Application for SSTS Permit

MILLE LACS COUNTY EST. 1857

INSTRUCTIONS

Before you apply for a SSTS Permit, all property taxes must be current. Please complete this application in full. Incomplete or incorrect applications will be returned to the applicant. The application and required submittal documents may be submitted in person or mailed to:

Mille Lacs County Environmental Resources
635 2nd Street SE
Milaca, MN 56353

APPLICANT INFORMATION

Name: MILLE BAND OF OJIBWE Contact Phone: _____

Mailing Address: 43408 Oodena Dr. Onamia Mn. 56359

E-mail Address: _____

Are you purchasing the property on a Contract for Deed? ☐ Y ☐ N

If yes, please have the Contract Holder sign here: _____

Are you an agent acting on behalf of the landowner? ☐ Y ☐ N

If yes, please have the landowner sign here: _____

SSTS PROFESSIONAL INFORMATION

Installer Name: _____ Installer Phone: _____

Installer Email Address: _____ Installer License #: _____

Designer Name: ENVIRONMENTAL SYSTEMS Designer Phone: 320-241-7036

Designer Email Address: ENVSYSTEMS@HOT Designer License #: 3945

PROPERTY INFORMATION

Property Owner: MILLE LACS BAND OF OJIBWE

Property Address: 12927 TWILIGHT DR. ONAMIA MN. Dwelling Type: HOME

Parcel ID Number: 17.007.0805 # Bedrooms: 3 Flow: 450

Is the property located within 1,000 feet of a lake or 300 feet of a river? ☑ Y ☐ N

Mille Lacs County Environmental Resources, 635 2nd Street SE, Milaca, MN 56353
320-983-8458 • www.millelacs.mn.gov ssts@millelacs.mn.gov

Application for SSTS Permit

MILLE LACS COUNTY EST 1857

SYSTEM INFORMATION

Installation Type:	☐ New ☑ Replacement ☐ Upgrade		
Septic Tank Capacity:	1600	Pump Tank Capacity:	1000
Sewage Pump:	☑ Yes ☐ No	Garbage Disposal:	☑ Yes ☑ No
Pressure Test:	☐ Yes ☑ No	Filter/Alarm:	☑ Yes ☑ No
Well Setback:	140'	Well Type:	☑ Deep ☐ Shallow
Building Setback:	122'	OHWM Setback:	290'
Property Line Setback:	108 NW 180 E 120 SE	Road Setback:	205
System Type:	☑ Type I ☐ Type II	☑ Type III ☐ Type IV	☑ Type V
Drainfield Type:	ROCKBED/MOUND	Drainfield Size (sq ft):	500
Restrictive Layer (in):	0	Sand Lift (in):	36
Well Setback:	148	Well Type:	☑ Deep ☑ Shallow
Building Setback:	107	OHWM Setback:	340
Property Line Setback:	130' E- 30'NW-126'SE	Road Setback:	255

APPLICATION SUBMITTAL REQUIREMENTS

Management Plan.

Soil Verification Form(s).

- Percolation test required if a soil pit is not utilized.

Site Map:

- Elevations of tanks and soil treatment system.
- Setbacks to buildings, property lines, water bodies, and wells.
- Soil borings and/or pits identified.
- Distance between tank and soil treatment system.

Type II Holding Tank Service Agreement, if applicable.

Type IV and V Operating Permit, as applicable.

Homeowner-Installed System Indemnification Agreement Form, as applicable.

Permit fee, based on system and/or permit type, payable by cash, check, or credit card:

- $250 Standard System
- $100 Tank Only
- $150 Holding Tank
- $50 System Repair
- $150 Soil Treatment System Only
- $1,200 - $1,500 Performance System (call office to determine permit cost)
- $1,750 – $2,000 Other Establishments 2,500-4,999 GPD & MSTS 5,000-10,000 GPD

MPCA Compliance Inspection Form for Existing SSTS, if reusing existing tank.

Mille Lacs County Environmental Resources, 635 2nd Street SE, Milaca, MN 56353
320-983-8458 • www.millelacs.mn.gov ssts@millelacs.mn.gov

Application for SSTS Permit

MILLE LACS COUNTY EST. 1857

TERMS AND CONDITIONS

The information in this application and submitted materials are true and correct to the best of my knowledge. I agree that all work will comply with all applicable federal and state regulations, the documents contained herein, and the Mille Lacs County Subsurface Sewage Treatment System Ordinance. I also agree to allow Mille Lacs County staff to enter the property during normal business hours to conduct tests and inspections as may be needed to process the application.

_____ _____

Signature of Applicant/Owner Date

I hereby certify that I am a currently licensed SSTS designer certified to design this system, that I have followed all requirements of state administrative rules and the Mille Lacs County Subsurface Sewage Treatment System Ordinance, and that the number of bedrooms identified is true and correct.

_____ 5-7-2021

Signature of Designer Date

OFFICE USE ONLY

Date Application Received: _____ Taxes Verified as Current: Y N

Building Permit #: _____ Any Violations on Property: Y N

Ownership Verified: Y N

Date Staff Approved Application as Complete: _____

- ☐ Ownership
- ☐ Setbacks
- ☐ Floodplain
- ☐ Wetlands
- ☐ Public Waters
- ☐ Soils Verified

Soil Verification Date: _____

Permit Approved Date: _____

Permit Number: _____

LSO Notification Date: _____

Reviewer Initials: _____

Notes:

_____

_____

_____

_____

Mille Lacs County Environmental Resources, 635 2nd Street SE, Milaca, MN 56353
320-983-8458 • www.millelacs.mn.gov ssts@millelacs.mn.gov

ENVIRONMENTAL SYSTEMS LLC.

