



December 1, 2009

Mr. Tom Mansfield  
Mr. Spencer Harris  
Town of Charlotte  
PO Box 119  
Charlotte, VT 05445

Re: Tegatz Family Trust Property, Guinea Road, Charlotte, VT – Water/Wastewater Permit Submittals

Dear Tom and Spencer:

Please find the Tegatz Family Trust's application for a water and wastewater permit related to a proposed 5 bedroom single family residence (SFR) and a barn with a convenience toilet. The +/- 307 acre property is shown with dimensions and the site development plan on Figure 1. The proposed SFR and barn will be served by a mound disposal system shown on Plan Sheet 2. The details of the wastewater and water systems are shown on Plan Sheets 3 and 4, respectively.

The site and soil conditions were comprehensively defined with test pits on August 3, 2009 around the 10 acre Homestead Lot shown on Plan Sheet 2. An acceptable wastewater disposal area was identified southwest of the Homestead Lot. A second set of test pits were excavated, evaluated and reviewed by myself and Spencer Harris on November 2, 2009. The soil profile descriptions are attached which indicate the presence of very fine sandy loams to loams overlying loams to silt loams with shallow seasonal water table indicators 10" to 12" below the surface. The unsaturated 10" to 12" of the profile were found to be loose to friable with strong to moderate developed blocky structure. Two representative percolation tests were conducted at a depth of 12" to 18" with results ranging from 32.6 to 42.6 minutes/inches.

The soils are suitable for a performance based mound disposal system depending on the results of a site specific hydrogeological analysis. The results of the analysis are attached which indicate that a 190' single trench mound application area is required. The Darcy's Law analysis utilized a 5 bedroom waste load of 560 gallons per day (gpd) or 74.9 ft<sup>3</sup>/day, a hydraulic conductivity of 20 feet/day for loams to silt loams with moderate to strong blocky structure, a gradient of 6 feet/foot (6% slope), and an effluent mound of 0.33' to solve for an application area length of 189.16' or 190'. Based on this a 3' x 190' (570 ft<sup>2</sup>) single trench mound is required with 2.5' of approved mound sand. With 0.5' of unsaturated soil remaining beneath the ground, the required 3' separation between the induced effluent mound and the bottom of the application is

achieved. The complete pressure distribution and mound dimension details are attached along with a head-capacity curve for a 0.5 h.p. effluent pump that meets and exceeds the required 34.3 gpm versus 37.6' of head specification. The wastewater system details are presented on Plan Sheet 3.

The proposed mound disposal area is properly isolated from all water supplies in the area. The Kantor well shown on Plan Sheet 2 is the only off-site well adjacent to the proposed disposal area. As shown on Plan Sheet 2, the Kantor well is properly isolated from the proposed disposal system. In this regard, wastewater effluent migrating from the mound disposal area will predicatively move to the east rather than to the south in the direction of the Kantor well or its 100' x 200' well isolation zone.

A drilled bedrock well is proposed for the Tegatz 5 bedroom residence. The proposed location of the well is shown on Plan Sheet 2 along with its 200' radius well isolation zone. The water system details are presented on Plan Sheet 4, which describes a typical residential water system.

The Tegatz's and I believe the application is complete with a signed application, a \$500.00 application fee payable to the Town of Charlotte, 2 copies of all design plans, one copy of this letter, the attachments and the 11" x 17" copies of the Plan Sheets, and a CD copy of everything. We look forward to your concurrence and issuance of the required permit.

If you have any questions or concerns, please do not hesitate to contact me at (800) 477-4384.

