Jason Barnard
Consulting, LLC
4400 VT Route 17
Starksboro, VT 05487
(802) 453-2597 Phone
(802) 453-8497 Fax

November 18, 2015

Town of Charlotte
Planning and Zoning Department
Attn: Jeannine McCrumb
159 Ferry Road
Charlotte, Vermont 05445

Subject: Jeffrey and Linda Hanson, 4.3+/- Acre Parcel, 2644 Guinea Road, Charlotte, VT - Wastewater System and Potable Water Supply Permit Application

Dear Jeannine:

Enclosed you will find two (2) copies of the Jeffrey and Linda Hanson full size design drawings, two (2) copies of the 11" x 17" design drawings, electronic copies of the design drawings in PDF format, and the required supporting documents (paper and electronic copies) relative to a 4.3+/- acre residential property located at 2644 Guinea Road in Charlotte. The subject property is improved with a 4-bedroom single-family residence that is provided water by an on-site drilled well and is served by an on-site in-ground wastewater disposal system. The in-ground wastewater system that serves the 4-bedroom single-family residence is starting to fail (effluent is surfacing in the vicinity of the leach field) and therefore the existing system needs to be replaced.

For this reason, Jeffrey and Linda Hanson are applying for a State of Vermont Wastewater System and Potable Water Supply Permit so that a replacement mound wastewater system can be installed that will serve the 4-bedroom single-family residence. The proposed replacement wastewater disposal system is a performance-based mound with an upslope curtain drain.

Included to facilitate your review of this permit application are the following:

1. Check made payable to the Town of Charlotte for the amount of two hundred and fifty dollars ($250.00).
2. State of Vermont, Agency of Natural Resources, Potable Water Supply and Wastewater System Permit Application.
3. Landowner Notification Exemption Form.
4. Test Pit Logs.
5. Percolation Tests.
6. Effluent Mounding Analysis.
7. Replacement Mound System Basis of Design.
8. Replacement Mound System Pressure Distribution Details.
9. Required Effluent Pump Specifications.
10. High Water Level Alarm Specifications.
11. Mound System Construction Instructions.

12. Polylok PL-122 Effluent Filter Specification Sheet.
13. Design Drawings No. 1 and No. 2 dated November 18, 2015.

Should you have any questions or comments relative to the information submitted herein, please do not hesitate to call me at (802) 453-2597.

Sincerely,

Jason S. Barnard
Licensed Designer #430-B

c: Jeff and Linda Hanson (2)

Drinking Water & Groundwater Protection Division - Permit Application

Wastewater System & Potable Water Supply

VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

For Office Use Only:

Application#	PIN#	Date Complete Application Received

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)
Hanson	Jeffery

3 Mailing Address Line 1	4 Mailing Address Line 2
2644 Guinea Road	

5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
Charlotte	Vermont	United States	05445

9 Email Address	10 Telephone
	802-425-6586

Remove This Applicant

1 Last Name	2 First Name (and Middle Initial if appropriate)
Hanson	Linda

3 Mailing Address Line 1	4 Mailing Address Line 2
2644 Guinea Road	

5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
Charlotte	Vermont	United States	05445

9 Email Address	10 Telephone
	802-425-6586

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	8 Zip/Postal Code
		United States	

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)

3 Mailing Address Line 1	4 Mailing Address Line 2

5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
		United States	

9 Email Address	10 Telephone

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	8 Zip/Postal Code
		United States	

9 Email Address	10 Telephone

Part II Certifying Designer(s) Information

1 Designer Last Name	2 Designer First Name (and Middle Initial if appropriate)
Barnard	Jason S.

3 Designer License#	4 Company Name
430	Jason Barnard Consulting, LLC

5 Mailing Address Line 1	6 Mailing Address Line 2
4400 VT Route 17	

7 Town/City	8 State/Province	9 Country	10 Zip/Postal Code
Starksboro	Vermont	United States	05487

11 Email Address	12 Telephone
jason@jasonbarnardconsulting.com	802-453-2597

13 Designer Role(s) (check all that apply)

- ☐ Water Supply Designer
- ☒ Wastewater Disposal System Designer

Remove This Designer

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		

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	M10B01L22	110	193-194

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	11/18/2015	
X	2	Replacement Wastewater System Details	11/18/2015	

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	4.3	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 with existing permits?
X	Lot 1 House	Residential	Prior to Jan 1, 07	None Found	◉ Yes ◯ No

Add Another Building

Remove This Lot

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	2644 Guinea Road

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°)

N 44.28009 °

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

W (-) 73.20203 °

Part IV Project Information

Section A - General Project Information & Questions

1 Project Name (if applicable)

2 Total Acreage of Property: 4.3

3 Business Name (if applicable)

4 Detailed Project Description

Jeffrey and Linda Hanson own a 4.3+/- acre parcel of land located at 2644 Guinea Road in Charlotte. The property is improved with a 4-bedroom single-family residence that is served by an on-site in-ground wastewater disposal system and is provided water by an on-site drilled water supply well. The existing in-ground wastewater system has failed (effluent is surfacing in the vicinity of the leach field) and therefore the system needs to be replaced. For this reason, Mr. and Mrs. Hanson are applying for a Wastewater System and Potable Water Supply Permit to replace the existing in-ground disposal system. A performance-based mound wastewater system with an upslope curtain drain is proposed as the replacement wastewater disposal system.

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: Brian Tremback

(b) Date of Visit (m/d/yyyy): 10/13/2015

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.

Add Another Lot

Section E - Proposed Project Lot/BuildingDetails

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	4.3	4-Bedroom Single-family Residence

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	Lot 1 House		☐	4-Bedroom Single-family Residence

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	2 Water Supply Owner (if not Applicant)
Hanson Drilled Well	
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

	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's Supply	Design Flows (Gallons Per Day) (d) Existing	(e) Change	(f) Total	(g) Rule or Meter Based Flows
X	1	Lot 1 House	No Change	490	0	490	Rule-based
				6 490	7 0	8 490	

Add Another Lot/Building Served by this Supply

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	Hanson Drilled Well	490	0	490
		2 490	3 0	4 490

Add Another Water Supply

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	2 Wastewater Disposal System Owner (if not Applicant)
Hanson Replacement System	
3 Wastewater Disposal System Type	**4 Type of Change to System**
Mound	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) (d) Existing	(e) Change	(f) Infiltration	(g) Total	(h) Rule or Meter Based Flows
X	1	Lot 1 House	Replacement of Failed Syster	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

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	Hanson Replacement System	490	0	0	490
	Add Another Wastewater System	2	3	4	5
		490	0	0	490

Part VII Application Fees

1 Fee Amount $250.00

2 Fee Calculation Details

In accordance with the Town of Charlotte permit fee schedule, the application fee for a replacement system is $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
Jason S. Barnard		11/18/15

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

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."

