Preliminary & Field Evaluation Form

www.SepticResource.com vers 12.4

Owner Information

Date	8/9/2019	Sec / Twp / Rng	S-34, T-51, R-26
Parcel ID	20-0-056000	LUG (county, city, township)	Aitkin Co.
Property Owner:	Conrad Gorsuch	Owners address (if different)	
Property Address:	58349 US Hwy 169 Palisade MN 56469		22813 Zion Pkwy NW
City / State / Zip:			Oak Grove MN 55005

Flow Information and Waste Type / Strength

Estimated Design flow: 450

Comments:
Abandon Existing System
New Deep Well Installed meets all setbacks.

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	New 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)	☑ 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: Abandon existing system
No Lakes or Rivers for setbacks.

Soil Information

Old Garden area

Original soils	☑ Yes	☐ No
Soil logs completed and attached	☑ Yes	☐ No
Soil loading rate (gpd/ft^2)	0.60	
Depth/elev to SHWT	20"	
Depth to system bottom maximum (or elev minimum)	(+18")	
Depth/elev to standing water (if applicable)		
Depth/elev to bedrock (if applicable)		
Soil Survey information determined (see attachment)	☑ Yes	☐ No
Differences between soil survey and field evaluation (if applicable)		

Evidence of site:

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

Perk test completed and attached (if applicable)	☐ Yes	☑ No
Percolation rate (if applicable)		
Flooding or run-on potential (comments)	☐ Yes	☑ No
Flood elevation (if applicable)		
Elevation of ordinary high water level (if applicable)		
Floodplain designation and elev - 100 yr/10 yr (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: Conrad Gorsuch Date 8/9/2019

Property Address / PID: 58349 US Hwy 169 Palisade MN 564

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: 1150 slope 7 % direction- North

Soil Log #1

☑ Boring ☐ Pit Elevation 97.9' Depth to SHWT 20"

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 10	Topsoil Sandy Loam	<35	10YR3/2		Loose	Loose	Granular
10 - 20	Sandy Loam	<35	10YR5/4		Loose	Loose	Granular
20 - 24	Loam	<35	10YR5/3	7.5YR5/4	Friable	Loose	Granular
		<35					
		<35					

Comments:

58349 US Hwy 169 Palisade MN 56469 **Soil Log #2**

☑ Boring ☐ Pit Elevation 97.8' Depth to SHWT 20"

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 10	Topsoil Sandy Loam	<35	10YR3/2		Loose	Loose	Granular
10 - 20	Sandy Loam	<35	10YR5/4		Loose	Loose	Granular
20 - 24	Loam	<35	10YR5/3	7.5YR5/4	Friable	Loose	Granular
		<35					
		<35					

58349 US Hwy 169 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.

Jeff Brummer
Designer Signature

Brummer Septic LLC.
Company

L-1347
License #

2011 purple code

Mound Design - Aitkin county

www.SepticResource.com (vers 15.2)

Property Owner: Conrad Gorsuch **Date:** 8/9/2019

Site Address: 58349 US Hwy 169 Palisade MN 56469 **PID:** 20-0-056000

Comments:

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

1) [3] bedroom Type [I] Residential System

2) [450] GPD design flow

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

4) [1000] Gal Septic tank (code minimum) [1120] 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 [37.5] ft. long rockbed

6) [10.0] ft rockbed width [37.5] 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 [35.5] feet long [12.0] perfs / lateral [36] 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) [64] 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) [70] gallons TOTAL pump out volume (treatment + drainback)

15) [10] feet vertical lift from pump to mound laterals, leads to a:

16) [27] GPM @ [16] 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) [5.5] inch swing on Demand float, or timed dosing of [2.6] min ON (confirm pump rate with drawdown
(this delivers Average flow, =70% of Peak design flow) [5.2] hrs OFF test and adjust as necessary)

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

20) [18] inches from bottom of tank to "Pump ON" float, or [12] inches to "Timer ON" float if time dosed

21) [21] inches from bottom of tank to "Hi Level" float, or [31] inches to "Hi Level" float if time dosed

22) [267] gallons reserve capacity (after High Level Alarm is activated)

