

3522 4th Avenue South Fargo, ND 58103 P: 701.232.1822 F: 701.232.1864

www.NTIgeo.com

Unearthing confidence™

August 21, 2019

Philip Rogers 2624 110th St. Barnesville, MN 56514

Attn:

Mr. Philip Rogers

Subject:

Felton Gravel Exploration

County Road 26 and 170th Street N. – Rural Felton, Minnesota

NTI Project No. 19.FGO08089.000

Northern Technologies, LLC (NTI) has been contracted by Phillip Rogers to perform a gravel exploration of his properties near Felton, Minnesota. The exploration included geotechnical drilling and sampling using flight auger, and mechanical analysis testing of select samples.

Background Information and Exploration

Site geotechnical drilling was performed on June 17 & 18, 2019, and it included advancement of thirteen (13) flight auger borings extending to depths of 17 to 50 feet below grade. Borings were performed throughout Section 30, NW ½ of Section 31, NW ¼ of Section 29, and the west half of the SW ¼ of Section 29 of Keene Township. The boring locations were determined by Philip Rogers to provide coverage area of the properties. Borings were backfilled with bentonite grout per Minnesota Department of Health requirements.

Assumptions and Assignments

The boring coverage area is limited in relation to the total acreage of the property. NTI has arbitrarily assigned specific coverage areas for each soil boring. Soil types and depths exhibited at specific boring do not necessary reflect the soils across individual assigned coverage area. Our estimated quantities are solely based on the assigned coverage area detailed on the attached Boring Plan, the samples obtained from specific borings, and mechanical analysis testing of select samples.

Site soils were visually classified, logged, and sampled by NTI field personnel. Samples were returned to the laboratory for further testing and classification per USGS criteria. NTI has assigned ratings of "Excellent", "Good", "Above Average", "Average", "Below Average", and "Poor" for soils obtained during this project. The ratings represent the following:

Precision · Expertise · Geotechnical · Materials





Excellent (A) – Poorly Graded Gravel (GP)

Above Average (B) – Sand, With/Some Gravel (SP)

Average (C) – Sand, Little / Trace Gravel (SP, SP-SM)

Below Average (D) – Silty Sand / Fine Sand (SP-SM, SM)

Poor (F) – Fat Clay / Lean Clay (CH, CL)

Topsoil (T) – Organic Surface Topsoil (OL)

Estimated Quantities

We estimate the following Total Quantities based on the samples obtained during the exploration, depth of boring, and the respective assigned coverage areas. A detailed breakdown of the quantities for individual coverage areas is provided within the attachments. Actual soil quantities likely exceed estimates listed below as select were terminated within specific soil layer. Reference specific boring location and soil type at depth of termination.

Soil Type	Estimated Total Cubic Yards	Estimated Total Acre-Ft
Topsoil	881,962	546
Gravel (GP)	1,345,171	834
Sand, With / Some Gravel (SP)	3,802,439	2,356
Sand, Little / Trace Gravel (SP, SP-SM)	8,239,609	5,104
Silty Sand / Fine Sand (SP-SM, SM)	9,853,082	6,106
Clay (CH, CL)	1,027,039	636

Standard of Care

The findings in this document represent our professional opinions, based on our interpretation of the site conditions and information provided to us by others at the time of issue. Other than this, no warranty is implied or intended. Please contact us immediately if you have questions concerning this correspondence. We may be reached at (701) 232-1822.

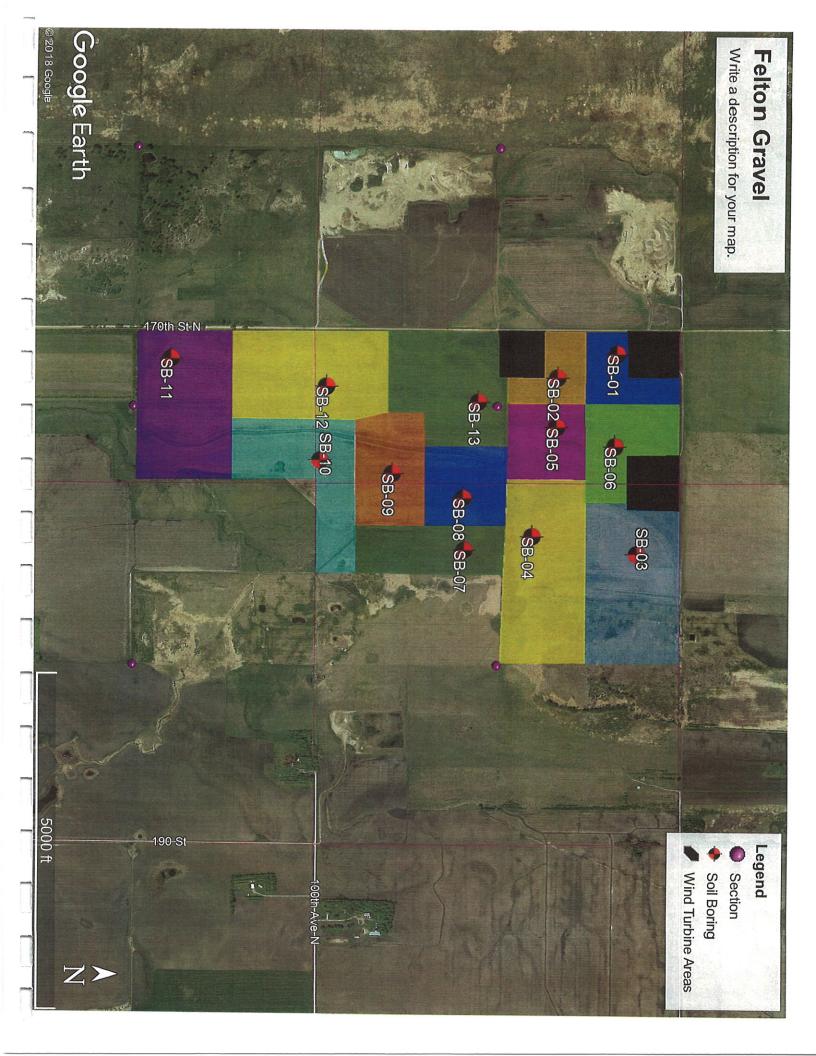
Northern Technologies, LLC

Josh Holmes, P.E.

Engineer

Dan Gibson, P.E. Senior Engineer

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merchantability, or fitness for any particular purpose.