	2 Print Applicant Name	3 Applicant Signature	4 Signature Date
X	Jeffrey Hanson		
X	Linda Hanson		

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 _____
>
> Name (Printed) Jeffrey and Linda Hanson
>
> Property Address or Property Tax ID # 2644 Guinea Road, Charlotte, Vermont
>
> Date of this certification _____

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

TEST PIT LOG

Client: Jeffrey and Linda Hanson Date: October 13, 2015 Location: 2644 Guinea Road, Charlotte, Vermont

Project Description: Replacement Wastewater Disposal System Design and Permitting

Logged By: Jason Barnard, Licensed Designer #430-B Topographic Setting: Gently Sloping Lawn Area

Current/Historic Land Use: Residential Slope: 10 – 12% Vegetation: Lawn Area

Weather Conditions: 65^0 Mostly Sunny Method of Excavation: Rubber Tired Backhoe

Test Pit #	Depth (inches)	Dominant Color	Soil Texture	Soil Structure	Consistency	Mottles	Comments
01	0-10"	Brown	Very fine sandy loam (topsoil)	Granular	Loose	No	Fairly well drained
	10-15"	Brown	Very fine sandy loam	Granular	Loose	Prominent, common and distinct at 10"	Fairly well drained, SHWT estimated at 10"
	15-34"	Gray	Clay loam	Sub-angular blocky	Friable	Prominent, common and distinct	Ledge at 34", no groundwater to 34"
02	0-6"	Brown	Very fine sandy loam (topsoil)	Granular	Loose	No	Fairly well drained
	6-15"	Brown	Very fine sandy loam	Granular	Loose	Prominent, common and distinct at 6"	Fairly well drained, SHWT estimated at 6"
	15-28"	Gray	Clay loam	Sub-angular blocky	Friable	Prominent, common and distinct	Ledge at 28", groundwater at 28"

Client: Jeffrey and Linda Hanson Date: October 13, 2015 Location: 2644 Guinea Road, Charlotte, Vermont

Test Pit #	Depth (inches)	Dominant Color	Soil Texture	Soil Structure	Consistency	Mottles	Comments
03	0-7"	Brown	Very fine sandy loam (topsoil)	Granular	Loose to very friable	No	Well drained
	7-16"	Tan-brown	Very fine sandy loam	Granular	Loose	Prominent, common and distinct at 16"	Well drained, SHWT estimated at 16"
	16-36"	Tan-brown	Very fine sandy loam	Weak sub-angular blocky	Friable	Prominent, common and distinct	No ledge or groundwater to 36"
04	0-4"	Brown	Very fine sandy loam (topsoil)	Granular	Loose to very friable	No	Well drained
	4-16"	Tan-brown	Very fine sandy loam	Granular	Loose	Fine, faint and few at 16"	Well drained, SHWT estimated at 16"
	16-36"	Tan-brown	Very fine sandy loam	Weak sub-angular blocky	Friable	Prominent, common and distinct at 18"	No ledge to 36", groundwater at 32"

Table 1

Jeffrey and Linda Hanson
Replacement Wastewater Disposal System
2644 Guinea Road, Charlotte, Vermont

Percolation Tests of October 28, 2015

P-01	Drop Time (min)	Total Drop Time (min)	Total Drop (inches)	Drop Rate (min/inch)
	8.00	8.00	1	8.00
	10.00	18.00	2	9.00
	12.00	30.00	3	10.00
	12.50	42.50	4	10.63
	14.00	56.50	5	11.30
	14.45	70.95	6	11.83
	15.10	86.05	7	12.29
	---	**1440.00**	---	**20.44**

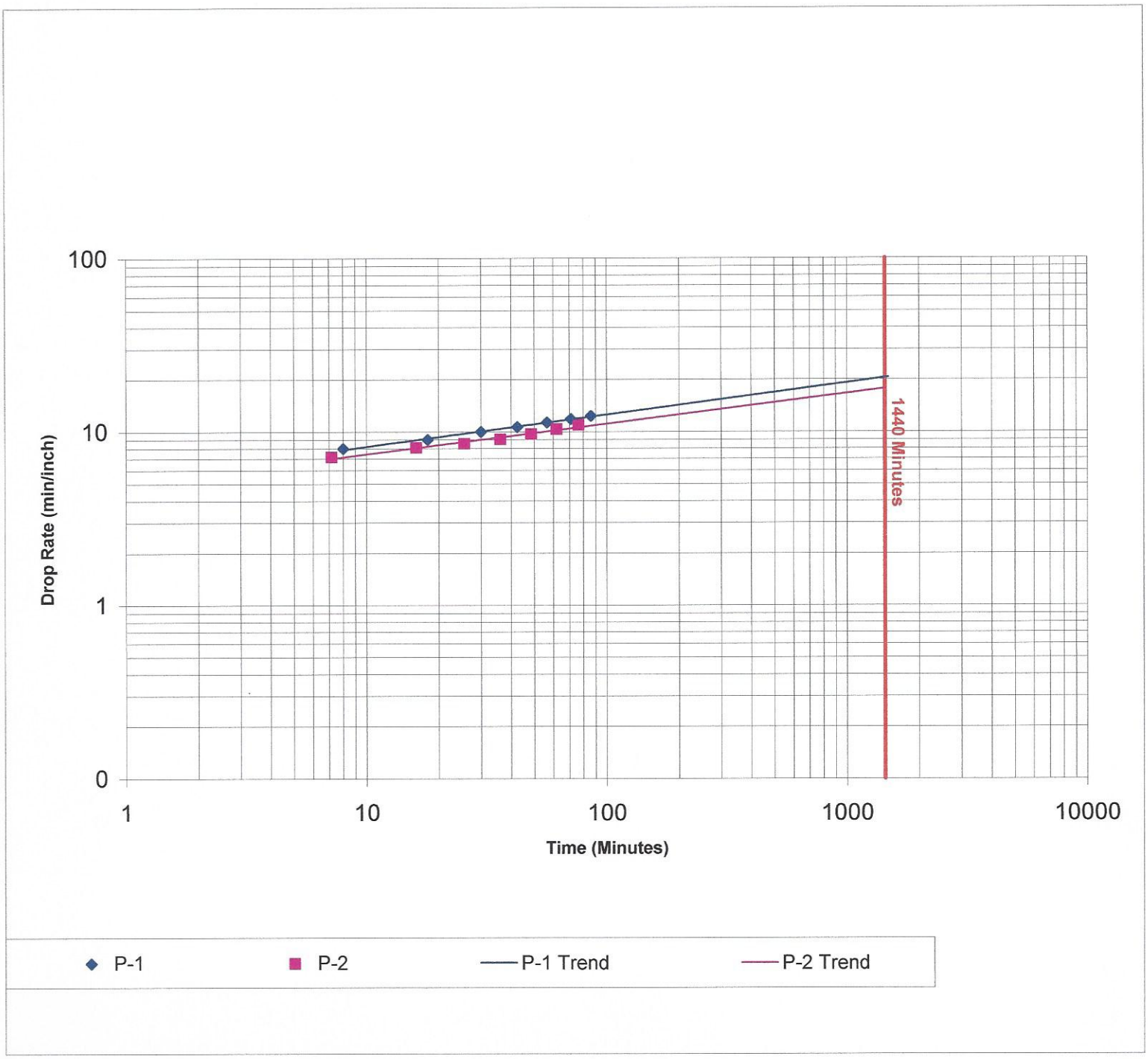
P-02	Drop Time (min)	Total Drop Time (min)	Total Drop (inches)	Drop Rate (min/inch)
	7.15	7.15	1	7.15
	9.00	16.15	2	8.08
	9.45	25.60	3	8.53
	10.50	36.10	4	9.03
	12.35	48.45	5	9.69
	13.45	61.90	6	10.32
	14.56	76.46	7	10.92
	---	**1440.00**	---	**17.70**

