Preliminary & Field Evaluation Form

www.SepticResource.com vers 12.4

Owner Information

Date	4/30/2020	Sec / Twp / Rng	S-12, T-49, R-27
Parcel ID	52-1-037400	LUG (county, city, township)	Aitkin Co.
Property Owner:	Timothy Rosecrans	Owners address (if different)	
Property Address:	40091 502nd LN. Palisade MN 56469		
City / State / Zip:			

*Flow Information and Waste Type / Strength

Estimated Design flow: 300

Comments:
New Tank and Abandon extising system

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

Site Information

Existing & proposed lot improvements located (see site map)	☑ Yes	☐ No	Well casing depth	Shallow Well NW of house 10 ft.
Easements on lot located (see site map)	☐ Yes	☑ No	Drainfield w/in 100' of residential well	☐ Yes ☑ No
Property lines determined (see site map) By Owner	☑ 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

Soil Information

Original soils	☑ Yes	☐ No	Evidence of site:	
			Cut	☐ Yes ☑ No
			Filled	☐ Yes ☑ No
			Compacted	☐ Yes ☑ No
			Disturbed	☐ Yes ☑ No
Soil logs completed and attached	☑ Yes	☐ No	Perk test completed and attached (if applicable)	☐ Yes ☑ No
Soil loading rate (gpd/ft^2)	0.60		Percolation rate (if applicable)	
Depth/elev to SHWT	16"		Flooding or run-on potential (comments)	☐ Yes ☑ No
Depth to system bottom maximum (or elev minimum)	(+24")			
			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)	☑ Yes	☐ 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: Timothy Rosecrans Date 4/30/2020

Property Address / PID: 40091 502nd LN. Palisade MN 5646'

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: 928C slope 6 % direction- SW

Soil Log #1

☑ Boring ☐ Pit Elevation 97.4' Depth to SHWT 17"

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 6	Topsoil Sandy Loam	<35	10YR3/2		Loose	Loose	Granular
6 - 17	Sandy Loam	<35	10YR4/4		Loose	Loose	Granular
17 - 22	Clay Loam	<35	10YR6/4	7.5YR5/6 & 10YR6/2	Friable	Moderate	Blocky
		<35					
		<35					

Comments:

40091 502nd LN. Palisade MN 56469			**Soil Log #2**				
	☑ Boring	☐ Pit	Elevation	97.6	Depth to SHWT	16"	
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 6	Topsoil Sandy Loam	<35	10YR3/2		Loose	Loose	Granular
6 - 16	Sandy Loam	<35	10YR4/4		Loose	Loose	Granular
16 - 20	Clay Loam	<35	10YR6/4	7.5YR5/6 & 10YR6/2	Friable	Moderate	Blocky
		<35			Loose	Loose	Granular
		<35			Loose	Loose	Granular

40091 502nd LN. Palisade MN 56469			**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.

[signature] Designer Signature | Brummer Septic LLC. Company | L-1347 License #

2011 purple code

Mound Design - Aitkin county

www.SepticResource.com (vers 15.2)

Property Owner: Timothy Rosecrans **Date:** 4/30/2020

Site Address: 40091 502nd LN. Palisade MN 56469 **PID:** 52-1-037400

Comments: Replacement System

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

1) [2] bedroom Type [1] 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: none

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) [40] feet of [2.0] inch supply line leads to [7] gallons of drainback volume
(Tip: "top feed" manifold to control the drainback)

14) [50] gallons TOTAL pump out volume (treatment + drainback)

15) [12] feet vertical lift from pump to mound laterals, leads to a:

16) [18] GPM @ [18] 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 [2.8] 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, (this must match the soil boring log) which gives a mound ratio of 2 (minimum) desired mound ratio 2.0

24) 6 percent site slope (0-20% range) 6 (% 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:)
38.6 greater of: absorption width OR sand slope

28) 0.0 ft. upslope and sideslope sand upslope 9.7
10.0 ft. Downslope sand down slope 18.9

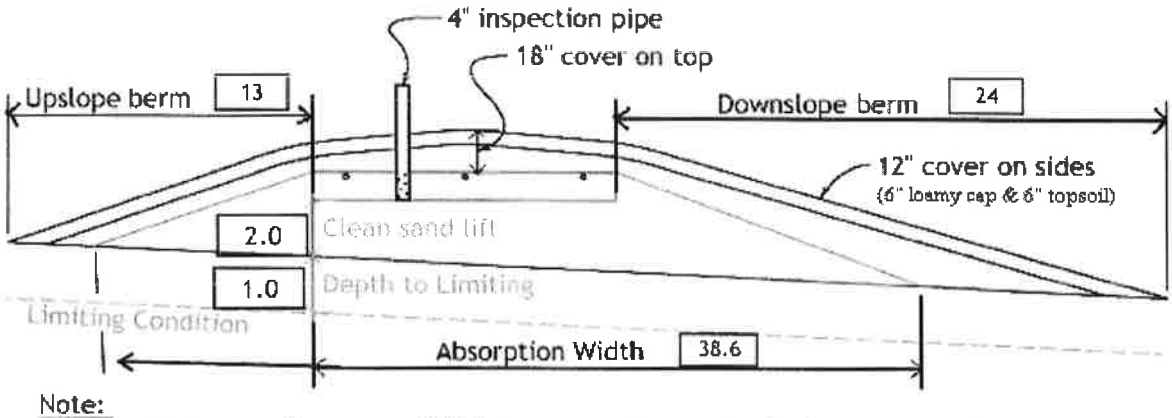
Individual slope ratios give BERM widths (topsoil beyond rockbed) of:

29) 4:1 upslope ratio 13 ft. upslope berm

30) 4:1 sideslope 18 ft. sideslope berms

31) 4:1 downslope 24 ft. downslope berm

32) Overall Dimensions: 10.0 ft. wide by 25.0 ft. long Rock bed
47 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)
28.5 up + 66.9 downslope + 19.2 ends + 21.3 under rock = 163 yd³ or *1.4= 228 ton
plus 20%

35) Loamy Cap:
43 ft. by 57 ft. 6" deep, plus 20% gives 55 yd³ or *1.4= 77 ton

36) Topsoil:
47 ft. by 61 ft. 6" deep, plus 20% gives 64 yd³ or *1.4= 90 ton

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

Designer Signature	Company	License#	Date
	Brummer Septic LLC.	L-1347	4/30/2020

Install electric alarm on pump tank

Installer Summary

1000 gallon Septic tank (minimum)

Tank options: none
Install 1650 Jacobson 2/Compartment Tank
at 12.69 gpi

533 gallon Dose tank (minimum)

18 GPM @ 18 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 --> 2.8 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

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

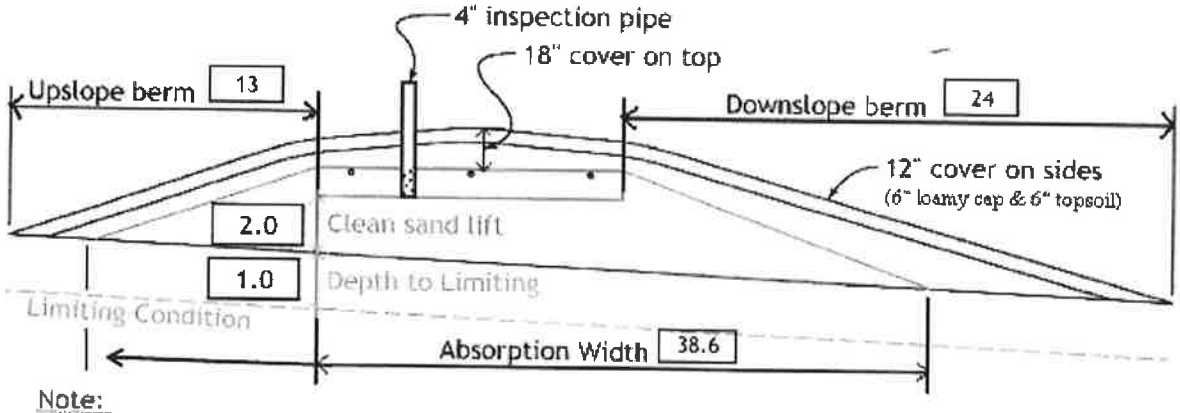
24 inch, or 2.0 ft. Sand Lift Mound
10.0 ft. wide by 25.0 ft. long Rock bed
3 laterals 1.50 inch diameter 23.0 ft. long 3.0 ft. lateral spacing
1/4" inch perfs 3.0 ft. perforation spacing

No Effluent filter & alarm
3 clean out & valve box assemblies

38.6 ft. Total sand ABSORPTION width (minimum)
9.7 ft. upslope and sideslope (sand beyond rockbed, minimum)
18.9 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 24 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:	163 yd^3 or *1.4=	228	ton	calculation based on 3:1/4:1 slope from top of rockbed
Loamy Cap:	55 yd^3 or *1.4=	77	ton	6" deep
Topsoil:	64 yd^3 or *1.4=	90	ton	6" deep

INSPECTOR CHECKLIST - mound

40091 502nd LN. Palisade MN 56469

☐ 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 sc 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 18 head VERIFY PUMP CURVE 2.8 min ON 5.1 hr OFF

☐ float setting drop 3.9 inches at 12.7 gpi "DESIGNED" 3.0 inches approx float tether length
50.0 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 9.7 upslope 18.9 downslope

☐ Bermed topsoil beyond rockbed 13 upslope 18 sideslope 24 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

