# Appendix 1 Historical Well and Boring Logs

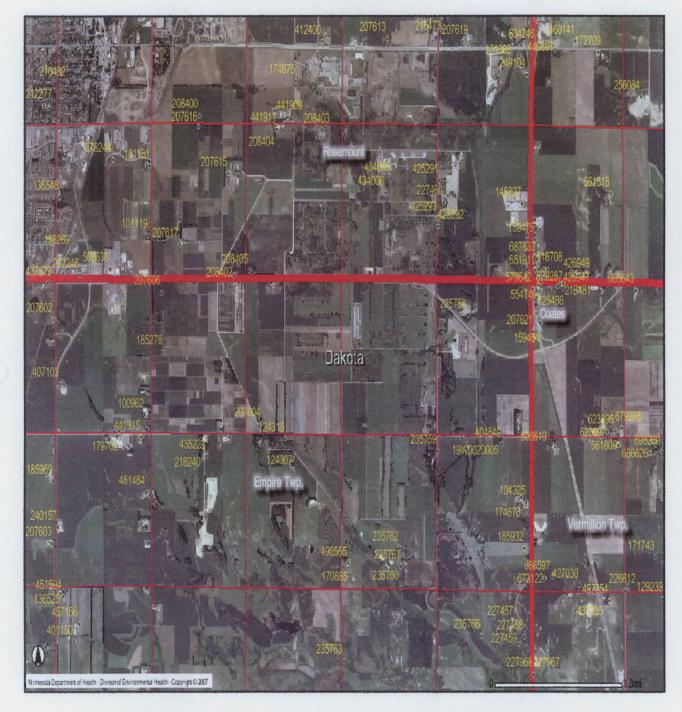
### **Appendix 1**

**Historical Documents** 

BWJ060361 April 2008 Print Map



#### The Minnesota County Well Index



#### Highlighted records indicates a Field Verified Well Location

Click a Well Unique Number to generate a well log

#### Well List

								Well Lis	38	a saluta in a							
Unique Number	Stratigraphy	County	Well Name	Township	Range	Dir	Section	Sub Sections	Depth (ft)	Use	Elevation (ft)	Depth Cased (ft)	SWL	Casing Diameter	Casing Material	Aquifer	Address
104325	Yes	Dakota	DECLOS, TONY	114	19	w	12	ADDACC	125	Abandoned	925	100	60	4	Steel (black or low carbon)	Prairie Du Chien Group	17461 81 CR . ROSEMOUNT
121082	<u>Yes</u>	Dakota	TIX, JIM	115	19	w	36	DDDDCC	365	Domestic	910	328	75	4	Steel (black or low carbon)	Jordan	15981 CLAYTON AV , ROSEMOUNT
124307	Yes	Dakota	OLSON, STEVE	114	19	w	10	BADDDD	130	Domestic	935	99	64	4	Steel (black or low carbon)	Prairie Du Chien Group	17110 STATION TR , FARMINGTON
124315	Yes	Dakota	BRODIL, GAYLE	114	19	w	10	BAABAC	135	Domestic	937	99	52	4	Steel (black or low carbon)	Prairie Du Chien Group	1210 170TH ST W . FARMINGTON
145827	Yes	Dakota	WESTIN, HAROLD J.	115	19	w	36	ADDCDC	320	Domestic	920	258	120	8	Steel (black or low carbon)	Jordan	52 HY . COATES
170826	Yes	Dakota	FRITZ, DALE	115	19	w	36	DDDACA	290	Domestic	912	273	78	4	Steel (black or low carbon)	Jordan	15915 COATES BL , COATES
170885	Yes	Dakota	ROSEMOUNT RESEARCH FARM	114	19	w	11	CCBDBB	305	Irrigation	970	134	106	8	Steel (black or low carbon)	Prairie Du Chien Group	ROSEMOUNT
174676	Yes	Dakota	DUCLOS. KENNETH	114	19	W	12	ADDBCB	280	Domestic	920	250	70	4	Steel (black or low carbon)	Jordan	17461 CLAYTON AV . ROSEMOUNT
185932	Yes	Dakota	BOHN, TED JR.	114	19	w	12	DDAACD	320	Domestic	910	280	78	4	Steel (black or low carbon)	Jordan	17801 CLAYTON AV E , COATS
207604	Yes	Dakota	FARM RUINS	114	19	W	3	CCDBDD	935	Domestic	935						
208402	Yes	Dakota	UNIV. OF MN. OFFICE BLDG.	115	19	w	33	DDDCC	166	Domestic	960	161	75	4	Steel (black or low carbon)	Prairie Du Chien Group	1605 160TH' ST W . ROSEMOUNT
208405	Yes	Dakota	UNIV. OF MN. SUPERINTENDENT RES.	115	19	W	34	CCCCD	235	Domestic	953		75	4	Steel (black or low carbon)		ROSEMOUNT
227456	Yes	Dakota	MURA PROJECT- BORING 1	114	19	W	13	AACC	20	Other (specify in remarks)	886						
227457	Yes	Dakota	MURA PROJECT- BORING 2	114	19	W	13	AACD	25	Other (specify in remarks)	897						
227458	Yes	Dakota	MURA PROJECT- BORING 3	114	19	w	13	ADAB	25	Other (specify in remarks)	904						
227459	Yes	Dakota	MURA PROJECT- BORING 4	114	19	W	13	ADBD	43	Other (specify in remarks)	889		30.5				
404840	<u>Yes</u>	Dakota	CLARK, KEVIN	114	19	w	12	ABABDD	160	Domestic	915	120	70	4	Steel (black or low carbon)	Prairie Du Chien Group	
425291	<u>Yeş</u>	Dakota	U OF M.	115	19	W	36	всвссс	230	Test well	930	97	80	6	Steel (black or low carbon)	Prairie Du Chien Group	
425292	Yes	Dakota	U OF M.	115	19	w	36	CBCBCB	230	Test well	926	105	85	6	Steel (black or low carbon)	Prairie Du Chien Group	
425293	Yes	Dakota	U OF M.	115	19	W	36	СВВССС	291	Abandoned	926	271	65	4	Steel (black or low carbon)	Jordan	
434005	Yes	Dakota	U OF M SE COMPLEX MW	115	19	w	35	ACBCCB	107	Abandoned	934	97	70	4	Steel (black or low carbon)	Prairie Du Chien Group	ROSEMOUNT
434006	Yes	Dakota	U OF M RESEARCH MW	115	19	w	35	BDDDBB	78	Abandoned	934	68	70	4	Steel (black or low carbon)	Quat. Buried Unconf. Aquife	ROSEMOUNT
435223	Yes	Dakota	HEIGH, CHUCK	114	19	W	9	ABCABD	320	Irrigation	962	130	60	12	Steel (black or low	Prairie Du Chien	1960 170TH ST W. ROSEMOUNT

http://mdh-agua.health.state.mn.us/cwi/cwiWellList.asp?township=&range=&section=&w... 4/13/2007

Well Log List Page 2 of 2

																carbon)	Group	
2	490565	<u>Yes</u>		WCAL TRANSMITTER BLDG.	114	19	W	11	CCBDB	370	Domestic	968	346	101	4	Steel (black or low carbon)		17979 ANNETTE AV . ROSEMOUNT
	19W0000043	No	Dakota	GROTN, HUGO	115	19	W	36	DA	130	Domestic	928	130	0				15640 CLAYTON AV . ROSEMOUNT

25 Well Records Returned

HOCH

Minnesota Unique Well No.

425293

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date 03/30/1990 03/27/2006

		Militiesola Statutes C	mapter 1001				
Well Name U OF M.	000 #	Well Depth	Depth Completed	Date Well Completed			
	926 ft. 7.5 minute	291 ft. 291 ft. 09/19/1986					
115 19 W 36 CBBCCC Elevation Method	topographic map	Drilling Method Non-speci					
	(+/- 5 feet)						
	,	Drilling Fluid 	Well Hydrofractured? [From Ft. to Ft.	Yes No			
		Use Abandoned Status	Saalad				
Geological Material Color Hardness	From To	Ose Abandoned Status	Sealed				
CLAY BROWN HARD GRAVEL BROWN HARD SANDROCK WHITE HARD LIMESTONE YELLOW HARD SANDROCK YELLOW MEDIUM	0 10 10 71 71 94 94 259 259 291	Casing Type Steel (black Yes No Above/Below		led Drive Shoe?			
		Casing Diameter	Weight	Hole Diameter			
		8 in. to 94 ft.	18 lbs./ft.	14 in. to 94 ft.			
		4 in. to 271 ft.	11 lbs./ft.	8 in. to 271 ft.			
		Open Hole from 271 ft.	to 291 ft.				
		Screen NO Make T	Гуре				
		Diameter Slo	ot/Gauze Lengt	h Set Between			
		Diameter Sic	Diroauze Lengt	ii Set between			
1/4/2015/19/20		Chatia Watan Laval					
		Static Water Level 65 ft. from Land surface	Date Measured 09/19/19	86			
		PUMPING LEVEL (below la 90 ft. after 2 hrs. pumpin					
			nt program and a transfer of the Article Article of the Article Article of the Article	entire de la filia de colocido de colocido de colocido de colocido de colocido de colocido colocido como de col			
		Well Head Completion Pitless adapter manufacture	er Model				
		Casing Protection	12 in. above grade				
		677	ntal Wells and Borings ONL	/\			
		E Argiade (Environmen	nai wells and bornigs ONE	',			
REMARKS		Grouting Information We	ell Grouted? Yes	No			
WELL SEALED 12-05-1998 BY 71677. ORIGINAL USE TW - TEST WELL.		, , , , , , , , , , , , , , , , , , , ,					
		Grout Material: Neat (	Cement from	to 271 ft. 3 yrds.			
		- Tour material. Hour		o yida.			
Located Minnesota Geological Survey Method Digitized - scalarger	ale 1:24,000 or						
Program COUNTY WELL INDEX Date N/A		Nearest Known Source of	Contamination				
Unique Number Verification Other, note in		1000 feet N direction					

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000425293

County Well Index Online Report	425293 Printed 4/13/2	
First Bedrock St.Peter Aquifer Jordan Last Strat Jordan Depth to Bedrock 71 ft.	Kimmes-Bauer         19521         LES/STEVE           License Business Name         Lic. Or Reg. No.         Name of Drille	
Ye	Abandoned Wells Does property have any not in use and not sealed well(s)?  Tes No  Variance Was a variance granted from the MDH for this well?  Yes	No
System UTM - Nad83, Zone15, Meters X: 495652 Y: 4952197	Well disinfected upon completion?  Yes No  Pump Not Installed Date Installed  Manufacturer's name Model number HP 0 Volts  Length of drop Pipe ft Capacity _g.p.m Type Material	

434005

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

### WELL AND BORING RECORD

Entry Date Update Date Received Date

01/04/1993 03/27/2006

	Minnesota Statutes Chapter 1031
Well Name U OF M SE COMPLEX MW	Well Depth Depth Completed Date Well Completed
Township Range Dir Section Subsections Elevation 934 ft.	107 ft. 107 ft. 07/17/1987
7.5 minute 115 19 W 35 ACBCCB Elevation Method topographic maj (+/- 5 feet)	Drilling Method Non-specified Rotary
Well Address	
ROSEMOUNT MN 55068	Drilling Fluid Additive (+ Bentonite)  Well Hydrofractured? Yes No From Ft. to Ft.
Geological Material Color Hardness From To SILTY CLAY BLACK SOFT 0 15	Use Abandoned Status Sealed
SAND	
	Casing Diameter Weight Hole Diameter 4 in. to 97 ft. 10.79 lbs./ft. 10 in. to 30 ft. 8 in. to 107 ft.
	Open Hole from ft. to ft.
	Screen YES Make JOHNSON Type stainless steel
	Diameter Slot/Gauze Length Set Between 4 10 10 97 ft. and 107 ft.
	Static Water Level 70 ft. from Land surface Date Measured 07/17/1987
	PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.
	Well Head Completion Pitless adapter manufacturer Model
	Casing Protection 12 in. above grade  At-grade (Environmental Wells and Borings ONLY)
	E Argiade (Chvironmental wells and Bollings ONLT)
REMARKS WELL SEALED 12-05-1998 BY 71677. ORIGINAL USE MW - MONITOR WELL	Grouting Information Well Grouted?  Yes  No
ONIGHAE GOE HITT - MONTH ON THEEL.	Grout Material: Neat Cement from 0 to 48 ft. 1 yrds
Method Digitization (Screen) - Map	Grout Material: Neat Cement from 0 to 48 ft. 1 yrds.  Grout Material: Bentonite from 48 to 84 ft. 1 yrds.
Located Minnesota Geological Survey (1:24,000)	
Program COUNTY WELL INDEX Date 07/27/2004 Unique Number Verification Other, note in	Nearest Known Source of Contamination _feetdirectiontype
remarks	Well disinfected upon completion? Yes W No
<b>System</b> <i>UTM - Nad83, Zone15, Meters</i> <b>X</b> : 494870 <b>Y</b> : 4952612	Pump Not installed Date installed

 $http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000434005$ 

		Manufacturer's name Model Length of drop Pipe _ft. Capacity	number HP 0 Volts g.p.m Type Materi	al
		Abandoned Wells Does property l	nave any not in use and not	sealed well(s)?
		Variance Was a variance granted to	from the MDH for this well?	Yes No
	Aquifer Prairie Du Chien Group	Well Contractor Certification		
First Bedrock Prairie Du Chien Group		Bergerson-Caswell	27058	DEHN, D.
Last Strat Prairie Du Chien Group	Depth to Bedrock 91 ft.	License Business Name	Lic. Or Reg. No.	Name of Driller
County Well Index O	nline Report	434005		Printed 4/13/2007 HE-01205-07

490565

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date 03/16/1993 01/22/2003

		Minnesota Stat	utes Chapter 103I			
Well Name WCAL TRANSMITTER BLDG.	200 6	Well Depth	Depth Completed D	ate Well Completed		
Township Range Dir Section Subsections Elevation	on 968 ft. 7.5 minute	370 ft.	370 ft.	06/24/1991		
114 19 W 11 CCBDB Elevation	on Method topographic r (+/- 5 feet)	Drilling Method No.	n-specified Rotary			
Well Address 17979 ANNETTE AV ROSEMOUNT MN 55068		<b>Drilling Fluid</b> Other	Well Hydrofractured? Ye	s No		
Geological Material Color CLAY-MUSHY BROWN	Hardness From To SOFT 0 20	Use Domestic				
SAND BROWN CLAY BLUE SHAKOPEE GRAY JORDAN WHITE	MEDIUM 32 1: HARD 111 3:	32 111 325 370 Yes No Above/Below 1 ft.				
		Casing Diamete 8 in. to 113 4 in. to 346	ft. 28.55 lbs./ft. 12	e <b>Diameter</b> in. to 113 ft. in. to 346 ft.		
		Open Hole from 34	6 ft. to 370 ft.			
		Screen NO Mak	е Туре			
		Diameter	Slot/Gauze Length	Set Between		
		Static Water Level 101 ft. from Land s	urface Date Measured 06/24/1991			
		PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.				
		[				
REMARKS ST.OLAF COLLEGE, NORTHFIELD, MN 55057		Grouting Information	n Well Grouted? Yes No	)		
Located Minnesota Geological Survey  Metho (1:24,0  Program COUNTY WELL INDEX  Date 1		Grout Material: I		46 ft. 7 yrds.		
Unique Number Verification Address verification System UTM Nod92 Zono15 Materia V: 400	1142 <b>V</b> · 4040607	Nearest Known Sou 50 feet South Wes Well disinfected upon				
System UTM - Nad83, Zone15, Meters X: 494	1143 <b>Y</b> : 4948607	well distributed upo	Tompleton? [7] Tes [7] No			

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000170885,0000490565

County Well Index On	line Report	490565		Printed 4/13/2007 HE-01205-07
First Bedrock Prairie Du Chien Group Last Strat Jordan	Aquifer Jordan  Depth to Bedrock 111 ft.	Well Contractor Certification  Hartmann Well Co.  License Business Name	40174 Lic. Or Reg. No.	JAECKELS, R. Name of Driller
		Variance Was a variance granted for	rom the MDH for this well?	Yes No
		Abandoned Wells Does property h	nave any not in use and not	sealed well(s)?
		Pump Not Installed Date Manufacturer's name GRUNDFOS HP 1 Volts 240 Length of drop Pipe 144 ft. Capa Type Submersible Material Steel	acity 10 g.p.m	<u>1015</u>

207604

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date 10/19/1990 02/23/2006

		Minnesota Statutes C	napter 1031				
Well Name FARM RUINS		Well Depth	Depth Completed Date Well Completed				
Township Range Dir Section Subsections Elevation	935 ft.	935 ft. 935 ft.					
	7.5 minute		OOO II.				
114 19 W 3 CCDBDD Elevation Method	topographic map (+/- 5 feet)	Drilling Method					
		Drilling Fluid 	Well Hydrofractured? Yes No From Ft. to Ft.				
Geological Material Color Hardness	From To	Use Domestic					
SAND AND GRAVEL ST. PETER SANDSTONE	0 50 50 935						
		Casing Diameter	Weight Hole Diameter				
		Open Hole from ft. to	ft.				
		Screen Make Type					
		Diameter Slot/Gauze Length Set Between					
		Static Water Level ft. from Date Measured	1				
		PUMPING LEVEL (below la ft. after hrs. pumping	and surface) g.p.m.				
		Well Head Completion Pitless adapter manufacturer Casing Protection At-grade (Environment	r Model 12 in. above grade tal Wells and Borings ONLY)				
REMARKS SOURCE: SWARTZ (1936).		Grouting Information We	Il Grouted? Yes No				
Located Minnesota Geological Survey Program COUNTY WELL INDEX Unique Number Verification N/A  Method Digitized - scale 1: Date N/A	24,000 or larger						
		Nearest Known Source of	Contamination				

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000207604

System UTM - Nad83, Zone15, Meters	X: 492679 Y: 4950066	_feet _direction _type  Well disinfected upon completion?  Yes  No					
		Pump Not Installed [ Manufacturer's name Mod Length of drop Pipe _ft. Capa	lel number HP _ Volts	al			
		Abandoned Wells Does properly	ty have any not in use and not	sealed well(s)?			
		Variance Was a variance grante	ed from the MDH for this well?	Yes No			
First Bedrock St Peter		Well Contractor Certification					
Last Strat St.Peter	Aquifer Depth to Bedrock 50 ft.	License Business Name	Lic. Or Reg. No.	Name of Driller			
County Well Index	Online Report	207604		Printed 4/13/2007 HE-01205-07			

124315

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

### WELL AND BORING RECORD

Entry Date Update Date Received Date 03/30/1990 02/23/2006

			Minnesota Statutes	Chapter 103l				
Well Name BRODIL, GAYLE	4		Well Depth	Depth Completed	Date Well Completed			
Township Range Dir Section Subsections Eleva	ation	937 ft.	135 ft.	135 ft.	00/00/1976			
114 19 W 10 BAABAC Eleva	ation Method	7.5 minute topographic map (+/- 5 feet)		ol				
Well Address 1210 170TH ST W FARMINGTON MN 55068			Drilling Fluid 	Well Hydrofractured? From Ft. to Ft.	Yes No			
Geological Material Color SOIL BLACK	Hardness SOFT	From To	Use Domestic					
COARSE GRAVEL BROWN BLUE CLAY BLUE CLAY RED GRAVEL BROWN SANDSTONE WHITE LIMESTONE YELLOW	HARD SOFT SOFT HARD SOFT HARD	1 16 16 39 39 46 46 47 47 93 93 135	Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe?  Yes No Above/Below 1 ft.					
			Casing Diameter Weight Hole Diameter 4 in. to 99 ft. lbs./ft. 4 in. to 135 ft.					
			Open Hole from 99 ft.	to 135 ft.				
			Screen NO Make	Туре				
			Diameter Slot/Gauze Length Set Between					
			Static Water Level 52 ft. from Land surface Date Measured 04/16/1976					
			PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.					
			Well Head Completion Pitless adapter manufacture Casing Protection At-grade (Environme	er Model  12 in. above grade  ntal Wells and Borings ONLY	)			
REMARKS FORMER OWNER WALTER CHRISTENSON.			Grouting Information W	ell Grouted? Yes	No			
la la	lethod Digitized - s arger ate N/A	scale 1:24,000 or						
Unique Number Verification Information from owner			Nearest Known Source of Contamination  116_feet S_direction Septic tank/drain field_type					
	: 493071 <b>Y</b> : 494	9906	Well disinfected upon com	E 55-3	No			
			Pump Not Installed Date Installed 04/16/1976					

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000124315

Last Strat Prairie Du Chien Group  County Well Index	Depth to Bedrock 47 ft.	License Business Name	Lic. Or Reg. No.	Name of Driller Printed 4/13/2007
First Bedrock St.Peter	Aquifer Prairie Du Chien Group	Well Contractor Certification  Corcoran Well Co.	19163	SCHWANZ, M.
		Variance Was a variance granted fi	rom the MDH for this well?	Yes No
		Abandoned Wells Does property h	nave any not in use and not	sealed well(s)?
		Manufacturer's name FAIRBANKS  HP 0.75 Volts 230  Length of drop Pipe 84 ft. Capac (black or low carbon)		per <u>7511</u> bmersible Material <u>Steel</u>

208402

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date

09/15/1988 03/24/2006

-			Minnesota Statutes C	Snapter IVSI	
Well Name UNIV. OF MN. OFFICE BLDG.			Well Depth	Depth Completed	Date Well Completed
Township Range Dir Section Subsections Ele	evation	950 ft.	166 ft.	166 ft.	12/00/1957
115 19 W 33 DDDCC Ele	evation Method	7.5 minute topographic map	Drilling Method		
THE TO WE GO BBBOO EN	vation method	(+/- 5 feet)	Drining mounds		
Well Address					
1605 160TH' ST W			Drilling Fluid		a
ROSEMOUNT MN 55068			Dinning Fluid	Well Hydrofractured?	Yes No
				From Ft. to Ft.	
Geological Material	Color Hardness	From To		1	
CLAY GRAVEL IN LAYERS		0 30	Use Domestic		
CLAY IN LAYERS		30 158			
WATER BEARING SAND LIMEROCK		158 161 161 166			N
LIMEROOK		101 100	Casing Type Steel (black	or low carbon) Joint No In	formation Drive Shoe?
			Yes No Above/Belo	w 0 ft.	
				Mainle 11	ala Diamatan
			Casing Diameter	Weight H	ole Diameter
			4 in. to 161 ft.	lbs./ft.	4 in. to 166 ft.
			Open Hole from 161 ft.	to 166 ft.	
			CONTRACTOR AND	Туре	
			Screen NO Make	type	
			Diameter Sle	ot/Gauze Lengt	h Set Between
			Static Water Level		
			75 ft. from Land surface	Date Measured 12/00/195	57
			PUMPING LEVEL (below )		
			ft. after 4 hrs. pumping	14 g.p.m.	
				eters have be a section of the Contragal and a secure and a section of the public and of the section reports	
			Well Head Completion		
			Pitless adapter manufacture		
			Casing Protection	12 in. above grade	
			(F227)	ntal Wells and Borings ONLY	^
			At-grade (Environment	mai vvens and Borings ONLY	)
REMARKS					371
WELL DRILLED BY BEAUDETTE WELL CO.			Grouting Information W	ell Grouted? Yes	No
1.1035.67					
	Method Digitized - s	cale 1:24 000 or			
Located Minnesota Geological Survey	larger				
Program COUNTY WELL INDEX	Date N/A				
Unique Number Verification Information from			Nearest Known Source of	Contamination	
owner			_feet _direction _type		
System UTM - Nad83, Zone15, Meters	X: 492206 Y: 495	1607	Well disinfected upon comp	pletion? Yes	No
7,2,2,110 0 7 11 110,000	1. 102200 1. 100		The annual section of the		

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000208402

		Pump Not Installed Date Manufacturer's name Model Length of drop Pipe _ft. Capacity	number HP <u>0</u> Volts	ial
		Abandoned Wells Does property h	nave any not in use and not	sealed well(s)?
First Bedrock Prairie Du Chien Group  Last Strat Prairie Du Chien Group	Aquifer Prairie Du Chien Group Depth to Bedrock 161 ft.	Variance Was a variance granted of Well Contractor Certification  License Business Name	from the MDH for this well?	Yes No
County Well Index O	nline Report	208402		Printed 4/13/2007 HE-01205-07

NE AOCS

Minnesota Unique Well No.

