GEOTECHNICAL ALTERNATIVES ANALYSIS REPORT

SOMERSET COUNTY, PA AND GARRETT COUNTY, MD
S.R. 6219, SECTION 050

ECMS NO. E05060, PART 1

VOLUME 1 OF 2 VOLUMES

Prepared for:

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 9-0

AND

STANTEC CONSULTING SERVICES, INC.

AUGUST 2023
(Amended Project Description - April 2025)

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AMENDED 2025 PROJECT DESCRIPTION REVISIONS

Based on the design change from the Draft Environmental Impact Statement (2024) to the Final Environmental Impact Statement (2025) at the northern end of the project area, the description of the Common Segment Improvements has been updated and included below.

It has been confirmed that these updates fall within the current study area discussed in this report.

All impact information for this subject Appendix is discussed in Chapter 3 of the Final Environmental Impact Statement.

2 DETAILED ALTERNATIVES

2.3 Common Segment Improvements

The northern three miles in Pennsylvania all follow the same alignment, starting from the existing Meyersdale interchange. In addition to the three miles being on the same alignment, other improvements described below are being proposed. These improvements include upgrades to portions of Mason-Dixon Highway, an extension of Mountain Road from its northern terminus to Fike Hollow Road on the east side of U.S. 219, in addition a cul-de-sac of Hunsrick Road, and cul-de-sacs on the bisected Clark Road are proposed. These improvements are intended to ensure that local traffic has continued access. These improvements are included with all alternatives being considered, other than the No Build Alternative. The scope of these proposed improvements is outlined below and depicted in **amended Figure 1**. The numbers below correspond to the number on the figure, illustrating the location of the improvement. Stormwater management facilities, which would result in the need for additional right-of-way and environmental impacts have also been incorporated into the design, as shown on **amended Figure 1**.

2.3.1 Mountain Road

As a result of the Hunsrick Road Bridge removal, a new roadway would be constructed: the Mountain Road Extension. This new roadway would connect existing Mountain Road (T-824) with Fike Hollow Road (T-363) and would parallel the new U.S. 219 alternative along the eastern side. This new connector roadway would provide access from Mountain Road to U.S. Business Route 219 (SR 2047) near the Meyersdale Interchange. The proposed typical section for the Mountain Road Extension includes two 9-foot travel lanes and 2-foot outside shoulders. The design speed is anticipated to be 25 miles per hour.

Prior to the opening of the Meyersdale Bypass, Mason-Dixon Highway carried U.S. 219. After the Meyersdale Bypass opened, PennDOT transferred ownership and maintenance of Mason-Dixon Highway to Summit Township. Following completion of a new U.S. 219

alternative proposed under this study, ownership of Mason-Dixon Highway is to be transferred back to PennDOT as part of re-routed traffic patterns in the area.

2.3.2 Clark Road

Clark Road (T-353) extends west from Mountain Road (T-824) to existing U.S. 219. Due to topographical and geometric constraints, providing a grade separated crossing of a new U.S. 219 alternative proposed under this study was not practical. It was determined Clark Road should be bisected where it crosses a new alternative of U.S. 219 proposed under this study. A cul-de-sac would be placed at each end of the roadway where it intersects the U.S. 219 right-of-way. The eastern side of Clark Road would maintain access to U.S. Business 219 near the Meyersdale interchange via Mountain Road, the Mountain Road Extension, and Fike Hollow Road.

2.3.3 Hunsrick Road Extension

Improvements made to tie a new U.S. 219 alternative into existing U.S. 219 require the removal of the existing Hunsrick Road Bridge (SR 2102). Due to geometric and intersection sight distance constraints at the intersection of Hunsrick Road (T -355) and Mason-Dixon Highway (T-355), it was determined that the Hunsrick Road Bridge would not be replaced and Hunsrick Road would terminate on the east side of U.S. 219.

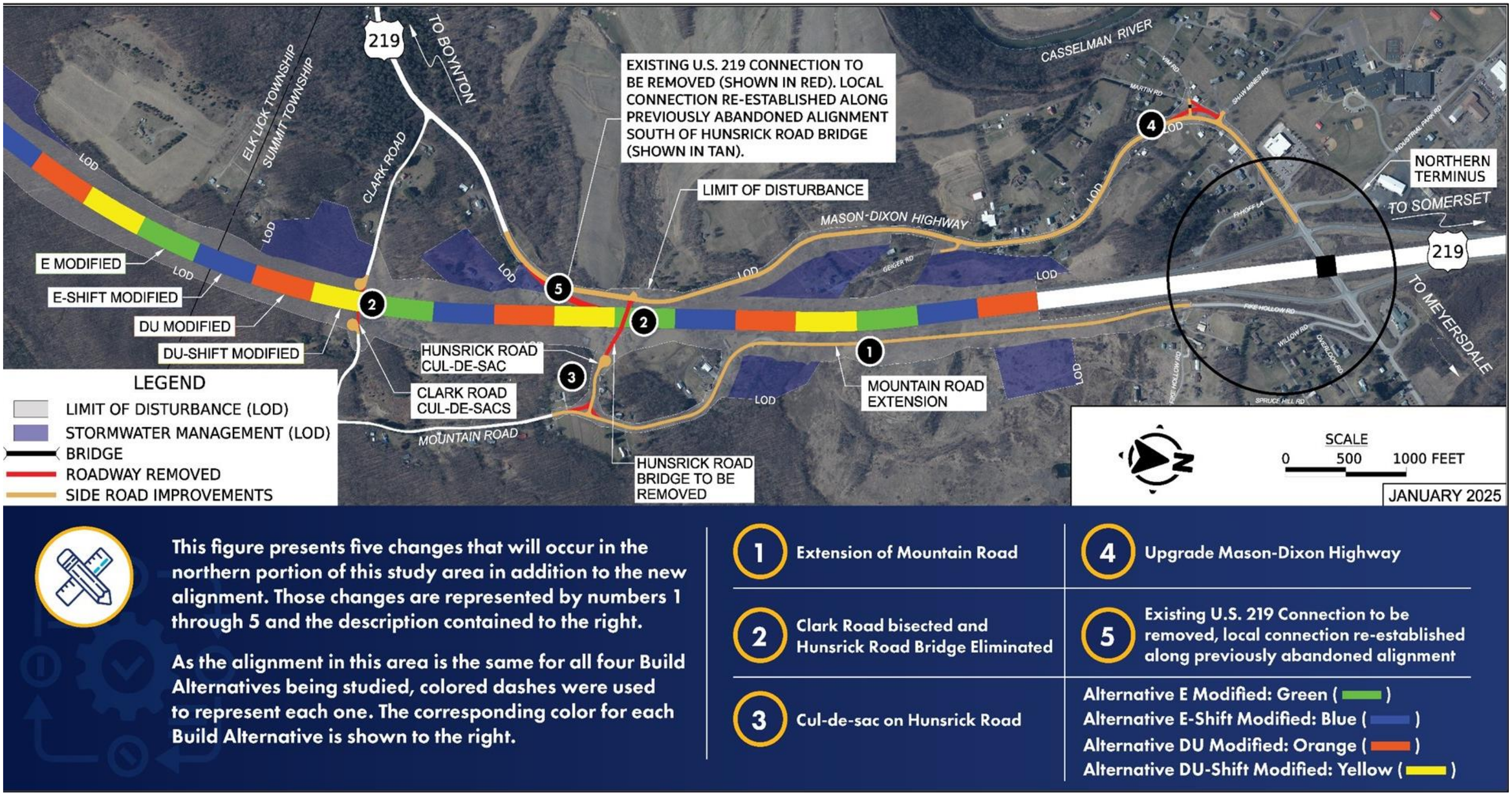
Hunsrick Road currently extends northwest from the intersection with Mountain Road to the Hunsrick Road Bridge. With the removal of the Hunsrick Road Bridge and proposed improvements associated with the Mountain Road Extension, a cul-de-sac would be placed at the northern end of Hunsrick Road. The intersection of Mountain Road with Hunsrick Road would be realigned and maintained. Access to property along Chipmonk Lane would be maintained from Mason-Dixon Highway.

2.3.4 Mason-Dixon Highway

The Mason-Dixon Highway (T-355) would be improved between Hunsrick Road and the U.S. 219 Meyersdale Interchange in accordance with PennDOT's Resurfacing, Restoration, and Rehabilitation (3R) design criteria, using a design speed transition from 55 mph to 35 mph. The upgrades are roughly 1.3-miles in length, starting near Hunsrick Road and ending at the U.S. 219 Meyersdale Interchange.

2.3.5 Existing U.S. 219 Connection to be Removed

Existing U.S. 219 would be severed, and a local connection would be re-established immediately south of the existing Hunsrick Road bridge along the previously abandoned roadway alignment. This new roadway would become Business U.S. 219.



This figure presents five changes that will occur in the northern portion of this study area in addition to the new alignment. Those changes are represented by numbers 1 through 5 and the description contained to the right.

As the alignment in this area is the same for all four Build Alternatives being studied, colored dashes were used to represent each one. The corresponding color for each Build Alternative is shown to the right.

1. Extension of Mountain Road
2. Clark Road bisected and Hunsrick Road Bridge Eliminated
3. Cul-de-sac on Hunsrick Road
4. Upgrade Mason-Dixon Highway
5. Existing U.S. 219 Connection to be removed, local connection re-established along previously abandoned alignment

Alternative E Modified: Green ( )
Alternative E-Shift Modified: Blue ( )
Alternative DU Modified: Orange ( )
Alternative DU-Shift Modified: Yellow ( )

Amended Figure 1: Additional Improvements in Northern Portion of Study Area

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1.0 INTRODUCTION

The project is located in southern Somerset County, Pennsylvania and northern Garrett County, Maryland and involves improvement to U.S. 219 between the Meyersdale Bypass at the northern terminus and Old Salisbury Road at the south (see Figures 1 through 3). The section of the new roadway in Pennsylvania will be about 6± miles long, while the section of new roadway in Maryland will be about 2± miles long. Presently, the scope of work includes four (4) possible build alternatives which will be described in detail below.

This ***Geotechnical Alternative Alternatives Report (GAAR***) is intended to identify significant favorable and objectionable geologic and geotechnical features for each of the four (4) alternatives under consideration, to provide such information for incorporation into the Geographical Information System (G.I.S.) database, and to assist Stantec Consulting Services, Inc. (Stantec) in selecting a preferred alternative based on consideration of these features within the context of a Geotechnical Alternatives Analysis investigation.

The four (4) alternatives plus the No Build Alternative under consideration are the following (see Figures 1 through 3 for detail):

- No Build Alternative
- Alignment E
- Alignment DU
- Alignment E-Shift
- Alignment DU-Shift

1.1 No Build Alternative

The No Build Alternative involves taking no action, except routine maintenance, along US 219. The existing two-lane alternative of US 219 between Meyersdale, Pennsylvania and Garrett County, Maryland would remain. No new alternatives or additional roadway would be constructed.

1.2 Alignment E

Alignment E begins at the north end of the study area, at the existing Meyersdale interchange. The north segment of Alignment E includes portions of the existing US 219 roadway and the surrounding area, including Mountain Road and Hunsrick Road. The alignment continues to the south of Hunsrick Road, where it diverges from existing US 219 and crosses Clark Road. The alignment then turns slightly west, avoiding the Pennsylvania State Gamelands 231. The alignment then traverses along the bottom of Allegheny Mountain. Alignment DU shares a similar line and grade to Alignment E in this section, and the combined alignments area referred to as Alignment DU-E,

Improvements to the existing US 219 roadway (Mason-Dixon Highway), Hunsrick Road Extension, Mountain Road, and Clark Road are proposed as part of the construction at the north end of the project. These improvements are intended to ensure that local traffic has continued access.

After separating from Alignment DU-E, Alignment E continues southwest for approximately one mile before spanning Piney Run Road. As Alignment E crosses Piney Creek and Greenville Road, it angles west towards existing US 219 and Alignment DU for 1.3 miles. Subsequently, Alignment E rejoins Alignment DU at the Pennsylvania/Maryland border. Alignment E and Alignment DU follow approximately the same path for approximately 0.8 mile, from the Pennsylvania/Maryland border until the beginning of the southern segment. Approximately 0.1 mile north of the Pennsylvania/Maryland border, there are preliminary plans for a PennDOT maintenance facility adjacent to Alignment E, along the eastern side of the proposed alignment, with access to US 219 from the northbound lanes.

Alignment E and Alignment DU rejoin after crossing the state line, and the combined alignments, referred to as Alignment DU-E once again, continue the individual alignments south of

the Pennsylvania/Maryland border and tie back into the newly constructed section of US 219, south of Old Salisbury Road. Alignment DU-E (consisting of Alignment DU and Alignment E) is located approximately 0.05 miles east of Old Salisbury Road.

1.3 Alignment DU

Alignment DU shares a similar line and grade with Alignment E throughout the northern segment of the project. This northern segment will be referred to as Alignment DU-E moving forward.

Alignment DU turns west from Alignment DU-E, towards existing US 219, and is situated between existing US 219 and Alignment E for about three miles. Alignment DU runs west across Piney Run Road and Piney Creek until it crosses Greenville Road, about 0.5 mile southeast of Salisbury Borough, and turns south. Alignment DU rejoins Alignment E at the Pennsylvania/ Maryland border. From the Pennsylvania/Maryland border, Alignment DU and Alignment E angle further towards existing US 219. About 0.1 mile north of the Pennsylvania/ Maryland border, there are preliminary plans for a PennDOT maintenance facility adjacent to Alignment DU, on the western side of the proposed US 219 alignment, with access to US 219 from the southbound lanes.

Alignment E and Alignment DU rejoin after crossing the state line, and the combined alignments, referred to as Alignment DU-E once again, continue the individual alignments south of the Pennsylvania/Maryland border and tie back into the newly constructed section of US 219, south of Old Salisbury Road. Alignment DU-E (consisting of Alignment DU and Alignment E) is located approximately 0.05 miles east of Old Salisbury Road.

1.4 Alignment E-Shift

Alignment E Shift is angled southwest, similarly to Alignment E, and ties into the newly constructed section of US 219 at the same location. However, Alignment E Shift is shifted eastward, farther from Old Salisbury Road, while avoiding impacts to the Little Meadows Historic District to the extent possible. Alignment E-Shift shares a similar line and grade to Alignment DU-Shift; thus, together they can collectively be referred to as Alignment DU-E Shift.

1.5 Alignment DU-Shift

Alignment DU Shift is angled southwest, similarly to Alignment DU, and ties into the newly constructed section of US 219 at the same location. However, Alignment DU Shift is shifted eastward, farther from Old Salisbury Road, while avoiding impacts to the Little Meadows Historic District to the extent possible. Alignment DU-Shift shares a similar line and grade to Alignment E-Shift; thus, together they can collectively be referred to as Alignment DU-E Shift.

1.6 Scope of Work

The scope of work performed during preparation of this report included the following:

- Review of available soils, geologic, and mining literature and maps to evaluate any unusual or significant aspects of the subsurface soils, bedrock, mining, and ground water conditions that may affect the design, construction or long-term performance of the proposed roadway improvements.

- Review of the previous subsurface information and/or construction information to identify/document the previous site work performed.

- Review of the GeoMechanics, Inc (GMI) report ***"Geotechnical Engineering Report in Preliminary Design – Phase II Detailed Alternatives Analysis"*** completed for S.R. 6219, Section 019 in 2006.

- Observation of the performance of existing roadway embankments and excavation slopes.
- Completion of a limited subsurface investigation program in areas of deep cut slopes, high fill embankments, and at proposed major structure locations that consisted of the drilling of sixteen (16) test borings and the

performance of laboratory tests on representative soil and rock samples from the borings.

- Correlation of the subsurface exploration and laboratory test data, and development of a geologic cross-section illustrating the subsurface conditions at the proposed structures;

- Interpretation of the data obtained, and performance of geotechnical engineering analyses; and

- Preparation of the ***"Geotechnical Alternatives Analysis Report"*** for S.R. 6219, Section 050.

2.0 SUMMARY OF RECOMMENDATIONS AND ALTERNATIVE CONSIDERATIONS

Based on our review of the limited available subsurface information in conjunction with our geologic literature search and field reconnaissance, it is our opinion that all alternatives evaluated for the project can be constructed at the locations and to the lines and grades indicated.

Of the four (4) alternatives investigated, the western alignment, Alignment DU, crosses significantly more areas that have been subjected to surface and deep mining. The eastern alignment, Alignment E, crosses the least amount of area permitted for mining. Of these, Alignment DU is approximately 1.5 miles longer than Alignment E and, hence, has a greater amount of potential coal reserves. Therefore, solely from a geotechnical standpoint, Alignment E is marginally preferred over Alignment DU.

2.1 Future Geotechnical Investigations

In order to properly evaluate the geotechnical parameters of the in-place soil and bedrock for the selected alternative, a detailed subsurface investigation and a subsequent laboratory testing program will be required. The purpose of the detailed field and laboratory investigations will be to describe and interpret the subsurface conditions that will impact the design and construction of the selected roadway and structures under consideration. The scope of the investigations will depend on the selected alternative; however, at a minimum, the program should include the following:

2.1.1 Roadway Borings

The roadway boring program during the future Preliminary Engineering investigation is intended to be complete so as to be able to make final design recommendations for the roadway portions of the project. As such, it should be able to identify/confirm adverse subsurface conditions and develop and present detailed justifiable solutions so that S.R. 6219, Section 050 can be designed and built as safely and economically as possible.

Roadway borings should be obtained every 300± feet along the alternative, depending on topography and uniformity of anticipated soil conditions, with offset borings to develop subsurface cross sections in critical excavation and embankment areas.

For borings in embankment areas, the borings should extend a minimum of 5 feet into bedrock in order to confirm the presence of the bedrock and to identify the thickness of any potentially compressible layer. For borings in excavation areas, the borings should be designed to develop geologic overlap in bedrock between adjacent borings, with those borings located within the limits of the paved roadway section extending to a minimum depth of 13± feet below the proposed road grade (3± feet of pavement section and 10± feet below subgrade).

2.1.2 Structure Borings

The structure boring program during the future Preliminary Engineering investigation is intended to provide sufficient information to develop preliminary estimates of feasible foundation types at the anticipated structure locations and to support the subsequent Type, Size and Location (TS&L) submissions during Final Design. Accordingly, at least one (1) structure boring should be obtained at each major grade separation and drainage structure location. Supplemental borings should be obtained for long, multi-span structures and for those structures where deep mining may have been performed.

The structure borings should be extended a minimum of 15± feet into competent bedrock below the anticipated bearing elevations. For borings in deep-mined areas, the borings should extend at least 5± feet below the bottom of the coal horizon being explored.

2.1.3 Laboratory Physical Property Testing

All geotechnical testing should be conducted in an AASHTO accredited laboratory. All chemical analyses during final design should be conducted in an EPA/DEP-certified analytical laboratory. At a minimum, the laboratory testing program for preliminary engineering should consist of the following:

Excavation Areas

- soil moisture content, classification, density (Standard Proctor) and shear strength (CBR and direct shear) tests to evaluate the suitability of the excavated soils for use in embankments and as a pavement subgrade;

- rock point load, wet-dry durability, and slake durability tests for use in rock cut slope stability analyses and to evaluate the quality of the excavated rock for selective use in embankment construction, such as in rock toes and as durable rock base; and

- acid-base accounting (paste pH, fizz rating, total sulfur, maximum potential acidity, and neutralization potential) tests to assess the acid-forming potential of the materials to be excavated and incorporated into the project embankments and, hence, the impact of seepage through the embankments on local stream quality.

Embankment Areas

- natural moisture content and classification tests on granular soils for use in selection of engineering parameters for settlement and stability analyses; and

- natural moisture content, classification, total density, consolidation, and shear strength tests on undisturbed Shelby Tube samples of fine-grained

deposits, again for use in selection of engineering parameters for settlement and stability analyses.

Structures

- unconfined compression and/or rock point load tests on representative rock core samples from the test borings for use in preliminary bearing capacity analyses;

- soil moisture and classification tests in granular deposits and soil moisture, classification, consolidation and shear strength tests in fine-grained deposits for use in preliminary settlement and stability analyses; and

- electrochemical (pH, resistivity, sulfate and chloride content, and bacteria count) tests to evaluate the corrosion potential of the in-place soils, ground water, and surface water in contact with the project structures and their foundations.

On the basis of our evaluation of available information, the following preliminary geotechnical guidelines should be used in evaluation of the alternatives under consideration:

2.2 Cut Slope Construction

Excavations up to 109± feet in depth at centerline will be required to achieve the desired grades.

2.2.1 Recommended Slope Ratios

- Cut slope estimates should be based on a slope ratio of 2H:1V with rounding at the top. Steeper slopes in bedrock, up to 1.5H:1V, will most likely be feasible based on more detailed subsurface investigations.

Flatter slopes with ratios near 2.5H:1V may be required in areas with strip mine turnover.

- So long as there is ample space to construct rock cut slopes using the recommended slope ratio, it is assumed that rockfall protection will not be necessary.

2.2.2 Surface and Subsurface Drainage

- Measures to control surface water runoff at the top of the slope and ground water seepage from springs along the slope face will be needed.

2.2.3 Material Utilization

- With the exception of topsoil, organic matter, coal, and carbonaceous material, soil and bedrock from the designated excavations should be suitable for use in embankments.

- Topsoil and organic matter can be stockpiled and used for slope dressing. Coal and carbonaceous material can be blended with suitable soil and bedrock so long as it is kept a minimum of 10 feet below the proposed roadway subgrade elevation.

- Dispose of unsuitable soils, construction debris, and demolition materials off-site.

2.2.4 Blasting Requirements

- Blasting is anticipated for rock excavation in the deeper cuts.

2.2.5 Coal Treatment on Slopes

- Several coal seams outcrop within the project limits and coal may be exposed on cut slopes. These coal seams are typically thin and non-persistent. However, if persistently present, these coal seams will need special treatment.

2.3 Fill Embankment Construction

Embankments and sidehill fills with heights as great as 82 feet will be required to achieve the design grades.

2.3.1 Recommended Slope Ratios

- Fill slope estimates should be based on a slope ratio of 2H:1V or flatter. Steeper slopes may be feasible if formed using select rockfill materials or if properly reinforced.

2.3.2 Material Utilization

- Use suitable embankment materials taken from on-site cuts as detailed in Section 2.2.3 to construct the slopes.

- Use the following shrink/swell factors in estimating the volume of materials available from on-site excavations for use in embankment construction.

Material	Factor
Soil	7% Shrinkage
Shale/Soft Rock	5% Swell
Hard Rock	20% Swell

2.3.3 Special Embankment Treatment

- Parallel and lateral bonding (construction) benches will be needed in areas where the proposed roadway embankments will be placed over sloping ground in order to properly key the embankment into the foundation soils and/or bedrock and to enhance global stability.

- A rock base may be required in areas where springs, wetlands, and waterways are encountered.

- Provide a rock toe bench at all embankment locations. Durable sandstone rock is expected to be readily available from cuts along the eastern end of the project where the Allegheny and Pottsville formations are located.

2.3.4 Potential for Settlement

- The majority of self-weight settlement within the compacted embankment materials is expected to occur during construction.

- Thick colluvial soil zones and strip mine backfill areas exist in multiple locations across the project site. These thick soil zones will cause an increase in embankment settlement and may require a quarantine period or special settlement treatment.

- Quarantine periods with settlement monitoring prior to installation of pile foundations at bridge abutments will likely be required at both the Piney Creek and Meadow Run structures.

2.4 Structure Foundation Construction

In addition to smaller drainage structures and wildlife crossings, larger grade separation structures (bridges) are proposed for this project. A listing of major structures is presented on Tables

6A and 6B in Appendix E of this report. Also included area anticipated foundation types and special geotechnical considerations for foundation construction and design. Additionally, a detailed subsurface investigation will be prepared for each structure once the final alternative is selected.

2.5 Pavement Design & Subgrade Stabilization

Pavement design is being prepared by the Design Manager for the overall SR 6219 project. GMI can provide CBR values for various subgrade conditions at a later stage of the project once CBR tests are included in the laboratory testing scope of work.

Transition benches will be needed where the pavement subgrade changes from slightly compressible in-place soils to essentially incompressible bedrock in order to reduce the possible risk to distress of the pavement section resulting from the differential compressibility of the subgrade materials. The transition benches must be aligned parallel to the strike of the in-place soil/bedrock contacts and will not necessarily be aligned either parallel with or perpendicular to the roadway centerline.

2.6 Mine Void Stabilization

Based on available mapping and background mining research, there is only one confirmed area where deep mining has been performed that will have an impact on the project. The DiValentino mine permit extends from Station 2402+50± to 2419+00± within the northern segment of the project where all alternatives are together. Mine void stabilization will be required beneath any structures in this area.

2.7 Treatment of Acid Producing Rock

Acid producing rock (APR) will be a concern throughout this site due to the extensive number of coal seams. Acid Base Accounting (ABA) laboratory tests were performed on select rock core samples from borings located within the limits of deep cuts. The results can be found on Table No. 4 in ***Appendix A*** of this report. The following recommendations should be used to treat APR when encountered:

NNP (ppt)	PR	Fizz Rating	NP (ppt)	% Total Sulfur	Interpretation	Recommended Action
-	-	≥ 1	> 30	-	Significant source of alkalinity	No treatment/disposal of material required and can potentially be used for APR mitigation design
> 30	-	-	-	-	Very likely to produce alkalinity	No special treatment/disposal of material required
20 – 30	> 2	-	-	-	Likely to produce alkalinity	
0 -20	1 – 2	-	-	-	May produce acidity or alkalinity	Treatment may or may not be required
< 0	< 1	-	-	-	Likely to produce acidity	Treatment and disposal of material required
-	-	-	-	> 0.5	May generate significant acidity	

2.8 Treatment of Sinkholes and Karst

Although limestone bedrock is present within the project area, sinkhole development due to karst terrain is not anticipated. Therefore, karst will not be a consideration for this project.

3.0 GEOTECHNICAL ANALYSES AND INTERPRETATION OF DATA

The most significant geotechnical factors affecting the choice of a roadway alternative are the type and extent to which the area crossed by a proposed alternative has been subjected to deep and surface mining. Of the alternatives investigated, Alignment DU crosses more areas permitted for surface mining, has the greatest amount of potential coal reserves and is substantially longer than Alignment E. Therefore, Alternative E (Alignment E) is preferred over Alternative DU (Alignment DU) from a geotechnical point of view.

Regardless of the preferred alternative, all alignments will cross rugged topography; and deep cuts and high embankments will be required to achieve the desired roadway grades. Detailed geologic data will be required to evaluate the interrelationship of geologic structure and bedrock lithology with the design of cut slopes formed in bedrock. Although limestone bedrock is present, no sinkhole development is anticipated due to karst terrain. In deep-mined areas, the primary geotechnical concerns are the potential for mine subsidence, especially in areas of multiple seam extraction, and acid mine drainage from flooded deep mine workings. In areas with thick deposits of strip mine spoil, the geotechnical concerns include the potential for settlement, the potential for a corrosive environment, the potential for extensive surface erosion, and the potential for slope stability problems in cut areas. Settlement and stability of high embankments is also a concern. In addition, the assessment of the economic value of coal reserves within the acquired right-of-way and the impact of roadway construction on surface and ground water resources are major considerations in the selection of a roadway alternative.

3.1 Embankment Construction

Construction of the proposed roadway will include placement of embankments up to 82± feet in height at centerline at the following locations:

3.1.1 Alignment E

A.) North Segment (Includes DU, DU-Shift, E-Shift)

- Sta. 2452+25± to Sta. 2450+75±, Side Hill Fill, Max. Ht. = 2±’

- Sta. 2441+25± to Sta. 2427+25±, Side Hill Fill, Max. Ht. = 35±'
- Sta. 2393+75± to Sta. 2392+25±, Side Hill Fill, Max. Ht. = 5±'
- Sta. 2365+75± to Sta. 2357+75±, Side Hill Fill, Max. Ht. = 21±'
- Sta. 2343+50± to Sta. 2332±, Side Hill Fill, Max. Ht. = 27±'
- Sta. 2332± to Sta. 2315+25±, Full Fill, Max. Ht. = 39±'

B.) Middle Segment (Includes E-Shift)

- Sta. 2264+25± to Sta. 2260+75±, Side Hill Fill, Max. Ht. = 20±'
- Sta. 2246+75± to Sta. 2244±, Side Hill Fill, Max. Ht. = 61±
- Sta. 2244± to Sta. 2230+51±, Full Fill, Max. Ht. = 56±'
- Sta. 2191+75± to Sta. 2167+13±, Full Fill, Max. Ht. = 71±'
- Sta. 2157+13± to Sta. 2151+25±, Full Fill, Max. Ht. = 41±'
- Sta. 2147+25 to Sta. 2116+75±, Full Fill, Max. Ht. = 82±'

C.) South Segment (Includes DU)

- Sta. 2086+75± to Sta. 2071+25±, Full Fill, Max. Ht. = 25±'
- Sta. 2062+25± to Sta. 2055±, Side Hill Fill, Max. Ht. = 11±'
- Sta. 2055± to Sta. 2043±, Full Fill, Max. Ht. = 52±'

3.1.2 Alignment DU

A.) Middle Segment (Includes DU-Shift)

- Sta. 6265+61± to Sta. 6255±, Side Hill Fill, Max. Ht. = 57±'
- Sta. 6255± to Sta. 6240+75±, Full Fill, Max. Ht. = 71±'
- Sta. 6187+25± to Sta. 6185+29±, Full Fill, Max. Ht. = 25±'
- Sta. 6167+88± to Sta. 6150+25±, Full Fill, Max. Ht. = 48±'
- Sta. 6146+25± to Sta. 6113+75±, Full Fill, Max. Ht. = 80±'

3.1.3 Alignment DU-Shift

A.) South Segment (Includes E-Shift)

- Sta. 6084+75± to Sta. 6077+75±, Full Fill, Max. Ht. = 11±'

- Sta. 6059+75± to Sta. 6043±, Full Fill, Max. Ht. = 60±'

One of the principal concerns in the design and performance of S.R. 6219, Section 050 is the stability of the proposed roadway embankments under static loading conditions. Stability analyses using the results of the site-specific test boring and laboratory classification testing data were performed assuming 2H:1V slopes to evaluate the suitability of on-site borrow materials for use in embankment construction.

A sensitivity analysis was performed to estimate the minimum effective angle of internal friction (ϕ') required for the embankment materials to exhibit factors of safety equal to 1.3 and 1.5 for varying embankment heights. Although Department Publication 293 (***Geotechnical Engineering Manual***) identifies a value of 1.5 as the minimum acceptable, it is our experience that a value of 1.3 may be adopted in the embankment stability analyses for locations where a thorough subsurface investigation has been conducted, as will be the case in the subsequent design stages for S.R. 6219, Section 050.

The minimum factor of safety against slope failure under "long-term" (steady state) static loading conditions was estimated using the computerized slope stability program SLIDE2, developed by RocScience. Bishop's simplified method was used to compute the minimum safety factors for static loading conditions. Results of the analyses are shown graphically in ***Appendix F*** and indicate that, as expected, the minimum ϕ' value required to achieve the desired factor of safety (F.S.) increases with increasing embankment height. In general, for embankment heights less than 50± feet, the required ϕ' value is 29± degrees for F.S. = 1.3 and 33± degrees for F.S. = 1.5. For greater embankment heights the required ϕ' values increase to about 31± degrees for F.S. = 1.3 and about 35± degrees for F.S. = 1.5. Therefore, for the higher embankment heights selective placement of materials such as rock fill will be required.

3.2 Excavation Construction

- Excavations are planned at the following locations:

3.2.1 Alignment E

A.) North Segment (Includes DU, DU-Shift, E-Shift)

- Sta. 2466+50± to Sta. 2452+25±, Full Cut, Max Depth = 5±'
- Sta. 2450+75± to Sta. 2441+25±, Full Cut, Max Depth = 37±'
- Sta. 2427+25± to Sta. 2421+50±, Full Cut, Max. Depth = 44±'
- Sta. 2421+50± to Sta. 2410+50±, Side Hill Cut, Max. Depth = 43±'
- Sta. 2410+50± to Sta. 2399+50±, Full Cut, Max. Depth = 64±'
- Sta. 2399+50± to Sta. 2393+75±, Side Hill Cut, Max. Depth = 20±'
- Sta. 2392+25± to Sta. 2365+75±, Full Cut, Max Depth = 38±'
- Sta. 2357+75± to Sta. 2352±, Side Hill Cut, Max Depth = 24±'
- Sta. 2352± to Sta. 2341+75±, Full Cut, Max. Depth = 35±'
- Sta. 2315+25± to Sta. 2312±, Side Hill Cut, Max. Depth = 25±'

B.) Middle Segment (Includes E-Shift)

- Sta. 2312± to Sta. 2303±, Full Cut, Max. Depth = 44±'
- Sta. 2303± to Sta. 2284±, Side Hill Cut, Max. Depth = 28±'
- Sta. 2284± to Sta. 2276+50±, Full Cut, Max. Depth = 40±'
- Sta. 2276+50± to Sta. 2264+25±, Side Hill Cut, Max. Depth = 16±'
- Sta. 2260+75± to Sta. 2246+75±, Side Hill Cut, Max. Depth = 38±'
- Sta. 2215+25± to Sta. 2191+75±, Full Cut, Max. Depth = 89±'
- Sta. 2151+75± to Sta. 2147+25±, Side Hill Cut, Max. Depth = 8±'
- Sta. 2116+75± to Sta. 2104±, Full Cut, Max. Depth = 61±'

C.) South Segment (Includes DU)

- Sta. 2103+50± to Sta. 2086+75±, Full Cut, Max. Depth = 41±'
- Sta. 2071+25± to Sta. 2062+25±, Full Cut, Max. Depth = 24±'

3.2.2 Alignment DU

A.) Middle Segment (Includes DU-Shift)

- Sta. 6330+50± to Sta. 6285+25±, Full Cut, Max. Depth = 109±'

- Sta. 6240+75± to Sta. 6221+50±, Full Cut, Max. Depth = 85±'
- Sta. 6221+50± to Sta. 6187+25±, Full Cut, Max. Depth = 104±'
- Sta. 6150+25± to Sta. 6146+25±, Full Cut, Max. Depth = 5±'
- Sta. 6113+75± to Sta. 6108±, Full Cut, Max. Depth = 55±'

3.2.3 Alignment DU-Shift

A.) South Segment (Includes E-Shift)

- Sta. 6101+00± to Sta. 6084+75±, Full Cut, Max. Depth = 46±'
- Sta. 6077+75± to Sta. 6059+75±, Full Cut, Max. Depth = 41±'

4.0 ENVIRONMENTAL CONCERNS

4.1 Hazardous Waste

KCI prepared a Phase I Environmental Site Assessment (ESA) for the project area in December 2022. The basic investigative elements of the Phase I ESA included a records review, interviews, and site reconnaissance. Several Areas of Concern (AOC) were identified during this ESA, with the majority of these areas related to historical mining and active mine water treatment which will be discussed further in this report. At this time, a site specific Health and Safety Plan (HASP) is not needed. As seen on Figure 13 in ***Appendix B*** of this report, one (1) abandoned gas well was located within the northern section of the project area adjacent to where all alignments are together.

4.2 Mining

Surface mining for coal has left areas covered with thick deposits of unconsolidated strip-mine spoil that are easily eroded. Therefore, it is imperative that an erosion and sediment control plan be developed and strictly enforced during roadway construction. Abandoned surface mines also present the potential for containing undocumented disposal of hazardous/residual waste products.

Acid mine drainage from both strip mine spoil and abandoned mine workings will need to be collected and treated prior to discharge into the surface water drainage system. Identification of flooded deep mines and mine pools in abandoned surface mines will be an important factor during subsequent design phases of the project.

4.3 Cultural Resources

Several historic properties or prehistoric archeological sites have been identified. At this point in time it is not known if they will be affected by the subsurface geotechnical investigation for subsequent design phases. However, these areas will be clearly marked on the Plan and Location of Borings; and Special Provisions will be included in the Boring Contract documents to avoid or minimize potential impacts during subsequent geotechnical field investigations.

4.4 Wetlands

Several wetland areas have been identified throughout the project area, particularly adjacent to the Piney Creek, Meadow Run, and their principal drainageways. These areas will be clearly marked on the Plan and Location of Borings, and Special Provisions will be included in the Boring Contract documents to avoid or minimize potential impacts during subsequent geotechnical field investigations.

4.5 Agricultural Resources

Prime farmlands have been identified throughout the project area. Construction of any of the proposed alternatives may impact these agricultural resources. There are no significant geotechnical problems or remedies that would impact the prime farmlands differently from one alternative to the next. Again, these areas will be clearly marked on the Plan and Location of Borings, and Special Provisions will be included in the Boring Contract documents to avoid or minimize potential impacts during subsequent geotechnical field investigations.

4.6 Ground Water Resources

Cuts as great as 109± feet at centerline will be necessary to construct the proposed roadway; therefore, the disturbance of several geologic formations is likely to occur, and blasting will most likely be required. This may result in permanent alterations to the ground water table and may adversely affect ground water wells. Existing wells which may be impacted should be identified and monitored prior to and during construction. Observation wells should be installed in major cut areas to establish current ground water levels. These wells can be set in conjunction with geotechnical core borings during subsequent design phases.

Several domestic water wells and previous mineral exploration test borings have penetrated ground water aquifer(s) under artesian conditions. These potential artesian flow areas will be elaborated on in the Reconnaissance section of this report. Refer to ***Appendix E*** of this report for well data.

4.7 Surface Water Resources

Piney Creek and Meadow Run are the major streams in the project area. Special provisions will be included in the Boring Contract documents to control the collection and treatment of drilling wash water prior to discharge into the streams.

As part of the laboratory testing program, acid-base accounting (fizz rating, paste pH, neutralization potential, maximum potential acidity and total sulfur) will be performed on representative samples from selected borings in areas of planned excavation. The results of these tests will be used to assess the suitability of the excavated materials for incorporation into roadway embankments constructed on or near flood plains.

According to available information provided by the Department of Environmental Protection, there is one (1) active surface water treatment site located within the project area within the Weimer Strip and Auger Mine Permit Boundary. Refer to the Reconnaissance section of this report for more detailed information.

5.0 ECONOMIC CONSIDERATIONS

The project area has been extensively mined for coal. Mining has been performed using both deep and surface mining methods. The approximate boundaries of the areas permitted for mining, both surface and deep, are shown on Figures 7A & 7B and Figure 8A, respectively in ***Appendix B***. The deep mine permit areas also include information from Works Project Administration (WPA) mine maps.

Deep mining has been performed using the room and pillar technique with subsequent retreat mining. Because the project area is adjacent to a major geologic structure, the Berlin syncline, a wide range of stratigraphic horizons containing numerous coal seams are exposed. Those coal seams of good quality and sufficient thickness are mined by open pit mining along the outcrops. Where the overburden becomes too thick to be economically removed by surface mining, the same coal seam is often horizontally auger-mined or subsequently deep-mined. The coal seams that have been mined in the general region include, from youngest to oldest:

- Wellersburg,
- Barton,
- Ames,
- Upper Bakerstown,
- Lower Bakerstown,
- Brush Creek,
- Upper Freeport (“E”),
- Lower Freeport (“D”),
- Upper Kittanning (C prime),
- Middle Kittanning (“C”),
- Lower Kittanning (“B”),
- Clarion (A prime),
- Brookville (“A”) coal
- Mercer coal, and
- Quakertown coal.

There are several other coal beds scattered throughout the Pennsylvanian system that have been mined on a smaller scale for domestic supplies in the project area. Unfortunately, published information on the locale and extent of this type of mining activity is unavailable.

Due to the vast amount of mining that has taken place over the past two hundred fifty (250) years in the project area and the size of the study corridor, the mining boundary lines for both surface and deep mines incorporated into the GIS data base for the current investigation are permit boundary lines. The areas within the permit boundaries may or may not have been mined, or they may have been partially mined. Another factor to consider is that mine permitting was not required until the mid-1960's and that, even to date, the extent of area mined within a permit boundary is not required in a mine permit document. Moreover, there is a great deal of confusion over the terminology used to identify the various coal seams present in the project area.

Since the initial investigation in the early 2000s, the western half of the project area (west of Casselman River valley) has been eliminated. The current project area lies east of the Casselman River valley along the flanks of Allegheny Mountain. Therefore, coal beds of the Allegheny group are the most economically important and have been strip and deep mined on a commercial scale.

Bedrock dip increases to the southeast in the eastern half of the project area. As a result, the more valuable coal seams of the Glenshaw formation and the Allegheny group occur near the surface; and mining activities are much more extensive. There are fifteen (15) mineable coal seams from the Quakertown up to the Wellersburg that outcrop in the eastern portion of the project area. These coal seams have been both deep mined and surface mined at various locations. Highway construction through this area will have the greatest impact to coal reserves. Geotechnical concerns include the potential for mine related subsidence, settlement and slope stability of thick (greater than 100± feet) unconsolidated surface mine spoil, and the potential for acid mine drainage. Special treatments will most likely be needed for coal seams exposed on cut slopes, particularly those on the up-dip side of the cuts to control the potential for acid mine drainage.

