54.0'

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-3-07

**Contract:** 25-113-01

Boring Location: Sta. 720+42.99, 5' Lt. C.L.

**Boring Surface Elev.: 30.00** Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: 2 Type of: Split Barrel O.D. O.D.

IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

Depth of Water 11.2' **Depth of Casing** Time **Depth of Hole** Elev. of Water Date 12.0' 4/2/08 14.0 18.8 30.0 30.0 30.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 100.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Hillebrand

					<del>-</del>	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
	j	1	0.5'	4 4 8	Visual Description: Wet firm brown clayey silt w/ sand.	No sieve analysis; ; Topsoil - 6"; fill material.
		2	2.0' 2.0'	4	2" RECOVERY No Sample Recovery	
2.49			4.0'	4 5 7	ORBIDIN 0" RECOVERY	1G
4.98		3	4.0' 6.0'	3 6 14 12	Wet very stiff brown coarse to fine sandy silt, trace of gravel.  12" RECOVERY	Fill material.
7.47		4	6.0'	4 5 5 8	Wet loose brown silty coarse to fine sand, trace of gravel.  A-2-4(0)	Fill material.
			8.0'		18" RECOVERY	
		5	8.0'	3 4 4 4	Wet loose brown coarse to fine sand w/ some silt, trace of gravel.	
9.96			10.0'		15" RECOVERY	
		6	10.0'	2 4 4 4	Saturated loose orange-brown coarse to fine sand w/ some silt, trace of gravel.  A-2-4(0)	
			12.0'		24" RECOVERY	
12.45		7	12.0'	5 5 6 7	Saturated medium dense orange-brown coarse to fine sand w/ some silt, trace of gravel.	
			14.0'	12	24" RECOVERY	
		8	14.0'	12 5	Saturated medium dense orange-brown fine to A-2-4(0)	

**Remarks:** Mud Rotary at 54.0

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./C	G.I. Remarks
14.94	J		'	6 12	coarse sand w/ some silt, trace of gravel.	
		9	16.0' 16.0'	8 7	13" RECOVERY  Saturated medium dense orange-brown coarse A-1-1	)
				8 7 8 9	to fine sand and gravel.	
17.43						
		10	18.0' 18.0'	14	24" RECOVERY Saturated medium dense orange-brown coarse A-1-l	)
				14 9 14 16	to fine sand w/ some silt, trace of gravel.	
19.92			20.0'		24" RECOVERY	
22.41						
22.41					<b>III</b> DRAFI	
		11	24.0'	26	Saturated dense brown coarse to fine sand w/ A-1-	
24.9				26 20 16 12	some silt and gravel.	NC
		<b>V</b> 1		ı		
			26.0'		20" RECOVERY	
			Λ		GUST 2015	
27.39				<b>\U</b>	IJUSI ZUR	
		12	29.0'	15 5 14 17	Saturated medium dense brown fine sand w/ A-2-4(	0)
29.88				17	some coarse sand and silt, trace of gravel.	
			31.0'		12" RECOVERY	
			31.0		12 RECOVERT	
20.07						
32.37						
		40	24.0	1.4		
34.86		13	34.0'	14 8 11 9	Saturated medium dense brown fine sand w/ A-2-4( some coarse sand and silt, trace of gravel.	0)
000						
			36.0'		16" RECOVERY	
37.35						

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

			-		1	Т		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
39.84		14	39.0'	12 7 3 10	11:1:1:4:4:1:1:1	Saturated loose brown fine sand w/ some coarse sand, trace of silt.  14" RECOVERY	A-3	
44.82		15	44.0'	11 13 13 16		Saturated medium dense gray-brown silty fine sand, trace of coarse sand and gravel.  24" RECOVERY	A-2-4(0)	
49.8		16	49.0'	5 9 11 13		Saturated medium dense gray silty fine sand w/ some coarse sand, trace of gravel.	A-2-4(0)	IG
52.29		U-1	5 <mark>1</mark> .0' 51.0'			21" RECOVERY  Saturated gray silty clayey fine to coarse sand with a trace of gravel.  22" RECOVERY	A-2-4(0)	Press Sample - Shelby Tube.
54.78		17	54.0'	4 4 5 8	t	Saturated stiff gray clayey fine sandy silt, trace of coarse sand and gravel.  24" RECOVERY	A-4(0)	
57.27		18	59.0'	5			A 4/0	
59.76		I IR		5 10 15 18		Saturated very stiff gray clayey fine sandy silt w/ some coarse sand, trace of gravel.	A-4(0)	
			61.0'			20" RECOVERY		

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
62.25								
64.74		19	64.0'	5 7 8 10		Saturated medium dense gray clayey fine sand w/ some coarse sand.	A-2-4(0)	
			66.0'			19" RECOVERY		
67.23								
69.72		20	69.0'	4 9 11 13		Saturated very stiff gray fine sandy silt w/ some clay, trace of coarse sand and gravel.	A-4(0)	
			71.0'			20" RECOVERY		
72.21				Τ		OR BIDI		IG
		21	74.0'	12			A-2-4(0)	
74.7		21		12 12 15 16		Saturated medium dense gray silty fine sand, trace of coarse sand.	A-2-4(0)	
			76.0'		-	18" RECOVERY		
77.19								
79.68		22	79.0'	10 11 15 17		Saturated very stiff gray fine sandy silt w/ some clay, trace of organic matter, gravel, and coarse sand.	A-4(0)	
			81.0'		-	24" RECOVERY		
82.17								
84.66		23	84.0'	8 11 15 19		Saturated very stiff dark green fine sandy silt, trace of organic matter, coarse sand, and	A-4(0)	Glauconitic.

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
()					gravel.		
			86.0'		19" RECOVERY		
87.15							
		24	89.0'	8 12	Saturated hard dark green fine sandy silt,	A-4(0)	Glauconitic.
89.64				8 12 21 24	trace of organic matter and coarse sand.		
			91.0'		15" RECOVERY		
92.13							
020							
					DRAFI		
94.62	_	25	94.0'	7 10 15	Saturated very stiff dark green fine sandy silt w/some organic matter, trace of coarse sand.	A-4(0)	Glauconitic.
				19	w sorte of game finance, the of course sund.	$\mathcal{I}$	
		<b>V</b>	96.0'		20" RECOVERY	<b>J</b> II'	
97.11			Λ		VIOT OO	15	
					JUSI ZU		
		26	98.0'	10 13 16 19	Saturated medium dense dark green silty fine sand, trace of organic matter rand coarse sand.	A-2-4(0)	Glauconitic.
				19	sand, trace of organic matter rand coarse sand.		
99.6			100.0'		19" RECOVERY		
					Boring terminated at 100.0 feet.		
102.09							
102.09							
104.58							
107.07							

Symbol Description

Strata symbols

Silt

Silty sand

1000000

Poorly graded sand with silt



Poorly graded clayey silty sand



Clayey sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 4/2/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 75.
- Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Boring elevation was obtained from Figure A-2, Structure BR1-3 Exploration Plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

74.0'

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301, Maryland State Line to I-95 Boring No.: BR1-3-08

**Contract:** 25-113-01

**Boring Location:** Sta. 718+66.33, 89' Rt. C.L.

**Boring Surface Elev.: 30.00** Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: 2 IN. Type of: Split Barrel O.D. O.D.

Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. U-Sampler: 3 Ball Sampler Core Bit: O.D.

To: To: **Casing Size:** 3 1/4 Inches From Depth of:

Hollow Stem Auger: From Depth of: 0.0'

Water Level Readings

**Depth of Casing** Elev. of Water Time **Depth of Hole Depth of Water** Date 20.0 30.0 3/31/08 12.0' 10.0' 14.0 30.0 30.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: 100.0 Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Hillebrand

		1					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.5'	2 7 8	Wet stiff brown clayey coarse sandy silt w/ some fine sand, trace of gravel.	A-4(1)	Topsoil - 3"; fill material.
			2.0'		18" RECOVERY		
2.49		2	2.0'	14 19 22 24	Wet hard brown and dark brown clayey	A-4(0)	Fill material.
				22 24	coarse to fine sandy silt, trace of gravel.		IG
		3	4.0' 4.0'	8	20" RECOVERY  Wet hard brown clayey coarse to fine sandy	A-4(1)	Fill material.
4.98			6.0'	8 12 20 17	silt, trace of gravel.  18" RECOVERY	15	Tili material.
7.47		4	6.0' 8.0'	9 7 4 4	Wet medium dense brown silty fine to coarse sand, trace of gravel.  16" RECOVERY	A-2-4(0)	Fill material.
		5	8.0'	1 2	Wet loose light brown coarse to fine sand,	A-1-b	
9.96			10.0'	1 2 3 4	trace of gravel and silt.		
		6	10.0'	2 4	Saturated loose light brown fine to coarse	A-2-4(0)	
				2 4 6 8	sand w/ some silt, trace of gravel.		
			12.0'		24" RECOVERY		
12.45		7	12.0'	2 2 4 5	Saturated loose orange-brown fine to coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
<u> </u>		<u> </u>	14.0'	7	18" RECOVERY		
		8	14.0'	7 4	Saturated loose orange-brown fine to coarse	A-2-4(0)	

