

Preliminary & Field Evaluation Form

24-174

www.SepticResource.com vers 12.4

Owner Information			
Date	<u>9/23/2024</u>	Sec / Twp / Rng	<u>S-17, T-46, R-27</u>
Parcel ID	<u>07-0-034000</u>	LUG (county, city, township)	<u>Aitkin Co.</u>
Property Owner:	<u>Aaron Novak</u>	Owners address (if different)	
Property Address:	<u>44157 320th St Aitkin MN 56431</u>		<u>37313 Nature Rd</u>
City / State / Zip:			<u>Hillman MN 55338</u>

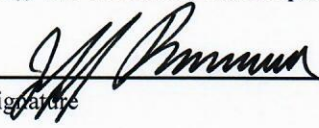
Flow Information and Waste Type / Strength			
Estimated Design flow	<u>300 GPD</u>	Anticipated Waste strength	<input type="checkbox"/> Hi Strength <input checked="" type="checkbox"/> Domestic
Comments: Steep Slope North of Mound area Gravity flow from House to Septic Tank Proposed Deep Well will be _ 50 ft from tank and Mound.		Any Non-Domestic Waste	<input type="checkbox"/> Yes (class V) <input checked="" type="checkbox"/> No
		Sewage ejector/grinder pump	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Water softener	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Garbage Disposal	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		Daycare / In home business	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Site Information					
Existing & proposed lot improvements located (see site map)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Well casing depth	Proposed deep well	
Easements on lot located (see site map)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Drainfield w/in 100' of residential well	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Property lines determined (see site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site w/in 200' of transient noncommunity water supply (TNCWS)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Req'd setbacks determined (see site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site w/in an inner wellhead mgmt zone (CWS/NTNCWS)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Utilities located & identified (gopher state one call)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Buried water supply pipe w/in 50' of system	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Access for system maintenance (shown on site map)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site located in Shoreland (w/in 1000' of lake, 300' of river)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Soil treatment area protected	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Site map prepared with previous items included	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Construction related issues	<u>Install mound before house.</u>				
	<u>Designer set Nails at the 4 rockbed corners</u>				

Soil Information

			Evidence of site:
			Cut <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
			Filled <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
			Compacted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
			Disturbed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Original soils	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Soil logs completed and attached	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Perk test completed and attached (if applicable)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Soil loading rate (gpd/ft ²)	<u>0.60</u>	Percolation rate (if applicable)	_____
Depth/elev to SHWT	<u>17"</u>	Flooding or run-on potential (comments)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Depth to system bottom maximum (or elev minimum)	<u>(+ 12")</u>	Flood elevation (if applicable)	_____
Depth/elev to standing water (if applicable)	_____	Elevation of ordinary high water level (if applicable)	_____
Depth/elev to bedrock (if applicable)	_____	Floodplain designation and elev - 100 yr/10 yr (if applicable)	_____
Soil Survey information determined (see attachment)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
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: <u>Aaron Novak</u>	Date <u>9/23/2024</u>
Property Address / PID: <u>44157 320th St Aitkin MN 56431</u>	

Soil Survey Information	
<input type="checkbox"/> refer to attached soil survey	
Parent matl's:	<input checked="" type="checkbox"/> Till <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Alluvium <input type="checkbox"/> Organic <input type="checkbox"/> Bedrock
landscape position:	<input type="checkbox"/> Summit <input type="checkbox"/> Shoulder <input checked="" type="checkbox"/> Side slope <input type="checkbox"/> Toe slope
soil survey map units:	<u>928C</u> slope <u>5</u> % direction- <u>SW</u>

Soil Log #1								
		<input checked="" type="checkbox"/> Boring	<input type="checkbox"/> Pit	Elevation <u>97.8'</u>	Depth to SHWT <u>21"</u>			
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape	
0 - 6	Topsoil Loam	<35	10YR3/2		Loose	Loose	Granular	
6 - 21	Loam	<35	10YR4/4		Loose	Loose	Granular	
21 - 24	Loam	<35	10YR4/4	7.5YR5/4	Loose	Loose	Granular	
24	Clay Loam	<35	10YR4/4	7.5YR5/6	Friable	Weak	Blocky	
Comments:								


44157 320th St Aitkin MN 56431 **Soil Log #2**

		<input checked="" type="checkbox"/> Boring	<input type="checkbox"/> Pit	Elevation <u>97.9'</u>	Depth to SHWT <u>17"</u>		
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 6	Topsoil Loam	<35	10YR3/2		Loose	Loose	Granular
6 - 17	Loam	<35	10YR4/4		Loose	Loose	Granular
17 - 24	Loam	<35	10YR4/4	7.5YR5/4	Loose	Loose	Granular
24	Clay Loam	<35	10YR4/4	7.5YR5/6	Friable	Weak	Blocky

44157 320th St Aitkin MN 56431 **Soil Log #3**

		<input type="checkbox"/> Boring	<input type="checkbox"/> 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 #

