



Original Date: January 11, 2021
Re-Issue Date: April 20, 2021

Directional Project Support (DPS)
33311 Lois Lane, Suite A
Magnolia, Texas 77354

Reference: **Geotechnical Exploratory Borings
Shoen Road (S3-0360)
Chester County, Pennsylvania
PSI Project No.: 04912023**

As requested, Professional Service Industries, Inc. (PSI), an Intertek company, provided drilling services at the above referenced site. Our services were performed under PSI Proposal No. 0491-214504, dated June 19, 2017 signed by Mr. William M. Gardner, President of Directional Project Support, on June 20, 2017. This letter report presents the results of the test borings performed at the locations and depths provided by DPS.

Work Task

PSI's services included hiring a geotechnical drilling subcontractor (Allied Well Drilling, Inc.) to drill two exploratory test borings designated as S3-0360_AP_A1 and S3-0360_AP_B1 within the right-of-way on the hillside north of Shoen Road in Chester County, Pennsylvania. PSI's services also included providing a field logger to visually classify the recovered soil samples. The soil samples were returned to PSI's office/laboratory in Harrisburg, Pennsylvania.

Area Geology

Based on the PA Geological Survey's OFGA 16-01.0 "Bedrock Geologic Map of Part of the Chester Valley Area, Chester, Delaware, Montgomery, and Philadelphia Counties, Pennsylvania" (W.E. Kochanov, 2016), the base of the hill is underlain by the Harpers Formation (Ch) which is indicated to consist of phyllite interlaminated in part with micaceous and argillaceous quartzite, and the peak of the hill is underlain by the Chickies Formation (Cch) which is indicated to consist of crystalline quartzite. Additionally, the Ledger Formation (Cl) is mapped approximately 300 feet south and is indicated to consist of dolostone. The OFGA 16-01.0 geology map has been included in Figure 3 at the end of this report. The Ledger Formation is generally mapped south of Shoen Road and is known for Karst topography (i.e. sinkholes, ground subsidence, irregular depth to bedrock). OFR 93-01 "Sinkholes and Karst-Related Features of Chester County, Pennsylvania" (W.E. Kochanov, 1993) has been included as Figure 4.



Subsurface Exploration

On January 4, 2020, the boring locations were initially hydro-vac cleared to depths of approximately 4 feet (S3-0360_AP_B1) and 4½ feet (S3-0360_AP_A1). The exploratory test borings were drilled on January 4 and 5, 2021 with a GeoProbe 7822DT drill rig.

The borings were advanced with hollow-stem augers and Standard Penetration Tests (SPT) typically performed continuously with a 24-inch length split-spoon (2-in O.D.) until spoon and/or auger refusal conditions were encountered (~29 feet at location S3-0360_AP_A1 and ~11½ feet at location S3-0360_AP_B1). PSI's field logger visually classified the soil samples collected from each test boring location. The results of the visual classifications, the SPT blow counts, and soil recoveries are presented in the boring logs attached to this report. The strata shown on the logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The strata represent the approximate boundaries between subsurface materials, where the actual transition may be gradual.

Should there be any questions regarding this data report, please contact our office at (717) 230-8622.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES, INC.

Forrest C. Hoffman
Project Manager



Paul H. McMichael, P.E.
Principal Consultant/Project Manager

Attachment: Figure 1 – Site Vicinity Map
Figure 2 – Boring Location Plan
Figure 3 – Site Geology Map
Figure 4 – Karst Map
Boring Logs/General Notes

FIGURE 1: SITE VICINITY MAP
Site: S3-0360 (Shoen Road)
Location: Chester Co, PA
PSI Project No.: 04912023

