

# NATURAL RESOURCE SOLUTIONS,

Consulting, Soil Evaluations & Data Collection

December 6, 2020

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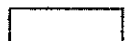
Leigh & Jan Ward  
126 Warm Springs Road  
Garden Valley, ID 83622

## **RE: Soil & septic evaluation – Garden Valley**

On December 1, 2020, Mike Raymond and I examined seven soil test pits on a 62-acre site south of the Banks Lowman Road, located between Severence Road and Hills Mtn. View Road. As you requested, the following provides an opinion of soils on the property in relation to their ability to accept septic systems for dwellings. A map is attached which shows the approximate property boundary along with test pit locations. Detailed soil profile descriptions with GPS locations of excavations are also included.

The test pit profiles provide valuable information about wetness conditions and soil characteristics that apply to installation and performance of septic systems. Soil textures, structure, drainage, and presence of mottles, roots and coarse fragments all play a part in the site evaluation.

Per Idaho DEQ, weekly monitoring of depth to ground water during a monitoring period prescribed by the local health district is used to determine the “normal” and “seasonal” high ground water levels, both of which are considered along with depth to fractured bedrock or other porous layers to assess suitability of the soils to accept drain fields. These ground water levels are defined in the DEQ Technical Guidance Manual as follows: The seasonal high groundwater level is the weekly measurement that is the highest level recorded during the monitoring period, while the normal high ground water level is the highest elevation of ground water that is maintained or exceeded for a continuous period of six weeks per year. In turn, the distance between these measured levels and the placement of the bottom of the drain field is termed the separation distance.



I constructed the attached table which displays an approximation of a suitable system for each of the test pit locations. Keep in mind these are only RECOMMENDED system types which are based on my estimate of groundwater conditions. Actual groundwater levels will need to be defined by weekly monitoring to determine the proper system to be used. Refer to the Technical Guidance Manual which is the Health Department document used to determine the optimum system types. This can be found online at <https://www.deq.idaho.gov/water-quality/wastewater/septic-systems/technical-guidance-manual/>.

Using indicators in the soil profile we observed a common thread of wetness through all test pits at about 4 feet below ground level. I utilized this as my normal high ground water value for six of the seven test pits. (At 6-20 I use 6 feet because of the static water level visible and substratum sands in the pit.) I also selected a range of 2 to 3 feet for the seasonal high ground water level. Meeting the separation requirements assigned by the Design Soil Subgroup an appropriate system type was selected. In the case of this property a Capping Fill system best fits soil and water conditions. These systems place the drainage trench higher than the usual 24-inch depth using a cap of native soil to provide the proper separation distance with a standard trench shape and size.

Plastic 4-inch pipes were placed in each test pit prior to backfilling for the purpose of measuring groundwater levels. These piezometers will need to be read weekly starting in mid-February through mid-June or until the readings drop consistently. It is essential that this data be accurately collected. The results will be needed as support to assign final systems that will be approved by Central District Health (CDH).

Should the measured peak levels be higher than my assumed 4-foot depth, an advanced system will be required. There are numerous systems available and Jerry Davis with CDH informed me that some of those will perform even with normal groundwater levels at 12 inches below ground surface. The Presby system is one of the newer recently certified types in Idaho. It utilizes a 12-inch diameter wrapped pipe in the trench which provides for additional breakdown of effluent. The system operates without added pumps or other hardware which makes it maintenance free. I suggest you check it out online at <https://www.infiltratorwater.com/products/presby-environmental/> or any of other websites with information related to the system.



Once you have the complete monitoring data, we can evaluate the ground water information you collect and determine the final treatment system. Permits will need to be purchased for each test pit so that they may be approved by CDH. If dwelling placements are changed and a new drainfield is required, those test pits will require a permit and inspection by CDH.

The 62-acre parcel looks good overall. Groundwater monitoring will define conditions so a final system type can be determined. I will provide you with monitoring data sheets and procedures for collecting the water levels. If you have questions, contact me or Mike by phone or e-mail.

