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OSTP Field Evaluation Form

1. Contact Information

Project ID: Test 1 v 03.19.15

Property Owner/Client: Heather Reese Client Phone Number: 218-838-2058

Address:

Date: 7/15/2019 Weather Conditions: wet/cloudy

2. Utility and Structure Information

Utility Locations Identified: ☑ Gopher State One Call # ☐ Any Private Utilities

Property Lines: ☑ Determined and Approved by Client ☐ Determined but not Approved ☐ Approximate ☐ Property Lines Surveyed — Client's Approval (initial)

Locate and Verify (see Site Evaluation map): ☐ Existing Buildings ☑ Improvements ☐ Easements ☐ Setbacks

3. Site Information

Percent Slope	3%	Slope Direction	SOUTH
Landscape Position	slope	Slope Shape	convex
Vegetation type(s)	Hay field grasses		

Evidence of cut, fill, compacted or disturbed areas: ☐ Yes ☑ No

Discuss the flooding or run-on potential of site: all run-on to be diverted around pressure bed

Identify benchmarks and elevations (Site Evaluation Map): bench mark = 100, Nail in tree set by general contractor

Proposed soil treatment area adequately protected: ☑ Yes ☐ No

4. General Soils Information

Original soils: ☑ Yes ☐ No

Type of observation: ☐ Soil Probe ☑ Soil Boring ☐ Soil Pit

Number of soil observations: 4

Soil observations were conducted in the proposed system location: ☑ Yes ☐ No

A soil observation was made within the most limiting area of the proposed system: ☑ Yes ☐ No

Soil boring log forms completed and attached: ☑ Yes ☐ No

Percolation tests performed, forms completed and attached: ☑ Yes ☐ No

5. Phase I. Reporting Information

Depth to standing water	48	inches
Flood elevation		feet
Depth to bedrock		inches
Depth to periodically saturated soil	48	inches
Maximum depth of system	12	inches
Elevation at system bottom	99	feet
Percolation rate		min/inch
Loading rate	0.79	gpd/ft^2
Contour loading rate	12	gpd/ft

Anticipated construction issues

Differences between soil survey and field evaluation

Site evaluation issues / comments

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Greg Westerlund (Designer) Greg Westerlund (Signature) 663 (License #) 7/15/19 (Date)

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OSTP Soil Observation Log

Project ID: Test 1 v 03.19.15

Client/ Address:	Heather Reese, 35758 ST HWY 47			Legal Description/ GPS:	S1/2 of S1/2 of sw sw-T47 R26 S26		
Soil parent material(s): (Check all that apply)	☑ Outwash	☐ Lacustrine	☐ Loess	☐ Till	☐ Alluvium	☐ Bedrock	☐ Organic Matter
Landscape Position: (check one)	☐ Summit	☐ Shoulder	☑ Back/Side Slope	☐ Foot Slope	☐ Toe Slope	Slope shape	convex
Vegetation	Hay Field grasses	Soil survey map units	504 C	Slope%	0.0	Elevation:	1247
Weather Conditions/Time of Day:	Wet/Cloudy--11:00 AM			Date	05/14/19		
Observation #/Location:	Soil Boriong #1, East end of primary site			Observation Type:	Auger		

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
3	Loamy Sand	<35%	10YR 3/1				Single grain	Weak	Friable
16	Loamy Fine Sand	<35%	10YR 4/4				Granular	Weak	Friable
48	Loamy Coarse Sand	<35%	10YR 4/4				Granular	Weak	Friable
49	Loamy Coarse Sand	35-50%	10YR 4/4	7.5YR 4/4	Concentrations	S4	Granular	Weak	Friable

Comments

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Greg Westerlund — Greg Westerlund — 663 — 7/15/17

(Designer/Inspector) (Signature) (License #) (Date)

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OSTP Soil Observation Log

Project ID: Test 1 v 03.19.15

Client/ Address:	Heather Reese, 35758 ST HWY 47	Legal Description/ GPS:	S1/2 of S1/2 of sw sw-T47 R26 S26

Soil parent material(s): (Check all that apply) ☑ Outwash ☐ Lacustrine ☐ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope Slope shape: convex

Vegetation	Hay Field grasses	Soil survey map units	504 C	Slope%	0.0	Elevation:	1247
Weather Conditions/Time of Day:	Wet/Cloudy--11:00 AM				Date	05/14/19	
Observation #/Location:	Soil Boring #2, West end of primary site				Observation Type:	Auger	

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
3	Loamy Sand	<35%	10YR 3/1				Single grain	Weak	Friable
20	Loamy Fine Sand	<35%	10YR 4/4				Granular	Weak	Friable
47	Loamy Coarse Sand	<35%	10YR 4/4				Granular	Weak	Friable
48	Loamy Coarse Sand	35-50%	10YR 4/4	7.5YR 4/4	Concentrations	S4	Granular	Weak	Friable

Comments:

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Greg Westerlund	Greg Westerlund	663	7/15/19
(Designer/Inspector)	(Signature)	(License #)	(Date)

Additional Soil Observation Logs

Project ID: Test 1

Client/ Address:	Heather Reese, 35758 ST HWY 47	Legal Description/ GPS:	S1/2 of S1/2 of sw sw-T47 R26 S26

Soil parent material(s): (Check all that apply) ☑ Outwash ☐ Lacustrine ☐ Loess ☐ Till ☐ Alluvium ☐ Bedrock ☐ Organic Matter