Install Electric alarm on pump tank

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) 7 percent site slope (0-20% range) 7 (% downslope site slope, if different than upslope)

25) 18 inches, or 1.5 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) 18 inch, or 1.5 ft. Sand Lift Mound **CRITICAL FOR FUTURE CERTIFICATIONS!!!**

27) 20.0 ft. base absorption width (with sand beyond rockbed as follows:)

35.6 greater of: absorption width OR sand slope

28) 0.0 ft. upslope and sideslope sand upslope 7.8

10.0 ft. Downslope sand down slope 17.8

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

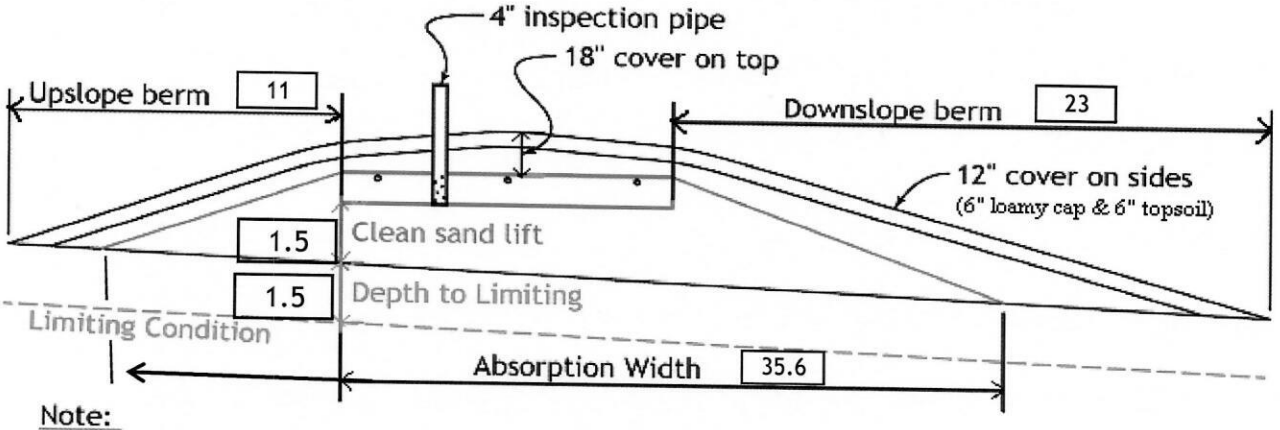
29) 4:1 upslope ratio 11 ft. upslope berm

30) 4:1 sideslope 17 ft. sideslope berms

31) 4:1 downslope 23 ft. downslope berm

32) Overall Dimensions: 10.0 ft. wide by 37.5 ft. long Rock bed

44 ft. wide by 72 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 37.5 ft. by 9 inches under pipe, plus 20% gives 17 yd³ or *1.4= 24 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)

22.9 up + 67.0 downslope + 15.2 ends + 25.7 under rock = 157 yd³ or *1.4= 220 ton
plus 20%

35) Loamy Cap:

40 ft. by 68 ft. 6" deep, plus 20% gives 60 yd³ or *1.4= 84 ton

36) Topsoil:

44 ft. by 72 ft. 6" deep, plus 20% gives 70 yd³ or *1.4= 98 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	8/9/2019

Installer Summary

1120 gallon Septic tank (minimum)

Tank options: none

Install Jacobson 1650 2/Compartment tank at 12.69 gpi

533 gallon Dose tank (minimum)

27 GPM @ 16 ft. of head, Pump required

5.5 inch swing on Demand float which translates to roughly 3.8 inches of float tether length

if time dosing is required --> 2.6 minutes ON time & 5.2 hours OFF time

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

21 inches from bottom of tank to "Hi Level Alarm" or 31 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)

18 inch, or 1.5 ft. Sand Lift Mound

10.0 ft. wide by 37.5 ft. long Rock bed

3 laterals 1.50 inch diameter 35.5 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

35.6 ft.Total sand ABSORPTION width (minimum)