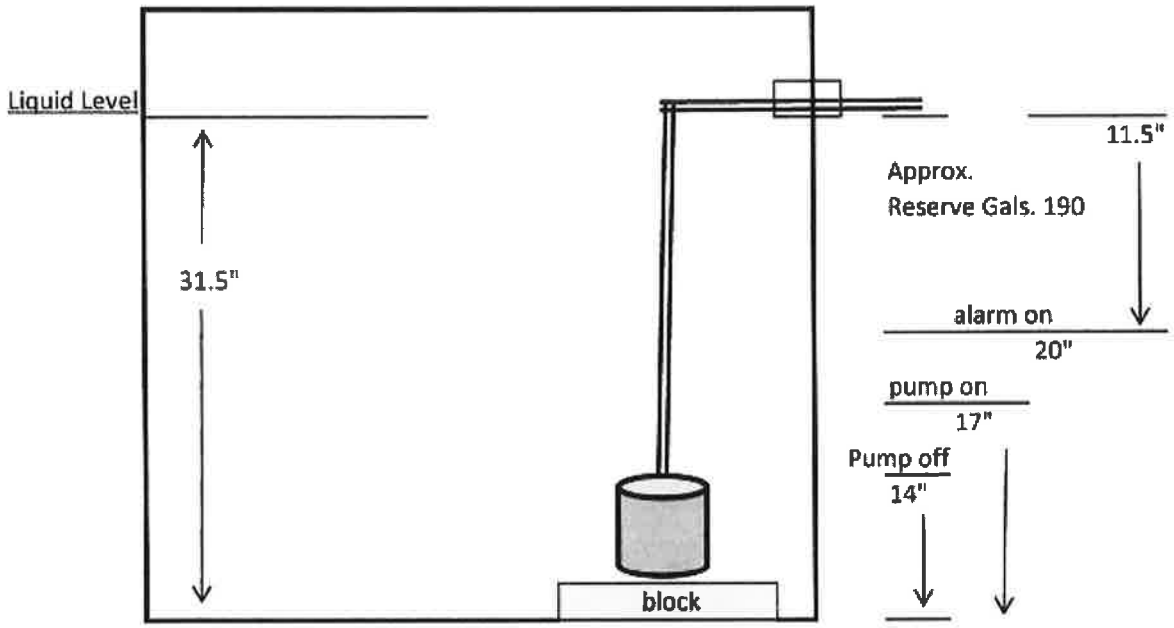
☐ monitoring plan and type _____

☐ well abandonment form - if necessary

Pump settings for 520 gal Jacobson Pump tank.

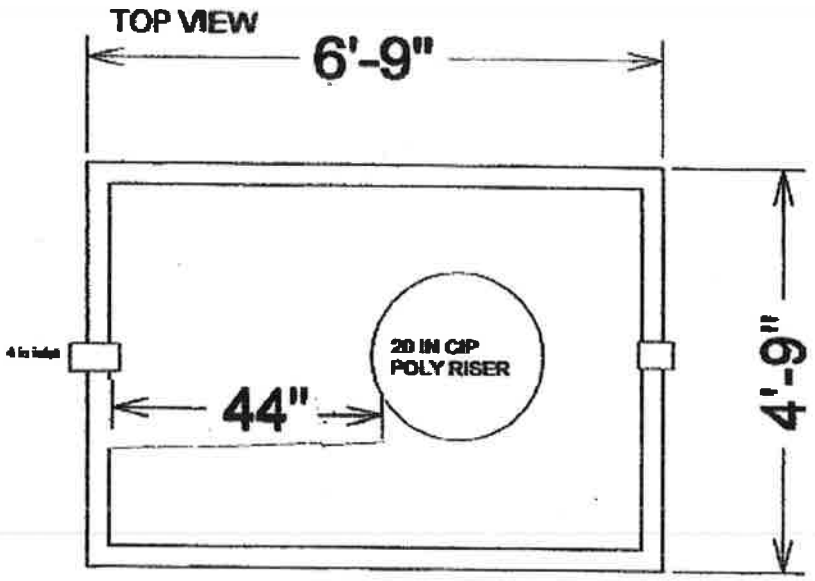
Timothy Rosecran
Parcel ID. 52-1-037400

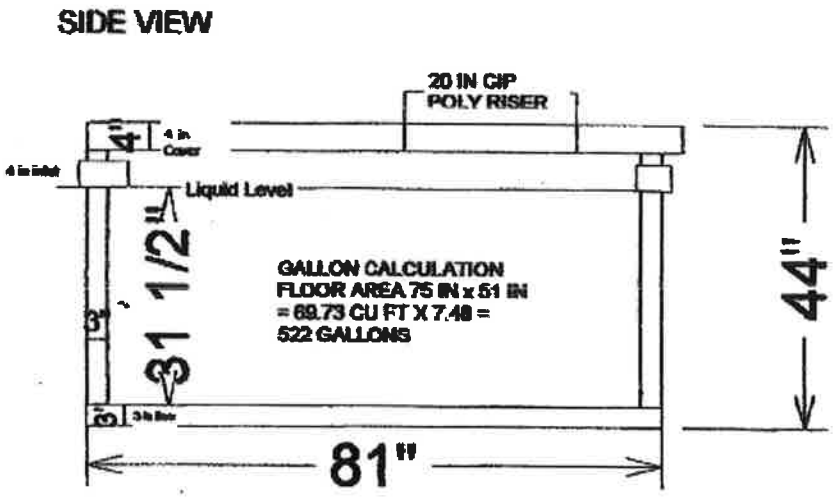
Tank Mfg. Jacobson 520 pump tank
Tank Size: MFG. 16.57 gals. Per inch



Assumes 10" pump
Pump out dose at 3" = (43 gals. dose + 7 drain back) = 50 pump out gals.
300 gpd ÷ 7 = 43 gals. Per Dose

