

The soils on this site are approved when the following is completed in full and signed by the approving authority. The information contained in this site evaluation reflects Delaware Department of Natural Resources and Environmental Control (DNREC) policies and procedures at the time of the review. Exhibits and Regulations cited in this report refer to DNREC "Regulations Governing the Design, Installation, and Operation of On-Site Wastewater Treatment and Disposal Systems" (OWTDS). Isolation distance requirements, limited area of suitable soils, filling, removal, and/or compaction of the soil may negate construction permit approval or modify the type of system that can be permitted. All information should be verified by interested parties prior to design and installation of the OWTDS. This is not a construction permit. Approval of this site evaluation is limited to five years. Upon expiration, a new site evaluation will be required in compliance with regulations in effect at the time. There are no guarantees supplemental approvals will be for the same system type (s) prescribed herein.

Property Owner's Name(s): Richard V. Francisco, Sr. and Joanne Francisco **Tax Map #:** 2-34-32.00-73.00

Initial Disposal System: *Innovative and Alternative Full Depth Gravity Fed/ Pressure Dosed OWTDS with a PSN3 Advanced Treatment Unit (ATU) or other Conventional drainfield or Innovative and Alternative (PSN3 required) OWTDS;* **Trenches** are recommended based on soil conditions with an average gravel placement at 24 inches bgs. and are required where average slopes exceed 2 percent. OWTDS Options are *provided* isolation distances are maintained per **Exhibit C**

User Notes: **1)** The OWTDS design area is shown irrespective of adjacent well isolation requirements. Maximize the OWTDS setback to the adjacent wells (recommendation). **2)** Fine textured soils range from 20 to 72 inches beneath grade in the design area. Trenches are recommended to mitigate the potential for mounding. **3)** As a result of soil and site conditions, proctoring of the drainfield installation (soil moisture conditions, drainfield invert, drainfield-soil interface, site disturbance/ compaction verification, and materials quality) is *strongly* recommended due to soil conditions and planned development activities. Contact the Site Evaluator (**72 hours notice**, subject to additional costs) to verify the drainfield invert/ soil-site conditions/ materials (**Note** to be placed on Construction Page of Permit/ Permit Conditions). **4)** No construction traffic is to occur in or adjacent to the potential OWTDS area – a substantial barrier is to be placed in the area to prevent over-trafficking. This is especially important given the design area in the front of the lot. The owner is responsible for placing a substantial barrier around the proposed OWTDS area to prevent over-trafficking/ compaction. No vehicular traffic (non-tracked) is to enter the drainfield area for the purposes of system installation. **5)** There is a large Sycamore **tree** along the road right-of-way with the potential for lateral roots. Maximize the setback to the tree to the extent practicable.

Location of Initial System: As shaded (cross-hatched) on the plot drawing in the vicinity of Soil Borings **1, 2, 3, and 4**

Depth to Limiting Zone: **72** inches (or greater) below ground surface (bgs., lowest design area elevation) to indications (prolonged, 7 to 14 continuous days) of seasonal saturation/ the high water table; *36 inch separation distance* recommended.

<u>SLOPES</u>	<u>SLOPE SIGNIFICANCE</u>	<u>LANDSCAPE POSITION(s)</u>
0 to 3 percent	<i>Significant, Trenches Recommended/ Required</i>	Backslope

