FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE 10/16/21, FIELD EVALUATION DATE 10/18/21
PROPERTY OWNER: Dean Soderling PHONE 952-451-3792
ADDRESS: 15263 214th Ave CITY,STATE,ZIP: McGrath MN 56350
LEGAL DESCRIPTION:
PIN# 38-0-007100 SEC 6 T 43 R 28 TWP NAME Williams
FIRE# X LAKE/RIVER X LAKE CLASS X OHWL X 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 X	YES___NO___
RUN ON POTENTIAL	YES___NO X	YES___NO___
SLOPE %	6%	
DIRECTION OF SLOPE	S.W.	
LANDSCAPE POSITION		
VEGETATION TYPES	Hay Field	

REFERENCE BM ELEV. 100 FT
REFERENCE BM DESCRIPTION
Top of well.

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1 13, 1A 12, 2 ____, 2A ____

BOTTOM ELEVATION--FIRST TRENCH OR BOTTOM OF ROCK BED: #1 +2 FT., #2 ____ FT.

SOIL SIZING FACTOR: SITE # 1 1.67, SITE #2 ____

CONSTRUCTION RELATED ISSUES: None

LIC# L 2006 SITE EVALUATOR SIGNATURE: Dave Eglund

SITE EVALUATOR NAME: Dave Englund TELEPHONE# 592-3606

LUG REVIEW ____ DATE ____

Comments:

SOIL BORING LOGS ON REVERSE SIDE

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

A. Average Design FLOW

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

B. SEPTIC TANK Capacity

1000 gallons *(see figure C-1)*

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

C. SOILS *(refer to site evaluation)*

1. Depth to restricting layer = 14 feet
2. Depth of percolation tests = — feet
3. Texture Loam
   Percolation rate 16-30 mpi
4. Soil loading rate .6 gpd/sqft *(see figure D-33)*
5. Percent land slope <1 %

D. ROCK LAYER DIMENSIONS

1. Multiply average design flow (A) by 0.83 to obtain required rock layer area.
   300 gpd x 0.83 sqft/gpd = 250 sqft
2. Determine rock layer width = 0.83 sqft/gpd x linear Loading Rate (LLR)
   0.83 sqft/gpd x 12 gpd/sqft = 10 ft
3. Length of rock layer = area ÷ width =
   250 sqft (D1) ÷ 10 ft (D2) = 25 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
   250 sqft x 1 ft = 250 cuft
2. Divide cuft by 27 cuft/cuyd to get cubic yards
   250 cuft ÷ 27 cuyd/cuft = 9.2 cuyd
3. Multiply cubic yards by 1.4 to get weight of rock in tons
   _____ cuyd x 1.4 ton/cuyd = 12.9 tons

F. SEWAGE ABSORPTION WIDTH

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

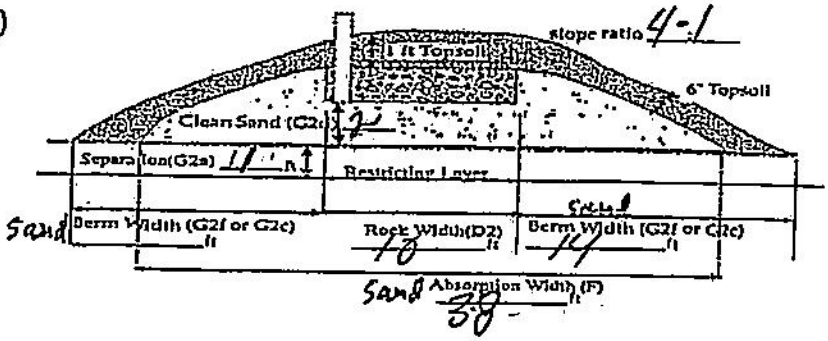
10 x 2.0 ft = 20 ft

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	1.20	1.50
16 to 30	Loam	0.60	4.00
31 to 45	Silt Loam Silt	0.50	2.50
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

<=1% land slope

G. Mound Slope Width and Length (landslope less than or equal to 1%)



1. Absorption width (F) 20 ft

2. Calculate mound size

a. Determine 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. Berm width = upslope mound height (G2b) times 4 *(4 is recommended, but could be 3-12)*

4 x 4 = 16 ft

d. The total landscape width is the sum of berm (G2c) width plus rock layer width (D2) plus berm wi (G2c): 16 ft + 10 ft + 16 ft = 42 ft

e. Additional width necessary for absorption = absorption width (F) minus the landscape width (G2d

20 ft - 38 ft = (<0) ft, *if number is negative (<0) skip to g*

f. Final berm width = additional width (G2e) plus the berm width (G2c)