2358 HWY# 23
MORA MN. 55051
Ph. 320-241-7036
05/07/2021

DESIGN

LOCATION: 12927 TWILIGHT RD. ONAMIA MN
PID# 17.007.0805

OWNER: MILLE LACS BAND OF OJIBWE

SYSTEM TYPE: TYPE III MOUND

DESIGN FLOW: 3 BEDROOM DESIGNED @ 450 GPD

TREATMENT AREA: 380 SQ.FT.

SLOPE: 0 %

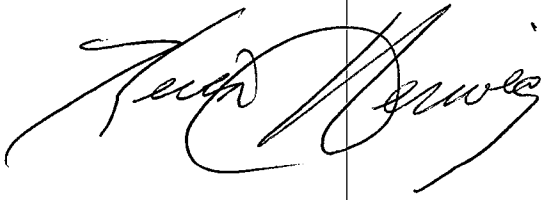
SEPTIC TANK: 1600 GAL. SPLIT/COMBO

PUMP TANK: 1000 GAL.

PUMP: GOULDS PE 51

FLOW METER: SEPTRONICS PMJ1B W/EVENT COUNTER

KEVIN HERWIG M.P.C.A. 3945



ENVIRONMENTAL SYSTEMS LLC.

DESIGN-INSPECTION

2358 HYY#23 MORA MN. 55051

Ph. 320-679-4031

CONSTRUCTION NOTES

PRODUCT BRAND & MODEL LISTED IN DESIGN MUST BE USED. (SEPTIC TANK – SPLIT SEPTIC 1600 GAL. CEMSTONE PRODUCT # 9551601, PUMP TANK -1000 GAL. CEMSTONE # 9551001 PUMP – GOULDS PE51 PUMP CHAMBER AND PUMP SETTINGS WILL NOT BE CORRECT IF OTHER PRODUCTS ARE USED.

CONTROL /FLOW METER / ALARM (SEPTRONIC WITH INDOOR ALARM) MODEL #PMJ1B WITH EVENT COUNTER

IT IS THE DESIGNERS DISCRETION TO APPROVE OR DISAPPROVE SUBSTITUTIONS.THE INSTALLER WILL BE RESPONSIBLE FOR DESIGN CHANGE FEE.

KEVIN HERWIG LIC # 3945

ONSITE SEWAGE TREATMENT PROGRAM

Preliminary Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

v 04.01.2021

1. Contact Information

Property Owner/Client: MILLE LACS BAND OF OJIBWE | Date Completed:

Site Address: 12927/12932 TWILIGHT RD. ONAMIA MN. | Project ID:

Email: | Phone:

Mailing Address: 43408 OoDENA DR. ONAMIA MN. | Alt Phone:

Legal Description:

Parcel ID: 17.007.0810/17.007.0805 | SEC: | TWP: | RNG:

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: 3 | 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: 450 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							
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)		Yes, source:	
Buried water supply pipes within 50 ft of proposed system (Y/N)	No		
B. Site located in a shoreland district/area?	Yes	Yes, name:	MILLE LACS
Elevation of ordinary high water level:	ft	Source:	
Classification:	Tank Setback: ft.	STA Setbk: ft.	
C. Site located in a floodplain?		Yes, Type(s):	
Floodplain designation/elevation (10 Year):	ft	Source:	
Floodplain designation/elevation (100 Year):	ft	Source:	

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: C41B Slope Range: 0-4 %

List landforms:

Landform position(s):

Parent materials:

Depth to Bedrock/Restrictive Feature: in Depth to Watertable: in

Map Unit Ratings

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

5. Local Government Unit Information

Name of LGU: MILLE LACS COUNTY

LGU Contact:

LGU-specific setbacks:

LGU-specific design requirements:

LGU-specific installation requirements:

Notes:

Field Evaluation Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

1. Project Information

v 04.01.2021

Property Owner/Client:	MILLE LACS BAND OF OJIBWE	Project ID:	
Site Address:	12927/12932 TWILIGHT RD. ONAMIA MN.	Date Completed:	5/7/2021

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):	Lawn	Landscape position:	
Percent slope:	0 %	Slope shape:	Slope direction:

Describe the flooding or run-on potential of site: NONE

Describe the need for Type III or Type IV system: DISTURBED/CUT SOIL

Note:

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

4. General Soils Information

Filled, Compacted, Disturbed areas (Y/N): Yes

If yes, describe: AREA HAS BEEN CUT DOWN TO SAND

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: 3 Soil observation logs attached (Y/N): Yes

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

5. Phase I. Reporting Information

	Depth		Elevation	
Limiting Condition*:		in	**95.3**	ft
Periodically saturated soil:		in	NA	ft
Standing water:		in	NA	ft
Bedrock:		in	MA	ft
Benchmark Elevation:	100.0	ft		

Most Restrictive Depth Identified from List Below

Soil Texture: Medium Loamy Sand

Percolation Rate: min/inch

Soil Hyd Loading Rate: 1.2 gpd/ft^2

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

Benchmark Elevation Location: TREE MARKER NW OF MOUND

Differences between soil survey and field evaluation: SOIL REMOVED TO SAND CUT/FILL

Site evaluation issues / comments:

Anticipated construction issues:

University of Minnesota Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.01.2021

Client:	MILLE LACS BAND OF OJIBWE	Location / Address:	12927/12932 TWILIGHT RD. ONAMIA MN.