Landscape Position: (check one) ☐ Summit ☐ Shoulder ☑ Back/Side Slope ☐ Foot Slope ☐ Toe Slope Slope shape: Convex

Vegetation	Hay Field	Soil survey map units	504 c	Slope%	3.0	Elevation:	1247
Weather Conditions/Time of Day:	Wet/ 11:00 AM			Date	05/14/19		
Observation #/Location:	Soil Boring #1A, East end of alternate site			Observation Type:	Auger		

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
4	Loamy Sand	<35%	10YR 3/1				Single grain	Weak	Friable
16	Loamy Sand	<35%	10YR 4/4				Single grain	Weak	Friable
24	Loamy Coarse Sand	<35%	10YR 4/4				Granular	Weak	Loose
40	Loamy Coarse Sand	35-50%	10YR 4/4				Granular	Weak	Loose
41	Coarse Sand	>50%	10YR 4/4	7.5YR 4/4	Concentrations	S2	Granular	Structureless	Loose

Comments:

Observation #/Location:	Soil Boring @2A, west end of alternate site			Observation Type:	Auger		

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
3	Loamy Sand	<35%	10YR 3/1				Single grain	Weak	Friable
14	Loamy Sand	<35%	10YR 4/4				Granular	Weak	Friable
38	Coarse Sand	35-50%	10YR 4/4				Granular	Weak	Friable
39	Coarse Sand	>50%	10YR 4/4	7.5YR 4/4	Concentrations	S2	Granular	Structureless	Loose

Comments:

OSTP Trench & Bed Design Worksheet

Minnesota Pollution Control Agency

University of Minnesota

1. SYSTEM SIZING:

A. *Design Flow*: 450 GPD

B. *Maximum Depth*: 12 inches

C. *Soil Loading Rate*: .79 GPD/ft²

C(I). *Recommended CLR*: 12 gal/ft

D. *Required Bottom Area: Design Flow (1.A) + Loading Rate (1.C) = Initial Required Bottom Area*

450 GPD ÷ .79 GPD/ft² = 569.9 ft²

E. Select *Dispersal Media*:
- ☒ Rock
- ☐ Other Approved Media (Describe):

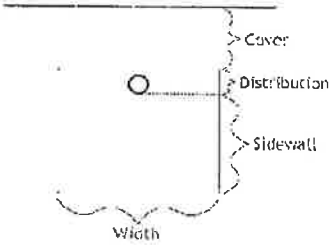
F. Select *Distribution Method*:
- ☒ Pressure (required for rapidly permeable soils)
- ☐ Gravity-Drop Box
- ☐ Gravity-Other (Describe):

G. Select *Dispersal Type*:
- ☐ Trench - Rock or equivalent (section 2 below)
- ☐ Trench - Registered Products (section 3 below)
- ☒ Bed (section 4 below)

2. TRENCH CONFIGURATION: (Rock or equivalent media)

A.

Initial required trench bottom area (ft²): (from 1.D)	Sidewall Absorption (inches)	Bottom Area Reduction	Bottom Area Multiplier	Design trench bottom area
	6 to 11	0%	1	
	12 to 17	20%	0.8	
	18 to 23	34%	0.66	
	24	40%	0.6	



B. Select *Sidewall Height*: _____ inches = _____ ft

C. *Design Bottom Area* (2.A): _____ ft²

D. Select *Trench Width*: _____ inches = _____ ft

E. *Total Designed Trench Length: Bottom Area* (2.C) ÷ *Trench Width* (2.D) = *Total Required Trench Length*

_____ ft² ÷ _____ ft = _____ ft

F. Select *Trench Spacing*: _____ ft *(typically 5 - 12 ft from center to center)*

G. Calculate Lawn Area: *Trench Length* (2.E) X *Trench Spacing* (2.F) = ft² lawn area

_____ ft X _____ ft = _____ ft² lawn area

H. Calculate Minimum length based on Contour Loading Rate: *Design Flow(1A) ÷ CLR (1Ci)* =

_____ gpd ÷ _____ gal/ft = _____ ft

I. If using rock or similar substitute media, select *Depth Required to Cover Distribution Pipe*:

_____ ft (0.33 for pressure, 0.5 for gravity)

J. Calculate *Media Volume*: (*Sidewall Height* (2.B) + Depth to Cover Pipe (2.H)) X *Bottom Area (2.C)* = cubic ft.

(_____ ft + _____ ft) X _____ ft² = _____ ft³

Divide ft³ by 27 ft³/yd³ to calculate cubic yards:

_____ ft³ ÷ 27 = _____ yd³

3. TRENCH CONFIGURATION: (Registered Products)

A. Registered Product: _____ (from MPCA list)

B. Product Absorption Area: _____ ft² / linear ft
(from MPCA Registered Product List)

C. Req'd *Bottom Area* (1.D): _____ ft²

D. Total *Required Trench Length: Bottom Area* (4.C) ÷ Sizing Value (4.B) = *Total Required Trench Length*

_____ ft² ÷ _____ ft² / lin. ft = _____ ft

E. Select *Trench Spacing* : _____ ft *(typically 5 - 12 ft from center to center)*

F. Calculate Lawn Area: *Trench Length* (3.D) X *Trench Spacing* (3.E) = ft² lawn area

_____ ft X _____ ft = _____ ft² lawn area

4. BED CONFIGURATION: (for sites with less than 6% slope)

A. Select size *Multiplier*: 1 1.0 = pressurized
1.5 = gravity (not allowed in rapidly permeable soils)

B, Req'd *Bottom Area* (1.D): 577 ft²

Designed Bottom Area: 577 ft²

C. Select *Bed Width*: 10 ft Maximum width = 25 ft. (pressurized)
Maximum width = 12 ft. (gravity)

D. Calculate *Bed Length: Designed Bottom Area* (4.B) ÷ *Bed Width* (4.C) = *Bed Length*

577 ft² ÷ 10 ft = 57.7 ft

E. Select *Sidewall Absorption*: 6 inches below the pipe = .5 ft

F. Calculate *Media Volume*: (*Media Depth (4.E)* + depth to cover pipe) X *Designed Bottom Area (4.B)* = ft³

(.5 ft + .25 ft) X 577 ft² = 432.75 ft³

Calculate *Volume in cubic yards*: Media volume in cubic feet (4.F) ÷ 27 = cubic yards

432.75 ft³ ÷ 27 = 16 yd³

5. ORGANIC LOADING: (Optional)

A. *Organic Loading* = *Design Flow* X *Estimated BOD* in mg/L in the effluent X 8.35 ÷ 1,000,000 (See Table III)

_____ gpd X _____ mg/L X 8.35 ÷ 1,000,000 = _____ lbs BOD/day

B. Calculate *System Organic Loading: lbs. BOD/day* (5.A) ÷ *Bottom Area* (2.C), (3.C) or (4.A) = lbs/day/ft²

_____ lbs/day ÷ _____ ft² = _____ lbs/day/ft²

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Greg Westerlund (Designer) Greg Westerlund (Signature) 663 (License #) 7/15/19 (Date)

OSTP Pressure Distribution Design Worksheet

Minnesota Pollution Control Agency

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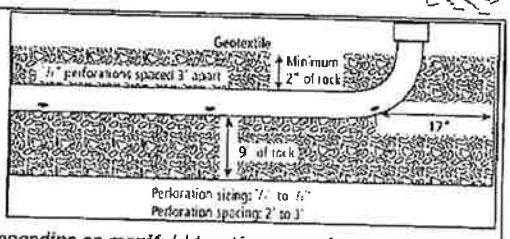

1. Select *Number of Perforated Laterals in system/zone*: 3
   (2 feet is minimum and 3 feet is maximum spacing)
2. Select *Perforation Spacing*: 2.5 ft
3. Select *Perforation Diameter Size* 1/4 inch
4. *Length of Laterals* = Media Bed Length - distance from edge *(1 or 2 feet depending on manifold location as perfs can not be closer then 1 foot from edge)*

   57.7 ft - 2 ft = 55.7 ft
5. Determine the *Number of Perforation Spaces*. Divide the *Length of Laterals* (Line 4) by the *Perforation Spacing* (Line 2) and round down to the nearest whole number.

   Number of Perforation Spaces = 55.7 ft ÷ 2.5 ft = 22 Spaces
6. *Number of Perforations per Lateral* is equal to 1.0 plus the *Number of Perforation Spaces* (Line 5).

   Perforations Per Lateral = 22 Spaces + 1 = 23 Perfs. Per Lateral

   Check Table I to verifty the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double if the a center manifold is used.
7. *Total Number of Perforations* equals the *Number of Perforations per Lateral* (Line 6) multiplied by the *Number of Perforated Laterals* (Line 1).

   23 Perf. Per Lateral X 3 Number of Perf. Laterals = 69 Total Number of Perf.
8. Calculate the *Square Feet per Perforation*. *Recommended value is 4-10 ft² per perforation.* ***Does not apply to At-Grades***

   Bed Area = Bed Width (ft) X Bed Length (ft)

   57.7 ft X 10 ft = 577 ft²

   Square Foot per Perforation = *Bed Area* divided by the *Total Number of Perforations* (Line 7).

   577 ft² ÷ 69 perforations = 8.36 ft²/perforations

Table III				
Perforation Discharge (GPM)				
Head (ft)	Perforation Diameter			
	1/8	5/32	3/16	1/4
1.0*	0.18	0.41	0.56	0.74
2.0*	0.26	0.59	0.80	1.04
5.0*	0.41	0.93	1.26	1.65

a: Use 1.0 for dwellings using 1/4 inch or 3/16 inch holes.

b: Use 2.0 for dwellings using 1/8 inch holes or, for other establishments using 1/4 inch or 3/16 inch holes.

c: Use 5.0 for other establishments using 1/8 inch perforations and media filters.

9. Select *Minimum Average Head*: 1 ft
10. Select *Perforation Discharge* (GPM) based on Table III: .74 GPM per Perforation
11. Determine required *Flow Rate* by multiplying the *Total Number of Perforations* (Line 7) by the *Perforation Discharge* (Line 10).

