Northern Environmental Solutions

SEPTIC DESIGNS | INSPECTIONS | INSTALLATIONS | LAND CLEARING | WATER TESTING

LICENSE #4072 PHONE 218-600-8808

Client: ED Hollen

Address: 29997 110th Place

Sturgeon Lake MN 55783

PID# 04-0-037200

System Type: I Mound

Construction Notes: Septic site and alternative site must be protected. Prior to installation the County Must verify the Soils and Gopher one must be called to locate utilities, all required setbacks must be met and verified prior to installation. All manhole covers must be to grade. It is the responsibility of the installer to verify that all required setbacks will be met prior to installing the system in this design. It is up to property owner to protect septic drain field sites (primary site and alternate site) from damage. Rope off area to be protected. Do not drive on sites with a wheeled vehicle of any type. Only a track type vehicle can be used. **All sewer pipe that runs under or**

through a driveway must be insulated and protected from frost. A clean out must be installed by the building and one added every 100 ft of pipe installed.

Please review the stakes I have placed on your property. The stakes indicate the location of drain field and tank area. I request that the property lines be verified to be 10 feet or more from the stakes.

It is up to property owner to preform maintenance on tank system by pumping

This design must be submitted for permit. Once local regulatory authority has issued a permit our responsibility for design is done.

Stakes are in place for the primary drain field area and marked. Any changes to be made should be done before approval of design.
Call 218- 600-8808 for changes.

Any changes to design will be at a cost for new design.

Ant tree removal is up to homeowner to have removed. If this design is for a mound trees need to be cut to grade. Do not remove roots or stumps.

Before digging get locates! Gopher state one call 1-800-252-1166
Any results and /or information in this report are strictly the interpretation of the licensed individual issuing the report. All field work and test results are done to the best of the individual's ability, and under no circumstances is any work to be performed or action taken as a result of this report prior to full review and approval by the proper governing authorities.
(Area is staked for 1650 septic/Pump Tank)

Northern Environmental Solutions LLC
3869 Sandberg RD
Duluth MN 55810
LIC # 4072
218-600-8808

Construction notes: prepared for ED Hollen

This system is going to be type I Mound.

Tank size: A new 1650-gallon septic/pump tank with alarm and block. All electric wiring needs to be protected around the pump and septic tanks. An event counter must be installed when type III is used.

All manhole lids bring to grade and secure.

Install inspection pipes all inspection must be 4" in diameter. Where needed, also install a clean out where needed in the supply line and end of laterals.

Pump: GPM 18 total head 15.4 feet:

All pumps piping, and controls must have access for servicing or replacement without entering the pump tank.

Piping: SCH 40 4'' or 3: house to septic tank 19' FT= field verify
SCH, 40 2'' pump tank to rock bed: 38 ' FT= field verify
From pump to tank place 2''SCH. 40 inside 4''SCH 40 help protect sagging of 2'' (5-10 FT)

Install insulated pipe across driveway, also place straw on all new construction to help prevent freezing.

MONITERING WILL NEED TO BE DONE:

SOILS MUST BE VERIFIED WITH THE COUNTY PRIOR TO INSTALLATION OF THIS SYSTEM!

It is up to the installer to receive and place clean material for mound and pressure bed construction accepting substandard material can cause the finished system to fail sooner!! Note: as built form, send to country. Fill out elevation form send to lug. Fill out abandonment form send to lug.

Make sure all water is diverted from mound and tanks,

All paperwork is included to send to LUG!!!!

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3869 Sandberg RD
Duluth MN 55810
LIC#4072
218-600-8808

Maintenance tips for new systems

The new system should be pumped after he first year.
(reason to see how your system is working and the pumping company can recommend how often your system should be pumped)

Alarms are put on systems for a reason to help the system owner avert back up into the home. Alarms should be checked each year when you change your smoke detectors battery. Ask your installer to show you how to check alarms (when an alarm goes off call for maintenance) \
Keep from driving on your system. (a riding lawn mower is excepted)
This is an option if you can put it somewhere else.
Do not put water softener water back wash into septic.
Do not put drain tile water into septic.
Do not put 90% furnace water into septic.

The last pages of design has information on management tasks of your new system.

ONSITE SEWAGE TREATMENT PROGRAM

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Contact Information

v 04.01.2020

Property Owner/Client: ED Hollen | Date Completed: 7/14/2022

Site Address: 29997 110th Place N Sturgeon Lake MN 55783 | Project ID:

Email: | Phone: 952-237-2056

Mailing Address: 8112 Virgina Circle NSt Louis Park MN 55426

Legal Description:

Parcel ID: 04-0-037200 | SEC: 23 | TWP: 46 | RNG: 22

2. Flow and General System Information

A. Client-Provided Information

Project Type: ☑ New Construction ☐ Replacement ☐ Expansion ☐ Repair

Project Use: ☑ Residential ☐ Other Establishment:

Residential use: # Bedrooms: 2 | Dwelling Sq.ft.: 1200 | Unfinished Sq. Ft.:

Adults: 2 | # Children: | # Teenagers:

In-home business (Y/N): No | If yes, describe:

Water-using devices: *(check all that apply)*

- ☐ Garbage Disposal/Grinder
- ☑ Dishwasher
- ☐ Hot Tub*
- ☐ Sewage pump in basement
- ☐ Water Softener*
- ☐ Sump Pump*
- ☐ Large Bathtub >40 gallons
- ☐ Iron Filter*
- ☐ Self-Cleaning Humidifier*
- ☑ Clothes Washing Machine
- ☐ High Eff. Furnace*
- ☐ Other:

* Clear water source - should not go into system

Additional current or future uses:

Anticipated non-domestic waste:

The above is complete & accurate: ***Client signature & date***

B. Designer-determined flow Information

Attach additional information as necessary.

Design Flow: 300 GPD | Anticipated Waste Type: Residential

BOD: <170 mg/L | TSS <60 mg/L | Oil & Grease <25 mg/L

3. Preliminary Site Information

A. Water Supply Wells

#	Description	Mn. ID#	Well Depth (ft.)	Casing Depth (ft.)	Confining Layer	STA Setback	Source
1	Shallow	<50' NA	<50' NA	<50' NA	<50' NA	100	
2							
3							
4							

Additional Well Information:

Onsite Sewage Treatment Program

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Site within 200' of noncommunity transient well (Y/N)	No	Yes, source:
Site within a drinking water supply management area (Y/N)	No	Yes, source:
Site in Well Head Protection inner wellhead management zone (Y/N)	No	Yes, source:
Buried water supply pipes within 50 ft of proposed system (Y/N)	No	
B. Site located in a shoreland district/area?	No	Yes, name:
Elevation of ordinary high water level:	ft	Source:
Classification:	Tank Setback: ft.	STA Setbk: ft.
C. Site located in a floodplain?	No	Yes, Type(s):
Floodplain designation/elevation (10 Year):	N/A ft	Source: N/A
Floodplain designation/elevation (100 Year):	N/A ft	Source: N/A

D. Property Line Id / Source: ☑ Owner ☐ Survey ☐ County GIS ☐ Plat Map ☐ Other:

E. ID distance of relevant setbacks on map: ☑ Water ☐ Easements ☑ Well(s) ☑ Building(s) ☐ Property Lines ☐ OHWL ☐ Other:

4. Preliminary Soil Profile Information From Web Soil Survey (attach map & description)

Map Units: 2z19y Slope Range: 1-4 %

List landforms: Moraines

Landform position(s): Back/ Side Slope

Parent materials: Till

Depth to Bedrock/Restrictive Feature: NA in Depth to Watertable: 16-24 in

Map Unit Ratings

- Septic Tank Absorption Field- At-grade:
- Septic Tank Absorption Field- Mound: Slightly Limited
- Septic Tank Absorption Field- Trench:

5. Local Government Unit Information

Name of LGU:

LGU Contact:

LGU-specific setbacks:

LGU-specific design requirements:

LGU-specific installation requirements:

Notes:

Onsite Sewage Treatment Program

Field Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Project Information

v 04.01.2020

Property Owner/Client: ED Hollen | Project ID:

Site Address: 29997 110th Place N Sturgeon Lake MN 55783 | Date Completed: 7/14/2022

2. Utility and Structure Information

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

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

3. Site Information

Vegetation type(s): Forest | Landscape position: Back/ Side Slope

Percent slope: 10 % | Slope shape: Linear, Linear | Slope direction:

Describe the flooding or run-on potential of site:

Describe the need for Type III or Type IV system:

Note:

Proposed soil treatment area protected? (Y/N): Yes | If yes, describe: Staked

4. General Soils Information

Filled, Compacted, Disturbed areas (Y/N): No

If yes, describe:

Soil observations were conducted in the proposed system location (Y/N): Yes

A soil observation in the most limiting area of the proposed system (Y/N): Yes

Number of soil observations: 6 | Soil observation logs attached (Y/N): Yes

Percolation tests performed & attached (Y/N): No

5. Phase I. Reporting Information

	Depth		Elevation	
Limiting Condition*:	18	in		ft
Periodically saturated soil:	19	in		ft
Standing water:		in		ft
Bedrock:	NA	in		ft
Benchmark Elevation:		ft		

*Most Restrictive Depth Identified from List Below

Soil Texture: fine loamy sand

Percolation Rate: min/inch

Soil Hyd Loading Rate: 0.6 gpd/ft^2

Elevations and Benchmark on map? (Y/N):

Benchmark Elevation Location:

Differences between soil survey and field evaluation:

Site evaluation issues / comments:

Anticipated construction issues:

ONSITE SEWAGE TREATMENT PROGRAM

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

1. PROJECT INFORMATION

v 04.01.2020

Property Owner/Client: ED Hollen

Project ID:

Site Address: 29997 110th Place N Sturgeon Lake MN 55783

Date: 07/14/22

Email Address:

Phone: 952-237-2056

2. DESIGN FLOW & WASTE STRENGTH

Attach data / estimate basis for Other Establishments

Design Flow: 300 GPD

Anticipated Waste Type: Residential

BOD: <170 mg/L TSS: <60 mg/L Oil & Grease: <25 mg/L

Treatment Level: C *Select Treatment Level C for residential septic tank effluent*

3. HOLDING TANK SIZING

Minimum Capacity: Residential =400 gal/bedroom, Other Establishment = Design Flow x 5.0, Minimum size 1000 gallons

Code Minimum **Holding Tank** Capacity: Gallons in Tanks or Compartments

Recommended **Holding Tank** Capacity: Gallons in Tanks or Compartments

Type of High Level Alarm: (Set @ 75% tank capacity)

Comments:

4. SEPTIC TANK SIZING

A. Residential dwellings:

Number of Bedrooms (Residential): 2

Code Minimum **Septic Tank** Capacity: 1500 Gallons in 1 Tanks or Compartments

Recommended **Septic Tank** Capacity: 1650 Gallons in 2 Tanks or Compartments

Effluent Screen & Alarm (Y/N): Yes Model/Type:

B. Other Establishments:

Waste received by: GPD x Days Hyd. Retention Time

Code Minimum **Septic Tank** Capacity: Gallons In Tanks or Compartments

Recommended **Septic Tank** Capacity: Gallons In Tanks or Compartments

Effluent Screen & Alarm (Y/N): Model/Type:

5. PUMP TANK SIZING

Pump Tank 1 Capacity (Minimum): 500 Gal

Pump Tank 1 Capacity (Recommended): 527 Gal

Pump 1 18.0 GPM Total Head 15.4 ft

Supply Pipe Dia. 2.00 in Dose Vol: 140.0 gal

Pump Tank 2 Capacity (Minimum): Gal

Pump Tank 2 Capacity (Recommended): Gal

Pump 2 GPM Total Head ft

Supply Pipe Dia. Dose Vol: Gal

ONSITE SEWAGE TREATMENT PROGRAM

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

6. SYSTEM AND DISTRIBUTION TYPE

Project ID:

Soil Treatment Type:	Mound	Distribution Type:	Pressure Distribution-Level
Elevation Benchmark:	ft	Benchmark Location:	
MPCA System Type:	Type I	Distribution Media:	Rock
Type III/IV Details:			

7. SITE EVALUATION SUMMARY:

Describe Limiting Condition: Redoximorphic Features/Saturated Soils

Layers with >35% Rock Fragments? (yes/no) No If yes, describe below: % rock and layer thickness, amount of soil credit and any additional information for addressing the rock fragments in this design.

Note:

	Depth		Depth		Elevation of Limiting Condition	
Limiting Condition:	18	inches	1.5	ft		ft
Minimum Req'd Separation:	36	inches	3.0	ft		
Code Max System Depth:	Mound	inches	-1.5	ft	Elevation	ft

Critical for system compliance

This is the maximum depth to the bottom of the distribution media for required separation. Negative Depth (ft) means it must be a mound.

Soil Texture:	Loamy Fine Sand		
Soil Hyd. Loading Rate:	1.20 GPD/ft^2	Percolation Rate:	MPI
Contour Loading Rate:	12	Note:	
Measured Land Slope:	10.0 %	Note:	
Comments:			

8. SOIL TREATMENT AREA DESIGN SUMMARY

Trench:

Dispersal Area	ft^2	Sidewall Depth	in	Trench Width	ft
Total Lineal Feet	ft	No. of Trenches		Code Max. Trench Depth	in
Contour Loading Rate	ft	Length	ft	Designed Trench Depth	in

Bed:

Dispersal Area	ft^2	Sidewall Depth	in	Maximum Bed Depth	in
Bed Width	ft	Bed Length	ft	Designed Bed Depth	in

Mound:

Dispersal Area	250.0 ft^2	Bed Length	25.0 ft	Bed Width	10.0 ft
Absorption Width	20.0 ft	Clean Sand Lift	1.5 ft	Berm Width (0-1%)	ft
Upslope Berm Width	10.4 ft	Downslope Berm	23.6 ft	Endslope Berm Width	22.0 ft
Total System Length	69.0 ft	System Width	44.0 ft	Contour Loading Rate	12.0 gal/ft

University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

Project ID:

At-Grade:

Bed Width	ft	Bed Length	ft	Finished Height	ft
Contour Loading Rate	gal/ft	Upslope Berm	ft	Downslope Berm	ft
Endslope Berm	ft	System Length	ft	System Width	ft

Level & Equal Pressure Distribution

No. of Laterals	3	Perforation Spacing	3 ft	Perforation Diameter	1/4 in
Lateral Diameter	0.00 in	Min Dose Volume	0 gal	Max Dose Volume	75 gal

Non-Level and Unequal Pressure Distribution

	Elevation (ft)	Pipe Size (in)	Pipe Volume (gal/ft)	Pipe Length (ft)	Perf Size (in)	Spacing (ft)	Spacing (in)
Lateral 1							
Lateral 2							
Lateral 3							
Lateral 4							
Lateral 5							
Lateral 6							

Minimum Dose Volume ____ gal

Maximum Dose Volume ____ gal

9. Additional Info for At-Risk, HSW or Type IV Design

A. Starting BOD Concentration = Design Flow X Starting BOD (mg/L) X 8.35 ÷ 1,000,000

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

B. Target BOD Concentration = Design Flow X Target BOD (mg/L) X 8.35 ÷ 1,000,000

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

Lbs. BOD To Be Removed: ____

PreTreatment Technology: ____ *Must Meet or Exceed Target

Disinfection Technology: ____ *Required for Levels A & B

C. Organic Loading to Soil Treatment Area:

____ mg/L X ____ gpd x 8.35 ÷ 1,000,000 ÷ ____ ft^2 = ____ $lbs./day/ft^2$

10. Comments/Special Design Considerations:

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

Mike Parrott	[signature]	2/23/1911	5/7/2022
(Designer)	(Signature)	(License #)	(Date)

