



Laura Clifford
Ashland Board of Health
Town Hall
101 Main Street
Ashland, MA 01721

June 1, 2021

Subject: Septic System Replacement - 7 Old Central Turnpike

Dear Ms. Clifford:

Enclosed please find the following information for a proposed system replacement at 7 Old Central Turnpike, submitted on behalf of the homeowner.

- Permit Application
- Application Fee
- Septic System Design Plan (4 copies)
- Design Calculations

RECEIVED

JUN 02 2021

Town of Ashland
Board of Health

#4182
\$253⁰⁰

The design requests the following variances to the Ashland regulations.

303-7 Two percolation tests required (one provided)

Rationale: The soil was observed to be consistent in test holes 1 and 2. Small working area for backhoe prevented a second safe test.

303-11 Leach area to be designed for a garbage grinder (Tank designed for garbage grinder but not leach area)

Rationale: The small lot size prohibits expanding the leach area by 50% to account for a garbage grinder.

303-14 Trench spacing to be 10 feet (6 feet provided per Title 5)

Rationale: The small lot size limits trench separation. As proposed, the design meets Title 5 requirements for trench spacing.

Should you have any questions or need additional information please let us know.

Sincerely,

Daniel McIntyre, P.E.

cc: Kim Draper, owner



Commonwealth of Massachusetts
 City/Town of Ashland
**Application for Disposal System
 Construction Permit**
 Form 1A

#4182
 Number

\$ 253.⁰⁰
 Fee

DEP has provided this form for use by local Boards of Health if they choose to do so. Before using the form, check with your local Board of Health to make sure that they will accept it.

A. Facility Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Application is hereby made for a permit to: Construct a new on-site sewage disposal system
 Repair or replace an existing on-site sewage disposal system
 Repair or replace an existing system component

1. Location of Facility:

7 Old Central Turnpike
 Address or Lot #
 Ashland MA 01721
 City/Town State Zip Code

2. Owner Information

Kim & Nathan Draper
 Name
 7 Old Central Turnpike
 Address (if different from above)
 Ashland MA 01721
 City/Town State Zip Code
 Telephone Number

3. Installer Information

TBD Scott Septic
 Name Name of Company
 Hopkinton
 Address City/Town
 MA 01748
 State Zip Code
 508-435-4168
 Telephone Number

4. Designer Information

Daniel McIntyre
 Name McIntyre Engineering & Septic Service Inc.
 Name of Company
 30 Elm Street
 Address
 Hopkinton MA 01748
 City/Town State Zip Code
 508-497-2374
 Telephone Number



Commonwealth of Massachusetts
 City/Town of Ashland
**Application for Disposal System
 Construction Permit**
 Form 1A

Number _____
 \$ _____
 Fee

A. Facility Information (continued)

5. Type of Building:

- Dwelling Garbage Grinder (check if present)

Other: Type of Building _____ Number of Persons Served _____

- Showers Number of showers _____ Cafeteria Other fixtures _____

Specify other fixtures: _____

6. Design Flow: 330
 Gallons per Day
 Calculated Daily Flow: 330
 Gallons

7. Plan: 5-28-2021
 Date of Original
 1 _____
 Number of Sheets Revision Date
 Septic System Plan - 7 Old Central Turnpike
 Title of Plan

8. Description of Soil:
 Loamy Sand
 5 MPI perc rate

9. Nature of Repairs or Alterations (if applicable):

10. Date last inspected: _____
 Date



Commonwealth of Massachusetts
 City/Town of Ashland
**Application for Disposal System
 Construction Permit**
 Form 1A

Number _____

\$ _____
 Fee

B. Agreement

The undersigned agrees to ensure the construction and maintenance of the aforescribed on-site sewage disposal system in accordance with the provisions of Title 5 of the Environmental Code and not to place the system in operation until a Certificate of Compliance has been issued by this Board of Health.