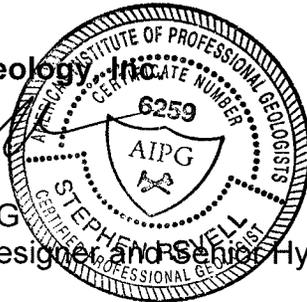
Very Truly Yours,

**Lincoln Applied Geology, Inc.**



Stephen Revell, CPG

Licensed Class B Designer and Senior Hydrogeologist



enclosures

cc: Fritz Tegatz



Lincoln Applied Geology, Inc.  
Environmental Consultants

163 Revell Drive • Lincoln, VT 05443 • (802) 453-4384 • FAX (802) 453-5399

# Wastewater Management Division - Permit Application Wastewater System & Potable Water Supply



**For Office Use Only:**

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

**Authority:**

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

**General Information:**

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

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

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

## Part I Applicant (Landowner) & Project Contact Information

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

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

Remove This Applicant

Add Another Applicant

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

1 Registered Legal Entity or Organization Name		2 Telephone	
Tegatz Family Trust		(818) 896-0828	
3 Mailing Address Line 1		4 Mailing Address Line 2	
11700 Little Tsunga Canyon Rd.		<input type="text"/>	
5 Town/City	6 State/Province	7 Country	8 Zip/Postal Code
Lake View Terrace	CA	United States	91342

**Certifying Official**

The Certifying Official must be a person who has signatory authority for the legal entity or organization that is the Applicant. A copy of the document authorizing this person to act as a signatory authority must be attached to this application.

9 Certifying Official Last Name		10 Certifying Official First Name (and MI if appropriate)	
Tegatz		Frederick R. and Betsy Rue	
11 Certifying Official Title			
Trustees			
12 Certifying Official Email Address			13 Telephone
<input type="text"/>			(818) 896-0828

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
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
9 Email Address		10 Telephone	

Part II Certifying Designer(s) Information			
1 Designer Last Name		2 Designer First Name (and Middle Initial if appropriate)	
3 Designer License#		4 Company Name	
5 Mailing Address Line 1		6 Mailing Address Line 2	
7 Town/City	8 State/Province	9 Country	10 Zip/Postal Code
11 Email Address		12 Telephone	
13 Designer Role(s) (check all that apply)			
<input checked="" type="checkbox"/> Water Supply Designer <input checked="" type="checkbox"/> Wastewater Disposal System Designer			
Remove This Designer			
Add Another Designer			

Part III Property Location Information		
Section A - Property Parcel ID#(s) and Location(s)		
1 Please provide the property location information including Town or City Parcel ID#, Town/City, and Street or Road location in the table below:		
(a) Town/City Parcel ID#	(b) Town or City	(c) Street or Road Location
X 05-07-32	Charlotte	100 Guinea Road
Add Another Property		

**Section B - Center of Property GPS Coordinates**

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

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

**N**  ° **W (-)**  °

**Part IV Project Information**

**Section A - General Project Information & Questions**

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

3 Business Name (if applicable)

4 Detailed Project Description

5 Were all buildings or structures, campgrounds, and their associated potable water supplies and wastewater systems substantially completed before January 1, 2007 and all 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 Wastewater Management Division's Regional Office been to the property?.....  Yes  No

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

(a) Name of Staff Person

(b) Date of Visit

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 Water Quality Division at (802) 241-3770.

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 Water Quality 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 Water Quality 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

<b>X</b>	<input type="text" value="Select"/>	<input type="text"/>
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**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, Book, and Page reference for the current landowner's deed(s) to this property in the table below:

	(a) Town	(b) Book	(c) Page(s)
X	Charlotte	170	439-445

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	Property Dimension Plan	11-25-2009	
X	2	Site Plan with Wastewater Disposal Area Blowup	11-25-2009	
X	3	Wastewater System Details	11-25-2009	
X	4	Water System Details	11-25-2009	

Add Another Plan Reference

**Section D - Existing Project Lot/BuildingDetails**

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	307	Undeveloped

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				<input type="radio"/> Yes <input type="radio"/> No

Add Another Building

Remove This Lot

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	307	Single Family Residential

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

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

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

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

(a) Building ID	(b) If building is exempt, indicate exemption	(c) Construction or increased flow?	(d) Proposed Use
X		<input checked="" type="checkbox"/>	5 bedroom residence
X		<input type="checkbox"/>	Barn w/ Convenience Toilet

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 for this project? .....  Yes  No
- 2 Are you proposing changes to an existing water supply for this project? .....  Yes  No
- 3 Is there a connection to an existing water supply for the project? .....  Yes  No

