Preliminary & Field Evaluation Form

www.SepticResource.com vers 12.4

Owner Information

Date	10/3/2018	Sec / Twp / Rng	S-23, T-46, R-27
Parcel ID	07-0-045001	LUG (county, city, township)	Aitkin Co.
Property Owner:	Steve Smith	Owners address (if different)	
Property Address:	41714 Diamond Lake St. Aitkin MN 56431		11001 Sumpter Ave. N.
City / State / Zip:			Champlin MN 55316

Flow Information and Waste Type / Strength

Estimated Design flow: 300

Comments: Shop with bathroom

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	Proposed 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) By Others	☑ 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

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) 0.60

Percolation rate (if applicable) _____

Depth/elev to SHWT 20"

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

Depth to system bottom maximum (or elev minimum) (+ 18")

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: Steve Smith Date 10/3/2018

Property Address / PID: 41714 Diamond Lake St. Aitkin MN

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: 928D & 928C slope 2 % direction- North

Soil Log #1

☑ Boring ☐ Pit Elevation 98.1' Depth to SHWT 36"

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 6	Topsoil Loam	<35	10YR3/2		Loose	Loose	Granular
6 - 26	Loam	<35	10YR4/4		Friable	Loose	Granular
26-36	Sandy Loam	<35	10YR4/4		Loose	Loose	Granular
36	Silt Loam	<35	10YR5/4	7.5YR5/6	Loose	Loose	Granular
		<35			Loose	Loose	Granular

Comments:

41714 Diamond Lake St. Aitkin MN 56431			**Soil Log #2**				
	☑ Boring	☐ Pit	Elevation 98.1'		Depth to SHWT 20"		
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 6	Topsoil Loam	<35	10YR3/2		Loose	Loose	Granular
6 - 20	Loam	<35	10YR5/4		Loose	Loose	Granular
20 - 28	Silt Loam	<35	10YR5/4	7.5YR4/4 & 10YR6/2	Friable	Weak	Blocky
		<35			Loose	Loose	Granular
		<35			Loose	Loose	Granular

41714 Diamond Lake St. 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: Steve Smith **Date:** 10/3/2018

Site Address: 41714 Diamond Lake St. Aitkin MN 56431 **PID:** 07-0-045001

Comments: Shop with bathroom

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 Jacobson 1650 compartment tank

4) [1000] Gal Septic tank (code minimum) [1120] 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) [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) 2 (% 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:)

31.6 greater of: absorption width OR sand slope

28) 0.0 ft. upslope and sideslope sand upslope 8.1

10.0 ft. Downslope sand down slope 13.5

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

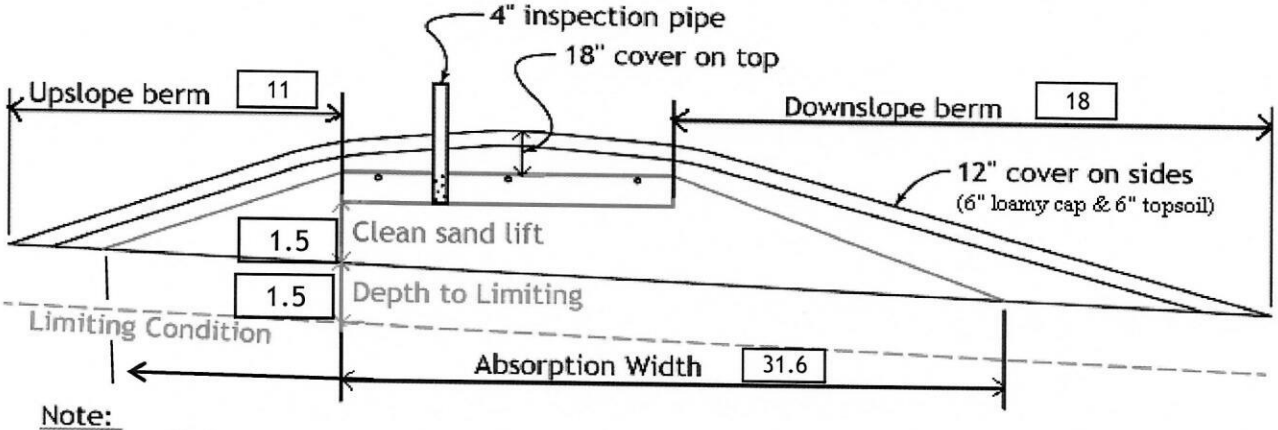
29) 4:1 upslope ratio 11 ft. upslope berm

