

LOG OF BORING NO. TP-3-26

PROJECT: **US 301 Preferred Alternative Green North and Spaw Road Alternative 13.1** ▼
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton** DATE: 5/11
CAVED (ft): 1.5

DATE STARTED: 5/11/10
 DATE COMPLETED: 5/11/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: GARY TANNER
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 67.21
 DATUM: **Survey**
 EQUIPMENT: **CMESSATV**
 LOGGED BY: T. Kane
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			cultivated soil +/- 8 inches		
S-1	0.0	10	3-3-4-4	7					Brown moist medium stiff sandy SILT		pushed Shelby tube 2-4' in offset Boring for unit weight
S-2	2.0	17	7-8-9-10	17				orange moist medium dense silty SAND			
S-3	4.0	18	3-7-12-12	19		5			orange moist medium poorly graded sand contains gravel		
S-4	6.0	16	10-14-10-9	24					orange moist medium poorly graded sand contains gravel		
S-5	8.0	20	3-3-6-6	9		10			Brown moist loose silty SAND		
S-6	10.0	0	7-7-9-11	16					No recovery gravel blocking tip of spoon		
S-7	12.0	20	3-5-8-8	13					Brown wet medium dense silty SAND		mid rotary 14'
S-8	14.0	16	3-4-5-7	9		15			brown green wet loose silty SAND		
S-9	16.0	14	2-4-6-8	10					green wet loose clayey SAND		
S-10	18.0	19	4-4-7-9	11		20			brown green wet medium dense silty SAND		
S-11	20.0	15	6-10-12-13	22					brown green wet medium dense silty SAND		
S-12	22.0	10	4-6-8-11	14					brown green wet medium dense silty SAND		
S-12B	23.0	10							green wet medium dense glauconitic silty SAND		
S-13	24.0	16	6-10-11-12	21		25			green wet medium dense glauconitic silty SAND		
S-14	26.0	20	5-8-9-11	17					green wet medium dense glauconitic silty SAND		
S-15	28.0	15	12-14-16-17	30		30			green wet medium dense glauconitic silty SAND		

LOG US301 PROJECT PLEASANTON.GPJ 5/6/10

NOTES:

LOG OF BORING NO. TP-3-27

PROJECT: **US 301 Preferred Alternative Green North and Spun Road Alternative** 12.0
 PROJECT NO: **28-113-01** DATE: 5/11/10
 PROJECT LOCATION: **Pleasanton** CAVED (ft): changed

DATE STARTED: 5/10/10
 DATE COMPLETED: 5/11/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: GARY TRANEV
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 61.31
 DATUM: **Survey**
 EQUIPMENT: EMES SATV
 LOGGED BY: T. Kane
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0		top soil +/- 8 inches		
S-1	0.0	10	247	311				Brown moist st. ft sandy silt		
S-2	2.0	15	115	203	35			Brown moist dense poorly graded SAND contains gravel		
S-3	4.0	17	918	1618	34	5		Brown moist dense poorly graded SAND contains gravel		
S-4	6.0	17	1315	2024	35			Brown moist dense poorly graded SAND contains gravel		
S-5	8.0	12	412	156	27			Brown moist medium poorly graded SAND dense contains gravel		
S-6	10.0	19	686	1018		10		Brown moist medium dense silty SAND		
S-7	12.0	19	457	912				Brown green moist medium dense silty SAND		with rotameter - 14'
S-8	14.0	17	236	119		15		Brown green wet loose silty SAND		
S-9	16.0	16	591	1013	19			Brown green wet medium dense silty SAND		Step 5/10
S-10	18.0	17	351	1011	15			Brown green wet medium dense silty SAND		Start 5/11
S-11	20.0	15	810	1214	22	20		Brown green wet medium dense silty SAND		
S-12	22.0	19	481	1111	19			Brown green wet medium dense silty SAND		
S-13	24.0	20	567	913		25		Brown green wet medium dense silty SAND		
S-14	26.0	12	581	1114	19			Brown green wet medium dense silty SAND		
S-15	28.0	21	489	1117		30		Green wet medium glauconitic dense silty SAND		

NOTES: Bulk sample obtained pH sample obtained 30-32

LOG US301 PROJECT - EASANTON.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. TP-3-27

LOG OF BORING NO. TP-3-28

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

ELEVATION: 8.6 ∇ 5.6 ∇
 DATE: 5-13-10 5-13-10
 CAVED (ft): Augers 6.6

DATE STARTED: **5-13-10**
 DATE COMPLETED: **5-13-10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **O. Burt**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **61.60**
 DATUM: **Survey**
 EQUIPMENT: **CME 55 ATV**
 LOGGED BY: **J. Lafferty**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
S-1	0.0	13"	4-4-5	8		0			Topsoil +/- 8"		Auger probe performed from 7'-5' to obtain bulk sample
S-2	2.0	19"	8-5-15-16	20					Brown, moist, medium stiff, Sandy lean CLAY, trace gravel		
S-3	4.0	18"	7-11-10-10	21		5			Orange, moist, medium dense, Clayey SAND, trace gravel		
S-4	6.0	3"	3-4-5-5	9					Orange and brown, moist to wet, medium dense, Silty SAND, trace gravel		
S-5	8.0	17"	1-3-5-6	8					Green and orange, wet, stiff, glauconitic, (piece of gravel in end of spoon) Sandy lean CLAY, trace gravel		
S-6	10.0	17"	4-5-8-9	13		10			Green, wet, loose, glauconitic, Silty SAND		
S-7	12.0	16"	3-5-6-6	11					Green, wet, medium dense, glauconitic, Silty SAND		
S-8	14.0	18"	3-6-9-8	15		15			Green, wet, medium dense, glauconitic, Clayey SAND		
S-9	16.0	18"	10-17-19-22	36					Green, wet, dense, glauconitic, Clayey SAND		
S-10	18.0	20"	4-5-5-5	10					Green, wet, loose, glauconitic, Silty SAND		
S-11	20.0	17"	6-7-9-12	16		20			Green, wet, medium dense, glauconitic, Silty SAND		
S-12	22.0	20"	5-6-6-7	12					Green, wet, medium dense, glauconitic, Silty SAND		
S-13	24.0	14"	3-4-6-5	10		25			Green and orange, wet, stiff, glauconitic, Sandy lean CLAY		
S-14	26.0	18"	6-10-12-14	22					Green and orange, wet, very stiff, glauconitic, Sandy lean CLAY		
S-15	28.0	18"	2-4-6-8	10					Green, wet, loose, glauconitic, Silty SAND		

NOTES:

Boring terminated at 30.0 ft.

LOGG US301 PROJEC 5/26/10



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 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. TP-3-28

LOG OF BORING NO. TP-3-29W

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: **5/11/11**
 CAVED (ft): **NAUGER**

DATE STARTED: **5/11/10**
 DATE COMPLETED: **5/12/10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **GARY TRAYER**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **62.56**
 DATUM: **Survey**
 EQUIPMENT: **CMESSATV**
 LOGGED BY: **T. Kane**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
									DESCRIPTION		
						0			Cultivated soil +/- 8 inches		
S-1	0.0	8	2.4.4.6	3					Brown moist medium stiff sandy silty		
S-2	2.0	14	5.9.9.9	18					Brown moist medium dense silty sand		
S-3	4.0	12	4.6.6.3	12		5			Brown moist medium poorly graded sand dense contains gravel		
S-4	6.0	16	6.3.4.4	7					tan orange moist loose silty sand		
S-5	8.0	10	5.7.7.11	14					orange wet medium poorly graded sand dense contains gravel		
S-6	10.0	20	11.12.12.10	24		10			orange wet medium poorly graded sand dense contains gravel		
S-7	12.0	10	5.5.5.9	10					brown green wet loose silty sand		
S-8	14.0	17	2.5.7.10	12		15			Brown green wet medium dense silty sand		MUD return 14"
S-9	16.0	18	4.7.9.14	16					Brown green wet medium dense silty sand		
S-10	18.0	20	5.6.9.10	15					Brown green wet medium dense silty sand		S
S-11	20.0	16	4.10.15.8	25		20			Brown green wet medium dense silty sand		stop 5/11
S-12	22.0	20	6.8.12.14	20					Brown green wet medium dense silty sand		starts 5/12
S-13	24.0	16	7.12.14.9	26		25			green wet medium glauconitic silty sand		
S-14	26.0	21	5.10.10.3	20					green wet medium glauconitic silty sand		
S-15	28.0	16	6.11.4.15	25		30			green wet medium glauconitic silty sand		