Date: 8/21/2019/

http://claycountymn.gov 218-299-5003



Felton Gravel Exploration Rural Felton, Minnesota NTI Project #19.FGO.08089

Estimated Sauare Yards	104.162	92.295	343,418	354.892	138,447	157,979	173,411	153.623	181.966	258.964	331,249	322,841	282,451
Estimated Square Feet	937,459	830,657	3,090,762	3,194,030	1,246,020	1,421,815	1,560,698	1,382,609	1,637,692	2,330,675	2,981,237	2,905,569	2,542,055
Estimated Acres	21.5	19	71	73.3	28.6	32.6	35.8	31.7	37.6	53.5	68.4	2.99	58.4
Location	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	SB-11	SB-12	SB-13

47.000	ארוב-גו						
Fetimated Total Acas Ft	Estimated 10tal.	010	2.256	2,330	5,104	636	
Estimated Total Cubic Yards	881.962	1.345,171	3.802.439	8.239.609	9.853.082	1,027,039	
Soil Type	Topsoil	Gravel (GP)	Sand, With / Some Gravel (SP)	Sand, Little / Trace Gravel (SP, SP-SM)	Silty Sand / Fine Sand (SP-SM, SM)	Clay (CH, CL)	
Grade	7	٨	В	S	D	4	



35	5	Н	0	Depth	SB-3	50	35	∞	1.4	0	Depth	SB-2	50	42.5	33.5	17	9.5	6.5	0.6	0	Depth	SB-1
	SP-SM	SP-SM	TS	Soil Class			SM	SP-SM	CL	TS	Soil Class			SP-SM	SM	SP	SP-SM	SP	SP-SM	TS	Soil Class	
	D	D	Т	Grade			D	С	Ŧ	Т	Grade			С	D	С	D	С	В	Т	Grade	
	30	4	1	Layer (Ft)			15	27	6.6	1.4	Layer (Ft)			7.5	9	16.5	7.5	ω	5.9	0.6	Layer (Ft)	
	3,434,180	457,891	114,473	Cubic Yd			461,476	830,657	203,049	43,071	Cubic Yd			260,405	312,486	572,892	260,405	104,162	204,852	20,832	Cubic Yd	
	2130.0	284.0	71.0	Acre-Ft			285.0	513.0	125.4	26.6	Acre-Ft			161.3	193.5	354.8	161.3	64.5	126.9	12.9	Acre-Ft	

	NORTHERN TECHNOLOGIES, LLC
4)

Felton Gravel Exploration Rural Felton, Minnesota NTI Project #19.FGO.08089	Acre-Ft 110.0 1062.9 1026.2	<i>Acre-Ft</i> 20.0 123.0 414.7 14.3	Acre-Ft 16.3 277.1 163.0 260.8 97.8	Acre-Ft 64.4 365.2 268.5 17.9
	Cubic Yd 177,446 1,715,312 1,656,164	Cubic Yd 32,304 198,440 669,159 23,074	Cubic Yd 26,330 447,608 263,299 421,279 157,979	Cubic Yd 104,047 589,597 433,527 28,902
·	Layer (Ft) 1.5 14.5 14	Layer (Ft) 0.7 4.3 14.5 0.5	Layer (Ft) 0.5 8.5 5	Layer (Ft) 1.8 10.2 7.5 0.5
	Grade T D B	<i>Grade</i> T B C C	Grade T B C C	Grade T D D
NORTHERN TECHNOLOGIES, LLC	Soil Class TS SP-SM SP	<i>Soil Class</i> TS SP SP CH	Soil Class TS SP-SM SP-SM SP-SM SP-SM SP-SM	Soil Class TS SP-SM SP-SM CH
	SB-4 Depth 0 1.5 16	SB-5 Depth 0 0.7 5 19.5	SB-6 Depth 0 0.5 9 14 22 25	20 SB-7 Depth 0 1.8 12 19.5 20

R:\Fargo\PROJECTS\Geo\GEOREP 2019\Felton Gravel Exploration\Gravel Quantities



SB-11 Depth 0 0.8 8.5 12 24 25	SB-10 Depth 0 0.7 7 17 20	SB-9 Depth 0 0.5 9 17 18.5	Depth 0 1 17 20
Soil Class TS SP SP-SM CH	Soil Class TS SP-SM SP-SM SP-SM	Soil Class TS SP SP CH	Soil Class TS SP-SM CH
Grade T C B D	Grade T C D	Grade T C B	Grade T C
Layer (Ft) 0.8 7.7 3.5 12	Layer (Ft) 0.7 6.3 10	Layer (Ft) 0.5 8.5 8	Layer (Ft) 1 16 3
Cubic Yd 88,333 850,205 386,457 1,324,994 110,416	<i>Cubic Yd</i> 60,425 543,824 863,213 258,964	<i>Cubic Yd</i> 30,328 515,570 485,242 90,983	<i>Cubic Yd</i> 51,208 819,324 153,623
Acre-Ft 54.7 526.7 239.4 820.8 68.4	Acre-Ft 37.5 337.1 535.0 160.5	Acre-Ft 18.8 319.6 300.8 56.4	Acre-Ft 31.7 507.2 95.1

Felton Gravel Exploration Rural Felton, Minnesota

NTI Project #19.FGO.08089

	Acre-Ft	53.4	313.5	266.8	833.8	200.1			Acre-Ft	29.2	262.8	525.6	116.8	58.4	
	Cubic Yd	86,091	505,784	430,455	1,345,171	322,841			Cubic Yd	47,075	423,676	847,352	188,300	94,150	
	Layer (Ft)	0.8	4.7	4	12.5	8			Layer (Ft)	0.5	4.5	6	2	1	
	Grade	F	U	U	A	ш			Grade	⊢	В	U	U	ш	
	Soil Class	TS	SP-SM	SP	GP	Н			Soil Class	TS	SP	SP	SP	H	
SB-12	Depth	0	8.0	5.5	9.5	22	25	SB-13	Depth	0	0.5	2	14	16	17



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GRAIN SIZE DISTRIBUTION

ASTM C136 & D422

Report To: Project: Felton Gravel Exploration Project Number: 19.FGO08089.000 Location: Rural Felton, Minnesota Attention:

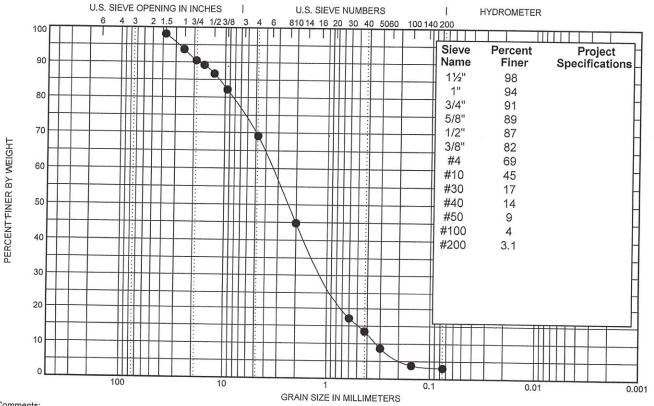
Sample Information

Sample Number: Date Sampled: 7/24/2019 Project Specifications: Sampled By: **Drillers** Aggregate Type:

Location Sampled: Soil Boring #1 [1'-4']

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
0.97	10.41	37.5	3.432	1.049	0.33	29.0	66.1	3	1



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes (8/13/19)



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GRAIN SIZE DISTRIBUTION

ASTM C136 & D422

Report To:	Project: Project Number:	Felton Gravel Exploration 19.FGO08089.000
Attention:	Location:	Rural Felton, Minnesota

 Sample Information

 Sample Number:
 2
 Date Sampled:
 7/24/2019

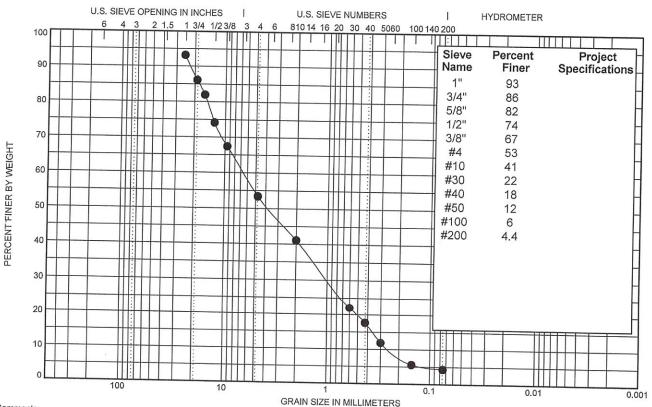
 Project Specifications:
 Sampled By:
 Drillers

 Aggregate Type:

Location Sampled: Soil Boring #1 [4'-7']

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
0.62	27.05	25	6.579	0.995	0.243	39.8	49.1	4	.4



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes (8/13/19)

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ASTM C136 & D422

Report To:	Project:	Felton Gravel Exploration
	Project Number:	19.FGO08089.000
	Location:	Rural Felton, Minnesota
Attention:		

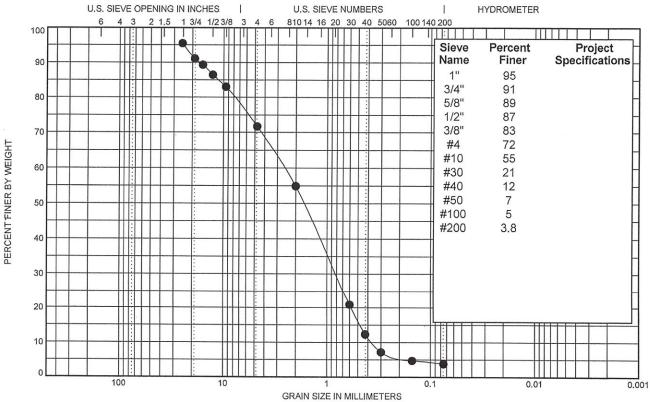
Sample Information

Sample Number: 3 Date Sampled: 7/24/2019
Project Specifications: Sampled By: Drillers

Aggregate Type:
Location Sampled: Soil Boring #5 [1'-4']

Sample Data

Cc	;	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
0.73		7.18	25	2.6	0.829	0.362	23.7	67.9	3	.8



Comments:

Submitted by,

Northern Technologies, LLC

Cc:

Josh Holmes (8/13/19)

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Report To:	Project:	Felton Gravel Exploration
	Project Number:	19.FGO08089,000
	Location:	Rural Felton, Minnesota
Attention:		

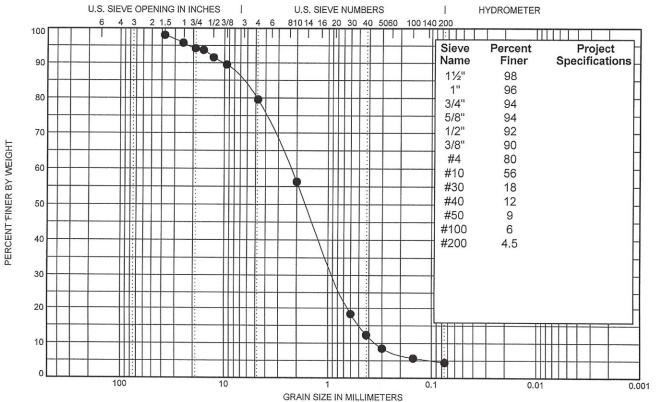
Sample Information

Sample Number: 4 Date Sampled: 7/23/2019
Project Specifications: Sampled By: Drillers
Aggregate Type:

Location Sampled: Soil Boring #6 [1'-4']

Sample Data

L	Campic Bu	Lu								
	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
	0.96	6.67	37.5	2.29	0.868	0.343	18.4	75.2	4	5



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes (8/13/19)

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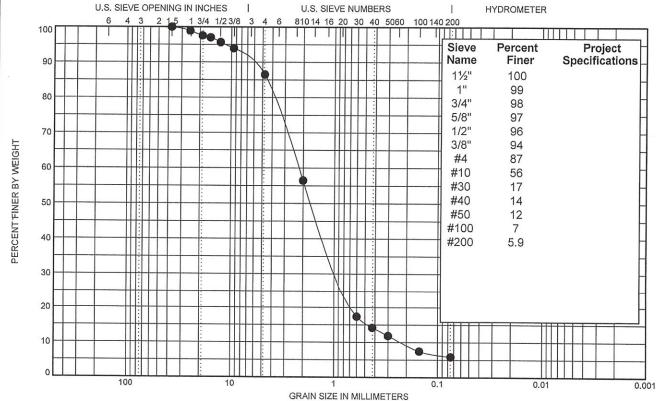
Report To:	Project:	Felton Gravel Exploration
·	Project Number:	19.FGO08089.000
	Location:	Rural Felton, Minnesota
Attention:		

Sample Information

Gampio illiorillacioni			
Sample Number:	5	Date Sampled:	7/23/2019
Project Specifications:		Sampled By:	Drillers
Aggregate Type:		The state of the s	The Control of the Co
Location Sampled:	Soil Boring #10 [1'-4']	The second secon	

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
1.59	9.91	37.5	2.213	0.885	0.223	13.5	80.6	5	.9



Comments:

Submitted by,

Northern Technologies, LLC

Cc:

Josh Holmes (8/13/19)

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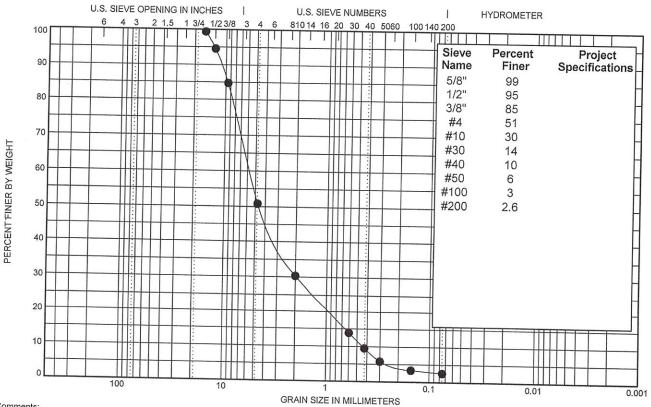
Report To:	Project: Project Number:	Felton Gravel Exploration 19.FGO08089.000
Attention:	Location:	Rural Felton, Minnesota