Make online reservations at
www.visitPAparks.com
or call toll-free 888-PA-PARKS

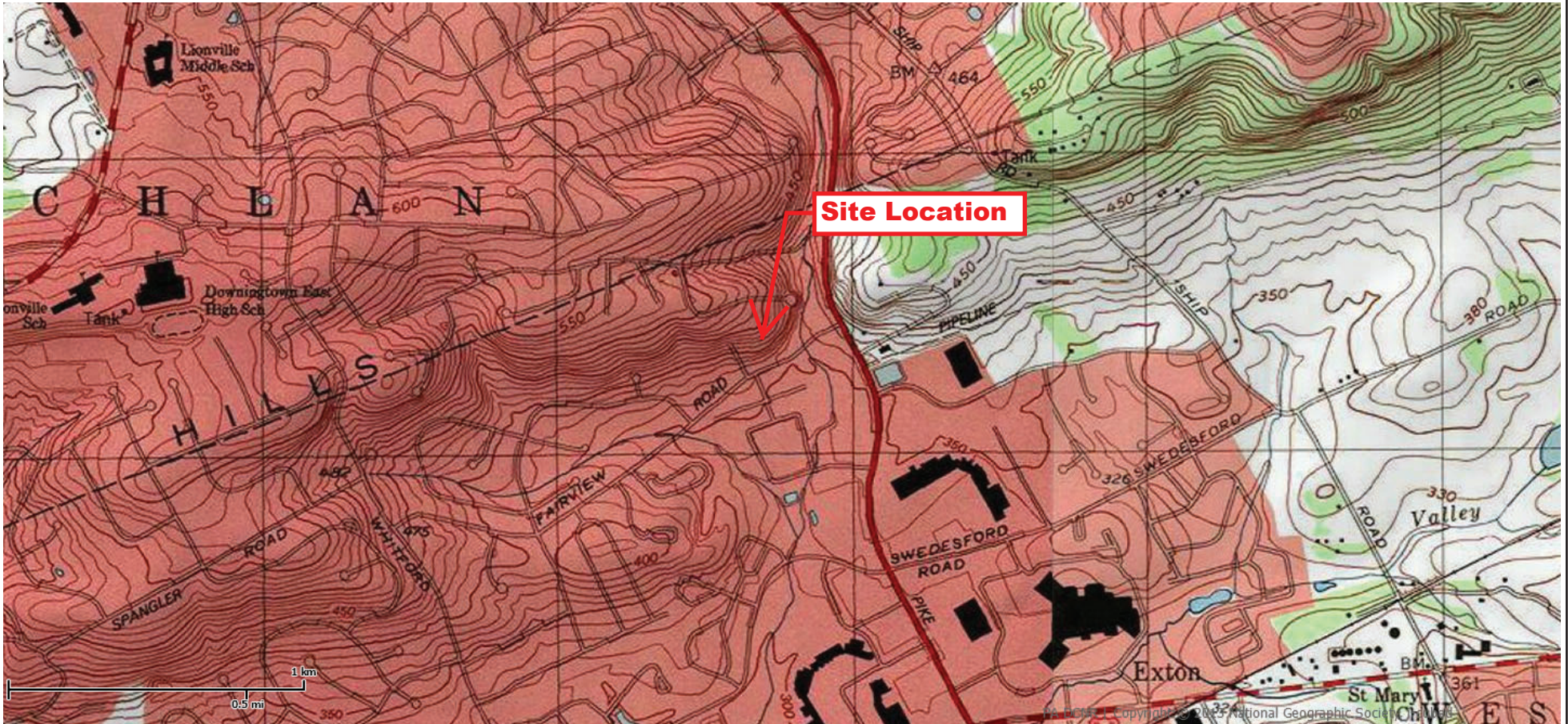


FIGURE 2: BORING LOCATION PLAN

Site Name: Shoen Road (S3-0360)
Site Location: Chester Co, PA
PSI Project No.: 04912023