    69 Perforations X .74 GPM per Perforation = 51 GPM
12. Select *Type of Manifold Connection* (End or Center): ☐ End ☑ Center

OSTP Pressure Distribution Design Worksheet

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Maximum Number of Perforations Per Lateral to Guarantee <10% Discharge Variation

1/4 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches) 1	1¼	1½	2	3
1	16	23	33	60	120
2½	8	12	16	28	54
3	8	12	16	25	52

3/16 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches) 1	1¼	1½	2	3
2	12	18	26	46	87
2½	12	17	24	40	80
3	12	15	22	37	75

7/32 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches) 1	1¼	1½	2	3
2	11	16	2	34	68
2½	10	14	20	32	64
3	9	14	19	30	60

1/8 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches) 1	1¼	1½	2	3
2	27	33	44	74	149
2½	20	30	4	69	135
3	20	28	38	64	125

14. *Select Lateral Diameter* based on Table I: 1 1/2 in

15. *Volume of Liquid Per Foot of Distribution Piping:* .11 Gallons/ft

16. *Volume of Distribution Piping* =

= [*Number of Perforated Laterals* (Line 1) X *Length of Laterals* (Line 4) X (Volume of Liquid Per Foot of Distribution Piping (Line 15)]

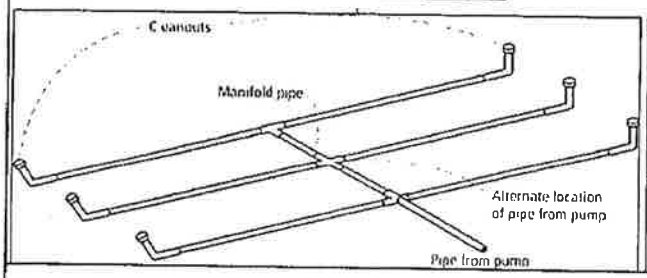
3 X 57.7 ft X .11 gal/ft = 18.4 Gallons

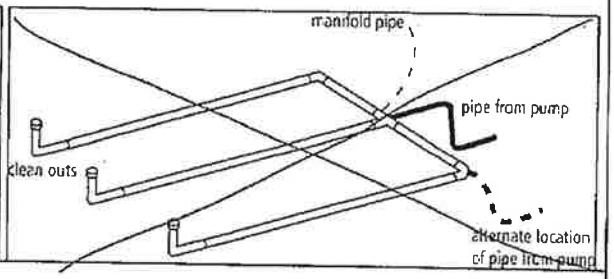
17. Minimum Dose = Volume of Distribution Piping (Line 17) X 5

18.4 gals X 5 = 91.9 Gallons

Table II Volume of Liquid in Pipe

Pipe Diameter (inches)	Liquid Per Foot (Gallons)
1	0.045
1.25	0.078
1.5	0.110
2	0.170
3	0.380
4	0.661





I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Greg Westerlund (Designer) Greg Westerlund (Signature) 663 (License #) 7/15/19 (Date)

OSTP Pump Selection Design Worksheet

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1. PUMP CAPACITY

A. **Pumping to Gravity or Pressure Distribution:** ○ Gravity ◉ Pressure

1. If pumping to gravity enter the gallon per minute of the pump: _____ GPM

2. If pumping to pressure, is the pump for the treatment system or the collection system:
◉ Treatment System ○ Collection System

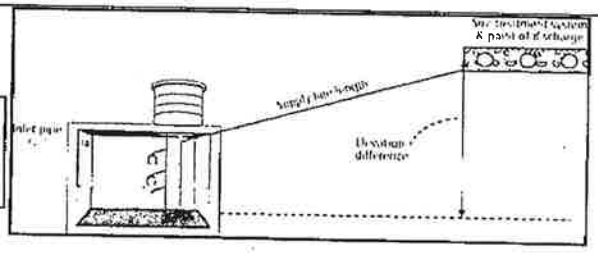
3. If pumping to a pressurized treatment system, what part or type of system:
☒ Soil Treatment ☐ Media Filter ☐ Other

4. If pumping to a pressurized distribution system: 51 GPM
(Line 11 of Pressure Distribution or Line 10 of Non-Level or enter if Collection System)

2. HEAD REQUIREMENTS

3. Elevation Difference between pump and point of discharge: 6 ft

NOTE: IF system is an individual subsurface sewage treatment system, complete steps 4 - 9. If system is a Collection System, skip steps 4, 5, 7 and 8 and go to Step 10.



4. Distribution Head Loss: 5 ft

5. Additional Head Loss: _____ ft (due to special equipment, etc.)

Distribution Head Loss	
Gravity Distribution = 0ft	
Pressure Distribution based on Minimum Average Head Value on Pressure Distribution Worksheet:	
Minimum Average Head	**Distribution Head Loss**
1ft	5ft
2ft	6ft
5ft	10ft

6. A. Supply Pipe Diameter: 2 in

B. Supply Pipe Length: 24 ft

7. Based on Friction Loss in Plastic Pipe per 100ft from Table I:

Friction Loss = 6.16 ft per 100ft of pipe

8. Determine *Equivalent Pipe Length* from pump discharge to soil dispersal area discharge point. Estimate by adding 25% to supply pipe length for fitting loss. *Supply Pipe Length (5.B)* X 1.25 = *Equivalent Pipe Length*

24 ft X 1.25 = 30 ft

Friction Loss in Plastic Pipe per 100 ft (C=130)					
	Nominal Pipe Diameter				
Flow Rate (GPM)	1	1¼	1½	2	3
10	9.11	3.08	1.27	0.31	---
12	12.77	4.31	1.78	0.44	---
14	16.99	5.74	2.36	0.58	---
16	---	7.35	3.03	0.75	0.10
18	---	9.14	3.76	0.93	0.13
20	---	11.11	4.58	1.13	0.16
25	---	16.79	6.92	1.71	0.24
30	---	---	9.69	2.39	0.33
35	---	---	12.90	3.18	0.44
40	---	---	16.52	4.07	0.57
45	---	---	---	5.07	0.70
50	---	---	---	6.16	0.86
55	---	---	---	7.35	1.02
60	---	---	---	8.63	1.20
65	---	---	---	10.01	1.39
70	---	---	---	11.48	1.60

9. Calculate *Supply Friction Loss* by multiplying *Friction Loss Per 100ft* (Line 6) by the *Equivalent Pipe Length* (Line 7) and divide by 100.