*If you answered No to all three of the above questions, skip to Part VI. Otherwise, proceed with Part V.*

**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 Water Supply Division at (802) 241-3400 for source, construction and operating*

- 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 Water Supply 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 Water Supply 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 Water Supply Division? .....  Yes  No

*If in areas of known interference issues, please contact the Water Supply 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 Tegatz Well	2 Water Supply Owner (if not Applicant)
3 Water Source Type Non-Public Drilled Bedrock Well	4 Type of Change to Supply New System

5 Lots/Buildings Served by this Water Supply System

	(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) Increase	(f) Total	
X	1	1	Connection to New System	0	560	560	Rule-based
				6 0	7 560	8 560	

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.*

**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) Increase	(d) Total
X Tegatz Well	0	560	560
<input type="button" value="Add Another Water Supply"/>	2 0	3 560	4 560

**Part VI Wastewater Disposal System Information**

**Section A - Wastewater Disposal System Screening Questions**

1 Are you proposing a new wastewater disposal system or replacement area for this project? .....  Yes  No

2 Are you proposing changes to an existing wastewater disposal system for this project? .....  Yes  No

3 Is there a connection to an existing wastewater disposal system for the project? .....  Yes  No  
*If you answered No to all three of the above questions, skip to Part VII. Otherwise, proceed with Part VI.*

**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 If the project has a soil-based wastewater disposal system with design flows that exceed 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 Wastewater Management 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 Water Supply Division? .....  Yes  No  
*If Yes, contact the Water Supply Division at (802) 241-3400.*

**Section C - Individual Wastewater Disposal System Details**

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

1 Wastewater Disposal System Name/Identifier <input style="width:95%;" type="text" value="Tegatz System"/>	2 Wastewater Disposal System Owner (if not Applicant) <input style="width:95%;" type="text"/>
3 Wastewater Disposal System Type <input style="width:95%;" type="text" value="Mound"/>	4 Type of Change to System <input style="width:95%;" type="text" value="New System"/>

5 Lots/Buildings Served by this Wastewater Disposal System

	(a) Lot#	(b) Building ID	(c) Type of Change to the Building's System	Design Flows (Gallons Per Day)				(h) Rule or Meter Based Flows
				(d) Existing	(e) Increase	(f) Infiltration	(g) Total	
<input checked="" type="checkbox"/>	<input style="width:30px;" type="text" value="1"/>	<input style="width:30px;" type="text" value="1"/>	<input style="width:95%;" type="text" value="Connection to New System"/>	<input style="width:30px;" type="text" value="0"/>	<input style="width:30px;" type="text" value="560"/>	<input style="width:30px;" type="text" value="0"/>	<input style="width:30px;" type="text" value="560"/>	<input style="width:95%;" type="text" value="Rule-based"/>
<input style="width:95%;" type="text" value="Add Another Lot/Building Served by this System"/>				<input style="width:30px;" type="text" value="0"/>	<input style="width:30px;" type="text" value="560"/>	<input style="width:30px;" type="text" value="0"/>	<input style="width:30px;" type="text" value="560"/>	

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.

Storage and Dose     Filtrate

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

**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) Increase	(d) Infiltration	(e) Total	
X Tegatz System	0	560	0	560	
Add Another Wastewater System	2	3	4	5	
	0	560	0	560	

**Part VII Application Fees**

1 Fee Amount

2 Fee Calculation Details

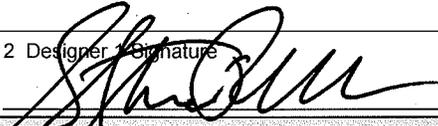
**Part VIII Designer Certification & Copyright License**

**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 Stephen Revell	2 Designer 1 Signature 	3 Signature Date 12/1/09
-------------------------------------	--------------------------------------------------------------------------------------------------------------	-----------------------------

**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, Wastewater Management 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? **NO**

