PROPOSED OSSF DESIGN

Prepared for:	Patrick & Beverly Drymala 12010 Cloudt Road Needville, Texas 77461
Property Description:	1.0 Acre Tract of Land Out of the F. Willaert Survey, A-492 Fort Bend County, Texas

Design Parameters

1.	Structure	3 Bedroom Residence
2.	Size	< 2,500 sq.ft.
3.	Design Flow Rate	240 gallons per day (GPD) Three (3) bedroom residence w/ water saving devices (<2,500 sq ft) => 240 GPD
4.	Loading Rate	0.045 gallons per square foot
5.	Area Required	5,333 square feet
6.	Area Designed	5,637 square feet, excluding overlap areas

System Parameters

1.	Pretreatment Tank	353 gallon capacity (Built into NuWater B-550) (or Equal)
2.	Treatment Unit	600 GPD NuWater B-550 (or Equal)
3.	Pump Tank	750 gallon capacity (Built into NuWater B-550) (or Equal)
4.	Pump	Myers MD Series – 20 GPM Model, ½ HP, or equal
5.	Disinfection	Liquid Chlorinator (or Equal) Design Flow = 240 GPD or 908 liters/day BOD_5 requirement = 20 mg/liter Chlorine dosage required = 15 mg/liter or 13.6 grams/day Chlorine Storage (120 days) = 1634 grams (minimum), or equal
6.	Sprinkler Area	5,637 square feet
7.	Sprinkler Heads	3 K-Rain ProPlus (or Equal) sprinkler heads with low angle nozzles

Site Evaluation

1.	Topography	Slight, < 2%
2.	Vegetation	Grass & trees
3.	Site Drainage	Adequate
4.	Flood Hazard	Outside the 100 Year Flood Plain, Zone X FIRM #48157C 0400 & 0525 L
5.	Water Supply	Private Water Well
6.	Soil Type	0-24" Gray Clay (Class IV)
7.	Seasonal Saturation	18" and deeper

An Aerobic Treatment Plant and Spray Irrigation System was chosen as the method of on-site disposal of sewage.

I Chad A. Nesvadba P.E., a Professional Engineer, #91092, did personally conduct the site evaluation on December 27, 2017.

Design Summary

Flow from the residence will be routed as necessary to a 353 gallon pretreatment tank (built into NuWater B-550 or equal) and then to a 600 gallon per day (GPD) NuWater Aerobic System Model B-550. Flow from the treatment unit will be to a 750 gallon pump chamber. From this chamber, disposal will be through K-Rain ProPlus (or Equal) sprinkler heads via a Myers MD Series – 20 GPM Model, ½ HP, or equal.

Sprayfield Design

The application rate for this portion of Fort Bend County is 0.045 gallons per square foot, and yields a minimum spray area of 5,333 square feet. In order to achieve this area, three (3) K-Rain ProPlus (or Equal) sprinkler heads with low angle nozzles will be placed according the enclosed drawing. The sprinkler heads will be set for a radius of 30 feet, with rotation as shown. The total spray area will be 5,637 square feet, excluding areas of overlap. This exceeds the minimum required area.

The disposal area is on the southwesterly side of the residence. The area currently supports natural vegetation and will be minimally disturbed during construction. The vegetation will provide cover for both erosion protection and irrigation. Grasses should be cut as necessary to prevent interfering with sprinkler operation. Plants intended for human consumption shall not be grown within the application area.

Pump Chamber Storage

The proposed pump chamber will have a capacity of 750 gallons (750 Guzman used for example).

Dimensions:

Depth below inlet:	65"
Volume per inch:	12 gal
Actual Volume Below Inlet:	780 gal

Float setting (Timer Controlled):

Alarm ON:	40"
Pump ON:	32"
Pump OFF:	12"

=> 240 gal per cycle

The required storage volume in chamber after alarm activation is one-third of the design flow rate, or 100 gallons. The above application has 300 gallons of storage between the alarm on level and the inlet to the tank. Alarm shall be both audio and visual. The pump will be controlled by a commercial grade timer.

Inside the pump chamber, the discharge line shall include a tee and a gate valve, looking down. The valve shall be used to adjust the pressure at the sprinkler heads, and will provide agitation of the tank contents to reduce the possibility of extreme septic conditions in the tank.

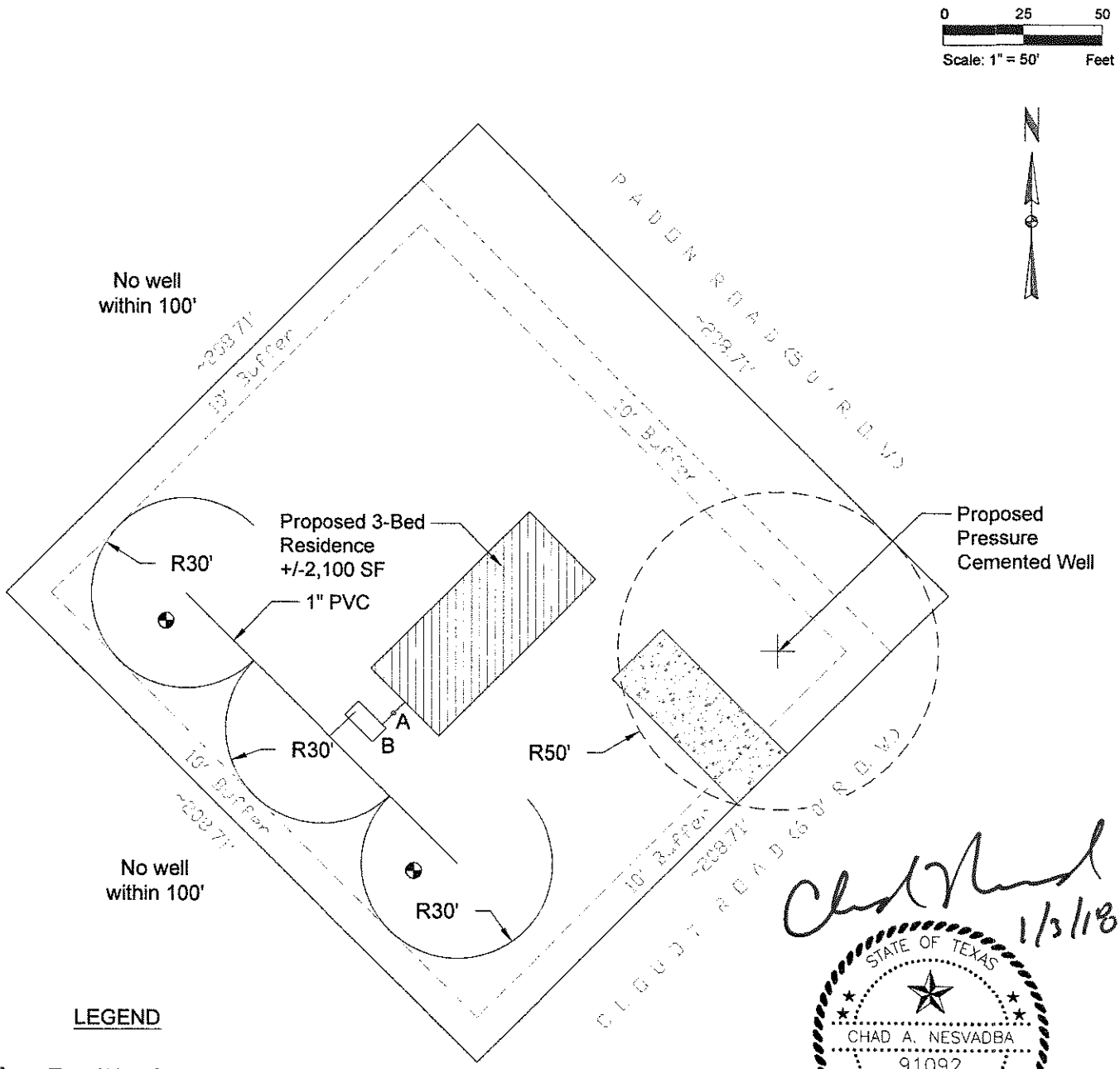
OSSF Maintenance and Management Practices

(a) An installer shall provide the owner of an OSSF with written information regarding maintenance and management practices and water conservation measures related to the OSSF installed, repaired, or maintained, by the installer.

(b) Owners shall have the treatment tanks pumped on a regular basis, in order to prevent sludge accumulation from spilling over to the next tank or the outlet device. Owners of treatment tanks shall engage only persons registered with the executive director to transport the treatment tank contents.

(c) Owners shall not allow driveways, storage buildings, or other structures to be constructed over the treatment or disposal systems.

(d) Owners shall not allow water softener and reverse osmosis back flush to enter into any portion of the OSSF.