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

Landscape Position: (select one)	Foot Slope	Slope %:	0	Slope shape	Elevation-relative to benchmark: 95.1
Vegetation:	Grass	Soil survey map units:	C41B		Limiting Layer Elevation:
Weather Conditions/Time of Day:	SUNNY	8AM		Date	05/07/21
Observation #/Location:	1	SW		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
0-3	Medium Loamy Sand	<35%	10YR 3/3				Granular	Weak	Friable
3-6	Medium Loamy Sand	<35%	10YR 4/4				Blocky	Weak	Friable
6-20	Medium Loamy Sand	<35%	10YR 4/4				Blocky	Structureless	Friable
20-30	Medium Loamy Sand	<35%	7.5YR 4/4				Single grain	Structureless	Loose

Comments

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

KEVIN HERWIG		3945	5/7/2021
(Designer/Inspector)	(Signature)	(License #)	(Date)

ONSITE SEWAGE TREATMENT PROGRAM

Soil Observation Log

Project ID:

v 04.01.2021

Client:	MILLE LACS BAND OF OJIBWE	Location / Address:	12927/12932 TWILIGHT RD. ONAMIA MN.

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

Landscape Position: (select one)	Foot Slope	Slope %:	0	Slope shape	Elevation-relative to benchmark: 95.1
Vegetation:	Grass	Soil survey map units:	C41B		Limiting Layer Elevation:
Weather Conditions/Time of Day:	SUNNY	8AM		Date	05/07/21
Observation #/Location:	2	NE		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
0-5	Medium Loamy Sand	<35%	10YR 3/3				Granular	Weak	Friable
5-20	Medium Loamy Sand	<35%	10YR 4/4				Blocky	Weak	Loose
20-30	Medium Loamy Sand	<35%	10YR 5/4				Single grain	Structureless	Loose

Comments

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

KEVIN HERWIG		3945	5/7/2021
(Designer/Inspector)	(Signature)	(License #)	(Date)

University of Manitoba
Onsite Sewage Treatment Program

Soil Observation Log

Project ID:

v 04.01.2021

Client:	MILLE LACS BAND OF OJIBWE	Location / Address:	12927/12932 TWILIGHT RD. ONAMIA MN.

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

Landscape Position: (select one)	Foot Slope	Slope %: 0	Slope shape	Elevation-relative to benchmark:	94.9
Vegetation:	Grass	Soil survey map units:	C43B	Limiting Layer Elevation:	
Weather Conditions/Time of Day:	SUNNY	8AM		Date	05/07/21
Observation #/Location:	3	SE		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
0-3	Medium Loamy Sand	<35%	10YR 3/3				Granular	Weak	Friable
3-20	Medium Loamy Sand	<35%	10YR 4/4				Blocky	Weak	Friable
20-34	Medium Loamy Sand	<35%	7.5YR 4/4				Single grain	Structureless	Loose

Comments

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

KEVIN HERWIG		3945	5/7/2021
(Designer/Inspector)	(Signature)	(License #)	(Date)

University of Minnesota Onsite Sewage Treatment Program

Design Summary Page

MINNESOTA POLLUTION CONTROL AGENCY

1. PROJECT INFORMATION

v 04.01.2021

Property Owner/Client:	MILLE LACS BAND OF OJIBWE	Project ID:	
Site Address:	12927/12932 TWILIGHT RD. ONAMIA MN.	Date:	05/07/21
Email Address:		Phone:	

2. DESIGN FLOW & WASTE STRENGTH

Attach data / estimate basis for Other Establishments

Design Flow: 450 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): 3

Code Minimum **Septic Tank** Capacity: 1500 Gallons in 2 Tanks or Compartments

Recommended **Septic Tank** Capacity: 1600 Gallons in 2 Tanks or Compartments

Effluent Screen & Alarm (Y/N): No Model/Type: CEMSTONE 9551601

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 2 Capacity (Minimum):	Gal
Pump Tank 1 Capacity (Recommended):	1070 Gal	Pump Tank 2 Capacity (Recommended):	Gal
Pump 1: 27.0 GPM Total Head	15.8 ft	Pump 2: GPM Total Head	ft
Supply Pipe Dia.: 2.00 in Dose Vol:	112.0 gal	Supply Pipe Dia.: Dose Vol:	Gal

