Soil and Site Evaluation For

Wastewater Treatment and Dispersal Systems

Winchester Road

Monroe, NC

Union County

(PIN: 08303007 & 08303007-D)

August 3, 2024

Findings: Based on the soil and site evaluation, there is a high degree of certainty that a conventional septic system could not be installed on the property. However, either a low profile chamber, drip or fill system could be installed. Using one of these systems, there is a high degree of certainty that the lot could be used for residential development.

No opinions are made regarding the following:

- Applicable zoning requirements;
- House location;
- Specific septic system layout/components; and
- Horizontal setbacks required from septic systems.

INTRODUCTION

Soil & Septic Solutions performed an on-site subsurface wastewater system investigation on a ±37 acres (PIN: 08303007 & 08303007-D) located on Winchester Road in Monroe, Union County, North Carolina on July 27, 2024. The property was evaluated in accordance with 15A NCAC 18E "Wastewater Treatment and Dispersal Systems". The purpose of this investigation was to perform an analysis of parcel capacity for subdivision for three potential lots.

At the time of the survey, the property was fallow agricultural fields and wooded. The fields typically had a slope of 2 to 5 percent and the wooded areas typically had a slope of less than 4 percent.

INVESTIGATION METHODOLOGY

Soil borings were made with a hand-turned auger in the study area. Observations of the landscape (slope, drainage patterns, past use, etc.) as well as soil properties (depth, texture, structure, seasonal wetness, restrictive horizons, etc.) to a depth ≥ 48 inches when possible were recorded. Soil color was determined with a Munsell Soil Color Chart. From these observations, potentially suitable areas for wastewater disposal were identified.

A handheld global positioning system (GPS) with sub-meter accuracy was used to locate each soil boring as well as other pertinent site features.

FINDINGS

On the day of the field investigation, twenty – eight (28) hand auger borings were made on the property, logged, and their locations are shown in the Soil Boring Location Exhibit. Soil Boring logs are attached.

Depth to rock and wetness were the limiting soil factor (See Soil Boring Logs). The shallowest depth to rock and wetness occurred at 12 and 10 inches, respectively. The areas that had limiting factors 12 inches or less are not considered suitable for septic systems. Most of the borings had saprolite, rock or wetness at least 18 inches deep. Some borings had deeper depths to these conditions that ranged from 24 to 26 inches. The soil texture was typically silty clay loam.

GENERAL DESIGN AND INSTALLATION CRITERIA

Wastewater systems can be used when there is at least 12 inches of naturally occurring soil between the bottom of the trench and the limiting condition.

The conventional type of system requires a 12 inch trench depth. With the required 12 inch soil depth and 12 inch trench depth, there needs to be at least 24 inches of suitable soil.

Low profile chamber systems could be used in areas that have at least 20 to 24 inches of soil. Low profile chambers are 8 inches tall and require the 12 inch trench separation. This system would require a 6 inch soil cap.

Drip dispersal systems can be used when there is at least 18 inches of suitable soil above a limiting condition. Based on soil borings, there is the potential to use drip systems for wastewater disposal.

Fill systems can be used when there is at least 18 inches of suitable soil and there is no soil wetness condition within the first 12 inches. Additionally, the system must have slopes less than four percent.

Permitting of the septic system may be done through the County Environmental Health Department or through the private permitting option. It is recommended that a site layout be performed to verify that there is enough space for the initial and repair systems. Additionally, careful placement of the house and other improvements will need to be considered as to maximum the area of soil that can be used for septic.

CONCLUSIONS

Depth to rock and wetness were the limiting soil condition. There does not appear to be any suitable area for a conventional type of system. There are areas that have enough suitable soil for either a drip or fill type of system. There are some areas that have enough soil depth for a low profile chamber system. Further analysis and site layout is recommended to determine the extent of the area and the potential system layout.

The exact location of the system and potential layout as well as house location and horizontal setbacks, were not calculated or defined. Careful consideration as to house location and other improvements will need to be evaluated to maximize the potential septic area.

