

# Preliminary & Field Evaluation Form

www.SepticResource.com vers 12.4

Owner Information			
Date	<u>8/9/2019</u>	Sec / Twp / Rng	<u>S-17, T-44, R-23</u>
Parcel ID	<u>25-0-027800</u>	LUG (county, city, township)	<u>Aitkin Co.</u>
Property Owner:	<u>Tim Pomerleau</u>	Owners address (if different)	
Property Address:	<u>19053 State Hwy 65 McGrath MN 56350</u>	<u>10122 Ewing Ln. North</u>	
City / State / Zip:	<u>621-867-6533</u>	<u>Brooklin Park 55443</u>	

Flow Information and Waste Type / Strength			
Estimated Design flow	<u>450</u>	Anticipated Waste strength	<input type="checkbox"/> Hi Strength <input checked="" type="checkbox"/> Domestic
Comments:		Any Non-Domestic Waste	<input type="checkbox"/> Yes (class V) <input checked="" type="checkbox"/> No
Existing system to be abandon		Sewage ejector/grinder pump	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Snake River is Forested in this area, SSTS setback is 100 ft.		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	Existing well in locked shed Shallow 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) By Others	<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 type="checkbox"/> Yes <input checked="" 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>Snake river is approx 400 ft. from mound area.</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 <sup>2</sup> )	<u>0.60</u>	Percolation rate (if applicable)	_____		
Depth/elev to SHWT	<u>20"</u>	Flooding or run-on potential (comments)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Depth to system bottom maximum (or elev minimum)	<u>( + 18" )</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.*

Jeff Brummer  
Designer Signature

Brummer Septic LLC.  
Company

L-1347  
License #

# Soil Observation Log

www.SepticResource.com vers 12.4

Owner Information	
Property Owner / project: <u>Tim Pomerleau</u>	Date <u>8/9/2019</u>
Property Address / PID: <u>19053 State Hwy 65 McGrath MN 56350</u>	

Soil Survey Information	
<input type="checkbox"/> refer to attached soil survey	
Parent mat'l'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>164B &amp; 738B</u> slope <u>5</u> %                    direction- <u>West</u>

Soil Log #1							
		<input checked="" type="checkbox"/> Boring	<input type="checkbox"/> Pit	Elevation <u>98.3'</u>	Depth to SHWT <u>20"</u>		
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 4	Topsoil Sandy Loam	<35	10Yr3/3		Loose	Loose	Granular
4 - 20	Loam	<35	10YR4/4		Loose	Loose	Granular
20 - 26	Loam	<35	10YR4/4	7.5YR5/6	Loose	Loose	Granular
		<35					
		<35					

Comments:

19053 State Hwy 65 McGrath MN 56350							
Soil Log #2							
<input checked="" type="checkbox"/> Boring		<input type="checkbox"/> Pit		Elevation <u>98'</u>		Depth to SHWT <u>26"</u>	
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 5	Topsoil Sandy Loam	<35	10Yr3/3		Loose	Loose	Granular
5 - 26	Sandy Loam	<35	10YR5/4		Loose	Loose	Granular
26 - 30	Loam	<35	10YR5/4	7.5YR5/6	Loose	Loose	Granular
		<35					
		<35					