Supply Friction Loss = 6.16 ft per 100ft X 30 ft ÷ 100 = 1.85 ft

OSTP Pump Selection Design Worksheet

Minnesota Pollution Control Agency

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10. Equivalent length of pipe fittings.

Section 10 is for Collection Systems ONLY and does NOT need to be completed for individual subsurface sewage treatment systems.

Quantity X Equivalent Length Factor = Equivalent Length

Fitting Type	Quantity		Equivalent Length Factor		Equivalent Length (ft)
Gate Valve		X		=	
90 Deg Elbow		X		=	
45 Deg Elbow		X		=	
Tee - Flow Thru		X		=	
Tee - Branch Flow		X		=	
Swing Check Valve		X		=	
Angle Valve		X		=	
Globe Valve		X		=	
Butterfly Valve		X		=	
Valve 10		X		=	
Valve 11		X		=	

Equivalent Length Factors (ft.) for PVC Pipe Fittings

Fitting Type	Pipe Diameter (in.)		
	1½	2	3
Gate Valve	1.07	1.38	2.04
90 Deg Elbow	4.03	5.17	7.67
45 Deg Elbow	2.15	2.76	4.09
Tee - Flow Thru	2.68	3.45	5.11
Tee - Branch Flow	8.05	10.30	15.30
Swing Check Valve	13.40	17.20	25.50
Angle Valve	20.10	25.80	38.40
Globe Valve	45.60	58.60	86.90
Butterfly Valve	-	7.75	11.50

NOTE: Equivalent length values for PVC pipe fittings are based on calculations using the Hazen-Williams Equation. See Advanced Designs for SSTS for equation. Other pipe material may require different equivalent length factors. Verify other equivalent length factors with pipe material manufacturer.

NOTE: System installer should contact system designer if the number of fittings varies from the design to the actual installation.

A. Sum of Equivalent Length due to pipe fittings: _____ ft

B. *Total Pipe Length* = Supply Pipe Length (5.B) + Equivalent Pipe Length (9.A.)

_____ ft + _____ ft = _____ ft

C. Hazen-Williams friction loss due to pipe fittings and supply pipe (h_f):

(10.5 ÷ Pipe Diameter$^{4.87}$) X (Flow Rate ÷ Constant)$^{1.85}$ X Total Pipe Length (10.B)

(10.5 ÷ _____ in$^{4.87}$) X (_____ gpm ÷ 130)$^{1.85}$ X _____ ft = _____ ft

Hazen-Williams Equation for h_f

$$h_f = \frac{10.5}{D^{4.87}} * (Q \div C)^{1.85} * L$$

Q in gpm L in feet D in inches C = 130

11. *Total Head* requirement is the sum of the *Elevation Difference* (Line 3), the Distribution Head Loss (Line 4), Additional Head Loss (Line 5), and either Supply Friction Loss (Line 9), or Friction Loss from the Supply Pipe and Pipe Fittings for collection systems (Line 10.C)

NOTE: Supply Friction Loss (Line 8) need ONLY be used if NOT a collection system.

NOTE: Friction Loss from the Supply Pipe and Pipe Fittings (Line 9.C) need ONLY be used if system is a collection system.