208405

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date 09/15/1988 03/24/2006

Well Name UNIV. OF MN. SUPERINTENDENT RES.	COLUMN TOWNS OF THE PARTY OF TH	Well Depth	Depth Completed	Date Well Completed	
Township Range Dir Section Subsections Elevation 953 ft. 7.5 minute		235 ft.	235 ft.	03/00/1953	
115 19 W 34 CCCCD Elevation Method topograph: (+/-5 feet)	ic map	Drilling Method Cable Too	I		
Well Address					
ROSEMOUNT MN 55068		Drilling Fluid 	Well Hydrofractured? From Ft. to Ft.	Yes No	
Geological Material Color Hardness From CLAY TO NEARLY LOAM (LOWER) 0 140	140 180	Use Domestic			
SAND-COARSE SAND & GRAVEL 180 GRAVEL TO LIMESTONE 195	195 235	Casing Type Steel (black or low carbon) Joint No Information Drive Shoe?  Yes No Above/Below 1.5 ft.			
Casing Diameter Weight Hole Diameter 4 in. to ft. lbs./ft. 4 in. to 235 ft.					
		Open Hole from ft. to	ft		
		Screen Make Type			
			t/Gauze Leng	th Set Between	
		Static Water Level 75 ft. from Land surface	Date Measured 03/00/19	953	
		PUMPING LEVEL (below la ft. after hrs. pumping			
		Well Head Completion Pitless adapter manufacturer Casing Protection At-grade (Environment		.Y)	
NO REMARKS		Grouting Information We	Il Grouted? Yes	No No	
Located Minnesota Geological Survey  Method Digitized - scale 1:24,00 larger  Data NIA	00 or				
Program COUNTY WELL INDEX Date N/A Unique Number Verification Information from		Nearest Known Source of to	Contamination		
owner		Well disinfected upon compl	etion? Yes	No	

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000208405

County Well Index Or	line Report	208405		Printed 4/13/2007 HE-01205-07
Last Strat Prairie Du Chien Group	Depth to Bedrock 195 ft.	License Business Name	Lic, Or Reg. No.	Name of Driller
First Bedrock Prairie Du Chien Group	Aquifer	Corcoran Well Co.	19163	
		Well Contractor Certification		
		Variance Was a variance granted to	from the MDH for this well?	Yes No
		Abandoned Wells Does property h	nave any not in use and not	sealed well(s)?
System UTM - Nad83, Zone15, Meters	X: 492463 Y: 4951658	Pump Not Installed Date Manufacturer's name Model Length of drop Pipe t. Capacity	number HP _ Volts	al

227456

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date 02/25/2003

	Minnesota Statutes Chapter 1031
Well Name MURA PROJECT-BORING 1	Well Depth Depth Completed Date Well Completed
Township Range Dir Section Subsections Elevation 886 ft.	20 ft. 20 ft. 03/08/1956
114 19 W 13 AACC Elevation Method Surveyed	Drilling Method Jetted
	Drilling Method Jetted
	Drilling Fluid - Well Hydrofractured? Yes No From Ft. to Ft.
Geological Material Color Hardness From To	Use Other (specify in remarks)
SANDY LOAM         GRY/BRN         0         1           CLAY LOAM         LT. BRN         1         2           SAND         BRN/TAN         2         7           SANDSTONE         WHT/TAN         7         20	Casing Type Joint No Information Drive Shoe? Yes No Above/Below ft.
	Casing Diameter Weight Hole Diameter
	Open Hole from ft. to ft.
	Screen Make Type
	Diameter Slot/Gauze Length Set Between
	Static Water Level ft. from Date Measured
	PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.
	Well Head Completion Pitless adapter manufacturer Model
	Casing Protection 12 in. above grade
	At-grade (Environmental Wells and Borings ONLY)
	g. == 2 (min o min o min o o o o o o o o o o o o o o o o o o o
REMARKS USE-SOIL BORING BY TWIN CITY TESTING	Grouting Information Well Grouted? Yes No
Located Minnesota Geological Survey  Method Digitized - scale 1:24,000 or larger  Program COUNTY WELL INDEX  Date N/A	
Unique Number Verification Information from	Nearest Known Source of Contamination
owner	_feet _direction _type
	Well disinfected upon completion? Yes No

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000227456

System UTM - Nad83, Zone15, M	leters X: 496846 Y: 4947918	Pump Not Installed I Manufacturer's name Mod Length of drop Pipe _ft. Capa	del number HP _ Volts	
		Abandoned Wells Does proper	rty have any not in use and not s	sealed well(s)?
		Variance Was a variance grante Well Contractor Certification		Yes No
First Bedrock St.Peter	Aguifer	Minnesota Geological Surv	vey MGS	
Last Strat St.Peter	Depth to Bedrock 7 ft.	License Business Name	Lic. Or Reg. No.	Name of Driller
County Well Index Online Report		227456		Printed 4/13/2007 HE-01205-07

227459

County Quad Quad ID Dakota Coates 88A

#### MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date 02/25/2003 02/25/2003

Minnesota Statutes Chapter 1031
Well Depth Depth Completed Date Well Completed
43 ft. 43 ft. 03/08/1956
Drilling Method Jetted
Drilling Fluid  Well Hydrofractured? Yes No From Ft. to Ft.
Use Other (specify in remarks)
Casing Type Joint No Information Drive Shoe? Yes No Above/Below ft.
Casing Diameter Weight Hole Diameter
Open Hole from ft. to ft.
Screen Make Type
Diameter Slot/Gauze Length Set Between
Static Water Level 30.5 ft. from Land surface Date Measured 03/08/1956
PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.
Well Head Completion Pitless adapter manufacturer Model Casing Protection 12 in. above grade At-grade (Environmental Wells and Borings ONLY)
Grouting Information Well Grouted? Yes No
Nearest Known Source of Contamination _feetdirectiontype Well disinfected upon completion? Yes No

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000227459

		Pump Not Installed Date Installed  Manufacturer's name Model number HP Volts  Length of drop Pipe ft. Capacity g.p.m Type Material	
		Abandoned Wells Does property have any not in use and not sealed well(s)?  Yes No	
		Variance Was a variance granted from the MDH for this well? Yes Well Contractor Certification	No
First Bedrock St.Peter	Aquifer	Minnesota Geological Survey MGS	
Last Strat St.Peter	Depth to Bedrock 5 ft.	License Business Name Lic. Or Reg. No. Name of D	riller
County Well Ind	ex Online Report	227459 Printed 4/13/	

227457

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

### WELL AND BORING RECORD

Entry Date Update Date Received Date 02/25/2003 02/25/2003

Well Name MURA PROJECT-BORING 2	Well Depth Depth Completed Date Well Completed
Township Range Dir Section Subsections Elevation 897 ft.	25 ft. 25 ft. 03/08/1956
114 19 W 13 AACD Elevation Method Surveyed	Drilling Method Jetted
	Drilling Fluid Well Hydrofractured? Yes No From Ft. to Ft.
Geological Material Color Hardness From To	Use Other (specify in remarks)
SANDY LOAM   GRY/BRN   0 1	Casing Type Joint No Information Drive Shoe? Yes No Above/Below ft.
	Casing Diameter Weight Hole Diameter
	Open Hole from ft. to ft.
	Screen Make Type
	Diameter Slot/Gauze Length Set Between
	Static Water Level ft. from Date Measured
	PUMPING LEVEL (below land surface) ft. after hrs. pumping g.p.m.
	Well Head Completion Pitless adapter manufacturer Model Casing Protection 12 in. above grade
	At-grade (Environmental Wells and Borings ONLY)
REMARKS USE-SOIL BORING BY TWIN CITY TESTING.	Grouting Information Well Grouted? Yes No
Located Minnesota Geological Survey  Method Digitized - scale 1:24,000 or larger	
Program COUNTY WELL INDEX Date N/A	
Unique Number Verification Information from owner	Nearest Known Source of Contamination _feet _direction _type
	Well disinfected upon completion? Yes No

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000227457

System UTM - Nad83, Zone15, Mete	rs X: 496945 Y: 4947993	Pump Not Instal Manufacturer's name Length of drop Pipe _ft.	led Date Installed  Model number HP _ Volts Capacity _g.p.m Type Materi	al
		Abandoned Wells Does p	property have any not in use and not	sealed well(s)?
First Bedrock St.Peter  Last Strat St.Peter	Aquifer Depth to Bedrock 3 ft.	Variance Was a variance Well Contractor Certificat Minnesota Geological License Business N	Survey MGS	Yes No
County Well Index	Online Report	227457		Printed 4/13/2007 HE-01205-07

425292

County Quad Quad ID Dakota Vermillion 87B MINNESOTA DEPARTMENT OF HEALTH

### WELL AND BORING RECORD

Entry Date Update Date Received Date 12/09/1992 03/27/2006

		Minnesota Statutes C	napter 1031		
Well Name U OF M.		Well Depth	Depth Completed	<b>Date Well Completed</b>	
Township Range Dir Section Subsections Elevation 926 ft.		230 ft.	230 ft.	09/18/1986	
115 19 W 36 CBCBCB Elevation Method	7.5 minute topographic map (+/- 5 feet)	Drilling Method Non-specified Rotary			
	ing mangangan kan di anggan kan gadi	Drilling Fluid 	Well Hydrofractured?	Yes No	
Geological Material Color Hardness	From To	Use Test well			
CLAY BROWN MEDIUM GRAVEL BROWN SOFT CLAY BROWN SOFT LIME BROWN MEDIUM	0 10 10 75 75 99 99 230	Casing Type Steel (black Yes No Above/Below	or low carbon) <b>Joint</b> Weldow 1 ft.	ed Drive Shoe?	
		Casing Diameter 6 in. to 105 ft.	Weight 18.97 lbs./ft.	Hole Diameter  12 in. to 105 ft. 6 in. to 230 ft.	
		Open Hole from 105 ft.	to 230 ft.		
		Screen NO Make T	уре		
		Diameter Slo	ot/Gauze Length	n Set Between	
		Static Water Level 85 ft. from Land surface	Date Measured 09/18/198	6	
		PUMPING LEVEL (below land) 115 ft. after 2 hrs. pump			
		Well Head Completion Pitless adapter manufacture Casing Protection At-grade (Environment	er Model  12 in. above grade  atal Wells and Borings ONLY	)	
NO REMARKS		Grouting Information We	ell Grouted? Yes	No No	
Located Minnesota Geological Survey Method Digitized - sca larger	ale 1:24,000 or	Grout Material: Neat (	Cement from 0	to 105 ft. 3 yrds.	
Program COUNTY WELL INDEX Date N/A Unique Number Verification Other, note in		Nearest Known Source of 500 feet S direction S			
			The tarm aran noid type		

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=425292

remarks		Well disinfected upon completion?	Yes No	
System UTM - Nad83, Zone15, Meters         X: 495654         Y: 4952117		Pump Not Installed Date  Manufacturer's name Model r  Length of drop Pipe ft. Capacity	number HP 0 Volts	al
		Abandoned Wells Does property h	ave any not in use and not	sealed well(s)?
		Variance Was a variance granted fi	rom the MDH for this well?	Yes No
		Well Contractor Certification		
First Bedrock Prairie Du Chien Group	Aquifer Prairie Du Chien Group	Kimmes-Bauer	19521	BAUER, S.
Last Strat Prairie Du Chien Group	Depth to Bedrock 99 ft.	License Business Name	Lic. Or Reg. No.	Name of Driller
County Well Index O	nline Report	425292		Printed 4/13/2007 HE-01205-07

Minnesota	Unique	e Well	No
	-		

425291

County Quad Quad ID Dakota Coates 88A

#### MINNESOTA DEPARTMENT OF HEALTH

#### WELL AND BORING RECORD

Entry Date Update Date Received Date 03/30/1990 03/27/2006

			Minnesota Statutes C	hapter 103l	
Well Name U OF M.			Well Depth	Depth Completed	Date Well Completed
Township Range Dir Section Subsections Elevation  115 19 W 36 BCBCCC Elevation Method		930 ft.	230 ft.	230 ft.	09/17/1986
		7.5 minute topographic map (+/- 5 feet)	Drilling Method Non-specified Rotary		
			<b>Drilling Fluid</b> Bentonite	Well Hydrofractured? From Ft. to Ft.	Yes No
			Use Test well		
LIMESTONE BLU	OWN MEDIUM OWN MEDIUM LOW HARD	From To 0 10 10 89 89 92 92 110 110 230	Casing Type Steel (black Yes No Above/Below		ded Drive Shoe?
			Casing Diameter 6 in. to 97 ft.	Weight 18 lbs./ft.	Hole Diameter  12 in. to 97 ft. 6 in. to 230 ft.
			Open Hole from 97 ft. t	to 230 ft.	
			Screen NO Make 7	Гуре	A THE STATE OF THE
			Diameter Slo	ot/Gauze Leng	th Set Between
			Static Water Level 80 ft. from Land surface	Date Measured 09/17/19	986
			PUMPING LEVEL (below I 95 ft. after 2 hrs. pumpir		
			Well Head Completion Pitless adapter manufacture Casing Protection At-grade (Environment	er Model  12 in. above grade  ntal Wells and Borings ONL	.Y)
NO RE	EMARKS		Grouting Information W	ell Grouted? Yes	No No
Located Minnesota Geological Survey	<b>Method</b> Digitized - larger	scale 1:24,000 or	Grout Material: Neat of Grout Material: Cuttin	Cernon	rom to 97 ft. 2
Program COUNTY WELL INDEX Unique Number Verification Other, note remarks	Date N/A		Nearest Known Source of 150 feet W direction		

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=425291

County Well Index Online Report		425291		Printed 4/13/2007 HE-01205-07
First Bedrock St.Peter Last Strat Prairie Du Chien Group	Aquifer Prairie Du Chien Group Depth to Bedrock 89 ft.	Well Contractor Certification <u>Kimmes-Bauer</u> License Business Name	<u>19521</u> Lic. Or Reg. No.	STEVE/LES Name of Driller
		Variance Was a variance granted to	from the MDH for this well?	Yes No
		Abandoned Wells Does property h	nave any not in use and not	sealed well(s)?
		Pump Not Installed Date Manufacturer's name Model Length of drop Pipe_ft. Capacity	number HP 0 Volts	al
System UTM - Nad83, Zone15, Meters	X: 495665 Y: 4952591	Well disinfected upon completion? Yes W No		

EGAOC 1-Southern

Minnesota Unique Well No.

227968

County Quad Quad ID Dakota Coates 88A MINNESOTA DEPARTMENT OF HEALTH

### WELL AND BORING RECORD

Entry Date Update Date Received Date 03/10/1994 06/27/2006

			Minnesota Statutes C	hapter 103l		
Well Name			Well Depth	Depth Completed	Date Well Completed	
Township Range Dir Section Subsections		ft. ninute	25 ft.	24 ft.	11/29/1989	
114 18 W 18 CBBBCB		graphic map	Drilling Method Power Au	ger		
			Drilling Fluid 	Well Hydrofractured?	Yes No	
Geological Material	Color Hardnes	ssFromTo	Use Monitor well			
LOAM CLAY COARSE SAND, DIRTY MED. COARSE SAND, DIRTY GRAVEL	BLACK SOFT BROWN MEDIUM BROWN SOFT LT. BRN SOFT LT. BRN	0 4 4 5 5 12 12 18 18 20	Casing Type Galvanized No Above/Below 3.8 ft.	Joint Threaded Drive Sh	oe? Yes	
FINE/COARSE GRAVEL, CLEAN FINE SAND & LARGE CHUNCKS R	LT. BRN EFUSALYELLOWHARD	20 24 24 25		Weight H	Hole Diameter 4 in. to 25 ft.	
			Ones Hele fees # to	£4		
			Open Hole from ft. to ft.  Screen YES Make JOHNSON Type stainless steel			
			Diameter Slot/G 2 10	auze Length Set		
			Static Water Level 8.8 ft. from Land surface	Date Measured 11/29/19	89	
			PUMPING LEVEL (below la ft. after hrs. pumping			
			Well Head Completion Pitless adapter manufacture Casing Protection At-grade (Environment	er Model  12 in. above grade  stal Wells and Borings ONLY	')	
REMARKS REFUSAL AT 24-25 FT. POSSIBLY ST. PET	FER SANDSTONE.		Grouting Information We	ell Grouted? Yes	No	
Located United States Geological Survey Program COUNTY WELL INDEX	Method Public Land Survey - Section Date N/A	QQQQQQ	Grout Material: Neat ( Grout Material: Bento	Jonion	om 0 to ft. 0	
Unique Number Verification Information from owner			Nearest Known Source of 80 feet S direction Bo	dy of water_type		
System UTM - Nad83, Zone15, Meters	<b>X</b> : 497270 <b>Y</b> : 4947451		Well disinfected upon comp	eletion? Yes	No	

http://mdh-agua.health.state.mn.us/cwi/well\_log.asp?wellid=0000227967,0000227968

		Pump Not Installed Date Installed  Manufacturer's name Model number HP 0 Volts  Length of drop Pipe _ft. Capacity _g.p.m Type Material	
First Bedrock Aquifer Quat. Water Table Aquifer Last Strat Sand-yellow Depth to Bedrock ft.		Abandoned Wells Does property have any not in use and not sealed well(s)?  Yes No	
		Variance Was a variance granted from the MDH for this well?	No
		Well Contractor Certification	
	Aquifer Quat. Water Table Aquifer	U.s. Geol Survey M0113	
	License Business Name Lic. Or Reg. No. Name of Dri	iller	
County Well Index Online Report		227968 Printed 4/13/	

### **Appendix 2**

### **Photographs**

Source: Selected photographs of each AOC are from Bay West Site visits conducted on October 10, 2006<sup>(1)</sup> and February 21, 2007<sup>(2)</sup>, from the USACE PA Report<sup>(3)</sup>, and the 2007 Focused SI field investigations<sup>(4)</sup>.



**Photo 1. AOC 1.** Looking generally south. Walking down drainage ditch towards primary settling basin. <sup>(1)</sup>



**Photo 2. AOC 1.** Looking Southeast. Entering Primary Settling Basin from drainage ditch. <sup>(1)</sup>



**Photo 3. AOC 1.** Looking north at remnants of the dam/weir at toe of primary settling basin. (2)



**Photo 4. AOC 1.** Looking South along the drainage ditch/low area where the drainage enters into the secondary settling basin (darker color vegetation). (1)



**Photo 5. AOC 1.** Remnants of gated weir/dam structure at the Southeastern end of the Secondary Settling Basin. <sup>(1)</sup>



**Photo 6. AOC 2.** Looking East. Crops: Soybeans, wheat, corn fields and rows of trees. (1)



**Photo 7. AOC 2.** Soybean fields. Foreground possible former building location. (1)



**Photo 8.** AOC 3, Drainage Area DA1. South and adjacent to AOC 5. (3)



**Photo 9. AOC 4.** Looking south from 170<sup>th</sup> Street.<sup>(1)</sup>



**Photo 10. AOC 5.** Looking east.DNT storage bunker with trash inside. <sup>(1)</sup>



**Photo 11. AOC 5.** Looking north at a drainage area south of the DNT storage bunkers and north of AOC 3 Drainage Area DA1. (1)



**Photo 12. AOC 5**. Looking East. DNT storage bunker. (1)



**Photo 13. AOC 6.** Looking northeast, standing at Bottom of 154 Street Disturbed Area <sup>(3)</sup>



**Photo 14. AOC 7A.** Possible Transformer storage pad on the south side of Pump House. (2)



**Photo 15. AOC 7A.** Looking east. Water Chemical Inlet house attached to the North side of Building 402-A. (2)



**Photo 16. AOC 7B.** Looking northeast. (2)



**Photo 17. AOC 7C.** Looking south at the location of the former Coal Storage Area. <sup>(2)</sup>

**Photo 18. AOC 7C.** Looking northeast at a culvert located in the northeast corner of AOC 7C. (2)



**Photo 19. AOC 7D.** Looking southeast at stockpiled soil. The toe end of the stockpile on the left side of the photograph is in AOC 7C. (2)



**Photo 20. AOC 7D.** Looking northeast at the former location of Building 401-A. <sup>(2)</sup>



**Photo 21. AOC 7D.** Looking northeast at the former Fuel Oil Tank location east of Building 401- $\alpha$  (2)



**Photo 22. AOC 7D.** Looking east at the former Ash Disposal Pit, south and adjacent to the Fuel Oil Tanks located east of Building 401-A. (2)

















Photo 65. Background Sample BG-4<sup>(4)</sup>

# **Appendix 4**

# Data Verification and Validation Summaries



## **TECHNICAL MEMORANDUM**

DATE: November 26, 2007

TO: Brenda Winkler, Project Manager

**Bay West** 

FROM: Marcia A. Kuehl

Chemical QC Officer

**SUBJECT:** Data Verification for Former Gopher Ordnance Works, Rosemount, Minnesota

Sampling Events August-September, 2007

### **OVERVIEW**

Analytical results for all of the data packages (except D7H300206, D7H230183 which were validated) collected from the Former Gopher Ordnance Works in August and September, 2007 have been verified. This process consisted of review of the Case Narrative, the supporting quality control forms and chain-of-custody forms. The appropriateness of the assigned data qualifiers was assessed and additional qualifiers added as detailed below by data package.

The verification was based on the data reports and QC results supplied by the analytical laboratories, Test America, located in Denver, Colorado and Sacramento, California. Any additional data qualifiers assigned to the data are described below. A hard copy of the verified data is also attached to this memorandum.

### D7I060355

The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7I130251

Samples collected and shipped for DRO analysis were not aliquoted according to Wisconsin method requirements. Action taken was to qualify all DRO results as estimated with a J code from this method non-compliance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

# D71070382

Samples collected and shipped for DRO analysis were not aliquoted according to Wisconsin method requirements. Action taken was to qualify all DRO results as estimated with a J code from this method non-compliance. Any E qualified results should not be used, the lowest dilution that

results in a value within the linear calibration range should be considered the most quantitative result. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H310262

Re-analysis of samples FOGW-AOC7D-SS-SS3, FOGW-AOC7D-SS-SS 4 and FOGW-AOC7D-SS-SS5 due to out of limit surrogate recoveries was done outside the holding time. Data was qualified as estimated from this holding time exceedance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7I010154

The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7I200237

The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7I150223

Re-analysis of sample FOGW-AOC2-S-GP1(8-10') due to out of limit surrogate recovery was done outside the holding time. Data was qualified as estimated from this holding time exceedance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D71220193

The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7I120319

Samples FGOW-AOC4-S-GP1(8-10') and FOGW-AOC4-SS-SS2(0-6") were received for GRO analysis with no methanol present. TestAmerica added methanol and the results for these two samples should be considered estimates due to this sampling non-compliance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D71290189

The soil lab method blank contained detectable nitrocellulose at 1.1 mg/kg. Action taken was to qualify detected nitrocellulose in samples with a concentration less than 5 X the method blank as undetected with a U code as the concentration reported is not significantly different from lab background. Nitrocellulose in FOGW-AO1CM-SS-SS3(0-6") was qualified as undetected. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7J060158

The soil lab method blank contained detectable nitrocellulose at 1.1 mg/kg. Action taken was to qualify detected nitrocellulose in samples with a concentration less than 5 X the method blank as undetected with a U code as the concentration reported is not significantly different from lab background. Nitrocellulose in FOGW-AOC1S-SS-SS2(0-6") and FOGW-AOC1S-SS-SS3(0-6") was qualified as undetected. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D71260277

Sample FGOW-AOC1S-W-GP1 was re-extracted outside the holding time for semivolatiles due to low surrogate recoveries. Action taken was to qualify all sample data for FGOW-AOC1S-W-GP1 extracted on 10/7/07 as estimated with a J code from this holding time exceedance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7I150223

The re-extraction for sample FOGW-AOC2-S-GP1(8-10') for explosives due to low surrogate recovery was done outside the holding time. Action taken was to qualify explosives results for FOGW-AOC2-S-GP1(8-10') as estimated with a J code from this holding time exceedance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H240251

The soil lab method blank contained detectable nitrocellulose at 1.1 mg/kg. Action taken was to qualify detected nitrocellulose in samples with a concentration less than 5 X the method blank as undetected with a U code as the concentration reported is not significantly different from lab background. Nitrocellulose in FOGW-AOC7C-SS-GP7(0-6") was qualified as undetected. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H250161

The soil lab method blank contained detectable nitrocellulose at 1.1 mg/kg. Action taken was to qualify detected nitrocellulose in samples with a concentration less than 5 X the method blank as undetected with a U code as the concentration reported is not significantly different from lab background. All detected nitrocellulose in the samples in this data package were qualified as undetected. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H090291

The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H180125

Samples collected and shipped for DRO analysis were not aliquoted according to Wisconsin method requirements. Action taken was to qualify all DRO results as estimated with a J code from

this method non-compliance. Bis(2-ethylhexyl)phthalte was detected in the water lab blank analyzed with the project samples at 1.9 ug/L. Action taken was to qualify detected bis(2-ethylhexyl)phthalate in samples with a concentration less than 10 X the method blank as undetected with a U code as the concentration reported is not significantly different from lab background. Bis(2-ethylhexyl)phthalate in FOGW-AOC7B-W-GP1 was qualified as undetected. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H170199

Samples collected and shipped for DRO analysis were not aliquoted according to Wisconsin method requirements. Action taken was to qualify all DRO results as estimated with a J code from this method non-compliance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H220190

Samples collected and shipped for DRO analysis were not aliquoted according to Wisconsin method requirements. Action taken was to qualify all DRO results as estimated with a J code from this method non-compliance. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H110169

The soil lab method blank contained detectable nitrocellulose at 1.1 mg/kg. Action taken was to qualify detected nitrocellulose in samples with a concentration less than 5 X the method blank as undetected with a U code as the concentration reported is not significantly different from lab background. Nitrocellulose in FOGW-AOC1S-SED-SED2(0-4") was qualified as undetected. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### D7H290237

Aromatic volatiles in FOGW-AOC7D-W-GP1were qualified as estimated with a J code as the sample was not received and analyzed at pH < 2 and the sample was analyzed after 7 days. Samples collected and shipped for DRO analysis were not aliquoted according to Wisconsin method requirements. Action taken was to qualify all DRO results as estimated with a J code from this method non-compliance. Re-analysis of DRO samples FGOW-AOC7D-W-GP1 and FGOW-AOC7D-W-GP2 due to non-compliant LCS/LCSD was accomplished outside the holding time and were qualified appropriately by TestAmerica as estimated. The case narrative was supported by the QC results. All qualifiers added by TestAmerica were appropriate.

### CONCLUSION

Data as reported by TestAmerica was well supported by the attendant QC results and the case narratives were thorough and accurate. Additional qualification of data was only needed for lab blank contamination and holding time exceedances.

If you have any questions regarding the data validation process, please contact me at 920-469-9113

Attachments: Verified Data Sheets-hard copy

### **TECHNICAL MEMORANDUM**

DATE:

November 26, 2007

TO:

Brenda Winkler, Project Manager

Bay West

FROM:

Marcia A. Kuehl

Chemical QC Officer

SUBJECT:

Data Validation for Former Gopher Ordnance Works, Rosemount, Minnesota

Sampling Event August, 2007

SDGs D7H300206 and D7H230183

### 1.0 OVERVIEW

Analytical results for a randomly selected 10 % of the data packages (D7H300206, D7H230183) collected from the Former Gopher Ordnance Works on August 21 and 29, 2007 have been evaluated using the EPA guidance documents "National Functional Guidelines for Organic Data Review", dated October 1999, EPA-540/R-99/008, "National Functional Guidelines for Inorganic Data Review", dated October, 2004, EPA-540/R-04-004 and the Department of Defense Quality Systems Manual for Environmental Laboratories, Version 3, January 2006. The requirements detailed in "Final Sampling and Analysis Plan Focused Site Inspection, Former Gopher Ordnance Works, Rosemount, Minnesota, dated July 2007" were also used in the validation.

The review was based on the Level IV full CLP data packages supplied by the analytical laboratories, Test America, located in Denver, Colorado and Sacramento, California. The validation qualifiers assigned to the data are described below. A hard copy of the validated data is also attached to this memorandum.

### **Data Qualification Summary**

### Volatile Organics

All volatile organic data was usable as reported, or usable and estimated or undetected. Detected 2-butanone in FGOW-AOC7C-SS-GP3(0-6"), FGOW-AOC7C-S-GP4(2-4') and FGOW-AOC7C-S-GP5(2-4') and detected methylene chloride in FGOW-AOC7D-S-GP3(6-8'), FGOW-AOC7D-SS-GP8(0-6"), FGOW-AOC7D-S-GP8(2-4') and FGOW-AOC7D-SS-GP11(0-6") was qualified as undetected as the concentration is not significantly different from lab background.

### Semivolatile Organics

All semivolatile organic data was usable as reported without qualification, or usable and qualified as estimated. Benzidine qualified by TestAmerica with a Q qualifier was further qualified as estimated with a J code from a low calibration bias.