19053 State Hwy 65 McGrath MN 56350							
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: Tim Pomerleau

Date: 8/9/2019

Site Address: 19053 State Hwy 65 McGrath MN 56350

PID: 25-0-027800

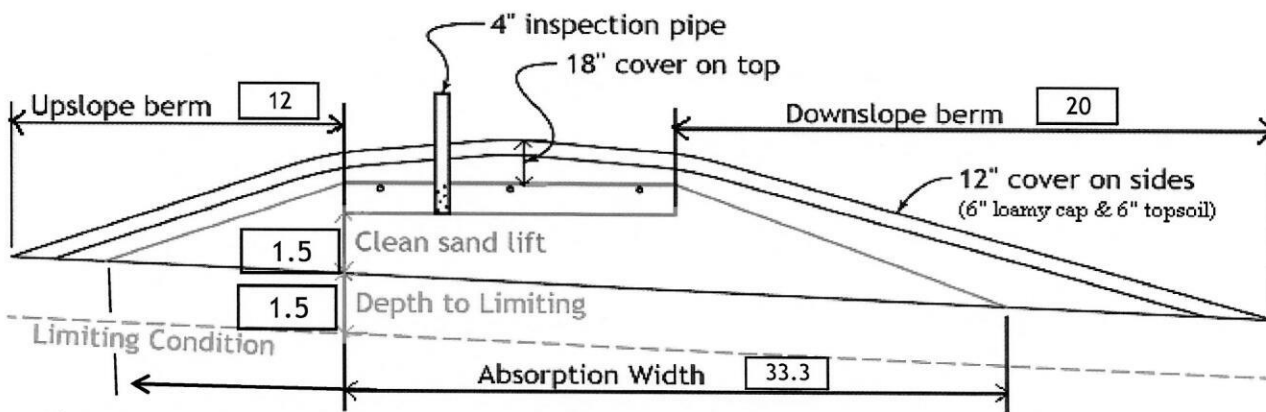
Comments: Future Owner

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

- 1)  bedroom    Type  Residential    System
- 2)  GPD design flow
- 3)  Garbage disposal or pumped to septic    Install Jacobson 1650 2/Compartment tank
- 4)  Gal Septic tank (code minimum)     Gal Septic tank (design size / LUG req'd)  
Tank options: none
- 5)  GPD/ft<sup>2</sup> mound sand loading rate    contour loading rate of  req's a min     ft. long rockbed
- 6)  ft rockbed width     ft rockbed length
- 7)  ft lateral spacing     ft perforation spacing    (maximum of 3 for both)  
 manifold connection
- 8)  laterals     feet long     perfs / lateral     perfs total  
(1/2 a perf means the first perf starts at the middle feed manifold)
- 9)  inch perfs at  feet residual head    gives  gpm flow rate per perforation  
for this perf size & spacing, & pipe size on line 12, max perfs/lateral = , line #8 must be less -->    OK
- 10)  doses per day    ( 4 minimum)
- 11)  gallons per dose    (treatment volume)    1.50    5x
- 12)  inch diameter laterals must be used to meet "4x pipe volume" requirement    2.00    3x
- 13)  feet of  inch supply line    leads to  gallons of drainback volume  
(Tip: "top feed" manifold to control the drainback)
- 14)  gallons TOTAL pump out volume (treatment + drainback)
- 15)  feet vertical lift from pump to mound laterals, leads to a:
- 16)  GPM @  feet of head, Pump requirement    (note: >50gpm may require an extra 3-6' of head)
- 17)  gal Dose tank (code minimum)     gal Dose tank (design size / LUG req'd)    at  gpi  
leads to a
- 18)  inch swing on Demand float,    or timed dosing of  min ON    (confirm pump rate with drawdown  
(this delivers Average flow, =70% of Peak design flow)  hrs OFF    test and adjust as necessary)
- 19)  inches from bottom of tank to "Pump OFF" float
- 20)  inches from bottom of tank to "Pump ON" float, or  inches to "Timer ON" float if time dosed
- 21)  inches from bottom of tank to "Hi Level" float, or  inches to "Hi Level" float if time dosed
- 22)  gallons reserve capacity    (after High Level Alarm is activated)

