

FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE 10-1-20, FIELD EVALUATION DATE 9-1-20
PROPERTY OWNER: STAN & JUDY CARLSON PHONE
ADDRESS: 28555 303 RD PL CITY, STATE, ZIP: AITKIN MN 56431
LEGAL DESCRIPTION:
PIN# 09-0-064002 SEC 34 T 46 R 25 TWP NAME GLEN
FIRE# LAKE/RIVER LAKE CLASS OHWL F

DESCRIPTION OF SOIL TREATMENT AREAS

AREA #1 AREA #2 REFERENCE BM ELEV. 100 F
DISTURBED AREAS YES NO YES NO REFERENCE BM DESCRIPTION
COMPACTED AREAS YES NO YES NO LROUND LEVEL NE
FLOODING YES NO YES NO CORNER OF CABIN
RUN ON POTENTIAL YES NO YES NO
SLOPE % 0
DIRECTION OF SLOPE -
LANDSCAPE POSITION
VEGETATION TYPES WOODED

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1 6'+, 1A 6'+, 2 6'+, 2A

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

SOIL SIZING FACTOR: SITE #1 1.27, SITE #2 1.27

CONSTRUCTION RELATED ISSUES: PRESSURE BED / 1650 COMBO TANK
9" OF ROCK UNDER PIPE

LIC# 127 SITE EVALUATOR SIGNATURE: Larry Liljenquist

SITE EVALUATOR NAME: LARRY LILJENQUIST TELEPHONE# 218 826 8886

LUG REVIEW DATE

Comments:

SOIL BORING LOGS ON REVERSE SIDE

PRESSURE DISTRIBUTION SYSTEM

Geotextile fabric

- Select number of perforated laterals 3
- Select perforation spacing = 13 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.

$$\frac{39}{\text{Rock layer length}} - 2 \text{ ft} = 37 \text{ ft}$$

- Determine the number of spaces between perforations. Divide the length (3) by perforation spacing (2) and round down to nearest whole number.
Perforation spacing = 37 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.
12 spaces + 1 = 13 perforations/lateral

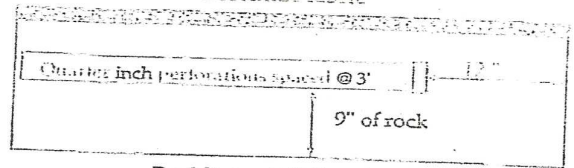
- A. Total number of perforations = perforations per lateral (5) times number of laterals (1)
13 perms/lat x 3 lat = 39 perforations

- 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)
10 ft x 39 ft = 390 sqft
Square foot per perforation = Rock bed area ÷ number of perms (6)
390 sqft ÷ 39 perms = 10 sqft/perf

- Determine required flow rate by multiplying the total number of perforations (6A) by flow per perforation (see figure E-6)
39 perms x .74 gpm/perfs = 29 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 = 1.25 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.



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

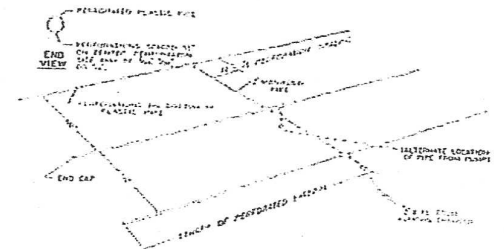
perforation spacing (feet)	1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	15	23
5.0	6	10	14	22

E-6: Perforation Discharge in gpm

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

^a Use 1.0 foot for single-family homes.
^b Use 2.0 feet for anything else.

MANIFOLD LOCATED AT END OF PRESSURE DISTRIBUTION SYSTEM



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

Larry Julmguid (Signature)

(Signature)

127

(license #)

10-1-20

(date)

TRENCH AND BED WORKSHEET

1. AVERAGE DESIGN FLOW

- A. Estimated 300 gpd (see figure A-1)
 or measured x 1.5 (safety factor) = gpd
- B. Septic tank capacity 1000 gal (see figure C-1)

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.