# **Explosives**

All explosives data was usable as reported without qualification. No detectable explosives were present in any of the project samples.

### **PCBs**

All PCB data was usable as reported without qualification. All detectable PCBs were based on at least a four peak match with the standard and confirmed on a second column.

### **Metals**

All metals data were usable as reported without qualification.

### **Nitrocellulose**

Detected nitrocellulose in FGOW-AOC7C-SS-GP4(0-6"), FGOW-AOC7C-SS-GP2(0-6") and FGOW-AOC7C-SS-GP6(0-6") was undetected as the concentration reported is not significantly (> 5X) lab background.

# 2.0 VOLATILE ORGANICS

Test America utilized EPA SW846 Methods 5030B, 5035 and 8260B. No deviations from these reference methods were apparent from the data reviewed. No action was needed to qualify validated sample data.

# 2.1 Completeness Assessment

The data packages received for volatile organic analysis was complete, and all samples collected were analyzed.

# 2.2 <u>Compliance Assessment</u>

# 2.2.1 Holding Times/Preservation

All validated samples and dilutions were originally analyzed within the 14 day holding time, and were received at  $4 \pm 2$  EC. Verification of sample pH upon analysis indicated that all aqueous samples were adequately preserved to pH < 2. No action was needed to qualify validated sample data.

### 2.2.2 Initial Calibration/Tuning

A six point initial calibration with concentrations ranging from 5- 200 ug/L associated with the samples were analyzed in accordance with method 8260B on 7/4/07 and 9/2/07. Tuning using bromofluorobenzene (BFB) was done at the start of the analysis and every 12 hours. All tuning criteria in the method and data validation protocols were met.

Method System Performance Check Compounds (chloromethane, 1,1-dichloroethane, bromoform, 1,1,2,2-tetrachloroethane, chlorobenzene) met the EPA method data validation criteria of mean RRF > 0.30 for 1,1,2,2-tetrachloroethane and chlorobenzene and > 0.10 for chloromethane, 1,1-dichloroethane, and bromoform. The minimum Relative Response Factor (RRF) of > 0.05 used by EPA Region V for data validation as proof of acceptable system response was met for all reported

volatile organic compounds. All Calibration Check Compounds (vinyl chloride, 1,1-dichloroethene, chloroform, 1,2-dichloropropane, toluene) and System Performance Check Compounds (chloromethane, 1,1-dichloroethane, bromoform, 1,1,2,2-tetrachloroethane, chlorobenzene) met the method data validation criteria of < 30 % Relative Standard Deviation (RSD). The mean RSD for all reported volatile organic compounds met the method criteria of < 15 % RSD. No action was needed to qualify sample data.

Naphthalene was qualified with an E qualifier to indicate a calibration exceedance in FGOW-AOC7D-S-GP3(2-4'). The diluted (1.23X) naphthalene result should be considered the most valid for the sample.

# 2.2.3 Continuing Calibration

A 0 ug/L continuing calibration standard (CCAL) was analyzed according to method 8260B every 12 hours. Method System Performance Check Compounds RRF<sub>10</sub> values (chloromethane, 1,1-dichloroethane, bromoform, 1,1,2,2-tetrachloroethane, chlorobenzene) met the EPA method data validation criteria of > 0.30 for 1,1,2,2-tetrachloroethane and chlorobenzene and > 0.10 for chloromethane, 1,1-dichloroethane, and bromoform. The minimum Response Factor (RF5) of > 0.05 used by EPA Region V for data validation as proof of acceptable system response was met for all reported volatile organic compounds. All Calibration Check Compounds RRF<sub>10</sub> values (vinyl chloride, 1,1-dichloroethene, chloroform, 1,2-dichloropropane, toluene) and System Performance Check Compounds (chloromethane, 1,1-dichloroethane, bromoform, 1,1,2,2-tetrachloroethane, chlorobenzene) met the EPA Region V data validation criteria of < 30 % difference and method 8260B limits of < 20 % difference. No action was needed to qualify sample data.

# 2.2.4 Laboratory Blanks

Detectable 2-butanone was present above the Method Detection Limit but below the Reporting Limit in the lab blanks analyzed with soil samples in D7H230183 at 9.1 and 9.2 ug/kg. Action taken was to qualify detected 2-butanone in samples at concentrations less than 5 X the associated lab blank as undetected with a U code as the concentration reported is not significantly different from lab background (FGOW-AOC7C-SS-GP3(0-6"), FGOW-AOC7C-S-GP4(2-4'), FGOW-AOC7C-S-GP5(2-4')).

Detectable methylene chloride was present above the Method Detection Limit but below the Reporting Limit in the lab blanks analyzed with soil samples in D7H300206 at 0.98 ug/kg. Action taken was to qualify detected methylene chloride in samples at concentrations less than 5 X the associated lab blank as undetected with a U code as the concentration reported is not significantly different from lab background (FGOW-AOC7D-S-GP3(6-8'), FGOW-AOC7D-SS-GP8(0-6"), FGOW-AOC7D-S-GP8(2-4'), FGOW-AOC7D-SS-GP11(0-6")).

### 2.2.5 Surrogate Recoveries

Surrogate recoveries in the samples were not within the TestAmerica limits, data validation and method 8260B limits. Sample FGOW-AOC7D-S-GP3(2-4') was extracted and analyzed on 9/11/07 and again on 9/12/07 at a dilution due to a high level of naphthalene. Low surrogate recoveries for all three surrogates were present in the re-extracted sample and TestAmerica qualified all the sample data with a J qualifier. As no surrogate recoveries were extremely low, no further action was taken to qualify sample data.

Low bromofluorobenzene and high  $d_8$ -toluene recovery was measured in FGOW-AOC7C-SS-GP4(0-6") and TestAmerica qualified all sample data as estimated with a J code. This sample was reanalyzed with similar out of limit surrogate recoveries and was also qualified by TestAmerica as estimated with a J code. No further action was needed to qualify sample data as a matrix effect was proven by the re-analysis.

# 2.2.6 Matrix Spike/Matrix Spike Duplicate

As non-project samples were used for the MS/MSD analyses, no action was taken to qualify project sample data due to outlier recoveries and RPD values, as the sample source and matrix is not equivalent.

# 2.2.7 Laboratory Control Standard (LCS)

An LCS and LCS Duplicate (LCSD) was prepared and analyzed at the required method 8260B frequency. All recoveries were within TestAmerica, data validation and method limits, except for acetone 173 %) in the method blank analyzed with the re-analysis of sample FGOW-AOC7D-S-GP3(2-4'). TestAmerica qualified the undetected acetone in the sample with a Q code to indicate the out of limit LCS recovery. No further action was needed, as no acetone was present in the sample and no high bias was possible.

### 2.2.8 Internal Standards

All internal standards retention times were within ± 30 seconds of the last calibration standard. All internal standard areas were within the -50 % to +100 % method and validation limits, except for 1,4-dichlorobenzene-d<sub>4</sub> in FGOW-AOC7C-SS-GP4(0-6"). Low area count just under the limit was measured and verified by re-analysis. A matrix effect was therefore proven and data from both analyses was qualified by TestAmerica as estimated with a J code and with a Q code to indicate the failed internal standard recovery. No further action was needed to qualify sample data.

# 2.3 Field QC Results

The trip blank collected on 8/22/07 (FGOW-W-TB(8/22/07) with the project samples contained detectable acetone at 3.1 ug/L and chloroform at 0.43 ug/L. No action was needed to qualify detected acetone and chloroform in project soil samples, as taking into account water vs. soil density, all reported detected acetone and chloroform was significantly different (> 5X) the trip blank concentration.

Any blind field duplicates in the two data packages were not evaluated for precision as their identities were not known to the validator.

### 2.4 Data Usability

All volatile organic data was usable as reported, or usable and estimated or undetected. Detected 2-butanone in FGOW-AOC7C-SS-GP3(0-6"), FGOW-AOC7C-S-GP4(2-4') and FGOW-AOC7C-S-GP5(2-4') and detected methylene chloride in FGOW-AOC7D-S-GP3(6-8'), FGOW-AOC7D-SS-GP8(0-6"), FGOW-AOC7D-S-GP8(2-4') and FGOW-AOC7D-SS-GP11(0-6") was qualified as undetected as the concentration is not significantly different from lab background.

No false negatives or false positives were noted during review of the raw data. Major and molecular ions were present and the relative intensities agreed reasonably with the reference spectrum for the reported detected volatile organic compounds.

# 3.0 SEMIVOLATILE ORGANICS DATA

TestAmerica Laboratories utilized EPA methods 3520C, 3550B and 8270C for semivolatile analysis in water. No deviations from these reference methods were apparent from the data reviewed. No action was needed to qualify sample data.

### 3.1 Completeness Assessment

The data packages received for semivolatile organic analysis were complete.

# 3.2 Compliance Assessment

# 3.2.1 Holding Times/Preservation

All water samples were extracted within 7 days of collection and analyzed within 40 days after extraction. All soil samples were extracted within 14 days of collection and analyzed within 40 days after extraction. Validated samples were received at TestAmerica within the acceptable temperature range of 2-6EC. No action was needed to qualify sample data.

# 3.2.2 Initial Calibration and Tuning

Decafluorotriphenylphosphine (DFTPP) tuning and calibration data was included in the data package. Tuning was done at the start of the analysis and every 12 hours. All DFTPP tuning criteria in method 8270 were met the day the initial calibration was analyzed and on the day the samples were analyzed. No action was needed to qualify sample data.

The minimum Relative Response Factor (RRF) criteria in method 8270 and the EPA Region V data validation guidelines (>0.05) was met for all reported semivolatile organic compounds in the initial calibration. An eight point calibration curve ranging from 4-200 ug/mL was analyzed on 9/2/07 and a seven point calibration curve ranging from 10-200 ug/mL was analyzed on 8/30/07. The allowable method 15 % rsd or curve correlation coefficient  $\geq$  0.990 criteria and minimum RRF criteria for initial calibration were met for all reported compounds. No action was needed to qualify sample data.

Low benzidine recovery in the initial calibration verification (ICV) solution was measured at 69 % (limit 75 %). Associated samples were qualified by TestAmerica with a Q qualifier and further qualified as estimated with a J code from this low calibration bias.

# 3.2.3 Continuing Calibration

A 80 ug/L continuing calibration standard was analyzed with the validated samples every 12 hours according to the method. The minimum Relative Response Factor (RRF) of > 0.05 used by EPA Region V for data validation as proof of acceptable system response was met for all compounds. The percent difference (% D) between the initial calibration average RRF and the continuing calibration RRF was within the 20 percent criteria in the method and the Region V data validation criteria of percent difference < 25 % for all reported compounds. No action was needed to qualify sample data.

### 3.2.4 Laboratory Blanks

Method blanks were prepared and analyzed at the required method frequency. No detectable semivolatile organics were present in the lab blanks analyzed with the project samples. No action was needed to qualify sample data.

# 3.2.5 Surrogate Recoveries

Surrogate recoveries were within the method limits in all of the project samples. No action was needed to qualify sample data.

# 3.2.6 Matrix Spike/Matrix Spike Duplicate

Recoveries and RPD values in one project sample used for MS/MSD analysis (FGOW-AOC7D-SS-GP3(0-6") were all within method limits except for several compounds due to a very high native concentration that overwhelmed the spike level. No action was needed to qualify sample data.

### 3.2.7 Internal Standards

All internal standard areas were within the -50 % to +100 % method and validation limits. All internal standards retention times were within  $\pm$  20 seconds of the last calibration standard. No action was needed to qualify sample data.

# 3.3 Field QC Results

No field blanks were identified as being collected with the samples. No action was taken to qualify sample data.

Any blind field duplicates in the two data packages were not evaluated for precision as their identities were not known to the validator.

# 3.4 Data Usability

All semivolatile organic data was usable as reported without qualification, or usable and qualified as estimated. Benzidine qualified by TestAmerica with a Q qualifier was further qualified as estimated with a J code from a low calibration bias.

Benzo(b)fluoranthene and benzo(k)fluoranthene could not be resolved in samples FGOW-AOC7D-SS-GP3(0-6"), FGOW-AOC7D-S-GP3(2-4'), FGOW-AOC7D-S-GP3(6-8'), FGOW-AOC7D-SS-GP11(0-6") and FGOW-AOC7C-S-GP3(2-4'). TestAmerica qualified the sample results with a K qualifier to indicate that the reported benzo(b)fluoranthene may consist of both benzo(b)fluoranthene and benzo(k)fluoranthene. No further action was taken to qualify sample data.

No false negatives or false positives were noted during review of the raw data. Major and molecular ions were present and the relative intensities agreed reasonably with the reference spectrum for the reported detected compounds.

# 4.0 EXPLOSIVES DATA

TestAmerica utilized EPA methods 3535 and 8330. No deviations from these reference methods were apparent from the data reviewed. No action was needed to qualify sample data.

# 4.1 Completeness Assessment

The data package received for explosives was complete.

# 4.2 <u>Compliance Assessment</u>

# 4.2.1 Holding Times/Preservation

All soil samples were extracted within 14 days of collection and analyzed within 40 days after extraction. Validated samples were received at TestAmerica within the acceptable temperature range of 2-6EC. No action was needed to qualify sample data.

### 4.2.2 Initial Calibration

An eight point calibration curve ranging from 0.01-25 applicable to the samples was analyzed on 8/20/07. The method allowable 15 % relative standard deviation (rsd) criteria for initial calibration was met for all reported explosives. No action was needed to qualify sample data.

### 4.2.3 Continuing Calibration

A midlevel continuing calibration standard was analyzed according to the method every 12 hours. All reported explosives met the method criteria of percent difference < 15 %. No action was needed to qualify sample data.

### 4.2.4 Laboratory Blanks

Method blanks were prepared and analyzed at the required method frequency. No detectable target explosives were present in the lab blank analyzed with the project samples. No action was needed to qualify sample data.

### 4.2.5 Surrogate Recoveries

Surrogate recoveries of 1,2-dinitrobenzene in all samples were within TestAmerica's statistically determined method limits. No action was needed to qualify sample data.

### 4.2.6 Matrix Spike/Matrix Spike Duplicate

Recoveries and RPD values in the project sample used for MS/MSD analysis were all within testAmerica's statistically determined method limits. No action was needed to qualify sample data.

### 4.2.8 Laboratory Control Standard (LCS)

Recoveries of target explosives in the LCS sample extracted and analyzed with the project samples were all within TestAmerica's limits. No action was needed to qualify sample data.

# 4.3 Field QC Results

No field blanks were identified as being collected with the samples. No action was taken to qualify sample data.

Any blind field duplicates in the two data packages were not evaluated for precision as their identities were not known to the validator.

# 4.4 Data Usability

All explosives data was usable as reported without qualification. No detectable explosives were present in any of the project samples.

# 5.0 PCB DATA

TestAmerica utilized EPA method 8082 for PCB analysis. No deviations from this reference method were apparent from the data reviewed. No action was needed to qualify sample data.

### 5.1 Completeness Assessment

The data package received for PCBs was complete.

### 5.2 Compliance Assessment

# 5.2.1 Holding Times/Preservation

All validated samples were extracted within 7 days of collection and analyzed within 40 days after extraction. Validated samples were received at TestAmerica within the acceptable temperature range of 2-6EC. No action was needed to qualify sample data.

### 5.2. Initial Calibration

A six point calibration curve applicable to the samples ranging from 50-1000 was analyzed on 7/30/07. The Region V allowable 30 % relative standard deviation (rsd) criteria for initial calibration was met for all PCBs. The allowable method 20 % rsd or curve correlation coefficient  $\geq$  0.990 criteria were met for all reported compounds. No action was needed to qualify sample data.

### 5.2.3 Continuing Calibration

A midlevel continuing calibration standard was analyzed according to the method every 12 hours. All PCBs met the EPA Region V and National Functional Guidelines data validation criteria of percent difference < 25 %. The method criteria of < 15 % difference was met for all PCBs. No action was needed to qualify sample data.

### 5.2.4 Laboratory Blanks

Method blanks were prepared and analyzed at the required method frequency. No detectable target PCBs were present in the lab blank analyzed with the project samples. No action was needed to

qualify sample data.

# 5.2.5 Surrogate Recoveries

Decachlorobiphenyl recoveries in all samples were within the TestAmerica statistically determined method limits. No action was needed to qualify sample data.

# 5.2.6 Matrix Spike/Matrix Spike Duplicate

Recoveries and RPD values in the project sample used for MS/MSD analysis were all within method limits and TestAmerica's limits. No action was needed to qualify sample data.

# 5.2.7 Laboratory Control Standard (LCS)

Recovery of Aroclor 1016 and 1260 in the LCS sample was within the TestAmerica limit. No action was needed to qualify sample data.

# 5.3 Field QC Results

No field blanks were identified as being collected with the samples. No action was taken to qualify sample data.

Any blind field duplicates in the two data packages were not evaluated for precision as their identities were not known to the validator.

# 5.4 Data Usability

All PCB data was usable as reported without qualification. All detectable PCBs were based on at least a four peak match with the standard and confirmed on a second column.

# 6.0 METALS

TestAmerica utilized EPA SW846 method 3010A, 3050B, 6010B, 7470A and 7471A. No significant deviations from these reference methods that affected data quality were evident from the documentation supplied. No action was taken to qualify sample data.

# 6.1 <u>Completeness Assessment</u>

The data packages received for metals were complete.

# 6.2 <u>Compliance Assessment</u>

# 6.2.1 Holding Time/Preservation

All samples were analyzed within the 6 month holding time for metals (28 days for mercury) and preservation pH was all acceptable at pH < 2.0. No action was needed to qualify sample data.

### 6.2.2 Calibration and Interference Check

All method calibration and interference check criteria were met. No exceptions to the method requirements for initial, continuing calibration frequency and stability and method of standard additions calibration coefficient requirements were noted for the project samples. Any exceptions to recovery limits for calibration standards resulted in the affected samples being reanalyzed with a compliant calibration. No action was needed to qualify sample data.

Trace levels of cadmium was present in the Interference Check Standard A and noted by the manufacturer as an impurity. As no sample matrix interference was the cause, no action was needed to qualify sample data.

# 6.2.3 Laboratory Blanks

The preparation blanks (PB), initial calibration blanks (ICB) and continuing calibration blanks (CCB) associated with the project samples did not contain and detectable metals above the method detection limit. No action was needed to qualify sample data.

### 6.2.4 Matrix Spike (MS) Sample Recovery and RPD

All recoveries and RPD values in project samples used for MS/MSD analysis were within TestAmerica and data validation limits. No action was needed to qualify sample data.

# 6.3 Field QC Results

No field blanks were identified as being collected with the samples. No action was taken to qualify sample data.

Any blind field duplicates in the two data packages were not evaluated for precision as their identities were not known to the validator.

### 6.4 Data Usability

All metals data were usable as reported without qualification.

# 7.0 NITROCELLULOSE DATA

TestAmerica utilized EPA method 353.2 for nitrocellulose analysis. No deviations from this reference method were apparent from the data reviewed. No action was needed to qualify sample data.

## 7.1 Completeness Assessment

The data package received for nitrocellulose was complete.

# 7.2 Compliance Assessment

### 7.2.1 Holding Times/Preservation

All validated samples were analyzed within 28 days of collection. Validated samples were received at

TestAmerica within the acceptable temperature range of 2-6EC. No action was needed to qualify sample data.

### 7.2. Initial Calibration

A six point calibration curve applicable to the samples ranging from 0.05-2 mg/L was analyzed with the project samples and the correlation coefficient was acceptable. No action was needed to qualify sample data.

# 7.2.3 Continuing Calibration

A midlevel continuing calibration standard at 1 mg/L was analyzed according to the method every 10 samples. All recoveries were within 90-110 %. No action was needed to qualify sample data.

### 7.2.4 Laboratory Blanks

Method blanks were prepared and analyzed at the required method frequency. Detectable nitrocellulose at 1.1 mg/kg was present in the soil blank analyzed with FGOW-AOC7C-SS-GP4(0-6"), FGOW-AOC7C-SS-GP2(0-6") and FGOW-AOC7C-SS-GP6(0-6"). Action taken was to qualify detected nitrocellulose in FGOW-AOC7C-SS-GP4(0-6"), FGOW-AOC7C-SS-GP2(0-6") and FGOW-AOC7C-SS-GP6(0-6") as undetected with a U code as the concentration reported is not significantly (> 5X) lab background.

# 7.2.5 Matrix Spike/Matrix Spike Duplicate

Recoveries and RPD values in the project sample used for MS/MSD analysis were all within method limits and TestAmerica's limits. No action was needed to qualify sample data.

### 7.2.6 Laboratory Control Standard (LCS)

Recovery of nitrate in the LCS sample was within the TestAmerica limit. No action was needed to qualify sample data.

### 7.3 Field QC Results

No field blanks were identified as being collected with the samples. No action was taken to qualify sample data.

Any blind field duplicates in the two data packages were not evaluated for precision as their identities were not known to the validator.

### 7.4 Data Usability

Detected nitrocellulose in FGOW-AOC7C-SS-GP4(0-6"), FGOW-AOC7C-SS-GP2(0-6") and FGOW-AOC7C-SS-GP6(0-6") was undetected as the concentration reported is not significantly (> 5X) lab background.

If you have any questions regarding the data validation process, please contact me at 920-469-9113.

Attachments: Validated Data Sheets-hard copy

### **TECHNICAL MEMORANDUM**

DATE:

April 24, 2008

TO:

Brenda Winkler, Project Manager

**Bay West** 

FROM:

**Peter Jacobs** 

SUBJECT:

Data Verification for Former Gopher Ordnance Works, Rosemount, Minnesota

Field Duplicate Precision Calculations Bay West Project Number J060361

As a supplement to the data verification and data validation memoranda by Marcia Kuehl, Project Chemical QC Officer, dated November 26, 2007, this memorandum presents the relative percent difference (RPD) calculations for blind field duplicates and associated data qualification.

### **Data Qualification Rationale**

Aleasurement Quality Objectives for field duplicate RPDs were not specified in the QAPP, so general values of 50% for soils and 25% for waters were used based on the MPCA Laboratory Data Checklist. Generally, high RPDs were not qualified for estimated values that were below the reporting limits (RLs) - exceptions were made in cases where one value was greater than the RL, one was less than the RL, and the difference was large (i.e. if the RL was substituted for the lower value and it would still result in a high RPD). Due to the large overall number of acceptable RPD results for various parameters, RPD results that were outside criteria were considered to be sample-specific and only used to qualify the parent samples, not other samples in the group.

Attached are RPD calculation tables for each Area of Concern (AOC) from which field duplicates were obtained. The attached RPD tables also include results for analytes that were undetected in both the sample and duplicate, because these results qualitatively demonstrate precision although the RPDs could not be calculated.

Based on these tables and the rationale described above, the following results were qualified as estimated:

Docs #103053

Analyte	Samples	Qualified	Flag
bis(2-Ethylhexyl) phthalate	FGOW-AOC1N-W-GP1	FGOW-AOC1N-W-GP2	J
Arsenic	FGOW-AOC4-SS-GP2(0-6INCHES)	FGOW-AOC4-SS-GP3(0-6INCHES)	J
Diesel Range Organics	FGOW-AOC5-SS-GP6(0-6INCHES)	FGOW-AOC5-SS-GP13(0-6INCHES)	J
Anthracene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Benzo(a)anthracene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	7
Benzo(a)pyrene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Benzo(b)fluoranthene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Benzo(ghi)perylene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Chrysene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Fluoranthene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	7
Indeno(1,2,3-cd)pyrene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Phenanthrene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Pyrene	FGOW-AOC6-SS-TP1(05FT)	FGOW-AOC6-S-TP7(6FT)	J
Mercury	FGOW-AOC7D-S-GP9(2-4FT)	FGOW-AOC7D-S-GP11(2-4FT)	J
Fluoranthene	FGOW-AOC7D-SS-GP8(0-6INCHES)	FGOW-AOC7D-SS-GP11(0-6INCHES)	J
Phenanthrene	FGOW-AOC7D-SS-GP8(0-6INCHES)	FGOW-AOC7D-SS-GP11(0-6INCHES)	J
Pyrene	FGOW-AOC7D-SS-GP8(0-6INCHES)	FGOW-AOC7D-SS-GP11(0-6INCHES)	J

The J-flags have been added to the data summary tables prepared for the Remedial Investigation Report.

\ttachments: RPD calculation tables

### NOTES FOR FIELD RPD TABLES

Data Flags - Laboratory

- U undetected at the limit of detection
- J estimated
- B blank contamination above the method detection limit
- Q One or more quality control criteria failed
- E estimated because value is above linear calibration range
- K the reported benzo(b)fluoranthene may consist of both benzo(b)fluoranthene and benzo(k)fluoranthene

In some cases multiple flags of the same type (e.g. J Q J) indicate the value was qualified as estimate for two different reasons (e.g. below RL and a QC issue such as low LCS recovery). Electronic Data Deliverable (EDD) upon which these tables are based did not contain flags for non-detect results (e.g. UJ) - refer to laboratory report for details on qualification of non-detect results.

### **DUPLICATE RPDs**

Field duplicate RPDs were not specified in the QAPP, so general values of 50% for soils and 25% for waters were used based on the MPCA Laboratory Data Checklist.

Generally high RPDs were not qualified for values that were below the reporting limits - exceptions were made in cases where one value was < RL and one was >RL and the difference was large (i.e. if the RL was substituted for the lower value and it still resulted in a high RPD).

Due to the large number of acceptable RPD results for varoius parameters, RPD results that were outside criteria were only used to qualify the parent samples, not other samples in the group.

### Reviewer notes in Qualification Columns:

- J flag analyte in both parent samples as J estimated in sample results table
- OK RPD high but value(s) used are estimated because they are <RL
- NA RPD could not be calculated because one or more results was ND or not reported.

