

**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ON-SITE WASTEWATER SYSTEMS CHECKLIST
FOR PROFESSIONALLY DESIGNED SYSTEMS**

APPLICATION NO. _____
FORT BEND COUNTY, TEXAS

The following information must be included with the design package for review by the Texas Natural Resource Conservation Commission. Failure to include or address all of the following items may result in approval delays.

- 1. Plans and reports must bear a signed and dated seal of the responsible registered engineer or sanitarian. The address and telephone number of this person must also be included in the submittal. (Two originals with seal / signature / date.)

- 2. A report must be included in the submittal containing the following information:
 - A. Basis of design;
 - B. Soil analysis and percolation test result;
 - C. System flow diagram and sizing calculation;
 - D. Material specification; and
 - E. Size and model number of approved aerobic system (if used.)

- 3. Construction drawings must include the following information:
 - A. A scaled, legible site plan with boundary description;
 - B. The location of all buildings (existing or proposed) on the site plan;
 - C. The location of the wastewater treatment units and disposal area;
 - D. Buffer zones and water wells must be identified and located on the site plan;
 - E. The site plan must also include topographical countours for slopes greater than 15 percent;
 - F. Easements and bodies of water (lakes, streams, ponds) must also be identified; and
 - G. Installation details such as septic tank configuration, layouts and cross-sections of drainfields and disposal beds, irrigation systems, pump station including piping and controls

Charles Garland
Signature of Designer

12-18-2019
Date

SITE EVALUATION FORM
FT. BEND COUNTY, TEXAS

DATE: 12/18/2019
CLIENT: JANET CASTILLO ADDRESS 211 LITTLE DOGIE RD.
WALLIS, TX. 77485

LEGAL DESCRIPTION:
SUBDIVISION BRAZOS VALLEY SUB. SEC. 1 LOT 16, 17 BL. 1

SURVEY: _____
ABSTRACT: _____
PROPERTY SIZE: 1.554 AC.
EXISTING OR PROPOSED STRUCTURE TO BE SERVED: A PROPOSED 4 BEDROOM SING. FAM. DWELLING, 1905 SQ.FT., W/ULF FIXTURES, 300 G.P.D.

TOPOGRAPHY

SLOPE:
FLAT(UNDER 2%) _____ SLIGHT(UNDER 6%) _____ * SEVERE(OVER 30%) _____

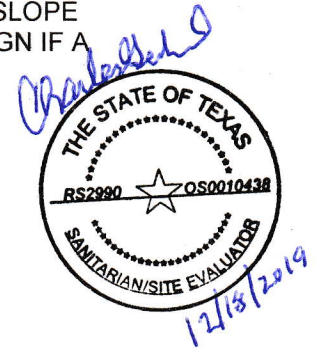
VEGETATION:
GRASS/BRUSH */ LIGHTLY WOODED _____ HEAVILY WOODED _____

SITE DRAINAGE: POOR() ADEQUATE(*) GOOD() OTHER()

NOTE: IF SLOPE IS SEVERE A TOPO SURVEY WITH HALF FOOT CONTOURS MUST BE PROVIDED WITH THIS FORM ON THE DESIGN. IF SITE DRAINAGE IS POOR OR SLOPE IS FLAT THEN A DETAILED DRAINAGE PLAN MUST BE PROVIDED ON THE DESIGN IF A SUBSURFACE SYSTEM IS PROPOSED.

FLOOD HAZARD

PROPERTY IS LOCATED:
PARTIALLY IN 100 YEAR FLOOD PLAIN ()
OUTSIDE 100 YEAR FLOOD PLAIN ()
IN 100 YEAR FLOOD PLAIN (*)
IN 500 YEAR FLOOD PLAN AND FLOODWAY ()



WATER SUPPLY:
PUBLIC () COMMUNITY () PRIVATE (*) WELL IS PROPOSED

NAME OF WATER SUPPLIER: _____

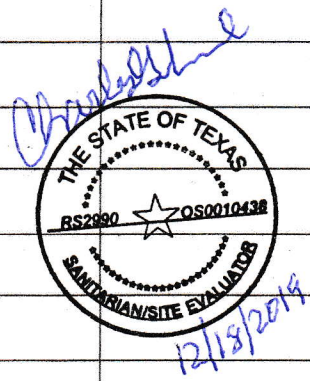
NOTE: IF WELL IS ON-SITE COMPLETE THE FOLLOWING.
SIZE OF WELL N/A YEAR DRILLED N/A DRILLER N/A
DEPTH OF WELL: N/A FT.

