Engineers and Soil Scientists

Agri-Waste Technology, Inc.
501 North Salem Street
Suite 203
Apex, NC 27502
919-859-0669
www.agriwaste.com

Soils & Site Evaluation Report – On-site Wastewater Systems

442 Cedar Rock Trail
Fuquay Varina, NC 27526
Harnett County
(PIN# 0623954889)

Prepared for: Kathy & Chuck Kurtzke, Clients

Prepared by: Christopher McGee, LSS
Senior Soil Scientist

Trent Bostic, Associate Soil Scientist

Report date: August 31, 2018

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Senior Soil Scientist

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DATE: August 31, 2018

Agri-Waste Technology, Inc. (AWT) was contacted by Kathy and Chuck Kurtzke to perform a soil & site evaluation for construction of a new single-family residence at 442 Cedar Rock Trail, Fuquay Varina, NC. The following report and attachments summarize the findings of the evaluation performed by Trent Bostic on August 8, 2018.

The subject property is approximately 12.5 ac. in size. The water source for the property will be provided by public utility. The evaluated area is sloping, from east to west with forest vegetation. There is evidence of previous tree harvesting. The property was likely part of a logging operation. There is evidence of vehicle traffic and slight surface disturbance in various places.

Findings

The soils in the surrounding area are mapped Cecil and Chewacla series in the Soil Survey issued by the Natural Resources Conservation Service. Sixteen borings were advanced during the evaluation. Their locations/depths are noted on the attached evaluation map. The majority of the borings encountered dominant Saprolite at depths ranging from 24-30 inches. These depths will likely require a Low-Pressure-Pipe (LPP) or Ultra Shallow Conventional system. Typical profile descriptions are attached to this report.

The provisionally suitable soils identified on the property consists of two areas; Area A, approximately 50,000 ft^2 and Area B, approximately 89,000 ft^2 of usable soil (not including the area occupied by the proposed residence, driveway, and any other required setbacks). Typically, septic systems require approximately 7,000 to 15,000 ft^2 of space (depending on the number of bedrooms in the home). Given the slope on the property and other constraints, it is likely a pressure dosed system will be required.

Conclusions

Based on the site findings, there appears to be enough usable space for a 3 to 5-bedroom septic system. Due to the depth of the usable soils area and topography, it is likely a Low-Pressure-Pipe (LPP) or Ultra Shallow Conventional system will be required for either the initial and/or the repair area. Area A is the recommended spot on the property for the septic system. Harnett County Health Department will ultimately be responsible for issuing the permit

We appreciate the opportunity to assist you. Please contact us with any questions, concerns, or comments upon review of this package.

Summary of Attachments

Attachment 1: Subdivision Plat
Attachment 2: AWT Evaluation Map
Attachment 3: Typical Soil Profile Descriptions
Attachment 4: Example Loading Rate & Area Calculations

Sincerely,

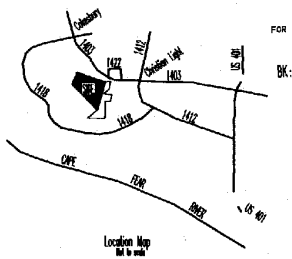
Christopher McGee, LSS

ATTACHMENT 1: Subdivision Plat

2007020869

FOR REGISTRATION REGISTER OF DEEDS
KIMBERLY S. HARGROVE
HARNETT COUNTY, NC
2007 NOV 27 09:46:36 AM
BK:2007 PG:994-995 FEE:$21.00

INSTRUMENT # 2007020869



VICINITY MAP – NO SCALE

I, C. GREGORY BAGLEY, CERTIFY THAT:

A. THIS SURVEY CREATES A SUBDIVISION OF LAND WITHIN THE AREA OF A COUNTY OR MUNICIPALITY THAT HAS AN ORDINANCE THAT REGULATES PARCELS OF LAND.

B. THIS SUBDIVISION IS LOCATED IN SUCH PORTION OF A COUNTY OR MUNICIPALITY THAT IS UNREGULATED AS TO AN ORDINANCE THAT REGULATES PARCELS OF LAND.

C. THIS SURVEY IS OF AN EXISTING PARCEL OR PARCELS OF LAND.

D. THIS SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT ORDERED SURVEY OR OTHER EXCEPTION TO THE DEFINITION OF A SUBDIVISION.

