

February 14, 2014

Jeannine McCrumb, Septic Officer
Spencer Harris, Septic Consultant
Town of Charlotte
P.O. Box 119
Charlotte, VT 05445

RE: Kroll Property, 581 Whalley Rd, Charlotte-4 Bedroom Residence Replacement
Disposal System Permitting

Dear Jeannine & Spencer:

The Kroll 4 bedroom residence has a failed in-ground disposal area that is submerged in the shallow groundwater system. The field is slowly taking effluent without any backup to the residence. In this regard, the proposed best-fix replacement mound disposal system can wait to go in until April-May 2014 to ensure acceptable ground conditions. A "best-fix" performance based mound disposal area shielded by a 2.5' deep curtain drain is proposed. Due to the location of the existing septic tank, as well as its deep burial, it will be abandoned and properly backfilled in place. The outlet plumbing of the house will be re-routed to come out the south side of the residence and connect to the septic tank and pump station shown on Figure 1. The site development area and the overall replacement disposal system are shown on Figure 1 and the replacement wastewater system details are shown on Figure 2.

The site and soil evaluation were conducted on January 27, 2014 with test pits and on January 29, 2014 with a percolation test and a site topographic survey. The soil profile descriptions and the percolation test results are attached. The soils were evaluated with Spencer in attendance and found to be permeable very fine to fine sandy loams overlying clay. The sandy loams have moderate to strong fine blocky structure and shallow seasonal water table indicators at 18" in the proposed disposal area. The "best-fix" design incorporates a curtain drain to lower the seasonal water table to 24" which will lower the impacts of effluent mounding. The attached site specific effluent mounding analysis indicates that the proposed 4.9' x 100' single trench mound will require 1.5' of mound sand to ensure the required 3' separation from the bottom of the application area. The attached pressure distribution and mound dimension details indicate the need of an effluent pump capable of pumping 14.35 gpm versus 14.82' of total dynamic head (TDH). An acceptable specification for a Hydromatic SHEF 30 effluent pump is attached.

The existing well and water system are unaffected by the replacement mound disposal system. In this regard, no changes are required so no related details are presented.

February 14, 2014
Jeannine McCrumb
Spencer Harris
Page 2 of 2

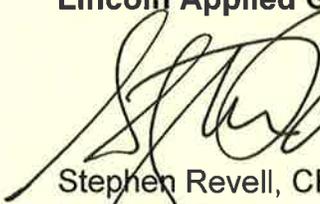
Additionally, no Act 145 notification is required because the septic isolation zone is maintained on-site and replacement disposal system construction is exempt.

I believe the Krolls replacement disposal system permitting package is complete with a signed application and ANR Form 5 (Act 145 exemption form), and an application fee of \$250.00 payable the Town of Charlotte, 2 signed copies of Figure 1 and 2, 1 signed 11" x 17" copy of Figure 1 and 2, 1 copy of this letter and the attachments and 1 CD of the complete application. The Krolls and I look forward to your favorable review and issuance of the requested permit.

If you have any questions, please give me a call.

Very truly yours,

Lincoln Applied Geology, Inc.



Stephen Revell, CPG
Licensed Designer #178B
Senior Hydrogeologist

SR/ih

Enclosures

CC: Alexander & Phyllis Kroll

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Lincoln Applied Geology, Inc.
Environmental Consultants

163 Revell Drive Lincoln, VT 05443 (802) 453-4384 Fax (802) 453-5399 www.lagvt.com

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 Kroll | | 2 First Name (and Middle Initial if appropriate) Alexander & Phyllis | |
| 3 Mailing Address Line 1 581 Whalley Rd | | 4 Mailing Address Line 2 | |
| 5 Town/City Charlotte | 6 State/Province VT | 7 Country United States | 8 Zip/Postal Code 05445 |
| 9 Email Address | | | 10 Telephone 802-238-4650 |

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 |
| 3 Mailing Address Line 1 | | | 4 Mailing Address Line 2 |
| 5 Town/City | 6 State/Province | 7 Country United States | 8 Zip/Postal Code |

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) | |
| 11 Certifying Official Title | | | |
| 12 Certifying Official Email Address | | | 13 Telephone |

