

FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE 4-22-21, FIELD EVALUATION DATE 4-22-21
PROPERTY OWNER: Jim WALKER PHONE
ADDRESS: 53785 172ND PL CITY, STATE, ZIP: MCGREGOR MN
LEGAL DESCRIPTION: N 150 FT OF S 820 FT OF LOT 1 LESS E 60' + PT LOT 1 IN DOC
PIN# 32-0-044401 SEC 26 T 50 R 23 TWP NAME TURNER 458774
FIRE# LAKE/RIVER GLACIER LAKE LAKE CLASS OHWL FT.

DESCRIPTION OF SOIL TREATMENT AREAS

AREA #1 AREA #2 REFERENCE BM ELEV. 100 FT
DISTURBED AREAS YES NO YES NO REFERENCE BM DESCRIPTION
COMPACTED AREAS YES NO YES NO SIDEWALK IN FRONT
FLOODING YES NO YES NO OF CABIN
RUN ON POTENTIAL YES NO YES NO
SLOPE % 0
DIRECTION OF SLOPE 0
LANDSCAPE POSITION
VEGETATION TYPES GRASS

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1 15", 1A 18", 2, 2A

BOTTOM ELEVATION--FIRST TRENCH OR BOTTOM OF ROCK BED: #1 FT., #2 FT.

SOIL SIZING FACTOR: SITE # 11.27, SITE #2

CONSTRUCTION RELATED ISSUES: 3 BORM STANDARD MOUND

LIC# 127 SITE EVALUATOR SIGNATURE: Larry Liljequist

SITE EVALUATOR NAME: LARRY LILJEQUIST TELEPHONE# 218 820 8886

LUG REVIEW DATE

Comments:

SOIL BORING LOGS ON REVERSE SIDE

# SOILS CHARTS FOR BOTH PROPOSED AND ALTERNATE SITES

1 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-6	TOPSOIL	10YR 3/1
6-13	LOAM	10YR 4/3
13-15	LOAM	10YR 4/4 10YR 4/6

2 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-6	TOPSOIL	
6-15	SANDY LOAM	10YR 5/8
15-18	SANDY LOAM	10YR 5/8 5YR 4/6
18-24	LOAM	5YR 4/6

1 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR

2 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR

ADDITIONAL SOIL BORINGS MAY BE REQUIRED



# MOUND DESIGN WORK SHEET (For Flows up to 1200 gpd)

## A. Average Design FLOW

Estimated 450 gpd (see figure A-1)  
 or measured \_\_\_\_\_ x 1.5 (safety factor) = \_\_\_\_\_ gpd

A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	60%
3	450	300	218	of the
4	600	375	256	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	columns.

## B. SEPTIC TANK Capacity

1000 gallons (see figure C-1)

## C. SOILS (refer to site evaluation)

1. Depth to restricting layer = 1 feet
2. Depth of percolation tests = \_\_\_\_\_ feet
3. Texture LOAM  
 Percolation rate 16-30 mpi
4. Soil loading rate .60 gpd/sqft (see figure D-33)
5. Percent land slope 0 %

C-1: Septic Tank Capacities (in gallons)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
2 or less	750	1125	1500
3 or 4	1000	1500	2000
5 or 6	1500	2250	3000
7, 8 or 9	2000	3000	4000

## D. ROCK LAYER DIMENSIONS

1. Multiply average design flow (A) by 0.83 to obtain required rock layer area.

450 gpd x 0.83 sqft/gpd = 380 sqft

2. Determine rock layer width = 0.83 sqft/gpd x linear Loading Rate (LLR)

0.83 sqft/gpd x 12 gpd/sqft = 10 ft

3. Length of rock layer = area ÷ width =

380 sqft (D1) ÷ 10 ft (D2) = 38 ft

Mound LLR

< 120 MPI ≤ 12

≥ 120 MPI ≤ 6

## E. ROCK VOLUME

1. Multiply rock area (D1) by rock depth of 1 ft to get cubic feet of rock

380 sqft x 1 ft = 380 cuft

2. Divide cuft by 27 cuft/cuyd to get cubic yards

380 cuft ÷ 27 cuyd/cuft = 14 cuyd

3. Multiply cubic yards by 1.4 to get weight of rock in tons

14 cuyd x 1.4 ton/cuyd = 19.6 tons

## F. SEWAGE ABSORPTION WIDTH

Absorption width equals absorption ratio (See Figure D-33) times rock layer width (D2)