Although surface mining continues to date, there are currently no active deep-mine operations in the project area.

In addition to coal, the Wymps Gap limestone has also been deep-mined approximately 2 miles southeast of Salisbury along Piney Creek valley. However, this limestone quarry, located outside the project study area, has since been abandoned.

6.0 SITE INVESTIGATION

6.1 History

The following is a list of known previous site investigations within the study corridor:

- Preliminary Engineering and Environmental Studies for the 24-mile long S.R. 6219 corridor from I-68 Garrett County, MD to Pennsylvania Turnpike interchange in Somerset, Pennsylvania (1991);
- Environmental Impact Statement for the Meyersdale Bypass (1993);
- Preliminary and Final Design of the Meyersdale Bypass (1974 and 1995);
- Phase I Geotechnical Engineering Report, S.R. 6219, Section 019, Somerset County, Pennsylvania and Garrett County, Maryland (2003)
- Phase II Geotechnical Engineering Report, S.R. 6219, Section 019, Somerset County, Pennsylvania and Garrett County, Maryland (2004)
- Phase I Environmental Site Assessment, S.R. 6219, Section 019, Somerset County, Pennsylvania and Garrett County, Maryland (Revised 2004)
- Phase II Environmental Site Assessment, S.R. 6219, Section 019, Somerset County, Pennsylvania and Garrett County, Maryland (2006)

6.2 Soils Conditions

According to the "Soil Survey of Somerset County, Pennsylvania" and the “Soil Survey of Garrett County, Maryland”, the soil series encountered in the project area include the following:

The Armaugh series (Ar, AsB), which consists of clayey to stony silt loams, are deep, poorly drained soils found on upland flats and in depressions. These soils are formed due to weathering of gray and brown shales and siltstones. Permeability of these soils is moderate, water runoff is medium and the hazard for erosion is moderate. Reaction of the surface layer and subsoil ranges from strongly acid to extremely acid; therefore, protection of concrete structures against acidic environments may have to be incorporated in the design.

The Atkins silt loams (At) are nearly level, deep, poorly drained soil occurring on flood plains along the major stream valleys. They formed in alluvium mainly comprised of soils derived from interbedded sandstones and shales and vary in composition from silty/clayey silt to silty and clayey sand that becomes silty gravel at bottom. These soils have moderate to high permeability, associated runoff is moderate and the hazard of erosion is severe. According to the published data, these soils exhibit strong acidic environments and should be tested in the areas of the structures.

The Berks series channery silt loams (BeB, BeC, BeD) and the Berks-Weikert channery silt loams (BkB, BkC, BkD, BkF) are gently sloping to steep, moderately deep, well-drained soil found on hilltops and ridges of uplands. They form in material derived from brown shales and siltstones and are classified as silty clay to clayey silts becoming silty sands with depth. These soils have moderately high permeability, and exhibit medium to rapid runoff. The hazard of erosion is moderate to very severe depending on severity of slope. Due to their moderate shear strength, cut slopes in these soils should not be steeper than 2H:1V. They represent a moderately good source of common fill and can safely support an embankment slope of 2H:1V or flatter.

The Blairton series channery silt loams (BnB, BnC) are gently sloping, moderately deep, moderately well-drained to somewhat poorly-drained soils found on the upper slopes of hills on uplands. They formed in material weathered from brown acidic shale. Permeability is moderately slow, runoff is medium to rapid and the hazard for erosion is moderate to very severe depending on slope. Reaction ranges from extremely acid to strongly acid in the surface layer and subsoil. Again, these soils exhibit low to moderate shear strength both in-situ and when properly compacted. Therefore, slopes in these soils should be 2H:1V or flatter.

The Brinkerton series silt loams (BrA, BrB, BtB) are nearly level to gently sloping, deep poor-drained soils on lower slopes of hills and mountains and in narrow valleys along streams. They formed in colluvium from acid, brown shale and siltstones. These soils have poor permeability, low shear strength and high compressibility. Runoff in these soils is slow to medium and the hazard for erosion is slight to moderate. Flatter cut slopes (3H:1V) will most likely be needed in these soils, particularly if the parent rocks are clayshales/claystones.

The Cavode series silt loams and very stony silty loams (CaA, CaB, CaC, CbB) are nearly level to sloping, somewhat poorly drained soils on upland flats and in depressions. They have formed in material derived from acidic brown shales and siltstones. Permeability is slow, runoff is very slow and the hazard for erosion is slight to moderate. Reaction is strongly acid and very strongly acid in the surface layer and subsoil. These soils are also moderately strong with low compressibility.

The Cookport series loams, very stony loams (CoB, CoC, CpB, CpD) are gently sloping to moderately steep, deep, moderately well-drained soils on ridges and hillsides. They formed in material weathered from acidic gray sandstone. Permeability is moderately slow, runoff is moderate to rapid and the hazard of erosion is slight to moderate. Reaction is very strongly acid and strongly acid in the surface layer and subsoil. These soils have generally moderate shear resistance and low compressibility and should form good common fill.

The DeKalb series channery sandy loams, very stony sandy loams (DhB, DkB) are gently sloping, moderately deep and deep well-drained soils on ridges and mountain tops. They formed in material derived from acidic gray sandstones. Permeability is moderately rapid to rapid, runoff is low to medium and the hazard for erosion is slight to moderate. Reaction ranges from extremely acid to strongly acid in the surface layer and subsoil. The geotechnical properties of these soils are very similar to those of the preceding series.

The Ernest series silt loams, very stony silt loams (ErB, ErC, EsB, EsD) are gently sloping to moderately steep, deep, moderately well-drained silty to stony soils on the lower slopes of hills and ridges. They formed in colluvium from weathered shales and siltstones. Permeability is moderately slow to slow, runoff is medium, and the hazard of erosion is slight to severe. Reaction is

very strongly acid to strongly acid in the surface layer and subsoil. These soils are highly susceptible to frost and exhibit poor shear strength and high compressibility, except for the lower part of the soil zone where it becomes more granular.

Fluvaquents (Fv) consists of nearly level, deep, poorly-drained soils on flood plains and drainageways. They formed in material ranging from stratified sand to clayey alluvial sediment. Consequently, they have moderate to low shear strength and low to moderate compressibility. Due to a shallow ground water table, subgrade preparation may be needed in these soils. Permeability is moderately slow to slow and runoff is variable. Reaction is very strongly acid and strongly acid.

The Hazleton series channery sandy loams (HaB, HaC, HaD), very stony sandy loams (HbB, HbD, HbF), and very bouldery sandy loams (HzB, HzD) are gently sloping to moderately steep, deep, well-drained soils on the upper side slopes of hills and ridges of uplands. They formed in material from acid sandstones. Permeability is moderately rapid to rapid, runoff ranges from medium to rapid and the hazard of erosion is slight to severe depending on slope. Reaction is extremely acid to strongly acid in the surface layer and subsoil. As a building material these soils form excellent subgrade for pavement both in their undisturbed state or as compacted fill. These soils have generally moderate frost depth and, when properly compacted, exhibit high shear strength.

The Nolo Series loams (NoA, NoB) and very stony loams (NsB) are nearly level to gently sloping, deep, poorly drained soils in depressions and drainage ways and on broad flats on uplands. They formed in material derived from acidic gray sandstones. Permeability is slow, runoff is slow to very slow and the hazard of erosion is slight to moderate. Reaction is very strongly acid and extremely acid in the surface layer and subsoil. These soils are highly susceptible to frost, exhibit low shear strength and make fair pavement subgrade and common fill.

The Philo series silt loams (Ph) are nearly level, deep, moderately well-drained soils on flood plains in major stream valleys. They formed in stream-deposited material derived from acid shales, siltstones and sandstones washed from the uplands. Permeability is moderate to moderately slow, runoff is slow and the hazard for erosion is slight. Reaction ranges from medium acid to very strongly acid in the surface layer and subsoil.

Pope series, fine sandy loams (Po) are nearly level, deep, well-drained soils found in flood plains in major stream valleys. They formed in stream-deposit material derived from acid shales, siltstones and sandstones washed from the uplands. Permeability is moderately rapid, runoff is slow and the hazard for erosion is slow. Reaction ranges from strongly acid to extremely acid in the surface layer and subsoil. These soils have geotechnical properties similar to those of Philo silt loam.

Purdy series, silt loams (Pu) are nearly level, deep, poorly to very poorly drained soils on stream terraces. They formed in old stream deposits from material derived from acid shale, siltstone and sandstone washed from uplands. Permeability is slow to very slow, runoff is slow and the hazard for erosion is slight. Reaction ranges from strongly acid to extremely acid in the surface layer and subsoil. The shear strength of these soils is low, while the compressibility is high. Some subgrade preparation will be warranted if embankments are to be constructed on these deposits. This subgrade preparation may require undercutting and backfilling or base reinforcement with geosynthetics.

The Rayne-Gilpin series channery silt loams (RgB, RgC, RgD, RgF) and very stony silt loams (RpB, RpD) are gently sloping to very steep, deep and moderately deep, well-drained soils on side slopes of hills, ridges and mountains. They formed in materials weathered from shale and siltstone. Permeability is moderate, runoff is medium to very rapid, and the hazard of erosion is moderate to severe depending on steepness of slope. Reaction is strongly and very strongly acid throughout. As a roadway material these soils form good subgrade after thorough proof-rolling. The thickness of these soils varies from 2 to 5 feet and may contain large stones (remnants of weathered rock). As a compacted embankment, these soils can provide higher shear strength; and shallow embankments could be constructed with steeper slopes (up to 1-1/2H:1V).

The Tyler series silt loams (Ty) are nearly level, deep, somewhat poorly drained soils on stream terraces in major valleys. They formed in stream-deposited material derived from shales and sandstone washed from uplands. Permeability is poor to very poor, runoff is slow, and the hazard of erosion is slight. Reaction ranges from strongly acid to extremely acid in the surface layer and subsoil. High water table and fine-grained nature of these soils result in their poor shear strength and high frost susceptibility. Consequently, these soils form poor highway subgrade and may require improvement.

Udorthents (UDA, UDD, UDF, UOA-smoothed) are areas that have been surface mined for coal. They are deep, well-drained soils consisting of a mixture of soil and unconsolidated fragments of shale, sandstone and coal. Permeability and runoff are variable, and the hazard for erosion varies from slight to very severe depending on the manner in which the excavated material was piled. Where unlimed, the soil ranges from slightly acid to extremely acid. Roadways constructed on these soils could experience high differential settlement due to non-homogeneous composition and density. Generally, subgrade preparation by undercutting to a suitable depth (depending upon the total thickness) and backfilling with properly compacted material is required. The backfill material could be the excavated material provided it is reasonably well-graded and is free of coal or potentially expansive carbonaceous shale rich in pyrite. Due to poor compaction, cuts in these soils should be made at flatter slopes. If coal is present in sufficient concentration it could present a combustion hazard. To protect from future fires and to enable vegetation growth, a clay cover may be needed in these soils. Any structures placed in the vicinity of these soils must be acid resistant. Where mine turnover is relatively thicker, dynamic compaction has been successfully used to densify it and to reduce long-term consolidation.

The Wharton series silt loams (WhB, WhC, WhD) and very stony silt loams (WvB, WvD) are gently sloping to moderately steep, deep, moderately well-drained soils on upper and lower side slopes of broad hills and ridges. They formed in material derived from acid shales. Permeability is poor to moderately poor; runoff is medium to rapid, and the hazard of erosion is moderate to severe depending on steepness of slope. Reaction is very strongly acid and strongly acid in the surface layer and subsoil. Due to their fine-grained nature (A-6 and A-7 AASHTO classifications) these soils have low shear strength and high compressibility and frost susceptibility. High moisture content will make these soils difficult to compact. Embankment constructed of these soils could experience high long-term consolidation under self-mass.

In addition to the above soil series, the "Soil Survey of Garrett County, Maryland" has identified the following soil types within the area of study.

The Brinkerton and Andover very stony silt loams (BsC) are deep, poorly drained soils that have a fragipan in the lower part of the subsoil. These soils are in upland draws and on flats where

they formed partly in material weathered from underlying fine textured shale and partly in local alluvium or colluvium. Stones and boulders more than 10 inches in diameter are common on or near the surface of these soils. Permeability is poor; runoff is slow to medium, and the hazard for erosion is slight to moderate. Reaction in the surface layer and subsoil is very strongly acid and strongly acid. Ground water table in these soils is generally high, and the fine-grained composition of the soils makes this series poor roadway material. It has low shear strength, high compressibility and frost depth and is difficult to compact. As a result, these soils make poor fill and require flatter cut slopes.

The Calvin and Lehew channery silt loams (ClE) consist of moderately deep, well-drained soils on uplands. These soils formed in material weathered from reddish shale, siltstone and fine-grained sandstone. Permeability is moderately high. Reaction is very strongly acid and strongly acid on the surface layer and subsoil. The thickness of these soils averages 3 to 5 feet; and they contain sufficient amount of rock fragments to make them good roadway subgrade and embankment fill with higher shear strength, lower compressibility and low frost susceptibility.

The Cookport and Ernest very stony silt loams (CaB, CaD) consist of moderately deep, moderately well-drained soils that have a very firm, dense brittle layer in the lower part of the subsoil. These soils are on uplands. They formed in material weathered from hard acid sandstone that has some seams of shale or siltstone. Permeability is slow, and the hazard for erosion is moderate. Reaction in the surface layer and subsoil is very strongly acid to strongly acid. The thickness of these soils ranges from 3 to 5 feet, and they exhibit a high perched water table. According to the AASHTO classification, these soils range from A-4 to A-6. Consequently, they have poor to fair stability and are difficult to compact, especially under wet conditions.

The DeKalb channery loams (DbC2) consist of moderately deep, well-drained soils on mountains. These soils formed in materials weathered from gray to pale-brown, acid sandstone that has some thin strata of shale or siltstone. They characteristically contain abundant fragments of angular hard sandstone. Permeability is moderately high to high. Runoff is medium, and the hazard for erosion is moderate. Reaction ranges from extremely acid to strongly acid in the surface layer and subsoil. The granular nature of these soils (AASHTO classifications A-2 and A-4) makes them good roadway subgrade as well as good to excellent fill material. Frost susceptibility in these soils is low;

and shear strength is high, enabling construction of steeper cut and fill slopes. They are also a good source of rock.

The DeKalb and Gilpin very stony loams (DgC, DgD) consist of moderately deep, well-drained soils in uplands. They differ from the DeKalb channery loams in that the Gilpin soils have more impurities of shale and/or siltstone and stones 10 inches or larger in size and commonly less than 30 feet apart are on the surface of these soils. As a result these soils provide good source of rock. In general these soils possess geotechnical properties similar to those of the DeKalb channery loams.

The Gilpin channery silt loams (GnB2, GnD2) consist of moderately deep, well-drained soils formed on uplands in material weathered from gray to brown, acid shale and siltstone and thin beds of sandstones. Permeability is moderate, and the hazard of erosion is moderate to severe. Reaction is strongly and very strongly acid throughout. Due to their silty nature, these soils are moderately susceptible to frost and difficult to compact.

The Lickdale silt loams (Lc) consists of soils that are very poorly drained. These soils are on upland flats and in depressions where they formed in material weathered from acid sandstones. Permeability is low, and the hazard of erosion is slight. Reaction in the surface layer and subsoil is strongly acid. Thickness of these soils ranges between 3.5 to 6.0 feet, and their composition is generally fine-grained (AASHTO classifications A-6 and A-4). As a result these soils are highly susceptible to frost.

Stony Land, steep (SrF) soil areas have slopes of 25 to 100 percent and contain large boulders and outcroppings of hard rock. Permeability is high, and reaction is strongly acid in the surface layer. They are a good source of rock and provide good common fill; however, the thickness of these soils is small, generally 1 to 3 feet.

Strip mines and dumps (St) are similar to the Udorthents units of Pennsylvania that have been described in the previous section.

The Wharton silt loams (WhB2, WhC2) are similar to the same unit names in Pennsylvania. Only the map symbols differ slightly.

6.3 Bedrock Stratigraphy

The project area crosses the state boundary between Pennsylvania and Maryland. Stratigraphic nomenclature, geologic formation boundary lines, coal crop lines and geologic structure contour lines have been delineated differently in the two (2) states. The stratigraphic names are essentially the same in both states for the Pennsylvania age bedrock units, except that in Maryland, the Clarion coal is not recognized; and the Brookville coal (of Pennsylvania) at the base of the Pennsylvanian system is called the "Lower Mount Savage" coal. The major differences between Pennsylvania and Maryland occur in the stratigraphic names and the formation boundary lines in the Mississippian age rocks. In Pennsylvania the Mississippian is divided into, from youngest to oldest, the Mauch Chunk, the Loyalhanna, and the Burgoon/Pocono formations. In Maryland the Mississippian is divided into, from youngest to oldest, the Mauch Chunk, the Greenbrier, the Purslane, and the Mississippian/Devonian undifferentiated Rockwell formation. Unfortunately, there is no direct correlation between the formation boundaries in Pennsylvania and the formation boundaries in Maryland. Another difficulty lies in the difference in the geologic structure contour lines between the two (2) states, especially in regard to the elevations of the various important coal seams.

With the exception of the Monongahela group and the top of the Casselman, the bedrock that underlies the project area includes the entire Pennsylvanian system and the Mississippian system (see Figures 5A and 5B).

Pennsylvanian System: The Conemaugh group contains rock extending downwards from the base of the Pittsburgh coal to the top of the Upper Freeport coal. It contains the upper Casselman and lower Glenshaw formations. The Ames limestone, the uppermost unit of the Glenshaw formation, marks the boundary between the two (2) formations. In southern Somerset County, the Conemaugh is 900± feet thick. It is composed of repeated sequences of sandstone, shale, clay, lime-stone and coal. Also contained within the Conemaugh group are several layers of redbeds. These

redbeds are generally composed of claystone with low shear strength that is easily eroded when exposed in cuts and susceptible to long-term slope failures. Therefore, cuts in these rock units will require flatter slopes and/or benching to maintain slope stability.

The Casselman formation includes the 500± feet of strata from the top of the Ames limestone to the base of the Pittsburgh coal. The formation consists of alternating layers of sandstone, shale, limestone and coal. Two (2) major sandstone units are recognized within the formation. The Morgantown sandstone, that lies above the Wellersburg coal and below the Clarksburg limestone, averages 20 to 30 feet thick and can be locally massive. The Grafton sandstone is separated into the upper and lower unit by the Federal Hill coal. The upper unit is characteristically 5 to 10± feet thick and often shaly. The lower unit is generally coarser grained with occasional interbeds of shale and ranges in thickness from 10 to 25± feet. Where these sandstone units are massive, pre-splitting and blasting may be required for excavation; but they should provide a good source of material for use in fill embankments and as road base. The Casselman formation also contains as many as fifteen (15) thin coal seams and eight (8) fresh water limestones. However, the Wellersburg coal is the only seam in this formation known to be commercially mined in the project area. Several other coal seams such as the Morantown, Franklin, Lonaconing, Hoffman, Upper and Lower Clarksville, Barton and Federal Hill coals are thick enough locally to have been mined for domestic use but are discontinuous and are of little commercial economic interest.

The Glenshaw formation averages approximately 375± feet in thickness and includes strata between the top of the Upper Freeport coal and the top of the Ames limestone. This formation also contains alternating sequences of sandstone, shale, limestone and coal. The units are generally more persistent and contain marine limestones and a greater abundance of redbeds. Three (3) sandstone beds are contained within the formation: the Saltsburg, Buffalo and Mahoning sandstones. The uppermost, the Saltsburg sandstone, lies between the Pittsburgh redbeds and the Upper Bakerstown coal. It is commonly 30± feet thick, but may reach thicknesses of over 60± feet. The Buffalo sandstone lies between the lower part of the Meyersdale redbeds and the Brush Creek limestone. It is commonly 10 to 15 feet thick, but may reach thicknesses of 30 feet or more. It is generally shaly and should require less effort to excavate. The Mahoning sandstone is divided into an upper and lower part by the Mahoning coal. The lower Mahoning sandstone lies directly over and, in some cases, has

cut through the Upper Freeport coal. The combined thickness of both units is 30 to 40 feet but may reach as much as 70± feet where it has cut downward into the Upper Freeport coal. The lower sandstone unit is fairly massive and, in part, conglomeratic and may require pre-splitting and blasting to facilitate excavation. The Glenshaw formation also contains three (3) distinct intervals of redbeds: the Pittsburgh redbeds, the Meyersdale redbeds and the Mahoning redbeds. In general, these units are comprised of claystone and are highly susceptible to "softening" and erosion when exposed in road cuts. Cuts in claystones should be designed using residual shear strength parameters. These rock strata are also generally overlain by more resistant strata such as limestone and sandstone and, through differential weathering, can produce overhangs, forming potential rock falls on steeper slopes. Therefore, flattening of slopes, incorporation of benches, construction of drop zones, etc. may be required to enhance slope stability. Only four (4) of the nine (9) coal beds occurring in the Glenshaw formation are known to have been mined commercially, the Upper and Lower Bakerstown, the Brush Creek and the Upper Freeport rider. Of these four (4) coals, the Lower Bakerstown is the most economically significant seam in the project area. The Upper Freeport rider is mined primarily only in conjunction with the main bench of the underlying Upper Freeport coal during strip mining operations.

The Allegheny group of rocks includes strata from the top of the Upper Freeport coal to the base of the Brookville coal, an average of 280± feet. This stratigraphic sequence also consists of cyclical layers of sandstone, shale, siltstone, limestone and coal of which shale, siltstone and sandstone are predominate. Although coal comprises only about 10 percent of this group, it contains seven (7) economically valuable coal seams. The coals typically have associated underclays, some of which contain refractory clays. The limestones of the Allegheny group occur as beds or as nodules within the underclay zones.

The Allegheny group is subdivided into three (3) formations: the Freeport, Kittanning and Clarion. The Freeport formation includes all strata between the top of the Upper Kittanning coal to the top of the Upper Freeport coal. This unit averages approximately 100± feet in thickness. This formation includes the Upper ("E") and Lower ("D") Freeport coal seams, both of which have been extensively mined in the project area. The Butler sandstone separates the Upper and Lower Freeport coals and is similar in appearance to the Freeport sandstone that underlies the Lower Freeport coal.

The Freeport sandstone, however, is one of the more massive sandstone beds in southern Somerset County, ranging in thickness from 10 to 40± feet; while the Butler sandstone, though a massive bed 20 to 30± feet thick in places, is generally comprised of interbedded sandstone and shale. The Freeport sandstone will require blasting for excavation, but the Butler sandstone may be rippable.

The Kittanning formation includes the strata between the base of the Lower Kittanning coal and the Upper Kittanning coal. This formation averages 100± feet in thickness and contains three (3) economically important coal seams; the Upper Kittanning ("C prime"), the Middle Kittanning ("C") and the Lower Kittanning ("B"). All three (3) seams have been mined, both surface and deep, within the project area. Where the Middle Kittanning coal seam is present, it is separated from the Upper and Lower Kittanning coal seams by the Upper and Lower Worthington sandstones. Where the Middle Kittanning coal is absent, the entire interval from the Upper Kittanning coal to the Lower Kittanning coal is composed of sandstone. This sandstone can be massive for as much as 60± feet in thickness and, therefore, may require blasting to excavate if roadway grading requires cuts through this sandstone.

The Clarion formation of the Allegheny group extends from the base of the Lower Kittanning coal to the base of the Brookville coal. It contains the Kittanning sandstone which ranges in thickness from 20 to 50± feet and lies just beneath the Lower Kittanning coal and above the Clarion coal. It is generally a massive conglomeratic quartzose sandstone; and, therefore, excavation through it will be difficult and will require blasting. Where the Clarion coal is present the sandstone lying beneath the Clarion coal is called the Clarion sandstone. The Clarion coal seam has also been mined to a limited extent in the project area, and its associated underclay has also been commercially developed.

The Brookville coal marks the base of the Clarion formation. This coal seam has been mined in areas where it attains considerable thickness, being on the order of 60 to 72 inches and ranging up to 132 inches. However, the Brookville coal seam is often partially or totally replaced by the overlying sandstone.

Rocks of the Pottsville group outcrop on the northeasternmost section of the proposed study area along the crest of the Negro Mountain anticline. The Pottsville group of rocks lies above the Mississippian Mauch Chunk formation and extends upward to the base of the Brookville coal. The average thickness of the Pottsville group in southern Somerset County is approximately 200± feet, and it consists almost entirely of sandstone. The group is divided from top to bottom into the Homewood sandstone, Mercer coal, Upper Connoquenessing sandstone, Quakertown coal, Lower Connoquenessing sandstone, Sharon coal, and Sharon sandstone. The coal beds are notably irregular, both in thickness and in structure, and are unimportant economically. The sandstone units are generally medium to coarse-grained with occasional shale and siltstone interbeds. The Homewood sandstone is the most persistent unit of the Pottsville group. It is quartzose, generally thick-bedded and massive, and may require pre-splitting and blasting for excavation in road cut areas.

Mississippian System: The Mauch Chunk formation is the uppermost Mississippian unit. In Pennsylvania, it lies between the Loyalhanna formation and the Pottsville group. The Mauch Chunk is an interbedded sequence of mostly red shale and some sandstone with minor amounts of siltstone and limestone. The upper part of the Mauch Chunk contains no limestone beds. The lower part contains considerable calcareous shale, calcareous sandstone and at least two beds of commercial limestone, namely the Wymps Gap and the Deer Valley. The Deer Valley lies at the base of the formation. The thickness of the Mauch Chunk in Somerset County, Pennsylvania is approximately 500± feet.

In Maryland, the Mauch Chunk extends downward from the base of the Pottsville group to the top of the Greenbrier formation (the Greenbrier formation is not recognized in Pennsylvania). The general lithology is interbedded sandstone, silty shale and mudstone. Sandstones are typically medium to fine-grained, cross bedded with occasional basal conglomerates. Shales and mudstones are predominantly red, red-brown. The base of the Mauch Chunk is placed at the top of the Wymps group limestone (formerly the upper tongue of the Greenbrier). The thickness in Maryland varies from 600± to 800± feet.

The Greenbrier formation (Maryland only) commonly consists of red-brown and white calcareous sandstones interbedded with red and green siltstones and shales. The Wymps Gap

limestone is present at the top of the formation. The base of the formation is the Loyalhanna limestone that reaches thicknesses of 35 to 45 feet. The Loyalhanna has been quarried and deep mined in the vicinity of the project area. The Greenbrier formation commonly forms the valleys that lie between the Pottsville and the Purslane (Burgoon) sandstone ridges. Total thickness of the Greenbrier formation ranges from 250± to 350± feet.

The Burgoon formation (formerly the Pocono formation) of Pennsylvania and the Purslane formation of Maryland, although not the same, have similar rock types and are of similar age. Both formations contain predominantly sandstone with interbedded siltstones and shales. The resistant character of this unit makes it second to the Pottsville sandstone as a ridge-former in the Allegheny Mountain section of the Allegheny Plateaus physiographic province. Thickness varies from 200± to 300± feet.

The Rockwell formation (Maryland only) is the equivalent to the Lower Pocono (Burgoon) group of previous reports and is undifferentiated between Mississippian and Devonian age. It consists of olive-gray to light gray quartzose sandstone and red-gray siltstone and shale. A few thin discontinuous coal seams are present near the middle of the formation. Thickness is approximately 200± to 250± feet.

6.4 Structural Geology

The northeast-southwest trending trace of the axis of the Berlin syncline cuts across the northwestern section of the project area (see Figures 5 and 6 in ***Appendix B***). The Berlin syncline is an asymmetrical fold occurring between the Negro Mountain anticline to the west and the Deer Park anticline to the east. Strata on the east flank of the Berlin syncline dip twice as steeply on average as those on the west flank. Bedrock dip values range from 3 degrees to 21 degrees, respectively. There is a slight high point in the axis of the syncline north of Meyersdale at Blue Lick Creek. To the northeast the syncline deepens near Pine Hill in Brothers Valley Township and plunges to the northeast at an average rate of about 70 feet per mile; to the southwest the axis gently rises into Maryland at a rate of 40 to 45 feet per mile. The Berlin syncline axis marks the location at which the bedrock dip

changes from a northwesterly directly on the eastern side of the axis to a southeasterly direction on the western side of the axis.

The magnitude of bedrock dip and the orientation of dip-azimuth with respect to the roadway alignment exert significant influence on the stability of cut slopes in rock. Cuts in bedrock dipping toward the highway alignment are more susceptible to slides and rock falls. In addition, attitude, geometry, and spatial distribution of rock discontinuities such as faults and jointing will also have a significant influence on cut slope stability. Although no major faults are evident in the project area, minor faulting has been noted in highwalls of open pit coal mines; and well-developed joint planes and joint sets were observed in various sandstone bedrock units during field reconnaissance.

6.5 Ground Water Hydrogeology

The town of Salisbury and the village of Boynton are serviced by a public water system, the source of which is in ground water. The areas off the main roads, however, must depend on independent ground water resources such as springs and wells to supply water for drinking and other uses. The ground water use in the project area is primarily for private households and relatively small businesses. There are no known major industrial users of ground water. Except in times of drought, overpumping of ground water is not a problem in most areas because only a small portion of the available ground water is utilized by private households and commercial users. Deep mining for coal, however, has caused the depletion of some shallow aquifers.

Ground water in the project area occurs under both water table and artesian conditions. Large yields are obtainable from drilled wells that tap any of the numerous sandstones of the Pottsville, Allegheny or Conemaugh formations. Wells located within synclinal bedrock structures are reportedly under considerable head. The sandstones crop out along Meadow Mountain at considerably higher altitudes where the opportunity for recharge is excellent. Local yields up to 570 gallons a minute are reported. However, the sandstones commonly grade into sandy shales and shales so that these large yields cannot be expected everywhere. Moreover, some wells that are situated close to active coal mines have been ruined. Large volumes of ground water may be “trapped” against buried highwalls in surface-mined areas. Roadway cuts in these areas may release a sudden discharge of ground water

that may be acidic in nature. Precautions to avoid or control this type of release should be made during preliminary engineering and final design. In addition, several existing domestic wells and previous mineral exploration boreholes penetrate artesian aquifers with excessive high iron concentrations. The water from these wells/borings must be collected and treated prior to discharge in the surface water drainage system. Roadway test borings may penetrate this aquifer and, therefore, must be properly sealed to avoid the potential of cross-contamination of aquifers.

Cuts as deep as 109± feet at centerline will be required to construct the proposed roadway, therefore, it is likely that several geologic formations will be disturbed. Cuts extending below the ground water level in existing wells are likely to cause permanent disruption of downgradient ground water supplies. Earthwork activities associated with roadway construction present the potential for short and long-term impacts to the ground water system in the form of reduced or altered ground water recharge, lowered ground water levels, water discoloration and degradation of water quality. In areas of major cuts where blasting is required, permanent alteration to the ground water table along and adjacent to roadway alignment may result. Installation of monitoring wells in areas of major cuts, monitoring of existing wells prior to, during and after roadway construction and erosion and sediment control measures to minimize adverse impacts to ground water quality should be implemented as part of the geotechnical investigation during subsequent design stages.

6.6 Aerial Photography

Google Earth was used to review aerial photography over the past 30 years. The terrain within the limits of the project site does not appear to have been altered significantly during this time period. Strip mining is the main source of land disturbance in this area, and all strip mining activities took place in the past prior to this 30 year review period.

6.7 Reconnaissance

A preliminary geologic field reconnaissance was intermittently conducted by GMI from May 25 to September 2, 2022. In general, the project area is characterized by long northeast to southwest trending ridges separated by stream dissected valleys. Water gaps created by Piney Creek and Meadow Run are impressive and display very steep valley walls. The most rugged and steep

terrain occurs at the Piney Creek water gap along Alignment E where it has cut through the Pottsville group rocks. The Pottsville Group rocks contain relatively thick occurrences of massive, hard sandstone creating steep valley walls on both sides of Piney Creek, thus requiring a proposed structure nearly 200± feet above stream elevation to carry the proposed roadway over Piney Run Road, Greenville Road, and Piney Creek.

During the geologic reconnaissance, the traverse encountered rugged topography at the higher elevations of Allegheny Mountain and more subdued topography along the lower flanks of Allegheny Mountain. The lower flanks mainly consist of agricultural land that has been strip mined in some places. However, there were no operating strip mines encountered within the footprint of the proposed roadway alignments.

Special attention to disturbed land, such as reclaimed and un-reclaimed surface mining operations, was noted. Other notable disturbances encountered were random soil and sandstone boulder piles inside the existing tree lines. The vegetation inside the tree lines consisted of dense forest and thick underbrush with frequent sandstone boulder float. The sandstone boulder float may be a result of downslope migration from the parent rock outcrop. Where thickest and most wide-spread, the crop-line of a prominent sandstone formation may be near. In general, the occurrence of thick woods with a bouldery mantle does not appear to be disturbed by strip mining. The random soil and sandstone rubble piles may be prospects, remnants of old unpermitted "punch mines" or disturbances from logging activities.

Alignment E - North Segment (Includes DU, DU-Shift, E-Shift):

All alignments start together where the existing Meyersdale Bypass terminates and the existing expressway tapers to two lanes of existing Business 219. Where all the alignments cross over a parcel of land north of Clark Road, permitted deep-mine and surface mine properties will be encountered (see Figure 7A and 8A in ***Appendix B***). Upon review of online mine map resources and conversations with various mine permitting and enforcement agencies, Carl F. Miller deep mine (permit # 467M019) and Galileo DiValentino deep mine (permit # 467M022) exist within the footprint of the proposed roadway from approximate Station 2400+30± (just north of Clark Road) to Station 2422± (Hunsrick Road). The Lower Freeport coal was reportedly mined at both locations. It should

be noted that a mine cavity was encountered in previously drilled boring P-11 during the 2004 preliminary drilling phase. Locations of previously drilled borings are plotted on the Geologic Cross Sections and the Subsurface Plans and Profiles located in ***Appendix J*** of this report. Subsequent to the deep mining activities, the same parcel was permitted by Croner & Ohler in the early 70's for surface mining as well. Therefore, construction activities at this location will likely encounter a combination of deep mine cavities and unconsolidated surface mine backfill material.

The alignments remain together to approximate Station 2290±. The terrain consists of dense woods with thick brush and frequent sandstone boulder float (see Photograph 1 in ***Appendix D***). Outcrops are scarce based on the topography and mantle of boulders. Based on a review of surface mine permit boundaries, it appears the roadway alignments are located upslope of the main portion of past strip-mining activities; and, in some cases the surface mine permit boundaries are tangent to the roadway alignments. One example is the Tom Moran Trucking permit that is also known as the Mast mine. All the alignments traverse over this permitted area from approximate Station 2289± to 2315±. The permitted area is quite extensive, but the alignments are located further upslope inside the tree line where vegetation consists of dense woods and sandstone boulder float. The topography looks relatively undisturbed inside the tree line; whereas the pastures at lower elevations are hummocky with random rock fragments mixed with the soil. The biggest impact from past surface mining activities on the roadway alignments will be near the Pennsylvania-Maryland border where the M.F. Fetterolf mine (Permit # 4072SM2), also known as the Weimer Strip and Auger mine, will be encountered. This area will be discussed in more detail subsequently.

The natural resource most likely to be impacted is water. During the geologic reconnaissance, an abundance of water was encountered and noted on the field notes. Springs and tributaries are common, and at two (2) locations it appears it may be a source of water for local residents. A cistern is located at approximate Station 2318±, offset 25' right (see Photograph 2). A second spring location was noted at Station 2328±, left of centerline where PVC pipes were run into a 55-gallon drum (see Photograph 3). Many tributaries were recognized. Even if channels were not developed, water was heard running beneath the mantle of boulders. Surface and ground water management will be necessary both during and after construction.

Alignment E - Middle Segment (Includes E-Shift):

Alignments DU (and DU-Shift) and E (and E-Shift) split apart at Station 2312±, where Alignment E continues on a southerly path while Alignment DU trends toward the southwest. Alignment E crosses Greenville Road, Piney Run Road, and Piney Creek where a structure is anticipated (see Photograph 4). Based on preliminary roadway profiles and cross-sections, the proposed north abutment of this structure is located at Station 2230+51 and the south abutment is located at Station 2215+91, thus resulting in a span length of 1,460 feet. The subsurface bedrock is expected to belong to the Pottsville group rocks of Pennsylvanian age and the top of the Mauch Chunk formation of Mississippian age. Bedrock dip is 13± degrees toward the northwest. The Pottsville group rocks consist mainly of hard, massive sandstone and conglomerate with lesser amounts of shale, siltstone, claystone and coal. The massive sandstone beds break off the outcrops and result in massive sandstone boulders (see Photograph 5). Based on the massive bedding and relative hardness of the sandstone, the topography created by Pottsville group rocks is rugged with steep valley walls. The Pottsville group does contain coal beds belonging to the Mercer coal (near top of group), Quakertown coal (near middle) and Sharon coal (near bottom of group). These coal beds are typically thin, non-persistent and economically unimportant within the study area. Mining has not been reported beneath the Piney Creek span at Alignment E.

South of Greenville Road (SR 2010), Alignment E again crosses densely wooded property with sandstone boulder float. Relatively good paths assumed to be a product of past logging activities will provide good access for future subsurface investigations. Evidence of past mining activities inside the tree line was lacking. The proposed alignment leaves the woods and enters a clearing near Station 2184+50. The clearing has been strip-mined in the past (see Photograph 6). The surface soils consist of various rock fragments including shale, carbonaceous shale, coal, and occasional sandstone boulders. The parcel was permitted to Penn Coal Land, Inc. and M.F. Fetterolf based on a review of permitted mine lands available on-line at PADEP's eMapPA website. The mine property is called the Weimer Strip and Auger Mine, Job 7. This implies that parts of the property were not only mined using surface mining techniques but also bored horizontally using augers when the maximum highwall was reached. Various District Mining Enforcement Agencies as well as permit file clerks at mine permit repositories were contacted. Very limited information was available; hence it is nearly impossible to predict depth to mine pits, locations of highwalls, and extent and direction of

augering. It should also be noted the site was released on November 3, 2021, except for 31.2 acres bonded for post mining water treatment. The water treatment is ongoing.

Alignment E enters the tree line again near Meadow Run where dense vegetation and a relatively thick grove of hemlock was noted. The second proposed long structure is located at Meadow Run. The proposed north abutment is located at Station 2167+13 and the southern abutment is located at Station 2157+13, thus resulting in a structure length of 1,000 feet. This area is situated within the Weimer Strip and Auger mine permit area. A relatively large area south of the proposed stream crossing appeared to be overgrown and may be evidence of past strip-mining activities. The area within the Weimer Strip and Auger mine permit area extends from Greenville Road to the Pennsylvania-Maryland line. This area should be investigated during the preliminary drilling phase, and additional test borings should be considered during subsequent phases of drilling.

Alignment E crosses into Maryland at approximate Station 2149+80 where it enters the Markowitz property. Action Mining Inc. had permitted a parcel on the Markowitz property where the Ames coal was strip mined. The open pit was reclaimed in the past. The mine permit boundary is located just east of Business 219, and Alignment E crosses the very southern edge of the permit area. It is unknown if coal was extracted in this area. According to Mr. Markowitz, when he purchased the property there were numerous strip mine pits on his property. Some areas he reported were 100± feet deep. This depth has not been confirmed.

At approximate Station 2139+50, 430± feet left of centerline, a collapsed deep mine entry with remnant rail was noted. Geologic mapping suggests it is in the Glenshaw formation, and the Lower Bakerstown coal has been reported to be of mineable thickness within the general region.

Inside the tree line there were regular occurrences of trench-like depressions with mounds of soil and rocky debris (see Photograph 7). This may represent small “punch mines” that are not permitted and are typically not very extensive. The other possibility is that the excavations represent prospecting for coal. An abandoned strip mine was noted near Station 2118±, approximately 150± feet right of centerline. It is located near a cut line for Alignment E and DU. The pit is filled with stagnant water (see Photograph 8).

Alignment E leaves the forest at approximate Station 2115+50±, south of the abandoned strip mine discussed in the previous paragraph. The alignment crosses over agricultural property to Station 2110±. This hayfield appears to be a reclaimed strip mine with random rock fragments mixed in with soil. The alignment again crosses over wooded property with occasional sandstone float.

Alignment E - South Segment (Includes DU):

At Station 2103±, Alignment E comes out of the forest, remerges with Alignment DU, and crosses into predominantly agricultural fields consisting of hay and corn to Station 2093+70±. The agricultural fields in this area appear to be undisturbed ground. There were no mine permitted areas at this location.