SEALING BLOCK PRESENT YES () NO ()
WELL HOUSE PROTECTING WELL YES () NO ()
IS A WELL LOG AVAILABLE (ATTACHED IF AVAILABLE) YES () NO ()
NEIGHBORING WELL WITHIN 100 FEET OF PROPERTY LINE. (IF NEIGHBORING WELL(S) EXIST, THEY MUST BE SHOWN ON THE DESIGN) YES () NO (*)
YES () NO (*)

SOIL EVALUATION

PROFILE DEPTH	TEXTURE (COLOR)	GRAVEL ANALYSIS (CLASS II & III)	RESTRICTIVE HORIZON	GROUND WATER	COMMENTS
0	Brown	Less than 5%	Yes	No	
	Clay				
48"					
60"					

PROFILE DEPTH	TEXTURE (COLOR)	GRAVEL ANALYSIS (CLASS II & III)	RESTRICTIVE HORIZON	GROUND WATER	COMMENTS
		Same as Above			
60"					



SOIL CLASSIFICATION:

- CLASS Ib: Sandy, Loamy Sand

- CLASS II: Sandy Loam, Loam

- CLASS III: Sandy Clay Loam, Sandy Clay, Clay Loam, Silty Clay Loam, Silt Loam, Silt

- CLASS IV: Silty Clay, Clay

EFFLUENT LOADING DETERMINATION

SOIL TEXTURE	SOIL CLASS	LONG TERM LOADING RATE
COARSE SAND/GRAVEL	1a	> .50 (NOT SUITABLE FOR STANDARD SYSTEMS)
SAND/LOAMY SAND	1b	.38
SANDY LOAM/LOAM	II	.25
SANDY CLAY LOAM/ SANDY CLAY/CLAY LOAM/ SILTY CLAY LOAM/SILTY LOAM	III	.20
CLAY/SILTY CLAY	IV	0.1 (NOT SUITABLE FOR STANDARD SYSTEMS)

NOTE: SOIL MUST BE EVALUATED TO A MINIMUM OF TWO (2) FEET BELOW APPLICATION AREA

INDICATION OF SEASONAL WATER TABLE: YES () NO (*) DEPTH _____

NOTE: SUBSURFACE HORIZONS WITH COLORS OF RED, YELLOW AND BROWN GENERALLY INDICATE GOOD SOIL AERATION AND DRAINAGE THROUGHOUT THE YEAR. SUBSURFACE HORIZONS THAT ARE IN COLORS OF GRAY, OLIVE OR BLACKISH COLORS INDICATE POOR AERATION AND POOR SOIL DRAINAGE. ANY SOIL PROFILE THAT HAS THE GRAYISH COLORS INDICATIVE OF HIGHWATER TABLES OR SOIL MOTTLING WITHIN 36 INCHES OF THE SURFACE OR HAS GROUND WATER VISIBLE IN THE TEST BORE HOLE LESS THAN 48 INCHES BELOW THE GROUND SURFACE SHALL BE DEEMED UNSUITABLE FOR CONVENTIONAL SUBSURFACE DISPOSAL DUE TO INTERNAL DRAINAGE.

IS SOIL SUITABLE FOR A CONVENTIONAL SYSTEM? YES () NO (*) APPLICATION RATE .1

NOTE: IF SOIL HAS AN APPLICATION RATE OF OVER .38 GPDSF OR LESS THAN .1 GPDSF OR A HIGH SEASONAL WATER TABLE THAN STANDARD SYSTEMS ARE PROHIBITED BY STATE LAW.