1/3/18

STATE OF TEXAS
CHAD A. NESVADBA
91092
LICENSED
PROFESSIONAL ENGINEER

LEGEND

A Two-Way Cleanout

B 353 Gal. Pretreatment
600 GPD Aerobic Treatment
NuWater B-550 (or Equal)
750 Gal. Pump Tank

Soil Boring Location

Summary of Site Evaluation

Topography	Slight, < 2%
Vegetation	Grass & trees
Site Drainage	Adequate
Flood Hazard	Outside the 100-Year Flood Plain Zone X, FIRM #48157C 0400 & 0525 L
Water Supply	Private Water Well
Soil Type	0-24" Grey Clay Class IV
Seasonal Saturation	Depth > 18"

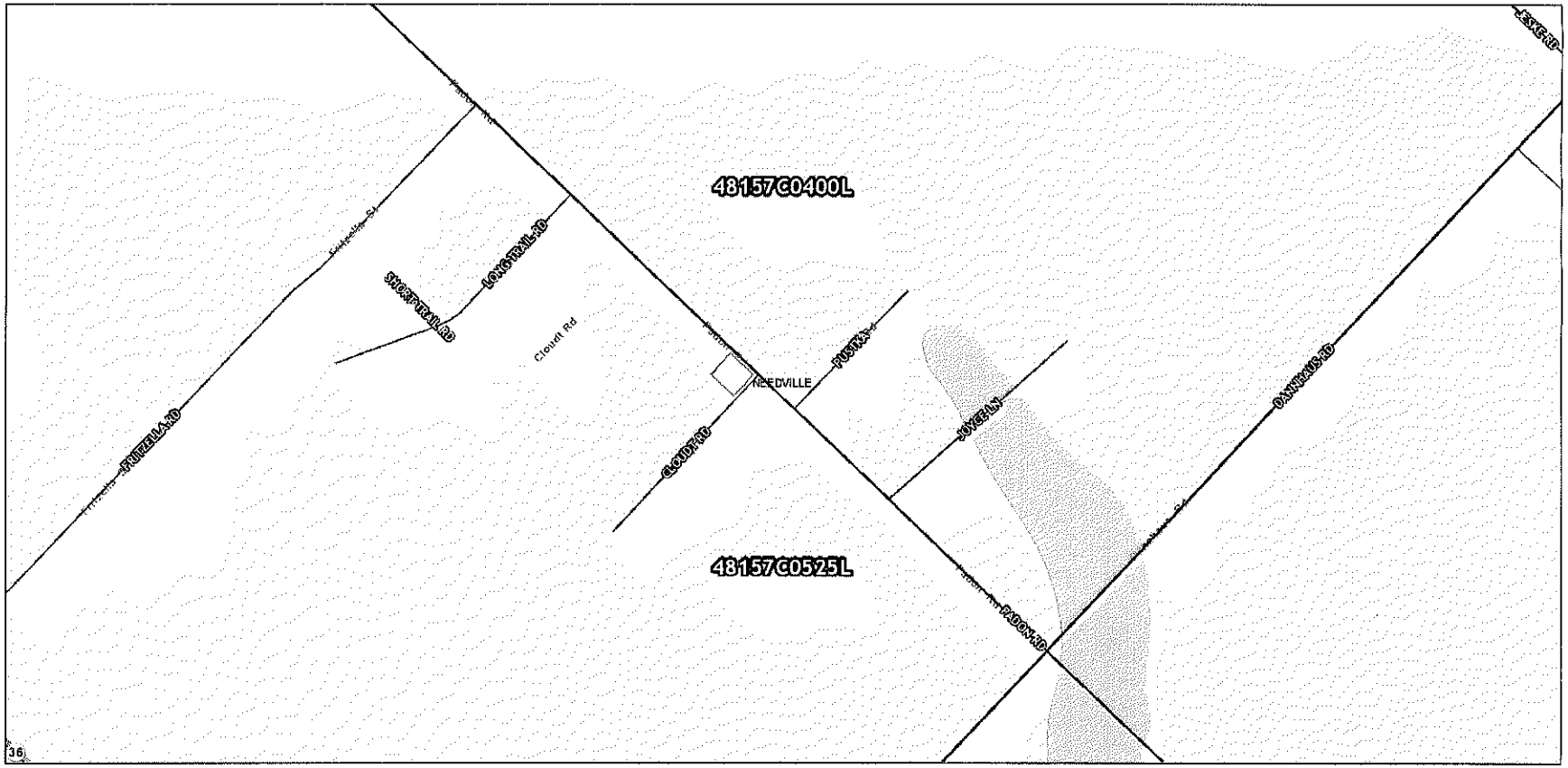
NESVADBA ENGINEERING SERVICES
PO Box 353, Needville, Texas 77461
Phone 281-543-4660
Texas Board of Professional Engineers Registration Number F-8079

ON-SITE SEWAGE FACILITY PLOT PLAN

Patrick & Beverly Drymala
12010 Cloudt Road
Needville, Texas 77461

1.0 Acres Being in the
F. Willaert Survey, A-92
Fort Bend County

FBC Floodplain Mapping Tool



December 28, 2017

1:9,028

0 0.075 0.15 0.3 mi

0 0.075 0.15 0.3 km

Highways
- INTERSTATE
- US HWY
- STATE HWY
- TOLL RD
- County Boundary

Streets
- Profile Baselines
- ACCESS
- COUNTY PROPOSED
- PRIVATE
- PUBLIC

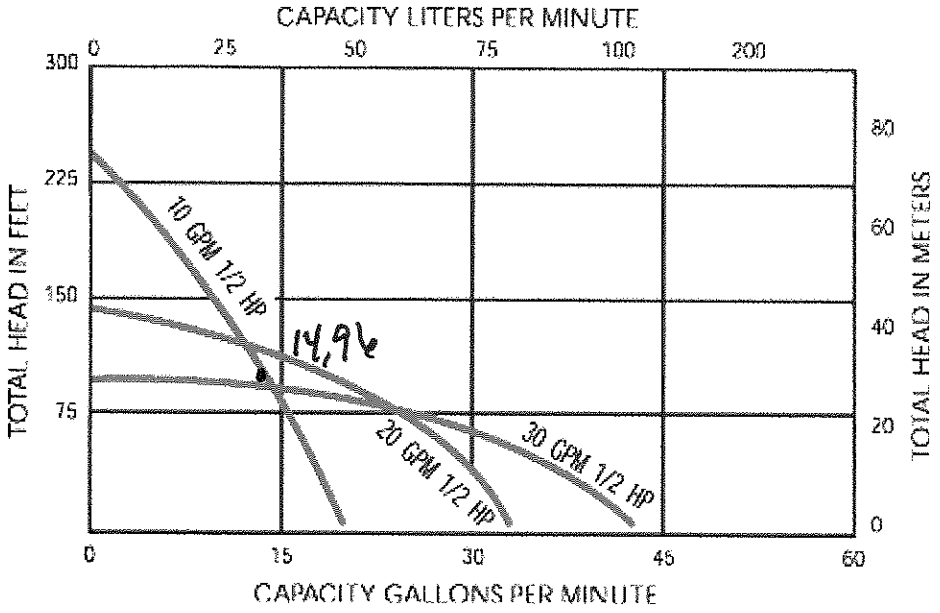
- PUBLIC MJR
- Base Flood Elevation
- Levees

Flood Plain Zone
- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD,
- A
- AE
- Floodway
- AO
- Protected By Levee
- Firm Panel
- Zip Code

FBCAD

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), Mapmyindia, NGCC, © OpenStreetMap contributors, and the GIS User Community

michael.wainright



Myers MD Series Pump Curves

4	= No. of K- Rain Proplus Gear Driven Sprinkler Heads (Max. per Zone)			
3.4	= GPM per Head			
13.6	= Total GPM			
Pressure Head = Line Pressure (psi) x 2.307 (ft/psi) =		30 (psi) x 2.307 (ft/psi) =	69.21	ft
Elevation Head = Difference in Elevation Between N.G. and F.L. of Pump Tank =			5	ft
Friction Loss for pipe = Calculated using Online Pipe Friction Loss Calculator =			21	ft
Friction Loss for pipe fittings =	3 90 Elbows	2 45 Elbows =	1.348	ft
		Total Dynamic Head =	**96.56**	ft

1/3/18

STATE OF TEXAS
CHAD A. NESVADBA
91092
LICENSED
PROFESSIONAL ENGINEER

Chad A. Nesvadba, PE
P.O. Box 353
Needville, TX 77461
281.543.4660
TX BPE Registration No. F-8079

PRO*PLUS*™ GEAR DRIVEN SPRINKLER SETTING INSTRUCTIONS

SPRINKLER INSTALLATION

1 ▶ INSTALL AND BURY

Do not use pipe dope.Thread the sprinkler on the pipe. Bury the sprinkler flush to grade. NOTE: Gear driven sprinklers and pop-up sprays should not be installed on the same watering zone.