*transmitted via e-mail*

HARLEY R. NOE  
Professional Soil Scientist

Test Hole Number	Estimated Seasonal High Groundwater (feet/bgs)	Estimated Normal High Groundwater (feet/bgs)	Design Soil Subgroup of Receiving soil	Required Separation Required to GW	Recommended System (see note below)
1-20	2 to 3	4	C-1	3	Capping Fill w/ 12-inch trench & 12-inch cap
2-20	2 to 3	4	C-1	3	Capping Fill w/ 12-inch trench & 12-inch cap
4-20	2 to 3	4	B-1	4	Capping Fill w/ 3-inch trench & 21-inch cap
5-20	2 to 3	4	B-1	4	Capping Fill w/ 3-inch trench & 21-inch cap
6-20	2 to 3	6	A-2b	5	Capping Fill w/ 12-inch trench & 12-inch cap
7-20	2 to 3	4	B-1	4	Capping Fill w/ 3-inch trench & 21-inch cap
8-20	2 to 3	4	B-2	3	Capping Fill w/ 12-inch trench & 12-inch cap

T+C

L+S

K+C

Eric

Derek

"bgs" denotes below ground surface

Seasonal High Groundwater Level of 2 to 3 feet bgs assumed for these system recommendations

Normal High Groundwater Level of 4 feet bgs assumed for these system recommendations

Separation is the allowable distance between bottom of trench to top of groundwater

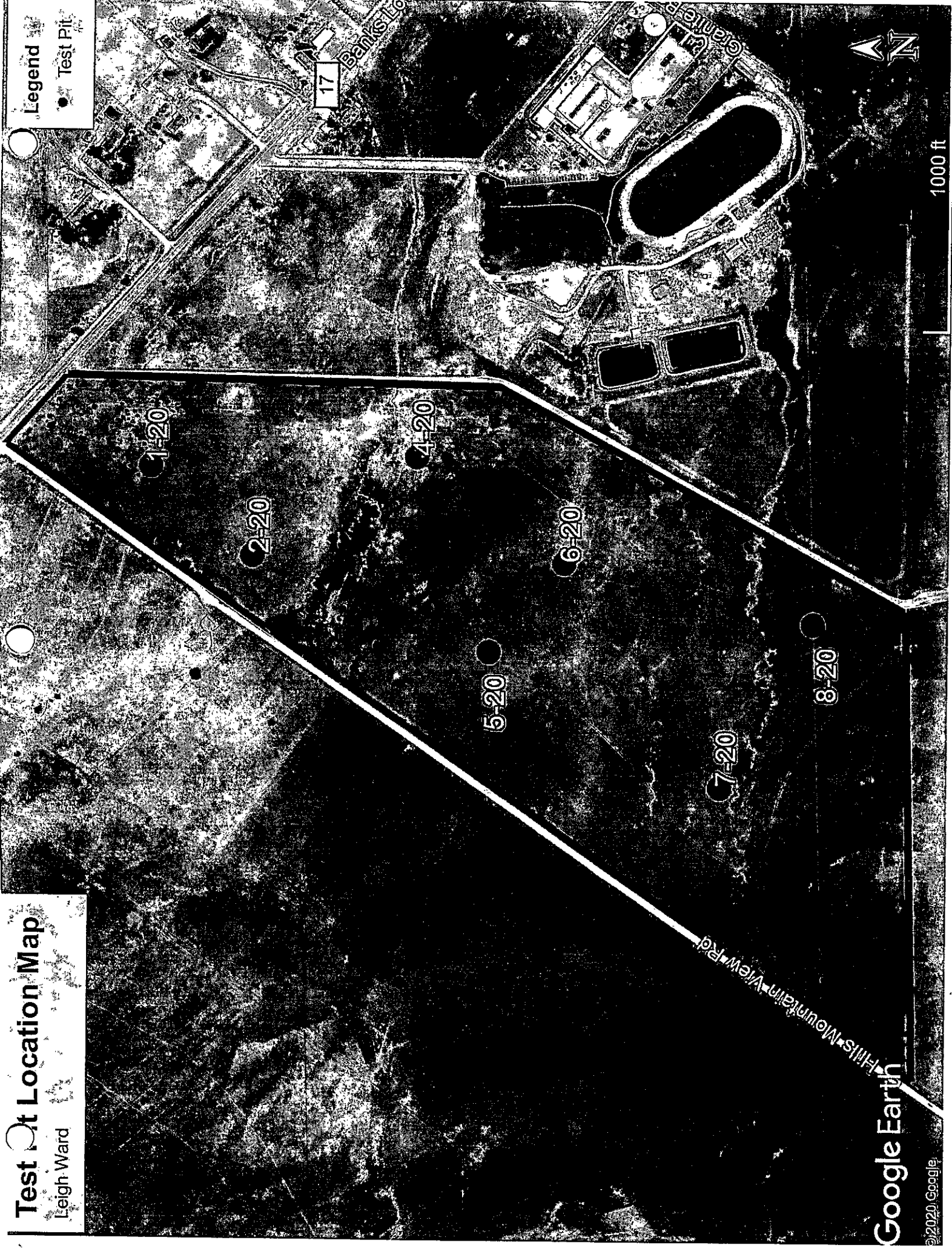
peak groundwater levels used are based on features present in soil profile