16 ft + 0 ft = 16 ft

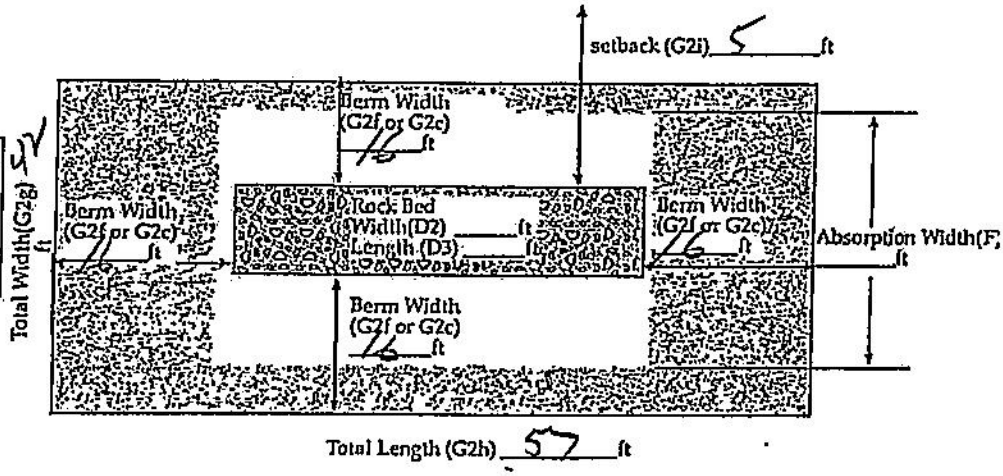
g. Total mound width is the sum of berm width (G2f or G2c) plus rock layer width (D2) plus berm width (G2f or G2c): 16 ft + 10 ft + 16 ft = 42 ft

h. Total mound length is the sum of berm (G2f or G2c) plus rock layer length (D3) plus berm (G2f or G2c): 16 ft + 25 ft + 16 ft = 57 ft

i. Setbacks from the rockbed are calculated as follows: the absorption width (F) minus the rock bed wi (D2) divided by 2: (20 ft - 10 ft) ÷ 2 = 5 ft

Final Dimensions:

42 x 57



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

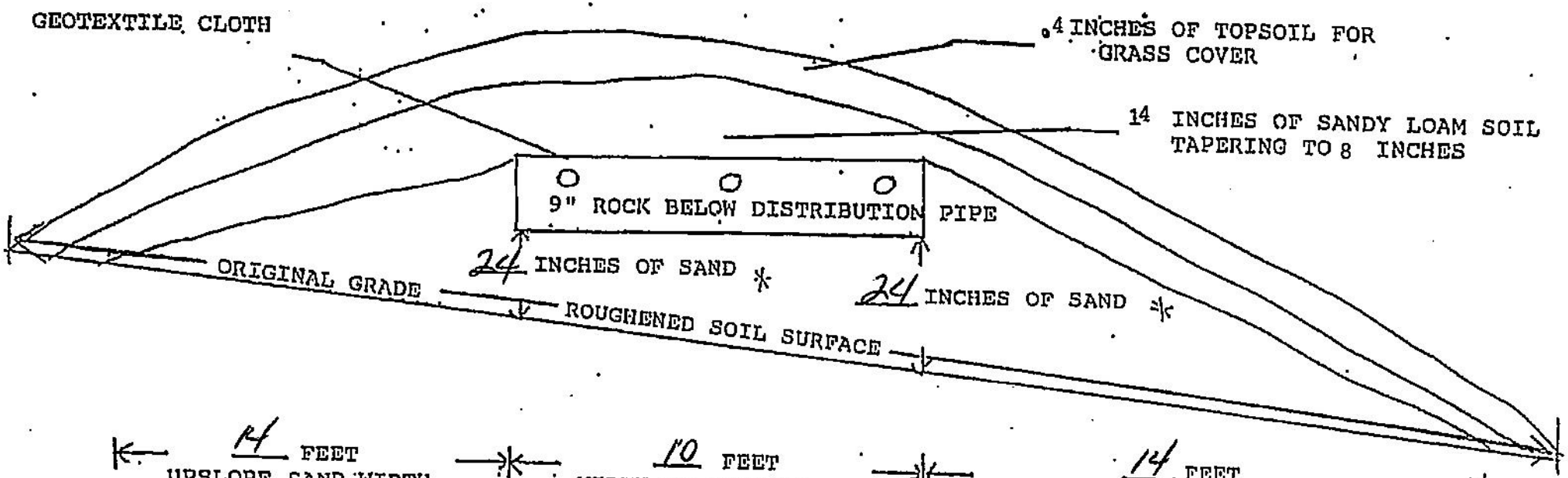
Steve Lydahl (signature) L2006 (license #) 10/18/21 (date)