30) 4:1 sideslope 16 ft. sideslope berms

31) 4:1 downslope 18 ft. downslope berm

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

39 ft. wide by 57 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)

18.3 up + 37.9 downslope + 14.2 ends + 16.7 under rock = 105 yd³ or *1.4= 146 ton
plus 20%

35) Loamy Cap:

35 ft. by 53 ft. 6" deep, plus 20% gives 42 yd³ or *1.4= 59 ton

36) Topsoil:

39 ft. by 57 ft. 6" deep, plus 20% gives 50 yd³ or *1.4= 70 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	10/3/2018

Installer Summary

1120 gallon Septic tank (minimum)

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

533 gallon Dose tank (minimum)

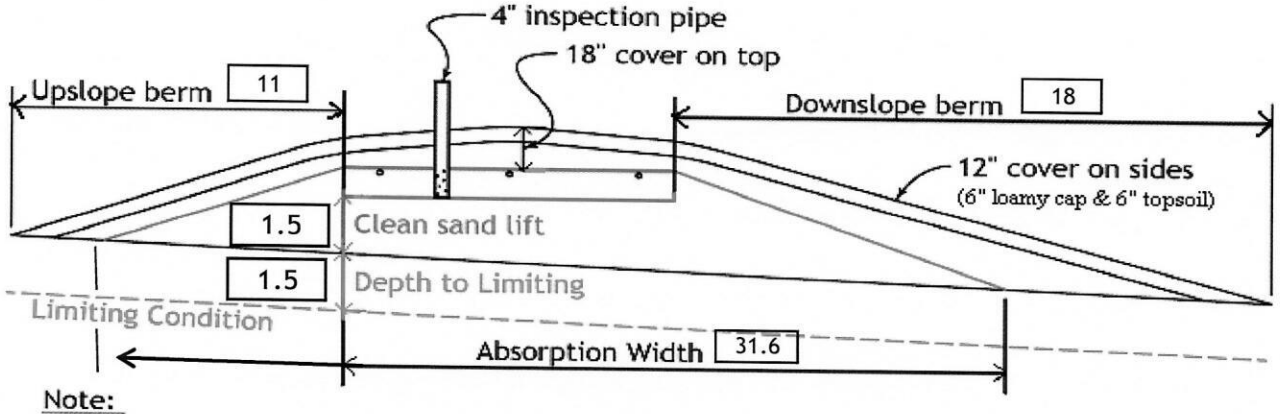
18 GPM @ 18 ft. of head, Pump required
3.9 inch swing on Demand float which translates to roughly 3.0 inches of float tether length
if time dosing is required --> 2.8 minutes ON time & 5.1 hours OFF time
16 inches from bottom of tank to "pump ON" float, or 12 inches to "timer ON" float
19 inches from 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)

18 inch, or 1.5 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

31.6 ft.Total sand ABSORPTION width (minimum)
8.1 ft. upslope and sideslope (sand beyond rockbed, minimum)
13.5 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 16 ft. sideslope berms
4:1 downslope 18 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:	105 yd^3 or *1.4=	146	ton	calculation based on 3:1/4:1 slope from top of rockbe
Loamy Cap:	42 yd^3 or *1.4=	59	ton	6" deep
Topsoil:	50 yd^3 or *1.4=	70	ton	6" deep

INSPECTOR CHECKLIST - mound

41714 Diamond Lake 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_____ 1120 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 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 18 inches. (Jar test : 2" sand leaves < 1/8" silt after 30 min)

☐ Absorption Sand beyond rock 8.1 upslope 13.5 downslope

☐ Bermed topsoil beyond rockbed 11 upslope 16 sideslope 18 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

