

HINSDALE CHARLOTTE FARMS WASTEWATER SYSTEM AND POTABLE WATER SUPPLY APPLICATION

TCE 17-124
286 Prindle Road
Charlotte, VT 05445

Date:
November 2017

Prepared For:
Irene Hinsdale &
Will Howard
Hinsdale Charlotte Farms, LLC
294 N Winooski Ave #120
Burlington, VT 05495

Prepared By:
Amanda Raab



WASTEWATER SYSTEM AND POTABLE WATER SUPPLY
PERMIT APPLICATION

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- 8 Does this project require an Underground Injection Control Permit? Yes No
- 9 Is this project located in a Class A Watershed? Yes No
- 10 If this project is in a Class A Watershed, does the design flow for the project exceed 1,000 gpd or is the project located on the same lot as other buildings, structures, or campgrounds where the total design flow for the lot is greater than 1,000 gpd? Yes No NA
- 11 Are any of the proposed water sources located within 1 mile of a hazardous waste site as designated by the Waste Management & Prevention Division and identified on the Agency mapping website (if Yes, please submit additional information on the site)? Yes No

K. Consultant/Designer Certification**Consultant/Designer 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."

WWWS Designer

Consultant/Designer Role

John P. Pitrowiski, P.E.

Print Consultant/Designer Name

Consultant/Designer Signature

11-8-17

Signature Date



Add Second Consultant/Designer

L. Signatures & Acknowledgements of Landowner(s)

This application must be signed by each Landowner listed on the property deed or by individuals with legal authority to sign on behalf of each Landowner. In order to insure compliance with the requirements of the regulations administered by the Department of Environmental Conservation, Drinking Water and 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.

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

"By signing this application, I certify that I am a landowner listed on the property deed or that I have the legal authority to sign on behalf of the landowner. I understand that by signing this application I am granting permission for the Department employees to enter the property, during normal business 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."

Irene Hinsdale

Print Landowner Name

Irene C Hinsdale

Landowner Signature

11-8-17

Signature Date



Add Landowner Signature Below

SITE REPORT

The applicant, Hinsdale Charlotte Farms, LLC, is submitting this wastewater system and potable water supply permit application for the replacement of an excising failed in-ground wastewater system currently serving an existing home on the property. The parcel is approximately 136.10 ac in size and is located at 286 Prindle Road in Charlotte, VT. The parcel is split by Prindle Road. The home connected to the existing failed system has seven bedrooms and no change in design flow is proposed. The existing failed in-ground disposal system will be abandoned in place and a new mound system will be constructed. The existing 1,000 gallon septic tank will continue to serve the property and will remain in place. A new 1,000 gallon pump station is proposed to serve the 7-bedroom home. A 2" PVC forcemain will convey sewage to the mound system designed with two 4' wide trenches. The existing 7-bedroom home is served by an on-site well and no changes are proposed to the water service or design flow as part of this project.

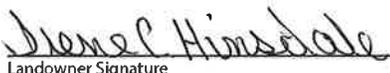
There are no wetland impacts proposed as part of this project. One hazardous waste sites was identified within a one mile radius of the site which was cleaned up and no contamination is present.

Department of Environmental Conservation
Wastewater System & Potable Water Supply Permit Application

ANR Form 5: Certification Statement for Wastewater System & 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.

Landowner Certification		
<i>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.</i>		
 Landowner Signature	Irene Hinsdale Print Landowner Name	11/8/2017 Certification Date
286 Prindle Road, Charlotte, VT 05445 Property Address or Property Tax ID#		



**Agency of Natural Resources
Environmental Research Tool**

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- [Brownfield Sites](#)
- [Spills](#)
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- [Salvage Yards](#)
- [AST](#)
- [Dry Cleaners](#)
- [Watershed](#)
- [Stormwater](#)
- [Wetlands](#)



Hazardous Site List

Enter the search criteria below and click the [Search] button when done. (Search will display a maximum of 100 sites)

Site#	<input type="text" value="20063541"/>	Site Name	
Site Town	<input type="text"/> List Towns	Address	
Primary Consultant	<input type="text"/> List Consultants		
Priority	<input type="text" value="All"/>		<input checked="" type="radio"/> All Sites
<input type="button" value="Search"/>			

Site Name	Kehoe Residence
Address	1142 Prindle Road
Town	Charlotte
Site Use	Residential
Site Number	20063541
DEC Manager	Ashley Desmond
Priority	SMAC - Site Management Activities Completed
Site Status	
Project Status	Home heating oil UST removed and contamination found. 20 yards of contaminated soil Monitoring wells were installed to determine if there had been a significant groundwater groundwater investigation showed no detection of any petroleum related compounds. The properly abandoned. The onsite water supply well showed no detection of petroleum cor
Source of Contamination	UST-Heating Oil
Contaminant	Heating Oil
Institutional Control	
Site Closure Date	12-20-2006
DEC Contact Email Address	Ashley.Desmond@vermont.gov
Record Last Updated	12-22-2006

Natural Resources Atlas

Quick Tools...

[Release Notes - GE4.8.2 - HTML5 v2.9.1 - Updated: 8/23/2017](#)



The Vermont Agency of Natural Resources has been busy making the Natural Resources Atlas the best online mapping tool for Vermont's Natural Resources. The application uses licensed Geocortex Technology for the Esri® ArcGIS

Online Site Reports		Relatio	
Report		Type	ID 1
20063541.si.pdf		View	Hazsite
20063541smac.pdf			20063541
20063541.si.pdf			
20063541smac.pdf			

*The documents listed above do not represent a comprehensive list of available site reports. To view additional site files, please schedule a file review by calling 802-828-1138.

*Relationships cited depict connections that th Management and Prevention Division. This cu underground storage tank facilities.