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

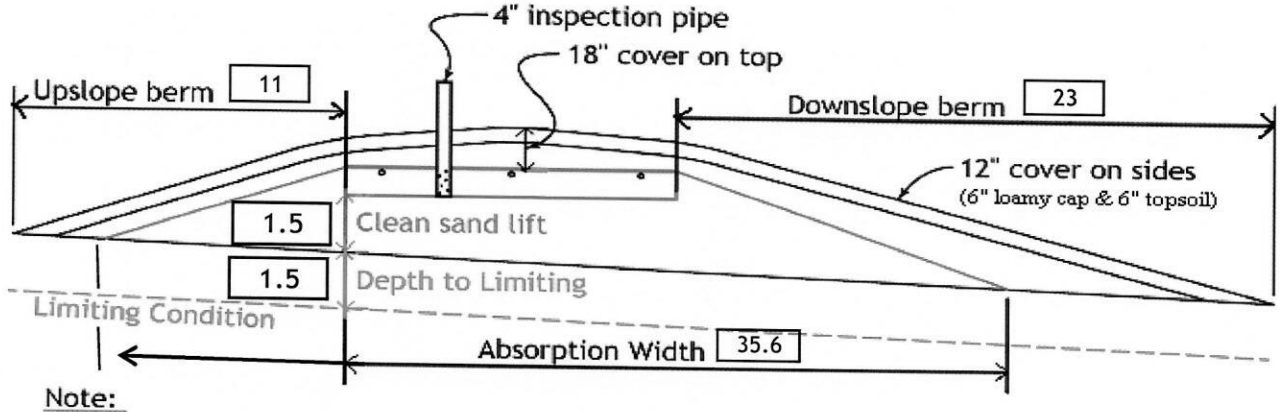
17.8 ft. Downslope (sand beyond rockbed, minimum)

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

4:1 upslope ratio 11 ft. upslope berm

4:1 sideslope 17 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:	17.0	yd^3 or *1.4=	24	ton
Mound Sand:	157	yd^3 or *1.4=	220	ton
Loamy Cap:	60	yd^3 or *1.4=	84	ton
Topsoil:	70	yd^3 or *1.4=	98	ton

9 inches under pipe

calculation based on 3:1/4:1 slope from top of rockbe

6" deep

6" deep

Install Electric alarm on pump tank

INSPECTOR CHECKLIST - mound

58349 US Hwy 169 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 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_____ 1120 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 _____ 27 gpm 16 head VERIFY PUMP CURVE 2.6 min ON 5.2 hr OFF

☐ float setting drop 5.5 inches at 12.7 gpi "DESIGNED" 3.8 inches approx float tether length
70.0 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 37.5

☐ Sand lift depth 18 inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)

☐ Absorption Sand beyond rock 7.8 upslope 17.8 downslope

☐ Bermed topsoil beyond rockbed 11 upslope 17 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 _____