2. SOILS (Site evaluation data)

- C. Depth to restricting layer = 6 ft
- D. Max depth of system Item 2C - 3 ft = 6 ft - 3 ft = 3 ft
- E. Texture SANDY LOAM Percolation rate 6-15 MPI
- F. Soil Sizing Factor (SSF) 1.27 sqft/gpd (see figure D-15)
- G. % Land Slope 0 %

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

3. TRENCH or BED BOTTOM AREA

- H. For trenches with 6 inches of rock below the pipe:
 $A \times F = \text{ } \text{ gpd} \times \text{ } \text{ sqft/gpd} = \text{ } \text{ sqft}$
- I. For trenches with 12 inches of rock below the pipe:
 $A \times F \times 0.8 = \text{ } \text{ gpd} \times \text{ } \text{ sqft/gpd} \times 0.8 = \text{ } \text{ sqft}$
- J. For trenches with 18 inches of rock below the pipe:
 $A \times F \times 0.66 = \text{ } \text{ gpd} \times \text{ } \text{ sqft/gpd} \times 0.66 = \text{ } \text{ sqft}$
- K. For trenches with 24 inches of rock below the pipe:
 $A \times F \times 0.6 = \text{ } \text{ gpd} \times \text{ } \text{ sqft/gpd} \times 0.6 = \text{ } \text{ sqft}$
- L. For gravity beds with 6 or 12 inches of rock below the pipe:
 $1.5 \times A \times F = 1.5 \times \text{ } \text{ gpd} \times \text{ } \text{ sqft/gpd} = \text{ } \text{ sqft}$
 For pressure beds with 6 or 12 inches of rock below the pipe:
 $A \times F = \text{300} \text{ gpd} \times \text{1.27} \text{ sqft/gpd} = \text{381} \text{ sqft}$

Percolation Rate (minutes per inch (mpi))	Soil Texture	Soil Sizing Factor square feet/gallon per day (sqft/gpd)
faster than 0.1*	Coarse sand	0.83
0.1 to 5*	Medium sand	0.83
	Loamy sand	
0.1 to 5**	Fine sand	1.67
6 to 15	Sandy loam	1.27
16 to 30	Loam	1.67
31 to 45	Silt loam	2.00
	Silt	
46 to 60	Clay loam	2.20
	Sandy clay	
	Silty clay	
over 61 to 120***	Clay	4.20
	Sandy clay	
	Silty clay	
slower than 120****		

*Use systems for rapidly permeable soils; pressure distribution or septic distribution with no trench > 25% of the total system.
 **Soil having 50% or more fine sand plus very fine sand
 ***A mound must be used.
 ****An other or performance system must be used

4. DISTRIBUTION (Check all that apply)

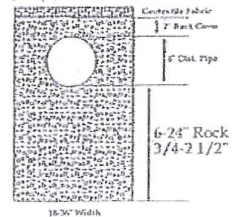
- Bed (< 6% slope) Drop boxes (any slope) Rock
- Trenches Distribution box (< 3%) Chamber
- Pressure Gravity Gravelless

5. SYSTEM WIDTH, LENGTH and VOLUME

- M. Select trench width = 10 ft
- N. If using rock, divide bottom area by width: $(H, I, J, K \text{ or } L) \div M =$
 $\text{381} \text{ sqft} \div \text{10 ft} = \text{38.1} \text{ lineal feet}$
 Rock depth below distribution pipe plus 0.5 foot times bottom area:
 Rock depth in feet + 0.5 feet x Area (H, I, J, K, or L)
 $(.5 \text{ ft} + 0.5 \text{ ft}) \times \text{38.1} \text{ sqft} = \text{38.1} \text{ cuft}$
 Volume in cubic yards = cuft $\div 27$
 $\text{38.1} \text{ cuft} \div 27 = \text{1.4} \text{ cu yds}$
 Weight of rock in tons = cubic yds x 1.4
 $\text{1.4} \text{ cu yds} \times 1.4 = \text{19.6} \text{ tons}$
- O. If using 10" Gravelless Pipe, Flow (A) x Gravelless SSF (see figure D-9)
 $\text{ } \text{ gpd} \times \text{ } \text{ lineal feet/gpd} = \text{ } \text{ lineal feet}$
- P. If using Chambers, H, I, J, or K (based on height of chamber slats) \div
 width of chamber in feet (M)
 $\text{ } \text{ sqft} \div \text{ } \text{ ft} = \text{ } \text{ lineal ft}$

percolation rate (minutes/inch)	soil texture	lineal feet/gallon/day
Faster than 0.1*	Coarse Sand	---
0.1 to 5*	Medium Sand	0.28
	Loamy Sand	
0.1 to 5**	Fine Sand**	0.6
6 to 15	Sandy Loam	0.42
16 to 30	Loam	0.56
31 to 45	Silt loam	0.67
	Silt	
46 to 60	Clay Loam (CL)	0.74
	Sandy CL	
	Silty CL	
slower than 60***	Clay	---
	Sandy Clay	
	Silty Clay	