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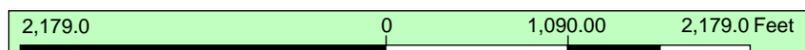


LEGEND

- Wetland - VSWI**
 - Class 1 Wetland
 - Class 2 Wetland
 - Buffer
- DFIRM Floodways**
- Flood Hazard Areas (Only FEMA-digitiz**
 - AE (1-percent annual chance floodplains with e
 - A (1-percent annual chance floodplains without
 - AO (1-percent annual chance zone of shallow f
 - 0.2-percent annual chance flood hazard zone
- Hazardous Site**
- Public Water Sources**
 - Active
 - Proposed
 - Inactive
- Groundwater Interference**
 - Other
 - Drilled Bedrock, Interference Reported
 - Drilled Bedrock, No Interference
 - Drilled gravel, Interference Reported
 - Drilled Gravel, No Interference
- SurfaceWaterSPA**
 - Active
 - Inactive
- Ground Water SPA**
 - Active
 - Proposed
 - Inactive
- Town Boundary**

1: 13,074

1in = 1090 ft.
 1cm = 131 meters



DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

NOTES

Map created using ANR's Natural Resources Atlas

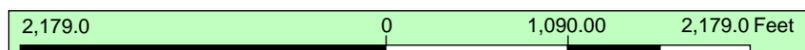


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THIS MAP IS NOT TO BE USED FOR NAVIGATION

NOTES

Map created using ANR's Natural Resources Atlas



TRANSMITTAL

TO: Trudell Consulting Engineers, Inc.
Attn: Amanda Raab

DATE: October 20, 2017
KCE #: 17412
PROJECT: 17-124 Hinsdale

We are sending you the following items:

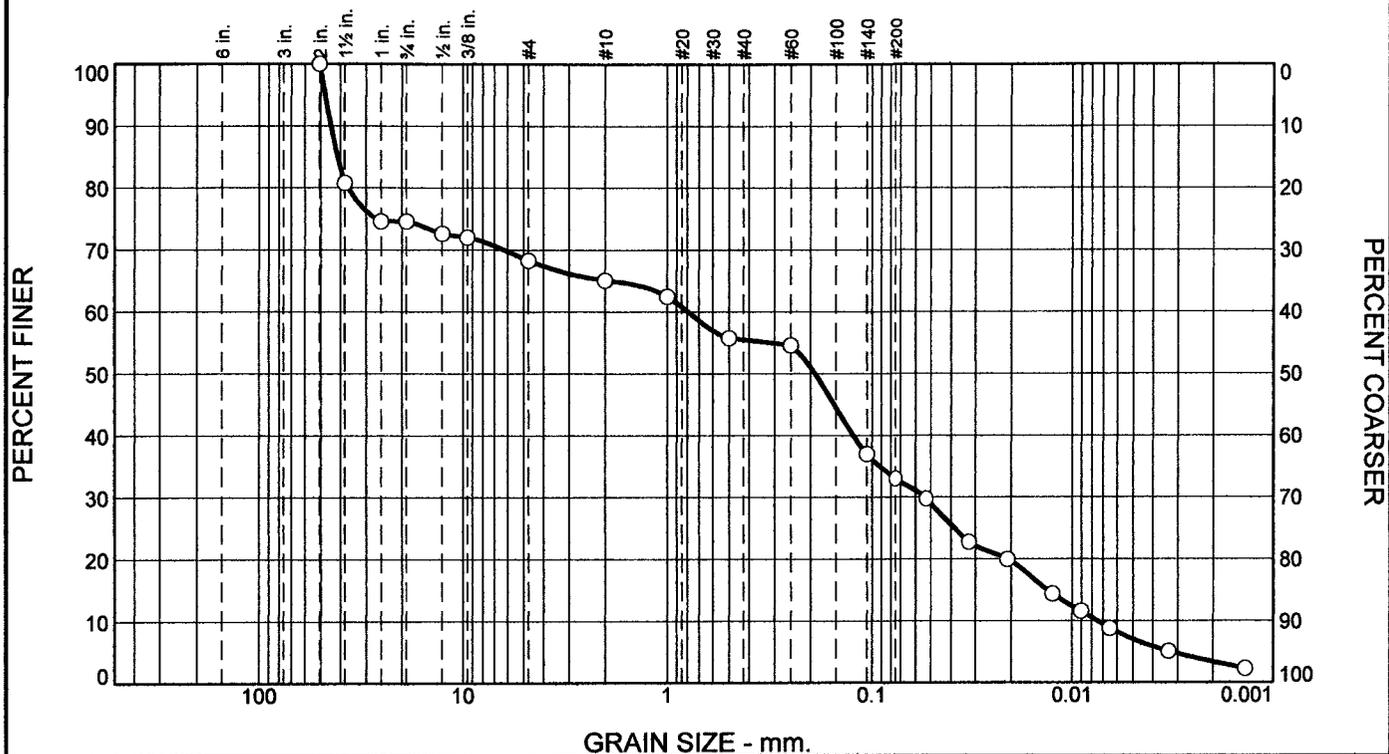
COPIES	DATE	NO. OF PAGES	DESCRIPTION
1	10-20-2017	3	USDA Classification

Signed: Peter H. Rixford
Testing and Lab Coordinator

PHR/nmv

S:\17\17412\Transmittal 10-20-2017.doc

Grain Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	25	7	3	9	23	26	7

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
2"	100		
1-1/2"	81		
1"	75		
3/4"	75		
1/2"	73		
3/8"	72		
#4	68		
#10	65		
#18	62		
#35	56		
#60	55		
#140	37		
#200	33		
#270	30		
0.0323 mm.	23		
0.0209 mm.	20		
0.0125 mm.	14		
0.0090 mm.	12		
0.0065 mm.	8.8		
0.0033 mm.	5.1		
0.0014 mm.	2.3		

* (no specification provided)

Material Description

Fine Sandy Loam

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 44.4624 D₈₅= 41.2140 D₆₀= 0.7899
D₅₀= 0.1899 D₃₀= 0.0541 D₁₅= 0.0133
D₁₀= 0.0075 C_u= 105.01 C_c= 0.49

Remarks

Sampled and Delivered by TCE on 10-18-17
F.M.=3.19

Date Received: 10-18-17 Date Tested: 10-20-17
Tested By: PHR
Checked By: P.Rixford
Title: Testing and Lab Coordinator