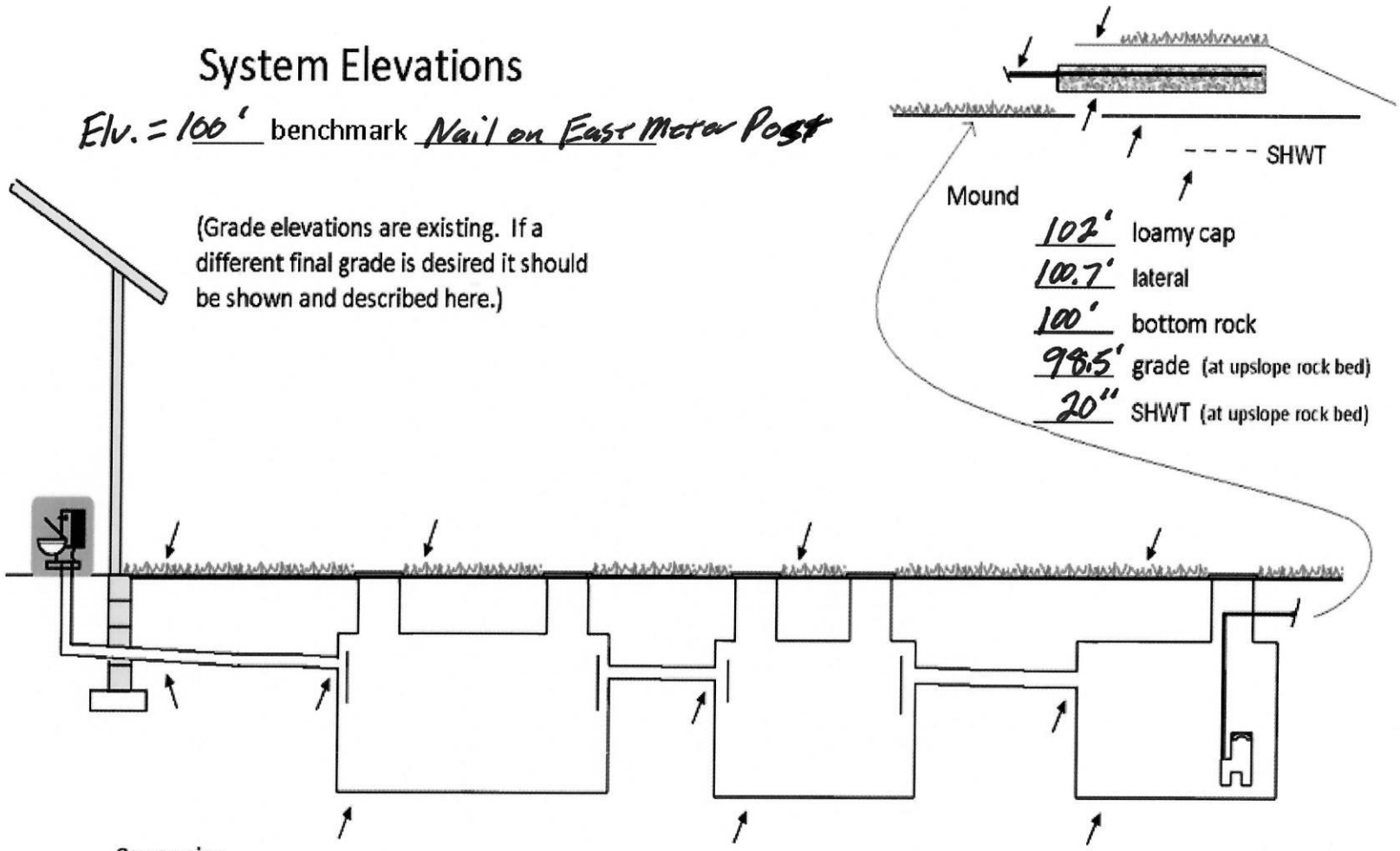
☐ monitoring plan and type _____

☐ well abandonment form - if necessary

System Elevations

Elv. = 100' benchmark Nail on East Metal Post

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



Shop	Sewer pipe ~~exiting house~~	Septic Tank	Septic Tank (if applicable)	Pump Tank
approx	100.1' Grade	97.9' Grade	____ Grade	97.9' Grade
	98' Pipe	96.5' inlet	____ inlet	96.3' inlet
		92.5 Tank bottom	____ Tank bottom	92.5 Tank bottom

