

Letter of Transmittal

To: Tom Mansfield
Town of Charlotte
Zoning Administrator / Deputy Health Officer
PO Box 119
Charlotte, VT 05445-0119

From: John Pitrowiski, P.E. Date: 6/11/13
Project Number: 2013032-1 Project Name: Guinea Road Subdivision

Please find attached the following items:

Copies	Description	Date
1	Cover Letter	6/6/13
1	Wastewater System & Potable Water Supply Permit Application	As Shown
1	Schnopp Living Trust Document (Signature Authority)	As Shown
1	Act 145 "Form 1" Notifications Sent	5/31/13
1	Act 145 "Form 4" Certification and Cert'd Mail Receipts	6/6/13
1	Planchek Fee Payment (\$580.00)	6/6/13
1	EPS of VT Hydrogeologic Study (John Kelliher)	5/29/13
1	Lincoln Applied Geology Peer Review Letter (Steve Rivell)	6/6/13
1	Lot 2 and Lot 3 Pump Station Design Brief	6/6/13
2	Sets of Subdivision and Sanitary Plan	As Shown

Comments:

Tom,

Please let me know if you need any other info or if anything is missing.

Thanks
Nate H.

S:\TCE PROJECTS\2013\032 Hergenrother - Charlotte\03-Water-Waste\WW Permit\App\WWApp Transmittal.docx

Copied to: File, Tom Hergenrother

Signed: 



June 6, 2013

Tom Mansfield
Town of Charlotte
Zoning Administrator / Deputy Health Officer
PO Box 119
Charlotte, VT 05445-0119

Re: Guinea Road Subdivision – Water/Wastewater Permit Application
Schnopp Living Trust & Hergenrother Construction, Inc
487 Guinea Road – Charlotte, Vermont

Dear Tom:

Attached please find Trudell Consulting Engineers' (TCE) WW permit application submittal package for the water, wastewater and subdivision of the existing lot at 487 Guinea Road in Charlotte.

Please let me know if you require additional information or have any questions. We look forward to your approval.

Very truly yours,
Trudell Consulting Engineers (TCE)

Nathan Howells, P.E.
Project Manager

Cc: Thomas Hergenrother
Helen Schnopp
File

S:_TCE PROJECTS\2013\052 Hergenrother - Charlotte\03-Water-Waste\WW Permit App\WW App Cover Letter.doc

TRUDELL CONSULTING ENGINEERS

478 BLAIR PARK ROAD, WILLISTON, VT 05495 | 802.879.6331 | WWW.TCEVT.COM

HERGENROTHER CONSTRUCTION, LLC

PH (802) 660-0907
97 BLAKELY RD, SUITE 103
COLCHESTER, VT 05446

1934
51-7218/2211
80301

Pay to the
Order of

Town of Charlotte
Five Hundred Eighty dollars ⁰⁰/₁₀₀ \$ *580*⁰⁰

Dollars

**People's United
Bank**

peoples.com

For



⑆ 221172186⑆ 0015240555⑆

1934

Drinking Water & Groundwater Protection Division - Permit Application Wastewater System & Potable Water Supply



For Office Use Only:

Application#	PIN#	Date Complete Application Received
<input type="text"/>	<input type="text"/>	<input type="text"/>

Authority:
10 V.S.A. Chapter 64, the Environmental Protection Rules, Chapter 1, Wastewater System & Potable Water Supply Rules, and Chapter 21, Water Supply Rules, Appendix A. Part 11 - Small Scale Water Systems.

General Information:
The organization and/or content of this form may not be altered, however, the form is designed to expand to allow additional information to be entered. Changes in the organization and/or content of the form may result in an invalid application or permit.

In most cases a licensed designer will be required for your project and to help complete this application form. There are also line-by-line instructions available to assist with completing this form.

NOTE: We strongly suggest referring to the application instructions while completing this application form.

Part I Applicant (Landowner) & Project Contact Information

Section A - Applicant Details (if Landowner is an Individual or Individuals)

1 Last Name		2 First Name (and Middle Initial if appropriate)	
<input type="text"/>		<input type="text"/>	
3 Mailing Address Line 1		4 Mailing Address Line 2	
<input type="text"/>		<input type="text"/>	
5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
<input type="text"/>	<input type="text"/>	United States	<input type="text"/>
9 Email Address			10 Telephone
<input type="text"/>			<input type="text"/>

Remove This Applicant

Add Another Applicant

Section B - Applicant Details (if Landowner is other than an Individual or Individuals, e.g. Corporations, Homeowner's Associations, etc.)

1 Registered Legal Entity or Organization Name			2 Telephone
Schnopp Living Trust			<input type="text"/>
3 Mailing Address Line 1		4 Mailing Address Line 2	
c/o Donna T. Bjerke, Trustee		487 Guinea Rd	
5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
Charlotte	Vermont	United States	05445

Certifying Official
The Certifying Official must be a person who has signatory authority for the legal entity or organization that is the Applicant.

9 Certifying Official Last Name		10 Certifying Official First Name (and MI if appropriate)	
Bjerke		Donna T.	
11 Certifying Official Title			
Trustee			
12 Certifying Official Email Address			13 Telephone
<input type="text"/>			<input type="text"/>

Remove This Applicant

Add Another Applicant

Section C - Primary Contact Information (if other than Applicant)			
1 Last Name Hergenrother		2 First Name (and Middle Initial if appropriate) Thomas	
3 Mailing Address Line 1 Hergenrother Construction, LLC		4 Mailing Address Line 2 97 Blakely Rd, Suite 103	
5 Town/City Colchester	6 State/Province Vermont	7 Country United States	8 Zip/Postal Code 05446
9 Email Address thomashergerrother@gmail.com			10 Telephone (802) 351-1381

Section D - Building/Business Owner Information			
1 Last Name		2 First Name (and Middle Initial if appropriate)	
3 Mailing Address Line 1		4 Mailing Address Line 2	
5 Town/City	6 State/Province	7 Country United States	8 Zip/Postal Code
9 Email Address			10 Telephone

Part II Certifying Designer(s) Information			
1 Designer Last Name Pitrowiski		2 Designer First Name (and Middle Initial if appropriate) John	
3 Designer License# 8104	4 Company Name Trudell Consulting Engineers (TCE)		
5 Mailing Address Line 1 478 Blair Park Rd		6 Mailing Address Line 2	
7 Town/City Williston	8 State/Province Vermont	9 Country United States	10 Zip/Postal Code 05495
11 Email Address john.pitrowiski@tcevt.com			12 Telephone (802)879-6331
13 Designer Role(s) (check all that apply)			
<input checked="" type="checkbox"/> Water Supply Designer <input checked="" type="checkbox"/> Wastewater Disposal System Designer			
<input type="button" value="Remove This Designer"/>			
<input type="button" value="Add Another Designer"/>			

Part III Property Location Information	
Section A - Property Location	
1 Please provide the property Town and the property address or a brief description of the location.	
(a) Town or City Charlotte	(b) Street or Road Location 487 Guinea Rd

Section B - Center of Property GPS Coordinates

1 Enter the approximate center of property coordinates using GPS set for NAD83 or as derived from a map (map must be based on NAD83).

(a) Latitude (in decimal degrees to five decimal places, ex. 44.38181°) (b) Longitude (in decimal degrees to five decimal places, ex. -72.31392°)

N ° **W (-)** °

Part IV Project Information

Section A - General Project Information & Questions

1 Project Name (if applicable) 2 Total Acreage of Property

3 Business Name (if applicable)

4 Detailed Project Description

Subdivide existing lot into 3 lots. Existing home with existing septic and well to remain, single family dwelling with onsite sewer and drilled bedrock well water proposed for each of the 2 proposed currently vacant lots.