NOTES:
1. Percolation tests performed at 10 to 20 inches below ground surface.

Jeffrey and Linda Hanson
Replacement Wastewater Disposal System
2644 Guinea Road, Charlotte, Vermont

Chart 1

Percolation Tests of October 28, 2015



Jeffrey and Linda Hanson
Replacement Wastewater
Disposal System
2644 Guinea Road
Charlotte, Vermont

Replacement Mound System
Desktop Effluent Mounding Analysis

Replacement Mound:

- Soils present in the vicinity of the replacement mound system consist of very fine sandy loam topsoil that has a loose consistency with a granular structure and extends to between 4" and 7" below ground surface. Beneath the very fine sand loam topsoil is well drained very fine sandy loam that has a loose consistency with a granular structure and extends to 16" below ground surface. Beneath the very fine sandy loam, is a very fine sandy loam that is friable with a weak sub-angular blocky structure. The very fine sandy loam was used in the effluent mounding analysis.

- The estimated depth to the seasonal high water table (SHWT) is 16" (1.33') below ground surface, based on the presence of redoximorphic features (soil mottles) in test pits TP-03 and TP-04.

- The average ground surface slope is estimated at approximately 10.3% in the vicinity and down slope of the replacement mound wastewater disposal system.

The following equation is used from the ANR "Simplified Procedure for Prescriptive Desktop Mounding Analysis", dated January 30, 2003:

$$LLR = (f)(h)$$

where: LLR = linear loading rate, gpd/ft.

h = soil thickness available for groundwater mounding in feet.

f = the LLR factor from Table 1 of the January 30, 2003 ANR document, which is based on soil texture and slope.

from Table 1:

Very fine sandy loam with a slope of 10.3%, therefore $f = 18.7$

SHWT = 1.33' (16") – 0.5' (6") = 0.83' (10") = h (available for mounding)

Using the formula above, the linear loading rate and minimum mound size is determined as follows:

- *LLR*= (0.83)(18.7) = 15.52 gpd/linear foot.
- 490 gpd/15.52 gpd/linear feet = 31.57 feet minimum mound length.
- Loading at 1.0 gpd/ft^2, 490 gpd/1.0 gpd/ft^2 = 490 ft^2 of infiltration area is required.
- 500 ft^2 of infiltration area is supplied via one 10 foot by 50 foot absorption bed.
- The actual linear loading rate (ALLR) is: 490 gpd/50 ft = 9.8 gpd/linear foot.
- The actual effluent mounding (AEM) is determined by dividing the actual linear loading rate (ALLR) by the linear loading rate factor (*f*) = AEM = (A*LLR*/*f*) = (9.8/18.7) = 0.52' or 6.26".
- Then, the amount of unsaturated soil ("freeboard") between the top of the induced groundwater mound and the ground surface is determined by subtracting the AEM from the highest SHWT = 1.33' (16") – 0.52' = 0.81' or 9.75"+/-

Conclusions

The replacement mound system, if constructed with a 10 foot wide by 50 foot long absorption bed with 2.2 feet (26.5 inches) of mound sand beneath the absorption bed will maintain the effluent plume at least 6 inches below existing ground surface at all times of the year. Further, since the replacement mound is being proposed with 2.2 feet of mound sand beneath the absorption bed, the system will provide at least 3 feet of separation to the induced groundwater mounding (0.81' of freeboard + 2.2 feet of mound sand = 3 feet (36 inches of separation to the induced groundwater mounding). Additionally, with 2.2 feet of mound sand beneath the absorption bed and at least 3 feet (36 inches) to bedrock in the test pits that were excavated in the vicinity of the replacement mound system area, there is greater than 4 feet (48 inches) of vertical separation between the bottom of the mound system's absorption bed and any underlying bedrock that may be present.