Design Considerations and Comments: For the optimal OWTDS, see Exhibit **K** {Full Depth Gravity; optimal gravel (quality washed) placement at an average of 24 inches bgs.; an over-dig is suitable, if necessary}. Interested parties should pay attention to slopes to the proposed building to ensure gravity flow – otherwise pressure dosing (Exhibit **R**), a lift station, or a set building sewer elevation may be required. Other conventional drainfield or innovative and alternative drainfield technologies OWTDS options are available at the discretion of the interested parties. It is recommended that the interested parties consider *tankage* that allows for project flow equalization and a water meter to monitor daily wastewater volume. It is recommended that the client consider a wastewater operator/ Class E installer to oversee the proper system function and pump out schedule given the proposed land-use. The designer/ installer should work closely with the property owner/ interested parties on this parcel due to site and soil conditions. The location of the design area was selected under the direction of the client; however, there are other areas of suitable size on the proposed parcel that are suited for the above-referenced OWTDS. Contact the Site Evaluator should additional or an alternative system location be required. A 100 ft. isolation distance is generally required from all non-public wells and **150 feet from all public wells**. A lesser well isolation distance may be approved for wells on a case by case basis; contact DNREC Water Supply and/ or reference Exhibit C. Maintain a minimum 50 feet setback to the invert of any planned, future stormwater basin-s (infiltration structure) or 100 feet to any stormwater structures/ features that intersect the seasonal high water table. **An OWTDS Permit is recommended prior to additional site planning.**

This evaluation is to site one On-site Wastewater Treatment and Disposal System (OWTDS) for the construction of a proposed sales office, to be situated on approximately 5.3 acres. Maintain the appropriate siting density as set forth in Section - *Continued on Approval Page 2 of 2* -

09/14/2015
 Date

01 0921'15 09:13 09/16/15 PM SITE EVAL. \$75.00
 Evaluator's Signature

COMMERCIAL INNOVATIVE AND ALTERNATIVE SITE EVALUATION - APPROVAL PAGE 2 OF 2

Property Owner's Name(s): Richard V. Francisco, Sr. and Joanne Francisco

Tax Map #: 2-34-32.00-73.00

Design Considerations and Comments: - Continued from Approval Page 1 of 2 -

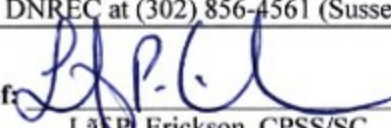
3.31.15. This Site Evaluation was conducted for wastewater volumes of less than 1,500 gallons per day. Should the system size exceed this wastewater volume, additional soils investigations (test pits and soil permeability testing) and geo-hydrologic (> 2,500 gallons per day) work will be required. See *Summary of Evaluation* on next page for explanatory information regarding the design criteria, limiting zone depth, and percolation rate. The potential disposal area is presently a portion of an unmaintained field in early succession (recently bush-hogged). Slopes are generally **0 to 3 percent** in the potential OWTDS area and are significant to OWTDS design and installation. Slopes are to be confirmed by the system designer. **Trenches** are recommended due to sloping conditions and required where average slopes exceed 2 percent.

Features of interest are shown on a plot drawing adapted from the Deed (DB 3959, PG 230). All soil borings and pertinent features were located with a differential GPS unit with reported sub-meter accuracy and referenced to the found, northwest property corner (found iron pipe) and Utility Pole **DPL 55755 01590**. NO CONSTRUCTION TRAFFIC IS TO OCCUR IN THE POTENTIAL DISPOSAL AREA. NO OVER-TRAFFICKING IS ALLOWED OVER OR ADJACENT TO THE SYSTEM AREA AND PARKING BARRIERS ARE RECOMMENDED/ REQUIRED. THE CLIENT/ PROPERTY OWNER/ DEVELOPER IS RESPONSIBLE FOR PLACING A SUBSTANTIAL BARRIER AROUND THE PROPOSED DISPOSAL AREA PRIOR TO BEGINNING ANY SITE DEVELOPMENT. SOIL DISTURBANCES IN THE DISPOSAL AREA WILL NEGATE THIS SITE EVALUATION (SEE DISCLAIMER ABOVE) AND MAY NECESSITATE THE USE OF A SAND-LINED SYSTEM. **System installation and all site work should occur during PROPER SOIL MOISTURE CONDITIONS and final grading must insure that no surface water be directed towards the OWTDS area (includes roof downspout and impervious area drainage or sump pump discharge). Irrigation use, system over-trafficking, water treatment discharge, and/ or tree plantings in the drainfield area are prohibited activities by the Site Evaluator and will void this Site Evaluation. Cautions are important given soil conditions.** The investigations and recommendations contained herein are based on our best professional judgments and knowledge of applicable regulations, policies, and procedures as they pertain to On-site Wastewater Treatment and Disposal Systems (OWTDS). ARM, Inc. is not responsible for any subsurface conditions not encountered at the time of this evaluation which may become evident in the future that affect the placement or design criteria of the OWTDS. It is important to note that conditions between borings are, in fact, unknown.