5 (a) Were all existing buildings or structures, campgrounds, and their associated potable water supplies and wastewater systems substantially completed before January 1, 2007? Yes No

(b) Were all existing improved and unimproved lots in existence before January 1, 2007? Yes No

6 Does this application include subdividing the property? Yes No

7 Has anyone from the Drinking Water & Groundwater Protection Division's Regional Office been to the property? Yes No

If Yes, enter the staff person's name and the date of the visit.

(a) Name of Staff Person (b) Date of Visit (m/d/yyyy)

8 Will any construction occur within 50 feet of a wetland boundary, mapped or designated? Yes No

If Yes, contact the Wetlands Program of the Watershed Management Division at (802) 338-4835.

9 Will more than one acre be disturbed during the entire course of construction, including all lots and phases? Yes No

If Yes, contact the Stormwater Program of the Watershed Management Division at (802) 241-4320.

10 Will there be any stream crossings by roads, utilities, or other construction? Yes No

If Yes, contact the River Corridor Mgmt. Program of the Watershed Management Division at:

Central & Northwest Vermont (802) 879-5631
 Southern Vermont (802) 786-5906
 Northeastern Vermont (802) 751-0129

11 Is the project located in a special flood hazard area as designated on the flood insurance maps prepared for a municipality by the Federal Emergency Management Agency? Yes No

If Yes, show the special flood hazard area limits on the site plan.

12 Act 250: Has the Applicant (Landowner) subdivided any other lots of any size within a five mile radius of this subdivision, or within the environmental district within the last five years? Yes No

If Yes, enter the town(s) and the associated number of lots in the table below:

	(a) Town	(b) Number of Lots
X	<input type="text"/>	<input type="text"/>

13 Is there any prior Act 250 jurisdiction on the tract of land? Yes No

If Yes, enter the Act 250 permit number:

(a) Act 250 Permit Number

Section B - Project Deed Reference

1 Please provide the Town, Parcel ID, Book, and Page reference for the current landowner's deed(s) to this property:

	(a) Town	(b) Parcel ID	(c) Book	(d) Page(s)
X	Charlotte	5-1-9-1	152	614 slide 37

Add Another Deed Reference

Section C - Project Plan Reference

1 Please provide the following information for all water supply and wastewater disposal system plans being submitted.

	(a) Sheet#	(b) Title	(c) Plan Date	(d) Plan Revision Date
X	C1-01	Existing Conditions	4/16/2013	
X	C2-01	Sanitary Plan	4/24/2013	
X	C8-01	Site Details	5/14/2013	
X	C8-02	Wastewater Details	5/14/2013	
X	C8-03	Notes and Test Pit Data	5/14/2013	
X	C8-04	Advantex System Details	5/14/2013	
X	C1.01	Subdivision Plat	4/16/2013	

Add Another Plan Reference

Section D - Existing Project Lot/Building Details

Please provide the existing project details. This section is used to describe what is existing for the project. For example, if you are subdividing an undeveloped 21-acre parcel, you would list the existing parcel. If you are revising the boundary lines of two commercial lots in an industrial park, and constructing an addition to an existing building you would list the existing lot numbers, existing acres, existing buildings, existing uses, construction date(s), prior permits, and answer the compliance questions.

1 Lot#	2 Lot Size (acres)	3 Existing Use of the Lot
Existing	26.72	Residential

4 Provide the following information for each building on the lot:

	(a) Building ID	(b) Existing Use	(c) Date Construction of Building Substantially Complete	(d) Prior Permits	(e) In compliance with existing permits?
X	Existing	Residential	01-01-1985	conservation district onsite	<input checked="" type="radio"/> Yes <input type="radio"/> No

Add Another Building

Remove This Lot

Add Another Lot

Section E - Proposed Project Lot/Building Details

This section is used to describe what you are proposing to do in this project. For example, if you were going to create 4 lots for construction of single family residences, you would list each lot, proposed acreage, proposed buildings, and proposed use.

1 Lot#	2 Lot Size (acres)	3 Proposed Use of the Lot
1	4.67	Residential (no change)

4 Is the lot being created as part of a subdivision? Yes No

5 Are you requesting that the Blood, Marriage, or Civil Union special fee be applied to this lot? Yes No

6 If the lot is exempt, please indicate the specific exemption from the Wastewater System and Potable Water Supply Rules?

7 Provide the following information for each building on the lot:

	(a) Building ID	(b) If building is exempt, indicate exemption	(c) Construction or increased flow?	(d) Proposed Use
X	Existing		<input type="checkbox"/>	Residential (no change)

Add Another Building

Remove This Lot

1 Lot#	2 Lot Size (acres)	3 Proposed Use of the Lot
2	11.3	Residential

4 Is the lot being created as part of a subdivision? Yes No

5 Are you requesting that the Blood, Marriage, or Civil Union special fee be applied to this lot? Yes No

6 If the lot is exempt, please indicate the specific exemption from the Wastewater System and Potable Water Supply Rules?

7 Provide the following information for each building on the lot:

	(a) Building ID	(b) If building is exempt, indicate exemption	(c) Construction or increased flow?	(d) Proposed Use
X	2		<input checked="" type="checkbox"/>	Residential

Add Another Building

Remove This Lot

1 Lot#	2 Lot Size (acres)	3 Proposed Use of the Lot
3	10.75	Residential

4 Is the lot being created as part of a subdivision? Yes No

5 Are you requesting that the Blood, Marriage, or Civil Union special fee be applied to this lot? Yes No

6 If the lot is exempt, please indicate the specific exemption from the Wastewater System and Potable Water Supply Rules?

7 Provide the following information for each building on the lot:

	(a) Building ID	(b) If building is exempt, indicate exemption	(c) Construction or increased flow?	(d) Proposed Use
X	3		<input checked="" type="checkbox"/>	Residential

Add Another Building

Remove This Lot

Add Another Lot

Part V Water Supply Information

Section A - Water Supply Screening Questions

1 Are you proposing a new water supply or water service line or changes to a permitted but not constructed water supply or water service line for this project? Yes No

2 Are you proposing changes to an existing water supply or water service for this project (including changes to location, design flows, or operational change)? Yes No

3 Is there an existing connection to a water supply or water service line for this project? Yes No

Complete Part V if you answered Yes to any of the above questions. A project with no existing or proposed water supply may skip to Part VI.