Sample Information Sample Number: 6 Date Sampled: 7/24/2019 **Project Specifications:** Sampled By: **Drillers** Aggregate Type:

Location Sampled: Soil Boring #12 [9'-14']

Sample Data

Сс	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
1.50	12.98	15.875	5.727	1.949	0.441	48.5	48.3	2	.6



Comments:

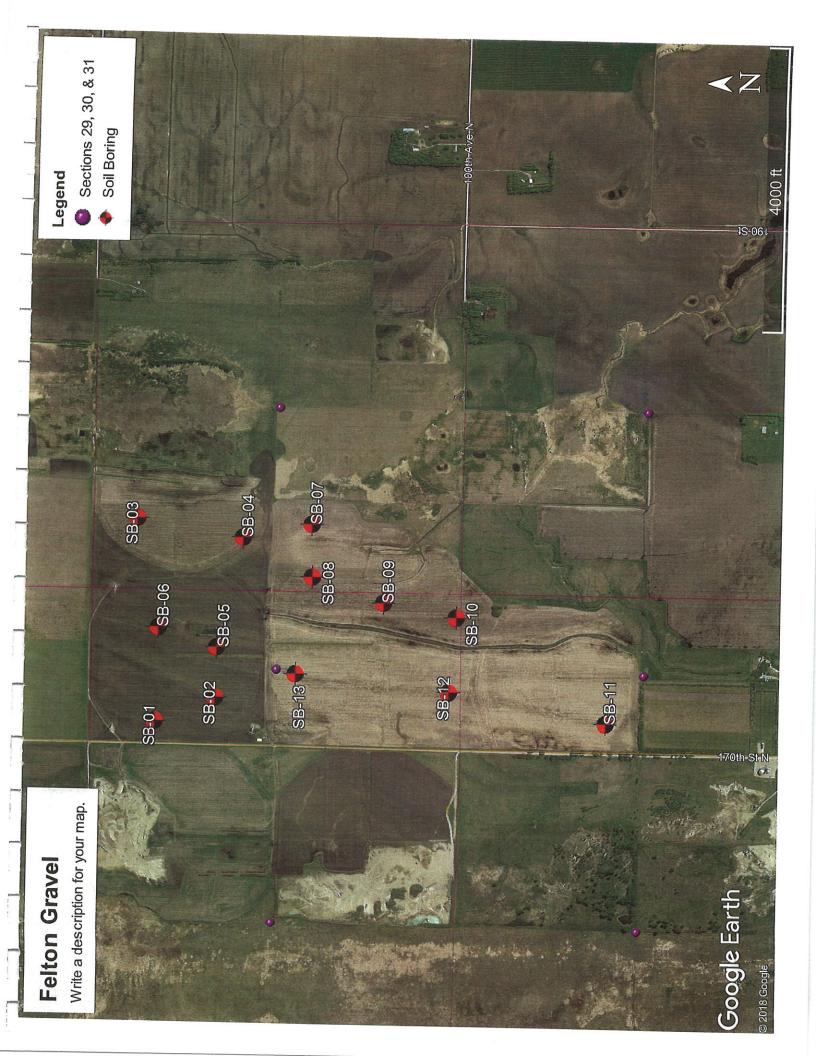
Cc:

Submitted by,

Northern Technologies, LLC

Le Flohe Josh Holmes (8/13/19)

				DEPARTMENT OF HEALTH Minnesota Well and Boring PRING SEALING DECORD Sealing No. H 352391		
County Name	County Name WELL AND BOP			Minnesota Unique Well No.		
			Minneson ange No. Section No. Fraction (sm. →			a Statutes, Chapter 103I or W-series No.
Township Name	1			raction	sm. → lg	
Keene					¼ ½	June 17&18, 2019 June 17&18, 2019
	GPS LOCATION - decimal degrees (to four decimal places)					
Latitude 47.00	3510	Longitu	de96.435	210		
Numerical Street Add	Numerical Street Address or Fire Number and City of Well or Boring Location				on	AQUIFER(S) STATIC WATER LEVEL Single Aquifer Multiaquifer
170th St ar	nd 110th	Ave, F	elton, N	1N 5	6536	WELL/BORING Date Measured June 17&18, 2019 Estimated
Show exact location of in section grid with "X	of well or boring		Sketch map location, shi lines, roads			
N	٧.		lines, roads	, and bu	ildings.	Env. Bore Hole Other ft. below above land surface CASING TYPE(S)
						N/A
	+++					Steel Plastic Tile Other Other
w		- (Dan A44	l 1 . 1		WELLHEAD COMPLETION
<u> </u>			See Attac	nea i	viap	Outside: Pitless Adapter/Unit At Grade Inside: Basement Offset
		½ Mile				☐ Well Pit ☐ Burled ☐ Well House
S	ШП.					Other
1 Mi						☐ Buried
PROPERTY OWNER'S	S NAME/COMPA	ANY NAME	·			CASING(S)
Philip & Jill Roc Property owner's mailing	gers	nt then well lea				Diameter Depth Set in oversize hole? Annular space initially grouted?
2624 110th		· ·	cation address inc	iicated at	oove	N/A in. from to ft. Yes No Yes No Unknown
						in. from toft.
Barnesville	e, IVIIV 56	514				
WELL OWNER'S NAM	IE/COMPANIVAL	A145				in. fromtoft. Yes No Yes No Unknown
NTI						SCREEN/OPEN HOLE
Well owner's mailing add		an property ow	ner's address ind	licated ab	ove	Screen from N/A toft. Open Hole fromtoft.
3522 4th A	ve S					OBSTRUCTIONS
Fargo, ND	58103		ŝ			☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
						Type of Obstructions (Describe)
GEOLOGICAL MAT	ERIAL C	OLOR	HARDNESS OR FORMATION	FROM	то	Obstructions removed? Yes No Describe
If not known, indicate	estimated forma	ation log from		200720000000000000000000000000000000000		PUMP
Outwash			, , , , , , , , , , , ,	0	End	■ Not Present ☐ Present, Removed Prior to Sealing ☐ Other
					Liid	Туре
						METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE
						☐ No Annular Space Exists ☐ Annular Space Grouted with Tremie Pipe ☐ Casing Perforation/Removal
						in from
						Type of Perforator N/A
						VARIANCE
						Was a variance granted from the MDH for this well? Yes No TN#
						GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.)
						Grouting Material Bentonite Grout from 0 to End ft. yards bags
						from to tt yards bags
						from to ft yards bags
						OTHER WELLS AND BORINGS
EMARKS, SOURCE	OF DATA, DIFF	CULTIES IN	SEALING			Other unsealed and unused well or boring on property? Yes No How many?
					- 1	LICENSED OR REGISTERED CONTRACTOR CERTIFICATION
						This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.
						Northern Technologies, LLC 3574
						Licensee Business Name ¿License or Registration No.
						Josh Holmes for Bill Canty 8/21/19
						Certified Representative Signature Certified Rep. No. Date
						Mike Johnson
IINN. DEPT OF H	IEALTH COP	γ H 3	5239	1		Name of Person Sealing Well or Boring
	D# 53159					
						8/16R





