ctors Based on Soil Texture
ound Slope

LINEAR LOADING RATE FACTORS (f)						
Natural Ground Slope						
0–2%	2.1–4%	4.1–6%	6.1–8%	8.1–10%	10.1–15%	15.1–20%
7.5	32.4	37.4	52.4	52.4	52.4	52.4
3.7	11.2	18.7	26.2	33.7	33.7	33.7
1.5	4.4	7.5	10.5	13.5	18.7	26.2
1.1	3.4	5.6	7.9	10.1	14.6	22.6
0.7	2.2	3.7	5.2	6.7	9.4	13.1
0.4	1.1	1.9	2.6	3.4	4.7	6.5
0.2	0.7	1.1	1.6	2.0	2.8	3.9

"Descriptive Desktop Mounding Analysis" dated
of Vermont Agency of Natural Resources
ition, Wastewater Management Division.

Basis of Design for Mound Style Wastewater Disposal System

Design Flow:
- For a 4 Bedroom Single Family
- Design Flow = 3 bedrooms * 140gpd gal/day/bedroom = 420 gals/day
  - Additional bedroom based on 1 person per bedroom = 70 gpd

Total Design Flow = 490 gpd

Application Rate:
- For mound system
- Application rate = D = 1.0 gals/s.f./day

Required Leach Area:
- Area required = $\frac{490}{1.0}$ = 490 s.f.
- Use 8' wide Bed
- Required system length = $\frac{490\ s.f.}{8\ ft.}$ = 61.25 ft

-Use 1, 62' long x 8' wide bed style mound

Mound Elevation Information

Existing Ground	Design H.S.W.T.	Bottom Stone	Pipe Inverts	Top Stone	Finish Grade
406.00	404.75	408.5	409.16	409.50	410.50

Basal Area Calculations

For Percolation rate of 0–60 minutes per inch,
Required effective basal area = 490 GPD/0.74 GPD/SF = 662 SF
Primary effective basal area provided = 1650 SF

Percolation Tests

Test #	Percolation Rate
A	33 min./inch
B	31 min./inch

opper or
t water service
minimum 6' of
ter lines must
om wastewater
10' from
er pipes.

Soil Logs

Engineer/Designer: Jay Renshaw
Excavation Date: April 6 ,2016
Others Present: Brian Tremback (Town of Charlotte)
Others Present: Don Morris (Applicant/Owner)

NLWTD = No ledge or water to depth
NWTD = No water to depth
HSWT = High seasonal water table
REDOX = Redoximorphic Features

TP #1
0"–8" Dark brown, loam/very fine sandy loam, crumb structure, soft, damp, loose, many roots
8"–13" Dull yellow brown, very fine sandy loam, subangular blocky, semi loose, damp, roots
13"–19" Light dull brown, very fine sandy loam, weak platy structure, faint redox features @ 15"
19"–29" Brown silt loam, platy structure, damp, few roots, distinct redox features
29"–36" Seep (filled with ground water)
HSWT @ 15" NLTD

TP #2
0"–6" Dark brown, loam/very fine sandy loam, fine granular structure, loose, many roots
6"–16" Light brown, very fine sandy loam, weak subangular blocky, semi loose, damp, roots faint redox @ 16"
16"–36" Dull brown, very fine sandy loam/silt loam, weak platy structure, damp to wet, common redox features
HSWT @ 16" NLTD Seep @ 36"

TP #3
0"–6" Dark brown, loam/very fine sandy loam, crumb structure, soft, damp, loose, many roots
6"–12" Yellow brown, very fine sandy loam, subangular blocky, semi loose, damp, roots
12"–18" Light dull brown, very fine sandy loam, weak subangular blocky, faint redox features @ 18"
18"–36" Brown silt loam, platy structure, damp, few roots, distinct redox features
36"–43" Seep (filled with ground water)
HSWT @ 18" NLTD

TP #4
0"–6" Dark brown, loam/very fine sandy loam, crumb structure, soft, damp, loose, many roots
6"–18" Yellow brown, very fine sandy loam, subangular blocky, very loose, slight dampness, roots, faint redox features @ 18"
18"–29" Light dull brown, very fine sandy loam, weak subangular blocky, common redox features
29"–36" Brown silt loam, platy structure, damp, few roots, distinct redox features
HSWT @ 18" NLWTD

TP #5
0"–8" Dark brown, fine sandy loam, fine granular structure, loose, many roots
8"–18" Yellow brown, very fine sandy loam, subangular blocky, very loose, slight dampness, roots, faint redox features @ 18"
18"–36" Light dull brown, very fine sandy loam/weak subangular blocky
36"–40" Grey silt loam, saturated, slight seep @ 36"
HSWT @ 18" NLTD