SURVEYOR'S CERTIFICATE

I, C. GREGORY BAGLEY, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK 2207, PAGE 325;) THAT THE RATIO OF PRECISION AS CALCULATED IS 1 : 20,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 6TH DAY OF OCTOBER, A.D. 2006.

SEAL L-3025

C. GREGORY BAGLEY

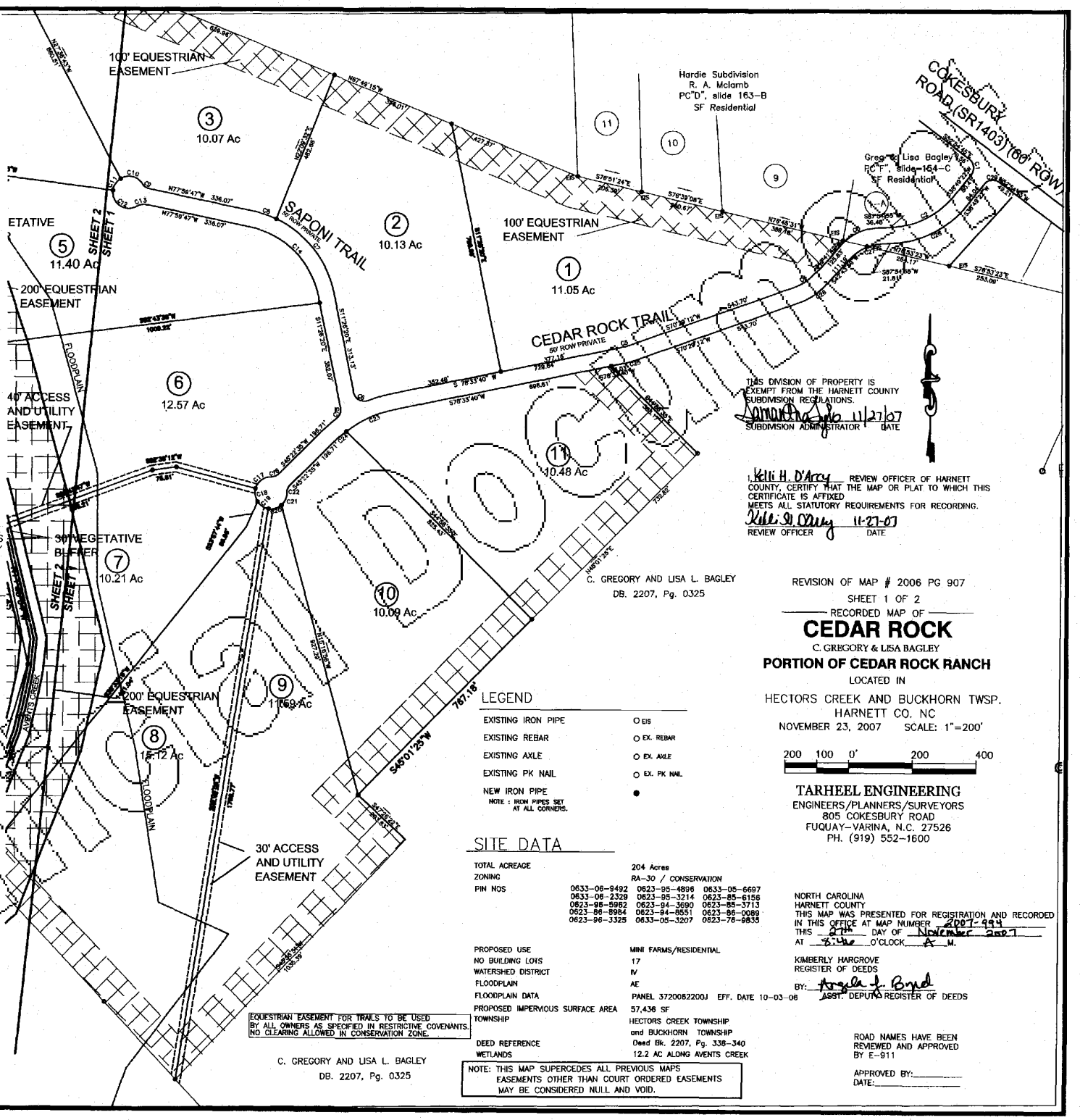
CERTIFICATE OF OWNER(S)

THE UNDERSIGNED HEREBY CERTIFY THAT I AM (WE ARE) THE OWNER(S) OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF HARNETT COUNTY AND THAT I (WE) HEREBY ADOPT THIS PLAT WITH MY (OUR) FREE CONSENT.

