bgwanderatgmail.com

Preliminary & Field Evaluation Form

www.SepticResource.com vers 12.4

Owner Information

Date	10/20/2022	Sec / Twp / Rng	S-30, T-45, R-26
Parcel ID	36-0-046200	LUG (county, city, township)	Aitkin Co.
Property Owner:	Robert Wander 763-360-6500	Owners address (if different)	
Property Address:	39545 State Hwy 18 Aitkin MN 56431		39545 State Hwy 18
City / State / Zip:	763-360-6500		Aitkin MN 56431

Flow Information and Waste Type / Strength

Estimated Design flow: 300

Comments: Type III Mound because constructed on Disturbed soils and fill soils.
Shed to be moved and existing drainfield to be removed
Type III septic requires an Aitkin Co Operating Permit

Anticipated Waste strength	☐ Hi Strength	☑ Domestic
Any Non-Domestic Waste	☐ Yes (class V)	☑ No
Sewage ejector/grinder pump	☐ Yes	☑ No
Water softener	☐ Yes	☑ No
Garbage Disposal	☐ Yes	☑ No
Daycare / In home business	☐ Yes	☑ No

Event Counter and Alarm on Pump controller (Aitkin Co. Operating Permit)

Site Information

Existing & proposed lot improvements located (see site map)	☐ Yes	☑ No	Well casing depth	Existing deep well		
Easements on lot located (see site map)	☐ Yes	☑ No	Drainfield w/in 100' of residential well	☑ Yes	☐ No	
Property lines determined (see site map) Surveyed	☑ Yes	☐ No	Site w/in 200' of transient noncommunity water supply (TNCWS)	☐ Yes	☑ No	
Req'd setbacks determined (see site map)	☑ Yes	☐ No	Site w/in an inner wellhead mgmt zone (CWS/NTNCWS)	☐ Yes	☑ No	
Utilities located & identified (gopher state one call)	☐ Yes	☑ No	Buried water supply pipe w/in 50' of system	☐ Yes	☑ No	
Access for system maintenance (shown on site map)	☑ Yes	☐ No	Site located in Shoreland (w/in 1000' of lake, 300' of river)	☑ Yes	☐ No	
Soil treatment area protected	☑ Yes	☐ No	Site map prepared with previous items included	☑ Yes	☐ No	

Construction related issues: Hwy 18 RW Setback is 100 ft from center line. Owner has lot surveyed

Soil Information

Evidence of site:

Cut	☐ Yes	☑ No
Filled	☑ Yes	☐ No
Compacted	☐ Yes	☑ No
Disturbed	☑ Yes	☐ No

Original soils ☐ Yes ☑ No

Soil logs completed and attached ☑ Yes ☐ No

Perk test completed and attached (if applicable) ☐ Yes ☑ No

Soil loading rate (gpd/ft^2) 0.78

Percolation rate (if applicable) _____

Depth/elev to SHWT 30"

Flooding or run-on potential (comments) ☐ Yes ☑ No

Depth to system bottom maximum (or elev minimum) (+ 12")

Flood elevation (if applicable) _____

Depth/elev to standing water (if applicable) _____

Elevation of ordinary high water level (if applicable) 1252.8'

Depth/elev to bedrock (if applicable) _____

Soil Survey information determined (see attachment) ☑ Yes ☐ No

Floodplain designation and elev - 100 yr/10 yr (if applicable) 1253.6'
Mille-Lacs Lake Elv.=92.3' 0n 10/20/2022
Upslope Edge of Rockbed Elv.= 99'

Differences between soil survey and field evaluation (if applicable) _____

I hereby certify this evaluation was completed in accordance with MN 7080 and any local req's.

Designer Signature | Brummer Septic LLC. (Company) | L-1347 (License #)

Soil Observation Log

www.SepticResource.com vers 12.4

Owner Information

Property Owner / project: Robert Wander Date 10/20/2022

Property Address / PID: 39545 State Hwy 18 Aitkin MN 5643

Soil Survey Information

☐ refer to attached soil survey

Parent matl's: ☐ Till ☑ Outwash ☐ Lacustrine ☐ Alluvium ☐ Organic ☐ Bedrock

landscape position: ☐ Summit ☐ Shoulder ☑ Side slope ☐ Toe slope

soil survey map units: 186 slope 2 % direction- South

Soil Log #1

☑ Boring ☐ Pit Elevation 98.3' Depth to SHWT 30"

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 6	Topsoil Med Sand	<35	10YR3/2		Loose	Loose	Granular
6 - 22	Med Sand Black	<35	10YR3/2 to 10YR4/3		Loose	Loose	Granular
22 - 30	Med Sand	<35	10YR5/4		Loose	Loose	Granular
30 - 38	Med Sand	<35	10YR5/4	7.5YR5/6	Loose	Loose	Granular