Mound Design - Aitkin county

Property Owner: Aaron Novak

Date: 9/23/2024

Site Address: 44157 320th St Aitkin MN 56431

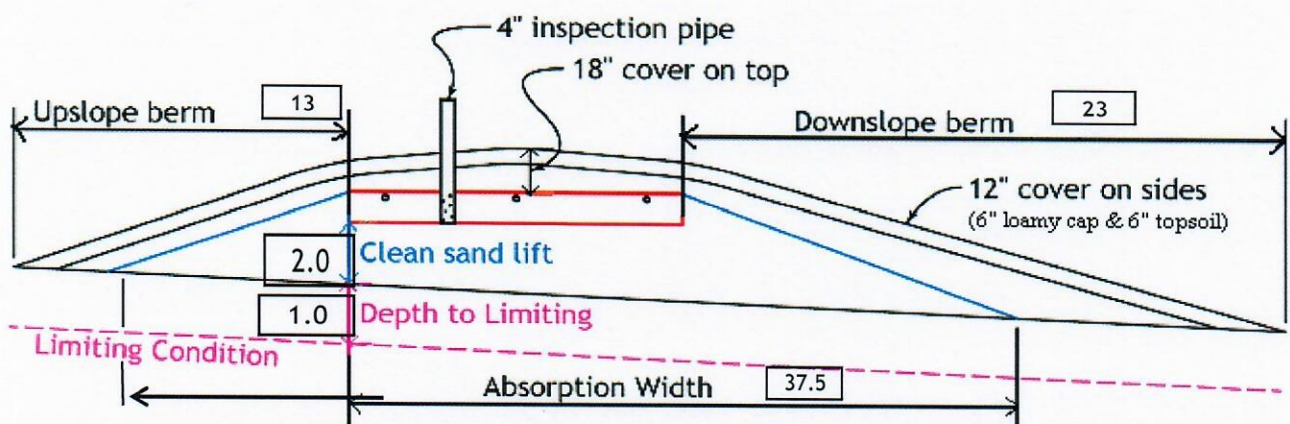
PID: 07-0-034000

Comments: _____

Instructions: = enter data = adjust if desired = computer calculated - DO NOT CHANGE!

- 1) 2 bedroom Type I Residential System
- 2) 300 GPD design flow
- 3) No Garbage disposal or pumped to septic Install 1650 Jacobson 2/Compartment Septic/Pump tank
- 4) 1000 Gal Septic tank (code minimum) 1000 Gal Septic tank (design size / LUG req'd)
 Tank options: none
- 5) 1.2 GPD/ft² 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)
- 12) 1.50 inch diameter laterals must be used to meet "4x pipe volume" requirement 1.50 5x
- 13) 45 feet of 2.0 inch supply line leads to 8 gallons of drainback volume 2.00 3x
 (Tip: "top feed" manifold to control the drainback)
- 14) 51 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) 4.0 inch swing on Demand float, or timed dosing of 2.8 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) **0.60** gpd/ft² Absorption area Soil Loading Rate, which gives a mound ratio of **2** (minimum)
 (this must match the soil boring log) desired mound ratio **2.0**
- 24) **5** percent site slope (0-20% range) **5** (% downslope site slope, if different than upslope)
- 25) **12** inches, or **1.0** 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) **24** inch, or **2.0** ft. Sand Lift Mound **CRITICAL FOR FUTURE CERTIFICATIONS!!!**
- 27) **20.0** ft. base absorption width (with sand beyond rockbed as follows):
37.5 greater of: absorption width OR sand slope
- 28) **0.0** ft. upslope and sideslope sand upslope **10.0**
10.0 ft. Downslope sand down slope **17.5**
- Individual slope ratios give BERM widths (topsoil beyond rockbed) of:
- 29) **4:1** upslope ratio **13** ft. upslope berm
- 30) **4:1** sideslope **18** ft. sideslope berms
- 31) **4:1** downslope **23** ft. downslope berm
- 32) Overall Dimensions: **10.0** ft. wide by **25.0** ft. long Rock bed
46 ft. wide by **61** 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)
29.4 up + **60.1** downslope + **18.1** ends + **20.8** under rock = **154** yd³ or *1.4= **216** ton
 plus 20%
- 35) Loamy Cap:
42 ft. by **57** ft. 6" deep, plus 20% gives **54** yd³ or *1.4= **76** ton
- 36) Topsoil:
46 ft. by **61** ft. 6" deep, plus 20% gives **63** yd³ or *1.4= **88** ton