2 x 10 ft = 20 ft

D-33: Absorption Width Sizing Table

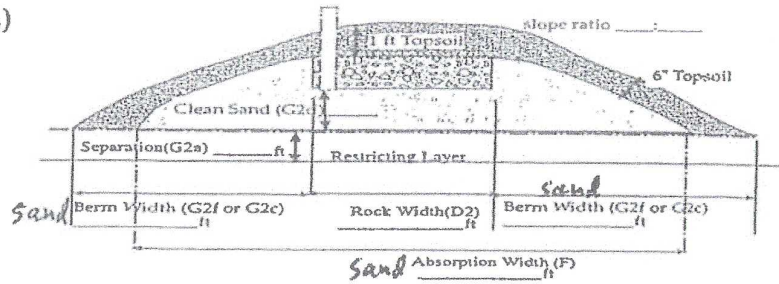
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand Medium Sand Loamy Sand Fine Sand	1.20	1.00
6 to 15	Sandy Loam	0.72	1.50
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam Silt	0.50	2.40
46 to 60	Sandy Clay Loam Silty Clay Loam Clay Loam	0.45	2.67
61 to 120	Silty Clay Sandy Clay Clay	0.24	5.00
Slower than 120*			

\*System designed for these soils must be other or performance

<=1% land slope

G. Mound Slope Width and Length  
(landslope less than or equal to 1%)

- 1. Absorption width (F) 20 ft
- 2. Calculate mound size



- a. Determine depth of clean sand fill at upslope edge of rock layer = 3 ft minus the distance to restricting layer (C1)

3 ft - 1 ft = 2 ft

- b. Mound height at the upslope edge of rock layer = depth of clean sand for separation (G2a) at upslope edge plus depth of rock layer (1 ft) plus depth of cover (1 ft)

2 ft + 1ft + 1ft = 4 ft

- c. Berm width = upslope mound height (G2b) times 4 (4 is recommended, but could be 3-12)

4 x 4 = 16 ft

- d. The total landscape width is the sum of berm (G2c) width plus rock layer width (D2) plus berm width (G2c): 16 ft + 10 ft + 16 ft = 42 ft

- e. Additional width necessary for absorption = absorption width (F) minus the landscape width (G2d)

\_\_\_\_\_ ft - \_\_\_\_\_ ft = \_\_\_\_\_ ft, if number is negative (<0) skip to g

- f. Final berm width = additional width (G2e) plus the berm width (G2c)

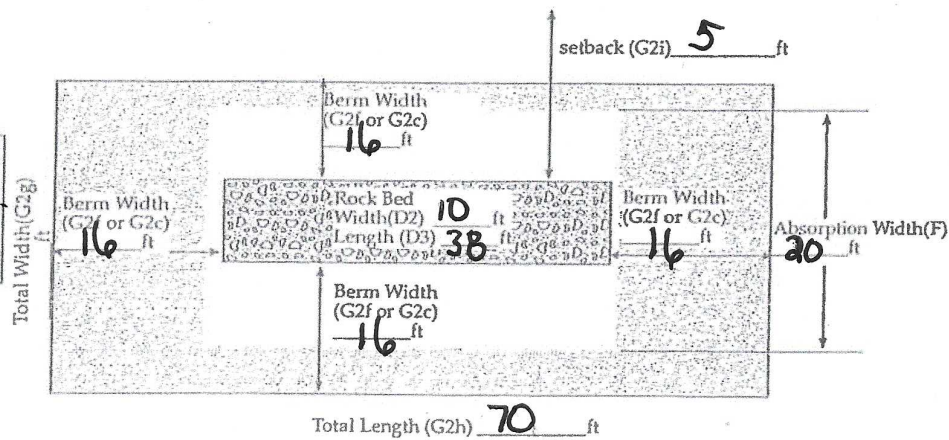
\_\_\_\_\_ ft + \_\_\_\_\_ ft = \_\_\_\_\_ ft