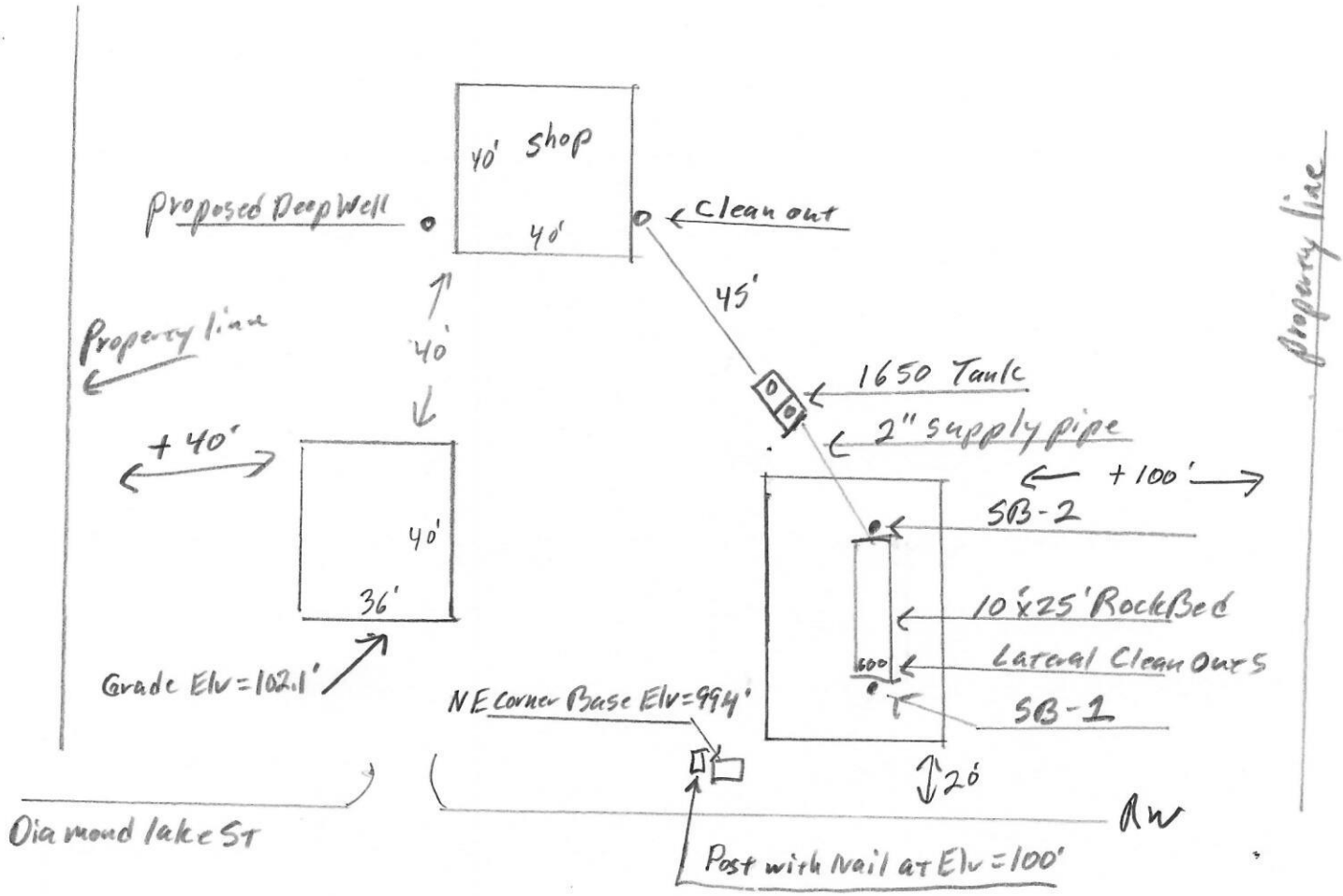
{ Design Drawing }

Property Owner: Steve Smith Date: 10/3/18 Designer's Initials : JB

Parcel ID. Number : 07-0-045001 Address : 41714 Diamond Lake St. Aitkin MN 56431

one Inch = 40ft.