2 ▶ INSPECTING THE FILTER

Unscrew the top and lift the complete sprinkler assembly out of the housing can. The filter is located on the bottom of the sprinkler assembly and can easily be pulled out, cleaned and re-installed.

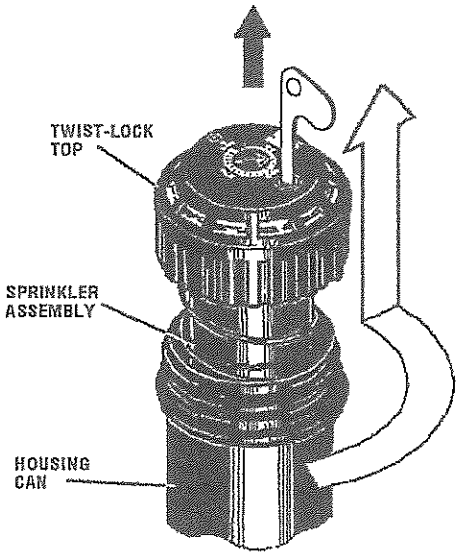
3 ▶ WINTERIZATION TIPS

When using an air compressor to remove water from the system please note the following:

1) Do not exceed 30 PSI.

2) Always introduce air into the system gradually to avoid air pressure surges. Sudden release of compressed air into the sprinkler can cause damage.

3) Each zone should run no longer than 1 minute on air. Sprinklers turn 10 to 12 times faster on air than on water. Over spinning rotors on air can cause damage to the internal components.



STANDARD NOZZLE PERFORMANCE

Nozzle	U.S. Pressure PSI	U.S. Radius Ft.	U.S. Flow GPM	METRIC Pressure KPa	METRIC Pressure Bars	METRIC Radius Meters	METRIC Flow L/M	METRIC Flow M³/H
#2.5 Factory Installed Nozzle	30	38'	2.5	206	2.04	11.6	9.46	.57
	40	39'	2.8	275	2.72	11.9	10.60	.64
	50	40'	3.2	345	3.40	12.2	12.11	.73
	60	41'	3.6	413	4.08	12.5	13.25	.79
#0.5	30	28'	0.5	206	2.0	8.5	1.89	.11
	40	29'	0.6	275	3.0	8.8	2.27	.14
	50	29'	0.7	345	3.5	8.8	2.65	.16
	60	30'	0.8	413	4.0	9.1	3.03	.18
#0.75	30	29'	0.7	206	2.0	8.8	2.65	.16
	40	30'	0.8	275	3.0	9.1	3.03	.18
	50	31'	0.9	345	3.5	9.4	3.41	.20
	60	32'	1.0	413	4.0	9.8	3.79	.23
#1	30	32'	1.3	206	2.0	9.8	4.92	.14
	40	33'	1.5	275	3.0	10.1	5.68	.18
	50	34'	1.6	345	3.5	10.4	6.05	.20
	60	35'	1.8	413	4.0	10.7	6.81	.23
#2	30	37'	2.4	206	2.0	11.3	9.08	.54
	40	40'	2.5	275	3.0	12.2	9.46	.56
	50	42'	3.0	345	3.5	12.8	11.35	.68
	60	43'	3.3	413	4.0	13.1	12.49	.75
#3	30	38'	3.6	206	2.0	11.6	13.63	.75
	40	39'	4.2	275	3.0	11.9	15.88	.95
	50	41'	4.6	345	3.5	12.5	17.41	1.04
	60	42'	5.0	413	4.0	12.8	18.92	1.13
#4	30	43'	4.4	206	2.0	13.1	16.65	.99
	40	44'	5.1	275	3.0	13.4	19.30	1.15
	50	46'	5.6	345	3.5	14.0	21.19	1.27
	60	49'	5.9	413	4.0	14.9	22.33	1.33
#6	40	45'	5.9	206	3.0	13.7	22.33	1.33
	50	46'	6.0	275	3.5	14.0	22.71	1.36
	60	48'	6.3	345	4.0	14.6	23.85	1.43
	70	49'	6.7	413	5.0	14.9	25.35	1.52
#8	40	42'	8.0	206	3.0	12.8	30.28	1.81
	50	45'	8.5	275	3.5	13.7	32.12	1.92
	60	49'	9.5	345	4.0	14.8	35.95	2.15
	70	50'	10.0	413	5.0	15.3	37.85	2.27

LOW ANGLE NOZZLE PERFORMANCE

Nozzle	U.S. Pressure PSI	U.S. Radius Ft.	U.S. Flow GPM	METRIC Pressure KPa	METRIC Pressure Bars	METRIC Radius Meters	METRIC Flow L/M	METRIC Flow M³/H
#1	30	22'	1.2	207	2.04	6.71	4.54	.34
	40	24'	1.7	275	2.72	7.32	5.43	.39
	50	26'	1.8	344	3.40	7.92	6.80	.41
	60	28'	2.0	413	4.08	8.53	7.56	.46
#3	30	29'	3.0	207	2.04	8.84	11.34	.68
	40	32'	3.1	275	2.72	9.75	11.72	.71
	50	35'	3.5	344	3.40	10.67	13.23	.80
	60	37'	3.8	413	4.08	11.58	14.36	.87
#4	30	31'	3.4	207	2.04	9.45	12.85	.78
	40	34'	3.9	275	2.72	10.36	14.74	.89
	50	37'	4.4	344	3.40	11.28	16.63	1.00
	60	38'	4.7	413	4.08	11.58	17.77	1.07
#6	40	38'	6.5	275	2.72	11.58	24.57	1.68
	50	40'	7.3	344	3.40	12.19	27.59	1.76
	60	42'	8.0	413	4.08	12.80	30.24	1.82
	70	44'	8.6	482	4.76	13.41	32.51	1.96

Data represents test results in zero wind for ProPlus. Adjust for local conditions. Radius may be reduced with nozzle retention screw.

K-RAIN MANUFACTURING CORP.
1640 Australian Avenue
Riviera Beach, FL 33404 USA
PH: 1-561-844-1002 / 1-800-735-7246
FAX: 1-561-842-9493
WEB: http://www.krain.com

© K-RAIN Manufacturing Corp. L-58921

BEING all that certain tract, piece or parcel of land lying and being situated in Fort Bend County, Texas, out of the F. Willaert Survey, Abstract 492 (North Quarter of H&TC RRY Co. Survey, Section 52), and being 1.0 acre only, referred to as Lot One for purposes of identification, out of the Original Iona Blanche Cloudt 120 acre tract that is better described in Volume 229, Page 326, of the Deed Records of Fort Bend County, to which refer in aid hereof; subject One Acre Lot One being more particularly described as follows, to-wit:

FOR CORRECTION COMMENCE at a point in the centerline of Padon Road, a 50 ft. wide county road, said point being the Northeast corner of the Original 120 acre Iona Blanche Cloudt Tract, the Northeast corner of said Willaert Survey, the South corner of the T.J. Marshall Survey, Abstract 427, the Eastern corner of the H&TC RRY Co. Survey, Section 47, Abstract 228, and the Western corner of H&TC RRY Co. Survey, Section 53, Abstract 231;

THENCE S 45°00'E with the centerline of Padon Road, a 50 ft. wide county road and the common Survey line between Sections 53 and 52, of the H&TC RRY Co. Survey, 2371.29 ft. to the TRUE POINT OF BEGINNING of this survey of Lot One;

THENCE continuing S 45°00'E with said centerline and survey line, 208.71 ft. to a 60d nail and the East corner of this survey of Lot One;

THENCE S 45°00'W with the Northwest R/W line of a 60 ft. wide access road, 208.71 ft. to the South corner of this survey;

THENCE N 45°00'W with the Northeast line of Lot 2 of this division, 208.71 ft. to an iron rod set for the Western corner of this 1.0 acre survey;

THENCE N 45°00'E with the Southeast line of Tract D, at 183.71 ft. pass an iron rod set for reference, in all, 208.71 ft. to the TRUE POINT OF BEGINNING of this survey of Lot One containing 1.0 acre of land.

CERTIFICATION

I hereby certify that the above Field Notes accurately reflect a true record of a survey made by me, on the ground, during September, 1977, with corners and distances as indicated on the accompanying Plat.

STATE OF TEXAS
THOMAS J. SANDERS
1578
REGISTERED PUBLIC SURVEYOR

Thomas J. Sanders
THOMAS J. SANDERS
Registered Public Surveyor #1578

TJS:jk

EXHIBIT "A"

FILED

'91 OCT 30 P4:14

COUNTY CLERK
FORT BEND COUNTY, TEXAS

STATE OF TEXAS COUNTY OF FORT BEND
I, hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the volume and page of the Official Records of Fort Bend County, Texas as stamped by me.