Install Electric alarm on pump tank

- 23)  gpd/ft<sup>2</sup> Absorption area Soil Loading Rate, which gives a mound ratio of  (minimum)  
 (this must match the soil boring log) desired mound ratio
- 24)  percent site slope (0-20% range)  (% downslope site slope, if different than upslope)
- 25)  inches, or  ft. to Redox or other limiting condition (need at least 12" to be a Type I)  
 Treatment zone contains  inches of 0% soil credit, and  inches of 50% soil credit. Giving a:
- 26)  inch, or  ft. Sand Lift Mound **CRITICAL FOR FUTURE CERTIFICATIONS!!!**
- 27)  ft. base absorption width (with sand beyond rockbed as follows):  
 greater of: absorption width OR sand slope
- 28)  ft. upslope and sideslope sand upslope   
 ft. Downslope sand down slope
- Individual slope ratios give BERM widths (topsoil beyond rockbed) of:
- 29)  upslope ratio  ft. upslope berm
- 30)  sideslope  ft. sideslope berms
- 31)  downslope  ft. downslope berm
- 32) Overall Dimensions:  ft. wide by  ft. long Rock bed  
 ft. wide by  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:  
 ft. by  ft. by  inches under pipe, plus 20% gives  yd<sup>3</sup> or \*1.4=  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)  
 up +  downslope +  ends +  under rock =  yd<sup>3</sup> or \*1.4=  ton  
 plus 20%
- 35) Loamy Cap:  
 ft. by  ft. 6" deep, plus 20% gives  yd<sup>3</sup> or \*1.4=  ton
- 36) Topsoil:  
 ft. by  ft. 6" deep, plus 20% gives  yd<sup>3</sup> or \*1.4=  ton

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

  
 Designer Signature

Brummer Septic LLC.  
 Company

L-1347  
 License#

8/9/2019  
 Date

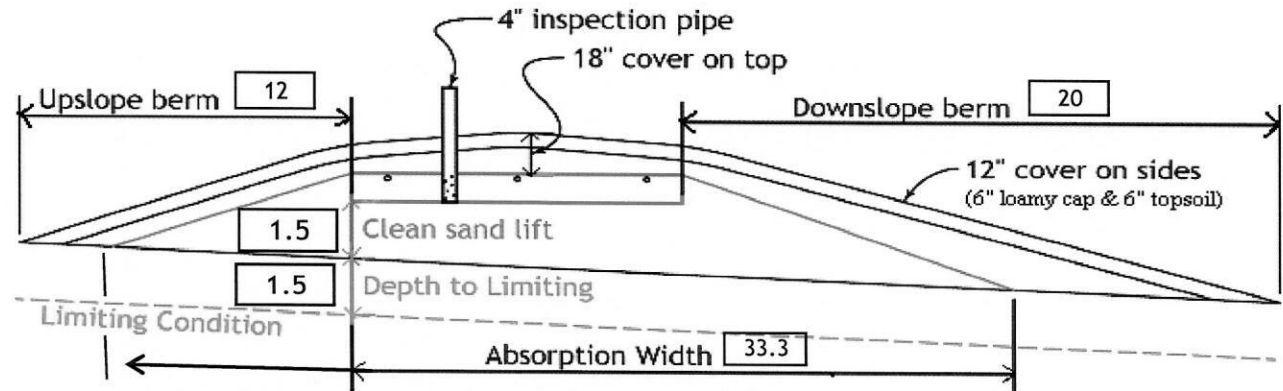
# Installer Summary

1120 gallon Septic tank (minimum) Tank options: none  
 Install Jacobson 1650 2/Compartment tank  
 533 gallon Dose tank (minimum) at 12.69 gpi  
 27 GPM @ 19 ft. of head, Pump required  
 5.8 inch swing on Demand float which translates to roughly 3.9 inches of float tether length  
 if time dosing is required --> 2.7 minutes ON time & 5.1 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  
 50 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  
 33.3 ft. Total sand ABSORPTION width (minimum)

8.3 ft. upslope and sideslope (sand beyond rockbed, minimum)  
 15.0 ft. Downslope (sand beyond rockbed, minimum)

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

4:1 upslope ratio	12 ft. upslope berm
4:1 sideslope	16 ft. sideslope berms
4:1 downslope	20 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 <sup>3</sup> or *1.4=	24 ton	9 inches under pipe
Mound Sand:	135 yd <sup>3</sup> or *1.4=	189 ton	calculation based on 3:1/4:1 slope from top of rockbe
Loamy Cap:	56 yd <sup>3</sup> or *1.4=	78 ton	6" deep
Topsoil:	65 yd <sup>3</sup> or *1.4=	91 ton	6" deep