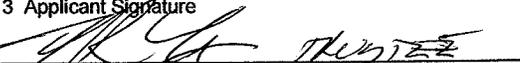
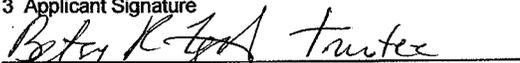
Call designer for appointment. **STEVE REVER**

"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 Wastewater Management 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 Frederick R. Tegatz, Trustee	3 Applicant Signature 	4 Signature Date 11/20/09
2 Print Applicant Name Betsy R. Tegatz, Trustee	3 Applicant Signature 	4 Signature Date 11/20/09
Add Applicant Signature Block		

**Tegatz Family Trust Property  
Guinea Road, Charlotte, VT  
Soil Profile Descriptions  
August 3, 2009 and November 2, 2009  
By Stephen Revell, LCBD # 178 and Senior Hydrogeologist**

**Test Pit 1 (TP-1)**

- 0 – 6"                      Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 6 – 24"                     Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 8 – 10".
- 24 – 36"                    Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24", no ledge.

**Test Pit 2 (TP-2)**

- 0 – 7"                      Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 7 – 14"                     Tan to yellow-brown loam to silt, friable, moderate blocky structure, mottled at 10".
- 14 – 40"                    Grey silt to loam to clay loam, firm, weak blocky structure, mottled/gleyed, mottled, minor water at 20", no ledge.

**Test Pit 3 (TP-3)**

- 0 – 8"                      Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 8 – 20"                     Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 8 – 10".
- 20 – 42"                    Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 20", no ledge.

**Test Pit 4 (TP-4)**

- 0 – 8"                      Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.



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- 8 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 8 – 10”.
- 24 – 42” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24”, no ledge.

**Test Pit 5 (TP-5)**

- 0 – 6” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 6 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 8”.
- 24 – 48” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24”, no ledge.

**Test Pit 6 (TP-6)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 10 – 18” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 10 – 12”.
- 18 – 36” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 7 (TP-7)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 10 – 15” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 15 – 36” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 8 (TP-8)**

- 0 – 12” Brown loam, loose to friable, strong to moderate fine blocky structure, mottled at 10 – 12”.



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- 12 – 22” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 22 – 40” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 9 (TP-9)**

- 0 – 12” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 12 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 24 – 38” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 10 (TP-10)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 10 – 25” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 10 - 12”.
- 25 – 42” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 11 (TP-11)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 10 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 12”.
- 24 – 48” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no ledge.

**Test Pit 12 (TP-12)**

- 0 – 12” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.



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- 12 – 26” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled, perched water at 24 – 26”.
- 26 – 42” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no ledge.

**Test Pit 13 (TP-13)**

- 0 – 15” Brown loam to very fine sandy loam, loose to friable, strong to moderate fine blocky structure, mottled at 12 – 14”.
- 15 – 24” Red-brown to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled, water at 24 – 26”.
- 24 – 48” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 14 (TP-14)**

- 0 – 12” Brown loam to very fine sandy loam, loose to friable, strong to moderate fine blocky structure, well drained, mottled.
- 12 – 24” Red-brown to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 14”.
- 24 – 48” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 15 (TP-15)**

- 0 – 6” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 6 – 18” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 12”.
- 18 – 36” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 18”, no ledge.

**Test Pit 16 (TP-16)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, mottled at 8 – 10”.



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- 10 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 24 – 36” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24”, no ledge.

#### **Test Pit 17 (TP-17)**

- 0 – 8” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 8 – 20” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 20 – 38” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 20”, no ledge.

#### **Test Pit 18 (TP-18)**

- 0 – 8” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 8 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 24 – 36” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24”, no ledge.

#### **Test Pit 19 (TP-19)**

- 0 – 6” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 6 – 20” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 10”.
- 20 – 42” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 20”, no ledge.

#### **Test Pit 20 (TP-20)**

- 0 – 12” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained, mottled at 8 - 10”.



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- 12 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, Friable, mottled.
- 24 – 48” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24”, no ledge.

**Test Pit 21 (TP-21)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 10 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 24 – 36” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24”, no ledge.

**Test Pit 22 (TP-22)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained, mottled at 8 - 10”.
- 10 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 24 – 40” Grey silt loam to clay loam, firm, weak blocky structure, mottled, free perched water at 24”, no ledge.

