Aitkin County

Detailed Parcel Report

Parcel Number: 12-0-058900

General Information

Township/City:	HILL LAKE TWP		
Taxpayer Name:	SMITH, GUY C TRUSTEE		
Taxpayer Address:	PO BOX 92 64837 368TH PL HILL CITY MN 55748		
Property Address:	64837 368TH PL		
Township:	52	**Lake Number:**	1098200
Range:	26	**Lake Name:**	LITTLE HILL RIVER
Section:	34	**Acres:**	18.00
Green Acres:	No	**School District:**	2.00
Plat:			
Brief Legal Description:	NW OF NW LESS PART N OF HILL RIVER		

Tax Information

Class Code 1:	Residential 1 unit
Class Code 2:	Unclassified
Class Code 3:	Unclassified
Homestead:	Owner Homestead
Assessment Year:	2019

Estimated Land Value:	$39,200.00
Estimated Building Value:	$113,100.00
Estimated Total Value:	$152,300.00
Prior Year Total Taxable Value:	$128,004.00
Current Year Net Tax (Specials Not Included):	$1,518.00
Total Special Assessments:	$0.00
****Current Year Balance Not Including Penalty:**	$759.00
Delinquent Taxes:	No

*** For more information on delinquent taxes, please call the Aitkin County Treasurer's Office at 218-927-7325.**

**** Balance Due on a parcel does not include late payment penalties.**

FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE 07/21/2019 , FIELD EVALUATION DATE 07/21/2019
PROPERTY OWNER: Guy Smith PHONE
ADDRESS: 64837 368th Place CITY,STATE,ZIP: Hill City, MN 55748
LEGAL DESCRIPTION: NW of NW Less Part N of Hill River
PIN# 12-0-058900 SEC 34 T 52 R 26 TWP NAME Hill Lake
FIRE# LAKE/RIVER Little Hill River LAKE CLASS OHWL FT.

DESCRIPTION OF SOIL TREATMENT AREAS

	AREA #1	AREA #2
DISTURBED AREAS	YES NO x	YES NO x
COMPACTED AREAS	YES NO x	YES NO x
FLOODING	YES NO x	YES NO x
RUN ON POTENTIAL	YES NO x	YES NO x
SLOPE %	3%	3%
DIRECTION OF SLOPE		
LANDSCAPE POSITION	Summit	Side Slope
VEGETATION TYPES	Grass	Grass

REFERENCE BM ELEV. FT.
REFERENCE BM DESCRIPTION

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1 18", 1A 12", 2 12", 2A 12"

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:

LIC# 1676 SITE EVALUATOR SIGNATURE:

SITE EVALUATOR NAME: Alan C. Nystrom TELEPHONE# 218-566-2759

LUG REVIEW DATE

Comments:

SOIL BORING LOGS ON REVERSE SIDE

Form dcs 2/20/98

SOILS CHARTS FOR BOTH PROPOSED AND ALTERNATE SITES

1 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-8	Loam	10YR 3/2
8-18	Loam	10YR 5/4
18	Loam	Mottles

2 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-6	Loam	10YR 3/2
6-12	Loam	10YR 5/4
12	Loam	Mottles