*Soil too coarse for sewage treatment.
 Use systems for rapidly permeable soils.
 **Soil having 50% or more fine sand + very fine sand.
 ***Soil with too high a percentage of clay for installation of a standard in-ground system.



6. LAWN AREA

- Q. Select trench spacing, center to center = feet
- R. Multiply trench spacing by lineal feet R x Q = sqft of lawn area
 $\text{10} \text{ ft} \times \text{38.1} \text{ ft} = \text{381} \text{ sqft}$

7. Include a drawing with scale (one inch = ft). Show pertinent boundaries, right of way, easements, location of house, garage, driveway, all other improvements, existing or proposed soil treatment system, well and dimensions of all elevations, setbacks and separation distances.

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

Larry Lyngstad (signature) 127 (license #) 10-1-20 (date)

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?

12 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

115 feet x 1.25 = 144 feet

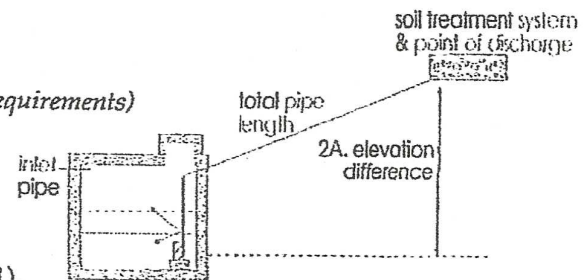
4. Calculate total friction loss by multiplying friction loss (C2) in ft/100 ft by the equivalent pipe length (C3) and divide by 100.