North



Bench Mark Nail on East post for power meter box. Elv.= 100'

	Surface/ SHWT	Nail on Post = Bench Mark 100'			Existing Grade
Soil Bore 1	98.1'/36"	Bench Mark	100'		Upslope Edge of Rockbed Elv.= 98.5'
Soil Bore 2	98.1'/20"	Ground Elv. BM	99.5'		Bottom of Rockbed Elv.= 100'
Soil Bore 3		Ground Elv. Tank	97.9'		Top of Washed sand Elv.= 100'
	Ground at	Proposed shop	100.1'	Approx.	Existing shed grade Elv. = 102.1'

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: Steve Smith **Date:** 10/3/18

Site Address: 41714 Diamond Lake St. Aitkin MN 56431 **PID:** 07-0-045001

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 Sizing for shop. Proposed deep well location will be North of Shop.
There are no wells on property or within 100 ft. of mound location.
NW corner of power transformer base at Elv.= 99.4'

2 Bench Mark is a nail on the East post for the power meter box. Elevation = 100'

3 Install cleanout near dwelling.

4 Install Jacobson 1650 Compartment tank for gravity flow from proposed shop (Elv. not set)

5 Elevation contour of rock bed upslope edge is 98.5'.
The area size of the rock bed is 10' x 25' . Absorption area is 25' x 31.6'.
Sand absorption area is 8.1 ft. up slope + 10 ft. rockbed + 13.5 downslope = approx. 31.6 ft. wide sand base.
Berms are 11ft. Upslope, 18ft. Down slope, 10ft. Rock bed = approx. 39ft. Wide. End berms are 16 ft. wide.
Overall mound size is approx. 39' wide x 57' long and approx. 3.5' high.

6 The bench mark is the nail on the post East of 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.

7 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.

8 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.

9 Install Effluent filter on septic tank outlet, install electric alarm on filter.
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.

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

Designed to Aitkin Co. and MPCA recommendations and requirements.