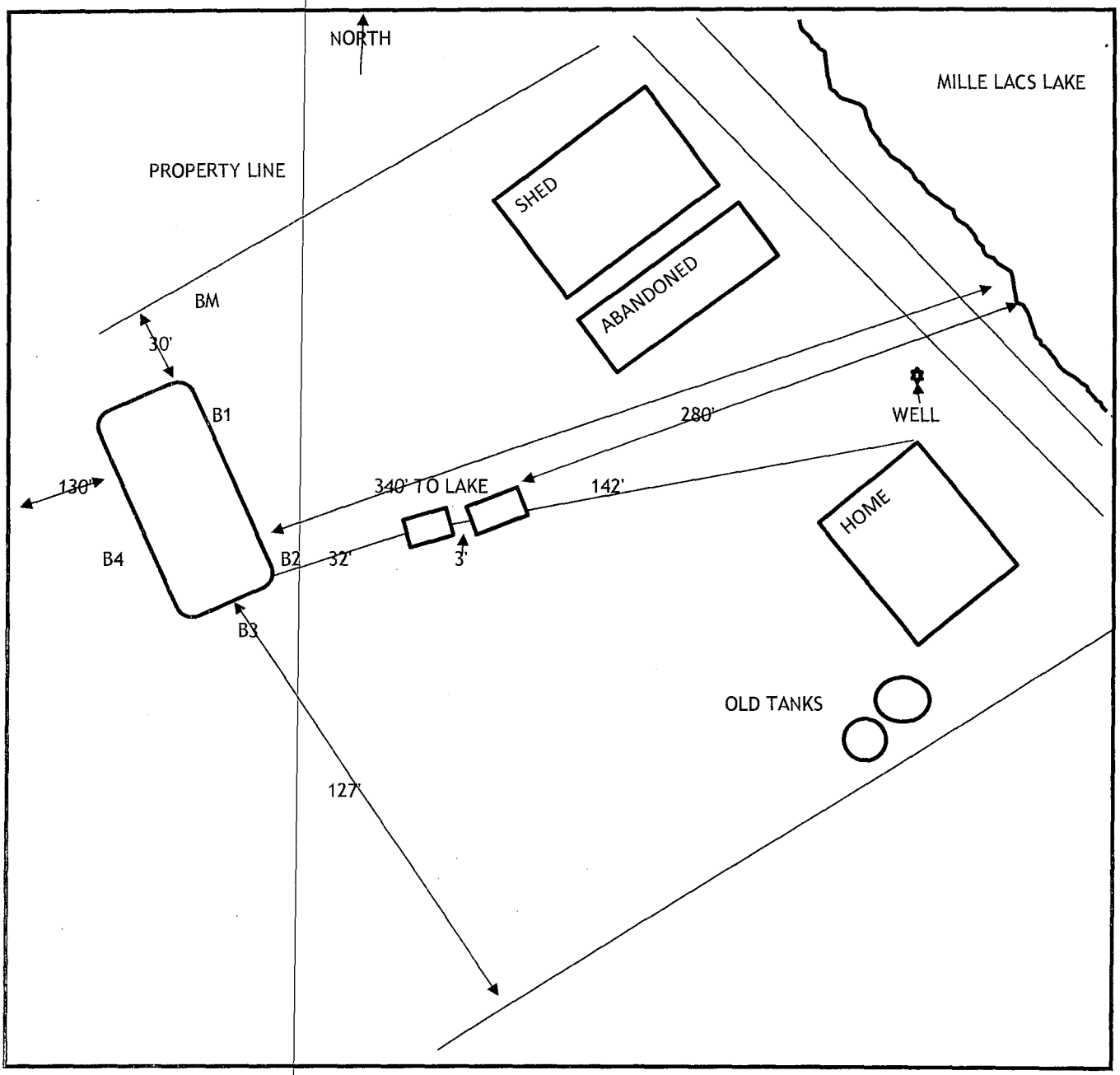
ONSITE SEWAGE TREATMENT PROGRAM

Proposed Design Map

MINNESOTA POLLUTION CONTROL AGENCY

Project ID: v 03.01.2021

Property Owner/Client: MILLE LACS BAND OF OJIBWE



Map scale: NONE ☒ Indicated north ☐ Show slope/contours

Elevations in feet Benchmark: 100 ft

System Corners:

NW:	95.3	ft
NE:	95.1	ft
SW:	95.3	ft
SE:	95.3	ft

Soil Borings:

#1:	95.1	ft
#2:	95.1	ft
#3:	94.9	ft

TANK INLET	92	ft
Other:		
TANK SURF.	94	ft
P-TANK SURF	93.5	ft

Date Completed: 5/7/2021

University of Minnesota 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:	100 ft	Benchmark Location:	TREE MARKER NW OF MOUND
MPCA System Type:	Type III	Distribution Media:	Rock
Type III/IV/V Details:	CUT/FILL SOIL		

7. SITE EVALUATION SUMMARY:

Describe Limiting Condition:

Layers with >35% Rock Fragments? (yes/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:	0	inches	0.0	ft	95.32	ft
Minimum Req'd Separation:	36	inches	3.0	ft		
					Elevation	
Code Max System Depth:	Mound	inches	-3.0	ft	98.32	ft

Critical for system compliance

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

Soil Texture:	Medium Loamy Sand		
Soil Hyd. Loading Rate:	1.20 GPD/ft^2	Percolation Rate:	MPI
Contour Loading Rate:	5	Note:	
Measured Land Slope:	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	Minimum 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	375.0 ft^2	Bed Length	37.5 ft	Bed Width	10.0 ft
Absorption Width	10.0 ft	Clean Sand Lift	3.0 ft	Berm Width (0-1%)	17.2 ft
Upslope Berm Width	17.2 ft	Downslope Berm	17.2 ft	Endslope Berm Width	17.2 ft
Total System Length	71.8 ft	System Width	44.3 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	2.00 in	Min Dose Volume	69 gal	Max Dose Volume	113 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 ÷ 1,000,00 = ____ 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 ÷ 1,000,00 = ____ 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.