**Remarks:** Mud Rotary at 74.0'

Reviewed By: Maureen Kelley Soils Supervisor: Randy Ferguson

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
14.94			2004	6 6	sand w/ some silt, trace of gravel.		
		9	16.0' 16.0'	8	12" RECOVERY Saturated medium dense orange-brown fine to	A-2-4(0)	
				8 10 10 17	coarse sand w/ some gravel and silt.	112 1(0)	
17.43							
		10	18.0' 18.0'	12	24" RECOVERY Saturated medium dense orange-brown fine to	A-2-4(0)	
				12 10 12 17	coarse sand w/ some silt, trace of gravel.	A-2-4(0)	
19.92			20.0'		24" RECOVERY		
00.44							
22.41					<b>II</b> DRAFI I		
		11	24.0'	10		A 2 4(0)	-
24.9			24.0	10 20 22 25	Saturated dense orange-brown silty fine sand w/ some gravel and coarse sand.	A-2-4(0)	
		7				ノロ	
			26.0'		17" RECOVERY		
			Λ		PILICT ON	15	
27.39				<b>\U</b>	GUST 20		
		12	29.0'	5 10 13 15	Saturated medium dense fine sand w/ some	A-2-4(0)	
29.88				13 15	silt and coarse sand, trace of gravel.		
			04.01		A III PEGOVERN		
			31.0'		24" RECOVERY		
32.37							
24.00		13	34.0'	9 11 13 14	Saturated medium dense brown fine sand w/ some coarse sand, trace of silt and gravel.	A-3	
34.86				14	refined states state, trace of site and graver.		
			36.0'		HANGE HANGE		
					GESTANSE GESTANSE GESTANSE		
37.35					174 Y 174 C 1		
					111 3 111 111 111 111 111 111 111 111 1		

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)   Progress   No.   Sample   Blows/6"   Sample Description   Class./G.I.   Remarks	
39.84  14 39.0'  8 16	
44.82  15  44.0'  12  22  20  20  20  20  20  20  20  20	
46.0' 14" RECOVERY	
16 49.0' 8 Saturated dense gray silty fine sand, trace of A-2-4(0)	
49.8  16 49.0'  15 15 22 26  Saturated dense gray silty fine sand, trace of coarse sand.  24" RECOVERY	
52.29	
54.78  17 54.0' 9 10 Saturated medium dense gray silty fine sand, trace of coarse sand and gravel.  A-2-4(0)	
56.0' 24" RECOVERY  57.27	
59.76  18 59.0' 9 4	_
61.0' 24" RECOVERY	

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
62.25								
64.74		19	64.0'	9 10 13 22		Saturated medium dense gray clayey fine sand	A-2-4(0)	
04.74	1			22		w/ some coarse sand.		
			66.0'			24" RECOVERY		
67.23								
		20	69.0'	4 6 9 9		Saturated medium dense gray clayey fine sand	A-2-4(0)	
69.72	-			9		w/ some coarse sand, trace of gravel.		
			71.0'			24" RECOVERY		
	N	1						
72.21		U-1	72.0'			Saturated gray fine sand w/ some silt, trace of	A-4(0)	Press Sample - Shelby Tube.
	•					gravel.	11 (0)	Tress bumple sheloy rube.
			73.3'			15" RECOVERY		
							115	
747		21	74.0'	7 9		Saturated medium dense gray clayey fine	A-2-6(0)	
74.7				13 17		sand, trace of coarse sand.		
			76.0'			24" RECOVERY		
77.19								
		22	79.0'	6 7		Saturated very stiff gray clayey fine sandy	A-4(0)	
79.68				6 7 14 16		organic silt, trace of coarse sand and gravel.		
			81.0'			20" RECOVERY		
82.17								
		23	84.0'	6		Saturated very stiff gray clayey fine sandy	A-4(1)	
84.66				6 12 16 17		silt, trace of organic matter, coarse sand, and	A-4(1)	
	I	1	1	1 ''	ZZZZ	· · · · · · · · · · · · · · · · · · ·	I	I .

**F.A. Project:** U.S. 301, Maryland State Line to I-95 **Contract:** 25-113-01

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(11.)	1 10g1000		Ворин		gravel.		
			86.0'		24" RECOVERY		
87.15							
89.64		24	89.0'	10 24 34 47	Saturated very dense dark gray silty fine sand, trace of coarse sand and organic matter.	A-2-4(0)	
				47	Ç		
			91.0'		17" RECOVERY		
92.13							
					DDAET		
					DRAFI		
94.62		25	94.0'	14 16 15	Saturated hard dark gray fine sandy silt, trace of organic matter, coarse sand, and gravel.	A-4(0)	
					()RBII)I		]( -
	•		96.0'		16" RECOVERY		
97.11			Λ		MICT 20	15	
		26	98.0'	17	Saturated hard dark gray fine sandy silt, trace	A 4(0)	
		20	30.0	17 15 23 20	of organic matter, coarse sand, and gravel.	A-4(0)	
99.6			100.0'		18" RECOVERY		
					Boring terminated at 100.0 feet.		
102.09							
104.58							
107.07							

Symbol Description

## Strata symbols

Low plasticity clay

Clayey sand



Silty sand



Well graded sand with silt



Poorly graded sand with silt



Poorly graded clayey silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory boring was drilled on 3/31/2008 using a 3 1/4-inch diameter continuous flight power auger. Rig is a Truck CME 75.
- 2. Groundwater levels recorded at time of drilling. Boring backfilled upon completion.
- 3. Boring elevation was obtained from Figure A-2, Structure BR1-3 Exploration Plan.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All SPT blow counts are uncorrected.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-89

**Contract:** 25-113-01

Boring Location: STA. 97+38 13' Lt. C. L.

**Boring Surface Elev.:** + 45.45 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/15/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: K. Kershaw

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
2.53	2/15/11	1 2	1.5' 2.0' 2.0'	7 7 7 4 5	No Sieve Analysis - Indication of wet firm brown sandy clay.  Wet stiff brown silt w/some fine to coarse  A-4(2)
	N	3	4.0'	2 1 2 4	sand and clay, trace of fine gravel.  24' RECOVERY  Wet soft brown clayey silt w/some fine to coarse sand, trace of fine gravel.  A-4(3)
5.06		4	6.0' 6.0'	5 7 12	Wet stiff brown clayey silt w/some fine sand, A-4(6)
7.59		4A	7.5' 7.5'	21	trace of coarse sand.  12" RECOVERY  Wet dense brown silty coarse to fine sand w/ A-2-4(0)
		5	8.0' 8.0'	6 12 13 10	Some fine gravel.  6" RECOVERY  Wet medium dense brown silty fine to coarse sand.  A-2-4(0)
10.12			10.0'		End of Boring  End of Boring
12.65					
15.18					

Remarks:

Symbol Description

## Strata symbols



Silty low plasticity clay



Low plasticity clay



Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 15, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-90

**Contract:** 25-113-01

Boring Location: STA. 102+41 7' Lt. C.L.

**Boring Surface Elev.:** + 46.21 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/14/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

- ·				1	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
(111)	2/14/11	1	0.5'	6 4 4	Moist loose brown silty fine to coarse sand w/ A-2-4(0) Topsoil - 7". some fine gravel.
			2.0'		13" RECOVERY
2.53		2	2.0'	5 6 3 3	Moist stiff brown fine to coarse sandy silt w/ A-4(0) trace of fine gravel.  20" RECOVERY
		3	4.0'	3 3 7 9	Moist loose brown silty fine to coarse sand w/ A-2-4(0)
5.06			6.0'	\U	some clay, trace of fine gravel.  17" RECOVERY
7.50		4	6.0'	3 7 12 10	Moist medium dense brown silty fine sand w/ A-2-4(0) some coarse sand, trace of fine gravel.
7.59	1		8.0'		20" RECOVERY
		5	8.0'	10 11 12 13	Moist medium dense tannish orange coarse to fine sand w/some fine gravel and silt.  20" RECOVERY
10.12			10.0		End of Boring
12.65					
-					
-					

Remarks:

Symbol Description

Strata symbols

Silty sand



Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 14, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-91

**Contract:** 25-113-01

Boring Location: STA. 106+70 13' Lt. C.L.