Source of Sample: Site
Sample Number: 1

Date Sampled: 10-18-17

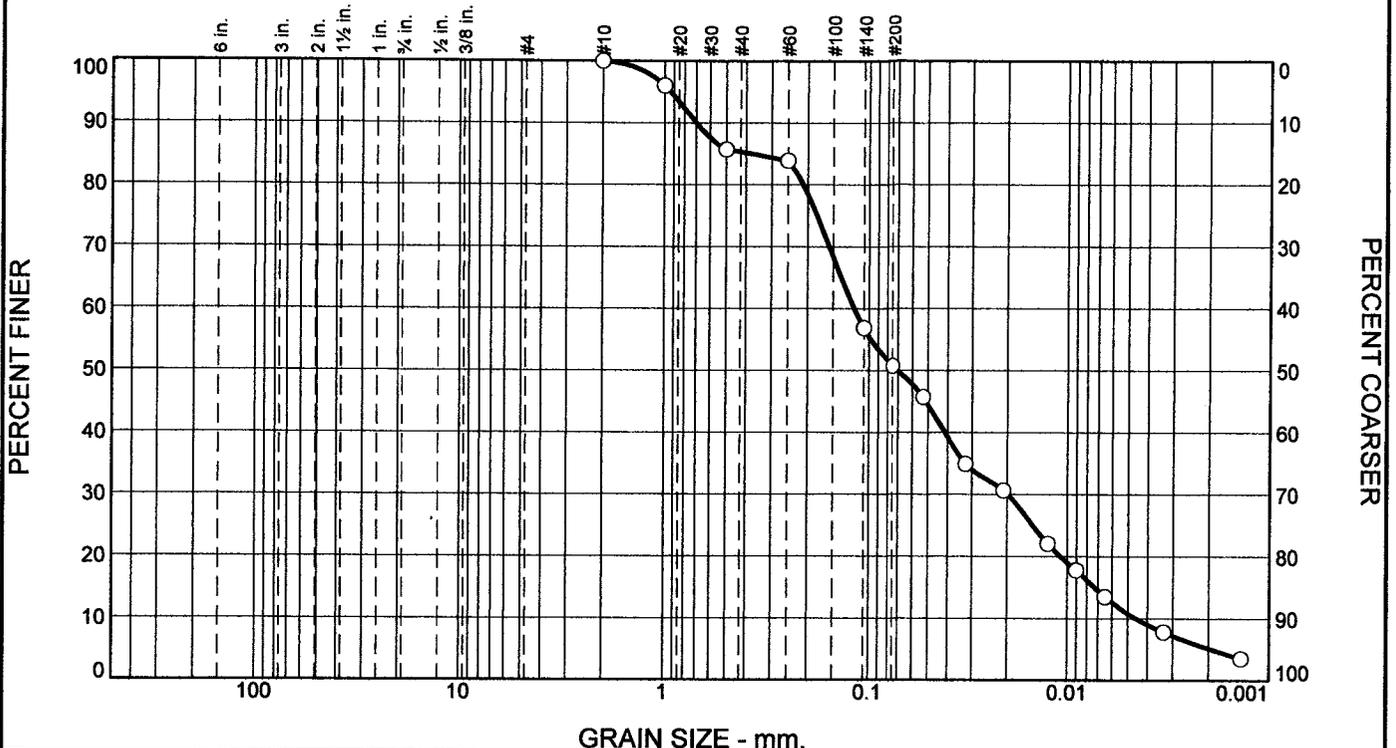
Knight Consulting
Engineers, Inc.
Williston, Vermont

Client: Trudell Consulting Engineers, INC
Project: 17-124 Hinsdale
Project No: 17412

Figure 1-3

Results reflect soil gradation only and not other specification requirements.

Grain Size Distribution Report



GRAIN SIZE - mm.

% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0	0	0	0	0	4	10	2	29	10	15	25	5

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100		
#18	96		
#35	86		
#60	84		
#140	57		
#200	51		
#270	46		
0.0323 mm.	35		
0.0209 mm.	31		
0.0125 mm.	22		
0.0090 mm.	18		
0.0065 mm.	14		
0.0033 mm.	7.8		
0.0014 mm.	3.5		

* (no specification provided)

Material Description

Fine Sandy Loam - Sand Portion

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 0.6998 **D₈₅**= 0.3830 **D₆₀**= 0.1182
D₅₀= 0.0709 **D₃₀**= 0.0198 **D₁₅**= 0.0073
D₁₀= 0.0046 **C_u**= 25.85 **C_c**= 0.73

Remarks

Sampled and Delivered by TCE on 10-18-17
F.M.=0.62

Date Received: 10-18-17 Date Tested: 10-20-17

Tested By: PHR

Checked By: P.Rixford

Title: Testing and Lab Coordinator

Source of Sample: Site
Sample Number: 1

Date Sampled: 10-18-17

**Knight Consulting
Engineers, Inc.
Williston, Vermont**

Client: Trudell Consulting Engineers, INC
Project: 17-124 Hinsdale

Project No: 17412

Figure 2-3

Results reflect soil gradation only and not other specification requirements.

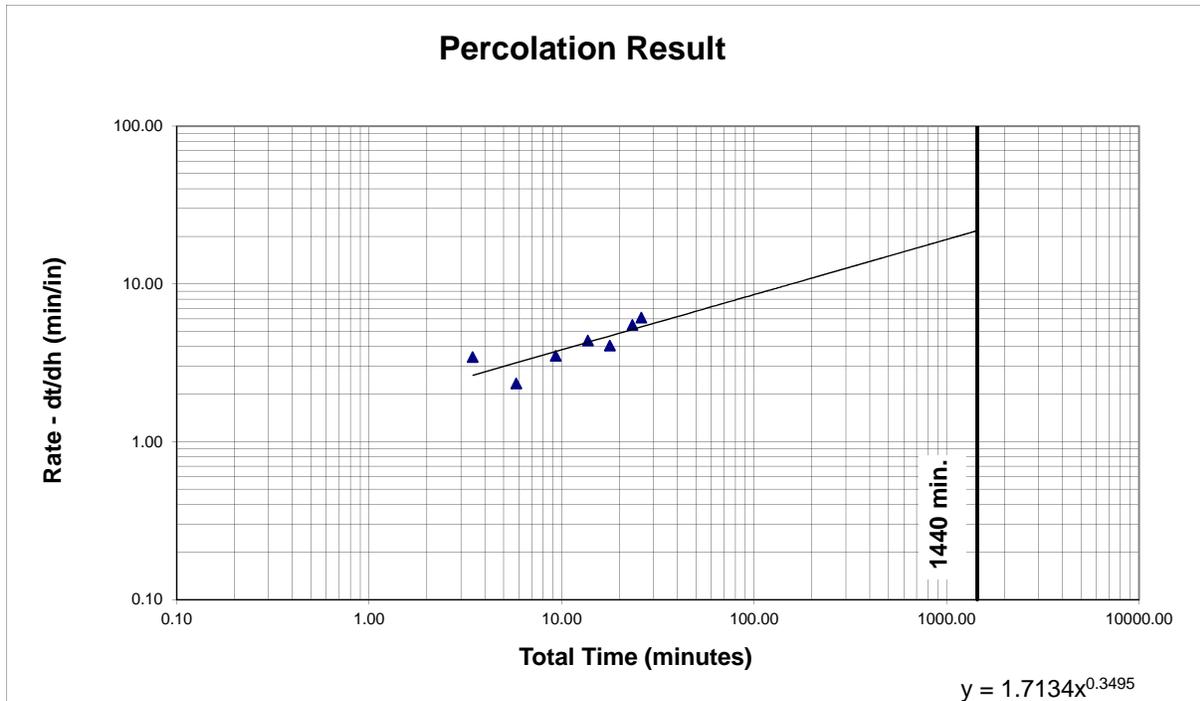
Client: Hinsdale Charlotte Farms
 Job: 17-124
 Location: 286 Prindle Road, Charlotte, VT