Comments: Conducted soil borings at original soil sites out side of existing drainfield and shed to be moved areas

39545 State Hwy 18 Aitkin MN 56431 — Soil Log #2

☑ Boring ☐ Pit Elevation 98.8' Depth to SHWT 36"

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 6	Topsoil Med Sand	<35	10YR3/2		Loose	Loose	Granular
6 - 18	Med Sand Black	<35	10YR3/2 to 10YR4/3		Loose	Loose	Granular
18 - 26	Med Sand	<35	7.5YR4/4		Loose	Loose	Granular
26 - 36	Med Sand	<35	10YR5/4		Loose	Loose	Granular
36 - 40	Med Sand	<35	10YR5/4	7.5YR5/6	Loose	Loose	Granular

39545 State Hwy 18 Aitkin MN 56431 — Soil Log #3

☐ Boring ☐ Pit Elevation ______ Depth to SHWT ______

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive

I hereby certify this work was completed in accordance with MN 7080 and any local req's.

Designer Signature

Brummer Septic LLC.
Company

L-1347
License #

2011 purple code

Mound Design - Aitkin county

www.SepticResource.com (vers 15.2)

Property Owner: Robert Wander **Date:** 10/20/2022

Site Address: 39545 State Hwy 18 Aitkin MN 56431 **PID:** 36-0-046200

Comments: Type III Because of Fill , Disturbed soils.

instructions: [ ] = enter data [ ] = adjust if desired [ ] = computer calculated - DO NOT CHANGE!

1) 2 bedroom Type III Residential System

2) 300 GPD design flow

3) No Garbage disposal or pumped to septic Install 1650 Jacobson 2/Compartment tank

4) 1000 Gal Septic tank (code minimum) 1000 Gal Septic tank (design size / LUG req'd)
Tank options: Effluent filter & alarm req'd

5) 1.2 GPD/ft^2 mound sand loading rate contour loading rate of 12 req's a min 25 ft. long rockbed

6) 10.0 ft rockbed width 25.0 ft rockbed length

7) 3.0 ft lateral spacing 3.0 ft perforation spacing (maximum of 3 for both)
end feed manifold connection

8) 3 laterals 23.0 feet long 8.0 perfs / lateral 24 perfs total
(1/2 a perf means the first perf starts at the middle feed manifold)

9) 1/4" inch perfs at 1 feet residual head gives 0.74 gpm flow rate per perforation

for this perf size & spacing, & pipe size on line 12, max perfs/lateral = 16, line #8 must be less --> OK

10) 7.0 doses per day (4 minimum)

11) 43 gallons per dose (treatment volume)

1.50 5x

12) 1.50 inch diameter laterals must be used to meet "4x pipe volume" requirement

2.00 3x

13) 35 feet of 2.0 inch supply line leads to 6 gallons of drainback volume
(Tip: "top feed" manifold to control the drainback)

14) 49 gallons TOTAL pump out volume (treatment + drainback)

15) 15 feet vertical lift from pump to mound laterals, leads to a:

16) 18 GPM @ 21 feet of head, Pump requirement (note: >50gpm may require an extra 3-6' of head)

17) 500 gal Dose tank (code minimum) 533 gal Dose tank (design size / LUG req'd) at 12.69 gpi
leads to a

18) 3.9 inch swing on Demand float, or timed dosing of 2.7 min ON (confirm pump rate with drawdown
(this delivers Average flow, =70% of Peak design flow) 5.1 hrs OFF test and adjust as necessary)

19) 12 inches from bottom of tank to "Pump OFF" float

20) 16 inches from bottom of tank to "Pump ON" float, or 12 inches to "Timer ON" float if time dosed

21) 19 inches from bottom of tank to "Hi Level" float, or 29 inches to "Hi Level" float if time dosed

22) 292 gallons reserve capacity (after High Level Alarm is activated)

23) 0.78 gpd/ft² Absorption area Soil Loading Rate, which gives a mound ratio of 1.5 (minimum)
(this must match the soil boring log) desired mound ratio 1.5

24) 2 percent site slope (0-20% range) 2 (% downslope site slope, if different than upslope)

25) 24 inches, or 2.0 ft. to Redox or other limiting condition (need at least 12" to be a Type I)
Treatment zone contains 0 inches of 0% soil credit, and 0 inches of 50% soil credit. Giving a:

26) 12 inch, or 1.0 ft. Sand Lift Mound **CRITICAL FOR FUTURE CERTIFICATIONS!!!**

27) 15.0 ft. base absorption width (with sand beyond rockbed as follows:)
24.0 greater of: absorption width OR sand slope

28) 0.0 ft. upslope and sideslope sand upslope 5.0
5.0 ft. Downslope sand down slope 9.0