**Boring Surface Elev.:** + 52.0 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/14/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
	2/14/11	1	0.5'	4 10 9	coarse sand, fine gravel and clay.	Гopsoil - 6".
		$\vdash$	2.0'	11	14" RECOVERY	
2.53		2	4.0'	11 10 12 6	Moist medium dense brown silty fine to coarse sand w/trace of fine gravel.  19" RECOVERY	G
		3	4.0'	6 8 9 5	Moist medium dense brown silty fine sand w/ A-2-4(0)	
5.06			6.0'	\U	some coarse sand, trace of fine gravel.  19" RECOVERY	
		4	6.0'	6 8 10 12	Wet very stiff tan silty clay w/trace of fine sand.	
7.59			8.0'		20" RECOVERY	
		5	8.0'	7 7 6 7	Wet stiff tan silty clay w/trace of fine sand. A-6(12)	
10.12			10.0'		22" RECOVERY	
10.12					End of Boring	
12.65						

Remarks:

Symbol Description

Strata symbols

Poorly graded clayey silty sand



Silty sand



Low plasticity clay

## DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 14, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-92

**Contract:** 25-113-01

Boring Location: STA. 112+49 13' Lt. C.L.

**Boring Surface Elev.:** + 58.3 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

**Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0 10.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/14/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/14/11	1	0.5' 2.0'	11 14 17	Moist medium dense brown fine gravelly coarse sand w/some fine sand and silt.  16" RECOVERY
		2	2.0'	14	
2.53			4.0'	14 15 11 8	Moist medium dense orangish brown fine gravelly coarse sand w/some fine sand, trace of silt.  20" RECOVERY
		3	4.0'	5 7	Moist medium dense brown coarse sand w/ A-1-b
5.06			6.0'	66	some fine gravel, trace of fine sand and silt.  21" RECOVERY
7.59		4	6.0'	7 6 5 4	Moist medium dense brown fine gravelly coarse sand w/some fine sand and silt.  A-1-b
1.58			8.0'		18" RECOVERY
		5	8.0'	4 5 5 3	Moist loose brown fine gravelly coarse sand w/some silt, trace of fine sand.  19" RECOVERY
10.12			10.0		End of Boring
					End of Boring
12.65					

Remarks:

Symbol Description

Strata symbols

Silty sand

Well graded sand with silt

1.633333 1.633333

Poorly graded sand with silt

## DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 14, 2011 using 3 1/4 inch continuous flight power auger. Rig is an ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-93

**Contract:** 25-113-01

Boring Location: STA. 119+32 13' Lt. C.L.

**Boring Surface Elev.:** + 56.55 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/14/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/14/11	1	0.5' 2.0'	3 5 6	Moist loose orange silty coarse to fine sand w/trace of fine gravel.  14" RECOVERY  Moist loose orange silty coarse to fine sand A-2-4(0)  Topsoil - 7".
2.53		2	2.0'	4 5 6 6	Moist medium dense orangish brown silty coarse to fine sand w/trace of fine gravel.  19" RECOVERY
5.06		3	4.0' 6.0'	5 4 5 3	Moist loose brownish orange coarse to fine sand w/trace of fine gravel, silt and clay.  18" RECOVERY   A-1-b  Loamy Sand
7.59		4	6.0' 8.0'	2 4 6 7	Moist loose brownish orange coarse to fine sand w/some fine gravel and silt.  20" RECOVERY
		5	8.0'	3 7 6 7	Moist medium dense orangish brown coarse to fine sand w/some silt, trace of fine gravel.  19" RECOVERY
10.12					End of Boring
12.65					

Remarks:

Symbol Description

Strata symbols



Silty sand

## DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 14, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-94

**Contract:** 25-113-01

Boring Location: STA. 125+20 13' Lt. C.L.

**Boring Surface Elev.:** + 46.1 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 2/11/11 Dry 10.0 10.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: K. Kershaw

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/11/11	1	1.0' 2.0'	5 6	Wet stiff brown clayey silt w/some coarse sand, trace of fine sand.  8" RECOVERY  A-4(6) Topsoil - 10".
2.53	N	2	2.0'	7 14 14 8	Wet medium dense brown coarse to fine sand w/some fine gravel and silt.  18" RECOVERY
5.06	•	3	4.0' 6.0'	3 6 7 10	Wet medium dense brown coarse to fine sand w/some fine gravel and silt, trace of clay.  USDA Classification: Loamy Sand
7.59		4	6,0' 8.0'	10 8 9 8	Wet medium dense orange fine to coarse sand w/some silt, trace of fine gravel.  24" RECOVERY
		5	8.0'	3 5 6 6	Wet medium dense orange fine to coarse sand w/some silt, trace of fine gravel.  A-2-4(0)  20" RECOVERY
10.12			10.0		End of Boring
12.65					

Remarks:

Symbol Description

Strata symbols

Low plasticity clay

Silty sand

## DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 11, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-95

**Contract:** 25-113-01

Boring Location: STA. 130+97 13' Lt. C.L.

**Boring Surface Elev.:** + 35.57 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/11/11 10.0 10.0 6.9

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: K. Kershaw

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	2/11/11	1	0.5'	3 3 5	00143060 00103000 0014300 0014300 0014300 0014300		A-1-b	Topsoil - 8".
			2.0'		66123166	15" RECOVERY		
2.53		2	2.0'	7 7 7 7		Moist medium dense brown fine gravelly coarse sand w/some fine sand and silt.	A-1-b	IG
$\vdash$		4	1.01					
-		3	4.0' 4.0'	4 7		22" RECOVERY  Moist medium dense brown coarse sand w/	A-1-b	USDA Classification : Sand
5.06			6.0'	777		some fine gravel, trace of fine sand, silt and clay.  17" RECOVERY	15	00011 0001110
		4	6.0'	12	**************************************	Saturated medium dense brown coarse sand	A-1-b	
				12 7 8 8	00 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	w/some fine sand, fine gravel and silt.	11 1 0	
				l 8	11111111	W 50 11.00 12.00 1		
7.59								
			8.0'		11.61.41.64 12.41.71.64	16" RECOVERY		
		5	8.0'	1 1 2 4	00133160 0014160	Saturated very loose brown fine to coarse	A-2-4(0)	
				4		sand w/some silt, trace of fine gravel.		
					64 14 15 E C			
40.40			10.0'		1913.1961. 1911.1971.0 1911.1971.66	22" RECOVERY		
10.12						End of Boring		
12.65								
	1 '							

Remarks:

Symbol Description

Strata symbols

1,000,000

Poorly graded sand with silt



Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 11, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-96

**Contract:** 25-113-01

Boring Location: STA. 141+01 95' Lt. C.L.

**Boring Surface Elev.:** + 25.65 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. D-Sampler: S-Sampler: U-Sampler: IN. Type of: O.D. O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:** 

Water Level Readings

Time **Depth of Hole Depth of Casing Depth of Water** Elev. of Water Date 2/14/11 5.0 5.0 4.7

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 5.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

**Helpers:** J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/14/11	1	2.0'		Moist brown clayey fine gravelly silt w/some A-4(0) Topsoil - 8". coarse to fine sand. Hand Auger
2.53		2	2.0' 3.0'		Moist brownish orange coarse to fine sandy silt w/trace of clay.
		3	3.0' 4.0' 4.0'		Saturated brownish orange coarse sandy silt
5.06		4	5.0'		clay.  Saturated brownish orange silt w/some fine
					sand, trace of coarse sand, fine gravel and clay.  12" RECOVERY
					End of Boring
7.59					
10.12					
12.65					
12.03					

Remarks: Hand Auger

Symbol Description

Strata symbols



Poorly graded clayey silty sand



Silt

## DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 14, 2011 using a hand auger.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: IT1-97

**Contract:** 25-113-01

Boring Location: STA. 142+69 95' Lt. C.L.

**Boring Surface Elev.:** + 26.29 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/11/11 10.0 10.0 6.9

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: K. Kershaw

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/11/11	1	0.5'	7 8 9	Moist medium dense brown fine to coarse sand w/some silt, trace of fine gravel.  A-2-4(0) Topsoil - 8".
2.53		2	2.0'	7 11 8 7	Moist medium dense dark brown coarse to fine sand w/some fine gravel and silt.
5.06		3	4.0' 4.0' 6.0'	5 3 3 4	14" RECOVERY  Moist loose brown coarse to fine sand w/some silt, trace of fine gravel.  18" RECOVERY
7.59		4	6.0'	3 4 4 4	Saturated loose brown coarse to fine sand w/ A-1-b some silt, trace of fine gravel.
		5	8.0'	3 6 7 9	Saturated medium dense brown fine to coarse sand w/some silt, trace of fine gravel.  24" RECOVERY
10.12					End of Boring
12.65					

Remarks:

Symbol Description

Strata symbols



Silty sand



Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 11, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

## STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: R1-104

**Contract:** 25-113-01

Boring Location: STA. 90+00 0' C.L.