NOTES: **Monitoring well**

ASANTON.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.
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LOG OF BORING NO. TP-3-29W

LOG OF BORING NO. TP-3-30

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: **5/16/10**
 CAVED (ft): **1.0**

DATE STARTED: **5/10/10**
 DATE COMPLETED: **5/10/10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **GARY TRUVER**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **60.51**
 DATUM: **Survey**
 EQUIPMENT: **CMSS ATU**
 LOGGED BY: **T. Kane**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			topsoil +/- 6 inches		
S-1	0.0	14	23.4	4	7				Brown moist medium stiff sandy silt		
S-2	2.0	19	55.7	10	12				Brown moist stiff sandy silt		
S-3	4.0	14	6.9	8.1	17	5			Brown moist medium dense silty sand		
S-4	6.0	16	11.4	18.2	32				Brown moist dense poorly graded sand		
S-5	8.0	16	3.5	8.9	15				Green + brown moist medium clayey sand		
S-6	10.0	17	7.1	11.0	13	10			Green + brown moist medium dense silty sand		
S-7	12.0	19	4.5	7.8	12				Green + brown wet medium dense silty sand		MWD rotary 14'
S-8	14.0	17	3.5	8.0	13	15			Green + brown wet medium dense silty sand		
S-9	16.0	18	4.8	11.5	19				Green + brown wet medium dense silty sand		
S-10	18.0	18	4.8	10.7	18	20			Green + brown wet medium dense silty sand		
S-11	20.0	14	9.15	20.2	35				Green + brown wet dense silty sand		
S-12	22.0	20	6.1	12.8	22				Green + brown wet medium dense silty sand		
S-13	24.0	13	10.13	15.13	28	25			Green + brown wet medium dense silty sand		
S-14	26.0	20	8.9	12.14	21				Green wet medium dense glauconitic silty sand		
S-15	28.0	14	4.8	14.20	27	30			Green wet medium dense glauconitic silty sand		

LOGS US301 PROJECT PLEASANTON.GPJ 5/6/10

NOTES:



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LOG OF BORING NO. TP-3-30

LOG OF BORING NO. TP-3-31

PROJECT: **US 301 Preferred Alternative Green North and Spun Road Alternative**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: **5/10**
 CAVED (ft) **NA**

DATE STARTED: **5/10/10**
 DATE COMPLETED: **5/10/10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **GRAY TRUVER**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **53.40**
 DATUM: **Survey**
 EQUIPMENT: **CME 55 ATV**
 LOGGED BY: **T. Kane**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (ft)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			top soil + 1-2 inches		
S-1	0.0	6	35.9.7	14					Brown moist soft SANDY SILT contains gravel		
S-2	2.0	15	5.6.7	9					Brown moist medium dense SILTY SAND		
S-3	4.0	16	4.5.5.5	10		5			Brown moist loose SILTY SAND		
S-4	6.0	17	4.3.2.4	5					Brown wet loose SILTY SAND		
S-5	8.0	17	3.3.5.6	8					Brown green wet loose clayey SAND		
S-6	10.0	18	5.8.15.21	23		10			Brown green wet medium dense clayey SAND		
S-7	12.0	20	4.5.6.8	11					Brown green wet medium dense SILTY SAND		MVD rotary 14"
S-8	14.0	12	11.3.6	4		15			Green wet very loose glauconitic SILTY SAND		
S-9	16.0	16	4.5.7.9	12					Green wet medium dense glauconitic SILTY SAND		
S-10	18.0	16	3.5.6.8	11		20			Green wet medium dense glauconitic SILTY SAND		
S-11	20.0	19	5.8.10.14	19					Green wet medium dense glauconitic SILTY SAND		
S-12	22.0	16	5.6.11.13	17					Green wet medium dense glauconitic SILTY SAND		
S-13	24.0	18	6.9.12.15	21		25			Green wet medium dense glauconitic SILTY SAND		
S-14	26.0	20	8.13.13.18	26					Green wet medium dense glauconitic SILTY SAND		
S-15	28.0	17	9.15.16.18	31		30			Green wet dense glauconitic SILTY SAND		

NOTES: Bulk sample obtained pH sample obtained 30-32'

LOG US301 PROJ. NO. 28-113-01-ASANTON.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. TP-3-31

LOG OF BORING NO. TP-3-32

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative 7.3** 7.3
 PROJECT NO: **28-113-01** DATE: 5/7
 PROJECT LOCATION: **Pleasanton** CAVED (ft): indicated

DATE STARTED: 5/7/10
 DATE COMPLETED: 5/7/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: Gary Traver
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 62.64
 DATUM: **Survey**
 EQUIPMENT: **CMES SATV**
 LOGGED BY: T. Kane
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
									DESCRIPTION		
						0			cultivated soil +/- 6 inches		
S-1	0.0	14	13.55	2					Brown moist loose sandy SILT		
S-2	2.0	16	9.81	18					medium Brown moist dense silty SAND		
S-3	4.0	17	25.57	10		5			Brown moist loose silty SAND		
S-4	6.0	12	9.91	20					Brown wet medium poorly graded SAND dense contains gravel		
S-5	8.0	10	2.78	15					Brown wet medium poorly graded SAND dense contains gravel		
S-6	10.0	17	7.99	18		10			Brown wet medium poorly graded SAND dense contains gravel		
S-7	12.0	15	6.45	10					Brown wet loose silty SAND contains gravel		
S-8	14.0	15	2.47	11		15			Brown wet medium dense clayey SAND		
S-9	16.0	20	6.71	17					Brown wet medium dense clayey SAND		
S-10	18.0	16	2.46	10					Brown + orange wet loose clayey SAND		NO Rotarok 19'
S-11	20.0	20	6.89	17		20			Brown + orange wet medium dense clayey SAND		
S-12	22.0	18	8.13	30					Brown + orange wet medium dense clayey SAND		
S-13	24.0	20	7.79	16		25			Brown and orange wet medium dense clayey SAND		
S-14	26.0	12	8.10	24					Green and Brown wet medium glauconitic dense clayey SAND		
S-15	28.0	22	5.79	16		30			Green wet medium glauconitic dense silty SAND		

NOTES: pH sample obtained 30-32' / Boring Terminated @ 30' / Bulk sample obtained

LOGG US301 PROJEC ASANTON.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. TP-3-32