6 ft + 5 ft + 1.55 ft + _____ ft = 12.85 ft

3. PUMP SELECTION

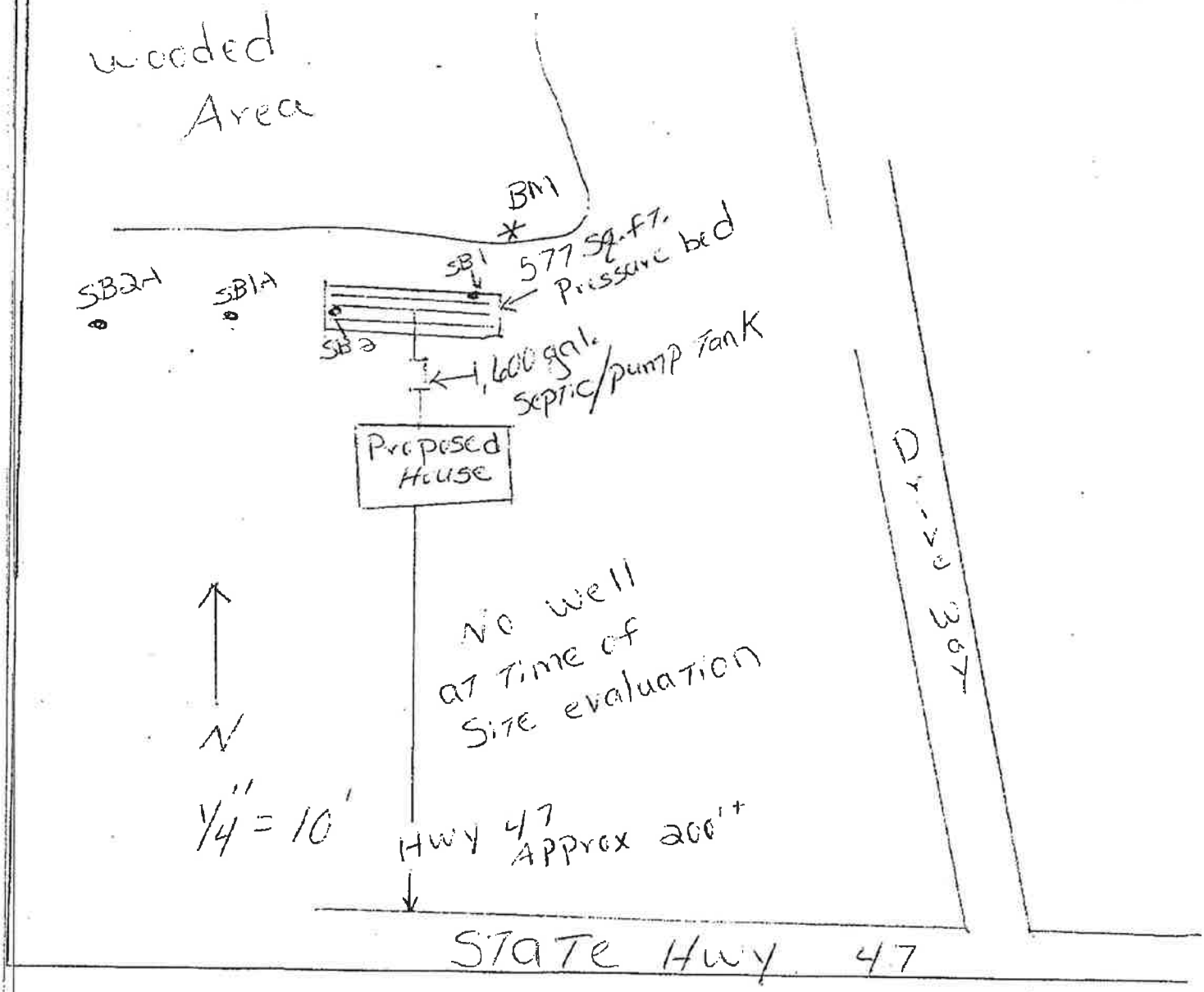
A pump must be selected to deliver at least 50 GPM (Line 1 or Line 2) with at least 13 feet of total head.

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

Greg Westerlund (Designer)	Greg Westerlund (Signature)	663 (License #)	7/15/19 (Date)

CLIENT: Heather Reese DATE: 7/15/19

MAP DRAWN TO SCALE WITH A NORTH ARROW



CHECK OFF LIST--HAVE ALL OF THE FOLLOWING BEEN DRAWN ON THE MAP??

SHOW EXISTING OR PROPOSED

- ☐ WATER WELLS WITHIN 100 FT OF TREATMENT AREAS
- ☐ PRESSURE WATER LINES WITHIN 10 FT OF TREATMENT AREAS
- ☐ STRUCTURES ☐ LOT IMPROVEMENTS
- ☐ ALL SOIL TREATMENT AREAS ☐ ALL ISTS COMPONENTS
- ☐ HORIZONTAL AND VERTICALREFERENCE
- ☐ POINT OF SOIL BORINGS ☐ DIRECTION OF SLOPE
- ☐ LOT EASEMENTS ☐ ALL LOT DIMENSIONS
- ☐ DISTURBED/ COMPACTED AREAS
- ☐ SITE PROTECTION--LATHE AND RIBBON EVERY 15 FT
- ☐ ACCESS ROUTE FOR TANK MAINTENANCE

REQUIRED SETBACKS

- ☐ STRUCTURES ☐ PROPERTY LINES
- ☐ OHWL

COMMENTS:

DESIGNER SIGNATURE Greg Westerlund

LICENSE# 663 DATE 7/15/19

INDICATE ELEVATIONS

BENCHMARK	100
ELEVATION OF SEWER LINE @ HOUSE	98
ELEVATION @ TANK INLET	97.5
ELEVATION @ BOTTOM OF ROCK LAYER	
ELEVATION @ BOTTOM OF BORING OR RESTRICTIVE LAYER	79
ELEVATION OF PUMP	94.5
ELEVATION OF DISTRIBUTION DEVICE	100

Subsurface Sewage Treatment System Management Plan

Property Owner: Heather Reese Phone: 218-838-2058 Date: 7/15/19

Mailing Address: 35762 ST. Hwy 47 City: Aitkin Zip: 56431

Site Address: 35758 ST. Hwy 47 City: Aitkin Zip: 56431

This management plan will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic service provider or maintenance provider.

System Designer: Recommends SSTS check every 36 months.
Local Government: Recommends SSTS check every ____ months.
State Requirement: Requires SSTS check every 36 months.
(State requirements are based on MN Rules Chapter 7080.2450, Subp. 2 & 3)

My System needs to be checked every ____ months.