**Boring Surface Elev.:** + 50.78 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4 **Casing Size:** Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 2/15/11 10 10 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: 10.0 Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: K. Kershaw

Depth	Daily	l	Sample		
(ft.)	Progress	No.	Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/15/11	1	1.0'	7 6	No Sieve Analysis - Indication of moist Topsoil - 6". Fill - 6".
			2.0'	7	medium dense clayey sand.  6" RECOVERY  A-2-4(0)
		2	2.0'	7 8 13 10	Moist medium dense orange silty coarse to  A-2-4(0)
3		_		10	fine sand w/trace of fine gravel.
			4.0'		19" RECOVERY
		3	4.0	3 4	Moist loose orange silty coarse sand w/some A-2-4(0)
	•	•		3 4 4 6	fine sand, trace of fine gravel.
6		4	6.0' 6.0'	7	16" RECOVERY
		+	0.0	7 4 6 3	Moist loose orange coarse sand w/some fine A-1-b sand and silt, trace of fine gravel.
				3	sand and sht, face of thic graver.
			8.0'		20" RECOVERY
		5	8.0'	3 3 8 9	Moist medium dense orange coarse sand w/ A-1-b
9				8 9	some fine sand and fine gravel, trace of silt.
			40.01		(# ) 1 m (# )
			10.0'		20" RECOVERY End of Boring
					Elid of Borning
12					
15					
<u> </u>					
1	I		1		

Remarks:

Symbol Description

Strata symbols



Silty sand



Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 15, 2011 using 3 1/4 inch continuous flight power auger. Rig is an ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: R1-105

**Contract:** 25-113-01

Boring Location: STA. 100+00 0' C.L.

**Boring Surface Elev.:** + 44.71 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

**Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0 10.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/15/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: K. Kershaw

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
3	2/15/11	2	1.5' 2.0' f 2.0'	8 15 15 16 13	Wet firm brown clayey silt w/trace of fine to A-4(5) Topsoil - 6". Fill - 12".  Coarse sand and fine gravel.  6" RECOVERY  Wet hard brown coarse to fine sandy silt w/ trace of fine gravel and clay.
6		3	4.0' 6.0'	4 2 3 4	Wet firm brown clayey silt w/some coarse sand, trace of fine sand and fine gravel.  18" RECOVERY  A-4(3)
		4	8.0'	4 4 6 6 14	Wet stiff brown silty coarse sandy clay w/ A-6(2) some fine sand and fine gravel.
9		5	8.0' 10.0'	24 20 17 13	Wet dense brown fine to coarse sand and fine gravel w/some silt.  24" RECOVERY
					End of Boring
12					
15					
18					

Remarks:

Symbol Description

## Strata symbols

Low plasticity clay



Silt



Silty low plasticity clay



Clayey sand



Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 15, 2011 using 3 1/4 inch continuous flight power auger. Rig is an ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: R1-106

**Contract:** 25-113-01

Boring Location: STA. 110+00 0' C.L.

**Boring Surface Elev.:** + 55.30 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4 **Casing Size:** Inches Hollow Stem Auger: 0.0 10.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 2/14/11 10 10 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Ft.; Dia. U-Sample Boring: U-Samples: 10.0 Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

D (1	5 "	1				
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
(111)	2/14/11	1	0.5'	7 8 9	Moist stiff brownish orange fine sandy fine A-6(1) Topsoil - 7".	
				9	gravelly clay w/some silt.	
			2.0'		16" RECOVERY	
		2	2.0'	5 7 11	Wet medium dense brownish orange silty  A-2-4(0)	
3	R	1		10	coarse to fine sand w/trace of fine gravel.	
			4.0		20" RECOVERY	
		3	4.0'	5 5 7 9	Wet medium dense brownish orange clayey A-2-6(1)	
				7 9	coarse sand w/some fine sand and silt, trace of	
					fine gravel.	
6		4	6.0' 6.0'	8	21" RECOVERY  Wet very stiff brown fine sandy silt w/trace of A-4(0)	
				8 9 7 6	fine gravel.	
				0		
			8.0'		18" RECOVERY	
		5	8.0'	6 6 6 8	Wet medium dense tan silty fine to coarse A-2-4(0)	
9				8	sand w/trace of fine gravel.	
			10.0'		20" RECOVERY	
			10.0		End of Boring	
12						
15						

Remarks:

Symbol Description

Strata symbols

Clayey sand

Silty sand

Silt

## DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 16, 2011 using 3 1/4 inch continuous flight power auger. Rig is an ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: R1-107

**Contract:** 25-113-01

Boring Location: STA. 4005+00 25' Lt. C.L.

**Boring Surface Elev.:** + 39.71 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 2/24/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/24/11		0.0'		No Sampling		Asphalt - 8". Concrete - 7".
			2.0'		0" RECOVERY		
3			4.0'	1 1 4 8	Wet loose brown silty fine to coarse sand w/ trace of fine gravel.  16" RECOVERY	A-2-4(0)	IG
		2	4.0'	5 7 10	Wet medium dense brown coarse to fine sand	A-1-b	
6			6.0'	7	w/some silt, trace of fine gravel.	15	
		3	6.0'	6 7 11	Wet medium dense brown coarse to fine sand	A-1-b	
				11	w/some silt, trace of fine gravel.		
			8.0'		20" RECOVERY		
9		4	8.0'	9 10 11 9	Wet medium dense brown coarse to fine sand w/some silt, trace of fine gravel.	A-2-4(0)	
			10.0'		22" RECOVERY		
					End of Boring		
12							
15							

Remarks:

Symbol Description

Strata symbols

Silty sand



Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 24, 2011 using 3 1/4 inch continuous flight power auger. Rig is an ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: R1-108

**Contract:** 25-113-01

Boring Location: STA. 124+00 60' Lt. C.L.

**Boring Surface Elev.:** + 47.90 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: IN. IN. Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 10.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 2/16/11 10.0 10.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: K. Kershaw

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	2/16/11		0.0'		No Sampling		Asphalt - 8". Concrete - 8".
			2.0'		0" RECOVERY		
3	N		3.0'	5 5	Moist stiff brown clayey silt w/some fine to coarse sand, trace of fine gravel.  12" RECOVERY	A-4(2)	
		1A	3.0' 4.0'	6 6	Moist medium dense brown silty fine sand w/	A-2-4(0)	
		2	4.0'	4 5 6	some coarse sand, trace of fine gravel.  10" RECOVERY	A-1-b	
			Λ	8	Moist medium dense brown coarse sand w/ some fine sand and silt, trace of fine gravel.	15	
6			6.0' 6.0'	9	16" RECOVERY		
		3	6.0	10 11 9	Moist medium dense brown fine to coarse sand w/some silt, trace of fine gravel.	A-2-4(0)	
			8.0'		17" RECOVERY		
9		4	8.0'	8 7 7 6	Moist medium dense brown fine to coarse sand w/some silt.	A-2-4(0)	
			10.0'		24" RECOVERY		
					End of Boring		
12							
15							

Remarks:

Symbol Description

Strata symbols



Silty low plasticity clay



Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 16, 2011 using 3 1/4 inch continuous flight power auger. Rig is an ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: U.S. 301 Maryland State Line to S.R. 1 Boring No.: R1-109

**Contract:** 25-113-01

Boring Location: STA. 115+00 55' Lt. C.L.

**Boring Surface Elev.:** + 52.63 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. **Casing Size:** 

From Depth of: From Depth of: To: To: 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 2/16/11 Dry 10.0 10.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Б	Б.:						
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(/	2/16/11		0.0'		No Sampling		Asphalt - 7". Concrete - 8".
			2.0'		0" RECOVERY		
3			4.0'	4 6 9 8	Moist stiff brown fine to coarse sandy silt w/ trace of fine gravel.  8" RECOVERY	A-4(0)	IG
		2	4.0'	4 5 3 5	Wet firm brown silt w/some fine to coarse	A-4(0)	
6			6.0'	5	sand.	15	
		3	6.0'	6699	Wet stiff orange fine to coarse sandy silt w/ trace of fine gravel.	A-4(0)	
			8.0'		18" RECOVERY		
9		4	8.0'	4 6 7 6	Wet stiff orange fine sandy silt w/some coarse sand.  20" RECOVERY	A-4(0)	
			10.0		End of Boring		
					-		
12							
15							

Remarks:

Symbol Description

Strata symbols

Silty sand

Silt



Poorly graded clayey silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 16, 2011 using 3 1/4 inch continuous flight power auger. Rig is an ATV mounted CME 55.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-074

**Contract:** 28-113-01

Boring Location: Sta. 313+00 0' C.L.