= 1.55 ft/100ft x 144 ÷ 100 = 2.25 ft

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

12 ft + 5 ft + 2.25 ft =

Total head: 19.25 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

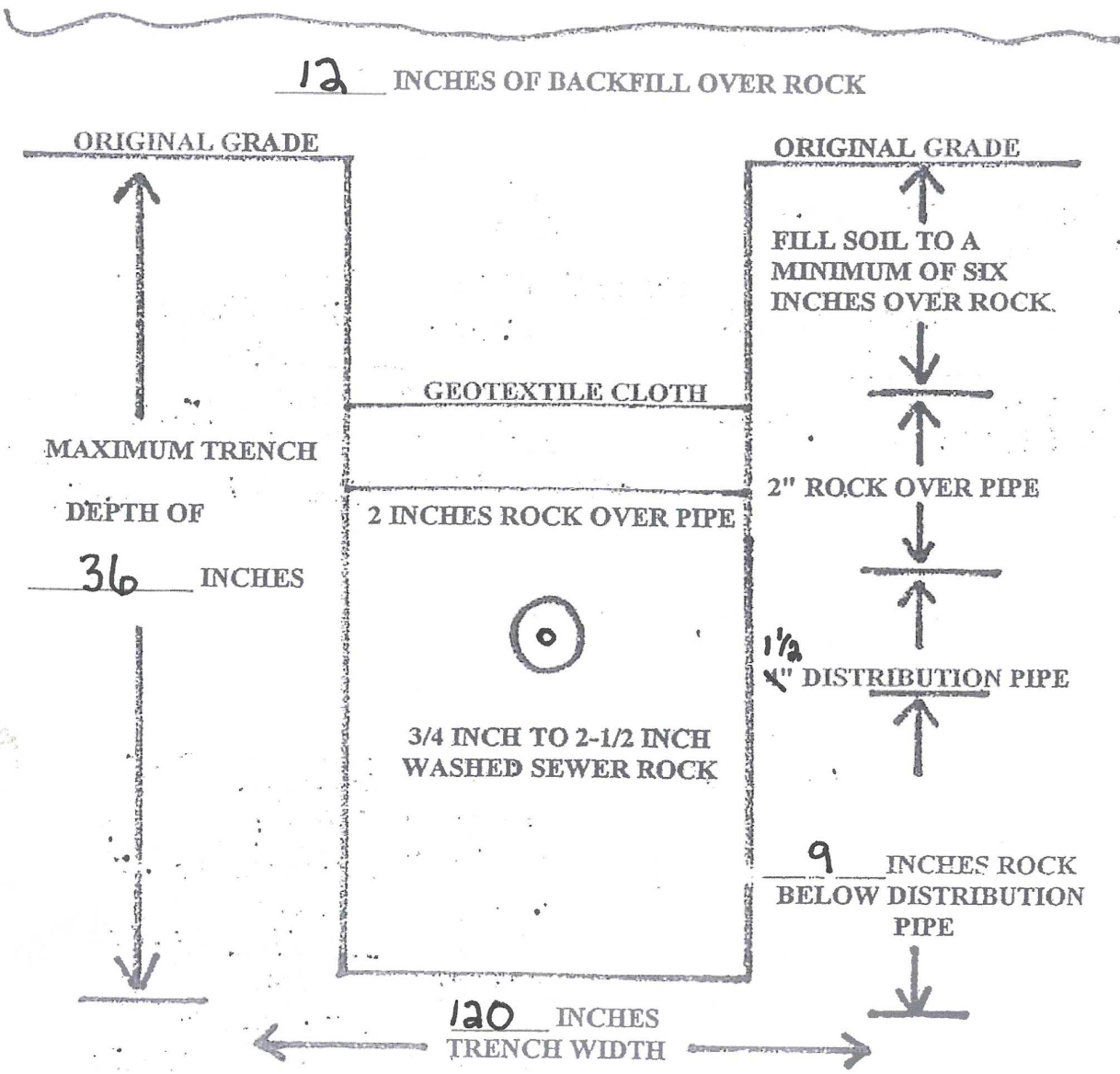
A pump must be selected to deliver at least 29 gpm (1A or B) with at least 19.25 feet of total head (2D)

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

Larry Lynguid (signature) 127 (license #) 10-1-20 (date)