LOG OF BORING NO. TP-3-33

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative 11.0** ▽
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**
 DATE: **5/7**
 CAVED (ft): **in Auger**
 DATE STARTED: **5/7/10**
 DATE COMPLETED: **5/7/10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **GARY TRAVEL**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**
 GROUND SURFACE ELEVATION: **61.60**
 DATUM: **Survey**
 EQUIPMENT: **CMESS' SATV**
 LOGGED BY: **T. Kane**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			cultivated soil to 8 inches		
S-1	0.0	10	2.4.5.4	9					Brown moist medium stiff sandy silt		
S-2	2.0	16	2.4.10.13	14					Brown moist medium silty sand dense contains gravel		
S-3	4.0	14	9.21.32.29	53		5			tan moist very poorly graded sand dense contains gravel		
S-4	6.0	15	19.19.20.21	39					tan moist dense poorly graded sand contains gravel		
S-5	8.0	19	5.5.9.12	14					Brown moist medium dense clayey sand		
S-6	10.0	18	8.10.11.13	21		10			Brown moist medium dense clayey sand		
S-7	12.0	18	5.7.8.9	15					Brown wet medium dense clayey sand		no rotary
S-8	14.0	77	2.4.7.7	11		15			Brown wet medium dense clayey sand		14'
S-9	16.0	12	6.8.11.17	19					Brown wet medium dense clayey sand		
S-10	18.0	20	5.8.9.11	17					Brown wet medium dense clayey sand		
S-11	20.0	14	9.9.11.13	20		20			Brown wet medium dense clayey sand		
S-12	22.0	19	5.7.11.11	18					Brown wet medium dense clayey sand		
S-13	24.0	16	5.9.11.12	20		25			Brown + green wet medium dense clayey sand		
S-14	26.0	19	4.7.9.13	16					Brown + green wet medium dense clayey sand		
S-15	28.0	11	6.6.9.13	15		30			Green wet medium dense clayey sand		

NOTES: **Boring Terminated @ 30 feet**

LOGG US301 PROJECT PLEASANTON.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. TP-3-33

LOG OF BORING NO. TP-3-34W

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative 13** ▼
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: **5/12**
 CAVED (ft): **in Auger**

DATE STARTED: **5/12/10**
 DATE COMPLETED: **5/12/10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **G. A. [Signature]**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **59.37**
 DATUM: **Survey**
 EQUIPMENT: **CMESS AV**
 LOGGED BY: **T. [Signature]**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	
									DESCRIPTION	REMARKS
						0			cultivated soil +/- 6 inches	
S-1	0.0	12	3.4.5.8	9					Brown moist medium stiff sandy silt	
S-2	2.0	15	7.11.8.10	19					Brown moist medium dense silty sand contains gravel	
S-3	4.0	16	7.12.8.10	20		5			Brown orange moist medium dense silty sand	
S-4	6.0	19	11.14.14.14	28					Brown + green moist medium dense silty sand	
S-5	8.0	16	3.4.6.8	10		10			Brown + green moist + 10 wet loose silty sand	
S-6	10.0	20	8.9.12.15	21					Brown green wet medium dense silty sand	
S-7	12.0	18	6.10.10.9	20					Brown green wet medium dense silty sand	
S-8	14.0	18	2.3.5.7	9		15			Brown green wet loose silty sand	
S-9	16.0	16	5.6.7.9	13					Brown green wet medium dense silty sand	
S-10	18.0	18	3.3.7.9	10		20			Brown green wet loose silty sand	
S-11	20.0	20	2.7.9.13	16					Brown green wet medium dense silty sand	
S-12	22.0	19	5.6.9.10	15					Brown green wet medium dense silty sand	
S-13	24.0	18	5.8.9.14	17		25			Brown green wet medium dense silty sand	
S-14	26.0	17	4.9.10.9	18					green wet medium dense silty sand glauconitic	
S-15	28.0	14	8.11.15.17	26		30			green wet medium dense glauconitic silty sand	

Mudstone 14'

NOTES: **Monitoring well**



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LOGG US301 PROJECT PLEASANTON.GPJ 5/6/10

LOG OF BORING NO. TP-3-35

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative 3.9**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: 5-11-10 5-12-10 5-13
 CAVED (ft): Augers 3.2 4.5

DATE STARTED: 5-11-10
 DATE COMPLETED: 5-12-10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: O. Burt
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 60.99
 DATUM: **Survey**
 EQUIPMENT: CME 55 ATU
 LOGGED BY: J. Lafferty
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S-1	0.0	10"	3-3-4	6		0			Topsoil +/- 10" Brown and orange, dry to moist, medium stiff, Sandy lean CLAY	Performed Auger probe 1' to 5' to obtain bulk sample.
S-2	2.0	14"	4-6-7-9	13				Brown and orange, moist, medium dense, Clayey SAND with gravel		
S-3	4.0	15"	13-22-23-23	45		5		Brown and orange, moist to wet, dense, Clayey SAND with gravel		
S-4	6.0	14"	20-19-13-15	32				Tan and orange, wet, dense, Silty SAND with gravel		
S-5	8.0	20"	7-7-6-6	13				Orange, wet, medium dense, Silty SAND, trace gravel		
S-6	10.0	12"	5-7-6-6	13		10		Orange, wet, medium dense, Silty SAND with gravel		
S-7	12.0	17"	4-5-8-10	13				Orange and green, wet, stiff, Sandy Lean CLAY		
S-8	14.0	18"	3-5-7-9	12		15		Green and orange, wet, stiff, glauconitic, Sandy Lean CLAY		
S-9	16.0	19"	4-6-6-6	12				Green, wet, stiff, glauconitic, Sandy Lean CLAY		
S-10	18.0	22"	8-11-14-18	25		20		Green, wet, medium dense, glauconitic, Clayey SAND	Stopped due to rain 5-11-10	
S-11	20.0	18"	8-15-13-14	28				Green, wet, medium dense, glauconitic, Clayey SAND	Started 5-12-10	
S-12	22.0	20"	8-11-13-14	24				Green and orange, wet, very stiff, glauconitic, Sandy Lean CLAY	Switched to mud rotary at 16.0 ft	
S-13	24.0	20"	5-7-11-12	18		25		Green, wet, very stiff, glauconitic, Sandy Lean CLAY		
S-14	26.0	20"	8-18-19-21	37				Green, wet, hard, glauconitic, Sandy Lean CLAY		
S-15	28.0	17"	5-7-9-11	16		30		Green, wet, medium dense, glauconitic, Clayey SAND		

A
B

LOG US301 PROJECT PLEASANTON.GPJ 5/6/10

NOTES:



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

24 hr
TP 3-41
3.0/4.2

LOG OF BORING NO. TP-3-35

LOG OF BORING NO. TP-3-36

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative 11.7** ▼ Dry ▼ Dry
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: 5-12-10 5-12-10 5-13
 CAVED (ft): Augers 5.2 8.9

DATE STARTED: 5-12-10
 DATE COMPLETED: 5-12-10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **D. Burt**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 64.08
 DATUM: **Survey**
 EQUIPMENT: **CME 55 ATV**
 LOGGED BY: **J Lafferty**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
S-1	0.0	13"	5-5-6	10		0			Topsoil 1/2 8" Brown, moist, stiff, Sandy Lean CLAY		Performed Auger probe from 7' to 5' to obtain bulk sample
S-2	2.0	16"	4-8-8-8	16				Orange and brown, moist, very stiff, Sandy Lean CLAY, trace gravel			
S-3	4.0	18"	3-7-9-10	16		5		Orange and brown, moist, medium dense, Clayey SAND, with gravel			
S-4	6.0	17"	12-10-11-11	21				Orange and tan, moist, medium dense, Silty SAND with gravel			
S-5	8.0	11"	4-14-16-9	30				Tan and orange, moist, medium dense, Silty SAND with gravel			
S-6	10.0	6"	10-9-10-13	19		10		Tan and orange, moist, medium dense, Silty SAND with gravel			
S-7	12.0	22"	3-7-7-10	14				Orange and black, moist, medium dense, Clayey SAND			
U-1	14.0	24"	PUSH	-		15		Push Shelby Tube orange and black, wet, Clayey SAND			
S-9	16.0	18"	4-4-7-9	11				Orange and green, wet, medium dense, Clayey SAND			
S-10	18.0	19"	4-5-6-6	11				Green and orange, wet, medium dense, glauconitic, Silty SAND		Switched to mud rotary at 16.0 ft	
S-11	20.0	18"	6-12-13-14	25		20		Green and orange, wet, medium dense, glauconitic, Clayey SAND			
S-12	22.0	20"	7-11-14-16	25				Green and orange, wet, medium dense, glauconitic, Silty SAND			
S-13	24.0	21"	4-5-7-9	12		25		Green and orange, wet, medium dense, glauconitic, Clayey SAND			
S-14	26.0	18"	4-8-16-20	24				Green and orange, wet, medium dense, glauconitic, Clayey SAND			
S-15	28.0	20"	7-6-10-13	16		30		Green, wet, very stiff, glauconitic, Sandy Lean CLAY			