**SINKHOLES AND KARST-RELATED FEATURES
OF CHESTER COUNTY, PENNSYLVANIA**

by **W.E.Kochanov**

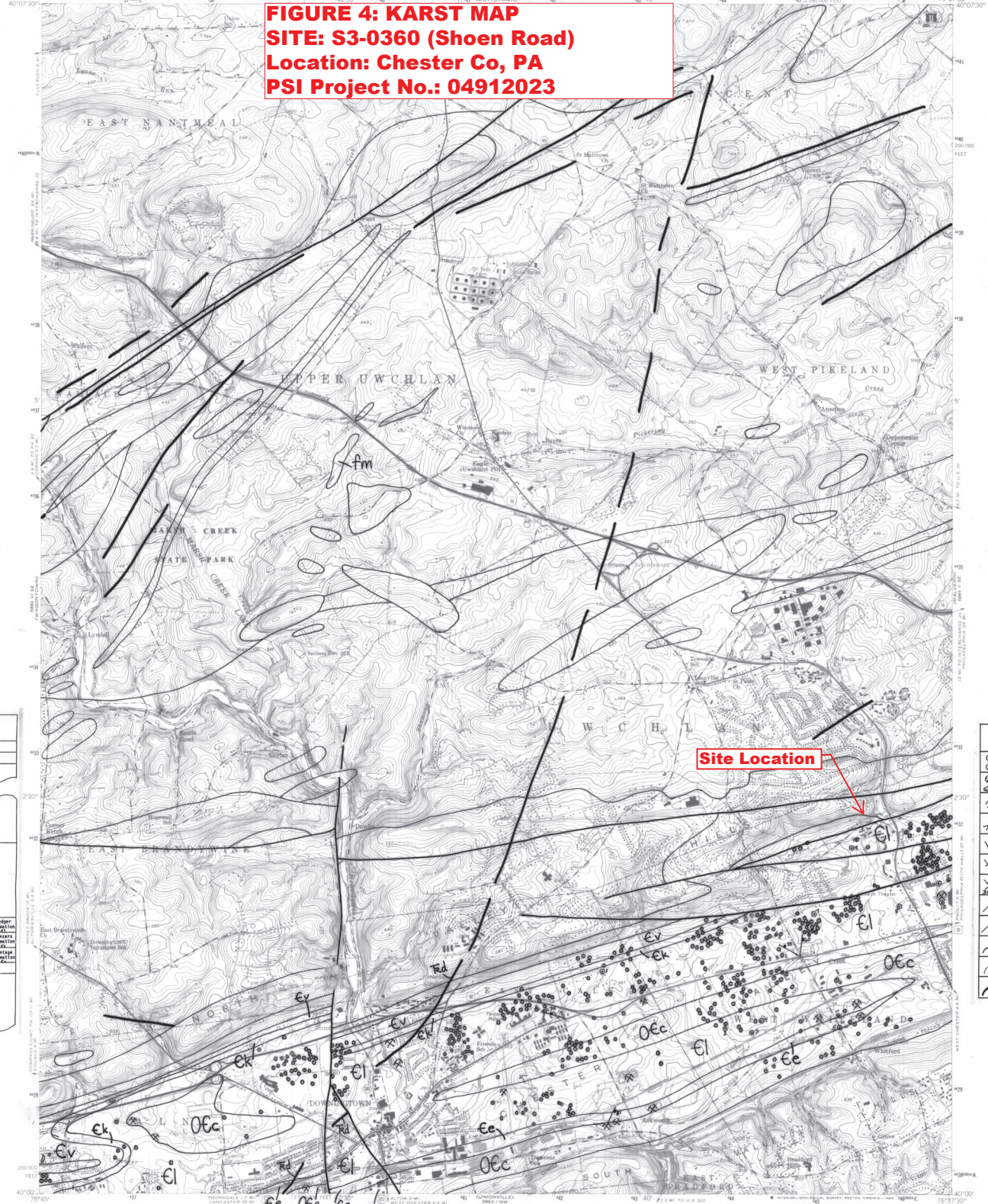
1993

OPEN FILE REPORT: 9301

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DOWNTOWN QUADRANGLE
PENNSYLVANIA—CHESTER CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
0746