Section B - General Water Supply Questions							
1 Does this project involve a failed water supply?							<input type="radio"/> Yes <input checked="" type="radio"/> No
2 Will any of the proposed water sources serve 25 or more people or have 15 or more service connections?							<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, the applicant must contact the Drinking Water & Groundwater Protection Division at (802) 241-3400 for source, construction and an operating permit.</i>							
3 Are any of the existing or proposed water sources located within a special flood hazard area?							<input type="radio"/> Yes <input checked="" type="radio"/> No
4 Are any of the existing or proposed water sources located within a floodway?							<input type="radio"/> Yes <input checked="" type="radio"/> No
5 Are any of the proposed water sources located within 1 mile of a hazardous waste site as designated by the Waste Management Division and identified on the Agency mapping website?							<input checked="" type="radio"/> Yes <input type="radio"/> No
<i>If Yes, please submit additional information on the site. The Waste Management Division can be reached at (802) 241-3888.</i>							
6 Does this project require an approval letter from the Drinking Water & Groundwater Protection Division for the construction of a public water system, municipal water line extension over 500 feet, or hydrants or sprinkler systems?							<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, please submit a copy of the approval letter from the Drinking Water & Groundwater Protection Division.</i>							
7 Does the proposed or existing water supply(ies) use a water treatment device to obtain compliance with the quality requirements in the Water Supply Rule?							<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, please submit additional information regarding the constituent(s) that exceeds the standards and plans, details, and specifications of the treatment device.</i>							
8 Is any portion of the proposed water supply located in or near a Water Source Protection Area as designated by the Drinking Water & Groundwater Protection Division?							<input checked="" type="radio"/> Yes <input type="radio"/> No
<i>If in areas of known interference issues, contact the Drinking Water & Groundwater Protection Division at (802) 241-3400.</i>							
Section C - Individual Water Supply Details							
Please provide the following information for each of the existing and proposed water supply(ies) serving a building or structure, or campground on the property.							
1 Water Supply Name/Identifier				2 Water Supply Owner (if not Applicant)			
Existing							
3 Water Source Type				4 Type of Change to Supply			
Non-Public Drilled Bedrock Well				No Change			
5 Lots/Buildings Served by this Water Supply System							
			Design Flows (Gallons Per Day)				
(a) Lot#	(b) Building ID	(c) Type of Change to the Building's Supply	(d) Existing	(e) Change	(f) Total	(g) Rule or Meter Based Flows	
X 1	existing	No Change	240	0	240	Rule-based	
Add Another Lot/Building Served by this Supply			6	7	8		
			240	0	240		
9 Is this water supply located off-lot?							<input type="radio"/> Yes <input checked="" type="radio"/> No
10 Is this water supply shared?							<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If the water supply is located off-lot or shared, submit a copy of the agreement to provide an easement prior to construction.</i>							
11 Is a variance being requested for this water supply?							<input type="radio"/> Yes <input checked="" type="radio"/> No
<i>If Yes, please submit additional details related to the variance request.</i>							
Remove This Water Supply							
1 Water Supply Name/Identifier				2 Water Supply Owner (if not Applicant)			
Lot 2							

3 Water Source Type Non-Public Drilled Bedrock Well	4 Type of Change to Supply New System
--	--

5 Lots/Buildings Served by this Water Supply System

X	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's Supply	Design Flows (Gallons Per Day)			(g) Rule or Meter Based Flows
				(d) Existing	(e) Change	(f) Total	
	2	2	Connection to New System	0	420	420	Rule-based
Add Another Lot/Building Served by this Supply				6	7	8	
				0	420	420	

9 Is this water supply located off-lot? Yes No

10 Is this water supply shared? Yes No
If the water supply is located off-lot or shared, submit a copy of the agreement to provide an easement prior to construction.

11 Is a variance being requested for this water supply? Yes No
If Yes, please submit additional details related to the variance request.

Remove This Water Supply

1 Water Supply Name/Identifier Lot 3	2 Water Supply Owner (if not Applicant)
3 Water Source Type Non-Public Drilled Bedrock Well	4 Type of Change to Supply New System

5 Lots/Buildings Served by this Water Supply System

X	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's Supply	Design Flows (Gallons Per Day)			(g) Rule or Meter Based Flows
				(d) Existing	(e) Change	(f) Total	
	3	3	Connection to New System	0	420	420	Rule-based
Add Another Lot/Building Served by this Supply				6	7	8	
				0	420	420	

9 Is this water supply located off-lot? Yes No

10 Is this water supply shared? Yes No
If the water supply is located off-lot or shared, submit a copy of the agreement to provide an easement prior to construction.

11 Is a variance being requested for this water supply? Yes No
If Yes, please submit additional details related to the variance request.

Remove This Water Supply

Add Another Water Supply

Section D - Water Supply Design Flows Summary Table

1 If the project includes more than one water supply, please list each water supply system and provide the total water supply design flows for the project. **IMPORTANT:** Please don't include systems that were identified in this Part on Section C, Line 4 as a "Replacement Area Designation" in this summary table.

X	(a) Water Supply Name/Identifier	Design Flows (Gallons Per Day)		
		(b) Existing	(c) Change	(d) Total
	Existing	240	0	240
	Lot 2	0	420	420

X	Lot 3	0	420	420
	Add Another Water Supply	2	3	4
		240	840	1,080

Part VI Wastewater Disposal System Information

Section A - Wastewater Disposal System Screening Questions

- 1 Are you proposing a new or replacement wastewater disposal system, a new wastewater service line, or changes to a permitted but not constructed wastewater disposal system or wastewater service line for this project? Yes No
- 2 Are you proposing changes to an existing wastewater disposal system, replacement wastewater disposal system, replacement area, or wastewater service line for this project (including changes to location, design flows, or operational change)? Yes No
- 3 Is there an existing connection to a wastewater disposal system or wastewater service line for this project? Yes No

Complete Part VI if you answered Yes to any of the above questions.
A project with no existing or proposed wastewater disposal systems may skip to Part VII.

Section B - General Wastewater Disposal System Questions

- 1 Does this project involve a failed wastewater disposal system? Yes No
- 2 Do any of the systems require a curtain or dewatering drain as part of the design? Yes No
- 3 Is a hydrogeologic study required for this project? Yes No
- 4 For projects using soil-based wastewater systems having a total design flow that exceeds 1,000 gpd, is this project located in a Class A Watershed? Yes No NA

If Yes, indicate the Class A Watershed in which the system(s) is located:

(a) Class A Watershed Name

- 5 Are there any existing or proposed floor drains as part of this project? Yes No

If Yes, indicate where the floor drains will discharge:

(a) Floor Drain Discharge Point

- 6 If the project utilizes an Innovative/Alternative System or Product, has the applicant received a copy of the Drinking Water & Groundwater Protection Division's approval letter? Yes No NA

- 7 Is any portion of the proposed wastewater disposal system located in or near a Water Source Protection Area as designated by the Drinking Water & Groundwater Protection Division? Yes No

If Yes, contact the Drinking Water & Groundwater Protection Division at (802) 241-3400.

Section C - Individual Wastewater Disposal System Details

Please provide the following information for each of the existing and proposed wastewater disposal systems serving a building or structure, or campground on the property.

1 Wastewater Disposal System Name/Identifier <input style="width: 95%; height: 25px;" type="text" value="Existing"/>	2 Wastewater Disposal System Owner (if not Applicant) <input style="width: 95%; height: 25px;" type="text"/>
3 Wastewater Disposal System Type <input style="width: 95%; height: 25px;" type="text" value="Mound"/>	4 Type of Change to System <input style="width: 95%; height: 25px;" type="text" value="No Change"/>

5 Lots/Buildings Served by this Wastewater Disposal System

	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	Design Flows (Gallons Per Day)				(h) Rule or Meter Based Flows
				(d) Existing	(e) Change	(f) Infiltration	(g) Total	
X	1	existing	No Change	240	0	0	240	Rule-based
				6	7	8	9	
				240	0	0	240	

Add Another Lot/Building Served by this System

10 Is this wastewater disposal system located off-lot? Yes No

11 Is this wastewater disposal system shared? Yes No
If the wastewater disposal system is located off-lot or shared, submit a copy of the agreement to provide an easement prior to initiation of construction.

12 Is a variance being requested for this wastewater disposal system? Yes No
If Yes, please submit additional details related to the variance request.

