, Inc, Omana, Ne	braska	•					Porter			
ing Rig	Acker Soilmax 80 Truc	k Mounted	· · ·			Type of Sampler	Split-		· · ·	· · · ·	
ite Star	ted 09/09/02	Date Completed	09	/09/	02	Field Ot	server (s) Iin	<u>Kra</u>	jicEK,	Tom Cole
epth in eet	Descript	tion		JSCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)		Remarks
1- 1- 2-	- SILT, light-n non pluthe will (fill)	1edium brou Lh fly Ash	M				1- 2-				
3-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1							3-				
5-							4-				
6- 	SILF, light L with fly ash	(6:11)	Y				6-				
8-1-8							8-				
9-1	1-2ft Coal moist, non P	l dust par lastic		5			9				
11- 12-	SILT, brownighg moist, with and silt (f	ninor sand	i i				11-				
13- 13- 14-							13-				

•	Drillin	g Lo	og, c	ontir	nue	L	
Project N Omaha	lame 9 Public Power District — North Omaha,	Nebrask	Э		· Pro	lect No.	Boring Number MW-16
Boring Lo	of Coal RIC	Derie	a Laantiaa	HEN SEC	ZB T75	NRIBE	Page 2 of 3
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in	Sample PID No. (ppm) Remarks
15-	sedimented - stratified (fill)				- 15		
16- -	SILT. light brown - tan somewhat plastic, wet with gravel and some fine sand (fill)				16-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-		wet at 16 ft
17 - 18 -	sand (fill)				17 - - - 18 -		
19- -					.0 19-		
20-	SILTY CLAY, blue ish tan				20-		
21- 22-	mothed stift moist				21 22		
23-					23-		
24-					24-		
25 26	SILTY CLAY, grey-tan-black layered very moist				25- 		
27_					27-		
28-	SAND, fine grey-yellow brown wet dense, with some silt				28-		
30-					30-		
31 -					- 31 -		

Drillina Loa. co ntinued

17 A. 19

2.845

All the s

1.200

2.4

1.1

Drilling Log, continued

rolect N Omaha	ame Public Power District - North Omaha, N	Vebrask	a		Pro.	lect No.		Boring		M	w - 1	6	
	cation Description F Coal Pite	NEW	Smild Na	Yy NE Yy			R13E	raye	3 0	sf. 3		• • •	
depth in Feet	Description	USCS Class.	Blow Count	Recovery		Sample No.	PID (ppm)			Remar	ks		
32-	SANTS, fine grey-yellow -brown wet, dense, with some				32-								-
33-	silt				33-								
34-					34-								
35-		•			35-								
36-	TOTAL DEPTH 35.0 ft				36-								
37-					37-								
9-					38-								
39-					39-								
40-					40-								
41-					41-								
42-					42-								
43-					43-								
44-					44-								
45					45-								
46-					46-								
► 47- 48					47-								

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	Phone (402)471-2363 DEPARTMEN WAT		-145975 - WWRf (2) of Natural Resources January 2004 DNR Form 145
	10.00		
	Registration Date <u>10-20-2004</u> Sequence Owner Code No. <u>#03216</u> Receipt	xe No. <u>143975</u> Regi No. <u>8/14944</u> 22	stration No. <u>1-130329</u> Loin Musauri Music
1.	 a. Well Owner's First Name b. Company Name <u>Omaba</u> Public Power District c. Correspondent Name James Kisjack Address 444 South 16th Street Mall 	Last Name	
2.	a. Contractor's License No 39266. Contractor		
	Contractor's Email Address <u>1072(a)Laynechrister</u> b. Drilling Firm Name Layne Western Address 4601 North 252 <u>nd Street</u> City Valley <u>Sta</u>	· · · ·	 Telephone 402-359-2042
	Drilling Firm's Email Address		
3.	 a. Well location <u>NE</u> % of the <u>NE</u> % of Section 2 b. Natural Resources District Papio-Missouri River c. The well is <u>9805</u> feet from the (<u>NE</u> or Latitude Degree <u>41</u> Minute <u>19</u> Longitude Degree <u>95</u> Minute <u>56</u> d. Street address and subdivision, if applicable 7475 Block c. Location of water use, if applicable (give legal de f. If for irrigation, the land to be irrigated is 	Natural Resource District S) section line and 710 W cle one) Second 58.00 Second 59.00 Pershing Drive, Omaha NE Lot	
	g. Well reference letter(s), if applicable MW-16	HHSS PWSID	
4,	Permits Management Area Permit Number Geothermal Permit Number Municipal Permit Number Well Spacing Permit Number HHSS	Industrial Permit Number Transfer Out-Of-State Pe Conduct Permit Number	rmit Number
5.		Groundwater Source Heat Pump	Dewatering (over 90 days) Irrigation Injection r Supply (with spacing (46-638)) (indicate use)
6.	 Wells in a Series. a. Is this well a part of a series? Yes go to part b. If one or more of the wells in the series is currentl c. How many wells in the series are you registering 	ly registered, give the well registratio	urt 7 of this application on number
7.	 Replacement and abandoned well information. a. Is this well a replacement well? Yes No b. Registration number of abandoned well c. Replacement well is 1,150 feet from abando c. Original well pump column size 2 ir g. Location of water use of abandoned well Coal co 	If not registered, date abando ned well. d. Abandoned well las nehes. f. Completion of origi	nal well abandonment on $\lim_{m} 9 = I_{(0)} 9 = I_{(0)} 2002$

							H	20229
							<u>×/</u> -`	130321
8. Pump Informa								
		t this time 📘						
						f by contractor in	section 27	YesNo
		mp installer, pl						
		mail Address						
		irm Name						
Pump Ins	aller's Pi	irm Address						
				Z.ip		166	epnone	
Pump Ins	aner's Fi	irm Email Addı	CSS			1		
e. Pumping	ate	gano	ns per minule	[] Me	easured	I Astimated	Fa	
		r					те	et
		it installed (m)_			. Pump Brand			
	_		ted to pump le	ss than 50 gpn	n 🛄 Yes 🕅			
9. Well Constructi								
			feet.		b. Static wate		feet.	
c. Pumping w	ater leve		feet	/ 2002	d. Well Const	ruction began (mo	nt <u>h) 9 /(d</u>	$\frac{1}{100} \frac{9}{100} \frac{1}{100} \frac{1}$
c. Well Cons	ruction c	completed _(month)	9 / _(day) 9 	/ _{(vear} 2002)	i. Bote hole d	liameter in inches	: Top <u>8.00</u>	Bottom 0.00
g. Casing and	Screen	ontes are were		100 1	imeaded <u></u>	Othe		
0. Well Construct	on (Casi	ng & Screen)- (. d. c. & g mca	asurements she	ould be in inche	s to three decimal	places	
a		b	c	d	c	ſ	<u>e</u>	h
Placement		Casing or	Inside	Outside	Wall	Screen Slot	Type of	Trade Name
Depth in Fe		Screen	Diameter	Diameter	Thickness	Size	Material	i i i i i i i i i i i i i i i i i i i
-	1	acreen	inameter	Diameter	THERICAS	3170	Materia	
rom To								
0.0 25.0			1					
		Casing	2.067	2.375	0.154		PVC	Monoflex
· · · · · · · · · · · ·		Casing Screen	2.0 <u>67</u> 20.067	2.375 2.375	0.154	0.010	PVC PVC	Monoflex Monoflex
· · · · · · · · · · · ·						0.010		
						0.010		
						0.010		
5.0 35.0	et Pack					0.010		
5.0 35.0 1. Grout and Grav		Sereen	20.067	2.375			PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement	Depth ir	Sereen	20.067	2.375				Monoflex
5.0 35.0 1. Grout and Grav Placement		Sereen	20.067	2.375			PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement Tom	Depth ir	Sereen	20.067	2.375		Mater	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement 10m 0	Depth ir	Sereen	20.067	2.375	0.154	Mater	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement from 0 0	Depth in To 4.0	Screen	20.067 Grav Grav Grout Grout	2.375	0.154	Mater out	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement from 0 0	Depth in 10 4.0 23.0	Screen	20.067 Grav Grav Grout	2.375	0.154 Cement Gro Bentonite C	Mater out	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement from 0 0	Depth in 10 4.0 23.0	Screen	20.067 Grav Grav Grout Grout	2.375	0.154 Cement Gro Bentonite C	Mater out	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement 1000 0 3.0	Depth ir 10 4.0 23.0 35.0	Sercen	20.067 Grav Grav Grout Grout	2.375	0.154 Cement Gro Bentonite C	Mater out	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement from 0 0 3.0 2. Geologic	Depth ir 10 4.0 23.0 35.0	Sereen Feet Logged	20.067 Grav Grav Grout Grout	2.375	0.154 Cement Gro Bentonite C Gravel Pack	Mater but htps (20-40)	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement from 0 0 3.0 2. Geologic	Depth ir 10 4.0 23.0 35.0	Sercen	20.067 Grav Grav Grout Grout	2.375	0.154 Cement Gro Bentonite C Gravel Pack	Mater but htps ((20-40) De	PVC	Monoflex
5.0 35.0 1. Grout and Grav Placement Torn 0 0 3.0 2. Geologic Depth in Feet rom To	Depth ir To 4.0 23.0 35.0 Materials	Sereen Feet Logged Description	20.067 Grav Grout Grout Gravel Pack	2.375	0.154 Cement Gro Bentonite C Gravel Pack Depth in Feet From T	Mater but https (20-40) De	PVC	Monoflex
25.0 35.0 1. Grout and Grav Placement from 0 0 3.0 2. Geologic Depth in Feet from To .0 5.0	Depth ir To 4.0 23.0 35.0 Materials	Sereen 	20.067 Gr Grav Grout Grout Gravel Pack	2.375	0.154 Cement Gro Bentonite C Gravel Pack	Mater htps (20-40) De o silty ctay, 1	PVC	Monoflex Monoflex
25.0 35.0 11. Grout and Grav Placement form 0 .0 3.0 2. Geologic Depth in Feet from To 0.0 5.0 .0 10.0	Depth ir To 4.0 23.0 35.0 Materials It, Fight	Sereen Feet Logged Description	20.067 Gravel Gravel Gravel Pack n, flyash fill on plastic as	2.375	0.154 Cement Gro Bentonite C Gravel Pack Depth in Feet From T 20.0 2.5.	Mater <u>https</u> (20-40) De o 0 silty clay, <u>1</u> 0 silty clay, <u>1</u>	PVC jal Description scription pluish tan mo	Monoflex