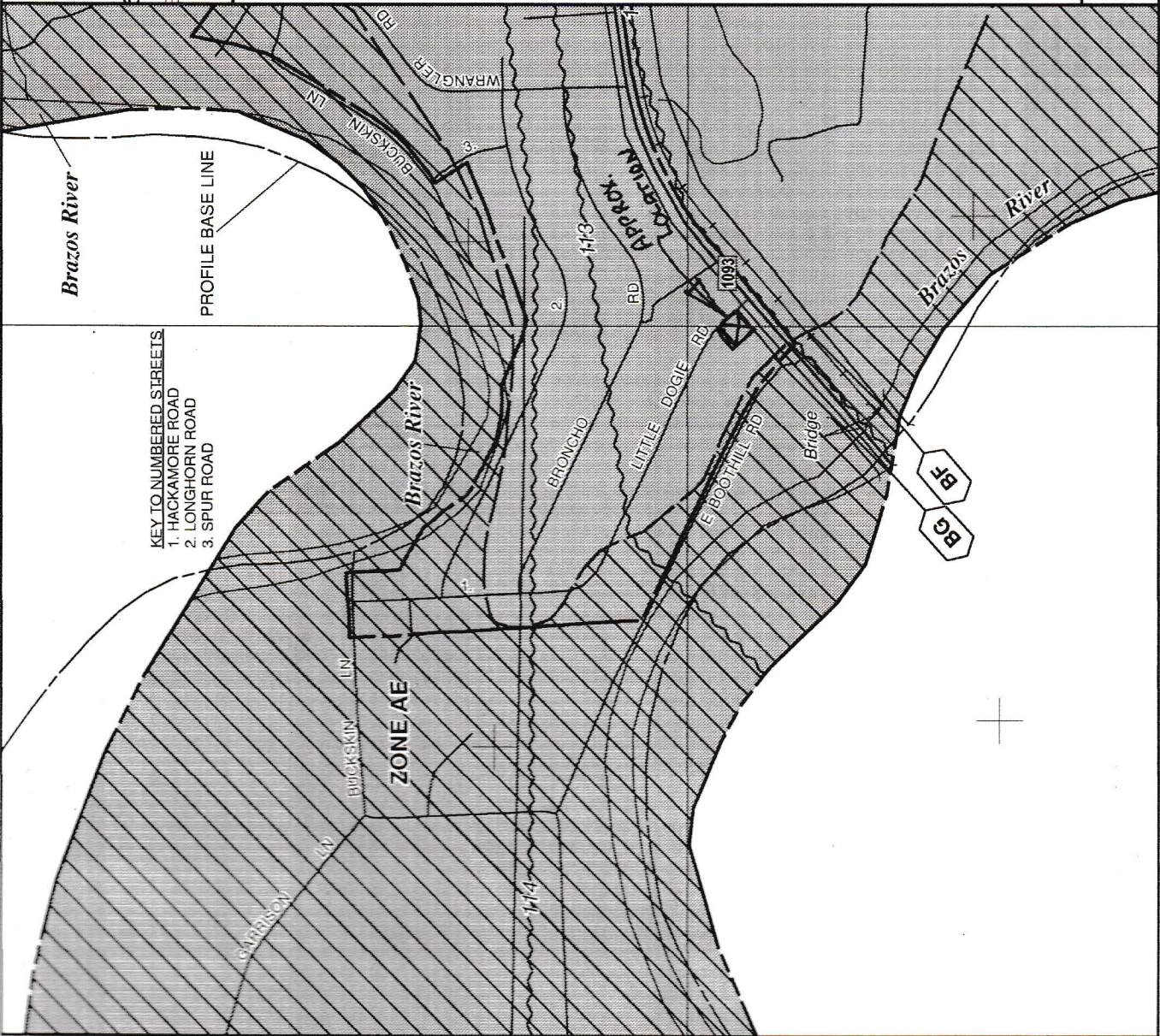
I CHARLES GERLAND, A REGISTERED SITE EVALUATOR DID PERSONALLY CONDUCT THIS SITE EVALUATION ON 211 LITTLE DOGIE RD., WALLIS, TX. 77485. BRAZOS VALLEY SUB., SEC. 1, BL. 1, LOT 16 & 17, 1.554 AC., FORT BEND CO. TEXAS.

I CERTIFY THESE RESULTS ARE TRUE AND CORRECT FOR THE PROPERTY EVALUATED.

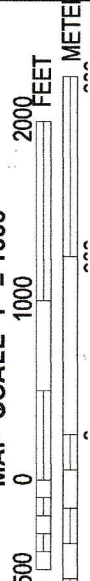
12/18/2019
DATE

Charles Gerland
SIGNATURE





MAP SCALE 1" = 1000'



PANEL 0070L

FIRM
FLOOD INSURANCE RATE MAP
FORT BEND COUNTY,
TEXAS
AND INCORPORATED AREAS

PANEL 70 OF 575
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
 COMMUNITY NUMBER PANEL SUFFIX
 FORT BEND COUNTY 480228 0070 L
 SIMONTON, CITY OF 481564 0070 L

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown below should be used on insurance applications for the subject community.



MAP NUMBER
48157C0070L
MAP REVISED
APRIL 2, 2014

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps, check the FEMA Flood Map Store at www.msc.fema.gov

NOTES:

1. AEROBIC SEWAGE TREATMENT PLANT – PRO FLO 500 G.P.D. AEROBIC SEWAGE TREATMENT PLANT OR EQUAL.
2. PUMP – PRO FLO ½ H.P. PUMP MODEL HE8-51, HE1251 OR HE20-51, SUBMERSIBLE PUMP OR EQUAL.
3. SPRINKLER HEADS - HUNTER PROFESSIONAL SERIES ADJUSTABLE GEAR DRIVEN OR RAIN-BIRD AG-5, POP-UP, LOW ANGLE, 40 P.S.I. MAX., OR EQUAL.
4. PUMP CONTROLS – B.I.O. INC. AEROBIC PUMP CONTROL, MODEL BIO500C OR EQUAL. A LIQUID CHLORINATOR IS ACCEPTABLE WITH THIS SYSTEM.

5. CALCULATIONS

CALCULATIONS ARE FOR A PROPOSED 4 BEDROOM SING. FAM. DWELLING, 1905 SQ.FT. W/ULF FIXTURES. PROPERTY LOCATION IS 211 LITTLE DOGIE RD., WALLIS, TX. 77485.

- A. TOTAL FLOW RATE - 300 G.P.D.
- B. $300 \text{ G.P.D.} / .045 \text{ GAL/SQ.FT.}\backslash\text{DAY} = 6666.66 \rightarrow 6667 \text{ SQ.FT. REQUIRED}$
- C. $A = \pi * 33^2 * 2 \text{ SPRAY AREAS}$
- D. TOTAL AREA PROVIDED – 6842 SQ.FT.