**FIGURE 4: KARST MAP
SITE: S3-0360 (Shoen Road)
Location: Chester Co, PA
PSI Project No.: 04912023**



Site Location

SYMBOL	FORMATION
	DIABASE Dike

SYMBOL	FORMATION
	Leithsville Formation
	Conestoga Formation
	Ledger Formation
	Altona Formation
	West Pireland Formation
	Upper Uwchlan Formation
	Lower Uwchlan Formation
	East Nantmeal Formation

SYMBOLS	
	INDIVIDUAL SINKHOLE
	SINKHOLE GROUP
	CLOSED, SEMI-CLOSED, OR LINEAR DEPRESSIONS
	SURFACE MINE, QUARRY, OR PIT
	CAVE ENTRANCE
	BEDDING ORIENTATION STRIKE AND DIP
	BEDDING ORIENTATION STRIKE AND 90° DIP
	OVERTURNED BED STRIKE AND DIP
	JOINT ORIENTATION STRIKE AND DIP
	JOINT ORIENTATION STRIKE AND 90° DIP
	FAULT CONTACT
	FORMATION CONTACT
	DIABASE DIKE

Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1991. Field checked 1996.

Projection: UTM, Zone 18N, Datum: NAD 83, Spheroid: GRS 1980, Units: Meter, Contour Interval: 10 Feet.

Scale: 1:24,000

Geology from: Bascom & Stose (1938) P&GS Compilation, MAP G1

PHOTOGRAPHED 1983
DMA 5684 D SW-SERIES 1951

The information presented here has not been reviewed for formal publication.

**Bureau of Topographic and Geologic Survey
P.O. Box 8453, Harrisburg, PA 17105-8453**

DATE STARTED: 1/4/21
 DATE COMPLETED: 1/4/21
 COMPLETION DEPTH: 28.8 ft
 BENCHMARK: N/A
 ELEVATION: 425.1 ft
 LATITUDE: 40.03988°
 LONGITUDE: -75.63686°
 STATION: N/A OFFSET: N/A

DRILL COMPANY: Allied Well Drilling, Inc.
 DRILLER: G. Brugger LOGGED BY: F. Hoffman
 DRILL RIG: Geoprobe 7822DT Track
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY: P. McMichael

BORING S3-0360_AP_A1

Water
 ▽ While Drilling Not Enc.
 ▼ Upon Completion Not Enc.
 ▽

BORING LOCATION:
 See Boring Location Plan

REMARKS: Elevations and coordinates provided by DPS.

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
0						Vacuum-excavated to ~4.5 ft.					
420	5	[Yellow dotted pattern]	S-1	16		RESIDUUM - Loose/Stiff, Light Brown, Silty SAND/Sandy SILT, moist	SM/ML	3-5-4 N=9	○		
			S-2	24		RESIDUUM - Loose to Medium Dense, Buff to Light Gray-Brown to Brown, Silty SAND, trace Gravel, moist		4-6-6-5 N=12	○		
			S-3	24			SM	2-5-4-6 N=9	○		
415	10		S-4	20				5-7-7-7 N=14	○		
			S-5	24		RESIDUUM (Saprolite) - Medium Dense, Brown to Light Gray-Brown, Silty SAND with Gravel, moist	SM	4-8-11-12 N=19	○		
410	15	[Yellow dotted pattern]	S-6	19		RESIDUUM (Saprolite) - Medium Dense, Red-Brown to Gray-Brown, Silty GRAVEL with Sand, moist	GM	8-9-10-13 N=19	○		
			S-7	17		RESIDUUM (Saprolite) - Medium Dense to Dense, Light Brown to Dark Gray-Brown, Silty SAND with Gravel, moist		8-9-12-14 N=21	○		
			S-8	24				7-10-10-10 N=20	○		
405	20		S-9	21			SM	5-6-5-9 N=11	○		
			S-10	16				7-12-12-11 N=24	○		
									○		