- g. Total mound width is the sum of berm width (G2f or G2c) plus rock layer width (D2) plus berm width (G2f or G2c): 16 ft + 10 ft + 16 ft = 42 ft

- h. Total mound length is the sum of berm (G2f or G2c) plus rock layer length (D3) plus berm (G2f or G2c): 16 ft + 38 ft + 16 ft = 70 ft

- i. Setbacks from the rockbed are calculated as follows: the absorption width (F) minus the rock bed width (D2) divided by 2: (20 ft - 10 ft) ÷ 2 = 5 ft

**Final Dimensions:**  
42 x 70



SANDBASE - 28 x 56

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

Larry Lyngard (signature) 127 (license #) 4-22-21 (date)

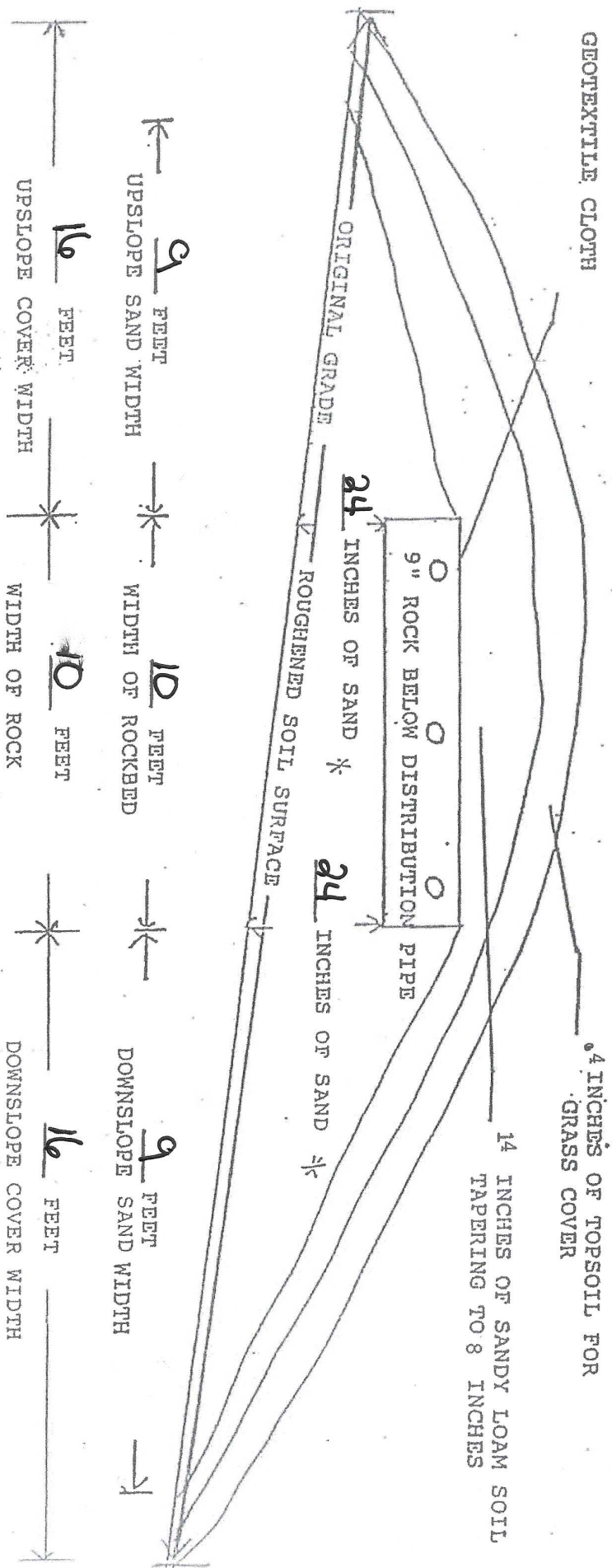


MOUND CROSS-SECTION

0 PERCENT SLOPE OF ORIGINAL SOIL

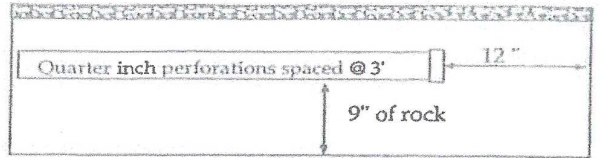
10 FT. x 38 FT. SIZE OF ROCKBED 28 FT. x 56 FT. SIZE OF SANDBASE

GEOTEXTILE CLOTH



# PRESSURE DISTRIBUTION SYSTEM

Geotextile fabric



Perf Sizing 3/16" - 1/4"  
Perf Spacing 1.5' - 5'

E-4: Maximum allowable number of 1/4-inch perforations per lateral to guarantee <10% discharge variation

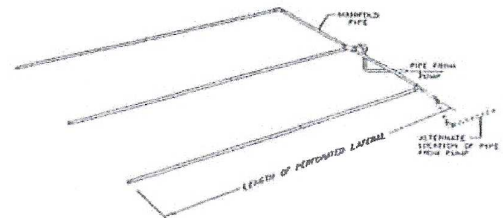
perforation spacing (feet)	1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	15	23
5.0	6	10	14	22

E-6: Perforation Discharge in gpm

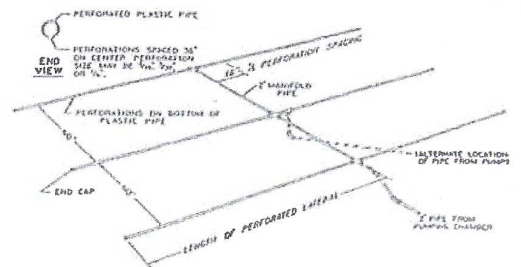
head (feet)	perforation diameter (Inches)			
	1/8	3/16	7/32	1/4
1.0 <sup>a</sup>	0.18	0.42	0.56	0.74