NOTES:

Boring terminated at 30.0 ft

LOG# US301 PROJECT PLEASANTON.GPJ 5/6/10



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LOG OF BORING NO. TP-3-36

LOG OF BORING NO. TP-3-37

PROJECT: **US 301 Preferred Alternative Green North and Spaw Road Alternative** 5.2 ∇ 3.9 ∇
 PROJECT NO: **28-113-01** DATE: 5-13-10 5-13-10
 PROJECT LOCATION: **Pleasanton** CAVED (ft): Aug 13 4.0
 DATE STARTED: 5-12-10 GROUND SURFACE ELEVATION: 50.70
 DATE COMPLETED: 5-13-10 DATUM: **Survey**
 DRILLING CONTRACTOR: **Walton Corporation** EQUIPMENT: CME 55 ATV
 DRILLER: D. Burt LOGGED BY: J. Lafferty
 DRILLING METHOD: **Hollow Stem Auger** CHECKED BY: **M. Lester**
 SAMPLING METHOD: **Split Spoon**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
S-1	0.0	9"	3-4-6	7		0			Topsoil 1/2 9"		Performed Auger probe, from to 5' to obtain bulk sample stopped 5-12-10 started 5-13-10 Offset Auger probe to 8 ft. took Shelby Tube <u>U-1</u> 21" recovery Green, wet, Silty SAND
S-2	2.0	15"	4-4-5-6	9					Brown, moist, loose, Clayey SAND with gravel		
S-3	4.0	16"	4-3-2-4	5		5			Brown and green, moist to wet, loose, Clayey SAND, trace gravel		
S-4	6.0	20"	4-4-4-9	8					Brown and green, wet, loose, Silty SAND		
S-5	8.0	16"	3-4-4-5	8					Brown and green, wet, loose, Silty SAND		
S-6	10.0	17"	6-6-9-11	15		10			Green, wet, loose, glauconitic, Silty SAND		
S-7	12.0	18"	6-9-18-19	27					Green, wet, medium dense, glauconitic, Clayey SAND		
S-8	14.0	20"	7-9-10-11	19		15			Green and orange, wet, medium dense, glauconitic, Silty SAND		
S-9	16.0	18"	3-4-7-9	11					Green and orange, wet, medium dense, glauconitic, Silty SAND		
S-10	18.0	22"	6-7-10-15	19		20			Green, wet, medium dense, glauconitic, Silty SAND		
S-11	20.0	20"	7-7-16-14	23					Green, wet, medium dense, glauconitic, Silty SAND		
S-12	22.0	22"	5-7-12-18	19					Green, wet, medium dense, glauconitic, Silty SAND		
S-13	24.0	16"	4-5-7-9	12		25			Green, wet, medium dense, glauconitic, Silty SAND		
S-14	26.0	16"	11-12-17-16	29					Green, wet, medium dense, glauconitic, Silty SAND		
S-15	28.0	18"	6-7-9-10	16		30			Green, wet, medium dense, glauconitic, Silty SAND		

LOG US301 PROJECT PLEASANTON.GPJ 5/6/10

NOTES:



GEO-TECHNOLOGY ASSOCIATES, INC.

18 Boulden Circle, Suite 36
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24 HR
TP-3-35 3.8/4.5
TP-3-36 Dry/8.9

LOG OF BORING NO. TP-3-37

LOG OF BORING NO. TP-3-38

PROJECT: **US 301 Preferred Alternative Green North and Spaw Road Alternative 5.1** ∇ 5.2 ∇
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: 5-10-10 5-10-10
 CAVED (ft): August 6.2

DATE STARTED: **5-10-10**
 DATE COMPLETED: **5-10-10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **D. Burt**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **62.41**
 DATUM: **Survey**
 EQUIPMENT: **CME 55 ATU**
 LOGGED BY: **S. Lafferty**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
S-1	0.0	13"	2-2-3	5		0			Topsoil, 8"		after completing sampling affect Auger probe performed to obtain Bulk sample
S-2	2.0	18"	3-7-9-6	16				Brown, moist, medium stiff, Sandy Lean CLAY			
S-3	4.0	17"	4-4-5-6	9		5		Brown and orange, moist, medium dense, Clayey SAND			
S-4	6.0	17"	4-4-5-6	9				Brown and orange, moist, to wet, loose, Silty SAND			
S-5	8.0	18"	3-2-3-3	5				Brown, wet, loose, Silty SAND			
S-6	10.0	16"	7-12-23-17	35		10		Brown and black, wet, dense, Silty SAND with gravel			
S-7	12.0	17"	15-8-5-6	13				Orange, wet, medium dense, Silty SAND with gravel			
S-8	14.0	14"	7-11-10-10	21				Orange and brown, wet, very stiff, Sandy Lean CLAY			
S-9	16.0	19"	4-5-8-10	13		15		Green, wet, stiff, glauconitic, Sandy Lean CLAY			
S-10	18.0	20"	4-11-20-25	31				Green and orange, wet, hard, glauconitic, Sandy Lean CLAY			
S-11	20.0	19"	7-11-12-16	23		20		Green and orange, wet, very stiff, glauconitic, Sandy Lean CLAY			
S-12	22.0	13"	5-6-7-6	13				Green, wet, stiff, glauconitic, Sandy Lean CLAY			
S-13	24.0	21"	5-8-8-6	16				Green, wet, medium dense, glauconitic, Clayey SAND			
S-14	26.0	17"	2-3-5-5	8		25		Green and black, wet, medium stiff, glauconitic, Sandy Lean CLAY			
S-15	28.0	17"	14-17-30-35	57				Black and green, wet, very hard, glauconitic, Sandy SILT, trace gravel			
		15"	20-22-54-13	-		30		Black and green, wet, very hard, glauconitic, Sandy SILT, trace gravel/shell fragments		Switched to mud rotary at 28.0 ft.	

NOTES:

Boring terminated at 30 feet



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LOG OF BORING NO. TP-3-38

LOG US301 PROJECT PLEASANTON.GPJ 5/6/10

LOG OF BORING NO. TP-3-39

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative 9.1** ▽ 6.5 ▽
 PROJECT NO: **28-113-01** DATE: 5-10-10 5-10-10
 PROJECT LOCATION: **Pleasanton** CAVED (ft): Aug 15 7.0