OWNER — DATE 11-26-07

OWNER — DATE

CURVE TABLE					
CURVE	LENGTH	RADIUS	TANGENT	BEARING	CHORD
C1	58.04	35.00	36.08	N07°02'42"W	50.24
C2	235.83	275.00	125.59	N63°22'08"E	228.46
C3	130.23	185.00	68.72	S65°18'18"W	128.87
C4	71.77	145.00	36.64	N86°16'27"E	71.04
C5	42.98	305.00	21.53	N74°31'26"E	42.95
C6	81.04	35.00	41.65	S81°23'56"E	53.59
C7	304.71	325.00	164.59	N38°17'54"W	293.87
C8	72.83	325.00	36.57	N71°34'38"W	72.67
C9	27.56	35.00	14.53	S39°28'44"E	26.86
C10	77.23	50.00	48.71	N77°08'48"W	69.78
C11	44.64	50.00	23.93	S33°01'51"W	43.17
C12	113.93	50.00	108.59	S52°46'10"E	90.83
C13	27.56	35.00	14.53	S76°27'14"W	26.86
C14	319.45	275.00	180.50	N44°43'04"W	301.79
C15	39.07	35.00	21.86	N20°32'48"E	37.08
C16	27.56	35.00	14.53	N67°55'34"E	26.86
C17	66.86	50.00	38.70	S82°44'19"W	61.20
C18	42.25	50.00	22.48	S08°32'11"E	41.00
C19	43.44	50.00	22.00	S67°09'11"E	40.27
C20	43.36	50.00	23.14	N74°15'51"E	42.00
C21	42.89	50.00	22.86	N24°51'07"E	41.50
C22	27.55	35.00	14.53	S22°49'37"W	26.84
C23	183.32	385.00	83.05	S65°44'33"W	181.98
C24	49.08	385.00	24.08	S48°09'01"W	48.05
C25	50.03	355.00	25.06	N74°31'26"E	49.99
C26	98.53	185.00	49.27	N56°18'21"E	95.54
C27	118.29	150.00	62.42	S85°19'22"W	115.25
C28	278.47	225.00	148.43	N63°22'08"E	270.03
C29	53.92	35.00	33.96	S82°57'18"W	48.74



LEGEND

EXISTING IRON PIPE	○ EIS
EXISTING REBAR	○ EX. REBAR
EXISTING AXLE	○ EX. AXLE
EXISTING PK NAIL	○ EX. PK NAIL
NEW IRON PIPE	●

NOTE : IRON PIPES SET AT ALL CORNERS.

SITE DATA

TOTAL ACREAGE	204 Acres
ZONING	RA-30 / CONSERVATION
PIN NOS	0633-06-9492 0623-95-4896 0633-05-6697 0633-06-2329 0623-95-3214 0623-85-6156 0623-95-5982 0623-94-3690 0623-85-3713 0623-86-8984 0623-94-8551 0623-86-0089 0623-96-3325 0633-05-3207 0623-76-9835
PROPOSED USE	MINI FARMS/RESIDENTIAL
NO BUILDING LOTS	17
WATERSHED DISTRICT	IV
FLOODPLAIN	AE
FLOODPLAIN DATA	PANEL 3720052200J EFF. DATE 10-03-06
PROPOSED IMPERVIOUS SURFACE AREA	57,436 SF
TOWNSHIP	HECTORS CREEK TOWNSHIP and BUCKHORN TOWNSHIP
DEED REFERENCE	Deed Bk. 2207, Pg. 336-340
WETLANDS	12.2 AC ALONG AVENTS CREEK

NOTE: THIS MAP SUPERCEDES ALL PREVIOUS MAPS EASEMENTS OTHER THAN COURT ORDERED EASEMENTS MAY BE CONSIDERED NULL AND VOID.