2.0 <sup>b</sup>	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

<sup>a</sup> Use 1.0 foot for single-family homes.  
<sup>b</sup> Use 2.0 feet for anything else.

MANIFOLD LOCATED AT END OF PRESSURE DISTRIBUTION SYSTEM



LAYOUT OF PERFORATED PIPE LATERALS FOR PRESSURE DISTRIBUTION IN MOUND



- Select number of perforated laterals 3
- Select perforation spacing = 3 ft
- Since perforations should not be placed closer than 1 foot to the edge of the rock layer (see diagram), subtract 2 feet from the rock layer length.

$$\frac{38}{\text{Rock layer length}} - 2 \text{ ft} = \underline{36} \text{ ft}$$

- Determine the number of spaces between perforations. Divide the length (3) by perforation spacing (2) and round down to nearest whole number.  
Perforation spacing = 36 ft ÷ 3 ft = 12 spaces
- Number of perforations is equal to one plus the number of perforation spaces(4). Check figure E-4 to assure the number of perforations per lateral guarantees <10% discharge variation.

$$\underline{12} \text{ spaces} + 1 = \underline{13} \text{ perforations/lateral}$$

- A. Total number of perforations = perforations per lateral (5) times number of laterals (1)

$$\underline{13} \text{ perfs/lat} \times \underline{3} \text{ lat} = \underline{39} \text{ perforations}$$

- B. Calculate the square footage per perforation. Should be 6-10 sqft/perf. Does not apply to at-grades.