NOV 01 1991

County Clerk, Fort Bend Co., Tex.

UNOFFICIAL DOCUMENT

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Pump ON:	32"
Pump OFF:	12"

=> 240 gal per cycle

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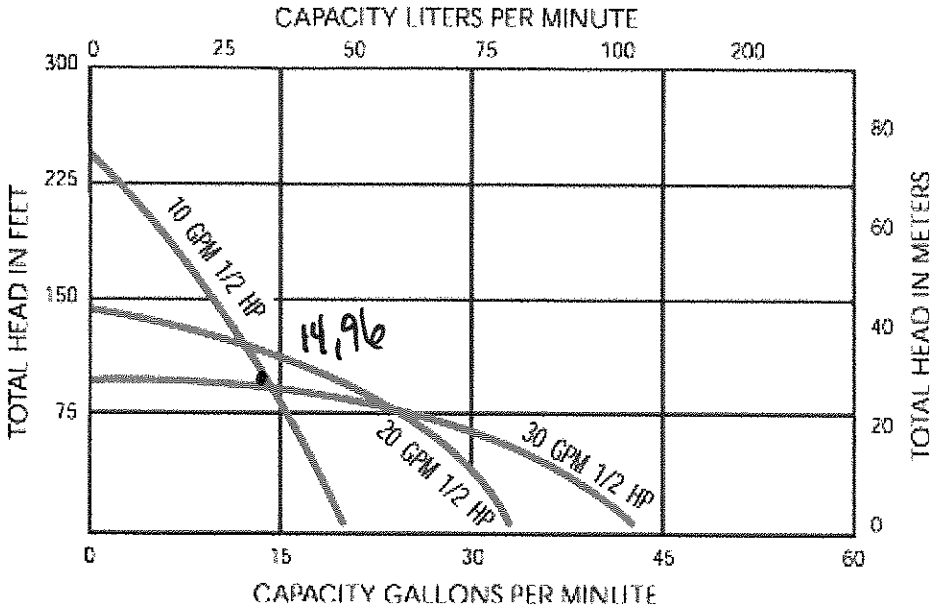

Myers MD Series Pump Curves

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13.6	= Total GPM			
Pressure Head = Line Pressure (psi) x 2.307 (ft/psi) =		30 (psi) x 2.307 (ft/psi) =	69.21	ft
Elevation Head = Difference in Elevation Between N.G. and F.L. of Pump Tank =			5	ft
Friction Loss for pipe = Calculated using Online Pipe Friction Loss Calculator =			21	ft
Friction Loss for pipe fittings =	3 90 Elbows	2 45 Elbows =	1.348	ft
		Total Dynamic Head =	**96.56**	ft

1/3/18

STATE OF TEXAS
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Chad A. Nesvadba, PE
P.O. Box 353
Needville, TX 77461
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TX BPE Registration No. F-8079

PROPLUS™ GEAR DRIVEN SPRINKLER SETTING INSTRUCTIONS

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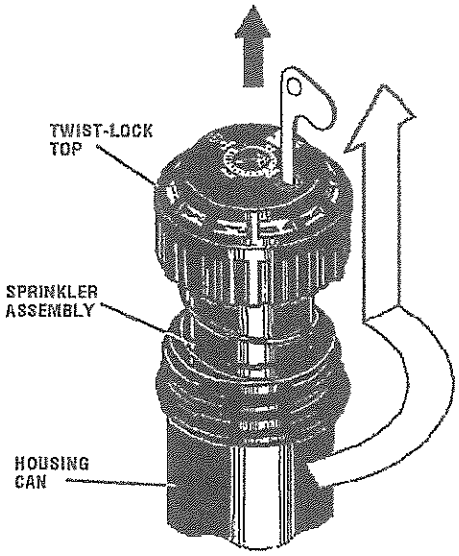

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	60	41'	3.6	413	4.08	12.5	13.25	.79
#0.5	30	28'	0.5	206	2.0	8.5	1.89	.11
	40	29'	0.6	275	3.0	8.8	2.27	.14
	50	29'	0.7	345	3.5	8.8	2.65	.16
	60	30'	0.8	413	4.0	9.1	3.03	.18
#0.75	30	29'	0.7	206	2.0	8.8	2.65	.16
	40	30'	0.8	275	3.0	9.1	3.03	.18
	50	31'	0.9	345	3.5	9.4	3.41	.20
	60	32'	1.0	413	4.0	9.8	3.79	.23
#1	30	32'	1.3	206	2.0	9.8	4.92	.14
	40	33'	1.5	275	3.0	10.1	5.68	.18
	50	34'	1.6	345	3.5	10.4	6.05	.20
	60	35'	1.8	413	4.0	10.7	6.81	.23
#2	30	37'	2.4	206	2.0	11.3	9.08	.54
	40	40'	2.5	275	3.0	12.2	9.46	.56
	50	42'	3.0	345	3.5	12.8	11.35	.68
	60	43'	3.3	413	4.0	13.1	12.49	.75
#3	30	38'	3.6	206	2.0	11.6	13.63	.75
	40	39'	4.2	275	3.0	11.9	15.89	.95
	50	41'	4.6	345	3.5	12.5	17.41	1.04
	60	42'	5.0	413	4.0	12.8	18.92	1.13
#4	30	43'	4.4	206	2.0	13.1	16.65	.99
	40	44'	5.1	275	3.0	13.4	19.30	1.15
	50	46'	5.6	345	3.5	14.0	21.19	1.27
	60	49'	5.9	413	4.0	14.9	22.33	1.33
#6	40	45'	5.9	206	3.0	13.7	22.33	1.33
	50	46'	6.0	275	3.5	14.0	22.71	1.36
	60	48'	6.3	345	4.0	14.6	23.85	1.43
	70	49'	6.7	413	5.0	14.9	25.35	1.52
#8	40	42'	8.0	206	3.0	12.8	30.28	1.81
	50	45'	8.5	275	3.5	13.7	32.12	1.92
	60	49'	9.5	345	4.0	14.8	35.95	2.15
	70	50'	10.0	413	5.0	15.3	37.95	2.27

LOW ANGLE NOZZLE PERFORMANCE

Nozzle	U.S. Pressure PSI	U.S. Radius Ft	U.S. Flow GPM	METRIC Pressure KPa	METRIC Pressure Bars	METRIC Radius Meters	METRIC Flow L/M	METRIC Flow M³/H
#1	30	22'	1.2	207	2.04	6.71	4.54	.34
	40	24'	1.7	275	2.72	7.32	5.43	.39
	50	26'	1.8	344	3.40	7.92	6.80	.41
	60	28'	2.0	413	4.08	8.53	7.56	.46
#3	30	29'	3.0	207	2.04	8.84	11.34	.68
	40	32'	3.1	275	2.72	9.75	11.72	.71
	50	35'	3.5	344	3.40	10.67	13.23	.80
	60	37'	3.8	413	4.08	11.58	14.36	.87
#4	30	31'	3.4	207	2.04	9.45	12.85	.78
	40	34'	3.9	275	2.72	10.36	14.74	.89
	50	37'	4.4	344	3.40	11.28	16.63	1.00
	60	38'	4.7	413	4.08	11.58	17.77	1.07
#6	40	38'	6.5	275	2.72	11.58	24.57	1.68
	50	40'	7.3	344	3.40	12.19	27.59	1.76
	60	42'	8.0	413	4.08	12.80	30.24	1.82
	70	44'	8.6	482	4.76	13.41	32.51	1.96

Data represents test results in zero wind for ProPlus. Adjust for local conditions. Radius may be reduced with nozzle retention screw.