# Test Pit Location Map

Leigh Ward

**Legend**

- Test Pit



Google Earth

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# Natural Resource Solutions, LLC

## Septic Drain Field Test Hole Description & Evaluation

Date Of Evaluation:	12/1/2020	Evaluated by:	Harley Noe & Mike Raymond, Pr		
Requested By:	Leigh & Jan Ward				
Address:	126 Warm Springs Road			Phone:	
City:	Garden Valley	State:	ID	Zip:	
Legal Desc:	62 acres in the east half of Section 27, Township 9 North, Range 4 East; Boise Meric				
General Desc:	Bounded by Severence Road on east side, Hills Mtn. View Rd. on west & Garden Valley high				

Depth (inches)	Moist Color	USDA Texture	Clay %	Roots	Mottles	Est. Permeability (in/hr)	Design Group
<b>Hole Number &amp; Location:</b>				<b>1-20 Latitude 44.095054 ; Longitude -1</b>			
0 to 20	7.5YR 3/2	clay loam	30 to 32	common fine and very fine, few medium	None	0.2 to 0.6	C-1
20 to 29	10YR 3/3	silty clay loam	35 to 37	few fine and very fine	None	0.06 to 0.2	C-2
29 to 49	10YR 3/4	clay loam	28 to 30	very few fine	None	0.2 to 0.6	C-1
49 to 96+	10YR 6/1	loamy sand	4 to 10	very few fine	None	4 to 10	A-2b

General Notes:	Slope: 0 to 2 percent. Water seeping into pit at 6 ft. Standing water at 8 ft. Veg: p WP004 Design Soil Subgroup C-1 using the 29 to 49 inch layer. Assume Normal GW peak at 49 inches.						
<b>RECOMMENDED SEPTIC SYSTEM TYPE:</b>	Capping fill trench system, 12 inch trench, 12 inch cap. MAR						

<b>Hole Number &amp; Location:</b>				<b>2-20 Latitude 44.094206; Longitude -1</b>			
0 to 13	10YR 3/2	clay loam	28 to 30	many very fine & fine	none	0.2 to 0.6	C-1
13 to 24	7.5YR 2.5/2	clay loam	32 to 34	many very fine & fine	none	0.06 to 0.2	C-2
24 to 48	5YR 3/3	clay loam	28 to 30	common very fine & fine to 30 inches; few below	none	0.2 to 0.6	C-1
48 to 100+	brownish variegated	very gravelly loamy sand	3 to 5	few very fine & fine to 60 inches	none readable	6 to 12	A-2b

General Notes:	Slope: 1 to 2 percent. Matrix of 45+ inch material is reddish brown. Sor 48 inch layer, not strong enough to be noted. Assume peak groundwater at 48 inches bgs. C-1 Design based on 24 to 48 inch layer. WP 001. UBN						
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Professional Soil Scientists

(208) 462-3225

83622

Idaho, Boise County, ID

Highway on north

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<b>Comments</b>
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**15.8961610**

granular, very friable  
moist

very friable

very friable

15% cobbles, 20% gravel


pasture grass.