13 If this wastewater disposal system type is a connection to an Indirect Discharge System, please provide the Indirect Discharge System ID number.
 Indirect Discharge System ID Number

14 If this wastewater disposal system type is a connection to a municipal system, please select the town.
 Town

15 If this wastewater disposal system is a soil-based system, please select the design approach used.
 Design Approach Used

16 For soil-based systems, please check all that apply (Note: Store and dose does not apply to standard pump/pump chamber systems).
 Storage and Dose Filtrate Constructed Wetlands

17 If this is an Innovative/Alternative soil-based system, please select the system use type.
 Innovative/Alternative System Use Type

18 If this is an Innovative/Alternative soil-based system, please select the Innovative/Alternative system or product.
 Innovative/Alternative System or Product

Remove This Wastewater System

1 Wastewater Disposal System Name/Identifier <input type="text" value="Replacement for Existing"/>	2 Wastewater Disposal System Owner (if not Applicant) <input type="text"/>
3 Wastewater Disposal System Type <input type="text" value="Mound"/>	4 Type of Change to System <input type="text" value="Replacement Area Designation"/>

5 Lots/Buildings Served by this Wastewater Disposal System

(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	Design Flows (Gallons Per Day)				(h) Rule or Meter Based Flows
			(d) Existing	(e) Change	(f) Infiltration	(g) Total	
X 1	Existing	Replacement Area Designation	0	240	0	240	Rule-based
<input type="button" value="Add Another Lot/Building Served by this System"/>			6	7	8	9	
			0	240	0	240	

10 Is this wastewater disposal system located off-lot? Yes No

11 Is this wastewater disposal system shared? Yes No
If the wastewater disposal system is located off-lot or shared, submit a copy of the agreement to provide an easement prior to initiation of construction.

12 Is a variance being requested for this wastewater disposal system? Yes No
If Yes, please submit additional details related to the variance request.

13 If this wastewater disposal system type is a connection to an Indirect Discharge System, please provide the Indirect Discharge System ID number.

Indirect Discharge System ID Number

14 If this wastewater disposal system type is a connection to a municipal system, please select the town.

Town

15 If this wastewater disposal system is a soil-based system, please select the design approach used.

Design Approach Used

16 For soil-based systems, please check all that apply (Note: Store and dose does not apply to standard pump/pump chamber systems).

Storage and Dose Filtrate Constructed Wetlands

17 If this is an Innovative/Alternative soil-based system, please select the system use type.

Innovative/Alternative System Use Type

18 If this is an Innovative/Alternative soil-based system, please select the Innovative/Alternative system or product.

Innovative/Alternative System or Product

Remove This Wastewater System

1 Wastewater Disposal System Name/Identifier <input type="text" value="Lot 2"/>	2 Wastewater Disposal System Owner (if not Applicant) <input type="text"/>
3 Wastewater Disposal System Type <input type="text" value="Mound"/>	4 Type of Change to System <input type="text" value="New System"/>

5 Lots/Buildings Served by this Wastewater Disposal System

(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	Design Flows (Gallons Per Day)				(h) Rule or Meter Based Flows
			(d) Existing	(e) Change	(f) Infiltration	(g) Total	
X 2	2	Connection to New System	0	420	0	420	Rule-based
Add Another Lot/Building Served by this System			6	7	8	9	
			0	420	0	420	

10 Is this wastewater disposal system located off-lot? Yes No

11 Is this wastewater disposal system shared? Yes No

If the wastewater disposal system is located off-lot or shared, submit a copy of the agreement to provide an easement prior to initiation of construction.

12 Is a variance being requested for this wastewater disposal system? Yes No

If Yes, please submit additional details related to the variance request.

13 If this wastewater disposal system type is a connection to an Indirect Discharge System, please provide the Indirect Discharge System ID number.

Indirect Discharge System ID Number

14 If this wastewater disposal system type is a connection to a municipal system, please select the town.

Town

15 If this wastewater disposal system is a soil-based system, please select the design approach used.

Design Approach Used

16 For soil-based systems, please check all that apply (Note: Store and dose does not apply to standard pump/pump chamber systems).

- Storage and Dose Filtrate Constructed Wetlands

17 If this is an Innovative/Alternative soil-based system, please select the system use type.

Innovative/Alternative System Use Type

18 If this is an Innovative/Alternative soil-based system, please select the Innovative/Alternative system or product.

Innovative/Alternative System or Product

Remove This Wastewater System

1 Wastewater Disposal System Name/Identifier <input type="text" value="Lot 3"/>	2 Wastewater Disposal System Owner (if not Applicant) <input type="text"/>
3 Wastewater Disposal System Type <input type="text" value="Mound"/>	4 Type of Change to System <input type="text" value="New System"/>

5 Lots/Buildings Served by this Wastewater Disposal System

	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	Design Flows (Gallons Per Day)			(g) Total	(h) Rule or Meter Based Flows
				(d) Existing	(e) Change	(f) Infiltration		
X	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="Connection to New System"/>	<input type="text" value="0"/>	<input type="text" value="420"/>	<input type="text" value="0"/>	<input type="text" value="420"/>	<input type="text" value="Rule-based"/>
<input type="button" value="Add Another Lot/Building Served by this System"/>				6	7	8	9	
				<input type="text" value="0"/>	<input type="text" value="420"/>	<input type="text" value="0"/>	<input type="text" value="420"/>	

10 Is this wastewater disposal system located off-lot? Yes No

11 Is this wastewater disposal system shared? Yes No

If the wastewater disposal system is located off-lot or shared, submit a copy of the agreement to provide an easement prior to initiation of construction.

12 Is a variance being requested for this wastewater disposal system? Yes No

If Yes, please submit additional details related to the variance request.

13 If this wastewater disposal system type is a connection to an Indirect Discharge System, please provide the Indirect Discharge System ID number.

Indirect Discharge System ID Number

14 If this wastewater disposal system type is a connection to a municipal system, please select the town.

Town

15 If this wastewater disposal system is a soil-based system, please select the design approach used.

Design Approach Used

Performance Based

16 For soil-based systems, please check all that apply (Note: Store and dose does not apply to standard pump/pump chamber systems).

Storage and Dose Filtrate Constructed Wetlands

17 If this is an Innovative/Alternative soil-based system, please select the system use type.

Innovative/Alternative System Use Type

18 If this is an Innovative/Alternative soil-based system, please select the Innovative/Alternative system or product.

Innovative/Alternative System or Product

Remove This Wastewater System

Add Another Wastewater System

Section D - Wastewater Disposal Systems Design Flows Summary Table

1 If the project includes more than one wastewater disposal system, please list each system on this page and provide the total wastewater disposal design flows for the project. **IMPORTANT:** Please don't include systems that were identified in this Part on Section C, Line 4 as a "Replacement Area Designation" in this summary table.

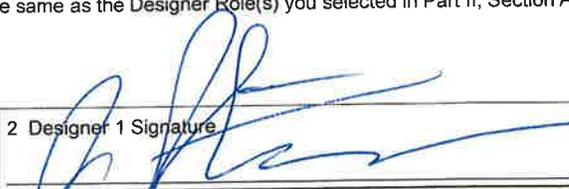
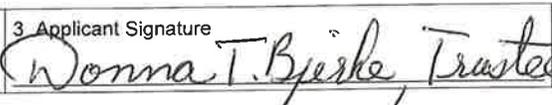
		Design Flows (Gallons Per Day)			
(a) Wastewater Disposal System Name/Identifier	(b) Existing	(c) Change	(d) Infiltration	(e) Total	
X Existing	240	0	0	240	
X Lot 2	0	420	0	420	
X Lot 3	0	420	0	420	
Add Another Wastewater System		2	3	4	5
		240	840	0	1,080

Part VII Application Fees

1 Fee Amount \$580.00

2 Fee Calculation Details

Subdivision with construction and 1080 gpd flow h2o and sewer per the most current fee schedule