520 Gallon Pump Tank





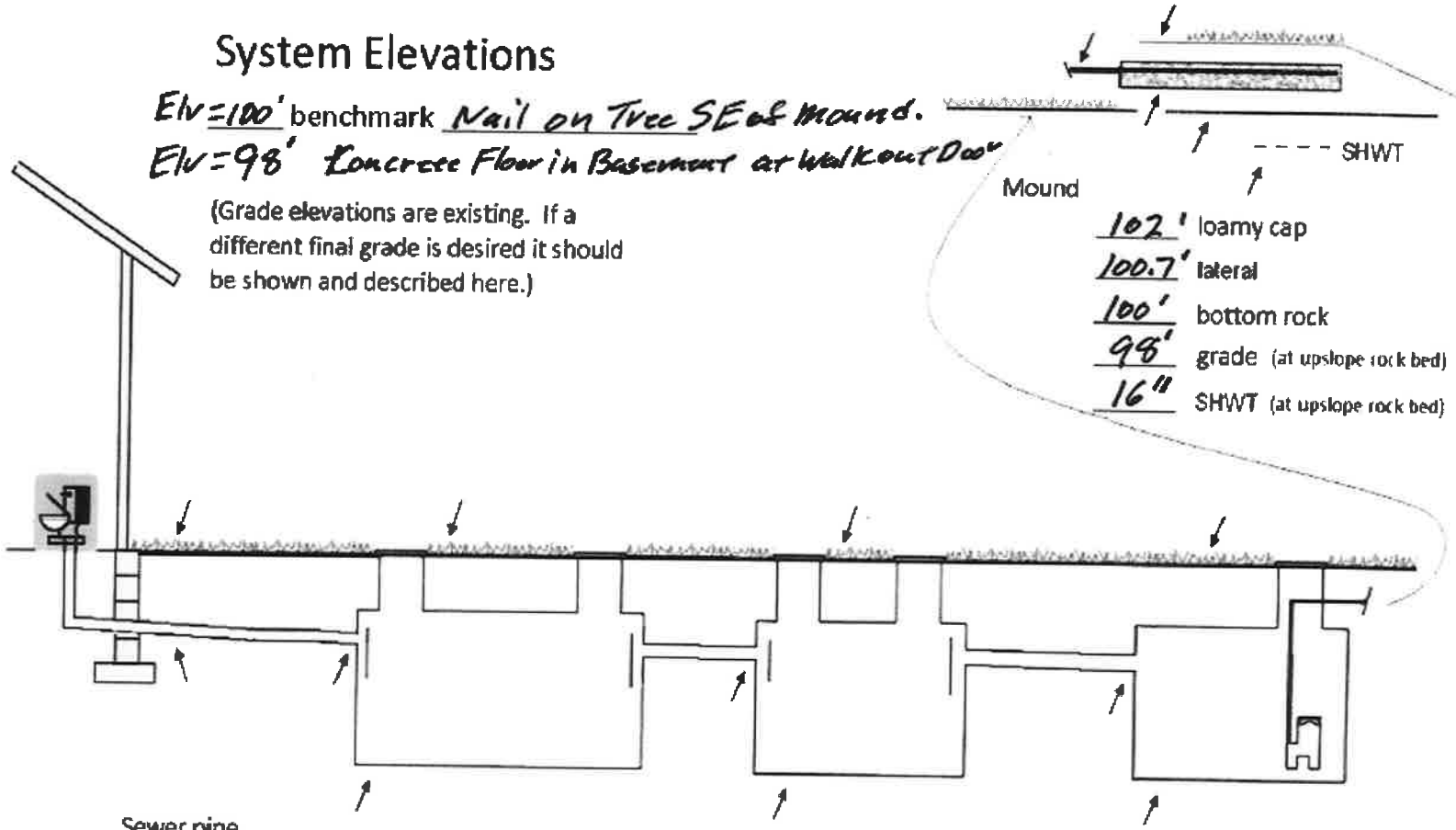
522 gals. / 31.5" = 16.57 GPI

System Elevations

Elv = 100' benchmark Nail on Tree SE of Mound.

