FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE _____, FIELD EVALUATION DATE 5-19-20
PROPERTY OWNER: Tom Sipe PHONE 612-619-6799
ADDRESS: 50078 465th Place CITY,STATE,ZIP: Palisade 56469
LEGAL DESCRIPTION: Lot 10 Blk 1 Northwood Shore
PIN# 32-1-045000 SEC 13 T 49 R 27 TWP NAME Unory
FIRE# _____ LAKE/RIVER Esq Wagamah LAKE CLASS RD OHWL _____ FT.

DESCRIPTION OF SOIL TREATMENT AREAS

	AREA #1	AREA #2
DISTURBED AREAS	YES___ NO X	YES___ NO___
COMPACTED AREAS	YES___ NO X	YES___ NO___
FLOODING	YES___ NO X	YES___ NO___
RUN ON POTENTIAL	YES___ NO X	YES___ NO___
SLOPE %	1%	_____
DIRECTION OF SLOPE	Easterly	_____
LANDSCAPE POSITION	Level	_____
VEGETATION TYPES	Maple Aspen	_____

REFERENCE BM ELEV. 100" FT.
REFERENCE BM DESCRIPTION
North West Corner of Lot 1A

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1_____, 1A_____, 2_____,2A_____

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

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

CONSTRUCTION RELATED ISSUES: 1500 combo to 10'x38' Rock Bed on 2' Sand Base

LIC# 2088 SITE EVALUATOR SIGNATURE: Bob Bartel
SITE EVALUATOR NAME: Bob Bartel TELEPHONE# 218 831-6430
LUG REVIEW _____ DATE _____
Comments: _____

SOIL BORING LOGS ON REVERSE SIDE

52-1-045000

SOILS CHARTS FOR BOTH PROPOSED AND ALTERNATE SITES

1 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
5"	Topsoil	10yr 3/3
	Sd	10yr 4/4
18"	mottles	7.5yr 4/2

Pit

2 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR

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

52-1-64500 8

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

B. SEPTIC TANK Capacity

1500 Comb
_____ gallons *(see figure C-1)*

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 = 18" feet
2. Depth of percolation tests = _____ feet
3. Texture Sandy loam
   Percolation rate _____ mpi
4. Soil loading rate 1.27 gpd/sqft *(see figure D-33)*
5. Percent land slope 1 %

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 = 386 sqft
2. Determine rock layer width = 0.83 sqft/gpd x linear Loading Rate (LLR)
   0.83 sqft/gpd x _____ gpd/sqft = _____ ft
3. Length of rock layer = area ÷ width =
   386 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 = 386 cuft
2. Divide cuft by 27 cuft/cuyd to get cubic yards
   386 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 = 20 tons

F. SEWAGE ABSORPTION WIDTH

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

1.50 x 10 ft = 15 ft

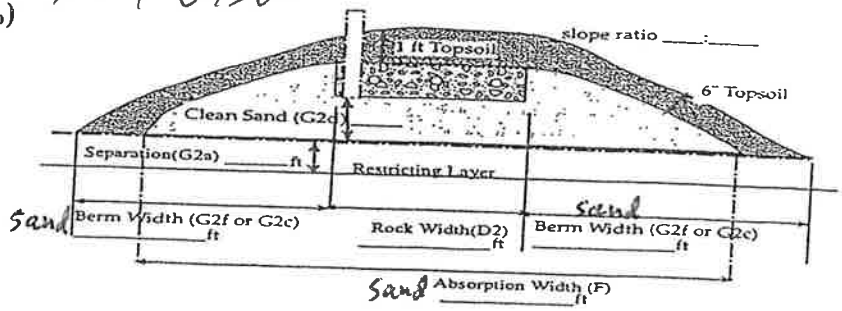
D-33: Absorption Width Sizing Table			
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand Medium Sand Loamy Sand Fine Sand	1.20	1.00
6 to 15	Sandy Loam	0.79	1.50
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam Silt	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

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

<=1% land slope

52-1-045060



1. Absorption width (F) 15 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 - 18 ft = 18" 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 wid (G2c): 16 ft + 10 ft + 16 ft = 42 ft