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

[Signature]
 Designer Signature

Brummer Septic LLC.
 Company

L-1347
 License#

9/23/2024
 Date

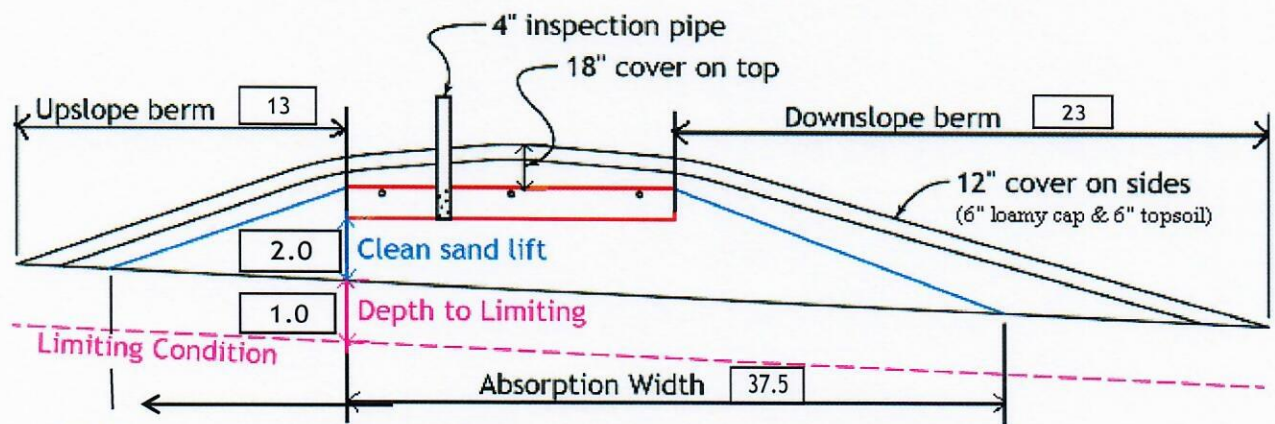
Installer Summary

1000 gallon Septic tank (minimum) Tank options: none
 Install 1650 Jacobson 2/Compartment Septic/Pump tank
 533 gallon Dose tank (minimum) at 12.69 gpi
 18 GPM @ 21 ft. of head, Pump required
 4.0 inch swing on Demand float which translates to roughly 3.0 inches of float tether length
 if time dosing is required --> 2.8 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
 45 ft. of 2.0 inch supply line with end feed manifold connection
 (Tip: "top feed" manifold to control drainback)
 24 inch, or 2.0 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
 No Effluent filter & alarm
 3 clean out & valve box assemblies

37.5 ft. Total sand ABSORPTION width (minimum)
 10.0 ft. upslope and sideslope (sand beyond rockbed, minimum)
 17.5 ft. Downslope (sand beyond rockbed, minimum)

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

4:1 upslope ratio	13 ft. upslope berm
4:1 sideslope	18 ft. sideslope berms
4:1 downslope	23 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:	154 yd ³ or *1.4=	216 ton	
Loamy Cap:	54 yd ³ or *1.4=	76 ton	6" deep
Topsoil:	63 yd ³ or *1.4=	88 ton	6" deep

INSPECTOR CHECKLIST - mound

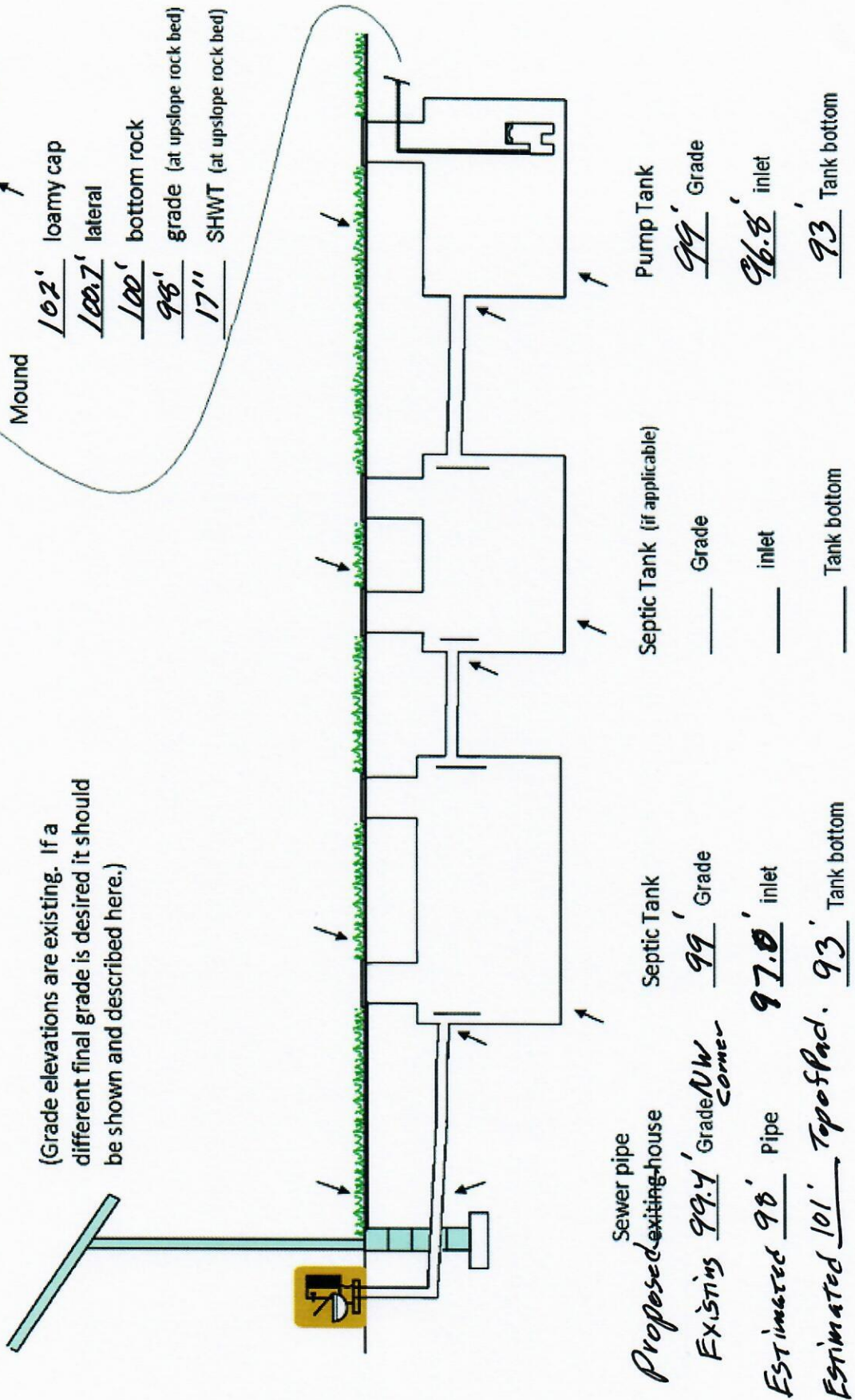
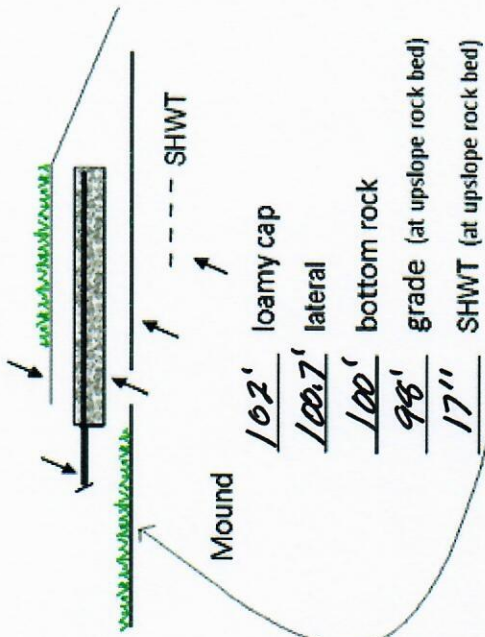
4415/ 320th St Aitkin MN 56431