Elv = 98' Concrete Floor in Basement at Walkout Door

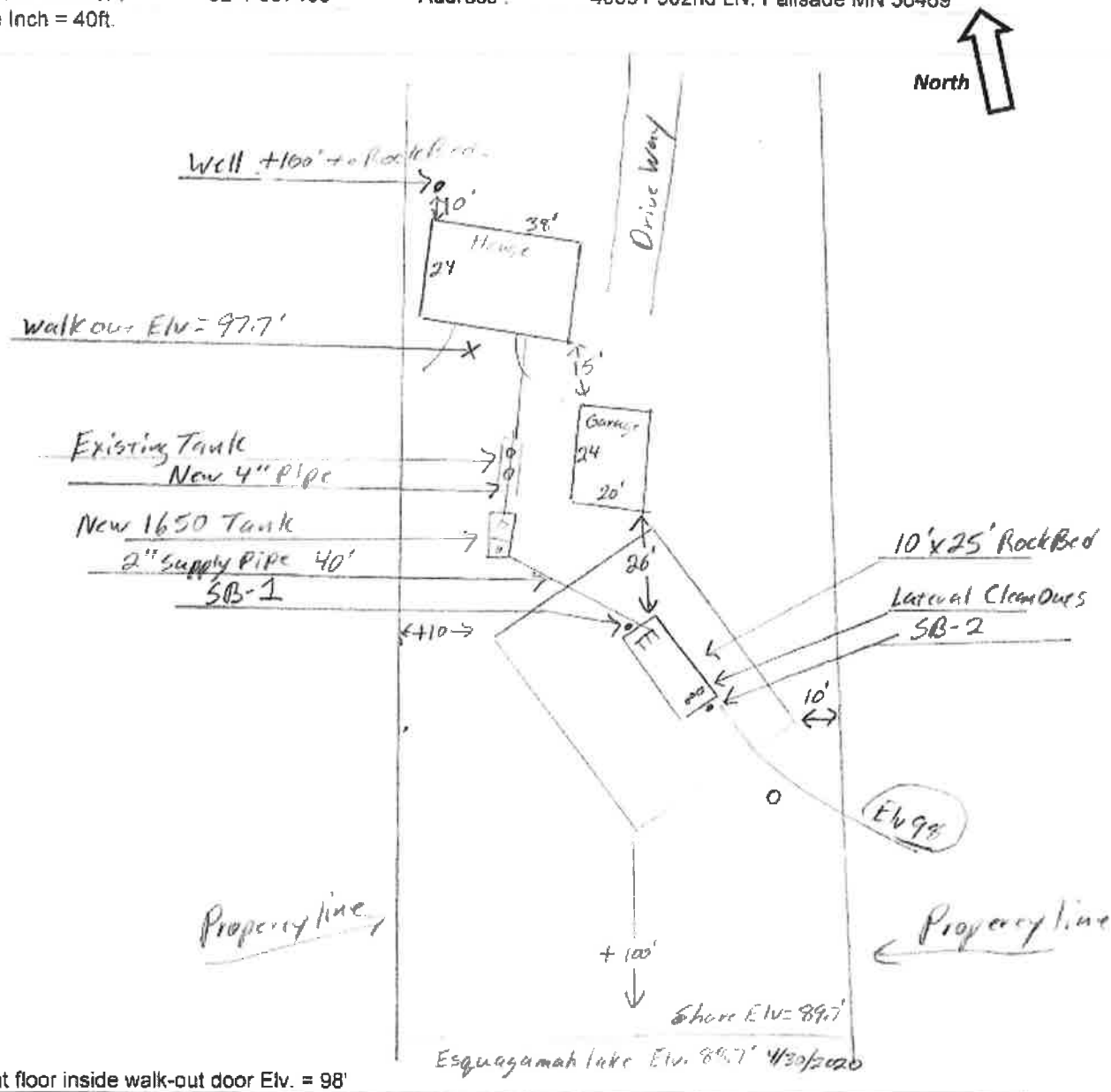
(Grade elevations are existing. If a different final grade is desired it should be shown and described here.)



Sewer pipe exiting house	Septic Tank	Septic Tank (if applicable)	Pump Tank
97.7' Grade	97.8' Grade	____ Grade	97.8' Grade
97' Pipe	96' inlet	____ inlet	95.7' inlet
	92' Tank bottom	____ Tank bottom	92' Tank bottom

{ Design Drawing }

Property Owner: Timothy Rosecrans Date: 4/30/20 Designer's Initials : JB
Parcel ID. Number : 52-1-037400 Address : 40091 502nd LN. Palisade MN 56469
one Inch = 40ft.



Basement floor inside walk-out door Elv. = 98'

	Surface/ SHWT	Nail on Tree = Bench Mark 100'			Existing Grade
Soil Bore 1	97.4'/17"	Bench Mark	100'		Upslope Edge of Rockbed Elv.= 98'
Soil Bore 2	97.6'/16"	Ground Elv. BM	97.7'		Bottom of Rockbed Elv.= 100'
Soil Bore 3		Ground Elv. Tank	97.8'	New	Top of Washed Sand Elv.= 100'
	Ground at	Existing house	97.7'	walkout	Existing Tank Inlet Elv.= 96.5'

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: Timothy Rosecrans **Date:** 4/30/20

Site Address: 40091 502nd LN. Palisade MN 56469 **PID:** 52-1-037400

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. Existing Shallow well location is 10' NW of House.

2 Existing Septic/pump tank to be pumped, Collapsed, Removed. Existing drainfield to be abandon.

3 The house is gravity flow into septic tank, no lift, no garbage disposal.

4 Bench Mark Elevation is a nail on a tree near SE corner of mound area. Elv. = 100'

5 Install Jacobson 1650 Compartment tank for gravity flow from house (Existing tank inlet Elv.= 96.5')
NE rockbed corner Upslope Corner is 26 ft from garage.

6 Elevation contour of rock bed upslope edge is 98'.
The area size of the rock bed is 10' x 25' . Absorption area is 25' x 38.6'.
Sand absorption area is 9.7 ft. up slope + 10 ft. rockbed + 18.9 downslope = approx. 38.6 ft. wide sand base.
Berms are 13ft. Upslope, 24ft. Down slope, 10ft. Rock bed = approx. 47ft. Wide.
Overall mound size is approx. 47' wide x 61' long and approx. 4 high. End Berms are 18 ft wide

7 The bench mark is the nail on the 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. 50 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, insulate top of tank.