KEVIN HERWIG		3945	5/7/2021
(Designer)	(Signature)	(License #)	(Date)

University of Minnesota Onsite Sewage Treatment Program

Mound Design Worksheet
<1% Slope

MINNESOTA POLLUTION CONTROL AGENCY

1. SYSTEM SIZING: Project ID: v 04.01.2021

A. Design Flow :	450	GPD
B. Soil Loading Rate:	1.20	GPD/ft^2
C. Depth to Limiting Condition:	0.0	ft
D. Percent Land Slope:	0.0	%
E. Design Media Loading Rate:	1.2	GPD/ft^2
F. Mound Absorption Ratio:	1.00	

Table I
MOUND CONTOUR LOADING RATES:

Measured Perc Rate	← OR →	Texture - derived mound absorption ratio	→	Contour Loading Rate:
≤ 60mpi		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/ft^2)	Mound Absorption Ratio	Absorption Area Loading Rate (gpd/ft^2)	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 (1.A) ÷ Design Media Loading Rate

450 GPD ÷ 1.2 GPD/ft^2 = 375 ft^2

If a larger dispersal media area is desired, enter size: _____ ft^2

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

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

10 ft^2 X 1.2 GPD/ft^2 = 12.0 gal/ft *Can not exceed Table 1*

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

375 ft^2 ÷ 10 ft = 37.5 ft

If a larger dispersal media Length is desired, enter size: _____ ft

3. ABSORPTION AREA SIZING

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

10.0 ft X 1.0 = 10.0 ft

B. For slopes from 0 to 1%, the Absorption Width is measured from the bed equally in both directions.

Absorption Width Beyond the Bed: Absorption Width - Bed Width ÷ 2

(10.0 ft - 10.0 ft) ÷ 2 = 0.0 ft

4. DISTRIBUTION MEDIA

Project ID:

Select Dispersal Media: Rock — Enter Either A. or B.

A. Rock Depth Below Distribution Pipe

6 in

B. Registered Media: 0

Registered Media Depth: in

Check registered product information for specific application details and design

Specific Media Comments:

6. MOUND SIZING

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

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

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

3.0 ft + 0.50 ft + 0.4 ft + 1.00 ft = 4.9 ft

C. Berm Width = Upslope Mound Height X 4 (4 is recommended, but could be 3-12)

4.9 ft X 3.5 ft = 17.2 ft

D. Total Landscape Width = Berm Width + Dispersal Bed Width + Berm Width

17.2 ft + 10.0 ft + 17.2 ft = 44.3 ft

E. Additional Berm Width necessary for absorption - Absorption Width - Total Landscape Width

10.0 ft - 44.3 ft = 0 ft if number is negative (<0), value is **ZERO**

F. Final Berm Width = Additional Berm Width + Berm Width

0 ft + 17.2 ft = 17.2 ft

G. Total Mound Width = Final Berm Width + Dispersal Bed Width + Final Berm Width

17.2 ft + 10.0 ft + 17.2 ft = 44.3 ft

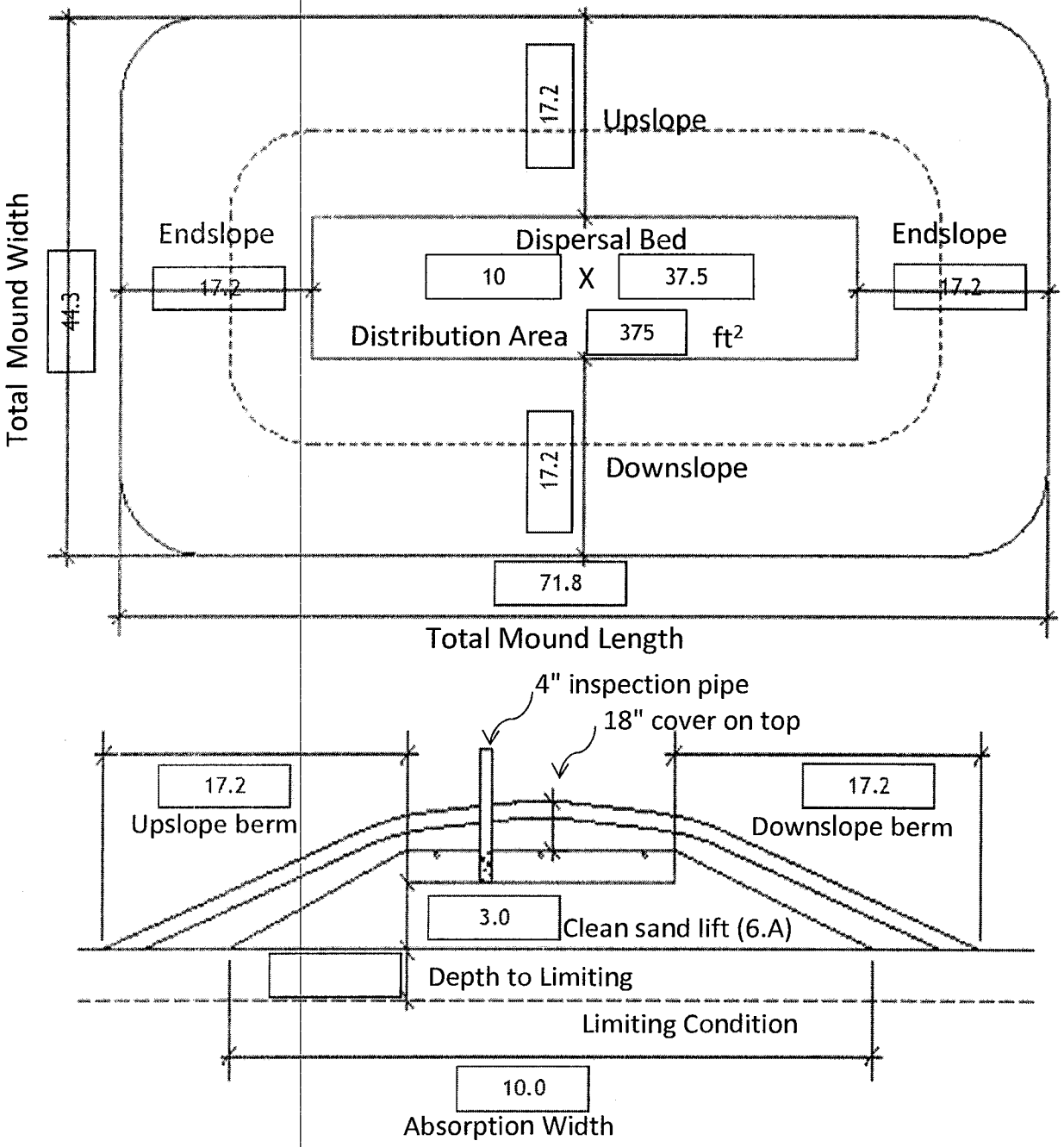
H. Total Mound Length = Final Berm Width + Dispersal Bed Length + Final Berm Width