Part VIII Designer Certification & Copyright License			
Section A - Certifying Designer 1 Certification & Copyright License			
<p>"I hereby certify that in the exercise of my reasonable professional judgment, the design-related information submitted with this application is true and correct, and that the design included in this application for a permit complies with the Vermont Wastewater System and Potable Water Supply Rules and the Vermont Water Supply Rules.</p> <p>As the individual who prepared this application, including all documents that are marked as copyrighted, I hereby grant a non-exclusive, limited license to the State to allow the documents to be made available for public review and copying in order to properly implement and operate the permitting programs for Wastewater Systems and Potable Water Supplies, and for no other purposes. As a condition to this license, the State agrees that it will not make any changes to such documents, nor will the State delete any copyright notices on such documents."</p>			
<p>1 Check the design(s) you are certifying. This should be the same as the Designer Role(s) you selected in Part II, Section A, Line 13.</p> <p><input checked="" type="checkbox"/> Water Supply Designer</p> <p><input checked="" type="checkbox"/> Wastewater Disposal System Designer</p>			
1 Designer 1 Name	2 Designer 1 Signature	3 Signature Date	
John P Pitrowiski		6/11/13	
Section B - Certifying Designer 2 Certification & Copyright License			
<p>"I hereby certify that in the exercise of my reasonable professional judgment, the design-related information submitted with this application is true and correct, and that the design included in this application for a permit complies with the Vermont Wastewater System and Potable Water Supply Rules and the Vermont Water Supply Rules.</p> <p>As the individual who prepared this application, including all documents that are marked as copyrighted, I hereby grant a non-exclusive, limited license to the State to allow the documents to be made available for public review and copying in order to properly implement and operate the permitting programs for Wastewater Systems and Potable Water Supplies, and for no other purposes. As a condition to this license, the State agrees that it will not make any changes to such documents, nor will the State delete any copyright notices on such documents."</p>			
<p>1 Check the design(s) you are certifying. This should be the same as the Designer Role(s) you selected in Part II, Section B, Line 13.</p> <p><input type="checkbox"/> Water Supply Designer</p> <p><input type="checkbox"/> Wastewater Disposal System Designer</p>			
1 Designer 2 Name	2 Designer 2 Signature	3 Signature Date	
Part IX Applicant(s) Signature & Acknowledgements			
<p>In order to insure compliance with the requirements of the regulations administered by the Department of Environmental Conservation, Drinking Water & Groundwater Protection Division, it may be necessary to visit the property. As this would involve a Department employee entering private property, we request your approval to do so.</p>			
<p>1 If we do visit your property, do you have any special instructions?</p> <div style="border: 1px solid black; height: 30px; width: 100%;"></div>			
<p>"As landowner of the property for which I am requesting a permit from the Department of Environmental Conservation, I understand that by signing this application I am granting permission for the Department employees to enter the property, during normal working hours, to insure compliance of the property with the applicable rules of the Department.</p> <p>I also understand that I am not allowed to commence any site work or construction on this project without written approval from the Department of Environmental Conservation.</p> <p>If my project utilizes an Innovative/Alternative System or Product, I have received a copy of the Drinking Water & Groundwater Protection Division's approval letter and agree to abide by the conditions of the approval.</p> <p>I also certify that to the best of my knowledge and belief the information submitted above is true, accurate and complete."</p>			
X	2 Print Applicant Name	3 Applicant Signature	4 Signature Date
	Donna T. Bjerke, Trustee		6/11/2013
<div style="background-color: #4f81bd; color: white; padding: 2px 10px; display: inline-block;">Add Applicant Signature Block</div>			

ANR Form 4: Certification Statement for Notification of Overshadowed Property Owner(s) pursuant to the Wastewater System and Potable Water Supply Program

A person submitting an application to the Secretary for a Wastewater System and Potable Water Supply Permit where the proposed project has isolation distances (overshadowing) that extend onto property owned by persons other than the permit applicant shall submit the following certification with the application.

Note: When the property subject to the permit application is owned by more than one person, only one of the landowners must sign this certification statement even though all landowners must sign the permit application itself.

I hereby certify that the individual(s) that own property that is overshadowed by my proposed project have been sent by certified mail a copy of the required notification form and the site plan(s) that accurately depicts all isolation distances. I also certify that I attached to this certification form a copy of all certified mail receipts for notifications that were sent to the affected property owners.

Signature _____

Name (Printed) Hergenrother Construction LLC, Thomas Hergenrother

Property Address or Property Tax ID # 487 Guinea Road Charlotte, VT
Tax Map # 5-1-9-1

Date of this certification _____

6/6/13

Please list all of the property owners who were sent a notification by certified mail.

Affected Property Owner(s) – (Please provide a second sheet using this format when there are more than three affected property owners)

Kiley Family Guinea Road Partnership
c/o Caleb Kiley
2033 Dorset St.
Charlotte, VT 05445

Roger Teese Family Trust
488 Guinea Rd.
Charlotte, VT 05445

John & Susan Zahn
566 Guinea Rd.
Charlotte, VT 05445

Tegatz Family Trust
1000 Guinea Rd.
Charlotte, VT 05445

Michael Nurczynski
703 Guinea Rd.
Charlotte, VT 05445

(To Comply with Act 145 and Act 117 – 8-24-12, Last Revised 9-11-12)

7012 3050 0000 3772 1992

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
 (Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com

CHARLOTTE VT 05445

Postage	\$ 0.46	0781 05 Postmark Here
Certified Fee	\$3.10	
Return Receipt Fee (Endorsement Required)	\$0.00	
Restricted Delivery Fee (Endorsement Required)	\$0.00	
Total Postage & Fees	\$ 3.56	

05/31/2013

Sent To *Fegatz Family Trust*
 Street, Apt. No., or PO Box No. *1000 Guinea Rd.*
 City, State, ZIP+4 *Charlotte, VT 05445*

PS Form 3800, August 2006 See Reverse for Instructions

7012 3050 0000 3772 1978

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
 (Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com

CHARLOTTE VT 05445

Postage	\$ 0.46	0781 05 Postmark Here
Certified Fee	\$3.10	
Return Receipt Fee (Endorsement Required)	\$0.00	
Restricted Delivery Fee (Endorsement Required)	\$0.00	
Total Postage & Fees	\$ 3.56	

05/31/2013

Sent To *Caleb Kiley*
 Street, Apt. No., or PO Box No. *2033 Dorset St.*
 City, State, ZIP+4 *Charlotte, VT 05445*

PS Form 3800, August 2006 See Reverse for Instructions

7012 3050 0000 3772 2005

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
 (Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com

CHARLOTTE VT 05445

Postage	\$ 0.46	0781 05 Postmark Here
Certified Fee	\$3.10	
Return Receipt Fee (Endorsement Required)	\$0.00	
Restricted Delivery Fee (Endorsement Required)	\$0.00	
Total Postage & Fees	\$ 3.56	

05/31/2013

Sent To *Roger Teese Family Trust*
 Street, Apt. No., or PO Box No. *488 Guinea Rd.*
 City, State, ZIP+4 *Charlotte, VT 05445*

PS Form 3800, August 2006 See Reverse for Instructions

7012 3050 0000 3772 1961

U.S. Postal Service™
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CHARLOTTE VT 05445

Postage	\$ 0.46	0781 05 Postmark Here
Certified Fee	\$3.10	
Return Receipt Fee (Endorsement Required)	\$0.00	
Restricted Delivery Fee (Endorsement Required)	\$0.00	
Total Postage & Fees	\$ 3.56	

05/31/2013

Sent To *M. Nwaczynski*
 Street, Apt. No., or PO Box No. *703 Guinea Rd*
 City, State, ZIP+4 *Charlotte, VT 05445*

PS Form 3800, August 2006 See Reverse for Instructions

7012 3050 0000 3772 1985

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
 (Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com

CHARLOTTE VT 05445

Postage	\$ 0.46	0781 05 Postmark Here
Certified Fee	\$3.10	
Return Receipt Fee (Endorsement Required)	\$0.00	
Restricted Delivery Fee (Endorsement Required)	\$0.00	
Total Postage & Fees	\$ 3.56	

05/31/2013

Sent To *John Zahn*
 Street, Apt. No., or PO Box No. *566 Guinea Rd.*
 City, State, ZIP+4 *Charlotte, VT 05445*

PS Form 3800, August 2006 See Reverse for Instructions

ANR FORM 1
Notice of Overshadowing at the time of Filing an Application for a Wastewater System and Potable Water Supply Permit

To Kiley Family Guinea Road Partnership c/o Caleb Kiley (Overshadowed Landowner):

I am currently preparing an application for a State of Vermont Wastewater System and Potable Water Supply Permit. My project proposes a water supply and/or wastewater (septic) system designed to comply with the technical standards of the Wastewater System and Potable Water Supply Rules (Rules). The Rules include required isolation distances around the supply or system. These isolation distances are designed to prevent wastewater systems and water supplies from being built too close to each other in order to protect drinking water quality and human health.