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

16 ft - 15 ft = 1 ft, ***if number is negative (<0) skip to g***

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

1 ft + 16 ft = 17 ft

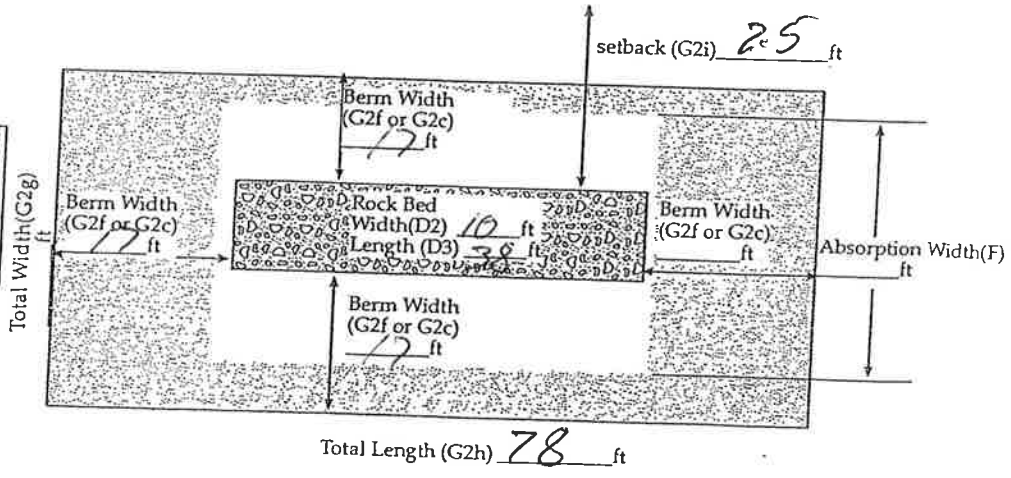
g. Total mound width is the sum of berm width (G2f or G2c) plus rock layer width (D2) plus berm width (G2f or G2c): 17 ft + 10 ft + 17 ft = 44 ft

h. Total mound length is the sum of berm (G2f or G2c) plus rock layer length (D3) plus berm (G2f or G2c): 17 ft + 38 ft + 17 ft = 72 ft

i. Setbacks from the rockbed are calculated as follows: the absorption width (F) minus the rock bed widt (D2) divided by 2: (15 ft - 10 ft) ÷ 2 = 2.5 ft

Final Dimensions:

44 x 78



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

Bob Bartel (signature) 2088 (license #) 5-19-20 (date)

32-1-045008

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.

   38 (Rock layer length) - 2 ft = 36 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 = 36 ft ÷ 3 ft = 12 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.*

   12 spaces + 1 = 13 perforations/lateral

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

   13 perfs/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 38 ft = 380 sqft
   Square foot per perforation = Rock bed area ÷ number of perfs (6)
   380 sqft ÷ 39 perfs = 9 sqft/perf

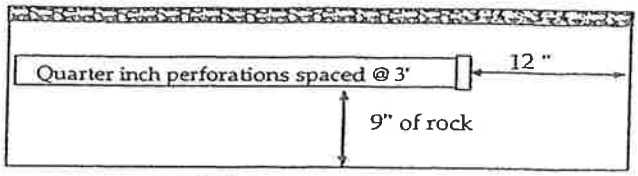
7. Determine required flow rate by multiplying the total number of perforations (6A) by flow per perforation *(see figure E-6)*

   39 perfs x .74 gpm/perfs = 29 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 = 2 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.

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

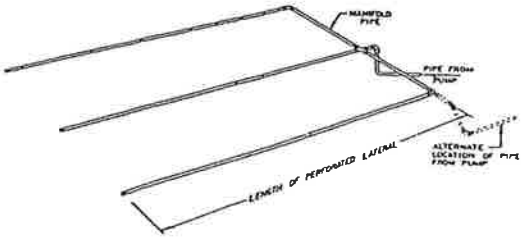
perforation spacing (feet)	1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	15	23
5.0	6	10	14	22

E-6: Perforation Discharge in gpm

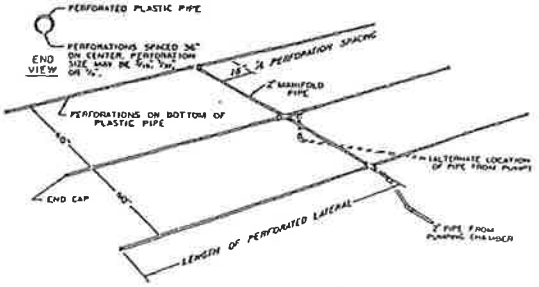
head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

[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 IN MOUND



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

BG Bold (signature) 2088 (license #) 8-19-20 (date)

