

From: Stollenwerk, Marita <MStollenwerk@trccompanies.com>
Sent: Wednesday, May 27, 2020 1:31 PM
To: Feeney, John M - DNR; Martinez, Joseph J - DNR
Cc: Amber Thomas; Sellwood, Alyssa; Enright, Alia
Subject: Followup to Vapor Investigation Discussion - Lime Kiln Landfill, Village of Grafton
Attachments: Private Well Log 1749 Manchester - 1974.pdf; MW8A and P8B.pdf; Monitoring Well Information Form 2000.pdf

Hello John and Joe,

Thank you so much for taking the time to talk with us today.

As a follow-up to the call, attached is the boring log for MW8A (was drilled twice – final drill to 120 ft bgs) and a Groundwater Monitoring Well Information form from the 2000 Annual Report (dated November 8, 2001). The 2000 Annual report includes detailed information on the proposed and completed installation of the well nest of MW8A and P8B at the former private well location at 1749 Manchester Dr.

Of note, in the 2017 SI there is a well construction information for the private well at 1749 Manchester Dr which is the hole that P8B was installed into (see attached for only that historic well). In our next report discussing groundwater, we will ensure all site related well information is included in a Well Summary Table.

As you can see from the information from the 2000 report, well MW-8A is screened in zone A, but is not a water table well – the well information form indicates it is screened from 105-115 ft bgs. Of note, in looking closely at the boring logs / well construction documentation, I have a well construction report for P8B, but not MW8A. Our verification efforts during the field work during Q1 2020 confirmed the measured depth to bottom in MW8A at 115.75 ft bgs, which corresponds to the bottom of screen and supports the information in the Groundwater Monitoring Well Information form.

We will work on the COVID 19 compliance request as we discussed and likely get it to you next week.

Thank you,
Marita

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Please note that our domain name and email addresses have changed

Facility Name			Facility ID Number		License, Permit or Monitoring No.		Date		Completed By (Name and Firm)													
LIME KILN PARK							7/19/2001		DAVID ZOLP/ EARTH TECH													
WI Unique Well No	Well Name	DNR Well ID Number	Well Location	Dir.		Date Established	Well Casing		Elevations			Reference		Depths			Screen Length	Well Type	Well Status	Enf. Stds.	Grad-ient	Distance to Waste
				N	S		Diam.	Type	Top of Well Casing	Ground Surface	MSL (√)	Site Datum (√)	Screen Top	Initial Groundwater	Well Depth							
PN851	P2A		482193.9	X		2/18/1998	2	P	713.2	711	X		10.5	15.8	20.5	10	11/mw	A	X	D	50	
			2544551	X																		
PN852	P2B		482200.9	X		3/25/1998	2	P	713.8	711.5	X		73.5	17.2	75.2	10	12/pz	A	X	D	50	
			2544559.7	X																		
PN853	P3B		482060.1	X		3/26/1998	2	P	716.9	714.6	X		70	17	82.4	10	12/pz	A	X	S	0	
			2544019.5	X																		
PN854	P4B		482666.6	X		3/30/1998	2	P	733.9	731.3	X		79.5	20.4	92.9	10	12/pz	A	X	U	0	
			2544118.5	X																		
PN855	LW-01		482448.2	X		2/16/1998	6	P	731.9	728.8	X		13	27.5	33	20	24/lh	A	X	N	0	
			2544360.7	X																		
PN856	LW-02		482348.3	X		2/17/1998	6	P	0	726.9	X		8.5	24.9	30	20	24/lh	A	X	N	0	
			2544422	X																		
PN857	P7B		479749.79	X		3/17/2000	1.4	P	693.34	690.5	X		55	10.46	150	10	11/mw	A			0	
			2546382.69	X																		
PN858	P8A		481635.3	X		3/23/2000	2	P	745.27	745.62	X		105	0	120	10	11/mw	A			0	
			2544947.09	X																		
PN859	P8B		481544.32	X		3/15/2000	2	P	740.29	740.35	X		188	52.44	210	10	11/mw	A			0	
			2544891.65	X																		
PN860	P9B		481568.22	X		3/15/2000	2	P	737.81	736.47	X		95	45.17	105	10	11/mw	A			0	
			2544327.56	X																		

Location Coordinates Are: State Plane Coordinate Local Grid System
 Northern Central Southern

Grid Origin Location: (Check if estimated:)
 Lat. ____ ° ____ ' ____ " Long. ____ ° ____ ' ____ " or
 St. Plane ____ ft. N. ____ ft. E. S Zone

Remarks: _____

Completion of this form is mandatory under a. NR 507.14 and NR 110.25 Wis. Adm. Code. Failure to file this form may result in forfeiture of not less than \$10 nor more than \$5,000 for each day of violation. Personally identifiable information provided is intended to be used by the Department for the purposes related to the waste management program.