MOUND CROSS-SECTION

5 1 PERCENT SLOPE OF ORIGINAL SOIL

10 FT. x 25 FT. SIZE OF ROCKBED

38 FT. x 49 FT. SIZE OF SANDBASE



14 FEET UPSLOPE SAND WIDTH

10 FEET WIDTH OF ROCKBED

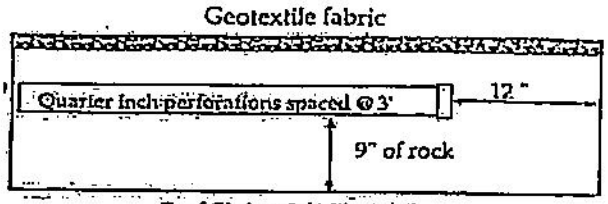
14 FEET DOWNSLOPE SAND WIDTH

16 FEET UPSLOPE COVER WIDTH

10 FEET WIDTH OF ROCK

16 FEET DOWNSLOPE COVER WIDTH

PRESSURE DISTRIBUTION SYSTEM



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

1. Select number of perforated laterals 3

2. Select perforation spacing = 2.5 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.

   25 (Rock layer length) - 2 ft = 23 ft

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

   Perforation spacing = 23 ft ÷ 2.5 ft = 9 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.*

   9 spaces + 1 = 10 perforations/lateral

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

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

   10 perfs/lat x 3 lat = 30 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 25 ft = 25 sqft
   Square foot per perforation = Rock bed area ÷ number of perfs (6)
   250 sqft ÷ 30 perfs = 8.3 sqft/perf

E-6: Perforation Discharge in gpm

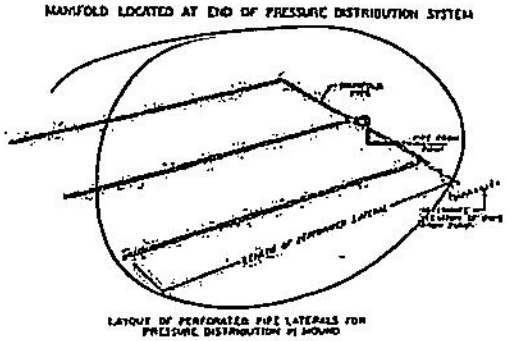
head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	(0.74)
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

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

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

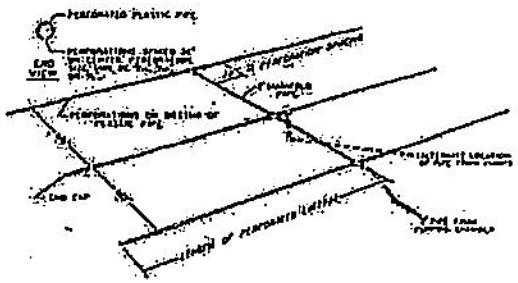
   30 perfs x .74 gpm/perfs = 22.2 gpm

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.



LAYOUT OF PERFORATED PIPE LATERALS FOR PRESSURE DISTRIBUTION FIELD MOUND

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 = _____ inches.



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Dave Eyrl (signature) C2006 (license #) 10/18/24 (date)

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

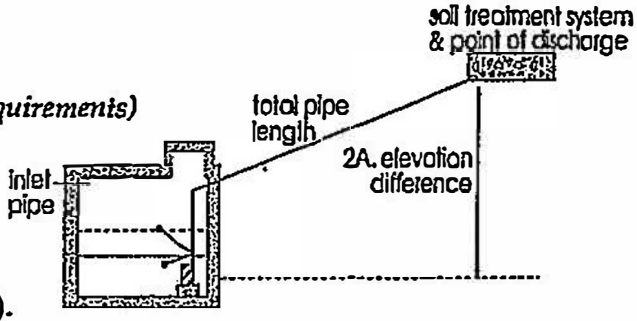
See pressure distribution work sheet

From A or B Selected pump capacity: 22.2 gpm

2. Determine pump head requirements:

A. Elevation difference between pump and point of discharge?
7.2 feet

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



Special Head Requirements	
Gravity Distribution	0 ft
Pressure Distribution	5 ft

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 = 1.11 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
   20 feet x 1.25 = 25 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.
   = 1.11 ft/100ft x 25 ÷100 = .3 ft

D. Total head required is the sum of elevation difference (A), special head requirements (B), and total friction loss (C4)
7.2 ft + 5 ft+ .3 ft =

Total head: 8 feet

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
flow rate gpm	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