## INSPECTOR CHECKLIST - mound

19053 State Hwy 65 McGrath MN 56350

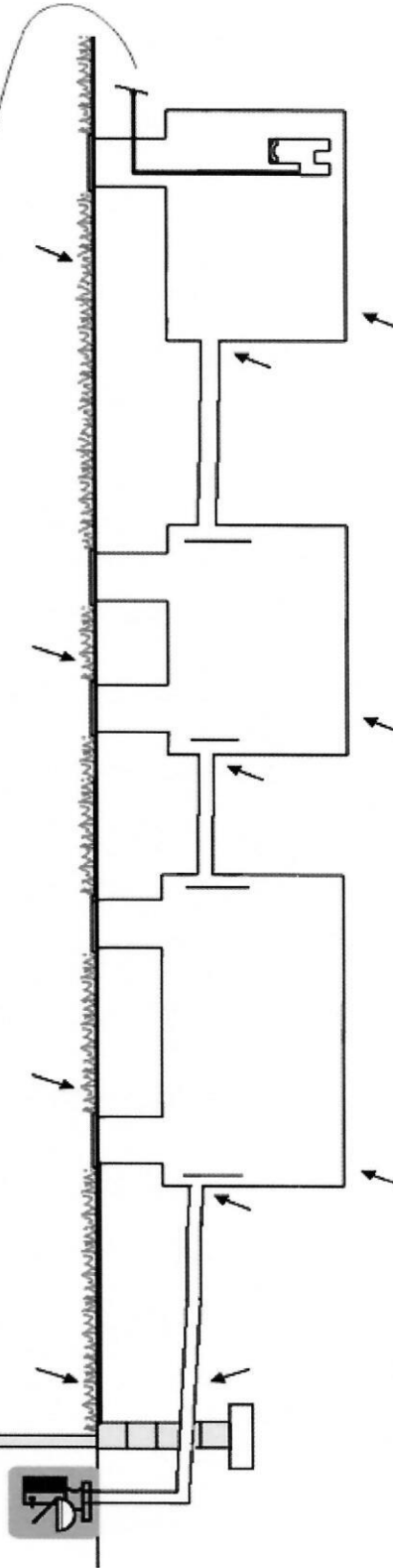
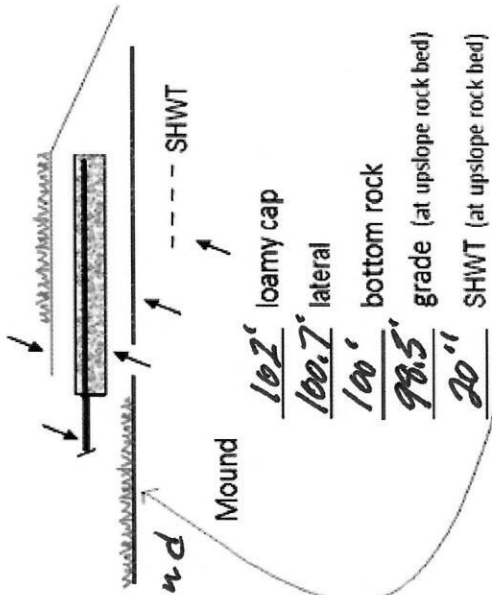
- WELL setbacks: 20' to pressure tested sewer line (5 psi for 15 min)  
50' to everything 100' to dispersal area with shallow well
- PROPERTY LINES setback: 10' to everything
- Road setback: platted: 10' prop line. Metes & bounds: out of road easement, or outer ditch.
- LAKE / BLUFF setback: 20' for 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 19 head VERIFY PUMP CURVE 2.7 min ON 5.1 hr OFF
  
- float setting drop 5.8 inches at 12.7 gpi "DESIGNED" 3.9 inches approx float tether length  
73.0 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 8.3 upslope 15.0 downslope
  
- Bermed topsoil beyond rockbed 12 upslope 16 sideslope 20 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 NW of mound

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



Sewer pipe exiting house

105' Grade

103' Pipe

Septic Tank

99.3' Grade

97.5' inlet

94' ~~90.0'~~ Tank bottom

Septic Tank (if applicable)