(Additional sheets may be submitted)

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

Water Well Contractor's Signature

Date

Well Owner's Signature if Contractor is unknown or Deceased

10/12/04 Date

-	LOG OF WEL					1					Pa	ige 1 d	of 2
CLI	ENT OPPD	Proj	ject	Mana	iger	6		Mike	Reif				
SIT		PR	OJE	CT									
	Omaha, Nebraska	ļ			r	N		Oma PLES	ha St	ation	TES	TS	
		WEL	,			-1	SAM	PLES					
GRAPHIC LOG	DESCRIPTION BOREHOLE DIA.: 8.25 in WELL DIA.: 2 in	DETA		DEPTH, ft.	USCS SYMBOL	3ER		RECOVERY, in.	SPT - N ** BLOWS / ft.	WATER CONTENT, %	FIELD VAPOR TEST (PPM)*	SAMPLE SENT TO LAB	
4 A	CASING AND SCREEN: PVC (sch. 40); 0.01 slotted screen TOP OF CASING: 1002.54 ft	1		EPT	SCS	NUMBER	TYPE	Ŭ Ŭ IJ		LAN CON		Mgo	
В	GROUND SURFACE ELEV.: 999.0 T		k	<u> </u>	2	z	⊢ HS	<u>ur</u>	0) [[]	30		07F	
	Coal dust at surface <u>LEAN CLAY</u> , trace sand Light brown			-	-	1	SS	22	6		ND		
	3.7 99	6		-									
	LEAN CLAY			-	1								
	Brown 2 inches of sandy lean clay at 4.5 feet			-	1				-	8			
	2 linches of sandy identicity at the rest			5-	1		HS			-			3
				-									
	Light brown-light gray, very soft, mottled, wet with ferrous stains from 7 to 13.5 feet				_								
					_	2	SS	16	1		ND		
									e -				
				10-	+		HS						
GDT SHTIOT	Light brown, moist with ferrous stains 13.5 to 14.5 feet				-	3	SS	5 20	7		NC		
RACON.	14.5 feet	85			_						1		
Ē	LEAN CLAY with very fine sand	<u>etresi</u>		- 15		\top	H	5					
S.CP	Brown-gray Moist	2.0											
50	Continued Next Page												
	he stratification lines represent the approximate boundaries etween soil and rock types: in-situ, the transition may be gradual.				* NE	indic f one	ates a (1) pa	readi rt per	ng of le million	ss than (ppm) i	the fiel	d detec ane equ	tion lim ivalents
H	etween soil and rock types: In-situ, the transition may be greater	-	-	-		a citizen a			TART	10 State 1			10:2
Š	VATER LEVEL OBSERVATIONS, ft								OMPI) 5	-10-07	14:3
2704							RIG		CME		RILLE		В
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CL	LOG OF V		Projec								F	age 2	2 0
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SIT			PROJ	ECT		_	_			-			
	Omaha, Nebraska					1	Nort	h Om	aha S	tation			
					Γ			MPLE				STS	
C	DESCRIPTION		WELL DETAIL					17				1	Γ
P	DESCRIPTION				BOL			.c.		2	۴.	E I	
GRAPHIC LOG		-		ц.	SYMBOL	æ		Ϊ̈́Υ	: 4	E	PM)	S	
RAP				DEPTH, ft.	SSS	ABE	ш	N N	N S	既町	>₫	ABL	ł
0				DE	USCS.	NUMBER	туре	RECOVERY, in.	SPT - N ** BLOWS / ft.	WATER CONTENT, %	FIELD VAPOR TEST (PPM)*	SAMPLE SENT TO LAB	
												54	_
		1									-		
	18 SILTY VERY FINE SAND, trace clay	981.5											
	Light grav			_		4	SS	18	3		ND		
	Soft, wet, ferrous stains, and trace roots												
		ŀ	-										
				20-									
	20.75	979	目		-1		HS						
	LEAN CLAY Dark gray-brown			_									
	Moist with organics and ferrous stains	ľ		_									
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		.											
4	23.25 9	76.5		-		5	ss	10					·
	SILTY VERY FINE SAND with clay Light gray-light brown			-		5	20	18	11		ND		
	Wet, ferrous stains			-									
2	59	74.5	目	-									
	SANDY LEAN CLAY		目	25			HS						_
	Light gray Wet, trace roots, trace magnesium staining	÷	目	-									
	the second starting		目	-						1			
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1			目										
/30	BOTTOM OF BORING	9.5	EI.	30									
	Note: Soil classifications were based on								T				2
	visual observations made by the field crew.												
							-						
e str	atification lines represent the approximate boundaries												1
twee	in soil and rock types: in-situ, the transition may be gradual.			* ND	indic fone	ates (1) pa	a read	ling of	less that n (ppm)	an the fi	eld det	ection	im
ATE	ER LEVEL OBSERVATIONS, ft							STAF					
- 1	18 WD 🗸										5-10-		-
Ţ						the second second	ING (PLETE		5-10-(07 14:	30
-			بالمع الم			RIG		CM	E 75	DRILLE	R		BC
<u> </u>					L	OGG	ED		KAC	JOB #	- 04	0270	A .