Rock bed area = rock width (ft) x rock length (ft)

$$\underline{10} \text{ ft} \times \underline{38} \text{ ft} = \underline{380} \text{ sqft}$$

Square foot per perforation = Rock bed area ÷ number of perfs (6)

$$\underline{380} \text{ sqft} \div \underline{39} \text{ perfs} = \underline{9.74} \text{ sqft/perf}$$

- Determine required flow rate by multiplying the total number of perforations (6A) by flow per perforation (see figure E-6)

$$\underline{39} \text{ perfs} \times \underline{74} \text{ gpm/perfs} = \underline{29} \text{ gpm}$$

- If laterals are connected to header pipe as shown on upper example, to select minimum required lateral diameter; enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5) Select minimum diameter for perforated lateral = 1 1/4 inches.

- If perforated lateral system is attached to manifold pipe near the center, lower diagram, perforated lateral length (3) and number of perforations per lateral (5) will be approximately one half of that in step 8. Using these values, select minimum diameter for perforated lateral = \_\_\_\_\_ inches.

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

Larry Lyngard (signature)

(signature)

127

(license #)

4-22-21

(date)



# PUMP SELECTION PROCEDURE

## 1. Determine pump capacity:

### A. Gravity distribution

1. Minimum required discharge is 10 gpm
2. Maximum suggested discharge is 45 gpm. For other establishments at least 10% greater than the water supply rate, but no faster than the rate at which effluent will flow out of the distribution device.

### B. Pressure distribution

See pressure distribution work sheet

From A or B Selected pump capacity: 29 gpm

## 2. Determine pump head requirements:

### A. Elevation difference between pump and point of discharge?

7 feet

### B. Special head requirement? (See Figure at right - Special Head Requirements)

5 feet

### C. Calculate Friction loss

1. Select pipe diameter 2 in
2. Enter Figure E-9 with gpm (1A or B) and pipe diameter (C1).

Read friction loss in feet per 100 feet from Figure E-9

Friction Loss = 1.55 ft/100ft of pipe

3. Determine total pipe length from pump discharge to soil treatment discharge point. Estimate by adding 25 percent to pipe length for fitting loss. Total pipe length times 1.25 = equivalent pipe length

51 feet x 1.25 = 64 feet

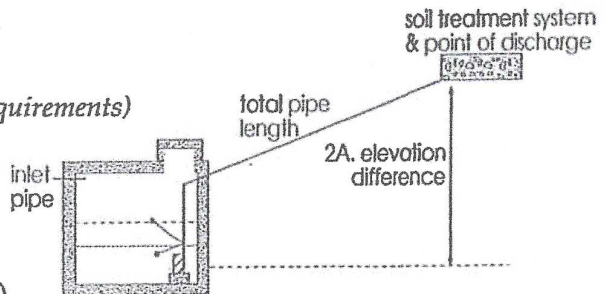
4. Calculate total friction loss by multiplying friction loss (C2) in ft/100 ft by the equivalent pipe length (C3) and divide by 100.

= 1.55 ft/100ft x 64 ÷ 100 = 1 ft

### D. Total head required is the sum of elevation difference (A), special head requirements (B), and total friction loss (C4)

7 ft + 5 ft + 1 ft =

Total head: 13 feet



Special Head Requirements	
Gravity Distribution	0 ft
Pressure Distribution	5 ft

E-9: Friction Loss in Plastic Pipe Per 100 feet			
flow rate gpm	nominal pipe diameter		
	1.5"	2"	3"
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	5.23	<u>1.55</u>	0.23
35	6.96	2.06	0.30
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55		4.76	0.70
60		5.60	0.82
65		6.48	0.95
70		7.44	1.09