From Station 2093+70 to approximate Station 2082+80±, the proposed alignment crosses over thick vegetation that appears to have been recently logged. The area does not appear to have been strip mined.

From approximate Station 2082+80 to the tie-in point with recently constructed U.S. 219 bypass, the land consists primarily of hay fields, corn fields and soybean fields. It should be noted, during the reconnaissance, centerline stakes were missing through some of the agricultural land. Based on the maturity of corn and soybeans, it is assumed stakes were not placed in order to avoid crop damage (see Photograph 9).

Alignment DU - Middle Segment (Includes DU-Shift):

Alignment DU (and DU-Shift) splits off from Alignment E at approximate Station 6332±. The trend of Alignment DU is in a general southwest direction. The proposed roadway traverses over densely wooded land with thick brush and sandstone boulders. Again, seeps and springs were noted and are shown on the field mapping. Occasional large boulder fields were encountered.

From Station 6284+90 (north abutment) to Station 6265+61(south abutment), a structure measuring approximately 1,929 feet long will be required to cross Piney Run Road and Piney Creek. Approximately 190 feet of vertical relief is expected. Stratigraphically, the bedrock is expected

to belong to the Allegheny group rocks that consist of sandstone, siltstone, shale, coal, claystone and limestone dipping 13± degrees toward the northwest. The Allegheny group rocks are one of the more prolific coal bearing rocks. Based on a review of surface mine permits, the majority of the permits have been in areas where Allegheny group coals were prospected. It should be noted that numerous prospects or "punch mines" are located on both sides of Piney Creek (see Figure 10 in ***Appendix F***). Unlike Alignment E that crosses over Piney Creek in the Pottsville group rocks (not reportedly mined), Alignment DU crosses over Piney Creek where the Allegheny coals outcrop. Surrounding hills have been permitted for mining of the Upper Freeport, Lower Freeport, Upper Kittanning, Middle Kittanning and Lower Kittanning coals. In most cases, "punch mines" are not permitted; and detailed mapping is not available. They are generally small in extent and were opened by property owners for domestic fuel (see Photograph 10 in ***Appendix I***).

The southwest side of Piney Creek is very steep and has some logging roads that wind up to the top of the slope. The terrain is typical for the undisturbed areas where dense woods and very thick brush dominate the landscape.

From Station 6253+30 to Station 6247+10±, Alignment DU crosses over the very southeastern corner of the River Hill Coal Company mine permit area (Permit # 4074SM1), also known as the Barbarine Mine. It was permitted for the Upper and Lower Bakerstown coals. It is unknown if the strip-mining activities extended all the way to the permit boundary lines.

From the limits of the permit boundary to Greenville Road (SR 2010), the landscape consists of dense woods with underbrush and sandstone float. Occasional land disturbances such as random piles of soil were noted that may represent prospects or "punch mines". A residential property located approximately 150 feet north of Greenville Road would be impacted if Alignment DU were to be selected for final design.

The Weimer Strip and Auger mine (permit # 4072SM2) encompasses the area south of Greenville Road to the Pennsylvania-Maryland border. Unlike Alignment E, which crosses the extreme southeast corner of the property, Alignment DU crosses the entire permitted area in a north-

south direction from Greenville Road to the state line. The property is still being actively treated for mine water discharge.

From Greenville Road to the state line, the landscape is typical as mentioned before. There are large tracts of land that are densely wooded with thick brush and sandstone float. The alignment crosses over a field/pasture from Station 6197+10 to Station 6190+60±. A potential "punch mine" was located at Station 6182+50± (see Photograph 11). Just upslope, a flat land surface appears to be a man-made feature where a tributary has been truncated by this feature. Regardless, it is not a natural feature and may be related to the potential punch mine referenced above.

From Station 6185+29 (north abutment) to Station 6167+88 (south abutment), a 1,741 feet long structure over Meadow Run is proposed. There are numerous springs and intermittent channels located approximately 400± feet north of Meadow Run. This area is included in the Weimer Strip and Auger mine permit boundary.

The topography south of Meadow Run is very steep (see Photograph 12). At the top of the steep slope south of Meadow Run the trees appear to be mature and open. However, an overgrown pasture was noted south of the tree line near Station 6168±. This area, from Station 6168± to Station 6154+60±, appears to be a reclaimed strip mine with distressed vegetation (see Photograph 13). The pasture bordering the Pennsylvania-Maryland border does not look like it was surface mined based on healthy vegetation (see Photograph 14).

Alignments DU-Shift and E-Shift - South Segment:

At Station 6103± (DU) / Station 2104± (E), Alignment DU and Alignment E converge, and the geologic and topographic conditions are similar. Refer to Segment 3 DU-E in above paragraphs for details. While Alignments E and DU eventually split from Alignments E-Shift and DU-Shift, the distance between them is small enough that the general topography at both locations remains the same.

6.7.1 Notable Water Resources

During the geologic reconnaissance, springs and intermittent tributaries were abundant and have been noted on the roadway plan. There were too many to accurately document, but two (2) notable springs appeared to be harnessed for personal use. One (1) location consisted of a cistern, and at the other, a 55-gallon drum was being used (see Photographs 2 and 3 in ***Appendix I***, respectively). Both locations were discussed in the paragraphs under the Segment 1 DU-E section.

Public water has not been run to the outlying areas surrounding the proposed highway alignments. Several notable wells were encountered within the general vicinity of the project. The first well, known as the Clevenger well, is located at approximate Station 2373±, 300± feet left of Alignment E centerline (see Photograph 15). The depth of the well is unknown.

The second well, known as the Hershberger well, is located at approximate coordinates 39.739040/-79.045657 with an elevation of 2713± feet (see Photograph 16). During conversations with Mr. Hershberger, he indicated the well was drilled to a depth of 300± feet during which two (2) coal seams were encountered. It produces hard water at a rate of about 6-8 gallons per minute. The Hershberger well is located beyond the limit of current mapping; however, Mr. Hershberger was concerned with spring locations on his property which fall very close to centerline for Alignment E. Based on a review of these spring locations, the springs will likely be impacted (see Photographs 17 and 18).

The Markowitz well was not located. However, the well is likely located near the house which is at least 400 feet from nearest roadway centerline.

The Billman well was located adjacent to the house during field reconnaissance. This property falls directly on the centerline of all alignments and thus will be a complete take. The depth of this well is not known; thus, it

can't be stated at this time whether the bedrock strata that the well is tapped into will be exposed during the 70± foot cut located in this area.

The final well, known as the McKenzie well, was thoroughly investigated, as Mr. McKenzie expressed concerns about the potential impact that the proposed test borings would have on it. The McKenzie well is located at surveyed coordinates 39°42'46.89"/-79°05'15.44" with an approximate elevation of 2650 feet. The well was drilled to a depth of 207 feet and had a pumping rate of 17 gallons per minute at the time of installation.

The Findley Spring is the public water supply for the Borough of Salisbury, Pennsylvania, and is located at coordinates: 39.726961/-79.051441 at elevation 2294± feet (see Photograph 19). According to Open File Report 2000-02 "Groundwater Resources of Somerset County" (CD ROM) by Thomas A. McElroy, James R. Shaulis and Marylin D. Wegweiser, the Findley Spring produces water at a rate of 42 gallons per minute. It flows from Mississippian age rocks. According to Norman K. Flint's report "Geology and Mineral Resources of Southern Somerset County, Pennsylvania", the spring has developed in the Loyalhanna formation consisting of sandy limestone. It is reported that the water requires little treatment.

A water valve on the north side of Piney Creek near Alignment DU crossing was noted at approximate coordinates 39.744834/-79.055903 at elevation 2100± feet (see Photograph 20).

6.7.2 Potential Artesian Conditions

Potential artesian conditions may exist within the study area. Previous test borings drilled in 2004 (boring P-13RA) near Piney Creek close to current Alignment DU reportedly encountered artesian conditions. The test boring was drilled to a depth of 43.5 feet. Present borings drilled at similar locations with

similar geology will likely have similar results. It should also be noted artesian conditions were observed at a residential property on Clark Road at the first property on the left after turning left off Business 219 (approximate coordinates 39.777222/-79.034444). Orange colored water has been harnessed and directed across the property via a concrete lined channel. The occupant of the house described a drilled well in the past that encountered artesian conditions. The well was not properly plugged according to the occupant. The water has been flowing for years. The location is approximately 1250± feet downslope from the nearest centerline (all alignments together at this location) and approximately 300± feet upslope from the intersection of Clark Road and Business 219 (see Photograph 21).

6.7.3 Historical Limestone Mining

Approximately 1,400 feet east of proposed Alignment E where it crosses over Piney Run Road, an abandoned limestone deep mine and limekiln were visited during the geologic reconnaissance (see Figures 13A and 13B in ***Appendix F***). The limestone mine includes 8,443 feet of mine passage and 697 feet of natural cave passage. The limestone belongs to the Mauch Chunk formation of Mississippian age and is likely the Wymps Gap Limestone. The portal was reportedly closed. Currently, construction debris has been dumped near the entrance (see Photograph 22 in ***Appendix I***). Based on the direction of past mining, it does not appear the mine location will impact any of the proposed alignments. Directly across the road from the mine entrance and above Piney Creek streambed, lime kilns were recognized (see Photograph 23). This area may have some historical significance. However, this area should have no impact on the design or construction of the proposed roadway.

7.0 SUBSURFACE EXPLORATION

7.1 Description

The current subsurface exploration program during the Geotechnical Alternatives Analysis investigation for S.R. 6219, Section 050 included drilling of sixteen (16) test borings. The boring locations and depths were recommended by GMI as part of the ***Subsurface Exploration Planning Submission*** that was submitted in October 2022 and approved by PennDOT District 9-0 prior to initiation of field operations. Previous investigations performed by GMI are referenced throughout this section. These investigations were related to Preliminary Engineering (drilled in 1993) and Final Design (1995) for the Meyersdale Bypass along with a previous alternatives alignment study for SR 6219 from Meyersdale to Interstate 68 (2004)

The Alternatives Analysis boring locations and depths were selected to focus on the following three (3) primary design considerations:

- confirmation of bedrock stratigraphy;
- preliminary cut slope and fill embankment stability, including the suitability of excavated material for use in project embankments; and
- the impact of past mining on project design, with particular attention to delineating the deep mine/strip mine boundaries and the potential for deep mining under structure locations.

In general, borings in areas of cut were terminated at a depth of 20± feet below proposed grade in order to accommodate potential future adjustments in vertical alignment. Borings in areas of embankments and/or structures were extended to a depth of 10± feet into bedrock to provide useful information in preliminary structure foundation analyses and slope stability analyses.

The borings were staked in the field by Monaloh Basin Engineers; and the locations and elevations of the borings referenced in this report have been based on their survey. All borings were drilled by TRC Engineers, Inc. on a subcontract basis to GMI during the time period from January 9 through February 13, 2023. GMI provided full-time observation and logging during drilling of the borings. In all 1048.0 lineal feet of soil and rock were sampled in the borings.

Soil sampling was performed in accordance PennDOT Publication 222 methods by means of threaded flush joint steel casing [Section 202.02(b)(2)] and standard 2-inch O.D. Split Barrel sampling (AASHTO: T206). In general, standard penetration tests were performed continuously (1.5-foot intervals) in all borings. At each sampling interval the spoon sampler was initially seated to a depth of 6 inches to penetrate any loose soils, and then driven an additional foot with blows from a 140-pound hammer falling a distance of 30 inches. The number of blows required to drive the sampler through each 6-inch increment was recorded, and the number of blows for the final two (2) 6-inch increments is designated "Standard Penetration Resistance." The penetration resistance gives an indication of the in-place relative density or consistency of the soils being sampled. The number of blows for each 6-inch increment is included on the Engineer's Logs in ***Appendix G*** of this report, and the standard penetration resistance values are shown for each boring on the Geologic Cross Sections and the Subsurface Profile drawings included in ***Appendix J*** of this report.

Bedrock was sampled in the borings using a diamond bit with an NX/NQ double-tube rigid-type core barrel that provides a rock core with a nominal 2± inch diameter (AASHTO: T225). The rock core samples were visually identified in the field, and the percentage of core recovery was recorded. Also, the Rock Quality Designation (RQD) values were calculated and have been recorded on the Engineer's Logs. Both the RQD and the percentage of core recovery values give a qualitative indication as to the engineering properties of the bedrock.

In addition to core recovery and RQD values, the relative dip (RD) angles of both bedding planes and joint surfaces for the rock cores were measured and recorded on the Engineer's Logs. These readings were used to supplement information gained during our geologic field reconnaissance regarding the structural attitude of bedrock.

Ground water level readings were taken in each boring whenever water was encountered during drilling, immediately upon completion of the individual borings and again at least 24 hours later. The ground water readings are included on the Final Engineer's Logs and are shown on the Geologic Cross Sections and Subsurface Profile drawings. Each boring was backfilled with sand-cement grout after obtaining the final water level reading.

The Engineer's Logs have been prepared by GMI in gINT format and have been corrected to incorporate the results of the laboratory soils testing program. The corrected logs for all borings are included in ***Appendix G*** of this report while the handwritten driller's logs are included in ***Appendix H***.

7.2 Subsurface Conditions at Roadway and Structure Locations

A limited subsurface exploration and laboratory testing program has been conducted during the Alternatives Analysis investigation. The data collected from this investigation and from the literature search, geologic reconnaissance, and review of previous geotechnical and environmental investigations in study area are presented and discussed in the following paragraphs.

The geologic field notes, relative stratigraphic position of coal seams, estimated locations of buried highwalls and approximate limits of surface and deep mining are presented on the Geologic Plan and Subsurface Profile drawings in ***Appendix J*** of this report. It is important to point out that not all coal seams are present or continuous although they may be drawn as such on the roadway profiles.

The information collected by GeoMechanics, Inc. has been incorporated into the GIS data base for use by Stantec to prepare constraints mapping for the study area. As described previously, there are four (4) proposed alternative alignments currently being studied for this project. All four (4) alignments share a common boundary along the northern section of the project before splitting apart in the middle section of the into Alignment DU and Alignment E. Alignment DU takes a westerly route towards existing SR 6219 and the town of Salisbury while Alignment E follows a more easterly route from along Meadow Mountain. Upon entering Maryland, these alignments

converge again and follow a singular track. Upon reaching the southern end of the project, the option exists for the main alignment to continue following a southernly path along Salisbury Road (Alignments DU and E) or shift slightly to the east away from Old Salisbury Road (Alignments DU-Shift and E-Shift).

Alignment E North Segment (Includes DU, DU-Shift, E-Shift)

North Terminus at Meyersdale Bypass to Station 2441+25±

The proposed new four lane section of SR 6219 is set to begin where the current four lane section of SR 6219 ends near the Meyersdale Bypass. Small cuts and fills will be required for the first 500± feet of this section while a full cut, with a maximum depth at centerline of 37± feet at Station 2443+50, will be required over the remaining 800± feet.

No test borings were drilled in this section during the present investigation; however, four borings (GM-8, GM-9, TB-1, and TB-2) were drilled within the current Limits of Disturbance during previous studies from 1974, 1993, and 1995. The cut will be founded in residual soils and bedrock belonging to the lower Casselman formation. Based on Borings TB-1, located at Station 2446+21.9, 96± feet left and TB-2, located at Station 2446+35.2, 115± feet right, the cut will extend through alternating layers of siltstone, sandstone, claystone, and shale corresponding to the Lower Grafton Sandstone. Based on this, the top of the cut appears to be located just below the Federal Hill coal while the bottom of cut appears to be located just above the Ames limestone and coal.

The cuts can be made with a slope ratio of 2H:1V in the soil zone and 1.5H:1V in the rock. This will provide a relatively maintenance free slope and prevent differential weathering of the different rock strata that can lead to overhangs and potential rock falls.

Except for coal, carbonaceous material, and organics, all soil and bedrock from the cut should be suitable for use as fill in embankment construction. Transition benches will be required where the roadway subgrade changes from residual soil to bedrock to engineered fill.

Station 2441+25± to Station 2427+25±

Alignment DU-E continues to follow the path of existing SR 6219 (Business 219) throughout this section. The current two lane road will be widened to four lanes, requiring a side hill cut downslope (left) of centerline and a side hill fill upslope (right) of centerline. The maximum centerline fill height will be 35± feet at Station 2438+50±.

The embankment will likely be founded on residual soils and keyed into the engineered fill forming the existing embankment. A rock toe and upslope bonding benches will be required during the construction of the embankment. The cut will likely be limited to the soil zone which is expected to consist of residual soils.

No test borings were drilled in this area during the current investigation; however borings WT-1 (1993), located at Station 2435+11.6, 155± feet right, and GM-7 (1995), located at Station 2430+89.9±, 97± feet right were drilled during previous investigations for the Meyersdale Bypass project.

Station 2427+25± to Station 2399+50

The first 500± feet of this section of roadway continues along the existing Business 219 alignment, where it eventually crosses beneath a bridge carrying Hunsrick Road (SR2102) over Business 219. The existing Hunsrick Road bridge will be demolished and additional roadway improvements will be made in this area to Hunsrick Road along with other roads to better improve the traffic flow and safety.

The proposed alignment splits off from Business 219 once it passes Hunsrick Road. At this point, the roadway crosses through both deep mine and strip mine permitted areas where the Lower Freeport coal has been mined. Boring P-11 (2004), drilled at Station 2405+41±, 47± feet right, encountered a deep mine cavity. Boring E-11 (2023), drilled at Station 2405+26±, 225± feet left of centerline, encountered strip mine turnover to a depth of 31.5± feet.

Boring P-11 was drilled to a total depth of 99 feet to investigate the reported deep mining activity. The soil zone encountered in test boring P-11 consisted of 10.5 feet of residual rock

fragments with sand. The bedrock consisted of alternating layers of medium hard to hard sandstone, soft to medium hard silty shale and siltstone and very soft to soft clayshale/claystone and coal. Approximately 2± feet of coal was encountered at elevation 2308± feet. From elevation 2290.7 to 2288.7, an open void in the bedrock was encountered. Below this void, downwards to elevation 2282±, clay and dark gray shale, most likely representing roof-fall and mine gob, were penetrated in test boring P-11. This horizon most likely corresponds to the stratigraphic position of the Lower Freeport coal. Deep mine entries have been identified left of centerline near Station 4221+00±, Station 4228+00± and Station 4230+00±. The depth and extent of deep mining activity is unknown. Geophysical studies were conducted in this area by Vibra-Tech Engineers, Inc. during the 2004 investigation and have identified abundant subsurface mine workings in this area.

Boring E-11 was drilled to a total depth of 92 feet to investigate the reported mining activity in the adjacent strip mine permitted area and to supplement the data from boring P-11. The soil zone encountered in Boring E-11 consisted of 31.5 feet of strip mine turnover. Beneath the mine turnover, clay residual soil and claystone and siltstone bedrock from the Lower Freeport claystone member were encountered to a depth of 43± feet. The remainder of this boring consisted of sandstone from the Freeport sandstone member.

Cut slopes in strip mine spoil may need to be flattened to 2.5 H:1V or less. A 1.5H:1V in bedrock should provide a relatively maintenance-free slope. Cuts in residual soil should not exceed 2H:1V.

Preliminary information indicates the deep mine will daylight at or near roadway subgrade elevation. Cuts made into abandoned deep-mine workings may release a sudden discharge of trapped ground water that may be acidic. The mine discharge may need to be collected and treated prior to release into the surface water drainage system.

The sandstone bedrock, where encountered, will be a good source of material for use in rock toes. The intervening strata consisting of softer shale, siltstones, claystone, and coal lie directly beneath the hard, resistant sandstone seams. As a result, there is the potential for the formation of rock overhangs and rock falls due to the differential weathering when exposed in road cuts. A uniform

rock cut slope with a ratio of 1.5H:1V is expected to provide an essentially maintenance-free slope. Use of steeper slopes will require a fall-out ditch at the toe to collect and control spalled rock blocks. Except for the carbonaceous material, the excavated soil and bedrock are well suited for use in embankments.

Mine stabilization techniques such as grout columns or saturation grouting may be required to reduce the potential for mine-related subsidence, especially at structure locations.

Transition benches will be needed at both ends of the cut section where the roadway subgrade spans from soil to bedrock.

This section ends where the proposed alignment meets Clark Road. The existing Clark Road bridge will be demolished and Clark Road will become a cul-de-sac on both sides of proposed SR 6219.

Station 2399+50± to Station 2365+75±

Alignment E crosses dense woods with thick brush and sandstone float in this area, as the proposed roadway makes its way up the side of Allegheny Mountain. The first 700± feet of this section will be founded on minor cuts and fills, while the remainder of this section will require a full cut to construct the proposed roadway. The maximum cut, 38± feet deep at centerline, is located at Station 2373+50±. The proposed alignment is located upslope of the past strip mining activities, which are mainly found in the flat farmland areas at the base of the mountain. Therefore, strip mining and deep mining are not a concern in this area.

Two (2) notable features that may impact construction were encountered near Station 2394±. Active underground springs were denoted left of centerline, while an unreclaimed strip mine was located right of centerline.

Boring E-10 (2023) was drilled approximately 163± feet right of centerline at Station 2372+10. The upper 10.5± feet of the soil zone consists of granular colluvial soils, which appear to be sandstone boulders that have broken off the side of the mountain; residual soils make up the

remaining 7.5± feet of the soil zone. The cut will then extend through bedrock belonging to the Kittanning and Clarion formations of the Allegheny Group. The bedrock encountered consists of alternating layers of medium hard to hard sandstone and interbedded siltstone and silty shale. The upper 8-10± feet of siltstone and shale may be rippable to an extent, but beneath that it is likely that blasting will be required. The sandstone can be utilized in the surrounding fill embankment rock toes, while the siltstone and shale should make for excellent material for embankment construction. No coal or carbonaceous material was encountered within the depth of boring E-10; thus, all material is considered suitable for use in embankment areas.

A uniform rock cut slope of 1.5H:1V is expected to provide a relatively maintenance-free slope. Cuts in residual soil should not exceed 2H:1V.

Transition benches will be needed at both ends of the cut section where the roadway subgrade spans from soil to bedrock.

Station 2365+75± to Station 2332±

Alignment E continues its ascent up the side of Allegheny Mountain where it crosses dense woods with thick brush and sandstone float. Cuts up to 36± feet deep and fills up to 37± feet will be required to construct the proposed roadway.

No test borings were drilled along this section during the present investigation; however, it is anticipated that the soil zone will contain both colluvial soils and residual soils as the proposed alignment is located upslope of past strip mining activities. Bedrock is expected to belong to the Pottsville group and the Kittanning formation of the Allegheny group, both of which contain several thin coal seams that may crop out along the cut slope faces.

Boring P-10 (2004) was drilled at Station 2341+69.4, 501± feet left of centerline. A thin carbonaceous seam was encountered near the bottom of the boring that potentially corresponds to the Mercer coal of the Pottsville group.

The use of rock toes, rock base, and bonding benches will most likely be required to ensure embankment stability and minimize differential settlements across the embankment.

Transition benches will be needed at both ends of the cut section where the roadway subgrade spans from soil to bedrock.

Station 2332+00± to Station 2312+36.67

Alignment E's path continues along the East-West sloping, densely wooded hillside. A full embankment will be required for this entire section, save for the final 400± feet, with a maximum fill height of 39± feet at Station 2327+50±. The final 400± feet consist of minor side hill cuts and fills before transitioning into a full cut where Alignments E and DU split from each other.

Boring E-9 (2023) was drilled at Station 2325+92, 180± feet left of centerline. The soil zone encountered within the depth of drilling consisted of 16± feet of colluvial soil overlaying 6.5± feet of residual soil, indicating a total depth to bedrock of approximately 22.5± feet. Settlement of the soil zone under the weight of the new high fill embankment will be a concern, and ground water will be a major factor in construction of this fill embankment due to numerous springs and tributaries throughout this area as noted in the reconnaissance section of this report.

The use of rock toes, rock base, and bonding benches will most likely be required to ensure embankment stability and minimize differential settlements across the embankment.

Alignment E Middle Segment (Includes E-Shift)

Station 2312+67 to Station 2244+00±

Alignment E splits from Alignment DU and maintains the current easterly track along the side of Allegheny Mountain, crossing through densely wooded areas scattered with sandstone boulder float. The proposed roadway requires a cut along the high side (right of centerline) over the entire section length. Alternating minor cuts and fills are required along the low side (left of centerline), with the cuts occurring in areas where the hillsides are flatter and more rounded, and the

fills required where the road cuts along steeper sections of the mountain. The deepest cuts are located near Station 2307+50± (44±' at CL) , Station 2299+50± (28±' at CL), and 2279+50± (40±' at CL).

Boring E-8 (2023) was drilled at Station 2246+72.6, 236± feet right of centerline at the top of the proposed cut. The soil zone in Boring E-8 included an upper layer of 10± feet colluvial soil underlain by 6.5± feet of residual soil. Bedrock at this location included alternating layers of medium hard to hard sandstone and conglomerate for the first 65± feet until the bottom of the Pottsville formation was reached at elevation 2389± feet, a depth of 81± feet. The remaining 19± feet of bedrock belonging to the Mauch Chunk formation included very soft to medium hard claystone and siltstone. No coal was encountered in this test boring, but very thin carbonaceous laminations were encountered from 55.8-55.9 feet.

Boring P-14 (2004) was drilled at Station 2263+32.4, 132± feet right of centerline. The soil zone at P-14 was classified as 13.6 feet of "residual" silty sandstone fragments with sand. The relative density of the soil varied from very loose to very dense and included boulders, carbonaceous shale, and "coaly" material. Bedrock sampled in the test borings consisted of alternating layers of medium hard to very hard sandstone, medium hard shales, and siltstones and very soft to soft claystones, carbonaceous shales, and coal corresponding to the Pottsville group and Mauch Chuck formation. Coal and carbonaceous shale were penetrated at a depth of 28 feet (elevation 2447.5±) which likely corresponds to the Quakertown coal.

Additionally, boring P-15 (2004) was drilled 285± feet right of centerline at Station 2281+35.3. The thickness of the soil zone at test boring P-15 was 2.6 feet and consisted of residual silty gravel and sand. A total of 242 feet of bedrock was sampled in the test boring. The bedrock consisted predominantly of medium hard to hard sandstone with relatively thinner (less than 15± feet) layers of soft to medium hard shale, siltstone, claystone and coal. Four (4) coal and/or carbonaceous shale and coal seams were encountered in the boring P-15, which most likely correspond, from top to bottom, to the Clarion, Brookville, Mercer, and Quakertown coals. The Mauch Chunk formation, which is typically composed predominantly of red shales, was encountered at a depth of 228 feet at elevation 2361± feet.

Of the four (4) coal seams penetrated in test boring P-15, the Brookville is the only coal in the immediate area that is known to have been deep-mined (near P-13R). The reduced core recovery and fractured bedrock reported on the test boring log at the Brookville coal horizon (depth = 161.6 feet) may indicate the presence of a partially collapsed deep mine. However, there are no available reports or mine maps that document any deep-mining activity at this location. Several springs and sandstone float blocks were noted on both sides of centerline.

The Pottsville sandstones encountered in this area are generally quartzitic and will most likely require blasting. This rock will make for excellent rock toe material for nearby fill embankments. A uniform cut slope with a ratio of 1.5H:1V is expected to provide a maintenance free slope. However, this will need to be confirmed by additional testing in later phases. All excavated soil and bedrock from this cut should be suitable for use in fill embankment areas.

The maximum fill height at centerline, which totals 61± feet at Station 2244+50±, will occur in the vicinity of Boring E-8 near the end of this section. Embankment stability and settlement will be the primary engineering concerns due to the height of the fill. Constructing the embankment with select rock material will aid in both the stability and settlement.

Transition benches will be needed at both ends of the cut sections where the roadway subgrade spans from soil to bedrock.

Station 2244+00± to Station 2230+51±

Along this section of Alignment E, the proposed roadway approaches the steep sided valley formed by Piney Creek. The roadway will be formed on a full embankment with a maximum height of 56± feet near Station 2244+00±. Fill continues up to the bridge abutment for the proposed bridge over Piney Creek. Similar to the previous sections of the proposed roadway, the embankment will most likely be founded on colluvial and residual soils. No test borings were drilled within this section; however, borings E-7 and E-8 were drilled just outside the limits of this section and indicate the thickness of the colluvial soil layer varies in thickness from 10± to 29± feet.

Construction of a rock toe and upslope lateral and parallel bonding benches will likely be required to key the embankment into the sloping ground. Embankment settlement and slope stability analysis will need to be investigated further if this alignment is selected.

Station 2230+51± to Station 2215+91± (Bridge Over Piney Creek)

This proposed section of roadway consists of dual bridges carrying a 1,460-foot section of SR 6219 over Piney Creek and Greenville Road. For the current investigation, two (2) preliminary test borings were drilled, one (1) at each abutment. Boring E-6 (2023) was drilled at the south abutment location while Boring E-7 (2023) was drilled at the north abutment location. Presently it is assumed that the bridge piers and abutments will be constructed using a combination of deep foundations (likely piles) and spread footers on rock. Thus, the depth to rock and the quality of rock will have a significant impact on the design of the bridge foundations.

The thickness of the soil zone at the bridge abutments varied from 13.6 feet at boring E-6 to 30.0 feet at boring E-7. Bedrock also varied significantly across the two (2) abutments, as the south abutment is located within the Pottsville group, while the north abutment is located within the Mauch Chunk formation. Bedrock encountered in boring E-6 at the south abutment included medium hard to hard sandstone for the upper 20± feet which forms a strong foundation bearing material. Uniaxial compression tests performed on this sandstone bedrock indicated a compressive strength value of 950 TSF. Bedrock encountered in boring E-7 included soft claystone for the majority of the 10-foot sample length, forming a very weak foundation bearing surface. No uniaxial compression tests were performed at this boring location.

Test boring P-19 (2004) was drilled on the valley floor of Piney Creek at Station 2223+85.2, 179± feet right of centerline. The soil zone at P-19 consisted of 8.3 feet of silty sandstone fragments and sand. The top of bedrock consisted of medium hard sandstone and interbedded siltstone to a depth of 27.2 feet. The bottom 11.1 feet of test boring P-19 consisted of very soft to medium hard claystone and siltstone. The bedrock at this location belongs to the Mississippian Mauch Chunk formation.

Additional test borings and laboratory tests should be performed during Preliminary Engineering and Final Design stages at both the abutment and bridge pier locations to supplement the currently available data for the bridge foundation design.

Station 2215+91± to Station 2191+75±

Once Alignment E crosses Greenville Road, the topography again becomes very rugged, densely wooded terrain with sandstone boulder float. The roadway veers off of its direct southernly path and begins to take more of a southwestern track down the side of Allegheny Mountain. Outside of minor fill required at the bridge abutment and a 200± section of side hill cut/fill from Station 2189± to 2191± feet, the entire section of roadway will be formed by making a full cut, with a maximum depth of 89± feet at Station 2207±.

No test borings were drilled within this section during the current phase; however, boring P-18 (2004) was drilled 135.5 feet right of centerline at Station 2206+96.8 during a previous investigation. The soil zone at test boring P-18 consisted of 8.5 feet of residual silty clay with sand and silty rock fragments overlaying 135± feet of bedrock. The bedrock penetrated by test boring P-18 included medium hard to very hard sandstone, alternating with soft to medium hard shales, siltstones, carbonaceous shales, and coal belonging to the lower Allegheny group and Upper Pottsville group. The harder sandstones may require blasting to facilitate excavation and may also provide a good source of durable rock.

The coal seams encountered within the limits of this cut likely correspond to the Lower Kittanning , Brookville, Clarion, and Mercer coals. Pyrite was noted in the carbonaceous shale layers. While the Brookville coal is known to have been both surface and deep mined in the project area, there were no indications of mining activity noted in the test boring data from this area.

The sandstone bedrock encountered in the cut will likely require presplitting and blasting and should provide a good source of rock for fill embankments. Cuts through the soil zone can be designed using a 2H:1V slope ratio, while cuts through bedrock can be designed using a uniform slope ratio of 1.5H:1V to create a maintenance free slope and avoid rock falls. Except for any coal,

carbonaceous material, and organics, the excavated soil and bedrock should be suitable for use as fill in the embankments.

Several springs were noted right of centerline along this section. Therefore, interceptor trenches, and lateral and vertical drains may be required especially along the length of the southeast cut face.

Transition benches will be needed at both ends of the cut section where the roadway subgrade spans from soil to bedrock.

Station 2191+75± to Station 2167+13±

The proposed roadway continues its descent towards the southwest, down the side of Allegheny Mountain, traversing heavily wooded terrain with sandstone float until it reaches approximate Station 2184+50. At this point, Alignment E leaves the woods and enters a clearing which had been strip mined in the past. This clearing extends to Station 2171±, at which point the alignment re-enters the existing tree line as it makes its way towards the hillside overlooking Meadow Run. A full embankment, with a maximum height of 71± feet at Station 2168±, will be required along this entire section to construct the proposed alignment.

Boring E-5 (2023) was drilled 153± feet left of centerline at Station 2179+20. This test boring confirms that the area within the clearing has indeed been strip mined in the past, as loose to medium dense mine turnover soils were encountered within the entire 51-foot depth of sampling. The strip mining likely extended through the Upper Kittanning and Middle Kittanning coal seams. Based on the blow counts (SPT N-values), it appears this soil was placed with little to no compaction control, which is often common practice for strip mining activities.

While the embankment will be founded on the strip mine turnover soils between Station 2184+50± and 2171+00±, it will likely be founded on a combination of colluvial and residual soils prior to and after this point. Thus, the use of rock toes, rock base, and bonding benches will likely be required to ensure embankment stability and minimize differential settlements across the embankment.

During Preliminary Engineering and Final Design additional test borings should be drilled in this area to delineate the limits of the strip mining activities and attempt to better identify the strip mine highwall locations. Coordination with the Pennsylvania Department of Environmental Protection will also be critical at this location during later stages of the project as post mining water treatment is ongoing within this area.

Station 2167+13± to Station 2157+13± (Bridge Over Meadow Run)

This proposed section of roadway consists of dual bridges carrying a 1,000-foot section of SR 6219 over Meadow Run. For the current investigation, two (2) preliminary test borings were drilled, one (1) at each abutment. Boring E-3 (2023) was drilled at the south abutment location, while boring E-4 (2023) was drilled at the north abutment location. Presently it is assumed that the bridge piers and abutments will be constructed using a combination of deep foundations and spread footings on rock. Thus, the depth to rock and the quality of rock will have a significant impact on the design of the bridge foundations.

The thickness of the soil zone at the bridge abutments was fairly consistent, varying from 13.5 feet at boring E-3 to 13.6 feet at boring E-4. Bedrock was also fairly consistent across the two (2) abutments, as both ridges above Meadow Run fall within the lower Glenshaw formation. Bedrock encountered in boring E-3 at the south abutment included medium hard to hard sandstone for the entire 20-foot sampling depth. Uniaxial compression tests performed on this sandstone bedrock indicated compressive strength value of 1,172 TSF. Bedrock encountered in boring E-4 included hard sandstone for the upper 10± feet and soft claystone for the lower 10± feet of sampling. Uniaxial compression tests performed on this sandstone bedrock indicated compressive strength value of 1,071 TSF. Initial observations indicate that the sandstone bedrock encountered in both borings belongs to the Lower Mahoning member of the Glenshaw formation, while the lower claystone encountered in boring E-4, which included traces of coal, is the upper limit of the Allegheny group which includes the Freeport Rider coal.

Additional test borings and laboratory tests should be performed during the Preliminary Engineering and Final Design stages at both the abutment and bridge pier locations to supplement the currently available data for the bridge foundation design.

Station 2157+13± to Station 2117+00±

Segment 2 Alignment E continues as an at-grade roadway and continues for another 500± feet across densely wooded terrain until it reaches the Pennsylvania-Maryland state line. A full fill with a maximum height at centerline of 41± feet is required to transition the grade from the Meadow Run bridge to the existing ground surface. Upon reaching the state line, the roadway takes a turn towards the east where a 500± foot section of relatively minor sliver cut/fill is required. The woods become less dense and slowly transition to open fields with weeds throughout this area. From Station 2146+50± to Station 2117+00± the alignment crosses a mixture of open woods and farming fields where a full embankment fill is required. The maximum height of this fill embankment at centerline, 82± feet, occurs at Station 2131±.

Boring P-22 (2004) was drilled at Station 2151+98.7, 500± feet right of centerline to establish the thickness of surface mine spoil at this location. No surface mining was indicated in test boring P-22. Therefore, borings P-22A (2004) and P-22B (2004) were drilled at Station 2149+48.7, 510± feet right and Station 2146+12.1, 468± feet right, respectively, to identify top of bedrock and thickness and extent of surface mine spoil. The only mine spoil sampled was 10.5 feet thick at P-22A. Test borings P-22 and P-22B encountered 9.7 feet of residual silty clay and 10.9 feet of residual silty sand, respectively. No bedrock was sampled in any of the three (3) test borings. While these borings are located well off the current centerline path, the lateral extents of the past strip-mining activities area not known and making it possible that the current alignment will cross through strip mined land as well.

An independent geophysical (magnetometer) survey was conducted by Vibra-Tech Engineers, Inc. in the vicinity of these test borings. The results of the survey indicate that mining equipment is most likely buried in the strip-mined area at this location.

Test boring E-2 (2023) was drilled 213± feet left of centerline at Station 2129+85. Within the sampling depth of Boring E-2, 28.5± feet of soil was encountered above the top of rock. This soil zone contained 21± feet of colluvial soil overlaying 7.5± feet of residual soil. Bedrock at this location consists of soft to hard sandstone, likely belonging to the Saltsburg sandstone member of the Glenshaw formation.

The use of rock toes, rock base, and bonding benches will most likely be required to ensure embankment stability and minimize differential settlement across the embankment.

While there was no evidence of past strip or deep mining in preliminary test boring E-2, available mapping indicates a mine permit on this property where the Ames coal was stripped. While this permitted area is located just east of Business 219, this alignment crosses the very southern edge of it. An abandoned strip mine was encountered near Station 2118±, right of centerline. This strip mine was never reclaimed and is currently filled with stagnant water. The proposed toe of fill runs directly through this ponded water; therefore, remediation of this abandoned mine will need to occur prior to construction.

Deep mining is also a concern in this area as a collapsed deep mine entry with remnants of a rail line were noted near Station 2139+50±, 430± feet left of centerline. During Preliminary Engineering and Final Design additional test borings should be drilled in this area to delineate the limits of the strip mining/deep mining activities. Several areas with acid mine drainage and acidic water were noted left of centerline near the collapsed deep mine entry.

Station 2116+75± to Station 2103+55.61

The proposed roadway continues to run parallel to Business 219 as it exits the tree line and traverses through small, wooded areas and agricultural fields, some of which appear to have been strip mined. A full cut with a maximum depth of 61± feet at Station 2110+50± will be required to construct the roadway. The cut will be made in colluvial and residual soils along with bedrock belonging to the lower Casselman formation and upper Glenshaw formation. Test boring E-1A (2023) was drilled 165.5 feet right of centerline at Station 2104+08.

The soil zone encountered in test boring E-1A included an upper 5± foot thick colluvial layer underlain by a lower 5± foot thick residual layer. Both soil layers were comprised of fine-grained silty clay, a stark difference from the mostly granular soils encountered within the borings drilled in Pennsylvania. Bedrock at this location included carbonaceous shale, limestone, claystone, and sandstone likely representing the rock strata from just below the Federal Hill coal through the Upper Saltsburg sandstone, including the Ames limestone. Preliminary observations indicate that a uniform

cut with a slope ratio of 1.5H:1V should provide a maintenance free slope. However, cuts made in the claystone bedrock may need to be locally flatted to 2H:1V.

Except for the carbonaceous material, the excavated soil and rock are well suited for use in embankment areas. Selective overexcavation of the coal and carbonaceous material and replacement with suitable granular material may be required if present at roadway subgrade. Transition benches will be needed at both ends of the cut section where the roadway subgrade spans from soil to bedrock.

Station 2103+55.61 to Station 2086+75±

At this point Alignment E and DU have reconverged after their initial split and start to head west on a path closer to Business 219. The proposed roadway crosses agricultural hay and corn fields while skirting the edge of a thick, vegetated area in between. A full cut with a maximum depth of 41± feet at Station 2096+50± will be required to construct the roadway. This cut is essentially an extension of the cut from Station 2117+00± to Station 2103+55.61 and will be made in colluvial and residual soils along with bedrock belonging to the lower Casselman formation and upper Glenshaw formations.

Boring E-1A (2023) was drilled just outside the limits of this area (refer to above section for boring conditions), and boring P-16 (2004) was drilled at Station 2096+18.8, 378± feet left of centerline. The soil zone at P-16, drilled outside the limits of the surface mining, consists of 15± feet of residual silty clay and clayey sand. The bedrock encountered in P-16 includes 14.4 feet of soft to medium hard silty/clayshale underlain by 9.4 feet of medium hard to hard sandstone and 13 feet of medium hard silty shale. Approximately 0.3 feet of coal was penetrated in the boring which most likely corresponds to the Federal Hill coal.