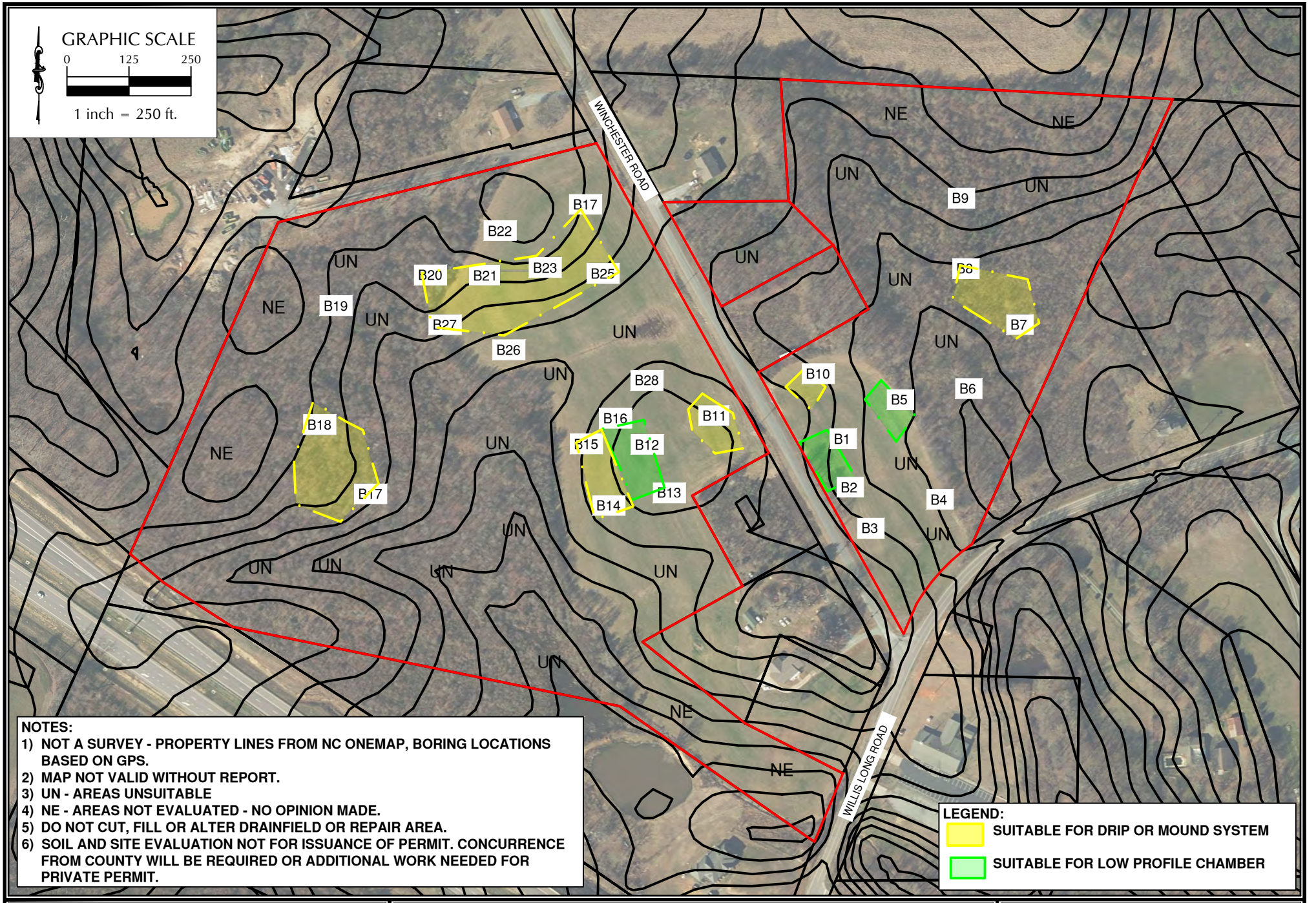
The findings presented herein represent Soil & Septic Solutions' soil and site evaluation and knowledge of the current laws and regulations governing on-site wastewater systems in North Carolina. This report discusses the general location of suitable soils and site conditions that are favorable for septic systems and does not constitute or imply any approval or permit as needed from the County Health Department.