PUMP SELECTION PROCEDURE

58-1-045600

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

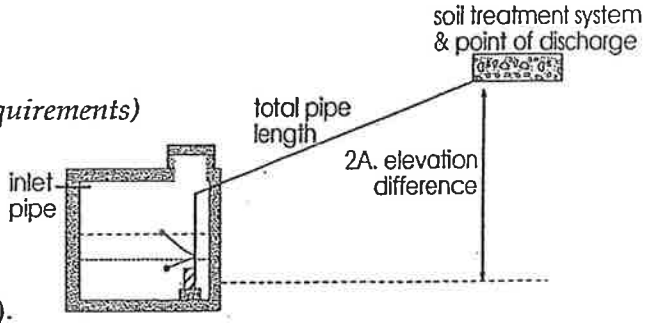
2. Determine pump head requirements:

A. Elevation difference between pump and point of discharge?

12 feet

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

5 feet



Special Head Requirements	
Gravity Distribution	0 ft
Pressure Distribution	5 ft

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

   78 feet x 1.25 = 97.5 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 97.5 ÷100 = 1.5 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+ 1.5 ft =

Total head: 18 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 29 gpm (1A or B) with at least 18 feet of total head (2D)

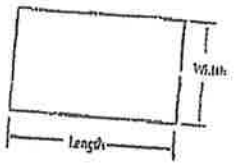
I hereby certify that I have completed this work in accordance with applicable ordinances, rules and laws.

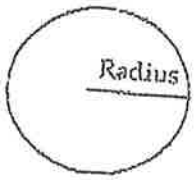
Bob Bartel (signature) 2088 (license #) 5-18-20 (date)

DOSING CHAMBER SIZING

52-1-045006

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 = 11.81 gallon per inch

3. Calculate total tank volume
   A. Depth from bottom of inlet pipe to tank bottom 46 in
   B. Total tank volume = depth from bottom of inlet pipe to tank bottom (3A) x gal/in (2)
   = 46 in x 11.81 gal/in = 543 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
   (12 in +2 in) x 11.81 gal/in = 165 gallon

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 ÷ 4 doses/day = 112.5 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)
   112.5 gal + 6.8 gal = 119.3 Total 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% of the values in the Class I, II, or III columns
3	450	300	210	
4	600	375	256	
5	750	450	294	
6	900	525	332	
7	1050	600	370	
8	1200	675	408	

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

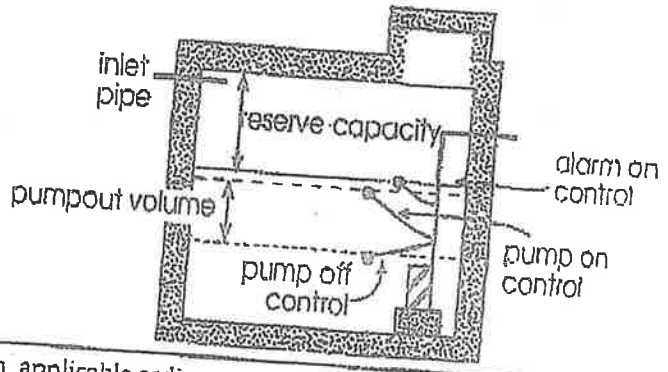
6. Float separation distance (using total pumpout volume)
   Total pumpout volume (5C) ÷ gal/inch (2)
   119.5 gal ÷ 11.81 gal/in = 9 inch

7. Calculate volume for alarm (typically 2 to 3 inches)
   Alarm depth (inch) x gallon/inch (2) = 11.81 in x 2 gal/in) = 23.6 gal

8. Calculate total gallon = gallons over pump (4) + gallons pumpout (5C) + gallons alarm (7)
   165 gal + 119.3 gal + 23.6 gal = 308 gallons

9. Total Tank Depth = total gallon (8) ÷ gallon/inch (2)
   308 gal ÷ 11.81 gal/in = 26 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.

Bob Bartl (signature) 2088 (license #) 8-17-19 (date)