**15.962621**

very friable moist; grass &  
forbs vegetation

very friable moist; fine  
subangular blocky  
structure

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friable moist

upper 12 inches has more  
fines


see odd colors at 24 to

Soil Subgroup

RECOMMENDED SEPTIC SYSTEM TYPE: Capping fill system, 12 inch trench & 12 inch cap.



**NATURAL RESOURCE SOLUTIONS, LLC**

Septic Drain Field Test Hole Description & Evaluation

**Continuation Sheet**

<b>Date Of Evaluation:</b> 12/1/2020		<b>Project:</b> Leigh Ward					
<b>Depth (inches)</b>	<b>Moist Color</b>	<b>Texture</b>	<b>Clay %</b>	<b>Roots</b>	<b>Mottles</b>	<b>Est. Perm. (in/hr)</b>	<b>Design Group</b>

**Hole Number & Location:** 4-20 **Latitude 44.092859; Longitude -**

0 to 22	10YR 3/2	sandy clay loam	22 to 24	common fine and very fine, few medium	None	1 to 2	B-2
22 to 30	10YR 3/2	sandy loam	10 to 12	few fine and very fine	None	2 to 4	B-1
30 to 42	10YR 4/2	sandy loam	14 to 16	few fine	10% distinct, 7.5 YR 4/6 moist	2 to 6	B-1
42 to 105+	10YR 4/4	sandy loam	10 to 12	None	30% distinct, 7.5 YR 4/6 moist	2 to 6	A-2b

**General Notes:** Slope: 0 to 2 percent. No free water in pit. Veg: Pasture Grass/Weeds MAR

WP005 Design Soil Subgroup B-1 based on 22 to 42 inch material. Estimate normal peak at 48 inches.

**RECOMMENDED SEPTIC SYSTEM TYPE:** Capping fill system; 3 inch trench and 21 inch cap.

**Hole Number & Location:** 5-20 **Latitude 44.092249; Longitude -11**

0 to 12	10YR 2/2	sandy clay loam	24 to 26	common very fine & fine	none	1 to 2	B-2
12 to 24	10YR 3/3	sandy clay loam	20 to 22	common very fine & fine	10% faint; 7.5 YR 5/6, moist	1 to 2	B-2
24 to 38	10YR 4/4	sandy loam	13 to 14	very few very fine & fine	40% distinct, 7.5 YR 5/6 moist	2 to 6	B-1
38 to 86	7.5YR 4/3	loamy sand to sandy loam	5 to 8	none	60% distinct, 7.5 YR 5/6 moist	6 to 12	A-2b
86 to 96+	reddish variegated	very gravelly loamy sand	5 to 8	none	none readable	6 to 12	A-2b

**General Notes:** Slope: 1 to 2 percent. Free water in pit at 90 inches & up to 77 inches c

Use B-1 Design Soil Subgroup based on 24 to 38 inch layer. I would expect a peak GW level at 48 inches

**RECOMMENDED SEPTIC SYSTEM TYPE:** Capping fill system; 3 inch trench & 21 inch cap


<b>Comments</b>

**115.961477**

granular, very friable

moderately dense in place,  
friable moist

friable moist

friable moist



**5.963712**

very friable; moderate  
medium granular structure

approaches high end of  
loam

very friable moist; weak,  
subangular blocky  
structure

bright mottles; very friable  
moist; medium sand

nearly loose; saturated  
below 75 inches


after 30 minutes. HRN

is or slightly higher.

NOTE: the system recommendation is based on soil profile characteristics and is ONLY a preliminary estimate intended to show interpretation of the site. Groundwater monitoring is required to design the final system type.

**NATURAL RESOURCE SOLUTIONS, LLC**

Septic Drain Field Test Hole Description & Evaluation

Continuation Sheet

Date Of Evaluation: 12/1/2020 Project: Leigh Ward

Depth (inches)	Moist Color	Texture	Clay %	Roots	Mottles	Est. Perm. (In/hr)	Design Group
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Hole Number & Location: **6-20** Latitude **44.091630**; Longitude

0 to 15	10YR 3/2	sandy loam	12 to 14	common fine and very fine	none	2 to 6	B-1
15 to 29	7.5YR 4/4	sandy loam	12 to 14	common fine	none	2 to 6	B-1
29 to 40	10YR 4/4	loamy sand	2 to 4	few fine	none	6 to 12	A-2b
40 to 82	tannish variegated	medium sand	< 3	none	none	9 to 11	A-2b
82 to 96+	10YR 4/2	sandy clay loam	24 to 26	none	none	1 to 2	B-2

General Notes: Slope: 0 to 2 percent. Discontinuous dark rust-colored streaks in 40-82" horizon. No Veg: Pasture grass. Use Design Soil Subgroup of A-2b based on soil at 29 to 82 inches. WP 006 MAR Assume 72 inch peak normal GW level.