BORING NUMBER SB-01

PAGE 1 OF 1 Long: -96° 26' 6.756" Lat: 47° 0' 12.636"

CLIE	NT_					PROJEC	T NAME	_Felto	on Gravel E	xplora	ition			30,00	may specific	0.005470	
			ER _19.FGO08089.0														
DATE	STA	RTED	6/17/19	COMPLETED	6/17/19	GROUNE	ELEVA	TION	1081 feet			HOI	LE SIZ	E 6	1/2 in.		
DRILL	ING	CONTR	RACTOR NTI	·		GROUNE	WATER	R LEVE	LS:								
			OD 3 1/4 in H.S.A			90.00 National Color (Color Color Co											
						AT END OF DRILLING											
CAVE	IN (fi	t) <u>NR</u>		FROST DEPTH	(ft) <u>NA</u>	AF	TER DRI	LLING									
NOTE	s																
							Й	%		÷	Ŀ	(9	ATT	ERBE			
E_	GRAPHIC						SAMPLE TYP NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)				S	
DEPTH (ft)	RAP		MAT	TERIAL DESCRI	PTION		PLE	OVE (RQI	BLO OUN VAL	E st	2 S	INTER-	LIQUID	STIC		FINES	
	5						SAM	REC	_0S	P00	ORY	MOS	95	PLASTIC LIMIT	PLASTICITY INDEX	_	
00	7, 1. 2	0.6	TOPSOIL, ORGAN	VIC CLAY WITH	I SAND (OL)	~1080.4 <i>x</i>		_							₫.		
			POORLY GRADE	D SAND WITH	SILT AND GRAVEL	/										3	
			(SP-SM) fine grain	ed													
																4	
		6.5	POORLY CRADE	D CAND (CD) f	ne to medium grain	1074.5											
			FOORLY GRADE	D SAND, (SF) II	ne to medium grain	leu											
10		9.5	POORLY GRADE	D SAND (SP-SI	M) fine grained	1071.5											
					,e g.aea												
		17.0				1064.0											
		17.0	POORLY GRADE	D SAND, (SP) fi	ne to medium grain												
20																.	
20																	
30																	
- 4		33.5	SILTY SAND, (SM) fine to coarse	grained	1047.5											
				,	g												
40_																	
. 4		42.5				1038.5											
			POORLY GRADEI		BILT AND GRAVEL												
			(SP-SM) fine to coa	arse granned													
													in the second				
50		50.0				1031.0											



Northern Technologies, LLC 3522 4th Ave S. Fargo, ND 58103

BORING NUMBER SB-02

PAGE 1 OF 1 Long: -96° 26' 1.716"

		NORTHERN TECHNOLOGIES, LLC	P: 701-232-1822 F: 701-232-1864 www.ntigeo.com								•		26 1. 7° 0' 4.		
CLIE	NT _			PROJECT NAME Felton Gravel Exploration											
		NUMBER _19.FGO0808								0.00					
DATE	STAF	RTED 6/17/19	COMPLETED 6/17/19	GROUNI	ELEVA	TION	1088 feet			НО	LE SIZ	ZE _6	1/2 in.		
DRIL	ING (CONTRACTOR NTI													
DRILI	ING N	METHOD 3 1/4 in H.S./	Α												
LOGO	SED B	Y Chris Nelson	CHECKED BY Josh Holmes	AT END OF DRILLING											
CAVE	IN (ft) <u>NR</u>	FROST DEPTH (ft) NA	AF	TER DRI	ILLING	ì <u></u>								
NOTE	s														
					Ъ	8		z	Ŀ.	@	AT	TERBE LIMITS			
王	음				₹ H	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	NE)	H (J. C.	9			S	
DEPTH (ft)	GRAPHIC LOG	V	MATERIAL DESCRIPTION		PLE JMB	NS IS	BLOW COUNTS (N VALUE)	(\$ £	Se	IST	LIQUID	STI	- - - - - - - - - - - - - - - - - - -	FINES	
	20				SAMPLE TYPE NUMBER	RECOVERY (RQD)	Z _O Z	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	SE	PLASTIC LIMIT	PLASTICITY INDEX	"	
0	7. 1. 1. 17	TOPSOU OP	GANIC CLAY WITH SAND, (OL)			-		-	-				П		
	<u> </u>	1.4 SANDY I FAN	CLAY, (CL) brown, trace gravel	1086.6											
		CANADA ELAN	OLIVIT, (OL) BIOWIT, trace graver												
		8.0		1080.0											
10		POORLY GRAI grained	DED SAND WITH SILT, (SP-SM) fine												
20															
.]															
30															
		05.0													
.]		35.0 SILTY SAND, (3	SM) fine grained	1053.0											
		•	· · · · · · · · · · · · · · · · · · ·												
40															
. 4															



BORING NUMBER SB-03

PAGE 1 OF 1 Long: -96° 25' 24.528" Lat: 47° 0' 15.48"

CLIENT	PROJECT NAME Felton Gravel Exploration										
PROJECT NUMBER 19.FGO08089.000	PROJECT LOCATION Rural Felton, Minnesota										
DATE STARTED 6/17/19 COMPLETED 6/17/19	GROUND ELEVATION 1108 feet HOLE SIZE 6 1/2 in										
DRILLING CONTRACTOR NTI	GROUND WATER LEVELS:										
DRILLING METHOD 3 1/4 in H.S.A	AT TIME OF DRILLING										
LOGGED BY Chris Nelson CHECKED BY Josh Holmes	AT END OF DRILLING										
CAVE IN (ft) NR FROST DEPTH (ft) NA	AFTER DRILLING										
NOTES											
	III 18 ATTERBERG										
⊥ ♀											
(#) (#) (#) MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER NUMBER (RQD) BLOW COUNTS (N VALUE) (st) DRY UNIT WT. (pcf) MOISTURE CONTENT (%) LIQUID LIMIT LIMIT PLASTICITY SUASTICITY SUA										
	SAMPLE NUMBE NUMBE (RQD BLOW COUNT (N VALL (pcf) (pcf) MOISTU CONTENT LIQUID LIMIT PLASTICITY INDEX FINES										
0	SAMPLE TY NUMBEF RECOVERY (RQD) BLOW COUNTS (N VALUE (bcf) DRY UNIT V (pcf) MOISTUR CONTENT C LIQUID LIMIT PLASTICITY INDEX FINES										
TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	1107.0										
POORLY GRADED SAND WITH SILT, (SP-SM) brow fine grained	vn,										
5 5.0 5.0 POORLY GRADED SAND WITH SILT, (SP-SM) tan,	1103.0										
fine grained											
10 - 1											
·											
T - 1											
15											
20											
25											
30											
25 -											
35 Solution of borehole at 35.0 feet.	1073,0										
Borehole backfilled with auger cuttings.											