10 Install electric alarm on pump tank.
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 clean-outs at far end of laterals.
Drill 1/4" holes for Perf sizing, 36" on centers.
Install inspection pipe to bottom of rock bed, secure in rock bed and raise to above final grade.

11 Installer will pressure test and squirt height laterals when finished.

Designed to Aitkin Co. and MPCA recommendations and requirements.

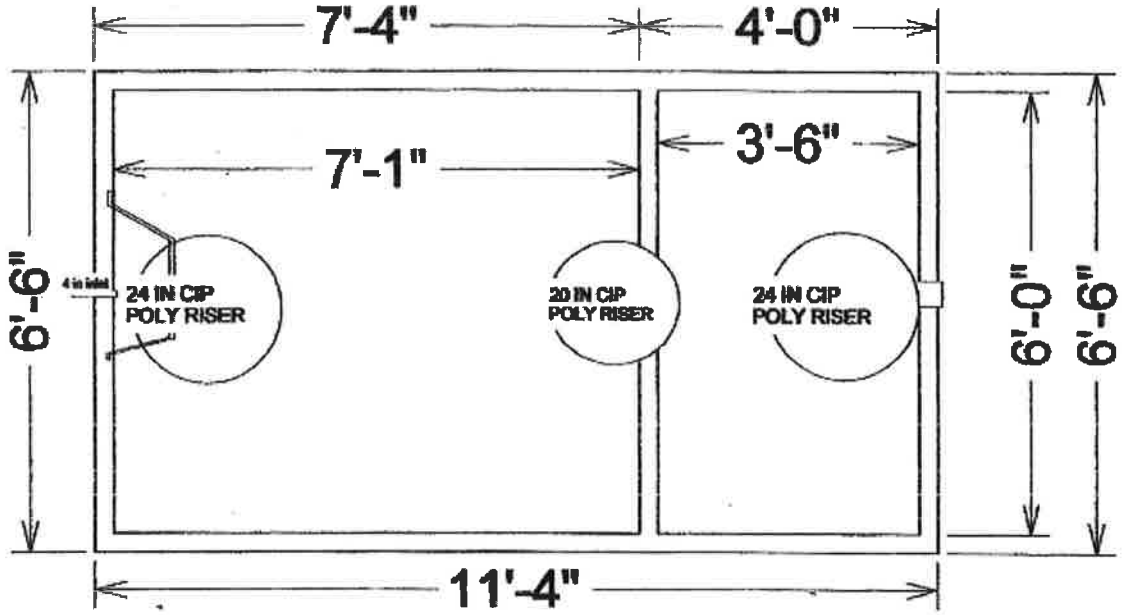
Designer Signature

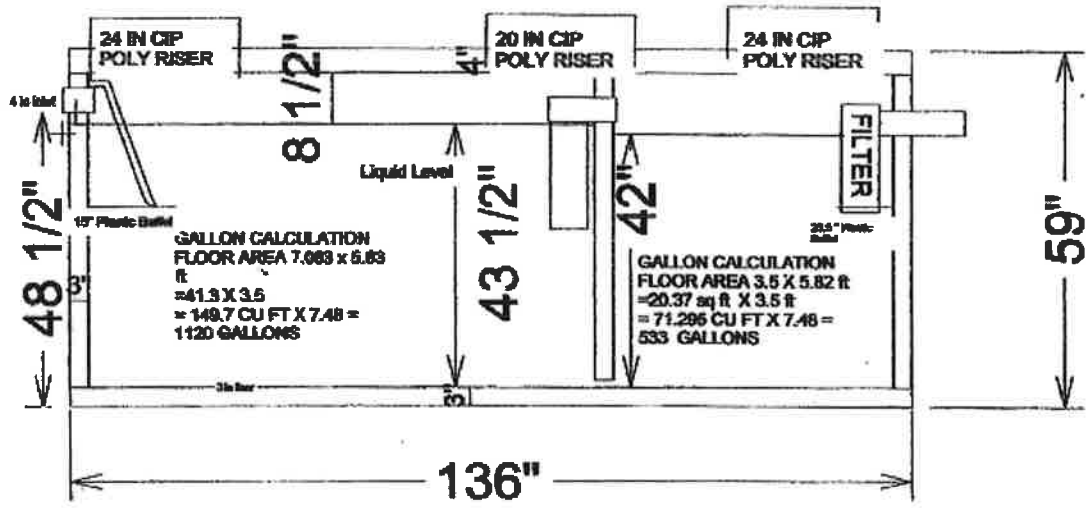
Brummer Septic LLC.
Design Company

L-1347
License#

1650 Gallon 2 Compartment Septic Tank

TOP VIEW





533 / 42" = 12.69 GPI

SIDE VIEW

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

Aitkin County

Detailed Parcel Report

Parcel Number: 52-1-037400

General Information

Township/City:	49-27 UNORG		
Taxpayer Name:	ROSECRANS, TIMOTHY J		
Taxpayer Address:	40091 502ND LN PALISADE MN 56469		
Property Address:	40091 502nd Ln		
Township:	49	**Lake Number:**	1014700
Range:	27	**Lake Name:**	ESQUAGAMAH LAKE
Section:	12	**Acres:**	0.00
Green Acres:	No	**School District:**	1.00
Plat:	ESQUAGAMAH BEACH		
Brief Legal Description:	LOT 12		