K. O'Leary

5/27/21

Signature _____

Date _____

Application Approved By:

Name _____

Date _____

Application Disapproved for the following reasons:

CALCULATION SUMMARY

PROJECT: 7 Old Central Turnpike Ashland, MA	
JOB NO.:	DATE: May 28, 2021
SUBJECT: Septic System Replacement	
OBJECTIVE: Design replacement septic system.	
CODES & STANDARDS:	
<ol style="list-style-type: none"> 1. Title 5, CMR 15.00 2. Town of Ashland Board of Health Regulations 	
REFERENCES:	
<ol style="list-style-type: none"> 1. Soils Report for testing on 5/4/2021 by Daniel McIntyre, Soil Evaluator. 	
DESIGN CRITERIA:	
Design Flowrate	= 330 GPD (3 Bedroom)
Percolation Design Rate	= 5 MPI
Soil Type	= Class I
LTAR	= 0.74 GPD/SF
Garbage Grinder	No
CONCLUSIONS:	
<ul style="list-style-type: none"> • 3 - 30 foot long stone and pipe trenches, 3 feet wide 12 inch stone depth • 1500 gallon two compartment septic tank • 1000 gallon pump tank 	
<u>Attachments</u>	
<ol style="list-style-type: none"> 1. Soils Report 2. Percolation Test Report 3. Pump calculations 	

REV	DESCRIPTION	DATE	BY	
				<div style="border: 1px solid black; width: 100%; height: 100%;"></div>

MCINTYRE ENGINEERING & SEPTIC SERVICES, INC.

**TITLE: 7 Old Central Turnpike Ashland, MA
Septic System Replacement**

**DATE: 05/28/21
PAGE: 1 OF 2
BY: DM**

DESIGN CRITERIA

No information available on existing design. The design criteria will be 330 GPD to match existing conditions based on Assessor's records.

SOIL CLASSIFICATION

Field evaluation indicates greater than 4 feet of naturally occurring pervious soil including subsoil. Soil is considered as Class I.

Perc No. 1 5 MPI ("C" Layer)

Use an LTAR of 0.74 gpd/square foot based on 5 MPI per rate and Class I soil.

LEACH FIELD SELECTION

LTAR per Title 5: 0.74 gpd/sq. ft.
Leaching Area Req'd.: 446 Square Feet (330 GPD/0.74)

Use stone & pipe in a trench design.

Leaching Area Dimensions: 12" Sidewall Area; 2 x (12"/12) = 2.00 SF/LF
36" Bottom Area; (36"/12) = 3.00 SF/LF
Total Leaching Area = 5.00 SF/LF

Leaching Area Provided:

Use 3 - 30 Foot Long Trenches
3 Lines x 30' x 5.00 SF/LF = 450 SF Leach Area > 446 SF -O.K.-

GROUNDWATER CONDITIONS

	<u>Grade</u>	<u>Hole Depth</u>	<u>Refusal</u>	<u>Mottling</u>	<u>Seasonal High Groundwater</u>
Deep No. 1	244.5	90"	None	80"	80" (mottles El. 237.8)
Deep No. 2	244.5	100"	None	None	100" (bottom El. 236.1)

Set trench bottom elevations to maintain at least 4 feet above groundwater at 80 inches below grade.

<u>Trench</u>	<u>Ground Water</u>	<u>Trench Bottom</u>	<u>Ground Water Offset</u>	<u>Top of Peastone (Breakout)</u>	<u>Final Grade</u>	<u>Cover</u>
All	237.8	241.8	4.0'	243.5	245.5 - 244.5	12" - 24"

MCINTYRE ENGINEERING & SEPTIC SERVICES, INC.

DATE: 05/28/21

TITLE: *7 Old Central Turnpike Ashland, MA
Septic System Replacement*

PAGE: 2 OF 2

BY: DM

SEPTIC TANK

Install 2 compartment, 1500 gallon tank with an effluent filter in the outlet tee. .

First Compartment = 200% Design Flow = 660 gallons; 1000 gallons provided; O.K

Second Compartment = 100% Design Flow = 330 gallons; 500 gallons provided; O.K.

NITROGEN LOADING

Lot is served by a town water and is not in a Nitrogen Sensitive Area.

ASHLAND VARIANCES & TITLE 5 LOCAL UPGRADE APPROVALS

303-7 Two perc test required. One provided.

303-11 Leach area to be designed for a garbage grinder (not included)

303-14 Trench spacing to be 10 feet (6 feet provided per Title 5)

LOCATION *7 Old Central Turnpike Ashland***OBJECTIVE**

Develop system head curve and select a residential effluent pump for using a schedule 40 force main.