17.2 ft + 37.5 ft + 17.2 ft = 71.8 ft

I. Setbacks from the Bed: Absorption Width - Dispersal Bed Width divided by 2

(10.0 ft - 10.0) / 2 = ft

7. MOUND DIMENSIONS (Feet) Project ID:



Required Separation	36 (in)	Distribution Media	Rock
Manifold Connection	End	Media Depth	6.0 (in)
Perforation Size:	1/4 (in)	Perforation Spacing:	36.0 (in)

If Split and Non-Level Pressure Distribution Used: See Non-Level Pressure Distribution Form

Comments:

University of Minnesota Onsite Sewage Treatment Program

Mound Materials Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

Project ID:

v 04.01.2021

A. Rock *Volume*: (Rock Below Pipe + Rock to cover pipe (*pipe outside dia + ~2 inch*)) X *Bed Length* X *Bed Width* = *Volume*

(6 in + 6.0 in) ÷ 12 X 37.5 ft X 10.0 ft = 375.0 ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards: 375.0 ft^3 ÷ 27 = 13.9 yd^3

Add 30% for constructability: 13.9 yd^3 X 1.3 = 18.1 yd^3

B. Calculate *Clean Sand Volume*:

Volume Under Rock bed: *Average Sand Depth* x *Media Width* x *Media Length* = cubic feet

3.0 ft X 10.0 ft X 37.5 ft = 1125 ft^3

For a Mound on a slope from 0-1%

Volume from Length = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Length)

4.90 ft - 1) X X 37.5 ft = 6.0

Volume from Width = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Width)

4.90 ft - 1) X X 10 ft = 6.0

Total Clean Sand Volume: *Volume from Length* + *Volume from Width* + *Volume Under Media*

6.0 ft^3 + 6.0 ft^3 + 1125.0 ft^3 = 1137.0 ft^3

For a Mound on a slope greater than 1%

Upslope Volume: ((*Upslope Mound Height - 1*) x 3 x *Bed Length*) ÷ 2 = cubic feet

((ft - 1) X 3.0 ft X) ÷ 2 = ft^3

Downslope Volume: ((*Downslope Height - 1*) x Downslope Absorption Width x *Media Length*) ÷ 2 = cubic feet

((ft - 1) X ft X) ÷ 2 = ft^3

Endslope Volume: (*Downslope Mound Height - 1*) x 3 x *Media Width* = cubic feet

(ft - 1) X 3.0 ft X ft = ft^3

Total Clean Sand Volume: *Upslope Volume* + *Downslope Volume* + *Endslope Volume* + *Volume Under Media*

ft^3 + ft^3 + ft^3 + ft^3 = ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards: 1137.0 ft^3 ÷ 27 = 42.1 yd^3

Add 30% for constructability: 42.1 yd^3 X 1.3 = 54.7 yd^3

C. Calculate *Sandy Berm Volume*:

Total Berm Volume (approx): ((Avg. Mound Height - 0.5 ft topsoil) x Mound Width x Mound Length) ÷ 2

(4.9 - 0.5)ft X 44.3 ft X 71.8) ÷ 2 = 6997.6 ft^3

Total Mound Volume - Clean Sand volume -Rock Volume = cubic feet

6997.6 ft^3 - 1137.0 ft^3 - 375.0 ft^3 = 5485.6 ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards: 5485.6 ft^3 ÷ 27 = 203.2 yd^3

Add 30% for constructability: 203.2 yd^3 x 1.3 = 264.1 yd^3

D. Calculate *Topsoil Material Volume: Total Mound Width X Total Mound Length X .5 ft*

44.3 ft X 71.8 ft X 0.5 ft = 1590.4 ft^3

Divide ft^3 by 27 ft^3/yd^3 to calculate cubic yards: 1590.4 ft^3 ÷ 27 = 58.9 yd^3

Add 30% for constructability: 58.9 yd^3 x 1.3 = 76.6 yd^3

Pressure Distribution Design Worksheet

Onsite Sewage Treatment Program

MINNESOTA POLLUTION CONTROL AGENCY

Project ID: v 04.01.2021

1. Media Bed Width: 10 ft

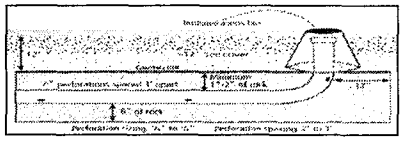
2. Minimum Number of Laterals in system/zone = Rounded up number of [(Media Bed Width - 4) ÷ 3] + 1.