Remove This Applicant

Add Another Applicant

| Section C - Primary Contact Information (if other than Applicant) | | | |
|---|----------------------|--|----------------------|
| 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"/> |

| Section D - Building/Business Owner Information | | | |
|---|----------------------|--|----------------------|
| 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"/> |

| Part II Certifying Designer(s) Information | | | |
|---|-------------------------------|---|--------------------|
| 1 Designer Last Name | | 2 Designer First Name (and Middle Initial if appropriate) | |
| Revell | | Stephen | |
| 3 Designer License# | 4 Company Name | | |
| 178 | Lincoln Applied Geology, Inc. | | |
| 5 Mailing Address Line 1 | | 6 Mailing Address Line 2 | |
| 163 Revell Drive | | <input type="text"/> | |
| 7 Town/City | 8 State/Province | 9 Country | 10 Zip/Postal Code |
| Lincoln | VT | United States | 05443 |
| 11 Email Address | | | 12 Telephone |
| srevell@lagvt.com | | | 453-4384 |
| 13 Designer Role(s) (check all that apply) | | | |
| <input 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 | (b) Street or Road Location |
| Charlotte | 581 Whalley 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) <input type="text" value="Kroll Replacement"/> | 2 Total Acreage of Property <input type="text" value="109.63"/> |
|--|--|

3 Business Name (if applicable)

4 Detailed Project Description

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 <input type="text" value="Spencer Harris"/> | (b) Date of Visit (m/d/yyyy) <input type="text" value="1/27/2014"/> |
|---|--|

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"/> |
| <input type="button" value="Add Another Town/Lot"/> | |

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 | 00011-0581 | 67 | 152-154 |

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 | 1 | Site Plan with Replacement Wastewater System | 2/17/2014 | |
| X | 2 | Wastewater System Details | 2/17/2014 | |

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 |
| 1 | 109.63 | Single Family Residence |

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 | 1 | Residential | Pre-1969 | Local | <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 | 109.63 | 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 | | | <input type="checkbox"/> | |

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? Yes No
- 2 Will any of the proposed water sources serve 25 or more people or have 15 or more service connections? Yes No
If Yes, the applicant must contact the Drinking Water & Groundwater Protection Division at (802) 241-3400 for source, construction and an operating permit.
- 3 Are any of the existing or proposed water sources located within a special flood hazard area? Yes No
- 4 Are any of the existing or proposed water sources located within a floodway? Yes 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? Yes No
If Yes, please submit additional information on the site. The Waste Management Division can be reached at (802) 241-3888.
- 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? Yes No
If Yes, please submit a copy of the approval letter from the Drinking Water & Groundwater Protection Division.
- 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? Yes No
If Yes, please submit additional information regarding the constituent(s) that exceeds the standards and plans, details, and specifications of the treatment device.
- 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? Yes No
If in areas of known interference issues, contact the Drinking Water & Groundwater Protection Division at (802) 241-3400.

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 Kroll Well | 2 Water Supply Owner (if not Applicant) |
| 3 Water Source Type Non-Public Drilled Bedrock Well | 4 Type of Change to Supply No Change |

5 Lots/Buildings Served by this Water Supply System

| | (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 | |
| X | 1 | 1 | No Change | 490 | 0 | 490 | Rule-based |
| Add Another Lot/Building Served by this Supply | | | | 6 | 7 | 8 | |
| | | | | 490 | 0 | 490 | |

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.

| (a) Water Supply Name/Identifier | Design Flows (Gallons Per Day) | | |
|----------------------------------|--------------------------------|------------|-----------|
| | (b) Existing | (c) Change | (d) Total |
| X Kroll Well | 490 | 0 | 490 |
| Add Another Water Supply | 2 490 | 3 0 | 4 490 |

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 Kroll Primary | 2 Wastewater Disposal System Owner (if not Applicant) |
|---|---|

| | |
|--|--|
| 3 Wastewater Disposal System Type In-ground | 4 Type of Change to System Replacement of Failed 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 | 1 | 1 | | 490 | 0 | 0 | 490 | Rule-based |
| Add Another Lot/Building Served by this System | | | | 6 | 7 | 8 | 9 | |
| | | | | 490 | 0 | 0 | 490 | |