GW | GP | GM | GC | SW | SP | SM | SC | ML | MH | CL | CH | OL | OH

PERCENTAGES OF GRAVEL, SAND AND FINES MAY BE STATED IN TERMS INDICATING A RANGE OF PERCENTAGES AS FOLLOWS:

TRACE PARTICLES ARE PRESENT BUT EST. TO BE LESS THAN 5%

FEW 5 TO 10%

LITTLE 15 TO 25%

SOME 30 TO 45%

MOSTLY 50 TO 100%

CRITERIA FOR DESCRIBING ANGULARITY OF COARSE-GRAINED PARTICLES

DESCRIPTION	CRITERIA
ANGULAR	PARTICLES HAVE SHARP EDGES AND RELATIVELY PLANE SIDES WITH UNPOLISHED SURFACES
SUBANGULAR	PARTICLES ARE SIMILAR TO ANGULAR DESCRIPTION BUT HAVE ROUNDED EDGES
SUBROUNDED	PARTICLES HAVE NEARLY PLANE SIDES BUT HAVE WELL-ROUNDED CORNERS AND EDGES
ROUNDED	PARTICLES HAVE SMOOTHLY CURVED SIDES AND NO EDGES

ADDITIONAL DRILLING DATA

SPLIT TUBE SIZE _____ ID _____ OD

HAMMER WT. _____ lb _____ In drop

THIN WALL TUBE SIZE _____ OD

CASING USED _____ LF _____ Dia.

DRILL ROD SIZE _____

DRILL BIT TYPE _____ (a) _____ (b)

DRILL BIT SIZE _____ (a) _____ (b)

AUGER TYPE _____ OD

HOLLOW STEM AUGER _____ ID

STANDARD PENETRATION TEST CONSISTENCY OR DENSITY

FINE GRAINED

VERY SOFT (VS)	0-2
SOFT (S)	3-4
MEDIUM (M)	5-8
STIFF (ST)	9-16
VERY STIFF (VST)	17-30
HARD (H)	>30

COARSE GRAINED

VERY LOOSE (VL)	0-4
LOOSE (L)	5-9
MEDIUM DENSE (MD)	10-29
DENSE (D)	30-49
VERY DENSE (VD)	>50

CRITERIA FOR DESCRIBING MOISTURE CONDITION

DESCRIPTION	CRITERIA
DRY	ABSENCE OF MOISTURE. DUSTY, DRY TO THE TOUCH
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

SOIL DESCRIPTION REQUIREMENTS (TO BE LISTED IN THIS ORDER WITH EACH ITEM SEPARATED BY A COMMA)

- 1 CONSISTENCY OR DENSITY (BASED ON N VALUE)
- 2 MUNSELL COLOR DESCRIPTION
- 3 MUNSELL HUE/CHROMA
- 4 USCS GROUP NAME (ALL CAPS)
- 5 GRAIN SIZE RANGE (FOR SAND & GRAVEL)
- 6 ROUNDNESS OR ANGULARITY (SAND & GRAVEL)
- 7 MOISTURE
- 8 PLASTICITY
- 9 COHESIVENESS
- 10 DISTINCTIVE FEATURES
- 11 DEPOSITIONAL ENVIRONMENT
- 12 FORMATION/MEMBER (OPTIONAL, IF KNOWN-ALL CAPS)

NOTE: INCLUDE ESTIMATE OF GRAVEL, SAND, AND SILT AND CLAY PERCENTAGES IN LOWER RIGHT CORNER OF DESCRIPTION INTERVAL (SEE EXAMPLE BELOW)

CRITERIA FOR DESCRIBING STRUCTURE

STRATIFIED	ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS AT LEAST 6MM THICK (NOTE THICKNESS)
LAMINATED	ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH THE LAYERS LESS THAN 6MM THICK; NOTE THICKNESS
FRAGMENTED	BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING
FLICKEN-ENDED	FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED
LOCKY	COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALL ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN
UNHOMOGENEOUS	INCLUSION OF SMALL POCKETS OF DIFFERENT SOILS SUCH AS SMALL LENSES OF SAND SCATTERED THROUGH A MASS OF CLAY; NOTE THICKNESS
HOMOGENEOUS	SAME COLOR AND APPEARANCE THROUGHOUT

CRITERIA FOR DESCRIBING PLASTICITY

NON-PLASTIC	A 1/2-IN (3MM) THREAD CANNOT BE ROLLED AT ANY WATER CONTENT
LOW	THE THREAD CAN BARELY BE ROLLED AND THE LUMP CANNOT BE FORMED WHEN DRIER THAN THE PLASTIC LIMIT
MEDIUM	THE THREAD IS EASY TO ROLL AND NOT MUCH TIME IS REQUIRED TO REACH THE PLASTIC LIMIT. THE THREAD CANNOT BE REROLLED AFTER REACHING THE PLASTIC LIMIT. THE LUMP CRUMBLES WHEN DRIER THAN THE PLASTIC LIMIT
HIGH	IT TAKES CONSIDERABLE TIME ROLLING AND KNEADING TO REACH THE PLASTIC LIMIT. THE THREAD CAN BE REROLLED SEVERAL TIMES AFTER REACHING THE PLASTIC LIMIT. THE LUMP CAN BE FORMED WITHOUT CRUMBLING WHEN DRIER THAN THE PLASTIC LIMIT

TYPICAL HOLLOW-STEM AUGER SIZES WITH SLIP-FIT, BOX AND PIN CONNECTIONS (AFTER CENTRAL MINE EQUIPMENT CO. 1987)

HOLLOW-STEM INSIDE DIAMETER (IN.)	FLIGHTING DIAMETER (IN.)	AUGER HEAD CUTTING DIAMETER (IN.)
2 1/4	5 5/8	6 1/4
2 3/4	6 1/8	6 3/4
3 1/4	6 5/8	7 1/4
3 3/4	7 1/8	7 3/4
4 1/4	7 5/8	8 1/4
6 1/4	8 5/8	10 1/4
8 1/4	11 5/8	12 1/2