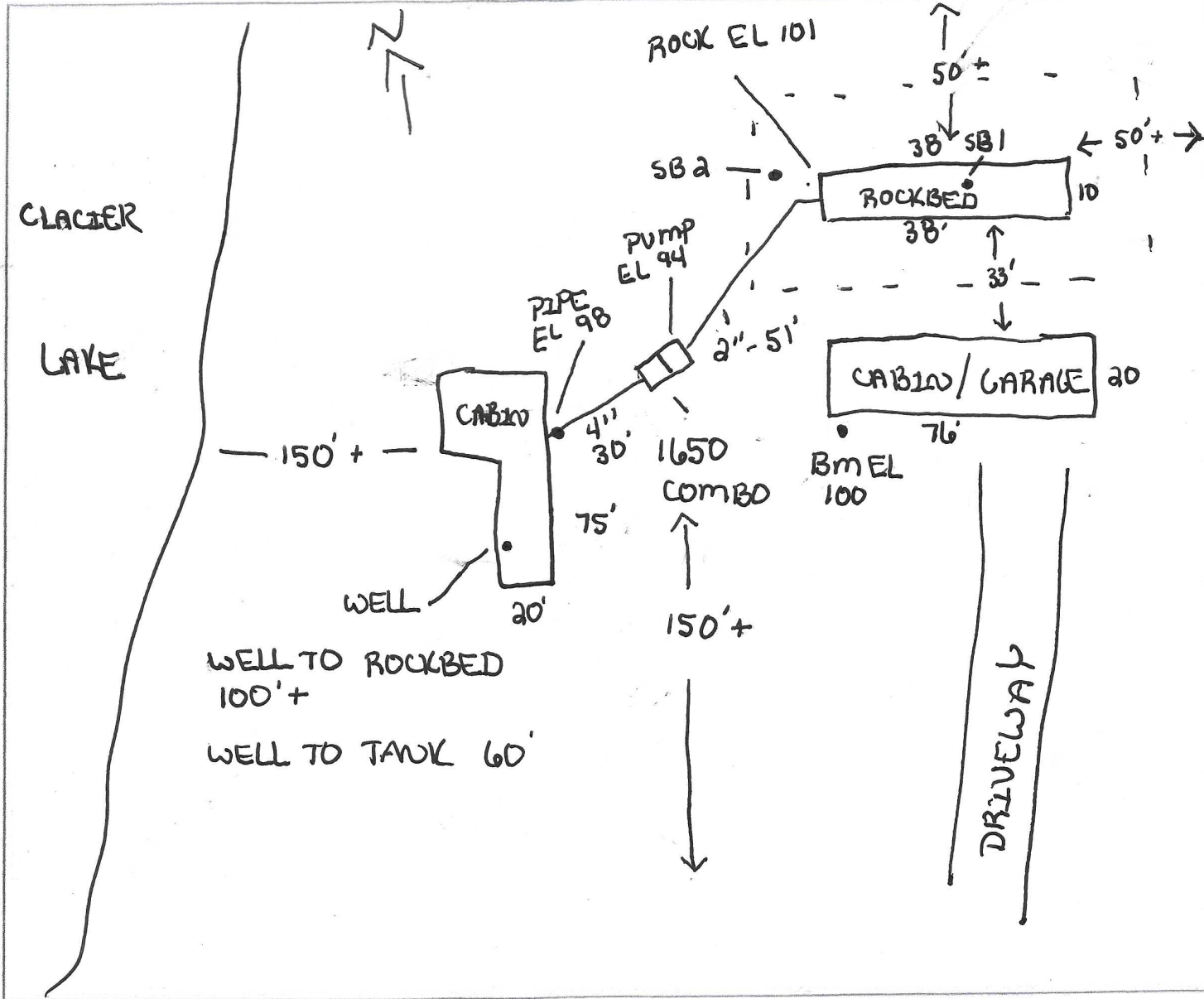
## 3. Pump selection

A pump must be selected to deliver at least 29 gpm (1A or B) with at least 13 feet of total head (2D)

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

Larry Lyman (signature) 127 (license #) 4-22-21 (date)

MAP DRAWN TO SCALE WITH A NORTH ARROW



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

SHOW EXISTING OR PROPOSED

- WATER WELLS WITHIN 100 FT OF TREATMENT AREAS
- PRESSURE WATER LINES WITHIN 10 FT OF TREATMENT AREAS
- STRUCTURES
- ALL SOIL TREATMENT AREAS
- HORIZONTAL AND VERTICAL REFERENCE
- POINT OF SOIL BORINGS
- LOT EASEMENTS
- DISTURBED/ COMPACTED AREAS
- SITE PROTECTION--LATHE AND RIBBON EVERY 15 FT
- ACCESS ROUTE FOR TANK MAINTENANCE