Mail to Department of Natural Resources PO Box 94676 Lincoln, NE 68509-4676 Phone (402)471-2363

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STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

	iled <u>12507</u> Owner Code No. 52007 - 185056 - WWR		R2187	Registration No	6-145150 PMR	NRD
	Well Owner's First Name Company NameOmaha Public Power Distr		Last Name			
b.	Attention NameJim Krajicek					
c.	Address 444 South 16th Street Mall					
	City_Omaha	_State_NE	Zip68102	2Tele	ephone 402-636-230	9
2. a.	Contractor's License No_39325 Contra	ctor's Name				
	Contractor's Email Addresslebazer@terrad					
b.	Drilling Firm Name Terracon Consultants,	Inc.				
	Address 2211 South 156th Circle		(0120	2507	102.220.2202	
	City Omaha		Zip68130-	-2506Tele	ephone_402-330-2202	
	Drilling Firm's Email Address_lebazer@ter					
3. a.	Well location <u>NE</u> ¹ / ₄ of the <u>NE</u> ¹ / ₄ of Section Natural Resources District <u>Papio-Missouri</u>				W, Douglas	County.
b.						
c.	The well is $\sim 1,380$ feet from the (N OR Latitude Degree Minute				om the (E - w -) s	ection line
	Longitude Degree Minute					
d.	Street address and subdivision, if applicable					
	Block					
e.	Location of water use (give legal description					
f.	If for irrigation, the land to be irrigated is					
g.	Well reference letter(s), if applicable <u>MW-1</u>	17	HHSS P	WSID		
4. Perr Mar	nits nagement Area Permit Number			Permit Number it Number		
Geo	thermal Permit Number		Transfer Out-O	f-State Permit Num	ber	
	nicipal Permit Number l Spacing Permit Number					
HH	SS		NDEQ			
5. Pur	pose of well (indicate one) Aquacult Domestic Ground Heat Exchange Livestock Monitoring Public Water Supply (without spacing) Record	r Groun		eat Pump	Dewatering (over 90 d Irrigation with spacing (46-638))	ays)
6. We a. b. c.	Ils in a Series. Is this well a part of a series? Yes go to If one or more of the wells in the series is cur How many wells in the series are you registe	rently register	ed, give all well	lo go to part 7 of thi registration number		

July 2006 DNR Form 145

7. Replacement and decommissioned/modified well information.											
a. Is the b. Reg c. Orig	his well a repla gistration numb ginal well last o	cement well?	Yes N ell/(d)/(y)	lo go to part 8 If n d.	ot registered, da Replacement wo	te original well well well is f	eet from origin	(m)/(d/(y) nal well.			
	Select One:	use of original v	well								
		wall docommi	acionad an	1 1	OR						
3.	 I hereby certify that the original water well will be modified and equipped to pump 50 gallons per minute or less within 180 days after such construction of the replacement water well. It will be used for one of the following: a. Livestock b. Monitoring c. Observation d. nonconsumptive or de minimus use approved by the applicable natural resources district. State use: 										
	If 3d is choser	n. NRD signatur	e is required.								
. —	-	re				e	OR				
4.	Decommission	Modification (Certification for	rm is submitte	ed by landowner						
a. Is p Is pump If pump b. Pun Pun Pun City Pun c. Pun d. Dro f. Pur h. This 9. Well Con a. Total d. Well	Pump Installer's Email Address Pump Installer's Firm Name Pump Installer's Firm Name Pump Installer's Firm Address CityState ZipTelephone Pump Installer's Firm Email Address c. Pumping rate gallons per minute Measured Estimated d. Drop pipe diameter inches e. Length of drop pipe feet f. Pumping equipment installed (m)/(d/(y)g. Pump Brand No b. This well is designed and constructed to pump less than 50 gpm Yes No										
	s drilled prior t toriums require	o stays or e NRD signature	e NRD sig	nature			Date				
		in inches Top <u>8</u> Joints are Weld			Threaded _	Othe	r				
						s to three decimal					
· · · · · · · · · · · · · · · · · · ·	a ement	b Casing or	c Inside	d Outside	e Wall	f Screen Slot	g	h			
	in Feet	Screen	Diameter	Diameter	Thickness	Size	Type of Material	Trade Name			
From	То	Sereen	Liuniotor	Liamotor	. monicos	Gize					
0											
20											

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6-14515

Placeme	nt Depth in Feet	Grout or	Material Description
From	То	Gravel Pack	
	0.75	Cement	Cement
75	15	Grout	Bentonite Grout
5	18	Grout	Bentonite Chips
8	30	Gravel Pack	Gravel Pack (20-40)
2. Geologi	c Materials Logged	1	
epth in Feet	Descrip		Depth in Feet Description
rom To			From To
	SEE ATTACHED	BORING LOG	
· ·			
		·	
		· · · · · · · · · · · · · · · · · · ·	

(Additional sheets may be submitted)

13. I hereby certify that the information provided on this registration is true and accurate to the best of my knowledge.

Amgen 6/18/07 MX Water Well Contractor's Signature Date

Well Owner's Signature if Contractor is unknown or Deceased

Date

Please note this document contains three pages.

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\bigcap	LOG OF WEL	LNC	D. MV	V-1	7					Pa	age 1 (of 2
CLI	ENT	Proj	ect Mana	ager			Mik	e Reif				
SIT	OPPD E North Omaha Station	PRC	JECT				IVIIK	e Rell				
011	Omaha, Nebraska				N			aha St	ation			
		WELL				SAN	IPLES	5		TES		
ບ່	DESCRIPTION	DETA		Ъ			.Ľ		\$	Υ,	ŧ	
СС	BOREHOLE DIA.: 8.25 in		ť	YMB	~		ERY,	* + / ff.	ЧТ, %	APO PM)	E SE	
GRAPHIC LOG	WELL DIA.: 2 in CASING AND SCREEN: PVC (sch. 40); 0.01 slotted screen		DEPTH, ft.	USCS SYMBOL	NUMBER	щ	RECOVERY, in	SPT - N ** BLOWS / ft.	WATER CONTENT,	FIELD VAPOR TEST (PPM)*	SAMPLE SENT TO LAB	
GRA	TOP OF CASING: 1002.54 ft GROUND SURFACE ELEV.: 999.6 ft		DEF	nsc	NN	ТҮРЕ	RE(SP1 BLO	₹0 S	E E	10 TO	
	Coal dust at surface LEAN CLAY, trace sand		× -			HS						
	Light brown		2 _	-								
			-	{								
			-	1								
				1								
	3.7 996		_	4	1	SS	22	6		ND		
	LEAN CLAY		-	-								
	Brown 2 inches of sandy lean clay at 4.5 feet			1								
			5-			HS						
			_	4								
			-	-								
	Light brown-light gray, very soft, mottled.		-	-								
	Light brown-light gray, very soft, mottled, wet with ferrous stains from 7 to 13.5 feet		-	1								
					2	SS	16	1		ND		
			-	-								
			-	-								
			10			HS						
			-	4								
				-								
LOL			-	1								
1 5/17/0	Light brown, moist with ferrous stains 13.5 to 14.5 feet		-		3	SS	20	7		ND		
ON GD			-	4						FOFU		
TERRACON.GDT	14.5 3 inches of light brown fine clayey sand at 985		-							ECEI	ED	
	LEAN CLAY with very fine sand		15—			HS			JU	N 23	200	7
es.cl	Brown-gray Moist											: DES
HALO	Continued Next Page											
05027041 NORTH OMAHA LOGS. GPJ	stratification lines represent the approximate boundaries ween soil and rock types: in-situ, the transition may be gradual.		*	ND in of c	ndicate one (1)	es a re part	eading per m	of less illion (pp	than th m) isob	e field o outylene	etectio e equiva	n limit ilents.
WORT	ATER LEVEL OBSERVATIONS, ft				BO	RIN	G ST	ARTE)		0-07 1	
11 ML								MPLE			0-07 1	
220 WL	Σ Σ				RIC			CME 7		LLER		BC
WL					LOC	GGED)	KA	C JOI	3 #	05027	7041

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	LOG OF V	NEL	L NO.	MV	V-1	7					Pa	age 2 c	of 2
CLI	ENT OPPD		Projec	t Mana	ager			Mike	e Reif				
SIT	E North Omaha Station		PROJ	ECT			lorth		aha St	ation			
	Omaha, Nebraska					r		APLES		ation	TES	STS	
GRAPHIC LOG	DESCRIPTION		WELL DETAIL	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N ** BLOWS / ft.	WATER CONTENT, %	FIELD VAPOR TEST (PPM)*	SAMPLE SENT TO LAB	
	18 SILTY VERY FINE SAND, trace clay Light gray Soft, wet, ferrous stains, and trace roots	981.5			-	4	SS	18	3		ND		
	20.75 LEAN CLAY Dark gray-brown Moist with organics and ferrous stains	979		20			HS			×			
	23.25 <u>SILTY VERY FINE SAND</u> with clay Light gray-light brown Wet, ferrous stains	976.5			-	5	SS	18	1		ND		
	25 SANDY LEAN CLAY Light gray Wet, trace roots, trace magnesium staining	974.5		25— — — — —	-		HS						
	30	969.5			-	6	SS	24	1 B	ECEIV	ND ED		
The bett	BOTTOM OF BORING Note: Soil classifications were based on visual observations made by the field crew.			30—				-	JU	N 25 PARTM	2.00		
The	L stratification lines represent the approximate boundaries ween soil and rock types: in-situ, the transition may be gradua	ıl.		*	ND in of c	ndicate	es a re) part	eading per m	of less illion (pp	than th m) isot	e field (outylene	detectior e equiva	i limit lents
W	ATER LEVEL OBSERVATIONS, ft					BC	RIN	G ST	ARTE)	5-1	0-07 1	0:20
WL		ce.							MPLE			0-07 14	
WL			JL	U		RI			CME 7			05007	BC
WL						LÜ	GGED)	KA	C JO	d #	05027	041