DATE STARTED: **5-10-10**
 DATE COMPLETED: **5-10-10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **D. Burt**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **64.67**
 DATUM: **Survey**
 EQUIPMENT: **CME 55 ATV**
 LOGGED BY: **J. LaFesty**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
S-1	0.0	12"	2-3-3	5		0			Topsoil 1/2 - 8" Brown, moist, medium stiff, Sandy lean CLAY		Performed offset Auger probe to obtain bulk sample 7-5'
S-2	2.0	17"	3-8-5-4	13					Brown, moist, medium dense, Clayey SAND, trace gravel		
S-3	4.0	20"	4-5-7-7	12		5			Brown, moist, medium dense, Clayey SAND, trace gravel		
S-4	6.0	22"	3-3-8-7	11					Brown, moist to wet, medium dense, Silty SAND		
S-5	8.0	17"	7-11-16-11	27					Orange and brown, wet, medium dense, Silty SAND with gravel		
S-6	10.0	22"	5-4-7-9	16		10			Orange and brown, wet, medium dense, Silty SAND, trace gravel		switched to mud rotary at 18.0 ft
S-7	12.0	21"	3-4-5-5	9					Orange and brown, wet, loose, Silty SAND, trace gravel		
A S-8	14.0	13"	6-6-6-8	12		15			Orange and brown, wet, medium dense, Silty SAND with gravel		
B S-8	15.5	6"	6-6-6-8	12					Green and orange, wet, stiff, glauconitic, Sandy lean CLAY		
S-9	16.0	10"	6-12-11-13	23					Green, wet, very stiff, glauconitic, Sandy lean CLAY		
S-10	18.0	19"	3-3-5-6	8					Green and orange, wet, medium stiff, glauconitic, Sandy lean CLAY		
S-11	20.0	21"	4-4-5-6	9		20			Green and orange, wet, stiff, glauconitic, Sandy lean CLAY		
S-12	22.0	22"	7-11-11-16	22					Green, wet, very stiff, glauconitic, lean CLAY with sand		
S-13	24.0	11"	2-5-6-7	11		25			Green, wet, stiff, glauconitic, lean CLAY with sand		
S-14	26.0	20"	7-11-12-11	23					Green and black, wet, very stiff, glauconitic, Sandy lean CLAY		
S-15	28.0	20"	3-4-5-7	9		30			Black and green, wet, stiff, glauconitic, Sandy SILT, trace shell fragments		

NOTES: Boring terminated at 30.0 feet

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LOG OF BORING NO. TP-3-39

LOG US301 PROJECT PLEASANTON.GPJ 5/6/10

LOG OF BORING NO. TP-3-40W

PROJECT: **US 301 Preferred Alternative Green North and Spaw Road Alternative 11-2** V
 PROJECT NO: **28-113-01** DATE: 5/13/10
 PROJECT LOCATION: **Pleasanton** CAVED (ft): IN AREA

DATE STARTED: 5/13/10 GROUND SURFACE ELEVATION: 62.56
 DATE COMPLETED: 5/13/10 DATUM: Survey
 DRILLING CONTRACTOR: **Walton Corporation** EQUIPMENT: CME SS TRACK
 DRILLER: **GARY TRUYER** LOGGED BY: D. ZMITENSKI
 DRILLING METHOD: **Hollow Stem Auger / mud rotary** CHECKED BY: M. Lester
 SAMPLING METHOD: **Split Spoon**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
									DESCRIPTION	REMARKS
						0			CULTIVATED SOIL: +/- 11in	
S-1	0.0	10	3-2						BROWN, MOIST, SOFT, SANDY SILT	
S-2	2.0	14	2-3-3-5	6					ORANGE, MOIST, LOOSE, SILTY SAND.	
S-3	4.0	17	2-5-9-10	14		5			ORANGE, YELLOW MOIST, MED. DENSE SILTY SAND	
S-4	6.0	21	9-11-9-8	20					ORANGE & YELLOW MOTTLED, MOIST MED. DENSE, POORLY GRADED SAND w/ SILT	
S-5	8.0	15	2-3-6-9	9		10			ORANGE WET, LOOSE, POORLY GRADED SAND w/ SILT	
S-6	10.0	19	8-14-15-3	34					ORANGE & BLACK MOTTLED, WET, DENSE POORLY GRADED SAND w/ SILT & GRAVEL	
S-7	12.0	19	9-5-8-10	13					GREEN, WET, MED. DENSE, SILTY SAND	
S-8	14.0	12	3-6-9-10	15		15			BROWN, WET, MED DENSE, CLAYEY SAND	
S-9	16.0	15	7-12-12-9	24					BROWN, WET, MED DENSE, CLAYEY SAND	
S-10	18.0	24	3-4-7-8	11					BROWN, WET, MED DENSE, CLAYEY SAND	
S-11	20.0	19	3-6-9-12	15		20			BROWN, WET, MED DENSE, CLAYEY SAND	SWITCHED TO MUD FLANK @ 20.0 FT
S-12	22.0	18	2-4-8-16	12					BROWN, WET, MED. DENSE, CLAYEY SAND	
S-13	24.0	4	8-8-11-11	19					GREEN, WET, MED. DENSE, GLAUCONITIC CLAYEY SAND	
S-14	26.0	24	3-6-6-7	12					GREEN, WET, MED. DENSE, GLAUCONITIC CLAYEY SAND	
S-15	28.0	23	3-6-6-7	12		30			GREEN, WET, MED DENSE GLAUCONITIC CLAYEY SAND	

NOTES: **BULK SAMPLE** / SET WELL / BORING TERM @ 30.0 FT.

LOG US301 PROJECT PLEASANTON GPJ-56/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. TP-3-40W

LOG OF BORING NO. TP-3-41

PROJECT: **US 301 Preferred Alternative Green North and Spur Road Alternative**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Pleasanton**

DATE: 5-11-10 5-11-10 4-12
 CAVED (ft): Augers 8.5 4.2

DATE STARTED: **5-11-10**
 DATE COMPLETED: **5-11-10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **D. Burt**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **56.92**
 DATUM: **Survey**
 EQUIPMENT: **CME 55ATU**
 LOGGED BY: **J. Lafferty**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
									DESCRIPTION		
S-1	0.0	10"	5-4-8	9		0			Topsoil +/- 8" Brown, moist, medium stiff, Sandy lean CLAY		Performed one Auger Probe from .7' to 5' to obtain bulk sample
S-2	2.0	4"	12-13-6-4	19				Orange and brown, moist, medium dense, (piece of gravel in end of spoon) Clayey SAND, trace gravel			
S-3	4.0	17"	4-3-3-4	6		5		Brown and orange, moist to wet, loose, Silty SAND			
S-4	6.0	16"	8-5-4-4	9				Brown and orange, wet, loose, Silty SAND			
S-4	7.5	6"	8-5-4-4	9				Green, wet, loose, glauconitic, Silty SAND			
S-5	8.0	20"	4-4-6-7	10				Green, wet, loose, glauconitic, Silty SAND		Washed out Augers using mud/water mix	
S-6	10.0	17"	5-5-9-10	14		10		Green, wet, medium dense, glauconitic, Silty SAND			
S-7	12.0	15"	4-5-11-10	16				Green, wet, medium dense, glauconitic, Silty SAND			
S-7	13.5	6"	4-5-11-10	16				Orange and brown, wet, very stiff, Sandy lean CLAY with gravel			
S-8	14.0	16"	7-6-8-9	14		15		Green, wet, medium dense, glauconitic, Silty SAND, trace gravel		Switched to mud rotary at 16.0 ft.	
S-9	16.0	21"	8-9-10-10	19				Green, wet, medium dense, glauconitic, Silty SAND, trace gravel			
S-10	18.0	19"	2-3-4-5	7				Green, wet, medium stiff, glauconitic, Sandy SILT, trace gravel			
S-11	20.0	18"	10-23-35-37	58		20		Green, wet, very dense, glauconitic, Silty SAND, trace gravel			
S-12	22.0	21"	13-15-18-21	33				Green, wet, dense, glauconitic, Silty SAND, trace gravel			
S-13	24.0	4"	5-50/3"	-		25		Green and gray, wet, very dense, glauconitic, Silty SAND, trace shell fragments			
S-14	26.0	22"	40-20-32-37	52				Gray, wet, hard, glauconitic, Sandy SILT, trace shell fragments			
S-15	28.0	20"	10-13-15-18	28				Gray, wet, medium dense, glauconitic, Clayey SAND, trace gravel			

NOTES:

Boring terminated at 30.0 feet

ASANTON.GPJ 5/6/10
LOG US301 PROJ#



GEO-TECHNOLOGY ASSOCIATES, INC.
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24 hr
 TP-3-39
 6/6/7.2

LOG OF BORING NO. TP-3-41

LOG OF BORING NO. B-6-04

PROJECT: **US 301 Preferred Alternative Green North and Spur Road**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **New Castle County, Delaware**