Homeowner Management Tasks:

Leaks – Check (look, listen) for leaks in toilets and dripping faucets. Repair leaks promptly.
Surfacing sewage – Regularly check for wet or spongy soil around your soil treatment area.
Effluent filter – Inspect and clean twice a year or more.
Alarms – Alarm signals when there is a problem. Contact a service or maintenance provider any time an alarm signals.
Event counter or water meter – Record your water use.
-recommend meter readings be conducted (*circle one:* DAILY WEEKLY MONTHLY N/A)

Licensed septic service provider or maintenance provider (Check all that apply):

- ☐ Check to make sure tank is not leaking
- ☐ Check and clean the in-tank effluent filter (if exists)
- ☐ Check the sludge/scum layer levels in all septic tanks
- ☐ Recommend if tank should be pumped
- ☐ Check inlet and outlet baffles
- ☐ Check the drainfield effluent levels in the rock layer
- ☐ Check the pump and alarm system functions
- ☐ Check wiring for corrosion and function
- ☐ Check dissolved oxygen and effluent temperature in tank
- ☐ Provide homeowner with list of results and any action to be taken
- ☐ Flush and clean laterals if cleanouts exist

"I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in the Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."

Property Owner Signature: _____ Date: _____

Designer Signature: Greg Westerlund Date: 7/15/19

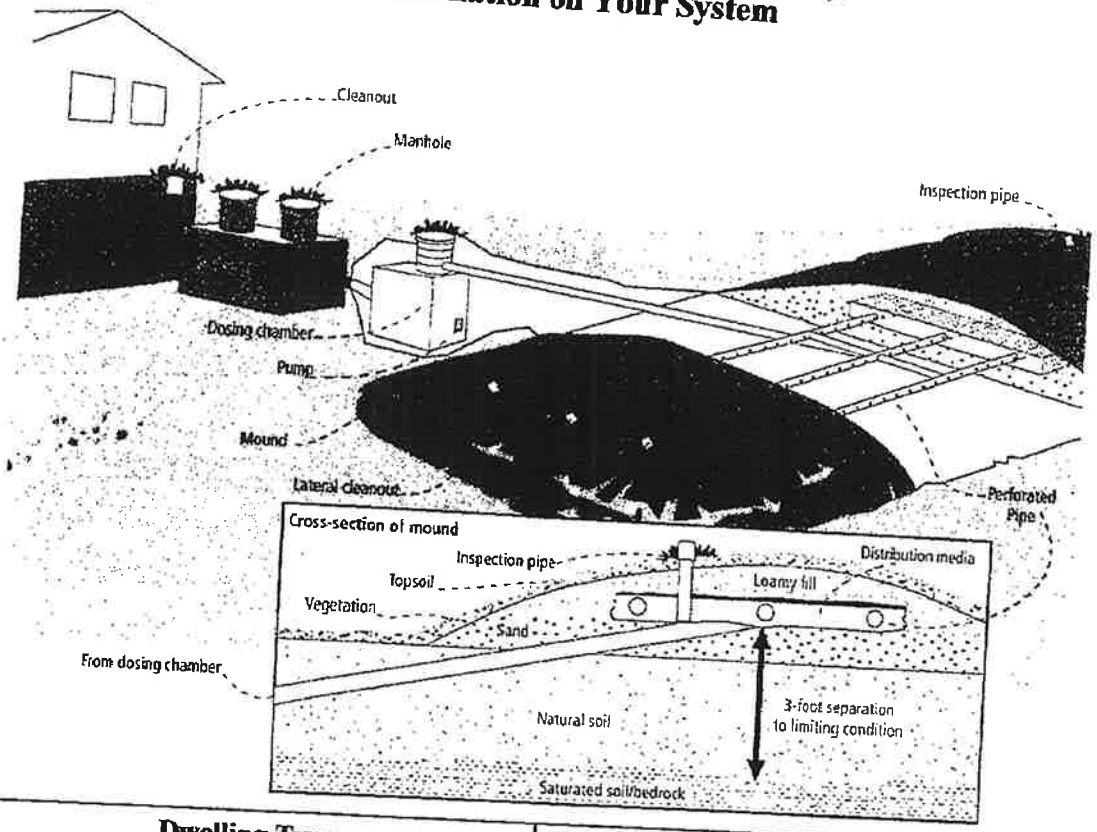
See Reverse Side for Management Log

University of Minnesota
Onsite Sewage Treatment Program

Septic System Management Plan for Mound Systems

University of Minnesota Extension

Information on Your System



Dwelling Type	Well Construction
Number of bedrooms: 3	Well depth (ft): ———
System capacity/ design flow (gpd): 450	☐ Cased well Casing depth:
Anticipated average daily flow (gpd): <450	☐ Other (specify):
Comments	Distance from septic (ft):
In-home business? ___ What type?	Is the well on the design drawing? Y N

Septic Tank

☐ One tank *Tank volume:* 1,000 gallons	☐ Pump Tank (*if one*) 600 gallons
Does tank have two compartments? Y (N)	☐ Effluent Pump *type:* Zoeller
☐ Two tanks *Tank volume:* 1,000 gallons	TDH 20 Feet of head
☐ Tank is constructed of Pre-Cast	Pump capacity 50 GPM
☐ Effluent Screen *type:* N	☐ Alarm ✓ visual ✓ audible

Soil Treatment Area

Mound area (length x width): ___ ft x ___ ft	☐ Cleanouts or Inspection Ports
Rock bed size (length x width): 57 ft x 10 ft	☐ Surface Water Diversions