**Test Pit 100 (TP-100)**

- 0 – 12” Brown loam, loose to friable, strong to moderate fine blocky structure, mottled at 10 - 12”.
- 12 – 22” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 22 – 42” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

**Test Pit 101 (TP-101)**

- 0 – 10” Brown loam, loose to friable, strong to moderate fine blocky structure, well drained.



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- 10 – 24” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled at 10 – 12”.
- 24 – 42” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

#### **Test Pit 102 (TP-102)**

- 0 – 12” Brown loam, loose to friable, strong to moderate fine blocky structure, mottled at 10 - 12”.
- 12 – 23” Tan to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 23 – 44” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no ledge.

#### **Test Pit 103 (TP-103)**

- 0 – 14” Brown loam to very fine sandy loam , loose to friable, strong to moderate fine blocky structure, mottled at 12 - 14”.
- 14 – 24” Red-brown to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 24 – 48” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

#### **Test Pit 104 (TP-104)**

- 0 – 14” Brown loam to very fine sandy loam, loose to friable, strong to moderate fine blocky structure, well drained.
- 14 – 24” Red-brown to yellow-brown loam to silt loam, moderate blocky structure, friable, mottled.
- 24 – 42” Grey silt loam to clay loam, firm, weak blocky structure, mottled, no water or ledge.

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**Tegatz Family Trust Property  
Guinea Road  
Charlotte, Vermont  
Percolation Test Results**

**All tests were performed on August 3, 2009 at a depth of 12" - 18"**

PT-1	Drop Time (min)	Total Drop Time (min)	Total Drop (inches)	Drop Rate (min/inch)
	10.5	10.5	1	10.5
	16.2	26.7	2	13.4
	19.2	46.0	3	15.3
	21.7	67.6	4	16.9
	24.5	92.1	5	18.4
	26.3	118.4	6	19.7
	27.2	145.6	7	20.8
	---	<b>1440.0</b>	---	<b>32.6</b>

PT-2	Drop Time (min)	Total Drop Time (min)	Total Drop (inches)	Drop Rate (min/inch)
	12.8	12.8	1	12.8
	20.9	33.7	2	16.8
	25.0	58.7	3	19.6
	31.8	90.5	4	22.6
	34.0	124.5	5	24.9
	35.7	160.2	6	26.7
	37.1	197.3	7	28.2
	---	<b>1440.0</b>	---	<b>42.6</b>

**\*NOTE:**

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

# Tegatz Family Trust Property Guinea Road

Charlotte, Vermont

## Percolation Test Results

All tests were performed on August 3, 2009 at a depth of 12" - 18"