Continued Next Page



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04912023
 PROJECT: Energy Transfer (DPS)
 LOCATION: "Shoen Rd" (S3-0360)
 Chester Co., PA

DATE STARTED: 1/4/21
 DATE COMPLETED: 1/4/21
 COMPLETION DEPTH: 28.8 ft
 BENCHMARK: N/A
 ELEVATION: 425.1 ft
 LATITUDE: 40.03988°
 LONGITUDE: -75.63686°
 STATION: N/A OFFSET: N/A


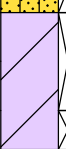
DRILL COMPANY: Allied Well Drilling, Inc.
 DRILLER: G. Brugger LOGGED BY: F. Hoffman
 DRILL RIG: Geoprobe 7822DT Track
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY: P. McMichael

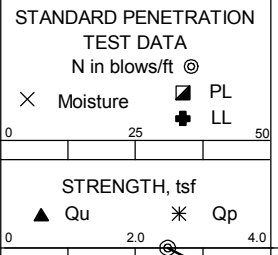
BORING S3-0360_AP_A1

Water: While Drilling Not Enc.
 Upon Completion Not Enc.

BORING LOCATION:
 See Boring Location Plan

REMARKS: Elevations and coordinates provided by DPS.

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
25			S-11		24		SM	12-13-18-25 N=31			
			S-12		22	Highly Weathered PHYLLITE Sampled As:- Very Dense, Brown to Gray-Brown, Silty SAND with Gravel, trace quartzite, moist	SM	23-34-32-35 N=66			>>Ⓞ
			S-13		10				35-50/4"		
						Spoon refusal @ 28.8 ft					



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04912023
 PROJECT: Energy Transfer (DPS)
 LOCATION: "Shoen Rd" (S3-0360)
 Chester Co., PA

DATE STARTED: 1/5/21
 DATE COMPLETED: 1/5/21
 COMPLETION DEPTH: 11.4 ft
 BENCHMARK: N/A
 ELEVATION: 395.7 ft
 LATITUDE: 40.03956°
 LONGITUDE: -75.6365°
 STATION: N/A OFFSET: N/A





DRILL COMPANY: Allied Well Drilling, Inc.
 DRILLER: G. Brugger LOGGED BY: F. Hoffman
 DRILL RIG: Geoprobe 7822DT Track
 DRILLING METHOD: Hollow Stem Auger
 SAMPLING METHOD: 2-in SS
 HAMMER TYPE: Automatic
 EFFICIENCY: N/A
 REVIEWED BY: P. McMichael

BORING S3-0360_AP_B1

Water: While Drilling Not Enc.
 Upon Completion Not Enc.

BORING LOCATION:
 See Boring Location Plan

REMARKS: Elevations and coordinates provided by DPS.

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft @	Additional Remarks
395	0					Vacuum-excavated to ~4 ft.					
	5		S-1	17		RESIDUUM - Medium Dense, Light Brown to Gray-Brown, Silty SAND with Gravel, moist	SM	10-9-11-8 N=20			
390			S-2	13		RESIDUUM (Saprolite) - Medium Dense, Light Brown to Light Gray-Brown, Silty GRAVEL with Sand, moist	GM	7-10-13-8 N=23			
	10		S-3	21		RESIDUUM (Saprolite) - Very Dense, Buff to Gray-Brown to Light Red-Brown, Silty SAND with Gravel, moist	SM	16-26-29-43 N=55			>>⊙
385			S-4	12		Highly Weathered PHYLLITE Sampled As:- Very Dense, Brown to Gray-Brown, Silty GRAVEL with Sand, trace quartzite, moist	GM	29-20-50/5"			>>⊙
						Spoon refusal @ 11.4 ft Auger refusal @ 11 ft					



Professional Service Industries, Inc.
 1707 S. Cameron Street, Suite B
 Harrisburg, PA 17104
 Telephone: (717) 230-8622