SUGGESTED PROCEDURES FOR ESTIMATING THE PERCENTAGES OF GRAVEL, SAND, AND FINES IN A SOIL SAMPLE

JAR METHOD - THE RELATIVE PERCENTAGE OF COARSE-AND FINE-GRAINED MATERIAL MAY BE ESTIMATED BY THOROUGHLY SHAKING A MIXTURE OF SOIL AND WATER IN A TEST TUBE OR JAR, AND THEN ALLOWING THE MIXTURE TO SETTLE. THE COARSE PARTICLES WILL FALL TO THE BOTTOM AND SUCCESSIVELY FINER PARTICLES WILL BE DEPOSITED WITH INCREASING TIME; THE SAND SIZES WILL FALL OUT OF SUSPENSION IN 20 TO 30 SEC. THE RELATIVE PROPORTIONS CAN BE ESTIMATED FROM THE RELATIVE VOLUME OF EACH SIZE SEPARATE. THIS METHOD SHOULD BE CORRELATED TO PARTICLE-SIZE LABORATORY DETERMINATIONS

VISUAL METHOD - MENTALLY VISUALIZE THE GRAVEL SIZE PARTICLES PLACED IN A SACK (OR OTHER CONTAINER) OR SACKS, THEN DO THE SAME WITH THE SAND SIZE PARTICLES AND THE FINES. THEN MENTALLY COMPARE THE NUMBER OF SACKS TO ESTIMATE THE PERCENTAGE OF PLUS NO. 4 SIEVE SIZE AND MINUS NO. 4 SIEVE SIZE PRESENT. THE PERCENTAGES OF SAND AND FINES IN THE MINUS SIEVE SIZE NO. 4 MATERIAL CAN THEN BE ESTIMATED FROM THE WASH TEST (X4.3)

WASH TEST - FOR RELATIVE PERCENTAGE OF SAND AND FINES. SELECT AND MOISTEN ENOUGH MINUS NO. 4 SIEVE SIZE MATERIAL TO FORM A 1-IN (25-MM) CUBE OF SOIL. CUT THE CUBE IN HALF, SET ONE HALF TO THE SIDE, AND PLACE THE OTHER HALF IN A SMALL DISH. WASH AND DECANT THE FINES OUT OF THE MATERIAL IN THE DISH UNTIL THE WASH WATER IS CLEAR AND THEN COMPARE THE TWO SAMPLES AND ESTIMATE THE PERCENTAGE OF SAND AND FINES. REMEMBER THAT THE PERCENTAGE IS BASED ON WEIGHT, NOT VOLUME. HOWEVER THE VOLUME COMPARISON WILL PROVIDE A REASONABLE INDICATION OF GRAIN SIZE PERCENTAGES. X4.3.1 WHILE WASHING, IT MAY BE NECESSARY TO BREAK DOWN LUMPS OF FINES WITH THE FINGER TO GET THE CORRECT PERCENTAGES

IDENTIFICATION OF INORGANIC FINE-GRADED SOILS FROM MANUAL TESTS

SOIL SYMBOL	DRY STRENGTH	DILATANCY	TOUGHNESS
ML	NONE TO LOW	SLOW TO RAPID	LOW OR THREAD CANNOT BE FORMED
CL	MEDIUM TO HIGH	NONE TO SLOW	MEDIUM
MH	LOW TO MEDIUM	NONE TO SLOW	LOW TO MEDIUM
CH	HIGH TO VERYHIGH	NONE	HIGH

VOLUME OF SCHEDULE 40 PVC PIPE

DIAMETER	O.D.	I.D.	VOLUME GAL./LINEAR FT.
1 1/4"	1.66	1.38	0.08
2"	2.37	2.06	0.17
3"	3.50	3.06	0.38
4"	4.50	4.02	0.66
6"	6.62	6.06	1.50
8"	8.62	7.88	2.60
12"	12.75	11.93	5.81

VOLUME OF OPEN BOREHOLE AND ANNULUS BETWEEN CASING AND HOLE

HOLE DIAMETER	VOLUME LIN. FT.		CASING DIA.	VOLUME LIN. FT.		LBS./LIN. FT. SAND PELLETS	
	GAL.	CU. FT.		GAL.	CU. FT.		
7 1/4"	2.14	.29	1 1/4"	2.03	0.27	27	21
7 1/4"	2.14	.29	2"	1.91	0.26	26	20
7 3/4"	2.45	.33	2"	2.22	0.30	30	23
8 1/4"	2.78	.37	2"	2.55	0.34	34	26
10 1/4"	4.28	.57	2"	4.06	0.54	54	41
8 1/4"	2.78	.37	3"	2.28	0.30	30	23
10 1/4"	4.29	.57	3"	3.79	0.51	51	38
12 1/4"	6.13	.82	3"	5.62	0.75	75	57
8 1/4"	2.78	.37	4"	1.95	0.26	26	20
10 1/4"	4.29	.57	4"	3.46	0.46	46	35
12 1/4"	6.13	.82	4"	5.30	0.71	71	54
12 1/4"	6.13	.82	6"	4.33	0.58	58	44

MISCELLANEOUS DATA

1 CU. FT. = 7.5 GAL. (APPROX)

1 GALLON = .134 CU. FT. (APPROX)

1 CU. YD. = 202 GAL. (APPROX)

1 GALLON = .005 CU. YD. (APPROX)

1 GALLON OF WATER = 8.34 LBS. (APPROX)

1 CU. FT. OF FRESH WATER = 62.4 LBS. (APPROX)

PSI = .434 X THE HEIGHT OF THE WATER COLUMN IN FT.