A 20 foot thick seam of forming the top of rock in boring E-1A exhibited sulfur content greater than 0.5%, which is considered potentially acidic. More ABA tests should be performed on rock in this area during the preliminary engineering and final design stages to determine its suitability for use in embankments. The soil and bedrock, with the exception of coal, carbonaceous material, and organics, should be suitable for use as fill in embankments.

Transition benches will be required where roadway subgrade changes from strip mine turnover to residual soil to bedrock.

A rock cut slope design of 1.5H:1V will most likely provide a relatively maintenance free slope. Slopes within the residual soil zone can be designed using a 2H:1V slope ratio while cut slopes through the strip mine soils may need to be flattened to 2.5H:1V.

Station 2086+75± to Station 2071+25±

Alignment E continues along its western path closer to Business 219 where it crosses agricultural fields filled with corn, hay, and soybeans. The roadway will be constructed on top of a full fill embankment with a maximum height of 25± feet at Station 2074+50±. The fill embankment will likely be constructed on colluvial and residual soils, as there is no evidence of past strip mining in this area. No preliminary test borings were drilled in this area.

The use of rock toes, rock base, and bonding benches will most likely be required to ensure embankment stability and minimize differential settlement across the embankment.

Station 2071+25± to Station 2062+75±

Along this section, Alignment E continues crossing the western edge of the agricultural fields. This segment will be formed in full cut with a maximum depth of 24± feet at Station 2068+00±. The cut will be made in residual soil and bedrock belonging to the Casselman formation. No preliminary test borings were drilled within this segment.

Due to the shallow depth of excavation, cut slopes should be able to safely be designed using a 2H:1V slope ratio. It is expected that the soil zone will consist of fine-grained silty clay and the bedrock will consist of alternating layers of siltstone, claystone, sandstone, and shale.

The soil and bedrock, with the exception of coal and carbonaceous material, should be suitable for use as fill in embankments. Transition benches will be needed at both ends of the cut section where the roadway subgrade spans from soil to bedrock.

Station 2062+25± to Southern Terminus

The final segment of Alignment DU-E exits the agricultural fields and re-renters the woods prior to merging with the current Maryland section of SR 6219. At this time, it is not known how the new alignment will tie into the existing road and what kind, if any, grade separation structure will be required. Alignment DU-E will be constructed on a full fill with a maximum height of 52± feet at Station 2047±. No test borings were drilled in this area, but it is expected that the embankment will be founded on residual soils.

The use of rock toes, rock base, and bonding benches will most likely be required to ensure embankment stability and minimize differential settlement across the embankment.

Alignment DU Middle Segment (Includes DU-Shift)

Station 6322+05.23 to Station 6284+90±

Alignment DU splits from Alignment E at Station 6322+05 where it begins to take a more western path compared to Alignment E. The proposed roadway traverses over densely wooded land with thick brush and sandstone boulders and occasional seeps and springs along the side of Allegheny Mountain. Alignment DU will be formed by constructing a full roadway cut over this entire section with a maximum cut depth at centerline of 109± feet located at Station 6301+00±. The cut will likely be founded in colluvial and residual soils and extend into bedrock belonging to the Pottsville group.

No test borings were drilled in this area during the present or during any previous investigations; however, based on the surroundings, it can be assumed that the rock will consist of medium hard to hard sandstone. Presently, cuts should be designed using a slope ratio of 2H:1V in soil and 1.5H:1V in rock.

Transition benches will be needed at both ends of the cut where the roadway subgrade changes from embankment to residual soil to bedrock.

Station 6284+90± to Station 6265+61 (Bridge Over Piney Creek)

This proposed section of roadway consists of dual bridges carrying a 1,929-foot section of SR 6219 over Piney Creek and Greenville Road. For the current 2023 investigation, two (2) preliminary test borings were drilled, one (1) at the north abutment and one (1) along Piney Run Road. boring DU-5 (2023) was drilled along Piney Run Road in an attempt to locate any mined out coal seams, while boring DU-6 (2023) was drilled at the north abutment location to serve as a preliminary structure boring. Presently it is assumed that the bridge piers and abutments will be constructed using a combination of deep foundations (likely piles) and spread footers on rock. Thus, the depth to rock and the quality of rock will have a significant impact on the design of the bridge foundations.

The thickness of the soil zone at the bridge abutments varied from 16.5 feet at boring DU-6 to 21.6 feet at boring DU-5. Both borings included relatively thick colluvial soil zones comprised of sandstone boulders, ranging from 10± to 15± feet.

Bedrock was fairly consistent across the two (2) abutment borings as both borings encountered rocks from the lower Allegheny group and Upper Pottsville group. Bedrock consisted of alternating layers of carbonaceous shale, siltstone, sandstone, and claystone dipping to the northwest at a rate of 13± degrees. Numerous thin coal seams were encountered in both borings with these coal seams belonging to the Clarion through Quakertown members of the Allegheny and Pottsville groups, respectively. Uniaxial compression tests performed on sandstone bedrock from DU-6 indicated a compressive strength value of 1,645 TSF. No uniaxial compression tests were performed at Boring DU-5.

Test boring P-13RA (2004) was drilled on the Piney Creek valley floor 9 feet left of centerline at Station 6272+60. Several collapsed deep mine entries and gob piles were observed on the western valley wall of Piney Creek, and one (1) deep mine entry was noted on the eastern side of the creek near test boring P-13RA.

The soil zone encountered in P-13RA was 11.8 feet thick and consisted of 4± feet of deep mine waste and approximately 7.8 feet of alluvial, sand, gravel, cobbles and boulders. The upper 32.2 feet of bedrock sampled in test boring P-13A included carbonaceous shale, claystone, siltstone

and coal. Very hard sandstone was encountered in the bottom 11.3 feet of the test boring. Two (2) coal seams were penetrated at this location, an upper 0.6 foot thick seam and a lower 3.6 feet seam separated by 2.6 feet of claystone. The coal most likely correlates to the Brookville coal horizon. This coal seam has been deep-mined into the eastern valley wall of Piney Creek near test boring P-13A. No evidence of deep mining was indicated at the test boring location; thus, the extent of the deep mining is unknown. There are no available records of the deep mining on either side of Piney Creek.

Based on field measurements of outcrops and on bedrock sampled in test borings in this area, bedrock dips to the northwest at 10 to 13 degrees. As a result, bedrock lithologies will change over short lateral distance and will have an impact on bridge foundation design.

Additional test borings and laboratory tests should be performed during the Preliminary Engineering and Final Design stages at both the abutment and bridge pier locations to supplement the currently available data for the bridge foundation design.

Station 6265+61 to Station 6255±

Alignment DU continues on its western path along the south side of Piney Creek crossing through dense woods along a northwest sloping hillside. The new road will be constructed by making a cut along the southeast side (right of centerline) and a sidehill fill along the northwest side (left of centerline). The maximum cut depth at centerline will be 19± feet located at Station 6263+50± while the maximum fill height at centerline will be 57± feet located at Station 6265±. Bedrock will likely belong to the lower Glenshaw formation and upper Allegheny group

Although no test borings were drilled within this area during the present 2023 investigation, boring P-12R (2004) was drilled 449± feet right of centerline at Station 6262+62.2. A relatively thin soil zone, approximately 7± feet thick consisting of residual silty rock fragments with sand was penetrated in test boring P-12R. The test boring was extended to a depth of 269.2 feet to investigate the reported presence of deep-mined coal seams of the Allegheny group. Although no significant voids were encountered, intersecting high angle fractures in the rock core below a depth of 255± feet (elevation 2189± feet) and poor core recovery in a coal seam elevation at 2186± may indicate the presence of a collapsed deep mine at this location. This elevation corresponds to the approximate

elevation of the deep mine locally known as “Panther Hole” on the western stream bank of Piney Creek.

Cut through the soil zone should be designed using a slope ratio of 2H:1V. The design of permanent cut slopes in rock will be controlled by the differential weathering of the bedrock to be exposed on the cut face as the bedrock within the limits of the cut belongs to the Glenshaw formation. A uniform cut slope ratio of 1.5H:1V in bedrock is expected to provide a relatively maintenance free slope. However, redbeds characteristically have low shear strength and weather rapidly when exposed in cuts and may need to be flattened, if encountered.

Except for coal and carbonaceous material, and organics, the excavated soil and bedrock should be suitable for embankment construction. A rock toe along with parallel and lateral bonding benches will be required to key the new fill into the sloping hillside. Transition benches may be needed where roadway subgrade changes from embankment to residual soil.

Station 6255± to Station 6240+75±

With the exception of a 620± foot section of open farmland from Station 6235+30 to 6247+10± that falls within a strip mine permitted area (mining status unknown), this section of Alignment DU crosses through more dense woods with sandstone float, similar to the surrounding topography. The proposed roadway will be constructed on a full fill embankment with a maximum height of 71± feet at Station 6253+50±.

No test borings were drilled within this area. However, based on the available data nearby borings, the new fill will be founded on colluvial and residual soils and potentially strip mine turnover.

The use of rock toes, rock base, and bonding benches will most likely be required to ensure embankment stability and minimize differential settlement across the embankment.

Station 6240+75 to Station 6185+29±

The proposed roadway again continues through heavily wooded trees along the top of two (2) ridges. Alignment DU crosses through the Weimer Strip and Auger mine permit area (same property as E-5); however, this alignment appears to stay within the tree line, potentially avoiding any areas that have been strip mined. The alignment proceeds to cross Greenville Road in this section, where a bridge will be required from Station 6221+50 to Station 6220+00. A full cut along both sides of Greenville Road will be required to reach finished grade, with a maximum cut depth at centerline of 104± feet at Station 6197+50 south of Greenville Road and 85± feet north of Greenville Road at Station 6230+50±. The final 200± feet of this section will require full fill to transition the at-grade roadway to the proposed bridge over Meadow Run with a maximum height at centerline of 25± feet at Station 6185+50±.

Boring DU-3 (2023) was drilled at Station 6200+45, 314 feet right of centerline during the current investigation. The soil zone encountered in boring DU-3 was 15.5 feet thick and consisted entirely of residual soil. Bedrock at this boring location belongs to the Casselman formation of the Conemaugh group and consists of alternating layers of carbonaceous shale and coal, argillaceous siltstone, and claystone, with a single isolated limestone layer and a sandstone seam at the bottom. The coal seams encountered in this boring likely correspond to the Wellersburg, Barton, and Federal Hill coals.

Test boring P-5R (2004) was drilled 139± feet right of centerline at Station 6230+15.7. The soil zone at P-5R consisted of 10.6 feet of residual silty sand with rock fragments. Approximately 19 feet of medium hard to hard sandstone was encountered at the top of bedrock. The sandstone is underlain by 15.4± feet of medium hard silty sandstone. These lithologic units most likely correspond to the Morgantown sandstone horizon. A 10-foot layer of fine to medium-grained sandstone was penetrated at the bottom of P-5R which most likely corresponds to the Saltsburg sandstone. The intervening 80± feet of strata consisted predominantly of very soft to soft claystone and clayshale and siltstone with minor amounts of medium hard silty shale. Pyrite was noted in several bedrock units. A 0.9 foot thick coal seam that corresponds to the Ames coal horizon was encountered at elevation 2415± feet. This coal seam has been surface mined at other locations in the study area, but there are no reports of mining activity along this section of the proposed roadway.

Cuts made through the soil zone can be designed using a 2H:1V slope ratio while cuts designed with a 1.5H:1V slope ratio through rock should provide a relatively maintenance free slope.

With the exception of coal, carbonaceous material, and organics, the excavated soil and bedrock will be suitable for use in embankments. Transition benches will be needed at both ends of the cut where roadway subgrade changes from embankment to residual soil to bedrock.

Additional test borings and laboratory tests should be performed during the Preliminary Engineering and Final Design stages at both the Greenville Road bridge abutment and pier locations to supplement the currently available data for the bridge foundation design.

Station 6185+29± to Station 6167+88± (Bridge over Meadow Run)

This proposed section of Alignment DU consists of dual bridges carrying a 1,929-foot section of SR 6219 over Meadow Run. For the current 2023 investigation, two (2) preliminary test borings were drilled, one (1) at each abutment. Boring DU-1 (2023) was drilled at the south abutment, while Boring DU-2 (2023) was drilled at the north abutment. Presently it is assumed that the bridge piers and abutments will be constructed using a combination of deep foundations (likely piles) and spread footings on rock. Thus, the depth to rock and the quality of rock will have a significant impact on the design of the bridge foundations.

The thickness of the soil zone at the bridge abutments varied from 6.1 feet at boring DU-2 to 8.0 feet at Boring DU-5. Both borings included relatively thin colluvial soil zones overlaying the residual soils.

Bedrock was fairly consistent across the two borings as both borings encountered rocks from the Glenshaw formation. Bedrock consisted of alternating layers of sandstone, siltstone, claystone, and shale. Uniaxial compression tests performed on sandstone bedrock from DU-2 indicated a compressive strength value of 1,164 TSF, while point load tests performed on sandstone bedrock from DU-1 indicated a compressive strength value of 666 TSF.

Additional test borings and laboratory tests should be performed during the Preliminary Engineering and Final Design stages at both the abutment and bridge pier locations to supplement the currently available data for the bridge foundation design.

Station 6167+88± to Station 6115+00±

Alignment DU leaves the steep topography of the Meadow Run valley and enters an overgrown pasture that appears to have been strip mined from Station 6168+00± to 6164+60± based on the overgrown vegetation. As the alignment enters Maryland, it crosses open farm fields and dense woods similar to the topography of Alignment E in this area. A full fill with a maximum height of 80± feet at Station 6128± will be required to construct the proposed roadway in this area.

No test borings were specifically drilled for Alignment DU; however, boring E-2 (2023) was drilled near the convergence point of the alignment at Station 6128+84.5, 258± feet left of centerline. Thus, outside of the potential strip mined pasture as noted above, soil and bedrock conditions throughout this section can be expected to be similar to those noted in the Segment 2 Alignment E section from Station 2157+13± to Station 2117+00±.

The use of rock toes, rock base, and bonding benches will most likely be required to ensure embankment stability and minimize differential settlement across the embankment.

Station 6115+00± to Station 6102+57.61

This section of Alignment DU follows a similar line and grade as Alignment E from Station 2117+00± to Station 2103+55.61. The roadway will be founded in a full cut with a maximum depth of 55± feet at Station 6108+00±. The geologic features and geotechnical considerations are similar to those described for Alignment E in the section mentioned above.

Alignment DU-Shift South Segment (Includes E-Shift)

Station 6101+42.39 to Station 6084+75±

After Alignment DU and Alignment E reconverge in Maryland, they have the option to continue together on a western path as described in the Alignment E south segment section above

or shift and continue on an eastern path farther away from Business 219 as Alignment DU-Shift (and E-Shift). Alignment DU-Shift traverses a path that is slightly higher in elevation but still passes along the same geologic features as Alignment E. A full cut will be needed to construct this section of roadway with a maximum depth of 46± feet at Station 6092+50±. The geotechnical considerations will be similar to those described for Alignment E from Station 2103+55.61 to Station 2087+00±.

Station 6084+75± to Station 6077+25±

Within this section of the proposed roadway, Alignment DU-Shift crosses topography similar to that of Alignment E. A full embankment will be needed to achieve the desired grades between these two (2) stations. The maximum embankment height at centerline of 11± feet can be found at Station 6081±. Geologic features and geotechnical considerations are similar to those described in the above Alignment E section from Station 2086+75+00± to Station 2071+25±.

Station 6077+75± to Station 6059+75±

Alignment DU-Shift crosses topography similar to that of Alignment E from Station 2071+00± to Station 2061+50±. The alignment will be formed in a full cut with a maximum depth at centerline of 41± feet at Station 6069+00±. Similar geologic features compared to Alignment E will be encountered along this alignment and thus the geotechnical considerations will be similar as well.

Station 6059+75± to Southern Terminus

The proposed roadway will cross topography similar to that of Alignment DU-E from Station 2061+50± to the Southern Terminus. Thus, the geologic features will closely resemble those of Alignment E as well. A full fill embankment will be required to bring the roadway up to the proposed grade at this location with a maximum height at centerline of 60± feet at Station 6046±. Geotechnical considerations within this segment of the proposed roadway will be similar to Alignment E as well.

7.3 Laboratory Testing Program

The information obtained from visual observation of the materials encountered in the borings and the need for obtaining the appropriate parameters for subsequent geotechnical engineering

analyses under the anticipated grading and loading conditions dictated the general requirements for the laboratory testing program. In addition to determination of the routine index properties (moisture content, grain-size distribution and plasticity characteristics), the testing program included rock strength (unconfined compression) tests for use in preliminary bearing capacity analyses. Acid-base accounting tests (fizz rating, paste pH, neutralization potential, maximum potential acidity, and sulfur) were also performed on rock core samples to assess the potential for acidic discharges from embankments constructed using on-site excavated materials.

With the exception of the acid-base accounting tests, all of the above-listed tests were performed by GMI, an AASHTO-accredited laboratory, using in-house personnel and equipment. The acid-base accounting tests were performed by Milltech Analytical Services, Inc., a PaDEP-certified laboratory.

The following subsections present a brief description of the methods that were used in the testing program. Whenever applicable, American Association of State Highway and Transportation Officials (AASHTO), Pennsylvania Test Methods (PTM), American Society of Testing and Materials (ASTM) and International Society of Rock Mechanics (ISRM) methods have been used in order to ensure both the quality of results and the ability to readily duplicate testing methods.

7.3.1 Soil Testing

The laboratory testing program for soils was limited to index property testing. Thirteen (13) representative soil samples were selected. These tests consisted of determining the grain-size distribution through sieve and hydrometer analysis as well as the liquid and plastic limits by conducting Atterberg Limit tests. Together, these two (2) tests form what is commonly referred to as a classification test. Concurrently, the natural moisture content of the soils was also determined.

The index property test results are presented on the Particle Size Distribution Reports, Figures LT-1 through LT-13, in ***Appendix C*** of this report and are included on Table No. 2 in ***Appendix A*** and on the appropriate Geologic Cross Sections and Subsurface Profile drawings in ***Appendix J***.

- *Natural Moisture Content Tests (AASHTO: T 265; ASTM: D 2216)*

  Natural moisture content tests were performed on sets of jar samples obtained from the borings and selected for classification testing. The natural moisture content of the soils, which is expressed as the ratio of the weight of water to the weight of dry solids, provides an indirect indication of the compressibility and shear strength of the soils as well as their handling requirements during placement and compaction as roadway embankment. The results of these tests are included on the Particle Size Distribution Reports and are summarized on Table No. 2.

  The moisture content of the fine-grained soils ranged from 14.4 to 15.8 percent. The average moisture content of the fine-grained soils was 15± percent. The moisture content of the granular soils ranged from 6.2 to 17.2 percent and averaged 11± percent.

  In general, the results of the tests indicate that the soil samples were typically damp on a scale of dry, damp, moist, and wet. Therefore, the moisture content of the excavated soils should be conducive to proper placement and compaction, with only limited drying or blending with drier material needed to achieve an appropriate moisture content. Obviously, the natural moisture content of the soil can be expected to increase in response to precipitation events.

- *Sieve and Hydrometer Tests (AASHTO: T 88; ASTM: D 422)*

  Sieve and hydrometer tests were performed on each of the soil samples selected for classification testing in order to evaluate their grain-size

distribution. The results of the gradation tests are shown graphically on the Particle Size Distribution Reports and are included on Table No. 2. Eleven (11) of the samples tested were granular in nature, with an average of 30± percent fines; and the remaining two (2) samples were fine-grained, with an average of 70± percent finer than the U.S. No. 200 sieve.

- *Atterberg Limits Tests (AASHTO: T 89 and 90; ASTM: D 4318)*
  Liquid and plastic limits tests were performed on each sample that was selected for moisture content and gradation testing. The results of the plasticity tests were used in conjunction with the results of the sieve and hydrometer tests to classify the soils according to the Unified Soil Classification System (ASTM: D 2487) and the AASHTO method (M 145).

  The liquid limit of the granular soils varied from non-plastic to 33 percent and averaged 28± percent; and the plasticity index varied from non-plastic to 13 percent and averaged 10± percent. The liquid limit of the fine-grained soils ranged from 42 to 44 percent and averaged 43± percent; and the plasticity index was 20 percent. This indicates that the soils are slightly to moderately plastic and, hence, are generally suited for use in highway construction.

7.3.2 Rock Testing

The laboratory rock testing program for the Geotechnical Alternatives borings focused on areas of planned excavation and consisted of acid-base accounting tests to evaluate the potential for acidic discharges to the surrounding environment from embankments constructed using the excavated rock materials. In addition, uniaxial compression and rock point load tests were performed on rock core samples from structure locations for use in evaluating preliminary strength characteristics of the bedrock.

The results of the various tests conducted on the rock core samples are summarized on Table No. 3 in ***Appendix A*** of this report, and the individual test methods employed are described in the following paragraphs.

- *Rock Point Load Tests (ASTM: D 5731)*

  The rock point load test is intended as an index test for the strength classification of rock materials. Hence, when properly correlated with other parameters it can be used as an indirect method of estimating the uniaxial compressive strength of the rock.

  A series of three (3) rock point load tests were conducted on representative core samples of the bedrock in areas of structure foundations where the rock was too broken to conduct uniaxial compression tests. The tests were conducted in the laboratory using a Humboldt Manufacturing Model HS-4157 Point Load Tester.

  Both axial and irregular lump tests were performed, and the gauge pressures were recorded at failure. The gauge pressure was used to compute the point load strength index for each test. The average point load index was then computed for each testing interval (average 10± tests per interval). The average values varied from 551.5 to 880.3 TSF for shaley sandstone.

- *Uniaxial Compression Tests (AASHTO: T208; ASTM: D 2938)*

  The uniaxial compression tests were conducted by loading cylindrical rock core specimens to failure in unconfined compression in a Test Mark Industries, Inc. 250,000 lb. compression machine. This test evaluates the unconfined (uniaxial) compressive strength of the rock core which is, in turn, utilized to calculate the bearing capacity of a rock mass.

  Six (6) tests were conducted on "medium hard" to "hard" sandstone core samples from borings DU-2 and DU-6 at the Piney Creek and Meadow Run

crossings of Alignment DU and exhibited an average uniaxial strength of 1405 TSF.

Nine (9) tests were conducted on "medium hard" to "hard" sandstone core samples from borings E-3, E-4, and E-6 at the Piney Creek and Meadow Run crossings of Alignment E and exhibited an average uniaxial strength of 1065 TSF.

- *Acid-Base Accounting Tests ("Sobek Method", EPA-600/2-78-054)*

  Toxicity associated with acid from earth disturbance activities, such as highway construction, results largely from the oxidation of iron disulfides.

  Acid-base accounting (ABA) was developed by Andrew Sobek et. al. in 1978 for the U.S. Environmental Protection Agency as a dependable criterion by which overburden materials can be evaluated. The overall test includes a qualitative determination of the fizz rating of the material being tested and quantitative determinations of the paste pH, neutralization potential, maximum potential acidity, and total or pyritic sulfur.

  Acid-base accounting tests were conducted on representative portions of 101 of the rock core samples from proposed cut slope locations. All test results are included in ***Appendix C*** and shown on Table No. 4 in ***Appendix A*** of this report. The Sobek Method (1978) of analysis was adopted for testing of the samples.

  Fizz ratings are reported on the basis of reaction of the sample with 25 percent solution of hydrochloric acid. The fizz ratings are then rated as none, slight, moderate, or strong based on the volatility of the reaction with the tested material. The fizz ratings for the 101 samples tested varied from "none" to "strong".

Paste pH is a test of the acidity/alkalinity of the sample. The measured paste pH of the samples varied from 5.1 to 8.7 and averaged 7.5±. Although the test results indicate that the samples were essentially neutral, this test may be of little to no predictive use because acid mine drainage (AMD) is the product of a weathering process; and the samples collected for analyses were relatively fresh rock core samples.

Neutralization potential (NP) is a method of determining the carbonate content or deficiency of the material and the capacity of the material to supply alkalinity. It is expressed in tons of calcium carbonate ($CaCO_3$) equivalent per 1,000 tons of rock (ppt). The neutralization potential of the samples tested varied from 2.5 to 425.0 tons of $CaCO_3$ equivalent per 1,000 tons of rock and averaged 78.12 tons. Materials that have a NP greater than 30 ppt $CaCO_3$ and fizz are significant sources of alkalinity. As shown on Table No. 4, fifty (50) samples indicated NP higher than 30 ppt with fizz.

Maximum potential acidity (MPA) represents the acid generating potential and is a function of the material's measured total sulfur content. It is expressed in tons of calcium carbonate ($CaCO_3$ equivalent per 1,000 tons of rock. The maximum potential acidity varied from 0.31 to 94.38 tons of $CaCO_3$ equivalent per 1,000 tons of rock and averaged 12.64 tons.

Net neutralization potential (NNP) is the difference between the NP and MPA expressed in ppt $CaCO_3$ equivalent. A NNP less than zero ppt $CaCO_3$ will most certainly produce acidic conditions, and an NNP value of 20 ppt $CaCO_3$ or higher will likely produce alkaline conditions. Material having NNP values between 0 and 20 ppt $CaCO_3$ may produce acidity or alkalinity; however, a NNP value of 12 ppt $CaCO_3$ or higher is considered favorable for alkaline conditions to prevail. Material with an NNP value of 30 ppt is confidently expected to generate alkalinity.

Current PaDEP criteria evaluates the **potential ratio** (PR) of Neutralization Potential (NP) to Maximum Potential Acidity (MPA). Values exceeding 2.0 are considered essentially inert (alkaline), whereas values of 2.0 or lower are considered indicative of higher acid-forming potential. In between 1.0 and 2.0, the material may be either acidic or alkaline. As presented on Table 4, twenty-four (24) of the rock samples tested exhibited NP to MPA ratios of 2.0 or less.

Total sulfur in the samples tested varied from .01 percent (dry weight basis) to 3.02 percent of the total mass and averaged 0.42 percent. Values of 0.5 percent or higher are considered indicative of potentially acid-forming materials. Twenty-three (23) of the rock samples tested exhibited sulfur contents in excess of 0.5 percent.

In general, the preliminary testing program did not indicate a high concern for encountering potential acid-forming rocks in the majority of the project excavations. Only isolated pockets were encountered, with the main concern areas located at depths of 15.5 feet (top of rock) to 28.0 feet and 56.6 feet to 66.4 feet in boring DU-3; 10.1 feet (top of rock) to 39.0 feet in boring E-1A; and 32.5 feet to 43.5 feet and 54.1 feet to 65.0 feet (bottom of boring) in boring E-10. The net neutralization potential for all samples tested averaged about 65 percent. Additional acid-base accounting testing will be needed during subsequent design phases to better identify the spatial extent of the potential acid-forming materials and to develop an appropriate mitigation strategy.

7.3.3 Water Testing

Electrochemical tests consisting of pH (ASTM: D4972), resistivity tests (ASTM: G57), sulfate (EPA 9038) and chloride (EPA 9252) tests were performed on seven (7) ground water samples in order to assess the potential corrosivity of the water. Additionally, pH tests were performed on

forty-four (44) surface water samples. The results of these tests are presented in ***Appendix C*** and are also summarized on Table No. 5 and 6 in ***Appendix A***, respectively.

The lowest pH value of ground water was 5.7 while the lowest pH of the surface water was 6.3. A pH value of less than 5.5 is considered indicative of a potentially corrosive environment (Ref. PennDOT DM-4/2019). Therefore, it can be concluded that the on-site soils are not considered potentially corrosive due to reduced pH values.

The resistivity value of ground water varied from 3,100 to 28,750 ohm-cm. A threshold value of 2,000 ohm-cm has been identified for foundation design in PennDOT DM-4/2019. Therefore, it can be concluded the on-site soils are not considered potentially corrosive due to reduced resistivity values.

The maximum sulfate concentration of the ground water samples was less than the detection limit of 50 ppm. This value is below the threshold value of 150 ppm for water; Consequently, the ground water is not considered potentially corrosive due to elevated sulfate concentrations. However, considering that the project area is subject to acid mine drainage, it would be prudent to use sulfate resistant Type II cement for concrete elements in contact with the in-place soils and ground water.

The maximum chloride concentration of the ground water sample tested was below the detection limit of 32 ppm, which is lower than the threshold value of 1000 ppm.

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APPENDIX A
Tables

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TABLE NO.1
SUMMARY OF PERTINENT TEST BORING INFORMATION

Location	Boring No.	Station	Offset (ft.)	Ground Surface Elevation (ft.)	Total Depth (ft.)	Soil												Total Soil Thickness (ft.)
						Fill [1]				*Colluvial* [1]				*Residual*				
						Thickness (ft.)	USCS Classification	N_{60Av}	Base Elevation (ft.)	Thickness (ft.)	USCS Classification	N_{60Av} [2]	Base Elevation (ft.)	Thickness (ft.)	USCS Classification	N_{60Av} [2]	Base Elevation (ft.)	
Segment 2 DU	DU-1	6167+83.4	1.2' R	2335.7	28.0					4.5	**SC**	83	2331.2	3.5	gw-gm	65	2327.7	8.0
	DU-2	6185+28.2	1.6' L	2301.3	26.0					3.0	cl	11	2298.3	3.1	gc	51	2295.2	6.1
	DU-3	6200+45.0	314.0' R	2479.7	140.0									15.5	gm, **CL**	46	2464.2	15.5
	DU-5	6276+57.2	9.0' L	2190.8	97.0					15.0	gp-gm	44	2175.8	6.6	gw-gm	98	2169.2	21.6
	DU-6	6285+02.0	7.3' L	2356.4	177.0					10.5	gp	28	2345.9	6.0	gp	33	2339.9	16.5
	Segment 2 DU Averages									8.3		41	2287.8	6.9		56	2319	13.5
Segment 2 E	E-1A	2104+08.0	165.5' R	2687.2	60.0					4.5	cl	18	2682.7	5.6	**CL**	68	2677.1	10.1
	E-2	2129+85.0	213.0' L	2421.7	38.5					21.0	sc, gc, cl	25	2400.7	7.5	sc	52	2393.2	28.5
	E-3	2157+13.0	CL	2369.6	33.5					9.0	sc	25	2360.6	4.5	gp-gm	85	2356.1	13.5
	E-4	2167+20.5	1.4' R	2370.5	34.0					9.0	**GW-GM**	35	2361.5	4.6	gw-gm	64	2356.9	13.6
	E-5	2179+20.0	153.0' L	2399.8	51.0	51.0	**GC**, sc	17	2348.8									51.0
	E-6	2215+89.2	1.8' R	2392.8	35.0					9.0	gp	38	2383.8	4.6	gp	106	2379.2	13.6
	E-7	2230+51.0	CL	2320.3	40.0					28.5	**SC, SC-SM**	42	2291.8	1.5	gp	81	2290.3	30.0
	E-8	2246+72.6	235.9' R	2469.8	100.0					10.0	**SC-SM**	39	2459.8	6.5	gm	53	2453.3	16.5
	Segment 2 E Averages					51.0		17	2348.8	13.0		34	2420.1	5.0		69	2415.2	22.1
Segment 1 DU-E	E-9	2325+92	180.0' L	2436.6	31.0					16.0	sc, **GM**	41	2420.6	6.5	gc	80	2414.1	22.5
	E-10	2372+10	163.0' R	2443.2	65.0					10.5	sc	28	2432.7	7.6	**SC**, gm	56	2425.1	18.1
	E-11	2405+26.4	225.2' R	2346.8	92.0	31.5	**GC**	15	2315.3					4.1	cl	106	2311.2	35.6
	Segment 1 DU-E					31.5		15	2315.3	13.3		36	2426.7	6.1		76	2383.5	24.6
Overall Boring Averages						41.3		16	2332.1	12		37	2378.2	6		66.9	2372.6	20.1

[1] Includes Topsoil in all Borings

[2] Does not include 50/0.x values.

-- Not Applicable

TABLE NO.1
SUMMARY OF PERTINENT TEST BORING INFORMATION

Location	Boring No.	Station	Offset (ft.)	Ground Surface Elevation (ft.)	Total Depth (ft.)	***Bedrock***							***Ground Water***			
						Top of Rock Elev. (ft.)	*Sandstone, Siltstone, Shale, Limestone, Claystone, Conglomerate*						*0-Hour*		*Final*	
							Thickness (ft.)	Recovery (ft)	Recovery (%)	RQD (ft.)	RQD (%)	Base Elevation (ft.)	Depth (ft.)	Elevation (ft.)	Depth (ft.)	Elevation (ft.)
Segment 2 DU	DU-1	6167+83.4	1.2' R	2335.7	28.0	2327.7	20.0	18.2	91	0.4	2	2307.7	14.1	2321.6	19.1	2316.6
	DU-2	6185+28.2	1.6' L	2301.3	26.0	2295.2	19.9	18.9	95	9.1	46	2275.3	21.5	2279.8	21.3	2280.0
	DU-3	6200+45.0	314.0' R	2479.7	140.0	2464.2	124.5	119.7	96	82.6	66	2339.7	12.3	2467.4	25.4	2454.3
	DU-5	6276+57.2	9.0' L	2190.8	97.0	2169.2	75.4	65.1	86	47.4	63	2093.8	51.7	2139.1	57.2	2133.6
	DU-6	6285+02.0	7.3' L	2356.4	177.0	2339.9	160.5	149.8	93	102.9	64	2179.4	38.1	2318.3	42.4	2314.0
	Segment 2 DU Averages					2319.2	80.1	74.3	93	48.5	61	2239.2	27.5	2305.2	33.1	2299.7
Segment 2 E	E-1A	2104+08.0	165.5' R	2687.2	60.0	2677.1	49.9	43.5	87	16.3	33	2627.2	12.6	2674.6	12.6	2674.6
	E-2	2129+85.0	213.0' L	2421.7	38.5	2393.2	10.0	8.2	82	1.3	13	2383.2	12.7	2409.0	12.3	2409.4
	E-3	2157+13.0	CL	2369.6	33.5	2356.1	20.0	18.9	95	9.8	49	2336.1	12.6	2357.0	14.5	2355.1
	E-4	2167+20.5	1.4' R	2370.5	34.0	2356.9	20.4	14.4	71	7.9	39	2336.5	25.3	2345.2	31.5	2339.0
	E-5	2179+20.0	153.0' L	2399.8	51.0	2348.8							48.3	2351.5	36.6	2363.2
	E-6	2215+89.2	1.8' R	2392.8	35.0	2379.2	21.4	20.5	96	10.9	51	2357.8	29.7	2363.1	29.9	2362.9
	E-7	2230+51.0	CL	2320.3	40.0	2290.3	10.0	8.0	80	1.3	13	2280.3	35.7	2284.6	34.0	2286.3
	E-8	2246+72.6	235.9' R	2469.8	100.0	2453.3	83.5	77.4	93	49.0	59	2369.8	81.4	2388.4	81.2	2388.6
	Segment 2 E Averages					2406.9	30.7	27.3	89	13.8	45	2384.4	32.3	2396.7	31.6	2397.4
Segment 1 DU-E	E-9	2325+92	180.0' L	2436.6	31.0	2414.1	8.5	7.8	92	4.9	58	2405.6	0.0	2436.6	0.4	2436.2
	E-10	2372+10	163.0' R	2443.2	65.0	2425.1	46.9	45.5	97	28.3	60	2378.2	6.2	2437.0	28.9	2414.3
	E-11	2405+26.4	225.2' R	2346.8	92.0	2311.2	56.4	55.1	98	35.4	63	2254.8	42.6	2304.2	42.3	2304.5
	Segment 1 DU-E					2383.5	37.3	36.1	97	22.9	29	2346.2	16.3	2392.6	23.9	2385.0
Overall Boring Averages						2375.1	48.5	44.7	93	27.2	36	2311.8	23.7	2345.2	26.1	2342.8

(1) Includes Topsoil in all Borings

(2) Does not include 50/0.x values.

-- Not Applicable

TABLE NO. 2
LABORATORY TEST RESULTS FOR SOIL

Boring Number	Depth (ft.)	Type of Sample	Origin	LABORATORY TEST RESULTS											
				Moisture (%)				Gradation (% AASHTO)					Frost Group	Soil Classification	
				Liquid Limit	Plastic Limit	Plasticity Index	Natural Water Content	Aggregate	Sand	Silt	Clay	<0.02 mm		USCS	AASHTO
DU-1	1.5-4.5	Jar	Colluvial	29	19	10	6.2	44.8	30.3	14.5	10.4	22	F-3	SC	A-2-4(0)
DU-3	6.0-9.0	Jar	Residual	42	22	20	15.8	12.2	6.3	47.4	34.1	72	F-3	CL	A-7-6(17)
E-1A	6.0-9.0	Jar	Residual	44	24	20	14.4	8.8	21.8	35.8	33.6	67	F-3	CL	A-7-6(13)
E-4	6.0-9.0	Jar	Colluvial	NP [(1)]	NP [(1)]	NP [(1)]	17.2	68.4	22.4	7.3	1.9	8	F-1	GW-GM	A-1-a
E-5	4.5-9.0	Jar	Fill	33	20	13	11.9	48.8	16.3	20.0	14.9	32	F-3	GC	A-2-6(1)
E-5	12.0-15.0	Jar	Fill	33	20	13	11.4	50.8	16.6	19.7	12.9	26	F-3	GC	A-2-6(1)
E-7	6.0-9.0	Jar	Colluvial	22	15	7	9.0	33.8	30.8	23.7	11.7	30	F-3	SC-SM	A-2-4(0)
E-7	12.0-15.0	Jar	Colluvial	27	17	10	15.1	28.1	25.4	30.1	16.4	36	F-3	SC	A-4(1)
E-8	3.0-7.5	Jar	Colluvial	17	12	5	6.4	30.5	44.6	15.9	9.0	20	F-3	SC-SM	A-1-b
E-9	4.5-7.5	Jar	Colluvial	NP [(1)]	NP [(1)]	NP [(1)]	7.9	50.4	28.6	15.8	5.2	17	F-1	GM	A-1-b
E-10	10.5-13.5	Jar	Residual	30	21	9	11.7	31.1	27.8	30.1	11.0	34	F-3	SC	A-4(1)
E-11	6.0-12.0	Jar	Fill	31	18	13	8.5	55.6	11.8	18.9	13.7	29	F-3	GC	A-2-6(1)
E-11	12.0-21.0	Jar	Fill	29	18	11	10.5	61.3	13.9	16.9	7.9	21	F-3	GC	A-2-6(0)

[(1)] NP - Non-Plastic

TABLE NO 3:
LABORATORY TEST RESULTS FOR ROCK

Boring No.	Sample Depth (feet)	Sample Elevation (feet)	Bedrock Lithology	Core Recovery (%)	RQD (%)	Type of Test [1]	Point Load Index		Uniaxial Compressive Strength (TSF)	
							Corrected Index (PSI)	Mean Corrected Index (PSI)	By Test	By Correlation [2]
DU-1	8.0 - 10.0	2327.7 - 2325.7	Sandstone	85	0	PL-A	585.5	509.4		880.3
						PL-A	406.8			
						PL-A	823.8			
						PL-A	754.8			
						PL-A	336.5			
						PL-A	593.2			
						PL-A	757.1			
						PL-A	375.6			
						PL-A	215.2			
						PL-A	340.7			
DU-1	13.0 - 15.0	2322.7 - 2320.7	Sandstone	96	0	PL-A	240.3	331.1		572.2
						PL-A	139.5			
						PL-A	553.7			
						PL-A	726.3			
						PL-A	527.7			
						PL-A	465.9			
						PL-A	162.5			
						PL-A	419.4			
						PL-A	170.9			
						PL-A	162.2			
DU-1	16.0 - 18.0	2319.7 - 2317.7	Sandstone	96	0	PL-A	249.9	319.2		551.5
						PL-A	444.7			
						PL-A	579.5			
						PL-A	272.2			
						PL-A	352.0			
						PL-A	381.3			
						PL-A	151.2			
						PL-A	165.0			
						PL-A	221.2			
						PL-I	438.5			
DU-2	16.3 - 16.9	2285.0 - 2284.4	Sandstone	100	86	UC			1,082	
DU-2	17.2 - 17.8	2284.1 - 2283.5	Sandstone	100	86	UC			1,136	
DU-2	17.8 - 18.4	2283.5 - 2282.9	Sandstone	100	86	UC			1,273	
DU-6	16.8 - 17.4	2339.6 - 2339.0	Sandstone	100	92	UC			1,907	
DU-6	17.4 - 18.0	2339.0 - 2338.4	Sandstone	100	92	UC			1,541	
DU-6	18.0 - 18.6	2338.4 - 2337.8	Sandstone	100	92	UC			1,488	
E-3	19.6 - 20.0	2350.0 - 2349.6	Sandstone	84	8	UC			1,080	
E-3	22.0 - 22.4	2347.6 - 2347.2	Sandstone	100	54	UC			1,356	
E-3	23.5 - 23.9	2346.1 - 2345.7	Sandstone	100	54	UC			1,081	
E-4	16.0 - 16.7	2354.5 - 2353.8	Sandstone	100	82	UC			1,108	
E-4	16.7 - 17.4	2353.8 - 2353.1	Sandstone	100	82	UC			862	
E-4	18.4 - 18.8	2352.1 - 2351.7	Sandstone	100	82	UC			1,243	
E-6	18.0 - 18.4	2374.8 - 2374.4	Sandstone	90	13	UC			945	
E-6	18.5 - 19.1	2374.3 - 2373.7	Sandstone	100	74	UC			920	
E-6	20.3 - 20.7	2372.5 - 2372.1	Sandstone	100	74	UC			986	

[1] PL-A - Axial Point Load Test, PL-I - Irregular Lump Point Load Test, UC - Uniaxial Compression Test;

[2] A Point Load Index to Strength Conversion Factor of 24 for NX Core as recommended by ASTM is used.