Calculated By: ALR
 Test Date: 11/3/2017
 Page: 1 of 2

Percolation Test # 1

Total Drop: 1.0 in
 Depth of Perc. Test: 24 in

Interval No.	Time Start (h:mm:ss)	Time Finish (h:mm:ss)	Fill Time (h:mm:ss)	Drop Time (h:mm:ss)	Total Time	Total Time (min)	Total Drop (in.)	Rate dt/dh (min/in)
1	0:17:53	0:21:20	0:00:00	0:03:27	0:03:27	3.45	1.0	3.45
2	0:21:20	0:23:41	0:00:00	0:02:21	0:05:48	5.80	1.0	2.35
3	0:23:41	0:27:12	0:00:00	0:03:31	0:09:19	9.32	1.0	3.52
4	0:27:12	0:31:35	0:00:00	0:04:23	0:13:42	13.70	1.0	4.38
5	0:31:35	0:35:40	0:00:00	0:04:05	0:17:47	17.78	1.0	4.08
6	0:35:40	0:41:11	0:00:00	0:05:31	0:23:18	23.30	1.0	5.52
7	0:41:11	0:47:19	---	0:06:08	0:25:59	25.98	1.0	6.13



Percolation Design Rate from best fit straight line through data points on graph at 1440 minutes (1-day) 21.8 min/in

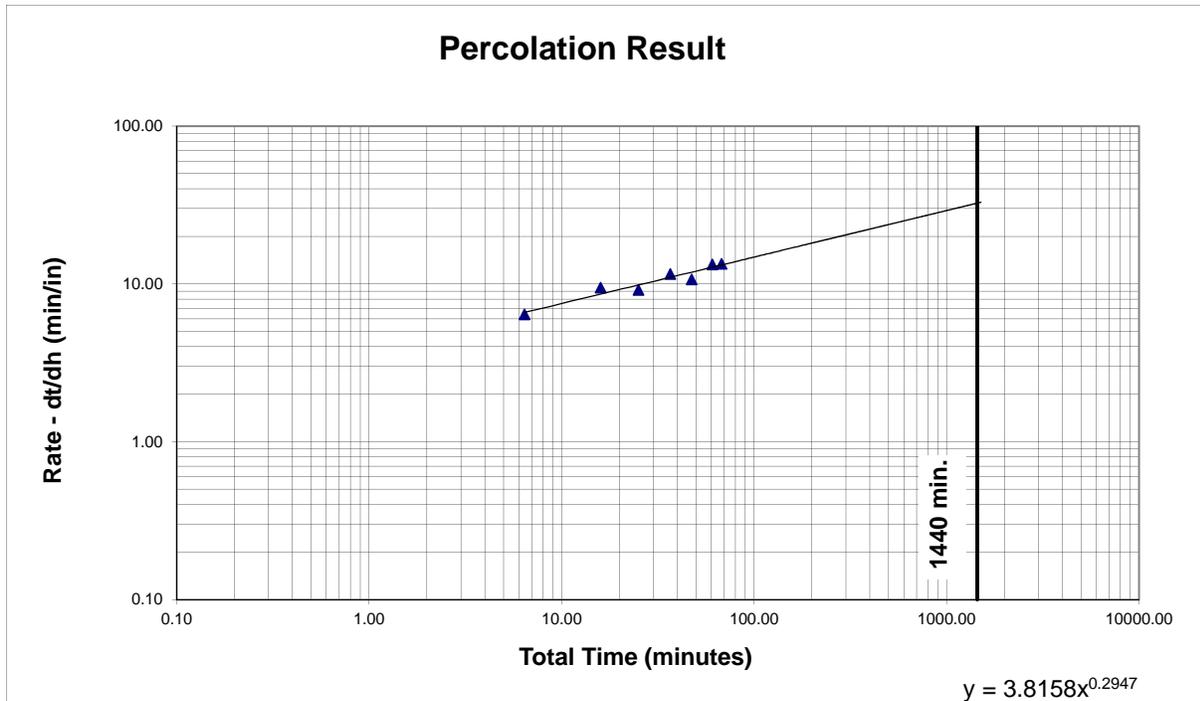
Client: Hinsdale Charlotte Farms
 Job: 17-124
 Location: 286 Prindle Road, Charlotte, VT

Calculated By: ALR
 Test Date: 11/3/2017
 Page: 2 of 2

Percolation Test # 2

Total Drop: 1.0 in
 Depth of Perc. Test: 20 in

Interval No.	Time Start (h:mm:ss)	Time Finish (h:mm:ss)	Fill Time (h:mm:ss)	Drop Time (h:mm:ss)	Total Time	Total Time (min)	Total Drop (in.)	Rate dt/dh (min/in)
1	0:01:50	0:08:15	0:00:00	0:06:25	0:06:25	6.42	1.0	6.42
2	0:08:15	0:17:45	0:00:00	0:09:30	0:15:55	15.92	1.0	9.50
3	0:17:45	0:26:57	0:00:00	0:09:12	0:25:07	25.12	1.0	9.20
4	0:26:57	0:38:31	0:00:00	0:11:34	0:36:41	36.68	1.0	11.57
5	0:38:31	0:49:12	0:00:00	0:10:41	0:47:22	47.37	1.0	10.68
6	0:49:12	1:02:33	0:00:00	0:13:21	1:00:43	60.72	1.0	13.35
7	1:02:33	1:16:01	---	0:13:28	1:07:46	67.77	1.0	13.47