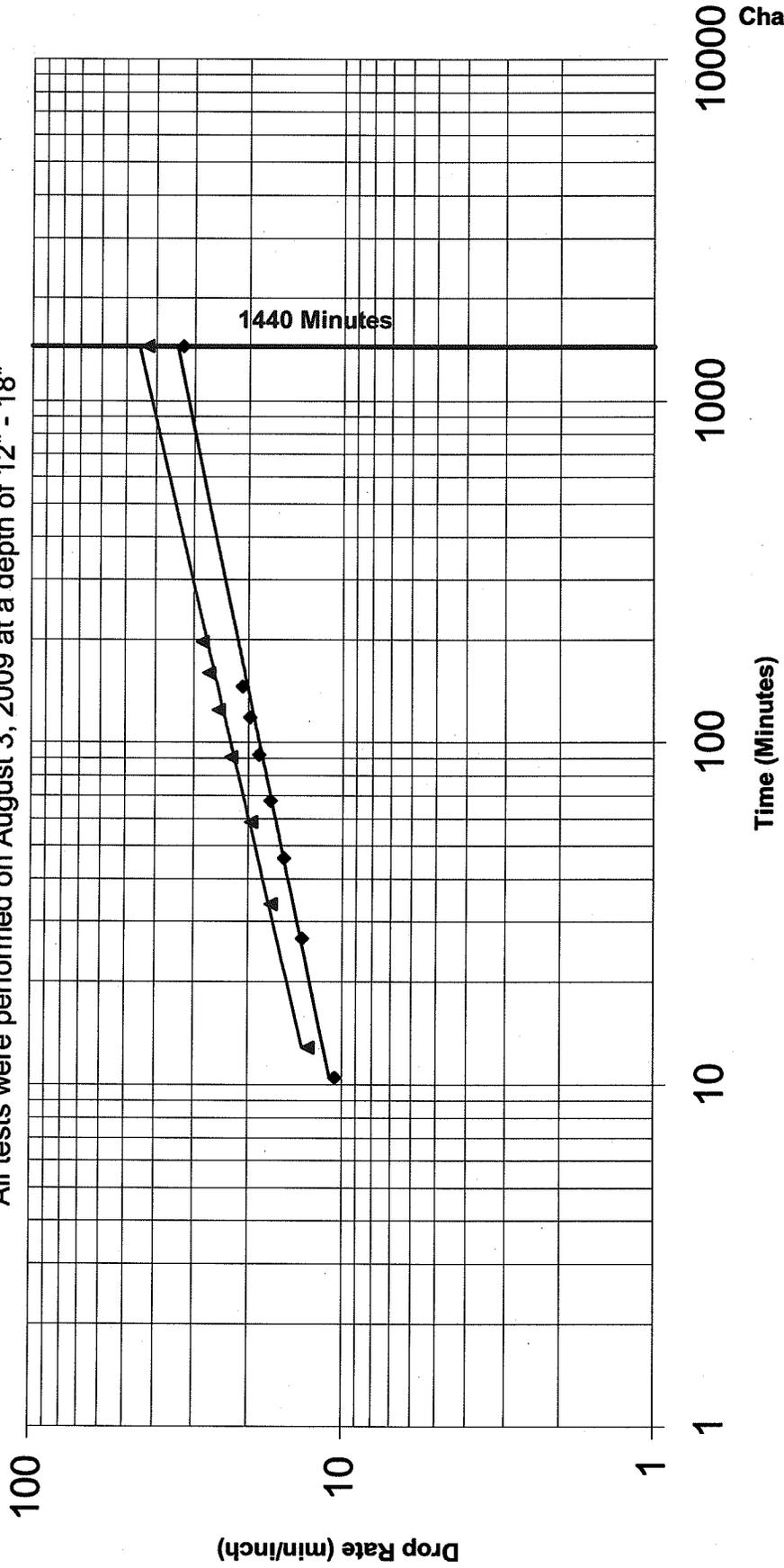


Chart 1

**Tegatz Family Trust Property  
Guinea Road, Charlotte, VT  
Site Specific Hydrogeological Evaluation  
of  
Effluent Mounding**

1. Darcy's Law

$Q = k i h l$  where.

$Q = 74.9 \text{ ft}^3/\text{day}$  (560 gpd)

$k = 20 \text{ ft/day}$  for loams/silt loams with moderate to strong structure

$i = 0.06 \text{ feet/foot}$  (6%)

$h = 0.33 \text{ foot}$  allowable effluent mound

$l = x \text{ feet}$  required application area length

$x = 189.16'$ , so use 190' application area length

Note: 0.33' allowable effluent mound based on mottling at 10" (0.83') leaving 6" (0.50') of unsaturated soil beneath ground surface.



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PRESSURE DISTRIBUTION & MOUND DIMENSION DETAILS

CLIENT'S NAME: Tegatz-Primary Mound  
 DATE: 11/17/2009 PERFORMED BY: S. Revell LAG Project #: 09047