REVISION OF MAP # 2006 PG 907

SHEET 1 OF 2

RECORDED MAP OF

CEDAR ROCK

C. GREGORY & LISA BAGLEY

PORTION OF CEDAR ROCK RANCH

LOCATED IN

HECTORS CREEK AND BUCKHORN TWSP.
HARNETT CO. NC

NOVEMBER 23, 2007 SCALE: 1"=200'

200 100 0' 200 400

TARHEEL ENGINEERING
ENGINEERS/PLANNERS/SURVEYORS
805 COKESBURY ROAD
FUQUAY-VARINA, N.C. 27526
PH. (919) 552-1600

NORTH CAROLINA
HARNETT COUNTY
THIS MAP WAS PRESENTED FOR REGISTRATION AND RECORDED IN THIS OFFICE AT MAP NUMBER 2007-994
THIS 27th DAY OF November 2007
AT 9:46 O'CLOCK A M.
KIMBERLY HARGROVE
REGISTER OF DEEDS
BY: Angela L. Byrd
ASST. DEPUTY REGISTER OF DEEDS

ROAD NAMES HAVE BEEN REVIEWED AND APPROVED BY E-911

APPROVED BY:_____
DATE:_____

map#2007-994

ATTACHMENT 2: AWT Evaluation Map

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Preliminary
Soil Evaluation Map

Kurtzke
Harnett Co. NC

N

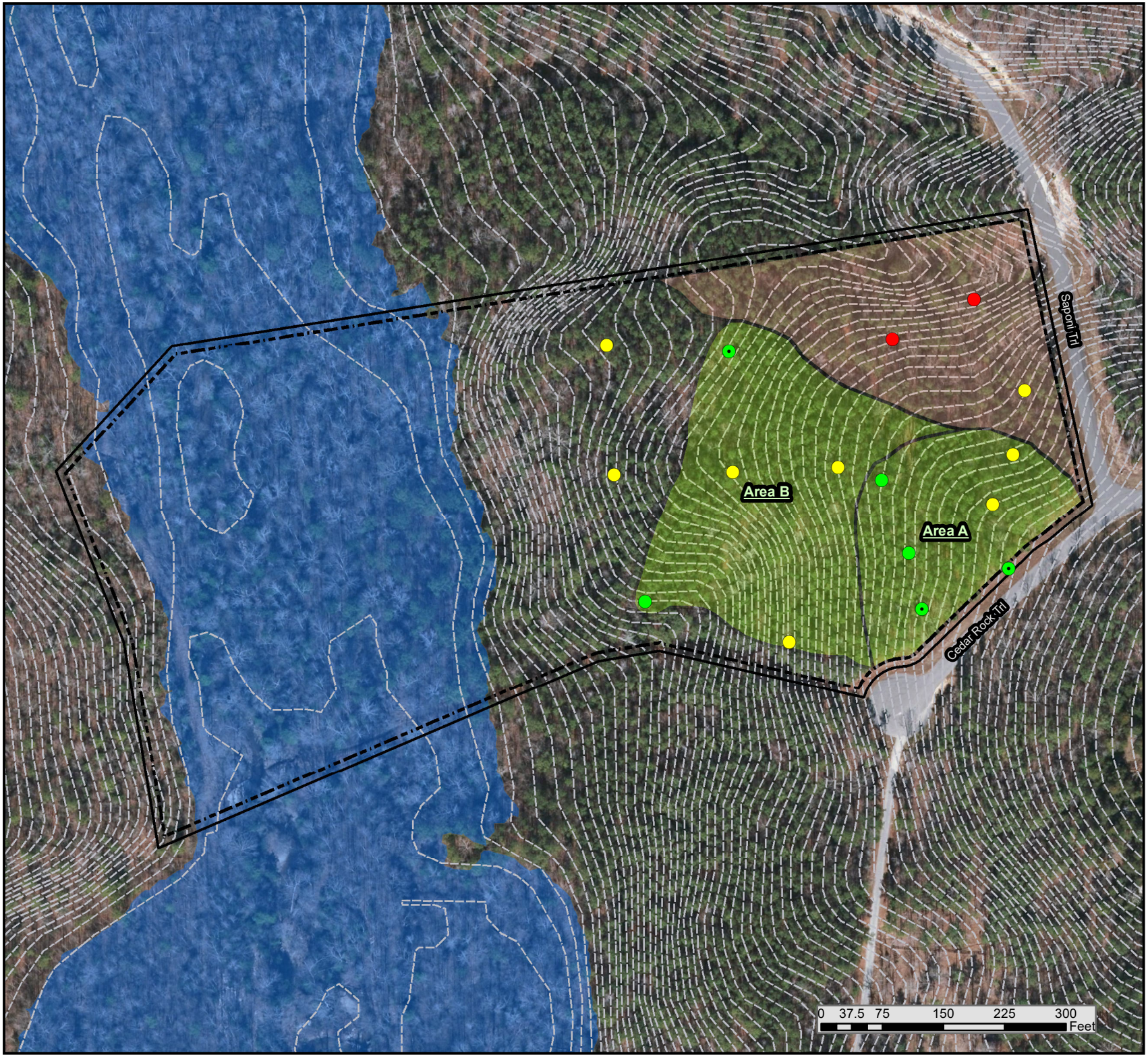
Suitable Area:

Area A ~ 49,905 sq. ft.
Area B ~ 89,273 sq. ft

Total ~ 139,178 sq. ft.