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 Kroll Replacement | 2 Wastewater Disposal System Owner (if not Applicant) |
| 3 Wastewater Disposal System Type Mound | 4 Type of Change to System 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) | | | | (n) Rule or Meter Based Flows |
|---|-----------------|---|--------------------------------|------------|------------------|-----------|-------------------------------|
| | | | (d) Existing | (e) Change | (f) Infiltration | (g) Total | |
| X | 1 | Connection to New System | 490 | 0 | 0 | 490 | Rule-based |
| Add Another Lot/Building Served by this System | | | 6 | 7 | 8 | 9 | |
| | | | 490 | 0 | 0 | 490 | |

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

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 | Kroll Replacement | 490 | 0 | 0 | 490 |
| <input type="button" value="Add Another Wastewater System"/> | | 2 | 3 | 4 | 5 |
| | | 490 | 0 | 0 | 490 |

Part VII Application Fees

1 Fee Amount

2 Fee Calculation Details

Replacement Disposal System = \$250.00

Part VIII Designer Certification & Copyright License

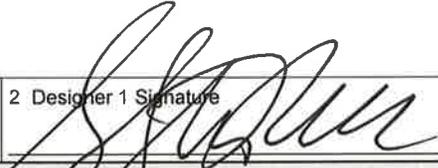
Section A - Certifying Designer 1 Certification & Copyright License

"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.

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."

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.

- Water Supply Designer
- Wastewater Disposal System Designer

| | | |
|-------------------|---|------------------|
| 1 Designer 1 Name | 2 Designer 1 Signature | 3 Signature Date |
| Stephen Revell |  | 2/19/14 |

Section B - Certifying Designer 2 Certification & Copyright License

"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.

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."

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.

- Water Supply Designer
- Wastewater Disposal System Designer

| | | |
|----------------------|------------------------|----------------------|
| 1 Designer 2 Name | 2 Designer 2 Signature | 3 Signature Date |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |

Part IX Applicant(s) Signature & Acknowledgements

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.

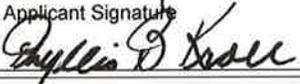
1 If we do visit your property, do you have any special instructions?

"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.

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.

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.

I also certify that to the best of my knowledge and belief the information submitted above is true, accurate and complete."

| | | | |
|--|---|---|--|
| X | 2 Print Applicant Name <input type="text" value="Alexander S. Kroll"/> | 3 Applicant Signature  | 4 Signature Date <input type="text" value="2/13/14"/> |
| X | 2 Print Applicant Name <input type="text" value="Phyllis B. Kroll"/> | 3 Applicant Signature  | 4 Signature Date <input type="text" value="2/13/14"/> |
| <input type="button" value="Add Applicant Signature Block"/> | | | |

ANR Form 5: Certification Statement for Wastewater System and Potable Water Supply Permits when there is no Required Notification of Overshadowed Property Owner(s)

A person submitting an application to the Secretary for a Wastewater System and Potable Water Supply Permit shall use this statement whenever overshadowing notification of affected landowners is not required (see guidance and instructions for examples).

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 "overshadowing" notification is not required either because there is an exemption to the notification requirement or there are no landowners whose property may be affected by the proposed water and wastewater systems.

Signature Alex S. Kroll

Name (Printed) Alexander S. Kroll

Property Address or Property Tax ID # 381 Whiskey Rd

Date of this certification 2/13/14

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

**Soil Profile Descriptions
Kroll Property
January 27, 2014
By Stephen Revell
Licensed Designer #178B
Senior Hydrogeologist**

Test Pit 1 (TP-1)

- | | |
|--------|--|
| 0-7" | Brown very fine to fine sandy loam, loose to friable, strong fine blocky structure, well drained |
| 7-20" | Brown to orange-brown very fine to fine sandy loam, friable, moderate to string blocky structure, mottled at 16" |
| 20-40" | Gray clay, friable to firm, weak blocky to platy structure, mottled, permeability boundary |

Test Pit 2 (TP-2)

- | | |
|--------|--|
| 0-8" | Brown very fine to fine sandy loam, loose to friable, strong fine blocky structure, well drained |
| 8-22" | Brown to orange-brown very fine to fine sandy loam, friable, moderate to string blocky structure, mottled at 18" |
| 22-36" | Gray clay, friable to firm, weak blocky to platy structure, mottled, permeability boundary |

Test Pit 3 (TP-3)