**Boring Surface Elev.:** + 32.79 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water Depth of Casing** Time Depth of Hole Elev. of Water Date 7/16/10 16.0 14.0 11.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 16.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

	<del></del>		T			
Depth	Daily	No.	Sample	Blows/6"	Sample Description Class./G.I. Remains	arks
(ft.)	Progress	<del>  </del>	Depth			
	7/16/10	1	0.5'	5 10 7	Moist medium dense brown silty coarse to A-2-4(0) Topsoil - 4".	
				/	fine sand w/trace fine gravel.	
		<u> </u>	2.0'	10	12" RECOVERY	
		2	2.0'	10 13 14	Moist very stiff brown silt w/some clay,  A-4(0)	
3.3		Ι		14	coarse to fine sand and fine gravel.	
<u> </u>						
	•		4.0' 4.0'		20" RECOVERY	
		3	4.0	4 10 12	Moist medium dense gray silty coarse to fine A-2-4(0)	
				13	sand w/some fine gravel and clay.	
			6.0		19# DECOVEDY	
		4	6.0'	24	18" RECOVERY  Moist dense tan coarse to fine sand w/some A-2-4(0)	
6.6		~	0.0	24 24 20 18		
	]			18	silt, trace fine gravel.	
			8.0'		18" RECOVERY	ļ
		5	8.0'	7	Moist medium dense brown fine to coarse A-1-b	
	1		0.0	7 5 6 6	sand and fine gravel w/some silt.	
				6	sand and thie graver w/some sitt.	
9.9			10.0'		12" RECOVERY	
		6	10.0'	3	Wet loose brown coarse to fine sand w/some A-1-b	
				3 3 4 5	silt, trace fine gravel.	ļ
				5	sht, trace the graver.	
			12.0'		20" RECOVERY	I
		7	12.0'	3	Wet very loose brown coarse sand w/some A-1-b	
13.2				3 2 2 3	fine sand and silt, trace fine gravel.	I
13.2				3	heritands [eijinet] Environi	
			14.0'		翻翻 17" RECOVERY	
		8	14.0'	3 4	Wet loose brown coarse sand w/some fine A-1-b	
				4	sand, trace silt and fine gravel.	
	1				heit takes lei is inci Europiett	
	<u> </u>		16.0'		16" RECOVERY	
16.5					End of Boring	
L						
I '						

Remarks:

Symbol Description

Strata symbols

Silty sand



Poorly graded clayey silty sand



Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 16, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-084

**Contract:** 28-113-01

Boring Location: Sta. 115+00 0' C.L.

**Boring Surface Elev.:** + 59.36 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

3 1/4 **Casing Size:** Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0 20.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 7/27/10 Dry 20.0 18.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks	
	7/27/10	1	0.5' 2.0'	4 7 10	Moist stiff brown silt w/some fine to coarse sand, trace fine gravel and clay.  12" RECOVERY  A-4(0) Topsoil - 6".	
		2	2.0'	8 8 9 7	Moist stiff brown coarse sandy silt w/some A-4(0)	
3.6			4.0'		fine sand, trace fine gravel and clay.  14" RECOVERY	
	· ·	3	4.0	3 3 4 5	Wet firm brown clayey silt w/trace fine to  Coarse sand and fine gravel.  A-4(4)	
			6.0'		18" RECOVERY	
7.0		4	6.0'	5 4 6 7	Wet stiff tan fine sandy silt w/some coarse  A-4(0)  sand, fine gravel and clay.	
7.2			8.0'		saild, The graver and Cray.  19" RECOVERY	
		5	8.0'	4 6 6 10	Wet medium dense tan coarse sand w/some A-1-b	
				10	fine sand and silt, trace fine gravel.	
			10.0'		17" RECOVERY	
10.8						
14.4		6	14.0'	4		
14.4		0	14.0	4 5 8 8	Wet medium dense tan coarse to fine sand w/ A-1-b some silt, trace fine gravel.	
			16.0'	8	18" RECOVERY	
			10.0		16 RECOVERT	
18						
		7	18.0'	5 7 6 5	Wet medium dense tan fine to coarse sand w/ A-2-4(0)	
				5	some silt, trace fine gravel.	
			20.0'		End of Boring	

Remarks:

Symbol Description

Strata symbols

Silt



Poorly graded clayey silty sand



Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-085

**Contract:** 28-113-01

Boring Location: Sta. 128+00 0' C.L.

**Boring Surface Elev.:** + 48.89 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 7/27/10 20.0 18.0 16.4

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	7/27/10	1	0.5' 2.0'	12 20 15	Moist hard brown fine sandy silt w/some coarse sand, trace clay and fine gravel.  12" RECOVERY  A-4(0) Topsoil - 4".
		2	2.0'	18 23 13 11	Moist dense brown clayey coarse to fine sand A-2-4(0)
3.6	N		4.0'	13	and fine gravel w/trace silt.  18" RECOVERY
		3	4.0	4 6 8 9	Moist medium dense orange silty coarse sand A-1-b w/some fine sand, trace fine gravel.
			6.0'		15" RECOVERY
7.2		4	6.0' 8.0'	14 7 10 7	Moist medium dense tan coarse sand w/some silt and fine sand, trace fine gravel.  21" RECOVERY
		5	8.0'	3 5 5 7	Moist loose orange coarse sand w/some fine sand and silt, trace fine gravel.
			10.0'	,	16" RECOVERY
10.8					
					R 2   1   2   2   2   2   2   2   2   2
					KR 19-10-61 KR 18-10-61 KR 18-10-61
					1
14.4		6	14.0'	6	REJAMEN BELLIAGE BELLIAGE
14.4		6	14.0	6 7 7 7	Moist medium dense brown coarse to fine  A-1-b  sand w/some silt, trace fine gravel.
			16.0'	,	18" RECOVERY
					(2) 13 (2) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4
					551 1755 651 1356 81 34961 91 1 4 2 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
18		7	18.0'	7	Wet medium dense tan coarse to fine sand w/ A-1-b
				7 8 9 8	trace silt and fine gravel.
			20.0'		ERECTER ERECTER ERECTER ERECTER 14" RECOVERY
					End of Boring

Remarks:

Symbol Description

Strata symbols

Silt



Poorly graded clayey silty sand



Silty sand



Poorly graded sand with silt



Well graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-086

**Contract:** 28-113-01

Boring Location: Sta. 85+00 20' Rt. C.L.

**Boring Surface Elev.:** + 40.52 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. 3 1/4 **Casing Size:** 

From Depth of: From Depth of: To: To: Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 7/27/10 11.0 20.0 18.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
7.2	Progress 7/27/10	1 2 3 4 5 5	Depth 1.0' 2.0' 2.0' 4.0' 4.0' 6.0' 6.0' 8.0'	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Moist firm brown coarse to fine sandy silt w/ trace fine gravel and clay.  Moist loose tan coarse sand w/some fine sand and silt, trace fine gravel.  17" RECOVERY  Moist medium dense tan coarse sand w/some fine sand and silt, trace fine gravel.  18" RECOVERY  Moist medium dense tan coarse to fine sand w/some silt, trace fine gravel.  18" RECOVERY  Saturated loose tan coarse to fine sand w/trace silt and fine gravel.  15" RECOVERY  Saturated loose tan coarse to fine sand w/trace silt and fine gravel.  15" RECOVERY
14.4		7	14.0'	4 6 6 8 8	Saturated medium dense brown coarse to fine sand w/some fine gravel and silt.  12" RECOVERY  Saturated medium dense brown coarse to fine sandy fine gravel w/some silt.  3" RECOVERY
			20.0'		End of Boring

Remarks:

Symbol Description

Strata symbols

Silty sand

Well graded sand with silt

1.000000 1.0000000

Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-087

**Contract:** 28-113-01

Boring Location: Sta. 95+00 10' Rt. C.L.

**Boring Surface Elev.:** + 46.22 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/27/10 Dry 10.0 8.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	7/27/10	1	0.5'	4 5 7	Wet stiff brown silt w/some fine to coarse A-4(1) Topsoil - 6". sand, trace fine gravel and clay.
			2.0'		12" RECOVERY
2.6		2	2.0'	5 5 5 5	Wet stiff brown fine sandy silt w/some coarse A-4(0)
				5	sand, trace clay.
			4.0'		18" RECOVERY
		3	4.0'	3 5 7	Wet medium dense brown silty fine gravel A-1-b
5.2			6.0'	7	and coarse to fine sand.
		4	6.0'	8 5 3 4	Wet loose orange coarse to fine sand w/some A-2-4(0)
				3 4	silt, trace fine gravel.
7.8					
7.0		5	8.0' 8.0'	3	19" RECOVERY
		3	0.0	3 3 3 3	Wet loose orange fine to coarse sand w/some A-2-4(0) silt, trace fine gravel.
			10.0'		12" RECOVERY
10.4					End of Boring
40					
13					

Remarks:

Symbol Description

Strata symbols

Silt

Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-088

**Contract:** 28-113-01

Boring Location: Sta. 105+00 10' Rt. C.L.