- 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 none _____
- Riser over outlet, riser over inlet or center, and 6"+ inspection pipe over any remaining baffles.
- No _____ 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 2.8 min ON 5.1 hr OFF
- float setting drop 4.0 inches at 12.7 gpi "DESIGNED" 3.0 inches approx float tether length
51.0 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 24 inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)
- Absorption Sand beyond rock 10.0 upslope 17.5 downslope
- Bermed topsoil beyond rockbed 13 upslope 18 sideslope 23 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

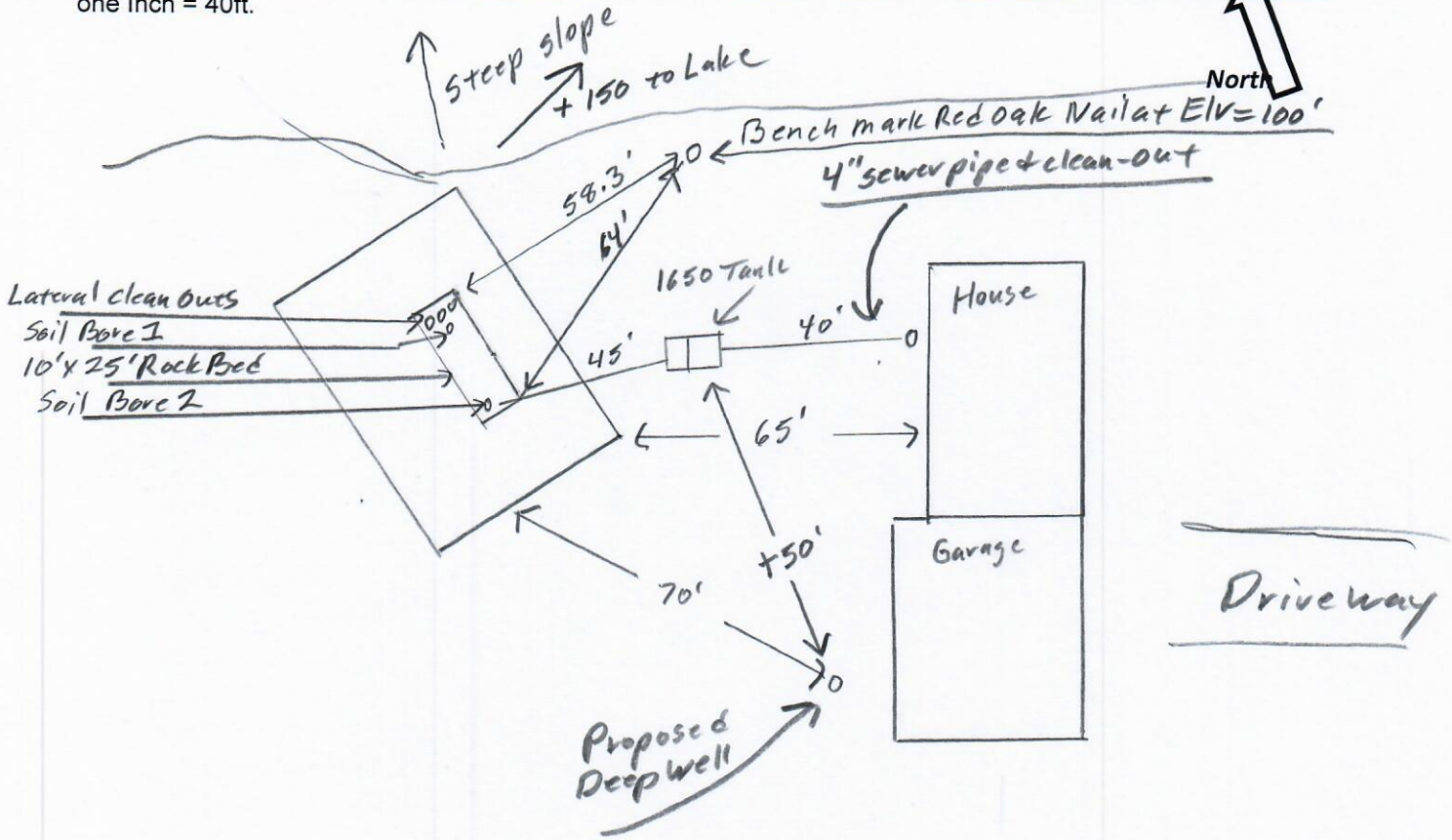
ELV = 100' benchmark Nail on Red oak Tree.