RECOMMENDED SEPTIC SYSTEM TYPE: Capping fill system: 12 inch cap and 12 inch cap

Hole Number & Location: **7-20** Latitude **44.090335**; Longitude **-11**

0 to 17	10YR 2/2	loam to coarse sandy loam	8 to 10	common very fine & fine	none	1 to 2	B-2
17 to 39	10YR 4/6	coarse sandy loam	12 to 14	few very fine, fine & medium	25% faint, 7.5 YR 4/6 moist	4 to 8	B-1
39 to 72	2.5Y 4/4	sandy loam	14 to 16	none	10% faint, 7.5 YR 5/4 moist	2 to 6	B-1
72 to 101+	brownish variegated	very gravelly coarse sand	<5	none	none readable	15 to 20	unsulted

General Notes: Slope: 1 to 2 percent. Free water standing in pit at 88 inches after 30 min below about 80 inches. B-1 Design Soil Subgroup based on 17 to 72 inch soil. Assume 48 inch GW peak


<b>Comments</b>

**-115.962681**

granular, very friable moist
very friable moist
slight to moderately dense in place
15% cobbles, 20% gravel, nearly loose in place
friable moist

free water in pit.


**5.965248**

very friable moist; coarse sands; stiff consistence
very friable moist; mottles are difficult to read
very friable moist; medium and fine sands
approaches loamy coarse sand; 15% cobbles

minutes. Saturated

WP 003 HRN

**RECOMMENDED SEPTIC SYSTEM TYPE:** Capping fill system; 3 Inch french and 21 inch cap.

*NOTE: the system recommendation is based on soil profile characteristics and is ONLY a preliminary estimate intended to show interpretation of the site. Groundwater monitoring is required to design the final system type.*

**NATURAL RESOURCE SOLUTIONS, LLC**

Septic Drain Field Test Hole Description & Evaluation

**Continuation Sheet**

<b>Date Of Evaluation:</b>		12/1/2020	<b>Project:</b>		Leigh Ward		
<b>Depth (inches)</b>	<b>Moist Color</b>	<b>Texture</b>	<b>Clay %</b>	<b>Roots</b>	<b>Mottles</b>	<b>Est. Perm. (in/hr)</b>	<b>Design Group</b>

**Hole Number & Location:** **8-20 Latitude 44.089570; Longitude -**

0 to 13	10YR 3/2	sandy loam	17 to 18	common fine and very fine	None	2 to 6	B-1
13 to 24	10YR 4/4	sandy clay loam	22 to 24	few fine and very fine	None	1 to 2	B-2
24 to 40	10YR 4/4	loam	18 to 20	very few very fine and medium	None	0.5 to 1	B-2
40 to 96+	Orangeish variegated	very gravelly, medium sand	<3	very few medium	None	15 to 18	A-2b

**General Notes:** Slope: 0 to 2 percent. No free water in pit. Veg: Pasture Grass/Weeds MAR Desi  
B-2 based on 13 to 40 inch layer. Assume normal peak at 48 inches. WP 007 MAR

**RECOMMENDED SEPTIC SYSTEM TYPE:** Capping fill system; 12 inch cap and 12 inch cap

**NOTE:** the system recommendation is based on soil profile characteristics and is ONLY a preliminary estimate intended to show interpretation of the site. Groundwater monitoring is required to design the final system type.


<b>Comments</b>
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**115.963358**

very friable moist,  
approaching sandy clay  
loam and loam

very friable moist

friable moist

40% cobbles, 40% gravel

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gn Soil Subgroup

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ow the Soil Scientist's