K-RAIN MANUFACTURING CORP.
1640 Australian Avenue
Riviera Beach, FL 33404 USA
PH: 1-561-844-1002 / 1-800-735-7246
FAX: 1-561-842-9493
WEB: http://www.krain.com

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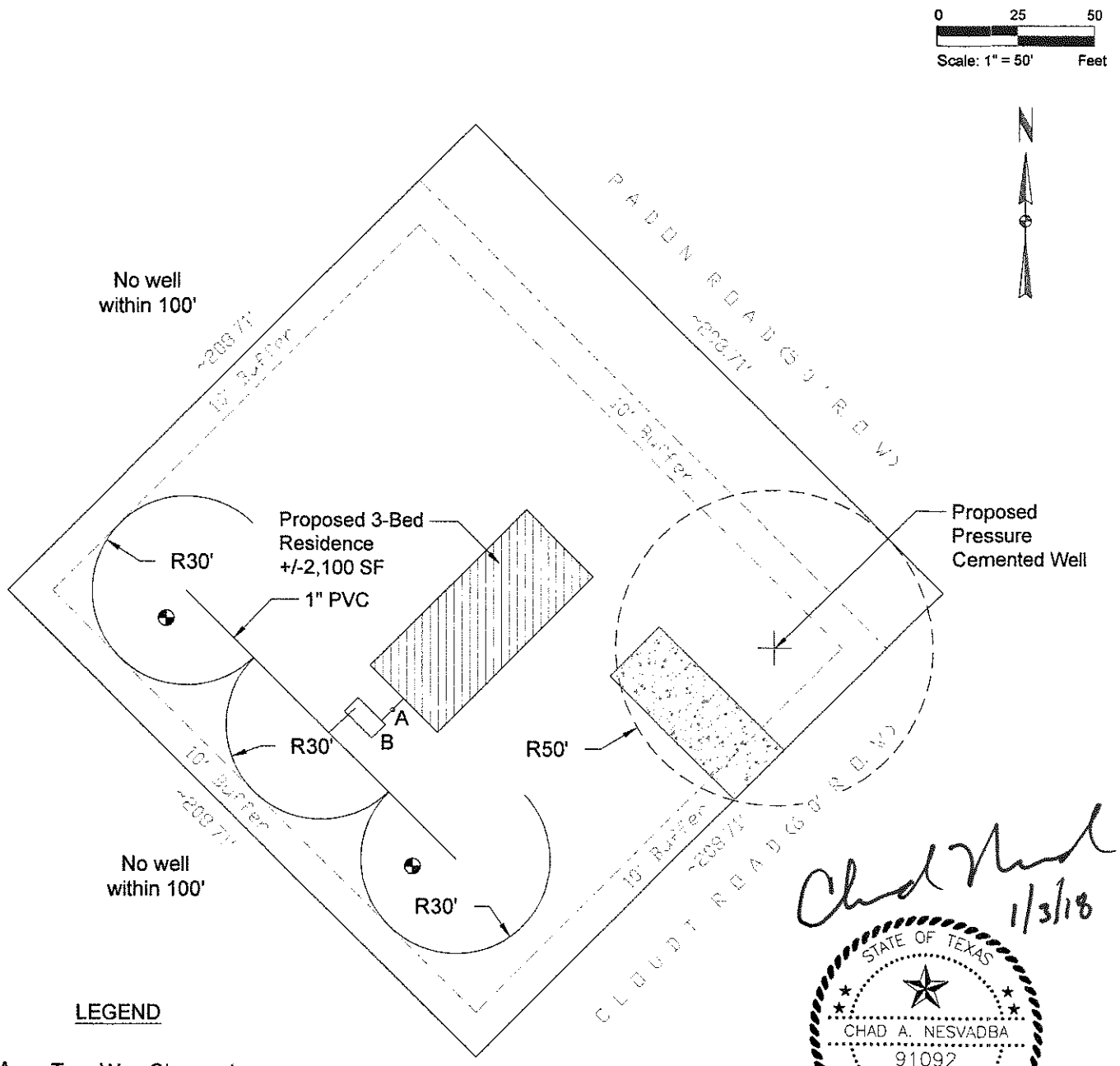


1/3/18

STATE OF TEXAS
CHAD A. NESVADBA
91092
LICENSED PROFESSIONAL ENGINEER

LEGEND

A Two-Way Cleanout

B 353 Gal. Pretreatment
600 GPD Aerobic Treatment
NuWater B-550 (or Equal)
750 Gal. Pump Tank

Soil Boring Location

Summary of Site Evaluation

Topography	Slight, < 2%
Vegetation	Grass & trees
Site Drainage	Adequate
Flood Hazard	Outside the 100-Year Flood Plain Zone X, FIRM #48157C 0400 & 0525 L
Water Supply	Private Water Well
Soil Type	0-24" Grey Clay Class IV
Seasonal Saturation	Depth > 18"

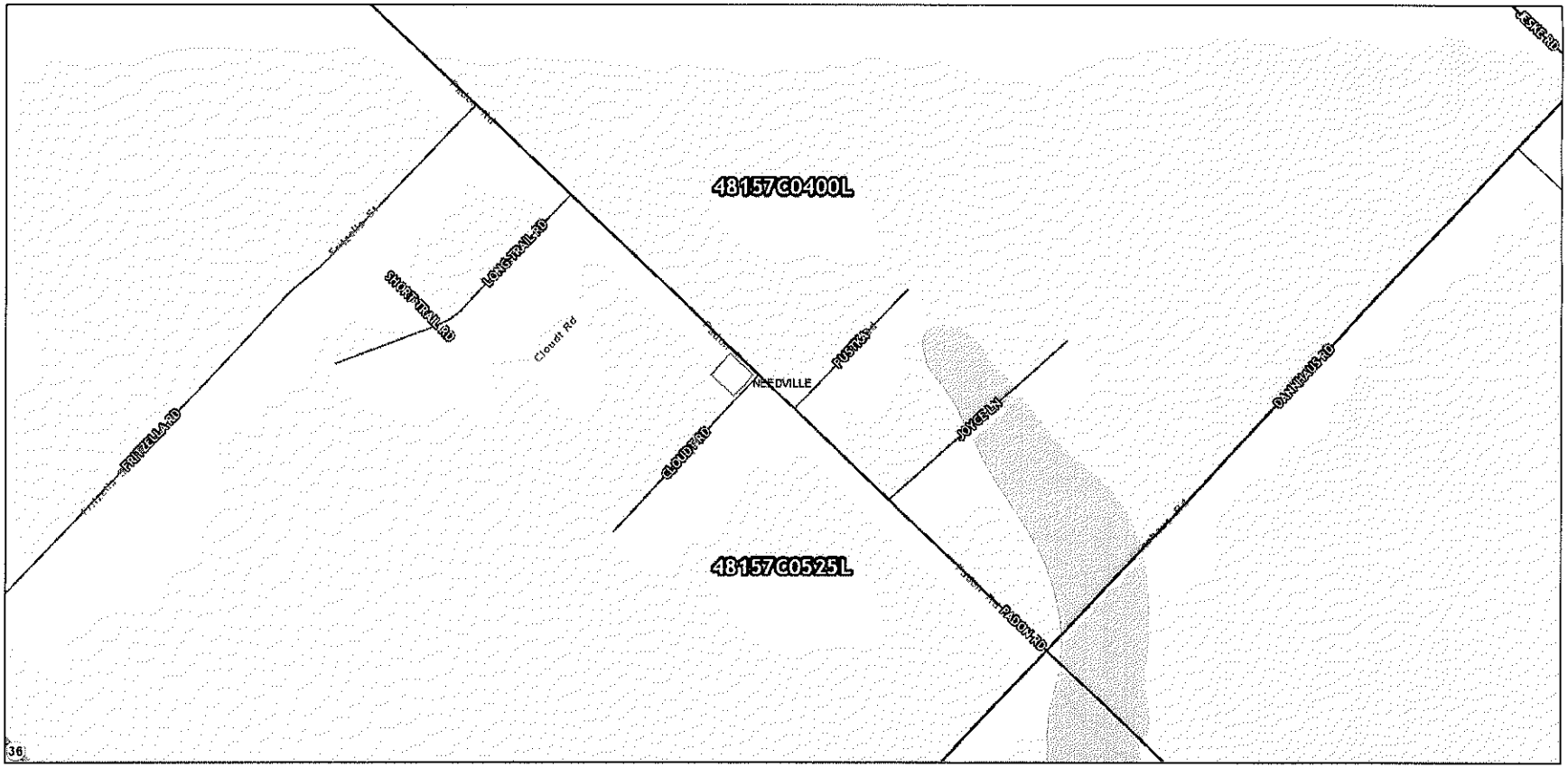
NESVADBA ENGINEERING SERVICES
PO Box 353, Needville, Texas 77461
Phone 281-543-4660
Texas Board of Professional Engineers Registration Number F-8079

ON-SITE SEWAGE FACILITY PLOT PLAN

Patrick & Beverly Drymala
12010 Cloudt Road
Needville, Texas 77461

1.0 Acres Being in the
F. Willaert Survey, A-92
Fort Bend County

FBC Floodplain Mapping Tool



December 28, 2017

1:9,028

0 0.075 0.15 0.3 mi

0 0.075 0.15 0.3 km

Highways
- INTERSTATE
- US HWY
- STATE HWY
- TOLL RD
- County Boundary

Profile Baselines

Streets
- ACCESS
- COUNTY PROPOSED
- PRIVATE
- PUBLIC

PUBLIC MJR

Base Flood Elevation

Levees

Flood Plain Zone
- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD,
- A
- AE
- Floodway
- AO
- Protected By Levee
- Firm Panel
- Zip Code