DEPTH (ft): 8.2
 DATE: 5/14
 CAVED (ft): Auger

DATE STARTED: 5/14/10
 DATE COMPLETED: 5/14/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: GARY TURNER
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 49.94
 DATUM: Survey
 EQUIPMENT: CM 55 ADV
 LOGGED BY: T. Kame
 CHECKED BY: M. Lester

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (%)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						0			Cultivated soil TL 4 inches	
S-1	0.0		123443	8					Brown moist loose silty SAND	
S-2	2.0		156555	10					Brown moist loose silty SAND	
S-3	4.0		155677	13		5			Brown wet MEDIUM DENSE clayey SAND	
S-4	6.0		186759	12					Brown wet MEDIUM DENSE silty SAND	
S-5	8.0		163344	7		10			Brown green wet loose clayey SAND	
S-6	10.0		174566	11					Brown green wet MEDIUM DENSE clayey SAND	
S-7	12.0		223446	8					Brown green wet loose clayey SAND	
S-8	14.0		204444	8		15			Brown green wet loose clayey SAND	
S-9	16.0		204786	15					green wet MEDIUM DENSE clayey SAND	
S-10	18.0		214887	16		20			green wet MEDIUM DENSE clayey SAND	
S-11	20.0		4 5 1/4"						green wet very DENSE clayey SAND	
S-12	22.0		12362518	41					gray wet DENSE clayey SAND	
S-13	24.0		206101310	23		25			gray wet MEDIUM DENSE clayey SAND	
S-14	26.0		2083116	24					gray wet MEDIUM DENSE clayey SAND	
S-15	28.0		19681220	20		30			gray wet MEDIUM DENSE clayey SAND	

NOTES: CR

LOG US301 PROJECT PLEASANTON 2.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. B-6-04

LOG OF BORING NO. B-6-05W

PROJECT: **US 301 Preferred Alternative Green North and Spur Road**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **New Castle County, Delaware**

DEPTH (ft): 30
 DATE: 5/13
 CAVED (ft): None

DATE STARTED: 5/13/10
 DATE COMPLETED: 5/13/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: Jason Truvel
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 55.98
 DATUM: **Survey**
 EQUIPMENT: **CMESS ATV**
 LOGGED BY: T. Lester
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	
									REMARKS	
						0			cultivated soil to 5 inches	
S-1	0.0	14	2-3-3-2	6					Brown moist ^{medium} stiff sandy silt	
S-2	2.0	16	5-4-5-4	9					Brown moist loose silty sand	
S-3	4.0	13	9-7-7-10	14		5			tan moist ^{medium} dense silty sand contains gravel	
S-4	6.0	16	6-7-7-10	16					orange moist ^{medium} dense silty sand contains gravel	
S-5	8.0	15	5-6-6-5	11					orange moist ^{medium} dense silty sand contains gravel	
S-6	10.0	18	6-4-5-6	9		10			tan wet loose silty sand	
S-7	12.0	17	3-3-3-3	6					tan wet loose silty sand	
S-8	14.0	6	6-7-1-1-0	18		15			Brown wet ^{medium} dense clayey sand	
S-9	16.0	13	8-9-7-9	16					green wet ^{medium} dense clayey sand	
S-10	18.0	12	3-3-2-5	5					gray + green wet ^{medium} stiff sandy lean clay	
S-11	20.0	15	6-9-7-7	16					Brown wet ^{medium} dense clayey sand	
S-12	22.0	16	3-3-3-3	6					gray + green wet ^{medium} stiff sandy lean clay	
S-13	24.0	16	7-1-6-1-9-7	35		25			gray + green wet dense clayey sand	
S-14	26.0	2	50/2						gray + green wet ^{very} dense clayey sand	
S-15	28.0	20	7-1-4-1-9-2-5	33					gray wet dense clayey sand	

NOTES: Bulk

LOG US301 PROJECT - ASANTON 2.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. B-6-05W

LOG OF BORING NO. B-6-06

PROJECT: **US 301 Preferred Alternative Green North and Spur Road**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **New Castle County, Delaware**

DEPTH (ft): 31.1
 DATE: 5/14
 CAVED (ft): 1 1/2

DATE STARTED: 5/14/10
 DATE COMPLETED: 5/14/10
 DRILLING CONTRACTOR: Walton Corporation
 DRILLER: STAPIT MUE
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: Split Spoon

GROUND SURFACE ELEVATION: 57.91
 DATUM: Survey
 EQUIPMENT: CHESS ATV
 LOGGED BY: T. Kane
 CHECKED BY: M. Lester

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	
									DESCRIPTION	REMARKS
						0			+/- 7 inches cultivated soil	
S-1	0.0	20	2-2-3-4	5					Brown moist medium stiff sandy silt	
S-2	2.0	14	4-2-2-6	15					Brown moist medium dense silty sand	
S-3	4.0	16	13 17 22 26 39			5			tan moist dense silty sand contains gravel	
S-4	6.0	21	24 24 24 9 50						tan moist dense silty sand contains gravel	
S-5	8.0	17	6 7 8 8 15						orange moist medium dense silty sand	
S-6	10.0	6	7 10 7 6 17			10			orange wet medium dense silty sand	
S-7	12.0	18	2 4 5 6 9						brown green wet loose clayey sand	
S-8	14.0	17	2 4 6 8 10			15			brown green wet loose clayey sand	
S-9	16.0	8	7 8 11 22	14					brown green wet medium dense clayey sand	
S-10	18.0	17	6 7 8 8 15			20			brown green wet medium dense clayey sand	
S-11	20.0	14	4 4 5 6 9						brown green wet loose clayey sand	
S-12	22.0	20	4 7 15 16 22						brown green wet medium dense clayey sand	
S-13	24.0	20	4 6 9 10 14			25			brown green wet medium dense clayey sand	
S-14	26.0	8	10 50						green wet very dense glauconitic clayey sand	
S-15	28.0	29	5 7 10 11 17			30			green wet medium dense glauconitic clayey sand	

LOG US 301 PROJECT P.E. SANTON 2.GPJ 5/6/10

NOTES: TUBE BULK



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. B-6-06

LOG OF BORING NO. B-7-04

PROJECT: **US 301 Preferred Alternative Green North and Spur Road**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **New Castle County, Delaware**

DEPTH (ft) **29.2**
 DATE **5/13/10**
 CAVED **IN ANGER**

DATE STARTED: **5/13/10**
 DATE COMPLETED: **5/13/10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **Jason F. Mover**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **57.10**
 DATUM: **Survey**
 EQUIPMENT: **CMESS ATU**
 LOGGED BY: **T. Kane**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						0			cultivated soil +/- 6 inches	
S-1	0.0	14	2.447	8					tan moist medium stiff SANDY SILT	pushed shallowly tube
S-2	2.0	16	8.103	16					gray mottled moist very stiff sandy tan clay	2-4' in offset boring
S-3	4.0	12	7.986	17		5			Brown moist medium dense silty SAND.	
S-4	6.0	18	8.178	18					Brown wet medium dense silty SAND contains gravel	
S-5	8.0	12	6.103	7		10			Brown wet medium dense poorly graded SAND contains gravel	
S-6	10.0	12	8.113	16					Brown green wet medium dense silty SAND	
S-7	12.0	0	6.778	14					NOT RECOVERED	
S-8	14.0	17	4.555	10		15			Green wet loose glauconitic clayey SAND	
S-9	16.0	13	6.131	7					Gray green wet medium dense glauconitic clayey SAND	
S-10	18.0	23	4.611	13		20			Gray green wet medium dense glauconitic clayey SAND	
S-11	20.0	13	6.212	13					Gray green wet dense glauconitic clayey SAND	
S-12	22.0	19	5.771	18					Gray wet medium dense glauconitic clayey SAND	
S-13	24.0	20	6.123	19		25			Gray wet medium dense clayey SAND	
S-14	26.0	20	1.141	18					Gray wet medium dense clayey SAND	
S-15	28.0	23	7.911	11		30			Gray wet medium dense clayey SAND	