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			WELL LO	G NO. MW	-18				F	age	1 of 3
PR	OJECT	OPPD North Omaha Station		CLIENT: Omah	na Public Pov	ver D	istric	t			
SIT	E:	7475 Pershing Drive Omaha, Nebraska		-							
GRAPHIC LOG	LOCATIC Latitude: 4 -95.952574	1.3333153° Longitude:		Surface Elev.: 1037.1 (Ft.)	INSTALLATION DE Top Casing Elev: 1037.00 Well Completion: Surface Mount	ETAILS	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
,,,,,,		MATERIAL DESCRIP N CLAY (CL), dark brown, moist, Grass at su		ELEVATION (Ft.)	-Concrete		1	>ō	S	R	
		<u> </u>			-Seal hydrated → chip bentonite		-	-	X	8	2-1-2-3 N=3
	2.5 LEA with	N CLAY (CL), with fine sand, gray, moist oxidized mottles		1034.6				_	X	10	2-4-5-6 N=9
							5-	-		12	2-2-4-4 N=6
	beco	mes dry					=	-	\square	14	2-2-5-5 N=7
	with	trace black oxidized mottles					-	-	\square	18	2-3-5-5 N=8
					-Grout portland → bentonite grout		10- 	-	\square	16	2-2-4-5 N=6
	13.5	N CLAY (CL), brown, dry, with iron mottles		1023.6	<u>}</u>				\square	20	3-4-5-5 N=9
	15.0	VERT (CE) , brown, dry, with non-motiles		1022.1		ИĽ		1	\square		2-4-4-6
		(ML), gray to brown, dry		1022.1	-		15-		M	16	N=8
								_	X	16	2-5-7-9 N=12
	19.0 LEA	<u>N CLAY (CL)</u> , gray, dry, with orange mottles		1018.1	-		-		\square	16	2-6-6-8 N=12
							20-		\square	18	3-4-7-7 N=11
		NCLAY (CL), red to brown, with red mottles moist		1014.1	-			-	\square	18	3-6-7-7 N=13
							25-	-	\times	16	2-2-3-4
	I ne strati types; in-	fication lines represent the approximate transition l situ these transitions may be gradual or may occur	etween differing soil typ at different depths than	bes and/or rock shown.	Hammer Type: 7	Automat	üC				
Muc Holl	ow stem au	it spoon sample hole ger, 8.25-inch diameter borehole	Soo Appondisco for any		Notes: Soil descriptions ; field crew. Actua				serva	tions m	ade by the
	onment Met -Well install		abbreviations.	planation of symbols and							
	WAT	ER LEVEL OBSERVATIONS			Well Started: 12/1/	2015	,	Well C	omple	eted: 12	2/1/2015
\square	33 ft wh	ile drilling	llerr	acon	Drill Rig: 770	•		Driller:			
			15080	A Circle	Project No : 05157	591		Evhibit		1	

		WELL LOG N					Page	e 2 of 3
	OJECT: OPPD North Omaha Station	CL	ENT: Omah	na Public Power	Distric	t		
SIT	E: 7475 Pershing Drive Omaha, Nebraska						_	
GRAPHIC LOG	LOCATION - Latitude: 41.3333153° Longitude: -95.9525745°		ace Elev.: 1037.1 (Ft.)		DEPTH (ft)	WATER LEVEL OBSERVATIONS SAMPI F TYPF	RECOVERY (In.)	SPT N-VALUE
	DEPTH MATERIAL DESCRIPT LEAN CLAY (CL), red to brown, with red mottles		ELEVATION (Ft.)				16	N=5
					-		18	4-6-5-6 N=11
	becomes gray				-		14	3-3-3-3 N=6
					30-		14	1-1-2-4 N=3
	becomes wet				-		16	2-2-4-5 N=6
					- 35-		18	1-1-3-5 N=4
	becomes oxidized becomes gray with black mottles				-		24	2-4-4-5 N=8
	becomes gray, trace black & orange mottles				-		24	3-4-4-6 N=8
	becomes gray with black mottles				40-		20	2-3-3-4 N=6
					-		20	2-4-5-5 N=9
					- 45-		18	3-4-6-7 N=10
					-		18	7-7-6-7 N=13
	48.0 LEAN CLAY (CL), gray, wet, trace fine sand		989.1		-		20	2-4-4-5 N=8
/////	The stratification lines represent the approximate transition b	netween differing soil types and	or rock	Hammer Type: Auton	50 -			
	types; in-situ these transitions may be gradual or may occur		OFFOCK	Папіпісі Туре. Айтоп	latic			
Muc	cement Method: I rotary / split spoon sample hole ow stem auger, 8.25-inch diameter borehole			Notes:				
	onment Method: -Well installed	See Appendices for explanatic abbreviations.	n of symbols and					
$\overline{\nabla}$	WATER LEVEL OBSERVATIONS 33 ft while drilling			Well Started: 12/1/2015		Well Com	pleted: 1	12/1/2015
<u> </u>		Tierra	LOU	Drill Rig: 770		Driller: JN		
_		Omaha, Nebras	- ka	Project No.: 05157581		Exhibit:	1	

		WELL LO	g no. Mw-	18			P	age	3 of 3
PRC	OJECT: OPPD North Omaha Station		CLIENT: Omah	a Public Power D	istric	t			
SITE	E: 7475 Pershing Drive Omaha, Nebraska								
GRAPHIC LO	LOCATION - Latitude: 41.3333153° Longitude: .95.9525745° DEPTH MATERIAL DESCRIP	TION	Surface Elev.: 1037.1 (Ft.) ELEVATION (Ft.)		DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
	LEAN CLAY (CL), gray, wet, trace fine sand (cor		985.1				X	20	3-4-4-6 N=8
	SANDY LEAN CLAY (CL), trace organics, brown	ı, moist	303.1	-Sand silica -	_		X	18	5-7-8-11 N=15
	becomes gray at 54.5 becomes dark brown at 55.5			sand. 16/30 grade	- 55-		X	24	2-8-7-10 N=15
	57.0 LEAN CLAY (CL), trace sand, trace organics, da 58.0	rk gray	<u>980.1</u> 979.1	- Seal hydrate d →	_			14	5-8-11-11 N=19
	FAT CLAY (CH), gray 59.0 LEAN CLAY (CL), gray 50.0		978.1 977.1	-Seal nydratee → pellet bentonite	- 60-		$\left \right $	16	4-5-6-5 N=11
	LEAN CLAY (CL), trace sand, gray			-Riser Pipe 2" diameter schedule 40 PVC. Flush			X	20	1-3-3-5 N=6
				threaded to PVC Screen	-		X	14	4-5-5-6 N=10
				- Filter Material silica sand. 16/30 grade	65- -		X	14	4-6-7-11 N=13
				-Screen 2"	-		X	12	3-6-7-8 N=13
7	70.1		967	schedule 40 PVC slotted screen, 0.010" slot	- 70-		X	15	2-8-10-15 N=18
7	1.0 LIMESTONE*		966.1				\times	0	25-50/0"
	Boring Terminated at 71 Feet								
	The stratification lines represent the approximate transition types; in-situ these transitions may be gradual or may occur			Hammer Type: Automat	ic	<u>. </u>			
Mud r	ement Method: rotary / split spoon sample hole w stem auger, 8.25-inch diameter borehole			Notes:					
	nment Method: Nell installed	See Appendices for exp abbreviations.	lanation of symbols and						
	WATER LEVEL OBSERVATIONS			Well Started: 12/1/2015	,	Well Co	mple	eted: 12	2/1/2015
\square	33 ft while drilling	Ilerr	acon	Drill Rig: 770		Driller:	JM		
		15080	A Circle	Project No.: 05157581		Exhibit:		1	