It is Soil & Septic Solutions' professional opinion that this lot can be used for residential development if a low profile chamber, drip, or fill type system is used. Any concurrence with the findings of this report would be made during the County's site evaluation. Additionally, do not clear or grub any land until the County has granted the appropriate approvals.

Sincerely,

Attachments:

1) Soil boring Location Exhibit
2) Soil Boring Logs



WINCHESTER ROAD

MONROE UNION COUNTY NORTH CAROLINA

SOIL BORING LOCATIONS

SOIL & SEPTIC SOLUTIONS

PROPERTY ID #: _____
COUNTY: _Union_____

SOIL/SITE EVALUATION *for* ON-SITE WASTEWATER SYSTEM
(Complete all fields in full)

OWNER: _____ DATE EVALUATED: _7/27/24_____
ADDRESS: _____Winchester Road_____
PROPOSED FACILITY: _____ PROPOSED DESIGN FLOW (.0400): _____ PROPERTY SIZE: _____
LOCATION OF SITE: _____ PROPERTY RECORDED: _____
WATER SUPPLY: ☐ Public ☐ Single Family Well ☐ Shared Well ☐ Spring ☐ Other _____ WATER SUPPLY SETBACK:_____
EVALUATION METHOD: ☒ Auger Boring ☐ Pit ☐ Cut TYPE OF WASTEWATER: ☒ Domestic ☐ High Strength ☐ IPWW

PROFILE #	.0502 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY .0503 STRUCTURE/ TEXTURE	SOIL MORPHOLOGY .0503 CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .0504 SOIL WETNESS/ COLOR	OTHER PROFILE FACTORS .0505 SOIL DEPTH	OTHER PROFILE FACTORS .0506 SAPRO CLASS	OTHER PROFILE FACTORS .0507 RESTR HORIZ	.0509 PROFILE CLASS & LTAR*	.0502(d) SLOPE CORRECTION
1	L 2-3%	0-30	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/8 2.5Y 6/4 2.5Y 6/2 @ 24 “	S	-	-	S 0.3	0.72-1.08
		30-AR	ROCK							
2	L 2-3%	0-36	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/8 2.5Y 6/4 2.5YR 4/6 2.5Y 6/2 @ 25"	S	-	-	S 0.3	0.72-1.08
		36-AR	ROCK							
3	L 2-3%	0-18	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/8	U	-	-	U – MOUND SYSTEM OR DRIP	
		18-AR	ROCK							
4	L 3-5%	0-12	GR/SiL	FR/SS/SP/SEXP	2.5Y 6/4	U	-	-	U	-
		12-AR	ROCK							

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.0508)		
System Type(s)		
Site LTAR		
Maximum Trench Depth		