REQUIRED SETBACKS

- STRUCTURES
- OHWL
- LOT IMPROVEMENTS
- ALL ISTS COMPONENTS
- DIRECTION OF SLOPE
- ALL LOT DIMENSIONS
- PROPERTY LINES

COMMENTS:

INDICATE ELEVATIONS

- BENCHMARK 100
- ELEVATION OF SEWER LINE @ HOUSE 98
- ELEVATION @ TANK INLET 97.5
- ELEVATION @ BOTTOM OF ROCK LAYER 101
- ELEVATION @ BOTTOM OF BORING OR RESTRICTIVE LAYER
- ELEVATION OF PUMP 94
- ELEVATION OF DISTRIBUTION DEVICE 101

DESIGNER SIGNATURE Harry Dymond  
 LICENSE# 127

DATE 4-22-21



# Subsurface Sewage Treatment System Management Plan

Property Owner: JIM WALKER Phone: \_\_\_\_\_ Date: 4-22-21  
Mailing Address: \_\_\_\_\_ City: \_\_\_\_\_ Zip: \_\_\_\_\_  
Site Address: 53785 172<sup>ND</sup> PL City: ANDOVER Zip: \_\_\_\_\_

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

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

**My System needs to be checked  
every 36 months.**

## Homeowner Management Tasks:

*Leaks* – Check (look, listen) for leaks in toilets and dripping faucets. Repair leaks promptly.

*Surfacing sewage* – Regularly check for wet or spongy soil around your soil treatment area.

*Effluent filter* – *Inspect and clean twice a year or more.*

*Alarms* – Alarm signals when there is a problem. Contact a service or maintenance provider any time an alarm signals.

*Event counter or water meter* – Record your water use.

-recommend meter readings be conducted (circle one): DAILY WEEKLY MONTHLY N/A

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

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

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

Property Owner Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Designer Signature: Larry Lyngard Date: 4-22-21

See Reverse Side for Management Log







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Suitabilities and Limitations Ratings

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- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications
- Land Management
- Military Operations
- Recreational Development
- Sanitary Facilities**
- Aquifer Assessment (MN)
- Daily Cover for Landfill
- Sanitary Landfill (Area)
- Sanitary Landfill (Trench)
- Septage Application - Incorporation or Injection (MN)
- Septage Application - Surface (MN)
- Septic Tank Absorption Fields
- Septic Tank Absorption Fields -- At-Grade (MN)
- Septic Tank Absorption Fields -- Mound (MN)**