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		_			Fee P		5 Fee: <u>0.00</u>	
Well Reg	gistration o	or Area	Permit				DF: <u>0.00</u> g ID: <u>53643</u>	
Source:	<u>Nebraska On Lin</u>	Import E Status:	Accepted	Use:	Monitoring (Groun Water Quality)	d Owner ID:	<u>49927</u>	
Import ID:	1455055385265	0 Status:	<u>Active</u> <u>Registered</u> <u>Well</u>	Decommission Date:	_	Registration Number:	<u>G-</u> <u>178704B</u>	
Well ID:	241804	NRD:	Papio-Missour	i River		Registration Date:	2/19/2016	
Last Change User:	hmcpherson	Call Up Code:	_	Call Up Date:	_	Last Change Date:	<u>2/19/2016</u>	
Owner:								
<u>Display</u>	ContactID Type 49927 Owner		egin Date <mark>End D</mark> /19/2016	ate Name Omaha Public P	ower District,			
Contractor:	Certificate ID Fir 39570 Mic	rstName Las chael B Rei						
Drilling Firm:	Employ 159781	yerID Emplo Terrac	oyer con Consultants,	Inc.				
Township	ion: <u>NW1/4NE1/4</u> <u>16</u> North, Range _ esource District: <u>P</u>	<u>13</u> (<u>East</u> E/	/W), <u>Douglas</u> Co <u>uri River</u>	bunty Longitude				
Well GPS Lat/Long	Coordinates: DD	<u>41° 19</u> 41.33	<u>9' 59.93''</u> 331	<u>-095° 57' 09.27''</u> <u>-95.95258</u>	GPS Requir	<u>ed</u>		
	s: feet from th			eet from the	section line.			
	-				ng Drive Block No	Lot		
	f water use, if app	plicable (give	e legal descripti	on): <u>INWINE 528 </u>	<u>16 RI3E</u>			
G. Well refere	ence letter(s) if an	oplicable: M	W-18					
	ence letter(s) if ap es	oplicable: <u>M</u>	<u>W-18</u>					
Well In A Serie	., .		<u>W-18</u>					
Vell In A Serie Well Part of a Series # of V	es a Series with Site I Vells Reg <mark>. Total <i>#</i> V</mark>	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD			ries Reg Num (Extern		
Vell In A Serie Well Part of a Series # of V	es a Series with Site I	Plan: <u>Yes</u> Wells Acres		Appr StartDate Er 12/1/2015		ries Reg Num (Exterr 145159		Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Well In A Serie Well Part of a Series # of V 244878 3	es a Series with Site I Vells Reg <mark>. Total <i>#</i> V</mark>	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD No No			145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for 145159 2/ spill or underground storage 241802 G- 178704A 1/2 241804 G- 12
Vell In A Serie Well Part of a Series # of V 244878 3	es a Series with Site I Vells Reg <mark>. Total <i>#</i> V</mark>	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD	12/1/2015	G-	<u> </u>	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Well In A Serie Well Part of a Series # of V 244878 3	es a Series with Site I Vells Reg <mark>. Total <i>#</i> V</mark>	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD No No	12/1/2015	G-	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Well In A Serie Well Part of a Series # of V 244878 3 Permits Area Permit	es a Series with Site I Vells Reg <mark>. Total <i>#</i> V</mark>	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD No No	12/1/2015	G- App Code	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 244378 3 Permits Area Permit GeoPermit MWF	es a Series with Site I Vells Reg <mark>. Total <i>#</i> V</mark>	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD No No	12/1/2015 SWater / Industria Transfer	G- App Code	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 224378 3 Permits Area Permit GeoPermit MWF WSP	es a Series with Site I Vells Reg <mark>. Total <i>#</i> V</mark>	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD No No	12/1/2015 SWater / Industria Transfer	G- App Code	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 2448778 3 2448778 3 244778 3 24477878 3 24477878 3 244778778 3 2447787878 3 24477	es a Series with Site I Vells Reg Total # V 4	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD No No	12/1/2015 SWater / Industria Transfer Swater (G- App Code	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II	es a Series with Site I Vells Reg Total # V 4	Plan: <u>Yes</u> Wells Acres	Acres Cert NRD No No	12/1/2015 SWater / Industria Transfer Swater (Other	G- App Code	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II NDEQ	es a Series with Site I Vells Reg Total # V 4	Vells Acres	Acres Cert NRD No No Aprvd Date(s) 	12/1/2015 SWater / Industria Transfer Swater (Other	G- App Code	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II NDEQ	es a Series with Site I Vells Reg Total # V 4 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Vells Acres	Acres Cert NRD No No Aprvd Date(s) 	12/1/2015 SWater / Industria Transfer Swater (Other	G- App Code	145159	DEQ	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II NDEQ 5. Purpose of	es a Series with Site I Vells Reg Total # V 4 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Plan: Yes Wells Acres	Acres Cert NRD No No Aprvd Date(s) 	12/1/2015 SWater / Industria Transfer Swater (Other ITN	App Code al Conduct Code	145159	DEQ Date(s)	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Vell In A Serie Well Part of a Series # of V 2241378 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II NDEQ 5. Purpose of 7. Replaceme	es a Series with Site I Vells Reg Total # V 4 4 5 5 5 5 6 7 6 7 8 8 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	Plan: Yes Wells Acres 054739 (Ground Wa	Acres Cert NRD No No Aprvd Date(s) 	12/1/2015 SWater / Industria Transfer Swater C Other ITN	App Code al Conduct Code Well Considered a re	Aprvd I Aprvd I 	DEQ Date(s)	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Well In A Serie Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II NDEQ 5. Purpose of 7. Replaceme A. Is this wel	es a Series with Site I Vells Reg Total # V 4 4 5 5 5 5 6 7 6 7 8 8 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	Plan: Yes Wells Acres Wells Acres 054739 (Ground Wa on. vell? <u>No</u> Rep	Acres Cert NRD No No Aprvd Date(s) — — — — ter Quality) — ter Quality) — —	12/1/2015 SWater / Industria Transfer Swater C Other ITN	G- App Code al Conduct Code Well Considered a re RegCD)	Aprvd I Aprvd I eplacement by NRD(V eg CD	DEQ Date(s)	Part of a DEQ site WellID 185656 RegCD 2/ St plan for underground storage 145159 2/ 241802 G- 178704A 1/2 241804 G- 178704B 12
Well In A Serie Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II NDEQ 5. Purpose of 7. Replaceme A. Is this wel B. Registratic C. Abandone	es a Series with Site I Vells Reg Total # V 4 4 5 5 5 6 7 7 7 7 8 7 7 7 7 7 8 7 7 8 7 7 7 7 7	Plan: Yes Wells Acres Wells Acres Optimized Acres (Ground Wa (Ground Wa	Acres Cert NRD No No Aprvd Date(s) — — — — ter Quality) — — = = = = = = = = = = = = = = = = =	12/1/2015 SWater / Industria Transfer Swater C Other ITN pproval Date registered, date a	G- App Code al Conduct Code Well Considered a re RegCD) Well Replacement R	Aprvd I Aprvd I eplacement by NRD(V eg CD constructed	DEQ Date(s)	Part of a DEQ site WellID 185656 RegCD St plan for underground storage 145159 2/ 1/ 241802 G- 178704A 1/ 1/ 241804 G- 178704B 1/

WellID RegCD StartDate EndDate

2/19/2016

1/20/2016

12/1/2015

11/9/2015

be decommissioned within 180 days after such construction of the replacement water well.

[] I hereby certify that the original water well will be modified and equipped to pump 50 gallons per minute or less within 180 days after such construction of the replacement water well.