SITE CLASSIFICATION (.0509): _____
EVALUATED BY: ___GARY KREISER_____
OTHER(S) PRESENT: _____

Comments: _____
_____
_____
_____

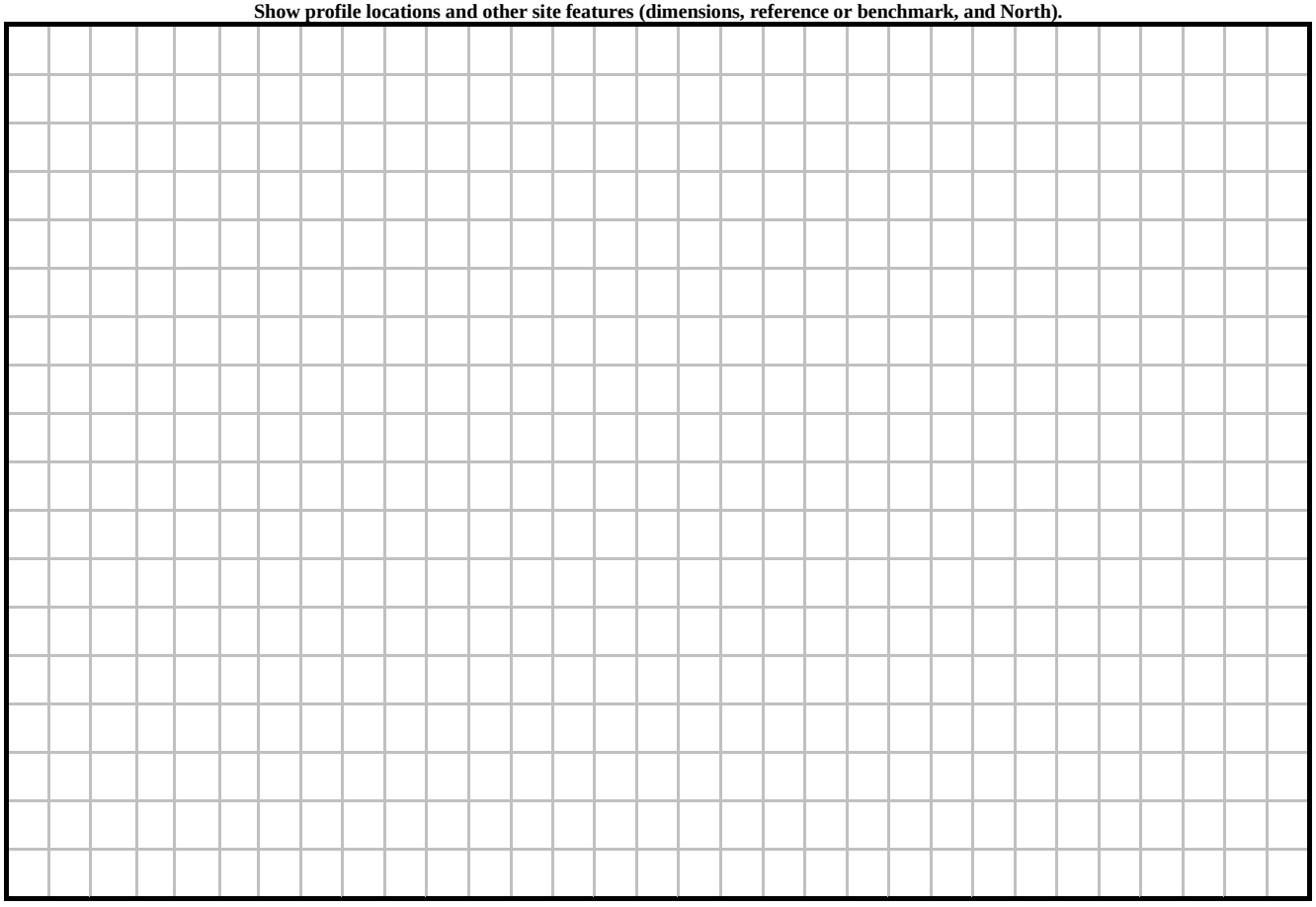
LEGEND

LANDSCAPE POSITION	SOIL GROUP	SOIL TEXTURE	CONVENTIONAL LTAR (gpd/ft²)	SAPROLITE LTAR (gpd/ft²)	LPP LTAR (gpd/ft²)	MINERALOGY/ CONSISTENCE		STRUCTURE
CC (Concave slope)	I	S (Sand)	0.8 - 1.2	0.6 - 0.8	0.4 -0.6	**MOIST**	**WET**	SG (Single grain)
CV (Convex Slope)		LS (Loamy sand)		0.5 -0.7		Lo (Loose)	NS (Non-sticky)	M (Massive)
D (Drainage way)	II	SL (Sandy loam)	0.6 - 0.8	0.4 -0.6	0.3 - 0.4	VFR (Very friable)	SS (Slightly sticky)	GR (Granular)
FP (Flood plain)		L (Loam)		0.2 - 0.4		FR (Friable)	S (Sticky)	SBK (Subangular blocky)
FS (Foot slope)	III	SiL (Silt loam)	0.3 - 0.6	0.1 - 0.3	0.15 - 0.3	FI (Firm)	VS (Very sticky)	ABK (Angular blocky)
H (Head slope)		SCL (Sandy clay loam)		0.05 - 0.15**		VFI (Very firm)	NP (Non-plastic)	PR (Prismatic)
L (Linear Slope)		CL (Clay loam)		None		EFI (Extremely firm)	SP (Slightly plastic)	PL (Platy)
N (Nose slope)		SiCL (Silty clay loam)					P (Plastic)	
R (Ridge/summit)		Si (Silt)					VP (Very plastic)	
S (Shoulder slope)	IV	SC (Sandy clay)	0.1 - 0.4		0.05 - 0.2	SEXP (Slightly expansive)		
T (Terrace)		SiC (Silty clay)				EXP (Expansive)		
TS (Toe Slope)		C (Clay)						
		O (Organic)	None					