PROJECT NO.: 04912023
 PROJECT: Energy Transfer (DPS)
 LOCATION: "Shoen Rd" (S3-0360)
 Chester Co., PA

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.	☒ SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted.	■ ST: Shelby Tube - 3" O.D., except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry	▮ RC: Rock Core
R.C.: Diamond Bit Core Sampler	⬇ TC: Texas Cone
H.A.: Hand Auger	☞ BS: Bulk Sample
P.A.: Power Auger - Handheld motorized auger	☒ PM: Pressuremeter
	CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N ₆₀ : A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q _u : Unconfined compressive strength, TSF
Q _p : Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼, ▼, ▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Relative Density</u>	<u>N - Blows/foot</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

<u>Description</u>	<u>Criteria</u>
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

<u>Component</u>	<u>Size Range</u>
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

<u>Description</u>	<u>Criteria</u>
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

<u>Q_u - TSF</u>	<u>N - Blows/foot</u>	<u>Consistency</u>
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

<u>Description</u>	<u>Criteria</u>
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

<u>Description</u>	<u>Criteria</u>	<u>Description</u>	<u>Criteria</u>
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick	Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick	Lensed:	Inclusion of small pockets of different soils
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing	Layer:	Inclusion greater than 3 inches thick (75 mm)
Slickensided:	Fracture planes appear polished or glossy, sometimes striated	Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
		Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

<u>Q_u - TSF</u>	<u>Consistency</u>
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

<u>Description</u>	<u>Criteria</u>
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

<u>Voids</u>	<u>Void Diameter</u>
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

<u>Component</u>	<u>Size Range</u>
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

<u>Rock Mass Description</u>	<u>RQD Value</u>
Excellent	90 - 100
Good	75 - 90
Fair	50 - 75
Poor	25 - 50
Very Poor	Less than 25

Degree of Brokenness

<u>Characteristic</u>	<u>Description</u>
Less than 1 inch	Very Broken
1 inch to 3 inches	Broken
3 inches to 6 inches	Slightly Broken
Greater than 6 inches	Massive

Brokenness: A general rock description referring to any breaks or separations in the rock. Includes bedding planes and fractures.

DEGREE OF WEATHERING

Slightly Weathered: Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.

Weathered: Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.

Highly Weathered: Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS (LITTLE OR NO FINES)	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
	SAND AND SANDY SOILS (LITTLE OR NO FINES)	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
		SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES	
	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)			SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
	FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
					CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
				CH	INORGANIC CLAYS OF HIGH PLASTICITY	
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	
HIGHLY ORGANIC SOILS						

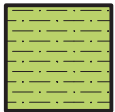
Graphic Symbols for Materials and Rock Deposits



CONCRETE
Portland Cement Concrete



BITUMINOUS CONCRETE



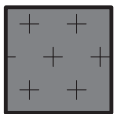
CLAYSTONE



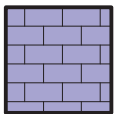
COAL
Coal, Anthracite Coal



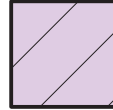
CONGLOMERATE/BRECCIA
Conglomerate, Breccia



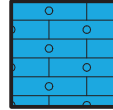
IGNEOUS ROCK
Anorthosite, Basalt, Metabasalt, Diabase (Gabbro), Gabbro, Granite/Granodionite, Homfels, Pegmatite, Rhyolite/Metarhyolite



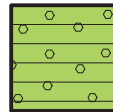
LIMESTONE
Limestone, Dolomite



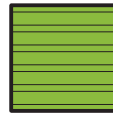
METAMORPHIC ROCK
Amphibolite, Gneiss, Marble, Phyllite, Quartzite, Schist, Serpentinite, Slate



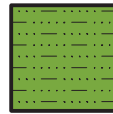
CHERT



SANDSTONE
Sandstone, Orthoquartzite (Sandstone)



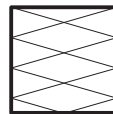
SHALE



SILTSTONE



NO RECOVERY



VOID