Field Duplicate RPD Calculation Table - Former Gopher Ordnance Works Background Samples

background Sam	pies				_								
		FGOW-BG-SS		FGOW-BG-SS				FGOW-BG-SS		FGOW-BG-SS	H		
		GP13(0-		GP15(0-	ľ			GP14(0-		GP16(0-	ll		
Field Sample ID:		6INCHES)		6INCHES)				6INCHES)		6INCHES)	li		
Lab Sample ID:		D7l290189012		D7l290189014		RPD	Qualification	D7l290189013		D7I290189015	П	RPD	Qualification
Sample Matrix:		SOLID		SOLID				SOLID		SOLID			
Analyte:	Unit	:			H				Н		Н		
Metals											П		
Arsenic	mg/kg	5.5		5.9		7%		2.8	J	3.2	П	13%	
Barium	mg/kg	93		99		6%		79		80	П	1%	
Cadmium	mg/kg	<0.58		< 0.63		NA		<0.60		<0.59	П	NA	
Chromium	mg/kg	17		17		0%		15		12	П	22%	
Lead	mg/kg	12		11		9%		6.6	J	6.7	J	49%	
Mercury	mg/kg	0.017	J	0.023	J	30%		<0.040		< 0.039	П	NA	
Selenium	mg/kg	<3.5		<3.8		NA		<3.6		<3.5	П	NA	
Silver	mg/kg	<1.8		<1.9		NA		<1.8		<1.8	П	NA	
Percent Moisture	%	14		20		35%		17		15	П	29%	

March   Marc		-	GOW-AOC1N- SS-SS1(0-		FGOW-AOC1N- SS-SS2(0-				FGOW-AOC1M- SS-SS1(0-		FGOW-AOC1M- SS-SS3(0-				FGOW-AOC1S- SS-GP1(0-		FGOW-AOC1S- SS-GP3(0-			
Column	d Sample ID: Sample ID:	$\dashv$				_	RPD	Qualification					RPD	Qualification					RPD	Qualification
Second Property			SOLID	=	SOLID				SOLID		SOLID				SOLID		SOLID			
March   Marc	losives		0.55		04		32%		c0 25	<u> </u>	<0.25		NA.		<0.25		<0.25	H	NA NA	
The color   The				JJ			NA			<b> </b>		-	NA				<0.25		NA	
Column	tals enic m	ng/kg	3.7		2.7	J	NA		3.8				17%							
The column   1	ium m	ng/kg	0.14	J	0.11	J	24%		<0.60		<0.62		NA		0.18	J	0.11	J	48%	
The column   196	d m	ng/kg	78		67		15%		6.9		7.6		10%		18		21		15%	
The color of the	m muine	ng/kg	<4.2	J	<3.7		NA	OK	<3.6	J	<3.8	J	NA		<4.7		<6.0		NA	
Cale		ng/kg	<2.1		<1.8		NA .		<1.8		<1.9		INA		<2.4	<b>!</b>	43.0	H	140	
March   Marc	4-Trichlorobenzene ug																	Н		
Second	Diphenylhydrazine ug	ıg/kg	<550000		<460000		NA		<390		<410		NA		<520		<660			
Campaigne   No.   1985   198	Dichlorobenzene u	ig/kg	<550000		<460000		NA		<390	-	<410						<660		NA	
State   Stat	6-Trichlorophenol u	ıg/kg									<410		NA		<520		<660		NA	
Section   19	Dimethylphenol u Dinitrophenol u	ig/kg ig/kg	<2700000		<2200000		NA		<1900		<2000		NA		<2500		<3200		NA	
Column	Dichlorophenol u	ıg/kg	<550000		<460000		NA		<390	<u> </u>	<410		NA		<520		<660		NA	
Column	hloronaphthalene u	ıg/kg	<550000		<460000		NA		<390	<u> </u>	<410		NA		<520		<660		NA	
The color of the	ethylnaphthalene u	ıg/kg	<550000		<460000		NA		<390	<b>†</b> =	<410		NA		<520		<660		NA	
Second Column	troaniline	ıg/kg	<2700000		<2200000		NA .		<1900	上	<2000		NA		<2500		<3200	F	NA	
The content of the	Dichlorobenzidine u	ıg/kg	<2700000		<2200000		NA		<1900		<2000		NA		<2500		<3200	F	NA	
Column	troaniline u	ıg/kg	<2700000		<2200000	- 1	NA		<1900	F	<2000		NA		<2500		<3200 <3200	E	NA NA	
The color of the	romophenyl phenyl ether u	ıg/kg	<550000		<460000		NA		<390		<410 <410		NA NA		<520 <520		<660 <660	E	NA NA	
Company   Comp	hloroaniline u	ıg/kg	<550000		<460000		NA		<390 <390	E	<410 <410		NA NA		<520 <520		<660 <660	E	NA NA	
March   Marc	troaniline u trophenol u	ig/kg ig/kg	<2700000 <2700000		<2200000 <2200000		NA NA		<1900 <1900	E	<2000 <2000		NA NA		<2500 <2500		<3200	E	NA	
Column	naphthene u	ıg/kg ıg/kg	<550000 <550000		<460000 <460000		NA NA		<390 <390	E	<410 <410		NA		<520		<660	E	NA	
Section   Sect	nracene u zidine u	ıg/kg ıg/kg	<550000 <6600000		<460000 <5500000		NA NA		<390 <4800	E	<410 <5000		NA		<6300		<8000	E	NA	
Section   Column	zo(a)anthracene u zo(a)pyrene u	ig/kg ig/kg	<550000		<460000		NA		<390	E	<410		NA		<520		<660		NA	<u> </u>
Section   Column	zo(ghi)perylene u	ıg/kg	<550000		<460000		NA		<390	+	<410		NA		<520	$\vdash$	<660	<u> </u>	NA	
Commonstration	zoic acid u	ıg/kg	<2700000		<2200000		NA		420	JJ	560		29%		570	JJ	730	J	25%	<del>                                     </del>
Company   Comp	2-Chloroethoxy)methane u	ıg/kg	<550000		<460000		NA		<390	‡=	<410		NA		<520		<660	F	NA NA	
Company	2-Chloroisopropyl) ether u	ıg/kg	<550000		<460000		NA		<390	H	<410	JJ	NA		<520 110	JJ	<660 <660	E	NA NA	
September   15, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10	yl benzyl phthalate u	ıg/kg	<550000		<460000		NA		<390								<660	E	NA	
March   Marc	n-butyl phthalate u		<550000		<460000		NA		<390		<410		NA		<520		<660	$\vdash$	NA	
Part	enz(a,h)anthracene u	ig/kg	<550000		<460000		NA		<390		<410		NA		<520		<660	Ł	NA	
Section	thyl phthalate u	ıg/kg	<1100000		<920000		NA		<790		<820		NA		<1000	$\pm$	<1300	+	NA	<u> </u>
March   Marc	oranthene u	ıg/kg	<550000		<460000		NA		<390	+	<410		ΝA		<520		<660	Þ	NA	<u> </u>
althousebars	achlorobenzene u	ug/kg	<550000		<460000		NA		<390	#	<410		NA		<520	<b>†</b>	<660	F	NA	<u> </u>
December   Property   Company   Co	kachloroethane u	ug/kg	<550000		<460000		NA		<390		<410		NA		<520	$\vdash$	<660	-	NA	
International purpose   Property   19000   1	ohorone u	ug/kg	<550000		<460000		NA		<390		<410		NA		<520			F	NA	
Interpretation	litrosodimethylamine u	ıg/kg								-					<520	_	<660		NA	
machengemis with a processor of the control of the	litrosopyrrolidine u	ug/kg	<550000		<460000		NA		<390		<410		NΑ		<520		<660		NA	
Description	ntachlorophenol u	ug/kg	<2700000		<2200000		NA		<1900		<2000		NA		<2500		<3200	$\vdash$	NA	
Telephonophase   19	onol u	ug/kg	<550000		<460000		NA		<390	11	<410	JJ	NA		<520	1 11	<660	L	NA	
12 Free Processor		ugrkg	<b>2000000</b>		<550000				<b>1400</b>	1	2500		10/		1000			+		
22 February   1979   73	1,2-Tetrachioroethane u									1						1		F		
Ophisophesis	2,2-Tetrachloroethane u	ug/kg	<7.3		<7.1				<6.3	+	<5.5		NA		<7.5		<9.6		NA	
3 Trickonomename   19/19   3.3   10.3   27.1   NA   d.3   d.5.5   NA   c.7.5   d.6.6   NA   NA   c.7.5   d.6.6   N	-Dichloroethane u -Dichloroethene u	ug/kg	<7.3		<7.1		NA		<6.3	$\pm$	<5.5		NA		<7.5		<9.6	E	ŅĀ	
4 Fraincentement why years   4.4   Joj   7.1   NA	-Dichloropropene u 3-Trichlorobenzene u	ug/kg ug/kg	3.2	101	<7.1		NA		<6.3	E	<5.5	$oxed{oxed}$	NA	<u> </u>	<7.5		<9.6	=	NA	
Dimonshane (BEP)   gylg   cli	4-Trichlorobenzene u	ug/kg	2.4		<7.1		NA		<6.3	$\pm$	<5.5		NA	ļ	<7.5		<9.6	+	NA	<u> </u>
Debtoorberstern	-Dibromo-3-chloropropane (DBCP) u	ug/kg	<15	101	<14		NA		<13	F	<11		NA	<b></b>	<15	1	<19	F	NA	‡
Delincompanies   Uglig   2/3   2/1   NA   683   6.8   NA   2/5   6.8   NA   1.7   1.8	-Dichlorobenzene u	ug/kg	0.82	101	<7.1		NA		<6.3	#	<5.5		NA		<7.5	<b>†</b>	<9.6	+	NA	-
Definitions   Ug/Ng   73	-Dichloropropane u	ug/kg	<7.3	<b> </b>	<7.1		NA		<6.3	+	<5.5		NA		<7.5	1	<9.6	F	NA NA	
Otherboropeans	-Dichlorobenzene u -Dichloropropane u	ug/kg	<7.3		<7.1		NA		<6.3 <6.3	F	<5.5 <5.5	$\mathbf{L}$	NA NA		<7.5 <7.5		<9.6 <9.6	E	NA NA	
visitione (MEK)         ug/kg         4.4         JQJ         -28         NA         -25         -28         NA           Incombiume         ug/kg         -7.7         -7.7         NA         -6.5         NA         -2.5         -6.6         NA           hibrotoliume         ug/kg         -7.3         -7.7         NA         -6.5         NA         -2.5         -6.6         NA           hibrotoliume         ug/kg         -7.3         -7.7         NA         -6.5         NA         -7.5         -6.6         NA           hibrotoliume         ug/kg         -2.7         -7.7         NA         -6.5         NA         -7.5         -6.6         NA           hibrotoliume         ug/kg         -2.7         -7.7         NA         -6.5         NA         -7.5         -6.6         NA           hibrotoliume         ug/kg         -7.7         NA         -6.7         NA         -6.5         NA         -7.5         -6.6         NA           rotolium         ug/kg         -7.7         NA         -6.5         NA         -7.5         -6.6         NA           mochamic         ug/kg         -7.3         -7.7         NA         -6.5	-Dichlorobenzene u -Dichloropropane u	ug/kg ug/kg	<7.3 <7.3		<7.1 <7.1		NA NA		<6.3 <6.3	E	<5.5 <5.5		NA NA		<7.5		<9.6	E	NA	$\pm \overline{}$
Interoblemen	utanone (MEK) hlorotoluene	ug/kg ug/kg	4.4 <7.3	101	<29 <7.1		NA NA		<25 <6.3	F	<5.5		NA		<7.5		<9.6	£	NA	<u> </u>
NA   1976   19	hlorotoluene	ug/kg	<7.3		<7.1		NA		<6.3	+	<5.5		NA		<7.5	+	<9.6	‡	NA	<b>†</b>
imobenzene         ug/kg         cf.3         cf.1         NA         c6.5         NA         cf.5         c9.6         NA           mode/informethane         ug/kg         cf.3         cf.1         NA         c6.5         NA         cf.5         c9.6         NA           mode/informethane         ug/kg         cf.3         cf.1         NA         c6.3         c6.5         NA         cf.5         c9.6         NA           mode/more mode/mo	etone	ug/kg	9.1	101	<29		NA		<25	‡	<22		NA	1	<30	-	<38	+	NA	#
model-horomethane	mobenzene	ug/kg	<7.3		<7.1		NA	-	<6.3	+	<5.5		NA	<u> </u>	<7.5	-	<9.6	#	NA	<del> </del>
	modichloromethane L	ug/kg	<7.3		<7.1		, NA		<6.3	丰	<5.5		NA		<7.5	<del>                                     </del>	<9.6	F	NA	#
Door National Processes   1964   17.5   17.5   17.5   18.6   18	momethane u	ug/kg	<15		<14		NA		<13	+	<11		NA		<15 <7.5	-	<19 <9.6	-	NA NA	
December   Surging   Content   Con	rbon tetrachloride	ug/kg	<7.3		<7.1		NA	<b>!</b>	<6.3	+	<5.5	1	NA		<7.5		<9.6	F	NA NA	$oxed{\mathbb{H}}$
	oroethane u oroform u	ug/kg	<15		<14		NA		<13	F	<11 <11	<u> </u>	NA NA		<15 <15		<19 <19	E	NA NA	E
1.3-Dichloropropene         ug/kg         <7.3         <7.1         NA         <6.3         <5.5         NA         <7.5         <9.6         NA           romomechloromethane         ug/kg	oromethane u-1,2-Dichloroethene u	ug/kg ug/kg	<15 <3.7		<14 <3.6		NA NA		<13 <3.1	${\mathbb F}$	<11 <2.8		NA NA		<3.8		<4.8	E	NA	$\pm \overline{z}$
hibrordifluoromethane   ug/kg   <15	-1,3-Dichloropropene uromochloromethane	ug/kg ug/kg	<7.3		<7.1		NA		<6.3	£	<5.5	$oxed{\Box}$	NA		<7.5		<9.6	Ė	NA	<u> </u>
Archlorobutadiene ug/kg <7.3 < 7.1	romomethane L hlorodifluoromethane L	ug/kg ug/kg	<15		<14		NA		<13	Ŧ	<11	ΙΞ	NA		<15	+=	<19	+	NA	
Kylene & p-Xylene         ug/kg         <3.7         <3.6         NA         <3.1         <2.8         NA         <3.8         <4.8         NA           thyl tert-buyl ether         ug/kg         <29	xachlorobutadiene L	ug/kg	<7.3		<7.1		NA		<6.3	+	<5.5		NA	<b> </b>	<7.5		<9.6	#	NA	<b>†</b>
thylene chloride	Kylene & p-Xylene L	ug/kg	<3.7		<3.6		NA		<3.1	L	<2.8	<u> </u>	NA	<b>_</b>	<3.8	<b>—</b>	<4.8	‡	NA	#=
Propylbenzene	thylene chloride	ug/kg	1.7	JBQJ	1.7	JBQJ	0%		1.4	JВ	J 1.1	JBJ	24%		1.6	JBQJ	2.1	JB	27%	+
kylene         ug/kg         43.7         43.6         NA         43.1         42.8         NA         43.8         44.8         NA           sopropyltoluene         ug/kg         47.3         47.1         NA         46.3         45.5         NA         47.5         49.6         NA           Ebulythenzene         ug/kg         47.3         47.1         NA         46.3         45.5         NA         47.5         49.6         NA           Bulythenzene         ug/kg         47.3         47.1         NA         46.3         45.5         NA         47.5         49.6         NA           Bulythenzene         ug/kg         47.3         47.1         NA         46.3         45.5         NA         47.5         49.6         NA           Burlberzene         ug/kg         47.3         47.1         NA         46.3         45.5         NA         47.5         49.6         NA           Burlberzene         ug/kg         47.3         47.1         NA         46.3         45.5         NA         47.5         49.6         NA           Burlberzene         ug/kg         47.3         47.1         NA         46.3         45.5         NA <td< td=""><td>Propylbenzene</td><td>ug/kg</td><td>&lt;7.3</td><td>101</td><td>&lt;7.1</td><td>101</td><td>NA</td><td>ÚK.</td><td>&lt;6.3</td><td><del> </del></td><td>&lt;5.5</td><td>1,,</td><td>NA</td><td></td><td>&lt;7.5</td><td>+</td><td>&lt;9.6</td><td>#</td><td>NA</td><td><del> </del></td></td<>	Propylbenzene	ug/kg	<7.3	101	<7.1	101	NA	ÚK.	<6.3	<del> </del>	<5.5	1,,	NA		<7.5	+	<9.6	#	NA	<del> </del>
-Butylbenzene ug/kg <7.3 <.7.1 NA <.6.3 <.5.5 NA <.7.5 <.9.6 NA	(ylene t	ug/kg	<3.7	3 (2)	<3.6	3 (2)	NA		<3.1	+,,	<2.8	133	NA	<b></b>	<3.8	+	<4.8	#	NA	#
-Butylbenzene ug/kg <7.3 < 7.1 NA <6.3 <5.5 NA <7.5 <9.6 NA rachloroethene ug/kg <7.3 < 7.1 NA <6.3 <5.5 NA <7.5 <9.6 NA <6.3 <5.5 NA <7.5 <9.6 NA <6.3 NA <7.5 <9.6 NA <7.5 <9.6 NA <7.5 <9.6 NA <7.5 S S NA S S S S NA S S S S S NA S S S S	:-Butylbenzene l	ug/kg	<7.3	-	<7.1		NA		<6.3	+	<5.5	1	NA		<7.5	1	<9.6	F	NA NA	$oxed{oxed}$
uene         ug/kg         1         J Q J	-Butylbenzene t	ug/kg	<7.3		<7.1		NA		<6.3	F	<5.5 <5.5		NA NA		<7.5 <7.5	<u> </u>	<9.6 <9.6	$\pm$	NA NA	
ns-1,3-Dichloropropene	uene ເ ns-1,2-Dichloroethene ເ	ug/kg ug/kg	1 <3.7	101	<7.1 <3.6		NA NA		<6.3 <3.1	F	<5.5 <2.8		NA NA		<7.5 <3.8		<9.6 <4.8	E	NA NA	
shiorofluoromethane         ug/kg         <15         <14         NA         <13         <11         NA         <15         <19         NA           yl chloride         ug/kg         <7.3	ns-1,3-Dichloropropene uchloroethene u	ug/kg ug/kg	<7.3 <7.3		<7.1 <7.1		NA NA		<6.3 <6.3	$\pm$	<5.5 <5.5		NA NA		<7.5 <7.5		<9.6 <9.6	E	NA	$\pm \overline{}$
	chlorofluoromethane	ug/kg					NA			ŧ		$\pm \overline{\equiv}$				<u> </u>		+		<u> </u>
	ner rocellulose					oxdot	NA			巨		+				<u> </u>		+		<u> </u>

Page 1 of 1 AOC1 Solid

Field Duplicate RPD Calculation Table - Former Gopher Ordnance Works

Araa	AOC1	Water	Samples
Area	AUCI	water	Samples

Field Sample ID:		FGOW-AOC1N-W- GP1		FGOW-AOC1N-W- GP2	Н		
_ab Sample ID:		D7l200237004		D7I200237005	$\Box$	RPD	Qualification
Sample Matrix:		WATER		WATER			
•					П		
Analyte:	Units				Ш		
Explosives					Н		
2,4-Dinitrotoluene	ug/L	0.26	J	0.18	기	36%_	ОК
2,6-Dinitrotoluene	ug/L	<0.40		<0.40	$\sqcup$	NA NA	
					₩	NA NA	
Metals	/1	.OF		-05	╂┼	NA NA	ļ
Arsenic	ug/L	<25 33		<25 33	Н	0%	
Barium Cadmium	ug/L	<5.0		<5.0	Н	NA	
Chromium	ug/L ug/L	2.6	J	<15	Н	NA NA	
Lead	ug/L	<15	٦	<15	Н	NA NA	
Mercury	ug/L	<0.20		<0.20	H	NA NA	
Selenium	ug/L	<22		<22	H	NA NA	
Silver	ug/L	<15		<15	H	NA NA	
Silvei	ug/L	V13		×10	H	14/	-
SVOCs	-				╁┼		†
1,2,4-Trichlorobenzene	ug/L	<10		<10	H	NA	
1,2-Dichlorobenzene	ug/L	<10		<10	╁╅	NA NA	<del>                                     </del>
1,2-Dichloroberizerie 1,2-Diphenylhydrazine	ug/L	<10		<10	╁┼	NA	
1,3-Dichlorobenzene	ug/L	<10		<10	Н	NA	
1,3-Dichlorobenzene 1,4-Dichlorobenzene	ug/L ug/L	<10		<10	H	NA NA	<del>                                     </del>
7,4-Dichlorobenzene 2,4,5-Trichlorophenol	ug/L ug/L	<10 <20		<20	╁┤	NA NA	<del>                                     </del>
2,4,6-Trichlorophenol	ug/L ug/L	<20 <20	<b></b>	<20	╫	NA NA	
2,4,0- i richiorophenoi 2,4-Dichlorophenol	ug/L ug/L	<20 <10		<10	╁	NA NA	<del>                                     </del>
2,4-Dichiorophenol 2,4-Dimethylphenol	ug/L ug/L	<10		<10	╁┤	NA NA	<del> </del>
2,4-Dimethylphenol 2,4-Dinitrophenol	ug/L ug/L	<80		<80	$\dashv$	NA NA	<u> </u>
2,4-Dinitrophenoi 2,4-Dinitrotoluene	ug/L ug/L	<80 <20	$\vdash$	<20	╁┤	NA NA	<u> </u>
2,4-Diffictoration 2,6-Dichlorophenol	ug/L	<20 <10	$\vdash$	<10	╁┤	NA NA	<del>                                     </del>
2,6-Dichloropheriol 2,6-Dinitrotoluene	ug/L ug/L	<20		<20	╁	NA NA	
2,0-Diffictoriuerie 2-Chloronaphthalene	ug/L	<10	<del>                                     </del>	<10	╁	NA NA	
2-Chlorophenol	ug/L	<10	$\vdash$	<10	+	NA	<del> </del>
2-Methylnaphthalene	ug/L	<10	-	<10	Ħ	NA NA	
2-Methylphenol	ug/L	<10		<10	H	NA	
2-Nitroaniline	ug/L	<50		<50	Ħ	NA	
2-Nitrophenol	ug/L	<20		<20	Ħ	NA	
3,3-Dichlorobenzidine	ug/L	<50	<del></del>	<50	Ħ	NA	
3-Methylphenol & 4-Methylphenol	ug/L	<20	<u> </u>	<20	Ħ	NA	
3-Nitroaniline	ug/L	<50	<b></b> -	<50	Ħ	NA	<del>                                     </del>
4,6-Dinitro-2-methylphenol	ug/L	<80		<80	Н	NA	
4-Bromophenyl phenyl ether	ug/L	<10		<10	Ħ	NA	
4-Chloro-3-methylphenol	ug/L	<20		<20	Ħ	NA	1
4-Chloroaniline	ug/L	<25		<25	Ħ	NA	1
4-Chlorophenyl phenyl ether	ug/L	<10		<10	П	NA	1
4-Nitroaniline	ug/L	<50		<50	П	NA	
4-Nitrophenol	ug/L	<50		<50	П	NA	
Acenaphthene	ug/L	<10		<10	П	NA	
Acenaphthylene	ug/L	<10		<10	П	NA	
Anthracene	ug/L	<10		<10	П	NA	
Benzidine	ug/L	<200		<200	П	NA	
Benzo(a)anthracene	ug/L	<10		<10	$\prod$	NA	
Benzo(a)pyrene	ug/L	<10		<10	П	NA	
Benzo(b)fluoranthene	ug/L	<10		<10		NA	
Benzo(ghi)perylene	ug/L	<10		<10	$\Box$	NA	
Benzo(k)fluoranthene	ug/L	<10		<10	$\Box$	NA	
Benzoic acid	ug/L	<80		<80	$\Box$	NA	
Benzyl alcohol	ug/L	<25		<25	$\Box$	NA	
bis(2-Chloroethoxy)methane	ug/L	<10		<10	$oldsymbol{oldsymbol{\sqcup}}$	NA	ļ
bis(2-Chloroethyl) ether	ug/L	<20		<20	Ш	NA	<b></b>
bis(2-Chloroisopropyl) ether	ug/L	<10	ļ .	<10	$\sqcup$	NA 1100/	<del>                                     </del>
bis(2-Ethylhexyl) phthalate	ug/L	74	J	11	$oldsymbol{+}$	148%	J
Butyl benzyl phthalate	ug/L	<20		<20	+	NA	<del> </del>
Carbazole	ug/L	<10	<u> </u>	<10	+	NA	<del> </del>
Chrysene	ug/L	<10		<10	┦	NA	<u> </u>
Di-n-butyl phthalate	ug/L	<20	<del>                                     </del>	<20	+	NA NA	<del> </del>
Di-n-octyl phthalate	ug/L	<20	-	<20 <10	+	NA NA	<del> </del>
Dibenz(a,h)anthracene Dibenzofuran	ug/L	<10 <10	-	<10 <10	+	NA NA	<del> </del>
Diethyl phthalate	ug/L ug/L	<10 <20		<10 <20	+	NA NA	<del> </del>
Dietnyl phthalate  Dimethyl phthalate	ug/L ug/L	<20 <20		<20 <20	╫	NA NA	<u> </u>
Fluoranthene	ug/L ug/L	<20 <20	<del>                                     </del>	<20	+	NA NA	<del>                                     </del>
Fluoranthene	ug/L ug/L	<20 <10	<del> </del>	<10	╁┤	NA NA	<del> </del>
Hexachlorobenzene	ug/L ug/L	<10	$\vdash$	<10	+	NA NA	<del> </del>
Hexachlorobenzene Hexachlorobutadiene	ug/L ug/L	<30	1	<30	+	NA NA	<del>                                     </del>
Hexachloroputadiene Hexachloroethane	ug/∟ ug/L	<30 <10	+-	<10	╫	NA NA	
Indeno(1,2,3-cd)pyrene	ug/L ug/L	<10	$\vdash$	<10	+	NA NA	<del>                                     </del>
Isophorone	ug/L ug/L	<10	<del>                                     </del>	<10	+	NA NA	<del> </del>
N-Nitrosodi-n-propylamine	ug/L	<20	<del>                                     </del>	<20	+	NA NA	
N-Nitrosodimethylamine	ug/L	<10	t	<10	+	NA	1
N-Nitrosodimetriylariine N-Nitrosodiphenylamine	ug/L	<10	<del>                                     </del>	<10	+	NA NA	†
N-Nitrosogyrrolidine	ug/L	<10		<10	+	NA NA	†
Naphthalene	ug/L	<10	$\vdash$	<10	+	NA NA	<del>                                     </del>
Nitrobenzene	ug/L ug/L	<20	$\vdash$	<20	+	NA NA	<del>                                     </del>
Pentachlorophenol	ug/L	<80		<80	+	NA NA	1
Phenanthrene	ug/L	<10	<del>                                     </del>	<10	$\forall$	NA NA	
	1 49/ -	<10		<10	+	NA NA	<b></b>