MOUND WASTEWATER DISPOSAL SYSTEM BASIS OF DESIGN

Jeffrey and Linda Hanson
Replacement Wastewater Disposal System
2644 Guinea Road, Charlotte, Vermont
November 13, 2015
Prepared By: Jason S. Barnard, Licensed Designer #430-B

Replacement Mound Wastewater Disposal System

I. WASTEWATER FLOWS AND MOUND DISPOSAL SYSTEM SIZING

A. WASTEWATER FLOWS (Q)

3	Bedrooms	140	gpd/bedroom=	420	gpd
1	Bedroom	70	gpd/bedroom=	70	gpd
			Total Flows =	**490**	gpd

B. REQUIRED SEPTIC TANK

Required Septic Tank Capacity = **1,000 gallons** for a **4-bedroom** single-family residence. The existing tank shall be pumped out, inspected and if in good condition the tank shall be retrofitted with a Polylok PI-122 effluent filter or equal. If the existing septic tank is in poor condition or does not appear to be water-tight, it shall be replaced with a new 1,000-gallon water-proof concrete septic tank with an approved effluent filter.

C. PERCOLATION RATE (PR)

All percolation tests were less than 60 min/inch, therefore a basal area application rate of **0.74** gallons per day (gpd) per square foot (sf) is used.

D. MOUND SYSTEM APPLICATION RATE (AR)

AR = Application rate for sizing the mound system leachfield area (LA)
Ra maximum = 1.0 gpd/sf for Mounds
Selected Ra = **1.0** gpd/sf

E. REQUIRED LEACHFIELD AREA (RLA)

RLA = Q / AR
RLA = 490 / 1.0
RLA = **490** sf

F. PROPOSED LEACHFIELD AREA (PLA)

PLA = LENGTH (L) x WIDTH (W) x NUMBER OF TRENCHES or BEDS (N)

L =	50	ft
W =	10	ft
N =	1	Absorption Bed

PLA= **500** sf
PLA > RLA therefore PLA is acceptable

G. MOUND SYSTEM BASAL AREA (BA)

G1. BASAL AREA APPLICATION RATE (BAAR)

BAAR = Application rate for sizing basal area (BA)
BAAR = 0.74 gpd/sf for PR<60 min/inch
BAAR = 0.24 gpd/sf for 60 min/inch < PR < 120 min/inch
Selected BAAR = **0.74** gpd/sf

G2. REQUIRED BASAL AREA (RBA)

RBA = Q / BAAR
RBA = 490 / 0.74
RBA = **662** sf

G3. PROPOSED BASAL AREA (BA)

PBA = Trench or Seepage Bed Length (L) x Distance from uphill side of trench to downhill mound toe (MT).

L =	50	ft
MT =	28.5	ft

PBA = **1425** sf
PBA > RBA, therefore the PBA is acceptable

MOUND WASTEWATER DISPOSAL SYSTEM BASIS OF DESIGN

Jeffrey and Linda Hanson
Replacement Wastewater Disposal System
2644 Guinea Road, Charlotte, Vermont
November 13, 2015
Prepared By: Jason S. Barnard, Licensed Designer #430-B

II. MOUND SYSTEM PRESSURE DISTRIBUTION DETAILS

A. PROPOSED MOUND SYSTEM DISTRIBUTION SYSTEM

SEE THE ATTACHED ORENCO SYSTEMS, INC. PUMP SELECT SPREAD SHEET FOR THE PROPOSED MOUND SYSTEM PRESSURE DISTRIBUTION DETAILS.

B. TOTAL NUMBER OF ORIFICES IN THE DISTRIBUTION SYSTEM

Number of Orifices = **20** orifices

C. LEACHFIELD AREA (LA) PER ORIFICE

LA/Orifice = LA / Total Number of Orifices
LA/Orifice = **25.0** sf
LA/Orifice is less than 25 SF per Orifice, therefore the proposed number of orifices is in accordance with the current State of Vermont, EPRs.

III. PROPOSED PUMP STATION DESIGN

A. REQUIRED PUMP STATION

Required Pump Station Capacity = **1,000 gallons** for a **4-bedroom** single-family residence.

B. REQUIRED MOUND SYSTEM DOSE

Required Dose Volume = **122.5** Gallons
Pump Station Dimensions: Camp Precast 1,000 Gallon Low-Profile Pump Station = 5.63 ft x 9.71 ft
Area of Pump Station = 54.7 sf
Volume per Inch of depth = 34.1 gallons / vertical inch
Pump on/off switch difference setting required for dose: 4 inches

C. REQUIRED PUMP STATION STORAGE

Storage Required = 490 gallons (1 day's flow)

D. PUMP STATION STORAGE

Pump alarm to overflow point height difference = 16.0 inches
Storage Provided = **546** gallons
Storage provided is greater than 1 day's flow, therefore the proposed pump station is adequately sized.

E. PROPOSED EFFLUENT PUMP

Goulds Model Number WE0512HH 1/2 hp 230 volt 1 phase

F. PROPOSED PUMP STATION EFFLUENT PUMP

See Attached Effluent Pump Curve

Pump Selection for a Pressurized System - Single Family Residence Project

Jeff and Linda Hanson, 2644 Guinea Road, Charlotte / Replacement Mound Pressure Distribution Details

Parameters

Discharge Assembly Size	2.00	inches
Transport Length	320	feet
Transport Pipe Class	40	
Transport Line Size	2.00	inches
Distributing Valve Model	None	
Max Elevation Lift	29	feet
Manifold Length	5	feet
Manifold Pipe Class	40	
Manifold Pipe Size	2.00	inches
Number of Laterals per Cell	2	
Lateral Length	45	feet
Lateral Pipe Class	40	
Lateral Pipe Size	2.00	inches
Orifice Size	7/32	inches
Orifice Spacing	5	feet
Residual Head	5	feet
Flow Meter	None	inches
'Add-on' Friction Losses	0	feet

Calculations

Minimum Flow Rate per Orifice	1.33	gpm
Number of Orifices per Zone	20	
Total Flow Rate per Zone	26.5	gpm
Number of Laterals per Zone	2	
% Flow Differential 1st/Last Orifice	0.5	%
Transport Velocity	2.5	fps