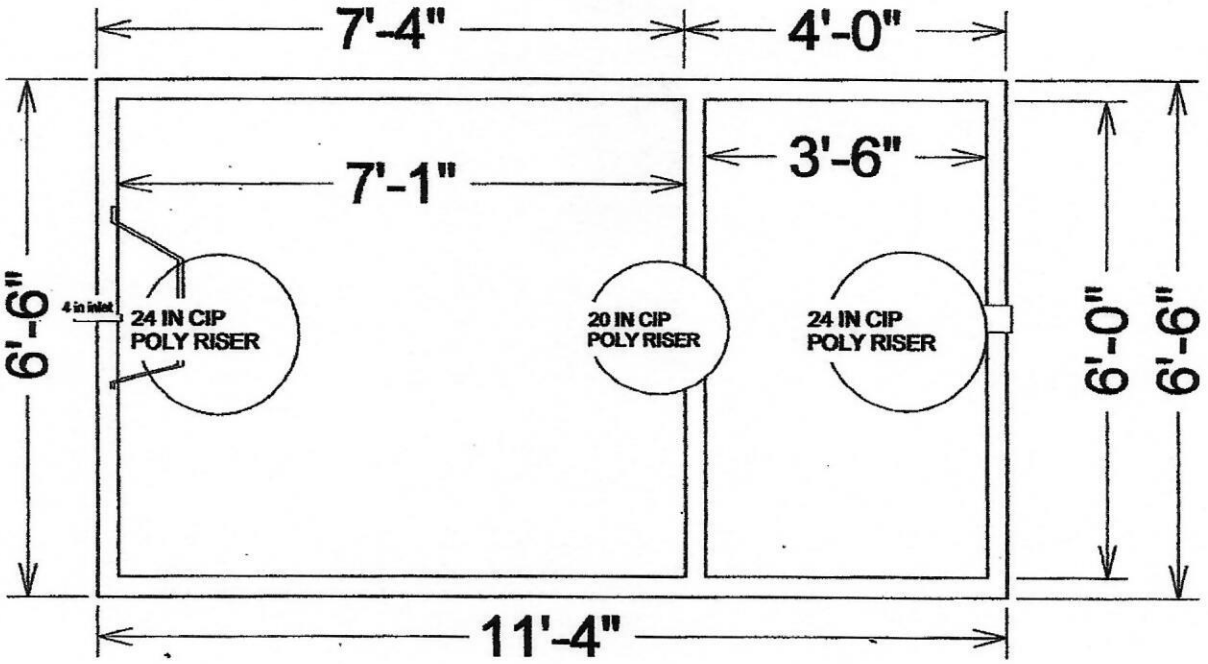
Designer Signature

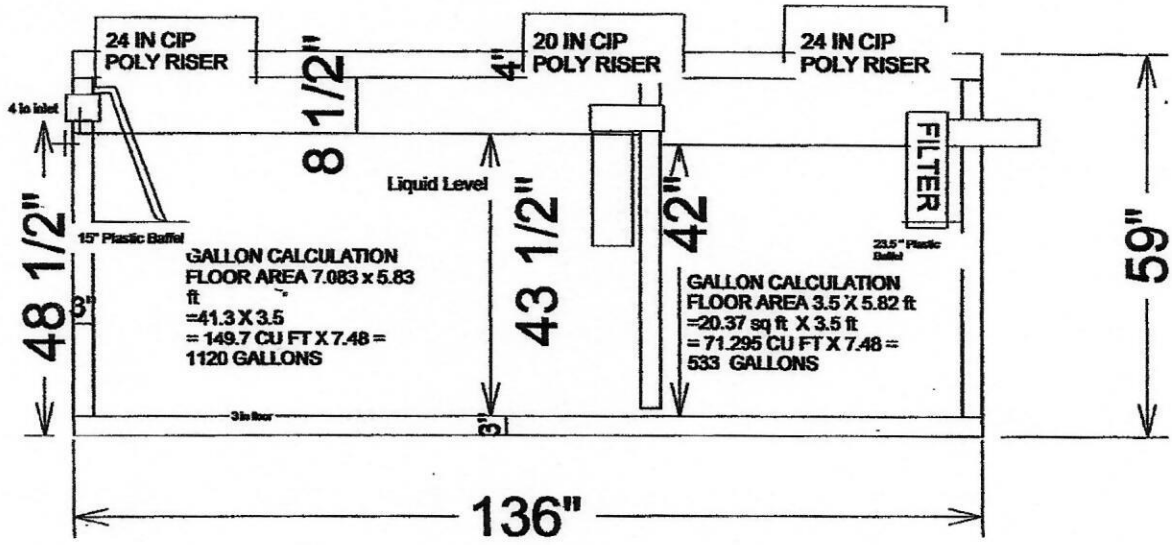
Brummer Septic LLC.
Design Company

L-1347
License#

1650 Gallon 2 Compartment Septic Tank

TOP VIEW





SIDE VIEW

533 / 42" = 12.69 GPI

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

Aitkin County

Detailed Parcel Report

Parcel Number: 07-0-045001

General Information

Township/City:	FARM ISLAND TWP		
Taxpayer Name:	SMITH, STEVE E		
Taxpayer Address:	11001 SUMPTER AVENUE N CHAMPLIN MN 55316		
Property Address:	41714 DIAMOND LAKE ST		
Township:	46	**Lake Number:**	0
Range:	27	**Lake Name:**	
Section:	23	**Acres:**	10.00
Green Acres:	No	**School District:**	1.00
Plat:			
Brief Legal Description:	S 1/2 OF S 1/2 OF S 1/2 OF NW 1/4 LYING E OF ZISKE ROAD		

Tax Information

Class Code 1:	Non-Comm Seasonal Residential Recreational
Class Code 2:	Unclassified
Class Code 3:	Unclassified
Homestead:	Non Homestead
Assessment Year:	2018

Estimated Land Value:	$33,500.00
Estimated Building Value:	$8,000.00
Estimated Total Value:	$41,500.00
Prior Year Total Taxable Value:	$39,700.00
Current Year Net Tax (Specials Not Included):	$286.00
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.**