-Values Omitted From Mean

TABLE NO. 4:
ACID-BASE ACCOUNTING TEST RESULTS

Boring Number	Surface Elevation (feet)	Sample Depth (feet)	Sample Thickness (feet)	Sample Elevation (feet)	Lithology	Acid Base Accounting Results						
						Paste pH	Fizz Rating	Neutralization Potential - NP (tons CaCO3/ 1000 tons)	Maximum Potential Acidity - MPA (tons CaCO3/ 1000 tons)	NNP = NP-MPA	NP/MPA Ratio	Sulfur (%)
DU-3	2479.7	15.5 - 17.5	2.0	2464.2 - 2462.2	Carbonaceous Shale	5.69	Slight	15.25	50.94	-35.69	0.30	1.63
		17.5 - 19.2	1.7	2462.2 - 2460.5	Carbonaceous Shale	6.02	Slight	20.00	62.81	-42.81	0.32	2.01
		19.2 - 22.2	3.0	2460.5 - 2457.5	Claystone	6.64	Slight	45.00	73.44	-28.44	0.61	2.35
		22.2 - 25.3	3.1	2457.5 - 2454.4	Claystone	7.95	Moderate	100.00	76.56	23.44	1.31	2.45
		25.3 - 28.0	2.7	2454.4 - 2451.7	Argillaceous Siltstone	8.05	Moderate	138.75	27.19	111.56	5.10	0.87
		28.0 - 31.0	3.0	2451.7 - 2448.7	Argillaceous Siltstone	8.32	Slight	38.25	0.31	37.94	123.39	0.01
		31.0 - 34.0	3.0	2448.7 - 2445.7	Argillaceous Siltstone	8.15	Slight	56.00	0.63	55.37	88.89	0.02
		34.0 - 37.0	3.0	2445.7 - 2442.7	Argillaceous Siltstone	8.11	None	24.75	1.88	22.87	13.16	0.06
		37.0 - 40.0	3.0	2442.7 - 2439.7	Claystone	8.16	None	22.25	1.88	20.37	11.84	0.06
		40.0 - 43.0	3.0	2439.7 - 2436.7	Claystone	8.35	None	20.25	1.25	19.00	16.20	0.04
		43.0 - 45.0	2.0	2436.7 - 2434.7	Claystone	8.24	None	19.50	1.25	18.25	15.60	0.04
		45.0 - 47.6	2.6	2434.7 - 2432.1	Claystone	8.22	None	25.50	0.63	24.87	40.48	0.02
		47.6 - 50.6	3.0	2432.1 - 2429.1	Argillaceous Siltstone	8.31	Slight	40.75	0.31	40.44	131.45	0.01
		50.6 - 53.6	3.0	2429.1 - 2426.1	Argillaceous Siltstone	8.22	Slight	31.50	0.63	30.87	50.00	0.02
		53.6 - 56.6	3.0	2426.1 - 2423.1	Argillaceous Siltstone	8.15	Slight	46.50	2.19	44.31	21.23	0.07
		56.6 - 59.8	3.2	2423.1 - 2419.9	Argillaceous Siltstone	7.88	Slight	42.25	47.50	-5.25	0.89	1.52
		59.8 - 62.0	2.2	2419.9 - 2417.7	Carbonaceous Shale/Coal	7.07	Slight	33.75	63.44	-29.69	0.53	2.03
		62.0 - 63.4	1.4	2417.7 - 2416.3	Carbonaceous Shale/Coal	7.35	None	22.25	48.13	-25.88	0.46	1.54
		63.4 - 66.4	3.0	2416.3 - 2413.3	Interbedded Siltstone/Shale	7.79	Slight	46.50	25.31	21.19	1.84	0.81
		66.4 - 69.4	3.0	2413.3 - 2410.3	Interbedded Siltstone/Shale	7.63	None	35.00	5.94	29.06	5.89	0.19
		69.4 - 72.4	3.0	2410.3 - 2407.3	Shale	7.78	None	36.75	7.81	28.94	4.71	0.25
		72.4 - 75.4	3.0	2407.3 - 2404.3	Shale	7.48	None	31.00	7.19	23.81	4.31	0.23
		75.4 - 78.5	3.1	2404.3 - 2401.2	Interbedded Siltstone/Shale	7.59	None	26.00	5.00	21.00	5.20	0.16
		78.5 - 81.6	3.1	2401.2 - 2398.1	Interbedded Siltstone/Shale	8.03	None	27.50	4.38	23.12	6.28	0.14
		81.6 - 84.7	3.1	2398.1 - 2395.0	Interbedded Siltstone/Shale	7.02	Slight	56.50	5.94	50.56	9.51	0.19
		84.7 - 86.1	1.4	2395.0 - 2393.6	Claystone	8.11	Moderate	100.00	38.44	61.56	2.60	1.23
		86.1 - 89.1	3.0	2393.6 - 2390.6	Limestone	7.75	Moderate	115.00	11.56	103.44	9.95	0.37
		89.1 - 91.3	2.2	2390.6 - 2388.4	Limestone	7.65	Strong	425.00	5.94	419.06	71.55	0.19
		91.3 - 94.3	3.0	2388.4 - 2385.4	Argillaceous Siltstone	8.13	Moderate	375.00	1.56	373.44	240.38	0.05
		94.3 - 97.3	3.0	2385.4 - 2382.4	Argillaceous Siltstone	7.85	Moderate	293.75	1.25	292.50	235.00	0.04
		97.3 - 100.3	3.0	2382.4 - 2379.4	Argillaceous Siltstone	8.16	Moderate	237.50	0.31	237.19	766.13	0.01
		100.3 - 103.3	3.0	2379.4 - 2376.4	Argillaceous Siltstone	8.49	Moderate	200.00	0.31	199.69	645.16	0.01
		103.3 - 106.3	3.0	2376.4 - 2373.4	Argillaceous Siltstone	8.44	Moderate	166.25	0.31	165.94	536.29	0.01
		106.3 - 109.3	3.0	2373.4 - 2370.4	Argillaceous Siltstone	8.34	Moderate	187.50	0.31	187.19	604.84	0.01
		109.3 - 112.3	3.0	2370.4 - 2367.4	Argillaceous Siltstone	8.46	Moderate	125.00	0.31	124.69	403.23	0.01
		112.3 - 115.3	3.0	2367.4 - 2364.4	Argillaceous Siltstone	8.32	Slight	45.00	0.63	44.37	71.43	0.02
		115.3 - 118.3	3.0	2364.4 - 2361.4	Argillaceous Siltstone	8.21	Slight	21.50	0.63	20.87	34.13	0.02
		118.3 - 121.3	3.0	2361.4 - 2358.4	Argillaceous Siltstone	8.34	None	15.00	0.94	14.06	15.96	0.03
		121.3 - 124.3	3.0	2358.4 - 2355.4	Argillaceous Siltstone	8.23	None	17.00	3.44	13.56	4.94	0.11
		124.3 - 127.3	3.0	2355.4 - 2352.4	Argillaceous Siltstone	7.85	None	20.25	2.81	17.44	7.21	0.09
		127.3 - 130.3	3.0	2352.4 - 2349.4	Argillaceous Siltstone	7.84	None	22.50	2.50	20.00	9.00	0.08
		130.3 - 133.3	3.0	2349.4 - 2346.4	Interbedded Sandstone/Shale	8.34	None	24.50	1.25	23.25	19.60	0.04
		133.3 - 136.0	2.7	2346.4 - 2343.7	Interbedded Sandstone/Shale	8.13	None	20.75	0.63	20.12	32.94	0.02
		136.0 - 138.0	2.0	2343.7 - 2341.7	Interbedded Sandstone/Shale	8.23	None	17.50	1.88	15.62	9.31	0.06
		138.0 - 140.0	2.0	2341.7 - 2339.7	Interbedded Sandstone/Shale	8.14	None	12.75	3.75	9.00	3.40	0.12
					Average to Bottom of Cut Slope	7.93		77.50	11.89	65.60	102.26	0.38

Potential source of alkalinity:		**Potentially toxic/acidic per Table 11.1 of "Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania":**	
NP greater than 30 ppt $CaCO_3$ and "fizz"	Paste pH less than 4.0		NP/MPA ratio less than 1
NNP greater than 20 ppt $CaCO_3$	Net Neutalization Potential (NNP) less than -5.		Sulfur greater than 0.5%

TABLE NO. 4:
ACID-BASE ACCOUNTING TEST RESULTS

Boring Number	Surface Elevation (feet)	Sample Depth (feet)	Sample Thickness (feet)	Sample Elevation (feet)	Lithology	Acid Base Accounting Results						
						Paste pH	Fizz Rating	Neutralization Potential - NP (tons CaCO3/ 1000 tons)	Maximum Potential Acidity - MPA (tons CaCO3/ 1000 tons)	NNP = NP-MPA	NP/MPA Ratio	Sulfur (%)
E-1A	2687.2	10.1 - 13.0	2.9	2677.1 - 2674.2	Carbonaceous Shale	6.05	None	7.75	9.69	-1.94	0.80	0.31
		13.0 - 16.0	3.0	2674.2 - 2671.2	Carbonaceous Shale	6.45	None	10.75	23.75	-13.00	0.45	0.76
		16.0 - 19.0	3.0	2671.2 - 2668.2	Carbonaceous Shale	7.09	None	22.00	23.44	-1.44	0.94	0.75
		19.0 - 22.0	3.0	2668.2 - 2665.2	Shale	7.16	Slight	48.75	60.94	-12.19	0.80	1.95
		22.0 - 24.5	2.5	2665.2 - 2662.7	Shale	6.98	Slight	61.25	56.88	4.37	1.08	1.82
		24.5 - 27.1	2.6	2662.7 - 2660.1	Shale	7.83	Moderate	150.00	60.00	90.00	2.50	1.92
		27.1 - 29.1	2.0	2660.1 - 2658.1	Fossiliferous Limestone	7.45	Moderate	255.00	45.63	209.37	5.59	1.46
		29.1 - 31.1	2.0	2658.1 - 2656.1	Fossiliferous Limestone	7.85	Moderate	150.00	60.00	90.00	2.50	1.92
		31.1 - 32.9	1.8	2656.1 - 2654.3	Carbonaceous Shale/Coal	7.02	Moderate	318.75	94.38	224.37	3.38	3.02
		32.9 - 36.0	3.1	2654.3 - 2651.2	Calcareous Claystone	6.87	Moderate	302.50	32.50	270.00	9.31	1.04
		36.0 - 39.0	3.0	2651.2 - 2648.2	Calcareous Claystone	6.98	Moderate	375.00	22.81	352.19	16.44	0.73
		39.0 - 42.0	3.0	2648.2 - 2645.2	Calcareous Claystone	8.03	Moderate	300.00	10.94	289.06	27.42	0.35
		42.0 - 45.0	3.0	2645.2 - 2642.2	Calcareous Claystone	8.21	Moderate	291.25	0.31	290.94	939.52	0.01
		45.0 - 48.0	3.0	2642.2 - 2639.2	Calcareous Claystone	6.99	Moderate	262.50	3.75	258.75	70.00	0.12
		48.0 - 50.3	2.3	2639.2 - 2636.9	Calcareous Claystone	8.19	Moderate	311.25	3.75	307.50	83.00	0.12
		50.3 - 53.0	2.7	2636.9 - 2634.2	Sandstone	7.42	Moderate	375.00	2.50	372.50	150.00	0.08
		53.0 - 56.0	3.0	2634.2 - 2631.2	Sandstone	8.61	Moderate	148.75	0.94	147.81	158.24	0.03
		56.0 - 58.0	2.0	2631.2 - 2629.2	Sandstone	8.44	Moderate	112.50	0.63	111.87	178.57	0.02
		58.0 - 60.0	2.0	2629.2 2627.2	Sandstone	8.65	Slight	73.75	0.31	73.44	237.90	0.01
					Average to Bottom of Cut Slope	7.44		187.67	25.37	162.30	102.86	0.81
E-10	2443.2	21.0 - 24.0	3.0	2422.2 - 2419.2	Interbedded Siltstone/Shale	7.43	Slight	25.00	1.88	23.12	13.30	0.06
		24.0 - 26.5	2.5	2419.2 - 2416.7	Interbedded Siltstone/Shale	7.54	None	20.25	5.00	15.25	4.05	0.16
		26.5 - 29.5	3.0	2416.7 - 2413.7	Sandstone	6.94	None	18.50	2.50	16.00	7.40	0.08
		29.5 - 32.5	3.0	2413.7 - 2410.7	Sandstone	7.44	None	17.50	2.19	15.31	7.99	0.07
		32.5 - 35.5	3.0	2410.7 - 2407.7	Sandstone	7.43	None	5.00	6.88	-1.88	0.73	0.22
		35.5 - 37.5	2.0	2407.7 - 2405.7	Sandstone	6.55	None	5.00	5.94	-0.94	0.84	0.19
		37.5 - 40.5	3.0	2405.7 - 2402.7	Sandstone	5.98	None	4.50	7.81	-3.31	0.58	0.25
		40.5 - 43.5	3.0	2402.7 - 2399.7	Sandstone	7.29	None	7.50	12.81	-5.31	0.59	0.41
		43.5 - 46.5	3.0	2399.7 - 2396.7	Sandstone	7.54	None	16.00	1.88	14.12	8.51	0.06
		46.5 - 49.5	3.0	2396.7 - 2393.7	Sandstone	8.04	None	19.00	1.25	17.75	15.20	0.04
		49.5 - 52.0	2.5	2393.7 - 2391.2	Sandstone	7.05	None	17.50	12.19	5.31	1.44	0.39
		52.0 - 54.1	2.1	2391.2 - 2389.1	Sandstone	6.08	None	9.75	1.88	7.87	5.19	0.06
		54.1 - 57.0	2.9	2389.1 - 2386.2	Interbedded Siltstone/Shale	5.56	None	7.50	9.69	-2.19	0.77	0.31
		57.0 - 60.0	3.0	2386.2 2383.2	Sandstone	5.45	None	12.50	41.88	-29.38	0.30	1.34
		60.0 - 63.0	3.0	2383.2 - 2380.2	Sandstone	5.13	None	5.25	18.44	-13.19	0.28	0.59
		63.0 - 65.0	2.0	2380.2 - 2378.2	Sandstone	5.65	None	3.25	3.75	-0.50	0.87	0.12
					Average to Bottom of Cut Slope	6.72		12.39	8.79	3.60	4.43	0.28

Potential source of alkalinity:	**Potentially toxic/acidic per Table 11.1 of "Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania":**	
NP greater than 30 ppt $CaCO_3$ and "fizz"	Paste pH less than 4.0	NP/MPA ratio less than 1
NNP greater than 20 ppt $CaCO_3$	Net Neutalization Potential (NNP) less than -5.	Sulfur greater than 0.5%

TABLE NO. 4:
ACID-BASE ACCOUNTING TEST RESULTS

Boring Number	Surface Elevation (feet)	Sample Depth (feet)	Sample Thickness (feet)	Sample Elevation (feet)	Lithology	Acid Base Accounting Results						
						Paste pH	Fizz Rating	Neutralization Potential - NP (tons CaCO3/ 1000 tons)	Maximum Potential Acidity - MPA (tons CaCO3/ 1000 tons)	NNP = NP-MPA	NP/MPA Ratio	Sulfur (%)
E-11	2346.8	35.6 - 38.3	2.7	2311.2 - 2308.5	Claystone	5.92	None	2.50	4.06	-1.56	0.62	0.13
		38.3 - 41.3	3.0	2308.5 - 2305.5	Argillaceous Siltstone	6.44	None	7.75	0.63	7.12	12.30	0.02
		41.3 - 43.3	2.0	2305.5 - 2303.5	Argillaceous Siltstone	7.11	None	6.75	0.63	6.12	10.71	0.02
		43.3 - 46.0	2.7	2303.5 - 2300.8	Sandstone	7.45	None	12.25	0.31	11.94	39.52	0.01
		46.0 - 49.0	3.0	2300.8 - 2297.8	Sandstone	7.66	None	5.75	0.31	5.44	18.55	0.01
		49.0 - 52.0	3.0	2297.8 - 2294.8	Sandstone	7.42	Slight	21.25	0.31	20.94	68.55	0.01
		52.0 - 55.0	3.0	2294.8 - 2291.8	Sandstone	7.59	Slight	52.50	0.31	52.19	169.35	0.01
		55.0 - 58.0	3.0	2291.8 - 2288.8	Sandstone	7.65	None	14.75	0.31	14.44	47.58	0.01
		58.0 - 61.0	3.0	2288.8 - 2285.8	Sandstone	7.88	None	18.50	0.63	17.87	29.37	0.02
		61.0 - 64.0	3.0	2285.8 - 2282.8	Sandstone	8.15	None	25.00	0.31	24.69	80.65	0.01
		64.0 - 67.0	3.0	2282.8 - 2279.8	Sandstone	7.84	None	7.25	0.94	6.31	7.71	0.03
		67.0 - 70.0	3.0	2279.8 - 2276.8	Sandstone	7.63	None	7.50	0.31	7.19	24.19	0.01
		70.0 - 73.0	3.0	2276.8 - 2273.8	Sandstone	7.55	None	7.00	0.31	6.69	22.58	0.01
		73.0 - 75.4	2.4	2273.8 - 2271.4	Sandstone	7.73	None	6.25	0.94	5.31	6.65	0.03
		75.4 - 78.5	3.1	2271.4 - 2268.3	Claystone	8.11	None	5.25	8.44	-3.19	0.62	0.27
		78.5 - 81.5	3.0	2268.3 - 2265.3	Sandstone	7.22	None	4.50	4.06	0.44	1.11	0.13
		81.5 - 84.5	3.0	2265.3 - 2262.3	Sandstone	7.84	None	17.75	0.63	17.12	28.17	0.02
		84.5 - 86.5	2.0	2262.3 - 2260.3	Sandstone	6.98	Slight	22.50	3.44	19.06	6.54	0.11
		86.5 - 88.3	1.8	2260.3 - 2258.5	Sandstone	7.04	Slight	77.50	4.06	73.44	19.09	0.13
		88.3 - 90.0	1.7	2258.5 - 2256.8	Claystone	7.82	Moderate	312.50	35.00	277.50	8.93	1.12
		90.0 - 92.0	2.0	2256.8 - 2254.8	Claystone	8.05	Slight	31.50	14.06	17.44	2.24	0.45
					Average to Bottom of Footing Elevation	7.49		45.60	5.43	22.36	30.94	0.10

Potential source of alkalinity:		**Potentially toxic/acidic per Table 11.1 of "Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania":**	
NP greater than 30 ppt $CaCO_3$ and "fizz"		Paste pH less than 4.0	NP/MPA ratio less than 1
NNP greater than 20 ppt $CaCO_3$		Net Neutalization Potential (NNP) less than -5.	Sulfur greater than 0.5%

TABLE NO. 5

ELECTROCHEMICAL TEST RESULTS

Sample Location	Sample Source	Sample Depth (ft.)	pH (std. units)	Minimum Resistivity (ohm-cm)	Total Bacteria (bacteria / ml)	Chloride (Cl) Concentration (ppm)	Sulfate (SO_4) Concentration (ppm)
DU-1	Ground Water	N/A	6.7	6,750		<32*	<50*
DU-2	Ground Water	N/A	6.9	3,100		<32*	<50*
DU-6	Ground Water	N/A	6.1	26,000		<32*	<50*
E-3	Ground Water	N/A	6.7	6,425		<32*	<50*
E-4	Ground Water	N/A	5.7	20,750		<32*	<50*
E-6	Ground Water	N/A	7.0	17,500		<32*	<50*
E-7	Ground Water	N/A	6.5	28,750		<32*	<50*

< Below Detection Limits

Potentially Corrosive Environments per PENNDOT Design Manual Part 4 December 2019 Edition):

1. Driven Piles (Section 10.7.5.6P on Pages B.10-61 and B.10-62)

Soil and Groundwater:

* Resistivity less than 2,000 ohm-cm in soil
* Resistivity between 2,000 and 5,000 ohm-cm and combined with,
  -- sulfate concentration greater than 200 ppm, or
  -- chloride concentration greater than 100 ppm
* pH less than 5.5
* pH between 5.5 and 8.5 in soils with high organic content
* Sulfate concentration greater than 1,000 ppm in soil or greater than 150 ppm in groundwater
* Landfills and cinder fills
* Soils subject to mine or industrial drainage
* Mixtures of high resistivity and low resistivity high-alkaline soils

Water:

* Chloride content greater than 1,000 ppm
* Sulfate content greater than 150 ppm
* Mine or industrial runoff
* High organic content
* pH less than 5.5

2. Buried Concrete Structures (Section 12.6.9.3.3P on Page B.12-15)
   * pH less than 4.0
   * Sulfate content in solutions within the range of 100 to 1,000 ppm.

TABLE NO. 6:
pH TEST RESULTS

Sample Location [1]	Sample Source	Sample Depth (ft.)	pH (std. units)		Sample Location	Sample Source	Sample Depth (ft.)	pH (std. units)
S-1	Stream Surface Water (PA)	N/A	6.8		S-30	Stream Surface Water (PA)	N/A	7.8
S-2	Stream Surface Water (PA)	N/A	6.8		S-31	Stream Surface Water (PA)	N/A	7.3
S-2A	Stream Surface Water (PA)	N/A	6.9		S-33	Stream Surface Water (PA)	N/A	7.0
S-3	Stream Surface Water (PA)	N/A	7.3		S-38	Stream Surface Water (PA)	N/A	7.9
S-4	Stream Surface Water (PA)	N/A	7.5		S-39	Stream Surface Water (PA)	N/A	7.8
S-6	Stream Surface Water (PA)	N/A	6.6		S-40	Stream Surface Water (PA)	N/A	6.8
S-7	Stream Surface Water (PA)	N/A	7.2		S-43	Stream Surface Water (PA)	N/A	8.0
S-8	Stream Surface Water (PA)	N/A	6.0		S-48	Stream Surface Water (PA)	N/A	7.5
S-8A	Stream Surface Water (PA)	N/A	6.6		S-51	Stream Surface Water (PA)	N/A	7.4
S-9	Stream Surface Water (PA)	N/A	7.0		S-53	Stream Surface Water (PA)	N/A	7.1
S-10	Stream Surface Water (PA)	N/A	6.6		Piney Creek (DU Crossing)	Stream Surface Water (PA)	N/A	7.6
S-11	Stream Surface Water (PA)	N/A	6.3		Piney Creek (E Crossing)	Stream Surface Water (PA)	N/A	7.4
S-12	Stream Surface Water (PA)	N/A	6.9		WL007	Stream Surface Water (MD)	N/A	7.2
S-13	Stream Surface Water (PA)	N/A	6.8		WL009/WL010	Stream Surface Water (MD)	N/A	6.8
S-16	Stream Surface Water (PA)	N/A	7.2		WL012	Stream Surface Water (MD)	N/A	7.7
S-16A	Stream Surface Water (PA)	N/A	6.8		WL014	Stream Surface Water (MD)	N/A	7.6
S-16E	Stream Surface Water (PA)	N/A	7.0		W4	Wetland Surface Water (PA)	N/A	6.6
S-18	Stream Surface Water (PA)	N/A	7.1		W10	Wetland Surface Water (PA)	N/A	6.4
S-19	Stream Surface Water (PA)	N/A	6.3		W14	Wetland Surface Water (PA)	N/A	6.7
S-23	Stream Surface Water (PA)	N/A	6.9		W15	Wetland Surface Water (PA)	N/A	6.9
S-26	Stream Surface Water (PA)	N/A	6.8		W21	Wetland Surface Water (PA)	N/A	7.0
S-29	Stream Surface Water (PA)	N/A	7.0		W30	Wetland Surface Water (PA)	N/A	6.9

(1) Sample location based on surveyed field numbering. Location can be found on Subsurface Profiles in Appendix J.

TABLE NO. 7A:

PROPOSED STRUCTURES - ALIGNMENT DU

LOCATION	STRUCTURE TYPE	APPLICABLE BORINGS	ANTICIPATED FOUNDATION TYPES	SPECIAL CONSIDERATIONS
Station 6185+29± to Station 6167+88±	Dual 8-Span Structures, Mainline Over Meadow Run	DU-1, DU-2	Driven Piles or Drilled Caissons at Abutments; Spread Footings on Bedrock at Piers	Potential Strip Mine Spoil/ Buried Highwall(s) at South Abutment
Station 6220+00± to Station 6221+50±	Single-Span Structure, Mainline Over SR 2010	N/A	Spread Footings on Bedrock	N/A
Station 6265+61± to Station 6284+90±	Dual 8-Span Structures, Mainline Over Piney Creek and T-496	P-12R, P-13R/ 13RA, DU-5, DU-6	Driven Piles or Drilled Caissons at Abutments; Spread Footings on Bedrock at Piers	Potential Deep Mine(s); Artesian Ground Water
Station 6419+90±	Single-Span Structure, T-353 Over Mainline	E-11, P-11	Driven Piles or Drilled Caissons at Abutments and Piers	Potential Strip Mine Spoil/ Buried Highwall(s)

TABLE NO. 7B:

PROPOSED STRUCTURES - ALIGNMENT E

LOCATION	STRUCTURE TYPE	APPLICABLE BORINGS	ANTICIPATED FOUNDATION TYPES	SPECIAL CONSIDERATIONS
Station 2157+13± to Station 2167+13±	Dual 5-Span Structures, Mainline Over Meadow Run	E-3, E-4	Driven Piles or Drilled Caissons at Abutments; Spread Footings on Bedrock at Piers	Potential Strip Mine Spoil/ Buried Highwall(s) at South Abutment
Station 2215+91± to Station 2230+51±	Dual 7-Span Structures, Mainline Over SR 2010, Piney Creek and T-496	E-6, E-7, P-19	Driven Piles or Drilled Caissons at Abutments; Spread Footings on Bedrock at Piers	N/A
Station 2400+10±	Single-Span Structure, T-353 Over Mainline	E-11, P-11	Driven Piles or Drilled Caissons at Abutments and Piers	Potential Strip Mine Spoil/ Buried Highwall(s)

APPENDIX B
Figures

LIST OF FIGURES

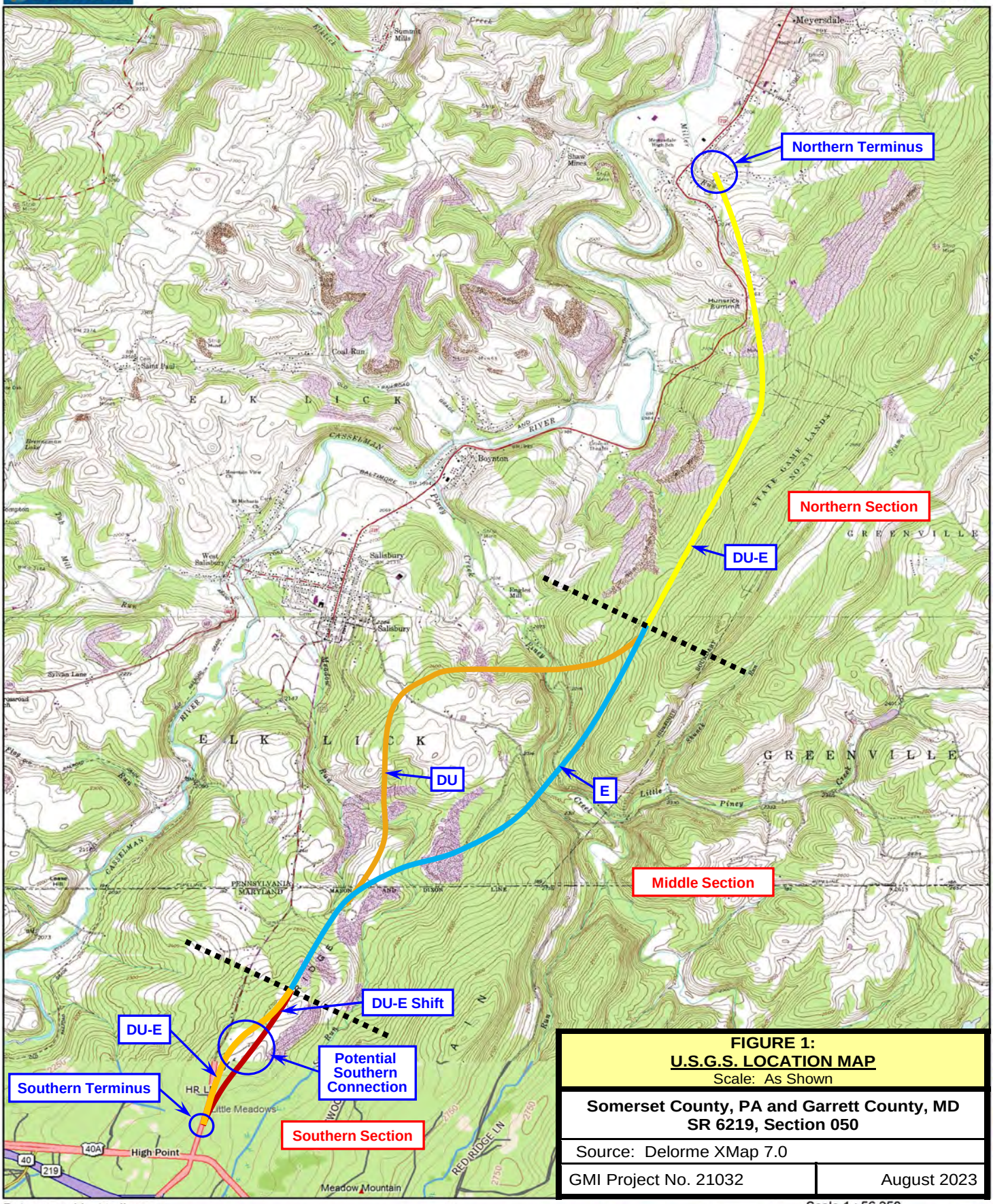

FIGURE 1:
U.S.G.S. LOCATION MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: Delorme XMap 7.0

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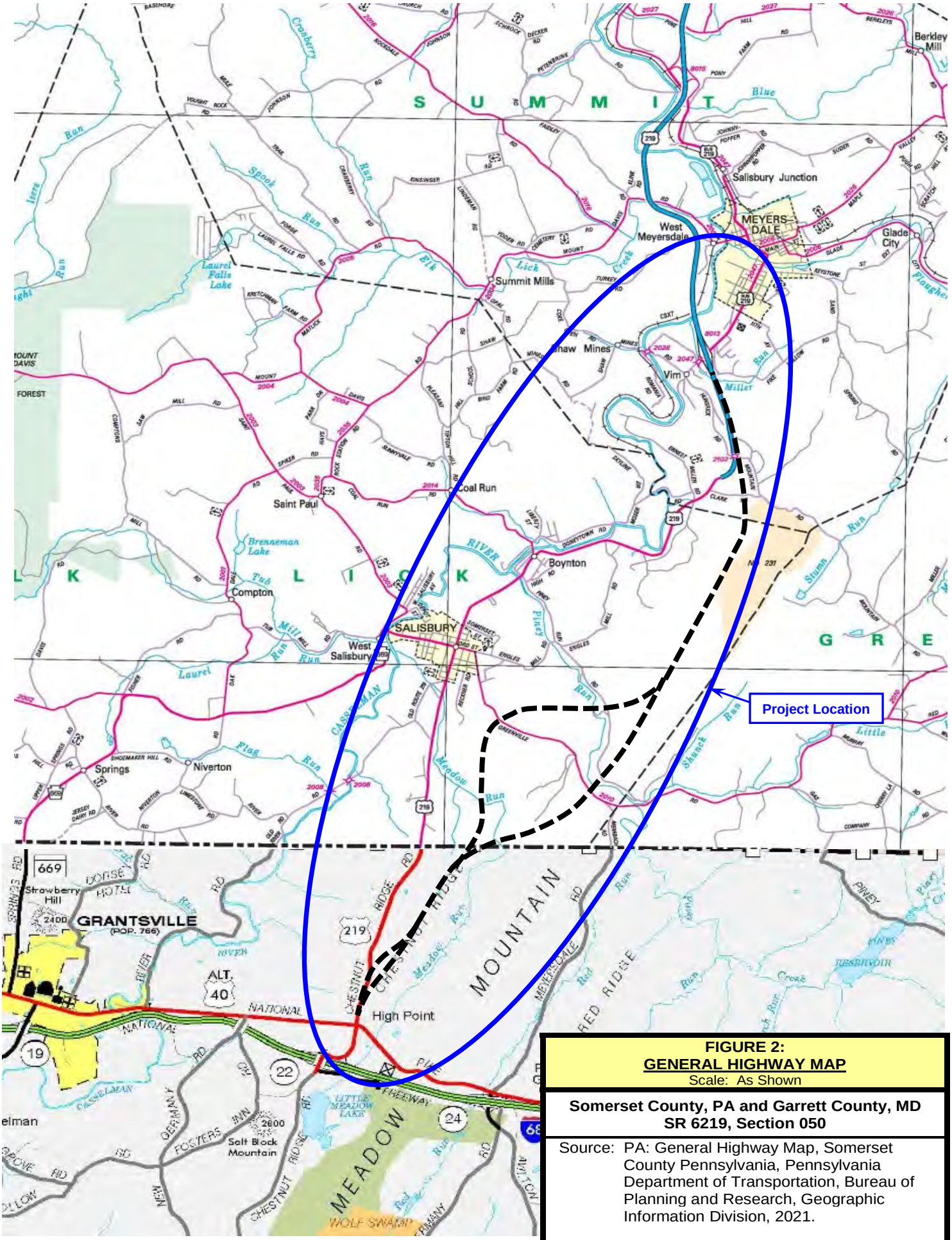

FIGURE 2:
GENERAL HIGHWAY MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: PA: General Highway Map, Somerset County Pennsylvania, Pennsylvania Department of Transportation, Bureau of Planning and Research, Geographic Information Division, 2021.

MD: https://roads.maryland.gov/TownGridmaps/100000_Garrett.pdf

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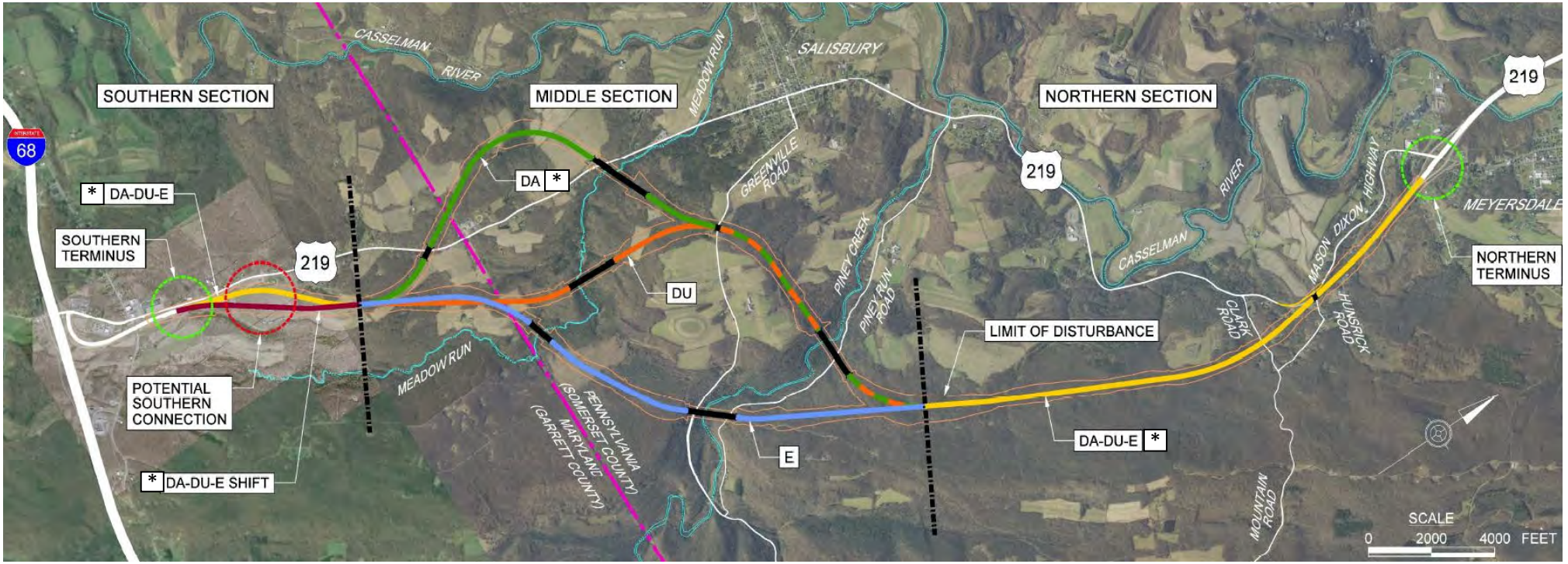

* Alignment DA Eliminated

FIGURE 3:
AERIAL PHOTOGRAPH OF SITE
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: Pennsylvania Department of Transportation

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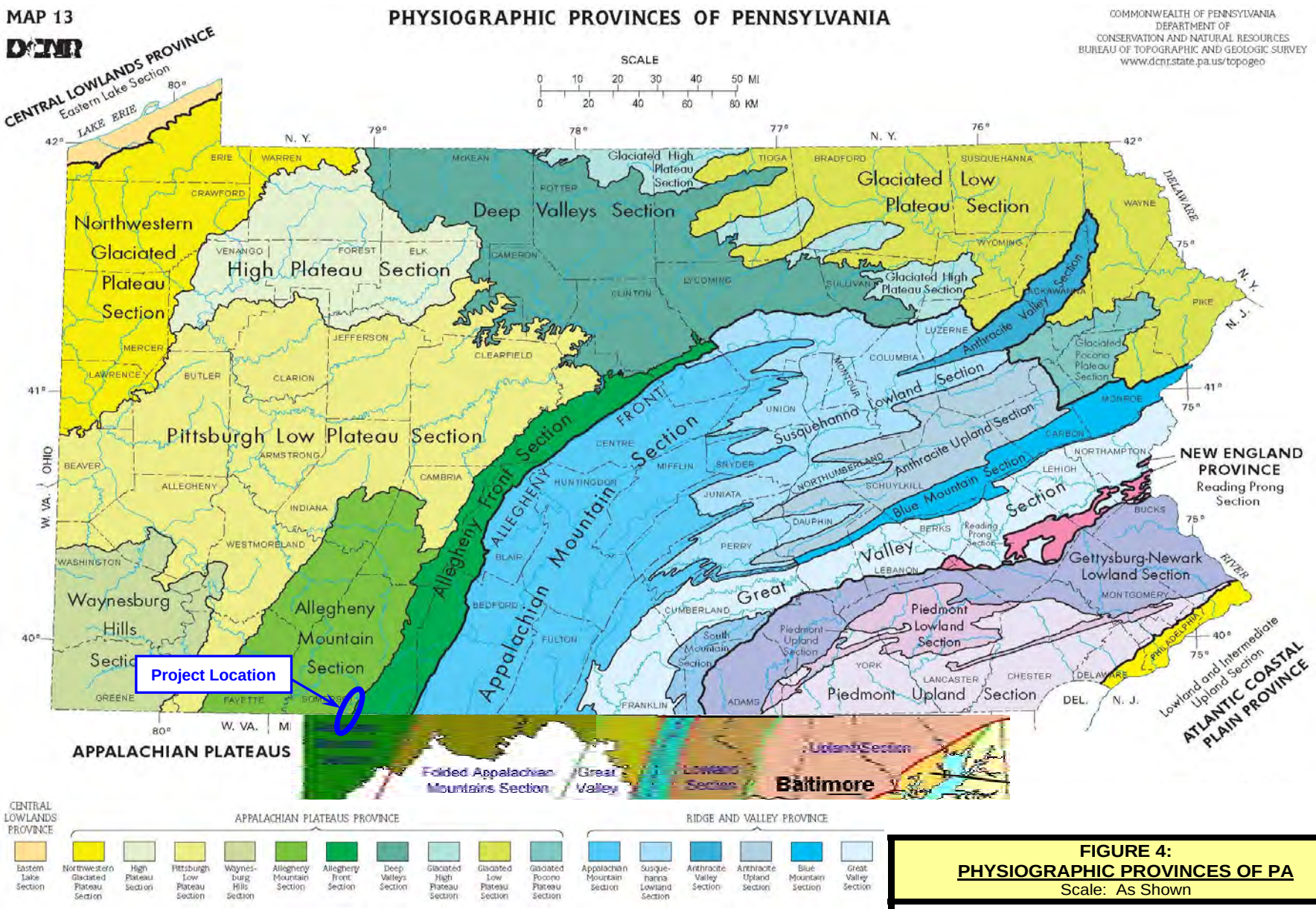

FIGURE 4:
PHYSIOGRAPHIC PROVINCES OF PA
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: PA: Commonwealth of Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey.