ONSITE SEWAGE TREATMENT PROGRAM

Mound Design Worksheet
≥1% Slope

MINNESOTA POLLUTION CONTROL AGENCY

1. SYSTEM SIZING:

Project ID:

v 04.01.2020

A. Design Flow:	300	GPD
B. Soil Loading Rate:	1.20	GPD/ft²
C. Depth to Limiting Condition	1.5	ft
D. Percent Land Slope:	10.0	%
E. Design Media Loading Rate:	1.2	GPD/ft²
F. Mound Absorption Ratio:	2.00	

Table I
MOUND CONTOUR LOADING RATES:

Measured Perc Rate	OR	Texture - derived mound absorption ratio		Contour Loading Rate:
≤ 60mpi	OR	1.0, 1.3, 2.0, 2.4, 2.6		≤12
61-120 mpi	OR	5.0		≤12
≥ 120 mpi*		>5.0*		≤6*

TABLE IXa

LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA AND ABSORPTION RATIOS USING PERCOLATION TESTS

Percolation Rate (MPI)	Treatment Level C		Treatment Level A, A-2, B,	
	Absorption Area Loading Rate (gpd/ft²)	Mound Absorption Ratio	Absorption Area Loading Rate (gpd/ft²)	Mound Absorption Ratio
<0 1	-	1	-	1
0 1 to 5	1.2	1	1.6	1
0 1 to 5 (fine sand and loamy fine sand)	0.6	2	1	1.6
6 to 15	0.78	1.5	1	1.6
16 to 30	0.6	2	0.78	2
31 to 45	0.5	2.4	0.78	2
46 to 60	0.45	2.6	0.6	2.6
61 to 120	-	5	0.3	5.3
>120	-	-	-	-

*Systems with these values are not Type I systems. Contour Loading Rate (linear loading rate) is a recommended value.

2. DISPERSAL MEDIA SIZING

A. Calculate Dispersal Bed Area: Design Flow ÷ Design Media Loading Rate

300 GPD ÷ 1.2 GPD/ft² = 250 ft²

If a larger dispersal media area is desired, enter size: ft²

B. Enter Dispersal Bed Width: 10.0 ft *Can not exceed 10 feet*

C. Calculate Contour Loading Rate: Bed Width X Design Media Loading Rate

10 ft² X 1.2 GPD/ft² = 12.0 gal/ft *Can not exceed Table 1*

D. Calculate Minimum Dispersal Bed Length: Dispersal Bed Area ÷ Bed Width

250 ft² ÷ 10.0 ft = 25.0 ft

3. ABSORPTION AREA SIZING

A. Calculate Absorption Width: Bed Width X Mound Absorption Ratio

10.0 ft X 2.0 = 20.0 ft

B. For slopes >1%, the Absorption Width is measured downhill from the upslope edge of the Bed.

Calculate Downslope Absorption Width: Absorption Width - Bed Width

20.0 ft - 10.0 ft = 10.0 ft

4. DISTRIBUTION MEDIA: ROCK

Project ID:

A. Rock Depth Below Distribution Pipe

6 in 0.50 ft

5. DISTRIBUTION MEDIA: REGISTERED TREATMENT PRODUCTS: CHAMBERS AND EZFLOW

A. Enter Dispersal Media:

B. Enter the Component: Length: ft Width: ft Depth: ft

C. Number of Components per Row = Bed Length divided by Component Length (Round up)

ft ÷ ft = components/row

Check registered product information for specific application details and design

D. Actual Bed Length = Number of Components/row X Component Length:

components X ft =

E. Number of Rows = Bed Width divided by Component Width (Round up)

ft ÷ ft = rows *Adjust width so this is a whole number.*

F. Total Number of Components = Number of Components per Row X Number of Rows

X = components

6. MOUND SIZING

A. Clean Sand Lift: Required Separation - Depth to Limiting Condition = Clean Sand Lift (1 ft minimum)

3.0 ft - 1.5 ft = 1.5 ft Design Sand Lift (optional): ft

B. Upslope Height: Clean Sand Lift + Depth of Media +Depth to Cover Pipe+ Depth of Cover (1 ft)

1.5 ft + 0.50 ft + 1.5 ft + 1.0 ft = 4.5 ft

Land Slope %		0	1	2	3	4	5	6	7	8	9	10	11	12
Upslope Berm Ratio	3:1	3.00	2.91	2.83	2.75	2.68	2.61	2.54	2.48	2.42	2.36	2.31	2.26	2.21
	4:1	4.00	3.85	3.70	3.57	3.45	3.33	3.23	3.12	3.03	2.94	2.86	2.78	2.70

C. Select Upslope Berm Multiplier (based on land slope): 2.31

D. Calculate Upslope Berm Width: Multiplier X Upslope Mound Height

2.31 ft X 4.5 ft = 10.4 ft

E. Calculate Drop in Elevation Under Bed: Bed Width X Land Slope ÷ 100 = Drop (ft)

10.0 ft X 10.0 % ÷ 100 = 1.00 ft

F. Calculate Downslope Mound Height: Upslope Height + Drop in Elevation

4.5 ft + 1.00 ft = 5.5 ft

Land Slope %		0	1	2	3	4	5	6	7	8	9	10	11	12
Downslope Berm Ratio	3:1	3.00	3.09	3.19	3.30	3.41	3.53	3.66	3.80	3.95	4.11	4.29	4.48	4.69
	4:1	4.00	4.17	4.35	4.54	4.76	5.00	5.26	5.56	5.88	6.25	6.67	7.14	7.69