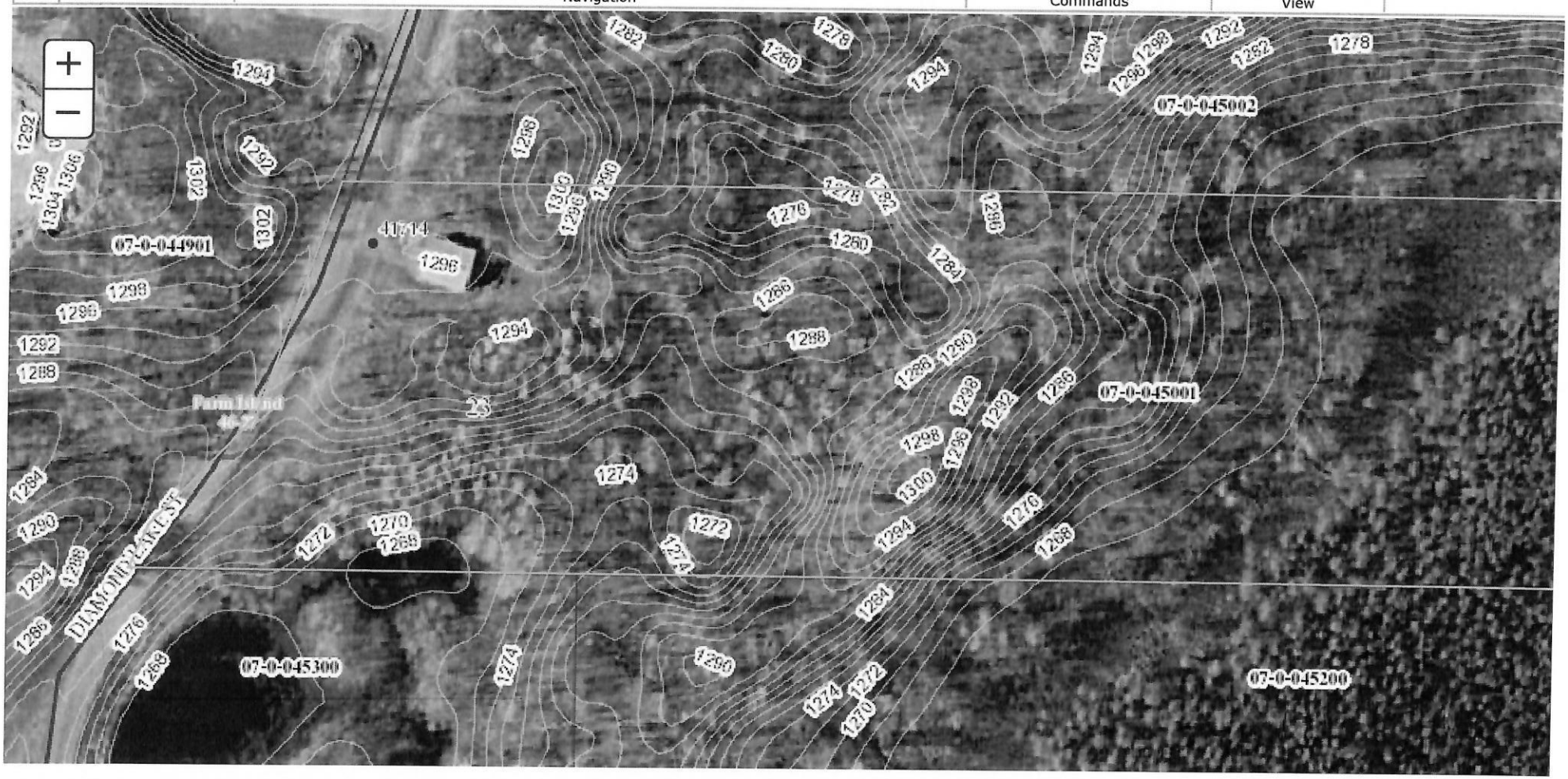
Aitkin County

Zoom In | Zoom Out | Pan | Zoom Prev | Zoom Next | Zoom Select | Zoom Extent
Navigation