Design Flow Rate	560	GPD
Width of Distribution Stone Bed/Trench	3	FEET
Length of Distribution Stone Bed/Trench	190	FEET
Thickness of Sand Beneath Distribution Stone Bed/Trench	2.5	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	6	PERCENT
Thickness of Sand on Upper Side of Level Area	3.19	FEET
Thickness of Sand on Lower Side of Level Area	3.49	FEET
Width of Level Area	5	FEET
Length of Level Area	192	FEET
Area of Distribution Stone Bed/Trench	570	SQUARE FT
Volume of Stone Required	13	CUBIC YARDS
Proposed Basal Area	3596	SQUARE FEET
Volume of Mound Sand Required	566.6	CUBIC YARDS
Number of Laterals	2	
Length of Each Lateral	92.5	FEET
Number of Orifices in the Manifold	0	
Number of Orifices in Each Lateral	19	
Distance Between Manifold and First Orifice	2.5	FEET
Distance Between Orifices (on center)	5	FEET
Distribution Area per Orifice	15.00	SQ. FT.
Design Pressure Head	5	FEET
Diameter of Orifices (enter as fraction)	0.188	INCHES
Elevation From Pump Intake to Laterals (0 if siphon)	14	FEET
Diameter of Force Main	2	INCHES
Length of Force Main	720	FEET
Length of Manifold to Lateral	0	FEET
Diameter of Manifold Pipe	2	INCH
Diameter of Lateral Pipe	2	INCH
Friction Loss in Force Main	18.21	FEET
Friction Loss in Manifold	0.00	FEET
Friction Loss in Section 1	0.02	FEET
Friction Loss in Entire Lateral	0.20	FEET
Discharge Rate at First Orifice	0.93	GPM
Discharge Rate at Last Orifice	0.91	GPM
Percent Difference in Flow Rate First to Last Orifice	1.86	PERCENT
Total Dynamic Head Loss	37.616	FEET
Total Distribution System Flow	34.28	GPM
Volume of Distribution System	30.19	GALLONS
Pump Capacity	34.28 GPM vs	37.616 FEET OF HEAD
Volume per Dose	122.5	GALLONS
On/Off Float Swing (1,000 gal. Tank)	4.1	INCHES

PRESSURE DISTRIBUTION & MOUND DIMENSION DETAILS

CLIENT'S NAME: Tegatz-Primary Mound  
 DATE: 11/17/2009 PERFORMED BY: S. Revell LAG Project #: 09047

DIMENSIONS OF MOUND SYSTEM

Dimensions of Mound Sand

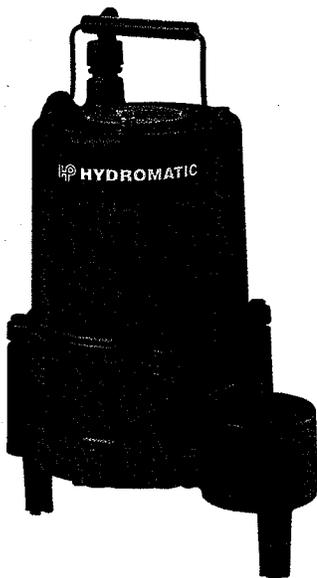
8.2 feet from level area to uphill sand toe	11.6 ft corner of level area to upper toe corner
5 ft wide level area	9.7 ft to side toe from upper edge of level area
3 ft wide stone bed/trench	
190 ft long stone bed/trench	10.6 ft to side toe from lower edge of level area
192 ft long level area	
12.9 feet from level area to downhill sand toe	18.3 ft corner of level area to lower toe corner

Dimensions of Final Cover

10.7 feet from level area to uphill toe	15.2 ft corner of level area to upper fill toe
	12.7 ft to side toe from upper edge of level area
5 ft wide level area	
192 ft long level area	13.6 ft to side toe from lower edge of level area
	23.5 ft corner of level area to lower fill toe
16.6 feet from level area to downhill toe	