- [] Livestock
- [] Monitoring
-] 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	
8. 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: Yes
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?	Yes
9. Well Construction Information	
A. Total well depth: 70.8 feet.	B. Static water level <u>33</u> feet.
C. Well Construction began: <u>12/1/2015</u>	D. Well Construction Completed: <u>12/1/2015</u>
E. Bore hole diameter in inches. Top 8.25 Botto	m <u>8.25</u>
F. Casing and Screen Joints are: <u>Threaded</u>	Other Joints description:
H. Total Estimate Capacity of Well gallons per	minute. 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
241804 0	60.8	casing	2.07	2.38	0.154		PVC	EMI
241804 60.8	70.8	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 = 6

WellID	FromDepth	ToDepth	Grout/Gravel	Material Description ¹	Quantity Gravel ²	Volume &Type Grout ³
241804	0	0.5	grout	Concrete and well vault		4.5 bags
241804	0.5	1.5	grout	Bentonite chips		0.5 bags
241804	1.5	52.8	grout	Bentonite cement grout		4 bent/8 portland
241804	52.8	54.8	gravel	#16-30 Silica sand	1 bag	
241804	54.8	59.8	grout	Bentonite pellets		2.5 buckets
241804	59.8	70.8	gravel	#16-30 Silica sand	7 bags	

* are in Feet, all else is in inches

¹Description 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

²Quantity #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-pelletgranular)

12. Well Geologic Materials Logged

WellID	FromDepth*	ToDepth*	Туре	Hardness	Color	Other/Drilling Action
241804	0	15	Other		Brown	Lean Clay
241804	15	19	Silt		Brown	
241804	19	52	Other		Brown	Lean Clay
241804	52	57	Other		Brown	Sandy Lean Clay
241804	57	58	Other		Brown	Lean Clay
241804	58	59	Other		Gray	Fat Clay
241804	59	70.1	Other		Gray	Lean Clay
241804	70.1	70.8	Limestone		Gray	
* are in	Fast					

* are in Feet.

		g no. MW-	·19			Page 1 of 4				
PR	OJECT: OPPD North Omaha Station		CLIENT: Omah	a Public Pov	ver	Distric	t			
SIT	E: 7475 Pershing Drive Omaha, Nebraska									
GRAPHIC LOG	LOCATION - Latitude: 41.3314505° Longitude: -95.9521803°		Surface Elev.: 1037.3 (Ft.)	INSTALLATION DE Top Casing Elev: 1037.10 Well Completion: Surface Mount	ETAIL	o DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
	DEPTH MATERIAL DESCRIP LEAN CLAY (CL), brown, Grass at surface	TION	ELEVATION (Ft.)	-Concrete		X	-0		Ľ.	
	2.0		1035.3			-		\square	10	6-4-4-3 N=8
	LEAN CLAY (CL), light brown		1033.3			-	-	X	6	2-3-2-3 N=5
	LEAN CLAY (CL), light brown, oxidized			− Grout portla nd ► bentonite grout		5-			17	2-3-4-5 N=7
								\square		2-3-5-7 N=8
						- 10-		\mathbb{X}	18	2-5-5-7 N=10
						-		\square	20	2-3-5-8 N=8
						-		\mathbb{X}	15	4-7-9-9 N=16
						15-		\mathbb{X}	16	2-3-6-7 N=9
						-	_	\square	20	4-6-7-6 N=13
						- 20-	-	\square	21	3-3-5-5 N=8
	no oxides					-		\square	22	2-3-4-4 N=7
						-		\square	19	2-4-4-5 N=8
						25-		X	24	2-3-4-4
	The stratification lines represent the approximate transition types; in-situ these transitions may be gradual or may occur			Hammer Type: A	Autom	atic				
Mud	cement Method: rotary / split spoon sample hole ow stem auger, 8.25-inch diameter borehole	_		Notes: Soil descriptions a field crew. Actual				serva	tions m	nade by the
	onment Method: Well installed	See Appendices for exp abbreviations.	lanation of symbols and							
	WATER LEVEL OBSERVATIONS			Well Started: 1/20/2	2016		Well C	omple	eted: 1/	/20/2016
\square	30 ft while drilling	IIerr	acon	Drill Rig: 770			Driller	JM		
		15080	A Circle	Project No.: 05157	581		Exhibi	t:	2	

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		WELL LOG NO. MW	-19			F	ade	2 of 4
PR	OJECT: OPPD North Omaha Station	CLIENT: Oma	ha Public Power Di	istric	t		<u> </u>	
SIT	E: 7475 Pershing Drive Omaha, Nebraska							
GRAPHIC LOG	LOCATION - Latitude: 41.3314505° Longitude: -95.9521803°	Surface Elev.: 1037.3 (Ft		DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
	DEPTH MATERIAL DESCRIF LEAN CLAY (CL), light brown, oxidized (continu					X	24	N=7
				_		X		
						X	24	2-2-3-2 N=5
	becomes moist					X	24	1-1-2-3 N=3
				_		X	24	2-3-3-3 N=6
				35— _		X	24	1-3-3-3 N=6
				_		X	24	3-3-4-5 N=7
				- 40-		X	24	2-3-3-3 N=6
	41.0 LEAN CLAY (CL), gray	996.	3	-		X	24	3-3-4-3 N=7
				_		X	18	2-3-2-3 N=5
				45— _		X	12	3-4-9-4 N=13
	manganese and iron inclusions			_		X	12	3-9-5-4 N=14
				_ 50—		X	12	3-4-5-7 N=9
	The stratification lines represent the approximate transition types; in-situ these transitions may be gradual or may occu	n between differing soil types and/or rock ur at different depths than shown.	Hammer Type: Automation					
Mud	cement Method: rotary / split spoon sample hole ow stem auger, 8.25-inch diameter borehole		Notes:					
	onment Method: Well installed	See Appendices for explanation of symbols and abbreviations.						
			Well Started: 1/20/2016	١	Vell Co	omple	eted: 1	/20/2016
\square	30 ft while drilling	lerracon	Drill Rig: 770	T I	Driller:	JM		
		15080 A Circle Omaha. Nebraska	Project No.: 05157581	F	Exhibit:		2	

		WELL LOG NO. MW	-19			F	Page	3 of 4
PR	OJECT: OPPD North Omaha Station	CLIENT: Omat	na Public Power D	istric	t			
SIT	E: 7475 Pershing Drive Omaha, Nebraska							
GRAPHIC LOG	LOCATION - Latitude: 41.3314505° Longitude: -95.9521803° DEPTH MATERIAL DESCRIP	Surface Elev.: 1037.3 (Ft.) TION ELEVATION (Ft.)		DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
	LEAN CLAY (CL), gray (continued)			_		X	18	3-5-5-7 N=10
	54.0	983.3		-			12	3-4-6-7 N=10
	LEAN CLAY (CL), brown, iron staining			- 55		$\left \right $	24	3-5-5-7 N=10
				-		X	18	4-4-7-8 N=11
	60.0	977.3	-Sand sand →	- 60		X	24	4-4-6-7 N=10
	LEAN CLAY (CL), gray			-		X	24	2-4-6-5 N=10
	64.0	973.3	-Seal hydrated → bentonite pellet	-		X	24	3-4-5-5 N=9
	LEAN CLAY (CL), brown 66.0	971.3	-Riser Pipe 2"	65- -		X	24	3-6-5-6 N=11
	LEAN CLAY (CL), dark brown, trace shells	969.3	diameter schedule 40 PVC. Flush threaded to PVC Screen	-		X	17	2-5-6-6 N=11
	<u>SILTY CLAY (CL)</u> , gray		-Filter Material	- 70-		X	24	3-3-3-4 N=6
	71.0 SILTY CLAY (CL), gray, and limestone gravel	966.3	silica sand. 16/30 grade	-		X		3-14-26-24 N=40
	73.0 LEAN CLAY (CL), trace sand, gray, (glacial till)	964.3	diameter	-		X	18	18-26-6-7 N=32
			screen, 0.010"	75-	_ ,	Х	16	3-6-7-8
	The stratification lines represent the approximate transition types; in-situ these transitions may be gradual or may occur		Hammer Type: Automat	ic				
Muc	cement Method: rotary / split spoon sample hole ow stem auger, 8.25-inch diameter borehole		Notes:					
	onment Method: Well installed	See Appendices for explanation of symbols and abbreviations.						
	WATER LEVEL OBSERVATIONS	76	Well Started: 1/20/2016	Ņ	Well Co	omple	eted: 1/	/20/2016
\square	30 ft while drilling	lerracon	Drill Rig: 770		Driller:	JM		
		15080 A Circle	Project No.: 05157581		Exhibit:		2	

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 05157581 LOGS.GPJ TERRACON2012.GDT 2/4/16