FBCAD

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), Mapmyindia, NGCC, © OpenStreetMap contributors, and the GIS User Community

michael.wainright

BEING all that certain tract, piece or parcel of land lying and being situated in Fort Bend County, Texas, out of the F. Willaert Survey, Abstract 492 (North Quarter of H&TC RRY Co. Survey, Section 52), and being 1.0 acre only, referred to as Lot One for purposes of identification, out of the Original Iona Blanche Cloudt 120 acre tract that is better described in Volume 229, Page 326, of the Deed Records of Fort Bend County, to which refer in aid hereof; subject One Acre Lot One being more particularly described as follows, to-wit:

FOR CONNECTION COMMENCE at a point in the centerline of Padon Road, a 50 ft. wide county road, said point being the Northeast corner of the Original 120 acre Iona Blanche Cloudt Tract, the Northeast corner of said Willaert Survey, the South corner of the T.J. Marshall Survey, Abstract 427, the Eastern corner of the H&TC RRY Co. Survey, Section 47, Abstract 228, and the Western corner of H&TC RRY Co. Survey, Section 53, Abstract 231;

THENCE S 45°00'E with the centerline of Padon Road, a 50 ft. wide county road and the common Survey line between Sections 53 and 52, of the H&TC RRY Co. Survey, 2371.29 ft. to the TRUE POINT OF BEGINNING of this survey of Lot One;

THENCE continuing S 45°00'E with said centerline and survey line, 208.71 ft. to a 60d nail and the East corner of this survey of Lot One;

THENCE S 45°00'W with the Northwest R/W line of a 60 ft. wide access road, 208.71 ft. to the South corner of this survey;

THENCE N 45°00'W with the Northeast line of Lot 2 of this division, 208.71 ft. to an iron rod set for the Western corner of this 1.0 acre survey;

THENCE N 45°00'E with the Southeast line of Tract D, at 183.71 ft. pass an iron rod set for reference, in all, 208.71 ft. to the TRUE POINT OF BEGINNING of this survey of Lot One containing 1.0 acre of land.

CERTIFICATION

I hereby certify that the above Field Notes accurately reflect a true record of a survey made by me, on the ground, during September, 1977, with corners and distances as indicated on the accompanying Plat.

Thomas J. Sanders
THOMAS J. SANDERS
Registered Public Surveyor #1578

STATE OF TEXAS
THOMAS J. SANDERS
1578
REGISTERED PUBLIC SURVEYOR

TJS:jk

EXHIBIT "A"

FILED

'91 OCT 30 P4:14

COUNTY CLERK
FORT BEND COUNTY, TEXAS

STATE OF TEXAS COUNTY OF FORT BEND
I, hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the volume and page of the Official Records of Fort Bend County, Texas as stamped by me.

NOV 01 1991

County Clerk, Fort Bend Co., Tex.

UNOFFICIAL DOCUMENT

PROPOSED OSSF DESIGN

Prepared for:	Patrick & Beverly Drymala 12010 Cloudt Road Needville, Texas 77461
Property Description:	1.0 Acre Tract of Land Out of the F. Willaert Survey, A-492 Fort Bend County, Texas

Design Parameters

1.	Structure	3 Bedroom Residence
2.	Size	< 2,500 sq.ft.
3.	Design Flow Rate	240 gallons per day (GPD) Three (3) bedroom residence w/ water saving devices (<2,500 sq ft) => 240 GPD
4.	Loading Rate	0.045 gallons per square foot
5.	Area Required	5,333 square feet
6.	Area Designed	5,637 square feet, excluding overlap areas

System Parameters

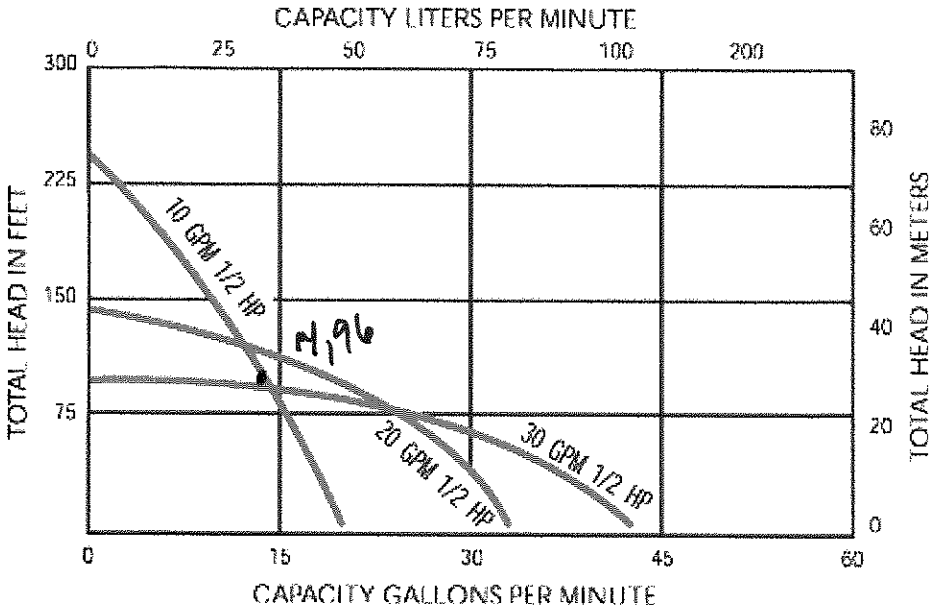
1.	Pretreatment Tank	353 gallon capacity (Built into NuWater B-550) (or Equal)
2.	Treatment Unit	600 GPD NuWater B-550 (or Equal)
3.	Pump Tank	750 gallon capacity (Built into NuWater B-550) (or Equal)
4.	Pump	Myers MD Series – 20 GPM Model, ½ HP, or equal
5.	Disinfection	Liquid Chlorinator (or Equal) Design Flow = 240 GPD or 908 liters/day BOD_5 requirement = 20 mg/liter Chlorine dosage required = 15 mg/liter or 13.6 grams/day Chlorine Storage (120 days) = 1634 grams (minimum), or equal
6.	Sprinkler Area	5,637 square feet
7.	Sprinkler Heads	3 K-Rain ProPlus (or Equal) sprinkler heads with low angle nozzles

Site Evaluation

1.	Topography	Slight, < 2%
2.	Vegetation	Grass & trees
3.	Site Drainage	Adequate
4.	Flood Hazard	Outside the 100 Year Flood Plain, Zone X FIRM #48157C 0400 & 0525 L
5.	Water Supply	Private Water Well
6.	Soil Type	0-24" Gray Clay (Class IV)
7.	Seasonal Saturation	18" and deeper

An Aerobic Treatment Plant and Spray Irrigation System was chosen as the method of on-site disposal of sewage.

I Chad A. Nesvadba P.E., a Professional Engineer, #91092, did personally conduct the site evaluation on December 27, 2017.



Myers MD Series Pump Curves

4	= No. of K- Rain Proplus Gear Driven Sprinkler Heads (Max. per Zone)				
3.4	= GPM per Head				
13.6	= Total GPM				
Pressure Head = Line Pressure (psi) x 2.307 (ft/psi) =			30 (psi) x 2.307 (ft/psi) =	69.21	ft
Elevation Head = Difference in Elevation Between N.G. and F.L. of Pump Tank =				5	ft
Friction Loss for pipe = Calculated using Online Pipe Friction Loss Calculator =				21	ft
Friction Loss for pipe fittings =	3	90 Elbows	2 45 Elbows =	1.348	ft
			Total Dynamic Head =	**96.56**	ft

1/3/18

STATE OF TEXAS
CHAD A. NESVADBA
91092
LICENSED
PROFESSIONAL ENGINEER

Chad A. Nesvadba, PE
P.O. Box 353
Needville, TX 77461
281.543.4660
TX BPE Registration No. F-8079

PRO*PLUS*™ GEAR DRIVEN SPRINKLER SETTING INSTRUCTIONS

SPRINKLER INSTALLATION

1 ▶ INSTALL AND BURY

Do not use pipe dope.Thread the sprinkler on the pipe. Bury the sprinkler flush to grade. NOTE: Gear driven sprinklers and pop-up sprays should not be installed on the same watering zone.

2 ▶ INSPECTING THE FILTER

Unscrew the top and lift the complete sprinkler assembly out of the housing can. The filter is located on the bottom of the sprinkler assembly and can easily be pulled out, cleaned and re-installed.