		FGOW-AOC1N-W-	FGOW-AOC1N-W-	٦	<u> </u>	
Field Sample ID:		GP1	GP2	4	DDD	Ovelitiesties
Lab Sample ID: Sample Matrix:		D7I200237004 WATER	D7l200237005 WATER	+	RPD	Qualification
Pyrene	ug/L	<10	<10	$\dashv$	NA	
1 yiene	ug/L	110		1		
VOCs						
1,1,1,2-Tetrachloroethane	ug/L	<1.0	<1.0		NA	
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	4	NA	
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0 <1.0	$\dashv$	NA NA	_
1,1,2-Trichloroethane 1,1-Dichloroethane	ug/L ug/L	<1.0 <1.0	<1.0	$\dashv$	NA NA	
1,1-Dichloroethene	ug/L	<1.0	<1.0	_	NA	
1,1-Dichloropropene	ug/L	<1.0	<1.0	T	NA	
1,2,3-Trichlorobenzene	ug/L	<1.0	0.42	J	NA	
1,2,3-Trichloropropane	ug/L	<2.0	<2.0		NA	
1,2,4-Trichlorobenzene	ug/L	<1.0	<1.0	Ц	NA	
1,2,4-Trimethylbenzene	ug/L	<1.0	<1.0	Н	NA	
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	<5.0	<5.0 <1.0	Н	NA NA	
1,2-Dibromoethane (EDB) 1,2-Dichlorobenzene	ug/L ug/L	<1.0 <1.0	<1.0	H	NA NA	
1,2-Dichloropenzene	ug/L ug/L	<1.0	<1.0	H	NA NA	<del> </del>
1,2-Dichloropropane	ug/L	<1.0	<1.0	Н	NA	
1,3,5-Trimethylbenzene	ug/L	<1.0	<1.0		NA	
1,3-Dichlorobenzene	ug/L	<1.0	<1.0		NA	
1,3-Dichloropropane	ug/L	<1.0	<1.0	$\square$	NA	
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	Ц	NA	
2,2-Dichloropropane	ug/L	<1.0	<1.0	Ц	NA	-
2-Butanone (MEK)	ug/L	<6.0	<6.0 <1.0	Н	NA NA	<b> </b>
2-Chlorotoluene 2-Hexanone	ug/L ug/L	<1.0 <5.0	<1.0 <5.0	Н	NA NA	
4-Chlorotoluene	ug/L	<1.0	<1.0	Н	NA NA	
4-Methyl-2-pentanone	ug/L	<5.0	<5.0	Н	NA	
Acetone	ug/L	<10	<10	Н	NA	<u> </u>
Benzene	ug/L	<1.0	<1.0	П	NA	
Bromobenzene	ug/L	<1.0	<1.0		NA	
Bromochloromethane	ug/L	<1.0	<1.0	Ц	NA	
Bromodichloromethane	ug/L	<1.0	<1.0	Ц	NA	ļ
Bromoform	ug/L	<1.0	<1.0	Н	NA	
Bromomethane	ug/L	<2.0 <2.0	<2.0 <2.0	Н	NA NA	<u> </u>
Carbon disulfide Carbon tetrachloride	ug/L ug/L	<2.0	<2.0	Н	NA NA	<u> </u>
Chlorobenzene	ug/L	<1.0	<1.0	Н	NA	
Chloroethane	ug/L	<2.0	<2.0	П	NA	
Chloroform	ug/L	<1.0	<1.0		NA	
Chloromethane	ug/L	<2.0	0.31	J	NA	
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	L	NA	
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	L	NA	
Dibromochloromethane	ug/L	<1.0	<1.0	H	NA NA	
Dibromomethane Dichlorodifluoromethane	ug/L ug/L	<1.0 <2.0	<1.0 <2.0	$\vdash$	NA NA	1
Ethylbenzene	ug/L ug/L	<1.0	<1.0	t	NA NA	†
Hexachlorobutadiene	ug/L	<1.0	0.15	J	NA	1
Isopropylbenzene	ug/L	<1.0	<1.0	Γ	NA	
m-Xylene & p-Xylene	ug/L	<2.0	<2.0		NA	
Methyl tert-butyl ether	ug/L	<5.0	<5.0	L	NA	
Methylene chloride	ug/L	<5.0	<5.0	$\vdash$	NA NA	-
n-Butylbenzene	ug/L	<1.0	<1.0	H	NA NA	<del> </del>
n-Propylbenzene	ug/L	<1.0 <1.0	<1.0 <1.0	$\vdash$	NA NA	<del> </del>
Naphthalene o-Xylene	ug/L ug/L	<1.0	<1.0	$\vdash$	NA NA	<del>                                     </del>
p-Isopropyltoluene	ug/L	<1.0	<1.0	$\vdash$	NA NA	1
sec-Butylbenzene	ug/L	<1.0	<1.0	T	NA	
Styrene	ug/L	<1.0	<1.0		NA	
tert-Butylbenzene	ug/L	<1.0	<1.0		NA	
Tetrachloroethene	ug/L	<1.0	<1.0	lacksquare	NA	ļ
Toluene	ug/L	<1.0	<1.0	$\vdash$	NA NA	-
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	+-	NA NA	<del> </del>
trans-1,3-Dichloropropene Trichloroethene	ug/L ug/L	<1.0 <1.0	<1.0 <1.0	$\vdash$	NA NA	-
Trichlorofluoromethane	ug/L ug/L	<2.0	<2.0	+	NA NA	<u> </u>
Vinyl chloride	ug/L	<1.0	<1.0	T	NA NA	
	<del></del>			T		
Out.	1	1		Т		
Other Nitrocellulose				┺	NA NA	

AOC1 Water Page 2 of 2

Field Duplicate RPD Calculation Table - Former Gopher Ordnance Works Area AOC2 Water Samples

Alea AOOZ Water	Camp	103	 		
		FGOW-AOC2-	FGOW-AOC2-		
Field Sample ID:	l.	W-GP1	W-GP3		
Lab Sample ID:		D7l150223010	D7l150223011	RPD	Qualification
Sample Matrix:		WATER	WATER		
Analyte:	Units				
Explosives					
2,4-Dinitrotoluene	ug/L	<0.15	<0.14	NA	
2,6-Dinitrotoluene	ug/L	<0.15	<0.14	 NA	
SVOCs					
Diphenylamine	ug/L	<10	 <10	NA	
Other					
Nitrocellulose	mg/L	<0.50	<0.50	NA	

Field Duplicate RPD Calculation Table - Former Gopher Ordnance Works Area AOC4 Solid Samples

	E0011 1001					
I	FGOW-AOC4-		FGOW-AOC4-			
	SS-GP2(0-		SS-GP3(0-			
	6INCHES)		6INCHES)			1
	D7l130251003		D7l130251004		RPD	Qualification
	SOLID		SOLID			
Unit						
	5.1	J	5.3	J	4%	
	1.6	JΒ	2.4	JΒ	40%	
"			****			1
ma/ka	2.4	J	7.3		101%	J
		<u> </u>				
				J		
		J				
				J		
						<del> </del>
		<u> </u>				
						†
			11.0			
	<del></del>					
ua/ka	<350		<350		NA	<u>†                                     </u>
						<u> </u>
						<u>†</u>
					NA	<u> </u>
					NA	
					NA	1
	<350		<350		NA	
	<350		<350		NA	
	<350		<350		NA	
	<350		<350		NA	
ug/kg	<350		<350		NA	
ug/kg	<350		<350		NA	
	<350		<350		NA	
	<350		<350		NA	
ug/kg	<430		<430		NA	
	-					
%	6.8		6.5		5%	
	ug/kg ug/kg ug/kg ug/kg	SS-GP2(0-6INCHES) D7I130251003 SOLID  Unit mg/kg 5.1 mg/kg 1.6  mg/kg 41 mg/kg 41 mg/kg 41 mg/kg 4.9 mg/kg 0.011 mg/kg <3.2 mg/kg <1.6  ug/kg <350	SS-GP2(0-6INCHES) D71130251003 SOLID  Unit mg/kg 5.1 J mg/kg 1.6 JB  mg/kg 41 mg/kg 41 mg/kg 41 mg/kg 40.54 mg/kg 41 mg/kg 4.9 J mg/kg 4.9 J mg/kg 4.9 J mg/kg 4.9 J mg/kg 4.9 S mg/kg 4.9 J mg/kg 4.9	SS-GP2(0-6INCHES)	SS-GP2(0-6INCHES)         6INCHES)           D7I130251003         D7I130251004           SOLID         SOLID           Unit         SOLID           mg/kg         5.1         J         5.3         J           mg/kg         1.6         JB         2.4         JB           mg/kg         1.6         JB         2.4         JB           mg/kg         4.1         50         mg/kg         LB           mg/kg         4.1         50         mg/kg         LB         LB	SS-GP2(0-6 NCHES)

Field Duplicate RPD Calculation Table - Former Gopher Ordnance Works Area AOC5 Solid Samples

Area AOC5 Solid Samples	<del></del>												· · · · · · · · · · · · · · · · · · ·
		FGOW-AOC5-		FGOW-AOC5-				FGOW-AOC5-		FGOW-AOC5-			
		SS-GP6(0-		SS-GP13(0-				SS-GP12(0-	ŀ	SS-GP14(0-			
Field Sample ID:		6INCHES)		6INCHES)				6INCHES)	l	6INCHES)	L		
Lab Sample ID:		D7I070382006		D7I070382013		RPD	Qualification	D7I070382012		D7I070382014		RPD	Qualification
Sample Matrix:	ļ	SOLID		SOLID				SOLID		SOLID			
Analyte:	Unit												
Pesticides	1												
4,4-DDD	ug/kg	<17		<17		ÑĀ	,	<21		<21		NA	
4,4-DDE	ug/kg	<17		<17		NA	· · · · · · · · · · · · · · · · · · ·	4.1	J	4.7	J	14%	
4,4-DDT	ug/kg	<20		<20		NA		7.6	J	8.8	J	15%	
Aldrin	ug/kg	<17		<17		NA		<21		<21		NA	<del></del>
alpha-BHC	ug/kg	<17		<17		NA		<21		<21		NA	
alpha-Chlordane	ug/kg	<17		<17	П	NA		<21		<21		NA	
beta-BHC	ug/kg	<17		<17	$\vdash$	NA		<21	$\vdash$	<21		NA	
delta-BHC	ug/kg	<17		<17	Ш	NA		<21	$\vdash$	<21		NA	
Dieldrin	ug/kg	<17		<17		NA		<21		<21		NA	
Endosulfan I	ug/kg	<17		<17		NA		<21		<21		NA	
Endosulfan II	ug/kg	<17		<17		NA		<21		<21		NA	
Endosulfan sulfate	ug/kg	<17		<17	$\vdash$	NA		<21		<21		NA	
Endrin	ug/kg	<17		<17		NA		<21		<21		NA	
Endrin aldehyde	ug/kg	<17		<17		NA		<21		<21		NA	
Endrin ketone	ug/kg	<17	$\Box$	<17		NA		<21		<21		NA	
gamma-BHC (Lindane)	ug/kg	<17		<17		NA		<21		<21		NA	
gamma-Chlordane	ug/kg	<17	$\neg$	<17		NA		<21		<21		NA	
Heptachlor	ug/kg	<17		<17		NA		<21		<21		NA	
Heptachlor epoxide	ug/kg	<17		<17	П	NA		<21		<21		NA	
Methoxychlor	ug/kg	<33	$\Box$	<34	$\Box$	NA		<41		<41		NA	
Toxaphene	ug/kg	<1700		<1700		NA		<2100		<2100		NA	
Total Petroleum Hydrocarbons	<u> </u>												
Diesel Range Organics	mg/kg	2	j	15	$\vdash$	153%	J	3.5	J	4.8	J	31%	
Gasoline Range Organics	mg/kg	1.6	JΒ	1.4	JВ	13%	<u></u>	1.7	JΒ		JΒ	13%	
Explosives													
2,4-Dinitrotoluene	malka	<0.25		<0.25	$\vdash$	NA		-0.0E	_	10.05	$\vdash$	NA	
2,6-Dinitrotoluene	mg/kg	<0.25		<0.25		NA NA		<0.25 <0.25	├	<0.25 <0.25		NA NA	
2,0-Diriti otoluerie	mg/kg	<0.25		<0.25	$\vdash$	INA		<0.25	├	<0.25		INA	
Metals													
Arsenic	mg/kg	1.7	J	1.5	J	13%		7.8		7.9		1%	
Barium	mg/kg	14		14		0%		160		160		0%	
Cadmium	mg/kg	0.065	J	0.07	J	7%		0.11	٦	0.11	J	0%	
Chromium	mg/kg	5.8		6.3		8%		21	7	21		0%	
Lead	mg/kg	3.2	J	3	J	6%		18		18	L	0%	

		FGOW-AOC5-	FGOW-AOC5-			FGOW-AOC5-	IFGOW-AOC5-I		
		SS-GP6(0-	SS-GP13(0-			SS-GP12(0-	SS-GP14(0-	1	
Field Sample ID:		6INCHES)	6INCHES)			6INCHES)	6INCHES)		
Lab Sample ID:		D7I070382006	D7I070382013	RPD	Qualification	D7I070382012	D7I070382014	RPD	Qualification
Sample Matrix:		SOLID	SOLID			SOLID	SOLID		
Mercury	mg/kg	<0.033	<0.034	NA		0.05	0.05	0%	
Selenium	mg/kg	<3.0	<3.0	NA		<3.8	<3.7	NA	
Silver	mg/kg	<1.5	<1.5	NA		<1.9	<1.9	NA	
PAHs			<del></del>						
2-Methylnaphthalene	ug/kg	<330	<340	NA		<410	<410	NA	
Acenaphthene	ug/kg	<330	<340	NA NA		<410	<410	NA	
Acenaphthylene	ug/kg	<330	<340	NA NA		<410	<410	NA	
Anthracene	ug/kg	<330	<340	NA		<410	<410	NA	
Benzo(a)anthracene	ug/kg	<330	<340	NA		<410	<410	NA	
Benzo(a)pyrene	ug/kg	<330	<340	NA		<410	<410	NA	
Benzo(b)fluoranthene	ug/kg	<330	<340	NA		<410	<410	NA	
Benzo(ghi)perylene	ug/kg	<330	<340	NA		<410	<410	NA	
Benzo(k)fluoranthene	ug/kg	<330	<340	NA		<410	<410	NA	
Chrysene	ug/kg	<330	<340	NA		<410	<410	NA	
Dibenz(a,h)anthracene	ug/kg	<330	<340	NA		<410	<410	NA	
Diphenylamine	ug/kg	<330	<340	NA		<410	<410	NA	
Fluoranthene	ug/kg	<330	<340	NA		<410	<410	NA	
Fluorene	ug/kg	<330	<340	NA	l	<410	<410	NA	
Indeno(1,2,3-cd)pyrene	ug/kg	<330	<340	NA		<410	<410	NA	
Naphthalene	ug/kg	<330	<340	NA		<410	<410	NA	
Phenanthrene	ug/kg	<330	<340	NA		<410	<410	NA	
Pyrene	ug/kg	<400	<410	NA		<500	<500	NA	
Ott.									
Other			<del></del>			<del>                                     </del>		- 451	
Nitrocellulose	mg/kg	<5.1	<5.1	NA		2.2	B 2.3	B 4%	
Percent Moisture	%	1.2	1.6	29%	1	20	20	0%	<u>. J</u>

Area AOC6 Solid Samples

Area AOC6 Solid Samp	ies						
		FGOW-AOC6-SS-TP1(0-		FGOW-AOC6-S-			
Field Sample ID:		.5FT)		TP7(6FT)			
Lab Sample ID:		D7H090291001		D7H090291013		RPD	Qualification
Sample Matrix:		SOLID		SOLID	П		
Analyte:	Unit				H		<u> </u>
Metals							
Arsenic	mg/kg	2.5	J	1.9	J	27%	
Barium	mg/kg	44		39	П	12%	
Cadmium	mg/kg	<0.53		<0.52	П	NA	
Chromium	mg/kg	10		8.5		16%	·
Lead	mg/kg	12		10	П	18%	
Mercury	mg/kg	0.038		0.045	П	17%	
Selenium	mg/kg	<3.2		<3.1	П	NA	
Silver	mg/kg	<1.6		<1.6	П	NA	
PAHs					Н		
2-Methylnaphthalene	ug/kg	<350		<340	Ħ	NA	
Acenaphthene	ug/kg	<350		<340	П	NA	
Acenaphthylene	ug/kg	<350		<340	П	NA	
Anthracene	ug/kg	75	J	350	П	129%	J
Benzo(a)anthracene	ug/kg	250	J	1500	П	143%	J
Benzo(a)pyrene	ug/kg	230	J	1400	П	144%	J
Benzo(b)fluoranthene	ug/kg	380	К	2300	Κ	143%	J
Benzo(ghi)perylene	ug/kg	130	J	760		142%	J
Benzo(k)fluoranthene	ug/kg	<350		<340	П	NA	
Chrysene	ug/kg	260	J	1500	П	141%	J
Dibenz(a,h)anthracene	ug/kg	47	J	250	J	137%	OK
Fluoranthene	ug/kg	430		2400	П	139%	J
Fluorene	ug/kg	<350		43	J	NA	
Indeno(1,2,3-cd)pyrene	ug/kg	130	J	750		141%	J
Naphthalene	ug/kg	<350		<340		NA	
Phenanthrene	ug/kg	240	J	1100		128%	J
Pyrene	ug/kg	400	J	2200	$\prod$	138%	J
Other					H		
Percent Moisture	%	5.4		4		30%	

**Area AOC7A Solid Samples** FGOW-AOC7A-FGOW-AOC7A-SS-GP3(0-SS-GP8(0-6INCHES) 6INCHES) Field Sample ID: D7H160289003 **RPD** Qualification D7H160289004-RE2 Lab Sample ID: SOLID SOLID Sample Matrix: Unit Analyte: NA **VOCs** NA <4.7 <5.1 1,1,1,2-Tetrachloroethane ug/kg NΑ <4.7 <5.1 1,1,1-Trichloroethane ug/kg NA 1,1,2,2-Tetrachloroethane <4.7 <5.1 ug/kg NΑ <4.7 <5.1 1,1,2-Trichloroethane ug/kg NA ug/kg 1,1-Dichloroethane <4.7 <5.1 NA 1,1-Dichloroethene <5.1 <4.7 ug/kg NA <5.1 <4.7 1,1-Dichloropropene ug/kg NA 1,2,3-Trichlorobenzene <4.7 <5.1 ug/kg NA 1,2,3-Trichloropropane ug/kg <4.7 <5.1 NA 1,2,4-Trichlorobenzene <4.7 <5.1 ug/kg NA 0.72 JJ <5.1 1,2,4-Trimethylbenzene ug/kg NA 1,2-Dibromo-3-chloropropane (DBCP) <9.4 <10 ug/kg NA 1,2-Dibromoethane (EDB) <4.7 <5.1 ug/kg NA <4.7 <5.1 1,2-Dichlorobenzene ug/kg <4.7 <5.1 NA ug/kg 1,2-Dichloroethane NA <4.7 <5.1 1,2-Dichloropropane ug/kg <5.1 NΑ <4.7 1,3,5-Trimethylbenzene ug/kg <5.1 NA <4.7 ug/kg 1,3-Dichlorobenzene <4.7 <5.1 NA 1,3-Dichloropropane ug/kg NA <4.7 <5.1 1,4-Dichlorobenzene ug/kg NA <4.7 <5.1 2,2-Dichloropropane ug/kg JBJ 16 JΒ 0% 16 2-Butanone (MEK) ug/kg NA 2-Chlorotoluene <4.7 <5.1 ug/kg <19 <20 NA 2-Hexanone ug/kg <5.1 NA <4.7 4-Chlorotoluene ug/kg <20 NA <19 4-Methyl-2-pentanone ug/kg 69 8% 75 ug/kg Acetone 0.89 6% 0.84 Benzene ug/kg <4.7 <5.1 NA Bromobenzene ug/kg <5.1 NA <4.7 Bromochloromethane ug/kg <5.1 NA <4.7 Bromodichloromethane ug/kg NA <4.7 <5.1 Bromoform lug/kg <10 NA <9.4 Bromomethane ug/kg 4.5 JJ 3.9 14% Carbon disulfide ug/kg NA <5.1 Carbon tetrachloride <4.7 ug/kg NA <5.1 <4.7 Chlorobenzene ug/kg NA <10 <9.4 Chloroethane ug/kg <9.4 <10 NA Chloroform ug/kg <10 NΑ <9.4 Chloromethane ug/kg NA <2.4 <2.5 cis-1,2-Dichloroethene ug/kg NA cis-1,3-Dichloropropene ug/kg <4.7 <5.1 NA <4.7 <5.1 Dibromochloromethane ug/kg NA <5.1 Dibromomethane <4.7 ug/kg NA <10 <9.4 Dichlorodifluoromethane ug/kg NA <5.1 Ethylbenzene ug/kg <4.7 NA Hexachlorobutadiene <4.7 <5.1 ug/kg ÑΑ <5.1 <4.7 Isopropylbenzene ug/kg NA <2.5 m-Xylene & p-Xylene <2.4 ug/kg NA <20 Methyl tert-butyl ether <19 ug/kg NA <4.7 <5.1 Methylene chloride ug/kg NA n-Butylbenzene <4.7 <5.1 ug/kg NA ug/kg n-Propylbenzene <4.7 <5.1 ug/kg NA Naphthalene <4.7 <5.1 NA <2.4 <2.5 ug/kg o-Xylene NA <5.1 p-Isopropyltoluene ug/kg <4.7 NA sec-Butylbenzene ug/kg <4.7 <5.1 NΑ Styrene ua/ka <4.7 <5.1 tert-Butylbenzene NΑ ug/kg <4.7 <5.1 NA ug/kg <4.7 <5.1 Tetrachloroethene 0% Toluene ug/kg 1.1 JJ 1.1 J NA <2.4 <2.5 trans-1,2-Dichloroethene ug/kg NA <4.7 <5.1 trans-1,3-Dichloropropene ug/kg NA <4.7 <5.1 Trichloroethene ug/kg NA <9.4 <10 Trichlorofluoromethane ug/kg NA Vinyl chloride ug/kg <4.7 <5.1

%

NA

16

Other

Percent Moisture

Field Duplicate RPD Calculation Table - Former Gopher Ordnance Works Area AOC7C Solid Samples

Aica Accide cond campics	·						
Field Sample ID:		FGOW-AOC7C- SS-SS10(0- 6INCHES)		FGOW-AOC7C- SS-SS5(0- 6INCHES)			
Lab Sample ID:		D7H250161015	l	D7H250161010	i	RPD	Qualification
Sample Matrix:		SOLID		SOLID			
Analyte:	Unit						
Explosives							1
2,4-Dinitrotoluene	mg/kg	<0.25		<0.25		NA	
2,6-Dinitrotoluene	mg/kg			<0.25		NA	
						NA	
SVOCs							
Diphenylamine	ug/kg	<520		<480		NA	
Other							
Nitrocellulose		1.7	ВJ	2.7	ВJ	45%	
Percent Moisture	%	37		32		14%	

Field Sample ID:		FGOW-AOC7C- W-GP8		FGOW-AOC7C- W-GP6			
ab Sample ID:		D7H230183009	$\dashv$	D7H230183010	H	RPD	Qualification
Sample Matrix:		WATER		WATER			
nalyte:	Unit				Ц		
xplosives		0.10	Ц	0.40	Н	NIA .	<u> </u>
2,4-Dinitrotoluene	ug/L	<0.40	$\dashv$	<0.40	Н	NA NA	<del> </del>
2,6-Dinitrotoluene	ug/L	<0.40	Н	<0.40	Н	NA NA	
Metals			Н		Н	NA	
Arsenic	ug/L	<25	H	<25	Н	NA	
Barium	ug/L	55	Н	57	Н	4%	
Cadmium	ug/L	<5.0	Н	<5.0	Н	NA	
Chromium	ug/L	<15	Н	<15	Н	NA	
ead	ug/L	<15	П	<15	Т	NA	
Mercury	ug/L	<0.20	П	<0.20	П	NA	
Selenium	ug/L	<22	П	<22		NA	
Silver	ug/L	<15		<15		NA	
SVOCs			$\square$		$\Box$		
,2,4-Trichlorobenzene	ug/L	<10	Ц	<10	Ш	NA	
,2-Dichlorobenzene	ug/L	<10	Ц	<10	Ц	NA	
,2-Diphenylhydrazine	ug/L	<10	Ц	<10	Ц	NA	<b></b>
,3-Dichlorobenzene	ug/L	<10	Ц	<10	Н	NA NA	<del> </del>
,4-Dichlorobenzene	ug/L	<10	Ц	<10	Н	NA	<del> </del>
2,4,5-Trichlorophenol	ug/L	<20	Н	<20	$\vdash$	NA NA	ļ
2,4,6-Trichlorophenol	ug/L	<20	$\vdash$	<20	$\vdash$	NA NA	ļ
2,4-Dichlorophenol	ug/L	<10	H	<10	$\vdash$	NA NA	<del> </del>
2,4-Dimethylphenol	ug/L	<10 <80	H	<10 <80	$\vdash$	NA NA	<del> </del>
2,4-Dinitrophenol 2,4-Dinitrotoluene	ug/L	<80 <20	H	<80 <20	H	NA NA	
	ug/L	<10	H	<10	$\vdash$	NA NA	
2,6-Dichlorophenol 2,6-Dinitrotoluene	ug/L ug/L	<20	H	<20	$\vdash$	NA NA	+
2-Chloronaphthalene	ug/L ug/L	<10	H	<10	$\vdash$	NA	
2-Chlorophenol	ug/L	<10	H	<10	H	NA NA	
2-Methylnaphthalene	ug/L	<10	┝	<10	H	NA NA	
2-Methylphenol	ug/L	<10	H	<10	Н	NA	
2-Nitroaniline	ug/L	<50	H	<50	T	NA NA	
2-Nitrophenol	ug/L	<20	t	<20	H	NA	
3,3-Dichlorobenzidine	ug/L	<50	t	<50	T	NA	
3-Methylphenol & 4-Methylphenol	ug/L	<20		<20	t	NA	
B-Nitroaniline	ug/L	<50	T	<50	T	NA	
1,6-Dinitro-2-methylphenol	ug/L	<80	T	<80	Т	NA	
I-Bromophenyl phenyl ether	ug/L	<10	T	<10	T	NA	
I-Chloro-3-methylphenol	ug/L	<20	T	<20	Г	NA	
1-Chloroaniline	ug/L	<25	Γ	<25		NA	
1-Chlorophenyl phenyl ether	ug/L	<10		<10	Π	NA	
1-Nitroaniline	ug/L	<50		<50		NA	
1-Nitrophenol	ug/L	<50		<50		NA	
Acenaphthene	ug/L	<10		<10		NA	
Acenaphthylene	ug/L	<10		<10		NA	
Anthracene	ug/L	<10		<10		NA	
Benzidine	ug/L	<200		<200		NA	
Benzo(a)anthracene	ug/L	<10	Ĺ	<10	匚	NA	
Benzo(a)pyrene	ug/L	<10	Ĺ	<10	Ĺ	NA	ļ
Benzo(b)fluoranthene	ug/L	<10	Ĺ	<10	1	NA	
Benzo(ghi)perylene	ug/L	<10	1	<10	1	NA	
Benzo(k)fluoranthene	ug/L	<10	1	<10	$\vdash$	NA	+
Benzoic acid	ug/L	<80	+	<80	+	NA NA	<del> </del>
Benzyl alcohol	ug/L		$\vdash$	<25	+	NA NA	-
ois(2-Chloroethoxy)methane	ug/L		+	<10	+	NA NA	
ois(2-Chloroethyl) ether	ug/L		╀	<20 <10	+	NA NA	<del>                                     </del>
pis(2-Chloroisopropyl) ether	ug/L	<10 2.2	J		┧		<del> </del>
bis(2-Ethylhexyl) phthalate Butyl benzyl phthalate	ug/L ug/L	2.2 <20	17	2.2 <20	17	NA	+
Sutyl benzyl primalate Carbazole	ug/L ug/L	<20 <10	+	<20	+	NA NA	<u> </u>
Darbazole Chrysene	ug/L ug/L	<10	+	<10	$\vdash$	NA NA	+
Di-n-butyl phthalate	ug/L ug/L	<20	+	<20	+	NA NA	1
Di-n-octyl phthalate	ug/L ug/L	<20	+	<20	+	NA NA	†
Dibenz(a,h)anthracene	ug/L ug/L	<10	T	<10	T	NA NA	†
Dibenzofuran	ug/L		+	<10	†	NA	
Diethyl phthalate	ug/L		T	<20	+	NA NA	†
Dimethyl phthalate	ug/L		T	<20	T	NA	1
Diphenylamine	~g, _	<10	T	<10	十	NA NA	<del> </del>
Fluoranthene	ug/L	<20	T	<20	T	NA	
Fluorene	ug/L		T	<10	1	NA	
Hexachlorobenzene	ug/L		T	<10	T	NA	<u> </u>
Hexachlorobutadiene	ug/L		T	<30	T	NA	
Hexachloroethane	ug/L		Ţ	<10	Γ	NA	
ndeno(1,2,3-cd)pyrene	ug/L	<10	Γ	<10	Γ	NA	
sophorone	ug/L		Г	<10	Г	NA	