[(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.

36.0 - 2ft = 34.0 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 = 34.0 ft ÷ 3.0 ft = 11 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 = 11 Spaces + 1 = 12 Perfs. Per Lateral

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
2	10	13	18	30	60
2½	8	12	16	28	54
3	8	12	16	25	52

7/32 Inch Perforations

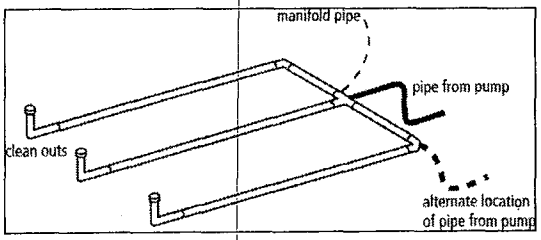
Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2	11	16	21	34	68
2½	10	14	20	32	64
3	9	14	19	30	60

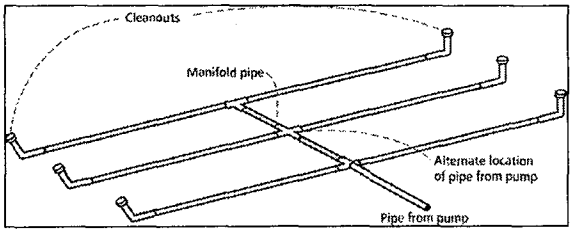
3/16 Inch Perforations

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	16	22	37	75

1/8 Inch Perforations

Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1¼	1½	2	3
2	21	33	44	74	149
2½	20	30	41	69	135
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.*

12 Perf. Per Lat. X 3 Number of Perf. Lat. = 36 Total Number of Perf.

10. Spacing of laterals; Must be greater than 1 foot and no more than 3 feet: 2.5 ft

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

12. *Select Lateral Diameter (See Table)*: 2.00 in

ONSITE SEWAGE TREATMENT PROGRAM

Pressure Distribution Design Worksheet

MINNESOTA POLLUTION CONTROL AGENCY

13. Calculate the *Square Feet per Perforation.*

Recommended volue is 4-11 ft2 per perforatian, Does not apply to At-Grades

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

10 ft X 36 ft = 360 ft^2

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

360 ft^2 ÷ 36 perf = 10.0 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.*

36 Perfs X 0.74 GPM per Perforation = 27 GPM

17. *Volume of Liquid Per Foot of Distribution Piping (Table II)*: 0.170 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 34 ft X 0.170 gal/ft = 17.3 Gallons

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

17.3 gals X 4 = 69.4 Gallons

Perforation Discharge (GPM)				
Head (ft)	Perforation Diameter			
	1/8	3/16	7/32	1/4
1.0[a]	0.18	0.41	0.56	0.74
1.5	0.22	0.51	0.69	0.9
2.0[b]	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[c]	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

Onsite Sewage Treatment Program

Minnesota Pollution Control Agency

1. PUMP CAPACITY | Project ID: | v 04.01.2021

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: 27.0 GPM

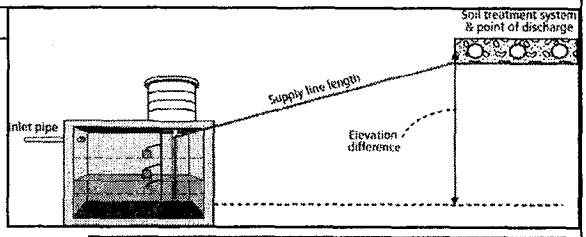
C. Enter pump description: Demand Dosing

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

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 32 ft

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

Friction Loss = 1.95 ft per 100ft of pipe

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

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*

32 ft X 1.25 = 40.0 ft

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

Supply Friction Loss =

1.95 ft per 100ft X 40.0 ft ÷ 100 = 0.8 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 + 0.8 ft = 15.8 ft

3. PUMP SELECTION

A pump must be selected to deliver at least **27.0** GPM with at least **15.8** feet of total head.

Comments:

Pump Tank Design Worksheet (Demand Dose)

MINNESOTA POLLUTION CONTROL AGENCY

DETERMINE TANK CAPACITY AND DIMENSIONS Project ID: v 04.01.2021

1. A. *Design Flow (Design Sum.1A)*: 450 GPD C. Tank Use: Dosing
   B. Min. required pump tank capacity: 500 Gal D. Recommended pump tank capacity: 1070 Gal

2. A. Tank Manufacturer: CEMSTONE B. Tank Model: 9551001
   C. Capacity from manufacturer: 1070 Gallons
   D. Gallons per inch from manufacturer: 32.0 Gallons per inch
   E. Liquid depth of tank from manufacturer: 32.0 inches

Note: Design calculations are based on this specific tank. Substituting a different tank model will change the pump float or timer settings. Contact designer if changes are necessary.