G. Select Downslope Berm Multiplier (based on land slope): 4.29

H. Calculate Downslope Berm Width: Downslope Multiplier X Downslope Height

4.29 x 5.5 ft = 23.6 ft

I. Calculate Minimum Berm to Cover Absorption Area: Downslope Absorption Width + 4 feet

10.0 ft + 4 ft = 14.0 ft

J. Design Downslope Berm = greater of 4H and 4I: 23.6 ft

K. Select Endslope Berm Multiplier: 4.00 *(usually 3.0 or 4.0)*

L. Calculate Endslope Berm X Downslope Mound Height = Endslope Berm Width

4.00 ft X 5.5 ft = 22.0 ft

M. Calculate Mound Width: Upslope Berm Width + Bed Width + Downslope Berm Width

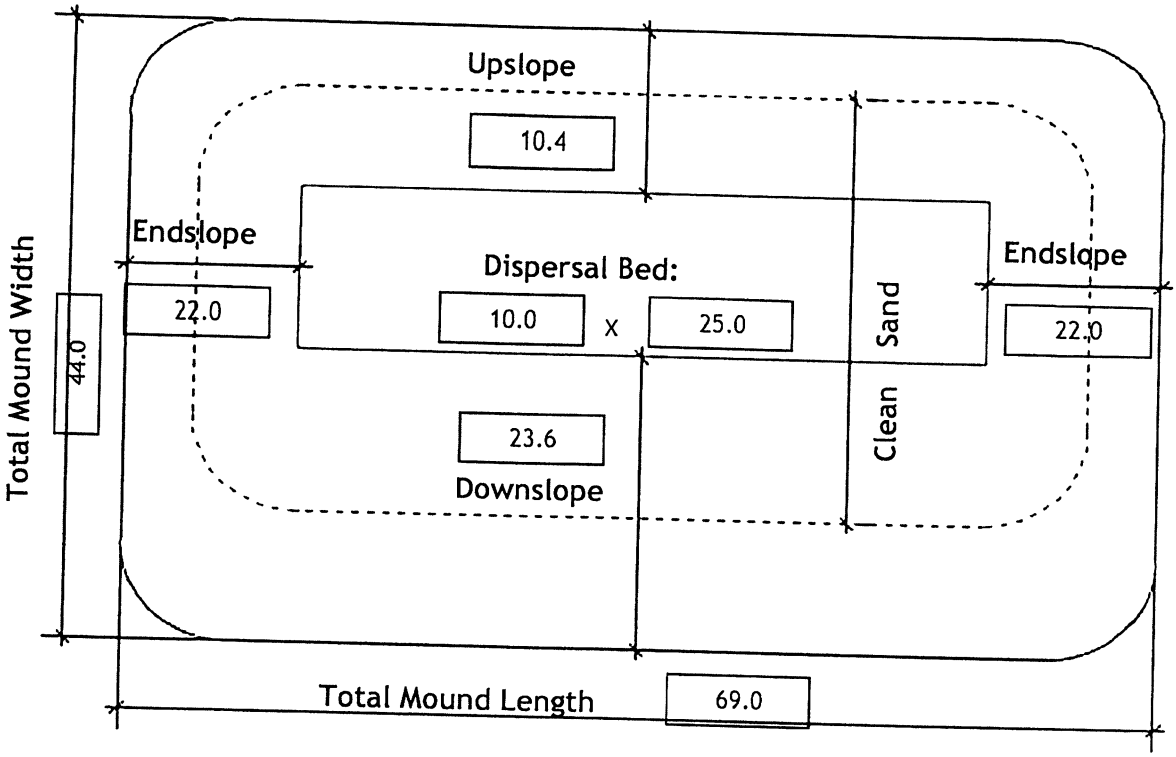
10.4 ft + 10.0 ft + 23.6 ft = 44.0 ft

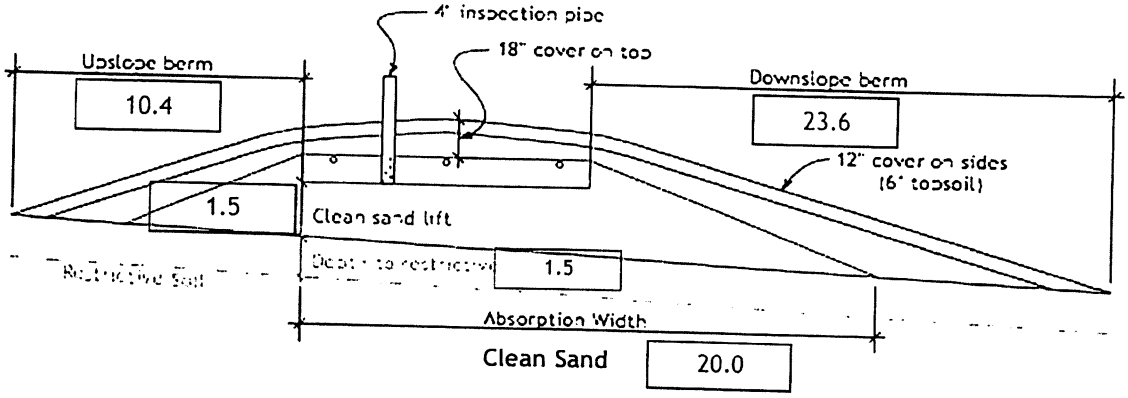
N. Calculate Mound Length: Endslope Berm Width + Bed Length + Endslope Berm Width

22.0 ft + 25.0 ft + 22.0 ft = 69.0 ft

7. MOUND DIMENSIONS

Project ID:





Comments:

Onsite Sewage Treatment Program

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Project ID: v 04.01.2020

1. Media Bed Width: 10 ft

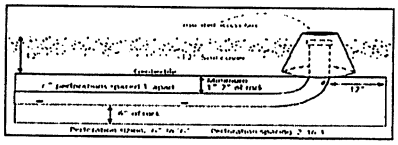
2. Minimum Number of Laterals in system/zone = Rounded up number of [(Media Bed Width - 4) ÷ 3] + 1.

[(10 - 4) ÷ 3] + 1 = 3 laterals *Does not apply to at-grades*

3. Designer Selected *Number of Laterals*: 3 laterals
Cannot be less than line 2 (Except in at-grades)

4. Select *Perforation Spacing*: 3.00 ft

5. Select *Perforation Diameter Size:* 1/4 in



6. *Length of Laterals* = Media Bed Length - 2 Feet.

25.0 - 2ft = 23.0 ft *Perforation can not be closer then 1 foot from edge.*

7. Determine the *Number of Perforation Spaces*. Divide the *Length of Laterals* by the *Perforation Spacing* and round down to the nearest whole number.

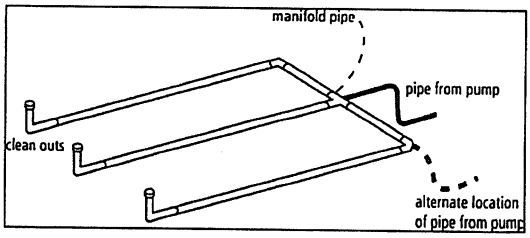
Number of Perforation Spaces = 23.0 ft ÷ 3.0 ft = 7 Spaces

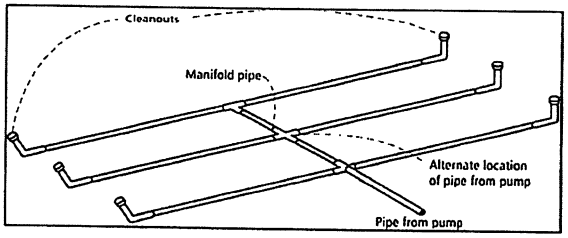
8. *Number of Perforations per Lateral* is equal to 1.0 plus the *Number of Perforation Spaces*. Check table below to verify the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double with a center manifold.

Perforations Per Lateral = 7 Spaces + 1 = 8 Perfs. Per Lateral

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

1/4 Inch Perforations						7/32 Inch Perforations					
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3		1	1¼	1½	2	3
2	10	13	18	30	60	2	11	16	21	34	68
2½	8	12	16	28	54	2½	10	14	20	32	64
3	8	12	16	25	52	3	9	14	19	30	60
3/16 Inch Perforations						1/8 Inch Perforations					
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3		1	1¼	1½	2	3
2	12	18	26	46	87	2	21	33	44	74	149
2½	12	17	24	40	80	2½	20	30	41	69	135
3	12	16	22	37	75	3	20	29	38	64	128





9. *Total Number of Perforations* equals the *Number of Perforations per Lateral* multiplied by the *Number of Perforated Laterals.*

8 Perf. Per Lat. X 3 Number of Perf. Lat. = 24 Total Number of Perf.

10. Spacing of laterals; Must be greater than 1 foot and no more than 3 feet: ft

11. Select *Type of Manifold Connection* (End or Center):

12. *Select Lateral Diameter (See Table)*: in

Onsite Sewage Treatment Program

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

13. Calculate the *Square Feet per Perforation.*

Recommended value is 4-11 ft2 per perforation, Does not apply to At-Grades

a. *Bed Area* = Bed Width (ft) X Bed Length (ft)

10 ft X 25 ft = 250 ft^2

b. *Square Foot per Perforation* = *Bed Area* ÷ by the *Total Number of Perfs*

250 ft^2 ÷ 24 perf = 10.4 ft^2/perf

14. Select *Minimum Average Head*: 1.0 ft

15. Select *Perforation Discharge* based on Table: 0.74 GPM per Perf

16. *Flow Rate* = *Total Number of Perfs X Perforation Discharge.*

24 Perfs X 0.74 GPM per Perforation = 18 GPM

17. *Volume of Liquid Per Foot of Distribution Piping (Table II)*: _____ Gallons/ft