The isolation distances for my proposed water supply and/or wastewater system extend onto your property. The extension of these isolation distances is often referred to as an “overshadowing” of property.

In 2010, the legislature determined that people who own property that will be “overshadowed” by the required isolation distance be notified of that fact. This form is being sent to you in order to provide that notice. Attached to this form is a copy of a plan that shows what I propose to build and the isolation distance(s) that extend onto your property.

Please consider the following facts to help you understand what this actually means to you:

1. Under the existing Rules, an evaluation of the horizontal relationship between existing wastewater systems and potable water supplies and newly proposed wastewater systems and potable water supplies is required during the review of any application. Therefore, the horizontal isolation distance between newly proposed wastewater systems and potable water supplies and the location of your current water supply and wastewater system will be evaluated and determined to comply with the Rules as part of the permit process.
2. A permit application review does not determine if the proposed water supply or wastewater system may affect or restrict potential future development of a water supply or wastewater system on your property. These possible restrictions exist because of the required isolation distances between potable water supplies and wastewater systems.
3. It is important to note that in many instances overshadowing may have no effect on the ability to develop adjoining properties. Whether there is actually any effect is a very site specific determination that depends on a number of factors. For example, the fact that an isolation distance from a wastewater system may prohibit where a well could be drilled may have no real effect because that portion of the neighboring property that is overshadowed by the wastewater system is too steep to be accessed by a well drilling rig. Another example is where a well isolation distance means that no wastewater system could be placed in a certain area but that area is a wetland that prevents the construction of a wastewater system.

ANR FORM 1
Notice of Overshadowing

4. When considering potential effects on your property, you should be aware that you may drill a well within the identified well isolation zone and you may build a wastewater systems in the identified septic isolation zones provided the well or wastewater system complies with the technical standards of the Rules. What may not be allowed without providing additional technical information is putting a wastewater system in a well isolation zone and putting a well in a wastewater system isolation zone.

5. The water supply and wastewater system isolation zones only restrict the construction of water supplies and wastewater systems. Construction of other things such as houses, garages, and driveways may be in the isolation zones as allowed by the Rules.

6. This notification requirement did not start until 2010 and the state permit program has been in place since 1969 so it is possible that there are already water supplies or wastewater systems that “overshadow” your property or that your own wastewater system and/or water supply “overshadows” your neighbor’s property.

7. The Legislature created the notification requirement so that neighbors have the opportunity to discuss the possible effects on future development and potentially resolve them before a well is drilled or a septic system is built. Therefore you are getting this notice before the permit application is filed so that you may consider having those discussions.

8. VERY IMPORTANT: Although the legislature has required notification to potentially affected landowners, the legislature did not give the Agency of Natural Resources the authority to deny a permit application based on isolation zones that may “overshadow” your property.

Please contact me if you have any questions.

Sincerely,

Name of Applicant Hergenrother Construction, Inc., Thomas Hergenrother

Address 97 Blakely Road, Suite 103
Colchester, VT 05446

Phone Number (802) 351 - 1381

8/24/12 Last Revised 9/11/12 (To Comply with Act 145 and Act 117)

ANR FORM 1
Notice of Overshadowing at the time of Filing an Application for a Wastewater System and Potable Water Supply Permit

To Roger Teese Family Trust

(Overshadowed Landowner):

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ANR FORM 1

Notice of Overshadowing

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Address 97 Blakely Road, Suite 103
Colchester, VT 05446

Phone Number (802) 351 - 1381

8/24/12 Last Revised 9/11/12 (To Comply with Act 145 and Act 117)

ANR FORM 1
**Notice of Overshadowing at the time of Filing an Application for a Wastewater
System and Potable Water Supply Permit**

To _ John & Susan Zahn

_(Overshadowed Landowner):

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ANR FORM 1

Notice of Overshadowing

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Sincerely,

Name of Applicant Hergenrother Construction, Inc., Thomas Hergenrother

Address 97 Blakely Road, Suite 103
Colchester, VT 05446

Phone Number (802) 351 - 1381

8/24/12 Last Revised 9/11/12 (To Comply with Act 145 and Act 117)

ANR FORM 1
Notice of Overshadowing

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ANR FORM 1
Notice of Overshadowing at the time of Filing an Application for a Wastewater System and Potable Water Supply Permit

To _ Michael Nurczynski

_(Overshadowed Landowner):

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ANR FORM 1
Notice of Overshadowing

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Phone Number (802) 351 - 1381

8/24/12 Last Revised 9/11/12 (To Comply with Act 145 and Act 117)

273 Commerce Street
Williston, VT 05495
Website: www.epsofvermont.com



PHONE: (802) 862-1212
FAX: (802) 860-7445
1-800-THETANK

May 29, 2013

Mr. John Pitrowiski, P.E.
Trudell Consulting Engineers
P.O. Box 308
478 Blair Park Road
Williston, Vermont 05495

Re: Hergenrother Construction
Charlotte, VT

Hydrogeologic Evaluation

Dear Mr. Pitrowiski:

At your request, Environmental Products & Services of Vermont, Inc. (EPSVT) has prepared this hydrogeologic study and mounding analysis for proposed development of a property located at 487 Guinea Road, in Charlotte, VT. The project consists of a three lot subdivision with associated septic disposal systems to be designed by Trudell Consulting Engineers (TCE). A desktop two-year time of travel analysis was conducted to determine whether or not the proposed septic designs could satisfy requirements promulgated in Section 1-920 of the Environmental Protection Rules (EPRs).

Executive Summary

A Two-Year Time of Travel Management Zone was delineated relative to two proposed septic disposal areas. An analytical model approach was then used to simulate local induced groundwater mounding effects of a proposed wastewater disposal system. The analytical model utilized requires the estimation of hydraulic conductivity values of unsaturated and saturated soils beneath the proposed mound to solve for the height of induced mounding. The model results indicate that induced mounding will completely dissipate within the limits of the delineated Two-Year Time of Travel Management Zone. Additionally, TCE has proposed curtain drains upgradient of each disposal system. It is our professional opinion that the location of a professionally engineered and installed curtain drains at these locations will effectively dewater local downgradient soils by *at least* 6 inches. The high permeability materials which comprise the curtain drains will drain groundwater into the 4" diameter piping, and away from the area of the proposed systems. The two disposal systems, in conjunction with the proposed curtain drain will work as designed, and will meet or exceed the regulations promulgated in the Environmental Protection Rules Section 1-920.

The following attachments are included for your reference:

Sheet C1-01Existing Conditions;
Sheet C2-01Sanitary Plan;
Sheet C8-08Site Details;
Sheet C8-02Wastewater Details;

Sheet C8-03Notes and Test Pit Data; and
Sheet C8-04Advantex System Details.