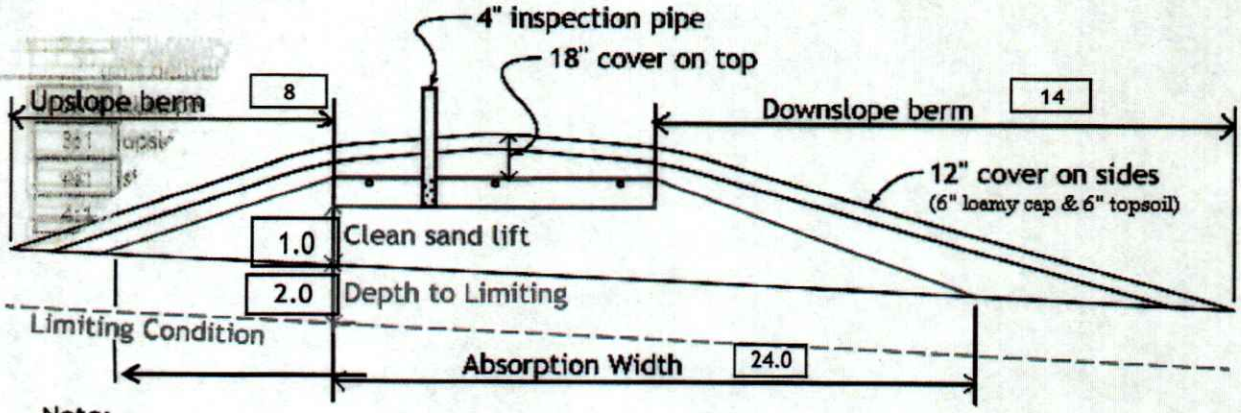
Individual slope ratios give BERM widths (topsoil beyond rockbed) of:

29) 3:1 upslope ratio 8 ft. upslope berm

30) 4:1 sideslope 13 ft. West sideslope berm East Sideslope Berm 3:1 or 10 feet wide

31) 4:1 downslope 14 ft. downslope berm

32) Overall Dimensions: 10.0 ft. wide by 25.0 ft. long Rock bed
32 ft. wide by 51 ft. long Mound footprint



Note:
For 0 to 1% slopes, ***Absorption Width*** is measured from the ***Bed*** equally in both directions.
For slopes >1%, ***Absorption Width*** is measured downhill from the upslope edge of the ***Bed***.

33) Rock Bed:
10.0 ft. by 25.0 ft. by 9 inches under pipe, plus 20% gives 12 yd³ or *1.4= 17 ton

34) Mound Sand: (note: volume is based on 3:1/4:1 slope from top of rockbed, Exchange sand for loamy cap if desired)
9.4 up + 16.8 downslope + 7.2 ends + 10.2 under rock = 52 yd³ or *1.4= 73 ton
plus 20%

35) Loamy Cap:
28 ft. by 47 ft. 6" deep, plus 20% gives 30 yd³ or *1.4= 42 ton

36) Topsoil:
32 ft. by 51 ft. 6" deep, plus 20% gives 37 yd³ or *1.4= 52 ton

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

Designer Signature	Brummer Septic LLC.	L-1347	10/20/2022
	Company	License#	Date

Aitkin Co Operating Permit Required

Event Counter on pump controler or water meter on household water

Installer Summary

1000 gallon Septic tank (minimum)

Tank options: Effluent filter & alarm req'd
Install 1650 Jacobson 2/Compartment tank
at 12.69 gpi

533 gallon Dose tank (minimum)

18 GPM @ 21 ft. of head, Pump required

3.9 inch swing on Demand float which translates to roughly 3.0 inches of float tether length

if time dosing is required --> 2.7 minutes ON time & 5.1 hours OFF time

16 inches from bottom of tank to "pump ON" float, or 12 inches to "timer ON" float

19 inches from bottom of tank to "Hi Level Alarm" or 29 inches to "Hi level alarm" if time dosed

35 ft. of 2.0 inch supply line with end feed manifold connection
(Tip: "top feed" manifold to control drainback)

12 inch, or 1.0 ft. Sand Lift Mound

10.0 ft. wide by 25.0 ft. long Rock bed

3 laterals 1.50 inch diameter 23.0 ft. long 3.0 ft. lateral spacing

1/4" inch perfs 3.0 ft. perforation spacing

Yes Effluent filter & alarm

3 clean out & valve box assemblies

24.0 ft.Total sand ABSORPTION width (minimum)

5.0 ft. upslope and sideslope (sand beyond rockbed, minimum)