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



{ Design Drawing }

Property Owner: Aaron Novak Date: 9/23/24 Designer's Initials: JB
 Parcel ID. Number: 07-0-034000 Address: 44157 320th St Aitkin MN 56431
 one Inch = 40ft.



Estimated Pad for House Elv. = 101'

Estimated Septic Tank In-let Elv. = 97'

	Surface/ SHWT	Nail on Tele Ped = Bench Mark 100'		Existing Grade	
Soil Bore 1	97.8' / 21"	Bench Mark	100'		Upslope Edge of Rockbed Elv. = 98'
Soil Bore 2	97.9' / 17"	Ground Elv. BM	96.9'		Bottom of Rockbed Elv. = 100'
Soil Bore 3		Ground Elv. Tank	99'		Top of Washed Sand Elv. = 100'
		Ground at Proposed house	99.4'	Existing	Estimated Sewer pipe At House Elv. = 98'

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: Aaron Novak

Date: 9/23/24

Site Address: 44157 320th St Aitkin MN 56431

PID: 07-0-034000

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

- 1 This is a type I mound for a 2 bedroom House. Proposed deep well location will be SW of House.
- 2 NW Mound Berm Corner is over top of slope. There is a steep slope North of mound.
- 3 Camp lake is Plus 150 ft from mound and tank.
- 4 Bench Mark Elevation = 100' is a nail on a Red Oak tree near NE corner of mound area.
- 5 Install Jacobson 1650 Compartment tank for gravity flow from Slab on grade house (Elv. not set)
Install clean-out near house.
- 6 Elevation contour of rock bed upslope edge is 98'.
The area size of the rock bed is 10' x 25' . Sand area is 25' x 37.5'.
Sand absorption area is 10 ft. up slope + 10 ft. rockbed + 17.5 downslope = approx. 37.5 ft. wide sand base.
Berms are 13ft. Upslope, 23ft. Down slope, 10ft. Rock bed = approx. 46ft. Wide.
Overall mound size is approx. 46' wide x 61' long and approx. 4' high. End berms are 18 ft wide.
- 7 The bench mark is the nail on a Red Oak tree near mound area, BM = Elv. 100'.
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.
- 8 The top of the washed sand and bottom of rock bed is Elv. 100'.
It is important that the soils do not get compacted, and that clean washed sand is used.
- 9 The Jacobson 1650 compartment tank will be gravity flow from dwelling. Install the pump for 7 demand doses per day. approx. 51 gallons per dose, 4 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, insulate top of tank.
Recommend raising manholes 4" above finished grade.
- 10 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" holes for Perf sizing, 36" on centers.**
Install 4" inspection pipe to bottom of rock bed, secure in rock bed and raise to above final grade.
MPCA recommends Installing an Effluent filter and Alarm on septic tank outlet.
MPCA recommends installing an event counter on all systems with a pump.

Designed to Aitkin Co. and MPCA recommendations and requirements.