Frictional Head Losses

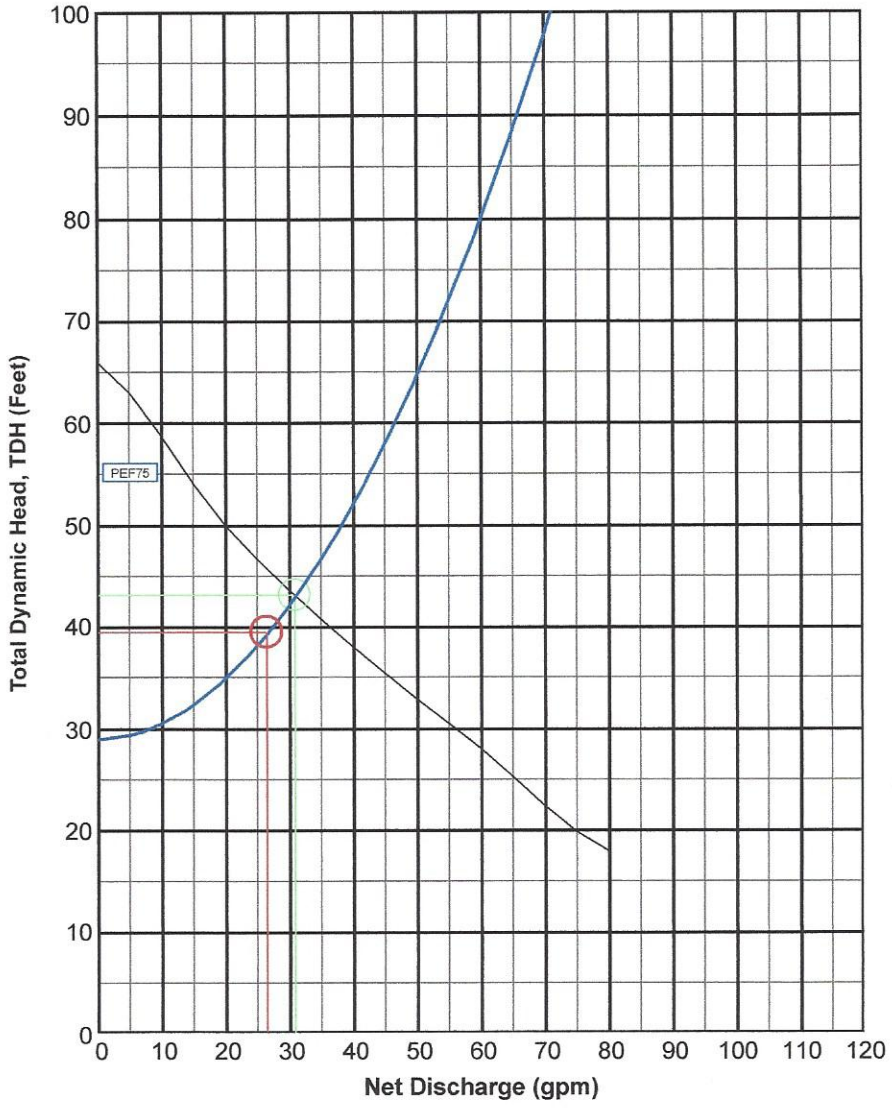
Loss through Discharge	1.4	feet
Loss in Transport	3.9	feet
Loss through Valve	0.0	feet
Loss in Manifold	0.0	feet
Loss in Laterals	0.1	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	0.0	feet

Pipe Volumes

Vol of Transport Line	55.8	gals
Vol of Manifold	0.9	gals
Vol of Laterals per Zone	15.7	gals
Total Volume	72.3	gals

Minimum Pump Requirements

Design Flow Rate	26.5	gpm
Total Dynamic Head	39.5	feet



PumpData

PEF75 Effluent Pump
3/4HP, 230V 1Ø

Legend

System Curve:
Pump Curve:
Pump Optimal Range:
Operating Point:
Design Point:

Orenco Systems®
Incorporated
Changing the Way the World Does Wastewater®

Jeffrey & Linda Hanson
2644 Guinea Road, Charlotte -
Replacement Mound System Required
Effluent Pump or Equal

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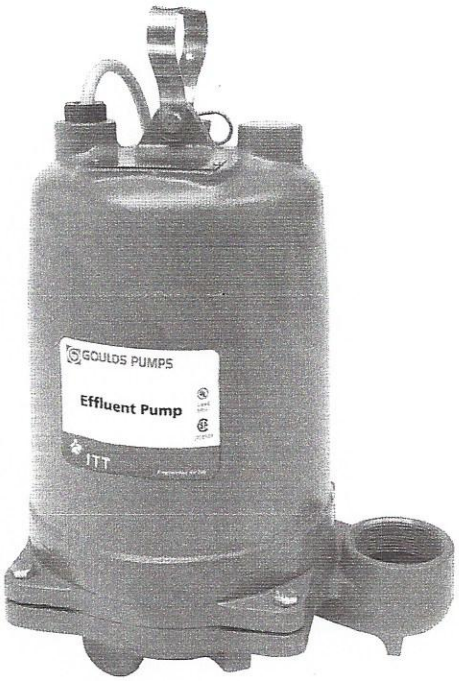
Wastewater

Goulds Pumps

WE Series Model 3885

Submersible Effluent Pump

PROSURANCE AVAILABLE FOR
RESIDENTIAL APPLICATIONS.



FEATURES

- **Impeller:** Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.
- **Casing:** Cast iron volute type for maximum efficiency. 2" NPT discharge.
- **Mechanical Seal:** Silicon Carbide vs. Silicon Carbide sealing faces. Stainless steel metal parts, BUNA-N elastomers.
- **Shaft:** Corrosion-resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.
- **Fasteners:** 300 series stainless steel.
- Capable of running dry without damage to components.
- Designed for continuous operation when fully submerged.

GOULDS PUMPS

Goulds Pumps is a brand of ITT
Residential and Commercial Water.

www.goulds.com

Engineered for life

Jeffrey & Linda Hanson
2644 Guinea Road, Charlotte -
Replacement Mound System Required
Effluent Pump or Equal

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GOULDS PUMPS
Wastewater

APPLICATIONS

Specifically designed for the following uses:

- Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

SPECIFICATIONS

Pump

- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on ⅓-1½ HP models.
- Class F insulation on 2 HP models.

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ⅓ – 1 HP models have NEMA three prong grounding plugs.
- 1½ HP and larger units have bare lead cord ends.