* Adjust LTAR due to depth, consistence, structure, soil wetness, landscape, position, wastewater flow and quality.
**Sandy clay loam saprolite can only be used with advanced pretreatment in accordance with 15A NCAC 18E .1200.

HORIZON DEPTH In inches below natural soil surface
DEPTH OF FILL In inches from land surface
RESTRICTIVE HORIZON Thickness and depth from land surface
SAPROLITE S(suitable) or U(unsuitable); Evaluation of saprolite shall be by pits.
SOIL WETNESS Inches from land surface to free water or inches from land surface to soil colors with chroma 2 or less - record Munsell color chip designation
CLASSIFICATION S (Suitable) or U (Unsuitable)

Show profile locations and other site features (dimensions, reference or benchmark, and North).



SOIL/SITE EVALUATION

(Continuation Sheet-Complete all field in full)

DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH

PROPERTY ID #: _____
DATE OF EVALUATION: _____
COUNTY: _____

PROFILE #	.0502 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY		OTHER PROFILE FACTORS				.0509 PROFILE CLASS & LTAR*	.0503 SLOPE CORRECTION
			.0503 STRUCTURE/ TEXTURE	.0503 CONSISTENCE/ MINERALOGY	.0504 SOIL WETNESS/ COLOR	.0506 SOIL DEPTH	.0507 SAPRO CLASS	.0508 RESTR HORIZ		
5	L 3-5%	0-26	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 5/6	S	U	-	S 0.3	1.08-1.8
		26-33	M/SiCL	FI/SS/SP/SEXP						
		33-AR	ROCK							
6	L 2%	0-12	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/4 2.5Y 6/2 @12”	-	-	-	U	-
7	L 2%	0-18	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/4 2.5Y 6/2 @ 18”	-	-	-	U -MOUND SYSTEM OR DRIP	-
		18-30+	M/SiCL	FI/SS/SP/SEXP						
8	L 2%	0-20	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/4 2.5Y 4/6	-	-	-	U - MOUND/DRIP	
		20-36+	M/SiCL	FI/SS/SP/SEXP						
9	L 2%	0-24	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/4 2.5Y 4/6 2.5Y 6/2 @ 12”	-	-	-	U	
		24-36	M/SiCL	FI/SS/SP/SEXP						

COMMENTS:_____

SOIL/SITE EVALUATION

(Continuation Sheet-Complete all field in full)

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			.0503 STRUCTURE/ TEXTURE	.0503 CONSISTENCE/ MINERALOGY	.0504 SOIL WETNESS/ COLOR	.0506 SOIL DEPTH	.0507 SAPRO CLASS	.0508 RESTR HORIZ		
10	L 2-4%	0-18	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/4	-	-	-	U- MOUND OR DRIP	
		18-AR	ROCK							
11	L 2%	0-18	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	U	U	-	U- MOUND OR DRIP	
		18-30+	M/SiCL	FI/SS/SP/SEXP						
12	L 2%	0-32	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 5/8	S	U	-	S 0.3	0.72
		32-40	M/CL	FI/SS/SP/SEXP						
13	L 2%	0-26	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 5/5	S	-	-	S 0.3	0.72
		26-AR	ROCK							
14	L 2%	0-18	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/5	S	-	-	S 0.3	0.72
		18-30+	M/CL	FI/SS/SP/SEXP	2.5Y 5/5 2.5Y 6/2 @ 24”					