NOTES

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BORING NUMBER SB-04

PAGE 1 OF 1 Long: -96° 25' 28.236" Lat: 47° 0' 0.468"

·			
CLIENT		PROJECT NAME Felton Gravel Exploration	
PROJECT NUMBER _19.FGO08089.0	000	PROJECT LOCATION Rural Felton, Minnesota	
DATE STARTED 6/17/19	COMPLETED 6/17/19	GROUND ELEVATION 1106 feet	HOLE SIZE 6 1/2 in.
DRILLING CONTRACTOR NTI		GROUND WATER LEVELS:	
DRILLING METHOD 3 1/4 in H.S.A		AT TIME OF DRILLING	
LOGGED BY Chris Nelson	CHECKED BY Josh Holmes	AT END OF DRILLING	
CAVE IN (ft) NR	FROST DEPTH (ft) NA NA	AFTER DRILLING	

				PE	%		zi	7.	(%	ATT L	ERBE	RG	
DEPTH (ft)	GRAPHIC	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID	PLASTIC LIMIT	PLASTICITY INDEX	FINES
0	<u> </u>	TOPSOIL, ORGANIC CLAY WITH SAND	(01)									Δ.	
-	- 111	1.5	1104.5										
5 - 10 - 10		POORLY GRADED SAND WITH SILT, (Signal grained)	P-SM) fine										
- 15	- 111												
15		16.0	1090.0										
	-	POORLY GRADED SAND WITH GRAVE coarse grained		э									
20													
25													
30		30,0	1076.0										
		Bottom of horehole at 30.0 fee											-

Bottom of borehole at 30.0 feet. Borehole backfilled with auger cuttings.



BORING NUMBER SB-05

PAGE 1 OF 1 Long: -96° 25' 51.24"

		1	www.nugeo.com										0 (
CLIE	TV		000	PROJE	CT NAM	E Fals		- .				Lat:	47° 0'	3.96"
PROJ	ECT	19.FG008089.	000	DDO IE	CTIOO	TION	n							
DATE	STAI	RTED 6/17/19	COMPLETED _6/17/19	GROUN	ID FI FV	MOITA	1101 foot	ton, M	innesc	ota			. 2740.00	
1				GROUN	D WATE	RIFV	-1101166			_ HC	DLE SI	ZE _6	1/2 in	
DidL	IIVO I	3 1/4 In H.S.A		A ⁻										
LOGG	ED B	Y Chris Nelson	CHECKED BY Josh Holmes	A	Γ END O	DRIL	LING LING							
NOTES	IN (ft) S	NR	FROST DEPTH (ft) NA	AF	TER DR	ILLING								
						Т			_			TERBE		
王	GRAPHIC LOG				YPE	% ≻	SΘ	Ä.	¥.	щ [®]	A1	LIMITS		
DEPTH (ft)	LO RA	MAT	ERIAL DESCRIPTION		LET	VER (QD)	-OW UNT	ET P	N (p)	FIN		2	È×	FINES
	9				SAMPLE TYP NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	S,	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID	PLASTIC LIMIT	PLASTICITY INDEX	E
0	17:11	17 TOPSOIL, ORGAN	NIC CLAY WITH SAND, (OL)	4400.0	S	œ		ď		-8		<u>-</u>	PLA =	
- 7		POORLY GRADE	SAND (SP) fine to coorge grained	1100.3 ,										
		some gravel, trace	copples											4
5	4	5.0		1096.0										
		POORLY GRADED trace gravel	SAND, (SP) fine to coarse grained	1000,0										
]														
10														
-							1							
15											-	- 1		
10														
-														
20	19			1081.5										
		FAT CLAY, (CH)	of borehole at 20.0 feet.	1081.0										_
		Borehole ba	ackfilled with auger cuttings											

Borehole backfilled with auger cuttings.



DRILLING CONTRACTOR NTI DRILLING METHOD 3 1/4 in H.S.A

NOTES _

PROJECT NUMBER 19.FG008089.000

DATE STARTED 6/17/19 COMPLETED 6/17/19

LOGGED BY Chris Nelson CHECKED BY Josh Holmes CAVE IN (ft) NR FROST DEPTH (ft) NA

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BORING NUMBER SB-06

PAGE 1 OF 1 Long: -96° 25' 47.28" Lat: 47° 0' 12 276"

		241. 17 0 12.270
_	PROJECT NAME Felton Gravel Exploration	
	PROJECT LOCATION Rural Felton, Minneson	ta
	GROUND ELEVATION _1103 feet	
	GROUND WATER LEVELS:	
	AT TIME OF DRILLING 14.00 ft / Elev 10	089.00 ft
	AT END OF DRILLING	-
	AFTER DRILLING	

	_											
			Ш			Τ.	Ι.		AT	TERB	ERG	
DEPTH (ff)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)		LIMIT	<u>S</u>	FINES
0	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.5 TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	SAMF	RECC (F	SCB SCB	POCK	DRY L	MOIS	LIQUID	PLASTIC	PLASTICITY INDEX	Ę
		POORLY GRADED SAND WITH SILT, (SP-SM) fine to coarse grained, some gravel										4
5												
 	<u> </u>	9.0										
10		POORLY GRADED SAND WITH SILT, (SP-SM) fine grained, little gravel										
15	1	4.0 ♥ 1089.0 POORLY GRADED SAND WITH SILT, (SP-SM) fine to										
-		medium grained, wet, trace gravel										
20												
	22	POORLY GRADED SAND WITH SILT, (SP-SM) fine to										
25	25	mediani grained, wel, trace gravel, trace cobbles										
20	:F1 F 25	Bottom of borehole at 25.0 feet										
		Borehole backfilled with auger cuttings										

Bottom of borehole at 25.0 feet. Borehole backfilled with auger cuttings.