**Boring Surface Elev.:** + 49.09 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/27/10 10.0 8.0 Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
	7/27/10	1	1.0' 2.0'	6 3	Moist stiff brown fine to coarse sandy silt w/ some clay.	A-4(0)	Topsoil - 9".
2.6		2	2.0'	3 6 7 10	12" RECOVERY  Wet stiff brown silt w/some fine sand, trace	A-4(2)	
				10	coarse sand and clay.		
			4.0'		15" RECOVERY	)   N	
		3	4.0'	7 8 12 14	Wet very stiff brown silt w/trace fine to	A-4(2)	
5.2				14	coarse sand and clay.		
			6.0'		14" RECOVERY	15	
		4	6.0'	7 7 12 13	Wet very stiff brown silt w/some fine sand, trace clay.	A-4(1)	
				13	trace cray.		
7.8			8.0'		20" RECOVERY		
		5	8.0'	3 7 8 10	Wet stiff brown silt w/some fine sand and clay.	A-4(3)	
				10	ciay.		
			10.0'		18" RECOVERY		
10.4					End of Boring		
13							

Remarks:

Symbol Description

### Strata symbols



Poorly graded clayey silty sand



Silty low plasticity clay



silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-089

**Contract:** 28-113-01

Boring Location: Sta. 83+00 0' C.L.

**Boring Surface Elev.:** + 80.85 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. Core Bit: O.D.

**Casing Size:** 3 1/4 Inches

From Depth of: From Depth of: To: To: Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/20/10 Dry 10.0 8.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	7/20/10	1	0.5'	5 9 12	Wet very stiff brown clayey silt w/trace fine to coarse sand.  Topsoil - 8".
			2.0' 2.0'	0	11" RECOVERY
2.6		2	4.0'	9 8 9 7	Wet very stiff brown silt w/some fine sand, trace coarse sand.  16" RECOVERY
		3	4.0'	7 8	Wet very stiff orange fine sandy silt w/some A-4(0)
5.2			6,0'	12 16	coarse sand and fine gravel.  20" RECOVERY
		4	6.0'	12 9 10 10	Wet medium dense orange silty coarse to fine sand w/trace fine gravel.  A-2-4(0)
7.8			8.0'		21" RECOVERY
		5	8.0'	10 9 8 9	Wet medium dense orange silty fine sand w/ A-2-4(0) some coarse sand.
10.4					End of Boring
13					

Remarks:

Symbol Description

Strata symbols

Silt

Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 20, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-090

**Contract:** 28-113-01

Boring Location: Sta. 120+00 60 Lt. C.L.

**Boring Surface Elev.:** + 55.10 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D. IN.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/28/10 25.0 23.0 22.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 25.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Jason Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	7/28/10	1	1.0' 2.0'	6 8		Moist stiff brown coarse sandy silt w/some fine sand and fine gravel, trace clay.	A-4(0)	Asphalt - 6".
		2	2.0'	9 11 9 11		10" RECOVERY  Moist very stiff orange coarse sandy fine	A-4(0)	
3.4			4.0'	11		gravelly silt w/some fine sand and clay.  14" RECOVERY		
		3	4.0'	5 8 8 6		Moist medium dense orange fine gravelly	A-1-b	
		,	6.0'	6	12 1 7 2 1 C 12 1 2 3 3 1 C 12 1 2 3 3 1 C 12 1 2 3 3 1 C			
6.8		4	6.0'	5 6 7		Moist medium dense orange silty fine sand w/ some coarse sand and fine gravel.	A-2-4(0)	
			8.0'	6		21" RECOVERY	15	
		5	8.0'	4 6 7 7		Moist medium dense brown silty coarse to fine sand w/trace fine gravel.	A-1-b	
			10.0'	7		18" RECOVERY		
10.2			10.0		-	10 KECCYEKI		
13.6								
		6	14.0'	5 6 6 5		Moist medium dense tan fine to coarse sand w/some silt, trace fine gravel.	A-2-4(0)	
			16.0'	5		16" RECOVERY		
17			10.0		-	TO RECOVER		
17								
		7	19.0'	3 4 7		Wet medium dense tan fine sand w/some silt,	A-2-4(0)	

Remarks:

### **STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

**F.A. Project:** US 301 Maryland State Line to SR-1 **Contract:** 28-113-01

**Boring No.:** R1-090

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Cla	ass./G.I.	Remarks
20.4	<u> </u>			8	coarse sand and fine gravel.		
			21.0'		14" RECOVERY		
		8	23.0'	4	Wet loose tan coarse to fine sand w/some silt,	A-1-b	
23.8				4 4 5 6	trace fine gravel.	A-1-0	
			25.0'				
			25.0		End of Boring		
					2 0.1 2.016		
27.2							
30.6							
					DRAFT		
34	R				FOR BIDD		
34					F()R KII)III		
		A .					
					<b>IGUST 201</b>		
37.4						5	
				1			
40.8							
44.2							
47.6							
<u> </u>							
-							
_							
51							
<u> </u>							

Symbol Description

Strata symbols

Silty sand



Poorly graded clayey silty sand



Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 28, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-091

**Contract:** 28-113-01

Boring Location: Sta. 125+00 60' Rt. C.L.

**Boring Surface Elev.:** + 45.62 Reference:

Inches

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing** Time **Depth of Water Depth of Hole** Elev. of Water Date 7/27/10 25.0 23.0 14.7

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 25.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Jason Truver

3 1/4

**Helpers:** J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.	. Remarks
	7/27/10	1	0.0'	3 5 4 5	Moist stiff brown silt w/some coarse to fine sand.  A-4(0)	
		2	2.0'	7 8 8 9	12" RECOVERY  Moist medium dense brownish orange silty A-2-4(0)	
3.4			4.0'		coarse to fine sand w/some fine gravel.  19" RECOVERY	NG
		3	4.0'	6 8 9 10	Moist medium dense tan coarse to fine sand A-1-b w/some silt, trace fine gravel.	
			6.0		16" RECOVERY	-
6.8		4	6.0'	7 7 7 7	Moist medium dense tan coarse to fine sand w/some silt, trace fine gravel.  A-1-b	
			8.0'		16" RECOVERY	
		5	8.0'	5 5 8 7	Moist medium dense tan coarse to fine sand w/some silt, trace fine gravel.  A-2-4(0)	
10.2			10.0'		19" RECOVERY	
13.6						
		6	14.0'	5 5 5 5	Wet loose brown coarse to fine sand w/some A-1-b silt and fine gravel.	
			16.0'		15" RECOVERY	
17						
		7	18.0'	7 5 5	Wet loose brown coarse to fine sand w/some A-1-b	

Remarks:

### **STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

**F.A. Project:** US 301 Maryland State Line to SR-1 **Contract:** 28-113-01

**Boring No.:** R1-091

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
( )				4	silt, trace fine gravel.		
20.4			20.0'		開道院。 19" RECOVERY		
20.4					12:37:12:1 6:13:30:6 1:13:31:12:1		
					net (anne) let (a juic) Let (a juic)		
					683 3 3 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6		
					165145664 166173461 166343660		
23.8		8	23.0'	7 23 26 18	Wet dense brown coarse sandy fine gravel w/	A-1-b	
25.0				26 18	some fine sand and silt.		
			25.0'		語語語 語刊語 記述語 14" RECOVERY		
					End of Boring		
27.2							
30.6					DRAFT		
34		V			FOR BIDI		
					GUST 20	4 —	
						115	
					IGUSI ZU		
37.4							
40.8							
44.2							
-							
47.6							
51		1	1	1	i		I

Symbol Description

Strata symbols

Silt

Silty sand

1.63 (0.10 1.63 (0.10 1.63 (0.10 1.64 (0.10)

Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-092

**Contract:** 28-113-01

Boring Location: Sta. 130+00 0' C.L.

**Boring Surface Elev.:** + 36.84 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: 3 1/4 **Casing Size:** Inches Hollow Stem Auger: 0.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 7/27/10 5.5 10.0 8.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	7/27/10	1	0.5'	2 3 5	Moist loose brown coarse to fine sand w/some A-1-b Topsoil - 6". fine gravel and silt.
			2.0'		18" RECOVERY
2.6		2	2.0'	6 8 9 11	Moist medium dense brown coarse sand w/ A-1-b
			4.0'		some fine gravel and silt, trace fine sand.  19" RECOVERY
		3	4.0'	4 6	Wet medium dense brown fine to coarse sand A-2-4(0)
5.2			6.0'	7	w/some silt, trace fine gravel.
		4	6.0'	5 6 7 9	Wet medium dense brown coarse to fine sand w/some silt, trace fine gravel.
7.8			8.0'		19" RECOVERY
		5	8.0'	5 5 6	Wet loose brown coarse to fine sand w/trace silt and fine gravel.
40.4			10.0'		End of Boring
10.4					End of Boring
13					

Remarks:

Symbol Description

Strata symbols



Silty sand



Well graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-093

**Contract:** 28-113-01

Boring Location: Sta. 135+00 50' Lt. C.L.

**Boring Surface Elev.:** + 29.89 Reference:

Wt. of Casing Hammer: Average Fall: IN. Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 O.D.

IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0 10.0

Water Level Readings

Time **Depth of Water Depth of Hole Depth of Casing** Elev. of Water Date 7/26/10 10.0 8.0 4.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	7/26/10	1	1.0'	21 17	Moist dense gray silty fine gravel w/some A-2-4(0) Asphalt - 8".
			2.0' 2.0'	7	coarse to fine sand, trace clay.
2.6		2	2.0	7 5 6 7	Wet stiff gray silt w/some clay, trace fine to  A-4(2)
				7	coarse sand and fine gravel.
			4.0		20" RECOVERY
		3	4.0'	5 3	Wet loose gray silty coarse to fine sand and A-1-b
				5 3 3 3	fine gravel.
5.2			6.0'		To Trecovery 2015
		4	6.0'	4 6	Wet medium dense orange coarse to fine sand A-1-b
			_	16 17	w/some fine gravel and silt.
7.8			8.0'		18" RECOVERY
		5	8.0'	9 13 16 17	Wet medium dense orangish brown coarse to A-1-b
				16 17	fine sand w/some silt, trace fine gravel.
			10.0'		20" RECOVERY
10.4					End of Boring
13					
		L		I	

Remarks:

Symbol Description

Strata symbols



Silty sand



Silty low plasticity clay

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 26, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-094

**Contract:** 28-113-01

Boring Location: Sta. 301+00 0' C.L.

**Boring Surface Elev.:** + 34.55 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/21/10 20.0 18.0 3.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

**Helpers:** J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"		Sample Description	Class./G.I.	Remarks
	7/21/10	1	0.5' 2.0'	3 5 7	15 14 1006 16 17 17 16 16 17 17 16 17 16 17 17 18 17 16 17 17 18 17	Moist loose brown coarse sand w/some fine gravel and silt, trace fine sand.  16" RECOVERY	A-1-b	Topsoil - 5".
		2	2.0'	6 3 2 2		Moist loose brown fine gravelly coarse sandy w/some silt and fine sand.	A-1-b	
3.6			4.0'			22" RECOVERY		
		3	4.0	1 3 3 5		Saturated loose tan fine gravelly coarse to fine sand w/some silt.	A-1-b	NG
		4	6.0'	_9		15" RECOVERY	-A 1 -L	
7.0		4	0.0	9 7 13 16		Saturated medium dense brownish orange coarse to fine sand w/some silt and fine	A-1-b	
7.2			8.0'			gravel.  21" RECOVERY	CL	
		5	8.0'	3 5 7		Saturated medium dense brownish orange	A-1-b	
				8		coarse to fine sand w/some silt, trace fine		
			10.0'			gravel.		
10.8		6	10.0'	6 8 5 4		17" RECOVERY	A-2-4(0)	
10.0				5 4		Saturated medium dense brownish orange fine to coarse sand w/some silt and fine gravel.		
			12.0'			19" RECOVERY		
		7	12.0'	2 2		Saturated loose orange silty fine to coarse	A-2-4(0)	
				2 2 3 3		sand w/trace fine gravel.		
			14.0'			15" RECOVERY		
14.4		8	14.0'	2 3		Saturated loose orange fine to coarse sand w/	A-2-4(0)	
				2 3 4 6		some silt, trace fine gravel.	. ,	
			16.0'			20" RECOVERY		
		9	16.0'	6		Saturated loose orange fine to coarse sand w/	A-2-4(0)	
				6 5 5 9		some silt, trace fine gravel.	. /	
18			18.0'			16" RECOVERY		
		10	18.0'	6		Saturated medium dense brownish orange fine	A-2-4(0)	
				6 8 7 8		to coarse sand w/some silt, trace fine gravel.	. /	
			20.0'			18" RECOVERY		
					11:1:1:1:1:1:1:1:1:1:1:L	End of Boring		

Remarks:

Symbol Description

Strata symbols

Poorly graded sand with silt



Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 21, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-095

**Contract:** 28-113-01

Boring Location: Sta. 306+00 0' C.L.

**Boring Surface Elev.:** + 40.90 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. O.D.

Core Bit: IN. O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing** Time **Depth of Hole Depth of Water** Elev. of Water Date 7/16/10 12.9 20.0 18.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
	7/16/10	1	0.0'	2 6 7 9	Moist medium dense orange clayey coarse to fine sand w/some fine gravel and silt.  Gravel - 3	;" <u>.</u>
		2	2.0'	24 34 38 39	13" RECOVERY  Moist very dense orange fine to coarse sand A-2-4(0)  w/some clay, silt and fine gravel.	
3.6		3	4.0' 4.0'	9 13 13	w/some clay, silt and fine gravel.  20" RECOVERY  Moist medium dense orange silty coarse to  A-1-b	
			6.0'	15	fine sand w/trace fine gravel.  21" RECOVERY	
7.2		4	6.0' 8.0'	14 15 16 17	Moist dense brown silty coarse sand w/some fine sand, trace fine gravel.  21" RECOVERY	
		5	8.0'	6 8 8 6	Moist medium dense brown silty coarse sand w/some fine sand, trace fine gravel.  A-1-b	
		6	10.0' 10.0'	7 19	20" RECOVERY  Moist medium dense brown clayey coarse  A-2-4(0)	
10.8			11.0'		sand w/some fine sand, fine gravel and silt.	
		6A	11.0' 12.0'	50	10" RECOVERY A-2-4(0)	
		7	12.0'	5 14 7 7	Moist dense gray silty coarse sand and fine gravel w/some fine sand, trace clay.  6" RECOVERY  Wet very stiff gray fine sandy silt w/some	
14.4		8	14.0' 14.0'	2	coarse sand, clay and fine gravel.	
			16.0'	2 4 2 4	Coarse sand, clay and fine gravel.  18" RECOVERY  Wet firm gray clayey coarse to fine sandy silt  w/some fine gravel.	
		9	16.0'	5 10 16 19	15" RECOVERY  Wet medium dense brownish gray clayey fine to coarse sand w/some silt and fine gravel.  A-2-4(0)	
18			18.0'		18" RECOVERY	
		10	18.0'	9 12 11 10	Wet medium dense brown fine to coarse sand w/some silt, trace fine gravel.  A-2-4(0)	
			20.0'		16" RECOVERY	

Remarks:

### **STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

**F.A. Project:** US 301 Maryland State Line to SR-1 **Contract:** 28-113-01

**Boring No.:** R1-095

						1	
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
(11.)	1 Togrooo		Ворин		End of Boring		
04.0					-		
21.6							
25.2							
25.2							
28.8							
32.4					DRAFT		
					FOR BIDI		
					$F(\ IR\ R H\ H)$		
36		1 1					
					GUST 20		
					1/21191 /2/1	115	
				1			
39.6							
43.2							
46.8							
40.0							
50.4							
33.4							

Symbol Description

Strata symbols



Poorly graded clayey silty sand



Silty sand

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 16, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-096

**Contract:** 28-113-01

Boring Location: Sta. 311+00 0' C.L.

**Boring Surface Elev.:** + 37.05 Reference:

IN. IN. IN. Wt. of Casing Hammer: Average Fall: Lbs. Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 IN. IN. O.D. O.D.

Core Bit: O.D. 3 1/4 **Casing Size:** 

From Depth of: From Depth of: To: To: Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Casing Depth of Water** Time **Depth of Hole** Elev. of Water Date 7/16/10 20.0 18.0 13.8

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 20.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: T. Kane

B #	5 "					
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I.	Remarks
(11.)	7/16/10	1	0.5'	5	Moist medium dense brown silty coarse to A-2-4(0) Topsoil -	A"
	17,10,10	l '	0.0	5 7 8		4.
			2.0'		fine san <mark>d</mark> w/trace fine gravel.	
		2	2.0'	10 16 17	Moist dense brown clayey coarse sand w/ A-2-4(0)	
	-			17 18	some fine sand, fine gravel and silt.	
3.6			4.01	10	20" RECOVERY	
		3	4.0' 4.0'	10	Moist medium dense brown silty coarse to A-2-4(0)	•
		1	7.0	10 14 15 9		
	•	_		9	fine sand w/trace fine gravel.	
			6.0'		18" RECOVERY	
		4	6.0'	9 19 20 24	Moist dense brown coarse to fine sand w/ A-2-4(0)	
7.2			/ /	20 24	some silt and clay, trace fine gravel.	
			8.0'		21" RECOVERY	
		5	8.0'	14	Moist dense brown fine to coarse sand w/ A-2-4(0)	
				14 18 20	some silt, trace fine gravel.	
				17		
			10.0'	40	19" RECOVERY	
10.8		6	10.0'	10 10 10	Moist medium dense orange fine sand w/some A-2-4(0)	
	1			10 5	silt, trace coarse sand and fine gravel.	
			12.0'		20" RECOVERY	
		7	12.0'	4 7	Wet medium dense brown coarse to fine sand A-1-b	
				10 10	w/some silt, trace fine gravel.	
				10		
14.4		8	14.0' 14.0'	4	16" RECOVERY	
17.7	1	ľ°	14.0	4 5 6 5	Saturated medium dense brown coarse to A-1-b	
				5	dense sand w/some silt, trace fine gravel.	
			16.0'		18" RECOVERY	
		9	16.0'	2 4	Saturated loose brown coarse to fine sand w/ A-1-b	
				2 4 5 7	some silt, trace fine gravel.	
18	1		18.0'	'	EHAME BELAME 20" RECOVERY	
10	1	10	18.0'	2	HINEL Saturated loose brown coarse sand w/some A-1-b	
				2 2 5 3	111111111 C	
				3	titiatiti	
			20.0'		14" RECOVERY	
	1				End of Boring	

Remarks:

Symbol Description

Strata symbols

Silty sand



Clayey sand



Poorly graded clayey silty sand



Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 16, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: R1-097

**Contract:** 28-113-01

Boring Location: Sta. 140+00 50 Lt. C.L.