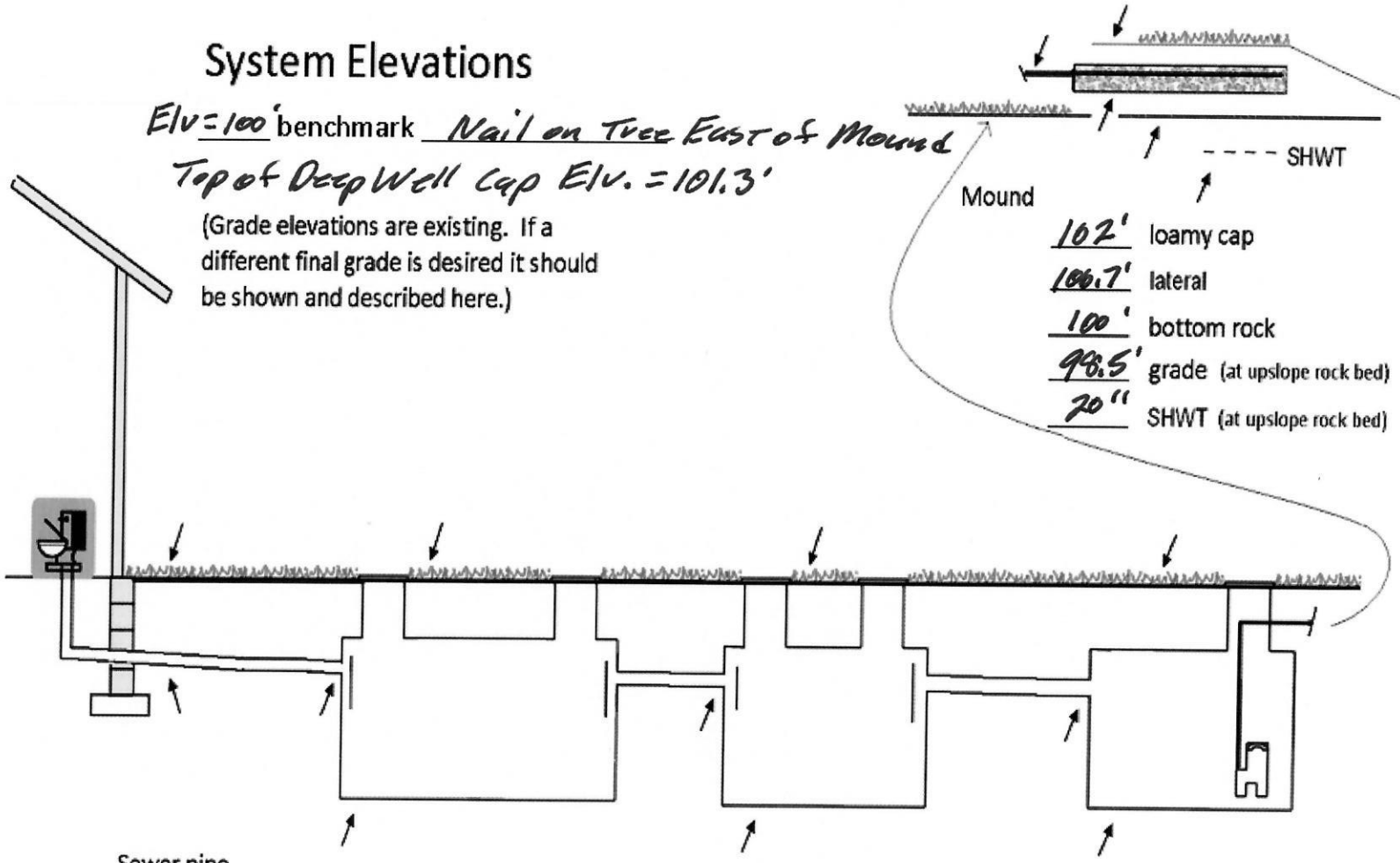
☐ well abandonment form - if necessary

System Elevations

Elv = 100' benchmark Nail on Tree East of Mound

Top of Deep Well Cap Elv. = 101.3'