3. Pump selection

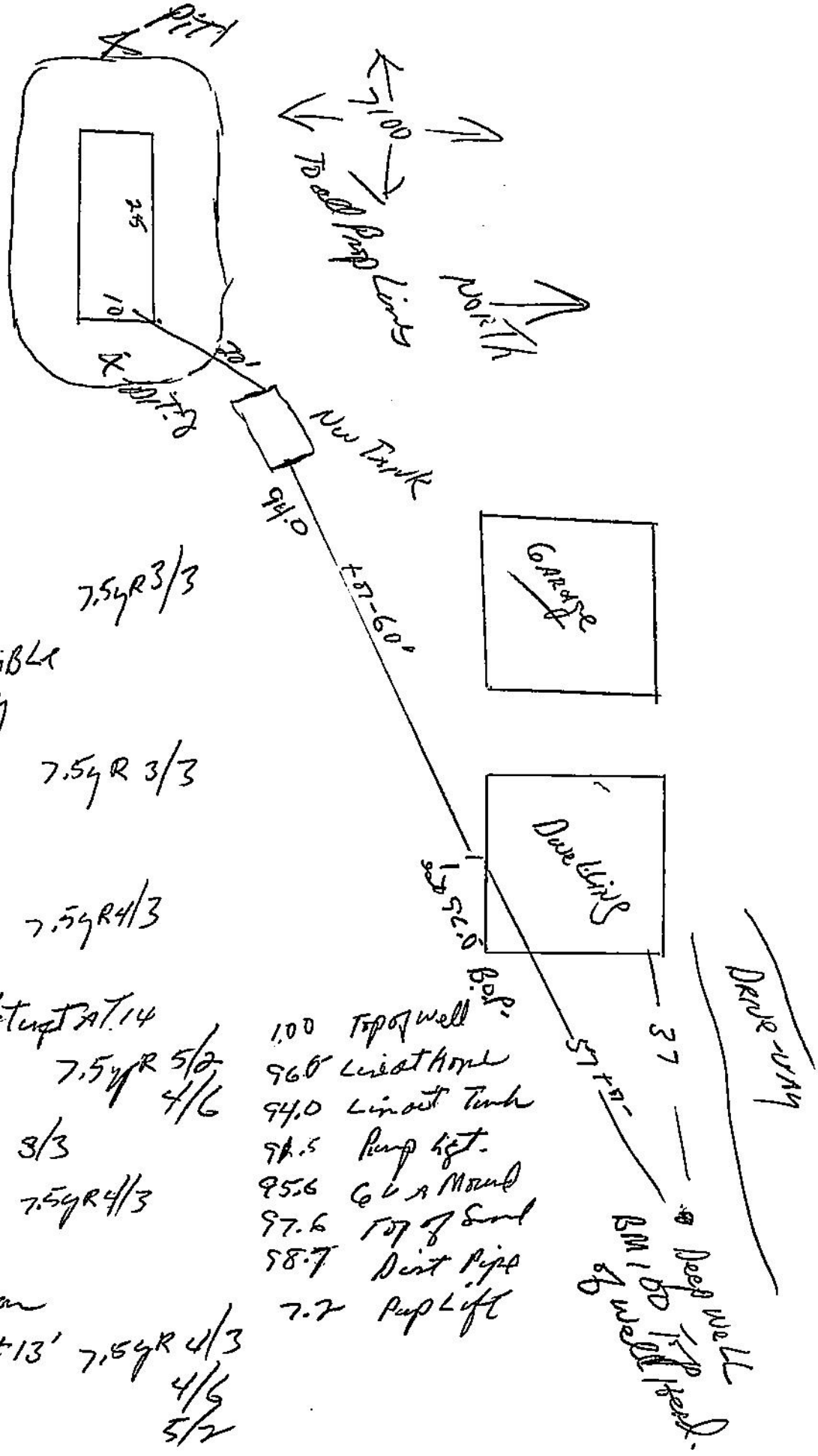
A pump must be selected to deliver at least 22.2 gpm (1A or B) with at least 12.5 feet of total head (2D)

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

[signature] (signature) L2006 (license #) 10/18/2021 (date)

38-0-009100

15263 214th Ave



Shovel Pit #1

0-8 T.S 7.5yR 3/3
Loam
Roots Friable
Blocky

8-13 Loam 7.5yR 3/3
Firm
Roots

13-15 Sand 7.5yR 4/3
Loam
Firm
Redox Distinct at 14
7.5yR 5/2
4/6

Shovel Pit #2

0-7 T.S 7.5yR 3/3

7-12 Loam 7.5yR 4/3
Roots
Firm

12-15 Sand Loam
Redox at 13' 7.5yR 4/3
4/6
5/2

100 Top of well
96.6 Lineal Head
94.0 Lineal Tank
91.5 Pump Eff.
95.6 G L A Mound
97.6 Top of Sand
58.7 Dist Pipe
7.7 Pump Lift