\_\_\_ Grade

\_\_\_ inlet

\_\_\_ Tank bottom

Pump Tank

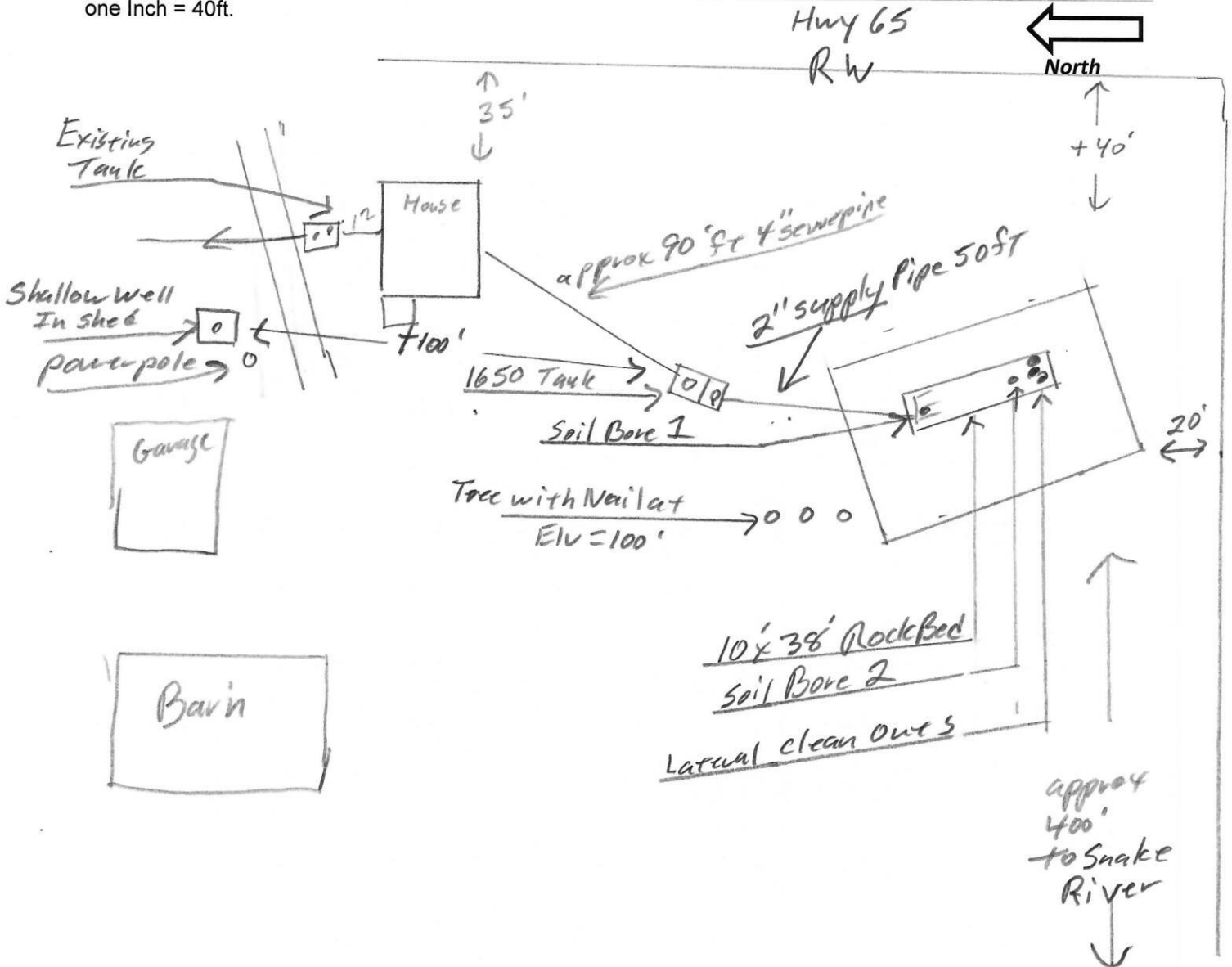
99.3' Grade

97.3' inlet

94' Tank bottom

# { Design Drawing }

Property Owner: Tim Pomerleau      Date: 8/9/19      Designer's Initials: JB  
 Parcel ID. Number: 25-0-027800      Address: 19053 State Hwy 65 McGrath MN 56350  
 one Inch = 40ft.



	Surface/ SHWT	Nail on Tree = Bench Mark 100'		Existing Grade
Soil Bore 1	98.3' / 20"	Bench Mark	100'	Upslope Edge of rockbed Elv. = 98.5'
Soil Bore 2	98' / 26"	Ground Elv. BM	98	Bottom of rockbed Elv. = 100'
Soil Bore 3		Ground Elv. Tank	99.3'	Top of Washed sand Elv. = 100'
	Ground at	Existing house	105' SW corner	

Please show all that apply ( Existing )

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

- Wells within 100ft. Of Drain field.
- Water lines within 10 ft. of Drain field.
- Drain field Areas:

- |                           |                                   |
|---------------------------|-----------------------------------|
| 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: Tim Pomerleau

Date: 8/9/19

Site Address: 19053 State Hwy 65 McGrath MN 56350

PID: 25-0-027800

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. Existing Shallow well location is North of House.
- 2 Existing Septic system will be abandon. Tank will be pumped, collapsed, filled or removed.
- 3 South property line is approx. 20 ft. from mound berm.  
Existing house will be re-plumbed for sewer pipe to exist house on South side.
- 4 Bench Mark Elevation is a nail on a tree near NW corner of mound area. Elv.= 100'
- 5 Install Jacobson 1650 Compartment tank for gravity flow from Existing house, install clean-out near house.
- 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 33.3'.  
Sand absorption area is 8.3 ft. up slope + 10 ft. rockbed + 15 downslope = approx. 33.3 ft. wide sand base.  
Berms are 12ft. Upslope, 20ft. Down slope, 10ft. Rock bed = approx. 42ft. Wide.  
Overall mound size is approx. 42' wide x 70' long and approx. 3.5' high. End berms are 16 dft. 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. 73 gallons per dose, 5.8 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.  
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.  
Install electric alarm on pump tank.  
Designed to Aitkin Co. and MPCA recommendations and requirements.