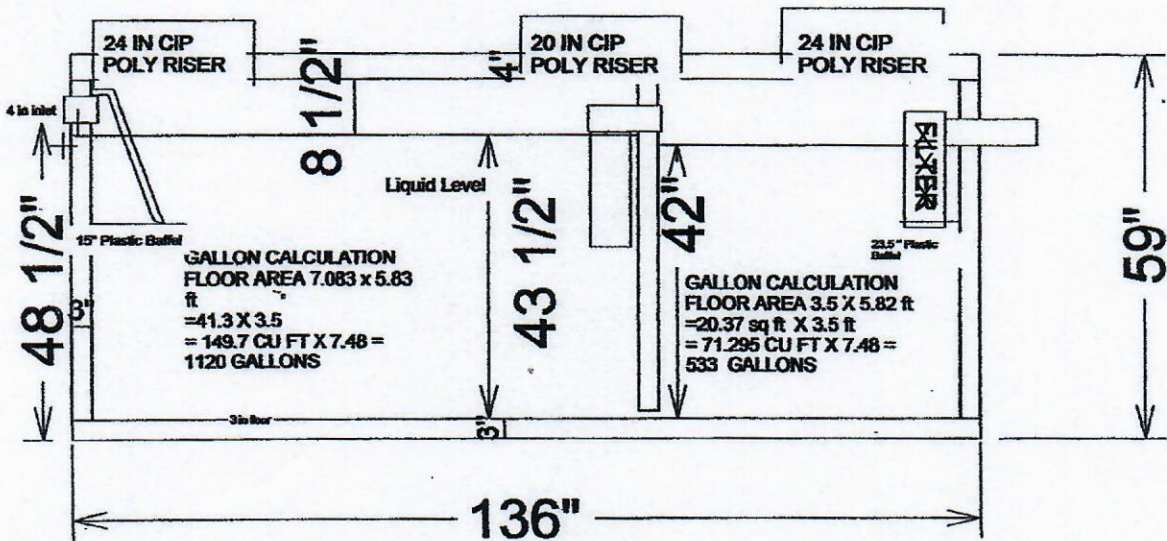
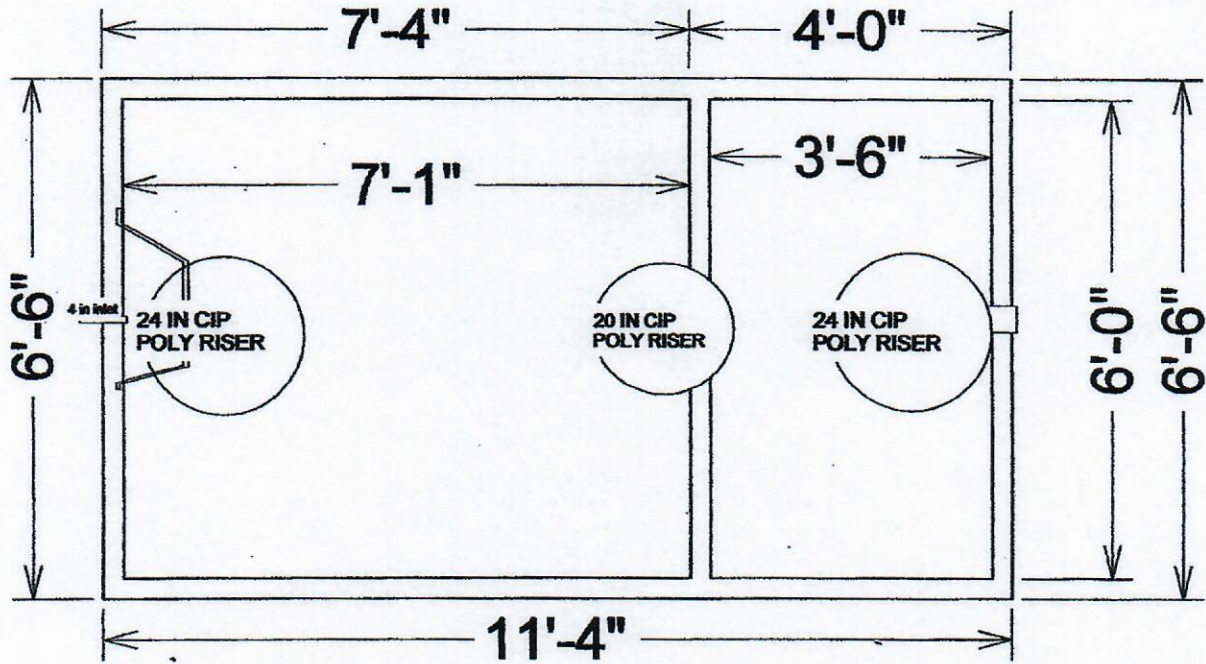

Designer Signature

Brummer Septic LLC.
Design Company

L-1347
License#

1650 Gallon 2 Compartment Septic Tank

TOP VIEW



$533 / 42" = 12.69 \text{ GPI}$

SIDE VIEW

Drawings Owned BY Jacobson Precast, Inc.
36641 HWY 169, Aitkin, Mn 56431



Detailed Parcel Report

Parcel Number: 07-0-034000

General Information

Township/City:	FARM ISLAND TWP		
Taxpayer Name:	NOVAK, AARON D & PEKAREK, HEATHER		
Taxpayer Address:	37312 NATURE RD HILLMAN MN 56338		
Property Address:	44157 320TH ST		
Township:	46	Lake Number:	1022300
Range:	27	Lake Name:	CAMP LAKE - FARM ISLAND TWP <i>NE</i>
Section:	17	Estimated Acres:	40.00
Green Acres:	No	School District:	1.00
Plat:			
Brief Legal Description:	NW NE		