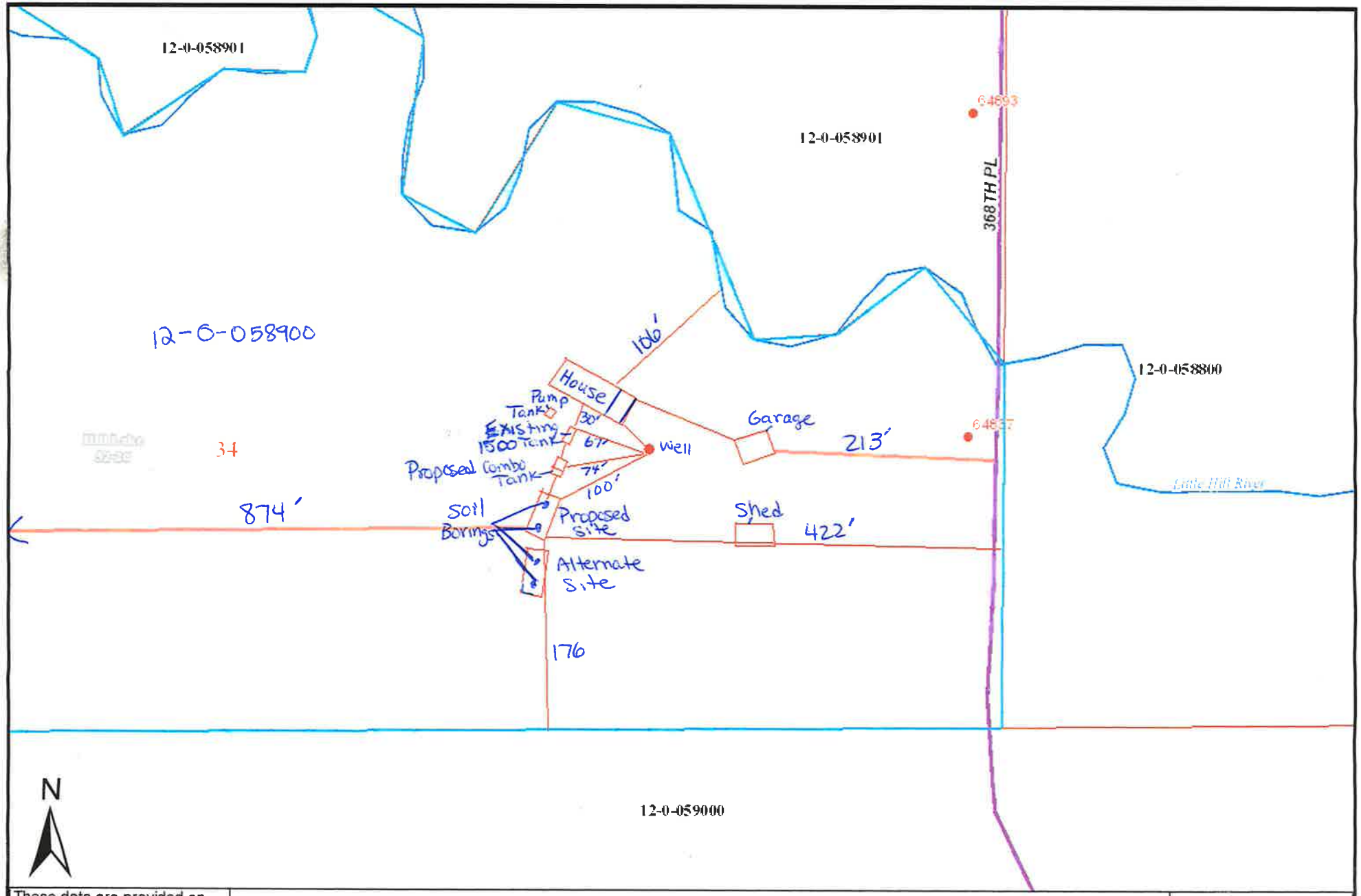
1 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-4	Loam	10YR 3/2
4-12	Loam	10YR 5/4
12	Loam	Mottles

2 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-6	Loam	10YR 3/2
6-12	Loam	10YR 5/4
12	Loam	Mottles

ADDITIONAL SOIL BORINGS MAY BE REQUIRED



These data are provided on an "AS-IS" basis, without warranty of any type, expressed or implied, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.

0 65 130 ft

1 inch = 179 feet

Aitkin County

Date: 9/5/2019

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

Existing 1500 gallons *(see figure C-1)*
Adding 1500 Compartment Tank

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

C. SOILS *(refer to site evaluation)*

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

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 = 375 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 =
   375 sqft (D1) ÷ 10 ft (D2) = 37.5 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
   375 sqft x 1 ft = 375 cuft
2. Divide cuft by 27 cuft/cuyd to get cubic yards
   375 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 = 19.4 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