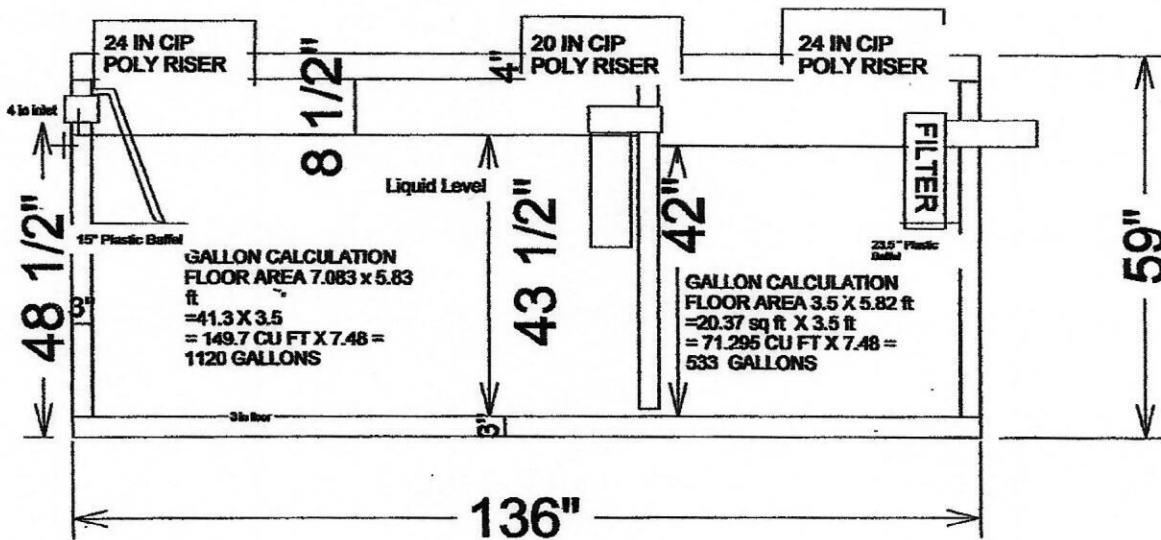
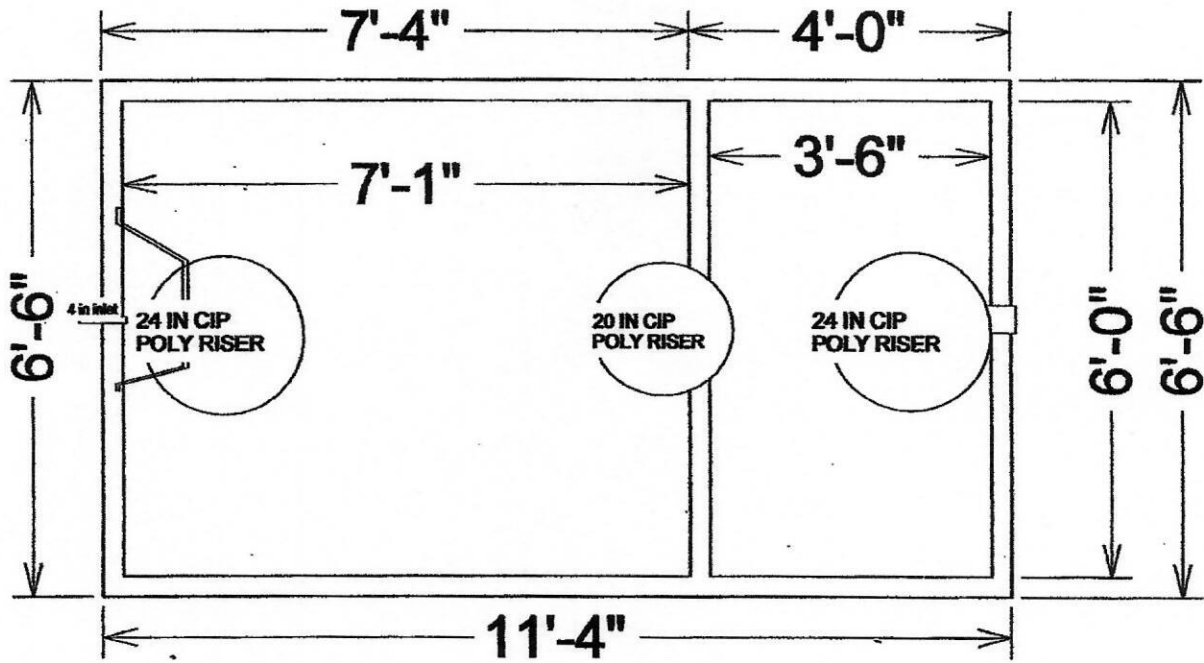
  
Designer Signature

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: 25-0-027800

## General Information

**Township/City:** PLINY TWP  
**Taxpayer Name:** BARTELMA, WALTER & BERNICE  
**Taxpayer Address:** 19053 STATE HWY65  
 MCGRATH MN 56350  
**Property Address:** 19053 STATE HWY 65  
**Township:** 44 **Lake Number:** 1099200  
**Range:** 23 **Lake Name:** SNAKE RIVER  
**Section:** 17 **Acres:** 39.22  
**Green Acres:** No **School District:** 4.00  
**Plat:**  
**Brief Legal Description:** SE OF SE LESS .78 AC HY

## Tax Information

**Class Code 1:** Agricultural  
**Class Code 2:** Ag Non-Productive Contiguous  
**Class Code 3:** Unclassified  
**Homestead:** Owner Homestead  
**Assessment Year:** 2019

**Estimated Land Value:** \$72,500.00  
**Estimated Building Value:** \$31,000.00  
**Estimated Total Value:** \$103,500.00

**Prior Year Total Taxable Value:** \$85,440.00  
**Current Year Net Tax (Specials Not Included):** \$240.00  
**Total Special Assessments:** \$0.00  
**\*\*Current Year Balance Not Including Penalty:** \$120.00  
**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.

**Pomerleau**

USDA

**Aitkin County**

Date: 8/7/2019

0 90 180 ft 1 inch = 246 feet

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
164B	Mora fine sandy loam, 1 to 4 percent slopes	0.7	97.4%
738B	Milaca-Millward complex, 2 to 8 percent slopes	0.0	2.6%
<b>Totals for Area of Interest</b>		<b>0.7</b>	<b>100.0%</b>



**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

### 164B—Mora fine sandy loam, 1 to 4 percent slopes

#### Map Unit Setting

*National map unit symbol:* gjf9  
*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:* All areas are prime farmland

#### Map Unit Composition

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

#### Description of Mora

##### Setting

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

##### Typical profile

*A - 0 to 3 inches:* fine sandy loam  
*E1,E2 - 3 to 15 inches:* fine sandy loam  
*2B/E,2Bt1-2 - 15 to 28 inches:* sandy loam  
*2Bc - 28 to 42 inches:* sandy loam  
*2Cd - 42 to 60 inches:* sandy loam

##### Properties and qualities

*Slope:* 1 to 4 percent  
*Depth to restrictive feature:* 40 to 60 inches to densic material  
*Natural drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)  
*Depth to water table:* About 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 15 percent  
*Available water storage in profile:* Low (about 5.4 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2e  
*Hydrologic Soil Group:* C  
*Forage suitability group:* Sloping Upland, Low AWC, Acid (G090AN008MN)



*Hydric soil rating:* No

**Minor Components**

**Giese and similar soils**

*Percent of map unit:* 4 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

**Twig and similar soils**

*Percent of map unit:* 4 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

**Ronneby and similar soils**

*Percent of map unit:* 3 percent

*Hydric soil rating:* No

**Milaca and similar soils**

*Percent of map unit:* 2 percent

*Hydric soil rating:* No

**Stones on the surface**

*Percent of map unit:* 2 percent

*Hydric soil rating:* No

**Data Source Information**

Soil Survey Area: Aitkin County, Minnesota

Survey Area Data: Version 19, Sep 12, 2018

## Aitkin County, Minnesota

### 738B—Milaca-Millward complex, 2 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* gjjl  
*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:* Farmland of statewide importance

#### Map Unit Composition

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

#### Description of Milaca

##### Setting

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

##### Typical profile

*A - 0 to 4 inches:* fine sandy loam  
*E - 4 to 17 inches:* fine sandy loam  
*2E/B - 17 to 22 inches:* sandy loam  
*2B/E, 2Bt, 2BC - 22 to 48 inches:* sandy loam  
*2Cd - 48 to 60 inches:* sandy loam

##### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* 40 to 60 inches to densic material  
*Natural drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)  
*Depth to water table:* About 24 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Low (about 5.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2e  
*Hydrologic Soil Group:* C  
*Forage suitability group:* Sloping Upland, Low AWC, Acid (G090AN008MN)

*Hydric soil rating:* No

### **Description of Millward**

#### **Setting**

*Landform:* Moraines

*Landform position (two-dimensional):* Backslope, summit

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Loamy glaciofluvial deposits over loamy till

#### **Typical profile**

*E - 0 to 4 inches:* fine sandy loam

*Bw1 - 4 to 21 inches:* fine sandy loam

*2Bw2,2Bw3 - 21 to 34 inches:* sand

*3Bt1,3Bt2 - 34 to 46 inches:* sandy loam

*3Cd - 46 to 60 inches:* sandy loam

#### **Properties and qualities**

*Slope:* 2 to 8 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 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:* Moderate (about 7.4 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3e

*Hydrologic Soil Group:* B

*Forage suitability group:* Sloping Upland, Low AWC, Acid  
(G090AN008MN)

*Hydric soil rating:* No

#### **Minor Components**

##### **Giese and similar soils**

*Percent of map unit:* 3 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

##### **Mora and similar soils**

*Percent of map unit:* 3 percent

*Hydric soil rating:* No

##### **Pomroy and similar soils**

*Percent of map unit:* 3 percent

*Hydric soil rating:* No

##### **Twig and similar soils**

*Percent of map unit:* 3 percent

*Landform:* Depressions

*Hydric soil rating: Yes*

**Sandy 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