B & T Services

Btservices56401@gmail.com (218) 831-6430

Order Form

Date 9/17/18

Property Address 27471 300th PL
Aitkin, MN 56431

PID Number 21-1-076400

____ Water Test — Due Date ____

_X_ Septic Inspection — Due Date Before freeze

____ Septic Design — Due Date ____

Closing Company ____

____

Closing Company email ____

Closing Company Phone Number ____

Closing Date Scheduled ____

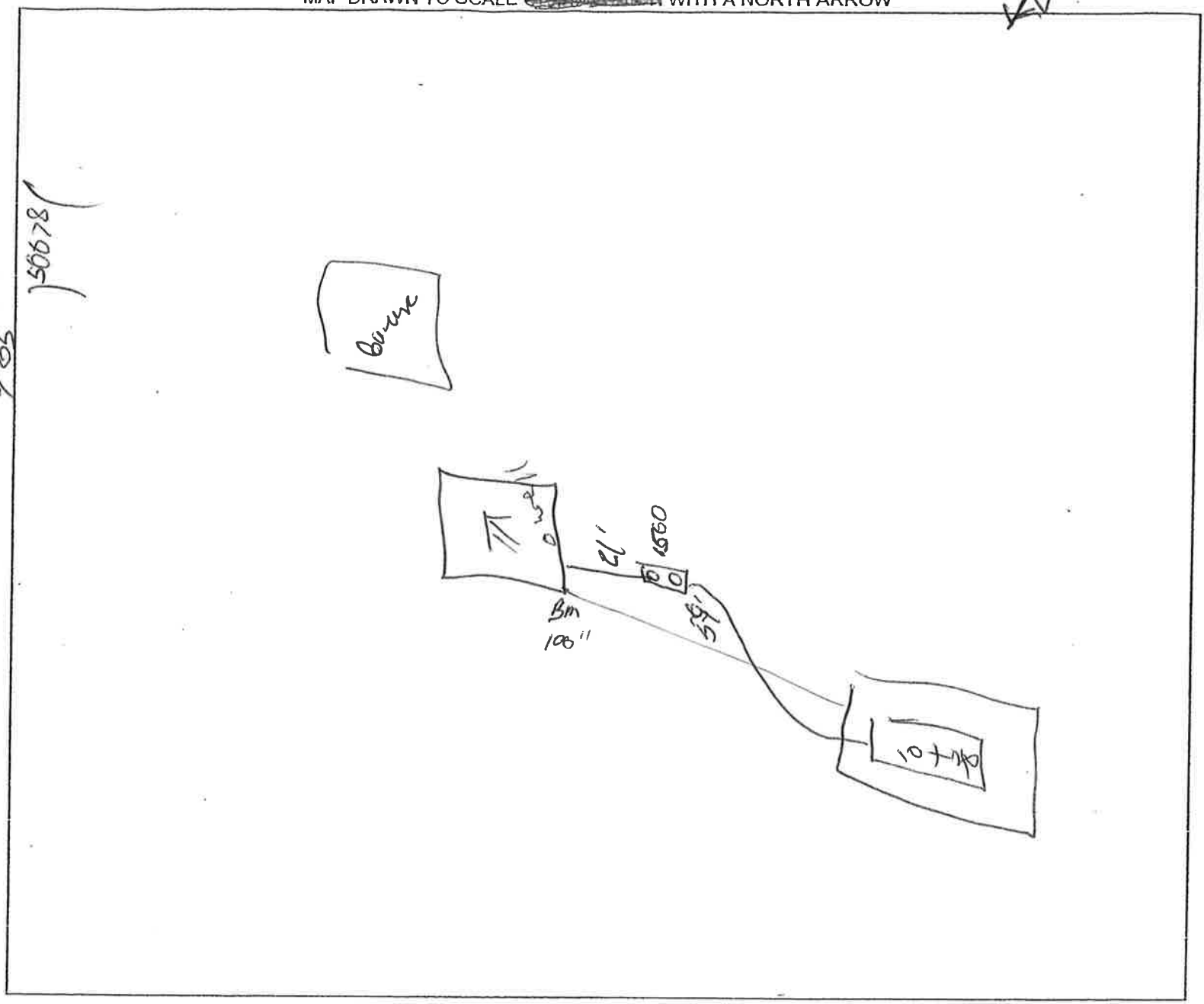
Ordered By Cheryl Larson

Email MilleLACsagent@gmail.com

Telephone Number 651-587-8282

CLIENT: Tom Sipe 32-1-045000 DATE: 5-19-20

MAP DRAWN TO SCALE [redacted] 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 ☐ LOT IMPROVEMENTS
- ☐ ALL SOIL TREATMENT AREAS ☐ ALL ISTS COMPONENTS
- ☐ HORIZONTAL AND VERTICALREFERENCE
- ☐ POINT OF SOIL BORINGS ☐ DIRECTION OF SLOPE
- ☐ LOT EASEMENTS ☐ ALL LOT DIMENSIONS
- ☐ DISTURBED/ COMPACTED AREAS
- ☐ SITE PROTECTION–LATHE AND RIBBON EVERY 15 FT
- ☐ ACCESS ROUTE FOR TANK MAINTENANCE