- | | |
|--------|--|
| 0-6" | Brown very fine to fine sandy loam, loose to friable, strong fine blocky structure, well drained |
| 6-22" | Brown to orange-brown very fine to fine sandy loam, friable, moderate to string blocky structure, mottled at 17" |
| 22-42" | Gray clay, friable to firm, weak blocky to platy structure, mottled, permeability boundary |



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Test Pit 4 (TP-4)

- 0-8" Brown very fine to fine sandy loam, loose to friable, strong fine blocky structure, well drained
- 8-21" Brown to orange-brown very fine to fine sandy loam, friable, moderate to string blocky structure, mottled at 18"
- 21-44" Gray clay, friable to firm, weak blocky to platy structure, mottled, permeability boundary

Test Pit 5 (TP-5)

- 0-8" Brown very fine to fine sandy loam, loose to friable, strong fine blocky structure, well drained
- 8-22" Brown to orange-brown very fine to fine sandy loam, friable, moderate to string blocky structure, mottled at 18"
- 22-38" Gray clay, friable to firm, weak blocky to platy structure, mottled, permeability boundary

Test Pit 6 (TP-6)

- 0-7" Brown very fine to fine sandy loam, loose to friable, strong fine blocky structure, well drained
- 7-20" Brown to orange-brown very fine to fine sandy loam, friable, moderate to string blocky structure, mottled at 18"
- 20-40" Gray clay, friable to firm, weak blocky to platy structure, mottled, permeability boundary

Test Pit 7 (TP-7)

- 0-8" Brown very fine to fine sandy loam, loose to friable, strong fine blocky structure, well drained
- 8-20" Brown to orange-brown very fine to fine sandy loam, friable, moderate to string blocky structure, mottled at 16"



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20-36" Gray clay, friable to firm, weak blocky to platy structure, mottled,
permeability boundary

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163 Revell Drive Lincoln, VT 05443 (802) 453-4384 Fax (802) 453-5399 www.lagvt.com

**Kroll Property
581 Whalley Road
Charlotte, Vermont
Percolation Test Results**

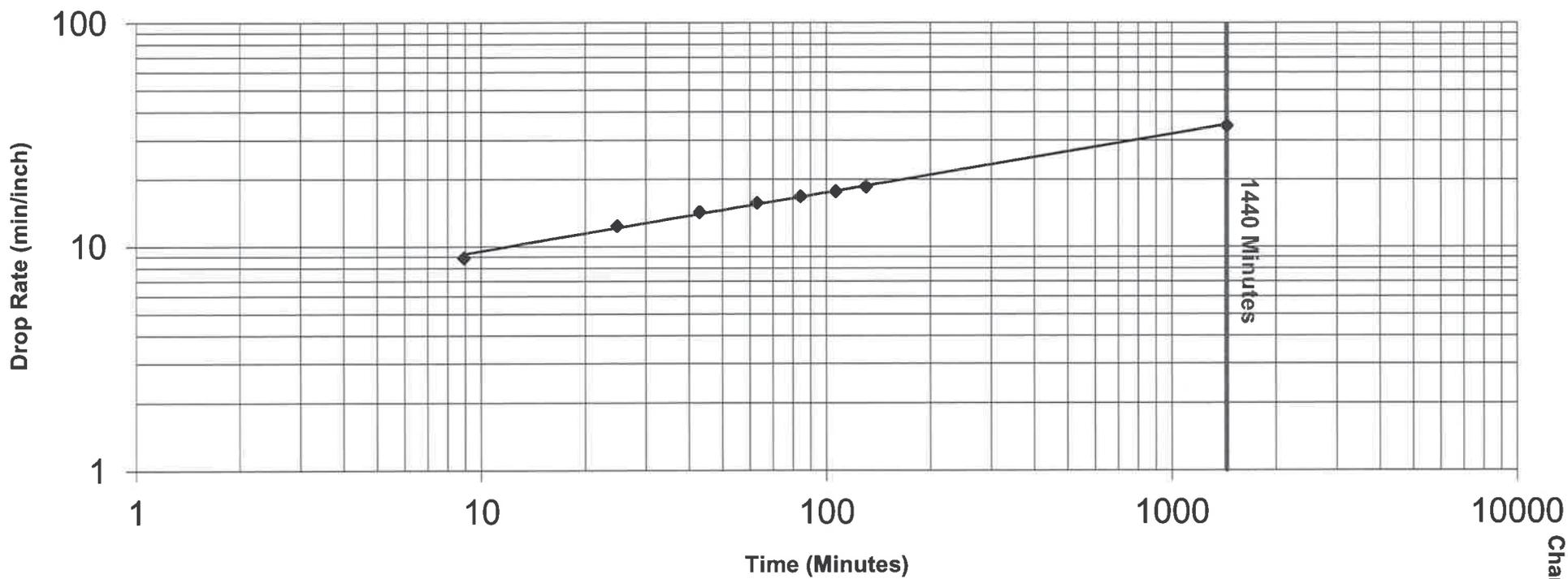
All tests were performed on January 29, 2014 at a depth of 18"