BORING NUMBER SB-07

PAGE 1 OF 1

Long: -96° 25' 25.284" Lat: 46° 59' 50.748"

		A 1900 A		_ PROJE	JI NAME	= Felt	on Gravel	Explor	ation					
1		NUMBER _19.FGO08089.		_ PROJE	CT LOCA	TION	Rural Felt	on, Mi	nneso	ta				
DATE	E STA	RTED 6/17/19	COMPLETED 6/17/19	GROUN	D ELEVA	TION	1104 feet			НО	LE SI	ZE 6	1/2 in.	
DKIL	LING	CONTRACTOR NTI												
DRIL	LING	METHOD 3 1/4 in H.S.A		_ ∑ A1	TIME O	F DRIL	LING _13.	00 ft /	Elev 1	091.0	0 ft			
LOGO	GED E	Y Chris Nelson	CHECKED BY Josh Holmes				ING							
CAVE	IN (ft) <u>NR</u>	FROST DEPTH (ft) NA	AF	TER DRI	LLING								
NOTE	ES													
					Ш	%		Ţ			AT	TERBI		
표_	GRAPHIC LOG				SAMPLE TYPE NUMBER	75	>2E)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)		LIMITS T	_	
DEPTH (ft)	E &	MA ⁻	TERIAL DESCRIPTION		LE.	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	(tsf)	PG N	STS	₽⊨	PLASTIC LIMIT	PLASTICITY INDEX	FINES
	ত				AMF	ECC	m O Z	Š	۳۲ ۱	N N	LIQUID	LAS	STI	됴
0	71. 11/2	TOPSOIL ODGA	NIC CLAVIANTI LOAND (CL)		<i>S</i>	<u> </u>		Δ.	Ω	O		<u>a</u>	7	
	1.11	1.8	NIC CLAY WITH SAND, (OL)	1102.2										
		POORLY GRADE grained	D SAND WITH SILT, (SP-SM) fine											
- ₋ -		32												
10														
		12.0												
			O SAND WITH SILT, (SP-SM) fine	1092.0										
		grained, wet	, (=====,,											
15														
20		19.5		1084.5										
		FAT CLAY, (CH)		1084.0										

Bottom of borehole at 20.0 feet. Borehole backfilled with auger cuttings.



BORING NUMBER SB-08

Long: -96° 25' 36.3"

CLIE	NT			DD0 1=							La	t: 46°	59. 50).568"
PRO	JECT	NUMBER 19.FGO08089.0	200	_ PROJE	CT NAM	E <u>Fe</u>	ton Gravel	Explor	ation					
				_ PROJE	CT LOCA	ATION	Rural Felt	on, Mi	nneso	ita				
DRIL	LING (CONTRACTOR NTI	COMPLETED 6/17/19	GROUN	D ELEVA	ATION	_1105 feet			_ HC	LE SI	ZE _6	1/2 in	
DRIL	LING N	METHOD 3 1/4 in H.S.A												
				Α.	TIME	F DRI	LLING			-				
CAVE	E IN (ft)	NR	CHECKED BY Josh Holmes	A	END O	- DRIL	LING							
NOTE	S		FROST DEPTH (ft) NA	Ar	IEK DK	ILLING	ن							
						_								
_	o				PE	%		z	F.	@	AT.	TERB LIMIT		
DEPTH (ft)	GRAPHIC LOG	MAT	TERIAL DESCRIPTION		YH.	1 K	BLOW COUNTS (N VALUE)	H (×	NA S				S
DE)	3RA L	IVIAT	ERIAL DESCRIPTION		PLE	1000	NA VAI	而 (語	120	TSE T	음투	STI	들 전	FINES
0					SAMPLE TYPE NUMBER	RECOVERY (RQD)	OS	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	25	PLASTIC	PLASTICITY INDEX	"
	71/2		NIC CLAY WITH SAND, (OL)	1104.0		-							<u>a</u>	
		POORLY GRADED coarse grained, tra	D SAND WITH SILT, (SP-SM) fine t	to							3			
-		gramou, na	oc graver											
5														
-														
40														
10														
1														
-														
15					2									
-														
	1	7.0 FAT CLAY, (CH)		1088.0										
		22, (011)												
20	2	0.0		4007.0	- 1	- 1								- 1

Bottom of borehole at 20.0 feet. Borehole backfilled with auger cuttings.



BORING NUMBER SB-09

PAGE 1 OF 1 Long: -96° 25' 41.484" Lat: 46° 59' 40.416"

CLIENT _			PROJEC	CT NAME	_Felt	on Gravel I	Explora	ation					
PROJECT	NUMBER _19.FGO08089.0	00	PROJEC	T LOCA	TION	Rural Felt	on. Mi	nneso	ta				
DATE STA	RTED <u>6/17/19</u>	COMPLETED _6/17/19	GROUN	D ELEVA	TION	1106 feet			_ но	LE SI	ZE 6	1/2 in.	
DRILLING	CONTRACTOR NTI		GROUNI	WATER	R LEVE	LS:							
DRILLING	METHOD 3 1/4 in H.S.A		AT	TIME O	F DRIL	LING							
LOGGED B	SY Chris Nelson	CHECKED BY Josh Holmes	AT	END OF	DRILL	ING							
CAVE IN (H	:) <u>NR</u>	FROST DEPTH (ft) NA	AF	TER DRI	LLING								
DEPTH (ft) GRAPHIC LOG		ERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	OCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID	PLASTIC LIMIT	PLASTICITY SUBJECT OF	FINES
5	POORLY GRADED trace gravel	SAND, (SP) fine to coarse grained	1097.0									<u>-</u>	
	17.0 FAT CLAY, (CH) Bottom	of borehole at 18.5 feet.	1089.0										

Borehole backfilled with auger cuttings.



BORING NUMBER SB-10

PAGE 1 OF 1

Long: -96° 25' 44.292"

1	CLIENT		'	general de la company de la co								La	it: 46°	9 59' 28	3.932
1	DDO IEC	T All IRAC	35D 40 5000000	000	_ PROJE	CT NAM	IE F	elton Gravel	Exploi	ration					
	DATEST	CCONT	<u>6/1//19</u>	COMPLETED _6/17/19	GROUN	ID FI FV	ΔΤΙΩ	1 1107 foo	t		НС	DLE SI	ZE 6	1/2 in	
					GROUN	Π WATE	BIE	VEI C.							
1'	DRILLING	3 IVIE I H	OD 3 1/4 in H.S.A		$\nabla_{\mathbf{A}}$	T TIME	חב חם	11.11.10. 40	.00 ft /	Elev	1095.0	O ft			
1			110110011	Josh Holmes	A.	T FND C	F DRI	LLING							
1				11001 DEI 111 (IL) _1VA	Al	TER DE	RILLIN	G							
L	NOTES _														
	- 1					111	1.0			T	T	T AT	TERB	FRG	_
F	(ft) (RAPHIC	:0				SAMPLE TYPE NUMBER	% }	ς s û	Ë.	¥.	₩®	LIMIT	LIMIT	S	
	(ft)	<u> </u>	MAT	ERIAL DESCRIPTION		MBE	RECOVERY	BLOW COUNTS (N VALUE)	Sf)	声色	E		١٤.	Ĕ	FINES
-	<u>ا</u> ق					MP	100		S	>	OIS	SE N	AST	ISE B	I I
	0	. <u>1</u> 0.7	TODOGU				8		9	H.	≥8		립	PLASTICITY INDEX	
-	-		POORLY GRADER	IIC CLAY WITH SAND, (OL) O SAND WITH SILT, (SP-SM) fine t	1106.3										
_]		coarse grained, littl	e gravel	.0										6
-	5														
_															
_	4	7.0			1100.0										
	- 1		medium grained, we	SAND WITH SILT, (SP-SM) fine to	0										
1	10														
	-														
	7 11	Σ	<u>7</u>												
10 L]														
1	5								_	1					
		17.0													
]		POORLY GRADED	SAND WITH SILT, (SP-SM) fine to	1090.0										
20		20.0	medium grained, tra	ce cobbles											
4	U	.JZU.U			4007.0			1		- 1	- 1		- 1	- 1	- 1