Page 1 of 2 AOC7C Water

Field Sample ID:		FGOW-AOC7C- W-GP8		FGOW-AOC7C- W-GP6			
Lab Sample ID:		D7H230183009		D7H230183010		RPD	Qualification
Sample Matrix:		WATER	4	WATER	4		
N-Nitrosodimethylamine	ug/L	<10	$\dashv$	<10	$\dashv$	NA	
N-Nitrosodiphenylamine	ug/L	<10		<10		NA	
N-Nitrosopyrrolidine	ug/L	<10		<10	_	NA	
Naphthalene	ug/L	<10	_	<10	4	NA NA	
Nitrobenzene Pentachlorophenol	ug/L ug/L	<20 <80	$\dashv$	<20 <80	┥	NA NA	
Phenanthrene	ug/L	<10	$\dashv$	<10	$\dashv$	NA	
Phenol	ug/L	<10		<10		NA	
Pyrene	ug/L	<10		<10		NA	
			Ц		_		
VOCs 1,1,1,2-Tetrachloroethane	ug/L	<1.0	$\dashv$	<1.0	┪	NA	
1,1,1-Trichloroethane	ug/L	<1.0	$\dashv$	<1.0		NA	
1,1,2,2-Tetrachloroethane	ug/L	<1.0		<1.0		NA	
1,1,2-Trichloroethane	ug/L	<1.0		<1.0		NA	
1,1-Dichloroethane	ug/L	<1.0	Н	<1.0	-	NA NA	
1,1-Dichloroethene 1,1-Dichloropropene	ug/L ug/L	<1.0 <1.0	$\dashv$	<1.0 <1.0		NA NA	
1,2,3-Trichlorobenzene	ug/L	<1.0	Н	<1.0		NA NA	
1,2,3-Trichloropropane	ug/L	<2.0	H	<2.0		NA	
1,2,4-Trichlorobenzene	ug/L	<1.0		<1.0		NA	
1,2,4-Trimethylbenzene	ug/L	<1.0	Ц	<1.0	Ц	NA	
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	<5.0 <1.0	Н	<5.0 <1.0	Н	NA NA	
1,2-Dibromoethane (EDB) 1,2-Dichlorobenzene	ug/L ug/L	<1.0 <1.0	Н	<1.0 <1.0	Н	NA NA	<del> </del>
1,2-Dichloroethane	ug/L	<1.0	H	<1.0	H	NA	<u> </u>
1,2-Dichloropropane	ug/L	<1.0		<1.0		NA	
1,3,5-Trimethylbenzene	ug/L	<1.0		<1.0		NA	
1,3-Dichlorobenzene	ug/L	<1.0	Ц	<1.0	Щ	NA	
1,3-Dichloropropane 1,4-Dichlorobenzene	ug/L ug/L	<1.0 <1.0	Н	<1.0 <1.0	Н	NA NA	
2,2-Dichloropropane	ug/L	<1.0	Н	<1.0		NA NA	
2-Butanone (MEK)	ug/L	<6.0	П	<6.0		NA	
2-Chlorotoluene	ug/L	<1.0		<1.0		NA	
2-Hexanone	ug/L	<5.0	Ц	<5.0		NA	
4-Chlorotoluene	ug/L ug/L	<1.0 <5.0	Н	<1.0 <5.0	$\vdash$	NA NA	
4-Methyl-2-pentanone Acetone	ug/L	<10	H	<10	-	NA NA	
Benzene	ug/L	<1.0		<1.0		NA	
Bromobenzene	ug/L	<1.0		<1.0		NA	
Bromochloromethane	ug/L	<1.0	L	<1.0	L	NA	
Bromodichloromethane Bromoform	ug/L ug/L	<1.0 <1.0	-	<1.0 <1.0	-	NA NA	<del>                                     </del>
Bromomethane	ug/L ug/L	<2.0	H	<2.0	H	NA NA	
Carbon disulfide	ug/L	<2.0	Ħ	<2.0	T	NA	
Carbon tetrachloride	ug/L	<2.0		<2.0		NA	
Chlorobenzene	ug/L	<1.0	L	<1.0	L	NA	<u></u>
Chloroethane Chloroform	ug/L ug/L	<2.0 1	┝	<2.0 0.99	J	NA 1%	
Chloromethane	ug/L ug/L	<2.0	H	<2.0	۲	NA	<del></del>
cis-1,2-Dichloroethene	ug/L	<1.0	Г	<1.0	T	NA	
cis-1,3-Dichloropropene	ug/L	<1.0		<1.0		NA	
Dibromochloromethane	ug/L	<1.0	L	<1.0	L	NA NA	<u> </u>
Dibromomethane Dichlorodifluoromethane	ug/L ug/L	<1.0 <2.0	$\vdash$	<1.0 <2.0	$\vdash$	NA NA	
Ethylbenzene	ug/L ug/L	<1.0	H	<1.0	$\vdash$	NA NA	<del> </del>
Hexachlorobutadiene	ug/L	<1.0	T	<1.0		NA	
Isopropylbenzene	ug/L	<1.0		<1.0		NA	
m-Xylene & p-Xylene	ug/L		igspace	<2.0	L	NA NA	<del> </del>
Methyl tert-butyl ether Methylene chloride	ug/L ug/L		$\vdash$	<5.0 <5.0	$\vdash$	NA NA	<u> </u>
n-Butylbenzene	ug/L ug/L		+	<5.0 <1.0	$\vdash$	NA NA	
n-Propylbenzene	ug/L	<1.0	T	<1.0		NA	
Naphthalene	ug/L			<1.0		NA	
o-Xylene	ug/L	<1.0	Ļ	<1.0	L	NA	<del> </del>
p-Isopropyltoluene sec-Butylbenzene	ug/L ug/L	<1.0 <1.0	+	<1.0 <1.0	$\vdash$	NA NA	<u> </u>
Styrene	ug/L ug/L		+	<1.0 <1.0	$\vdash$	NA NA	<u> </u>
tert-Butylbenzene	ug/L ug/L		T	<1.0	T	NA NA	
Tetrachloroethene	ug/L	<1.0	L	<1.0	Γ	NA	
Toluene	ug/L		$oxed{\Box}$	<1.0	Ĺ	NA	<u> </u>
trans-1,2-Dichloroethene	ug/L		$\vdash$	<1.0	-	NA NA	
trans-1,3-Dichloropropene Trichloroethene	ug/L ug/L		J	<1.0 0.17	IJ		<del>                                     </del>
Trichlorofluoromethane	ug/L ug/L		ť	<2.0	ť	NA	<u> </u>
Vinyl chloride	ug/L		İ	<1.0	I	NA	
					Ľ		
Other		-0.50	+	0.87	L	NA NA	
Nitrocellulose	mg/L	. <0.50	L	0.07	_	INA	1

Area AOC7D Solid Samples		er Gopher Ordnan	100 1101110				-			_						Т		
		FGOW-AOC7D-	FGOW-AOC7D-				FGOW-AOC7D- SS-GP8(0-		FGOW-AOC7D- SS-GP11(0-				FGOW-AOC7D-SS-		FGOW-AOC7D-SS-			
Field Sample ID: Lab Sample ID:		S-GP9(2-4FT) D7H310262005	S-GP11(2-4FT) D7H310262006	$\pm$	RPD	Qualification	6INCHES) D7H300206006 SOLID		6INCHES) D7H300206008 SOLID		RPD	Qualification	SS4 D7H310262016-RE2 SOLID		SS5 D7H310262017-RE2 SOLID	7	RPD	Qualification
Sample Matrix: Analyte:	Unit	SOLID	SOLID	H			SOLID		GOEID									
Fotal Petroleum Hydrocarbons Diesel Range Organics	mg/kg															$\exists$		
GCSEMI Aroclor 1016	ug/kg			H	NA NA		<36	-	<36		NA NA		<82		<42		NA NA	
Aroclor 1221 Aroclor 1232	ug/kg ug/kg				NA NA		<36 <36		<36 <36		NA NA		<82 <82		<42 <42		NA NA	
Aroclor 1242 Aroclor 1248	ug/kg ug/kg			H	NA NA NA		<36 <36 <36		<36 <36 <36		NA NA NA		<82 <82 410		<42 <42 410		NA NA 0%	
Aroclor 1254 Aroclor 1260	ug/kg ug/kg				NA NA		36		60		50%		310		350		12%	
Metals Arsenic	mg/kg	5.2	4.8		8%		2.7		3		11%							
Barium Cadmium Chromium	mg/kg mg/kg	230 <0.70 18	230 <0.68 18	H	0% NA 0%		38 0.1 15	J	28 0.21 12	J	30% 71% 22%	ОК						
Lead Mercury	mg/kg mg/kg mg/kg	9.7	J 11 J 0.12	J	13% 138%	J	33 0.026	J	52 0.036		45% 32%							
Selenium Silver	mg/kg mg/kg	<4.2 <2.1	<4.1 <2.0		NA NA		<3.2 <1.6		<3.3 <1.6		NA NA NA							
SVOCs 1,2,4-Trichlorobenzene	ug/kg	<460	<450	H	NA NA		<360		<360		NA NA							
1,2-Dichlorobenzene 1,2-Diphenylhydrazine	ug/kg ug/kg	<460 <460	<450 <450		NA NA		<360 <360		<360 <360		NA NA							
1,3-Dichlorobenzene 1,4-Dichlorobenzene 2,4,5-Trichlorophenol	ug/kg ug/kg	<460 <460 <460	<450 <450 <450	$\Box$	NA NA NA		<360 <360 <360	Ė.	<360 <360 <360		NA NA NA							
2,4,6-Trichlorophenol 2,4-Dichlorophenol	ug/kg ug/kg ug/kg	<460 <460	<450 <450	Ħ	NA NA		<360 <360		<360 <360		NA NA							
2,4-Dimethylphenol 2,4-Dinitrophenol	ug/kg ug/kg	<460 <2300	<450 <2200		NA NA		<360 <1700		<360 <1700		NA NA							
2,4-Dinitrotoluene 2,6-Dichlorophenol 2,6-Dinitrotoluene	ug/kg ug/kg ug/kg	<460 <460 <460	<450 <450 <450	Ħ	NA NA NA		<360 <360 <360		<360 <360 <360		NA NA NA			E				
2-Chloronaphthaiene 2-Chlorophenol	ug/kg ug/kg	<460 <460	<450 <450	H	NA NA		<360 <360		<360 <360		NA NA							
2-Methyinaphthalene 2-Methylphenol	ug/kg ug/kg	<460 <460	<450 <450	Ħ	NA NA		<360 <360		<360 <360 <1700		NA NA NA			Ë				
2-Nitroaniline 2-Nitrophenol 3,3-Dichlorobenzidine	ug/kg ug/kg ug/kg	<2300 <460 <2300	<2200 <450 <2200	Ħ	NA NA NA		<1700 <360 <1700		<360 <1700	E	NA NA			E				
3-Methylphenol & 4-Methylphenol 3-Nitroaniline	ug/kg ug/kg	<460 <2300	<450 <2200	$\exists$	NA NA		<360 <1700		<360 <1700		NA NA			E				
4,6-Dinitro-2-methylphenol 4-Bromophenyl phenyl ether 4-Chloro-3-methylphenol	ug/kg ug/kg ug/kg	<2300 <460 <460	<2200 <450 <450	Ħ	NA NA NA		<1700 <360 <360	_	<1700 <360 <360		NA NA NA							
4-Chloroaniline 4-Chlorophenyl phenyl ether	ug/kg ug/kg	<460 <460	<450 <450	Ħ	NA NA		<360 <360		<360 <360		NA NA							
4-Nitroaniline 4-Nitrophenol	ug/kg ug/kg	<2300 <2300	<2200 <2200	Ħ	NA NA		<1700 <1700 43		<1700 <1700 66	,	NA NA 42%			F				
Acenaphthene Acenaphthylene Anthracene	ug/kg ug/kg ug/kg	<460 <460 <460	<450 <450 <450	$\dashv$	NA NA NA	-	<360 100	J	<360 180	J	NA 57%	ОК		F				
Benzidine Benzo(a)anthracene	ug/kg ug/kg	<5600 <460	<5400 <450	Ħ	NA NA		<4300 320	J	<4400 520		NA 48%							
Benzo(a)pyrene Benzo(b)fluoranthene Benzo(ghi)perylene	ug/kg ug/kg ug/kg	<460 <460 <460	<450 <450 <450	Ħ	NA NA NA		270 460 150	J	770 250	K	52% 50% 50%	OK		Ħ				
Benzo(k)fluoranthene Benzoic acid	ug/kg ug/kg	<460 <2300	<450 <2200	H	NA NA		<360 <1700		<360 <1700		NA NA			E				
Benzyl alcohol bis(2-Chloroethoxy)methane	ug/kg ug/kg	<460 <460	<450 <450		NA NA		<360 <360		<360 <360 <360		NA NA NA							
bis(2-Chloroethyl) ether bis(2-Chloroisopropyl) ether bis(2-Ethylhexyl) phthalate	ug/kg ug/kg ug/kg	<460 <460 <460	<450 <450 <450		NA NA		<360 <360 <360		<360 <360		NA NA							
Butyl benzyl phthalate Carbazole	ug/kg ug/kg	<460 <460	<450 <450		NA NA		<360 61	J	<360 110	J	NA 57%	ок		E				
Chrysene Di-n-butyl phthalate	ug/kg ug/kg	<460 <460 <460	<450 <450 <450	$\exists$	NA NA NA		310 <360 <360	J	<360 <360		NA NA	OK		Ė				
Di-n-octyl phthalate Dibenz(a,h)anthracene Dibenzofuran	ug/kg ug/kg ug/kg	<460 <460	<450 <450 <450	$\Box$	NA NA		43 <360	J	75 <360	j	54% NA	OK						
Diethyl phthalate Dirnethyl phthalate	ug/kg ug/kg	<930 <460	<890 <450		NA NA		<710 <360		<720 <360		NA NA NA							
Diphenylamine Fluoranthene Fluorene	ug/kg ug/kg	<460 <460	<450 <450	$\Box$	NA NA		710 44	J	1300	J	59% 40%	J		-		-		
Hexachlorobenzene Hexachlorobutadiene	ug/kg ug/kg	<460 <460	<450 <450		NA NA		<360 <360		<360 <360		NA NA							
Hexachloroethane Indeno(1,2,3-cd)pyrene Isophorone	ug/kg ug/kg ug/kg	<460 <460 <460	<450 <450 <450	$\forall$	NA NA NA		<360 140 <360	j	<360 230 <360	J	NA 49% NA			F				
N-Nitrosodi-n-propylamine N-Nitrosodimethylamine	ug/kg ug/kg	<460 <730	<450 <700	$\exists$	NA NA		<360 <560	E	<360 <570		NA NA			E				
N-Nitrosodiphenylamine N-Nitrosopyrrolidine Naphthalene	ug/kg ug/kg ug/kg	<460 <460 <460	<450 <450 <450	Ħ	NA NA NA		<360 <360 <360		<360 <360 <360		NA NA NA			F				
Nitrobenzene Pentachiorophenol	ug/kg ug/kg	<460 <2300	<450 <2200	H	NA NA		<360 <1700		<360 <1700		NA NA			E				
Phenanthrene Phenoi	ug/kg ug/kg	<460 <460 <560	<450 <450 <540	Ħ	NA NA NA		430 <360 590		770 <360 1000		57% NA 52%	J		Ħ		<u> </u>		
Pyrene VOCs	ug/kg	<560	<b>₹540</b>	H	NA.		590		1000	<b>!</b>	32.76			Ħ				
1,1,1,2-Tetrachloroethane 1,1,1-Trichloroethane	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0		NA NA		<13 <13		<4.9 <4.9		NA NA							
1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane 1,1-Dichloroethane	ug/kg ug/kg ug/kg	<7.0 <7.0 <7.0	<7.0 <7.0 <7.0	$\Box$	NA NA NA	<u> </u>	<13 <13 <13		<4.9 <4.9 <4.9	<u> </u>	NA NA NA			‡				
1,1-Dichloroethene 1,1-Dichloropropene	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0		NA NA		<13 <13	E	<4.9 <4.9	E	NA NA			E				
1,2,3-Trichlorobenzene 1,2,3-Trichloropropane	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0	$\Box$	NA NA NA		<13 <13 <13	F	<4.9 <4.9 <4.9	F	NA NA NA			+				
1,2,4-Trichlorobenzene 1,2,4-Trimethylbenzene 1,2-Dibromo-3-chloropropane (DBCP)	ug/kg ug/kg ) ug/kg	<7.0 0.97 <14	<7.0 J <7.0 <14	Ħ	NA NA		<13 <25	F	<4.9 <9.8	E	NA NA			E		E		
1,2-Dibromoethane (EDB) 1,2-Dichlorobenzene	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0	$\exists$	NA NA		<13 <13	E	<4.9 <4.9	E	NA NA			E		E		
1,2-Dichloroethane 1,2-Dichloropropane 1,3,5-Trimethylbenzene	ug/kg ug/kg ug/kg	<7.0	<7.0 <7.0 <7.0	+	NA NA NA		<13 <13 <13	F	<4.9 <4.9 <4.9		NA NA NA			+		E		
1,3-Dichlorobenzene 1,3-Dichloropropane	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0	E	NA NA		<13 <13	Ε	<4.9 <4.9		NA NA			E				
1,4-Dichlorobenzene 2,2-Dichloropropane 2-Butanone (MEK)	ug/kg ug/kg ug/kg	<7.0	<7.0 <7.0 <28		NA NA NA	<u> </u>	<13 <13 <50	=	<4.9 <4.9 <20	+	NA NA NA			‡				
2-Chlorotoluene 2-Hexanone	ug/kg ug/kg	<7.0 <28	<7.0 <28		NA NA	<u> </u>	<13 <50		<4.9 <20		NA NA			E				
4-Chiorotoluene 4-Methyl-2-pentanone	ug/kg ug/kg	<7.0 <28	<7.0 <28	F	NA NA		<13 <50	E	<4.9 <20	Ē	NA NA NA			Ė		Ė	ļ	
Acetone Benzene Bromobenzene	ug/kg ug/kg ug/kg	<7.0	J <28 <7.0 <7.0	#	NA NA NA	<u> </u>	<50 <13 <13	F	<20 <4.9 <4.9	$\pm$	NA NA NA			1		E		
Bromochloromethane Bromodichloromethane	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0	F	NA NA		<13 <13	E	<4.9 <4.9	E	NA NA			F				<u> </u>
Bromoform Bromomethane Carbon disulfide	ug/kg ug/kg ug/kg	<14	<7.0 <14 <7.0	$\pm$	NA NA NA		<13 <25 <13	+	<4.9 <9.8 <4.9	-	NA NA NA		<del>                                     </del>	+				
Carbon tetrachloride Chlorobenzene	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0		NA NA		<13 <13	E	<4.9 <4.9		NA NA			E		E		
Chloroethane Chloroform	ug/kg ug/kg	<14 <14	<14 <14	F	NA NA NA		<25 <25 <25		<9.8 <9.8 <9.8	F	NA NA NA			+		+	<u> </u>	
Chloromethane cis-1,2-Dichloroethene cis-1,3-Dichloropropene	ug/kg ug/kg ug/kg	<3.5	<14 <3.5 <7.0	+	NA NA NA		<6.3 <13	E	<9.8 <2.5 <4.9	F	NA NA			E		E		
Dibromochloromethane Dibromomethane	ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0	F	NA NA		<13 <13	F	<4.9 <4.9 <9.8	E	NA NA NA			Ŧ		<u> </u>		
Dichlorodifluoromethane Ethylbenzene Hexachlorobutadiene	ug/kg ug/kg ug/kg	<7.0 <7.0	<14 <7.0 <7.0	+	NA NA NA	<u> </u>	<25 <13 <13	$\vdash$	<4.9 <4.9	1-	NA NA			$\perp$				
Isopropyibenzene m-Xylene & p-Xylene	ug/kg ug/kg	<7.0 <3.5	<7.0 <3.5	1	NA NA		<13 <6.3	E	<4.9 <2.5	E	NA NA			E		E		
Methyl tert-butyl ether Methylene chloride n-Butylbenzene	ug/kg ug/kg ug/kg	1.1	JB 1.1 <7.0	JВ	NA 0% NA		<50 2 <13	JВ	<20 u 0.84 <4.9	JB	NA 82% NA	ок		+		F	<u> </u>	
n-Propylbenzene Naphthalene	ug/kg	<7.0 1.1	<7.0 J 0.93	J	NA 17%		<13 4.7	J	<4.9 1.4	J	NA 108%	OK		1				
o-Xylene p-isopropyitoluene	ug/kg ug/kg	<3.5 <7.0	<3.5 <7.0 <7.0	+	NA NA NA		<6.3 <13 <13	+	<2.5 <4.9 <4.9	Ė	NA NA NA			+		$\vdash$		
sec-Butylbenzene Styrene tert-Butylbenzene	ug/kg ug/kg ug/kg	<7.0 <7.0	<7.0 <7.0	+	NA NA	<u> </u>	<13 <13	F	<4.9 <4.9	E	NA NA			$\pm$				
Tetrachioroethene Toluene	ug/kg	<7.0 2.4	J 2	J	NA 18%		<13 <13	E	<4.9 <4.9	E	NA NA			F		+		<u> </u>
	ug/kg	<3.5	<3.5	_	NA NA	+	<6.3 <13	+	<2.5 <4.9	+	NA NA	+	+	+	+	+	+	
trans-1,2-Dichloroethene trans-1,3-Dichloropropene	ug/kg	<7.0	<7.0 <7.0	╁	NA NA	T	<13	+	<4.9	1	NA.					1	<u> </u>	<u> </u>
trans-1,2-Dichloroethene		<7.0 <7.0 <14	<7.0 <7.0 <14 <7.0					E		E								

AOC7D Solid

WAR WOCLD Solid Sallibles								 	 			_			
Field Sample ID:		FGOW-AOC7D- S-GP9(2-4FT)	FGOW-AOC7D- S-GP11(2-4FT)				FGOW-AOC7D- SS-GP8(0- 6INCHES)	FGOW-AOC7D- SS-GP11(0- 6INCHES)			FGOW-AOC7D-SS- SS4		FGOW-AOC7D-SS-		
Lab Sample ID:	+	D7H310262005	D7H310262006	_	RPD	Qualification	D7H300206006	 D7H300206008	RPD	Qualification	D7H310262016-RE2		D7H310262017-RE2	RPD	Qualification
Sample Matrix	_	SOLID	SOLID	$\vdash$			SOLID	SOLID			SOLID		SOLID		
Nitrocellulose	T			$\vdash$	NA	1								 	
Percent Moisture	%	29	26	1	11%		7.6	8.2	8%						l

Final Focused	Site In:	spection Re	port
Former Gopher Ordnance	Works.	Rosemount.	MN