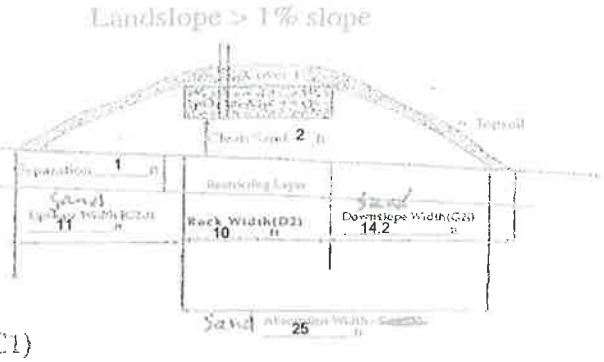
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand Medium Sand Loamy Sand Fine Sand	1.20	1.00
5 to 15	Sandy Loam	0.72	1.66
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam Silt	0.50	2.40
46 to 60	Sandy Clay Loam Silty Clay Loam Clay Loam	0.45	2.67
61 to 120	Silty Clay Sandy Clay Clay	0.24	5.00
Slower than 120*			

*Systems designed for these soils must be other or performance

G. MOUND SLOPE WIDTH & LENGTH
(landslope greater than 1%)

1. Downslope absorption width = absorption width (F) minus rock layer width (D2)

20 ft - 10 ft = 10 ft



2. Calculate mound size

UPSLOPE

a. 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. Upslope berm multiplier based on land slope

2.75 *(see figure D-34)*

d. Upslope width = berm multiplier (G2c) x upslope mound height (G2b):

2.75 x 4 ft = 11 ft

D-34: SLOPE MULTIPLIER TABLE

Land Slope in %	UPSLOPE multipliers for various slope ratios						DOWNSLOPE multipliers for various slope ratios				
	3:1	4:1	5:1	6:1	7:1	8:1	3:1	4:1	5:1	6:1	7:1
0	3.0	4.0	5.0	6.0	7.0	8.0	3.0	4.0	5.0	6.0	7.0
1	2.91	3.85	4.76	5.66	6.54	7.41	3.09	4.17	5.26	6.38	7.53
2	2.83	3.70	4.54	5.36	6.14	6.90	3.19	4.35	5.56	6.82	8.14
3	2.75	3.57	4.35	5.08	5.79	6.45	3.30	4.54	5.88	7.32	8.86
4	2.68	3.45	4.17	4.84	5.46	6.06	3.41	4.76	6.25	7.89	9.72
5	2.61	3.33	4.00	4.62	5.19	5.71	3.53	5.00	6.67	8.57	10.77
6	2.54	3.23	3.85	4.41	4.93	5.41	3.66	5.26	7.14	9.38	12.07
7	2.48	3.12	3.70	4.23	4.70	5.13	3.80	5.56	7.69	10.34	13.73
8	2.42	3.03	3.57	4.05	4.49	4.88	3.95	5.88	8.33	11.54	15.91
9	2.36	2.94	3.45	3.90	4.30	4.65	4.11	6.25	9.09	13.04	18.92
10	2.31	2.86	3.33	3.75	4.12	4.44	4.29	6.67	10.00	15.00	23.33
11	2.26	2.78	3.23	3.61	3.95	4.26	4.48	7.14	11.11	17.65	30.43
12	2.21	2.70	3.12	3.49	3.80	4.08	4.69	7.69	12.50	21.43	43.75

DOWNSLOPE

e. Drop in elevation = rock layer width (D2) x percent landslope (C5) ÷ 100

10 ft x 3 % ÷ 100 = .3 ft

f. Downslope mound height = depth of clean sand for slope difference (G2e) at downslope rock edge plus the mound height at the upslope edge of rock layer (G2b)

.3 ft + 4 ft = 4.3 ft

g. Downslope berm multiplier based on percent land slc

3.30 *(see figure D-34)*

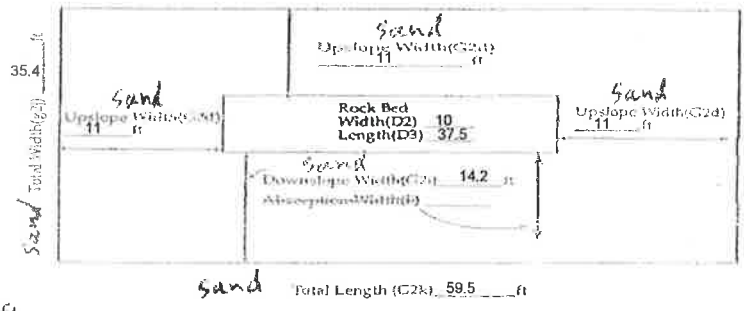
h. Downslope width = downslope multiplier (G2g) times downslope mound height (G2f)