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



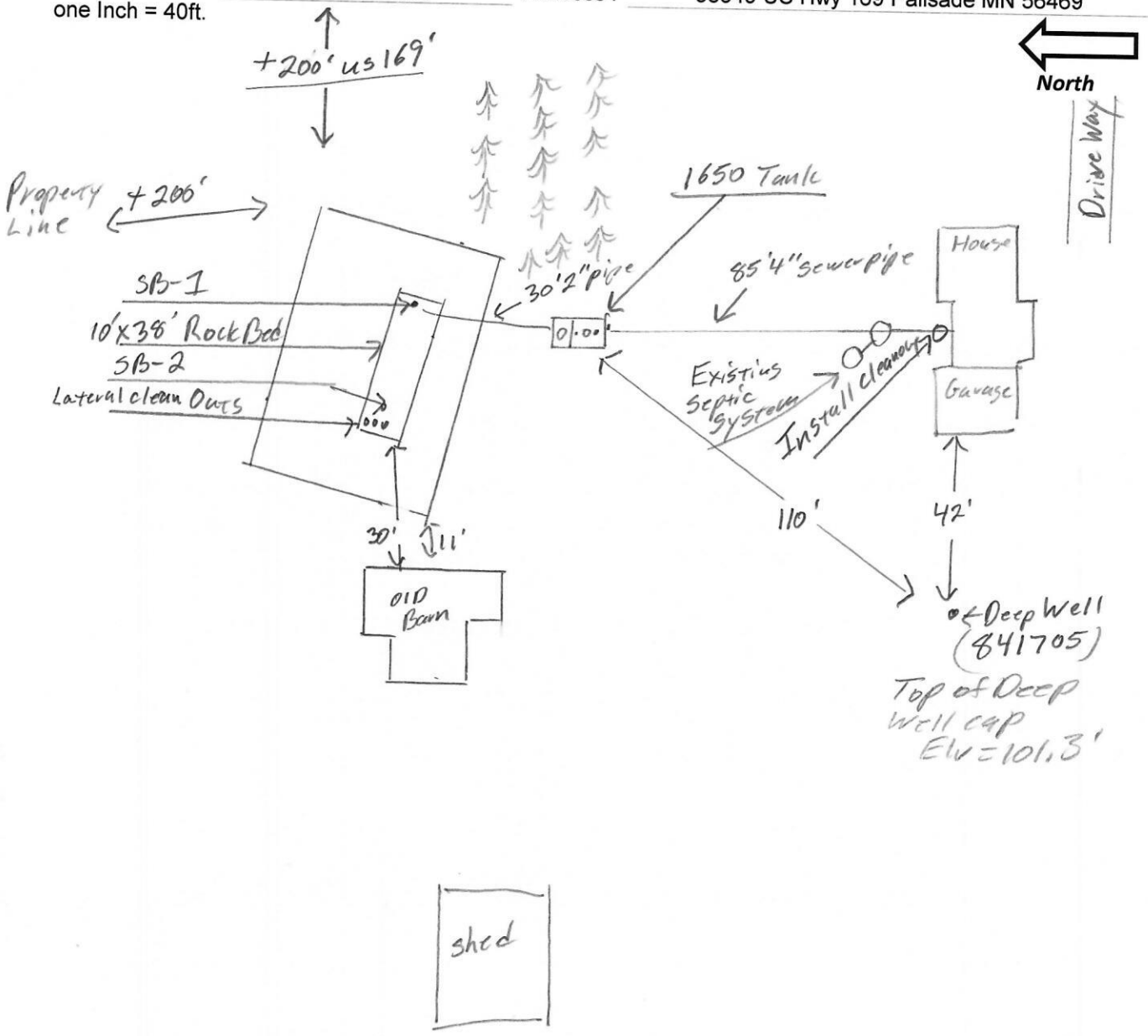
Sewer pipe exiting house	Septic Tank	Septic Tank (if applicable)	Pump Tank
100.6' Grade	99.1' Grade	____ Grade	99.1' Grade
97' Pipe	96' inlet approx.	____ inlet	95.6' inlet
	92.5' Tank bottom	____ Tank bottom	92.5 Tank bottom

{ Design Drawing }

Property Owner: Conrad Gorsuch Date: 8/9/19 Designer's Initials : JB

Parcel ID. Number : 20-0-056000 Address : 58349 US Hwy 169 Palisade MN 56469

one Inch = 40ft.



	Surface/ SHWT	Nail on Tree Elv.= Bench Mark 100'			Existing Grade
Soil Bore 1	97.9'/20"	Bench Mark	100'		Upslope Edge of Rockbed Elv.= 98.5'
Soil Bore 2	97.8'/20"	Ground Elv. BM			Bottom of Rockbed Elv. = 100'
Soil Bore 3		Ground Elv. Tank	99.1'		Top of Washed Sand Elv.= 100'
	Ground at	Existing house	100.6'	North side	Existing Tank inlet Elv. = 97'

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: Conrad Gorsuch **Date:** 8/9/19