Three phase (60 Hz):

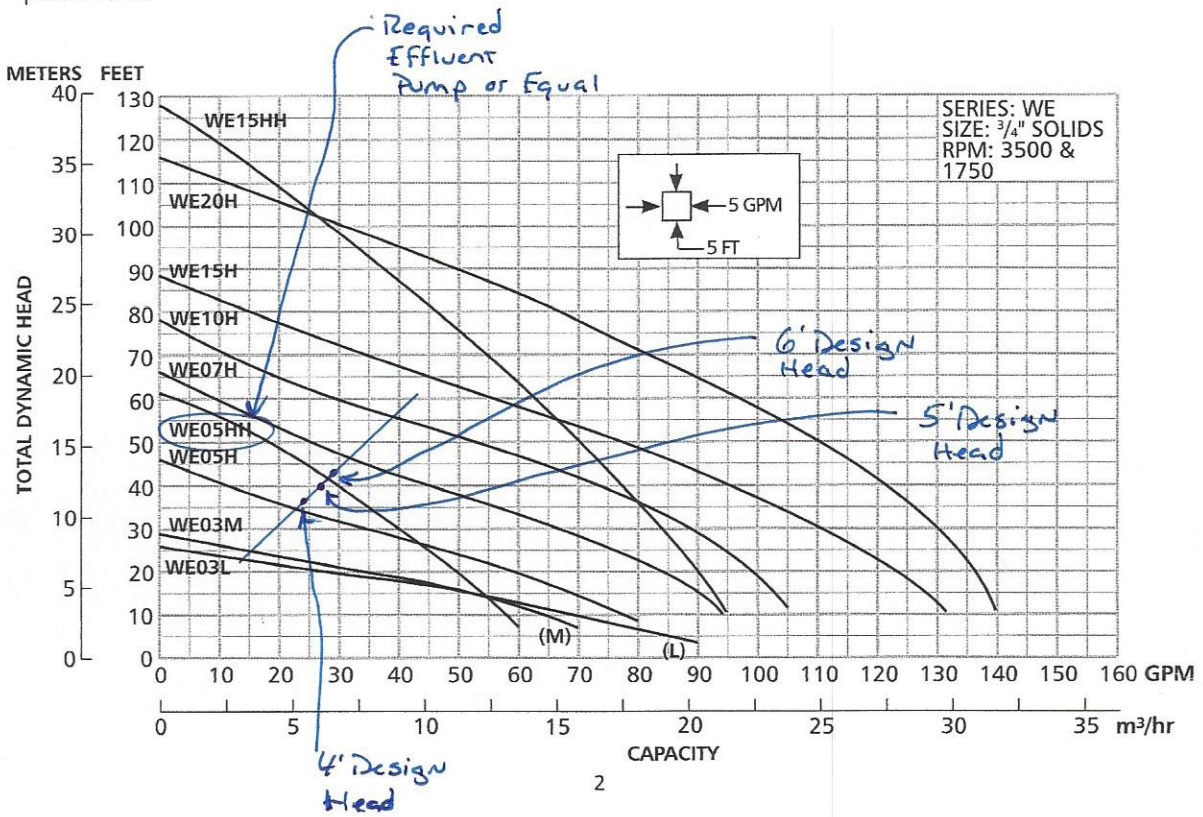
- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.

- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **O-ring:** Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards By Canadian Standards Association File #LR38549

Goulds Pumps is ISO 9001 Registered.



Jeffrey & Linda Hanson
2644 Guinea Road, Charlotte -
Replacement Mound System Required
Effluent Pump or Equal

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GOULDS PUMPS
Wastewater

MODELS

Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency %	Resistance Start	Resistance Line-Line	Power Cable Size	Weight (lbs.)
WE0311L	0.33	1	115	1750	5.38	10.7	30.0	M	54	11.9	1.7	16/3	56
WE0318L			208			6.8	19.5	K	51	9.1	4.2		
WE0312L			230			4.9	14.1	L	53	14.5	8.0		
WE0311M			115			10.7	30.0	M	54	11.9	1.7		
WE0318M			208			6.8	19.5	K	51	9.1	4.2		
WE0312M			230			4.9	14.1	L	53	14.5	8.0		
WE0511H	0.5		115		3.56	14.5	46.0	M	54	7.5	1.0	14/3	60
WE0518H			208			8.1	31.0	K	68	9.7	2.4	16/3	60
WE0512H			230			7.3	34.5	M	53	9.6	4.0		
WE0538H		3	200			4.9	22.6	R	68	NA	3.8	14/4	60
WE0532H			230			3.3	18.8	R	70	NA	5.8		
WE0534H			460			1.7	9.4	R	70	NA	23.2		
WE0537H			575			1.4	7.5	R	62	NA	35.3		
WE0511HH		1	115		3.88	14.5	46.0	M	54	7.5	1.0	14/3	60
WE0518HH			208			8.1	31.0	K	68	9.7	2.4	16/3	60
WE0512HH			230			7.3	34.5	M	53	9.6	4.0		
WE0538HH		3	200			4.9	22.6	R	68	NA	3.8	14/4	60
WE0532HH			230			3.6	18.8	R	70	NA	5.8		
WE0534HH			460			1.8	9.4	R	70	NA	23.2		
WE0537HH			575			1.5	7.5	R	62	NA	35.3		
WE0718H	0.75	1	208	3450	4.06	11.0	31.0	K	68	9.7	2.4	14/3	70
WE0712H			230			10.0	27.5	J	65	12.2	2.7		
WE0738H		3	200			6.2	20.6	L	64	NA	5.7	14/4	70
WE0732H			230			5.4	15.7	K	68	NA	8.6		
WE0734H			460			2.7	7.9	K	68	NA	34.2		
WE0737H			575			2.2	9.9	L	78	NA	26.5		
WE1018H	1	1	208		4.44	14.0	59.0	K	68	9.3	1.1	14/3	70
WE1012H			230			12.5	36.2	J	69	10.3	2.1		
WE1038H		3	200			8.1	37.6	M	77	NA	2.7	14/4	70
WE1032H			230			7.0	24.1	L	79	NA	4.1		
WE1034H			460			3.5	12.1	L	79	NA	16.2		
WE1037H			575			2.8	9.9	L	78	NA	26.5		
WE1518H	1.5	1	208		4.56	17.5	59.0	K	68	9.3	1.1	14/3	80
WE1512H			230			15.7	50.0	H	68	11.3	1.6		
WE1538H		3	200			10.6	40.6	K	79	NA	1.9	14/4	80
WE1532H			230			9.2	31.7	K	78	NA	2.9		
WE1534H			460			4.6	15.9	K	78	NA	11.4		
WE1537H			575			3.7	13.1	K	75	NA	16.9		
WE1518HH		1	208		5.50	17.5	59.0	K	68	9.3	1.1	14/3	80
WE1512HH			230			15.7	50.0	H	68	11.3	1.6		
WE1538HH		3	200			10.6	40.6	K	79	NA	1.9	14/4	80
WE1532HH			230			9.2	31.7	K	78	NA	2.9		
WE1534HH			460			4.6	15.9	K	78	NA	11.4		
WE1537HH			575			3.7	13.1	K	75	NA	16.9		
WE2012H	2	1	230		5.38	18.0	49.6	F	78	3.2	1.2	14/3	83
WE2038H		3	200			12.0	42.4	K	78	NA	1.7	14/4	83
WE2032H			230			11.6	42.4	K	78	NA	1.7		
WE2034H			460			5.8	21.2	K	78	NA	6.6		
WE2037H			575			4.7	16.3	L	78	NA	10.5		