Clear | Search | Identify
Commands

Legend | Results
View

Buffer | X/Y | Map



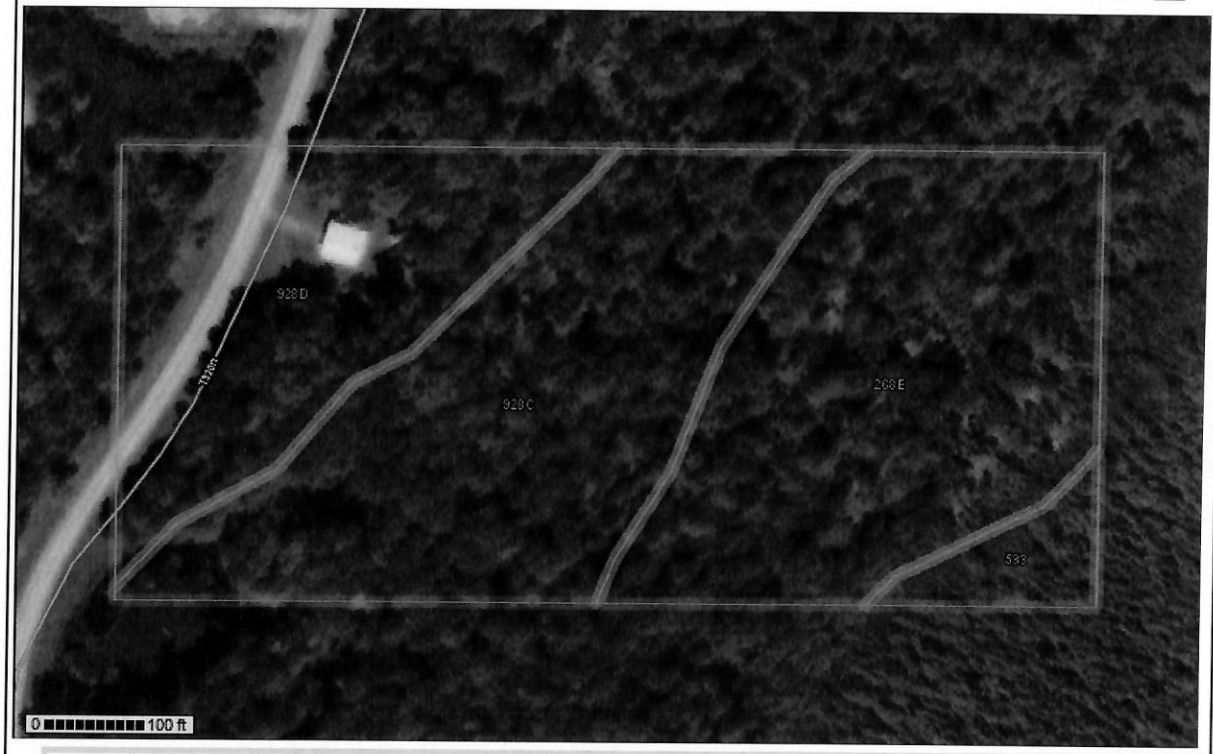
Scale 1: 2257

No Tool Active

Aitkin County, Minnesota (MN001)

Aitkin County, Minnesota (MN001)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
268E	Cromwell fine sandy loam, 12 to 25 percent slopes	3.5	35.2%
533	Loxley peat	0.4	3.8%
928C	Cushing-Mahtomedi complex, 2 to 10 percent slopes	3.5	35.3%
928D	Cushing-Mahtomedi complex, 10 to 25 percent slopes	2.6	25.7%
Totals for Area of Interest		**10.0**	**100.0%**



Aitkin County, Minnesota

928D—Cushing-Mahtomedi complex, 10 to 25 percent slopes

Map Unit Setting

National map unit symbol: gjk5
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: 45 percent
Mahtomedi and similar soils: 40 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): Shoulder, backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

E - 0 to 7 inches: loam
B/E - 7 to 17 inches: loam
Bt - 17 to 30 inches: loam
C - 30 to 60 inches: loam

Properties and qualities

Slope: 10 to 25 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 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Forage suitability group: Sloping; Fine Texture (G090AN023MN)
Hydric soil rating: No

Description of Mahtomedi

Setting

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

Typical profile

A - 0 to 3 inches: loamy coarse sand
E - 3 to 13 inches: coarse sand
Bw - 13 to 25 inches: gravelly coarse sand
C - 25 to 60 inches: gravelly sand

Properties and qualities

Slope: 10 to 25 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

Alstad and similar soils

Percent of map unit: 8 percent
Hydric soil rating: No

Cathro and similar soils

Percent of map unit: 7 percent
Landform: Bogs
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Aitkin County, Minnesota
Survey Area Data: Version 18, Oct 4, 2017

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

Sandwick and similar soils

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

Meehan and similar soils

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

Cathro and similar soils

Percent of map unit: 4 percent
Landform: Bogs
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 18, Oct 4, 2017

Aitkin County, Minnesota

268E—Cromwell fine sandy loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: gjgg
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

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

Description of Cromwell

Setting

Landform: Outwash plains
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy outwash

Typical profile

A - 0 to 2 inches: fine sandy loam
Bw,2Bw,2C - 2 to 60 inches: gravelly sand

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Forage suitability group: Steep; Coarse Testure; Low AWC (G090AN018MN)
Hydric soil rating: No

Minor Components

Oesterle and similar soils
Percent of map unit: 8 percent
Hydric soil rating: No

Leafriver and similar soils
Percent of map unit: 7 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Aitkin County, Minnesota
Survey Area Data: Version 18, Oct 4, 2017