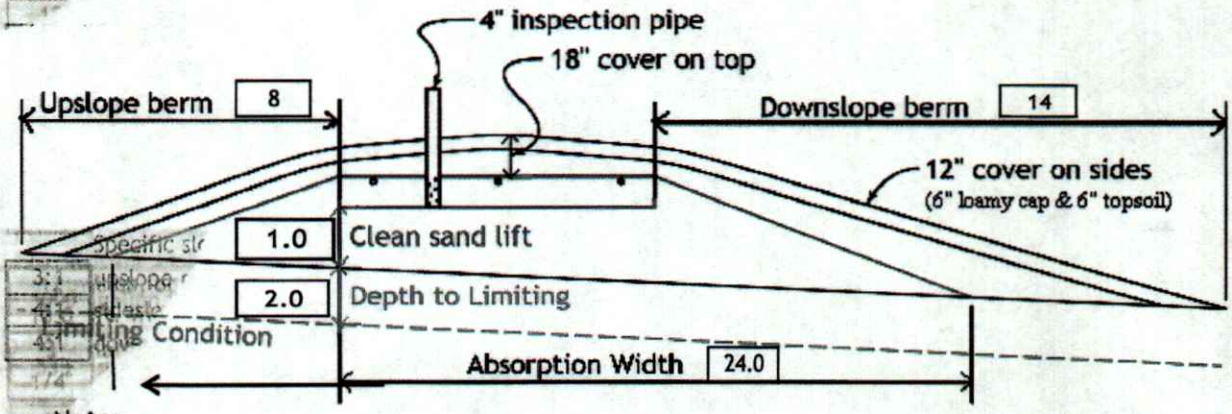
9.0 ft. Downslope (sand beyond rockbed, minimum)

Specific slope ratios give BERM widths (topsoil beyond rockbed) of:

3:1 upslope ratio 8 ft. upslope berm

4:1 sideslope 13 ft. West sideslope berms East Sideslope Berm 3:1 or 10 feet wide

4:1 downslope 14 ft. downslope berm



Note:
For 0 to 1% slopes, ***Absorption Width*** is measured from the ***Bed*** equally in both directions.
For slopes >1%, ***Absorption Width*** is measured downhill from the upslope edge of the ***Bed***.

Rock Bed:	12.0	yd^3 or *1.4=	17	ton	9 inches under pipe
Mound Sand:	52	yd^3 or *1.4=	73	ton	
Loamy Cap:	30	yd^3 or *1.4=	42	ton	6" deep
Topsoil:	37	yd^3 or *1.4=	52	ton	6" deep

INSPECTOR CHECKLIST - mound

39545 State Hwy 18 Aitkin MN 56431

☐ WELL setbacks: 20' to pressure tested sewer line (5 psi for 15 min)
50' to everything 100' to dispersal area with shallow well

☐ PROPERTY LINES setback: 10' to everything

☐ Road setback: platted: 10' prop line. Metes & bounds: out of road easement, or outer ditch.

☐ LAKE / BLUFF setback: 20' for bluff. Lakes: GD ___, RD ___, NE ___. Protected wetland ___.

☐ Building setbacks: 10' for everything, 20' for dispersal area.

☐ WATER LINE under pressure se 10' to bed,tank & sewer line. (else sewer line > 12" below, else ok w/pvc)

☐ Sewer line & baffle connection (no 90's, 3' between 45's, slope min 1" in 8', max 2" in 8')
(no depth req's, clean out every 100', Sch 40 pipe)

☐ Septic tank and risers (water tight, insulated, proper depth, existing verified by pumping)
mfg_____ 1000 gallons Effluent filter & alarm req'd

☐ Riser over outlet, riser over inlet or center, and 6"+ inspection pipe over any remaining baffles.

☐ Yes effluent filter & alarm

☐ Dose tank risers and piping (water tight, insulated, proper depth, drainback)
mfg_____ 533 gallons

☐ dose pump _____ 18 gpm 21 head VERIFY PUMP CURVE 2.7 min ON 5.1 hr OFF

☐ float setting drop 3.9 inches at 12.7 gpi "DESIGNED" 3.0 inches approx float tether length
49.0 gal dose divided by _____ gpi "INSTALLED" = _____ inches float drop (field corrected

LABEL pump requirements and drawdown on riser or panel

☐ Cam lock reachable from grade - 30" max. J-hook weep hole. Supply line access (no hard 90's)

☐ 2.0 inch supply pipe: Sch40, sloped 1/8"+, supported by 4" sch40 sleeve or compacted, and buried 6"+.