6. ACCEPTABLE SURFACE APPLICATION AREAS. LAND ACCEPTABLE FOR SURFACE APPLICATION SHALL HAVE FLAT TERRAIN (WITH LESS THAN OR EQUAL TO 15 % SLOPE) AND SHALL BE COVERED WITH GRASSES, EVERGREEN SHRBS, BUSHES, TREES OR LANDSCAPED BEDS CONTAINING MIXED VEGETATION. THERE SHALL BE NOTHING IN THE SURFACE APPLICATION AREA WITHIN TEN FEET OF THE SPRINKLER WHICH WOULD INTERFERE WITH THE UNIFORM APPLICATION OF THE EFFLUENT. SLOPED LAND (WITH GREATER THAN 15%) MAY BE ACCEPTABLE IF IT IS PROPERLY LANDSCAPED AND TERRACED TO MINIMIZE RUNOFF.

7. UNACCEPTABLE SURFACE APPLICATION AREAS. LAND THAT IS USED FOR GROWING FOOD, GARDENS, ORCHARDS, OR CROPS THAT MAY BE USED FOR HUMAN CONSUMPTION AS WELL AS UNSEEDDED BARE GROUND, SHALL NOT BE USED FOR SURFACE APPLICATION.

8. LANDSCAPING PLAN - SPRAY IRRIGATION AREAS MUST BE PLANTED WITH GRASSES SUITABLE FOR THE FT. BEND CO. COUNTY AREA. GRASSES THAT ARE THE BEST FOR THIS AREA ARE: ST. AUGUSTINE, CENTIPEDE, AND ZOYSIA. A QUICK GROWING TEMPORARY GRASS SUCH AS GULF COAST RYE, MAY BE UTILIZED UNTIL ONE OF THE PERMANENT GRASSES LISTED ABOVE ARE PLANTED. ANY SPRAY AREAS THAT HAVE NATIVE GRASSES GROWING NATURALLY, DO NOT NEED TO BE MODIFIED, BUT ANY BARE AREAS MUST BE SEEDDED OR SODDED WITH ONE OF THE ABOVE.

9. NO EXISTING OR PROPOSED ADDITIONAL TREES MAY BE WITHIN 10 FT. OF ANY SPRAY AREA. LOCATION OF SPRAY HEADS MAY BE ADJUSTED TO ACCOMODATE ANY EXISTING TREES.

10. ALL ELECTRICAL CONNECTIONS MUST BE 2 FT. MIN. ABOVE FLOOD PLAIN LEVEL (IF APPLICABLE)

11. CONTAMINATES SUCH AS HYDROCARBON WASTE, PESTICIDES, OR TRASH SUCH AS PAPER TOWELS, SANITARY NAPKINS, CONDOMS, ET.C SHOULD NOT BE ALLOWED TO ENTER THIS SYSTEM.

12. EXISTING SEPTIC TANKS MAY BE RE-USED. THEY MUST BE PUMPED AND CLEANED AND BROUGHT UP TO ALL CONSTRUCTION STANDARDS AS REQUIRED BY THE TCEQ MANDATE OF JAN. 1997. IF TANK(S) ARE NOT RE-USED THEY MUST BE ABANDONED BY THE SAME TCEQ MANDATE. (IF APPLICABLE)

13. SITE DRAINAGE - INSTALLER OR PROPERTYOWNER SHALL ADD ADDITIONAL FILL ON DISPOSAL AREA TO PROVIDE POSITIVE STORM WATER RUNOFF AND CONSTRUCT DRAINAGE SWALES TO EXISTING ROADSIDE DRAINAGE AS NECESSARY.

14. IT IS THE OWNERS RESPONSIBILITY TO KEEP A MAINTENANCE/SERVICE CONTRACT WITH AN APPROVED AEROBIC SYSTEM MAINTENANCE COMPANY. ONLY APPROVED CHLORINE TABLETS ARE TO BE USED IN THIS SYSTEM. LIQUID CHLORINATORS ARE ACCEPTABLE.



15. WHEN A WATER SUPPLY LINE MUST BE CROSSED BY A SPRAY IRRIGATION LINE, OSSF INSTALLERS WILL LOCATE IRRIGATION LINES AT LEAST 6 INCHES BELOW THE WATER SUPPLY LINE, UTILIZE 150 PSI OR GREATER PRESSURE PIPE AND CENTER AT LEAST AN 18 FT. LONG PIPE ON THE WATER LINE THUS MAKNG THE PIPE JOINTS AT LEAST 9 FT. FROM THE WATER LINE. IN INSTANCES WHEN THE IRRIGATION LINE CANNOT BE PLACED BELOW THE WATER LINE, THE IRRIGATION LINE MUST BE PLACED AT LEAST SIX INCHES ABOVE THE WATER LINE, USE 150 PSI PIPE, CENTER AN 18 FT. OR LONGER PIPE ON THE WATER LINE, AND SLEEVE THE IRRIGATION LINE INSIDE ANOTHER PRESSURE RATED PIPE. (IF APPLICABLE)

16. THIS PLAN IS INTENDED FOR USE AS AN INSTALLATION GUIDE THE DIMENSIONS OF THE PROPERTY ARE TAKEN FROM SURVEYS AND APPROXIMATE FIELD MEASUREMENTS. THIS IS NOT INTENDED AS A LEGAL LAND SURVEY AND SHOULD NOT BE TREATED AS SUCH.