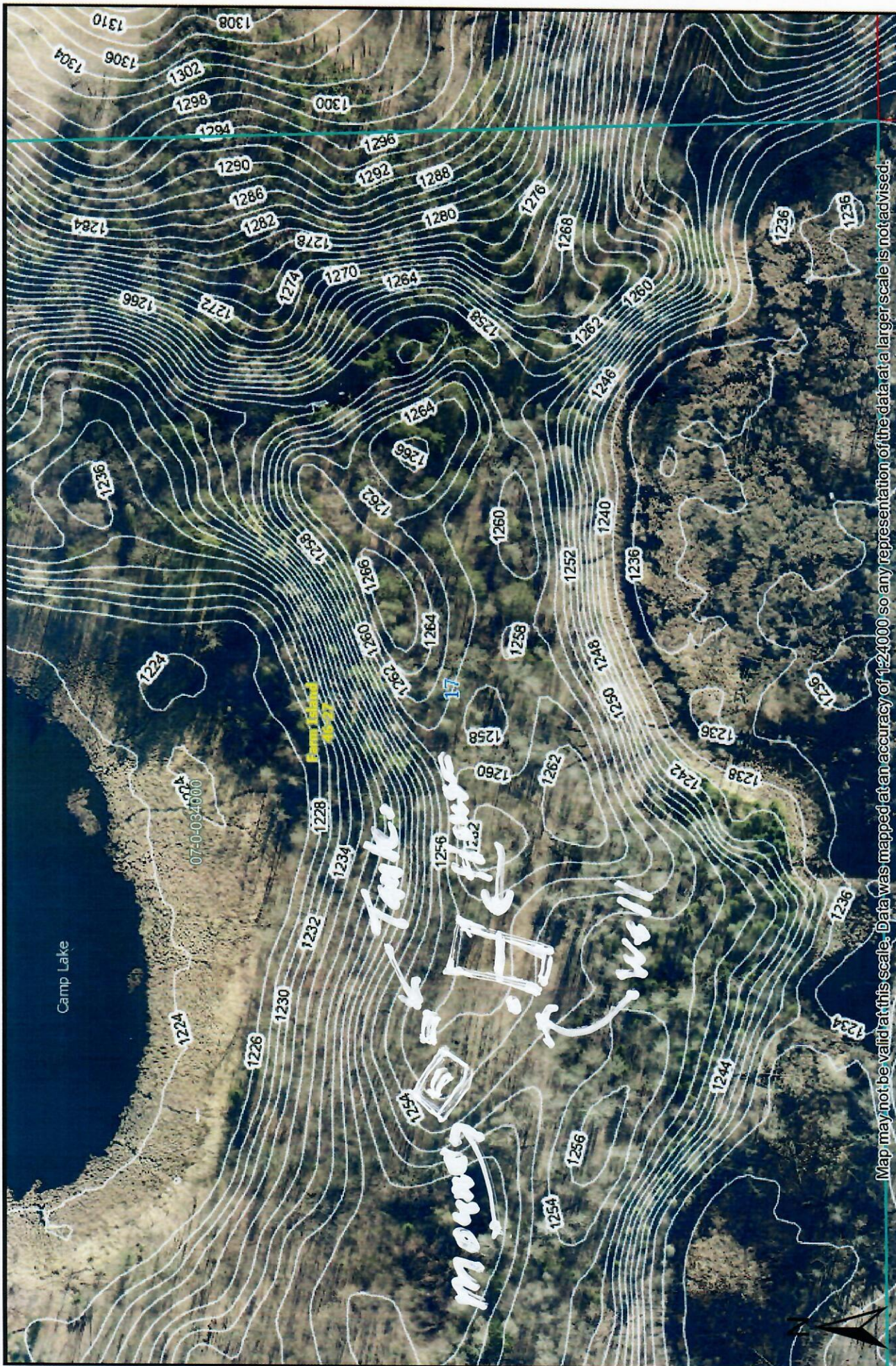
Tax Information

Class Code 1:	Rural Vacant Land
Class Code 2:	Wetlands Located on Ag Property
Class Code 3:	Unclassified
Homestead:	Non Homestead
Assessment Year:	2024

Estimated Land Value:	\$160,700.00
Estimated Building Value:	\$0.00
Estimated Total Value:	<u>\$160,700.00</u>
Prior Year Total Taxable Value:	\$76,500.00
Current Year Net Tax (Specials Not Included):	\$168.00
Total Special Assessments:	\$0.00
**Current Year Balance Not Including Penalty:	\$0.00
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.**



Map may not be valid at this scale. Data was mapped at an accuracy of 1:24,000 so any representation of the data at a larger scale is not advised.

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.