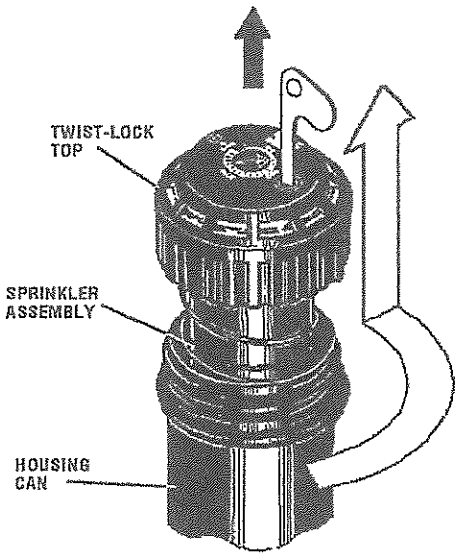
3 ▶ WINTERIZATION TIPS

When using an air compressor to remove water from the system please note the following:

1) Do not exceed 30 PSI.

2) Always introduce air into the system gradually to avoid air pressure surges. Sudden release of compressed air into the sprinkler can cause damage.

3) Each zone should run no longer than 1 minute on air. Sprinklers turn 10 to 12 times faster on air than on water. Over spinning rotors on air can cause damage to the internal components.



STANDARD NOZZLE PERFORMANCE

Nozzle	U.S. Pressure PSI	U.S. Radius Ft.	U.S. Flow GPM	METRIC Pressure KPa	METRIC Pressure Bars	METRIC Radius Meters	METRIC Flow L/M	METRIC Flow M³/H
#2.5 Factory Installed Nozzle	30	38'	2.5	206	2.04	11.6	9.46	.57
	40	39'	2.8	275	2.72	11.9	10.60	.64
	50	40'	3.2	345	3.40	12.2	12.11	.73
	60	41'	3.6	413	4.08	12.5	13.25	.79
#0.5	30	28'	0.5	206	2.0	8.5	1.89	.11
	40	29'	0.6	275	3.0	8.8	2.27	.14
	50	29'	0.7	345	3.5	8.8	2.65	.16
	60	30'	0.8	413	4.0	9.1	3.03	.18
#0.75	30	29'	0.7	206	2.0	8.8	2.65	.16
	40	30'	0.8	275	3.0	9.1	3.03	.18
	50	31'	0.9	345	3.5	9.4	3.41	.20
	60	32'	1.0	413	4.0	9.8	3.79	.23
#1	30	32'	1.3	206	2.0	9.8	4.92	.14
	40	33'	1.5	275	3.0	10.1	5.68	.18
	50	34'	1.6	345	3.5	10.4	6.05	.20
	60	35'	1.8	413	4.0	10.7	6.81	.23
#2	30	37'	2.4	206	2.0	11.3	9.08	.54
	40	40'	2.5	275	3.0	12.2	9.46	.56
	50	42'	3.0	345	3.5	12.8	11.35	.68
	60	43'	3.3	413	4.0	13.1	12.49	.75
#3	30	38'	3.6	206	2.0	11.6	13.63	.75
	40	39'	4.2	275	3.0	11.9	15.89	.95
	50	41'	4.6	345	3.5	12.5	17.41	1.04
	60	42'	5.0	413	4.0	12.8	18.92	1.13
#4	30	43'	4.4	206	2.0	13.1	16.65	.99
	40	44'	5.1	275	3.0	13.4	19.30	1.15
	50	46'	5.6	345	3.5	14.0	21.19	1.27
	60	49'	5.9	413	4.0	14.9	22.33	1.33
#6	40	45'	5.9	206	3.0	13.7	22.33	1.33
	50	46'	6.0	275	3.5	14.0	22.71	1.36
	60	48'	6.3	345	4.0	14.6	23.85	1.43
	70	49'	6.7	413	5.0	14.9	25.35	1.52
#8	40	42'	8.0	206	3.0	12.8	30.28	1.81
	50	45'	8.5	275	3.5	13.7	32.12	1.92
	60	49'	9.5	345	4.0	14.8	35.95	2.15
	70	50'	10.0	413	5.0	15.3	37.85	2.27

LOW ANGLE NOZZLE PERFORMANCE

Nozzle	U.S. Pressure PSI	U.S. Radius Ft.	U.S. Flow GPM	METRIC Pressure KPa	METRIC Pressure Bars	METRIC Radius Meters	METRIC Flow L/M	METRIC Flow M³/H
#1	30	22'	1.2	207	2.04	6.71	4.54	.34
	40	24'	1.7	275	2.72	7.32	5.43	.39
	50	26'	1.8	344	3.40	7.92	6.80	.41
	60	28'	2.0	413	4.08	8.53	7.56	.46
#3	30	29'	3.0	207	2.04	8.84	11.34	.68
	40	32'	3.1	275	2.72	9.75	11.72	.71
	50	35'	3.5	344	3.40	10.67	13.23	.80
	60	37'	3.8	413	4.08	11.58	14.36	.87
#4	30	31'	3.4	207	2.04	9.45	12.85	.78
	40	34'	3.9	275	2.72	10.36	14.74	.89
	50	37'	4.4	344	3.40	11.28	16.63	1.00
	60	38'	4.7	413	4.08	11.58	17.77	1.07
#6	40	38'	6.5	275	2.72	11.58	24.57	1.68
	50	40'	7.3	344	3.40	12.19	27.59	1.76
	60	42'	8.0	413	4.08	12.80	30.24	1.82
	70	44'	8.6	482	4.76	13.41	32.51	1.96

Data represents test results in zero wind for ProPlus. Adjust for local conditions. Radius may be reduced with nozzle retention screw.

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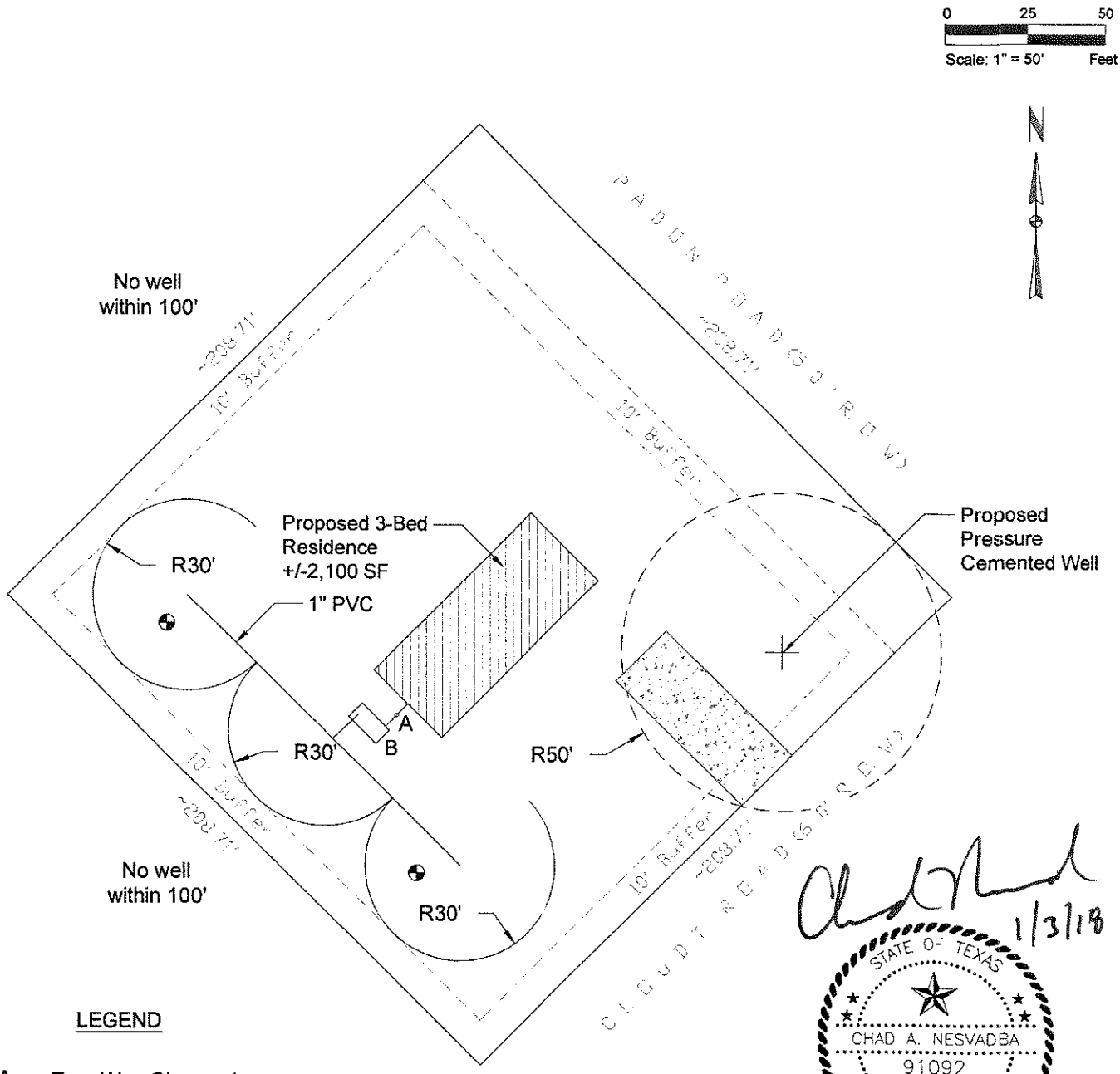