View Description | View Rating

View Options

Map

Table

Component Breakdown and Rating Reasons

Numeric Values

Description of Rating

Rating Options

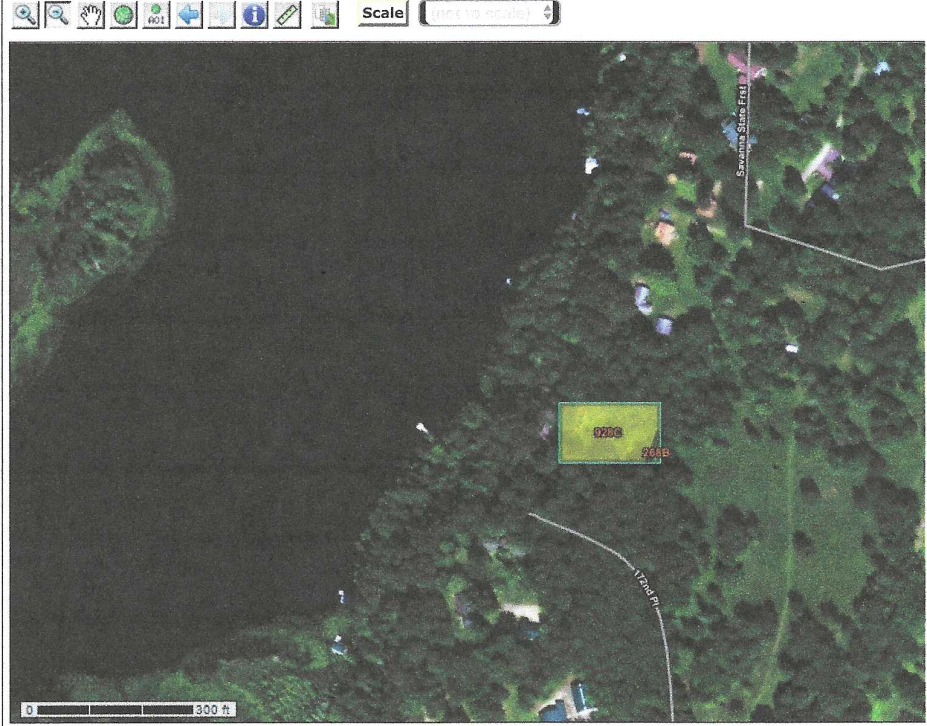
Detailed Description

Advanced Options

View Description | View Rating

- Septic Tank Absorption Fields -- Trench (MN)
- Sewage Lagoons
- Soil-Based Residential Wastewater Disposal Ratings (VT)
- Soil Health
- Vegetative Productivity
- Waste Management
- Water Management

Map -- Septic Tank Absorption Fields -- Mound (MN)



Warning: Soil Ratings Map may not be valid at this scale.

Tables -- Septic Tank Absorption Fields -- Mound (MN) -- Summary By Map Unit

Summary by Map Unit -- Aitkin County, Minnesota (MN001)

Summary by Map Unit -- Aitkin County, Minnesota (MN001)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
268B	Cromwell fine sandy loam, 1 to 6 percent slopes	Slightly limited	Cromwell (85%)	Slope (0.15)	0.0	3.3%
928C	Cushing-Mahtomedi complex, 2 to 10 percent slopes	Moderately limited	Cushing (50%) Mahtomedi (35%)	Slope (0.41) Slope (0.41)	0.5	96.7%
<b>Totals for Area of Interest</b>					<b>0.5</b>	<b>100.0%</b>

Table -- Septic Tank Absorption Fields -- Mound (MN) -- Summary by Rating Value

Summary by Rating Value

Summary by Rating Value

Rating	Acres in AOI	Percent of AOI
Moderately limited	0.5	96.7%
Slightly limited	0.0	3.3%





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AOI Inventory

Building Site Development

Construction Materials

Disaster Recovery Planning

Land Classifications

Land Management

Recreational Development

**Sanitary Facilities**

Aquifer Assessment (MN)

Landfills

Septage Application - Incorporation or Injection (MN)

[View Description](#) [View Soil Report](#)

**Options**

Include minor soils?

[View Description](#) [View Soil Report](#)

Septage Application - Surface (MN)

Septic Tank Absorption Fields (MN)

Soil Chemical Properties

Soil Erosion

Soil Health

Soil Physical Properties

Soil Qualities and Features

Vegetative Productivity

Waste Management

Water Features

Water Management

Soil Map

Warning: Soil Map may not be valid at this scale.

**Report -- Septage Application - Incorporation or Injection (MN)**

Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. The table shows only the five most limiting features for any given soil. The soil may have additional limitations.

Aitkin County, Minnesota

Map symbol and soil name	Pct. of map unit	Septage application - incorporation or injection	
		Rating class and limiting features	Value
268B—Cromwell fine sandy loam, 1 to 6 percent slopes			
Cromwell	85	Very limited	
		Surface texture	1.00
928C—Cushing-Mahtomedi complex, 2 to 10 percent slopes			
Cushing	50	Limited	
		Slope	0.18
Mahtomedi	35	Very limited	
		Surface texture	1.00