	WELL LOG NO. MW	-19	Page 4 of 4
PROJECT: OPPD North Omaha Station	CLIENT: Omal	na Public Power Distric	
SITE: 7475 Pershing Drive			
STIE: /4/5 Persning Drive Omaha, Nebraska	ll) <i>(continued)</i> 961.3		In VALUE
The stratification lines represent the approximate transit types; in-situ these transitions may be gradual or may o Advancement Method: Mud rotary / split spoon sample hole Hollow stem auger, 8.25-inch diameter borehole Abandonment Method:	ion between differing soil types and/or rock ccur at different depths than shown.	Hammer Type: Automatic	
N/A-Well installed	abbreviations.		
WATER LEVEL OBSERVATIONS 30 ft while drilling		Well Started: 1/20/2016	Well Completed: 1/20/2016
30 ft while drilling	lerracon	Drill Rig: 770	Driller: JM
	15080 A Circle Omaha, Nebraska	Project No.: 05157581	Exhibit:2

/IP Wells - Reg P	rint								
Well Reg	gistration or	Area	Permit		Fee Paid: DNR Cash Fur	<u>\$130.00</u> HHSS d: <u>\$18.50</u> WWDF Billing			
Source:	<u>Nebraska On Line</u>	Import Status:	Accepted	Use:	<u>Monitoring (Ground</u> <u>Water Quality)</u>	Owner ID:	<u>49927</u>		
Import ID:	145505413029741	Status:	<u>Active</u> <u>Registered</u> _Well	Decommission Date:	_	Registration Number:	<u>G-</u> 178704A		
Well ID:	241802	NRD:	Papio-Missouri	River		Registration Date:	2/19/2016		
Last Change User:	<u>hmcpherson</u>	Call Up Code:	_	Call Up Date:	_	Last Change Date:	<u>2/19/2016</u>		
)wner:									
<u>Display</u>	ContactID Type S 49927 Owner 1		gin Date End Da 9/2016	te Name Omaha Public Po	ower District,				
Contractor:	Certificate ID First 39570 Mich	Name Last ael B Reif							
Drilling Firm:		rID Employ							
	159781	Terraco	on Consultants, Ir	IC.					
A. Well Locat	ion: <u>SW1/4NE1/4</u>	of Section	n <u>28</u>						
	<u>16</u> North, Range <u>13</u> esource District: <u>Pa</u>			inty					
		Latitud		ongitude					
Well GPS Lat/Long I	Coordinates:	<u>41° 19</u> 41.331		<u>095° 57' 07.85''</u> 95.95218	GPS Required				
	s: feet from the				section line.				
D. Street add	ress or block, lot ar	nd subdivis	ion: Addr/Sub D	iv 7475 Pershing	g Drive Block No	Lot			
	f water use, if applic ence letter(s) if app			n): <u>SWNE S28 T</u>	<u>16 R13E</u>				
Vell In A Serie			<u>-15</u>						
Well Part of a	Series with Site Pla	an: <u>Yes</u>							
									1
Series # of W 244878 3	/ells Reg Total # We 4		Acres Cert <mark>NRD A</mark> No No	ppr StartDate En 1/20/2016	dDate Comment Series G-145			e Description Part of a	Wells in the Serie WellID RegCD
<u></u> 0				1/20/2010	0.110		514	DEQ site plan for	<u>185656</u> G-
								spill or	145159 241802 G-
								underground storage	170704A
									<u>241804</u> 241805
ermits								-	
			Aprvd Date(s)			Aprvd D	ate(s)		
Area Permit				SWater A Industria					
GeoPermit MWF				Transfer	I				
WSP					onduct Code				
HHSS				Other					
HHSS PWS II)			ITN					
NDEQ	<u>NE005</u>	4739							
	Well <u>Monitoring (G</u>		er Quality)						
	Other Use		<u> </u>						
	Notes		_						
7. Replaceme	ent well information.				Vell Considered a replace RegCD)	cement by NRD(W	ellID,		
				proval Date V	Vell Replacement Reg C				
B. Registratio	on number of aband	oned well:	If not re	gistered, date at	pandoned well was con	structed			
				•					
	d well last operated ell pump column siz			acement well is _	feet from abandoned				

WellID RegCD StartDate EndDate

2/19/2016

1/20/2016

12/1/2015 11/9/2015

F. [] Original water well decommissioned ______ [] I hereby certify that the original water well will be decommissioned within 180 days after such construction of the replacement water well.

[] I hereby certify that the original water well will be modified and equipped to pump 50 gallons per minute or less within 180 days after such construction of the replacement water well.

[] Livestock

- [] Monitoring
-] 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	
8. Pump Information.	
A. Is Pump installed at this time? No	Pump present but Well Inactive: <u>No</u>
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?	Yes
9. Well Construction Information	
A. Total well depth: <u>76.5</u> feet.	B. Static water level <u>30</u> feet.
C. Well Construction began: <u>1/20/2016</u>	D. Well Construction Completed: 1/20/2016
E. Bore hole diameter in inches. Top 8.25 Botto	om <u>8.25</u>
F. Casing and Screen Joints are: <u>Threaded</u>	Other Joints description:
H. Total Estimate Capacity of Well gallons per	minute. 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
241802 0	66.5	casing	2.07	2.38	0.154		PVC	EMI
241802 66.5	76.5	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 = 5

WellID	FromDepth	ToDepth	Grout/Gravel	Material Description ¹	Quantity Gravel ²	Volume &Type Grout ³
241802	0	0.5	grout	Concrete and well vault		4.5 bags
241802	0.5	58.5	grout	Bentonite cement grout		6 bent/12port
241802	58.5	60.5	gravel	#16-30 Silica sand	1 bags	
241802	60.5	65.5	grout	Bentonite pellets		2.5 buckets
241802	65.5	76.5	gravel	#16-30 Silica sand	7 bag	

* are in Feet, all else is in inches

¹Description 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

²Quantity #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-pelletgranular)

12. Well Geologic Materials Logged

WellID FromD	epth* ToDepth	* Type Har	dness Color	Other/Drilling Action
241802 0	68	Other	Gray	Lean Clay
241802 68	73	Other	Gray	Silty Clay
241802 73	76.5	Other	Gray	Fat Clay

* are in Feet.

		ELL LOG NO. MW		Distri		F	Page	1 of 2
SIT	DJECT: OPPD North Omaha Station E: 7475 Pershing Drive Omaha, Nebraska		a Public Power	Distric	CT			
GRAPHIC LOG	LOCATION - Latitude: 41.3286174° Longitude: -95.9477104°	Surface Elev.: 991.2 (Ft.	INSTALLATION DETAI Top Casing Elev: 993.47 Well Completion: Aboveground	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
	DEPTH MATERIAL DESCRIPTION LEAN CLAY (CL), dark brown, Grass at surface 1.0	ELEVATION (Ft.) 990.2	-Concrete		-		10	4-5-9-12 N=14
					_		13	4-10-13-1 N=23
	5.5 becomes black and moist FAT CLAY (CH), trace fine sand, gray, moist	985.7		5 -	-		15	4-6-6-5 N=12
	yray, frace fine sand, yray, moist		-Grout portland → cement grout				0	3-4-4-4 N=8
	becomes wet	981.2				\square	24	1-2-3-3 N=5
	SANDY FAT CLAY (CH), gray			10-		X	15	2-3-3-2 N=6
	becomes oxidized				_	X	16	2-2-2-3 N=4
				15-	_	M	16	3-6-3-4 N=9
			-Sand silica		_	X	20	-1-2
	becomes dark gray		sand. 16/30 grade	20-	_	X	19	1-1-1-1 N=2
			-Seal hydrated ► bentonite pellets		_	X	20	2-1-1-1 N=2
					_	X	24	
			-Riser Pipe 2"	25-		X	24	
	The stratification lines represent the approximate transition between types; in-situ these transitions may be gradual or may occur at diffe		Hammer Type: Auto	matic				
Mud	ement Method: rotary / split spoon sample hole w stem auger, 8.25-inch diameter borehole		Notes: Soil descriptions are b field crew. Actual con			servat	tions r	nade by the
Abando N/A-		ppendices for explanation of symbols and viations.						
	WATER LEVEL OBSERVATIONS		Well Started: 11/9/2015	5	Well C	omple	eted: 1	1/9/2015
	9 ft while drilling	lerracon	Drill Rig: 770		Driller:	JM		
		15080 A Circle Omaha, Nebraska	Project No.: 05157581		Exhibit		3	