FEET OF HEAD = PSI X 2.304

1 BARREL = 42 GALLONS (APPROX)

1 SACK OF SAND = 1 CU. FT. AND APPROX 100 LBS.

1 SACK OF CEMENT = 1 CU. FT. AND APPROX 96 LBS.

1 PAIL OF BENTONITE PELLETS = 50 LBS. (APPROX)

EXAMPLE:

DEPTH IN FEET	SAMPLING DATA					GRAPHIC LOG	USCS	SOIL DESCRIPTION AND DRILLING COMMENTS
	B	N	A	R	NO. T			
3					1	SS	SP	Loose, Yellowish brown, (10YR 5/6), POORLY GRADED SAND WITH GRAVEL, fine to medium, subangular to subrounded, dry, iron-stained, LACUSTRINE
4								
4								
6								

15/85/00



FIELD BORING LOG W/ATMOSPHERIC MONITORING

BORING NO. P1749 B
CL010

SITE: GRAFTON PROJECT NO. _____

DRILLING METHOD: _____ LOG BY: <u>[Signature]</u> FIRM/DRILLER: _____ PHYSICAL SETTING: _____	WATER LEVEL READINGS DATE/TIME _____ WATER DEPTH _____ HOLE DEPTH _____ CASING DEPTH _____ ABANDONMENT DATE: _____ ABANDONMENT METHOD: _____	GROUND SURFACE ELEV.: _____ COORDINATE TYPE: _____ NORTH: _____ EAST: _____ DATE/TIME START: _____ DATE/TIME COMPLETE: _____ WELL INSTALLATION DATE: _____
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DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL DESCRIPTION AND DRILLING COMMENTS	SAMPLING DATA				AIR MONITORING				
				B	N	A	R	SAMPLE		TIME	PID	LEL
								TYPE	INTERVAL			
			GRAYISH ORANGE TOYAL FIL Dolomite, GRAFTON, Very porous									
100			↓									
120			Bottom of hole @ 120 ft. Because of clay on hole below where casing was set to (47.5) and the grainstone dolomite breaking up into fine sand, the casing plugged and the hole continued to collapse to a less feet. tried re-drilling hole using wash rotary - however gravel continued to fall into hole and clay plugged the bitum. could not get the hole advanced past 70 feet because of cove in. Abandoned hole with bentonite chips. Prior to abandonment, depth to bottom to 4.2. Used 17 bags of chips to abandon borehole.									



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LITTLE 15 TO 25%

SOME 30 TO 45%

MOSTLY 50 TO 100%

STANDARD PENETRATION TEST CONSISTENCY OR DENSITY

FINE GRAINED

VERY SOFT (VS)	0-2
SOFT (S)	3-4
MEDIUM (M)	5-8
STIFF (ST)	9-16
VERY STIFF (VST)	17-30
HARD (H)	>30

COARSE GRAINED

VERY LOOSE (VL)	0-4
LOOSE (L)	5-9
MEDIUM DENSE (MD)	10-29
DENSE (D)	30-49
VERY DENSE (VD)	>50

CRITERIA FOR DESCRIBING ANGULARITY OF COARSE-GRAINED PARTICLES

DESCRIPTION CRITERIA

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ROUNDED PARTICLES HAVE SMOOTHLY CURVED SIDES AND NO EDGES

CRITERIA FOR DESCRIBING MOISTURE CONDITION

DESCRIPTION CRITERIA

DRY ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH

MOIST DAMP BUT NO VISIBLE WATER

WET VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE

ADDITIONAL DRILLING DATA

SPLIT TUBE SIZE _____ ID _____ OD _____

HAMMER WT. _____ lb _____ in drop _____

THIN WALL TUBE SIZE _____ OD _____

CASING USED _____ LF _____ Dia. _____

DRILL ROD SIZE _____

DRILL BIT TYPE _____ (a) _____ (b) _____

DRILL BIT SIZE _____ (a) _____ (b) _____

AUGER TYPE _____ OD _____

HOLLOW STEM AUGER _____ ID _____

SOIL DESCRIPTION REQUIREMENTS
(TO BE LISTED IN THIS ORDER WITH EACH ITEM SEPARATED BY A COMMA)

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NOTE: INCLUDE ESTIMATE OF GRAVEL, SAND, AND SILT AND CLAY PERCENTAGES IN LOWER RIGHT CORNER OF DESCRIPTION INTERVAL (SEE EXAMPLE BELOW)

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FRAGMENTED BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING

LICKENED FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED

LOCKY COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALL ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN

INHOMOGENEOUS INCLUSION OF SMALL POCKETS OF DIFFERENT SOILS SUCH AS SMALL LENSES OF SAND SCATTERED THROUGH A MASS OF CLAY; NOTE THICKNESS

HOMOGENEOUS SAME COLOR AND APPEARANCE THROUGHOUT

CRITERIA FOR DESCRIBING PLASTICITY

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LOW THE THREAD CAN BARELY BE ROLLED AND THE LUMP CANNOT BE FORMED WHEN DRIER THAN THE PLASTIC LIMIT

MEDIUM THE THREAD IS EASY TO ROLL AND NOT MUCH TIME IS REQUIRED TO REACH THE PLASTIC LIMIT. THE THREAD CANNOT BE REROLLED AFTER REACHING THE PLASTIC LIMIT. THE LUMP CRUMBLES WHEN DRIER THAN THE PLASTIC LIMIT