DATE: 12/18/2019
SCALE: 1" = 40'

BRAZOS VALLEY SUB.
SEC. 1, BL. 1
LOT 16 & 17, 1,554 AC.
FORT BEND CO. TEXAS

JANET CASTILLO
211 LITTLE DOGIE RD.
WALLIS, TX. 77485

KEY MAP 520 P, Q
165.00

176.67

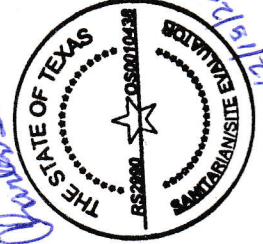
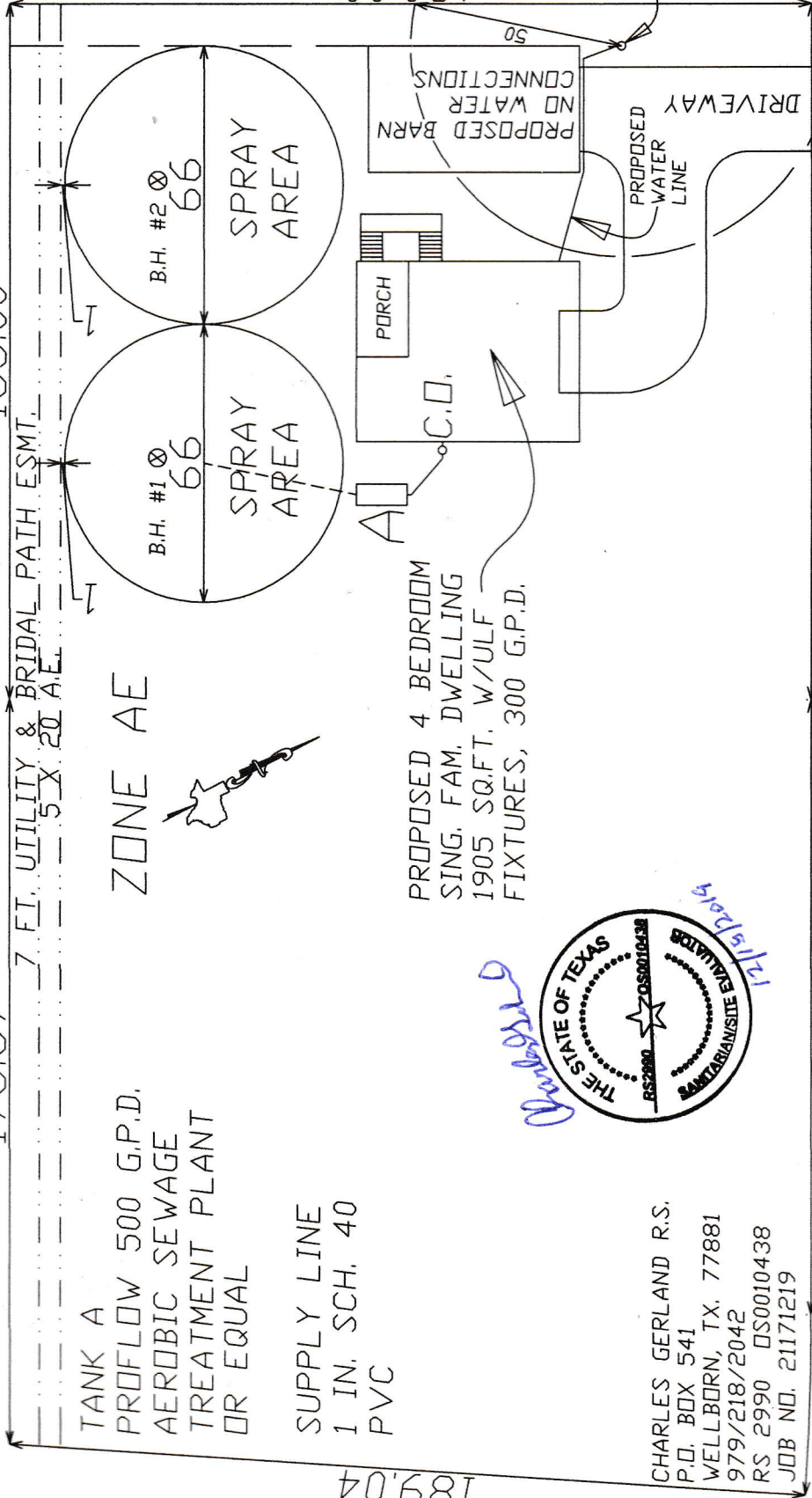
7. FI. UTILITY & BRIDAL PATH ESMT.
5 X 20 A.E.

ZONE AE

TANK A
PROFLOW 500 G.P.D.
AEROBIC SEWAGE
TREATMENT PLANT
OR EQUAL

SUPPLY LINE
1 IN. SCH. 40
PVC

PROPOSED 4 BEDROOM
SING. FAM. DWELLING
1905 SQ.FT. W/WULF
FIXTURES, 300 G.P.D.