Percolation Design Rate from best fit straight line through data points on graph at 1440 minutes (1-day) 32.5 min/in

PUMP STATION and DISPOSAL FIELD DESIGN COMPUTATIONS

7-Bedroom Failed Wastewater Remediation

Project Location:

*286 Prindle Road
Charlotte, VT*

Project Name:

Hindsdale

Applicant:

Hindsdale

Date:

October 25, 2017

Project No.:

17-124



478 Blair Park Road
Williston, VT 05495
VOICE (802) 879-6331

DISPOSAL AREA COMPUTATIONS

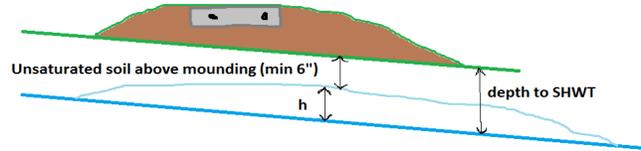
For: 286 Prindle Road
 Date: October 25, 2017

Project No. 17-124
 Calculated by: ALR
 Checked by: NTH

Mound System Simplified Mounding Analysis

Depth to SHWT 16 inches

Minimum Available Soil to
 Groundwater Mounding (h) 0.8 feet



Type of Soil **Fine Sandy Loam** slope category
 Natural Ground Slope **6.6** **D**

System Design Flow 700 gpd
 Loading Rate 1.0 gal/day/sf
 Minimum System Area 700 sf

Check minimum length using linear loading rate:

LLR = (h)(f)
 h = 0.8 the soil thickness available for groundwater mounding
 f = 10.5 the LLR Factor from Table 1 Appendix 7-A EPR
 LLR = 8.8

Minimum Length Required per Linear Loading Rate:

$\frac{700}{8.8} = 80$ feet

System Info:

System Width 4 feet
 System Length 90 feet
 # of Infiltration Areas 2
 System Area 720

Actual Linear Loading Rate = System Flow / Total System Length

LLR (actual) = 7.78 gpd/lf

Re-Solve for soil thickness available for groundwater mounding

LLR/f = 0.741 ft
 h (actual) = 9 inches

Unsaturated soil above induced mounding

depth to SHWT - 7 inches > 6 OK
 h (actual) =

Depth to ledge on-site	use 48 if no ledge to depth	=	48 inches	assumed
Required distance between bottom of trench ledge		=	48 inches	
Required distance between bottom of trench and induced SHWT		=	36 inches	App. 7-A Background
Distance between ground surface and induced SHWT		=	7 inches	
Minimum mound sand required		=	12 inches	
Mound sand required		=	29 inches	

Septic Tank
 1050

PUMP STATION DESIGN COMPUTATIONS

For: 286 Prindle Road
Date: October 25, 2017

Project No. 17-124
Calculated by: ALR
Checked by: NTH

DESIGN DATA:

DESIGN FLOW: **700 Gal/Day**
NUMBER OF DOSES PER DAY: 6 Minimum of 4
FORCE MAIN DIA. (INCHES): **2** SDR 26 PVC
PUMP STA. PIPE DIA (INCHES): **2** SDR 26 PVC
HAZEN WILLIAMS C-VALUE: **140**

PUMP CHAMBER SPECIFICATIONS:

DIMENSIONS: LENGTH: (Inside) **88.00** inches = **7.33** feet
WIDTH: (Inside) **58.00** inches = **4.83** feet
DEPTH: (inside) **56.00** inches = **4.67** feet

Weep hole at pump station? (yes / no) **NO**

STORAGE: VOL PER FOOT: 265 gal/ft = 22 gal/in
PRIMARY VOLUME (between on & off) 133 gal/dose
RESERVE VOLUME (above on float) 729 gal = 1.0 days
VOL. IN PIPE RUN (used with weep only) 0 gal

TOTAL STORAGE ABOVE ALARM 729 gal

ELEVATIONS: PUMP STATION INLET **436.5** feet

	<u>Float Elevations</u>	<u>Float Settings</u>
ALARM	433.8 feet	3 " above on
ON	433.5 feet	6 " above off
OFF	433.0 feet	8 " above sump
SUMP	432.4 feet	

Depth of Sump: **8** inches

FIELD INFORMATION:

DISPOSAL AREA ELEVATION **456.0** feet
DEPTH OF STONE IN TRENCH **12.0** inches

CALCULATE STATIC HEAD:

DISCHARGE ELEVATION 458.0 feet
PUMP OFF ELEVATION 433.0 feet

TOTAL STATIC HEAD ⇒ 25.0 feet

PUMP STATION DESIGN COMPUTATIONS

For: 286 Prindle Road
 Date: October 25, 2017

Project No. 17-124
 Calculated by: ALR
 Checked by: NTH

CALCULATE EQUIVALENT LENGTH:

FRICION LOSSES IN PUMP CHAMBER:

<u>QTY</u>	<u>DIA (IN)</u>	<u>LOSS/FITTING (FT)</u>	<u>FITTING</u>	<u>TOTAL</u>	
3	2	5.5	90 bend	16.5	FT
0	2	2.5	45 bend	0.0	FT
0	2	12.0	tee	0.0	FT
1	2	13.0	check valve	13.0	FT
1	2	55.0	gate or ball valve	55.0	FT
0	2	2.0	reducer (1 size)	0.0	FT
0	2	1.0	increaser (1 size)	0.0	FT
EQUIVALENT LENGTH:				85.0	FT
				84.5	FT

FITTING FRICTION TABLE

Dia:	1.5	2	2.5	3	4
90 bend	4.3	5.5	6.5	8	10.0
45 bend	2	2.5	3	3.8	5.0
tee	9	12	14	17	22.0
check valve	11	13	16	20	26.0
gate valve	43	55	67	82	110.0
reducer (1 size)	1.0	2.0	2.0	3.0	4.0
increaser (1 size)	1.0	1.0	1.0	1.0	1.0

FRICION LOSSES IN PIPE RUN:

<u>QTY</u>	<u>DIA (IN)</u>	<u>LOSS/FITTING (FT)</u>	<u>FITTING</u>	<u>TOTAL</u>	
0	2	5.5	90 bend	0.0	FT
8	2	2.5	45 bend	20.0	FT
1	2	12.0	tee	12.0	FT
0	2	13.0	check valve	0.0	FT
0	2	55.0	gate or ball valve	0.0	FT
0	2	2.0	reducer (1 size)	0.0	FT
0	2	1.0	increaser (1 size)	0.0	FT
				340.0	FT
				372.0	FT

			LENGTH OF RUN	⊖	
EQUIVALENT LENGTH:				372.0	FT

TOTAL EQUIVALENT LENGTH:	⇒	457 FT
---------------------------------	---	---------------

PUMP STATION DESIGN COMPUTATIONS

For: 286 Prindle Road
Date: October 25, 2017

Project No. 17-124
Calculated by: ALR
Checked by: NTH

PRESSURE DISTRIBUTION SYSTEM PARAMETERS:

	<u>Unit</u>	<u>Value</u>	<u>Comment</u>
GENERAL INFO:			
Min. Volume per Dose	gallons	133	
No. of Laterals		4	count each pipe off of manifold
System Width	feet	4	
System Length	feet	90	
Number of Infiltration Areas		2	
Total System Area	sq feet	720	
FORCE MAIN:			
Total Equivalent Length	feet	457	
Inside Diameter	inches	2	
MANIFOLD:			
No. of Segments		1	
Segment Equiv. Length	feet	4	
Inside Diameter	inches	2	
EACH LATERAL:			
Equivalent Length	feet	43	
Inside Diameter	inches	2	
Design Residual Pressure	feet	3	2.31' = 1 psi
Orifice Diameter	inches	0.2500	0.3125=5/16;0.4375=7/16; 0.5625=9/16 0.1875=3/16
1 Orifice per Square Foot (min.)	sq feet	25	inground 1/25 sand filter 1/4
SYSTEM:			
Minimum No. of Orifices		29	within system
No. of Orifices		34	within system
No. of Orifices per Lateral		8.5	per lateral
Orifice Spacing	inches	64.50	5' 4 4/8"

PUMP STATION DESIGN COMPUTATIONS

For: 286 Prindle Road

Date: October 25, 2017

Project No. 17-124

Calculated by: ALR

Checked by: NTH

PRESSURE DIFFERENTIAL PER LATERAL:

$$\text{Friction Loss (hL)} = \frac{4.72 \times L \times Q^{1.875}}{C^{1.85} \times D^{4.87}}$$

L Length of Lateral	43 FT
Q Per Lateral	10.85 GPM
C Coefficient of Friction	140
D Diameter of Pipe	2 inches
P Pressure	3.0 FT

$$hL = 0.0649 \text{ FT}$$

$$hL \text{ final} = hL / P \quad 2.164 \quad \%$$

SYSTEM PERFORMANCE SUMMARY:

FLOW VELOCITY:

Force Main	ft/sec	4.4	
Manifold	ft/sec	2.2	
Laterals	ft/sec	0.6	
ORIFICE DISCHARGE (per orifice)	gal/min	1.28	
NETWORK VOLUME	gallons	29	laterals and manifold
MIN. DOSE VOL./NETWORK VOL.		5	minimum allowable = 5
NETWORK DISCHARGE	gal/min	43	minimum pump discharge

PUMP STATION DESIGN COMPUTATIONS

For: 286 Prindle Road
Date: October 25, 2017

Project No. 17-124
Calculated by: ALR
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PRESSURE DISTRIBUTION NETWORK SYSTEM CURVE:

Pump Off Elev.	433.0	Hazen-Williams "C" Value	140
Manifold Invert Elev.	458.00	K Factor for C > 100	0.54
Lateral Invert Elev.	458.00		

FORCE MAIN

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
45	4.6	4.4	19.9
55	5.6	6.3	28.9
65	6.6	8.6	39.4
75	7.7	11.2	51.3
85	8.7	14.2	64.7
95	9.7	17.4	79.5
105	10.7	20.9	95.7
115	11.7	24.8	113.2
125	12.8	28.9	132.1

MANIFOLD (EACH SEGMENT)

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
45.0	4.6	4.4	0.17
55.0	5.6	6.3	0.25
65.0	6.6	8.6	0.34
75.0	7.7	11.2	0.45
85.0	8.7	14.2	0.57
95.0	9.7	17.4	0.70
105.0	10.7	20.9	0.84
115.0	11.7	24.8	0.99
125.0	12.8	28.9	1.16

EACH LATERAL

Flow (gpm)	Velocity (fps)	H _f /100 (ft./100 ft.)	Friction Loss (feet)
11.3	1.1	0.3	0.14
13.8	1.4	0.5	0.21
16.3	1.7	0.7	0.28
18.8	1.9	0.9	0.37
21.3	2.2	1.1	0.47
23.8	2.4	1.3	0.57
26.3	2.7	1.6	0.69
28.8	2.9	1.9	0.82
31.3	3.2	2.2	0.95

COMPOSITE SYSTEM CURVE

Flow (gpm)	Static Head (feet)	Residual Press. at Distal End	TDH (feet)
45	25.0	3.0	48.2
55	25.0	3.0	57.3
65	25.0	3.0	67.9
75	25.0	3.0	80.1
85	25.0	3.0	93.7
95	25.0	3.0	108.7
105	25.0	3.0	125.2
115	25.0	3.0	143.0
125	25.0	3.0	162.2

Plot Flow and TDH on Pump Curve to determine operating point of pump.

OPERATING POINT (From Attached Pump Curve):

NOTE: PUMP SHALL MEET THE SPECIFICATIONS ABOVE AND BE CAPABLE OF MEETING THE FOLLOWING FLOW AND HEAD CONDITION. ANY CHANGES TO THE PUMP SPECIFICATION SHALL BE APPROVED BY THE ENGINEER.