HIGH IT TAKES CONSIDERABLE TIME ROLLING AND KNEADING TO REACH THE PLASTIC LIMIT. THE THREAD CAN BE REROLLED SEVERAL TIMES AFTER REACHING THE PLASTIC LIMIT. THE LUMP CAN BE FORMED WITHOUT CRUMBLING WHEN DRIER THAN THE PLASTIC LIMIT

TYPICAL HOLLOW-STEM AUGER SIZES WITH FLIP-FIT, BOX AND PIN CONNECTIONS (AFTER CENTRAL MINE EQUIPMENT CO. 1987)

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2 3/4	6 1/8	8 3/4
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4 1/4	7 5/8	8 1/4
6 1/4	9 5/8	10 1/4
8 1/4	11 5/8	12 1/2

SUGGESTED PROCEDURES FOR ESTIMATING THE PERCENTAGES OF GRAVEL, SAND, AND FINES IN A SOIL SAMPLE

JAR METHOD - THE RELATIVE PERCENTAGE OF COARSE-AND FINE-GRAINED MATERIAL MAY BE ESTIMATED BY THOROUGHLY SHAKING A MIXTURE OF SOIL AND WATER IN A TEST TUBE OR JAR, AND THEN ALLOWING THE MIXTURE TO SETTLE. THE COARSE PARTICLES WILL FALL TO THE BOTTOM AND SUCCESSIVELY FINER PARTICLES WILL BE DEPOSITED WITH INCREASING TIME. THE SAND SIZES WILL FALL OUT OF SUSPENSION IN 20 TO 30 SEC. THE RELATIVE PROPORTIONS CAN BE ESTIMATED FROM THE RELATIVE VOLUME OF EACH SIZE SEPARATE. THIS METHOD SHOULD BE CORRELATED TO PARTICLE-SIZE LABORATORY DETERMINATIONS

VISUAL METHOD - MENTALLY VISUALIZE THE GRAVEL SIZE PARTICLES PLACED IN A SACK (OR OTHER CONTAINER) OR SACKS, THEN DO THE SAME WITH THE SAND SIZE PARTICLES AND THE FINES. THEN MENTALLY COMPARE THE NUMBER OF SACKS TO ESTIMATE THE PERCENTAGE OF PLUS NO. 4 SIEVE SIZE AND MINUS NO. 4 SIEVE SIZE PRESENT. THE PERCENTAGES OF SAND AND FINES IN THE MINUS SIEVE SIZE NO. 4 MATERIAL CAN THEN BE ESTIMATED FROM THE WASH TEST (X4.3)

WASH TEST - FOR RELATIVE PERCENTAGE OF SAND AND FINES. SELECT AND MOISTEN ENOUGH MINUS NO. 4 SIEVE SIZE MATERIAL TO FORM A 1-IN (25-MM) CUBE OF SOIL. CUT THE CUBE IN HALF, SET ONE HALF TO THE SIDE, AND PLACE THE OTHER HALF IN A SMALL DISH. WASH AND DECANT THE FINES OUT OF THE MATERIAL IN THE DISH UNTIL THE WASH WATER IS CLEAR AND THEN COMPARE THE TWO SAMPLES AND ESTIMATE THE PERCENTAGE OF SAND AND FINES. REMEMBER THAT THE PERCENTAGE IS BASED ON WEIGHT, NOT VOLUME. HOWEVER THE VOLUME COMPARISON WILL PROVIDE A REASONABLE INDICATION OF GRAIN SIZE PERCENTAGES. X4.3.1 WHILE WASHING, IT MAY BE NECESSARY TO BREAK DOWN LUMPS OF FINES WITH THE FINGER TO GET THE CORRECT PERCENTAGES

IDENTIFICATION OF INORGANIC FINE-GRADED SOILS FROM MANUAL TESTS

SOIL SYMBOL	DRY STRENGTH	DILATANCY	TOUGHNESS
ML	NONE TO LOW	SLOW TO RAPID	LOW OR THREAD CANNOT BE FORMED
CL	MEDIUM TO HIGH	NONE TO SLOW	MEDIUM
MH	LOW TO MEDIUM	NONE TO SLOW	LOW TO MEDIUM
CH	HIGH TO VERYHIGH	NONE	HIGH

VOLUME OF SCHEDULE 40 PVC PIPE

DIAMETER	O.D.	I.D.	VOLUME GAL./LINEAR FT.
1 1/4"	1.66	1.38	0.08
2"	2.37	2.06	0.17
3"	3.50	3.06	0.38
4"	4.50	4.02	0.66
6"	6.62	6.06	1.50
8"	8.62	7.98	2.60
12"	12.75	11.93	5.81

VOLUME OF OPEN BOREHOLE AND ANNULUS BETWEEN CASING AND HOLE

HOLE DIAMETER	VOLUME LIN. FT.		CASING DIA.	VOLUME LIN. FT.		LBS./LIN. FT. SAND PELLETS	
	GAL.	CU. FT.		GAL.	CU. FT.		
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7 1/4"	2.14	.29	2"	1.91	0.26	26	20
7 3/4"	2.45	.33	2"	2.22	0.30	30	23
8 1/4"	2.78	.37	2"	2.55	0.34	34	26
10 1/4"	4.29	.57	2"	4.06	0.54	54	41
8 1/4"	2.78	.37	3"	2.29	0.30	30	23
10 1/4"	4.29	.57	3"	3.79	0.51	51	38
12 1/4"	6.13	.82	3"	5.62	0.75	75	57
8 1/4"	2.78	.37	4"	1.95	0.26	26	20
10 1/4"	4.29	.57	4"	3.46	0.46	46	35
12 1/4"	6.13	.82	4"	5.30	0.71	71	54
12 1/4"	6.13	.82	6"	4.33	0.58	58	44