CHARLES GERLAND R.S.
P.O. BOX 541
WELLSBORO, TX. 77881
979/218/2042
RS 2990 DS0010438
JOB NO. 21171219

165.00

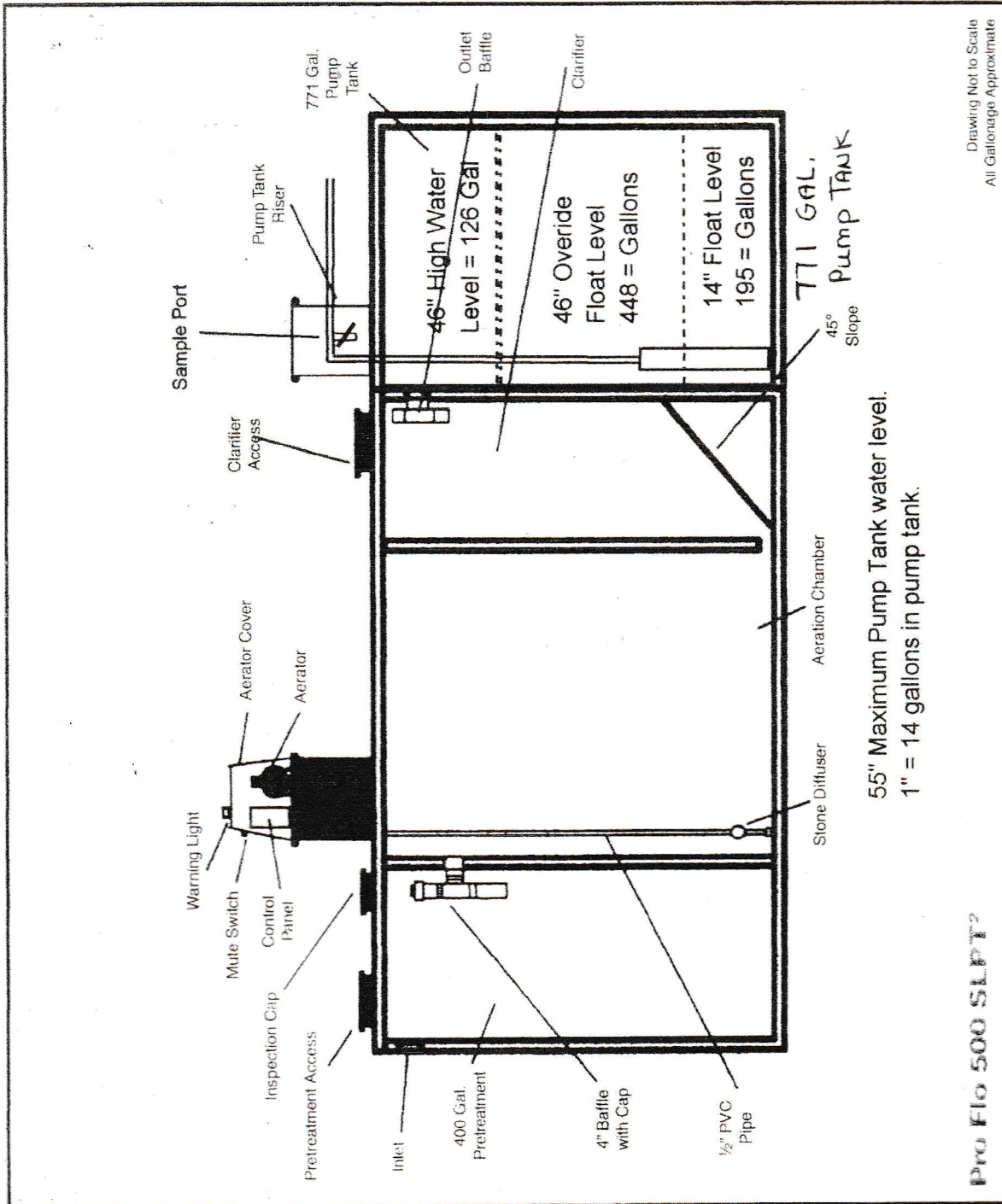
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211 LITTLE DOGIE RD.

43.15

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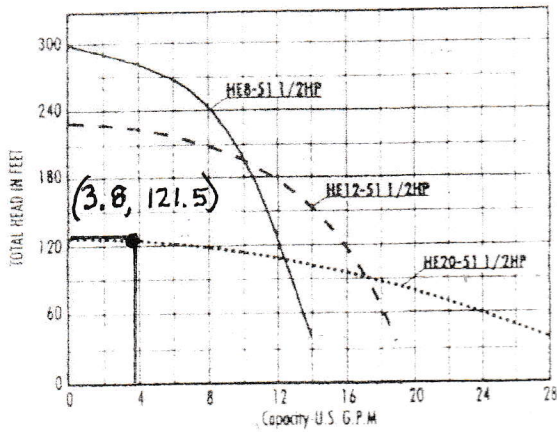
Pro Flo 500 SLPT² System Diagram



55" Maximum Pump Tank water level.
1" = 14 gallons in pump tank.