Soil Types:

CH-Chewacla and Congaree loams
CeD-Cecil fine sandy loam



Legend
- Suitable Area
- Unsuitable Area
- Parcel Buffer 10'
- Parcel
- FEMA Flood Zone
- 2 ft. Contour

Soil Boring Depth (in.)
- 12-17"
- 24-29"
- 30-35"
- 36"

Drawn By: Trevor Hackney
Reviewed By: Chris McGee
Date: 8/29/18

*** This map was created for proposed planning purposes only. It is not intended to be used as a plat or survey map of any type.***

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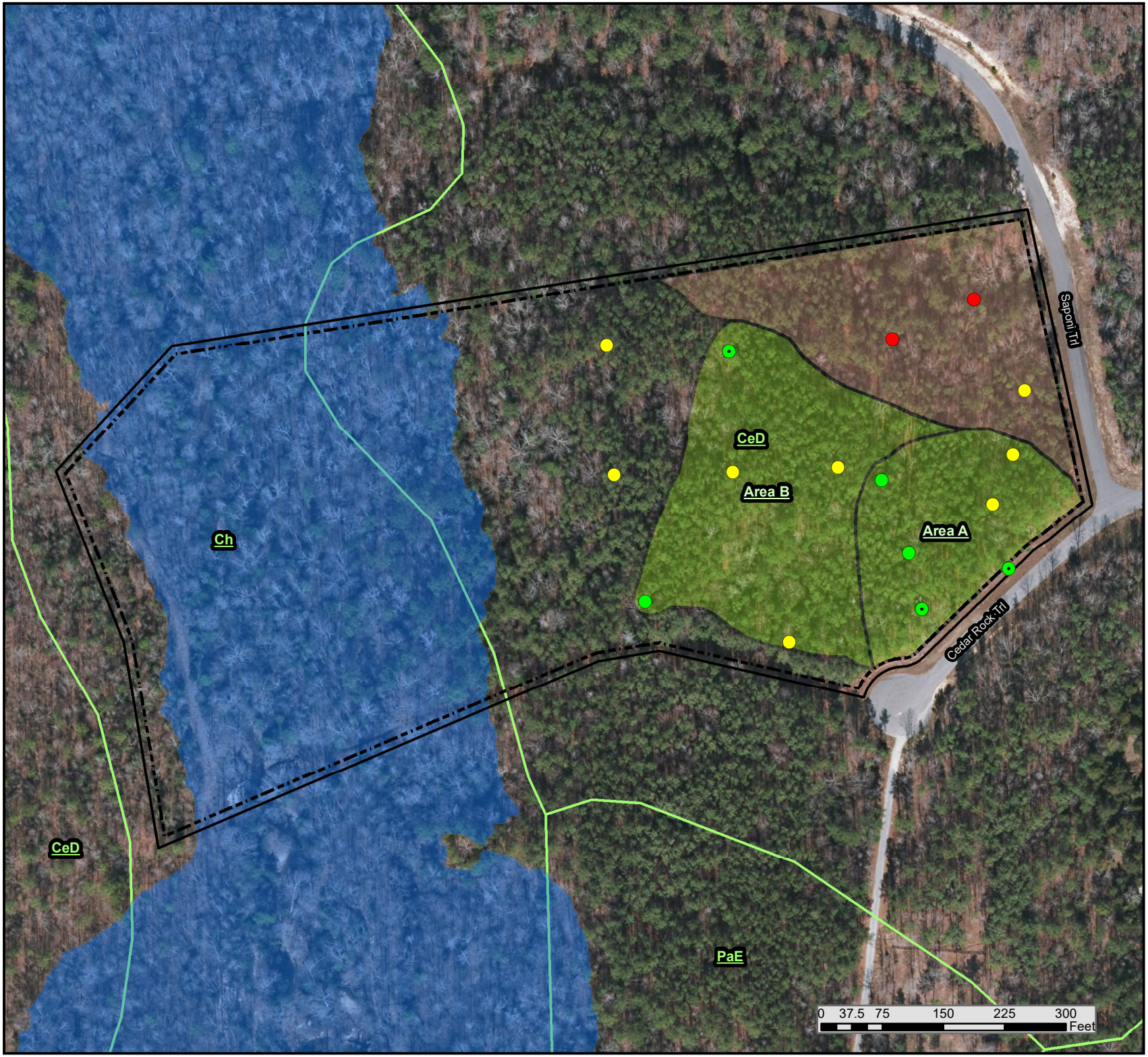
Legend
- Suitable Area
- Unsuitable Area
- Parcel Buffer 10'
- Parcel
- Soil Types Web Soil Survey 2017
- FEMA Flood Zone