MISCELLANEOUS DATA

1 CU. FT. = 7.5 GAL. (APPROX)

1 GALLON = .134 CU. FT. (APPROX)

1 CU. YD. = 202 GAL. (APPROX)

1 GALLON = .005 CU. YD. (APPROX)

1 GALLON OF WATER = 8.34 LBS. (APPROX)

1 CU. FT. OF FRESH WATER = 62.4 LBS. (APPROX)

PSI = .434 X THE HEIGHT OF THE WATER COLUMN IN FT.

FEET OF HEAD = PSI X 2.304

1 BARREL = 42 GALLONS (APPROX)

1 SACK OF SAND = 1 CU. FT. AND APPROX 100 LBS.

1 SACK OF CEMENT = 1 CU. FT. AND APPROX 96 LBS.

1 PAIL OF BENTONITE PELLETS = 50 LBS. (APPROX)

EXAMPLES

DEPTH IN FEET	SAMPLING DATA						GRAPHIC LOG	USCS	SOIL DESCRIPTION AND DRILLING COMMENTS
	B	N	A	R	NO.	T			
3					1	SS		SP	Loose, Yellowish brown, (10YR 5/6), POORLY GRADED SAND
4									WITH GRAVEL, fine to medium, subangular to subrounded,
4									dry, iron-stained, LACUSTRINE
6									

15/85/00

Well No. P8A

Date: 3, 21, 00
Mon. Tues. Weds. Thurs. Fri.

Site: GRAFTON

Weather: Sunny 60° light S. wind Project No.: _____

Development Method: Pumped Bailed Other: _____

Pump Type: Keck

Bailer Type: _____

Volume Calculation: $(115.30 - 56.13) \times 0.16 + (2.30 \times 1.7 \times 1.24) = 9.5 + 6.3 \approx 16$

(D.T.B. - D.T.W. x vol./ft. = PVC/well volume) + (N* x H* x Annulus vol./ft.) = Total Well Volume

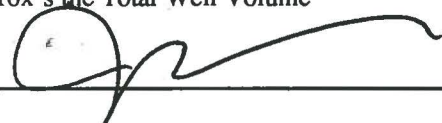
* (Wells that cannot be purged dry, 10x's the Total Well Volume must be purged)

(Wells that can be purged dry, slowly removing water, without surging until dry)

Time	Depth to Water (D.T.W.)	Depth to Bottom (D.T.B.)	Volume Removed (gal.)	pH	Cond.	Temp.	DO Etor	OILP Odor Y/N	TDS Turbidity
1202	56.13	115.30	-	7.27	655.3	14.9		98	484.9
1215			15	6.75	745	12.1		179	520.3
				6.70	748.4	12.4		190	522.2
1259			60	6.81	745.8	12.8		175	520.2
1315			75	6.77	752.6	12.9		180	523.3
1330			110	6.71	746.9	12.2		186	524.0
1340			130	6.74	750.2	11.7		182	524.4
1350			145	6.68	752.1	12.0		199	527.1
1400			140	6.68	750.1	11.7	9.63	188	524.7

Comments: _____

- *N = porosity of filter pack
- *H = length of filter pack or length of saturated filter pack (water level within screen length)
- ** = A 30-minute surge and purge before the 10x's the Total Well Volume

Signature: 

Annulus	vol./ft.	Inside Diameter	vol./ft.
4"	0.42	1"	0.04
6"	1.24	1.25"	0.06
8"	2.38	2"	0.16
10"	3.85	4"	0.65

HNu/PPM	LEL/%	O2/%	H2S/PPM	CO/PPM	

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 SERIALIZED _____
 INDEXED _____
 FILED _____

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MOBILE ALABAMA
 APR 15 1968

Facility/Project Name G. LARSON	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name P 1749 (House C zone) P88
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source 1/4 of _____ 1/4 of Sec. _____ T. _____ N. R. _____ <input type="checkbox"/> E. <input type="checkbox"/> W.	Date Well Installed 03/17/00 m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) Todd Schmaltz Beurt Longyear

A. Protective pipe, top elevation _____ ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Well casing, top elevation _____ ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: _____ ft. c. Material: Flush mount Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/> d. Additional protection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: _____
C. Land surface elevation _____ ft. MSL	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>
D. Surface seal, bottom _____ ft. MSL or _____ ft.	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input checked="" type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input checked="" type="checkbox"/>	5. Annular space seal: a. Granular Bentonite <input type="checkbox"/> 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. SOXSO volume added for any of the above f. How installed: Tremie <input checked="" type="checkbox"/> 01 Basic of Bentonite chips Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
13. Sieve analysis attached? <input type="checkbox"/> Yes <input type="checkbox"/> No	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
14. Drilling method used: Rotary <input type="checkbox"/> 50 Unknown Hollow Stem Auger <input type="checkbox"/> 41 Other <input type="checkbox"/>	7. Fine sand material: Manufacturer, product name & mesh size a. Bayer BB #7 b. Volume added 1250 lb ft ³
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input checked="" type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	8. Filter pack material: Manufacturer, product name and mesh size a. RED FLINT #30 b. Volume added 10250 lb ft ³
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input checked="" type="checkbox"/> 24 Other <input type="checkbox"/>
17. Source of water (attach analysis): _____	10. Screen material: PVC a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
E. Bentonite seal, top _____ ft. MSL or _____ ft.	b. Manufacturer _____ c. Slot size: 0.10 in. d. Slotted length: 09.8 ft.
F. Fine sand, top 112.5 ft. MSL or _____ ft.	11. Backfill material (below filter pack): Bentonite chips None <input type="checkbox"/> 14 Other <input type="checkbox"/>
G. Filter pack, top 123.5 ft. MSL or _____ ft.	
H. Screen joint, top 188 ft. MSL or _____ ft.	
I. Well bottom 198 ft. MSL or _____ ft.	
J. Filter pack, bottom 210 ft. MSL or _____ ft.	
K. Borehole, bottom 210 ft. MSL or _____ ft.	
L. Borehole, diameter _____ in.	
M. O.D. well casing 20 in.	
N. I.D. well casing 14 in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