Tax Information

Class Code 1:	Non-Comm Seasonal Residential Recreational
Class Code 2:	Unclassified
Class Code 3:	Unclassified
Homestead:	Non Homestead
Assessment Year:	2019

Estimated Land Value:	$98,000.00
Estimated Building Value:	$77,700.00
Estimated Total Value:	$175,700.00
Prior Year Total Taxable Value:	$156,100.00
Current Year Net Tax (Specials Not Included):	$1,206.00
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.**

These data are **proviced** 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.**

Fisher

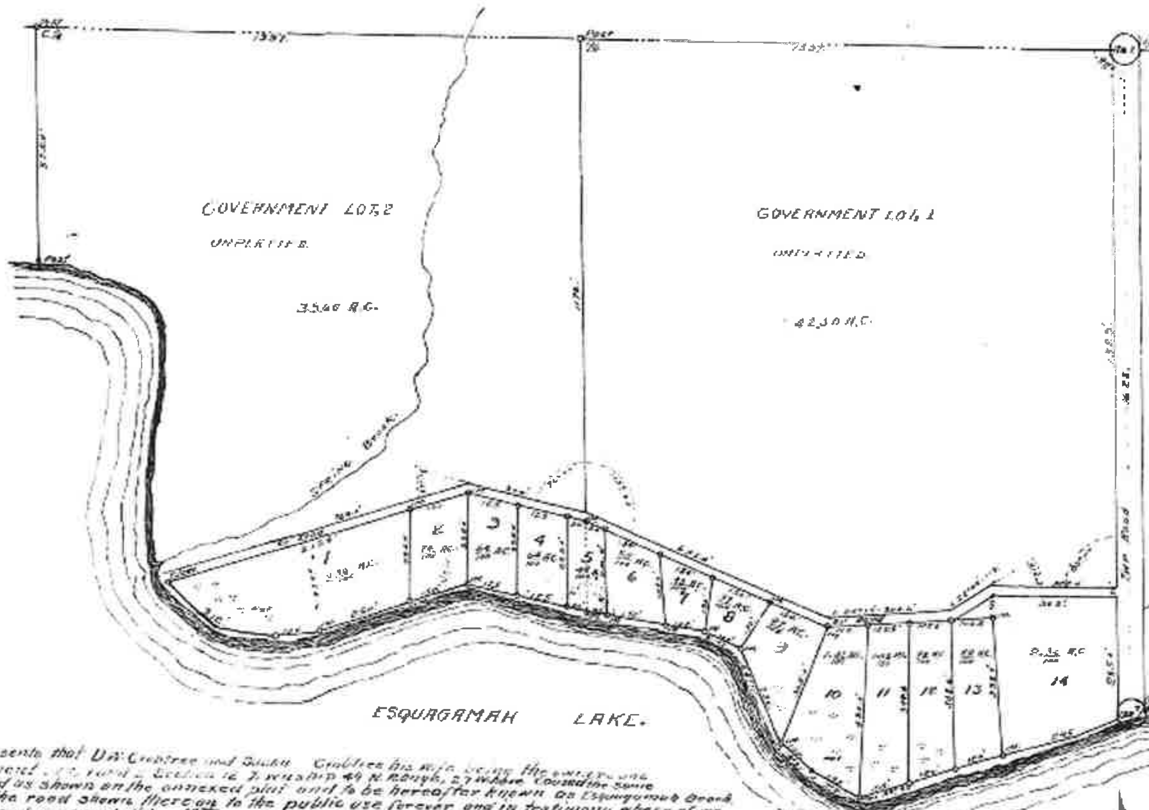
0 112.5 225 ft 1 inch = 296 feet

Aitkin County

Date: 3/3/2020

ESQUAGAMAH-BEACH

AITKIN COUNTY, MINN.



I hereby certify that I have surveyed Government Lots 1 and 2 Section 12 township 49 N range 27 W and platted South Parts of Same into Road and Lots as shown on the annexed plat which is a correct representation of said survey and have placed good and sufficient Iron Monuments as indicated I.M. on plat for guidance of any future survey all distances, angles, acreage, Net Land and Road are correctly shown thereon.

H. D. Heath
County Surveyor

The above certificate subscribed and sworn to before me this 16th day of June A.D. 1927.

H. Beecher
Auditor of Aitkin County, Minn.

State of Minnesota }
County of Aitkin } ss

I hereby certify that the within plat was [illegible] and is hereby approved this 14th day of July A.D. 1927.

H. Beecher
County Auditor

[illegible]
Chairman Board of County Commissioners

KNOW all men by these presents that D.W. Crabtree and Susan Crabtree his wife being the owners and proprietors of Government Lots 1 and 2 Section 12 Township 49 N Range 27 W have caused the same to be surveyed and platted as shown on the annexed plat and to be hereafter known as Esquagamah Beach and do hereby dedicate the road shown thereon to the public use forever and in testimony whereof we have hereunto set our hands and seal this 18th day of June, A.D. 1927.