☐ splice box / control panel / electrical connections

☐ flow measurement: CT, ETM, time dosed, home water meter

☐ mound absorption area rough up

☐ mound rock dimensions 10.0 X 25.0

☐ Sand lift depth 12 inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)

☐ Absorption Sand beyond rock 5.0 upslope 9.0 downslope

☐ Bermed topsoil beyond rockbed 8 upslope 13 sideslope 14 downslope

☐ cover depth of 12-18"+ VERIFY

☐ 3 laterals (1-2' from edge of rock)

☐ 1.50 inch pipe size (Sch40 pipe & fittings)

☐ 3.0 ft lateral spacing

☐ 1/4" inch perforations

☐ 3.0 ft perforation spacing

☐ Air inlet at end of laterals, and at top feed manifold if necessary. VERIFY

☐ clean outs (no hard 90's)

☐ 4" inspection pipe to bottom of rock, anchored VERIFY

☐ Abandon existing system - if necessary ☐ Re-use existing tank certification

☐ monitoring plan and type _____

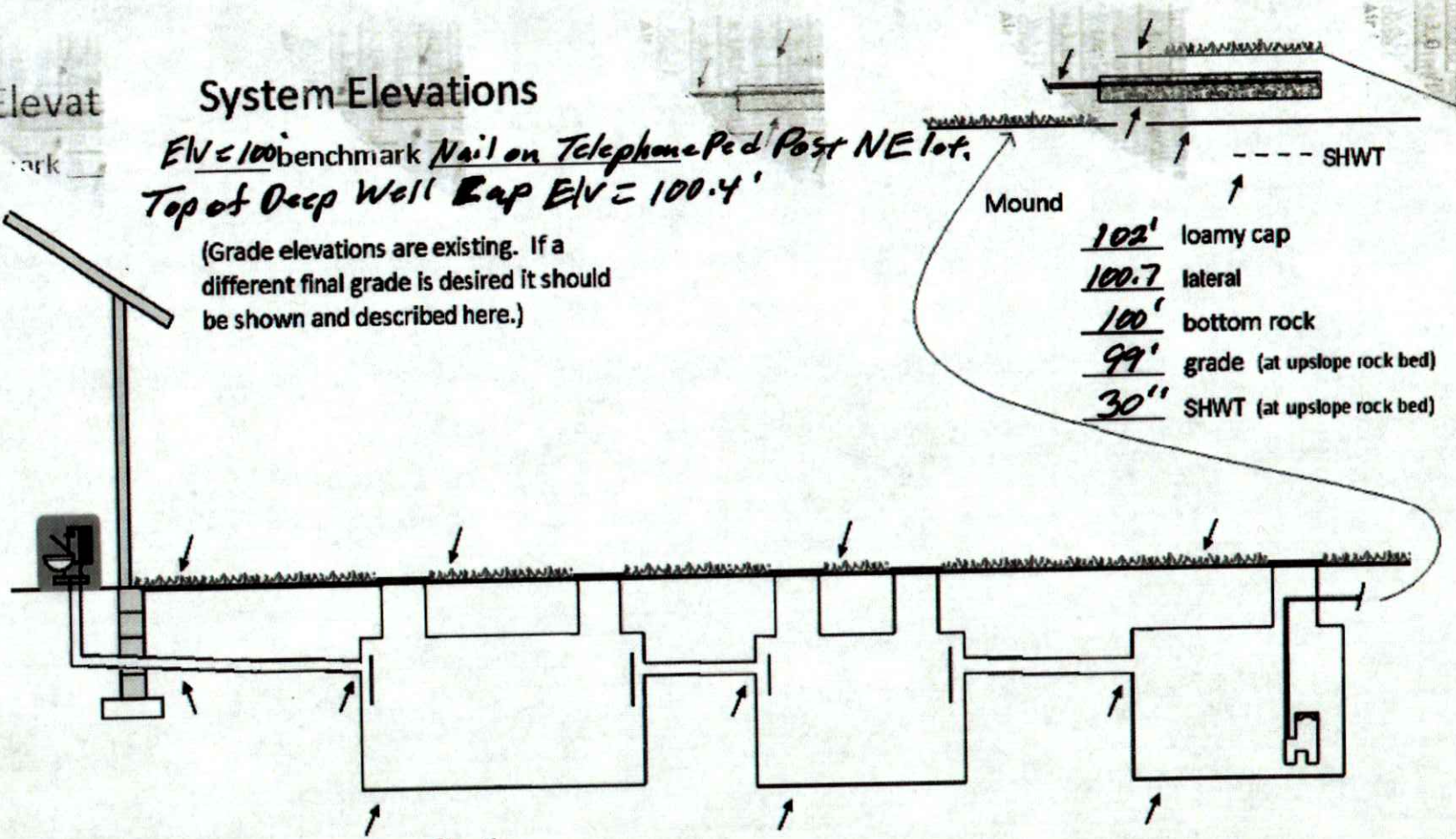
☐ well abandonment form - if necessary

System Elevations

Elv = 100 benchmark Nail on Telephone Ped Post NE lot.

Top of Deep Well Cap Elv = 100.4'

(Grade elevations are existing. If a different final grade is desired it should be shown and described here.)