| PT-1 | Drop Time (min) | Total Drop Time (min) | Total Drop (inches) | Drop Rate (min/inch) |
|------|-----------------|-----------------------|---------------------|----------------------|
| | 8.9 | 8.9 | 1 | 8.9 |
| | 15.8 | 24.7 | 2 | 12.4 |
| | 18.1 | 42.8 | 3 | 14.3 |
| | 20.0 | 62.8 | 4 | 15.7 |
| | 21.1 | 83.9 | 5 | 16.8 |
| | 22.2 | 106.1 | 6 | 17.7 |
| | 23.8 | 129.9 | 7 | 18.6 |
| | --- | 1440.0 | --- | 34.8 |

***NOTE:**

Drop time includes fill time for each of the seven runs.

Kroll Property
581 Whalley Road
Charlotte, Vermont
Percolation Test Results
All tests were performed on January 29, 2014 at a depth of 18"



◆ PT-1

— Best Fit PT-1

Chart 1

Site Specific Effluent Mounding Analysis
Kroll Property
Whalley Road, 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 ft³/ day;
k= Hydraulic Conductivity = 30 ft./ day (approved k value for very fine to fine sandy loam moderate to strong blocky structure);
i= Gradient = 5% = 0.05 ft./ ft.;
h= effluent mound height = 0.5'
l= mound length = x feet

Solving for the required mound length results in a mound with a minimum length of 87'. A mound with a length of 100' is proposed. Recalculating the mounding results in an effluent mound of 0.44'. Since this is a best-fix mound, a curtain drain is proposed to lower the seasonal groundwater system 0.44' to compensate for the mounding. Since evidence of seasonal high groundwater system was identified at 18" or 1.5', 1.5' of approved mound sand is required beneath the application area to achieve the required 3' separation.

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PRESSURE DISTRIBUTION & MOUND DIMENSION DETAILS

CLIENT'S NAME: Kroll Replacement
 DATE: 2/12/2014 PERFORMED BY: S. Revell LAG Project #: 13163

| | | |
|---|--------------|---------------------|
| Design Flow Rate | 490 | GPD |
| Width of Distribution Stone Bed/Trench | 4.9 | FEET |
| Length of Distribution Stone Bed/Trench | 100 | FEET |
| Thickness of Sand Beneath Distribution Stone Bed/Trench | 1.5 | FEET |
| Thickness of Stone Beneath Laterals | 6 | INCHES |
| Soil Cover Thickness at Edge of Level Area | 12 | INCHES |
| Front Slope of Finished Mound | 33 | PERCENT |
| Side and Rear Slope of Finished Mound | 33 | PERCENT |
| Percolation Rate | 30 | MPI |
| Natural Ground Slope | 5 | PERCENT |
| | | |
| Thickness of Sand on Upper Side of Level Area | 2.20 | FEET |
| Thickness of Sand on Lower Side of Level Area | 2.55 | FEET |
| Width of Level Area | 6.9 | FEET |
| Length of Level Area | 102 | FEET |
| Area of Distribution Stone Bed/Trench | 490 | SQUARE FT |
| Volume of Stone Required | 11 | CUBIC YARDS |
| Proposed Basal Area | 1699 | SQUARE FEET |
| Volume of Mound Sand Required | 201.4 | CUBIC YARDS |
| | | |
| Number of Laterals | 2 | |
| Length of Each Lateral | 47.5 | FEET |
| Number of Orifices in the Manifold | 0 | |
| Number of Orifices in Each Lateral | 10 | |
| Distance Between Manifold and First Orifice | 2.5 | FEET |
| Distance Between Orifices (on center) | 5 | FEET |
| Distribution Area per Orifice | 24.50 | SQ. FT. |
| | | |
| Design Pressure Head | 3 | FEET |
| Diameter of Orifices (enter as fraction) | 0.188 | INCHES |
| Elevation From Pump Intake to Laterals (0 if siphon) | 6 | FEET |
| Diameter of Force Main | 1.5 | INCHES |
| Length of Force Main | 320 | FEET |
| Length of Manifold to Lateral | 0 | FEET |
| Diameter of Manifold Pipe | 1.5 | INCH |
| Diameter of Lateral Pipe | 1.5 | INCH |
| | | |
| Friction Loss in Force Main | 5.67 | FEET |
| Friction Loss in Manifold | 0.00 | FEET |
| Friction Loss in Section 1 | 0.01 | FEET |
| Friction Loss in Entire Lateral | 0.07 | FEET |
| Discharge Rate at First Orifice | 0.72 | GPM |
| Discharge Rate at Last Orifice | 0.71 | GPM |
| Percent Difference in Flow Rate First to Last Orifice | 1.06 | PERCENT |
| | | |
| Total Dynamic Head Loss | 14.818 | FEET |
| Total Distribution System Flow | 14.35 | GPM |
| Volume of Distribution System | 8.72 | GALLONS |
| Pump Capacity | 14.35 GPM vs | 14.818 FEET OF HEAD |
| Volume per Dose | 125 | GALLONS |
| On/Off Float Swing (1,000 gal. Tank) | 4.2 | INCHES |