Required Effluent Pump or Equal

Jeffrey & Linda Hanson
2644 Guinea Rd., Charlotte -
Replacement Mound System
High Water Level Alarm or Equal

ITT

CENTRIPRO
Wastewater and Water Systems

TAN3M (XT Alarm System)

- The Tank Alert® XT can be used as a high level alarm in lift chambers, sump pump basins and holding tanks.
- UL Listed (for indoor and outdoor use) and CSA Certified.
- Voltage: 120 VAC, 50/60 Hz, 8.5 watts maximum, (alarm condition)
- Enclosure meets Type 3R water-tight standards, listed for indoor or outdoor use under UL standard 864. Dimensions are 6.5" x 4.5" x 3.0"
- Premounted terminal block so enclosure can also be used as a junction box for splicing pump, pump switch and pump power. Meets NEC standard for junction boxes.
- N.O. float switch has a 15' long, 18 gauge, 2 conductor SJOW (UL) cord
- Mechanical SignalMaster® Float on TAN3M, switches are rated for a maximum fluid temperature of 140° F (60° C)
- Automatic alarm reset, alarm test switch and horn silence switch
- Alarm Horn: 85 decibels at 10 feet (3 meters)
- Does not control or interface with pump
- Operates even if pump circuit fails when wired on separate circuit
- No power cord.

TAN4M (4X Alarm System)

- The Tank Alert® 4X can be used as a weatherproof high level alarm in lift chambers, sump pump basins and holding tanks.
- UL and cUL Listed
- Single phase, 120 volt, 60/50 hertz power supply required, 7 watts max. during alarm condition
- NEMA 4X enclosure rated for indoor or outdoor use.
- No power cord.
- Float Switch: Sensor Float® control switch with mounting clamp, 15' long, 18 gauge, SJOW.
- Stainless steel alarm horn sounds at 88db @ 10' (3 meters)
- NEMA 4X alarm beacon
- Automatic alarm reset and alarm test/normal/horn silence switch
- Dimensions are 6.4" x 5.3" x 5.0"
- Switches are rated for a maximum fluid temperature of 140° F (60° C)
- Does not control or interface with pump
- Operates even if pump circuit fails when wired on separate circuit.

LR54245 LISTED

Hydraulic LISTED

MOUND CONSTRUCTION INSTRUCTIONS

Mound construction procedures are just as important as the mound design. Good design with poor construction will result in the mound operating poorly and may result in failure. Proper equipment is essential. Small track type excavators work best. Wheel type tractors are too difficult to maneuver in the fill. The following is a step by step procedure for mound construction which has been tried and proven. Other techniques could be used as long as the basic principles of mound design, operation, and construction are not violated.

1. Submit a *representative* sample (enough to fill a 5 gallon bucket) of mound sand from the intended source for testing according to ASTM D 422 (Knight Consulting Engineers and Vermont Testing can perform this test). Submit a copy of the results to the designer.

2. Stake out the mound on this site so that the trenches or bed run perpendicular to the direction of the slope. Reference stakes are recommended in case corner stakes are disturbed.

3. Stake out corners of the bed and determine the bottom elevation of the bed.

4. Determine where the force main from the pump chamber connects to the distribution system in the mound.

5. Trench and lay the force main from the pump chamber to the mound. Lay the pipe 5.5' below the ground surface for frost protection. Where there is less than 5.5' of cover, insulate with 2" of rigid polystyrene insulation 4' wide (2' either side of pipe, placed in two 1" layers with staggered joints). Alternatively, where there is less than 5.5' of soil cover, the force main can be sloped *uniformly* back to the pumping chamber so that it drains after each dosing. Cut and cap the pipe one foot beneath the ground surface. Backfill and compact soil around the pipe to prevent back seepage of effluent along pipe. This step must be done before plowing to avoid compacting and disturbance of surface.

6. Install the curtain drain (if shown on plans).

7. Check the moisture content of the soil at 7 – 8 inches deep. If it is too wet, smearing and compaction will result, thus reducing the infiltration capacity of the soil. Soil moisture can be determined by rolling a soil sample between the hands. If it rolls into a ribbon, the site is too wet to prepare. If it crumbles, soil preparation can proceed.

8. Cut trees to ground level, remove excess vegetation by mowing. Prepare the site by using a moldboard plow to create 8 – 10 inch deep furrows perpendicular to the slope. Furrows must be thrown up hill. Chisel plowing may be used if a

moldboard plow is not available. Rototilling must not be done on heavy soils but can be used on non-structural soil such as sands. Alternatively, plowing can be done by using an excavator bucket to pull the soil into furrows parallel with the ground contours (the resulting surface must look as though it had been plowed with a moldboard plow, as outlined above). Immediate construction after plowing is necessary. Avoid rutting of plowed area with vehicular traffic. Inspection required at this point.

9. Extend the effluent pipe to several feet above the ground surface.

10. Place the approved fill material around the edge of the plowed area. Keep wheels of truck off plowed areas. Minimize the traffic on the downslope side of the mound. Work from the end and upslope side.

11. Move the fill material into place using a small track type tractor with a blade. Always keep a minimum of 6 inches of sand beneath tracks to prevent compaction of the natural soil.

12. Place the fill material to the required depth which is the top of the trenches or bed. Shape sides to the desired slope. Inspection required at this point.