3.30 x 4.3 ft = 14.2 ft

i. Select the greater of G1 and G2h as the downslope width: 14.2 ft

j. Total mound width is the sum of upslope width (G2d) width plus rock layer width (D2) plus downslope width (G2i)

11 ft + 10 ft + 14.2 ft = 35.2 ft



k. Total mound length is the sum of upslope width (G2d) plus rock layer length (D3) plus upslope width (G2d)

11 ft + 37.5 ft + 11 ft = 59.5 feet

Final Dimensions:

35.2 X 59.5

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

(signature) 1676 (license #) 09/03/2019 (date)

PRESSURE DISTRIBUTION SYSTEM

1. Select number of perforated laterals = 3

2. Select perforation spacing = 3 ft

3. 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.

   37.5 (Rock layer length) - 2 ft = 35.5 ft

4. Determine the number of spaces between perforations. Divide the length (3) by perforation spacing (2) and round down to nearest whole number.

   Perforation spacing = 35.5 ft ÷ 3 ft = 11 spaces

5. 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.*

   11 spaces + 1 = 12 perforations/lateral

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

   12 perfs/lat x 3 lat = 36 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 37.5 ft = 375 sqft
   Square foot per perforation = Rock bed area ÷ number of perfs (6)
   375 sqft ÷ 36 perfs = 10 sqft/perf

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

   36 perfs x .74 gpm/perfs = 26.6 gpm

8. 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 = 1.5 inches.

9. 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

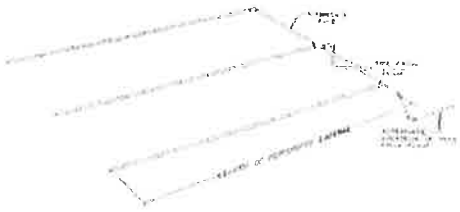
perforation spacing (feet)	1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	15	23
5.0	6	10	14	22

E-6: Perforation Discharge in gpm

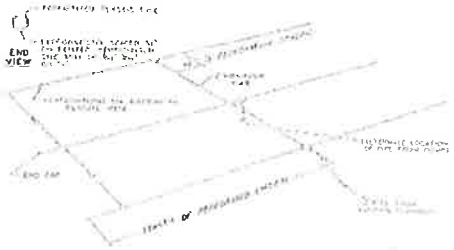
head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

[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



LAYOUT OF PERFORATED PIPE LATERALS FOR PRESSURE DISTRIBUTION SYSTEMS



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

_____ (signature) 1676 (license #) 09/03/2019 (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: 26.6 gpm

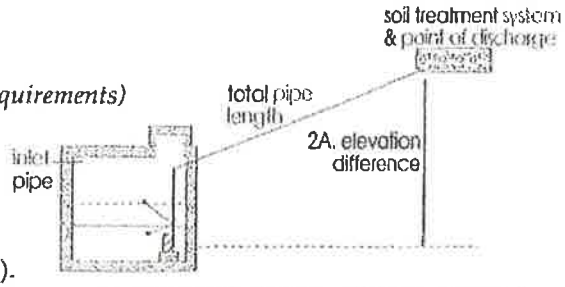
2. Determine pump head requirements:

A. Elevation difference between pump and point of discharge?

10 feet

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

5 feet



C. Calculate Friction loss

1. Select pipe diameter 1.5 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 = 5.23 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

   40 feet x 1.25 = 50 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.