Erving A. Murphy
[illegible] } witnesses.

D. W. Crabtree
Susan Crabtree

State of Minnesota }
County of Aitkin } ss

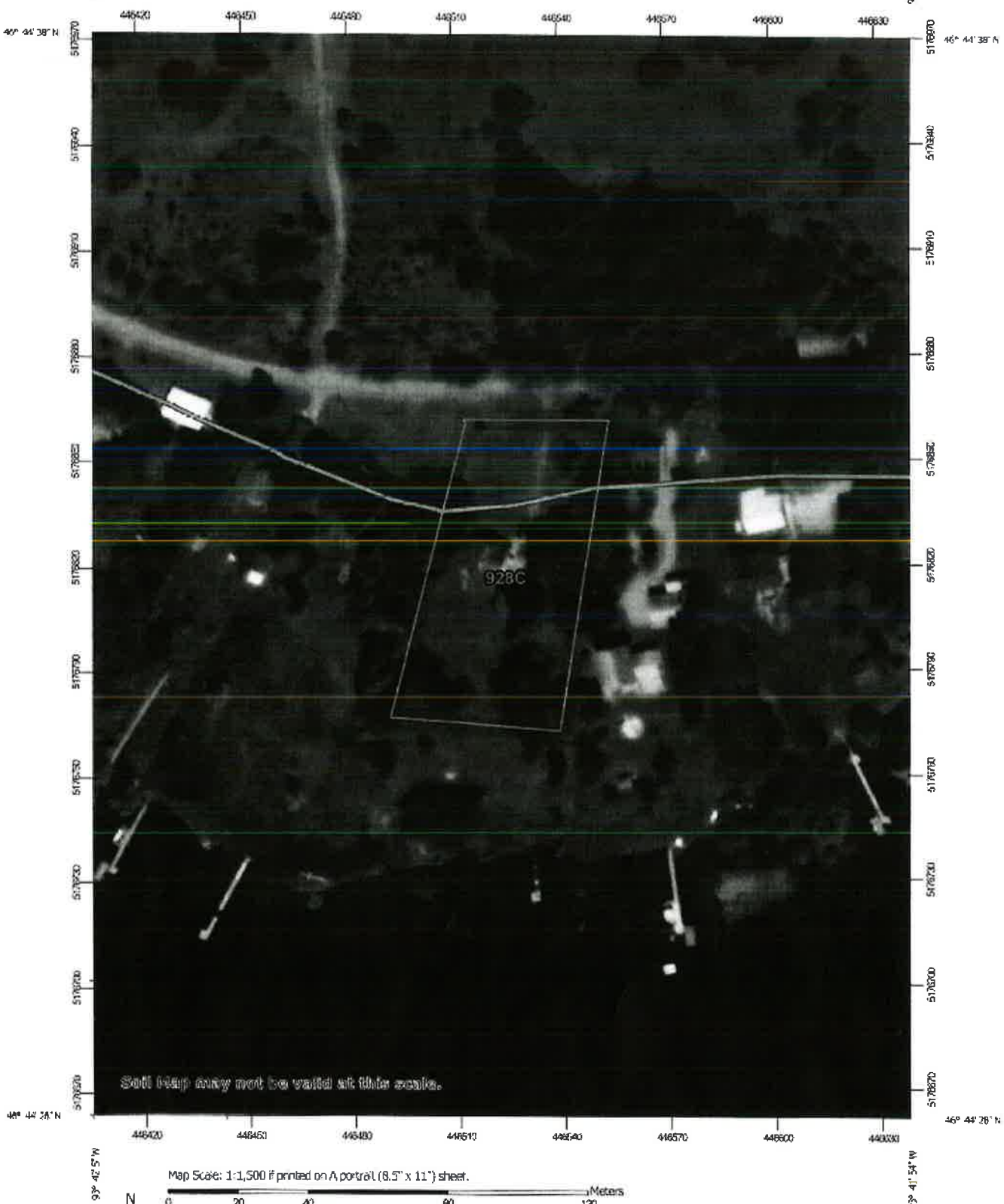
On this 18 day of June, A.D. 1927, before me a Town Clerk within and for said county and State personally appeared D.W. Crabtree and Susann Crabtree his wife to me personally known who being each by me duly sworn each did say that they executed the foregoing instrument as their own free act and decd.

J. L. Sorensen
Clerk of Esquagamah Township.

80715

July 14, 1927

Soil Map—Aitkin County, Minnesota
(Fischer)



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

N

Meters: 0, 20, 40, 80, 120

Feet: 0, 50, 100, 200, 300

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

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
Natural 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 in profile: 10 percent
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Forage suitability group: 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
Natural 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 in profile: 15 percent
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy (G090AN022MN)
Hydric soil rating: No

Minor Components

Cathro and similar soils

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

Meehan and similar soils

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

Sandwick and similar soils

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

Alstad and similar soils

Percent of map unit: 3 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Aitkin County, Minnesota
Survey Area Data: Version 20, Sep 16, 2019