**Well Abandonment Records** 

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WELL OR BORING LCCA COUNTY Name  Da KO + C		→ WELL :	AND BOR	ING SEALING RECORD Statutes, Chapter 1031  Minnesota Well and Borling Sealing No. Minnesota Unique Well No. or Winnesota Well and Borling Sealing No. Minnesota Unique Well No. or Winnesota Well and Borling Sealing No. Minnesota Unique Well No. or Winnesota Well and Borling Sealing No. Minnesota Unique Well No. or Winnesota Well and Borling Sealing No. Minnesota Unique Well No. or Winnesota Well and Borling No. Minnesota Unique Well No. or Winnesota Unique Well No. or Winnesota Well and Borling Sealing No. Minnesota Unique Well No. or Winnesota Unique
		Section No. Fre	iction (sm lg.)	4
Rose mount 118	6N 19W	36 9	5. SEL NK	8-15-07 8-15-07
GPS Lettude	degrees	minutes minutes	zbnoses	Doplin Refore Sealing 60 It Original Dapils 60 st
Numerical Stront Address or Fire				AQUIFER(S) Single Aquifor   Mullinguiller N/A STATIC WATER LEVEL
15324 Babe		ie Rosen		WELL/BORING Measured Estimated Date Measured
Show exect location of wall or to in section gold with "X."	<u> </u>	Sketch map	of well or passing	Water-Supply Well   Monit. Well
Property Bira with V		ines, resus,	of well or bering wing properly and buildings.	
		1-7		19/7
	4 5	—— L	7	Steel Plastic Tile Other
ν,			}	WELLHEAD COMPLETION N/A-
	-     \			Outelde: Well House At Grade Inside: Basemant Offset
	15 Miles			☐ Pilless Adapter/Unit ☐ Buried ☐ Well Pit
	_ I L	7		☐ Well Pit
1 Mile	-		•	☐ Other
PROPERTY OWNER'S NAME	OMPANY NAME			CASING(S) X\//)-
Property respects and the partitions if	doron the sail to	and Company	rated show	Chameter PIT Depth Set in oversize holo? Annular space initially grouted?
15325 /	BABCO	ck A	2.00	in from to ft Yes No Yes No Unknown
Rosema	ment.	MU	_	in. fromft.
الم المال الم	,	550	6 X	
WELL OWNER'S NAME/COMP	ANY NAME		<del>- 0</del>	
US ACE.				N/A O (a)
Well cwiter's mining address it dillo	and their property of	rymer's address inc	caled above	
106 5 154		. 🛋		OBSTRUCTIONS     Rods/Drop Pipe     Check Valve(s)     Debrie   Fill     No Obstruction
cmaha N	E. 1881(	J.S.		1
· _ ·		.,		Type of Obstructions (Describe)
GEOLOGICAL MATERIAL	COLOR	HARDHESS OR FORMATION	FROM TO	Obstructions removed? Yes No Describe
If not known, indicate estimate:	d formation log fro	om nearby well or	baring.	PUMP
Sand/Gravel	Brown	Hard	0 60	Type
		<del> </del>	<del> </del>	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  NO Appular Space Exists Annular Space Grouted with Tremis Fige Casing Perforation/Removal
	1			
	<del>                                     </del>			in, fromtoft.
		ļ		
я				in from to ft.   Perforated   Removed
,				
,				In from to ft. Perforated Hemoved
				In from to ft. Perforated Hemoved  Typic nf Perforator
,				
				Type of Perforator    Other   GROSTING MATERIAL(S)   (One beg of coment = 94 lbs., one beg of bentonita = 20 lbs.)  Grouting Material   GROSTING
REMARKS, SOURCE OF DAY	A, DIFFICULTIES	I IN SEALING		In. from to ft.   Perforated   Removed
		i IN SEALING		In. (rom 10   ft.   Perforated   Removed
		i in Sealing		In. (rom 10   ft.   Perforated   Removed
		i IN SEALING		In. (rom 10   Removed   Removed   Type of Perforated   Removed
HEMARKS, SOURCE OF DAY, POCTR 7470-1		3 IN SEALING		In. (rom 10   ft.   Perforated   Removed
		3 IN SEALING		In. (rom 10   Removed   Removed   Removed   Type of Perforated   Removed   Type of Perforator
		i IN SEALING		In from 10 ft. Perforated Hemoved  Type of Perforator.    Other
	1			Type of Perforator.    Other
	1	2649	02	Type of Perforator.    Other

WELL OF BORING COMMUNICATION	LOCATION 7	WELL	AND BOR	EPARTMENT OF HEALTH ING SEALING RECORD Statutes, Chapter 1031  Minnesota Well and Boring Sealing No. Minnesota Unique Well No. or W-sarias No. Grade Extransition (Care Extransition)
Township Name To	Minship No. Hango No.	Section No. Fr	action (em. 7 lg	
	fodegrees udedegrees			Darth Before Seufing 66 to the Original Dapth 66 h.
Numerical Street Address				AQUIEERIS STATIC WATER LEVEL  Desiragia Aquiter   Multisquiter
15324	BABCOC,		e	WELL/BORRING   Microsured   Wester-Supply Wall   Monit Well   Manual Wel
Show exact location of v in section grid with "X."	re1 or boring	Sketch map location, oho	of well or boring traing property and buildings.	TETS. Bore Hole   Other   Dollar   above land surface
- <del> </del>		iines, ronds,	and buildings.	CASINQ TYPE(S)
				Sleel   Plastic   Tile   Other
				WELLHEAD COMPLETION A
<b></b>				Outside: U Well House Al Grada / Inside: Basement Offset
	7/ Nie			☐ Pittsss Adapten/Unit ☐ Buried ☐ Well Pit
5				L Well Pit
1 125-		<u></u>		Colliner.
COPAT	T GORDO	XI GIA	272_	CASING(S) Diamoter Adopth Set in oversize hote? Annula: space initially goulded?
Property owner's making ad	Uress if different lasts we's	Contion address ind	iceled above	
1334	5 BABO COUNT,	Mal	,-0	
£050°	CARTI	11/04		
WELL OWNER PROME	POMPHINT NAME	<u></u>		In from to II. Yes No Yes No Unknown
Well owner's mailing address	i different then property	Towards address inc		Screen from 1 to Open Hoje from 0 to 66 11
106	5/52	518	27	OBSTRUCTIONS
		- د د سر	· -	☐ Rode/Orop Pipe ☐ Check Valve(s) ☐ Dabris ☐ Fill ☐ No Obstrustion
OMAH	+ ME	6810	ستت	Type of Obstructions (Describe)
GEOLOGICAL MATER	HAL COLOR	HARDNESS OR FORMAROS	FROM TO	Obstructions removed?
Il not known, indicate es	limated formation tog fr		-I	РИМР
ANIXX	RCC BEN	HACO	0 66	Type Removed Present [   Qiher
				METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:
				Arnular Space Exists Annular Space Grouted with Tremie Pipe Casing Pertoration/Romovat
			<del>                                     </del>	in, from to fit. Perforated Memoved
		<u> </u>		in. fromin
		-	<del>  </del>	Type of Perionitor
		<del> </del>		☐ Other
·			<del>                                     </del>	GROUTING MATERIAL(S) (One bag of coment = 94 lbs., one bag of bentonits = 50 fbs.)
			1	Partite DI
				, me
· · · · · · · · · · · · · · · · · · ·		-		lromloftbage
		1		
				OTHER WELLS AND BORINGS
REMARKS, SOURCE O	F DAYA, DIFFICULTIES	3 IN SEALING		Other unseated and unused well or boring on property?   Yes  No How many?
				This well or boring was scaled in accordance with Minnesota Rutes, Chapter 4725. The information contained in this seport lie true to the back of my knowledge.
				1/20
				Northeast Technical Services 1635 License Business Name License Or Registration No.
			(	
			_	1635 4-29-08
				full 1033
		** *		Certified Rep. No. Osla
MINN DEPT OF HE	ALTH COPY H	2649	<u> </u>	Scott Skruba

WELL OR BORING LOCAT	7	WELL	AND BOR	ING SEALING RECORD  Statiolos, Chapter 1001  Minnesota Well and Boring Sealing No.  Minnesota Unique Well No. or W-Spries No.  Litzed Extendardent
Township Name Township	No. Range Nn.	Section No. Fra	ction (sna. 7 to.	Date Schind  Date Well or Boring Constructed  8-20-08  8-20-09
GPS Labludo LOCATION; Lang'tude Numerical Street Address or Flor	degreesdegrees	minutes minutes of Well or Baring	. seconds	Oepih Aslore SeaFing 66 fl. Original Depih 6 f. ACUIFER(S) STATIC WATER LEVEL STATIC WATER LEVEL
Show exact location of weil or bein section grist with "X."	ABCOC oring	Sketch map of location, show lines, roads, a	N well or boring ding property and buildings.	WeLL/BORING   Measured   Measured   Data Menaured   Water-Supply Well   Mont. Well   Mont. Well   Mont. Well   Mont. Well   Mont. Well   Measured   Measur
				Casing TYPE(9)  [A Size   Plast   Tile   Other    WELLHEAD COMPLETION   A   A
S 8	-			Outside:   Well House
PROPERTY OWNERS NAME/CO	OVERNMANE CO O IZ	12000/1	artz	CASING(S)  Ulameter Debit A/A Set in corretze bale? Anader erace initiate arrated?
Property owner's multing address it		cation address indi	TVE	Diamoter Depth 4 9st in oversize hole? Annular space initially grouted?in, fronttoft.   Yes  No  Yes  No  No  No  No  No  No  No  No  No  N
ROSEMOU	NT /50	506	8	
WELL OWNER'S NAME/ODINGA				SCREEN/OPEN HOLE WAT
Wed career's meeting address it differ 104 S OM Att	A M	1E 68/0	2 2	Scrinn from to it. Open Hole from to to fil.  OBSTRUCTIONS    Rods/Drop Pipe   Check Velve(s)   Cebris   Fill   No Obstruction  Type of Obstructions (Describe)
GEOLOGICAL MATERIAL	COLOR	HARDNESS OR FORMATION	FROM TO	Obstructions removed? Yes No Describe
II not known, Indicate estimated	formation log Iro	m realty well or	baring.	Type
				NETHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
				in, from to it.   Perforated   Removed
				L) Other
				GROUTING MATERIAL(S) (One big of sement = 94 lbs., one bag of bankenile = 50 lbs.)  Grouting Maserial DENTON ITE from to 6 ft yerds bags
				from to tt. yards bags
				tions to the state of the state
Remarks, Source of Data	) A, DIFFICULTIES	IN SEALING		OTHER WELLS AND BORINGS  Other unsealed and unused well or boring on property? 1_1 Yes 1_No How many?
				LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This woll or boday was geniod in proportioned with Minnesota Rules, Chapter 4725. The information contained in this report is free to the boat of my knowledge.
				Northerd Technical Services 1635 Licensee Business Name License or Registration No.
				Partition Signature Signature Certified Rep. No. Conto
MINN. DEPT OF HEALTH	сору Н	2649	05	Scott Skraba Name of Person Sealing Well or Boring
HE-01434-10 IC# 1404	1	· · · · · · · · · · · · · · · · · · ·		507.6

WELL OF BORING LOC	ATION	Guer e <sup>N</sup>	MINNESOTA (	PEPARTMENT OF HEALTH Minnesota Well and Boring H 264906
Course Vame	•	AACTE		Sealing SEALING RECORD  Statutes, Chapter 1031  Sealing No.  Minnesota Unique Well No. or W-series No. tawa band And Incomp
Township Name Townsh	p No. IRange No	). Section No. Fe		[COLTE EAST TO PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE
1/2	19	36	1/2	Date Sealed  Date Well or Boring Constructed  8 - 21 - 07
ons Latitude	dymane	missis a n		1/ //
ura -	ds&tees	minutes minutes		Depth Before Sealingft. Original Depthft.
Numerical Street Address of Fr				AQUIFER(S) Static WATER LEVEL Single Aquiter   Multiaquiter
10349	PROCE	- Muc		WELL/BORING   Massured   Fallmated Data Measured     Water-Supply Well   Monit Well
Show exact location of well or in eaction grid with "X."	boring	location, she	al well or boring owing property	Em. Bora Hola   Olhar   60 to the day   above land surface
l III		rnes, roads,	and buildings.	CASING TYPE(S)
				Sieci   Piestic   Tile   Other
	<u></u>		•	WELLHEAD COMPLETION
				Outside: Well House At Grade Inside: Basement Offset
	7.17s			☐ Priless Adapter/Unit ☐ Burker ☐ Wolf Pil
	<u>.</u> 1			☐ Wall Pit ☐ Burled
1 M.b	1		•	C J Other
PROPERTY OVINIERS NAME	AND NAME	er Gi	chz.	CASUNG(8) Diameter Dapit A Set in nyamba hola? Sontilly appear in limits a
Property owner's mailing address i	Perent Corn see!	region acrices	icated abova	Diameter Depth Set in oversize hole? Annular space initially ground? in, fromtotreetree
15500 6	15	Mars		
KOSEMOU	ast,	5506	8	
WELL OWNER'S NAME COMP	NAME		·	SCREEN/OPEN HOLE
Wall owner's mailing address it still	erent theo proporty	owner's accress in	icated above	Screen from 10 10 11
106 5	150	5/		OBSTRUCTIONS
Chrown	4- 04		_	☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Dobrits ☐ FIT
	(S)	8102	<u></u>	Type of Obstructions (Describe)
GEOLOGICAL MATERIAL	COLOR	HARDHESS OR HOREMANN	<b>ГРОМ</b> ТО	Obstructions removed? Yes No Describe
Il not known, igrlicale estimate	d formation log fr	1 ./		PUMP Type
PAPERAVEL	DEN	MED	060	Removed Not Present Other
				AFTHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASHIGS, OR CASING AND BORE HOLE:
				No Annuler Space Exists   Annular Space Grouted with Tremite Pipe   Casing Perforation/Removal
				in, from to ft. Perforated [] Namoved
				Type of Pesterator
				L.  Other
				GROUTING MATERIAL(S) (One bag of cament = 94 lbs., one bag of bentonite = 60 lbs.)
				Groufing Material Control of the first page bage
	1	1		from to It. yards bags
		<del> </del>	1	
	+	1		OTHER WELLS AND BORINGS
REMARKS, SOURCE OF DAT	A, DIFFICULTIES	IN SEALING		Other binseased and unused well or boring on property? Yes Who How morry?
		<del>-</del>		LICENSED OR REGISTERED CONTRACTOR CERTIFICATION
	•			This well or boring was seeled in accordance with Minnesota Rules, Chapter 4725. The informalian contained in this report is from to the best of my knowledge.
				Northeast Technical Sonices 1635
				License of Registration vo.
				1635 4-29-08
				Certified Representative Signature Certified Rep No. Date
MINN. DEPT OF HEALTH	200V. H	0040		1 Scott Skrobe
Į.	COPY	2649	06	Namo of Persun Seeling Well or Boring

WELL OR BORING LOCATION COUNTY Name CAKO+CA	WELL		BOR	Minnesota Well and Boring Sealing No. Minnesota Unique Well No. or W-senies No. or W-senies No. Grad feet reprised
Township Name Township No. Hange !	In. Section No. Fre			Team-to State is the Control
Rose mount 16N AW		H 56		8-22-07 8-21-07
GPS Latitude degrees to CATION: Longitude fogrees	minutes			Depth Setore Souting (08 ft. Original Depth (08 ft.
Numerical Street Arkinsa or Fire Number and (				ADUIFER(S) STATIC WATER LEVEL
15325 Baback Ave	Rosema	int l	μŊ	WELL/BORING Library A Estimated Date Measured
Show exact localish of wall or boring a section grid with "X".	Sketch man	61 well or l	Indon	
N	location, sho lines, roads,	ន្ទរាជ ព្រះអ ថ្ងៃបែរថ ព្រះអ	inge,	CASING TYPE(S)
		h.		Sieel Plastic Tile Li Othar
w Thirty The T	•	COAL	i	WELLHEAD COMPLETION N/A
		Crus		Outside: Well House: At Grade Inside: Basement Offsot
2 Mia		_	ז'	☐ Fittess Adapter/Upit ☐ Buried ☐ Well Fit
			۲,	☐ Well Pit
1 IAla				Other
ROPERTY OWNER'S NAME COMPANY NAME	E ,	,		CASING[S]
U. OFON / Gordo	N (#1/1	12	-	Diameter Depth Set in oversize hole? Angular space (nillably grouted?)
ropedly comer's making pastress if different than we	ا بازده المتحدد	Caled abov	/0	15 In. from O to U 1 ft. Yes No Yes No Unforces
19 July College	Mul	,	•	in from tofi. Yes \[ No \] Yas \[ No \] Unknow
Posemount,	3306	5 Y		in trem to the life No res has life unknown
ELL OWNER'S NAME/COMPANY NAME				SCREEN/OPEN HOLE
USACE				104 109
Yell owner's mailing address it different than property	ibul asobbo sterwo k	Scried abou	IP.	a. Open rade non
701 owner's mailing address it different than properly 1024 S. 1574 St		Ranted show	/s:	DBSTRUCTIONS
701 owner's mailing address it different than properly 1024 S. 1574 St	3102,	Rented allow	/e.	a. Open rade from 10 ft.
Vell owner's mailing address it different than properly 1026 S. 15th St. 0 NOLYGE NE G.	MARDNESS OR FORMATION	FROM	10	DBSTRUCTIONS    Rads/Drop Pipe
TO NOW NE GEOLOGICAL MATERIAL COLOR	MARDNESS OR FORMATION	FROM boring.	10	OBSTRUCTIONS    Pads/Orop Pipe
To the section of the	MARDNESS OR FORMATION	FROM boring.		DBSTRUCTIONS    Rads/Drop Pipe
To the section of the	MANDRESS OR FORMATION from nearby well or	FROM boring.	10	OBSTRUCTIONS    Pads/Drop Pipe
COLOR Inat known, indicate estimated formation log	MANDRESS OR FORMATION from nearby well or	FROM boring.	10	DBSTRUCTIONS    Pads/Orop Pipe
To the section of the	MANDRESS OR FORMATION from nearby well or	FROM boring.	10	OBSTRUCTIONS    Rods/Drop Pipe
COLOGICAL MATERIAL COLOR	HARDNESS OR FORMATION  From nearby skell or  Hard	FROM boring.	10	DBSTRUCTIONS    Rods/Orop Pipe
ell owner's maring address il different than properly 1026 S. 15+4 St. 0 NOUNG NE G GEOLOGICAL MATERIAL COLOR not known, indicate settimated formation log	MANDRESS OR FORMATION from nearby well or	FROM boring.	10	DBSTRUCTIONS    Rods/Orop Pipe
COLOGICAL MATERIAL COLOR	HARDNESS OR FORMATION  From nearby skell or  Hard	FROM boring.	10	DBSTRUCTIONS    Rods/Orop Pipe
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COLOGICAL MATERIAL COLOR	HARDNESS OR FORMATION  From nearby well or  Hard	FROM boring.	10	DBSTRUCTIONS    Rods/Drop Pipe
COLOGICAL MATERIAL COLOR	HARDNESS OR FORMATION  From nearby well or  Hard	FROM boring.	10	DBSTRUCTIONS   Rads/Drop Pipe
COLOR Inat known, indicate estimated formation log	HARDNESS OR FORMATION  From nearby well or  Hard	FROM boring.	10	DBSTRUCTIONS   Rads/Drop Pipe
Ten owner's maring address it offerent than properly 1026 S. 15th St. ONOLYGE NE G. ONOLYGE NE G. GEOLOGICAL MATERIAL COLOR I not known, indicate estimated formation log Sand a Gravel 132N	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	DBSTRUCTIONS   Rods/Drop Pipe
Ten owner's maring address it offerent than properly 1026 S. 15th St. ONOLYGE NE G. ONOLYGE NE G. GEOLOGICAL MATERIAL COLOR I not known, indicate estimated formation log Sand a Gravel 132N	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	DBSTRUCTIONS   Rods/Drop Pipe
Ten owner's nearly address it offerent then properly 1026 S. 15th St. ONCLOS NE G. ONCLOS NE G. GEOLOGICAL MATERIAL COLOR I not known, indicate estimated formation log 3and a Gravel 132N	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	DBSTRUCTIONS    Reds/Orop Pipe
Ten owner's nearly address it offerent then properly 1026 S. 15th St. ONCLOS NE G. ONCLOS NE G. GEOLOGICAL MATERIAL COLOR I not known, indicate estimated formation log 3and a Gravel 132N	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	DBSTRUCTIONS    Rods/Orop Pipe
Ten owner's nearly address it offerent then properly 1026 S. 15th St. ONCLOS NE G. ONCLOS NE G. GEOLOGICAL MATERIAL COLOR I not known, indicate estimated formation log 3and a Gravel 132N	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	DBSTRUCTIONS    Reds/Orop Pipe
Ten owner's nearly address it offerent then properly 1026 S. 15th St. ONCLOS NE G. ONCLOS NE G. GEOLOGICAL MATERIAL COLOR I not known, indicate estimated formation log 3and a Gravel 132N	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	DBSTRUCTIONS    Reds/Orop Pipe
Ten owner's nearly address it offerent then properly 1026 S. 15th St. ONCLOS NE G. ONCLOS NE G. GEOLOGICAL MATERIAL COLOR I not known, indicate estimated formation log 3and a Gravel 132N	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	OBSTRUCTIONS   Reds/Orop Pipe   Check Valvu(s)   Debrts   Fill   No Obstruction   Type of Obstructions removed?   Yes   No Dascribe
Ten owner's markey address it different than properly 10% S. 15th St. 00000000000000000000000000000000000	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	OBSTRUCTIONS   Reds/Crop Pipe   Check Valvu(s)   Debrits   Fill   No Obstruction   Type of Obstructions (Describe)
COLOR S. 15th St. O'MOLYN NE G. GEOLOGICAL MATERIAL COLOR Incl known, indicate estimated formation log	HARDNESS OR FORMATION from nearby well or Hard	FROM boring.	10	OBSTRUCTIONS    Rods/Crop Pipe   Check Valvu(s)   Debrts   Fill   No Obstruction   Type of Obstructions removed?   Yes   No Describe
en owner's maring address it different than properly IOV S. 15th St. ONOLYN NE G. GEOLOGICAL MATERIAL COLOR not known, indicate estimated formation log Sand G. Grave I B2N  EMARKS, SOURCE OF DATA, DIFFICULTU	HARDNESS OR FORMATION from nearby well or Hard	FROM Dorling.	10	OBSTRUCTIONS   Reds/Crop Pipe   Check Valvu(s)   Debrts   Fill   No Obstruction   Type of Obstructions (Describe)   Other   Type of Obstructions removed?   Yes   No Describe

WELL OR BORING LOCATION Name		WELL /	AND BO	DEPARTMENT OF HEALTH RING SEALING RECORD  Sealing No. Minnesota Unique Well No. or W-series No.  Minnesota Unique Well No. or W-series No.
Dakota	<u></u>			( care care at secold
	1	Section No. Fre	ا → sm. خراصه	g.) Date Spated Date Well or Boring Constructed
Recement 114	N 19N	YNE	PNP N	<u>= 9-6-07                                   </u>
EMPIRE				/1.4
GPS Latitude Locations Locations	degrees	minutes	seconds	Depth Before Sesiing 14 tr. Original Depth 14.
				AQUIFER(S) STATIC WATER LEVEL
Numerical Street Address or Fire	Number and City	of Well or Boring	Location	Single Aquiter Multiaquiter
15325 Babco	ICK AVE	٠,		WELLIBORING Date Measured
Show exact location of well or b		Sketch men o	of well or borin	□ Water-Supply Well □ Monit, Well 45
in section grid with "X."	•	location, show	ing property	The Born Hole Other
, , , , , , , , , , , , , , , , , , ,	₩.	160	7 Tugonga.	CASHG TYPE(S)
<b>}•••</b> •••••••••••••••••••••••••••••••••	A	760		
<del></del>	-			Sizel Tallalic Tile Li Other
	···  \ \	j		WELLHEAD COMPLETION
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	15 Miles	I	ł	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	17 ***		Į.	
	] T [·	)		☐ Weil Pit
1 MFA	_,			Cther
	•			
PROPERTY OWNERS NAME OF	OMPANY NAME	Gul	,	CASING(S)
Property owner's mailing address of		C71872		Diameter C Depth Set in oversize hole? Annu'er space initially grouted?
Topicity Chi dia Heling Amicosyn	A 12 A	ic Arc	evous usve	1.5 in. from 0 to 34 tr. 1 Yes No 1 Yes No Unknown
1 - 1	Į.		_	5-10 10 10 10 10 10 10 10 10 10 10 10 10 1
Rosemoun	atm Mr	λ.		in, treat to ft Yes No Yes No Unknown
ACT & C	· -	5068		in. trans tafs.
· · · · · · · · · · · · · · · · · · ·		3000		
WELL OVINER'S NAME/COMPA USACE	NY NAME			SCREEN/OPEN HOLE  N/A
مري الله المعالمة Well owner's making eridana II differ	ant lose property o	umaria antivasa indi	reject alvers	Screen from 34 to 44 ft. Open Hole from to to
106 S. 15th		MINISTER BOOKERS KIND	PATRICE CONTRACT	OSSTRUCTIONS
		ļ		□ Rode/Drop Pipe □ Check Valve(s) □ Ochrio □ Fill ■ No Obstruction
omaha, Na	E (0816	ువ		Thursouth Like Character Admedia 1 Line Man Oppured it
_	_ ,	•		Type of Obstructions (Describe)
·				
GEOLOGICAL MATERIAL	COLOR	BARDNESS OF FORMATION	FROM TO	Obstructions removed?   Yes   No Describe
	Larmation to a fee	in nearby well or	berina.	PUMP
If not known, indicate estimated	riosinalian lao Ira	,		Туре
If not known, indicate estimated	1 <del></del>	1 1 1 1 1		
ll noi known, indicate estimated Sarels Grave (	Bのいへ	Hard	0 40	Removed Kini Present Other
	1 <del></del>	Hard	0 4	Demoked Vom Steren College
	1 <del></del>	Hard	0 91	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:
	1 <del></del>	Hard	O Hr	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  NO Annular Space Exists
<del></del>	1 <del></del>	Hard	Oldr	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:
	1 <del></del>	Hard	0 4	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  NO Annular Space Exists
<del></del>	1 <del></del>	Hard	0 4	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Exists
	1 <del></del>	Hard	0 41	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Exists
	1 <del></del>	Hard	O 41	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOKE:    No Annular Space Exists
	1 <del></del>	Hard	O 41	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
	1 <del></del>	Hard	Oldr	METHOD USEO TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOKE:    No Annular Space Exists
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	1 <del></del>	Hard	O 41	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
	1 <del></del>	Hard	O 41	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Exists
<del></del>	1 <del></del>	Hard	O 41	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Estata
	1 <del></del>	Hard	O 91	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Estata
<del></del>	1 <del></del>	Hard	(C) 41	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Estata
Sanala Grave 1	Brown		(C) 41	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
Sange Grave 1	Brown		Ο 4 <sup>1</sup>	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Estata
Sange Grave 1	Brown		(C) 41	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
Sange Grave 1	Brown	IN SEALING	O 91	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOLE:    No Annular Space Estata
Sange Grave 1	Brown		O 91	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
	Brown	IN SEALING	O 91	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists   Annular Space Grouted with Tremis Pipe   Casing Perforation/Removal in. from   to   t.   Perforated   Removed
Sand & Grave 1	Brown	IN SEALING		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
Sand & Grave 1	Brown	IN SEALING		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists   Annular Space Grouted with Tremis Pipe   Casing Perforation/Removal in. from   to   t.   Perforated   Removed
Sange Grave 1	Brown	IN SEALING		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND SORE HOUS:    No Annular Space Edata
Sange Grave 1	Brown	IN SEALING		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists   Annular Space Grouted with Tremis Pipe   Casing Perforation/Removal in. from   to   t.   Perforated   Removed
Sanal & Grave 1	Brown A, DIFFICULTIES	IN SEALING		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists   Annular Space Grouted with Tremis Pipe   Casing Perforation/Removal in. from   to   ft.   Perforated   Removed
Sana & Grave 1	Brown A, DIFFICULTIES	IN SEALING		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists
Paris Grave (	Brown  A, DIFFIGULTIES	IN SEALING		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:    No Annular Space Exists   Annular Space Grouted with Tremis Pipe   Casing Perforation/Removal in. from   to   ft.   Perforated   Removed

WELL OR BORING LOCA County Name  DO LOTO	·	WELL	AND Min	BOF nesota	RING SEALING RECORD Saaling No. Minnesota Unique Well No. Of Membring Saaling No. Minnesota Unique Well No. Of Membring No.
For PIRE Latitude	No. Hange No No. GW degrees	4	W 5	1 , 21 No	Date Sealed 9-14-07 Date Well or Borling Constructed 9-14-07
LOCATION: Longituda	degrees	_ minutes	886	conds	Depth Before Sonking LLQ M. Original Depth LLQ h.  AQUIFER(S) STATIC WATER LEVEL
Numerical Street Address or Fire		~			State Water Level    State Water Level
18325 Bubo ( Show exact location of well or b In section grid with "X."	KK Ave				Water-Supply Well   Monit. Walf   / /
in section and with "X."	25000	location, she interpretation	and ball	perty dings,	Env. Rore Hole   Other   15 m.   Delow   Labove land surfaces
1	- I				CASING TYPE(9)
	] [				Steel Plastic Title Other
w	6				WELLHEAD COMPLETION
	5 14 MRs   1	Dita		,	Outside: Well House WA Grade Inside: Basement Offsat
	-	<u> 121354</u>	<del></del>		☐ Pilless Adaptor/Unit ☐ Burled ☐ Wall Pit ☐ Burled ☐ Burled
\$ 1 M19	_				Other
PROPERTY OWNER'S NAME/O	I OMDANY MALIE	<u> </u>		<del></del> -	CASING(5)
PROPERTY OVINER'S NAME/O	Gordo	N GIR	12		Diameter Depth Set in exercise hole? Appular space initially grouped?
Property riviner's mailing address if	SAIBCUE	scalion address and	icaced abo	990	in from to 63 ft. Yes No Yes No Unkrawn
ROSEMOUL	+, M	201			in. fromtnft.
•	<u>-</u>	5506	5∢-		
WELL OWNER'S NAME/COMPA	NY NAME	***************************************			In from to the Yos No Yes No Unknown  SCREEN/OPEN HOLE
USACE Well ov/ner's mailing addrass it differ	ent than proceeds o	unges addense led	leated abo		Screen from Lo 2 to Le Lo fi. Open Hole from to fi.
106 South	15th 57		COLCTI AD	.va	DESTRUCTIONS
Omaha NE					☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Datais ☐ Fill X No Obstruction
OHO. WE INE	6810	) d	•		Type of Obstructions (Describe)
GEOLOGICAL MATERIAL	COLOR	HANDNESS OR FORMATION	FROM	TO	Obstructions removed? Yes No Describe
lf not knáwn, Indicate estimated	formation log fro	(	baring.	L	PUMP
Sand & grave 1	BLN	Hard	0	20	Type Cither
Coarse Souda goodel	Ben	Hard	T _		METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:
		,		90	Lasing Perforation/Hemoval
			-	<del></del>	in from to the Perforated Removed
				<u> </u>	
		-		-	Typo of Perforator
			ļ .		
				<u> </u>	Other
					GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of hantonite = \$0 lbs.)
					Growting Malerial Bentonite from O to QQ ft. yards bags
				L _	
					from to fit. yards bags
					OTHER WELLS AND BORINGS
REMARKS, SOURCE OF DATA	DIFFICULTIES	IN SEALING			Other unsealed and unused well or boring on property? Yes No. How many?
					LICENSED OR REGISTERED CONTRACTOR CERTIFICATION / This was or basing was sealed in accordance with Minnesota Raise, Chapter 4725. The information contained in this report
70	170 11				is true to the best of my knowledge,
1	1				NTS / 1635
				1	Licensed Rusiness Name 1. License or Registration No.
				1	- 949/1 tully 1635 10-15-07
					Corineo Expresentátive Stansture Certified Rep. No. Date
	1				Crost Strobas
MINN DEPT OF HEALTH O	юру Н	2649	16		Nama of Parson Sealing Welt or Boring
HE-01434-10 IC# 140-0					7.44.0 0.1 0.04.0 0.14.