   = 5.23 ft/100ft x 50 ÷100 = 2.6 ft

Special Head Requirements	
Gravity Distribution	0 ft
Pressure Distribution	5 ft

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

10 ft + 5 ft+ 2.6 ft =

Total head: 17.6 feet

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
flow rate gpm	1.5"	2"	3"
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	5.23	1.55	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 26.6 gpm (1A or B) with at least 17.6 feet of total head (2D)

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

(signature) 1676 (license #) 09/03/2019 (date)

DOSING CHAMBER SIZING

1. Determine area
   A. Rectangle area = L x W
   _____ x _____ = _____square feet
   B. Circle area = π (3.14) x radius in feet x radius in feet
   3.14 x _____ft x _____ft = _____sqft
   C. Get area from manufacturer _____sqft

2. Calculate gallons per inch
   There are 7.5 gallons per cubic foot of volume, therefore multiply the area (1A, B or C) times the conversion factor and divide by 12 inches per foot to calculate gallon per inch.
   Area x 7.5 ÷ 12 = _____sqft x 7.5 ÷ 12 in/ft = 12 gallon per inch

3. Calculate total tank volume
   A. Depth from bottom of inlet pipe to tank bottom 42 in
   B. Total tank volume = depth from bottom of inlet pipe to tank bottom (3A) x gal/in (2)
   = 42 in x 12 gal/in = 504 gal

Legal Tank:
500 gallons or
100% the Daily flow
or
Alternating Pumps

4. Calculate gallons to cover pump (with 2-3 inches of water covering pump)
   (Pump and block height (inch) + 2 inch) x gallon/inch
   (14 in +2 in) x 12 gal/in = 168 gallon

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.

5. Calculate total pumpout volume
   A. Select pump size for 4-5 does per day. Gallon per dose = gpd (see *figure A-1*)
   / doses per day = 450 gpd ÷ 5 doses/day = 90 gallons
   B. Calculate drainback
      1. Determine total pipe length, 40 feet
      2. Determine liquid volume of pipe, .17 gal per ft (*see figure E-20*)
      3. Drainback quantity = 40 ft (5B1) x .17 gal per ft (5B2) = 6.8 gal
   C. Total pump out volume = dose volume (5A) + drainback (5B3)
   90 gal + 6.8 gal = 96.8 Total gallon

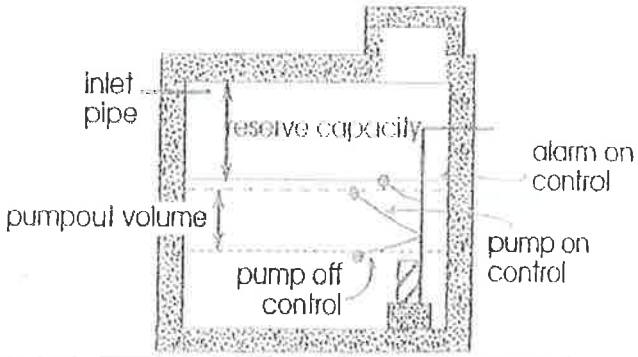
E-20: Volume of Liquid in Pipe	
Pipe Diameter inches	Gallons per foot
1	0.045
1.25	0.078
1.5	0.11
2	0.17
2.5	0.25
3	0.38
4	0.66

6. Float separation distance (using total pumpout volume)
   Total pumpout volume (5C) ÷ gal/inch (2)
   96.8 gal ÷ 12 gal/in= 8 inch

7. Calculate volume for alarm (typically 2 to 3 inches)
   Alarm depth (inch) x gallon/inch (2) = 3 in x 12 gal/in) = 36 gal

8. Calculate total gallon = gallons over pump (4) + gallons pumpout (5C) + gallons alarm (7)
   168 gal + 96.8 gal + 36 gal = 300.8 gallons

9. Total Tank Depth = total gallon (8) ÷ gallon/inch (2)
   300.8 gal ÷ 12 gal/in = 25 in



Recommended:
Calculate reserve capacity (75% the daily flow)
Daily flow x .75 = 450 x .75 = 338 gallons

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

(signature) 1676 (license #) 09/03/2019 (date)

Subsurface Sewage Treatment System Management Plan

Property Owner: Guy Smith Phone: _____ Date: 07/29/2019

Mailing Address: PO Box 92 City: Hill City Zip: 55748

Site Address: 64837 368th Pl City: Hill City Zip: 55748

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.

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 readings be conducted *(choose one:* Daily ○ Monthly ○ Yearly ○

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 Name: Guy Smith 07/29/2019

Designer Signature: _____ 07/29/2019

See Reverse Side for Home Owner Management Log

Home Owner 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: _____

_____

_____

_____

_____