NOTES: tube Bulk

LOGB US301 PROJECT - SANTON 2.GPJ 5/6/10

GTA GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. B-7-04

LOG OF BORING NO. B-7-05W

PROJECT: **US 301 Preferred Alternative Green North and Spur Road**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **New Castle County, Delaware**

DEPTH (ft): 8.5 Dry
 DATE: 5-15-10 5-15-10
 CAVED (ft): Augers 3.4

DATE STARTED: 5-15-10
 DATE COMPLETED: 5-15-10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: J. Truver
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 58.59
 DATUM: **Survey**
 EQUIPMENT: CME 55 ATU
 LOGGED BY: J. Lafferty
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	
									DESCRIPTION	REMARKS
S-1	0.0	12"	2-3-2	5		0			Topsoil 1/2 8" Brown, moist, medium stiff, Sandy lean CLAY	
S-2	2.0	14"	3-5-7-11	12					Brown, moist, stiff, Sandy lean CLAY	
S-3	4.0	17"	5-8-11-14	19		5			Brown and orange, moist, medium dense, Silty SAND with gravel	
S-4	6.0	16"	5-8-13-14	21					Brown, wet, medium dense, Silty SAND with gravel	
S-5	8.0	20"	4-5-6-7	11		10			Orange and green, wet, stiff, Clayey SAND	
S-6	10.0	20"	4-6-8-7	14					Green, wet, medium dense, glauconitic, Silty SAND	
S-7	12.0	19"	4-4-4-5	8					Orange and green, wet, medium stiff, Sandy lean CLAY, trace gravel	
S-8	14.0	20"	6-5-6-7	11		15			Green, wet, medium dense, glauconitic, Clayey SAND	
S-9	16.0	18"	4-4-4-4	8					Green, wet, loose, glauconitic, Clayey SAND, trace gravel	
S-10	18.0	18"	4-6-8-9	14		20			Green, wet, medium dense, glauconitic, Silty SAND, trace gravel	
S-11	20.0	19"	13-16-21-28	37					Green, wet, dense, glauconitic, Silty SAND, trace shell fragments	
S-12	22.0	21"	8-11-21-28	32					Green, wet, dense, glauconitic, Silty SAND, trace shell fragments	
S-13	24.0	20"	13-15-17-19	32		25			Green, wet, dense, glauconitic, Silty SAND, trace shell fragments	
S-14	26.0	19"	18-21-17-22	38					Gray, wet, dense, Silty SAND	
S-15	28.0		4-8-11-13	19		30			Gray, wet, medium dense, Clayey SAND	

NOTES:

Bulk

Boring terminated at 30.0 ft

LOG US301 PROJECT: ANTON 2.GPJ 5/6/10



GEO-TECHNOLOGY ASSOCIATES, INC.

18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. B-7-05W

LOG OF BORING NO. B-7-06

PROJECT: **US 301 Preferred Alternative Green North and Spur Road**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **New Castle County, Delaware**

DEPTH (ft): 8.1
 DATE: 5/13
 CAVED (ft): 1 Auger

DATE STARTED: 5/13/10
 DATE COMPLETED: 5/13/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: Tason Traver
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 61.86
 DATUM: **Survey**
 EQUIPMENT: CMSS ATV
 LOGGED BY: T. Kere
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			cultivated soil +/- 6 inches		
S-1	0.0	15	4.5	9.8	14				Brown moist stiff sandy silt		
S-2	2.0	16	9.8	11.8	19				orange moist medium dense silty sand		
S-3	4.0	14	5.1	14.16	25	5			orange moist medium dense silty sand		
S-4	6.0	19	11.6	11.13	27				orange moist medium dense silty sand		
S-5	8.0	17	5.6	6.10	12	10			orange wet medium dense silty sand		
S-6	10.0	18	13.2	12.10	24				orange wet medium dense poorly graded sand w/ silt		
S-7	12.0	0	5.1	15.6	34				NO RECOVERY		
S-8	14.0	16	5.6	7.8	13	15			tan wet medium dense poorly graded sand w/ silt		
S-9	16.0	12	6.8	13.8	21				tan wet medium dense poorly graded sand w/ silt		
S-10	18.0	13	15.0	5.7	15	20			Green brown wet medium dense silty sand		
S-11	20.0	12	10.7	6.8	13				Green Brown wet medium dense clayey sand		
S-12	22.0	19	3.2	2.3	4				Brown orange wet very loose clayey sand		
S-13	24.0	12	4.3	3.4	6	25			Brown orange wet loose clayey sand		
S-13B	25.0	22	4.3	3.4	6				green wet loose glauconitic clayey sand		
S-14	26.0	12	6.3	4.6	7				gray wet loose glauconitic clayey sand		
S-15	28.0	20	4.4	3.4	7	30			Brown orange wet loose clayey sand		

NOTES: CBR

LOG US301 PROJECT PLEASANTON 2.GPJ 5/6/10

GTA GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. PL SE-1

PROJECT: **US 301 Project Development**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Section 1**

WATER DEPTH (ft): 9.0 Dry
 DATE: 6/29 6/29
 CAVED (ft): Auger S.S.

DATE STARTED: 6/29/30
 DATE COMPLETED: 6/29/30
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: GARY Truver
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 62.75
 DATUM: **Survey**
 EQUIPMENT: **CMESSATV**
 LOGGED BY: T. Kane
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			topsoil +/- 6 inches		
S-1	0.0	9	3.9.9.8	18					tan moist ^{very} STIFF SANDY SILT		
S-2	2.0	15	6.8.8.9	16					Brown moist medium dense silty SAND		
S-3	4.0	10	3.7.14.15	21		5			Brown moist medium dense silty SAND contains gravel		
S-4	6.0	16	11.9.9.9	10					Brown moist medium dense poorly graded SAND contains gravel		
S-5	8.0	11	4.6.6.6	12		10			Brown moist to wet medium dense poorly graded SAND contains gravel		
S-6	10.0	13	2.2.3.3	5					Brown wet loose clayey SAND		
S-7	12.0	16	5.6.9.11	15					Brown wet medium dense silty SAND		
S-8	14.0	17	4.4.7.9	11		15			Brown wet medium dense silty SAND		
S-9	16.0	16	5.8.10.11	19					Brown wet medium dense silty SAND		
S-10	18.0	11	2.4.9.10	13					Brown green wet medium dense clayey SAND		18' charged Augers
S-11	20.0	16	6.7.12.13	19		20			Brown green wet medium dense silty SAND		
S-12	22.0	16	3.8.9	17					Brown green wet medium dense silty SAND		
S-13	23.5	12	3.8.10	18					Brown green wet medium dense silty SAND		
S-14	25	13	5.8.11	19		25			Brown green wet medium dense silty SAND		pH sample
Boring Terminated @ 26.5											

LOG US301 SECTION T.G.P.J 6/22/10

NOTES:



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. PL SE-1

LOG OF BORING NO. PL SE-2

PROJECT: **US 301 Project Development**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Section 1**

WATER DEPTH (ft): ∇ 9.4 ∇ 6.8 ∇ _____
 DATE: 6/24 6/24 _____
 CAVED (ft): Auger 9.3 _____

DATE STARTED: 6/24/10
 DATE COMPLETED: 6/24/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: GARY Traver
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 61.40
 DATUM: **Survey**
 EQUIPMENT: **CMESSATV**
 LOGGED BY: T. Kane
 CHECKED BY: M. Lester