13. With the blade of the tractor form the bed or trenches. Hand level the bottom of the bed. Make sure bottom is at the same elevation and level.

14. Place the coarse aggregate in the trenches or bed. It should be ¾ to 1 ½ inch, washed, durable aggregate (i.e. **not** limestone or marble). Level aggregate to the design depth.

15. Place the distribution system on the aggregate. Connect the manifold to the force main from the pump chamber or siphon chamber. Slope manifold slightly toward distribution laterals. Lay laterals level, removing rises and dips. Place orifices upwards until pressure testing is complete. Inspection required at this point (to observe discharge rate and pressure testing).

16. Rotate orifices downward and properly cement all components. Place 2 inches of aggregate over the distribution pipe.

17. Place a synthetic non-woven filter fabric (Mirafi 140N or equivalent) over the entire stone bed. Overlap joints by 12" minimum. Place an 8'x8' mat of rigid polystyrene insulation, 2 inches thick, centered over force main riser. Place insulation in two layers (1" each) and stagger the joint pattern.

18. Place soil on top of the bed or trench to a depth of 1 foot in center and 6 inches at outer edge of bed or trenches. This may be a subsoil or topsoil.

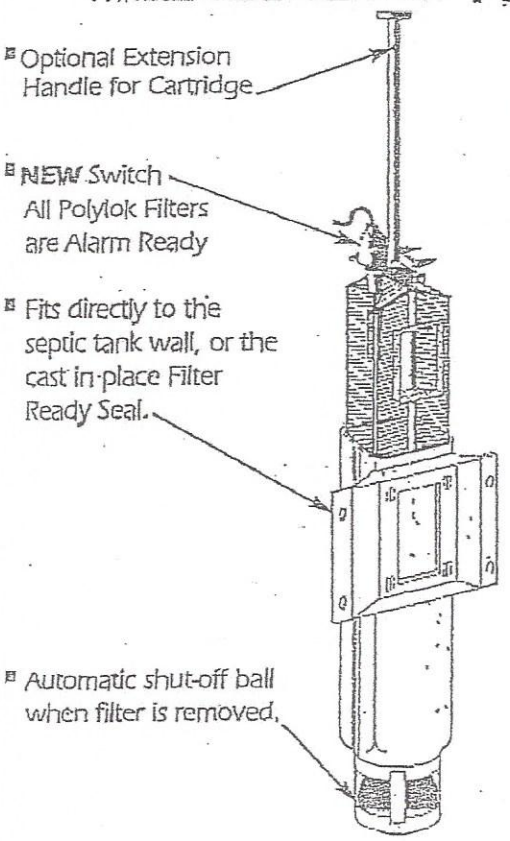
19. Place 6 inches of good quality topsoil over the entire mound surface. This will raise the elevation at the center of the mound to a minimum of 1.5 feet and the outside edges of bed or trenches 1 foot. Inspection required at this point.

20. Landscape the mound by planting grass, using the best vegetation adaptable to the area. A mixture of 90% birdsfoot trefoil and 10% timothy may be desirable if the mound is not manicured. If manicuring is desired, a combination of 60% bluegrass, 30% creeping red fescue and 10% annual rye grass may be the desired vegetative cover. Shrubs can be planted around the base and up the sideslopes. They should be somewhat moisture tolerant since the toe of the mound may be somewhat moist during various times of the year. Keep all trees and shrubs away from the top of the mound, as root systems can destroy the distribution network.

21. Mound maintenance involves pumping the septic tank and pump chamber every 1 to 3 years to avoid carryover of solids into the mound. A good water conservation plan within the house assures that the mound will not be overloaded. Avoid excess traffic on the mound area. Winter traffic on mound should be avoided to minimize the frost penetration. Inspect pump chamber and septic tank each year to determine the level of sludge accumulation.

Required Effluent Filter or Equal

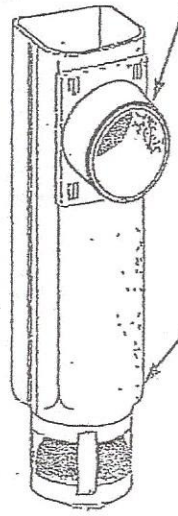
THE PL-122 EFFLUENT FILTER AND CARTRIDGE



Filter Housing with Filter Ready Seal Adapter

Polylok's filter housing is engineered to provide years of maintenance free service no matter what external forces arise during operation or service. Our housing is equipped with a gas deflection/shutoff ball that not only deflects TSS (total suspended solids) from entering filter, but stops the flow of unfiltered effluent from escaping to the field when the filter cartridge is removed for service.

We also give you the option of attaching the filter unit directly to the septic tank wall, the cast in place Filter Ready Seal or directly to three-inch or four-inch pipe.

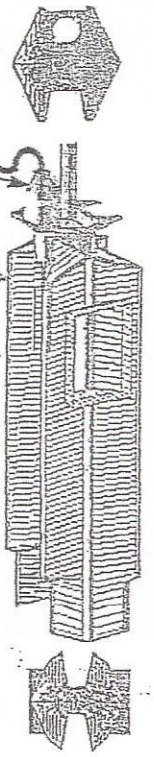


Filter Housing with 3" and 4" Pipe Adapter

NSF

Certified to ANSI/NSF46

Filter Cartridge



Polylok's new effluent filter is constructed with 1/16th inch filtration slots that will stop all solids greater than 1/16th inch. This design, although not new to the filter industry, provides the best design for septic effluent filtration. With our new patented filter, we provide more 1/16th filtration area than any other filter, including filtration slots on the top of the filter element.

SIZING THE PL-122 FILTER

Septic tank filters should be sized based upon solids removal efficiency and peak flows. For a typical four bedroom, two and a half bathroom household, one Polylok PL-122 should be used.

For sizing larger residential or commercial installations, community systems please use the following chart.

- 1 PL-122/800 GPD average flow
- 2 PL-122/1600 GPD average flow
- 3 PL-122/2400 GPD average flow
- 4 PL-122/3200 GPD average flow
- 5 PL-122/4000 GPD average flow

Systems with design flows exceeding 3200 GPD requires engineer design and project specific approval.

Lifetime Warranty: Polylok's filter is guaranteed to be free of defects in material and workmanship for the Lifetime of the homeowner/purchaser. Free replacement (excluding all