Future Replacement Disposal System Type: Same as above or sand-lined upgrade in area of initial system(s)

Instructions to Property Owner(s) – Client(s)

- 1) Contact a Class C System Designer.
- 2) A percolation rate of **35** minutes per inch (**with a 36 inch separation distance**) has been assigned to the soils in the OWTDS design area based upon rates as provided in Section 5 and Exhibit Y of the regulations and other factors. You may use the assigned percolation rate or, at your expense, have a percolation test conducted. If you do not choose to use the assigned percolation rate, contact a Licensed Class A Percolation Tester (2 sets of 3 tests recommended) and the Site Evaluator (testing specifications: depth and location).
- 3) If you have questions, call the evaluator at (302) 539-2029 or DNREC at (302) 856-4561 (Sussex) / (302) 739-9947 (Kent).

This report has been prepared by or under the supervision of: , License # A/D-2460
LARP Erickson, CPSS/SC

Disclaimer: Approval of this site evaluation indicates only that the site evaluation based on information presented to us, was conducted in compliance with these regulations. It is not an indication of the correctness or quality of the evaluation nor does it guarantee the evaluation is free of omissions.

Field Checked _____

For office use only

Expiration Date 10/2/20

Date 10/2/15


DNREC Reviewing Soil Scientist

Departmental Review Comments/Suggestions: _____

COMMERCIAL INNOVATIVE AND ALTERNATIVE DESIGN OWTDS SITE EVALUATION REPORT

Property Owner's Name(s): Richard V. Francisco, Sr. and Joanne Francisco

Tax Map #: 2-34-32.00-73.00

Owner's Address: 3707 Valley Brook Drive
Wilmington, DE 19808

Phone #: (302) 462-5658, Point of Contact: Edward Timmons

Property Location: Southeast of SR 24 (John J. Williams HWY; ADJ 911: 30007); 250'± NE of Washington ST EXT, Millsboro,

Property Size: 5.3± acres (per Deed: DB 3959, PG 230; parent parcel plat date 01/1944 or before; revised 1990) / Sussex Co., DE

Evaluator's Name: Lāf P. Erickson, CPSS/SC **License Number:** A/D-2460 **Evaluation Dates:** 08/04 and 08/29/2015

Central Sewer: N/A; > 200 feet to Millsboro Town Limits - Millsboro Planning Area

Central Water: N/A; > 200 feet to Millsboro Town Limits

Watershed: **Inland Bays**; Indian River Bay (HUC 020403030201); >100 feet from Watercourse(s); No area Tax Ditch R.O.W.s

Depth to and Type of Limiting Zones Encountered - all measurements are depths beneath ground surface (bgs)

Soil Boring 1: > 72 inches to redoximorphic features as an indication of seasonal saturation/ the seasonal high water table at
> 132 (both dates) inches to free water; Arenic Hapludult—Fort Mott Series (217772'±N, 692370'±E)

Soil Boring 2: > 72 inches to redox. features as an indication of seasonal saturation/ the seasonal high water table;
> 132 (both dates) inches to free water; Arenic Hapludult—Fort Mott Series (217760'±N, 692492'±E)

Soil Boring 3: > 72 inches to redoximorphic features as an indication the seasonal high water table/seasonal saturation
> 72 inches to free water; Arenic Hapludult—Fort Mott Series (217601'±N, 692417'±E)

Soil Boring 4: > 72 inches to redoximorphic features as an indication the seasonal high water table/seasonal saturation
> 72 inches to free water; Arenic Hapludult—Fort Mott Series

Recon Borings (un-logged): > 60 inches to limiting zone; > 72 inches to free water; Arenic Hapludult—Fort Mott Series