DETERMINE DOSING VOLUME

3 Calculate *Volume to Cover Pump* (The inlet of the pump must be at least 4-inches from the bottom of the pump tank & 2 inches of water covering the pump is recommended)

(Pump and block height + 2 inches) X *Gallons Per Inch*

(12 in + 2 inches) X 32.0 Gallons Per Inch = 448 Gallons

4 ***Minimum** Delivered Volume* = 4 X Volume of Distribution Piping:

-Item 18 of the Pressure Distribution or Item 11 of Non-level 69 **Gallons (Minimum dose)** 2.2 inches/dose

5 Calculate ***Maximum** Pumpout Volume* (25% of Design Flow)

Design Flow: 450 GPD X 0.25 = 113 **Gallons (Maximum dose)** 3.5 inches/dose

6 *Select a pumpout volume that meets both Minimum and Maximum:* 112 Gallons

7 Calculate *Doses Per Day* = Design Flow ÷ *Delivered Volume*

450 gpd ÷ 112 gal = 4.02 *Doses*

8 Calculate Drainback:

A. *Diameter of Supply Pipe* = 2 inches

B. Length of Supply Pipe = 32 feet

C. *Volume of Liquid Per Lineal Foot of Pipe* = 0.170 Gallons/ft

D. *Drainback = Length of Supply Pipe X Volume of Liquid Per Lineal Foot of Pipe*

32 ft X 0.170 gal/ft = 5.4 Gallons

9. *Total Dosing Volume = Delivered Volume* plus *Drainback*

112 gal + 5.4 gal = 117 Gallons

10. Minimum Alarm Volume = Depth of alarm (2 or 3 inches) X gallons per inch of tank

2 in X 32.0 gal/in = 64.0 Gallons

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

DEMAND DOSE FLOAT SETTINGS

11. Calculate *Float Separation Distance* using *Dosing Volume*.

Total Dosing Volume /Gallons Per Inch

117 gal ÷ 32.0 gal/in = 3.7 Inches

12. Measuring from bottom of tank:

A. *Distance to set Pump Off Float* = Pump + block height + 2 inches

12 in + 2 in = 14 Inches

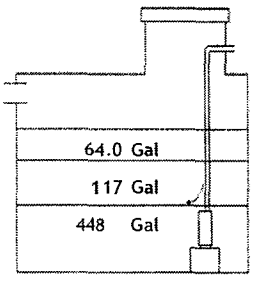
B. *Distance to set Pump On Float=Distance to Set Pump-Off Float + Float Separation Distance*

14 in + 3.7 in = 18 Inches

C. *Distance to set Alarm Float = Distance to set Pump-On Float + Alarm Depth* (2-3 inches)

18 in + 2.0 in = 20 Inches

Inches for Dose: 3.7 in
Alarm Depth 19.7 in
Pump On 17.7 in
Pump Off 14.0 in



Owners Septic System Management Plan

Date: 5/7/2021

Property Address: 12927 TWILIGHT RD ONAMIA MN

Septic Systems can be an expensive investment, good maintenance will ensure they last a lifetime. The purpose of a septic system is to properly "decompose" the pollutants before the water is recycled back into the groundwater. If you're not taking this seriously, ask yourself where your well water comes from.

Your septic design lists all the components of your system and their location. Keep the design, this management plan and the UofM "Septic System Owners Guide" in a safe place for future reference. For a copy of the Owners guide call the University of MN at 1-800-876-8636.

Some of the following tasks you can do yourself, some require a professional, but is it YOUR responsibility to see that it gets done.

Homeowner Tasks

- Do your best to conserve water. Don't overload your septic with multiple large water uses at the same time or on the same day.
- Fix household leaks promptly (leaky toilet, dripping faucets).
- Limit bleach and anti-bacterial products. Use Biodegradable dishwasher detergent.
- Consider a lint filter on your clothes washer.
- Regularly check for wet or spongy soil around your drainfield.
- Have a septic professional check your tanks every 3 years to determine if they need pumping.
- If you have a septic tank filter (effluent filter) clean it on a regular basis (or have a professional do it).
- If a septic alarm goes off, call your septic professional to diagnose the problem.
- Notify the County/City/Township when this management plan is not being met.
- Be aware of and protect your secondary drainfield site.

Professional Tasks

- Disclose the location of the secondary drainfield (if applicable).
- Respond to alarms and diagnose problems as needed.
- Review water use with the owner, check for a "soggy" drainfield.
- Pump the septic tanks as needed and ensure they are in proper working order.
- Verify the pump, dose amount, HI Level Alarm & drainback are all working properly.

"As the owner, I understand it is my responsibility to properly operate and maintain this septic system".

Property Owner Signature: _____ **Date** _____

MITIGATION ACTION PLAN

SEPTIC SYSTEM CLASSIFIED AS TYPE III

Should the system failed a new site for the septic system may be considered or the owner agrees to repair the septic system if it is possible If the septic system is not repairable the homeowner agrees to disconnect the septic tanks from the septic system and use and maintain the septic tanks as holding tanks.

Mille Lacs County and Kevin Herwig are to be notified as soon as possible about any operational problems. If a failure occurs the septic pump must be disconnected immediately and remain disconnected until any and all repairs are completed. A pumping contract will need to be set up with a septic maintenance contractor. A copy of all documents must be submitted to the county.

The system must be monitored for a minimum of three years. The mound system is to be inspected by the homeowner for leaks or saturated areas. Inspections are to be done every month for 36 months. Any leaks or failures in system must be reported to the county within 24 hours.

Type III systems are not warranted by the Designer, Installer, or the Local Unit of Government

Any and all expenses for inspections, maintenance, repair, or replacement are the homeowner's responsibility.

I _____, property owner of 12927 Twilight Rd. Onamia Mn.

Hereby agree that as long as I am the owner of the property, to accept all legal and financial responsibility for future system repair and/or replacement expense in the event that failure of the system on the above referenced property occurs.

_____

Owner

_____

Date