SYSTEM DATA

Pump Chamber Volume	1000 gallons
Design Flow	330 gpm
Force Main Diameter	2 inches
D-Box Inlet Invert Elevation	243.35 feet
Pump Ch'br. Outlet Invert Elev.	238.30 feet
Pump Ch'br. Bot. Elev.	233.80 feet
Groundwater Elevation	237.00 feet
Final Grade Elevation	242 feet
Force Main Length	37 feet
90 Elbows	6 each
45 Elbows	0 each
Gate Valves	1 each
Through "T"	0 each
Branch "T"	2 each
Check Valve	1 each

FORCE MAIN EQUIVALENT LENGTH

	Unit		Total
	Equiv Length	Quantity	Equiv Length
Pipe	1.00	37	37.00
90 Elbow	5.17	6	31.02
45 Elbow	2.76	0	0.00
Gate Valve	2.00	1	2.00
Through "T"	3.45	0	0.00
Branch "T"	10.30	2	20.60
Check Valve	17.20	1	17.20
	Total Equiv. Length		107.82

SYSTEM HEAD CURVE

Flow (gpm)	Velocity (fps)	Static Head (ft)	Vel. Head (ft)	Dyn. Head (ft)	Total Head (ft)
20	2.05	9.55	0.07	0.91	10.52
30	3.07	9.55	0.15	1.92	11.62
40	4.10	9.55	0.26	3.26	13.07
50	5.12	9.55	0.41	4.93	14.89
60	6.15	9.55	0.59	6.93	17.07
70	7.17	9.55	0.80	9.20	19.55

PUMP MANUFACTURER'S DATA

Pump Rate (gpm)	Total Dynamic Heads		
	Myer SRM4	Myers ME-40	Myers ME-45
20	16	27.5	34
30	15	25	30
40	13.25	22	27
50	11.9	18	23
60	10	15	20
70	8	10	17

DETERMINE DOSE VOLUME

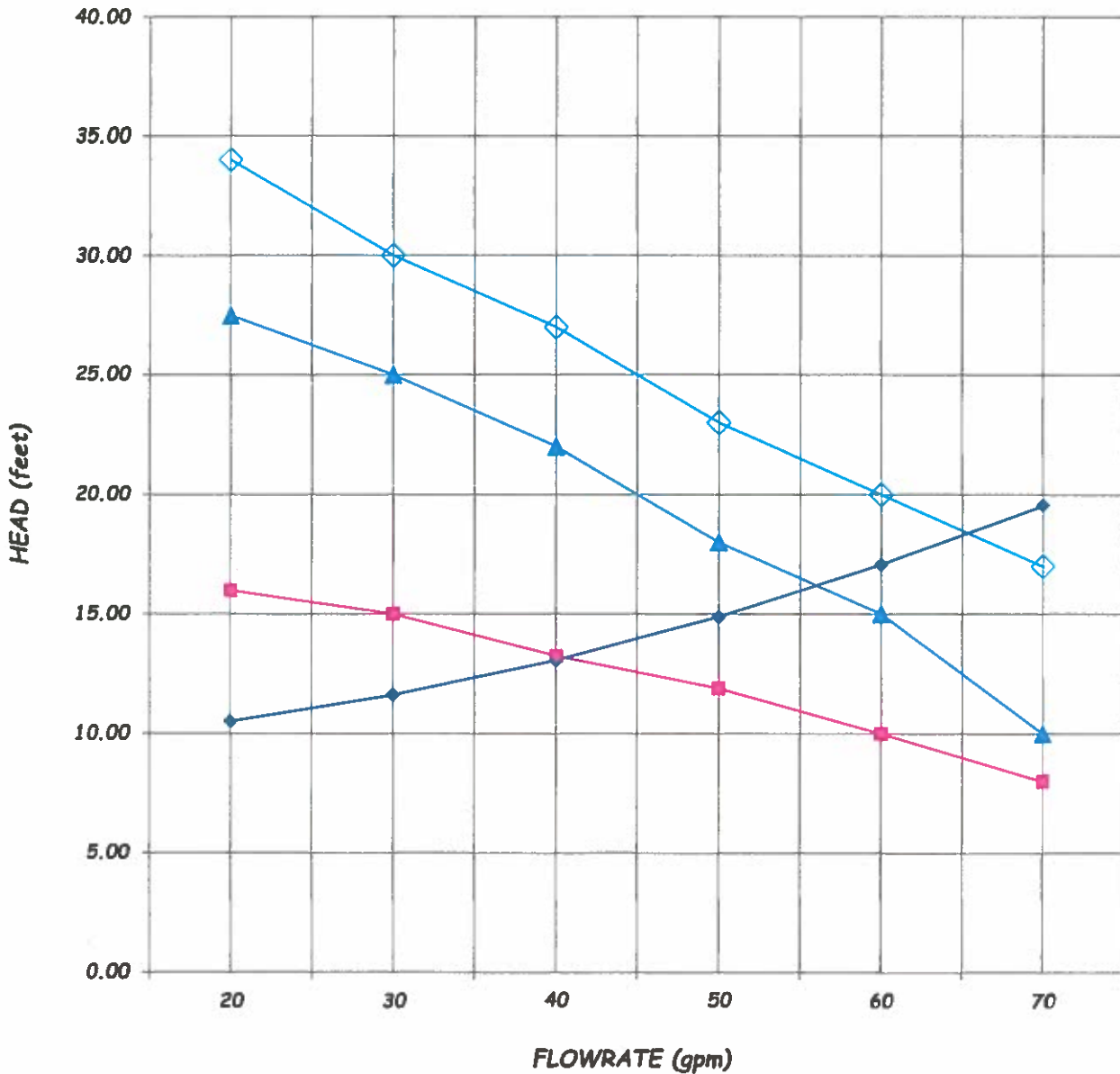
Distribution Pipe Diameter	4 inches	
Distribution Pipe Length	90 feet	
Distribution Pipe Volume	58.9 gallons	
Dose Vol. as % of Pipe Volume	200.0 %	
Trial Dose Volume	117.8 gallons	
Force Main Volume	6.1 gallons	(drain back volume)
Total Pumped Volume	123.8 gallons	
Doses per Day	2.8	OK > 4 minimum
Pumping Rate	40 gpm	(select from system head curve)
Pump Run Time	3.1 minutes	OK