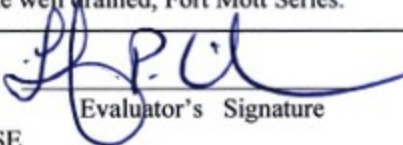
Summary of Evaluation: Soils in the potential OWTDS area are well drained (agricultural drainage class) with moderately rapidly and moderately (35 MPI OWTDS design with noted separation distance of 36 inches) permeable stratum/ substratum. Site conditions are suited for an **Innovative and Alternative Full Depth Gravity Fed/ Pressure Dosed OWTDS with a PSN3 Advanced Treatment Unit et al** in the vicinity of Soil Borings 1, 2, 3, and 4; **provided** isolation distances (especially area well) are maintained per Exhibit C. The soils in the potential disposal area are generally positioned on the summit, shoulder, and slight backslope landscape positions of a broad, ridge. Slopes are generally 0 to 3 percent in the OWTDS design area and are significant to OWTDS design and installation. The OWTDS design area is greater than 100 feet from any adjacent watercourse. Maintain a minimum 50 feet setback to any planned infiltration structure-s or 100 feet (shellfish waters) to any potential stormwater wet ponds/ practices. Tax ditch rights of way do not impact the parcel. The parcel is not located within any mapped Federal Emergency Management Agency (FEMA) floodplains, DNREC mapped wetlands (SWMP) areas, and/or DNREC mapped wellhead protection areas. See the **User Notes** and **Design Considerations and Comments** on the **Approval Pages** for important property information and details on system design and installation. The availability/ timing/ feasibility of sanitary sewerconnection-availability is beyond this work scope.

The limiting zone was assigned at 72 inches or greater based on the lack of redoximorphic features to that depth at all Soil Borings. The limiting zones were uniform across the evaluated area. Due to sloping conditions, a partially incised system may be suitable for this property; however, an average gravel placement of 24 inches is recommended. The deeper limiting zone allows for a maximum installation depth of 36 inches at the highest design area elevations. A hybrid Capping Fill - Full Depth - Overdig may be required to overcome elevational differences over a bed or trench area. Free water (groundwater) levels were greater than 132 inches bgs. over the dates of investigation. Through August 31st, precipitation levels for the water year: -0.5± inch below normal (Georgetown, DGS).

For design purposes, the moderate percolation rate was assigned at 35 minutes per inch based on the most hydraulically restrictive subsoil/ solum/ stratum/ substratum (horizon) observed from 0 to 60-72 inches. **Trenches** are recommended by the Site Evaluator due to sloping conditions with an average gravel placement of 24 inches beneath grade. The heaviest soil textures identified were sandy loam and/ or fine sandy loam (heavy in one case) materials observed within the argillic horizons (zones of maximum clay accumulation - soil forming factors/ deposition). These textures were found at all Soil Borings at varying depths ranging from 20 to 72+ inches from the surface. In addition to subsoil clay content, weak and massive soil structure, contrasting textural classes/ deposits, the depth to and thickness of hydraulically limiting horizons site development factors/ proposed land-use, and long term acceptance of wastewaters were determining factors in the assigned percolation rate. Percolation testing will be necessary to prove the feasibility of a faster (more permeable) rate.

The OWTDS area is mapped within the well to somewhat excessively drained, Fort Mott-Henlopen complex, 2 to 5 percent slopes (FhB) soil mapping unit in the Web Soil Survey. Soils in the OWTDS area correlate to the well drained, Fort Mott Series.

09/14/2015
Date


Evaluator's Signature

Atlantic Resource Management, Inc. Job # 294-DS15-CSE

Note: Site evaluation information was collected for OWTDS interpretations only. The information in this site evaluation and plot plan has been compiled from any of the following sources: tax map, deed, survey, recorded plot, or field located property corners, and may include anecdotal information supplied by property owners, adjacent residents, and/or other interested parties. Locations of wells and septic systems are by direct observation where possible, but are often based on information provided by permits, property owners, adjacent residents, and/or other interested parties. This plot plan represents the site conditions at the time of evaluation but it is not a survey. No title search has been conducted; any easements shown are from subdivision record plans or deed. Subsequent alteration of the site or adjacent properties may negate approval by the regulatory agency involved in permitting. All information should be reverified prior to purchase or use.