Background

The proposed development is located in an agricultural area that is gently sloping to the east-northeast as shown on **Sheet C1-01**. A copy of the Sanitary Plan is included as **Sheet C2-01**. Significant Class II wetlands are located to the east of the property and drain the region to the north towards the LaPlatte River via Bingham Brook. Two soil types on the property are described by the Soil Conservation Service¹. The Site is predominantly underlain by the Vergennes series, and is described as consisting of “very deep, moderately well drained soils on glacial lake plains. They formed in calcareous estuarine and glaciolacustrine clays. Saturated hydraulic conductivity is low or moderately high in the mineral solum and moderately low to very low in the substratum. Slope ranges from 0 to 50%.”

The northwestern portion of the property, especially east of the existing structures is underlain by soils of the Covington series. In fact, the existing septic disposal area for the original home is situated in these soils. The Covington series is described² as consisting of “very deep, poorly drained soils that formed in calcareous glaciolacustrine and estuarine clays on glacial lake plains. Saturated hydraulic conductivity is low to moderately high in the mineral surface layer and the subsoil, and moderately low to very low in the substratum. Slope ranges from 0 to 8 percent.” Copies of the Official Series Descriptions are included as **Attachment 1**.

Test pits were installed by TCE on April 15, 2013 and are indicated on the **Sheet C8-03**. EPSVT installed eight shallow soil borings on April 18th to provide additional coverage of the property. Review of the test pit and soil boring information indicates that the site is wholly underlain by silty-clays and clays. Identification of the Seasonal High Water Table (SHWT) was made by TCE and EPSVT during the field work. The SHWT was identified at depths ranging between 6”– 8” across the property. Because groundwater monitoring data have not been provided for the Site, it is reasonably presumed that groundwater gradients generally mimic local topography (to the east-northeast at an approximate gradient of 3%.

Two-Year Time of Travel Calculation

Each proposed disposal area will have a total discharge of 420 gallons per day (GPD), or 56.2 ft³/day. The long axis of each proposed system will be oriented along contour and represents the length along which the effluent will be dispersed. Thus, the primary flow direction from each proposed disposal area will be vertically downward and to the east-northeast.

Fluid flow through porous media is governed by Darcy’s Law, specifically:

¹ https://soilseries.sc.egov.usda.gov/OSD_Docs/V/VERGENNES.html
² https://soilseries.sc.egov.usda.gov/OSD_Docs/C/COVINGTON.html



$$q = \frac{Q}{A} = Ki$$

Where:	q	=	Darcy Velocity [L/T]		
	Q	=	Volumetric Flow Rate [L ³ /T]	=	56.2 ft ³ /day
	A	=	Area [L ²]	=	
	K	=	Hydraulic Conductivity [L/T]	=	3 – 10 ft/day
	i	=	Hydraulic Gradient [L/L]	=	0.03

Review of the soils test pit information obtained during the field work indicates that the surficial soils were generally silty clays with evidence of root structures to 8" below grade. Approximate hydraulic conductivity values were obtained from **Table 1**, provided by the Vermont Wastewater Management Division. The soils are noted to be firm, with blocky structure, eventually becoming platy with depth. Thus, it is reasonable to utilize the most conservative K value of 3 ft/day. Using this equation, coupled with parameters based upon field observations and engineering plans, the Darcy Velocity of fluids moving through shallow porous media can be calculated to be 0.09 ft/day. Septic pathogens entering the saturated zone would be able to thus travel approximately 66 feet over the course of two-years.

Based on this calculation, a Two-Year Time of Travel Management Zone can be delineated in accordance with Section 1-920 of the EPRs. Thus, the Management Zone will extend 50' uphill of the proposed wastewater disposal system, 50' to each side of the system, with a minimum downgradient extension of 66'.

EPSVT also reviewed available well completion reports for nearby water supply wells in an effort to ascertain the depth to bedrock. The closest well is the existing well located in the northwest corner of the property. This well was reportedly completed to a depth of 148' and is identified as a "gravel" well. Lithology is described as "layers of clay, hardpan, and hard-packed gravel." Other nearby water supply wells are deeper, and indicate significant overburden thicknesses of over 180'. Thus, septic effluent percolating vertically downward will not be able to reach the bedrock surface within two years.

In accordance with Section 1-920 of the Environmental Protection Rules, the separation distance normally required between the bottom of a wastewater disposal system and the seasonal high water table may be reduced or eliminated at this Site because the following criteria are met:

- The permittee owns or controls all of the property that is located within the two year time of travel management zone;
- There are no sources of potable water within the Management Zone;
- The design flow for the wastewater system is 700 gallons per day (GPD) or less; and
- A qualified hydrogeologist has delineated the Management Zone.



Additional Modeling

The wastewater disposal systems are being designed by TCE to meet the performance-based approach requirement that the mounded water table will remain at least 6" below the surface of the naturally occurring soil throughout the delineated Management Zone. Thus, a calculation of the lateral extent of mounding is required. EPSVT evaluated a model proposed by Khan et al³ to assess the characteristics and geometry of the induced mound below the proposed infiltration area. The model requires the assumption that a low permeability layer exists at depth. The assumption of a low permeability layer at depth is not unreasonable considering local and regional geology and surficial deposits, and is considered to be the blue-gray platy clays identified by TCE.

Our analysis will assume a conservative value for hydraulic conductivity of 3 ft/day. The "worst-case" scenario indicates that the Seasonal High Water Table (SHWT) inside the Management Zone is found at a depth of 6" below grade. TCE is proposing a single 300' long lateral with 12" of mound sand below the bottom of the lateral. No indication of ledge was noted to the depth of the test pits. Local well logs generally indicate 180+ feet of overburden in this area.

Like most "desktop" modeling, the Khan model requires simplification of the local hydrogeological system and is based on several additional assumptions, including: uniform geometry, two media types, saturated flows, constant infiltration rate, uniform application, and that the width of the proposed lateral is much smaller than the length. Based on my understanding of the site and proposed disposal system, these assumptions are not unreasonable, and allow us to use the model to obtain a general sense of the geometry of the theoretical induced mound.

The model is based on the following equation:

$$H_s = w \left[\frac{K_2}{K_1} \left(\frac{q^1}{K_2} - 1 \right) \left(\frac{q^1}{K_2} - \frac{x_s^2}{W^2} \right) \right]^{1/2}$$

Where H_s	=	Height of the induced mound (ft)
w	=	½ Design width, including interstitial spacing (ft) = 6 ft
q^1	=	Effective wastewater infiltration rate per unit width of infiltration area $Q/A = (56.15 \text{ ft}^3/\text{day}) / (4,200 \text{ ft}^2) = 0.013 \text{ ft/day}$
K_1	=	Hydraulic conductivity of infiltration area = 3 ft/day
K_2	=	Hydraulic conductivity of basal layer = 0.01 ft/day
x_s	=	Distance from center of induced mound (ft)

³ Khan, M.Y., D. Kirkham, and R.L. Handy. 1976. "Shapes of Steady State Perched Groundwater Mounds." *Water Resour. Res.* 12(3), 429-436.



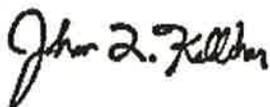
A conservative estimate of K_2 is provided to present a “worst-case” scenario.

The model predicts that the maximum height of the mound, H_{max} , occurs when $x_s = 0$ ft which makes sense as this is directly below the center of the proposed system. Conversely, when H_s is zero, x_s is at a maximum. Calculation of H_{max} and x_{max} is thus straightforward as shown in **Attachment 4**. Using a conservative value of 3 ft/day for K_1 , H_{max} is equivalent to 2.79”. The model predicts that the lateral extent of the induced mound will be negligible at $x_{max} = 6.9$ from the center of the proposed system. Coupled with a professionally designed and installed 4-inch diameter curtain drain (as depicted on **Sheet C8-01**), the proposed systems will easily maintain a minimum of 6” of naturally occurring unsaturated materials within the Two-Year Time of Travel Management Zone.