57 gpm @

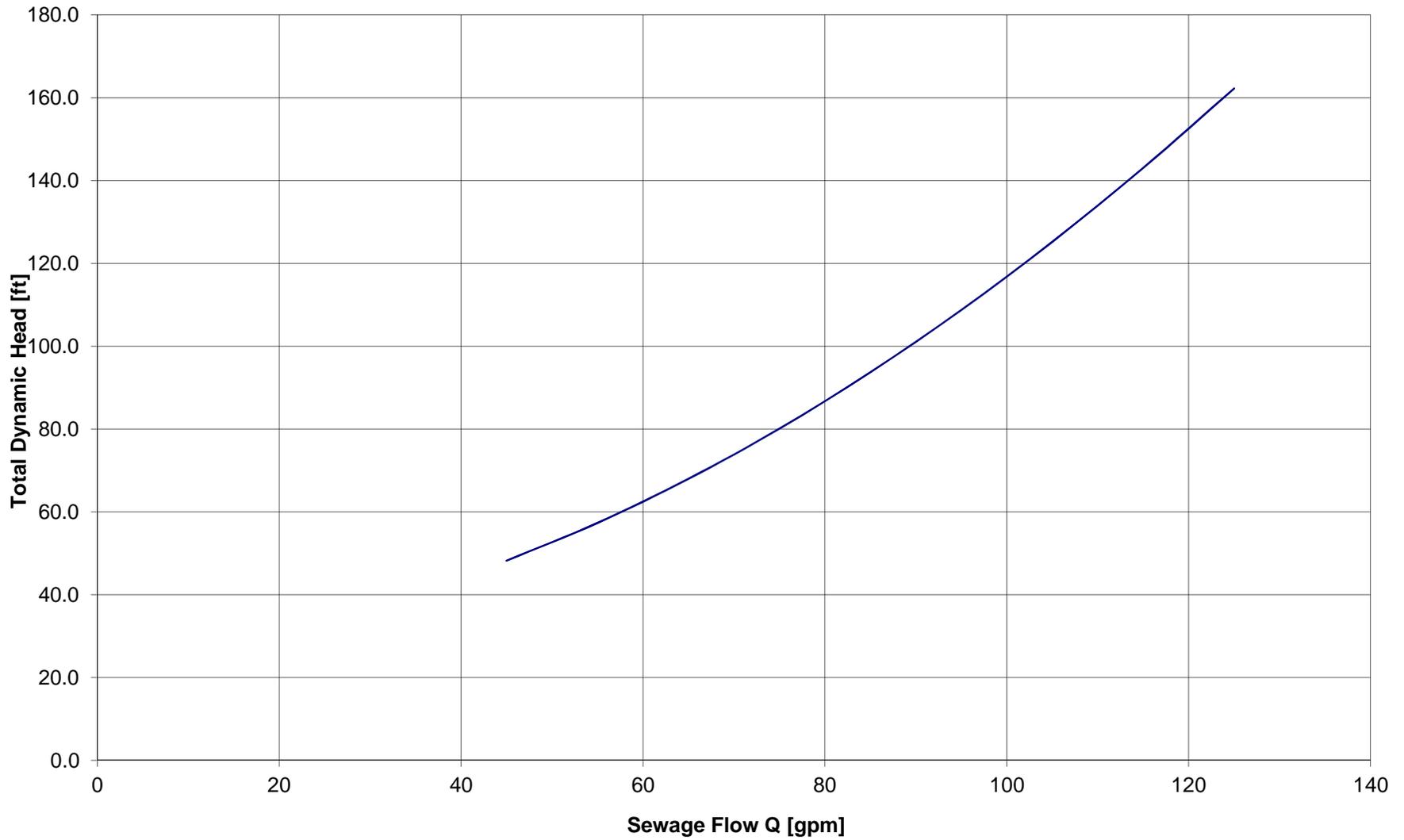
60 TDH

Run time: **2.3 min.**

SUBMERSIBLE PUMP SPECIFICATIONS:

MANUFACTURER:	Goolds	DISCHARGE:	2" NPT
MODEL #:	WE1512H	SPEED (RPM):	3450
HORSEPOWER:	1.5	VOLTAGE:	230
IMPELLER DIAMETER:	4.56"	PHASE:	1
SOLIDS HANDLING:	3/4"		

Pressurized Disposal Pump Requirement Curve





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.

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.

WE Series Model 3885

SUBMERSIBLE EFFLUENT PUMPS

APPLICATIONS

Specifically designed for the following uses:

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

SPECIFICATIONS

Pump

- Solids handling capabilities: $\frac{3}{4}$ " 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 $\frac{1}{3}$ - 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.
- $\frac{1}{3}$ - 1 HP models have NEMA three prong grounding plugs.
- 1½ HP and larger units have bare lead cord ends.

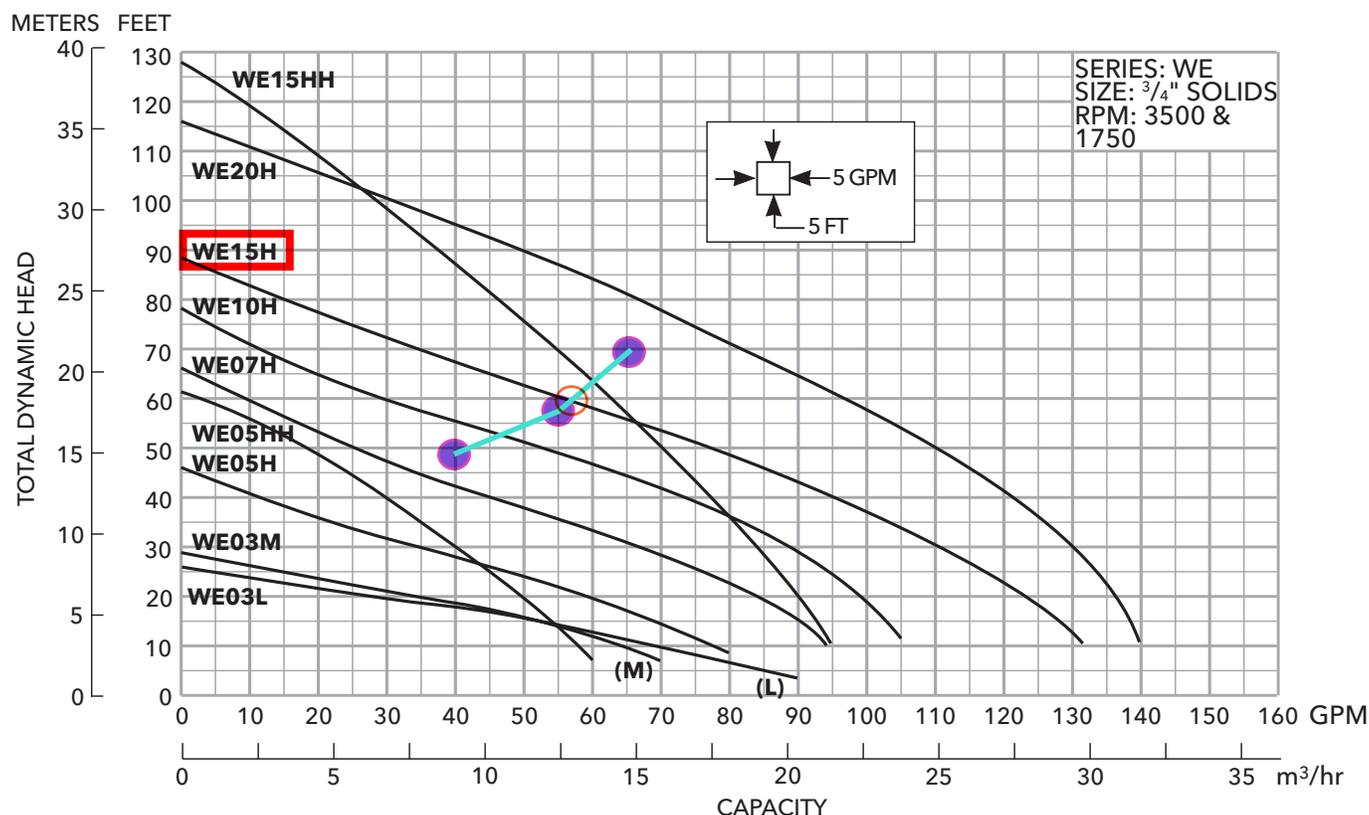
Three phase (60 Hz):