Drawing Not to Scale
All Gallonage Approximate

Pro Flo 500 SLPT²



HE8-51, HE12-51 & HE20-51

Typical Application*	High Head Filtered Effluent
Capacities	to 20 GPM (1.26 l/s)
Heads	to 300 ft (146.3m)
Electrics	115V, 1 ϕ , 14.5FLA, 60Hz, 3450 RPM 230V, 1 ϕ , 3.1FLA, 60Hz, 3450 RPM
Motor	(single phase) - 1/2HP 115 volts, single phase (single phase) - 1-1/2HP 230 volts 60 Hz, 3450 RPM
Diameter	Simplex = 4" (101.6mm)
Automatic Operation	Pressure Switch
Materials of Construction	300 SST
Impeller	Thermoplastic
Discharge Size	1-1/2" (38.1mm)
Power Cord	1 ϕ - 20' SJTW, STW-A (30' optional)

- Superior Features
- High pressure capacity
 - Corrosion resistant design for long life
 - Listings pending on 25 and 35 GPM units
 - Dependable field proven motor
 - Stainless-steel construction
 - Built-in overload and electric surge protection
 - Hermetically sealed windings
 - Continuous duty rating
 - Frequent cycling capabilities
 - Powerful, yet lightweight
 - Easy handling and installation

HE 20-51 1/2 HP TYPICAL

Friction Loss thru 103 ft of 1" plastic pipe
3.8 gpm

$$1.15 \times 1.03 \div 2.31 + 40 \times 2.31 + 8 \times 1.2 = 121.9 \text{ F.O. H.}$$

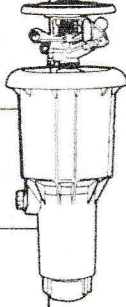
Pump must produce 3.8 gpm @ 121.5 F.O.H.

RAINBIRD

#7 & #10 ARE LOW ANGLE

AG-5/ Maxi-Paw Performance Chart

Water Pressure	Nozzle	Radius	GPM	Precip. Rate Inches/Hour
25 psi	Red, 06	-	-	-
	Black, 07	36	1.9	.41
	Blue, 08	37	2.8	.44
	Yellow, 10	49	4.2	.56
	Tan, 12	39	5.5	.70
35 psi	Red, 06	37	1.6	.28
	Black, 07	38	2.3	.38
	Blue, 08	38	3.3	.44
	Yellow, 10	41	4.8	.55
	Tan, 12	42	6.3	.69
45 psi	Red, 06	38	1.9	.31
	Black, 07	39	2.5	.38
	Blue, 08	40	3.7	.45
	Yellow, 10	42	5.4	.59
	Tan, 12	44	7.1	.71
55 psi	Red, 06	38	2.1	.33
	Black, 07	41	2.8	.38
	Blue, 08	41	4.1	.47
	Yellow, 10	44	6.0	.62
	Tan, 12	45	7.9	.75
60 psi	Red, 06	38	2.2	.35
	Black, 07	41	2.9	.40
	Blue, 08	42	4.2	.46
	Yellow, 10	44	6.4	.64
	Tan, 12	45	8.4	.80

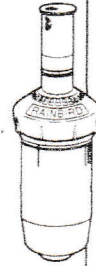


NOTES:

- Water pressure is the pressure at the sprinkler head while the sprinkler is operating.
- Precipitation rates based on half-circle operation and 50% diameter of throw.
- Sprinkler radius can be reduced up to 25% for all sprinklers shown.

TDR-2/R-50 Performance Chart

Nozzle	Water Pressure	GPM	Radius	Precip. Rate Inches/Hour
1.5 Black	25 psi	1.5	33	.27
	35 psi	1.7	34	.28
	45 psi	2.0	34	.33
	55 psi	2.1	34	.35
	60 psi	2.3	34	.38
2.0 Brown	25 psi	2.2	37	.31
	35 psi	2.5	38	.33
	45 psi	2.8	39	.35
	55 psi	3.1	39	.39
	60 psi	3.3	39	.42
3.0 Grey	25 psi	3.1	38	.41
	35 psi	3.5	39	.44
	45 psi	4.2	40	.51
	55 psi	4.5	40	.54
	60 psi	4.9	40	.59



LG-3/ Mini Paw-07 Performance Chart

Water Pressure	Radius	Maximum Space	GPM	Precip. Rate Inches/Hour
25 psi	33	39	1.9	.34
30 psi	34	41	2.0	.33
40 psi	36	43	2.3	.34
50 psi	36	43	2.6	.39