MD: Maryland Geological Survey, January, 2001.

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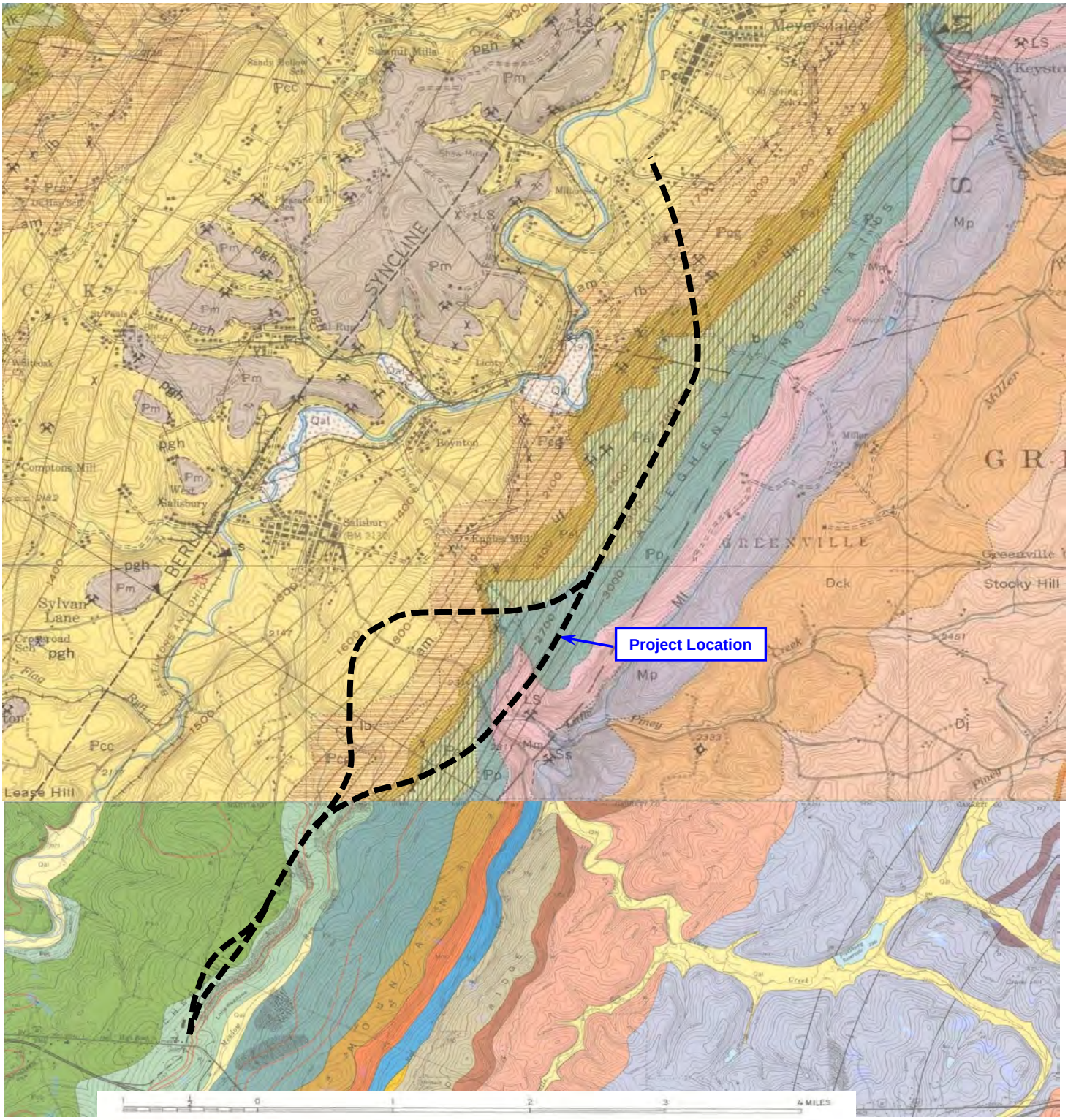

FIGURE 5A:
AREAL GEOLOGY MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: PA: Geology and Mineral Resources of Southern Somerset County, Pennsylvania, Flint, N.K., Commonwealth of Pennsylvania Department of Internal Affairs, Bureau of Topographic and Geologic Survey, 1965.

MD: https://ngmdb.usgs.gov/Prodesc/proddesc_37437.htm

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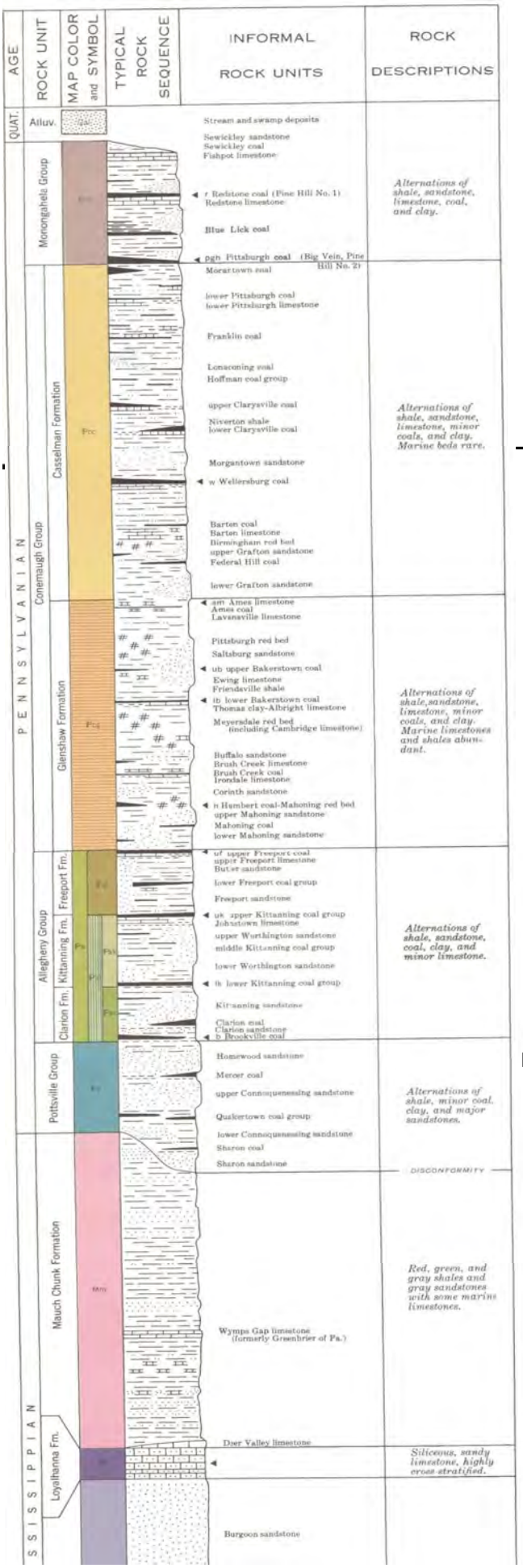
PA



MD

ALLUVIAL DEPOSITS

Unconsolidated sand, gravel, silt, and clay of varied composition and sorting which underlie the present day floodplains of streams. Color ranges from a light-tan to brown depending upon the amount of clays and organic material contained. Thickness was not determined, but is estimated at 3 to 15 feet.

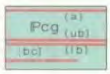
ALLEGHENY GROUP (undifferentiated)

Interbedded siltstone, shale, sandstone, coal and claystone. Sandstone units are generally tan to light-gray in color, whereas the shales and siltstones are most commonly dark-gray. Mined coals include: Lower Kittanning [lk], Middle Kittanning [mk], Upper Kittanning [uk], and Upper Freeport [uf]. The Lower Kittanning Sandstone near the base of the group and the Worthington Sandstone near the middle of the group are traceable. The Mount Savage fire-clay at the base of the unit has been extensively mined along Big Savage Mountain. The Bolivar fire-clay which underlies the Upper Freeport coal bed is also an important claystone interval. Base of the group is placed at the bottom of the Lower Mount Savage coal horizon (Brookville of Pennsylvania nomenclature), which is commonly absent, in which case the base is marked at the top of underlying Homewood Sandstone. Thickness ranges from 240 to 280 feet.

CONEMAUGH GROUP (differentiated)

Casselman Formation

Interbedded sandstone, siltstone, and shale with minor amounts of limestone and coal. Some shales red-brown, but predominately dark-gray in color. Important coals include: Franklin [f], Clarysville [c], Federal Hill [fh], Barton [b], and Wellersburg [we]. Of these coals, only the Barton is mined with any regularity. Marker sandstone units include: the Grafton near the base of the unit, the Morgantown overlying the Barton coal bed, the Connellsville overlying the Franklin coal bed, and the Lower Pittsburgh near the top of the formation. Base of the formation is placed at the top of the Ames marine interval. Thickness ranges from 450 to 500 feet.



Glenshaw Formation

Anticipated Bedrock In Project Area

FIGURE 5B:
AREAL GEOLOGY MAP LEGEND
Scale: None

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: PA: Geology and Mineral Resources of Southern Somerset County, Pennsylvania, Flint, N.K., Commonwealth of Pennsylvania Department of Internal Affairs, Bureau of Topographic and Geologic Survey, 1965.

MD: https://ngmdb.usgs.gov/Prodesc/proddesc_37437.htm

GMI Project No. 21032	August 2023

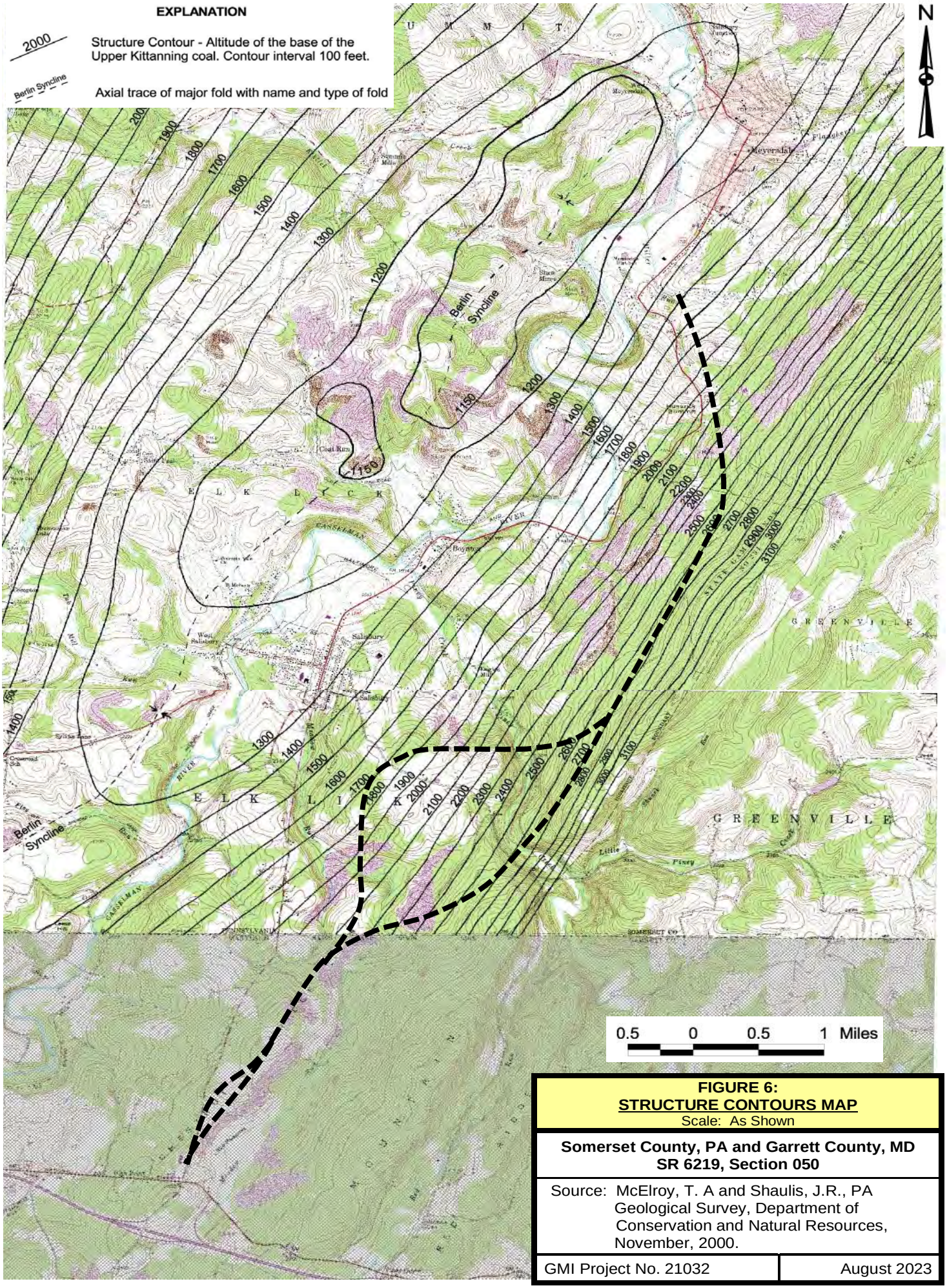


FIGURE 6:
STRUCTURE CONTOURS MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: McElroy, T. A and Shaulis, J.R., PA Geological Survey, Department of Conservation and Natural Resources, November, 2000.

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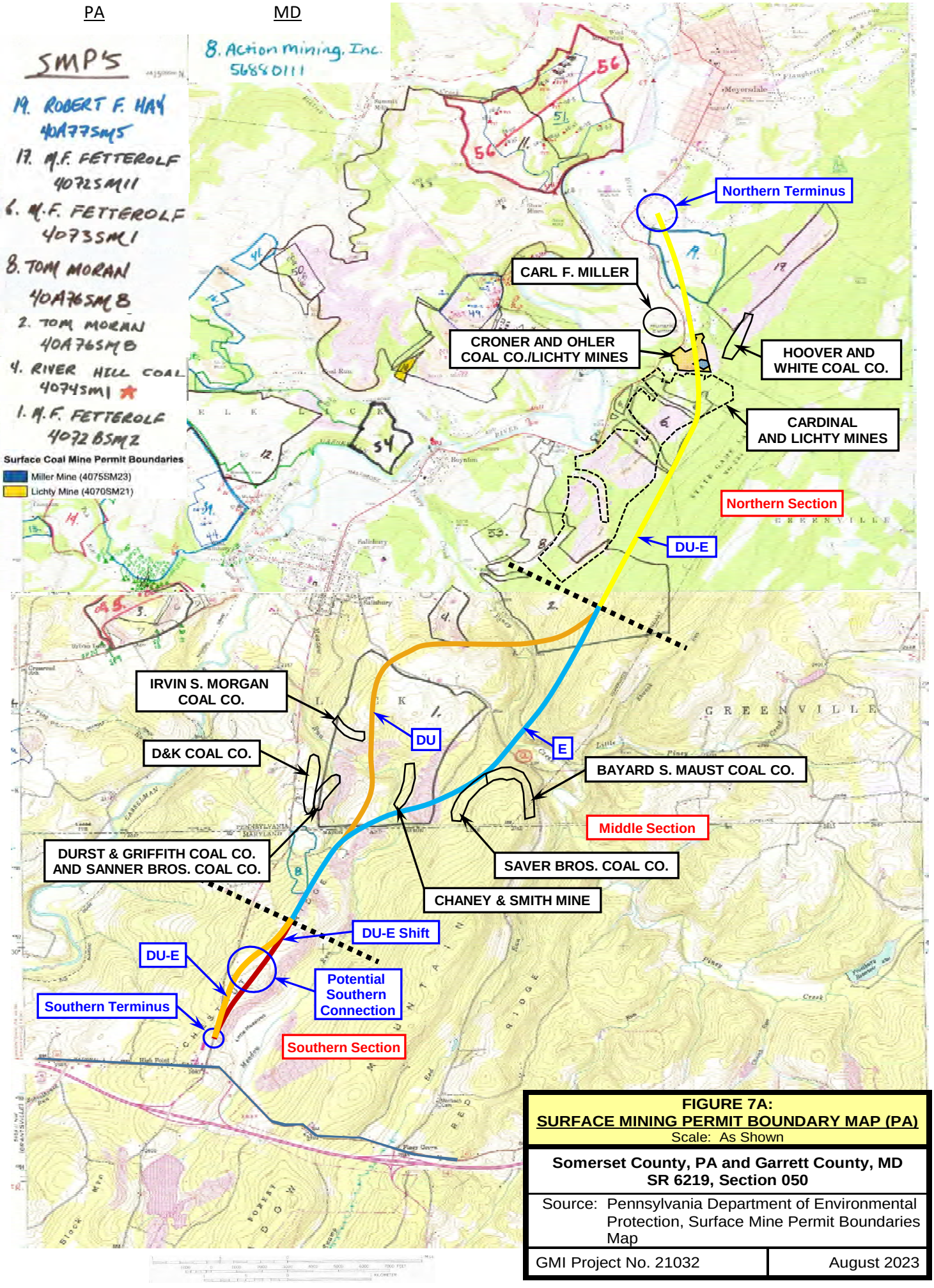

FIGURE 7A:
SURFACE MINING PERMIT BOUNDARY MAP (PA)
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: Pennsylvania Department of Environmental Protection, Surface Mine Permit Boundaries Map

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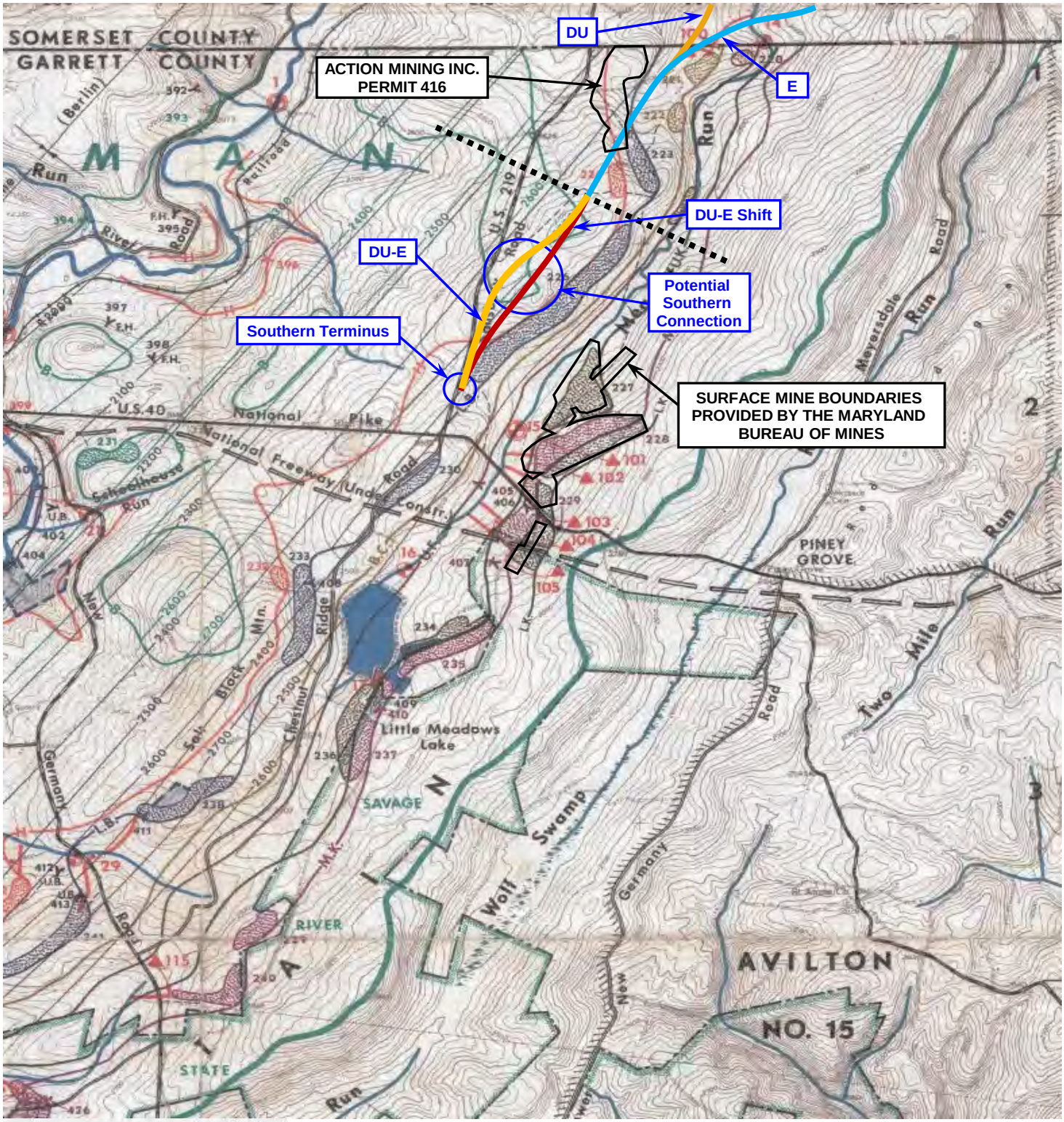

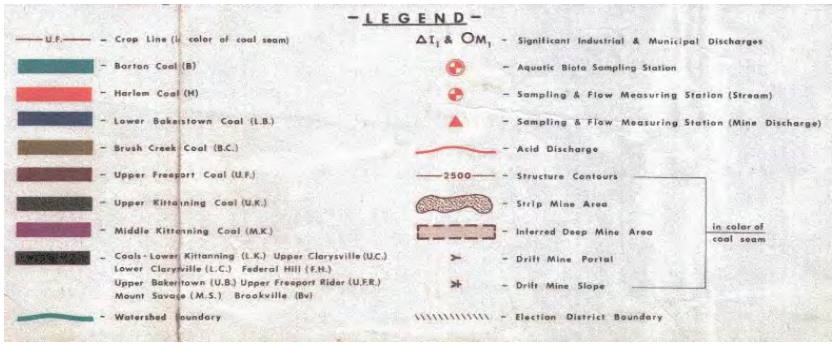

FIGURE 7B:
SURFACE MINING PERMIT BOUNDARY MAP (MD)
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: "Mine Drainage Pollution Watershed Survey, Cherry Creek and Casselman River Watersheds, Mine Development and Pollution Source Map", State of Maryland Department of Natural Resources Water Resources Administration, 1973.

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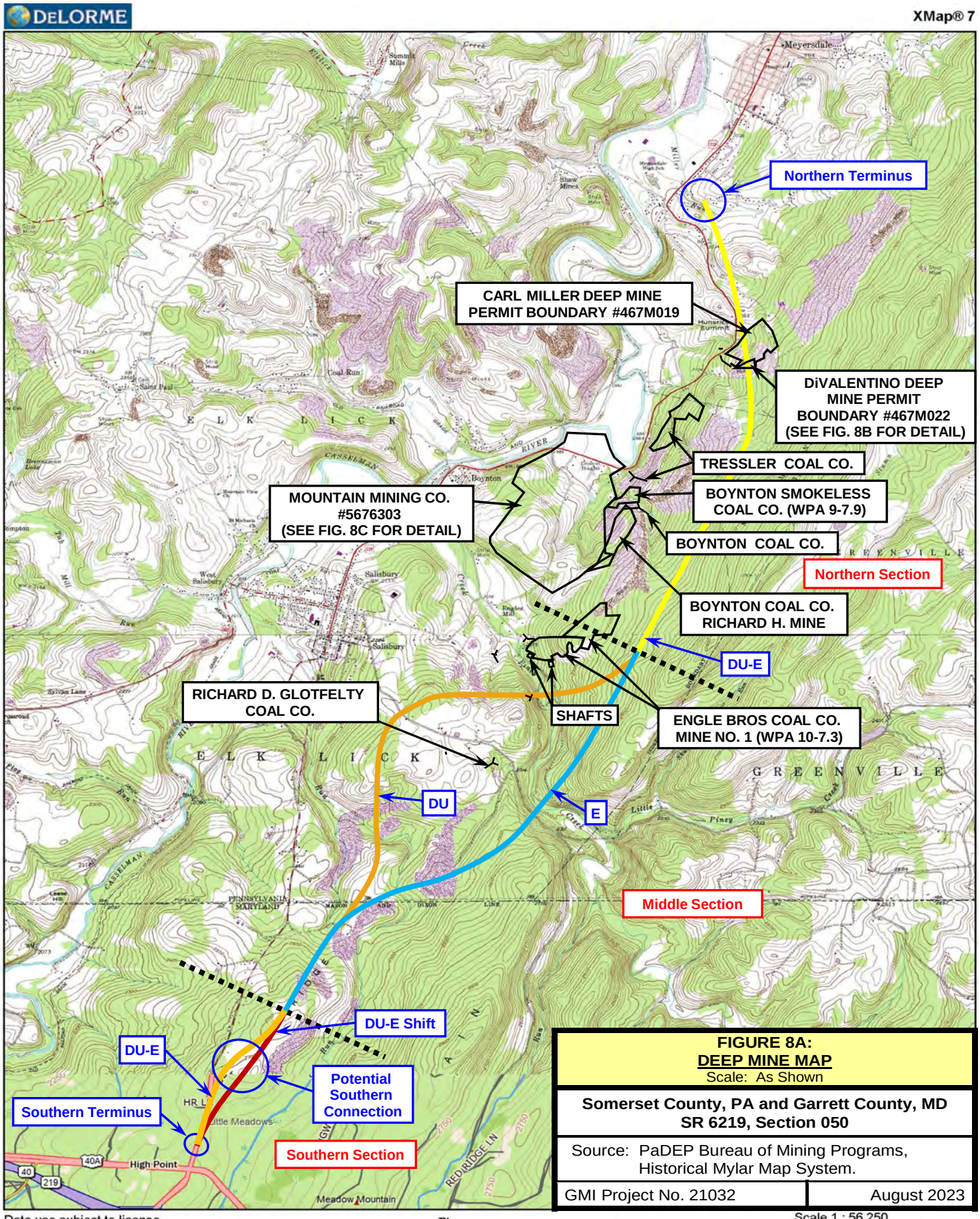

FIGURE 8A:
DEEP MINE MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: PaDEP Bureau of Mining Programs, Historical Mylar Map System.

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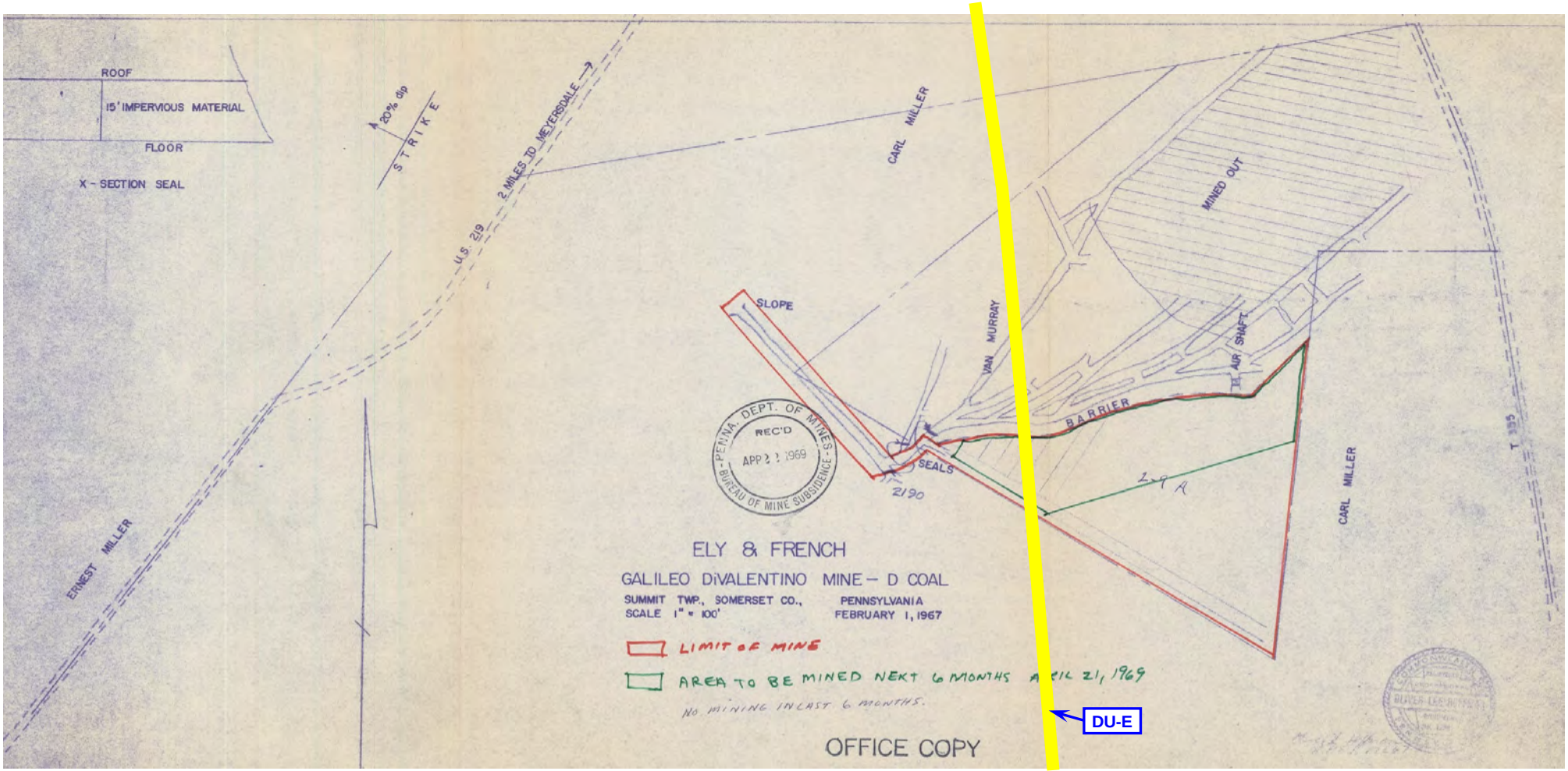

FIGURE 8B:
DiVALENTINO DEEP MINE PERMIT BOUNDARY
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: https://www.minemaps.psu.edu/

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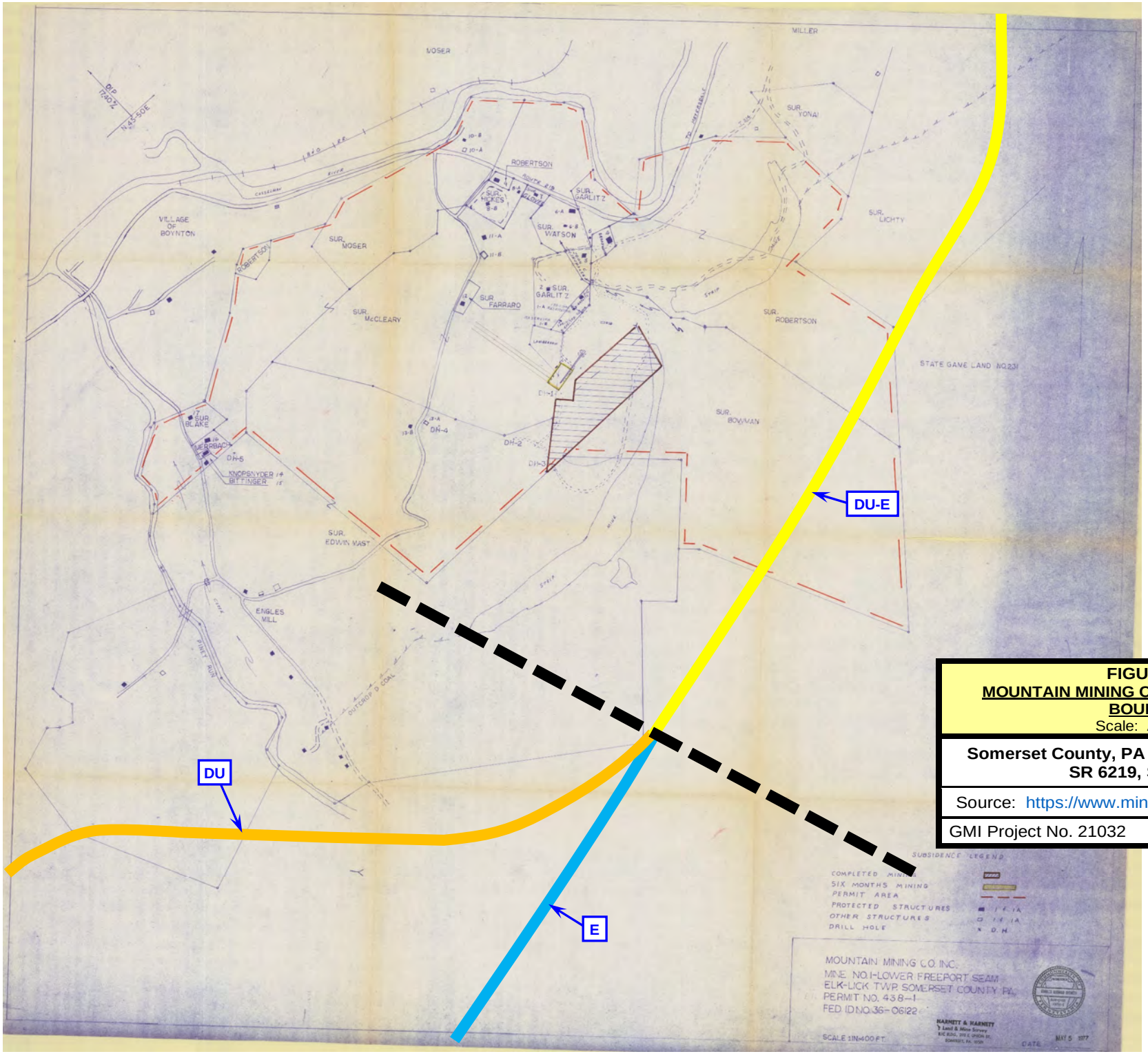

FIGURE 8C:
MOUNTAIN MINING CO. DEEP MINE PERMIT BOUNDARY
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: https://www.minemaps.psu.edu/

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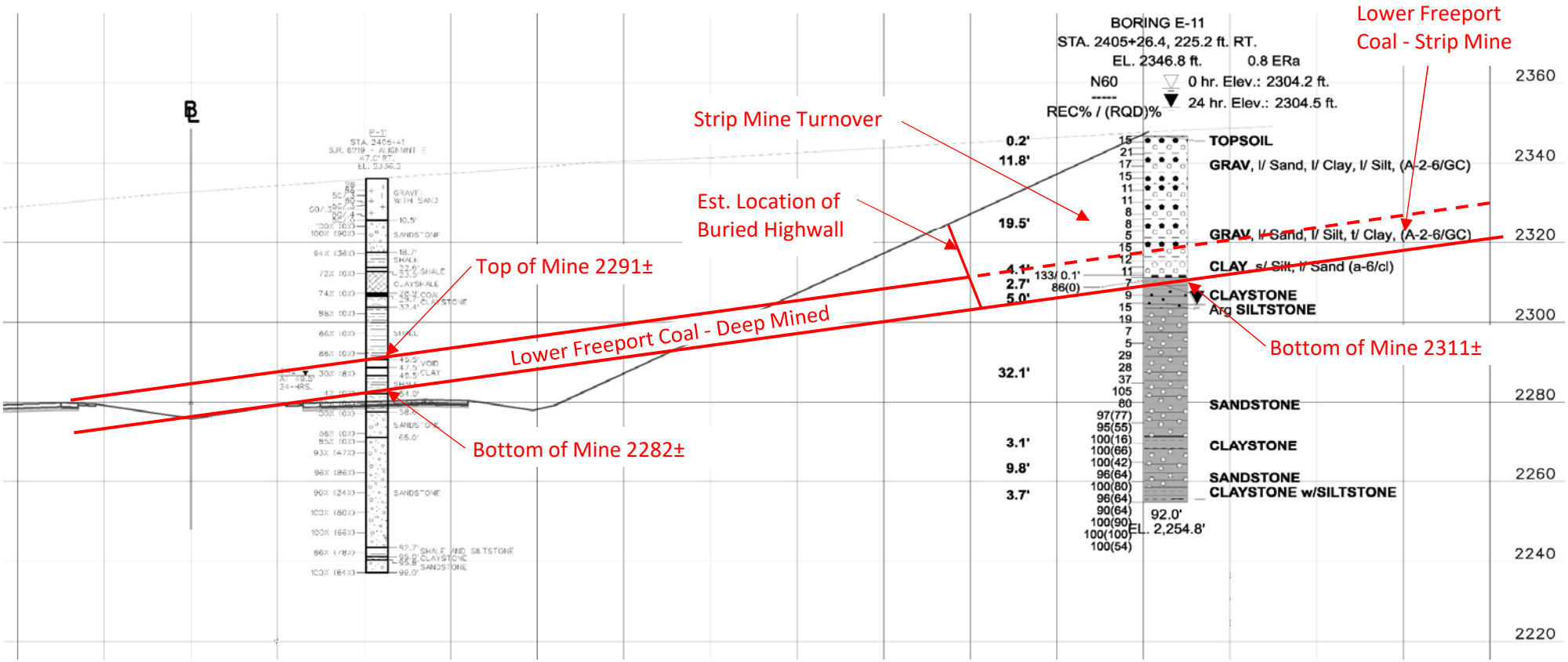

FIGURE 8D:
CROSS SECTION THROUGH
DiVALENTINO DEEP MINE
Scale: None

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: Geo-Mechanics, Inc.

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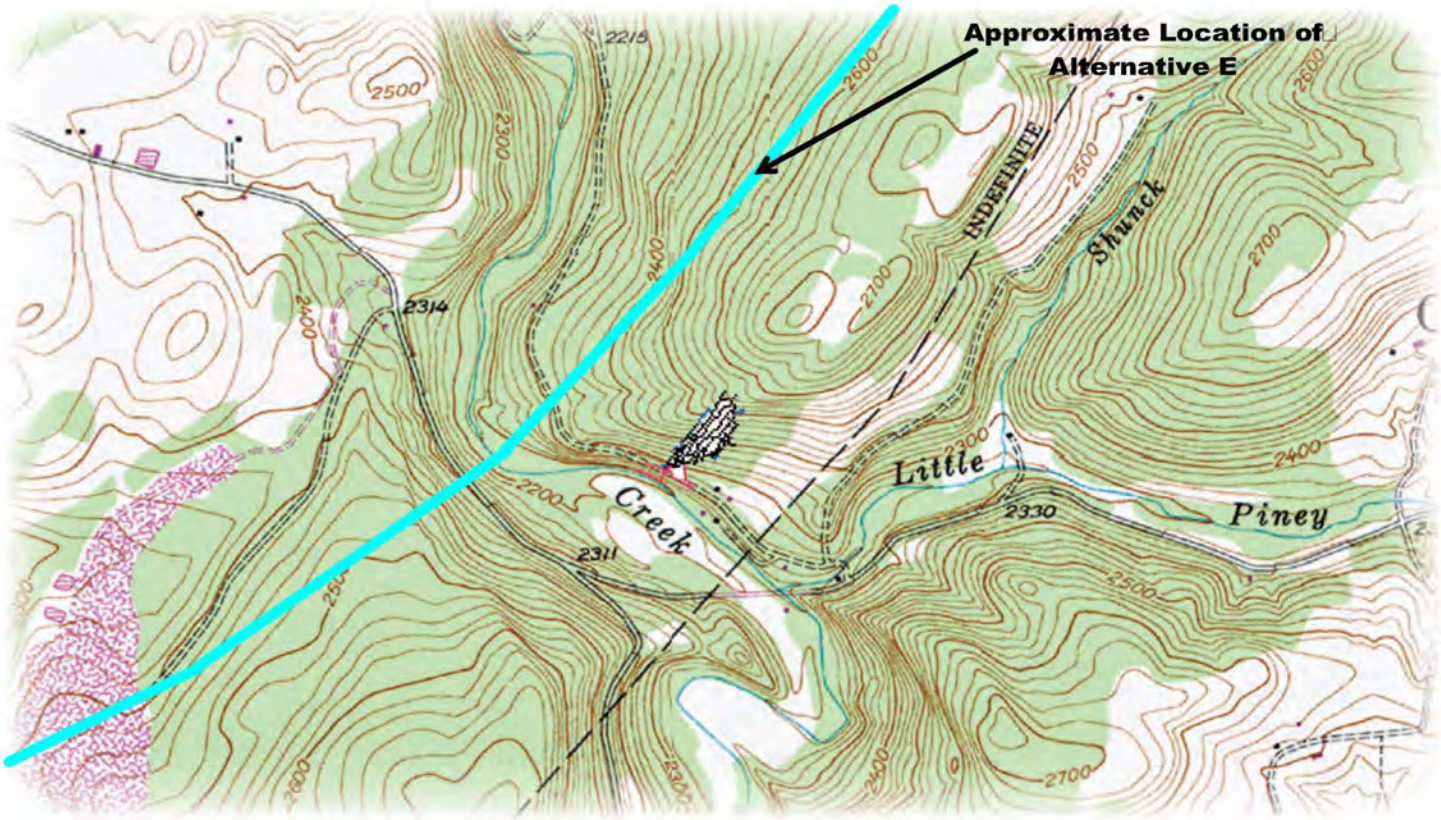
Salisbury Mine-Cave

Somerset County, Pennsylvania



Notes:
Total surveyed sections: 8,443' of mine passage, 697' of natural cave passage, and 1,713' of surface survey.