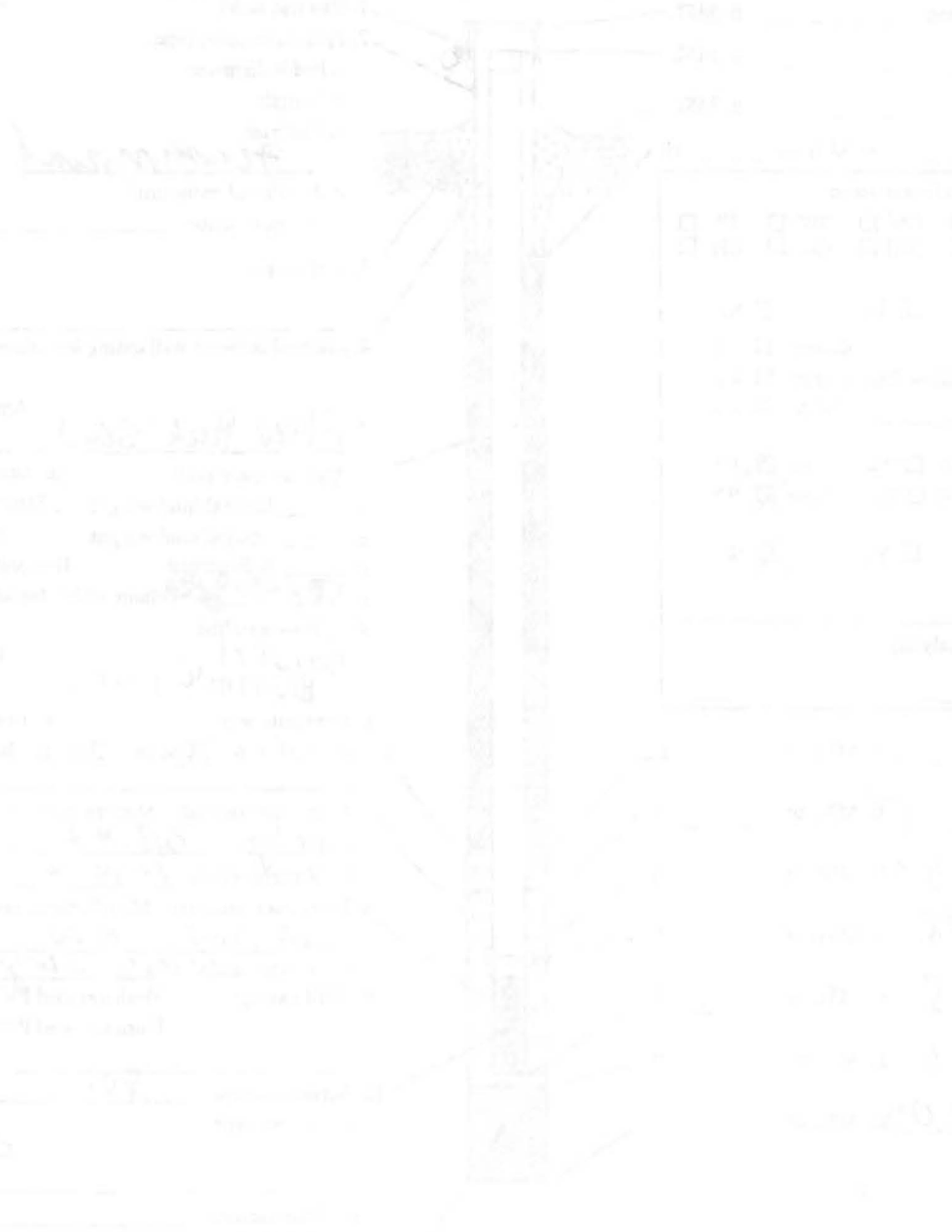
Signature _____ Firm _____

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

159 (Long 3) PPF 1

Year	Contributor	Contributed	Number of Shares	Value	Total Value
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					
2001					
2002					
2003					
2004					
2005					
2006					
2007					
2008					
2009					
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2012					
2013					
2014					
2015					
2016					
2017					
2018					
2019					
2020					
2021					
2022					
2023					
2024					
2025					

Handwritten notes: 159 (Long 3) PPF 1, 40500, 40500





A tyco INTERNATIONAL LTD. COMPANY

Project No.: GRAPTON Well No. PT749 Site: GRAPTON

Purging Method: Pumped Bailed Other: _____

Pump Type: Keck Bailer Type: _____

Weather Conditions: Mild

Volume Calculations: $(198.45 - 52.44) \times 0.25 \times 0.16 + (0.25 \times 17) \times 30 \times 17 \approx 24$

(D.T.B. - D.T.W. x vol./ft. = Gals./well vol.)