SOIL PROFILE NOTES

Atlantic Resource Management, Inc.

Post Office Box 869

Ocean View, DE 19970

(302) 539-2029 Office / (302) 539-4601 Fax

Profile: SB 1 4SB4 8/29/2015

Job Number: 294-DS15-RE

Date(s) of Test(s): 08/04/2015

Soil Boring ✓

or Test Pit

Property Owner(s): Richard V., Sr. & Joanne Francisco

Property Location: South of SR 24, 900' Northeast of CR 305; Millsboro, Sussex County, Delaware

Site Evaluator: Laf Erickson

License #: A/D-2460

Slope: 0 - 1.5%

Relief: SUMMIT OF RIDGE

Estimated Permeability:

MODERATELY RAPID & MODERATE (35m)

Depth to Limiting Zone:

> 72 INCHES TO A LIMITING ZONE FOR THE INTENDED PURPOSE

Soil Classification / Series:

ARWIK HAPW DOW - FULT MOTT

MPI	Horizon	Depth	Colors		Redox. Desc.		Texture	Structure	Consistence
			Matrix	Redox.	Ab.	S. Con.			
	A _p	0 to 7	10YR 4/1	N/A		N/A	LS	2MG	VFR
	E	7 to 20	10YR 6/4	"	"	"	LS	1 FSBK	VFR
	B+1	20 to 28	10YR 6/4	10YR 4/6	M 2, 3 D		SL -	3 ESBK	VFR / FR
	B+2	28 to 44	10YR 7/1	10YR 4/6	C 2 P		LS 4LS	1 ESBK	VFR
	B+3	44 to 57	10YR 5/4	10YR 7/2	L 2 D		SL +	3 M SBK	FR
	B+4 + CB	57 to 72	10YR 6/4	5YR 5/6	L 2, 3 D		LS & SL	2 ESBK	VFR / FR
	B+5	72 to 76	NO REDOX.				SL	M	FR
	C1	76 to 96	← " " → w/ Fe/mn sub.				LS-SL	1 C ₁ sub	VFR/FR

Precipitation:

None

Free Water:

> 132" (BOTH AREAS)

Land Cover:

Cleared Young Trees, Mowed Grass

Comments:

C3 102-120 : SL

C4 120-132 : SL +

SOIL BORING # 4

*SIMILAR TO SB3 IN TX. d CLASS; FW > 72"; 35m/I;

Coordinates: Z17.77E N+ 692370 E+

Site Evaluator's Signature:

[Signature]

Described by: Matt King

Property Owner / Property Location:

Francisco/ TM # 2-34-32.00-73.00

Profile: SB 2

Date(s): 08/04/2015 48/29 Soil Boring ☒ or Test Pit

Slope: 0 - 1.5

Relief: BACKSLOPE

Estimated Permeability:

MODERATELY RAPID & MODERATE

Depth to Limiting Zone:

> 72 INCHES TO A LIMITING ZONE FOR THE INTENDED PURPOSE

Soil Classification / Series:

ARONIC HAPLO DUTY FORT MOTT

MPI	Horizon	Depth	Colors		Redox. Desc.		Texture	Structure	Consistence
			Matrix	Redox.	Ab. S. Con.				
	Ap	0 to 8	10YR 3/2	N/A	N/A		LS	1 F.Gr	VFR / L
	EB	8 to 12	10YR 5/4	"	"		LS	1 FSBK	VFR
	BE	12 to 35	10YR 6/4	"	"		LS	1 FSBK	VFR
	Bt1	35 to 39	10YR 5/6	"	"		LS + SL	1 ESBK	VFR & HZ
	Bt2	39 to 54	10YR 6/6	"	"		LS + SL	1 ESBK	VFR & HZ
	CB	54 to 65	10YR 6/4	10YR 5/8	C 1, 2 P		LS	1 ESBK	VFR
	C1	65 to 72	10YR 7/4	10YR 5/8 10YR 6/6	M 2, 3 P C 2, 3 D		CLS	1 ESBK	VFR
	C2	72 to 132	(BOTH DATES)				LS		