UNIVERSITY OF MINNESOTA
ONSITE SEWAGE TREATMENT PROGRAM

Septic System Management Plan for Mound Systems

UNIVERSITY OF MINNESOTA EXTENSION

Water-Use Appliances and Equipment in the Home

Appliance	Impacts on System	Management Tips
Garbage disposal	• Uses additional water. • Adds solids to the tank. • Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Use of a garbage disposal is not recommended. • Minimize garbage disposal use. Compost instead. • To prevent solids from exiting the tank, have your tank pumped more frequently. • Add an effluent screen to your tank.
Washing machine	• Washing several loads on one day uses a lot of water and may overload your system. • Overloading your system may prevent solids from settling out in the tank. Unsettled solids can exit the tank and enter the soil treatment area.	• Choose a front-loader or water-saving top-loader, these units use less water than older models. • Limit the addition of extra solids to your tank by using a liquid or easily biodegradable detergents. • Install a ling filter after the washer and an effluent screen on your tank. • Wash only full loads. • Limit use of bleach-based detergents. • Think even – spread your laundry loads throughout the week.
2nd floor laundry	• The rapid speed of water entering the tank may reduce performance.	• Install an effluent screen in the septic tank to prevent the release of excessive solids to the soil treatment area. • Be sure that you have adequate tank capacity.
Dishwasher	• Powdered and/or high-phosphorus detergents can negatively impact the performance of your tank and soil treatment area. • New models promote "no scraping". They have a garbage disposal inside.	• Use gel detergents. Powdered detergents may add solids to the tank. • Use detergents that are low or no-phosphorus. • Wash only full loads. • Scrape your dishes anyways to keep undigested solids out of your septic system.
Grinder pump (in home)	• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.	• Expand septic tank capacity by a factor of 1.5. • Include pump monitoring in your maintenance schedule to ensure that it is working properly. • Add an effluent screen.
Large bathtub (whirlpool)	• Large volume of water may overload your system. • Heavy use of bath oils and soaps can impact biological activity in your tank and soil treatment area.	• Avoid using other water-use appliances at the same time. For example, don't wash clothes and take a bath at the same time. • Use oils, soaps, and cleaners in the bath or shower sparingly.
Clean Water Uses	**Impacts on System**	**Management Tips**
High-efficiency furnace	• Drip may result in frozen pipes during cold weather.	• Re-route water into a sump pump or directly out of the house. Do not route furnace recharge to your septic system.
Water softener Iron filter Reverse osmosis	• Salt in recharge water may affect system performance. • Recharge water may hydraulically overload the system.	• These sources produce water that is clean; clean water should not go into your septic system. • Reroute water from these sources to another outlet, such as a dry well or old drainfield. • When replacing consider using a demand-based recharge vs. a time-based recharge. • Check valves to ensure proper operation; have unit serviced per manufacturer directions
Surface drainage Footing drains	• Water from these sources will likely overload the system.	

Professional Management Tasks

These are the operation and maintenance activities that a pumper/maintainer performs to help ensure long-term performance of your system. Professionals should refer to the O/M Manual for detailed checklists for tanks, pumps, alarms and other components. Call 800-322-8642 for more details.

- ☐ Written record provided to homeowner after each visit.

Plumbing/Source of Wastewater

- ☐ Review the Water Use Appliance Chart on Page 5 with homeowner. Discuss any changes in water use and the impact those changes may have on the septic system.
- ☐ Review water usage rates (if available) with homeowner.

Septic Tank/Pump Tanks

- ☐ *Manhole lid.* A riser is recommended if the lid is not accessible from the ground surface. Insulate the riser cover for frost protection.
- ☐ *Liquid level.* Check to make sure the tank is not leaking. The liquid level should be level with the bottom of the outlet pipe. (If the water level is below the bottom of the outlet pipe, the tank may not be watertight. If the water level is higher than the bottom of the outlet pipe of the tank, the effluent screen may need cleaning, or there may be ponding in the drainfield.)
- ☐ *Inspection pipes.* Replace damaged caps.
- ☐ *Baffles.* Check to make sure they are in place and attached, and that inlet/outlet baffles are clear of buildup or obstructions.
- ☐ *Effluent screen.* Check to make sure it is in place; clean per manufacturer recommendation.
- ☐ *Alarm.* Verify that the alarm works.
- ☐ *Scum and sludge.* Measure scum and sludge in each tank, pump if needed.

Pump

- ☐ *Pump and controls.* Check to make sure the pump and controls are operating correctly.
- ☐ *Pump vault.* Check to make sure it is in place; clean per manufacturer recommendations.
- ☐ *Alarm.* Verify that the alarm works.
- ☐ *Drainback.* Check to make sure it is operating properly.
- ☐ *Event counter or run time.* Check to see if there is an event counter or run time log for the pump. If there is one, calculate the water usage rate and compare to the anticipated average daily flow listed on Page 4.

Soil Treatment Area

- ☐ *Inspection pipes.* Check to make sure they are properly capped. Replace caps that are damaged.
- ☐ *Surfacing of effluent.* Check for surfaced effluent or other signs of problems.
- ☐ *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean as needed.
- ☐ *Ponding.* Check for ponding. Excessive ponding in mounds indicates a problem.

All other components – inspect as listed here:

_____

_____

_____