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (ft)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			topsoil +/- 4 inches		
S-1	0.0	7	247.8	11					Brown moist stiff SANDY SILT		
S-2	2.0	18	58.1	12	19				Brown moist ^{VERY} stiff SANDY SILT		
S-3	4.0	15	56.7	11	13	5			orange moist MEDIUM DENSE SILTY SAND		
S-4	6.0	16	24.3	24.15	55				Brown moist ^{VERY} dense silty SAND		
S-5	8.0	17	33.3	3					Brown moist to wet loose silty SAND		
S-6	10.0	17	44.6	6	10				Brown wet loose silty SAND		
S-7	12.0	18	35.8	6	13				Brown wet MEDIUM dense silty SAND		
S-8	14.0	17	36.6	9	12	15			Brown wet MEDIUM dense silty SAND		
S-9	16.0	18	77.4	13	16				Brown wet MEDIUM dense silty SAND		
S-10	18.0	17	26.9	9	15				Brown wet MEDIUM dense silty SAND		
S-11	20.0	20	79.1	14	21				Brown wet MEDIUM dense silty SAND		
S-12	22.0	15	6.7	11	18				Brown wet MEDIUM dense silty SAND		
S-13	23.5	14	10.1	15	26	25			Brown wet MEDIUM dense silty SAND		
Boring terminated @ 25 feet											

NOTES:

LOG US301 SECTION J 6/22/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. PL SE-2

LOG OF BORING NO. PL SE-3

PROJECT: **US 301 Project Development**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Section 1**

WATER DEPTH (ft): **10.9** ~~10.1~~
 DATE: **6/25** ~~6/25~~
 CAVED (ft): **Auger** ~~8.4~~

DATE STARTED: **6/25/10**
 DATE COMPLETED: **6/25/10**
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **DAVE BURT**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: **61.58**
 DATUM: **Survey**
 EQUIPMENT: **CME 55 ATV**
 LOGGED BY: **T. Kane**
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	
									DESCRIPTION	REMARKS
						0			topsoil +/- 10 inches	
S-1	0.0	8	4.7	6.8	13				Brown wet stiff sandy SILT	
S-2	2.0	17	8.2	14.3	26				Brown moist medium dense silty SAND contains gravel	
S-3	4.0	16	8.5	20.20	35	5			Brown moist dense silty SAND contains gravel	
S-4	6.0	15	12.1	16.15	30				Brown moist medium dense silty SAND contains gravel	
S-5	8.0	12	6.8	6.6	14				Brown moist stiff sandy lean clay	
S-6	10.0	21	4.5	6.9	11	10			Brown moist medium dense clayey SAND green	
S-7	12.0	21	4.5	7.4	12				Brown wet medium dense silty SAND green	
S-8	14.0	21	9.4	5.4	9	15			Brown wet loose silty SAND green	
S-9	16.0	17	4.5	5.5	10				Brown wet loose silty SAND green	
S-10	18.0	20	2.4	8.8	12	20			Brown wet medium dense silty SAND green	
S-11	20.0	12	7.3	7.9	30				Brown wet medium dense silty SAND green	
S-12	22.0	15	9.1	10.10	20				Brown wet medium dense silty SAND green	
S-13	23.5	10	6.7	11.18	18	25			Brown wet medium dense silty SAND green	
									Boring Terminated @ 25 feet	

NOTES:

LOG US301 SECTION 1 SPJ 6/22/10

	<p>GEO-TECHNOLOGY ASSOCIATES, INC. 18 Boulden Circle, Suite 36 New Castle, Delaware 19720</p>	<p>LOG OF BORING NO. PL SE-3</p> <p style="text-align: right;">Sheet 1 of 1</p>
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LOG OF BORING NO. PL SE-4

PROJECT: **US 301 Project Development**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Section 1**

WATER DEPTH (ft): 10.9 Dry
 DATE: 6/25/10
 CAVED (ft): Auger 89

DATE STARTED: 6/25/10
 DATE COMPLETED: 6/25/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: **DAVE BURK**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 61.10
 DATUM: **Survey**
 EQUIPMENT: **CMESSATV**
 LOGGED BY: T. Kane
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION	
									DESCRIPTION	REMARKS
						0			topsoil +/- 10 inches	
S-1	0.0	9	3-4-5-8	9					Brown moist medium dense sandy silt	
S-2	2.0	18	10-11-16-17-27						Brown moist medium dense silty sand containing gravel	
S-3	4.0	10	9-15-24-20	39		5			tan moist dense poorly graded SAND w/silt and gravel	
S-4	6.0	13	32-23-17-12	40					tan moist dense poorly graded SAND w/silt & gravel	
S-5	8.0	14	3-6-6-8	12					Brown green moist medium dense clayey SAND	
S-6	10.0	13	6-6-5-7	11		10			Brown green moist medium dense clayey SAND	
S-7	12.0	21	3-3-5-8	8					Brown wet loose silty SAND	
S-8	14.0	23	5-6-9-12	15		15			Brown green wet medium dense silty SAND	
S-9	16.0	15	7-9-11-10	20					Brown wet medium dense clayey SAND	
S-10	18.0	15	6-11-13-12	24		20			Brown green wet medium dense silty SAND	
S-11	20.0	10	6-10-15-15	25					Brown green wet medium dense silty SAND	
S-12	22.0	16	8-13-14	27					Brown green wet medium dense silty SAND	
S-13	23.5	8	9-11-15	26		25			green wet medium dense silty SAND	
									Boring terminated @ 25 feet	

NOTES:

LOGG US301 SECTION 1 6/22/10



GEO-TECHNOLOGY ASSOCIATES, INC.
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720

LOG OF BORING NO. PL SE-4

LOG OF BORING NO. PL SE-5

PROJECT: **US 301 Project Development**
 PROJECT NO: **28-113-01**
 PROJECT LOCATION: **Section 1**

WATER DEPTH (ft): 7.3 Dry
 DATE: 6/28 6/28
 CAVED (ft): Auger 7.1

DATE STARTED: 6/28/10
 DATE COMPLETED: 6/28/10
 DRILLING CONTRACTOR: **Walton Corporation**
 DRILLER: GARY TRUVER
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING METHOD: **Split Spoon**

GROUND SURFACE ELEVATION: 53.84
 DATUM: **Survey**
 EQUIPMENT: CMES55ATV
 LOGGED BY: T. Kane
 CHECKED BY: **M. Lester**

SAMPLE NUMBER	SAMPLE DEPTH (ft)	SAMPLE RECOVERY (in)	SAMPLE BLOWS/6 inches	N (blows/ft)	ELEVATION (ft)	DEPTH (ft)	USCS	GRAPHIC SYMBOL	DESCRIPTION		REMARKS
						0			topsoil +/- 4 inches		
S-1	0.0	16	7.8.8.7	16					Brown moist medium dense silty SAND		
S-2	2.0	6	9.11.12.16	23					Brown moist medium dense silty SAND contains gravel		
S-3	4.0	12	7.9.9.9	18		5			Brown green moist medium dense silty SAND		
S-4	6.0	18	9.9.12.15	21					Brown moist medium dense silty SAND green to wet		
S-5	8.0	19	3.6.8.10	14		10			Brown wet medium dense clayey SAND		
S-6	10.0	18	3.6.12.9	18					Brown green wet medium dense silty SAND		
S-7	12.0	18	4.6.7.9	13					Green Brown wet medium dense silty SAND		
S-8	14.0	14	8.7.9.8	16		15			Green Brown wet medium dense silty SAND		
S-9	16.0	12	9.7.8.11	17					Green wet medium dense silty SAND		
S-10	18.0	14	W04-3.6.10	9		20			Green wet loose silty SAND		
S-11	20.0	14	8.11.12.14	23					Green wet medium dense silty SAND		charged augers 22'
S-12	22.0	16	3.6.11	17					Green wet medium dense silty SAND		
S-13	23.5	10	11.12.13	25					Green wet medium dense silty SAND		
						25			Boring terminated @ 25 feet		

LOG US301 SECTION J 6/22/10

NOTES:



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LOG OF BORING NO. PL SE-5