1087.0

Bottom of borehole at 20.0 feet. Borehole backfilled with auger cuttings.



BORING NUMBER SB-11

PAGE 1 OF 1 Long: -96° 26' 20.76"

	in con										1	at: 10	6º EOI	0 40411
CLI	ENT _		000	_ PROJE	ECT NAM	/IE Fe	Iton Gravel	Evnlo	ration		L	.at. 4t	6° 59' 8	3.484"
		10.1 0000003.	000	PRO IE	CTIO	ATION								
DAT	E STA	RTED <u>6/17/19</u>	COMPLETED 6/17/19	GROUN	VD FI FI	/ATION	1100 for	t		н) F S	17F 6	3 1/2 in	
1				GROUN	ND WAT	ER LE\	/ELS:			_ ''`	JLL O	ZL _0	1/2 111	
Didi	-LING I	3 1/4 In H.S.A		Α	TIME	OF DRI	LLING							
LOG	GED B	Chris Nelson	CHECKED BY Josh Holmes	A	T END C	F DRII	LING							
		:) <u>NR</u>	INOST DEPTH (III) NA	Α	FTER DI	RILLIN	G							_
					_		T	T	_	_		TEDD		_
E	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				SAMPLE TYPE NUMBER	%	(O (II)	ż	DRY UNIT WT.	ш%	AI	TERB LIMIT	ERG	
DEPTH (ft)	GRAPHIC LOG	MAT	ERIAL DESCRIPTION		LE T	(RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	1 = E	MOISTURE CONTENT (%)		O	≥	SI
	9				MPI	000	N V V	S &	5ē	NASIS I	SH	PLASTIC	ISS.	FINES
0	71.1	As TODSOU ODGE			SS	FE		8	R	≥8		157	PLASTICITY INDEX	
		POORLY GRADE	NIC CLAY WITH SAND, (OL) O SAND, (SP) fine to coarse grained	1102.2									+	
		trace gravel	, () , and to couldo grainet	4,										
 5														
_														
- 40		8.5 POORLY GRADED	SAND, (SP) fine to coarse grained	1094.5										
10		some gravel	o, into, (or) line to coarse grained	,										
-]	1	12.0		1091.0										
. 4		POORLY GRADED grained	SAND WITH SILT, (SP-SM) fine	1001.0										
15														
-														
1														
20														
20														
1														

1079.0

1078.0

FAT CLAY, (CH)

Bottom of borehole at 25.0 feet.
Borehole backfilled with auger cuttings.



BORING NUMBER SB-12

PAGE 1 OF 1 Long: -96° 25' 59.844"

Lat: 46° 59' 30 984"

CLIENT	Lat. 40 39 30.984
PROJECT NUMBER 19.FGO08089.000	PROJECT NAME Felton Gravel Exploration
DATE STARTED 6/17/10	PROJECT LOCATION Rural Felton, Minnesota
ORILLING CONTRACTOR NITI	GROUND ELEVATION 1102 feet HOLE SIZE 6 1/2 in.
DRILLING METHOD 3 1/4 in H.S.A	GROUND WATER LEVELS:
	AT TIME OF DRILLING 18.00 ft / Elev 1084.00 ft
21 Good Florings	AT END OF DRILLING
CAVE IN (ft) NR FROST DEPTH (ft) NA	AFTER DRILLING
0120	

_	$\overline{}$											
			Й	%		_;	Ţ	Τ	AT	TERB	ERG	
DEPTH (ff)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	U. ()	VTS UE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)		LIMIT		(0
ä	GR/L	WALKIAL DESCRIPTION	MPLE	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	CKET (tsf)	P S	STEN	LIQUID	PLASTIC	EX	FINES
0	7, 1×. 1/4 0.	2 TODOGU 22 2	SAI	RE	02	PO	DRY	ΣÖ	35	PLA	PLASTICITY INDEX	-
		POORLY GRADED SAND WITH SUIT (SD SM) fine to									ш.	
		medium grained, trace gravel										
5	5.	5										
		POORLY GRADED SAND, (SP) fine to coarse grained, trace gravel										
		,										
10	9.5	POORLY GRADED GRAVEL WITH SAND, (GP)										
- 5	000	ONVEL WITH SAND, (GP)										3
	0.5											
15	200											
0	0.5											
0	200	立										
20	200											
-0	0° 22.0											
		FAT CLAY, (CH) 1080.0										
25	25.0											
		Bottom of borehole at 25.0 feet. Borehole backfilled with auger cuttings.										_

Bottom of porenoie at 25.0 feet. Borehole backfilled with auger cuttings.



BORING NUMBER SB-13

PAGE 1 OF 1 Long: -96° 25' 56.532"

DRILLING METHOD 3 1/4 in H.S.A					GROUND ELEVATION 1103 feet HOLE SIZE 6 1/2 in. GROUND WATER LEVELS:										
CAVE IN (ft) NR FROST DEPTH (ft) NA NOTES					AT END OF DRIVING										
O DEPTH		MATERIAL DESCRIPTION MATERIAL DESCRIPTION TOPSOIL, ORGANIC CLAY WITH SAND, (OL)			SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID	PLASTIC LIMIT	PLASTICITY SAME	FINES	
5	5.0	POORLY GRADED coarse grained	O SAND WITH SAND, (OL) O SAND WITH GRAVEL, (SP) fine to O SAND, (SP) fine to coarse grained,												
10 15	14.0 16.0 17.0	POORLY GRADED wet, trace gravel FAT CLAY, (CH)	SAND, (SP) fine to coarse grained,	1089,0 1087.0 1086.0											

Bottom of borehole at 17.0 feet. Borehole backfilled with auger cuttings.