18. *Volume of Distribution Piping* =

= [*Number of Perforated Laterals* X *Length of Laterals* X (Volume of Liquid Per Foot of Distribution Piping]

3 X 23 ft X _____ gal/ft = #VALUE! Gallons

19. Minimum Delivered Volume = Volume of Distribution Piping X 4

#VALUE! gals X 4 = _____ Gallons

Perforation Discharge (GPM)

Head (ft)	Perforation Diameter			
	1/8	3/16	7/32	1/4
1.0*	0.18	0.41	0.56	0.74
1.5	0.22	0.51	0.69	0.9
2.0*	0.26	0.59	0.80	1.04
2.5	0.29	0.65	0.89	1.17
3.0	0.32	0.72	0.98	1.28
4.0	0.37	0.83	1.13	1.47
5.0*	0.41	0.93	1.26	1.65

1 foot	Dwellings with 3/16 inch to 1/4 inch perforations
2 feet	Dwellings with 1/8 inch perforations
	Other establishments and MSTS with 3/16 inch to 1/4 inch perforations
5 feet	Other establishments and MSTS with 1/8 inch perforations

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

Comments/Special Design Considerations:

Basic Pump Selection Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. PUMP CAPACITY Project ID: v 04.01.2020

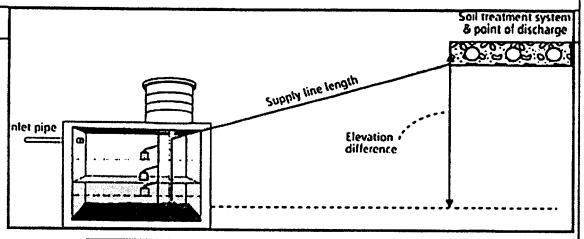
Pumping to Gravity or Pressure Distribution: Pressure

A. If pumping to gravity enter the gallon per minute of the pump: ____ GPM *(10 - 45 gpm)*

B. If pumping to a pressurized distribution system: 18.0 GPM

C. Enter pump description: Demand Dosing

2. HEAD REQUIREMENTS



A. Elevation Difference between pump and point of discharge: 10 ft

B. Distribution Head Loss: 5 ft

C. 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

Table I. Friction Loss in Plastic Pipe per 100ft

Flow Rate *(GPM)	Pipe Diameter (inches)			
	1	1.25	1.5	2
10	9.1	3.1	1.3	0.3
12	12.8	4.3	1.8	0.4
14	17.0	5.7	2.4	0.6
16	21.8	7.3	3.0	0.7
18		9.1	3.8	0.9
20		11.1	4.6	1.1
25		16.8	6.9	1.7
30		23.5	9.7	2.4
35			12.9	3.2
40			16.5	4.1
45			20.5	5.0
50				6.1
55				7.3
60				8.6
65				10.0
70				11.4
75				13.0
85				16.4
95				20.1

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 38 ft

E. **Friction Loss in Plastic Pipe per 100ft** from Table I:

Friction Loss = 0.92 ft per 100ft of pipe

F. 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 X 1.25 = *Equivalent Pipe Length*

38 ft X 1.25 = 47.5 ft

G. Calculate *Supply Friction Loss* by multiplying *Friction Loss Per 100ft* by the *Equivalent Pipe Length* and divide by 100.

Supply Friction Loss =

0.92 ft per 100ft X 47.5 ft ÷ 100 = 0.4 ft

H. *Total Head* requirement is the sum of the *Elevation Difference* + Distribution Head Loss, + Additional Head Loss + Supply Friction Loss

10.0 ft + 5.0 ft + ____ ft + 0.4 ft = 15.4 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **18.0** GPM with at least **15.4** feet of total head.

Comments:

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2020

Client: ED Hollen

Location / Address: 29997 110th Place North Sturgeon Lake MN 55783

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

Landscape Position: (select one) Back/Side Slope	Slope %: 10.0	Slope shape: Linear, Concave	Elevation-relative to benchmark:
Vegetation: Grass	Soil survey map units: 2z19y		Limiting Layer Elevation:
Weather Conditions/Time of Day: Sunny 12:00 PM		Date 07/14/22	
Observation #/Location: SP 1		Observation Type: Pit	

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-9	Fine Sand	<35%	7.5YR 3/2	None	None	None	Single grain	Weak	Friable
9-26	Fine Sand	<35%	7.5YR 4/4	None	None	None	Single grain	Weak	Friable
26-31	Fine Sand	<35%	7.5YR 4/4	7.5YR 4/6	Concentrations	S4	Single grain	Weak	Friable

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

Mike Parrott		4072	7/26/2022
(Designer/Inspector)	(Signature)	(License #)	(Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU Inspector)	(Signature)	(Cert. #)	(Date)

Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.01.2020

Client:	ED Hollen			Location / Address:	29997 110th Place North Sturgeon Lake MN 55783
Soil parent material(s): (Check all that apply)	☐ Outwash	☐ Lacustrine	☐ Loess	☑ Till	☐ Alluvium ☐ Bedrock ☐ Organic Matter
Landscape Position: (select one)	Back/Side Slope	Slope %: 10.0	Slope shape:	Linear, Concave	Elevation-relative to benchmark:
Vegetation:	Grass	Soil survey map units:	2z19y		Limiting Layer Elevation:
Weather Conditions/Time of Day:	Sunny 12:15 PM			Date	07/14/22
Observation #/Location:	SP 2			Observation Type:	Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-10	Loamy Fine Sand	<35%	7.5YR 3/2	None	None	None	Single grain	Weak	Friable
10-18	Loamy Fine Sand	<35%	7.5YR 4/4	None	None	None	Single grain	Weak	Friable
18-25	Fine Sandy Loam	<35%	7.5YR 4/4	7.5YR 4/6	Concentrations	S4	Single grain	Weak	Friable

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

Mike Parrott		4072	7/26/2022
(Designer/Inspector)	(Signature)	(License #)	(Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU Inspector)	(Signature)	(Cert. #)	(Date)

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2020

Client:	ED Hollen			Location / Address:	29997 110th Place North Sturgeon Lake MN 55783
Soil parent material(s): (Check all that apply)	☐ Outwash	☐ Lacustrine	☐ Loess	☑ Till	☐ Alluvium ☐ Bedrock ☐ Organic Matter
Landscape Position: (select one)	Back/Side Slope	Slope %: 10.0	Slope shape:	Linear, Concave	Elevation-relative to benchmark:
Vegetation:	Grass	Soil survey map units:	2z19y		Limiting Layer Elevation:
Weather Conditions/Time of Day:	Sunny 12:30 PM			Date	07/14/22
Observation #/Location:	SP 3			Observation Type:	Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-8	Loamy Fine Sand	<35%	7.5YR 3/2	None	None	None	Single grain	Weak	Friable
8-20	Loamy Fine Sand	<35%	7.5YR 4/4	None	None	None	Single grain	Weak	Friable
20-25	Fine Sandy Loam	<35%	7.5YR 4/4	7.5YR 4/6	Concentrations	S4	Single grain	Weak	Friable

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

Mike Parrott		4072	7/26/2022
(Designer/Inspector)	(Signature)	(License #)	(Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU Inspector)	(Signature)	(Cert. #)	(Date)

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2020

Client: ED Hollen

Location / Address: 29997 110th Place North Sturgeon Lake MN 55783

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

Landscape Position: (select one) Back/Side Slope | Slope %: 10.0 | Slope shape: Linear, Concave | Elevation-relative to benchmark:

Vegetation: Grass | Soil survey map units: 2z19y | Limiting Layer Elevation:

Weather Conditions/Time of Day: Sunny 12:45 PM | Date 07/14/22

Observation #/Location: Alt Site SP1 | Observation Type: Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-9	Loamy Fine Sand	<35%	7.5YR 3/2	None	None	None	Single grain	Weak	Friable
9-18	Loamy Fine Sand	<35%	7.5YR 4/4	None	None	None	Single grain	Weak	Friable
18-22	Fine Sandy Loam	<35%	7.5YR 4/4	7.5YR 4/6	Concentrations	S4	Single grain	Weak	Friable

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

Mike Parrott		4072	7/26/2022
(Designer/Inspector)	(Signature)	(License #)	(Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU Inspector)	(Signature)	(Cert. #)	(Date)

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2020

Client: ED Hollen

Location / Address: 29997 110th Place North Sturgeon Lake MN 55783

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

Landscape Position: (select one) Back/Side Slope | Slope %: 10.0 | Slope shape: Linear, Concave | Elevation-relative to benchmark:

Vegetation: Grass | Soil survey map units: 2z19y | Limiting Layer Elevation:

Weather Conditions/Time of Day: Sunny 12:45 PM | Date 07/14/22

Observation #/Location: Alt Site SP2 | Observation Type: Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-10	Loamy Fine Sand	<35%	7.5YR 3/2	None	None	None	Single grain	Weak	Friable
10-21	Loamy Fine Sand	<35%	7.5YR 4/4	None	None	None	Single grain	Weak	Friable
21-23	Fine Sandy Loam	<35%	7.5YR 4/4	7.5YR 4/6	Concentrations	S4	Single grain	Weak	Friable

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

Mike Parrott (Designer/Inspector) | (Signature) | 4072 (License #) | 7/26/2022 (Date)

Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU Inspector) | (Signature) | (Cert. #) | (Date)

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2020

Client: ED Hollen

Location / Address: 29997 110th Place North Sturgeon Lake MN 55783

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

Landscape Position: (select one) Back/Side Slope | Slope %: 10.0 | Slope shape: Linear, Concave | Elevation-relative to benchmark:

Vegetation: Grass | Soil survey map units: 2z19y | Limiting Layer Elevation:

Weather Conditions/Time of Day: Sunny 1:00 PM | Date 07/14/22

Observation #/Location: Alt Site SP3 | Observation Type: Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure: Shape	Structure: Grade	Structure: Consistence
0-8	Loamy Fine Sand	<35%	7.5YR 3/2	None	None	None	Single grain	Weak	Friable
8-18	Loamy Fine Sand	<35%	7.5YR 4/4	None	None	None	Single grain	Weak	Friable
18-22	Fine Sandy Loam	<35%	7.5YR 4/4	7.5YR 4/6	Concentrations	S4	Single grain	Weak	Friable

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

Mike Parrott (Designer/Inspector) | (Signature) | 4072 (License #) | 7/26/2022 (Date)

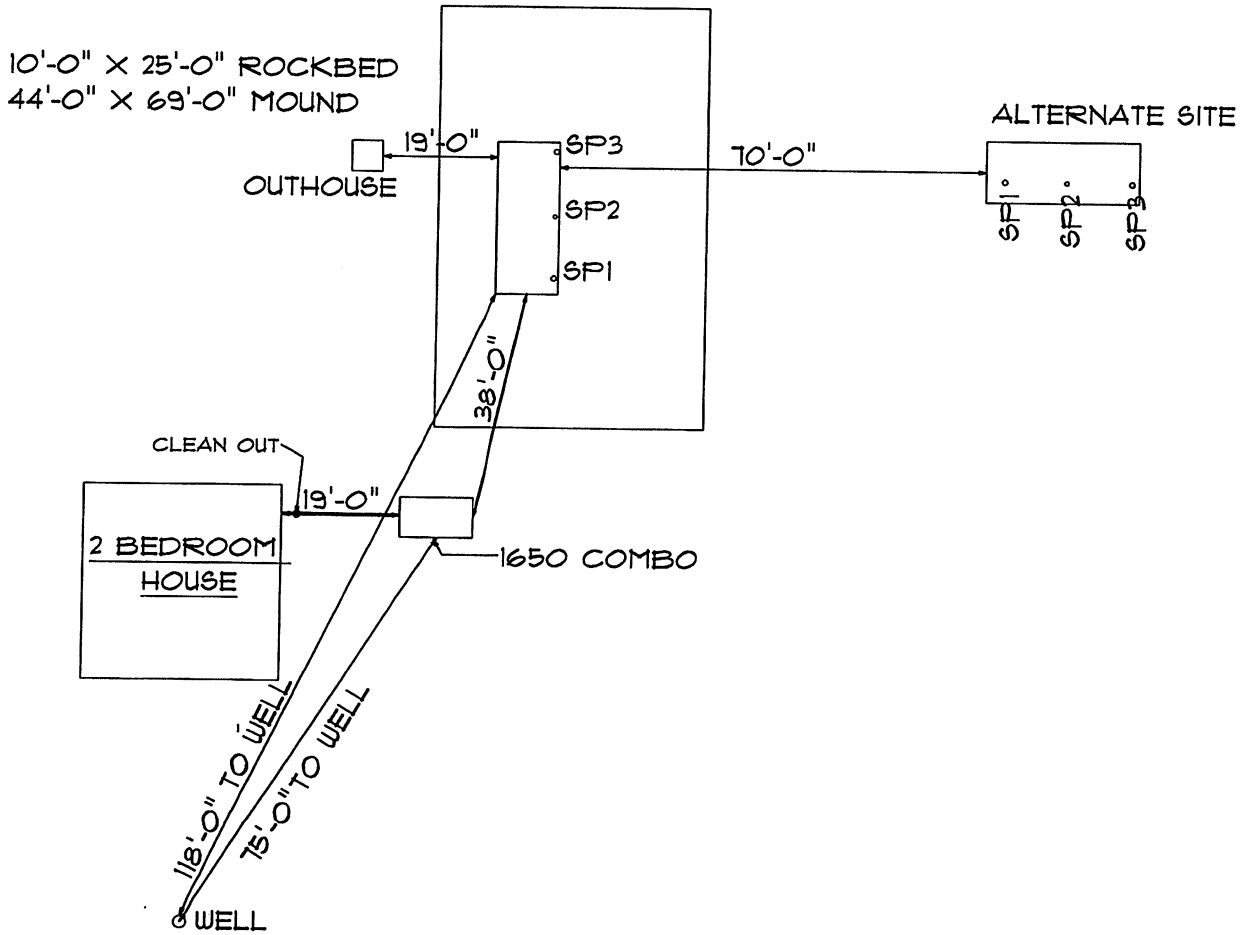
Optional Verification: I hereby certify that this soil observation was verified according to Minn. R. 7082.0500 subp. 3 A. The signature below represents an infield verification of the periodically saturated soil or bedrock at the proposed soil treatment and dispersal site.