In summary, a Two-Year Time of Travel Management Zone was delineated via application of Darcy’s Law and site-specific parameters. An analytical model approach was then used to simulate local induced groundwater mounding effects of a proposed wastewater disposal system. The analytical model requires the estimation of hydraulic conductivity values of unsaturated and saturated soils beneath the proposed mound to solve for H_s . The Khan model provides a conservative estimation and utilizes the assumption that the basal hydraulic conductivity is much lower than the hydraulic conductivity of the soils beneath the infiltration area. This assumption is not unreasonable given local well log information, and other site-specific characteristics. The Khan model indicates that induced mounding will completely dissipate within the limits of the delineated Two-Year Time of Travel Management Zone.

Please do not hesitate to contact me at jkelliher@epsofvermont.com or (802) 862-1212 with any questions or comments regarding these analyses.

Sincerely,
ENVIRONMENTAL PRODUCTS & SERVICES OF VERMONT, INC.

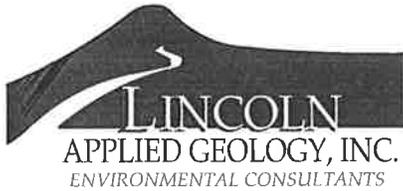


John Kelliher, Hydrogeologist
Williston Branch

Enclosures

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June 5, 2013

Mr. Spencer Harris, Septic Consultant
Town of Charlotte
P.O. Box 119
Charlotte, VT 05445

RE: Hergenrother 3-Lot Subdivision Project, Guinea Rd, Charlotte, VT-Peer Review
of Lot 2 & 3 Mound Layout and Design and Hydrogeologic Analysis

Dear Spencer:

As you know, I was retained by Trudell Consulting Engineers (TCE) to provide peer review services for Lot 2 and 3. My involvement was requested because TCE is proposing to utilize section 1-920 of the Wastewater System and Potable Water Supply Rules (the Rules) for designing and permitting the two (2) mound disposal systems for Lots 2 and 3. This section of the rules is titled, Systems located within a Two-Year Time of Travel Management Zone and this Section of the Rules has never been utilized for any project in Vermont. Following the last TAC meeting I had a conversation with Ernie Christianson and Roger Thompson (who wrote this section of the Rules) to determine the type of disposal system that they thought applied to this section of the Rules. They suggested a surface based drip disposal system or similar at-grade approach and suggested that a mound type approach was not necessary. They almost suggested that the system could be built in the shallow ground water system. I queried them on Section 1-920 (G) (5) which indicates the wastewater system has to meet the performance based approach requirement that the mounded water table remain at least 6 inches below the surface of the naturally occurring soil throughout the management zone. They mostly suggested that it depends on the amount of unsaturated soil that is available, the related system design and, of course, a good solid effluent mounding analysis (hydrogeologic analysis) using accepted methods or models.

Based on their response and the understanding that between 6 and 8" of silty clay with no redoximorphic impacts are present, I believe the long, narrow (4' x 300') mound disposal areas with one (1) foot of mound sand beneath the application area is exactly what Section 1-920 requires for the Hergenrother Project. TCE's approach of proposing the long, narrow mounds (shielded by upslope curtain drains located 20' away) reduces the application rate and more importantly the linear loading rate to a point where an acceptable hydrogeologic model can be employed to define the resulting effluent mound, the distance downslope where the mounding is dissipated and the two year travel time distance. From a peer review standpoint, we (TCE, LAG, John Kelliher and you) worked together to properly site the 2 subject mounds to minimize converging drainage and to maximize diverging drainage. By the way, the 3 bedroom (420 gpd) 4' x 300' mounds utilize a very low application rate of 0.35 gpd/sq. ft and a very low linear

loading rate of 1.4 gpd/linear foot. I like these rates because they are low enough that experienced hydrogeologists and design engineers can actually visualize the ability of the unsaturated soil profile to handle the applied effluent.

Now that an acceptable mound layout has been proposed (TCE Sheet C2-01), John Kelliher, a qualified Hydrogeologist from Environmental Products and Services of Vermont, Inc. (EPSVT) was able to conduct a hydrogeologic study and effluent mounding analysis (which is attached) to prove that the conditions imposed by Section 1-920 are met. A two pronged approach was taken utilizing widely accepted models, Darcy's Law and the 1976 Khan, et al model which predicts shapes of steady state perched groundwater mounds and how rapidly they dissipate downgradient. It all starts with the input variables based on the soil profile description, such as texture, consistence and structure. With the fine textured soils that we have on-site, the associated moderate to strongly developed blocky structure provides the secondary permeability that allows effluent and normal groundwater flow in the upper 12" of the profile. In this regard, the upper 12" or so of the soil profile is a friable to firm, blocky structured silty clay with reasonable permeability.

The Darcy's Law Travel time calculation is standard and straight forward. A velocity is calculated and the resulting Two Year Travel Time is related to a distance downgradient of the mound. The assigned variables are appropriate including the permeability/hydraulic conductivity of 3 feet/day, which for these soils would be considered moderately permeable. The hydraulic gradient is in fact equivalent to ground slope (3%). Based on Darcy's Law the two year travel distance is 66 feet and the management zone reflects it.

Before we go to the Khan effluent mounding analysis, I should devote sometime to the curtain drains and their effect. The curtain drains will effectively lower the shallow seasonal groundwater system from 6 to 12" because of a number of factors. The drains are located 20' uphill of each mound application area. The drains are installed into a permeability boundary to a minimum starting depth of 24". There is a very significant permeability boundary or transition below 12" or so which ensures shallow groundwater flow is focused in the top 12" of the soil profile. Guinea Rd is a local east-west drainage divide so only +/- 3.3 acres of drainage area (along +/- 700' of frontage) contributes to the curtain drainage system. There is a reasonable 3 ft/day permeability related to the blocky structured silty clays. Based upon these factors, it is my professional opinion that the proposed curtain drains will lower the seasonal shallow groundwater system from 6 to 12", rather than to flow under or around them. The bottom line is, the shallow seasonal groundwater system is a perched system not a system resulting from upward flow from the bedrock or the underlying low permeability massive clay.

The Khan mound and mound dissipation analysis is one of the few rather conservative models which are available for use without getting into extraordinary models that are



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unaffordable for this purpose. The assumptions of the model are reasonably met with the site conditions and the imposed wastewater application. The permeability/hydraulic conductivity range used for upper soils (3 ft/day) and permeability boundary soils (0.01 ft/day) is appropriate. One half of the design width (6') is appropriate given that the basal application area is about 12 to 14' wide. The described calculations and results are accurate with maximum mounding of 2.79" and a downslope mounding dissipation distance of 6.9'. In short, I support the presented analysis and its results, and I believe that the analysis indicates that 6" of freeboard will be maintained beneath the two year travel time management zone of the Lot 2 and 3 proposed mound disposal systems. Beyond this, I think this site is a great candidate for a disposal system meeting the requirements of Section 1-920. In this regard, the proposed design meets these requirements.

Let me know if you have questions, given the fact that this is a new application of design technology for very fine textured sites.

Very truly yours,
Lincoln Applied Geology, Inc.



Stephen Revell, CPG
Senior Hydrogeologist

SR/ih

Enclosure

CC: John Pitrowiski, TCE(electronically)
John Kelliher, EPSVT(electronically)

F:\CLIENTS\2013\13038\Peer Review



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