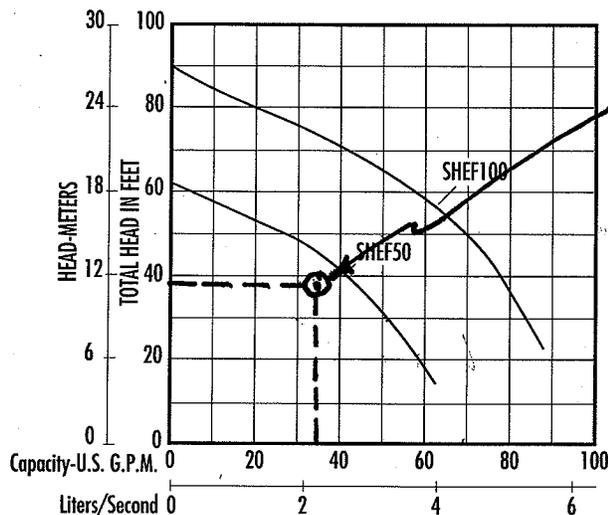
PLOW AREA LAYOUT MEASUREMENTS

Center of Bed/Trench to Downslope Toe	114.2 feet
End of Level Area @ Midpoint to Downslope Toe	25.3 feet
Center of Bed/Trench to Upslope Toe	107.6 feet
End of Level Area @ Midpoint to Upslope Toe	17.1 feet



SHEF50	
Typical Application*	High Head Effluent and Dewatering
Capacities	to 63 GPM (4.0 l/s)
Heads	to 63 ft (19.2 m)
Electrical	115V, 1ø, 14.5FLA, 60Hz; 200V, 1ø, 7.6FLA, 60Hz; 230V, 3ø, 3.1FLA, 60Hz; 460V, 3ø, 1.6FLA, 60Hz; 575V, 3ø, 1.2FLA, 60Hz
Motor	(single phase) - 1/2HP Split phase w/start capacitor and thermal overload protection, 3450 RPM ; (three phase) - 1/2HP polyphase, 3450 RPM
Minimum Recommended Sump Diameter	Simplex = 24" (609.6mm) Duplex = 30" (762mm)
Automatic Operation	Wide-angle float switch (1ø only) (manual available)
Materials of Construction	Class 30 cast iron
Impeller	Thermoplastic non-clog
Discharge Size	2" (50.8mm)
Solids Handling	3/4" (19.1 mm)
Power Cord	1ø - 20', SJTW, STW-A(30' optional); 3ø - 20', STW-A(30' optional)
Superior Features	<ul style="list-style-type: none"> <li>• Carbon/Ceramic type 21 mechanical seal</li> <li>• Oil filled motor w/automatic reset thermal overload for maximum protection</li> <li>• Upper &amp; lower ball bearing construction</li> <li>• Piggy-back plug available for easy maintenance and replacement</li> <li>• Patented inlet design for better solids handling</li> <li>• Capacitor start for increased starting torque</li> </ul>

SHEF100	
Typical Application*	High Head Effluent and Dewatering
Capacities	to 88 GPM (5.5 l/s)
Heads	to 90 ft (27.4 m)
Electrical	200V, 1ø, 12.1FLA, 60Hz; 230V, 1ø, 12.1FLA, 60Hz; 230V, 3ø, 5.8FLA, 60Hz; 460V, 3ø, 2.8FLA, 60Hz; 575V, 3ø, 1.9FLA, 60Hz
Motor	(single phase) - 1HP Split phase w/start capacitor and thermal overload protection, 3450 RPM ; (three phase) - 1HP polyphase, 3450 RPM
Minimum Recommended Sump Diameter	Simplex = 24" (609.6mm) Duplex = 30" (762mm)
Automatic Operation	Wide-angle float switch (1ø only) (manual available)
Materials of Construction	Class 30 cast iron
Impeller	Thermoplastic non-clog
Discharge Size	2" (50.8mm)
Solids handling	3/4" (19.1 mm)
Power Cord	1ø - 20', SJTW, STW-A(30' optional); 3ø - 20', STW-A(30' optional)
Superior Features	<ul style="list-style-type: none"> <li>• Carbon/Ceramic type 21 mechanical seal</li> <li>• Oil filled motor w/automatic reset thermal overload for maximum protection</li> <li>• Upper &amp; lower ball bearing construction</li> <li>• Piggy-back plug available for easy maintenance and replacement</li> <li>• Patented inlet design for better solids handling</li> <li>• Capacitor start for increased starting torque</li> </ul>



34.28 gpm us 37.62 TDH  
Use SHEF50 or equal

Piggyback Switch Plug