Site Address: 58349 US Hwy 169 Palisade MN 56469 **PID:** 20-0-056000

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

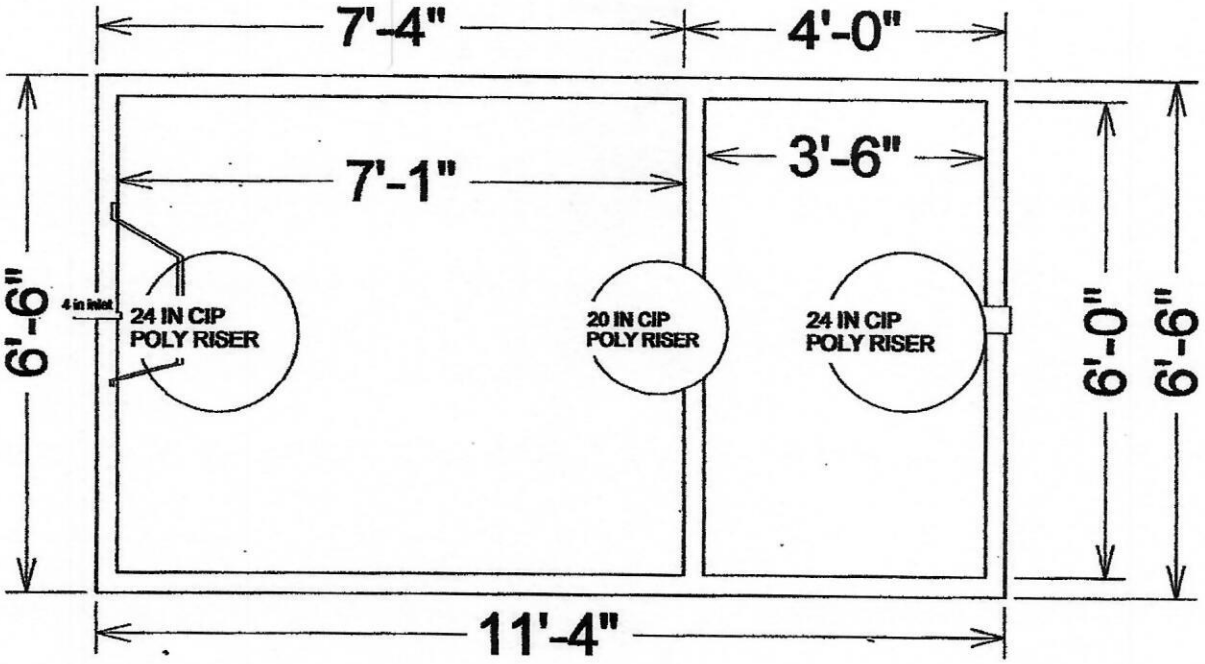
1 This is a type I mound for a 3 bedroom House. New deep well location is West of House.
2 Existing Tanks to be pumped, collapsed, filled or removed. Existing septic system to be abandon.
3 New septic system is + 50 ft. to any property line, +100' to the new well.
Mound rockbed is +30' to the old barn.
Top of the deep well cap at Elv. = 101.3'
4 Bench Mark Elevation is a nail on a tree near NE corner of mound area. Elv.= 100'
5 Install Jacobson 1650 Compartment tank for gravity flow from house, existing pipe at inlet is Elv. 97'
6 Elevation contour of rock bed upslope edge is 98.5'.
The area size of the rock bed is 10' x 38' . Absorption area is 38' x 35.6'.
Sand absorption area is 7.8 ft. up slope + 10 ft. rockbed + 17.8 downslope = approx. 35.6 ft. wide sand base.
Berms are 11ft. Upslope, 23ft. Down slope, 10ft. Rock bed = approx. 44ft. Wide.
Overall mound size is approx. 44' wide x 72' long and approx. 3.5' high. End berms are 17 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. 70 gallons per dose, 5.5 inches of tank level. Install alarm at 3 inches from pump on level.
Install electric alarm on pump tank.
10 Install all manholes, inspection pipes and clean-outs to grade or above, insulate top of 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.
11 **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.
12 Installer will pressure test and squirt height laterals when finished.