Sewer pipe exiting house
98.2' Grade

Existing Tank 94.8' Pipe Inlet'

New Septic Tank
98.1' Grade
94.5' inlet
90.5' Tank bottom

Septic Tank (if applicable)
____ Grade
____ inlet
____ Tank bottom

Pump Tank
98.1' Grade
94.3' inlet
90.5' Tank bottom

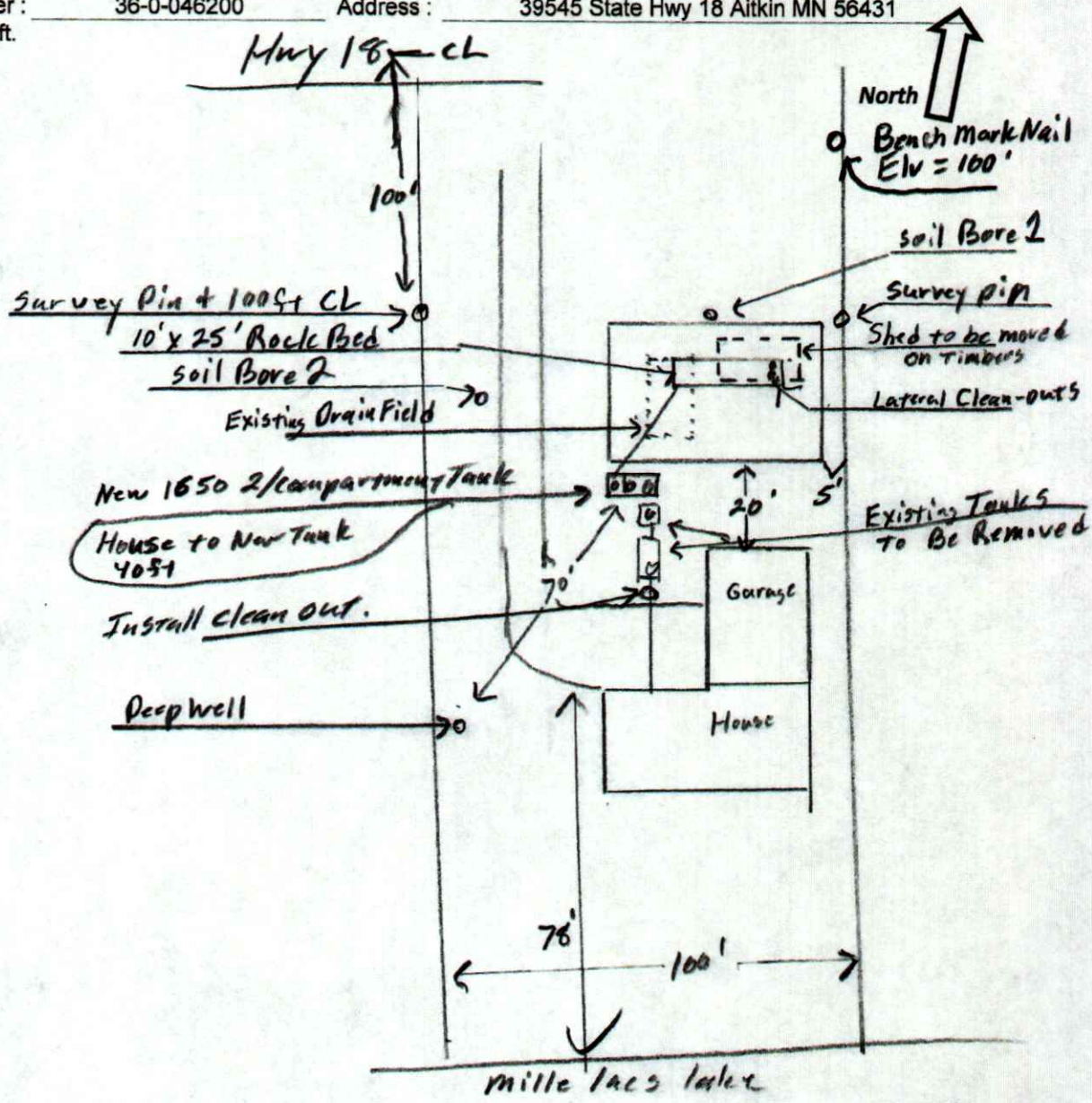
Mille-lacs lake Elv = 92.3' on 10-20-22

{ Design Drawing }

Property Owner: Robert Wander Date: 10/20/22 Designer's Initials : JB

Parcel ID. Number : 36-0-046200 Address : 39545 State Hwy 18 Aitkin MN 56431

one Inch = 40ft.



Top Of Deep Well Cap Elv. = 100.4' Mille-Lacs Lake Elv. = 92.3' on 10/20/22

	Surface/ SHWT	*Nail on Tele Ped = Bench Mark 100'*			Existing Grade
Soil Bore 1	98.3' / 30"	Bench Mark	100'		Upslope Edge of Rockbed Elv.= 99'
Soil Bore 2	98.8' / 36"	Ground Elv. BM	98.4'		Bottom of Rockbed Elv.= 100'
Soil Bore 3		Ground Elv. Tank	98.1'		Top of Washed Sand Elv.= 100'
	Ground at	Existing house	98.2'	NW Corner	Existing Septic Tank Inlet Elv.= 94.8'

Please show all that apply (Existing)

Wells within 100ft. Of Drain field.