			WELL LO		N-	20				F	age	2 of 2
PF	ROJECT:	OPPD North Omaha Station		CLIENT: Omaha Public Power District								
SI	TE:	7475 Pershing Drive Omaha, Nebraska		-								
GRAPHIC LOG	LOCATION Latitude: 41 -95.9477104 DEPTH	.3286174° Longitude:		Surface Elev.: 991.2 ELEVATION				DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
		<u>(EY SAND (SC)</u> , dark gray		ELEVATION	(Fl.)	diameter schedule 40 ,PVC. Flush				X	24	-2-2
					ļ	threaded to PVC Screen Screen 2" diameter schedule 40		_	-	$\left \right $	14	5-5-4-4 N=9
						PVC slotted screen, 0.010" slot		-		$\left \right $	16	1-2-4-3 N=6
	32.0			9	59.2	Filter Material silica sand. 16/30 grade		30- -	-	X	18	3-2-5-113 N=7
3DT 2/4/16	<u>GRA</u> 33.5	/EL (GP) <u>E*</u> , green to gray			157.7			_	-		14	7-16-12-20 N=28
ACON2012.G	36.0			0	55.2			- 35-	-		9	5-8-31-50 N=39
oJ TER	Borin	ng Terminated at 36 Feet										
THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 05157581 LOGS.GPJ TERRACON2012.GDT 중 편 표준	The statif	cation lines represent the approximate transiti	ne batuace differing soil tur			Hammer Tyres: A						
EPARA	types; in-s	cation lines represent the approximate transition to the set transitions may be gradual or may oc				Hammer Type: A	uiomat					
Advar Mu Hol Abane N/A	ncement Meth d rotary / split llow stem aug donment Meth A-Well installe	: spoon sample hole er, 8.25-inch diameter borehole nod:	See Appendices for exp abbreviations.	lanation of symbols a	and	Notes:						
0 FOG	WATE	R LEVEL OBSERVATIONS			_	Well Started: 11/9/2	015	,	Well C	omole	eted: 1	1/9/2015
	9 ft while	drilling	- Ilerr	ЭСОГ		Drill Rig: 770			Driller:			
THIS			15080	A Circle Nebraska	- F	Project No.: 051575	81		Exhibit	:	3	

	gistration o	r Area	Permit		Fee Paid DNR Cas	h Fund: 0.00 WWD		
Source:	<u>Nebraska On Line</u>	Import Status:	Accepted	Use:	Monitoring (Ground Water Quality)	Owner ID:	<u>49927</u>	
Import ID:	<u>14550559217013</u>	Status:	<u>Active</u> <u>Registered</u> <u>Well</u>	Decommission Date:	_	Registration Number:	<u>G-</u> <u>178704C</u>	
Well ID:	<u>241805</u>	NRD:	<u>Papio-Missouri</u>	River		Registration Date:	2/19/2016	
Last Change User:	<u>hmcpherson</u>	Call Up Code:	_	Call Up Date:	_	Last Change Date:	2/19/2016	
Owner:								
<u>Displa</u>	ContactID Type y 49927 Owner		egin Date <mark>End Da</mark> /19/2016	te Name Omaha Public P	ower District,			
Contractor:	Certificate IDFirst39570Mic	stName Las hael B Rei						
Drilling Firm:	Employe 159781	erID Emplo Terrac	oyer con Consultants, I	าс.				
Township 3. Natural R Well GPS Lat/Long C. The well i D. Street add	is: feet from the dress or block, lot a	3 (<u>East</u> E/ apio-Missou Latitu <u>41° 1'</u> <u>41.32</u> e Sectic and subdivi	/W), <u>Douglas</u> Cou <u>uri River</u> de 9' 43.02'' <u>862</u> m line and <u></u> feo	Longitude -095° 56' 51.76'' -95.94771 et from the	GPS Required	Lot		
G. Well refer Vell In A Seri Well Part of a Geries # of V	rence letter(s) if app ies a Series with Site P	plicable: <u>M</u> lan: <u>Yes</u> /ells <mark>Acres</mark>				<u> </u>		e Description Wells in the Series Part of a WellID RegCD StartDate EndDa DEQ site 185656 G- 2/19/2016 plan for 1415159 1425159 spill or 148704A 1/20/2016 underground 178704A 1/21/2015 241802 G- 1/21/2015 178704B 241805 G-
G. Well refer Well In A Seri Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS	rence letter(s) if applies a Series with Site P <u>Nells Reg Total # W</u> 4	plicable: <u>M</u> lan: <u>Yes</u> /ells <mark>Acres</mark>	W-20 Acres Cert NRD #	Appr StartDate Er 11/9/2015 SWater / Industria Transfer Swater (Other	hdDate Comment Serie G-145	<u> </u>	DEQ	Part of a DEQ site WellID RegCD StartDate EndDa plan for spill or underground storage 185656 241802 4178704A G- 2/19/2016 1/20/2016 178704A 178704A 1/20/2016 1/20/2016 1/20/2016
G. Well refer Vell In A Seri Well Part of a Series # of V 2448778 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS I	Pence letter(s) if applies a Series with Site P Nells Reg Total # V 4	plicable: <u>M</u> lan: <u>Yes</u> /ells <mark>Acres</mark>	W-20 Acres Cert NRD A No No	SWater / Industria Transfer Swater (hdDate Comment Serie G-145 G-145 App Code	159	DEQ	Part of a DEQ site WellID RegCD StartDate EndDa plan for spill or underground storage 185656 241802 G- 178704A 2/19/2016 1/20/2016 178704A 1/20/2016 1/20/2016 1/20/2016 241802 G- 178704B 1/2/1/2015 1/2/1/2015 241805 G- 1/1/9/2015 1/2/1/2015
G. Well refer Well In A Seri Well Part of a Series # of V 244878 3 Permits Area Permit GeoPermit MWF WSP HHSS HHSS PWS II NDEQ	Pence letter(s) if applies a Series with Site P Nells Reg Total # V 4	plicable: M lan: Yes /ells Acres	Acres Cert NRD A No No Aprvd Date(s)	Appr StartDate Er 11/9/2015 SWater / Industria Transfer Swater (Other	hdDate Comment Serie G-145 G-145 App Code	159	DEQ	Part of a DEQ site WellID RegCD StartDate EndDa plan for spill or underground storage 185656 241802 G- 178704A 2/19/2016 1/20/2016 178704A 1/20/2016 1/20/2016 1/20/2016 241802 G- 178704B 1/2/1/2015 1/2/1/2015 241805 G- 1/1/9/2015 1/2/1/2015

within 180 days after such construction of the replacement water well.

- [] Livestock
- [] Monitoring
-] 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	
8. 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: Yes
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	? <u>Yes</u>
9. Well Construction Information	
A. Total well depth: <u>35.3</u> feet.	B. Static water level <u>9</u> feet.
C. Well Construction began: <u>11/9/2015</u>	D. Well Construction Completed: <u>11/9/2015</u>
E. Bore hole diameter in inches. Top 8.25 Bot	tom <u>8.25</u>
F. Casing and Screen Joints are: Threaded	Other Joints description:

 F. Casing and Screen Joints are:
 <u>Threaded</u>
 Other Joints description: _____

 H. Total Estimate Capacity of Well ____ gallons per minute.
 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
241805 0	25.3	casing	2.07	2.38	0.154		PVC	EMI
241805 25.3	35.3	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 = 5

WellID	FromDepth	ToDepth	Grout/Gravel	Material Description ¹	Quantity Gravel ²	Volume &Type Grout ³
241805	0	0.5	grout	Concrete and well vault		4 bags
241805	0.5	17	grout	Bentonite cement grout		4 bent/6 port
241805	17	19	gravel	#16-30 Silica sand	1 bag	
241805	19	24.5	grout	Bentonite pellets		3 buckets
241805	24.5	35.3	gravel	#16-30 Silica sand	7 bags	

* are in Feet, all else is in inches

¹Description 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

²Quantity #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-pelletgranular)

12. Well Geologic Materials Logged

WellID	FromDepth*	ToDepth*	Туре	Hardness	Color	Other/Drilling Action
241805	0	1	Other		Brown	Lean Clay
241805	1	5.5	Other		Brown	Lean Clay w/Sand
241805	5.5	10	Other		Brown	Fat Clay
241805	10	25	Other		Brown	Sandy Fat Clay
241805	25	32	Other		Brown	Clayey Sand
241805	32	33.5	Gravel		Gray	
241805	33.5	35.3	Shale		Gray	

* are in Feet.