COMMENTS:_____

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			.0503 STRUCTURE/ TEXTURE	.0503 CONSISTENCE/ MINERALOGY	.0504 SOIL WETNESS/ COLOR	.0506 SOIL DEPTH	.0507 SAPRO CLASS	.0508 RESTR HORIZ		
15	L 3-5%	0-20	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	U	U	-	U MOUND OR DRIP	
		20-30	M/CL	FI/SS/SP/SEXP	2.5Y 6/2 @ 20”					
16	L 2-4%	0-26	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	S	U	-	S 0.3	0.72-1.4
		26-30	M/CL	FI/SS/SP/SEXP	2.5Y 6/2 @ 26”					
17	L 2%	0-20	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	U	U	-	U MOUND OR DRIP	
		20-24	M/CL	FI/SS/SP/SEXP	2.5Y 6/2 @ 20”					
		24-AR	AUGER REFUSAL							
18	L 2%	0-20	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	U	U	-	U MOUND OR DRIP	
		20-24	M/CL	FI/SS/SP/SEXP	2.5Y 6/2 @ 20”					
		24-AR	AUGER REFUSAL							
19	L 2%	0-26	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	U	U	-	U	
		26-AR	AUGER REFUSAL		2.5Y 6/2 @ 10”					

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			.0503 STRUCTURE/ TEXTURE	.0503 CONSISTENCE/ MINERALOGY	.0504 SOIL WETNESS/ COLOR	.0506 SOIL DEPTH	.0507 SAPRO CLASS	.0508 RESTR HORIZ		
20	L 2%	0-22	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6 2.5YR 4/6 2.5Y 6/2 @ 22”	U	U	-	U MOUND OR DRIP	
		22-30	M/SiCL	FI/SS/SP/SEXP						
21	L 2-4%	0-10	GR/SiL	FR/SS/SP/SEXP	2.5Y 4/4 2.5Y 6/4	U	U	-	U MOUND OR DRIP	
		20-24	M/SiCL	FR/SS/SP/SEXP						
		24-AR	ROCK							
22	L 2%	0-10	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/4 2.5Y 6/2, 2.5Y 4/6 @ 10”	U	U	-	U	
		10-24	M/SiCL	FI/SS/SP/SEXP						
23	L 3%	0-20	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6 2.5Y 6/2, 2.5Y 4/6 @ 20”	U	U	-	U MOUND OR DRIP	
		20-30	M/SiCL	FI/SS/SP/SEXP						
24	L 3%	0-12	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6 2.5Y 6/2, 2.5Y 4/6 @ 18”	U	U	-	U MOUND OR DRIP	
		12-30	M/SiCL	FI/SS/SP/SEXP						

COMMENTS:_____

SOIL/SITE EVALUATION

(Continuation Sheet-Complete all field in full)

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ENVIRONMENTAL HEALTH SECTION
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			.0503 STRUCTURE/ TEXTURE	.0503 CONSISTENCE/ MINERALOGY	.0504 SOIL WETNESS/ COLOR	.0506 SOIL DEPTH	.0507 SAPRO CLASS	.0508 RESTR HORIZ		
25	L 3-5%	0-10	GR/SCL	FR/SS/SP/SEXP	2.5Y 4/4	U	-	-	U MOUND OR DRIP	
		10-18	SBK/SiCL	FI/SS/SP/SEXP	2.5Y 6/4					
		18-30	M/SiC-SiCL	FI/SS/SP/SEXP	2.5Y 6/2 @20”					
26	L 5%	0-26	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/4	S	-	-	S 0.3	1.8
		26-AR	ROCK		2.5Y 6/2 @24”					
27	L 2-4%	0-18	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	S	-	-	U MOUND OR DRIP	
		18-24	M/SiC-SiCL	FI/SS/SP/SEXP	2.5Y 6/2 @ 18”					
		24-AR	ROCK							
28	L 3%	0-15	SBK/SiCL	FR/SS/SP/SEXP	2.5Y 6/6	U	U	-	U MOUND OR DRIP	
		15-24+	M/SiC-SiCL	FI/SS/SP/SEXP	2.5Y 6/2 @ 15”					

COMMENTS:_____