Water lines within 10 ft. of Drain field.

Drain field Areas:

Please Draw to Scale with North to Top or Left Side of Page:

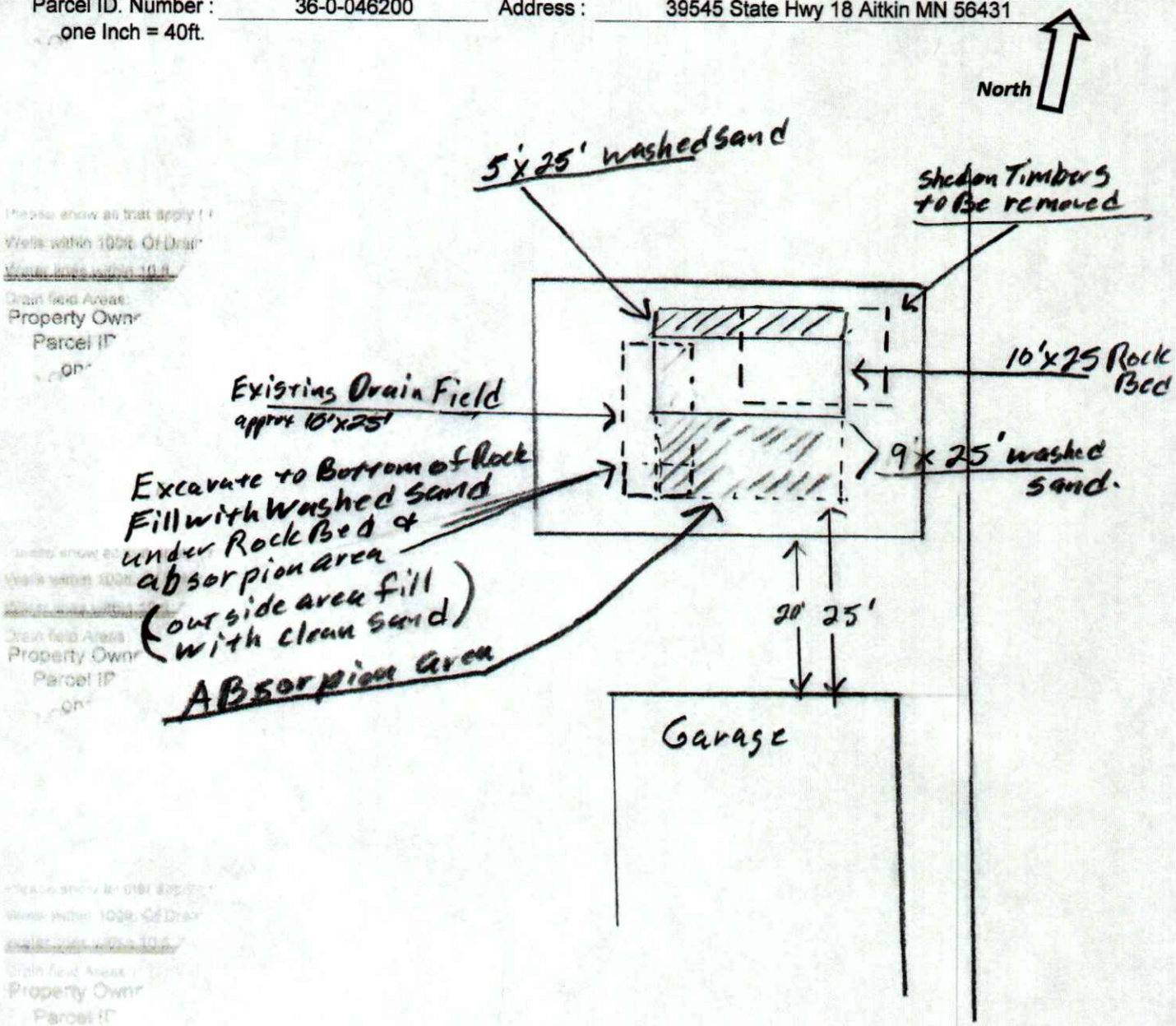
	Disturbed/Compacted Areas	Access Route for Tank Maintenance
	Component Location	Property Lines
	OHW ordinary high water	Structures
	Lot Easements	Setbacks

{ Design Drawing }

Property Owner: Robert Wander Date: 10/20/22 Designer's Initials : JB

Parcel ID. Number : 36-0-046200 Address : 39545 State Hwy 18 Aitkin MN 56431

one Inch = 40ft.