TP #6
0"–8" Dark brown, fine sandy loam, fine granular structure, damp, loose, many roots
8"–18" Yellow brown, very fine sandy loam, subangular blocky, very loose, roots, faint redox features @ 18"
18"–30" Light dull brown, very fine sandy loam, subangular blocky, common redox features
30"–36" Seep (filled with ground water)
HSWT @ 18" NLTD Seep @ 30"

TP #7
0"–6" Dark brown, fine sandy loam, fine granular structure, damp, loose, many roots
6"–18" Yellow brown, very fine sandy loam, subangular blocky, very loose, roots, faint redox features @ 18"
18"–29" Light dull brown, very fine sandy loam/silt loam, weak subangular blocky, common redox features
29"–36" Seep (filled with ground water)
HSWT @ 18" NLTD Seep @ 29"

TP #8
0"–10" Dark brown, fine sandy loam, fine granular structure, damp, loose, many roots
10"–15" Yellow brown, very fine sandy loam, subangular blocky, loose, roots, faint redox features @ 15"
15"–36" Light dull brown, very fine sandy loam/silt loam, weak subangular blocky, common redox features
HSWT @ 15" NLTD Seep @ 36"

TP #9
0"–6" Dark brown, very fine sandy loam, saturated, many roots, possible redox @ 6"
6"–36" Seep (filled with ground water)
HSWT @ surface NLTD Seep @ 6"

TP #10
0"–10" Dark brown, fine sandy loam, fine granular structure, damp, loose, excessive roots, possible redox features @ 10"
10"–20" Dull brown/grey, very fine sandy loam, moderate platy structure, loose, roots, common redox features
20"–36" Grey silt loam/very fine sandy loam, moderate cemented structure, prominent redox features
HSWT @ 10" NLWTD

TP #11
0"–10" Dark brown, fine sandy loam, fine granular structure, damp, loose, excessive roots, redox features @ 10"
10"–33" Dull brown/grey, very fine sandy loam/clay loam, moderate platy structure, loose, roots, common redox features
33"–36" Grey silt loam/very fine sandy loam, moderate cemented structure, prominent redox features
HSWT @ 10" NLWTD

Legend

- Soil test hole
- percolation test
- TBM #1 — Temporary bench mark
- Finish Contour
- Building Envelope
- 150 — Existing Contour
- FM — New Sewer Forcemain
- W — New Water Service
- 12 — Survey Control Point
- Approximate Property Line
- Wastewater disposal bed

Notes:

1. This plan is not a boundary survey. The property lines shown are based on tax maps of Charlotte. Property lines are considered approximate.
2. The underground utilities shown on this plan are based on visible utilities located during a topographic survey performed by Krebs & Lansing in May 3, 2016. Underground utilities are approximate and not warranted to be exact or complete. Dig Safe shall be contacted prior to any excavation.
3. Elevations are based on the NAVD 88 (Geoid 12A) vertical datum.
4. Project Horizontal Coordinates derived from GPS observation using reference frame NAD83 (2011) 2010.00 epoch.
5. The sole intent of this plan is to provide the applicant with the required information in the pursuit of wastewater system and potable water supply permit to construct a single family residence..

0' 20' 40' 80' 120'
Bar Scale 1" = 20'

For Permit Review

Date revised	Description	Checked	Date

Design	JAR
Drawn	JAR
Checked	WHH
Scale	1"=20'
Date	May 9, 2016
Project	16113

Wastewater Design Plan

Morris Residence

700 Mount Philo Road — Charlotte, Vermont

KREBS & LANSING Consulting Engineers, Inc.
164 Main Street, Colchester, Vermont 05446

C-2

Site Specific Effluent Mounding Analysis
Peyser Property-Lot A
Mt. Philo Rd, Charlotte, VT.

In order to support the proposed performance based mound-type disposal system design and show that the soils can accommodate the design flow rate associated with a year-round four-bedroom residence, a site specific hydrogeologic analysis using Darcy's Law was conducted. The following formula was used to determine the ability of the soil to accept the proposed amount of wastewater and determine its impact on the shallow seasonal ground water system.

Using the equation:

$Q = k \cdot i \cdot h \cdot l$ Where: Q= Volume= 490 gallons/ day = 65.5 ft^3/ day;
k= Hydraulic Conductivity = 30 ft./ day (approved k value for very fine to fine sandy loam with moderate to strong blocky structure);
i= Gradient = 8% = 0.08ft/ft;
h= 0.5' effluent mound height;
l= solve for mound length

When solving this equation for l, an effluent mound of 0.50' was assumed. Since evidence of a seasonal high ground water system was identified at 15" or 1.25' with an induced mound of 0.50', 0.75' of unsaturated soil will remain. To maintain the required 3' separation to the induced mound, 3' – 0.75' or 2.25' of state approved mound sand is required beneath the application area.

Analysis by Stephen Revell CPG,
LD#178BW and Senior Hydrogeologist

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