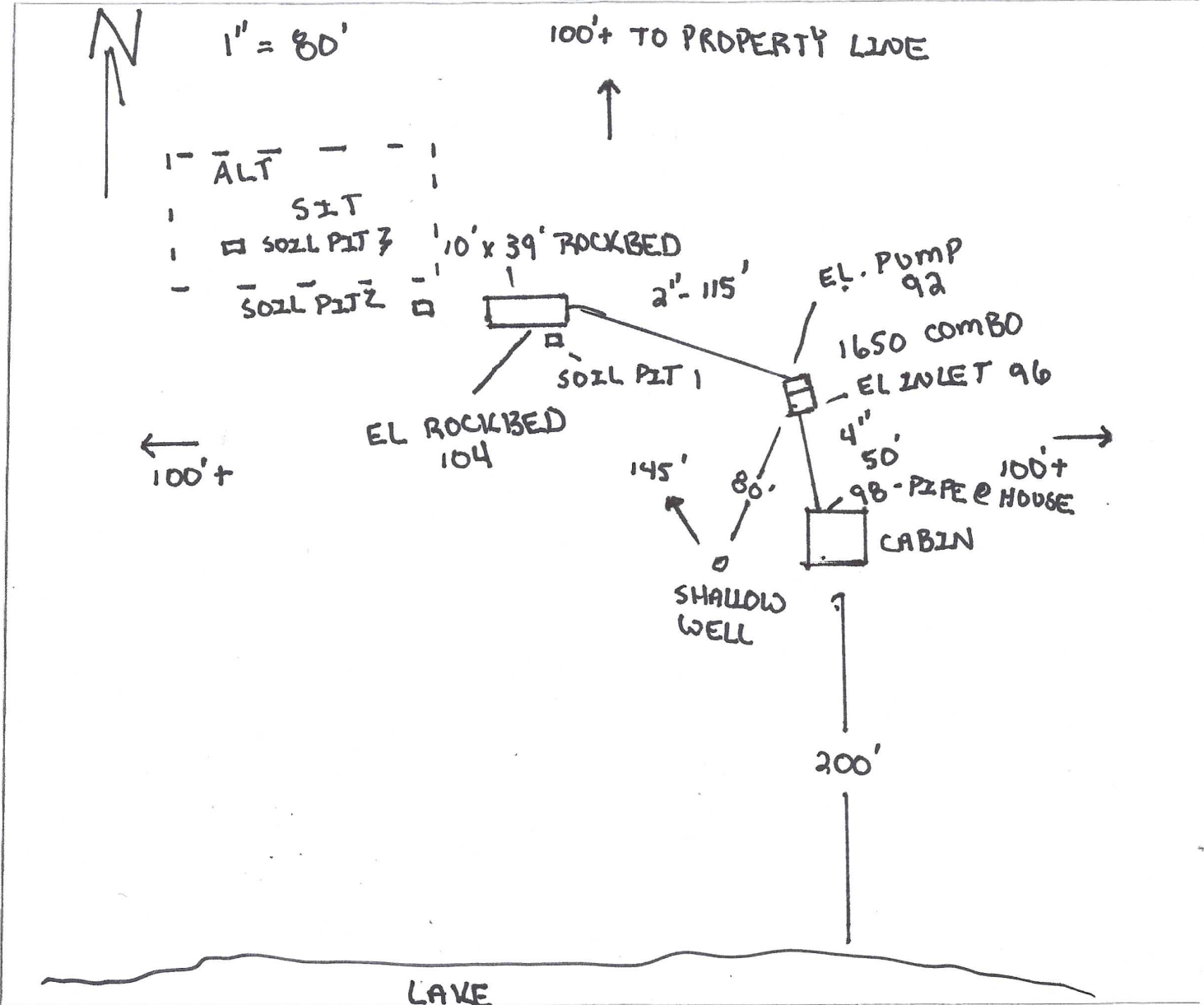
TRENCH CROSS-SECTION

FINISHED GRADE



INSTALL WILL BE APPR. 2' IN THE GROUND.
HAUL 2 LOADS OF FILL TO MOUND OVER
BED FOR MORE COVER

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
- LOT IMPROVEMENTS
- ALL ISTS COMPONENTS
- DIRECTION OF SLOPE
- ALL LOT DIMENSIONS

REQUIRED SETBACKS

- STRUCTURES
- OHWL
- PROPERTY LINES

COMMENTS:

INDICATE ELEVATIONS

- BENCHMARK 100
- ELEVATION OF SEWER LINE @ HOUSE 98
- ELEVATION @ TANK INLET 96
- ELEVATION @ BOTTOM OF ROCK LAYER 103
- ELEVATION @ BOTTOM OF BORING OR RESTRICTIVE LAYER 99
- ELEVATION OF PUMP 92
- ELEVATION OF DISTRIBUTION DEVICE

DESIGNER SIGNATURE Larry Lyngval

LICENSE# 127

DATE 10-1-20

Subsurface Sewage Treatment System Management Plan

Property Owner: STAN CARLSON Phone: _____ Date: _____

Mailing Address: _____ City: _____ Zip: _____

Site Address: _____ City: _____ 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.

System Designer: check every 36 months.

Local Government: check every 36 months.

State Requirement: check every 36 months.

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

(State requirements are based on MN Rules Chapter 7080.2450, Subp 2 & 3)

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 provider any time an alarm signals.

Event counter or water meter – Record your water use.

-recommend meter reading: be conducted (circle one: DAILY WEEKLY MONTHLY)

Professional Management Tasks

- Check to make sure tank is not leaking
- Check and clean the in-tank effluent filter
- 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: Harry Lyng _____ Date: _____

See Reverse Side for Management Log

Maintenance Log

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	
Water usage rate (monitor frequency _____)	
Check annually:	
Caps: inspect, replace if needed	
Sludge & Scum/Pump	
Inlet & Outlet baffles	
Drainfield effluent leaks	
Pump, alarm, wiring	
Flush & clean laterals if cleanouts exists	
Other: _____	
Other: _____	

Notes: _____

Mitigation/corrective action plan: _____
Call a licensed septic professional with problems.