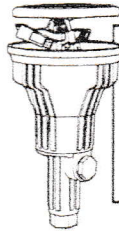
T-Bird Performance Chart

Water Pressure	Nozzle	GPM	Radius	Precip. Rate Inches/Hour
25 psi	T-22, 1.3	1.2	21	.52
	T-30, 2.5	2.2	29	.50
	T-40, 1.5	1.6	29	.34
	T-40, 2.0	2.2	36	.32
	T-40, 3.0	3.2	36	.48
35 psi	T-22, 1.3	1.3	22	.52
	T-30, 2.5	2.6	30	.56
	T-40, 1.5	1.8	35	.28
	T-40, 2.0	2.9	39	.32
	T-40, 3.0	3.0	41	.45
45 psi	T-22, 1.3	1.3	22	.53
	T-30, 2.5	2.9	31	.58
	T-40, 1.5	2.0	35	.32
	T-40, 2.0	2.9	39	.37
	T-40, 3.0	4.5	41	.51
55 psi	T-22, 1.3	1.4	22	.54
	T-30, 2.5	3.0	31	.60
	T-40, 1.5	2.2	35	.35
	T-40, 2.0	3.2	39	.41
	T-40, 3.0	5.0	43	.52
65 psi	T-22, 1.3	1.4	23	.54
	T-30, 2.5	3.1	32	.62
	T-40, 1.5	2.7	35	.38
	T-40, 2.0	3.5	41	.40
	T-40, 3.0	5.4	43	.57



MG-4/ Mini Paw-09 Performance Chart

Water Pressure	Radius	Maximum Space	GPM	Precip. Rate Inches/Hour
25 psi	36	43	2.6	.39
30 psi	37	44	2.8	.39
40 psi	39	47	3.3	.42
50 psi	41	49	3.6	.41



15111A Performance Chart

Water Pressure	Radius	Maximum Space	GPM	Precip. Rate Inches/Hour
30 psi	39	47	3.8	.38
40 psi	40	48	4.4	.53
50 psi	41	49	5.0	.57

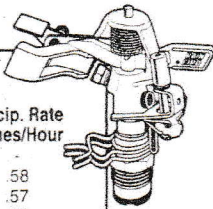
*Performance best at pressures of 40 psi or higher

X 2 heads = 3.8 gpm

Brass Impact Sprinkler Performance Chart

Water Pressure	20 & 25 Series*		35ADJ-TNT		Precip. Rate Inches/Hour
	Radius Feet	GPM Output	Radius Feet	GPM Output	
35 psi	39	4.1	-	-	-
40 psi	40	4.4	47	6.4	.58
45 psi	40	4.7	48	6.8	.57
50 psi	41	5.0	49	7.2	.58
55 psi	-	-	50	7.5	.58
60 psi	-	-	51	7.8	.58

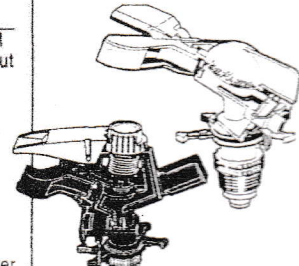
*Performance best at pressures of 40 psi or higher



Plastic Impact Sprinkler Performance Chart

Water Pressure	P5-PJ		P2-PJDA*	
	Radius Feet	GPM Output	Radius Feet	GPM Output
10 psi	-	-	24	2.2
15 psi	-	-	29	2.7
20 psi	-	-	33	3.2
25 psi	38	3.4	36	3.5
30 psi	39	3.8	38	3.9
35 psi	39	4.1	39	4.2
40 psi	40	4.4	40	4.5
45 psi	40	4.7	41	4.7
50 psi	41	5.0	-	-

*Not recommended for pressures of 50 psi or higher



AEROBIC TREATMENT UNIT UPLIFT CALCULATIONS
PRO FLO AEROBIC SYSTEMS, LP
 By D. Ray Young, P.E. No. 37068

TANK MODEL NOS. 500 SLPT2

Tank Dimensions:

Length =	159 Inches	=	13.25 Ft
Width =	68 Inches	=	5.67 Ft
Height =	71 Inches	=	5.92 Ft

Tank Displacement Volume = 444.24 Cu Ft

Uplift Force (@ 62.4 #/cu ft) = 27,720.77 LBS

Resisting Forces

Concrete Tank Deadweight (Empty) =	17,156.00 Lbs
Weight of Inserted Equipment & Hatches =	150.00 Lbs
Total Tank Weight =	17,306.00 Lbs

Weight of Soil Over Tank

Length =	159 Inches =		13.25 Ft
Width =	68 Inches =		5.67 Ft
X-Section Area =			75.08 Sq Ft

Less Access Hatch Areas

1	@	16 Inches		-1.05 Sq Ft
3	@	20 Inches		-3.93 Sq Ft

Net Area for Soil Cover = 70.11 Sq Ft

Height of Soil Cover =	18 Inches =		1.50 Ft
Soil Cover Volume =			105.16 Cu Ft
Unit Weight of Compacted Soil Cover =			100.00 Lbs/Cu Ft
Weight of Soil Cover =			10,516.37 Lbs

Total Downward Force = 27,822.37 Lbs

Net Uplift Force = -101.61

Since uplift force is negative, tank will not float when empty with indicated cover. Soil skin friction has been neglected. Actual resistance to flotation will be greater.



D. Ray Young
 09-02-2015