HORSEPOWER ESTIMATE

Pumping Rate 40 gpm (from head curve)
Total Dynamic Head 13 feet (select from head curve)
Approx. Efficiency 80%
Horsepower 0.16 HP

SYSTEM HEAD CURVE

Effluent Pump



PUMP SPECIFICATIONS

Pumping Rate	40 gpm	
Total Dynamic Head	13 feet	
Horsepower	0.30 HP	
Force Main Velocity	4.10 fps	OK > 2 fps
Manufacturer	Myers	
Model	SRM-4	

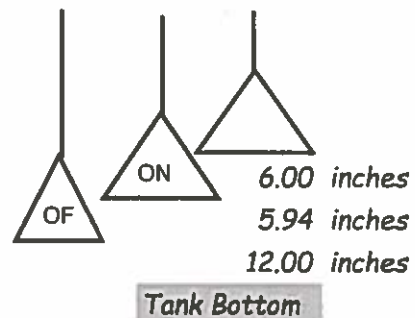
PUMP CHAMBER SIZE SELECTION

Selected Tank Model	1000 gallon
Tank Length (outside)	8.60 feet
Tank Width (outside)	5.00 feet
Tank Depth (outside)	5.80 feet
Liquid Depth	4.00 feet
Bottom Concrete Thickness	0.25 feet
Tank Weight	9,000 pounds

(1) Based on 1000 gallon tank dimensions as manufactured by LaMarre Concrete.

PUMP FLOAT ELEVATIONS

Pump Off Elevation	235.30
Pump On Elevation	235.80
Both Pumps On Elev.	236.30
Emergency Volume	501 OK
Working Volume	124



PUMP CHAMBER BUOYANCY (skin friction between tank and soil ignored)

Tank Weight	9,000 pounds
Overburden Weight	10,320 pounds (assumes soil wgt. of 100 pcf)
Counterweight	pounds
Hydrostatic Force	8,600 pounds
Factor of Safety	
During Construction	1.05 ALERT CONTRACTOR TO BALLAST
At Final Grade	2.25 OK



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Draper _____

Owner Name _____

7 Old Central Turnpike _____ 10-136 _____

Street Address _____ Map/Lot # _____

Ashland _____ MA _____ 01720 _____

City _____ State _____ Zip Code _____

B. Site Information

1. (Check one) New Construction Upgrade Repair
2. Soil Survey Available? Yes No If yes: _____
USDA Web Source _____ 629B _____
Soil Map Unit _____

Canton Chariton _____

Soil Name _____ Soil Limitations _____

Glacial Till _____ Hill _____

Soil Parent material _____ Landform _____

3. Surficial Geologic Report Available? Yes No If yes: _____
Year Published/Source _____ Map Unit _____

Description of Geologic Map Unit: _____

4. Flood Rate Insurance Map _____ Within a regulatory floodway? Yes No
5. Within a velocity zone? Yes No
6. Within a Mapped Wetland Area? Yes No If yes, MassGIS Wetland Data Layer: _____
Wetland Type Normal Below Normal
7. Current Water Resource Conditions (USGS): _____
Range: Above Normal Normal Below Normal
8. Other references reviewed: _____
Month/Day/ Year _____