Free Water:

7132'

Comments:

16 - 11 = 5'

< 5'

Coordinates: 217760' N+ 692492' E+

Profile: SB 3

Slope: 1 - 3%

Relief: Backslope

Estimated Permeability:

SAMS

Depth to Limiting Zone:

> 72 INCHES TO A LIMITING ZONE FOR THE INTENDED PURPOSE

Soil Classification / Series:

SAMS

MPI	Horizon	Depth	Colors		Redox. Desc.		Texture	Structure	Consistence
			Matrix	Redox.	Ab. S. Con.				
	Ap	0 to 11	10YR 4/2	N/A	N/A		LS	7 F.Gr	VFR
	E	11 to 30	10YR 6/4	"	"		LS	1 FSBK	VFR
	BE1	30 to 45	10YR 6/6	"	"		LS	1 C, 2 M Sbk	VFR
	Bt2 & Bt1	45 to 54	10YR 7/2	10YR 4/6 10YR 6/6	M 2 P C 1, 2 P		LS - SL	2 M Sbk 1 E	VFR & HZ
	Bt2 & Bt1	54 to 62	10YR 6/4	10YR 4/6 10YR 5/6	M 2, 3 P C 2 P		LS	1 C Sbk	VFR
	C	62 to 72	10YR 7/1	10YR 4/6	M 3 P		LS	1 C Sbk	VFR
		to							
		to							

Free Water:

> 72'

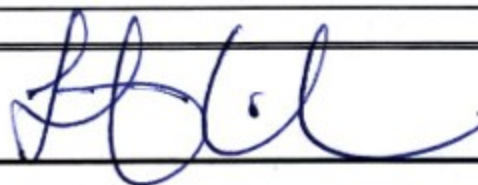
Comments:

*

Coordinates: 217601' N+ 692417' E+

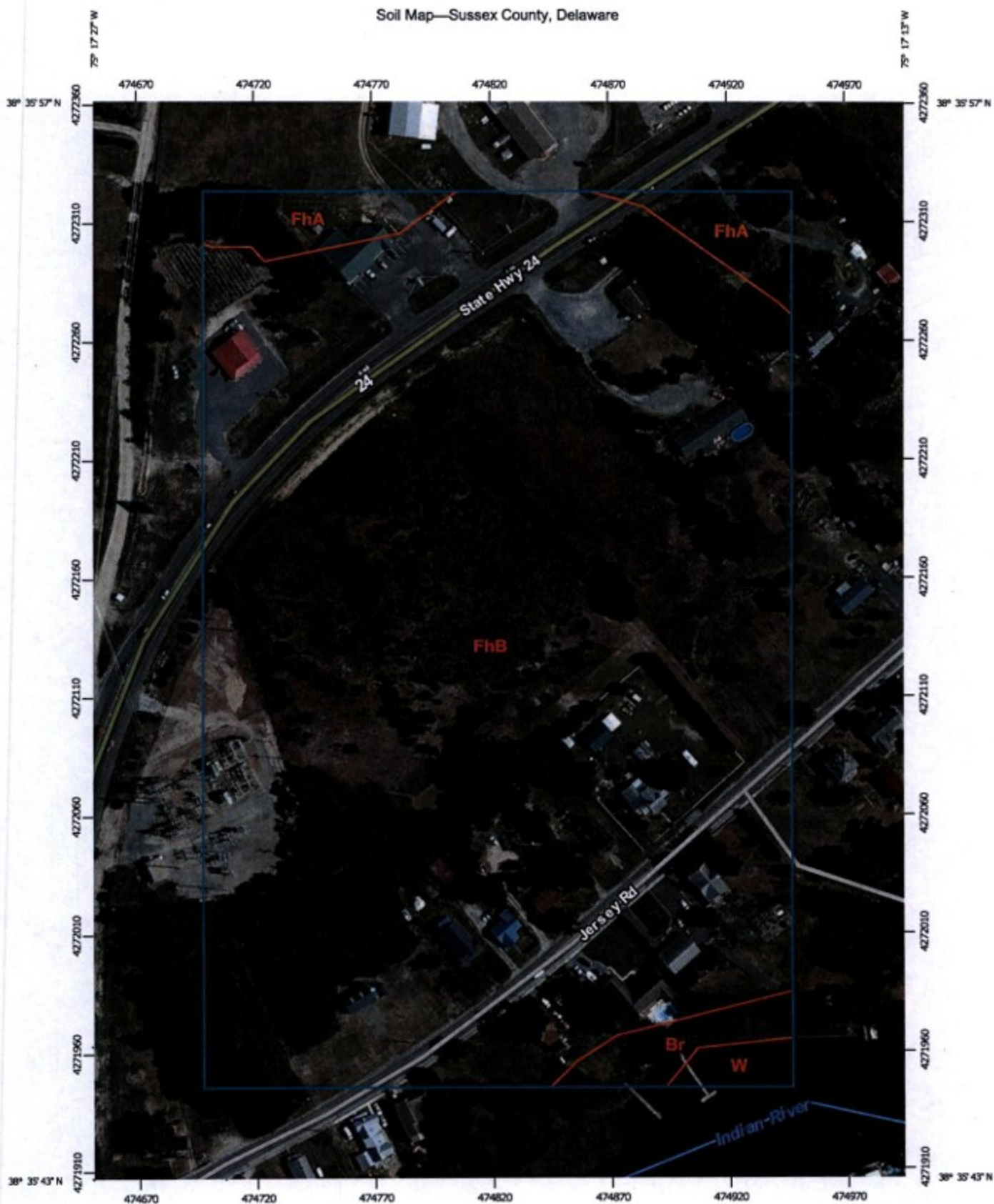
Described by: Site Evaluator's Signature:

Matt King

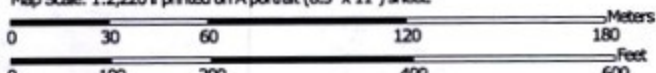




Soil Map—Sussex County, Delaware



Map Scale: 1:2,220 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

9/9/2015
Page 1 of 3



POTENTIAL OWTDS AREA;
PROVIDED ISOLATION DISTANCES
ARE MAINTAINED PER EXHIBIT C

▲ SB 1

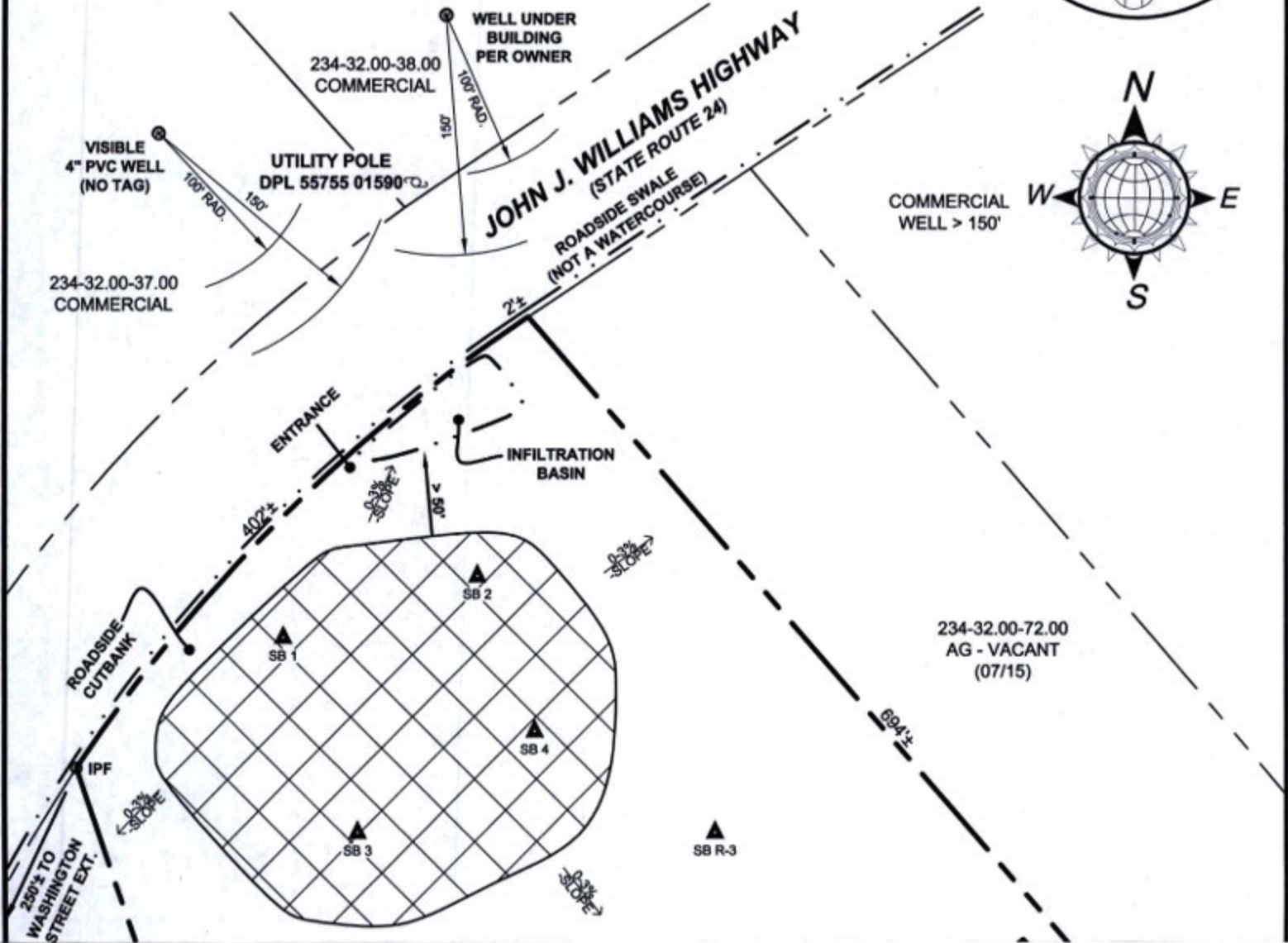
SOIL BORING



SLOPE ARROW

NOTES:

1. PARCEL IS ENTIRELY MAPPED FhB IN THE CURRENT SOIL SURVEY.
2. THIS PLOT DRAWING IS NOT A SURVEY - NO TITLE SEARCH WAS REQUESTED OR PERFORMED. THE SUBJECT PARCEL IS SUBJECT TO EASEMENTS OF RECORD. THE MOST RECENT DEED AND/OR PLOT WERE RESEARCHED FOR PROPERTY LINE PLACEMENT AND EASEMENTS. PROPERTY LINE ANGLES AND DIMENSIONS MAY VARY.



Sussex County, Delaware - Zoning and Sales Information

PROPERTY DETAILS

- [General Information](#)
 - [Appraisal & Assessment Info](#)
 - [Sales Info](#)
 - [Map of Property](#)
-

General Information

District-Map-Parcel:

2-34 32.00 73.00

Owner(s) Names:

FRANCISCO , RICHARD V SR & JOANNE FRANCISCO

Property Legal Description:

S/RT 24

900'NE/RT 305

Billing Address:

3707 VALLEY BROOK DR

WILMINGTON , DE 19808

Land Use:

Commercial

Zoning:

Agricultural/Residential

Town/Municipality:

-No Town or Municipality Specified-

Fire District(s):

Millsboro Fire District

Tax Ditch(es):

-No Ditch Records-

Sewer/Water

District:

-No Sewer Records-

Watershed:

CHINCOTEAGUE