REQUIRED SETBACKS

- ☐ STRUCTURES ☐ PROPERTY LINES
- ☐ OHWL

COMMENTS:

INDICATE ELEVATIONS

BENCHMARK 160"
ELEVATION OF SEWER LINE @ HOUSE 72"
ELEVATION @ TANK INLET 36"
ELEVATION @ BOTTOM OF ROCK LAYER 160"
ELEVATION @ BOTTOM OF BORING OR RESTRICTIVE LAYER 117"
ELEVATION OF PUMP -10
ELEVATION OF DISTRIBUTION DEVICE 164

DESIGNER SIGNATURE Bob Bartel
LICENSE# 2088 DATE 5-19-20

21947 Co. Rd. 3
Merrifield, MN, 56465
218-829-9678 or 800-829-5755

Tank Installation Instructions

Site Conditions
The site must be accessible for a heavy truck 10.5' wide, 13' height, 28' – 35' long and heavy weight up to 75,000 lbs. Free of items like trees, stumps, sharp objects, construction materials, vehicles, ext. Notified of overhead wires and\or underground wires, gas lines, old tanks ext. trucks must be on flat level ground conditions may vary and might interfere with the delivery or installation 3' to 6' from placement of tank for installing.

Excavation
Excavation should be 12" minimum larger than length and width of tank size to allow adequate backfill. Excavation should be level on the bottom so the weight bears on outside of tank walls and 4" greater than invert height to allow proper bedding. This may vary with soil conditions

Bedding
Proper bedding material is important to ensure service life of the tanks structure. Bedding must be capable of bearing the weight of a full tank. Bedding material shall have the ability of 100% to be able to pass through ¾ inch screen. Bedding thickness shall be 4"minimum compacted (thickness may vary with existing soil conditions)

Joint seal
Mid seam tanks or tanks that need to be set in two pieces need to be cleaned, dried, and properly place according to the manufactures recommendations for models-SCP2400,SCP2450,SCP2250,SCP2500,SCP2800,SCP2850,SCP2950, tanks

Water Table
When tanks are being placed where water levels can potentially be higher than the elevation of the tank cover, an alternate location should be considered.

Backfill material
Sidewall of tanks require dry backfill materials that have the ability of 100% to be able to pass through a 2" screen and a minimum of 12" on all sides from bottom to top of tank. Backfill material shall be placed to avoid loads on the sidewall of the tank.

Cover Material
Cover material shall be dry soil, materials that have the ability of 100% to be able to pass through a 4" screen. Cover material shall be mounded over tank and around risers to direct run-off away from tank and risers.

Risers
All risers on tanks should be completely sealed to prevent water from coming in around them into the tank. Sealant used should be placed between the tank and the riser. Sealant should be placed on clean dry surface and full circumference of riser should be placed on the sealant. All sealing of the risers is the responsibility of the installer upon installation and in the future.

Rubber Boots
All inlet and outlet pipe should be placed inside the rubber boot and tightened with the clamp provided to ensure a leak proof seal. All inlet and outlet pipe sealing is the responsibility of the installer upon installation and in the future unless the rubber boot or clamp is defective.

Inlet & Outlet
Pipe not to exceed 1" past interior wall of tank where baffle is used.

Burial Depth
Tanks to be installed to depths according to each models maximum bury recommendations

Model # 1500 Manufacturers Date 4-21-20

Gallons 1023-508 Maximum buried depth 6 Ft

SCP IS NOT RESPONSIBLE FOR TANK INSTALLATION

52-1-045000

Subsurface Sewage Treatment System Management Plan

Property Owner: Tom Sipe Phone: 612-619-6799 Date: 8-17-19

Mailing Address: 6232 83rd Pl. N City: Brooklyn Park Zip: 55445

Site Address: 56078 405th Place City: Palisade Zip: 56469

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 _____ months.
Local Government: check every _____ months.
State Requirement: check every 36 months.

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

My System needs to be checked every _____ 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 (*circle one:* DAILY WEEKLY MONTHLY)

Professional Management Tasks

- [x] Check to make sure tank is not leaking
- [x] Check and clean the in-tank effluent filter
- [ ] Check the sludge/scum layer levels in all septic tanks
- [ ] Recommend if tank should be pumped
- [x] 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: Bob Bald Date: 8-17-19

See Reverse Side for Management Log

52-1-045600

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: _____