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 1 Hole # 5-4-2021 Date 9:00 am Time Rainy Weather Longitude: +/-6%
 Residential Grass Vegetation Yes, stones Latitude +/-6%
 Land Use (e.g., woodland, agricultural field, vacant lot, etc.) Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Back yard
 2. Soil Parent Material: Glacial Till Hill Slope
 Landform Position on Landscape (SU, SH, BS, FS, TS)
 3. Distances from: Open Water Body +/-N/A feet Drainage Way +/-N/A feet Wetlands +/-N/A feet
Property Line +/-20 feet Drinking Water Well +/-N/A feet Other feet
 4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil Fill Material Weathered/Fractured Rock Bedrock
 5. Groundwater Observed: Yes No If yes: inches Depth Weeping from Pit inches Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0 - 6	A	Sandy Loam	10YR 3/2								Topsoil
6 - 24	B	Sandy Loam	10YR 5/6				< 15%	Few	Granular	Friable	Subsoil
24 - 36	C1	Sand	10YR 6/6				> 35%	Common	Granular	Friable	Fine - Med.
36 - 90	C2	Loamy Sand	2.5Y 5/3	80"	10YR 5/8	Few	> 35%	Common	Granular	Friable	Coarse
Large rocks											

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed primary and reserve disposal area)

Deep Observation Hole Number: 2 Hole # 5-4-2021 Date 9:00 am Time Rainy Weather Latitude Longitude: +/-6
 Residential (e.g., woodland, agricultural field, vacant lot, etc.) Grass Vegetation Yes, stones Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Back yard

2. Soil Parent Material: Glacial Till Hill Slope Position on Landscape (SU, SH, BS, FS, TS) _____
 Landform _____ Drainage Way N/A feet Wetlands N/A feet
 Open Water Body N/A feet Drinking Water Well N/A feet Other _____ feet
 Property Line +/-40 feet If Yes: Disturbed Soil Fill Material Weathered/Fractured Rock Bedrock
 3. Distances from: Yes No
 4. Unsuitable Materials Present: Yes No
 5. Groundwater Observed: Yes No If yes: _____ inches Depth Weeping from Pit _____ inches Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features		Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel			
0 - 4	A	Sandy Loam	10YR 3/2							Topsoil
4 - 12	B	Sandy Loam	10YR 5/6			< 15%		Granular	Friable	Subsoil
4 - 100	C	Loamy Sand	2.5Y 5/3			> 35%		Granular	Friable	Coarse

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

- Depth observed standing water in observation hole
- Depth weeping from side of observation hole
- Depth to soil redoximorphic features (mottles)
- Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)

Obs. Hole #1 _____ inches Obs. Hole # _____ inches

_____ inches _____ inches

80 inches _____ inches

_____ inches _____ inches

Index Well Number _____ Reading Date _____

$$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: 80 inches

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

- a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil system? absorption
- Yes No
- b. If yes, at what depth was it observed (exclude A and O Horizons)? Upper boundary: 24 inches Lower boundary: 100 inches
- c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches



Commonwealth of Massachusetts
City/Town of Ashland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Daniel McIntyre

Signature of Soil Evaluator

Daniel McIntyre SE#1562

Typed or Printed Name of Soil Evaluator / License #

Tom Ryder

Name of Approving Authority Witness

5-4-2021

Date

6/30/2022

Expiration Date of License

Ashland Board of Health

Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with [Percolation Test Form 12](#).

Field Diagrams: Use this area for field diagrams: Refer to septic design plan



Commonwealth of Massachusetts
 City/Town of Ashland
Percolation Test
 Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Site Information

Draper
 Owner Name
 7 Old Central Turnpike
 Street Address or Lot #
 Ashland MA 01720
 City/Town State Zip Code
 Daniel McIntyre 508-497-2374
 Contact Person (if different from Owner) Telephone Number

B. Test Results

	5-4-2021	9:13 am		
	Date	Time	Date	Time
Observation Hole #	1			
Depth of Perc	36"			
Start Pre-Soak	9:13 am			
End Pre-Soak	9:28 am			
Time at 12"	9:28 am			
Time at 9"	9:41 am			
Time at 6"	9:55 am			
Time (9"-6")	14 minutes			
Rate (Min./Inch)	5 MPI			

Test Passed:
 Test Failed:

Test Passed:
 Test Failed:

Daniel McIntyre; McIntyre Engineering & Septic Service, Inc.
 Test Performed By:
 T. Ryder Ashland Board of Health
 Board of Health Witness

Comments:

