Septic
Permit # 2016-0469

P# 42121
app-2016-000586

Contact Information

Are you the Property Owner?	No
If we have questions on the application who should we contact?	Name: David wm Lange
	Phone: (218) 380 - 6939
	Email Address: langes@scicable.com
	Mailing Address: 505 ione av. 35798 678th street hill city MN 55748

Property Owner Contact

Property Owner Email Address:	bwelk@002.org

Project Location Search

Property: **Selected:**

	Property Location				Property Address			Legal Description	Owner Information	Tax Payer Information
Parcel Number	Township or City Name	TWP	SEC	RGE	Property Address	Property City	Property Zip 5	Legal Description	Owner Name(s)	Taxpayer Name(s)
20-0-011801	MACVILLE TWP	51	8	26	62612 Osprey Ave	SWATARA	55785	N 1/2 OF NW-NW	WELK, BRENT J & SHELLY L	WELK, BRENT J & SHELLY L

Driving Directions to the project location.: north of Swatara on Osprey AV to adress about 3 miles

Designer/Installer

Designer Name:	David Lange
Installer:	Licensed Septic Professional
Installer Name:	David Lange
Installer License Number:	1174

System Information

Please attach a septic system design.:	File 1: 3361_001.pdf
Please select all that apply:	Residential Mound/At-Grade

Terms
General Terms Zoning Permits

Defining and staking the property lines, road right-of-ways, septic sites, and wells are the responsibility of the property owner. In some cases, a registered survey may be required to verify setbacks before granting a permit.

Land Use/Septic General Terms

Zoning permits and Subsurface Sewage Treatment System permits are valid for one (1) year (unless the sewage permit is to upgrade an Imminent Threat to Public Health or Safety system, which is then valid for ten (10) months).

All corners of the proposed structure(s) need to be staked with visible flags, ribbon, or lathes prior to onsite inspection by Aitkin County.

If property lines are not clearly marked and visible, then they need to be staked with visible flags, ribbon, or lathes prior to onsite inspection by Aitkin County.

It shall be a violation of the Aitkin County Zoning Ordinance to commence construction before the permit application is approved by Aitkin County.

The landowner or authorized agent may make application for a zoning permit agreeing to do such work in accordance with all Aitkin County Ordinances. The landowner or authorized agent agrees that the application, site plan, and all other attachments submitted herewith are true and accurate and shall become a part of the permit. The landowner or authorized agent agrees that, in making application for a zoning permit, the landowner grants permission to Aitkin County, at reasonable times, to enter the property to determine compliance of the application with applicable Local, County or State Ordinances or Statutes. It is the applicants sole responsibility to contact other Local, County or State agencies to ensure the applicant has complied with all relevant Local, County or State Ordinances or Statutes.

After a complete application is submitted and reviewed, an on-site inspection may be conducted; a permit may be issued describing the proposed construction that may take place on the property. Changes to a project may require a permit application to be resubmitted.

The septic installer shall notify Aitkin County Environmental Services a minimum of twenty-four (24) hours before the covering of any portion of the septic installation. Changes from the approved septic design will require approval by the County prior to construction.

Applicants are responsible for getting all applicable entrance permits from the appropriate road authority.

Applicants acknowledge that they are in compliance with MN Contractor Licensing laws per MN Statute 326B.85.

Invoice 07/06/2016

Charge	Cost	Quantity	Total
Residential Mound/At-Grade added 07/06/2016 2:44 PM $300 Flat Fee	$300.00	x 1	$300.00
Grand Total			
		Total (Paid)	**$300.00**

Results (Go to top)
Signature accepted
Status Changed
Change logged with reason
Sent external status notification to: langes@scicable.com;bwelk@002.org

Approvals

Approval	Signature
Applicant	Dave Lange - 07/06/2016 2:48 PM - witnessed by Kalea Suihkonen e2ad38c83619c0ae5b591a63dc460cf7 557d7c37621a82e3de896839dffc458f
#1 Adminsitrative Approval Group	Kalea Suihkonen - 07/06/2016 2:50 PM c8ea388324c41679f728796411a45c3f 40004ca394ca82cc83882e76c1ead7fe
#2 Inspector Group	Kalea Suihkonen - 07/06/2016 2:50 PM f3d8ce19b01bcd01335ecc8f3f4aeb8f 1af05902819f86c918d92c0923f18894
#3 Final Approval	Kalea Suihkonen - 07/06/2016 2:51 PM 769ba6f2453405cbb5a2e37b806dc9b7 1d1e2d3d89c36efa9d06c9091322975b

Admin Checklist

This application has been started by: Kalea Suihkonen ▼

Zoning District of project location: Farm Residential ▼

Required OWHL setback distance: ▼

"Other" OHWL setback distance is:

Pumping Agreement Attached? ▼

Low Interest Loan or SSTS Grant project? No ▼

Is this an After-The-Fact application? Yes ▼

DESIGN REVIEW CHECKLIST

Zoning Inspector: Becky Sovde ▼

SSTS Type: Type I ▼

SSTS Design: Mound ▼

New or Replacement SSTS: Replacement SSTS ▼

# of bedrooms: 3

gpd: 1-2,499 gpd ▼

Does this system require an Operating Permit? No ▼

Operating Permit #:

Attach appropriate inspection forms.:

Does this system belong to an other establishment? No ▼

Is this a Cluster System? No ▼

<u>Public Notes</u>

Text: permit 42121 issued for a mound replacement (3 bedroom)

File(s): File 1: 3362_001.pdf

     3362_001.pdf

<u>Numbers</u>

	Current Number	**Next from Sequence**
UID #	1383	*not applicable*
App. #	App-2016-000586	App-2016-000587
Permit #		2016-0469

FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE 7/5/16 , FIELD EVALUATION DATE 7/6/16

PROPERTY OWNER: Brent + Shelly Welk   PHONE 218-380-6939

ADDRESS: 62 612 Osprey Av CITY,STATE,ZIP: Swatara   Minn   55785

LEGAL DESCRIPTION:_____

PIN# 20-0-011801   SEC 8 T 51 R 26 TWP NAME Macville

FIRE# 62612 LAKE/RIVER_____ LAKE CLASS ___ OHWL ___ FT.

DESCRIPTION OF SOIL TREATMENT AREAS

	AREA #1	AREA #2
DISTURBED AREAS	YES___ NO X	YES___ NO___
COMPACTED AREAS	YES___ NO X	YES___ NO___
FLOODING	YES___ NO ✓	YES___ NO___
RUN ON POTENTIAL	YES___ NO X	YES___ NO___
SLOPE %	1-2%	___
DIRECTION OF SLOPE	W To E	___
LANDSCAPE POSITION		
VEGETATION TYPES	Brush	

REFERENCE BM ELEV._____FT.
REFERENCE BM DESCRIPTION___

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1 _18"_ , 1A _26"_ , 2_____ ,2A_____

BOTTOM ELEVATION--FIRST TRENCH OR BOTTOM OF ROCK BED: #1____FT., #2____FT.

SOIL SIZING FACTOR: SITE # 1_____, SITE #2_____

CONSTRUCTION RELATED ISSUES: At this Time, going to use existing Sept and Add New lift, pumper to Varify

LIC# 1174   SITE EVALUATOR SIGNATURE:_____

SITE EVALUATOR NAME: DAVID LANGE   TELEPHONE# 218-380-6939

LUG REVIEW_____DATE_____

Comments:_____
_____
_____
_____

APPROVED
SOIL BORING LOGS ON REVERSE SIDE

__ ONSITE INSPECTION
__ NO ONSITE INSPECTION

SIGN_____ DATE 7/6/16

Form des 2/20/98

1

SOILS CHARTS FOR BOTH PROPOSED AND ALTERNATE SITES

1 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-8"	Loam	10YR 3/1
9-13"	Silty Loam	10YR 5/4
14-18"	Loamy Sand	10YR 5/3
19	Silty Loam	10YR 6/4 depletion 10YR 5/8

2 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-6"	Silty Loam	10YR 2/1
7-14	Silt	10YR 4/4
15-24	Medium Sand	10YR 4/6
26	Clay	10YR 6/4 10YR 5/8

1 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR

2 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR

ADDITIONAL SOIL BORINGS MAY BE REQUIRED

CLIENT: Brent Welk   DATE: 7/6/16

MAP DRAWN TO SCALE ▬▬▬ WITH A NORTH ARROW

Osprey Ave

N ↑

20 Ac Parcel
20-0-011801

Future barge   94.87

Ex Barge
96.59

10x38 Rock Bm
43

62612
Osprey

O Sprey

2#
Ex Hom
44

50'   30'   68

Ex Tank
will use
must be
pumped +
Certified

1000
gal
Lift

100' +

@ Ex
Deep Well

Not To Scale
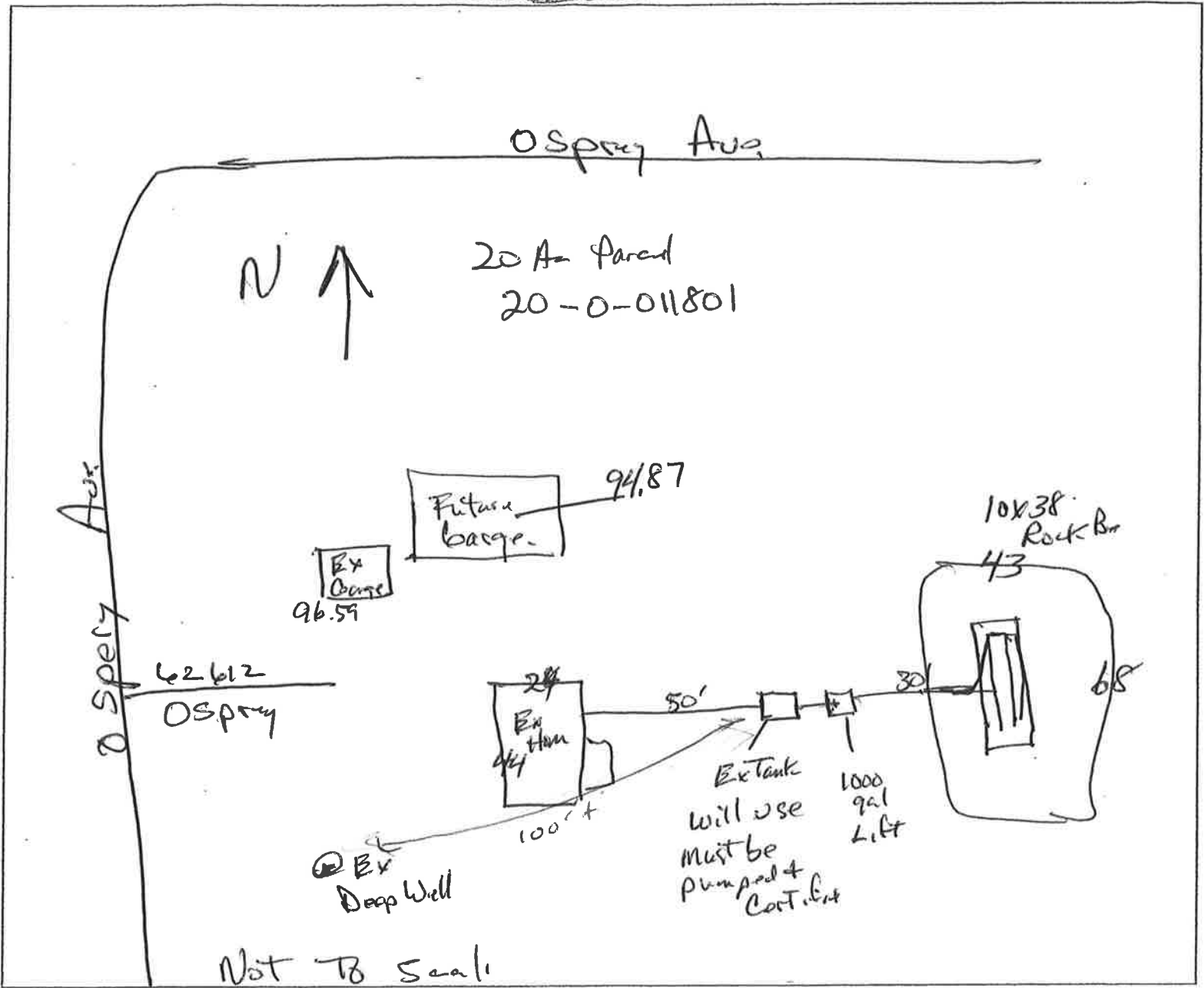
CHECK OFF LIST--HAVE ALL OF THE FOLLOWING BEEN DRAWN ON THE MAP??

SHOW EXISTING OR PROPOSED
- ☐ WATER WELLS WITHIN 100 FT OF TREATMENT AREAS
- ☐ PRESSURE WATER LINES WITHIN 10 FT OF TREATMENT AREAS
- ☐ STRUCTURES   ☐ LOT IMPROVEMENTS
- ☐ ALL SOIL TREATMENT AREAS   ☐ ALL ISTS COMPONENTS
- ☐ HORIZONTAL AND VERTICAL REFERENCE
- ☐ POINT OF SOIL BORINGS   ☐ DIRECTION OF SLOPE
- ☐ LOT EASEMENTS   ☐ ALL LOT DIMENSIONS
- ☐ DISTURBED/ COMPACTED AREAS
- ☐ SITE PROTECTION--LATHE AND RIBBON EVERY 15 FT
- ☐ ACCESS ROUTE FOR TANK MAINTENANCE

REQUIRED SETBACKS
- ☐ STRUCTURES   ☐ PROPERTY LINES
- ☐ OHWL

COMMENTS:

DESIGNER SIGNATURE

LICENSE# ____1174____

INDICATE ELEVATIONS

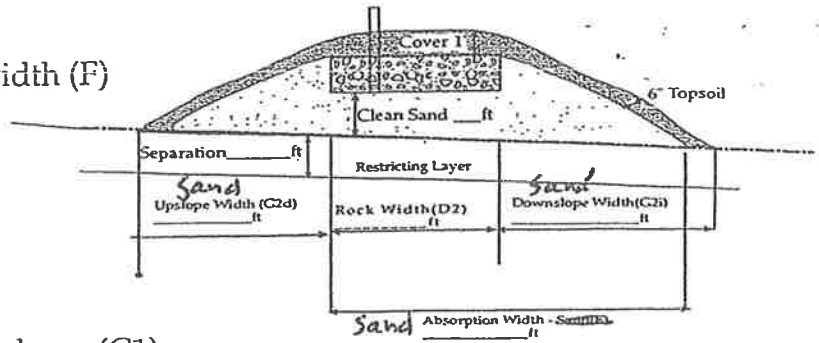|	
BENCHMARK	Top of Electra Box
ELEVATION OF SEWER LINE @ HOUSE	
ELEVATION @ TANK INLET	92.25
ELEVATION @ BOTTOM OF ROCK LAYER	96
ELEVATION @ BOTTOM OF BORING OR RESTRICTIVE LAYER	93
ELEVATION OF PUMP	90
ELEVATION OF DISTRIBUTION DEVICE	96.75

Liqui Lift

DATE 7/6/16

G. MOUND SLOPE WIDTH & LENGTH
(landslope greater than 1%)

1. Downslope absorption width = absorption width (F) minus rock layer width (D2)

__24__ ft - __10__ ft = __14__ ft

6" Topsoil
Cover 1
Clean Sand ___ft
Separation ___ft
Restricting Layer
Sand Upslope Width (G2d) ___ft
Rock Width(D2) ___ft
Sand Downslope Width(G2i) ___ft
Sand Absorption Width - Sand(F) ___ft

2. Calculate mound size

UPSLOPE

a. Depth of clean sand fill at upslope edge of rock layer = 3 ft minus the distance to restricting layer (C1)

3 ft - __1__ ft = __2__ ft

b. Mound height at the upslope edge of rock layer = depth of clean sand for separation (G2a) at upslope edge plus depth of rock layer (1 ft) plus depth of cover (1 ft)

__2__ ft + 1ft + 1ft = __4__ ft

c. Upslope berm multiplier based on land slope __3.7__ (see figure D-34)

d. Upslope width = berm multiplier (G2c) x upslope mound height (G2b):

__4__ x __3.7__ ft = __15__ ft

DOWNSLOPE

e. Drop in elevation = rock layer width (D2) x percent landslope (C5) ÷ 100

__10__ ft x __2__ % ÷ 100 = __.2__ ft

f. Downslope mound height = depth of clean sand for slope difference (G2e) at downslope rock edge plus the mound height at the upslope edge of rock layer (G2b)

__4__ ft + __.2__ ft = __4.2__ ft

g. Downslope berm multiplier based on percent land slope __4.35__ (see figure D-34)

h. Downslope width = downslope multiplier (G2g) times downslope mound height (G2f)

__4.35__ x __4.2__ ft = __18__ ft

i. Select the greater of G1 and G2h as the downslope width: __18__ ft

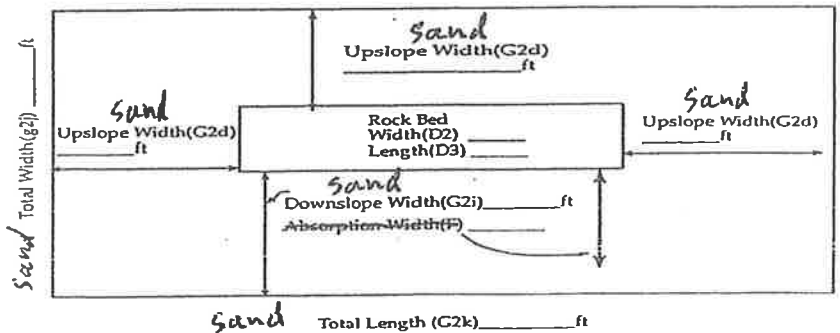j. Total mound width is the sum of upslope width (G2d) width plus rock layer width (D2) plus downslope width (G2i)

__10__ ft + __18__ ft + __15__ ft = __43__ ft

k. Total mound length is the sum of upslope width (G2d) plus rock layer length (D3) plus upslope width (G2d)

__38__ ft + __15__ ft + __15__ ft = __68__ feet

D-34: SLOPE MULTIPLIER TABLE

Land Slope, in %	UPSLOPE multipliers for various slope ratios						DOWNSLOPE multipliers for various slope ratios				
	3:1	4:1	5:1	6:1	7:1	8:1	3:1	4:1	5:1	6:1	7:1
0	3.0	4.0	5.0	6.0	7.0	8.0	3.0	4.0	5.0	6.0	7.0
1	2.91	3.85	4.76	5.66	6.54	7.41	3.09	4.17	5.26	6.38	7.53
2	2.83	3.70	4.54	5.36	6.14	6.90	3.19	4.35	5.56	6.82	8.14
3	2.75	3.57	4.35	5.08	5.79	6.45	3.30	4.54	5.88	7.32	8.86
4	2.68	3.45	4.17	4.84	5.46	6.06	3.41	4.76	6.25	7.89	9.72
5	2.61	3.33	4.00	4.62	5.19	5.71	3.53	5.00	6.67	8.57	10.77
6	2.54	3.23	3.85	4.41	4.93	5.41	3.66	5.26	7.14	9.38	12.07
7	2.48	3.12	3.70	4.23	4.70	5.13	3.80	5.56	7.69	10.34	13.73
8	2.42	3.03	3.57	4.05	4.49	4.88	3.95	5.88	8.33	11.54	15.91
9	2.36	2.94	3.45	3.90	4.30	4.65	4.11	6.25	9.09	13.04	18.92
10	2.31	2.86	3.33	3.75	4.12	4.44	4.29	6.67	10.00	15.00	23.33
11	2.26	2.78	3.23	3.61	3.95	4.26	4.48	7.14	11.11	17.65	30.43
12	2.21	2.70	3.12	3.49	3.80	4.08	4.69	7.69	12.50	21.43	43.75

Sand Total Width(g2d)
Sand
Upslope Width(G2d) ___ft
Sand Upslope Width(G2d) ___ft
Sand Upslope Width(G2d) ___ft
Rock Bed Width(D2) ___ Length(D3) ___
Sand Downslope Width(G2i) ___ft
Absorption Width(F) ___
Sand Total Length (G2k) ___ft

Final Dimensions:
__43__ x __68__

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

_____ (signature)   __1174__ (license #)   __7/6/16__ (date)

PRESSURE DISTRIBUTION SYSTEM

1. Select number of perforated laterals __3__

2. Select perforation spacing = __3__ ft

3. Since perforations should not be placed closer than 1 foot to the edge of the rock layer (see diagram), subtract 2 feet from the rock layer length.

    $\underset{\text{Rock layer length}}{\underline{\quad 38 \quad}}$ - 2 ft = __36__ ft

4. Determine the number of spaces between perforations. Divide the length (3) by perforation spacing (2) and <u>round down</u> to nearest whole number.

    Perforation spacing = __3__ ft ÷ __36__ ft = __12__ spaces

5. Number of perforations is equal to one plus the number of perforation spaces(4). *Check figure E-4 to assure the number of perforations per lateral guarantees <10% discharge variation.*

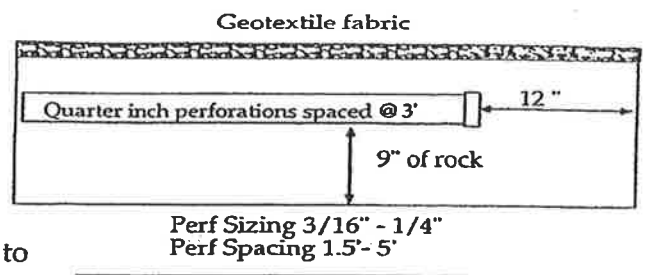   __12__ spaces + 1 = __13__ perforations/lateral

6. A. Total number of perforations = perforations per lateral (5) times number of laterals (1)

    __13__ perfs/lat x __3__ lat = __39__ perforations

    B. Calculate the square footage per perforation.
    Should be 6-10 sqft/perf. *Does not apply to at-grades.*
    Rock bed area = rock width (ft) x rock length (ft)
    __10__ ft x __38__ ft = __380__ sqft
    Square foot per perforation = Rock bed area ÷ number of perfs (6)
    __380__ sqft ÷ __39__ perfs = __9__ sqft/perf

7. Determine required flow rate by multiplying the total number of perforations (6A) by flow per perforation (*see figure E-6*).

    __.74__ perfs x __39__ gpm/perfs = __28.9__ gpm

8. If laterals are connected to header pipe as shown on upper example, to select minimum required lateral diameter; enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5) Select minimum diameter for perforated lateral = __1½__ inches.

9. If perforated lateral system is attached to manifold pipe near the center, lower diagram, perforated lateral length (3) and number of perforations per lateral (5) will be approximately one half of that in step 8. Using these values, select minimum diameter for perforated lateral = __1¼__ inches.

Geotextile fabric

Quarter inch perforations spaced @ 3' —12"—
9" of rock

Perf Sizing 3/16" - 1/4"
Perf Spacing 1.5'- 5'

E-4: Maximum allowable number of 1/4-inch perforations per lateral to guarantee <10% discharge variation				
perforation spacing (feet)	1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	15	23
5.0	6	10	14	22

E-6: Perforation Discharge in gpm				
head (feet)	perforation diameter (inches)			
	1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

[a] Use 1.0 foot for single-family homes.
[b] Use 2.0 feet for anything else.

MANIFOLD LOCATED AT END OF PRESSURE DISTRIBUTION SYSTEM
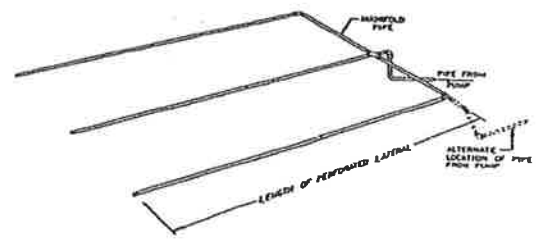
LAYOUT OF PERFORATED PIPE LATERALS FOR PRESSURE DISTRIBUTION IN MOUND

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

__(signature)__ __1174__ (license #) __7/6/16__ (date)

7

Mound Sewage Treatment System Design

For: Brent Welk
Date: 7/6/2016

Designer Name: Enter Company Name
DRP: Enter Company DRP
MPCA License No:

Job Address:	Legal Description:
62612 Osprey AV	
	Macville,

Delivery, Soils, and Site Information

			Landslope:	2	%	System Type:	Standard	
Flow Rate:	450	GPD	Percolation Rate:		MPI	Structure Type:	Residential	
Septic Tank 1 Capacity:	1250	Gal	Restrict Layer Depth:	12	In	Construction Type:	Existing	
Septic Tank 2 Capacity:		Gal	Garbage Disposal:	No		Soil Texture:	Silt Loam	
Lift Station Capacity:	1000	Gal	Raw Sewage Pump:	No		Soil Structure:	Spheroidal	
						Soil Structure Grade:	Moderate	

System Design Specifications

Absorbtion Width Ratio:	2	
Absorbtion Width:	20	Ft

Clean Sand SSF:	0.83	GPD / Sq Ft	
Rock Area:	380	Sq Ft	
Rockbed Width:	10	Ft	
Rockbed Length:	38	Ft	

Minimum Mound Width (Slopes less than 1%) OR
Minimum Downslope Width (Slopes 1% or more): 10 Ft

Clean Sand Upslope:	24	In	
Mound Height Upslope:	4	Ft	

Rock Volume

Cubic Feet:	380
Cubic Yards:	14
Tonnage:	20

Upslope Berm Ratio:	4	Ft	
Upslope Berm Width:	15	Ft	
Elevation Drop:	0.2	Ft	
Mound Height Downslope:	4.2	Ft	
Downslope Berm Ratio:	4	Ft	
Downslope Berm Width:	18	Ft	
Actual Mound Width:	43	Ft	
Actual Mound Length:	68	Ft	

Washed Sand Volume:	169	Cu Yds	
Fill Cover Volume:	74	Cu. Yds	
Topsoil Volume:	130	Cu. Yds	
Linear Loading Rate:	12	GPD / Ft	

Pump Capacity

Number of Laterals:	3	
Lateral Diameter:	1.5	In
Perforation Diameter:	0.25	In
Perforation Spacing:	3	Ft
Perforation Head:	1	Ft
Perforation GPM:	0.74	Ft
Perforations Per Lateral:	13	
Maximum Perforations / Lateral:	17	
Total Perforations:	39	
Lateral Length:	36	Ft
Pump Capacity:	**28.9**	**GPM**

Pump Head

Elevation Difference - Pump to Discharge Point:	8	Ft
Total Pipe Length:	30	Ft
Pipe Diameter:	2	In
Friction Loss Per Foot:	1.7	
Total Friction Loss:	0.6	Ft
Manifold Location:	End	
Total Head:	**13.6**	**Ft**

Comments: Number of bedrooms: 3. Install under dry conditions. Verify pump head before installing system.

LOCAL UNIT OF GOVERNMENT: ☐ APPROVED   ☐ ADDITIONAL INFORMATION NEEDED   ☐ DESIGN WORKSHEETS REQUIRED

MOUND CROSS-SECTION

2% PERCENT SLOPE OF ORIGINAL SOIL

10 FT. x **38** FT. SIZE OF ROCKBED **380** FT. x _____ FT. SIZE OF SANDBASE

2,000# ft

GEOTEXTILE CLOTH

.4 INCHES OF TOPSOIL FOR GRASS COVER

14 INCHES OF SANDY LOAM SOIL TAPERING TO 8 INCHES

9" ROCK BELOW DISTRIBUTION PIPE

ORIGINAL GRADE

24 INCHES OF SAND *

26 INCHES OF SAND *

ROUGHENED SOIL SURFACE

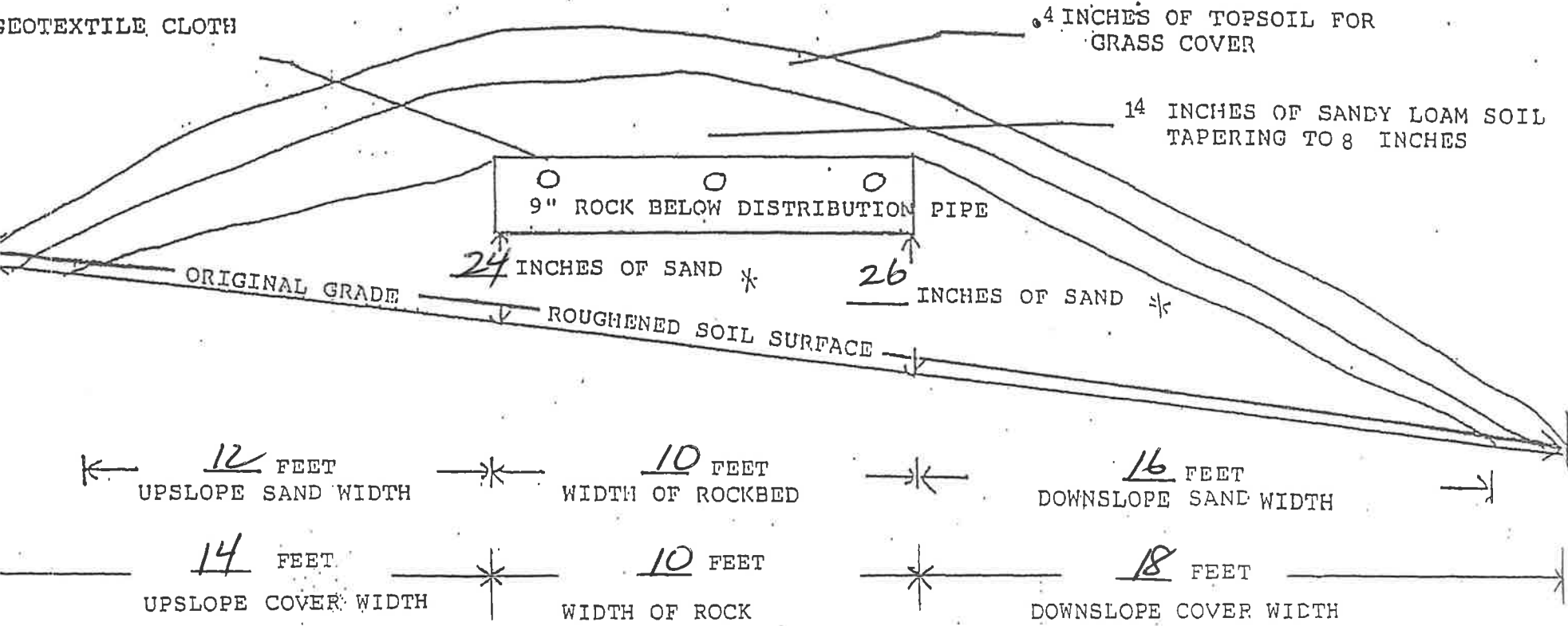**12** FEET UPSLOPE SAND WIDTH

10 FEET WIDTH OF ROCKBED

16 FEET DOWNSLOPE SAND WIDTH

14 FEET UPSLOPE COVER WIDTH

10 FEET WIDTH OF ROCK

18 FEET DOWNSLOPE COVER WIDTH

Mound Sewage Treatment System Design

For: Brent Welk
Date: 7/6/2016

Designer Name: Enter Company Name
DRP: Enter Company DRP
MPCA License No:

Job Address:	Legal Description:
62612 Osprey AV	Macville,

Delivery, Soils, and Site Information

			Landslope:	2	%	System Type:	Standard
Flow Rate:	450	GPD	Percolation Rate:		MPI	Structure Type:	Residential
Septic Tank 1 Capacity:	1250	Gal	Restrict Layer Depth:	12	In	Construction Type:	Existing
Septic Tank 2 Capacity:		Gal	Garbage Disposal:	No		Soil Texture:	Silt Loam
Lift Station Capacity:	1000	Gal	Raw Sewage Pump:	No		Soil Structure:	Spheroidal
						Soil Structure Grade:	Moderate

System Design Specifications

				Absorbtion Width Ratio:	2	
Clean Sand SSF:	0.83	GPD / Sq Ft		Absorbtion Width:	20	Ft
Rock Area:	380	Sq Ft	Minimum Mound Width (Slopes less than 1%) OR			
Rockbed Width:	10	Ft	Minimum Downslope Width (Slopes 1% or more):		10	Ft
Rockbed Length:	38	Ft	Clean Sand Upslope:		24	In
			Mound Height Upslope:		4	Ft

Rock Volume

Cubic Feet:	380	Upslope Berm Ratio:		4	Ft
Cubic Yards:	14	Upslope Berm Width:		15	Ft
Tonnage:	20	Elevation Drop:		0.2	Ft

			Mound Height Downslope:	4.2	Ft
Washed Sand Volume:	169	Cu Yds	Downslope Berm Ratio:	4	Ft
Fill Cover Volume:	74	Cu. Yds	Downslope Berm Width:	18	Ft
Topsoil Volume:	130	Cu. Yds	Actual Mound Width:	43	Ft
Linear Loading Rate:	12	GPD / Ft	Actual Mound Length:	68	Ft

Pump Capacity

Number of Laterals:	3	
Lateral Diameter:	1.5	In
Perforation Diameter:	0.25	In
Perforation Spacing:	3	Ft
Perforation Head:	1	Ft
Perforation GPM:	0.74	Ft
Perforations Per Lateral:	13	
Maximum Perforations / Lateral:	17	
Total Perforations:	39	
Lateral Length:	36	Ft
Pump Capacity:	***28.9***	***GPM***

Pump Head

Elevation Difference - Pump to Discharge Point:	8	Ft
Total Pipe Length:	30	Ft
Pipe Diameter:	2	In
Friction Loss Per Foot:	1.7	
Total Friction Loss:	0.6	Ft
Manifold Location:	End	
Total Head:	***13.6***	***Ft***

Comments: Number of bedrooms: 3. Install under dry conditions. Verify pump head before installing system.

LOCAL UNIT OF GOVERNMENT: ☐ APPROVED ☐ ADDITIONAL INFORMATION NEEDED ☐ DESIGN WORKSHEETS REQUIRED

MOUND DESIGN WORK SHEET (For Flows up to 1200 gpd)

A. Average Design FLOW

Estimated __450__ gpd (see figure A-1)
or measured _____ x 1.5 (safety factor) = _____ gpd

A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	60%
3	450	300	218	of the
4	600	375	256	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	columns.

B. SEPTIC TANK Capacity

__1000__ gallons (see figure C-1)

C. SOILS (refer to site evaluation)

1. Depth to restricting layer = _____ feet
2. Depth of percolation tests = _____ feet
3. Texture __Silty Loam__
   Percolation rate _____ mpi
4. Soil loading rate __.50__ gpd/sqft (see figure D-33)
5. Percent land slope __2__ %

C-1: Septic Tank Capacities (in gallons)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
2 or less	750	1125	1500
3 or 4	1000	1500	2000
5 or 6	1500	2250	3000
7, 8 or 9	2000	3000	4000

D. ROCK LAYER DIMENSIONS

1. Multiply average design flow (A) by 0.83 to obtain required rock layer area.
   __450__ gpd x 0.83 sqft/gpd = __380__ sqft
2. Determine rock layer width = 0.83 sqft/gpd x linear Loading Rate (LLR)
   0.83 sqft/gpd x __450__ gpd/sqft = ~~__10__~~ ft
3. Length of rock layer = area ÷ width =
   __380__ sqft (D1) ÷ __10__ ft (D2) = __38__ ft

Mound LLR

< 120 MPI	≤12
≥ 120 MPI	≤ 6

E. ROCK VOLUME

1. Multiply rock area (D1) by rock depth of 1 ft to get cubic feet of rock
   __380__ sqft x 1 ft = __380__ cuft
2. Divide cuft by 27 cuft/cuyd to get cubic yards
   __380__ cuft ÷ 27 cuyd/cuft = __14__ cuyd
3. Multiply cubic yards by 1.4 to get weight of rock in tons
   __14__ cuyd x 1.4 ton/cuyd = __20__ tons

F. SEWAGE ABSORPTION WIDTH

Absorption width equals absorption ratio (See Figure D-33)
times rock layer width (D2)

__2.4__ x __10__ ft = __24__ ft

D-33: Absorption Width Sizing Table

Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand Medium Sand Loamy Sand Fine Sand	1.20	1.00
6 to 15	Sandy Loam	0.79	1.50
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam Silt	0.50	2.40
46 to 60	Sandy Clay Loam Silty Clay Loam Clay Loam	0.45	2.67
61 to 120	Silty Clay Sandy Clay Clay	0.24	5.00
Slower than 120*			

*System designed for these soils must be other or performance

3

Elevations and Slopes Report

Customer Name: Brent Welk	***Tests By:*** Enter Company Name	
Date:	***DRP:*** Enter Company DRP	
	MPCA License No:	

Site Address:	Legal Description:
62612 Osprey AV	
	Macville,
Macville,	

Site Elevations

Benchmark: top of meter box		Transit Reading: 3.42 Ft		Elevation: 100 Ft

Description	Reading (Ft)	Elevation (Ft)
BM: top of meter box	3.42	100
ground at pole	8	95.42
drive way height	6.08	97.34
Ex slap	6.83	96.59
surface at tank	9.17	94.25
liquid level in tank	11.17	92.25
boring #2	10.25	93.17
Soil Boring One	9.23	94.19
center of garage grade area	8.55	94.87

Site Slopes

Description	Distance (Ft)	Drop (Ft)	Slope (%)
surface at tank to boring #2	60	1.1	1.8
drive way height to center of garage grade area	100	2.5	2.5

BEL53 del

PUMP SELECTION PROCEDURE

1. Determine pump capacity:
A. Gravity distribution
    1. Minimum required discharge is 10 gpm

    2. Maximum suggested discharge is 45 gpm. For other establishments at least 10% greater than the water supply rate, but no faster than the rate at which effluent will flow out of the distribution device.

B. Pressure distribution
See pressure distribution work sheet

From A or B Selected pump capacity: **28.9** gpm

2. Determine pump head requirements:
A. Elevation difference between pump and point of discharge?

    8 feet

B. Special head requirement? *(See Figure at right - Special Head Requirements)*

    5 feet

C. Calculate Friction loss

    1. Select pipe diameter **2** in

    2. Enter *Figure E-9* with gpm (1A or B) and pipe diameter (C1).

    Read friction loss in feet per 100 feet from Figure E-9
    Friction Loss = **1.5** ft/100ft of pipe

    3. Determine total pipe length from pump discharge to soil treatment discharge point. Estimate by adding 25 percent to pipe length for fitting loss. Total pipe length times 1.25 = equivalent pipe length
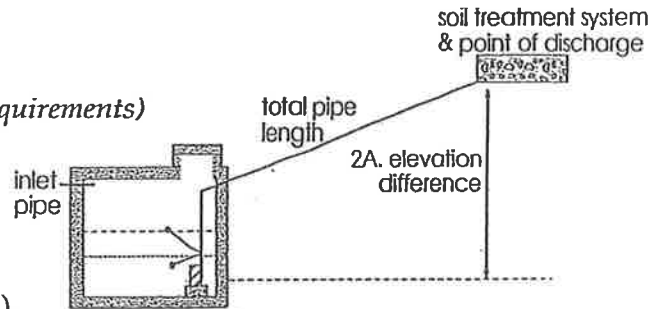   **30** feet x 1.25 = **37.5** feet

    4. Calculate total friction loss by multiplying friction loss (C2) in ft/100 ft by the equivalent pipe length (C3) and divide by 100.
    = **37.5** ft/100ft x **1.5** ÷100 = **1.7** ft

D. Total head required is the sum of elevation difference (A), special head requirements (B), and total friction loss (C4)

    5 ft + **1.7** ft+ **8** ft =

Total head: **14.7** feet

---
3. Pump selection

A pump must be selected to deliver at least **30** gpm
(1A or B) with at least **15** feet of total head (2D)

---

soil treatment system & point of discharge

total pipe length

2A. elevation difference

inlet pipe

Special Head Requirements	
Gravity Distribution	0 ft
Pressure Distribution	5 ft

E-9: Friction Loss in Plastic Pipe
Per 100 feet

flow rate gpm	nominal pipe diameter		
	1.5"	2"	3"
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	5.23	1.55	0.23
35	6.96	2.06	0.30
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55		4.76	0.70
60		5.60	0.82
65		6.48	0.95
70		7.44	1.09

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

_____ (signature) **11174** (license #) **7/6/16** (date)

10

AITKIN COUNTY ZONING

PERMIT NUMBER **42121**

PARCEL NUMBER 20-0-011801

Location N 1/2 OF NW-NW

Lot	Block	Gov't. Lot	Section	Twp.	Rge.
			8	51	26

Issued July 6, 2016   To Brent Welk

Nature of Authorization 3-bedroom Mound septic system

New Construction _____ Alteration _____

Sewer Installation X

Flood Plain and Lowest Floor Elev. _____

This permit expires one year from date of issuance
NOT TRANSFERABLE

NOTE:
This permit must be posted in a conspicuous place on premises on which work is to be done and remain until work has been completed and inspected.

Kaleaf.

ZONING ADMINISTRATOR

No Portion of any Sewage Disposal System shall be Covered Prior to Inspection.

AITKIN COUNTY
CERTIFICATE OF INSTALLATION/NOTICE OF NONCOMPLIANCE

This certificate of installation/notice of noncompliance has been issued this 3rd day of November , 20 16 to certify compliance/noncompliance with Aitkin County's Subsurface Sewage Treatment System Ordinance.
The premises covered by this certificate are legally described as:_____
N ½ of NW NW

Section __8__ Township _51_ Range _26_ , Lake _____
PERMIT NO. _42121_ Owner Name _Brent & Shelley Welk_
Address _62612 Osprey Ave Sunfora, Mn_
Installer Name _Dave Lange_
Type of System Inspected _3 bedroom mound -Type I_
Parcel Number _20-0-011801_

The certificate of installation/notice of noncompliance was based on No _1_ of the following:

1) Inspection of the installation or construction as in accordance with the above referenced permit and application design.

2) Review of as-built plans submitted in accordance with Subdivision 9.2 D of Aitkin County's Subsurface Sewage Treatment System Ordinance.

If the above permitted subsurface sewage treatment system is in noncompliance with Aitkin County's Subsurface Sewage Treatment System Ordinance, then the following shall serve as a Notice of Violation:

1) Statement of the findings of fact through inspections or investigations:
_____
_____

2) List of specific violations of Ordinance:_____
_____
_____

3) Requirements for correction or removal of violations: _____
_____
_____

4) Time schedule for compliance: _____

Failure to correct or remove the above violation(s) will result in this matter being turned over to the Aitkin County Attorney's Office for further legal action, which may result in revocation of licenses or registrations, fines and/or imprisonment.

INSPECTOR SIGNATURE _____

INDIVIDUAL SEWAGE TREATMENT SYSTEM INSPECTION FORM
AITKIN COUNTY, MINNESOTA

Township __Macville__ Date of Inspection __8-25-16/final__ __11-3-16__ Permit Number __42121__

Owner __Boen S + Shelly Welk__ Parcel Number __20-0-011801__

Project Address __62612 Osprey Ave__ Installer __Lange__

City __Swatara__ Zip Code __55785__

New [X]   Repair [ ]   DIST. or DROP BOX & TYPE _____

SETBACKS: **TRENCHES, BEDS, OR GRAVELLESS LEACHFIELD:**

Buildings to tank(s) __55'__   Trench depth_____

Buildings to drainfield __>70'__   Trench length _____

Well(s) 50' or 100' __>100'__   Trench bottom width _____

Lake/Creek/Wetland_____   Trench spacing_____

                                               Drainfield rock below pipe_____

SEPTIC TANKS: New____ Existing __X__   Size of gravelless pipe_____

Number of tanks installed _____   Depth of backfill _____

Liquid capacity and type _____   Absorption area: square feet _____

Type of baffle __Plastic__   lineal feet_____

Inspection pipes __1-4"__   **MOUNDS:**

Manholes size __1-24'__   Percent slope __2%__

Manhole to grade Yes __X__ No ____   Upslope dike width __15'__

                                               Downslope dike width __18'__

PUMPS: New. __X__ Existing____   Sideslope dike width __15'__

Tank capacity and type __520 Jac. Precast__   Drainfield rock below pipe__9"__

Pump manufacturer & model # __Zoeller 98__   Depth of sand below rock __2'__

Horsepower & GPM __.5 X 30__   Perforation size & spacing __1/4 X 3__

Feet of head __15__   Pipe size & spacing __1 1/2 x 3__

Gallons per cycle __125__   Dimensions of rock bed __10 X 38__

Size of discharge line __2'__   Dimensions of sand base __43 x 68__

Type & location of alarm __Elec at Tank__   Final cover __12" side/End   18" Top__

Water meter_____

DRAWING OF SYSTEM: (include soils)
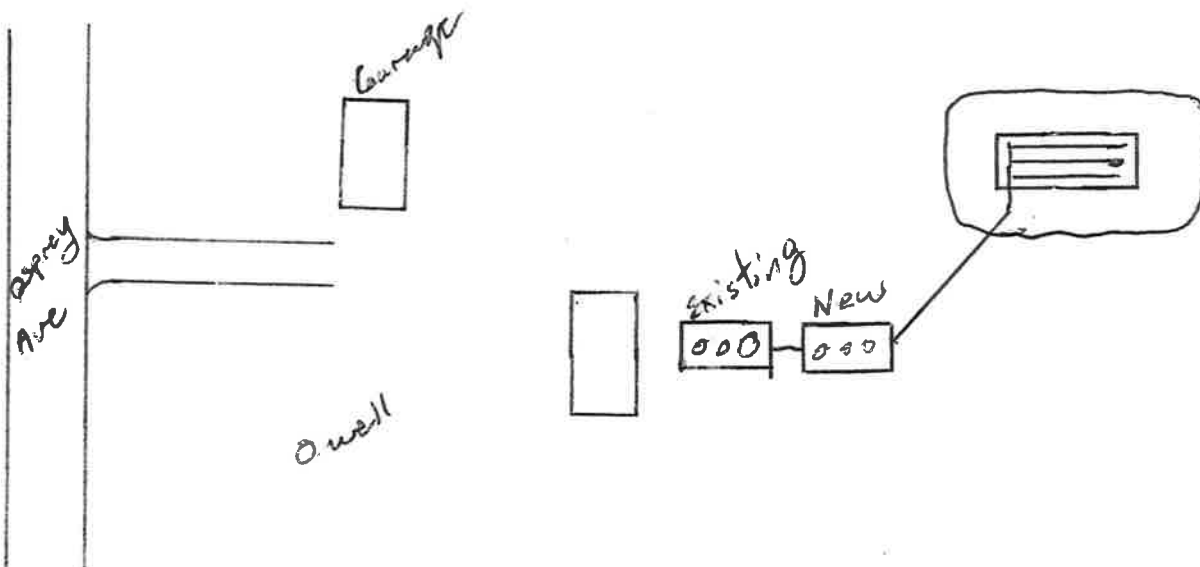
Inspector's Comments: _____

_____

Inspector's Signature _____   Installer's Signature _____

Rev:1/13   White – County   Yellow – Applicant   Pink - Installer