(LGU Inspector) | (Signature) | (Cert. #) | (Date)

N

DESIGN BY:
NORTHERN ENVIRONMENTAL SOLUTIONS
LICENSE # 4072
218-600-8808

SEPTIC DESIGN FOR:
ED HOLLEN
29997 110TH PLACE N
STURGEON LAKE, MN 55783
04-0-037200
PLAN # 22-55
DATE: 7/14/2022



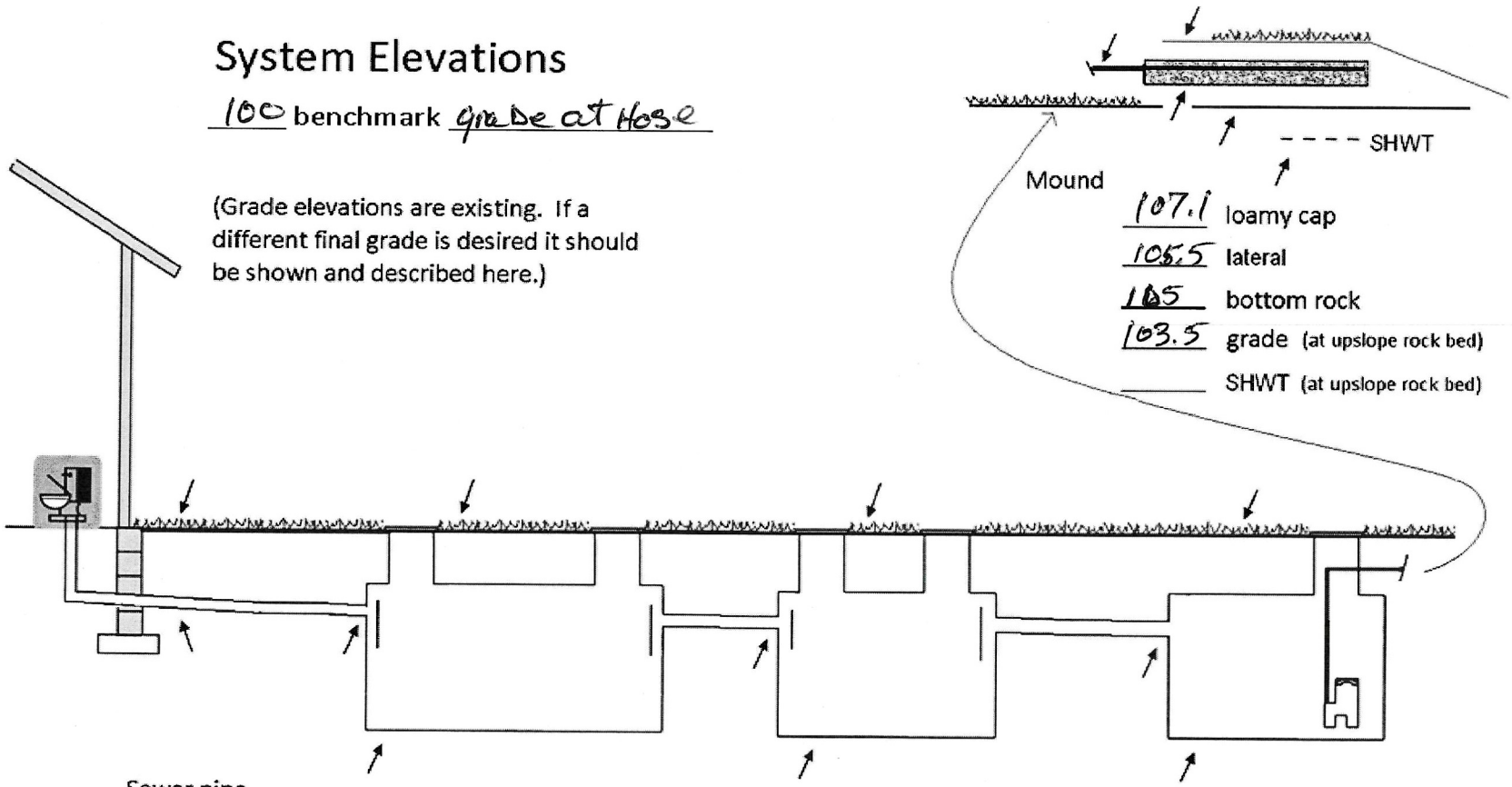
SEPTIC DESIGN

SCALE: 1" = 30'-0"

System Elevations

100 benchmark grade at Hose

(Grade elevations are existing. If a different final grade is desired it should be shown and described here.)



Sewer pipe exiting house	Septic Tank	Septic Tank (if applicable)	Pump ~~Tank~~ Chamber
100 Grade	100 Grade	____ Grade	100 Grade
97 Pipe	96.1 inlet	____ inlet	95.8 ~~inlet~~ outlet
	92.1 Tank bottom	____ Tank bottom	92.1 Tank bottom

Aitkin County, Minnesota

C9B—Mora-Ronneby complex, 1 to 4 percent slopes, stony

Map Unit Setting

National map unit symbol: 2z19y
Elevation: 790 to 1,970 feet
Mean annual precipitation: 27 to 36 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 80 to 150 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Mora, stony, and similar soils: 55 percent
Ronneby, stony, and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mora, Stony

Setting

Landform: Drumlins, moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till

Typical profile

A - 0 to 8 inches: silt loam
E - 8 to 11 inches: fine sandy loam
B/E - 11 to 15 inches: fine sandy loam
Bt1 - 15 to 23 inches: fine sandy loam
Bt2 - 23 to 42 inches: fine sandy loam
BCd - 42 to 79 inches: fine sandy loam

Properties and qualities

Slope: 1 to 4 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: 31 to 52 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: B/D
Forage suitability group: Level Swale, Acid (G090XN005MN)
Other vegetative classification: Level Swale, Acid (G090XN005MN)
Hydric soil rating: No

Description of Ronneby, Stony

Setting

Landform: Moraines, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till

Typical profile

A - 0 to 10 inches: silt loam
E - 10 to 11 inches: fine sandy loam
B/E - 11 to 17 inches: fine sandy loam
Bt - 17 to 45 inches: fine sandy loam
BCd - 45 to 79 inches: fine sandy loam

Properties and qualities

Slope: 1 to 3 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: 31 to 54 inches to densic material
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 8 to 20 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Forage suitability group: Level Swale, Acid (G090XN005MN)
Other vegetative classification: Level Swale, Acid (G090XN005MN)
Hydric soil rating: No

Minor Components

Cebana, stony

Percent of map unit: 8 percent
Landform: Moraines, interdrumlins
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Other vegetative classification: Level Swale, Acid (G090XN005MN)
Hydric soil rating: Yes

Milaca, stony

Percent of map unit: 5 percent
Landform: Drumlins, moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Other vegetative classification: Sloping Upland, Acid (G090XN006MN)
Hydric soil rating: No

Giese, frequently ponded, stony

Percent of map unit: 2 percent
Landform: Interdrumlins, moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Other vegetative classification: Ponded If Not Drained (G090XN013MN)
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Aitkin County, Minnesota
Survey Area Data: Version 22, Sep 10, 2021

UNIVERSITY
OF MINNESOTA

Septic System Management Plan for Above Grade Systems

The goal of a septic system is to protect human health and the environment by properly treating wastewater before returning it to the environment. Your septic system is designed to kill harmful organisms and remove pollutants before the water is recycled back into our lakes, streams and groundwater.

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 maintainer or service provider. However, it is **YOUR** responsibility to make sure all tasks get accomplished in a timely manner.

The University of Minnesota's *Septic System Owner's Guide* contains additional tips and recommendations designed to extend the effective life of your system and save you money over time.

Proper septic system design, installation, operation and maintenance means safe and clean water!

Property Owner ED Hollen	Email
Property Address 29997 110th Place N Sturgeon Lake MN	Property ID 04-037200
System Designer Mike Parrott/ NES	Contact Info 218-600-8808
System Installer Sandberg Construction	Contact Info 218-485-4058
Service Provider/Maintainer	Contact Info
Permitting Authority Aitkin County MN	Contact Info 218-927-7325
Permit #	Date Inspected

Keep this Management Plan with your Septic System Owner's Guide. The Septic System Owner's Guide includes a folder to hold maintenance records including pumping, inspection and evaluation reports. Ask your septic professional to also:

- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product use, activities, or water-use appliances.

For a copy of the *Septic System Owner's Guide*, visit www.bookstores.umn.edu and search for the word "septic" or call 800-322-8642.