Top Of Deep Well Cap Elv. = 100.4' Mille-Lacs Lake Elv. = 92.3' on 10/20/22

	Surface/ SHWT	*Nail on Tele Ped = Bench Mark 100'*			Existing Grade
Soil Bore 1	98.3' / 30"	Bench Mark	100'		Upslope Edge of Rockbed Elv.= 99'
Soil Bore 2	98.8' / 36"	Ground Elv. BM	98.4'		Bottom of Rockbed Elv.= 100'
Soil Bore 3		Ground Elv. Tank	98.1'		Top of Washed Sand Elv.= 100'
	Ground at	Existing house	98.2'	NW Corner	Existing Septic Tank Inlet Elv.= 94.8'

Please show all that apply (Existing)

Wells within 100ft. Of Drain field.

Water lines within 10 ft. of Drain field.

Drain field Areas:

Please Draw to Scale with North to Top or Left Side of Page:

	Disturbed/Compacted Areas	Access Route for Tank Maintenance
	Component Location	Property Lines
	OHW ordinary high water	Structures
	Lot Easements	Setbacks

Mound Design Notes - Aitkin county

Property Owner: Robert Wander **Date:** 10/20/22

Site Address: 39545 State Hwy 18 Aitkin MN 56431 **PID:** 36-0-046200

Comments: ***Mound design may not follow Aitkin co. Auto fill form for mound design.***

1 This is a type III mound , (On Fill and Disturbed soils, Soil Separation 30") sized for a 2 bedroom system.

2 Existing well location is off the SW corner of house. (Tank and mound will be Plus 70 ft)

3 Existing tanks to be pumped, collapsed, and removed. Existing drainfield to be removed (approx. 18" to 24" deep)
Excavate existing drainfield to bottom of rockbed, Absorption and rockbed area fill with Washed Sand, to Elv.= 99'
Excavated area outside of absorption area fill with clean sand, fill to existing grade. (Existing approx. bed 10' x 25')

4 The house is gravity flow from North side of house, install clean-out were connection to existing pipe is made.

5 Lot is Flat, install 1650 Jacobson compartment tank for gravity flow from house. (Side inlet, Water proof if possible).
Install tank low enough for drainback from mound to pump tank.
Install effluent filter in septic tank outlet. Install alarm on Effluent filter. Insulate tank tops.

6 The berm Downslope and West berms are at 4:1. The Upslope and East end Berms are at 3:1
The upslope berm toe is at 100 ft from CL of hwy 18' as survey marked. Downslope berm toe is 20 ft from garage.

7 Elevation contour of rock bed upslope edge is 99' . East berm will be approx. 5 ft. from property line.
The area size of the rock bed is 10' x 25' . Absorption area is 25' x 30'.
Sand absorption area is 5 ft. up slope + 10 ft. rockbed + 9 downslope = approx. 24 ft. wide sand base.
Berms are 9ft. Upslope, 14ft. Down slope, 10ft. Rock bed = approx. 32ft. Wide.
Overall mound size is approx. 32' wide x 51' long and approx. 3' high. End berms are 21ft. Wide.
West end berm is 13 ft wide, East end berm is 10 ft wide.

8 The bench mark is the nail on the Telephone Ped Post NE of mound area, BM = Elv. 100'.
The top of the deep well cap is Elv. = 100.4'
Installer to double check bench mark. Installer should confirm bench mark and sand height Elv. with inspector.
Installer should record bench mark Elv. and sand height on installation inspection form.
The top of the sand and bottom of rock bed is Elv. 100'.

9 It is important that the soils do not get compacted, and that clean Washed sand is used.

10 The Jacobson 1650 tank will be gravity flow from dwelling. Install the pump for 7 demand doses
per day. approx. 49 gallons per dose, 3.9 inches of tank level. Install alarm at 3 inches from pump on level.
Install all manholes, inspection pipes and clean-outs to grade or above. (Recommend min. 4" above grade)
Install a 2" supply pipe from tank to end manifold in rock bed, install so pipe drains back to tank.
Install 1.5" laterals with 9" of rock under them. (Install Lateral clean-outs at far end of laterals. Recommended)

11 **Drill 1/4" perf holes spaced 3 ft. on center.**
Install 4" inspection pipe to bottom of rock bed, secure in rock bed and raise to above final grade.

12 Install Event counter on Effluent pump, calibrate pump and give gallons per event to Owner.

13 Designer does not guarantee or warranty any Type III systems.
Designed to Aitkin Co. and MPCA recommendations and requirements.

Designer Signature | Brummer Septic LLC. (Design Company) | L-1347 (License#)

This System will require an Aitkin Co. Operator permit, annual inspection
There will be 2 alarms on this system one on the Effluent filter, one on the pump tank.
Owner and installer are responsible for owner knowing how system is maintained.
Owner should clean Effluent filter at least twice a year and check alarms and pump.