Soil Boring Depth (in.)
- 12-17"
- 24-29"
- 30-35"
- 36"

Drawn By: Trevor Hackney
Reviewed By: Chris McGee
Date: 8/29/18



*** This map was created for proposed planning purposes only. It is not intended to be used as a plat or survey map of any type.***

ATTACHMENT 3: Typical Soil Profile Descriptions

PIN#: 0623-95-4889
Property Recorded: (see survey)
County: Harnett

SOIL/SITE EVALUATION
FOR
ON-SITE WASTEWATER SYSTEM

Client: Kathy & Chuck Kurtzke (buyers)
Address:

Owner: ____ Agent: ____ Buyer: X
Dates Evaluated: 08/08/2018
Proposed Facility: 1 Single Family Residence
Property Size: ~12.5 ac.

Location Site: 442 Cedar Rock Trail, Fuquay Varina, NC

Water Supply: On-Site Well___ Comm. Well___ Public X Other___ Evaluation Method: Auger Boring X Pit____Cut_____

TYPICAL PROFILE 1

Horizon/ Depth (IN)	Matrix	Mottles	Mottle Abundance / Contrast	(a)(1) Texture	(a)(2) Structure	(a)(3) Minerology	Consistence (Wet)	Consistence (Moist)
A 0-6"	**10YR 4/3**	**N/A**	**N/A**	**SL**	**GR**	**NEXP**	**NS, NP**	**VFr**
E 7-12"	**7.5YR 5/6**	**N/A**	**N/A**	**SL**	**GR**	**NEXP**	**NS, NP**	**VFr**
Bt 13-28"	**7.5YR 5/6**	**10YR 4/6, 2.5YR4/6**	**1, D, m**	**SCL**	**SBK**	**SEXP**	**SS, SP**	**Fi**
BC 29-36"	**2.5YR 5/6**	**10YR 6/8**	**3, D, f**	**CL**	**w/SBK**	**SEXP**	**SS, SP**	**Fr**

.1940 Landscape Pos/Slope %	- Linear Slope/ 10-12%	Profile LTAR (estimated)	0.1-0.3 GPD/FT^2
.1942 Wetness Condition	- PS	System Type	LPP or Low Profile Chamber Systems.
.1943/.1956 Saprolite	- PS for LPP or LP Chamber		
.1944 Restrictive Horizon	- PS		
.1948 Profile Classification	- PS		

Comments: Depth to BC/dominant Saprolite ranged from 24 inches to 30 inches.

EVALUATED BY: Trent Bostic
COMMENTS:

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

LANDSCAPE POSITION

CC - Concave Slope
CV - Convex Slope
DS - Debris Slump
D - Depression
DW - Drainage Way
FP - Flood Plain
FS - Foot Slope
H - Head Slope
I - Interflueve
L - Linear Slope
N - Nose Slope
P - Pocosin
R - Ridge
S - Shoulder
T - Terrace

STRUCTURE

G - Single Grain
M - Massive
CR - Crumb
GR - Granular
SBK - Subgranular Blocky
ABK - Angular Blocky
PL - Platy
PR – Prismatic

TEXTURE GROUP

I

II

III

IV

MOIST CONSISTENCE

Vfr - Very Friable
Fr - Friable
Fi - Firm
Vfi - Very Firm
Efi - Extremely Firm

TEXTURE CLASS

S - Sand
LS - Loamy Sand

SL - Sandy Loam
L - Loam

SCL - Sandy Clay Loam
CL - Clay Loam
SiL - Silt Loam
Si - Silt
SiCL - Silt Clay Loam