- 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



MODELS

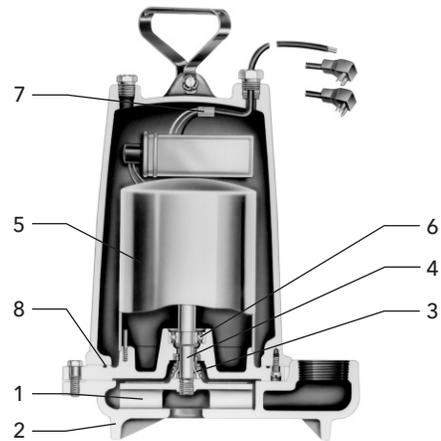
Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency %	Resistance		Power Cable Size	Weight (lbs.)			
										Start	Line-Line					
WE0311L	0.33	1	115	1750	5.38	10.7	30.0	M	54	11.9	1.7	16/3	56			
WE0318L			208			6.8	19.5	K	51	9.1	4.2					
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	1	115	3450	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				
WE0512H			230			7.3	34.5	M	53	9.6	4.0	16/3				
WE0538H		3	200			4.9	22.6	R	68	NA	3.8	14/4				
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	14/4						
WE0511HH		1	115		3.88	3.88	14.5	46.0	M	54	7.5	1.0		14/3		
WE0518HH			208				8.1	31.0	K	68	9.7	2.4		16/3		
WE0512HH			230				7.3	34.5	M	53	9.6	4.0		16/3		
WE0538HH			3				200	4.9	22.6	R	68	NA		3.8	14/4	
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	14/4						
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	14/3	
WE0738H			3		200			6.2	20.6	L	64	NA		5.7	14/4	
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	3450	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	14/3				
WE1038H		3	200			8.1	37.6	M	77	NA	2.7	14/4				
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	208	17.5	59.0	K	68	9.3	1.1	14/3							
WE1512H	1	230	15.7	50.0	H	68	11.3	1.6	14/3							
WE1538H	1.5	3	200	3450	4.56	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				
WE1512HH			230			15.7	50.0	H	68	11.3	1.6	14/3				
WE1538HH		3	200		5.50	10.6	40.6	K	79	NA	1.9	14/4				
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	3450	5.38	18.0	49.6	F	78	3.2		1.2	14/3	83
WE2038H					200			12.0	42.4	K	78	NA		1.7	14/4	
WE2032H	3		230	11.6	42.4			K	78	NA	1.7	14/4				
WE2034H			460	5.8	21.2			K	78	NA	6.6					
WE2037H			575	4.7	16.3			L	78	NA	10.5					

PERFORMANCE RATINGS (gallons per minute)

Order No.	WE-03L	WE-03M	WE-05H	WE-07H	WE-10H	WE-15H	WE-05HH	WE-15HH	WE-20H
HP	1/3	1/3	1/2	3/4	1	1 1/2	1/2	1 1/2	2
RPM	1750	1750	3500	3500	3500	3500	3500	3500	3500
Total Head Feet of Water									
5	86	-	-	-	-	-	-	-	-
10	70	63	78	94	-	-	58	95	-
15	52	52	70	90	103	128	53	93	138
20	27	35	60	83	98	123	49	90	136
25	5	15	48	76	94	117	45	87	133
30	-	-	35	67	88	110	40	83	130
35	-	-	22	57	82	103	35	80	126
40	-	-	-	45	74	95	30	77	121
45	-	-	-	35	64	86	25	74	116
50	-	-	-	25	53	77	-	70	110
55	-	-	-	-	40	67	-	66	103
60	-	-	-	-	30	56	-	63	96
65	-	-	-	-	20	45	-	58	89
70	-	-	-	-	-	35	-	55	81
75	-	-	-	-	-	25	-	51	74
80	-	-	-	-	-	-	-	47	66
90	-	-	-	-	-	-	-	37	49
100	-	-	-	-	-	-	-	28	30

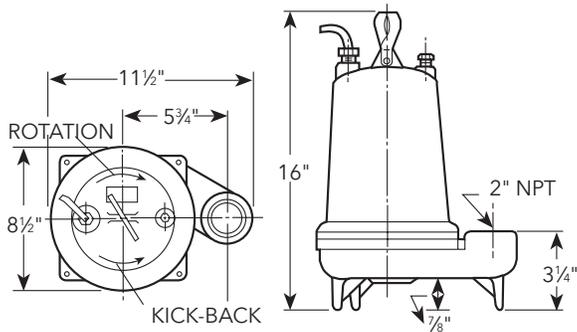
COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring



DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



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Let's Solve Water

Xylem, Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.gouldswatertechnology.com

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