(Gals./well vol. X 5 = Total Volume to be removed) Gals./well vol.: 24

Time	Depth to Water (D.T.W.)	Depth to Bottom (D.T.B.)	Volume Removed (gal.)	pH	Cond.	Temp.	Color	Odor Y/N	TDS Turbidity
	52.44	198.45	25	6.94	652	11.2	Clear	N	444.4
11:24			50	6.92	637.3	11.4	Clear	N	445.5
			75	6.97	624.1	11.2	Clear	N	436.3
11:57			100	7.08	628.7	11.2	Clear	N	438.1
12:17			135	7.14	625.4	11.8	Clear	N	436.1
12:29			170	7.14	622.5	11.4	Clear	N	434.6
12:41			185	7.07	622.5	11.1	Clear	N	437.5
12:57			200	7.09	628.7	11.1	Clear	N	435.3
13:07			220	7.03	633	11.4	Clear	N	441.4
Sample Readings									

P-749

DO - 4.70 at sample time
ORP 150

Comments: _____

Inside Diameter	vol./ft.
1"	0.04
1.25"	0.06
2"	0.16
4"	0.65

Field Blank Taken Time: _____

Well Duplicate No.: _____

Signature: _____

Date: 3/23/00

Hnu/PPM	LEL/%	O ₂ /%	H ₂ S/PPM	CO/PPM

198.45

$$146.01 \times 0.14 = 23.36 + 1.02$$

$$+ 17 \times \pi(3^2) \times .30$$

$$17 \times 28.26 \times .30$$

$$17 \times 0.20 \times .3 \quad 1.02$$

$$17 \times$$

25 x 10
250

Year	Area	Volume	Weight	Value
1980	100	1000	1000	1000
1981	100	1000	1000	1000
1982	100	1000	1000	1000
1983	100	1000	1000	1000
1984	100	1000	1000	1000
1985	100	1000	1000	1000
1986	100	1000	1000	1000
1987	100	1000	1000	1000
1988	100	1000	1000	1000
1989	100	1000	1000	1000
1990	100	1000	1000	1000
1991	100	1000	1000	1000
1992	100	1000	1000	1000
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2021	100	1000	1000	1000
2022	100	1000	1000	1000
2023	100	1000	1000	1000
2024	100	1000	1000	1000
2025	100	1000	1000	1000
2026	100	1000	1000	1000
2027	100	1000	1000	1000
2028	100	1000	1000	1000
2029	100	1000	1000	1000
2030	100	1000	1000	1000

NOTE
WHITE COPY - DIVISION'S COPY
GREEN COPY - DRILLER'S COPY
YELLOW COPY - OWNER'S COPY

1. COUNTY **Ozaukee** CHECK ONE Town Village City NAME **Grafton**

LOCATION - 1/4 Section Section Township Range 3. OWNER AT TIME OF DRILLING
SE. SW. NE. NW 25 10 21E **Dennis Johnson**

OR Grid or street no. Street name ADDRESS
1749 **Manchester Dr.** **3421 Clubview Ct.**

AND - If available subdivision name, lot & block no. POST OFFICE
Mequon, Wis.

4. Distance in feet from well to nearest: BUILDING SANITARY SEWER FLOOR DRAIN FOUNDATION DRAIN WASTE WATER DRAIN
C. I. TILE C. I. TILE SEWER CONNECTED INDEPENDENT C. I. TILE
(Record answer in appropriate block) **14** **14**

CLEAR WATER DRAIN SEPTIC TANK PRIVY SEEPAGE PIT ABSORPTION FIELD BARN SILO ABANDONED WELL SINK HOLE
C. I. TILE

OTHER POLLUTION SOURCES (Give description such as dump, quarry, drainage well, stream, pond, lake, etc.)

5. Well is intended to supply water for: **House**

6. DRILLHOLE						9. FORMATIONS			
Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)	Kind		From (ft.)	To (ft.)
10	Surface	40	6	40	212	Stoney clay		Surface	38
						Hardpan		38	66

7. CASING, LINER, CURBING, AND SCREEN			
Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
6	19.45# new bl steel	Surface	66
	T&C well cas.		

8. GROUT OR OTHER SEALING MATERIAL Kind From (ft.) To (ft.)
clay slurry Surface **40**

10. TYPE OF DRILLING MACHINE USED
 Cable Tool Direct Rotary Reverse Rotary
 Rotary - air w/drilling mud Rotary - hammer with drilling mud & air Jetting with Air Water

11. MISCELLANEOUS DATA
Yield test: **12** Hrs. at **15** GPM
Depth from surface to normal water level **50** ft.
Depth to water level when pumping **55** ft.

Well construction completed on **2/19/74** **19**
Well is terminated **10** inches above final grade below
Well disinfected upon completion Yes No
Well sealed watertight upon completion Yes No

Water sample sent to **Madison** laboratory on: **2/19/74** **19**

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, sub-surface pumphrooms, access pits, etc., should be given on reverse side.

SIGNATURE *Robert Oczkowski* Registered Well Driller COMPLETE MAIL ADDRESS **631 South Wash Ave. Cedarburg, Wis.**

COLIFORM TEST RESULT GAS - 24 HRS. GAS - 48 HRS. CONFIRMED REMARKS