

Preliminary & Field Evaluation Form

www.SepticResource.com vers 12.4

Owner Information

Date 10/8/2019 Sec / Twp / Rng S-23, T-46, R-27
 Parcel ID 07-0-046110 LUG (county, city, township) Aitkin Co.
 Property Owner: ~~XXXXXXXX~~ Loren Farrar Owners address (if different)
 Property Address: 41329 300th Ln. Aitkin MN 56431 41329 300th Ln.
 City / State / Zip: _____ Aitkin MN 56431

Flow Information and Waste Type / Strength

Estimated Design flow 450 Anticipated Waste strength Hi Strength Domestic
 Comments: Will need variance from lake to tank Any Non-Domestic Waste Yes (class V) No
 Will need Structural Engineer's report for shed to drainfield 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 Yes No Well casing depth Existing deep well (758690)
 Easements on lot located Yes No Drainfield w/in 100' of residential well Yes No
 Property lines determined Yes No Site w/in 200' of transient noncommunity water supply (TNCWS) Yes No
 (see site map) By Others
 Req'd setbacks determined Yes No Site w/in an inner wellhead mgmt zone (CWS/NTNCWS) Yes No
 (see site map)
 Utilities located & identified Yes No Buried water supply pipe w/in 50' of system Yes No
 (gopher state one call) Call for Locates
 Access for system maintenance Yes No Site located in Shoreland (w/in 1000' of lake, 300' of river) Yes No
 (shown on site map)
 Soil treatment area protected Yes No Site map prepared with previous items included Yes No
 Construction related issues Designer using directional bore up up to septic tank location.

Soil Information

			Evidence of site:		
			Cut	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
			Filled	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
			Compacted	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
			Disturbed	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Original soils	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Soil logs completed and attached	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Perk test completed and attached (if applicable)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Soil loading rate (gpd/ft ²)	<u>0.78</u>		Percolation rate (if applicable)	_____	
Depth/elev to SHWT	<u>61" (Elv.= 99.3')</u>		Flooding or run-on potential (comments)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Depth to system bottom maximum (or elev minimum)	<u>Elv.= 100'</u>		Flood elevation (if applicable)	_____	
Depth/elev to standing water (if applicable)	_____		Elevation of ordinary high water level (if applicable)	_____	
Depth/elev to bedrock (if applicable)	_____		Floodplain designation and elev - 100 yr/10 yr (if applicable)	_____	
Soil Survey information determined (see attachment)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Differences between soil survey and field evaluation (if applicable)	_____ _____				

I hereby certify this evaluation was completed in accordance with MN 7080 and any local req's.



 Designer Signature

Brummer Septic LLC.

 Company

L-1347

 License #

Soil Observation Log

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Owner Information

Property Owner / project: ~~Jocelyn Farrar~~ Loren Farrar

Date 10/8/2019

Property Address / PID: 41329 300th Ln. Aitkin MN 56431

Soil Survey Information

refer to attached soil survey

Parent mat'l's: Till Outwash Lacustrine Alluvium Organic Bedrock

landscape position: Summit Shoulder Side slope Toe slope

soil survey map units: 504B slope 1 % direction- SE

Soil Log #1

Boring Pit

Elevation 102.7'

Depth to SHWT 70"

Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 8	Topsoil Sandy Loam	<35	10YR3/2		Loose	Loose	Granular
8 - 70	Med Sand	<35	10YR5/4		Loose	Loose	Granular
70 - 74	Clay Loam	<35	10YR5/3	7.5YR5/6	Friable	Weak	Blocky
74 - 80	Med Sand	<35	10YR6/4		Loose	Loose	Granular
		<35					

Comments:

41329 300th Ln. Aitkin MN 56431

Soil Log #2

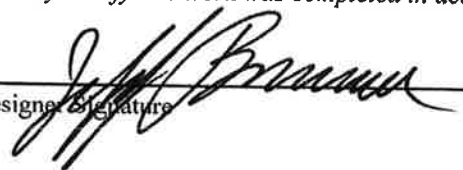
<input checked="" type="checkbox"/> Boring		<input type="checkbox"/> Pit		Elevation <u>101.4'</u>		Depth to SHWT <u>61"</u>	
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
0 - 8	Topsoil Sandy Loam	<35	10YR3/2		Loose	Loose	Granular
8 - 13	Loam	<35	10YR5/3		Loose	Loose	Granular
13 - 61	Med Sand	<35	10YR5/4	10YR4/4 (1/4" to 1/2") lamellae layers	Loose	Loose	Granular
61 - 65	silt Loam	<35	10YR5/3	7.5YR5/4	Friable	Weak	Blocky
65 - 70	Med Sand	<35	10YR5/4		Loose	Loose	Granular

41329 300th Ln. Aitkin MN 56431

Soil Log #3

<input type="checkbox"/> Boring		<input type="checkbox"/> Pit		Elevation _____		Depth to SHWT _____	
Depth (in)	Texture	fragment %	matrix color	redox color	consistence	grade	shape
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive
		<35 35 - 50 >50			loose friable firm rigid	loose weak moderate strong	single grain granular blocky prismatic platy massive

I hereby certify this work was completed in accordance with MN 7080 and any local req's.

Designer Signature 

Brummer Septic LLC.
Company

L-1347
License #

Pressure Bed Design

contact Troy Johnson at
www.SepticResource.com
for questions or comments

Property Owner: ~~Leason Farrar~~ Loren Farrar Date: 10/8/2019
 Site Address: 41329 300th Ln. Aitkin MN 56431 PID: 07-0-046110
 Comments: See Notes on special conditions

instructions: = req'd input = input or default = calculated field *** = installer info

- 1) bedroom Type Residential System
- 2) GPD design flow
- 3) Garbage disposal or pumped to septic 50% larger tank w/mult comp/tanks, effluent filter & alarm req'd
Install Jacobson 1650 Compartment tank
- 4) *** Gallon septic tank (minimum) Tank options: multiple tanks or compartments req'd
- 5) GPD/ft² Soil Loading Rate (must match soil boring log) ft² bed req'd, or ft² LUG minimum
- 6) *** ft desired bed width, (25' maximum) leads to a ft bed length
- 7) *** ft lateral spacing ft perforation spacing (maximum 3 for both)
 manifold connection
- 8) *** laterals feet long perfs / lateral perfs total
(1/2 perf means the first perf starts at the middle feed manifold)
- 9) *** inch perfs at feet residual head gives gpm flow rate per perforation
(If bed has > 1' of cover, increase residual head for cleanout req's)
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)
- 12) 1.25 inch diameter laterals (or smaller) will meet "5x pipe volume"
*** inch diameter laterals (or smaller) must be used to meet "4x pipe volume" requirement
1.50 inch diameter laterals (or smaller) will meet "3x pipe volume"
- 13) *** feet of inch supply line leads to gallons of drainback volume
("top feed" to control the drainback)
- 14) gallons TOTAL pump out volume (treatment + drainback)
- 15) feet vertical lift from pump to dispersal area, leads to a
- 16) *** GPM @ feet of head, Pump requirement
(>50 gpm may require additional 3-6' head allowance for discharge assy)

Infiltrator 540 lift tank below house, with lift pump up to septic tank.

Jacobson 1650 2/compartment tank as septic tank because of lifted septage.

Install Jacobson 520 gallon pump tank for pump tank of effluent to the pressure bed.

There will be 2 alarms on system when complete, one on 540 Lift tank and one on the 520 pump tank.

Pressure Bed

- 17) *** 520 gal Dose tank (minimum) at 16.57 gpi
- 18) *** 4.8 inch swing on Demand float, or Timed dosing of 2.3 min ON (confirm pump rate with drawdown test and adjust as necessary)
(<100% of design flow requires a larger OFF time) 4 hrs OFF
- 19) 12 inches of from bottom of tank to "pump OFF" float, and/or to cover pump
- 20) *** 17 inches from bottom of tank to "pump ON" float, or 12 inches to "timer ON" float
- 21) *** 20 inches from bottom of tank to "Hi Level" float (add 5-15 inches if Time Dosed)
- 22) 189 gallons reserve capacity (after High Level Alarm is activated)
- 23) 61 inches, or 5.08 ft. to Redox or other limiting condition (This must match the soil boring log)
- 24) 36 inches, or 3.00 ft. of vertical separation required
leads to bottom of rock no more than:
- 25) *** 25 inches, or 2.1 ft. Below existing grade **CRITICAL FOR FUTURE CERTIFICATIONS!!!**
Install Pressure bed bottom of rock at Elv. = 100'
- 26) *** 9 inches of rock below the pipe
3 inches of rock to cover the pipe
- 27) Overall Dimensions: 19.0 ft. wide by 30.4 ft. long Pressure Bed
- 28) *** Rock Bed materials:
19 ft. by 30.4 ft. by 12 inches total, plus 20% gives 26 yd³ or *1.4= 36 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#

10-8-19
Date

Installer Summary

Infiltrator 540 lift tank below house.

gallon Septic tank (minimum) multiple tanks Install Jacobson 1650
50% larger tank w/mult comp/tanks, effluent filter & alarm req'd
 gallon Dose tank (minimum) Pressure bed at gpi

GPM @ ft. of head, Pump required

inch swing on Demand float or minutes ON time & hours OFF time

inches from bottom of tank to "pump ON" float, or inches to "timer ON" float
 inches from bottom of tank to "Hi Level Alarm" float

ft. of inch supply line with manifold connection

laterals inch diameter feet long ft lateral spacing

inch perfs ft perforation spacing

No Effluent filter & alarm
 clean out & valve box assembly

Pressure Bed:

ft. wide by ft. Long

Bottom of rock no more than:

inches, or ft. Below existing grade Install Bottom of Rockbed at Elv.= 100'

inches of rock below the pipe

Overall Dimensions: ft. wide by ft. long Pressure Bed

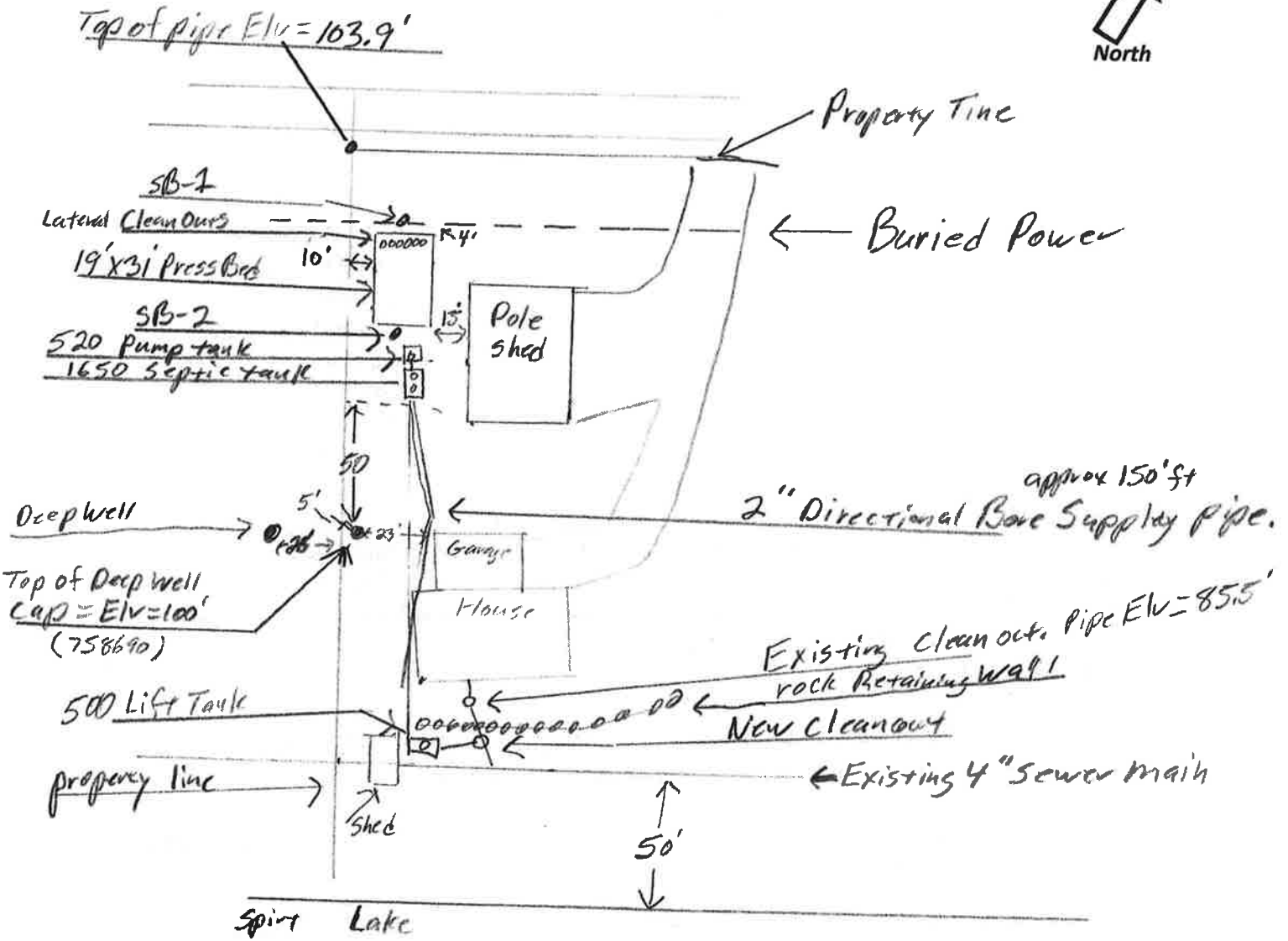
Rock Bed materials: yd³ or *1.4= ton

INSPECTOR CHECKLIST - Pressure bed

- 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: outer ditch, or 33' from center of township road, or 65' from center of cnty road
- LAKE / BLUFF setback: 20' for bluff. Lakes: gen 50', rec 75', nat 150'. Protected wetland 50'.
- Building setbacks: 10' for everything, 20' for dispersal area.
- WATER LINE under pressure 10' to bed, tank & sewer line.
- Sewer line & baffle connection (no 90's, 3' between 45's, slope of 1/8"/ft, or 1" in 8', or 1' in 96'.
(no depth req's, clean out every 100', Sch 40 D2665 or F891)
- Septic tank and risers (water tight, insulated, proper depth, existing verified by pumping)
mfg _____ 1500 gallons multiple tanks or compartments req'd
- Riser over outlet, riser over inlet, 6"+ inspection pipe over any remaining baffles.
- ~~XOX~~ effluent filter & alarm No
- Dose tank risers and piping (water tight, insulated, proper depth, drainback)
mfg _____ 520 gallons
- dose pump _____ 34 gpm 16 head VERIFY PUMP CURVE 2.3 M on 4 H off
- float setting drop 4.8 inches
LABEL pump requirements and drawdown on riser or panel
- Cam lock, weep hole, supply line access (no hard 90, pipes reachable from grade)
- supply pipe sloped 1/8"+, supported by sch40 sleeve, and buried 6"+.
- splice box / control panel / electrical connections
- Bed dimensions 19 X 30.4
- Rock depth below pipe 9 inches
- Rock bottom elevation 25.0 inches from Grade to bottom of rock (max)
- cover depth of 12"+ VERIFY Install bottom of Rock at Elev.=100'
- 6 laterals (1-2' from edge of rock)
- 1.50 inch pipe size (bigger is ok but do not exceed 4 times pipe volume)
- 3.0 ft lateral spacing
- 7/32 inch perforations (smaller is ok)
- 3.0 ft perforation spacing
- Air inlet at end of laterals, and at top feed manifold. VERIFY
- clean outs (deep bed 2' of head) (no hard 90's)
- 4" inspection pipe to bottom of rock, anchored VERIFY
- Abandon existing system if necessary
- monitoring plan and type _____

{ Design Drawing }

Property Owner: ~~Xxxxxxx~~ Loren Farrar Date: 10/8/19 Designer's Initials: JB
 Parcel ID. Number: 07-0-046110 Address: 41329 300th Ln. Aitkin MN 56431
 one Inch = 60ft.



Grade at Walk-out Elv. = 89.3'
 Grade below retaining wall Elv. = 86.1'
 Lake Elv. On 10/8/2019 Elv. = 80.6' shore Elv. = 83.6' Existing 4" sewer Main pipe approx. Elv. = 82.5'

Surface/ SHWT		Top of Well Cap = Bench Mark 100'		Existing Grade	
Soil Bore 1	102.7' / 70"	Bench Mark	100'	Grade at Bed	North End Elv. = 103'
Soil Bore 2	101.4' / 61"	Ground Elv. BM	98.9'		South End Elv. = 102'
Soil Bore 3		Ground Elv. Tank	101.4'	Bottom of Rock	Elv. = 100'
Grade at NW corner of House garage			99'	Grade at 500 Lift tank	Elv. = 85.5'

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: ~~Loran Farrar~~ Loren Farrar

Date: 10/8/2019

Site Address: 41329 300th Ln. Aitkin MN 56431

PID: 07-0-046110

Comments: Type I Pressure Bed / 3 bedroom

- 1 This is a type I Pressure Bed for a Existing 3 bedroom House.
Soil separation is at 61" at south end, area has a South slope of 1' across pressure bed area.
- 2 There are two existing Deep wells to the South of drainfield area. Both Deep wells will meet setbacks.
- 3 Existing septic system is in cluster system, Loran has to stay on this until all lots west are unhooked.
- 4 **Owner will need Structural Engineer's report from drainfield to shed. See report sheets.**
- 5 **Owner will have to apply for a variance to the lake setback for the new 500 lift tank below house.**
Tank will need a 50 ft. setback from lake, Location not set until installed as existing plumbing maybe reused.
And this will dictate where tank is located, and at what depth it is installed. See pump tank sheet for pump sizing. *note*
- 6 Install the 500 gal Infiltrator lift tank as high as possible, (it maybe in water) and add additional cover soil to try to keep tank from moving, (see Tank Buoyancy sheets). Installer should install with at least 24" of cover.
Owner has a rock retaining wall they would like left alone, Existing 4" pipe is approx. 24" to 36" bellow wall.
If existing pipe has to be turned just past wall to go unto lift tank, install clean-out at the new junction.
- 7 The 2" supply pipe from New lift tank to Septic tank will be directional bored, under or right next to house.
The 2" supply pipe has to stay 20 ft. or more from any well. Pressure test all new plumbing for this system.
Install 2" supply pipe from Lift tank to Septic tank to drain back to 500 lift tank.
- 8 **Bench Mark (Elv. = 100') is top of deep well cap, +50 ft. South of proposed pressure bed.**
- 9 The Pressure bed area will be 19 ft. wide and 31 ft. long. Bottom of rock Elv 100'.
The South end is the lowest end, use the excavated soil to build the berm out from South ends and to cover rockbed..
Elevation of the bottom of the rock bed should be approx. 100'
The area size of the rock bed is 19' x 31' .
Cover rock bed with fabric and 12" to 18" of soil.
- 10 Installer to double check bench mark. Installer should confirm bench mark height Elv. with inspector.
Installer should record bench mark Elv. and bottom of rockbed height on installation inspection form.
It is important that the soils do not get compacted, and area stays protected.
- 11 The Jacobson 1650 Combo tank to meet all setbacks. . Install the 520 pump tank with gravity flow from septic tank.
Install 520 pump tank with drainback from pressure bed to tank,
- 12 The Jacobson 520 pump tank to meet all setbacks. . Install the pump for 6 demand doses per day. approx. 79 gallons per dose, 4.8 inches of tank level. Install alarm at 3 inches from pump on level.
Install pump with 34 GPM and 16 Ft. head. Pump Calculations in design sheets for Pump to Drainfield.
Install all manholes, inspection pipes and clean-outs to grade or above, including lift tank.
- 13 Install a 2" supply pipe from 520 pump tank to end manifold in rock bed, install so pipe drains back to pump tank.
- 14 Install 1.5" laterals with 9" of rock under them. Install clean-outs at far end of laterals.(12" total inches of rock)
Drill 7/32" perf holes spaced 3 ft. apart.
Install inspection pipe to bottom of rock bed, secure in rock bed and raise to above final grade.
- 15 Installer will pressure test and squirt height laterals when finished. Give info to owner.
- 16 Owner is responsible to maintain protection of bed area through construction of septic system.

Designed to Aitkin Co. and MPCA recommendations and requirements.


Designer's Signature

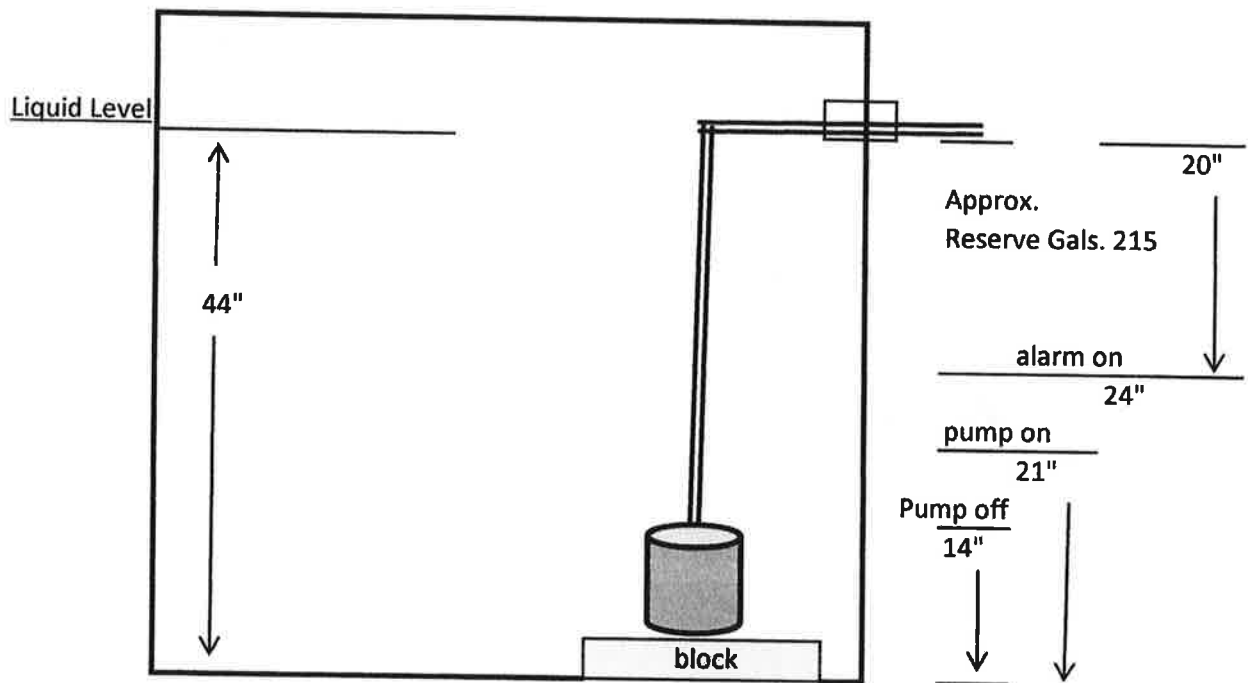
Brummer Septic LLC.
Design Company

L-1347
License#

Pump settings for 500 gal lift tank.

~~XXXXXX~~ Loren Farrar
Parcel ID. 07-0-046110

Tank Mfg. Infiltrator IM-540 Lift Tank 475 working gallons
Tank Size: MFG. 10.79 gals. Per inch



Assumes 10" pump

Pump out dose at 7" = (50 gals. dose + 26 drain back) = 76 pump out gals.

450 gpd ÷ 9 = 50 gals. Per Dose (small doses to septic tank = less surging in tank)

Drain back for 150 ft. of 2" supply pipe is = 26 gallons

Bottom of lift tank approx. Elv.= 78.5'

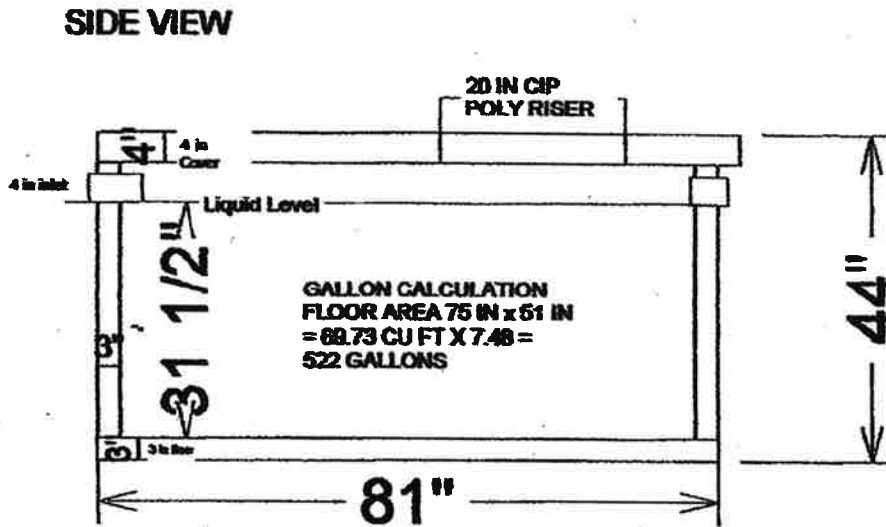
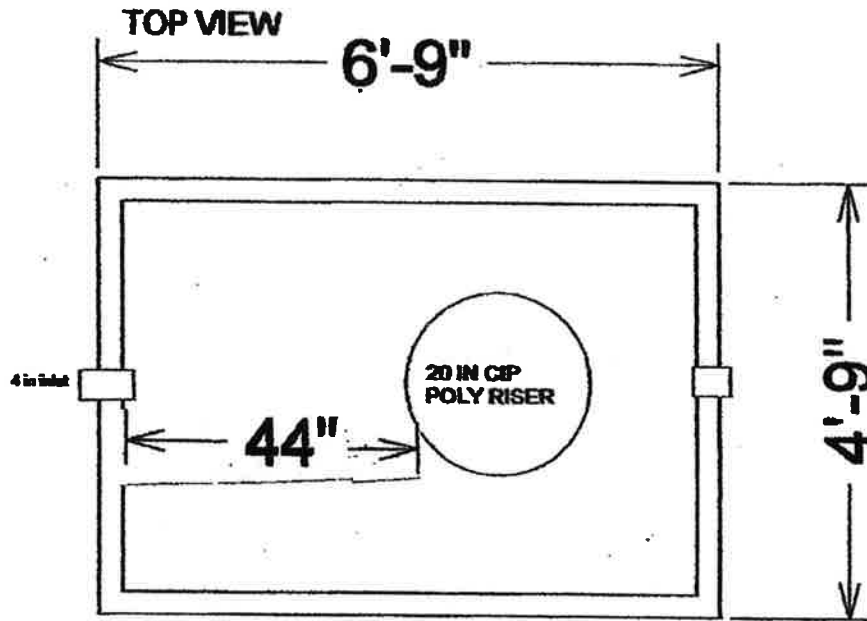
Inlet of 1650 Septic tank Approx. 99' approx. 20.5ft. Difference

Use 25 ft. minimum as head calculation for Lift pump (Grinder pump high lift)

See last ⁴ ~~X~~ pages (included with this design) for an example of information on a grinder pump.

520 Gallon Pump Tank

Pressure Bed



$522 \text{ gals.} / 31.5" = 16.57 \text{ GPI}$

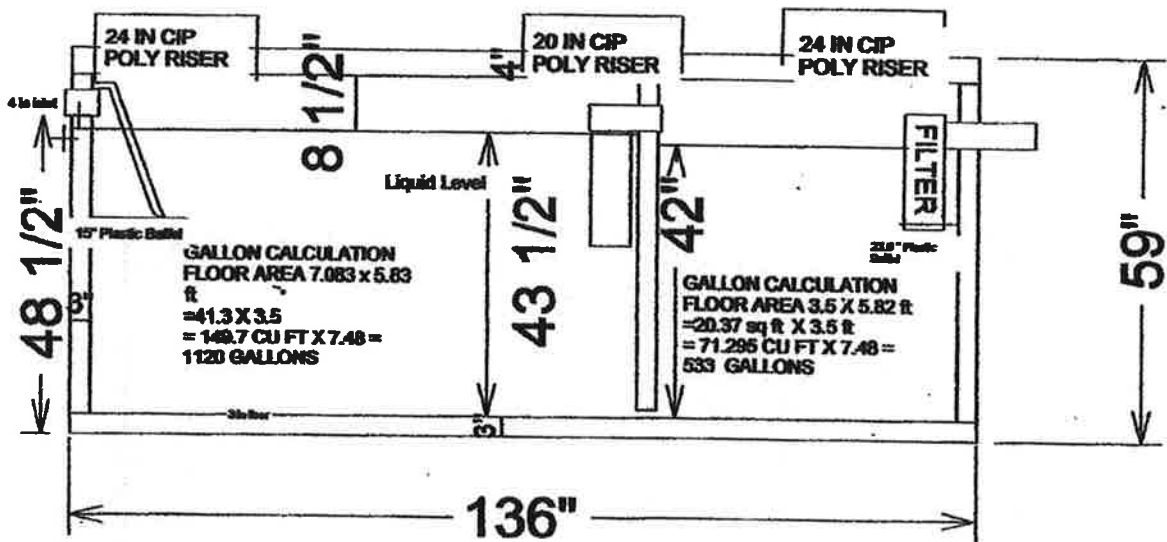
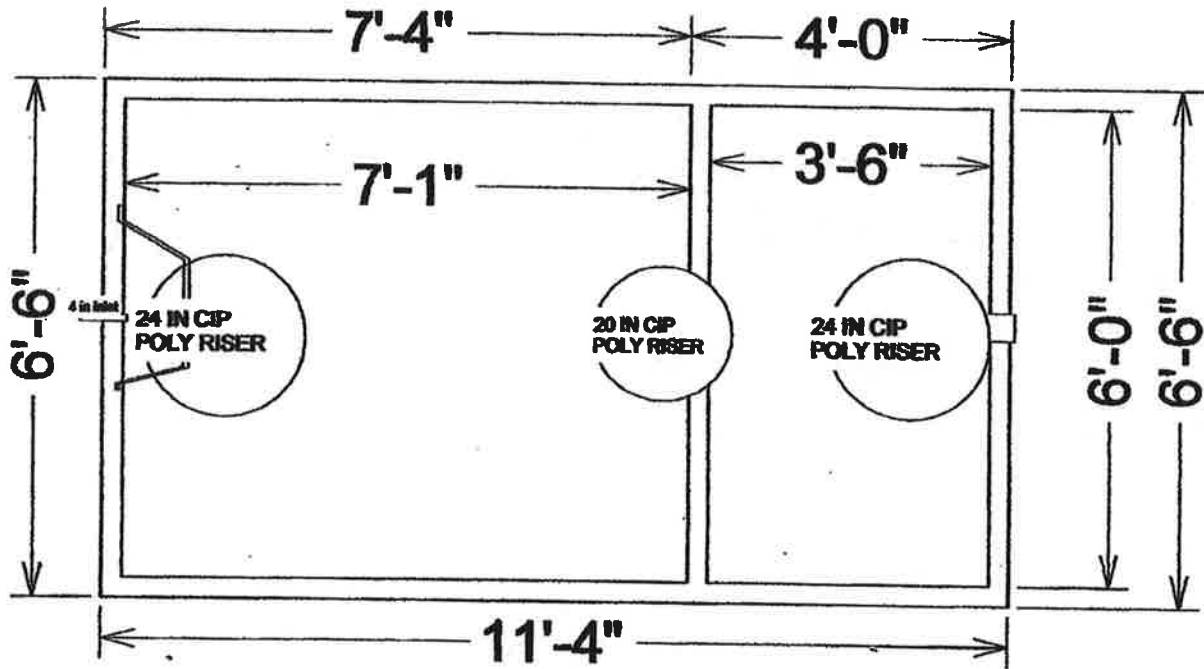
Drawings Owned BY Jacobson Precast, Inc.

36641 HWY 169, Aitkin, Mn 56431

DDo not copy drawings without permission of the Owner

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



INFILTRATOR®
tanks

Infiltrator 540 lift tank below house, with lift grinder pump

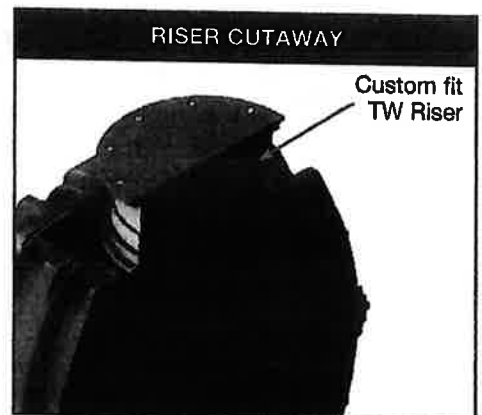
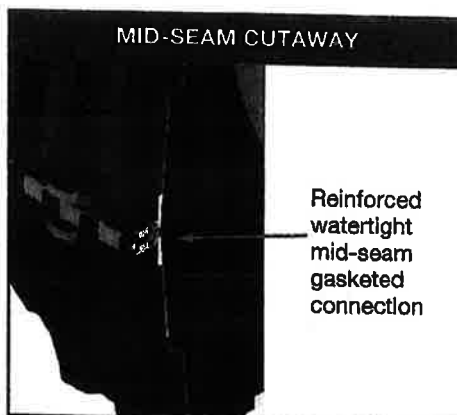
IM-540



The Infiltrator IM-540 is a lightweight strong and durable septic/pump tank. This watertight tank design is offered with Infiltrator's line of custom-fit risers and heavy-duty lids. Infiltrator injection molded tanks provide a revolutionary improvement in plastic tank design, offering long-term exceptional strength and watertightness.

Features & Benefits

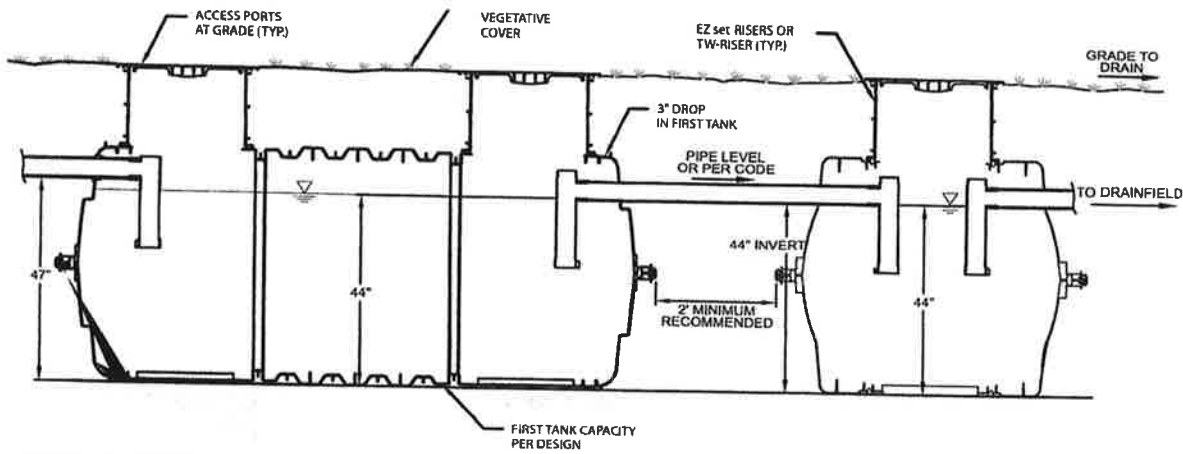
- Strong injection molded polypropylene construction
- Lightweight plastic construction and inboard lifting lugs allow for easy delivery and handling
- Integral heavy-duty green lids that interconnect with TW™ risers and pipe riser solutions
- Structurally reinforced access ports eliminate distortion during installation and pump-outs
- Reinforced structural ribbing offers additional strength
- Can be installed with 6" to 48" of cover
- Can be pumped dry during pump-outs
- Suitable for use as a pump tank or rainwater (non-potable) tank
- No special installation, backfill or water filling procedures are required



Protecting the Environment with **Innovative Wastewater Treatment Solutions**



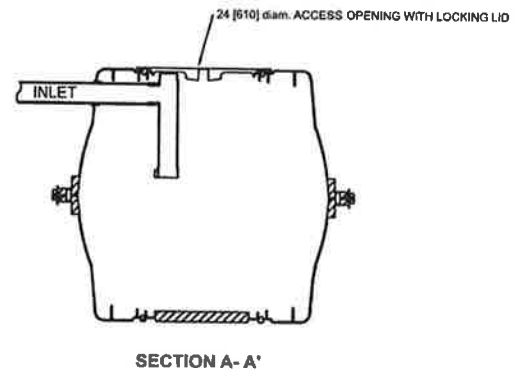
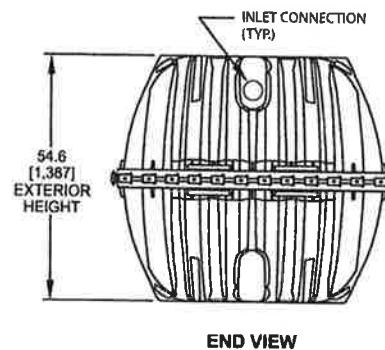
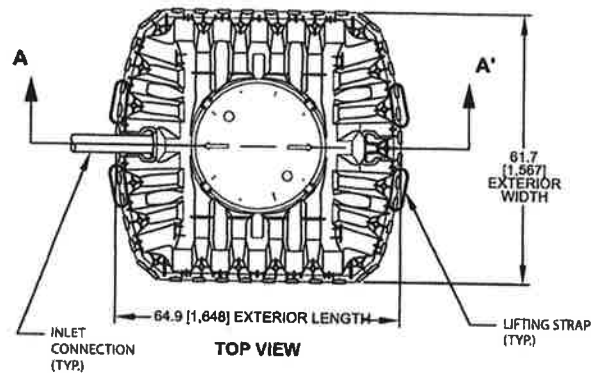
INFILTRATOR®
water technologies



The IM-540 is an injection molded two piece mid-seam plastic tank. The injection molded plastic design allows for a mid-seam joint that has precise dimensions for accepting an engineered EPDM gasket. Infiltrator's gasket design utilizes technology from the water industry to deliver proven means of maintaining a watertight seal. The two-piece design is permanently fastened using a series of non-corrosive plastic alignment dowels and locking seam clips. The IM-540 is assembled and sold through a network of certified Infiltrator distributors.

Must be backfilled and installed in accordance with Infiltrator Water Technologies, Infiltrator IM-Series Septic Tank General Installation Instructions and for shallow ground water conditions reference the Infiltrator IM-Series Tank Buoyancy Control Guidance.

Please visit www.infiltratorwater.com/images/pdf/ManualsGuides/TANK01.pdf for the latest information.



IM-540	
Working Capacity	475 gal (1799 L)
Total Capacity	552 gal (2089 L)
Airspace	16.2%
Length	64.9" (1648 mm)
Width	61.7" (1567 mm)
Height	54.6" (1387 mm)
Liquid Level	44" (1118 mm)
Compartments	1
Maximum Burial Depth	48" (1219 mm)
Minimum Burial Depth	6" (152 mm)
Maximum Pipe Diameter	4" (100 mm)
Weight	169 lbs (77 kg)



4 Business Park Road
P.O. Box 768
Old Saybrook, CT 06475
860-577-7000 • Fax 860-577-7001
1-800-221-4436
www.infiltratorwater.com

U.S. Patents: 4,759,661; 5,017,041; 5,156,488; 5,336,017; 5,401,116; 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,844 Canadian Patents: 1,329,959; 2,004,564 Other patents pending. Infiltrator, Equalizer, Quick4, and SideWinder are registered trademarks of Infiltrator Water Technologies. Infiltrator is a registered trademark in France. Infiltrator Water Technologies is a registered trademark in Mexico. Contour, MicroLeaching, PolyTuff, ChamberSpacer, MultiPort, PosiLock, QuickCut, QuickPlay, SnapLock and StraightLock are trademarks of Infiltrator Water Technologies. PolyLok is a trademark of PolyLok, Inc. TUF-TITE is a registered trademark of TUF-TITE, INC. Ultra-Rib is a trademark of IPEX Inc.

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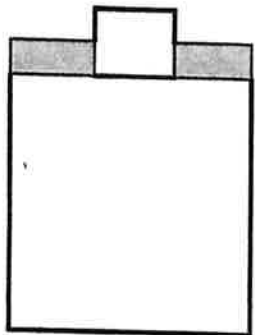
Contact Infiltrator Water Technologies' Technical Services Department for assistance at 1-800-221-4436

Tank Buoyancy Sheet
Infiltrator IM-540 Poly Tank

Tank ID.

Force of the water surrounding the empty tank = to the water displaced + safety factor.

Water = Lbs. per. Cubic ft. 62.4 Lbs.
Soil = lbs. per cubic ft. 80.0 Lbs.



Depth of soil cover on tank G
Weight of soil cover H
Sq. Ft of tank bottom A
Total height of tank B
Weight of tank C
Safety Factor (1.2 - 1.5) D
Cubic Ft. of tank volume (A x B) E
Weight of Water displaced (E x 6 F

2.5	Ft.
5500	Lbs.
27.5	
4.5	Ft.
169	Lbs.
1.5	
123.75	
7722	Lbs.

COVER ←

Total Downward forces on tank (F + H) I
Buoyancy forces on tank (F x D) J

13222	Lbs.
11583.0	Lbs.

Weight need to be added to tank K

-1639.0	Lbs.
---------	------

←

Weight of concrete per cubic ft. 150 Lbs.
Weight need to be added L
Weight converted to cubic ft. of concrete (L / 150) M
Ft of concrete needed to be added to tank. (M / A) N
Inches of concrete (N x 12") O
Double check weight (A x N X 150)

1	Lbs.
0.0	Cu.Ft.
0.00	Ft.
0.0	Inches
1	Lbs.

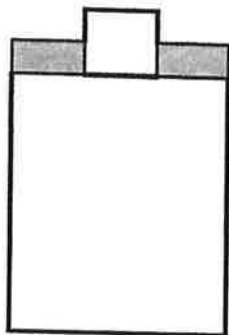
Tank Buoyancy Sheet

Tank ID.

Infiltrator IM-540 Poly Tank

Force of the water surrounding the empty tank = to the water displaced + safety factor.

Water = Lbs. per. Cubic ft. 62.4 Lbs.
 Soil = lbs. per cubic ft. 80.0 Lbs.



← Depth of soil cover on tank
 ↑ Weight of soil cover
 Sq. Ft of tank bottom
 ← Total height of tank
 Weight of tank
 Safety Factor (1.2 - 1.5)
 Cubic Ft. of tank volume (A x B)
 Weight of Water displaced (E x 62.4)

G	2.0	Ft.
H	4400	Lbs.
A	27.5	
B	4.5	Ft.
C	169	Lbs.
D	1.5	
E	123.75	
F	7722	Lbs.

Cover ←

Total Downward forces on tank (F + H)

I

12122	Lbs.
-------	------

Buoyancy forces on tank (F x D)

J

11583.0	Lbs.
---------	------

Weight need to be added to tank

K

-539.0	Lbs.
--------	------

 ←

Weight of concrete per cubic ft. 150 Lbs.

Weight need to be added

L

1	Lbs.
---	------

Weight converted to cubic ft. of concrete (L / 150)

M

0.0	Cu.Ft.
-----	--------

Ft of concrete needed to be added to tank. (M / A)

N

0.00	Ft.
------	-----

Inches of concrete (N x 12")

O

0.0	Inches
-----	--------

Double check weight (A x N X 150)

1 Lbs.



Detailed Parcel Report

Parcel Number: 07-0-046110

General Information

Township/City: FARM ISLAND TWP
Taxpayer Name: FARRAR, LOREN W & LILLIAN M
Taxpayer Address: 41329 300TH LANE
 AITKIN MN 56431
Property Address: 41329 300th Ln
Township: 46 **Lake Number:** 1017800
Range: 27 **Lake Name:** SPIRIT LAKE
Section: 23 **Acres:** 0.78
Green Acres: No **School District:** 1.00
Plat:
Brief Legal Description: .78 AC OF LOT 1 IN DOC 235053

Tax Information

Class Code 1: Residential 1-3 units Previously SRR
Class Code 2: Unclassified
Class Code 3: Unclassified
Homestead: Owner Homestead
Assessment Year: 2019

Estimated Land Value:	\$132,500.00
Estimated Building Value:	\$211,300.00
Estimated Total Value:	<u>\$343,800.00</u>
Prior Year Total Taxable Value:	\$313,631.00
Current Year Net Tax (Specials Not Included):	\$2,148.00
Total Special Assessments:	\$0.00
**Current Year Balance Not Including Penalty:	\$1,074.00
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.**



Minnesota Well Index

General Information

Unique Well ID:	758690	Well Name:	FARRAR, LOREN	County:	Itkin	Aquifer:	Quat. buried artes. aquifer
Well Elevation (msl in feet):	1272	Drilled Depth (ft):	125	Well Completed (ft):	125	Date Drilled:	10/10/2007
Township:	46	Range:	27	Dir:	W	Section:	23
Subsection:	DDCBDC	Use:	domestic	Well Status:	Active	Depth To Bedrock:	
Driller:	Northland Drilling, Inc.	Entry Date:	07/06/2010	Update Date:	09/12/2017		

Related Resources:

[Go to MN Well Index Map](#)
 [Well Log Report](#)
 [Scanned Record\(s\)](#)
 [Stratigraphy Report](#)

- [More Details](#)
- [Stratigraphy](#)
- [Address](#)
- [Chemical Data](#)
- [Construction](#)
- [Pump Test](#)
- [Static Water](#)
- [Comments](#)
- [Location Changes](#)
- [Overview Map](#)

Description	From(ft)	To(ft)	Color	Hardness	Lith Primary	Lith Secondary	Interpretation
SANDY/CLAY	0	26	BROWN	SOFT	CLAY		clay+sand-brown
SAND	26	37	BROWN	SOFT	SAND		sand-brown
CLAY	37	76	GRAY	MEDIUM	CLAY		clay-gray
CLAY	76	84	GRAY	SOFT	CLAY		clay-gray
CLAY	84	117	GRAY	MEDIUM	CLAY		clay-gray
SAND/ROCKS	117	125	GRAY	SFT-MED	SAND		sand +larger-gray



Minnesota Well Index

General Information

Unique Well ID:	753445	Well Name:	BOUCHEY, PAUL	County:	Itkin	Aquifer:	Quat. buried artes. aquifer
Well Elevation (msl in feet):	1273	Drilled Depth (ft):	131	Well Completed (ft):	131	Date Drilled:	05/31/2007
Township:	46	Range:	27	Dir:	W	Section:	23
Subsection:	DDCBCD	Use:	domestic	Well Status:	Active	Depth To Bedrock:	
Driller:	Northland Drilling, Inc.	Entry Date:	01/25/2008	Update Date:	09/12/2017		

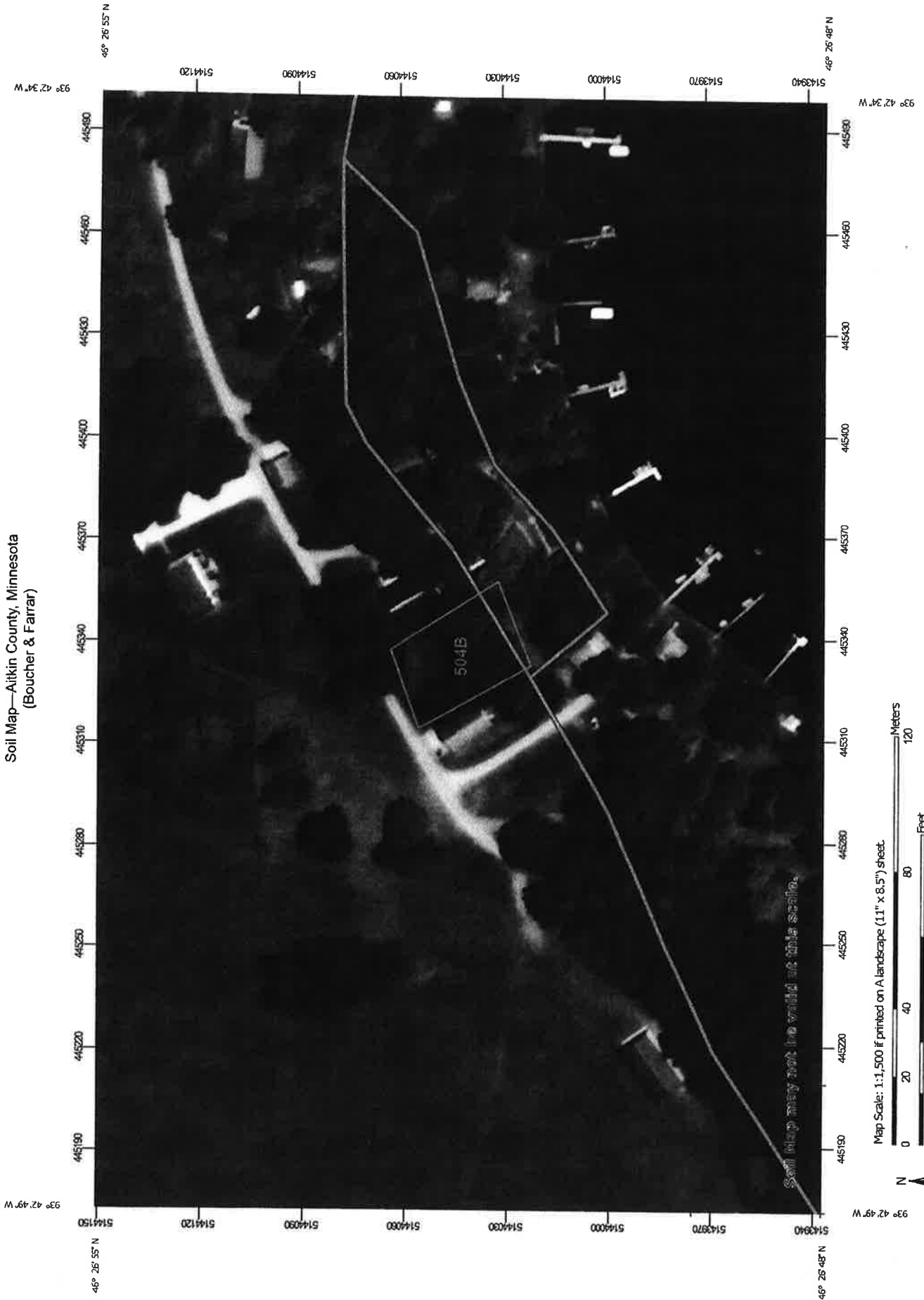
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[Construction](#)
[Pump Test](#)
[Static Water](#)
[Comments](#)
[Location Changes](#)
[Overview Map](#)

Description	From(ft)	To(ft)	Color	Hardness	Lith Primary	Lith Secondary	Interpretation
SANDY CLAY	0	51	BROWN	MEDIUM	CLAY		clay+sand-brown
SAND	51	66	GRAY	SFT-MED	SAND		sand-gray
CLAY	58	80	GRAY	SOFT	CLAY		clay-gray
SAND	80	123	GRAY	SOFT	SAND		sand-gray
SAND	123	131	GRAY	HARD	SAND		sand-gray

Soil Map—Aitkin County, Minnesota
(Boucher & Farrar)



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
504B	Duluth fine sandy loam, 1 to 6 percent slopes	0.2	100.0%
Totals for Area of Interest		0.2	100.0%

Aitkin County, Minnesota

504B—Duluth fine sandy loam, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: gjh7

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

Duluth and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Duluth

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

E,Bw,2BE,2Bt - 3 to 41 inches: clay loam

2C - 41 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately low to moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 13 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D

Forage suitability group: Sloping Upland, Acid (G090AN006MN)

Hydric soil rating: No

Minor Components

Mahtowa and similar soils

Percent of map unit: 3 percent

Landform: Depressions

Hydric soil rating: Yes

Blackhoof and similar soils

Percent of map unit: 3 percent

Landform: Depressions

Hydric soil rating: Yes

Rifle and similar soils

Percent of map unit: 3 percent

Landform: Bogs

Hydric soil rating: Yes

Cromwell and similar soils

Percent of map unit: 2 percent

Hydric soil rating: No

Dusler and similar soils

Percent of map unit: 2 percent

Hydric soil rating: No

Cutaway and similar soils

Percent of map unit: 2 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Aitkin County, Minnesota

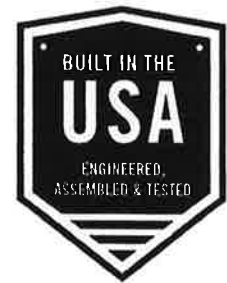
Survey Area Data: Version 20, Sep 16, 2019





AGS Series

AXIAL GRINDER PUMPS



Wastewater

FEATURES

Design: Capable of grinding domestic sewage in the modern wastewater stream.

Cutter System: Stainless steel, axial lobe-cutter design with 8-hole cutting plate, capable of 4.9 million bites per hour and TDH up to 66 feet.

Impeller: Cast Iron semi open 2 vane impeller.

Casing: Cast iron, volute type for high efficiency. Adaptable for guide rail system.

Motor: Fully submerged in oil-filled chamber. High grade turbine oil surrounds motor for more efficient heat dissipation, permanent lubrication of bearings and mechanical seal, and protection against outside environment.

Motor Shaft: 300 series stainless steel.

Designed for Continuous Operation: Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.

Bearings: Upper and lower single row sealed ball bearings for precision positioning of parts and to carry all radial and thrust loads.

Mechanical Seal: Hardfaced silicon carbide on silicon carbide for longer life, stainless steel metal parts, BUNA-N elastomers.

Power Cable: Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking.

O-Ring: Assures positive sealing against contaminants and oil leakage.

Paint: Electro-coat paint process protects all casting surfaces.

May be used with optional guide rail. See Fittings or Pump Removal Systems.

AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association

APPLICATIONS

Designed for residential/light commercial/small office sewage (2" pump replacement and new construction) or anywhere modern wastewater flushables are creating clogging issues.

SPECIFICATIONS

Pump:

- Capacities: to 53 gpm
- Total heads: to 66' TDH
- Discharge: 2" NPT
- Temperature: Class F insulation - 104°F (40°C) maximum continuous, 140°F (60°C) maximum intermittent
- Single mechanical seal: silicon carbide rotary/silicon carbide stationary, 300 series stainless steel metal parts, BUNA-N elastomers
- Fasteners: 300 series stainless steel
- Axial cutter and plate: 440C hardened stainless steel

Motor:

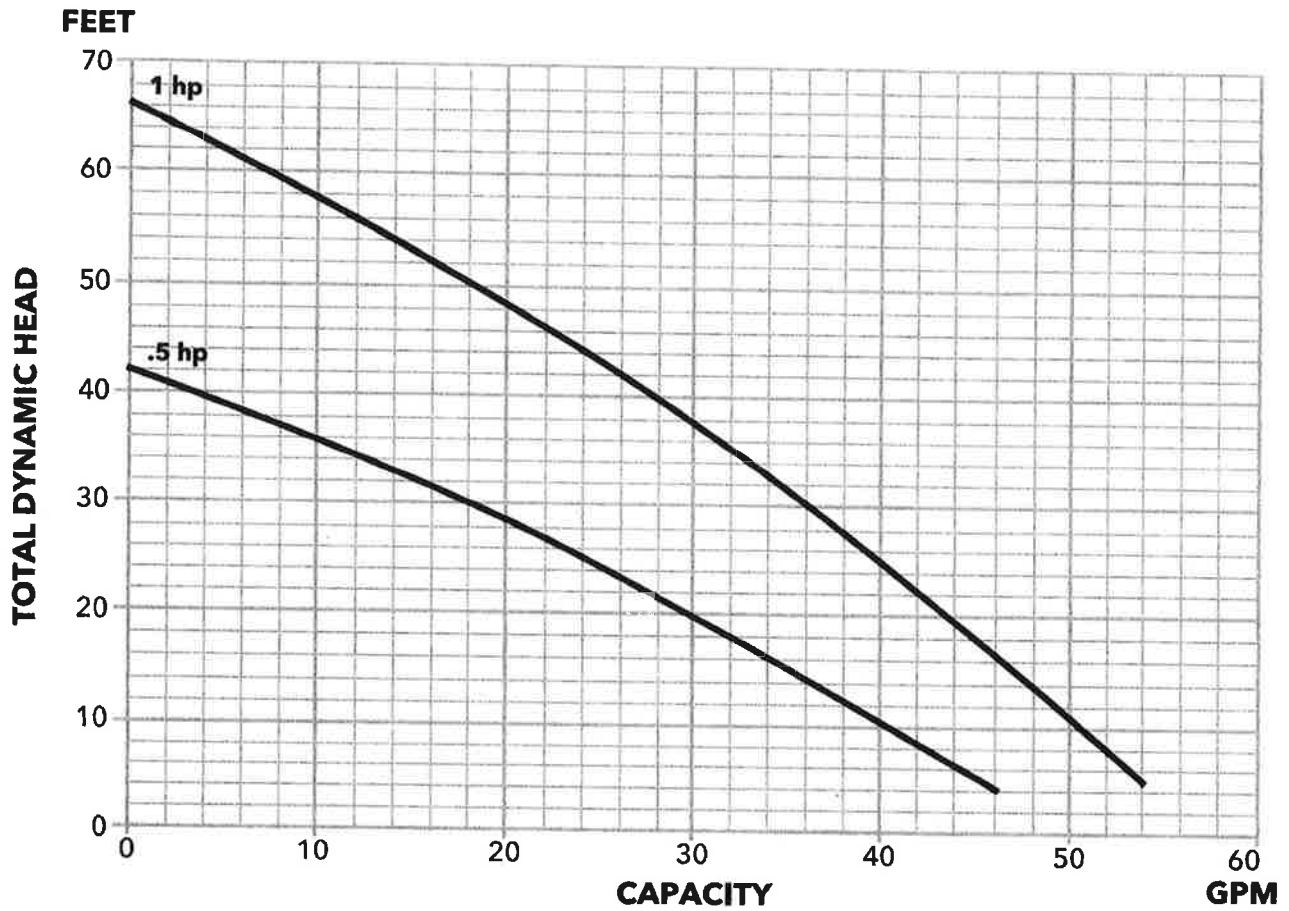
- Single-phase, 0.5 and 1 hp 60 Hz, 3500 rpm, 115V and 230V CSCR motor with on winding thermal protector. No external capacitor kits required.
- Class F insulation
- Shaft: 300 series stainless steel threaded design
- Bearings: Single row sealed ball bearings, upper and lower
- Power cord with a 115V or 230V NEMA three prong grounding plug. Allows connection to a piggyback float switch. 20 foot long cable.



MODEL INFORMATION

Order Number	HP	Phase	Volts	RPM	Operation	Maximum Amps	Discharge Size	Impeller Diameter	Power Cord	Weight (lbs.)
AGS0511	0.5	1	115	3500	Manual*	9	2"	3.5"	20' SJTOW with NEMA plug	65
AGS0512			230			4.5				
AGS1011	1		115			11				
AGS1012			230			5.5		4.25"		

* Use piggyback float for automatic operation

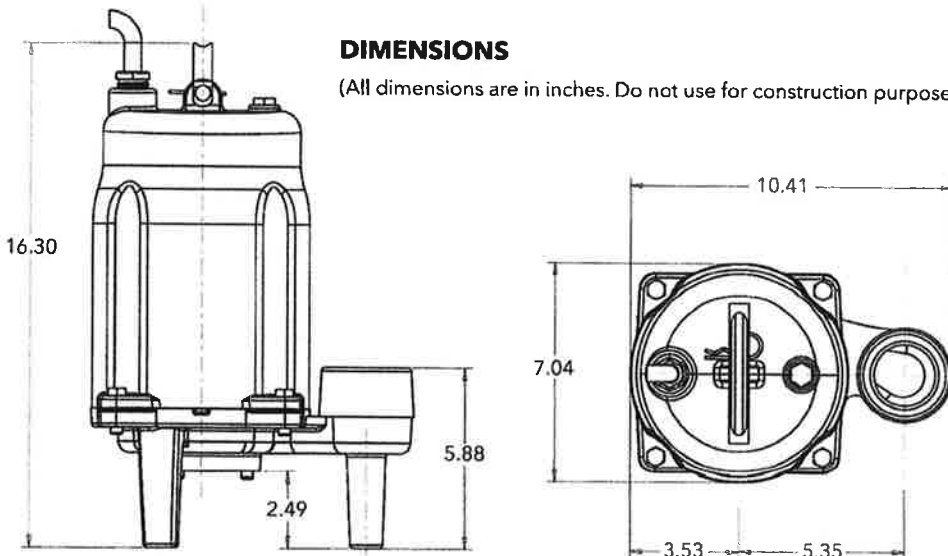


MOTOR DATA

HP	Volts	Phase	RPM	Maximum Amps	LRA	Resistance	Power Cable	Fuse/Circuit Breaker
						Line-Line		
0.5	115	1	3500	9	46	0.6	SJTOW 14/3	15
	230			4.5	25.5	2.6		10
1	115			11	46	0.6		15
	230			5.5	25.5	2.6		10

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



APPLICATION DATA

Minimum Casing Thickness	5/8"
Casing Corrosion Allowance	1/4"
Maximum Working Pressure	50 psi
Maximum Submergence	50 feet
Minimum Submergence	Fully submerged for continuous operation 6" below top of motor for intermittent operation
Maximum Environmental Temperature	40°C (104°F) continuous operation 60°C (140°F) intermittent operation
Maximum Number of Evenly Distributed Starts per hour	10
Bearings	B-10 life of 30,000 hours min.
Minimum Basin Size	Simplex - 24" x 24" Duplex - 36" x 36" Fiberglass
2" Maximum Discharge Pipe Diameter	Requires a minimum flow of 21 gpm to maintain a 2 ft./sec. scouring velocity

CONSTRUCTION DETAILS

Power Cable - type	14/3 SJTOW with NEMA Plug
Motor Cover	Gray cast iron - ASTM A48, Class 30
Bearing Housing	Gray cast iron - ASTM A48, Class 30
Seal Housing	Gray cast iron - ASTM A48, Class 30
Casing	Gray cast iron - ASTM A48, Class 30
Impeller	Gray cast iron - ASTM A48, Class 30
Motor Shaft	AISI 300 series stainless steel
Motor Design	NEMA 48 frame, oil filled with Class F insulation
Motor Overload Protection	On winding thermal protector - auto reset
External Hardware	300 series stainless steel
Impeller Type	Semi-opened with pump out vanes on back shroud
Cutter	Type 440C hardened stainless steel
Oil Capacity - motor chamber	.57 gallons

STANDARD PARTS

Ball Bearing - upper	Single row ball - SKF 6203-2Z
Ball Bearing - lower	Single row ball - SKF 6204-2Z
Mechanical Seal	Silicon carbide/silicon carbide; Type 16
O-Ring - motor cover	BUNA-N, AS 568A-166

CUTTER ASSEMBLY

8-hole cutting ring



3 lobe cutter



STANDARD PANEL OPTIONS

Pump Order Number	K-Series		Boulay Series	
	Simplex	Duplex	Simplex	Duplex
AGS0511	KS19020WF	KD19020WF	S10020	D10020
AGS0512	KS19020WF	KD19020WF	S10020	D10020
AGS1011	KS19020WF	KD19020WF	S10020	D10020
AGS1012	KS19020WF	KD19020WF	S10020	D10020

Note: Boulay Series part numbers have additional available features, see below for more information.

Note: K Series panel part numbers include floats, to order without float switches, remove the 'WF' suffix. Boulay Series panels do not include float switches.



K-SERIES

- NEMA 4X dead front outdoor rated enclosure
- Red LED alarm beacon
- HOA selector switch
- Field wiring terminal block
- Single phase models handle 120, 208 and 230V service
- Three phase models handle 200, 230 and 460V service
- Requires separate control/alarm power feed
- See brochure "BCPKSDPANELS" for additional information



BOULAY SERIES

- NEMA 4X outdoor rated enclosure
- Red alarm beacon
- HOA selector switch
- Through door pump run light(s)
- Through door alarm test and horn silence button
- Single phase models handle 120, 208 and 230V service
- Three phase models handle 200, 230, 460 and 575V service
- Accepts single or dual power feed
- See brochure "BCP3 R11" for additional information on simplex models
- See brochure "BCP4 R14" for additional information on duplex models



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Let's Solve Water

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Subsurface Sewage Treatment System Management Plan

Property Owner: _____ Phone: _____ Date: _____

Mailing Address: _____ City: _____ Zip: _____

Site Address: _____ City: _____ Zip: _____

This management plan will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic service provider.

System Designer: check every _____ months.

Local Government: check every _____ months.

State Requirement: check every 36 months.

(State requirements are based on MN Rules Chapter 7080.2450, Subp. 2 & 3)

**My System needs to be checked
every _____ months.**

Homeowner Management Tasks

Leaks – Check (look, listen) for leaks in toilets and dripping faucets. Repair leaks promptly.

Surfacing sewage – Regularly check for wet or spongy soil around your soil treatment area.

Effluent filter – *Inspect and clean twice a year or more.*

Alarms – Alarm signals when there is a problem. Contact a service provider any time an alarm signals.

Event counter or water meter – Record your water use.

-recommend meter readings be conducted (circle one: DAILY WEEKLY MONTHLY)

Professional Management Tasks

- Check to make sure tank is not leaking
- Check and clean the in-tank effluent filter
- Check the sludge/scum layer levels in all septic tanks
- Recommend if tank should be pumped
- Check inlet and outlet baffles
- Check the drainfield effluent levels in the rock layer
- Check the pump and alarm system functions
- Check wiring for corrosion and function
- Check dissolved oxygen and effluent temperature in tank
- Provide homeowner with list of results and any action to be taken
- Flush and clean laterals if cleanouts exist

"I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in the Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."

Property Owner Signature: _____ Date: _____

Designer Signature: _____ Date: _____

See Reverse Side for Management Log

Maintenance Log

Activity	Date Accomplished									
<i>Check frequently:</i>										
Leaks: check for plumbing leaks										
Soil treatment area check for surfacing										
Lint filter: check, clean if needed										
Effluent screen: if owner-maintained										
Water usage rate (monitor frequency _____)										
<i>Check annually:</i>										
Caps: inspect, replace if needed										
Sludge & Scum/Pump										
Inlet & Outlet baffles										
Drainfield effluent leaks										
Pump, alarm, wiring										
Flush & clean laterals if cleanouts exists										
Other: _____										
Other: _____										

Notes: _____

Mitigation/corrective action plan: _____