**Boring Surface Elev.:** + 25.89 Reference:

Wt. of Casing Hammer: IN. Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: IN. Lbs. 30 D-Sampler: S-Sampler: U-Sampler: IN. Type of: Split Barrel O.D. 2 IN. IN. O.D.

Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

Depth of Water Time **Depth of Hole Depth of Casing** Elev. of Water Date 7/27/10 10.0 8.0 5.2

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 30.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Jason Truver

**Helpers:** J. Lafferty

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class	s./G.I.	Remarks
	Daily Progress 7/27/10	No.		13 14 15 19 4 8 9 10	O" RECOVERY No Sieve Analysis - Indication of moist medium dense gray silty sand.  2" RECOVERY  Wet medium dense orange coarse sand w/ some fine sand and silt, trace fine gravel.  17" RECOVERY  Saturated medium dense orange fine gravelly coarse sand w/some fine sand, trace fine gravel.  21" RECOVERY  Saturated medium dense orange silty fine to coarse sand w/trace fine gravel.  14" RECOVERY	s./G.I. -1-b 4(0)	Asphalt - 5". Crushed Stone - 5".
			16.0'	5 7 9 9	sand w/some coarse sand and silt, trace fine gravel.  19" RECOVERY	, T(V)	
18							
		6	19.0'	4 6 8	Saturated medium dense orangish brown fine sand w/some silt and coarse sand, trace fine	2-4(0)	

Remarks:

### **STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

**F.A. Project:** US 301 Maryland State Line to SR-1 **Contract:** 28-113-01

**Boring No.:** R1-097

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	· · ·	(S
			21.0'	7	gravel. 20" RECOVERY	
21.6						
		7	24.0'	4 6 11 11	Saturated medium dense orangish brown fine A-2-4(0)	
25.2				11 11	sand w/some coarse sand and silt, trace fine gravel.	
			26.0'		18" RECOVERY	
		8	28.0'	3	Saturated medium dense orangish brown fine A-3	
28.8				3 8 19 23	sand w/some coarse sand, trace silt and fine	
			30.0'		gravel.	
					End of Boring	
					DRAFT	
32.4						
	R					
		$\mathbf{V}$			FOR BIDDING	
36	•					
					JGUST 2015	
39.6				10		
39.6						
43.2						
70.2						
46.8						
50.4						
54						

Symbol Description

Strata symbols

Silty sand

Well graded sand with silt

1.000000 1.0000000

Poorly graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- Exploratory borings were drilled on July 27, 2010 using a 3 1/4-inch diameter continuous flight power auger. Rig is a CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked to following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: SWM1-45-1

**Contract:** 25-113-01

Boring Location: STA. 95+58 211' Rt. C.L.

**Boring Surface Elev.:** + 38.34 Reference:

IN. IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. 30 D-Sampler: S-Sampler: U-Sampler: Type of: Split Barrel O.D. 2 O.D.

IN. IN. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** 3 1/4 Inches Hollow Stem Auger: 0.0

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/15/11 5.8 10.0 10.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 10.0 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

Boring Contractor: Walton Corporation Driller: Gary Truver

Helpers: K. Kershaw

Б	- ·			T		
Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./C	S.I. Remarks
(11.)	2/15/11	1	0.5'	2	Moist firm brown fine sandy silt w/some A-4(0	) Topsoil - 8".
				2 3 2	coarse sand, fine gravel and clay.	) Topson o .
					coase tand, and grave and only.	
			2.0'		13" RECOVERY	
2.35		2	2.0'	4 7	Wet stiff brown clayey fine sandy silt w/some A-4(0	
			3.0'		coarse sand and fine gravel.	
	l '	2A	3.0'	10 8	12" RECOVERY  Wet medium dense brown fine gravelly fine A-2-4(	0
	•	<b>.</b> ,		8	to coarse sand w/some silt.	
			4.0'		12" RECOVERY	
H		3	4.0'	4 8 15 17	Wet medium dense brown silty fine gravelly  A-2-4(	0)
4.7				15	fine sand w/some coarse sand.	
		4	6.0' 6.0'	10	12" RECOVERY	
		4	6.0	10 11 17	Wet medium dense brown fine gravelly fine to coarse sand w/some silt.	
7.05				19	to coarse sand w/some siit.	
			9.01		16" DECOVEDY	
		5	8.0' 8.0'	12	16" RECOVERY  Wet medium dense coarse sand w/some fine A-1-t	
			0.0	12 13 13 15	sand, trace of fine gravel and silt.	'
				15	Stand, trace of time graver and site.	
9.4					icicicicici Icicicicici Icicicicici	
			10.0'		16" RECOVERY	
			10.0		End of Boring	
11.75						
11./5						
$\vdash$						
	I		l			

Remarks:

Symbol Description

### Strata symbols



Silty low plasticity clay



Poorly graded clayey silty sand



Silty sand



Well graded sand with silt

# DRAFT NOT FOR BIDDING AUGUST 2015

- 1. Exploratory borings were drilled on February 15, 2011 using 3 1/4 inch diameter continuous flight power auger. Rig is CME 55 ATV.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.
- 6. All blows are uncorrected.

### STATE OF DELAWARE **DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS**

F.A. Project: US 301 Maryland State Line to SR-1 Boring No.: SWM1-46-1

**Contract:** 25-113-01

Boring Location: STA. 102+37 116' Lt. C.L.

**Boring Surface Elev.:** + 45.2 Reference:

IN. IN. Wt. of Casing Hammer: Lbs. Average Fall: Average Fall:
O.D. of Sampler:
O.D. of Samp. Tube:
O.D. of Samp. Tube:
O.D. of Rock Core: Wt. of Sample Hammer: Lbs. D-Sampler: S-Sampler: U-Sampler: IN. Type of: O.D. IN. IN. O.D. Core Bit: O.D.

From Depth of: From Depth of: To: To: **Casing Size:** Inches **Hollow Stem Auger:** 

Water Level Readings

**Depth of Water** Time **Depth of Hole Depth of Casing** Elev. of Water Date 2/17/11 9.8

Dry

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: No. of 2 in. Dia. Shelby Tubes: 2 1/2 in. Dia. Contin. Sample Boring: Dia. U-Sample Boring: U-Samples: 9.8 Ft.; Ft. Ft.; Core Drilling in Rock: Ft.

**Boring Contractor:** Walton Corporation **Driller:** Dave Burt

Helpers: K. Kershaw

Depth (ft.)	Daily Progress	No.	Sample Depth	Blows/6"	Sample Description Class./G.I. Remarks
	2/17/11	1	0.0'		Wet brown clayey silt w/some fine to coarse sand, trace of fine gravel.  Hand Auger
			2.0'		24" RECOVERY
2.35		2	3.5'		Wet brown clayey coarse sandy silt w/some fine sand, trace of fine gravel.  18" RECOVERY
		3	3.5'_		Wet brown fine sand and fine gravel w/some A-1-b Hand Auger
					Wet brown fine sand and fine gravel w/some A-1-b Hand Auger USDA Classification:
4.7					Alijani
			5.5'		HIVE HIVE HIVE HIVE HIVE 24" RECOVERY
		4	5.5'		Wet brown silty fine sand w/some coarse A-2-4(0) Hand Auger
					sand, trace of fine gravel.
	'				
7.05					
9.4	] '				
	]		10.0'		54" RECOVERY
			10.0		End of Boring
					Zind of Borning
1					
11.75					
		ĺ			
	·	1		1	

Remarks: Hand Auger

Symbol Description

Strata symbols

Low plasticity clay



Poorly graded sand with silt



Silty sand

# DRAFT NOT FOR BIDDING **AUGUST 2015**

- Exploratory borings were drilled on February 17, 2011 using a hand auger.
- 2. Groundwater levels recorded at the time of drilling and re-checked the following day.
- 3. Surveyed boring location and elevation was provided by Century Engineering.
- 4. These logs are subject to the limitations, conclusions, and recommendations in this report.
- 5. Results of tests conducted on samples recovered are reported on the logs.