PRESSURE DISTRIBUTION & MOUND DIMENSION DETAILS

CLIENT'S NAME: Kroll Replacement
 DATE: 2/12/2014 PERFORMED BY: S. Revel LAG Project #: 13163

DIMENSIONS OF MOUND SYSTEM

Dimensions of Mound Sand

| | |
|---|--|
| 5.8 feet from level area to uphill sand toe | 8.2 ft corner of level area to upper toe corner |
| 6.9 ft wide level area | 6.7 ft to side toe from upper edge of level area |
| 4.9 ft wide stone bed/trench | |
| 100 ft long stone bed/trench | 7.7 ft to side toe from lower edge of level area |
| 102 ft long level area | |
| 9.1 feet from level area to downhill sand toe | 12.9 ft corner of level area to lower toe corner |

Dimensions of Final Cover

| | |
|---|---|
| 8.4 feet from level area to uphill toe | 11.9 ft corner of level area to upper fill toe |
| | 9.7 ft to side toe from upper edge of level area |
| 6.9 ft wide level area | |
| 102 ft long level area | 10.7 ft to side toe from lower edge of level area |
| | 17.9 ft corner of level area to lower fill toe |
| 12.7 feet from level area to downhill toe | |

PLOW AREA LAYOUT MEASUREMENTS

| | |
|---|-----------|
| Center of Bed/Trench to Downslope Toe | 65.7 feet |
| End of Level Area @ Midpoint to Downslope Toe | 20.5 feet |
| Center of Bed/Trench to Upslope Toe | 60.6 feet |
| End of Level Area @ Midpoint to Upslope Toe | 14.6 feet |

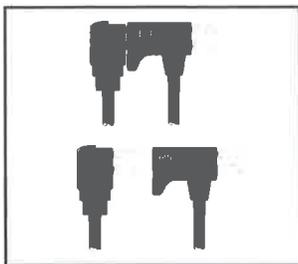
HYDROMATIC®

SHEF30

Submersible Effluent Pump

- Effluent Septic Tank

Automatic operation features easily adjustable, wide-angle float switch with a piggyback plug-in arrangement that allows for simple conversion to manual operation. Special inlet design allows pump to handle 3/4" solids. Cast iron body and an oil-filled motor provide superior cooling characteristics for longer pump life. Motor windings contain automatic thermal overload protection. Energy efficient .3 HP motor pumps up to 35 GPM at 10' total dynamic head. Discharge is 1-1/2" N.P.T.



May be operated manually or automatically with a piggyback switch.