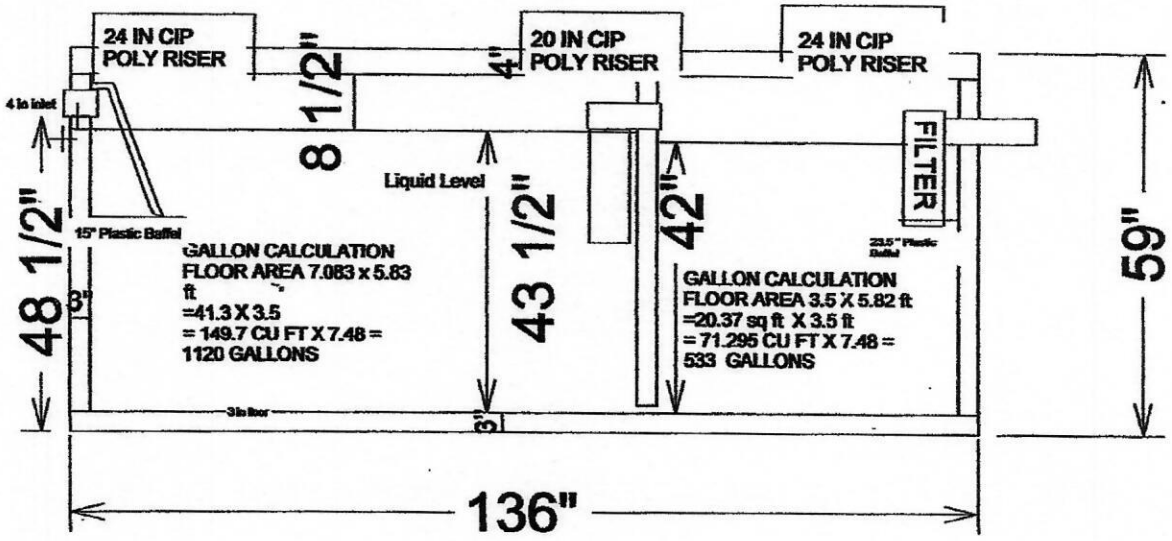
Designed to Aitkin Co. and MPCA recommendations and requirements.

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: 20-0-056000

General Information

Township/City:	MACVILLE TWP		
Taxpayer Name:	GORSUCH, CONRAD & DELORIS		
Taxpayer Address:	22813 ZION PKWY NW OAK GROVE MN 55005		
Property Address:	58349 US HWY 169		
Township:	51	**Lake Number:**	0
Range:	26	**Lake Name:**	
Section:	34	**Acres:**	40.00
Green Acres:	No	**School District:**	2.00
Plat:			
Brief Legal Description:	NE OF SE		

Tax Information

Class Code 1:	Non-Homestead Qualifying Single Res Unit
Class Code 2:	Rural Vacant Land
Class Code 3:	Unclassified
Homestead:	Non Homestead
Assessment Year:	2019

Estimated Land Value:	$72,000.00
Estimated Building Value:	$37,200.00
Estimated Total Value:	$109,200.00
Prior Year Total Taxable Value:	$104,200.00
Current Year Net Tax (Specials Not Included):	$1,144.00
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 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.

Gorsuch

0 40 80 ft 1 inch = 105 feet

Aitkin County

Date: 7/25/2019

USDA United States Department of Agriculture
Natural Resources Conservation Service

Web Soil Survey

Search

Map Unit Legend

Aitkin County, Minnesota (MN001)

Aitkin County, Minnesota (MN001)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1150	Jevne fine sandy loam	0.3	100.0%
Totals for Area of Interest		**0.3**	**100.0%**

Soil Map

Scale (not to scale)

Warning: Soil Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:20,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Aitkin County, Minnesota

1150—Jevne fine sandy loam

Map Unit Setting

National map unit symbol: gjch
Elevation: 980 to 1,310 feet
Mean annual precipitation: 20 to 27 inches
Mean annual air temperature: 37 to 41 degrees F
Frost-free period: 95 to 105 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Jevne and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Jevne

Setting

Landform: — error in exists on —
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy glaciolacustrine deposits over loamy till

Typical profile

A - 0 to 6 inches: fine sandy loam
Eg1,Eg2 - 6 to 19 inches: loam
Btg1-Btg3 - 19 to 43 inches: loam
Cg1,Cg2 - 43 to 60 inches: stratified loamy sand to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 6 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Forage suitability group: Level Swale, Acid (G088XN005MN)
Hydric soil rating: Yes

Minor Components

Hamre and similar soils
Percent of map unit: 6 percent
Landform: Depressions
Hydric soil rating: Yes

Sandwick and similar soils
Percent of map unit: 6 percent
Landform: Swales
Hydric soil rating: Yes

Dusler 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 19, Sep 12, 2018