WELL OR BORING LOCAT	TION-				MC CENTIME DECOMA	Minnesota Well and Bor Sealing No.	· 10	2649	317
Dakota						Minnesota Unique Well or W-aeries No.	No.		
Toyoghip Name Township	No. Range No.	Section No. Fm				Date Well or Boring Co	costructed		
ENPIRE 1140	V 19W	10 ME	·· NE-4	المين المين	9-14-07		9-14	1-07	
GPS Latitude LOCATION: Longitude	degrees	minutes minutes	59007		Depth Before Sealing (00	_tt_ Original Depth _	66	ft.	
Numerical Street Address or Fire					AQUIFER(S) Single Aquifer Mulilaquifer	STATIC WATER LEVE			· · · · · · · · · · · · · · · · · · ·
1532 5 Balacoc				J	WELL/BORING	Mossured XEs	limated Dat	le Manaured	
Show exact location of wall or b	cring	Škatch map č	if well or b.	arina	☐ Water-Supply Well ☐ Monil, Well	60 11	The‱ I	] above land surface	
N	. <del></del>	location, show lines, roads, a	aus priggui	ūr.	CASPIGTYPE(S)			J days land days	•
	K.I	10			⊠Strol Plastic ! Tile ∏ Other				
					WELLHEAD COMPLETION				
W	d•T	8			Outelde; 🗌 Well House 📗 🗎 🗎	Gm:fe Inside:	□ Веземел	t Offset	
	½ M10	N	_		Pillos:: Adaptavijnit 🔲 Bui	rled	Well Pil		
	<b>]</b>				☐ Woll Pit		☐ Burled		
)	<b>⊣</b>	151			☐ Other		Other		
PROPERTY OWNER'S HAME/C	DMPANY NAME	. 12			CASING(S)	·		··· ·· · · · · · · · · · · · · · · · ·	
PROPERTY OWNER'S NAME/C	GTO FOLCO	cation address typic	calcul shove		Diampter In. trem O to Co 2	Set in overs ∆ft. ☐ Yes	M .	Annutar space initia ☐ Yes ☐ No	ally grouted?
15325 1	BABCO	OCK_//	سيطسم		•				_
Resemour	47 /	V) 24	11		in, fromts	_ft. ☐Yes [	No [	]Yes []No	∏ Unknown
		2306	r		In. from to	_ftYes _[	_ No {	_l Yes □ No	Unknows
WELL OWNERS NAME/COMPA	NY NAME				SCREEN/OPEN HOLE				
Well owner's mailing address if diffe		wwwer's address indi	cated above			_ft. Open Hote from	to	nft,	
106 5. 15H					OBSTRUCTIONS ☐ Rode/Orop Pipn ☐ Check Valve(s)	☐ Debris ☐ F#	M No O	hatriction	
omaha, Ni	E (081C	) <del>}</del> }			_	٠٠٠ بــ	. X		
					Type of Obstructions (Describe)				
			r						
GEOLOGICAL MATERIAL	COLOR	HARDNESS OR FORMATION	FROM	το	Obstructions removed?   Yes   No C	Describe			
If not known, indicate eathmatec	l	FORMATION	boring.		РИМР Туре	Describe			
	l	FORMATION	boring.		PUMP	Describe	<del></del>		
If not known, indicate eathmatec	formation log fro	FORMATION om nearby well or	boring.		PUMP Type  I Removed  Not Present METHOD USED TO SEAL ANNULAR SPACE	☐ Other			
If not known, indicate eathmatec	formation log fro	FORMATION om nearby well or	boring.		PUMP Type  Removed  Not Present METHOD USED TO SEAL ANNULAR SPACE  Pro Annular Space Exists  Annular	☐ Oiter BETWEEN 2 CASINGS, C r Space Grouted with Trem	te Pipe	Casing Perforat	
If not known, indicate eathmatec	formation log fro	FORMATION om nearby well or	boring.		PUMP Type    Removed   Not Present  RETHOD USED TO SEAL ANNULAR SPACE   Not Present  RETHOD USED TO SEAL ANNULAR SPACE   Not Present	Other BETWEEN 2 CASINGS, C r Space Grouted with Trem_ toto	ie Pipe tt. {	Casing Perforat	Removed
If not known, indicate eathmated	formation log fro	FORMATION om nearby well or	boring.		PUMP Type  Removed  Not Present METHOD USED TO SEAL ANNULAR SPACE  Pro Annular Space Exists  Annular	☐ Oiter BETWEEN 2 CASINGS, C r Space Grouted with Trem	ie Pipe tt. {	Casing Perforat	
If not known, indicate eathmated	formation log fro	FORMATION om nearby well or	boring.		PUMP Type    Removed   Not Present  RETHOD USED TO SEAL ANNULAR SPACE   Not Present  RETHOD USED TO SEAL ANNULAR SPACE   Not Present	Other BETWEEN 2 CASINGS, C r Space Grouted with Trem_ toto	ie Pipe tt. {	Casing Perforat	Removed
If not known, indicate eathmated	formation log fro	FORMATION om nearby well or	boring.		PUMP Type    Removed   Not Present  METHOD USED TO SEAL ANNULAR SPACE   Not Present  METHOD USED TO SEAL ANNULAR SPACE   Annular Space Exists   Annular   In. from     In. from	Other BETWEEN 2 CASINGS, C r Space Grouted with Trem_ toto	ie Pipe tt. {	Casing Perforat	Removed
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If not known, indicate eathmated	formation log fro	FORMATION om nearby well or	boring.		PUMP Type    Removed   Not Present  METHOD USED TO SEAL ANNULAR SPACE   Not Annular Space Exists   Annular in, from in, from   Type of Perforator   Other   GROUTING MATERIAL(S)   (One both	Other BETWEEN 2 CASINGS, C r Space Grouted with Trem to to	tt. {	Casing Perforated Perforated Perforated Onlike = 50 lbs.)	[] Removed
If not known, indicate eathmatec	formation log fro	FORMATION om nearby well or	boring.		PUMP Type    Removed   Not Present  METHOD USED TO SEAL ANNULAR SPACE   Not Annular Space Exists   Annular in, from in, from   Type of Perforator   Other   GROUTING MATERIAL(S)   (One both	BETWEEN 2 CASINGS, C r Space Grouted with Trem to  to  ag of cemant = 94 lbs., on from to	tt. {	Casing Perforated Perforated Perforated Onlike = S0 lbs.) yards	Removed  Demoved  Demoved  Demoved
If not known, indicate eathmated	formation log fro	FORMATION om nearby well or	boring.		PUMP Type    Removed   Not Present  RETHOD USED TO SEAL ANNULAR SPACE   Annular Space Exists   Annular   In, from     Type of Perforator     Other     GROUTING MATERIAL(S)   (One based of County Material   Bendan   County Material   County     Grouting Material   Bendan   County     Grouting Material   Grouting   County     Grouting   Grouting   Grouting   Grouting   Grouting   Grouting   Grouting   Grouting   Grouting   Gro	Other   Casings, Ca	tt. {	Casing Perforated Perforated Perforated Onite = 50 lbs.)	Removed Removed
U not known, indicate earlmated	formation log for	PORMATION  The real type of type of the real type of type of the real type of type	boring.		PUMP Type    Removed   Not Present  METHOD USED TO SEAL ANNULAR SPACE   Not Annular Space Exists   Annular In, from in, from   Type of Perforator   Other     GROUTING MATERIAL(S)   (One both of the country of the cou	ag of coment = 94 lbs., on from lo	the Pipe ft. {ft. }  chap of beni  ftft  ftft	Casing Perforated Perforated Perforated Onlike = 50 lbs.) yards yards	Removed  Demoved  Demoved  Demoved
If not known, indicate eathmated	formation log for	PORMATION  The real type of type of the real type of type of the real type of type	boring.		PUMP Type    Removed   Not Present  METHOD USED TO SEAL ANNULAR SPACE   Sto Annular Space Exists   Annular   In, from     Type of Perforator     Other     GROUTING MATERIAL(9)   (One back of the conting Material   BCh to the continue material   BCh to the cont	BETWEEN 2 CASINGS, C r Space Grouted with Trem to to ag of cement = 94 lbs. on from to from to	the Pipe  ft. {  ft. {  ft. }  ft.    ft.    ft.    ft.    ft.    No How ma	Casing Perforated Perforated Perforated Tonite = 50 lbs.) yards yards	Removed Demoved bage bage bage
U not known, indicate earlmated	A, DIFFICULTIES	FORMATION TO REALING	boring.		PUMP Type    Removed   Not Present   Method used to seal Annular Space Exists   Annular	BETWEEN 2 CASINGS, C r Space Grouted with Trem to to ag of cement = 94 lbs. on from to from to	the Pipe  ft. {  ft. {  ft. }  ft.    ft.    ft.    ft.    ft.    No How ma	Casing Perforated Perforated Perforated Tonite = 50 lbs.) yards yards	Removed Demoved bage bage bage
U not known, indicate earlmated	A, DIFFICULTIES	PORMATION  The real type of type of the real type of type of the real type of type	boring.		PUMP Type	BETWEEN 2 CASINGS, C r Space Grouted with Trem to to ag of cement = 94 lbs. on from to from to	the Pipe  ft. {  ft. {  ft. }  ft.    ft.    ft.    ft.    ft.    No How ma	Casing Perforated Perforated Perforated Tonite = 50 lbs.) yards yards	Removed Demoved bage bage bage
U not known, indicate earlmated	A, DIFFICULTIES	FORMATION TO REALING	boring.		PUMP Type	BETWEEN 2 CASINGS, C r Space Grouted with Trem to to ag of cement = 94 lbs. on from to from to	the Pipe  ft. {  ft. {  ft. }  ft.    ft.    ft.    ft.    ft.    No How ma	Casing Perforated Perforated Perforated Onlike = 50 lbs.) yards yards yards	Removed Demoved bage bage bage
U not known, indicate earlmated	A, DIFFICULTIES	FORMATION TO REALING	boring.		PUMP Type	BETWEEN 2 CASINGS, C r Space Grouted with Trem to to ag of cement = 94 lbs. on from to from to	the Pipe  ft. {  ft. {  ft. }  ft.    ft.    ft.    ft.    ft.    No How ma	Casing Perforated Perforated Perforated Onlike = 50 lbs.) yards yards yards	Removed  Dags  bags  bags  bags  bags
U not known, indicate earlmatec	A, DIFFICULTIES	FORMATION TO REALING	boring.		PUMP Type	BETWEEN 2 CASINGS, Or Space Grouted with Trem  to  to  ag of cemant = 94 lbs., on  from to  from to  from to  ACENTIFICATION a with Minnesota Rules, Cl	the Pipe  ft. {  ft. {  ft. }  ft.    ft.    ft.    ft.    ft.    No How ma	Casing Perforated Perforated Perforated In Perforated  In It	Removed  Dags  bags  bags  bags  bags
U not known, indicate earlmatec	A, DIFFICULTIES	FORMATION TO REALING	boring.		PUMP Type	BETWEEN 2 CASINGS, Or Space Grouted with Trem  to  to  ag of cemant = 94 lbs., on  from to  from to  from to  ACENTIFICATION a with Minnesota Rules, Cl	the Pipe  ft.  ft.  ft.  shap of bent  ft.  ft.  ft.  No How ma  hapter 4725. I	Casing Perforated Perforated Perforated In Perforated  In It	Removed  Dags  bags  bags  bags  bags
U not known, indicate earlmatec	A DIFFICULTIES	FORMATION TO REALING	boring.		PUMP Type	BETWEEN 2 CASINGS, Or Space Grouted with Trem  to  to  ag of cemant = 94 lbs., on  from to  from to  from to  ACENTIFICATION a with Minnesota Rules, Cl	the Pipe  ft.  ft.  ft.  shap of bent  ft.  ft.  ft.  No How ma  hapter 4725. I	Casing Perforated Perforated Perforated In Perforated  In It	Removed  Dags  bags  bags  bags  bags

WELL OR BORING LOCATION NAMED TO A COURT NAMED TO A COURT OF THE PROPERTY OF T	<del></del> -	WELL	AND Minn	BOR esote S	ING SEALING RECORD Sealing No.  Minnesota Well and Boring Sealing No.  Minnesota Unique Well No. or W-series No.  Apper from treatment
Township Name Township	No. Range No.	Section No. Fra	ntion (sn	1 (g.)	Date Sealed 9-14-07 Date Well or Boring Constructed 9-13-07
GPS Laffh:do LOCATION: Longitude	degrees	aehunim ealunim	sect sect		Depth Defore Sealing ULC n. Original Depth 6 6 h.  AQUIFER(S) STATIC WATER   EVEL
Numerical Street Address or Fire		al Well of Borling	Location		☐ 9ingle Aquilor ☐ Multisquifor  WELL/BORING ☐ Measured ☐ Estimated Date Measured ☐ ☐
Show exact location of well or be in section grid with "X."		Skalch map o location, show lines, roads, r	ol well or wing prop and build	haring serty ings,	☐ Water-Supply Well ☐ Monif. Well  Cav. Boro Hote ☐ Other ☐ to ☐ fit. ☐ below ☐ above land surface  CASING TYPE(s)
X III	] /-	170th			Steel   Plastic   Title   Other
v · · · · · · · · · · · · · · · · · · ·	·┫ ── <mark>┺</mark> ┲──┃				WELLHEAD COMPLETION  N/K  Outside:   Well House
9	S Antie	i H			☐ Philesa AdapharA init ☐ Guried ☐ Well Pil ☐ Suried ☐ Other ☐ Other
PONDERTY MINIERS NAMES	OMERANY MARKET	THE CON			∐ Other
Property owner's NAMER'S Property owner's mailing address if	11 4 6 4	7 1-c	//m .	<u></u>	CASING(S)  Diameter Depth Sort in oversize I role? Attraiter space initially grouted?  In. from 10 10 17 is. Yes No Yes I No Virtuown
15325 ROSEMOU	ים פני זיק קרון מין מעשים	socie, sul	ייייניים		in.frcmtoif.
WELL OWNER'S NAME/COMPA		3506	:8		
USACE Well owners mailing address II office	est then property o	wrer's address indi	cated abo	v <del>e</del>	Screen from 6 2 tello ft. Open Hote from 10 .: ft.
104 515th Cmahane		マ			OBSTRUCTIONS    Reds/Drop Pipe   Check Valve(s)   Debris   Fill   Mo Obstruction  Type of Obstructions (Osseribe)
GEOLOGICAL MATERIAL If not known, Indicate estimated	COLOR	HARDNESS OR FORMATION	FROM	то	Obstructions removad? Yes No Describe
Sand + grave 1	BRN	Hard	٥	(060	Type Not Present Other
				-	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE MOLE; No Annular Space Exists Annular Space Ground with Tremle Pipe Casing Perforation/Removal
					in, from to Perforated Removed
					in. Iromtoft. Perforated Removed  Type of Perforator
	-				[] Other
					GROUTING MATERIAL(S) (One bag of coment = 94 lbc., and bag of bentantie = 50 lbs.)  Grouting Malcriel #1011/101 te from 0 to (Q (J 1) yands target
					Grounting Malonial CENTRAN Re from to COO ft. yands bags trom to Lo yards bags
					from to ft. yards bage
HEMARKS, SOURCE OF DATA	nizercin ned	IN CESTING		<u> </u>	Other Wells and Borings  Other unsealed and unused well or boring on property?   Yes   A) No How many?
MEMARIAS, SOURCE OF DAIL	, Dit i i i i i i i i i i i i i i i i i i	, in our ento			Cliented on Registered Contractor Certification  LICENSED OR REGISTERED CONTRACTOR CERTIFICATION  This well or boring was soaled in accordance with Minnesota Rules, Chapter 4725. The informalian contained in this report is true to the best of my knowledge.
7470	11	•			N75 1635
, ,				(	Ucense of Registration No  Ucense of Registration No  Obstituted Sept No.  Ucense of Registration No  Obstituted Sept No.  Uate
MINN. DEPT OF HEALTH	сору Н	2649	18		SLOH SKraba Nama at Person Sasiny Well or Boring
HE-01434-10 IC# 140-					50778

WELL OR BORING LOCATION Crinty Name DOLKOT	WELL AND	BOR mesola	ING SEALING RECORD Sealing No. Minnesota Unique Well No. or W-serles No. or W-serles No. or W-serles No. or W-serles No.
	No. Section No. Fraction (	sm 19.	[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
	M 36 PHRK	199 04	8-16-07 8-16-07
1-1-1	36 minutes 58 25 minutes 68		Depth Sefore Sealing 72 ft. Original Cepth 72 n
Numerical Street Address or Fire Number or			ADUIFER(S) Single Aquifer   Multiaquifer   STATIC WATER LEVEL
COOK OI	ve Rosemount		WELL/BORING   Measured   Salimated Date Measured
Show exact location of wall or boring in section grid with "X."	Skatch man of well a	oz bodna	☐ Water-Supply Well ☐ Monit. Well  ☐ Env. Bore Hole ☐ Other ☐ tt. ☐ below ☐ above land surface
11	localice, shaving pro lines, souds, and bui	ldings.	CASING TYPE(8)
	}		XSteel   Plastic   Title   Other_
	1 2 ( 1	•	WELLHEAD COMPLETION
W - E -	W \		Ourlaide:   Well House   At Grado Inside:   Basement Offset
	الله ا		☐ Pitless AdapterUnit ☐ Burled ☐ Well Pit
	170		☐ Weil Put
	20		Cither
PROPERTY OWNER'S NAME/COMPANY N	MARK .	<del></del> -	CASING(3)
PROPERTY OWNER'S NAME/COMPANY N Property owner's mailing address it different than	wall location address indicated ab	JOYE .	Diameter Depth Set in overeize India? Annotes space tritially grounder?
15225 BM	scock the	<u>د</u>	
Rosemant	My		kn. fmmtoft.
	51 06 Y		in, fracetoftYesNoYes NoUnknown
WELL OWNER'S NAME/COMPANY NAME  US ACE			SCREEN/OPEN HOLE
Well owner's making editions if different than pro-		FVOI	Screen from LOS to 72 ft. Open Hole from 17/17 to 11.
1065 15th S	<del> </del>		ОВЗТЯИСТЮКЬ
Omaha NE 6	8102		☐ Rods/Drup Pipe ☐ Check Valva(s) ☐ Debris ☐ Fill ☐ Vo Obstruction
			Type of Obstructions (Describe)
GEOLOGICAL MATERIAL COLO	HARDNESS OR FROM	10	Obstructions removed? Yes No Describe
If not known, indicate estimated formation t	og from nearby well or boring.		PUMP
Sand/Oravel Brown	1 Hard O	72	Type
			METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:
			No Annular Space Exists Annular Space Ground with Tremte Pipe Gesting Perforation/Removal
			In from to H. [] Perforated [] Removed
			in. from to fr. Perforated Removed
		<del>                                     </del>	Type of Pelikrotur
		+ -	Cher
		+	GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonile = 50 lbs.)
		-	Ground Material Bentinite from 0 to 72 11yards _   bags
		-	Ground Reservat CLERK ALLE 15. nom O to P. S. II Yanda ( 0.20s
			, ,,,, frcm to, yards bags
			OTHER WELLS AND BORINGS
HEMAHKS, SOURCE OF DATA, DIFFICU	TIES IN SEALING		Other unseeded and unused well or buring on property? Yes X No. How many?
ACC IN MUTH			LICENSED OR REGISTERED CONTRACTOR CERTIFICATION This well or boring was seeled in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.
14			a de la maraga.
	<del>.</del>		1631
		(	License or Registration No.
	4		
	_ 1		1635 10-15-07
			Certifical Bedresentative Signature Certifical Rep. No. Date
MINN. DEPT OF HEALTH COPY	<sup>H</sup> 264903		Certified Buresentative Signature  Certified Hep. No. Date  Continue of Person Seating Well of Lioning

WELL OF BORING LOCATION County Name Dakota	WELL AND	BORI esota S	ING SEALING RECORD Sealing No.  Statutes, Chapter 1031 Minnesota Well and Boring or W-series No.  Minnesota Well and Boring Sealing No.  Minnesota Unique Well No. or W-series No.  Living transport of Well and Boring Sealing No.  Minnesota Well No.  Or W-series No.  Living Experiment Records No.  Minnesota Well No.  Or W-series No.  Minnesota Well No.  Or W-series No.
Toyonchin Name O Trivenship No. Range No.	Section No. Fraction (sm	→ (g.) A)ts	Date Sealed Dhile Well or Royling Constructed 9-18-07
LOCATION: Longitude degrees	<b></b>	ಚಾರತ	Double Reform Sealing 53 RL Original Depth 53 R. ADDIFER(S) SYATIC WATER LEVEL
Numerical Street Address or Fire Number and City  1100s 170 th St W Fo Show exact location of wall or boring in seculon grid with "X".	rming to	hadan	Single Aquiter   Multiaquifor   Moneyred   Estimated Date Measured
II SEASON BILL WILL X.	location, showing prop lines, roads, and build 70+6	<u>5</u> †	CASING TYPE(S)  X Steel   Plastic   Tite   Other
W	1106		WELLHEAD COMPLETION  Dolsido:   Well House
) NGa		0	☐ Pilless Adapter/Unil: ☐ Burled ☐ Well Pit ☐ Other
PROPERTY OWNER'S NAME/COMPANY NAME  MOCK & SUSCIO THE Property current and long address if different then we'd to  1100 170 th St W	O I i I   O   O   O   O   O   O   O   O   O	ve	CASING(6) Diameter Set in oversize trole? Annuter space initially grouted? In. trom
1106 170th StW Farmington, MA	1 55024		in_fromtoft.
WELL OWNER'S NAME COMPANY NAME  WALL SUS THE  WALL OWNER'S MAZING JODGES A different than property of	ode belacióni ezentos anem		SCREEN/OPEN HOLE
Famington M	1N)		OBSTRUCTIONS  Solution Rods/Drop Pipe Check Valve(s) Debris Fill No Obstruction  Type of Obstructions (Describe)
GEOLOGICAL MATERIAL COLOR	HARDNESS OR FROM	то	Obstructions removed? Yes No Describe
canagrave 1 BEN	Hard O	53)	Type Not Present
Stipeter Sandstne BRN	Mard 50	<b>S3</b>	METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:
			OROUTING MATERIAL(5) (One bag of cement = 94 lbs., onc bag of bontonite = 50 lbs.)
			Grading Material Benton 1 te from 0 to 53 ft. yards bags
			from to H. Yards begs trom to H. Yards begs  There wells and borings
REMARKS, SOURCE OF DATA, DIFFICULTIES	IN SEALING		Other unsealed and unused well or boring on property? You No How many?
7470.	u .		This well are logicity was seeled in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the head of my knowledge.
		<	Certified Rep. No. Date
MINN, DEPT OF HEALTH COPY	264920		SCOH SKIOLOW  Name of Person Sealing Viell or Soving

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