SHEF30 - Submersible Effluent Pump

Details

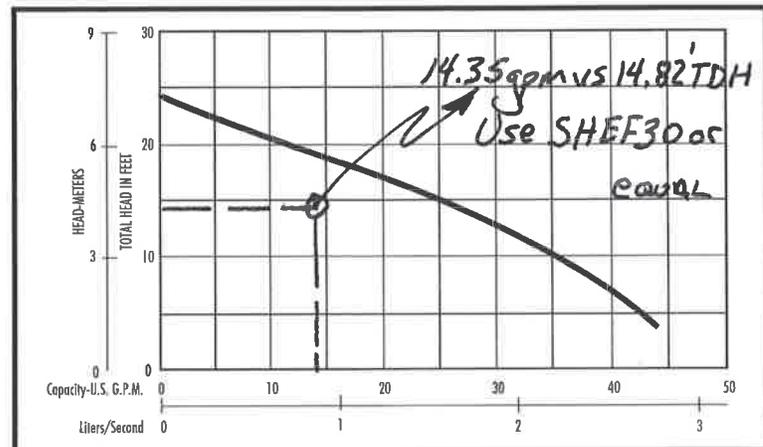
Pump Characteristics

| | |
|-----------------|----------------------|
| Pump/Motor Unit | Submersible |
| Automatic Model | SHEF30A1 |
| Horsepower | .30 |
| Full Load Amps | 8.0 |
| Motor Type | Shaded Pole (4 pole) |
| R.P.M. | 1550 |
| Phase Ø | 1 |
| Voltage | 115 |
| Hertz | 60 |
| Temperature | 120°F Ambient |
| NEMA Design | A |
| Insulation | Class A |
| Discharge Size | 1-1/2" NPT (38mm) |
| Solids Handling | 3/4" (19mm) |
| Unit Weight | 30 lbs. |
| Power Cord | 18/3, SJTW, 20' std. |

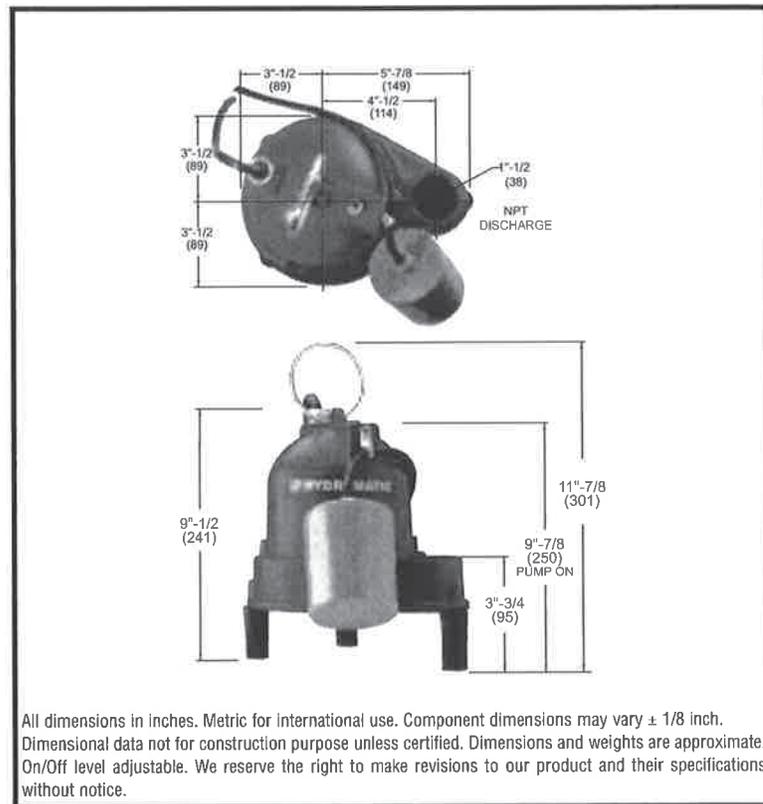
Materials of Construction

| | |
|-----------------------|---|
| Handle | Stainless Steel |
| Lubricating Oil | Dielectric Oil |
| Motor Housing | Cast Iron |
| Pump Volute | Cast Iron |
| Shaft | Steel |
| Mechanical Shaft Seal | Seal Faces: Carbon/Ceramic Seal Body: Anodized Steel Spring: Stainless Steel Bellows: Buna-N |
| Impeller | Engineered Thermoplastic |
| Upper Bearing | Cast Iron Sleeve |
| Lower Bearing | Single Row Ball Bearing |
| Legs | Engineered Thermoplastic |
| Fastener | Stainless Steel |

Performance Data



Dimensional Data



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Pentair Pump Group

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1840 Baney Road Ashland, Ohio 44805
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