Novak

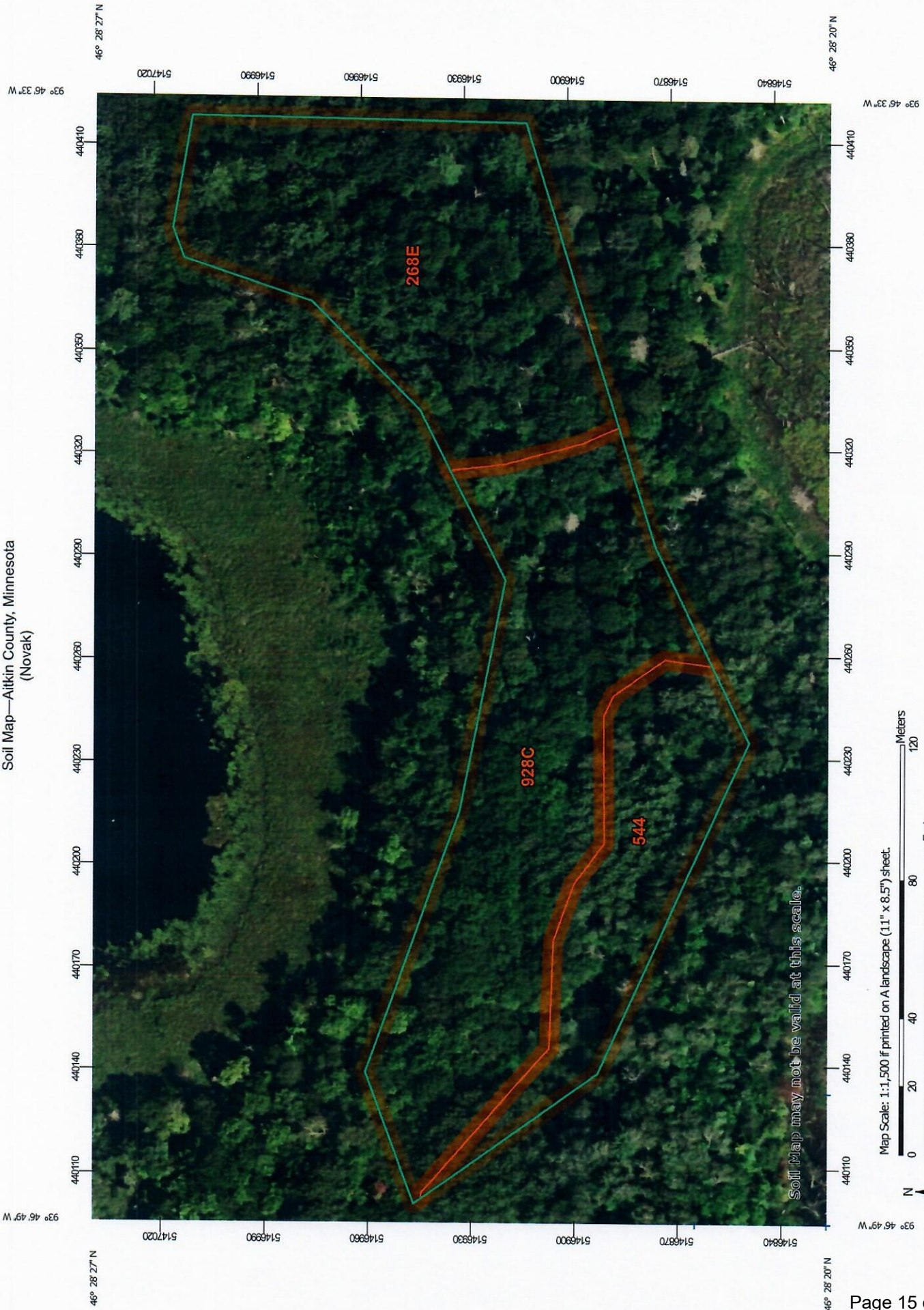


Web AppBuilder for ArcGIS



Date: 9/14/2024

Soil Map—Aitkin County, Minnesota
(Novak)



Soil Map may not be valid at this scale.

Map Scale: 1:1,500 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

9/14/2024
Page 1 of 3

Aitkin County, Minnesota

928C—Cushing-Mahtomedi complex, 2 to 10 percent slopes

Map Unit Setting

National map unit symbol: gjk4
Elevation: 980 to 1,640 feet
Mean annual precipitation: 25 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Cushing and similar soils: 50 percent
Mahtomedi and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cushing

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

E - 0 to 16 inches: very fine sandy loam
B/E - 16 to 19 inches: loam
Bt - 19 to 44 inches: loam
C - 44 to 60 inches: loam

Properties and qualities

Slope: 2 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F090AY015WI - Loamy Upland with Carbonates
Forage suitability group: Sloping Upland, Acid (G090AN006MN)

Other vegetative classification: Sloping Upland, Acid
(G090AN006MN)
Hydric soil rating: No

Description of Mahtomedi

Setting

Landform: Moraines
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly outwash

Typical profile

A - 0 to 4 inches: loamy sand
E - 4 to 15 inches: coarse sand
Bw - 15 to 26 inches: gravelly coarse sand
C - 26 to 60 inches: gravelly sand

Properties and qualities

Slope: 2 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F090AY019WI - Dry Sandy Uplands
Forage suitability group: Sandy (G090AN022MN)
Other vegetative classification: Sandy (G090AN022MN)
Hydric soil rating: No

Minor Components

Cathro

Percent of map unit: 4 percent
Landform: Bogs
Hydric soil rating: Yes

Meehan

Percent of map unit: 4 percent
Hydric soil rating: No

Sandwick

Percent of map unit: 4 percent
Landform: Flats
Hydric soil rating: Yes

Alstad

Percent of map unit: 3 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Aitkin County, Minnesota

Survey Area Data: Version 24, Sep 9, 2023