1/3/18

STATE OF TEXAS
CHAD A. NESVADBA
91092
LICENSED PROFESSIONAL ENGINEER

LEGEND

A Two-Way Cleanout

B 353 Gal. Pretreatment
600 GPD Aerobic Treatment
NuWater B-550 (or Equal)
750 Gal. Pump Tank

Soil Boring Location

Summary of Site Evaluation

Topography	Slight, < 2%
Vegetation	Grass & trees
Site Drainage	Adequate
Flood Hazard	Outside the 100-Year Flood Plain Zone X, FIRM #48157C 0400 & 0525 L
Water Supply	Private Water Well
Soil Type	0-24" Grey Clay Class IV
Seasonal Saturation	Depth > 18"

NESVADBA ENGINEERING SERVICES
PO Box 353, Needville, Texas 77461
Phone 281-543-4660
Texas Board of Professional Engineers Registration Number F-8079

ON-SITE SEWAGE FACILITY PLOT PLAN

Patrick & Beverly Drymala
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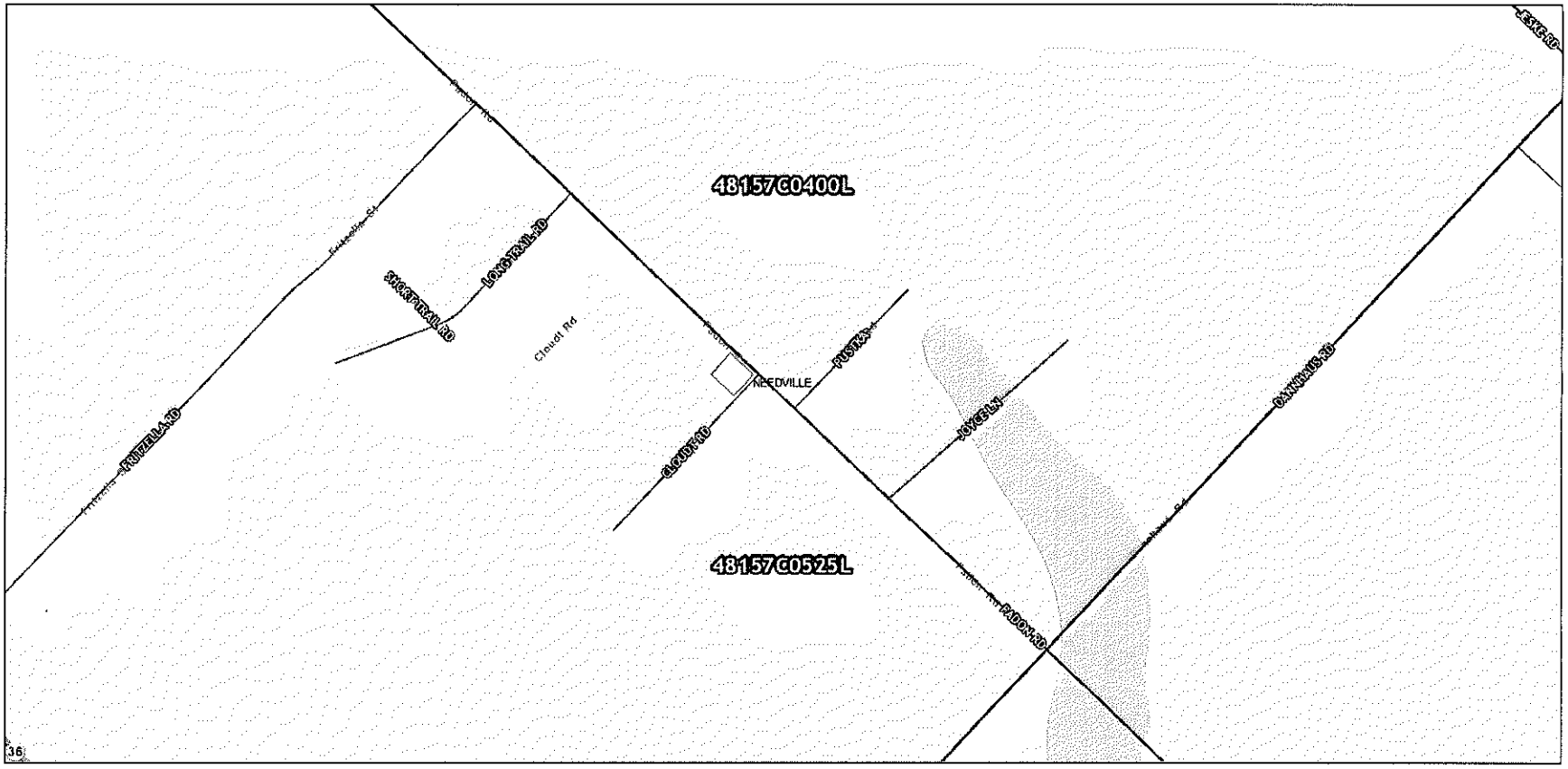
Needville, Texas 77461

1.0 Acres Being in the
F. Willaert Survey, A-92
Fort Bend County

FBC Floodplain Mapping Tool



December 28, 2017

Highways
- INTERSTATE
- US HWY
- STATE HWY
- TOLL RD
- County Boundary

Streets
- Profile Baselines
- ACCESS
- COUNTY PROPOSED
- PRIVATE
- PUBLIC
- PUBLIC MJR
- Base Flood Elevation
- Levees

Flood Plain Zone
- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- A
- AE
- Floodway
- AO
- Protected By Levee
- Firm Panel
- Zip Code

1:9,028

0 0.075 0.15 0.3 mi

0 0.075 0.15 0.3 km

FBCAD

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), Mapmyindia, NGCC, © OpenStreetMap contributors, and the GIS User Community

michael.wainright

BEING all that certain tract, piece or parcel of land lying and being situated in Fort Bend County, Texas, out of the F. Willaert Survey, Abstract 492 (North Quarter of H&TC RRY Co. Survey, Section 52), and being 1.0 acre only, referred to as Lot One for purposes of identification, out of the Original Iona Blanche Cloudt 120 acre tract that is better described in Volume 229, Page 326, of the Deed Records of Fort Bend County, to which refer in aid hereof; subject One Acre Lot One being more particularly described as follows, to-wit:

FOR CORRECTION COMMENCE at a point in the centerline of Padon Road, a 50 ft. wide county road, said point being the Northeast corner of the Original 120 acre Iona Blanche Cloudt Tract, the Northeast corner of said Willaert Survey, the South corner of the T.J. Marshall Survey, Abstract 427, the Eastern corner of the H&TC RRY Co. Survey, Section 47, Abstract 228, and the Western corner of H&TC RRY Co. Survey, Section 53, Abstract 231;

THENCE S 45°00'E with the centerline of Padon Road, a 50 ft. wide county road and the common Survey line between Sections 53 and 52, of the H&TC RRY Co. Survey, 2371.29 ft. to the TRUE POINT OF BEGINNING of this survey of Lot One;

THENCE continuing S 45°00'E with said centerline and survey line, 208.71 ft. to a 60d nail and the East corner of this survey of Lot One;

THENCE S 45°00'W with the Northwest R/W line of a 60 ft. wide access road, 208.71 ft. to the South corner of this survey;

THENCE N 45°00'W with the Northeast line of Lot 2 of this division, 208.71 ft. to an iron rod set for the Western corner of this 1.0 acre survey;

THENCE N 45°00'E with the Southeast line of Tract D, at 183.71 ft. pass an iron rod set for reference, in all, 208.71 ft. to the TRUE POINT OF BEGINNING of this survey of Lot One containing 1.0 acre of land.

CERTIFICATION

I hereby certify that the above Field Notes accurately reflect a true record of a survey made by me, on the ground, during September, 1977, with corners and distances as indicated on the accompanying Plat.

Thomas J. Sanders
THOMAS J. SANDERS
Registered Public Surveyor #1578

STATE OF TEXAS
THOMAS J. SANDERS
1578
REGISTERED PUBLIC SURVEYOR

TJS:jk

EXHIBIT "A"

FILED

'91 OCT 30 P4:14

Diane Wilson
COUNTY CLERK
FORT BEND COUNTY, TEXAS

STATE OF TEXAS COUNTY OF FORT BEND
I, hereby certify that this instrument was filed on the date and time stamped hereon by me and was duly recorded in the volume and page of the Official Records of Fort Bend County, Texas as stamped by me.

NOV 01 1991

Diane Wilson
County Clerk, Fort Bend Co., Tex.

UNOFFICIAL DOCUMENT