SC - Sandy Clay
C - Clay
SiC - Silty Clay
O - Organic

.1955 LTAR(gal/day/sqft)

1.2 - .08

0.8 - 0.6

0.6 - 0.3

0.4 - 0.1

MOTTLES

1 - Few
2 - Common
3 - Many

F - Faint
D - Distinct
P - Prominent

f - Fine
m - Medium
c - Coarse

WET CONSISTENCE

NS - Non Sticky
SS - Slightly Sticky
S - Sticky
VS - Very Sticky

NP - Non Plastic
SP - Slightly Plastic
P - Plastic
VP - Very Plastic

ATTACHMENT 4: Example Loading Rate & Area Calculations

Conventional Septic System Area Computation

Created by: TB
Created on: 9/5/2018
Updated on: N/A

Client Name:	*Kurtzke*	
Number Bedrooms:	***3***	
Design Flow (gal/day):	360	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.3*	
Trench Bottom Area (ft^2):	1200	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	400	(Conventional - Pipe & Gravel)
Minimum Field Area Required (ft^2):	3600	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	2700	(25% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	9000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	6750	(25% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	10800	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	8100	(25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name:	*Kurtzke*	
Number Bedrooms:	***4***	
Design Flow (gal/day):	480	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.3*	
Trench Bottom Area (ft^2):	1600	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	533.3333	(Conventional - Pipe & Gravel)
Minimum Field Area Required (ft^2):	4800	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	3600	(25% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	12000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	9000	(25% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	14400	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	10800	(25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name:	*Kurtzke*	
Number Bedrooms:	***5***	
Design Flow (gal/day):	600	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	*0.3*	
Trench Bottom Area (ft^2):	2000	(Design flow/LTAR)
Trench Width (ft):	3	
On-center distance between trenches (ft):	9	
Trench Bottom Length (ft):	666.6667	(Conventional - Pipe & Gravel)
Minimum Field Area Required (ft^2):	6000	(Trench Bottom Length*Trench on-center distance)
Minimum Field Area Required (Innovative) (ft^2):	4500	(25% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	15000	(Minimum field area*2.5)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	11250	(25% reduction from above)
Total Field Area Required (ft^2)$^{(1)}$:	18000	(Minimum field area*3)
Total Field Area Required (Innovative) (ft^2)$^{(1)}$:	13500	(25% reduction from above)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Low Pressure Septic System Area Computation

Created by: TB
Updated on: 8/31/2018

Client Name:	*Kurtzke*	
Number Bedrooms:	***4***	
Design Flow (gal/day):	480	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	***0.1***	
Trench Bottom Area (ft^2):	4800	(Design flow/LTAR)
Trench Width (ft):	1.5	
On-center distance between trenches (ft):	5	
Trench Bottom Length (ft):	960	
Minimum Field Area Required (ft^2):	4800	(Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft^2)$^{(1)}$:	12000	(Minimum field area*2.5)
Total Field Area Required (ft^2)$^{(1)}$:	14400	(Minimum field area*3)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name:	*Kurtzke*	
Number Bedrooms:	***4***	
Design Flow (gal/day):	480	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	***0.11***	
Trench Bottom Area (ft^2):	4363.636	(Design flow/LTAR)
Trench Width (ft):	2	
On-center distance between trenches (ft):	5	
Trench Bottom Length (ft):	872.7273	
Minimum Field Area Required (ft^2):	4363.636	(Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft^2)$^{(1)}$:	10909.09	(Minimum field area*2.5)
Total Field Area Required (ft^2)$^{(1)}$:	13090.91	(Minimum field area*3)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.

Client Name:	*Kurtzke*	
Number Bedrooms:	***4***	
Design Flow (gal/day):	480	(120 gal/day/bedroom, minimum 240 gal/day/dwelling)
LTAR (gal/day/ft^2)	***0.12***	
Trench Bottom Area (ft^2):	4000	(Design flow/LTAR)
Trench Width (ft):	2	
On-center distance between trenches (ft):	5	
Trench Bottom Length (ft):	800	
Minimum Field Area Required (ft^2):	4000	(Trench Bottom Length*Trench on-center distance)
Total Field Area Required (ft^2)$^{(1)}$:	10000	(Minimum field area*2.5)
Total Field Area Required (ft^2)$^{(1)}$:	12000	(Minimum field area*3)

(1) Provides for reserve area and soil irregularity, 2.5 to 3 is multiplier.