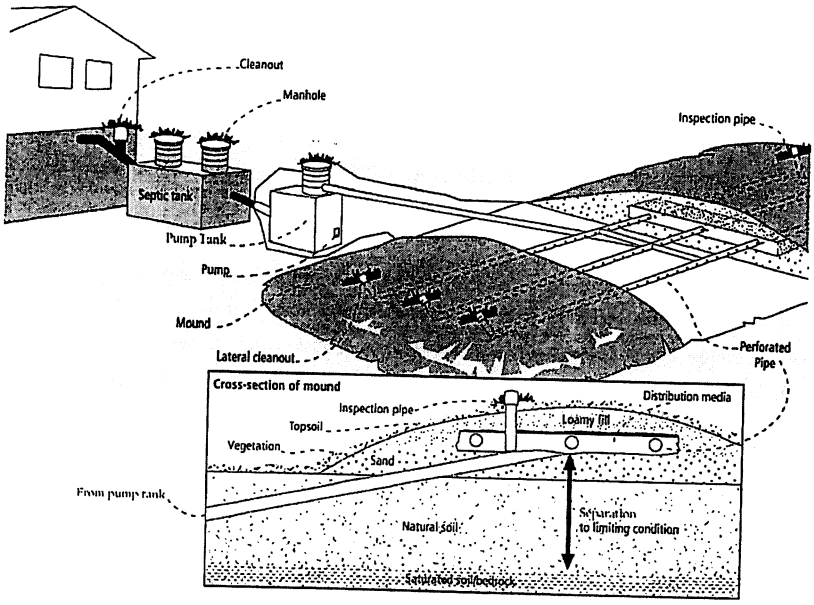
For more information see http://septic.umn.edu

Version: August 2015

UNIVERSITY OF MINNESOTA

Septic System Management Plan for Above Grade Systems

Your Septic System



Septic System Specifics

System Type: (●) I ( ) II ( ) III ( ) IV* ( ) V*

(Based on MN Rules Chapter 7080.2200 – 2400)

**Additional Management Plan required*

☐ System is subject to operating permit*

☐ System uses UV disinfection unit*

Type of advanced treatment unit _____

Dwelling Type

Number of bedrooms: 2

System capacity/ design flow (gpd): 300

Anticipated average daily flow (gpd): _____

Comments _____

Business? : (●) Y ( ) N What type? _____

Well Construction

Well depth (ft): <50

☐ Cased well Casing depth: <50

☐ Other (specify): _____

Distance from septic (ft): 118

Is the well on the design drawing? ( ) Y (●) N

Septic Tank

☐ First tank *Tank volume:* 1650 *gallons*

Does tank have two compartments? (●) Y ( ) N

☐ Second tank *Tank volume:* _____ *gallons*

☐ Tank is constructed of _____

☐ Effluent screen: (●) Y ( ) N Alarm (●) Y ( ) N

☐ Pump Tank 527 *gallons*

☐ Effluent Pump *make/model:* _____

Pump capacity 18 GPM

TDH 15.4 Feet of head

☐ Alarm location at pump

Soil Treatment Area (STA)

Mound/At-Grade area (width x length): 44 ft x 69 ft

Rock bed size (width x length): 10 ft x 25 ft

Location of additional STA: _____

Type of distribution media: rock

☑ Inspection ports ☑ Cleanouts

☐ Surface water diversions

☐ Additional STA not available

Homeowner Management Tasks

These op*eration and maintenance ac*tivities are your responsibility. *Chart on page 6 can help track your activities.*

Your toilet is not a garbage can. Do not flush anything besides human waste and toilet paper. No wet wipes, cigarette butts, disposal diapers, used medicine, feminine products or other trash!

The system and septic tanks needs to be checked every 36 months

Your service provider or pumper/maintainer should evaluate if your tank needs to be pumped more or less often.

Seasonally or several times per year

- *Leaks.* Check (listen, look) for leaks in toilets and dripping faucets. Repair leaks promptly.
- *Soil treatment area.* Regularly check for wet or spongy soil around your soil treatment area. If surfaced sewage or strong odors are not corrected by pumping the tank or fixing broken caps and leaks, call your service professional. *Untreated sewage may make humans and animals sick.* Keep bikes, snowmobiles and other traffic off and control borrowing animals.
- *Alarms.* Alarms signal when there is a problem; contact your service professional any time the alarm signals.
- *Lint filter.* If you have a lint filter, check for lint buildup and clean when necessary. If you do not have one, consider adding one after washing machine.
- *Effluent screen.* If you do not have one, consider having one installed the next time the tank is cleaned along with an alarm.

Annually

- *Water usage rate.* A water meter or another device can be used to monitor your average daily water use. Compare your water usage rate to the design flow of your system (listed on the next page). Contact your septic professional if your average daily flow over the course of a month exceeds 70% of the design flow for your system.
- *Caps.* Make sure that all caps and lids are intact and in place. Inspect for damaged caps at least every fall. Fix or replace damaged caps before winter to help prevent freezing issues.
- *Water conditioning devices.* See Page 5 for a list of devices. When possible, program the recharge frequency based on *water demand (gallons)* rather than *time (days).* Recharging too frequently may negatively impact your septic system. Consider updating to demand operation if your system currently uses time,
- *Review your water usage rate.* Review the Water Use Appliance chart on Page 5. Discuss any major changes with your service provider or pumper/maintainer.

During each visit by a service provider or pumper/maintainer

- Make sure that your service professional services the tank through the manhole. (NOT though a 4" or 6" diameter inspection port.)
- Ask how full your tank was with sludge and scum to determine if your service interval is appropriate.
- Ask your pumper/maintainer to accomplish the tasks listed on the Professional Tasks on Page 4.

Professional Management Tasks

These are the operation and maintenance activities that a pumper/maintainer performs to help ensure long-term performance of your system. At each visit a written report/record must be provided to homeowner.

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 soil treatment area.)
- *Inspection pipes.* Replace damaged or missing pipes and 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. Recommend retrofitted installation if one is not present.
- *Alarm.* Verify that the alarm works.
- *Scum and sludge.* Measure scum and sludge in each compartment of each septic and pump 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 draining properly.
- *Event counter or elapsed time meter.* Check to see if there is an event counter or elapsed time meter for the pump. If there is one or both, calculate the water usage rate and compare to the anticipated use listed on Design and Page 2. Dose Volume: 70 gallons: Pump run time: 4 Minutes

Soil Treatment Area

- *Inspection pipes.* Check to make sure they are properly capped. Replace caps and pipes that are damaged.
- *Surfacing of effluent.* Check for surfacing effluent or other signs of problems.
- *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean at recommended frequency.
- *Vegetation* - Check to see that a good growth of vegetation is covering the system.

All other components – evaluate as listed here:

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 liquid or easily biodegradable detergents. Limit use of bleach-based detergents and fabric softeners. • Install a lint filter after the washer and an effluent screen to your tank • Wash only full loads and think even – spread your laundry loads throughout the week.
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 directly out of the house. Do not route furnace discharge 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 not sewage and should not go into your septic system. • Reroute water from these sources to another outlet, such as a dry well, draintile 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 overload the system and is prohibited from entering septic system.	

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Septic System Management Plan for Above Grade Systems

Homeowner Maintenance Log

Track maintenance activities here for easy reference. See list of management tasks on pages 3 and 4.

Activity	Date accomplished									
Check frequently:										
Leaks: check for plumbing leaks*										
Soil treatment area check for surfacing**										
Lint filter: check, clean if needed*										
Effluent screen (if owner-maintained)***										
Alarm**										
Check annually:										
Water usage rate (maximum gpd ____)										
Caps: inspect, replace if needed										
Water use appliances – review use										
Other:										

*Monthly

**Quarterly

***Bi-Annually

Notes:

"As the owner of this SSTS, 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 this 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 _____

Management Plan Prepared By: Mike Parrott/ NES Certification # 1789

Permitting Authority: Aitkin County