The location of the cave stream resurgence is suspected to be at the northwest end of the surface survey (depicted in red) on the north bank of Piney Creek.

Mine may not be properly depicted until entrance location coordinates are verified.

2003-2005 Survey by John Chenger, Beth Dillion, Kelsea Johnson, Merideth Johnson, Michael Kerns, Marcia Maslonek, Kevin Rhome, Mike Schirato, Kerry Speelman, and Julie Winner.

FIGURE 9A: **SALISBURY LIMESTONE MINE LOCATION MAP** Scale: As Shown	
Somerset County, PA and Garrett County, MD **SR 6219, Section 050**	
Source: Bat Conservation and Management, Inc., 2005	
GMI Project No. 21032	August 2023

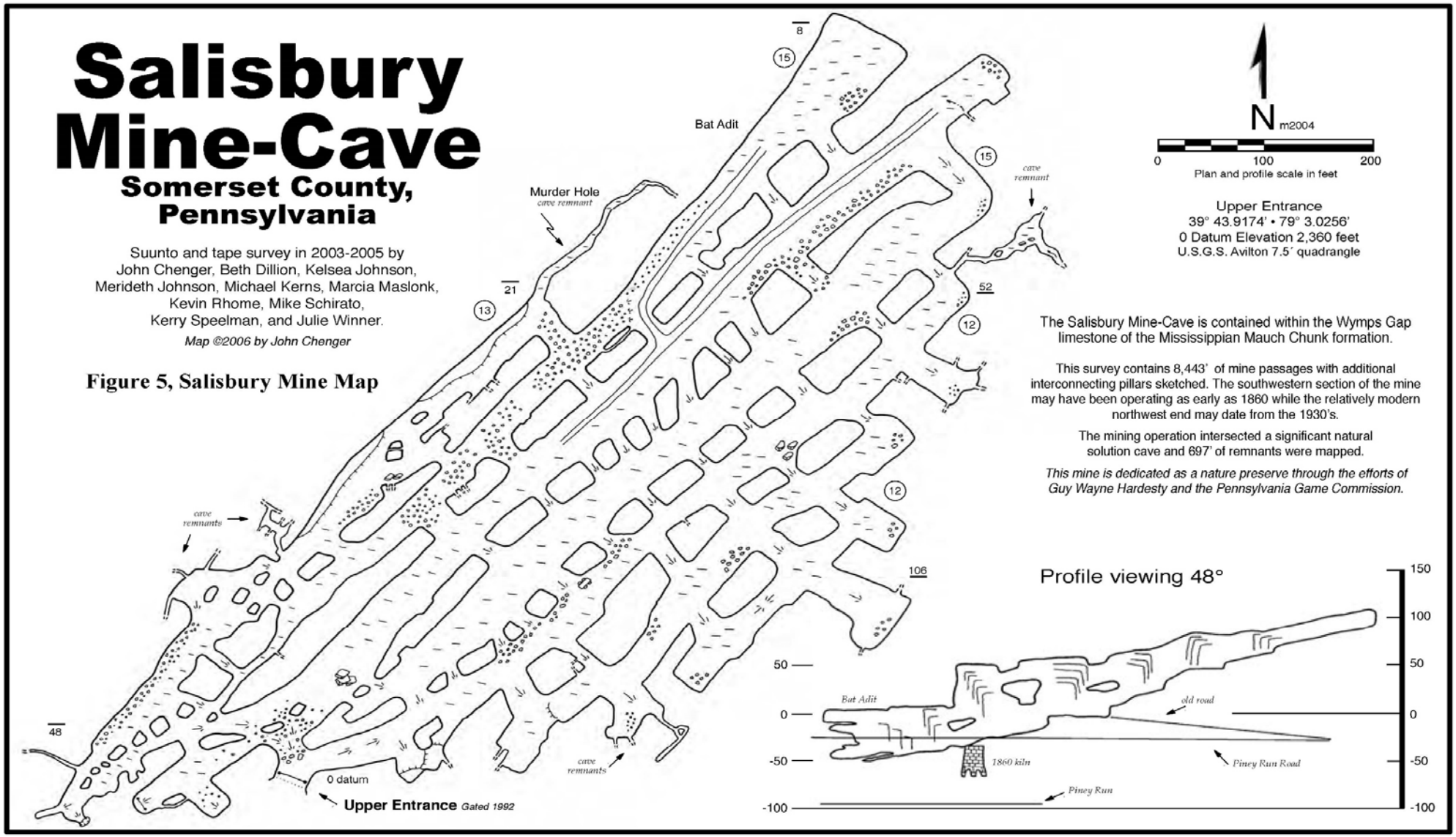


FIGURE 9B:
SALISBURY LIMESTONE MINE DETAIL MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: Suunto And Tape Survey 2003-2005.
Map By John Chenger, 2006

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FIGURE 10:
PUNCH MINE LOCATIONS NEAR PINEY RUN RD.
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: Google Earth & GMI Field Reconnaissance

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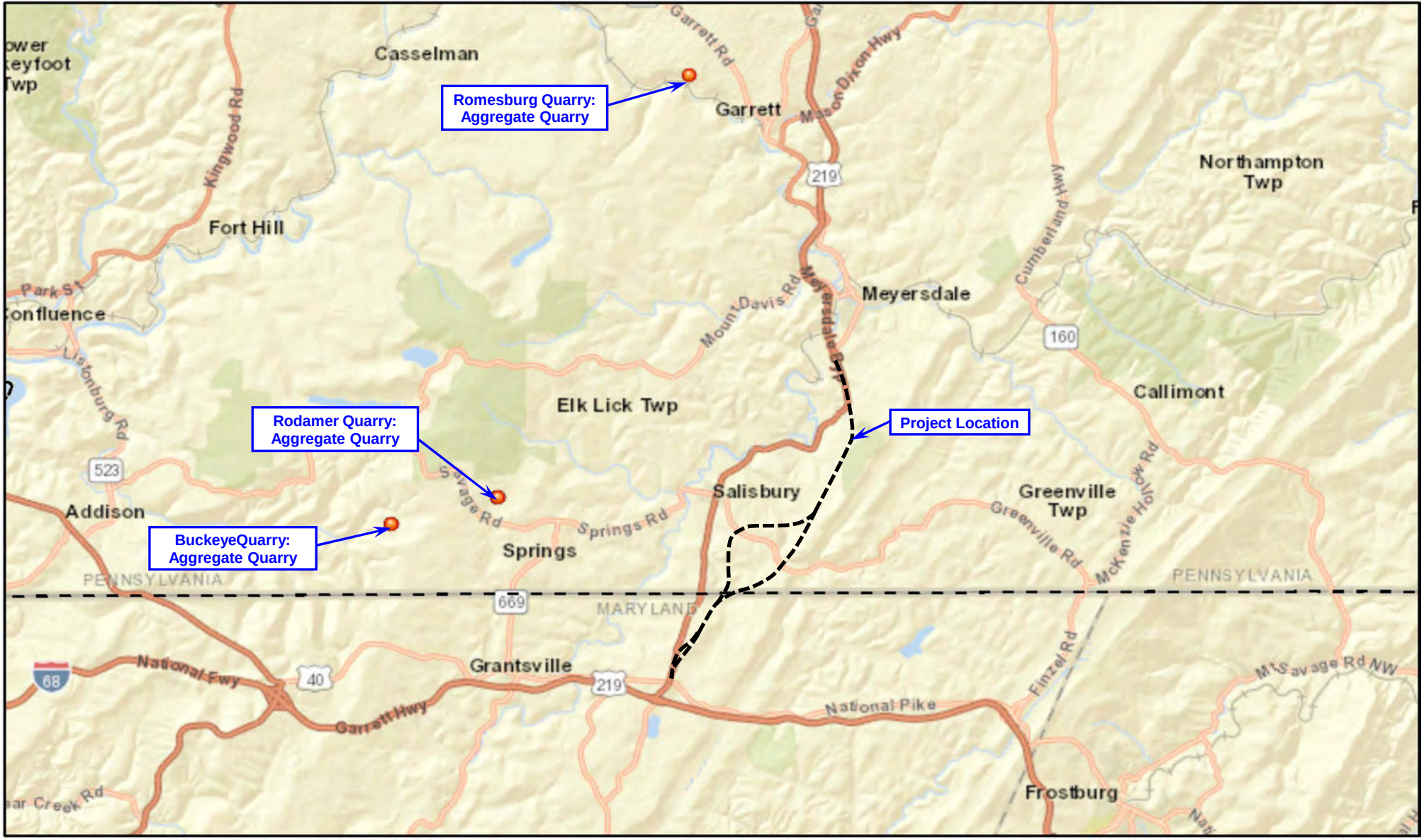

July 19, 2022

1:237,286

0 1.5 3 6 mi

FIGURE 11:
QUARRIES MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: http://maps.dcnr.pa.gov/TOPO/QUARRIES/

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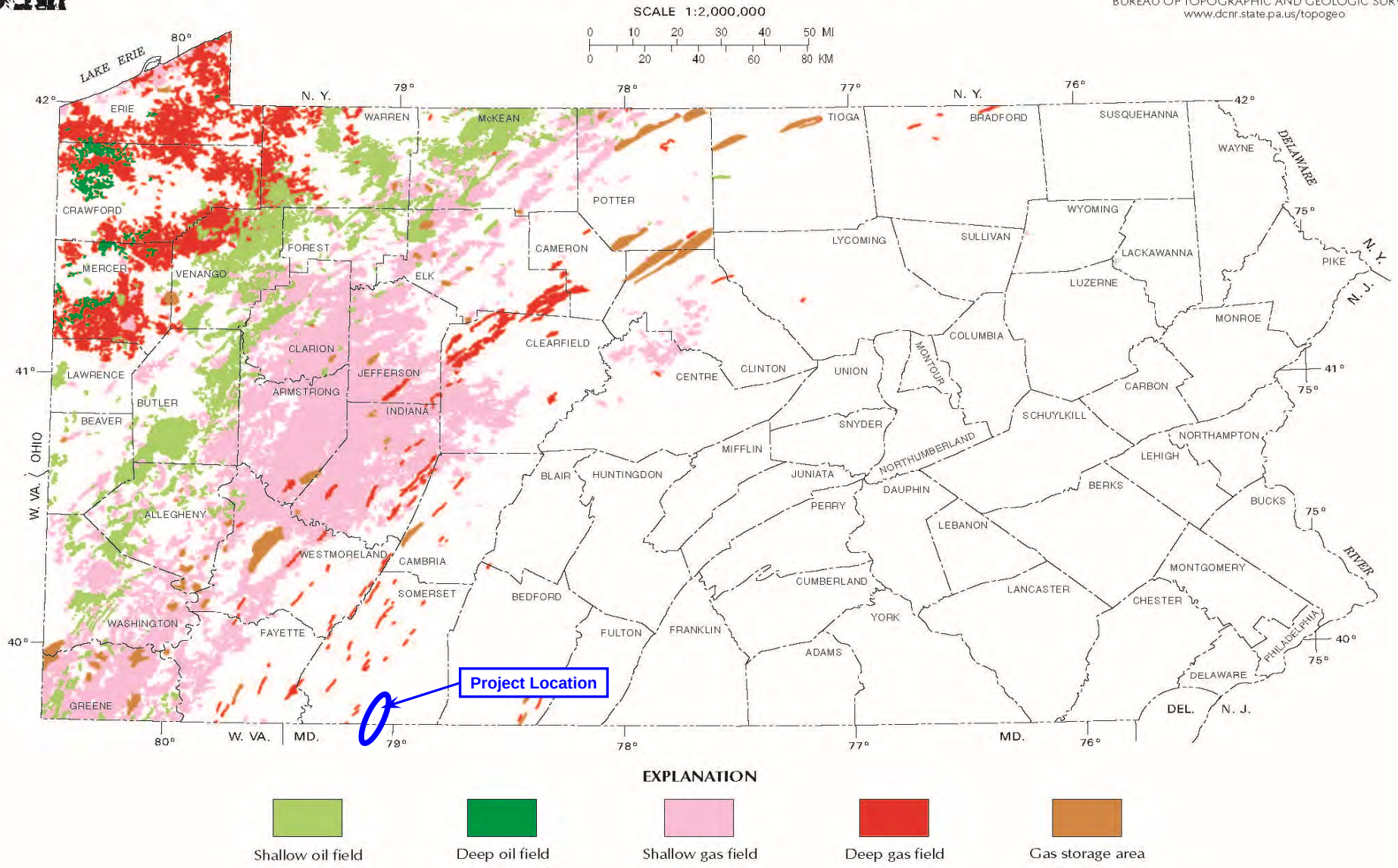
MAP 10

DCNR

OIL AND GAS FIELDS OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

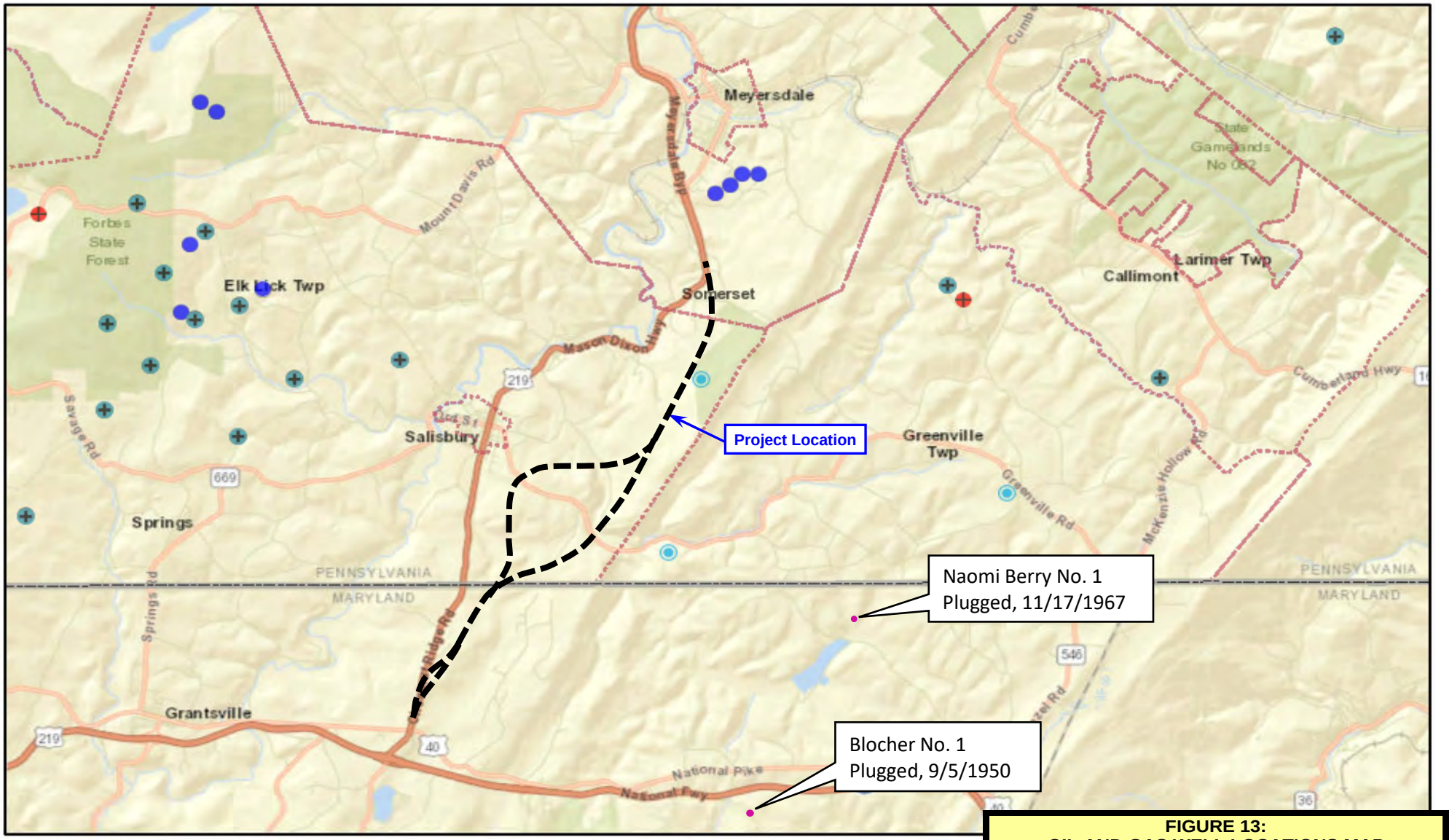
Shallow oil field | Deep oil field | Shallow gas field | Deep gas field | Gas storage area

FIGURE 12:
OIL AND GAS FIELDS MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_016204.pdf

GMI Project No. 21032 | August 2023



July 19, 2022

1:144,448

0 0.75 1.5 3 mi

0 1.5 3 6 km

Legend

Well Layers

Unconventional Oil and Gas Wells	Conventional Oil and Gas Wells
Active	Active
Abandoned	Abandoned
DEP Abandoned	DEP Abandoned
DEP Orphan	DEP Orphan
DEP Plugged	DEP Plugged
Plugged	Plugged
Regulatory Inactive Status	Regulatory Inactive Status

Base Layers

County Boundaries

Municipalities

Legend (MD):

Historical Gas Wells (6-29-2017)

FIGURE 13:
OIL AND GAS WELL LOCATIONS MAP
Scale: As Shown

Somerset County, PA and Garrett County, MD
SR 6219, Section 050

Source: http://www.depgis.state.pa.us/PaOilAndGasMapping/

"Maryland Oil and Gas Viewer"
https://www.arcgis.com/apps/mapviewer/index.htmlwebmap=437d27c219604f61a8e2573f20a0b89e

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APPENDIX C
Laboratory Test Results

TABLE OF CONTENTS

ENGINEER'S CERTIFICATION

I, the undersigned, hereby certify that I am Technical Director of the AASHTO-accredited laboratory of GeoMechanics, Inc. and that the following test methods were used for analysis of soil and rock samples during preparation of the Abbreviated Preliminary Geotechnical Engineering Report for S.R. 6219, Section 050 in Somerset County, Pennsylvania and Garrett County, Maryland. All reported test results have been reviewed for their accuracy and validity.

Type of Test	Method
Moisture Content	AASHTO: T 265; ASTM: D 2216
Gradation	AASHTO: T 88; ASTM: D 422
Atterberg Limits	AASHTO: T 89 and T 90; ASTM: D 4318
Point Load	ASTM: D 5731
Uniaxial Compression Tests	ASTM: D 2938
Acid Base Accounting	Sobek Method (EPA-600/2-78-054)
pH	ASTM: D 4972
Resistivity	ASTM: G 57
Sulfate	EPA 9038
Chloride	EPA 9252

July 28, 2023

GEO-MECHANICS, INC.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21874-E

Walter M. Lorence, P.E.
Executive Vice President

AASHTO ACCREDITED

CERTIFICATE OF ACCREDITATION

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AASHTO

Geo-Mechanics, Inc.

in

Elizabeth, Pennsylvania, USA

has demonstrated proficiency for the testing of construction materials and has conformed to the requirements established in AASHTO R 18 and the AASHTO Accreditation policies established by the AASHTO Committee on Materials and Pavements.

The scope of accreditation can be viewed on the Directory of AASHTO Accredited Laboratories (aashtoresource.org).

Jim Tymon,
AASHTO Executive Director

Moe Jamshidi,
AASHTO COMP Chair

This certificate was generated on 04/20/2023 at 11:46 AM Eastern Time. Please confirm the current accreditation status of this laboratory at aashtoresource.org/aap/accreditation-directory

Scope of AASHTO Accreditation for:

Geo-Mechanics, Inc.

in Elizabeth, Pennsylvania, USA

Quality Management System

Standard:	Accredited Since:
R18 Establishing and Implementing a Quality System for Construction Materials Testing Laboratories	07/01/1995

This certificate was generated on 04/20/2023 at 11:46 AM Eastern Time. Please confirm the current accreditation status of this laboratory at aashtoresource.org/aap/accreditation-directory

Scope of AASHTO Accreditation for:

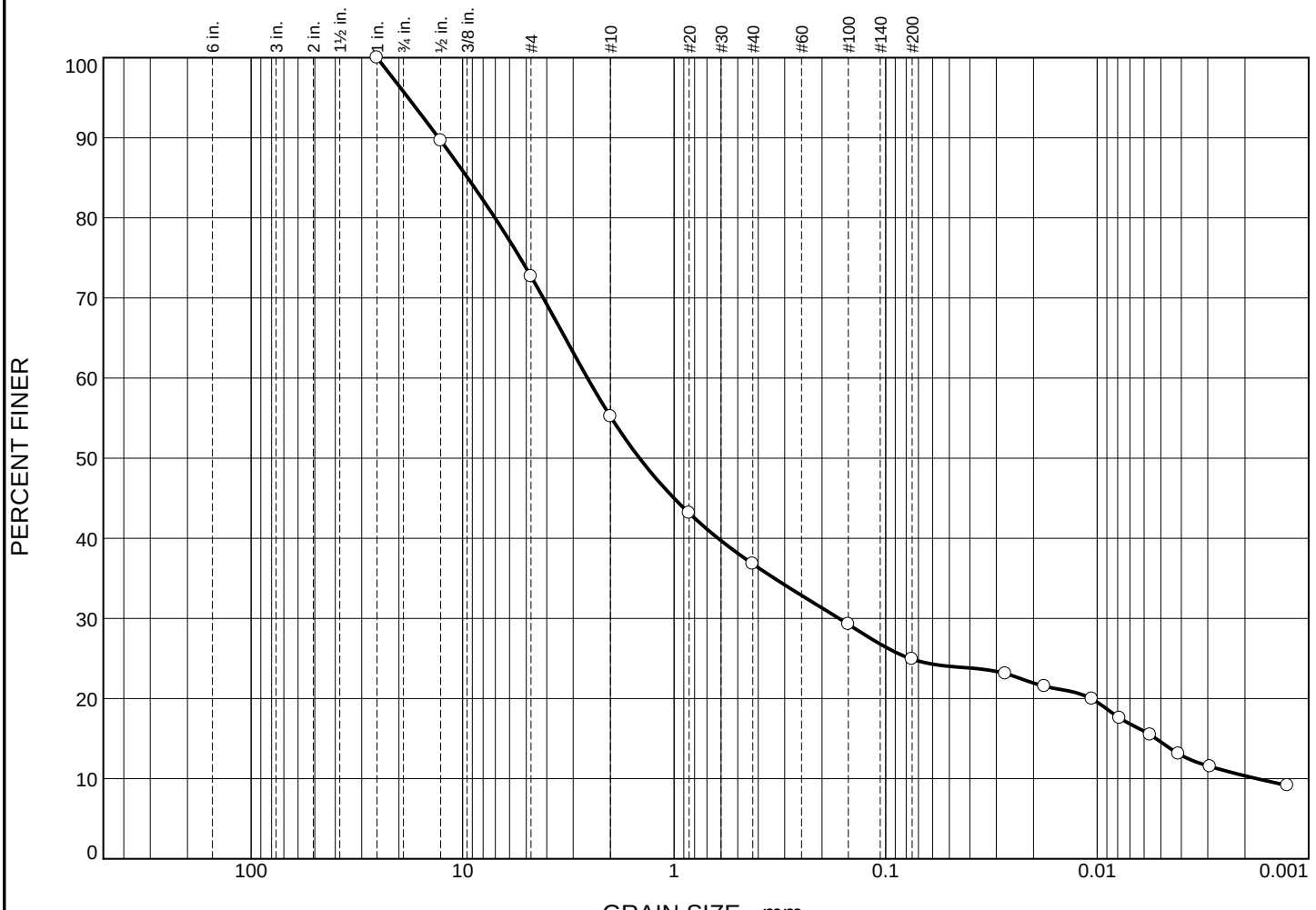
Geo-Mechanics, Inc.

in Elizabeth, Pennsylvania, USA

Soil

Standard:		Accredited Since:
R58	Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test	02/14/2018
T88	Particle Size Analysis of Soils by Hydrometer	07/01/1995
T89	Determining the Liquid Limit of Soils (Atterberg Limits)	07/01/1995
T90	Plastic Limit of Soils (Atterberg Limits)	07/01/1995
T99	The Moisture-Density Relations of Soils Using a 5.5 lb [2.5 kg] Rammer and a 12 in. [305 mm] Drop	07/01/1995
T100	Specific Gravity of Soils	07/01/1995
T193	The California Bearing Ratio	07/01/1995
T216	One-Dimensional Consolidation Properties of Soils Using Incremental Loading	07/01/1995
T236	Direct Shear Test of Soils Under Consolidated Drained Conditions	07/01/1995
T265	Laboratory Determination of Moisture Content of Soils	07/01/1995
D421	Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test	02/14/2018
D422	Particle Size Analysis of Soils by Hydrometer	07/01/1995
D698	The Moisture-Density Relations of Soils Using a 5.5 lb [2.5 kg] Rammer and a 12 in. [305 mm] Drop	07/01/1995
D1883	The California Bearing Ratio	07/01/1995
D2216	Laboratory Determination of Moisture Content of Soils	07/01/1995
D2435	One-Dimensional Consolidation Properties of Soils Using Incremental Loading	07/01/1995
D4318	Determining the Liquid Limit of Soils (Atterberg Limits)	07/01/1995
D4318	Plastic Limit of Soils (Atterberg Limits)	07/01/1995

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	44.8	18.4	11.9	14.5	10.4

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	29	19	9.4667	2.5673	1.4569	0.1663	0.0053	0.0018	6.13	1460.67

Material Description	USCS	AASHTO
○ CLAYEY SAND WITH GRAVEL (COLLUVIAL)	SC	A-2-4(0)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** DU-1 **Depth:** 1.5'-4.5'

Remarks:

○N.W.C.= 6.2%

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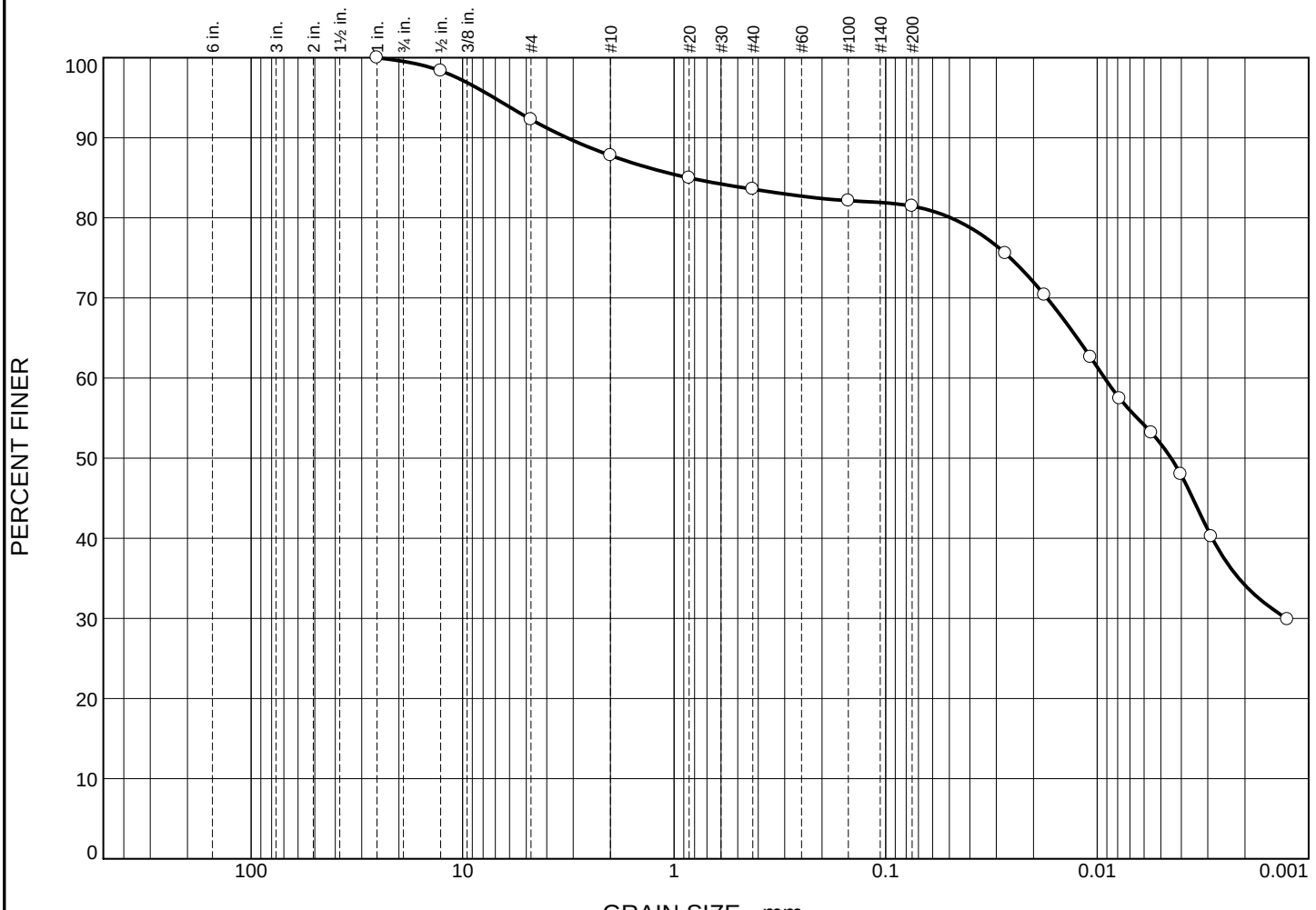
Figure LT-1

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	12.2	4.2	2.1	47.4	34.1

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	42	22	0.8515	0.0092	0.0045	0.0013				

Material Description	USCS	AASHTO
○ LEAN CLAY WITH GRAVEL (RESIDUAL)	CL	A-7-6(17)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** DU-3 **Depth:** 6.0'-9.0'

Remarks:

○N.W.C.= 15.8%

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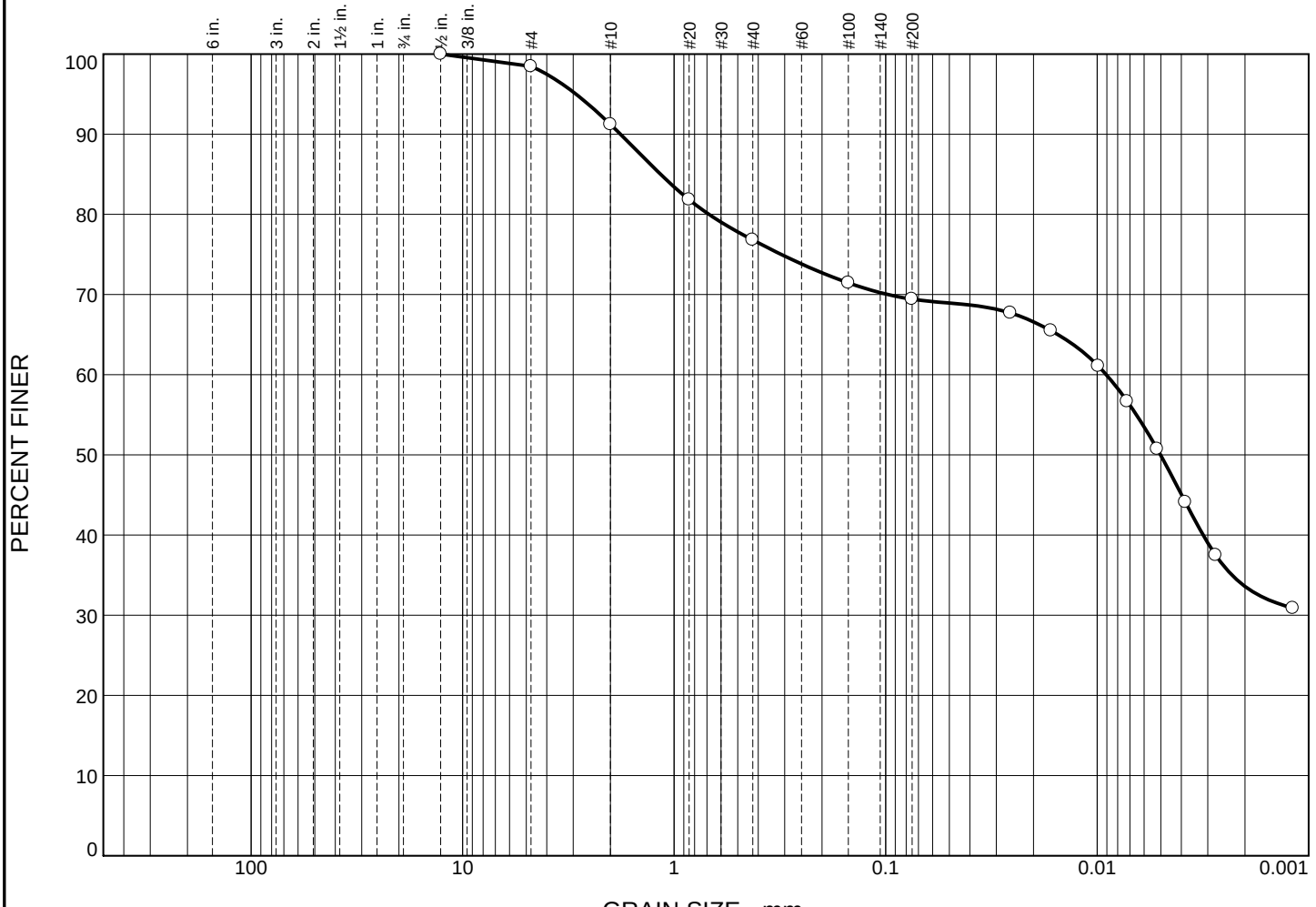
Figure LT-2

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	8.8	14.4	7.4	35.8	33.6

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	44	24	1.1580	0.0090	0.0050					

Material Description	USCS	AASHTO
○ SANDY LEAN CLAY (RESIDUAL)	CL	A-7-6(13)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-1A **Depth:** 6.0'-9.0'

Remarks:

○N.W.C.= 14.4%

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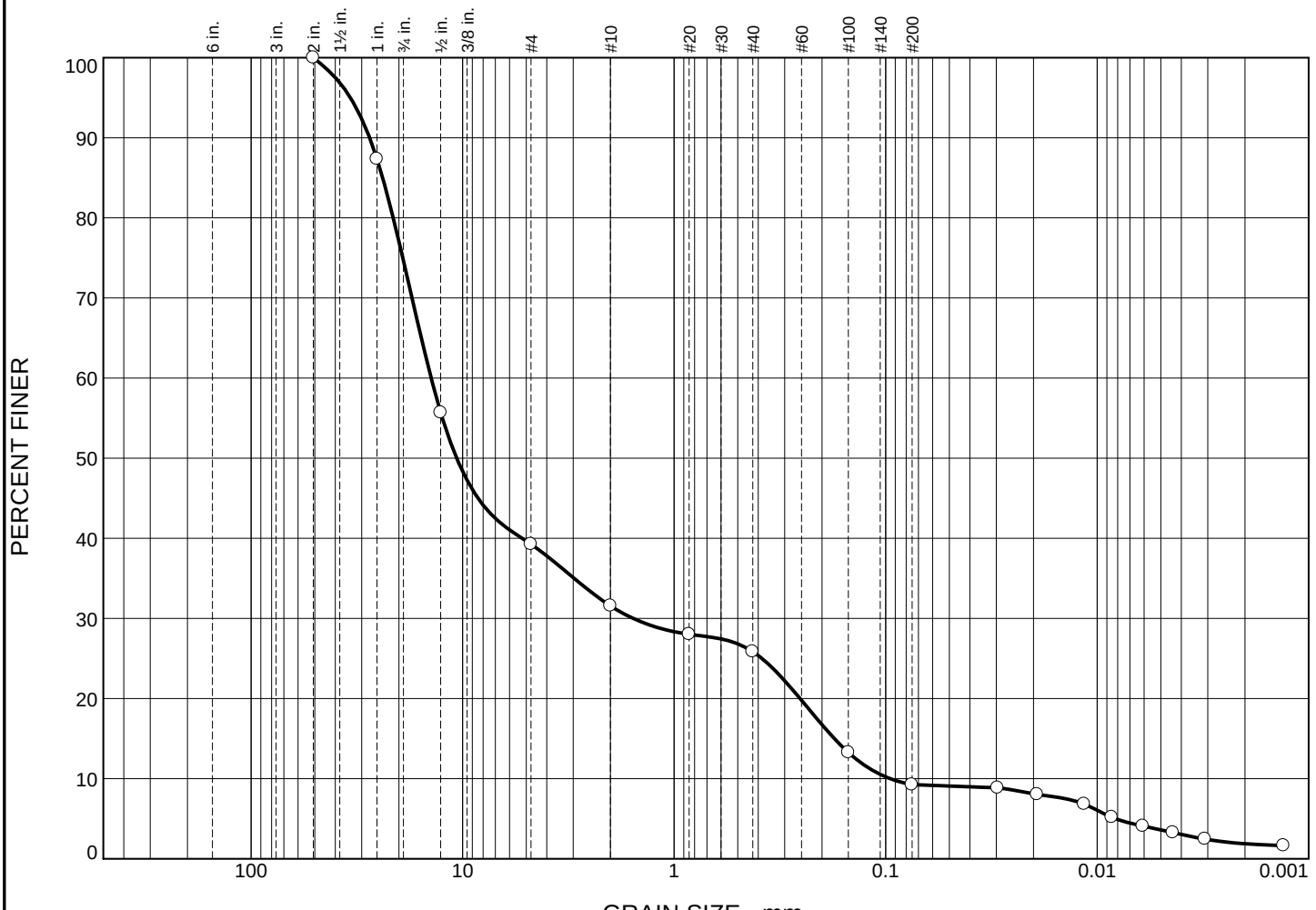
Figure LT-3

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	68.4	5.7	16.7	7.3	1.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	23.8852	14.0851	10.6678	1.5606	0.1748	0.0953	1.81	147.81

Material Description	USCS	AASHTO
○ WELL GRADED GRAVEL WITH SILT AND SAND (COLLUVIAL)	GW-GM	A-1-a

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-4 **Depth:** 6.0'-9.0'

Remarks:

○N.W.C.= 17.2%

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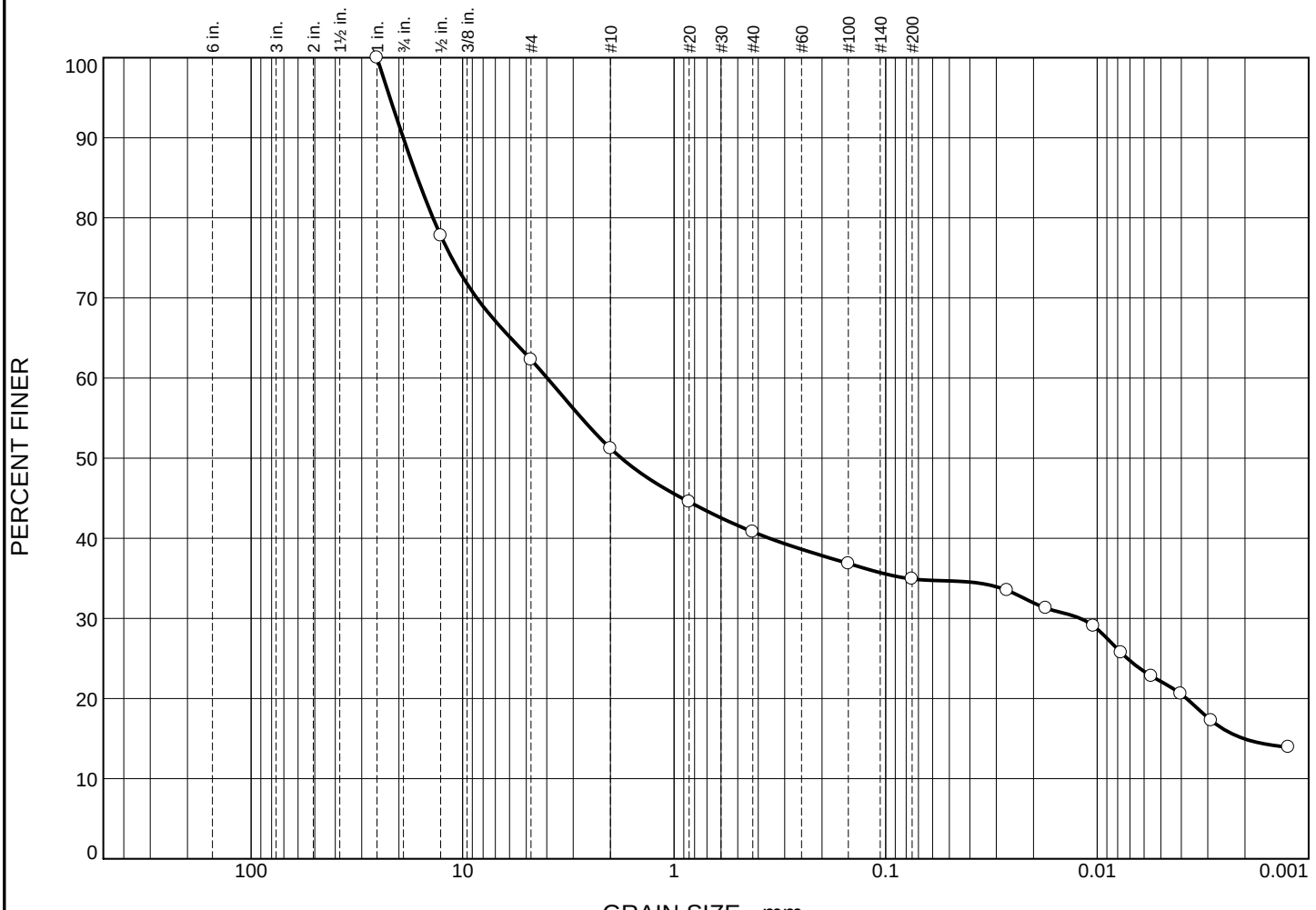
Figure LT-4

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	48.8	10.4	5.9	20.0	14.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	33	20	16.3737	3.9798	1.7748	0.0120	0.0020			

Material Description	USCS	AASHTO
○ CLAYEY GRAVEL WITH SAND (FILL)	GC	A-2-6(1)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-5 **Depth:** 4.5'-9.0'

Remarks:

○N.W.C.= 11.9%

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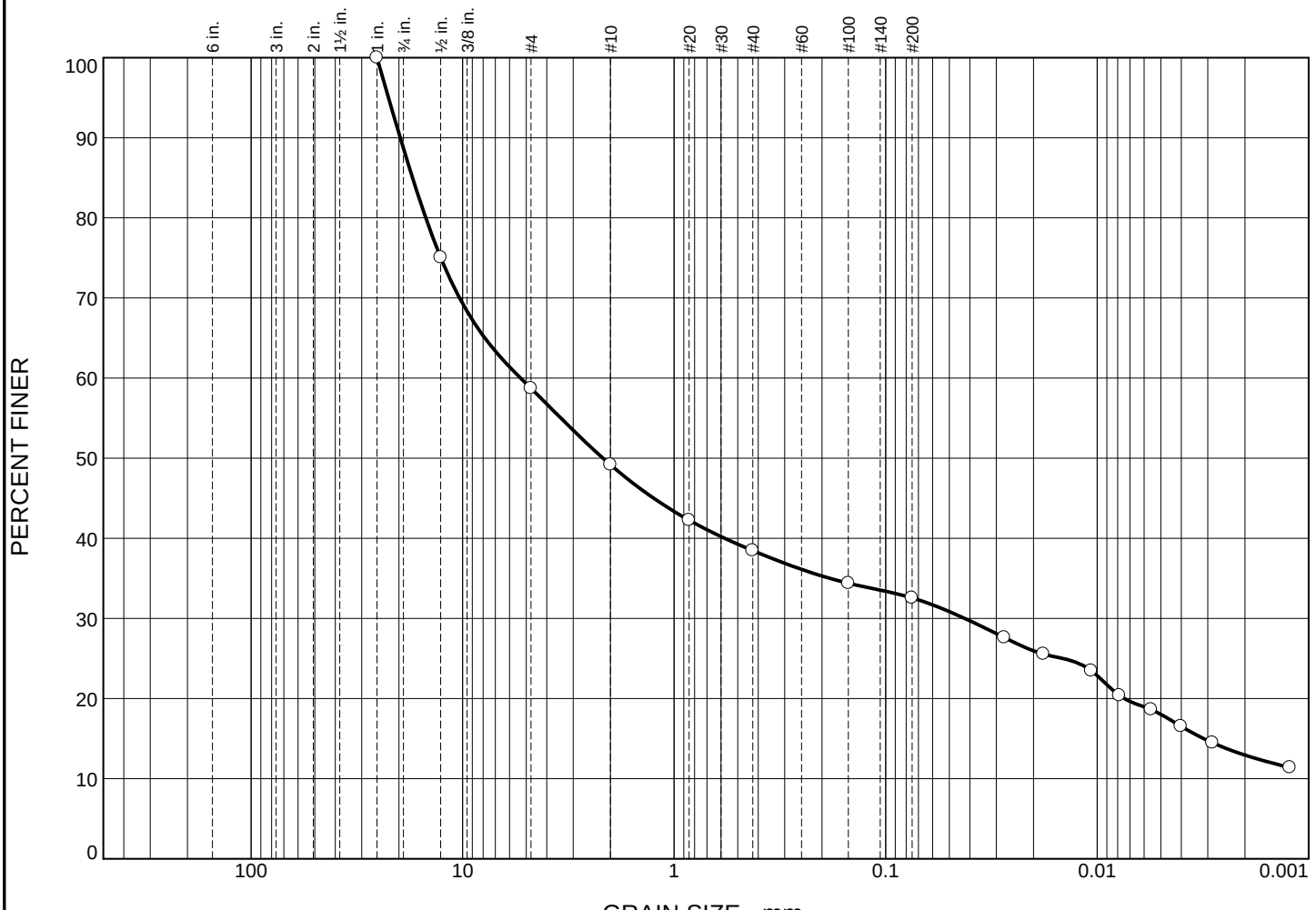
Figure LT-5

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	50.8	10.7	5.9	19.7	12.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	33	20	17.2543	5.3243	2.1704	0.0423	0.0031			

Material Description	USCS	AASHTO
○ CLAYEY GRAVEL WITH SAND (FILL)	GC	A-2-6(1)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-5 **Depth:** 12.0'-15.0'

Remarks:

○N.W.C.= 11.4%

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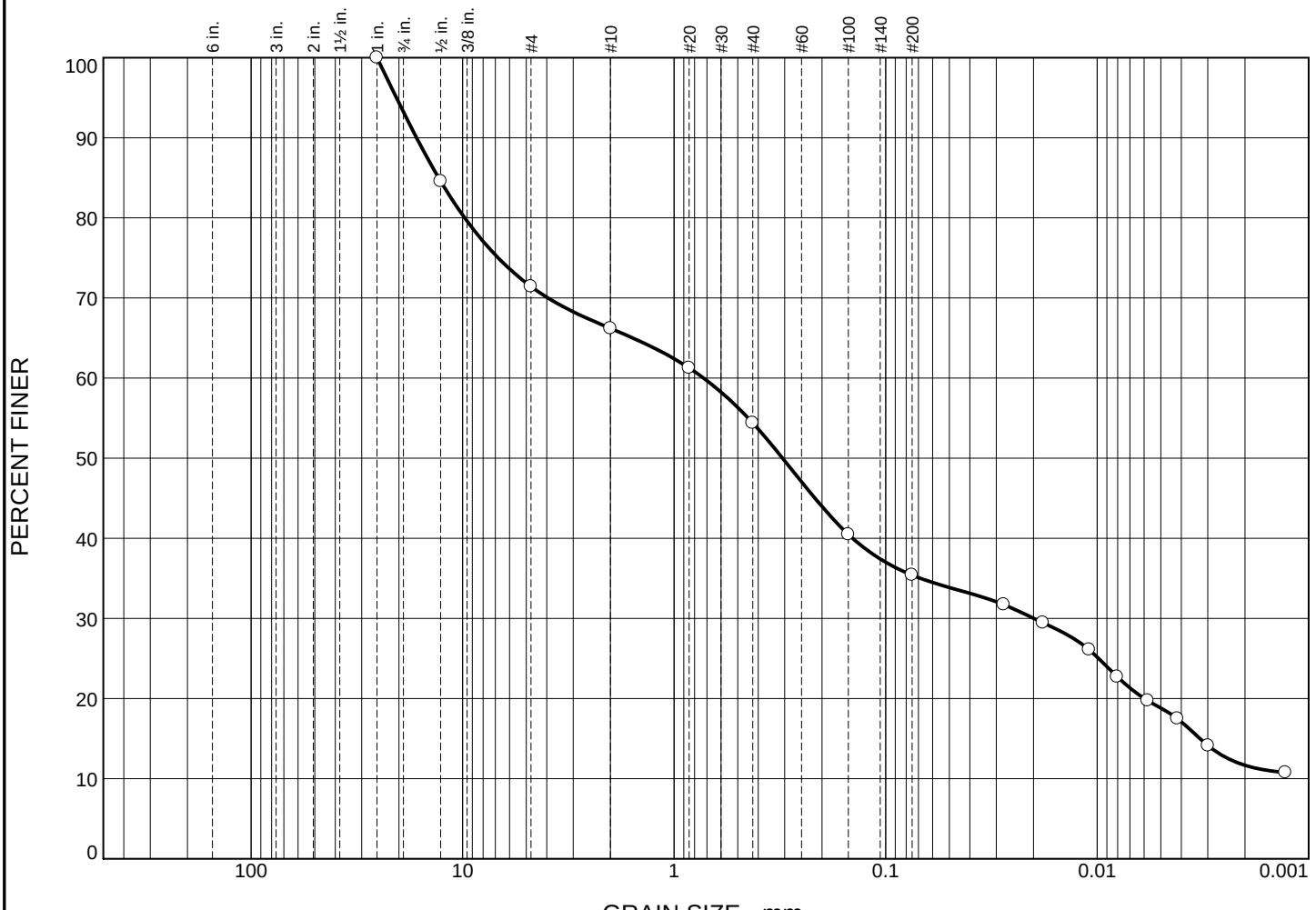
Figure LT-6

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	33.8	11.8	19.0	23.7	11.7

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	22	15	12.9895	0.7262	0.3071	0.0199	0.0033			

	Material Description	USCS	AASHTO
○	SILTY, CLAYEY SAND WITH GRAVEL (COLLUVIAL)	SC-SM	A-2-4(0)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-7 **Depth:** 6.0'-9.0'

Remarks:

○N.W.C.= 9.0%

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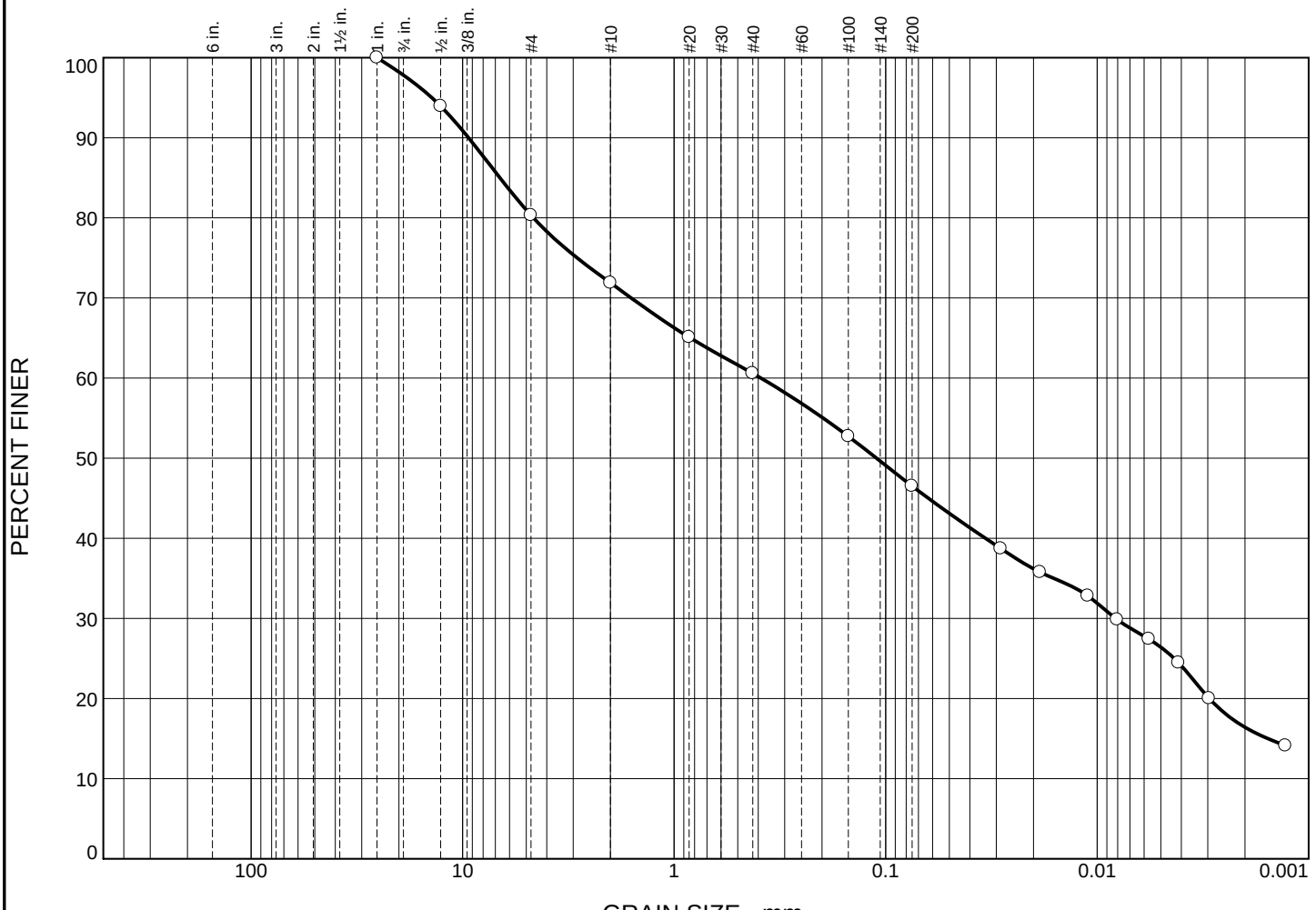
Figure LT-7

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	28.1	11.3	14.1	30.1	16.4

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	27	17	6.6623	0.3892	0.1105	0.0082	0.0016			

Material Description	USCS	AASHTO
○ CLAYEY SAND WITH GRAVEL (COLLUVIAL)	SC	A-4(1)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-7 **Depth:** 12.0'-15.0'

Remarks:

○N.W.C.= 15.1%

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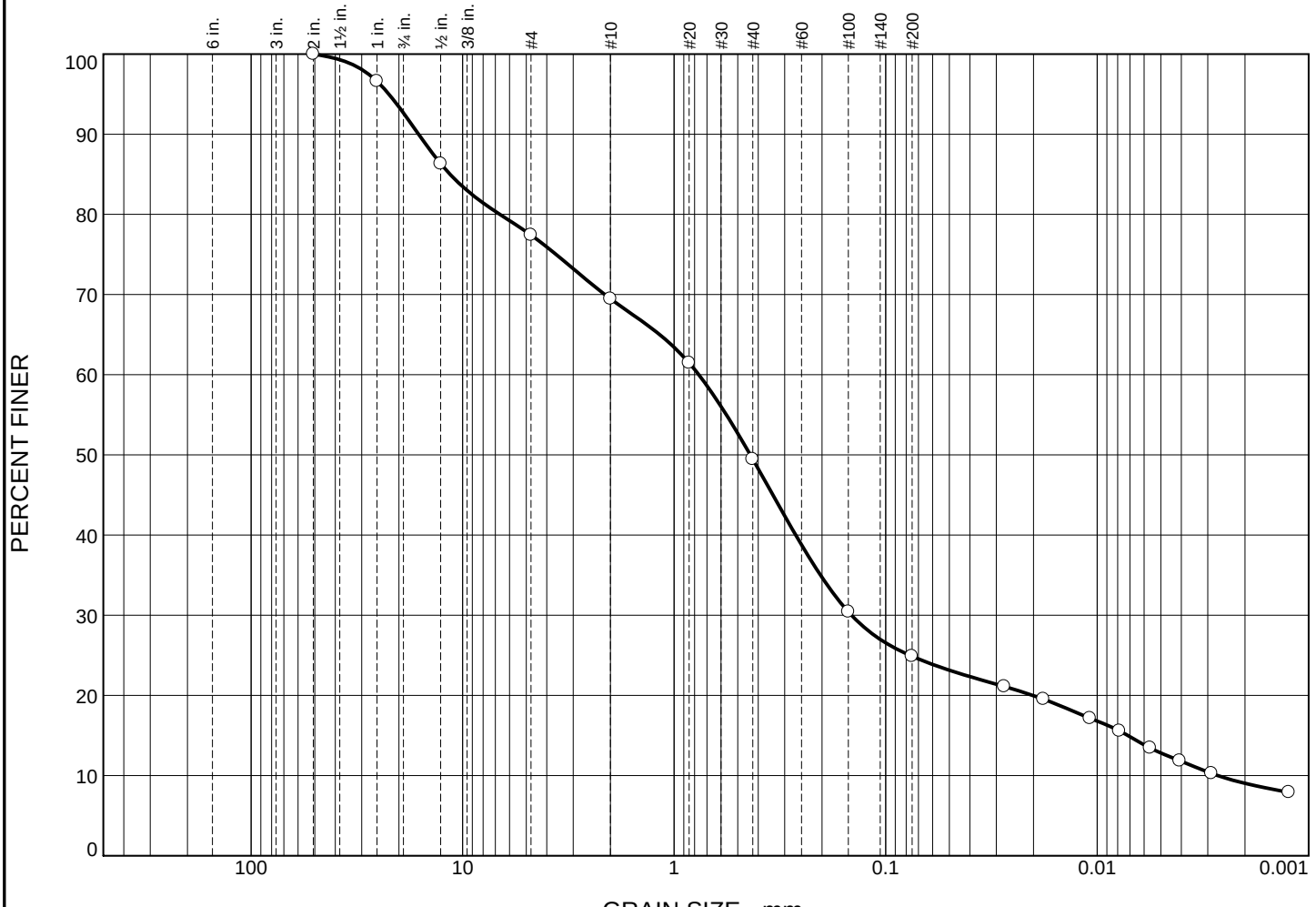
Figure LT-8

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	30.5	20.0	24.6	15.9	9.0

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	17	12	11.4679	0.7651	0.4365	0.1450	0.0072	0.0027	10.22	284.37

Material Description	USCS	AASHTO
○ SILTY, CLAYEY SAND WITH GRAVEL (COLLUVIAL)	SC-SM	A-1-b

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-8 **Depth:** 3.0'-7.5'

Remarks:

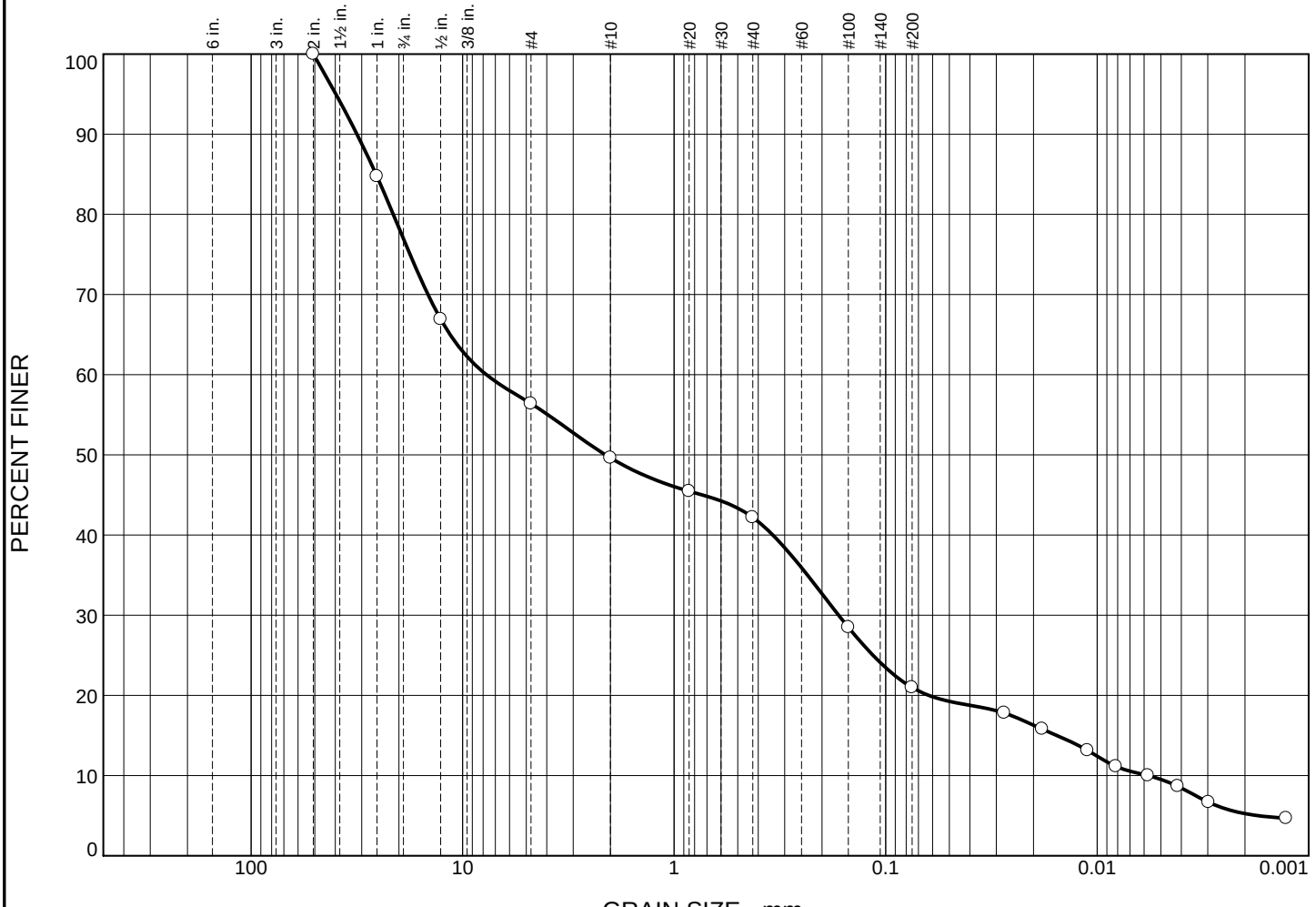
○N.W.C.= 6.4%

JAR SAMPLES

GEO-MECHANICS, INC.

Figure LT-9

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	50.4	7.4	21.2	15.8	5.2

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	25.6605	7.7192	2.1100	0.1668	0.0155	0.0058	0.63	1341.00

Material Description	USCS	AASHTO
○ SILTY GRAVEL WITH SAND (COLLUVIAL)	GM	A-1-b

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-9 **Depth:** 4.5'-7.5'

Remarks:

○N.W.C.= 7.9%

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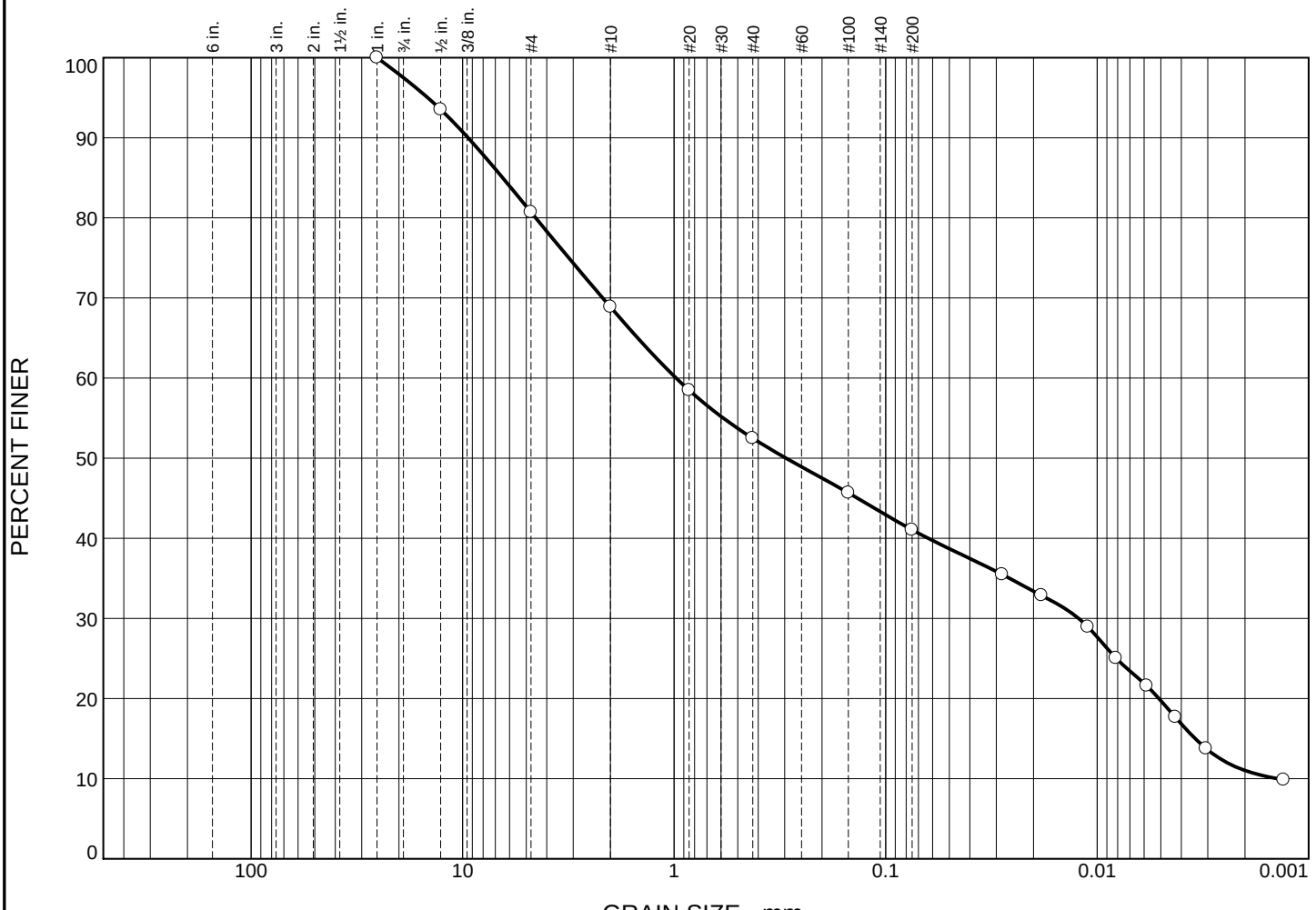
Figure LT-10

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	31.1	16.4	11.4	30.1	11.0

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	30	21	6.4660	0.9787	0.2956	0.0122	0.0034	0.0014	0.11	695.16

Material Description	USCS	AASHTO
○ CLAYEY SAND WITH GRAVEL (RESIDUAL)	SC	A-4(1)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-10 **Depth:** 10.5'-13.5'

Remarks:

○N.W.C.= 11.7%

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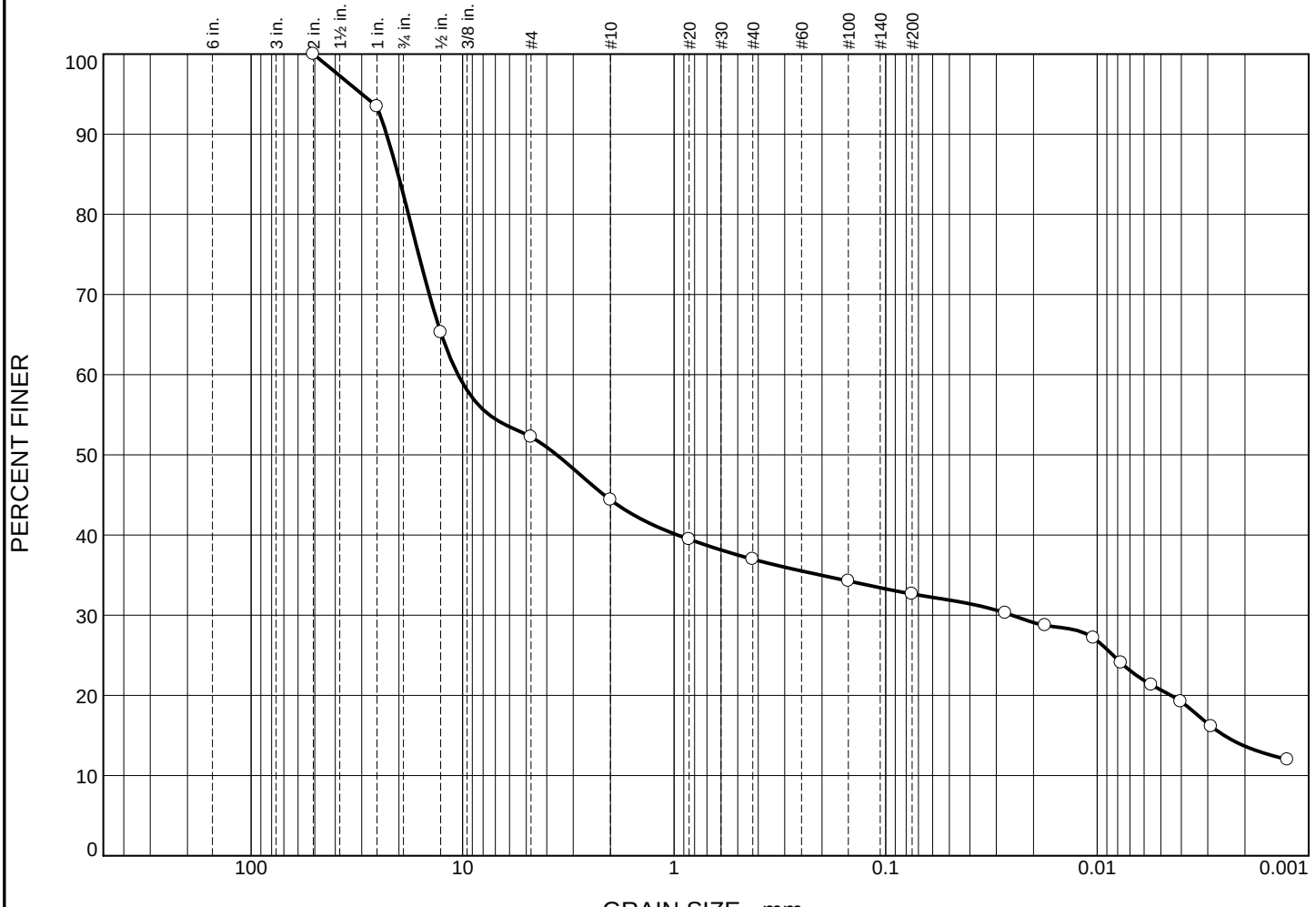
Figure LT-11

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	55.6	7.4	4.4	18.9	13.7

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	31	18	20.1973	10.5112	3.5855	0.0253	0.0025			

Material Description	USCS	AASHTO
○ CLAYEY GRAVEL (FILL)	GC	A-2-6(1)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-11 **Depth:** 6.0'-12.0'

Remarks:

○N.W.C.= 8.5%

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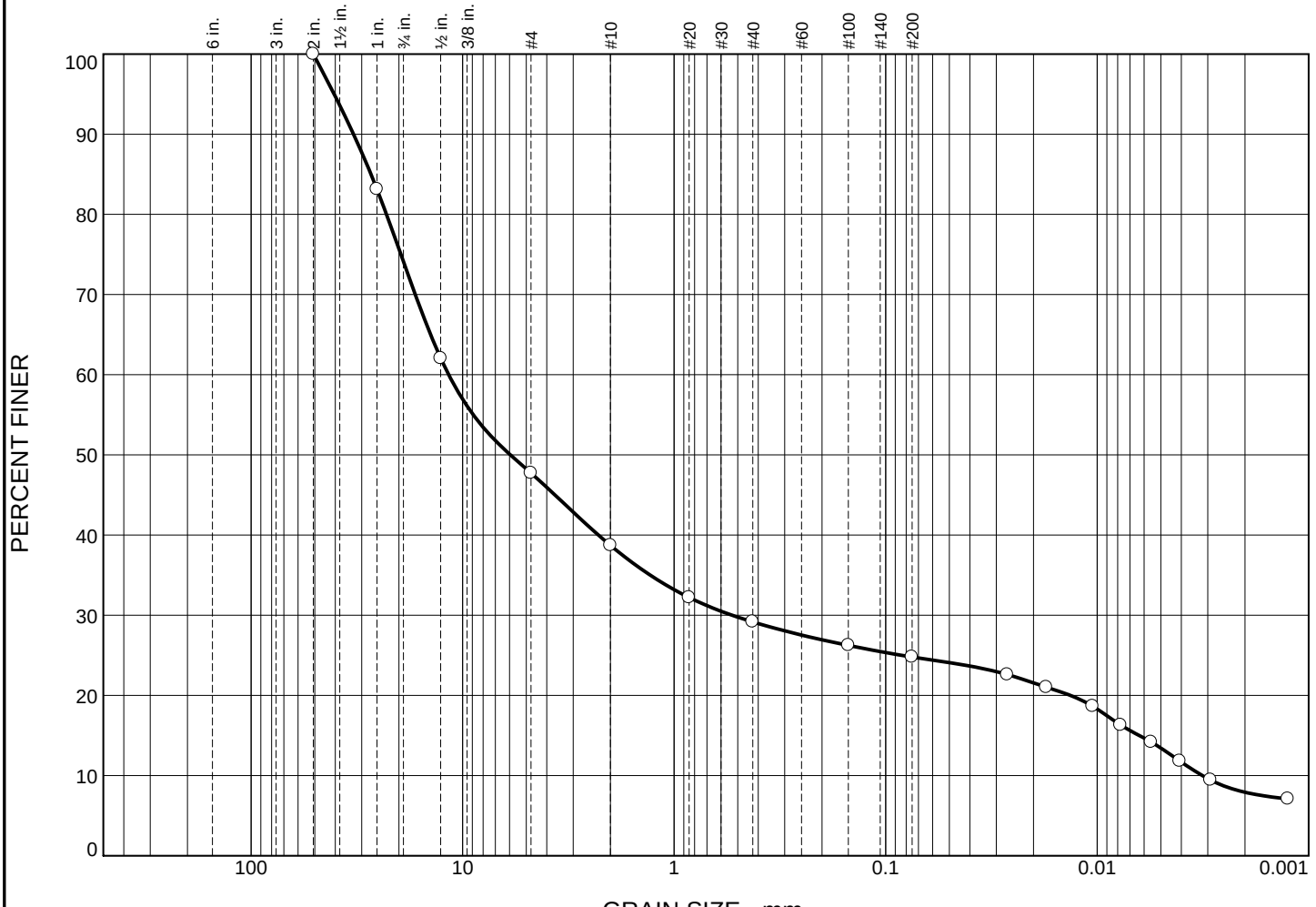
GEO-MECHANICS, INC.

Figure LT-12

Particle Size Distribution Report



	% +3"	% Gravel	% Sand		% Fines	
			Coarse	Fine	Silt	Clay
○	0.0	61.3	9.5	4.4	16.9	7.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	29	18	27.1156	11.6438	5.9501	0.5318	0.0063	0.0032	7.63	3658.25

Material Description	USCS	AASHTO
○ CLAYEY GRAVEL (FILL)	GC	A-2-6(0)

Project No. 21032 **Client:** STANTEC CONSULTING SERVICES, INC.

Project: S.R. 06219, SECTION 050 - SOMERSET CO., PA & GARRETT CO., MD

○ **Source of Sample:** E-11 **Depth:** 12.0'-21.0'

Remarks:

○N.W.C.= 10.5%

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Figure LT-13

GeoMechanics, inc
Consulting Engineers/Scientists
Elizabeth, Pennsylvania

POINT LOAD STRENGTH INDEX TEST DATA (ASTM: D 5731)

Project/Project No.: 21032
Project Location: S.R. 6219, Section 050 - Somerset Co., Pa & Garrett Co., Md
Date of Testing: 4/19/23

Sample No.: Depth	RockDescription/ Lithology	Load Type (1)	Sample Diameter (in.)	Sample Length (in.)	Equiv. Core Diameter D_e^2 (in.)	Gauge Reading G	Load P (lbs.)	Point Load Strength $I_s = P/D_e^2$ (PSI)	Correction Factor F	Corrected Point Load Strength $I_{s(D)} = F*I_s$		Uniaxial Compressive Strength (2) $24*I_{s(D)}$ (TSF)
										(PSI)	(TSF)	
DU-1: 8.0'-10.0'	SANDSTONE	A	1.976	0.935	2.352	1,541	1,541	655.1	0.89	585.5	42.2	1,011.8
DU-1: 8.0'-10.0'	SANDSTONE	A	1.978	0.591	1.488	751	751	504.6	0.81	406.8	29.3	703.0
DU-1: 8.0'-10.0'	SANDSTONE	A	1.975	1.141	2.869	2,529	2,529	881.5	0.93	823.8	59.3	1,423.6
DU-1: 8.0'-10.0'	SANDSTONE	A	1.985	1.299	3.283	2,572	2,572	783.4	0.96	754.8	54.3	1,304.2
DU-1: 8.0'-10.0'	SANDSTONE	A	1.978	1.240	3.123	1,103	1,103	353.2	0.95	336.5	24.2	581.4
DU-1: 8.0'-10.0'	SANDSTONE	A	1.984	0.827	2.089	1,424	1,424	681.7	0.87	593.2	42.7	1,025.0
DU-1: 8.0'-10.0'	SANDSTONE	A	1.986	0.866	2.190	1,885	1,885	860.8	0.88	757.1	54.5	1,308.2
DU-1: 8.0'-10.0'	SANDSTONE	A	1.985	0.472	1.193	584	584	489.6	0.77	375.6	27.0	649.0
DU-1: 8.0'-10.0'	SANDSTONE	A	1.974	0.748	1.880	476	476	253.2	0.85	215.2	15.5	371.8
DU-1: 8.0'-10.0'	SANDSTONE	A	1.976	0.866	2.179	845	845	387.8	0.88	340.7	24.5	588.8

(1) A = Axial , D = Diametral, I = Irregular Lump
(2) Based on an Index to Strength conversion factor of 24 for NX core as recommended by ASTM

GeoMechanics, inc
Consulting Engineers/Scientists
Elizabeth, Pennsylvania

POINT LOAD STRENGTH INDEX TEST DATA (ASTM: D 5731)

Project/Project No.: 21032
Project Location: S.R. 6219, Section 050 - Somerset Co., Pa & Garrett Co., Md
Date of Testing: 4/19/23

Sample No.: Depth	RockDescription/ Lithology	Load Type (1)	Sample Diameter (in.)	Sample Length (in.)	Equiv. Core Diameter D_e^2 (in.)	Gauge Reading G	Load P (lbs.)	Point Load Strength $I_s = P/D_e^2$ (PSI)	Correction Factor F	Corrected Point Load Strength $I_{s(D)} = F*I_s$		Uniaxial Compressive Strength (2) $24*I_{s(D)}$ (TSF)
										(PSI)	(TSF)	
DU-1: 13.0'-15.0'	SANDSTONE	A	1.980	0.827	2.085	576	576	276.3	0.87	240.3	17.3	415.3
DU-1: 13.0'-15.0'	SANDSTONE	A	1.968	0.551	1.381	243	243	176.0	0.79	139.5	10.0	241.1
DU-1: 13.0'-15.0'	SANDSTONE	A	1.978	1.024	2.579	1,565	1,565	606.9	0.91	553.7	39.9	956.9
DU-1: 13.0'-15.0'	SANDSTONE	A	1.983	0.807	2.037	1,710	1,710	839.3	0.87	726.3	52.3	1,255.0
DU-1: 13.0'-15.0'	SANDSTONE	A	1.968	0.906	2.270	1,351	1,351	595.1	0.89	527.7	38.0	911.8
DU-1: 13.0'-15.0'	SANDSTONE	A	1.967	0.945	2.367	1,232	1,232	520.6	0.89	465.9	33.5	805.1
DU-1: 13.0'-15.0'	SANDSTONE	A	1.981	0.787	1.985	375	375	188.9	0.86	162.5	11.7	280.8
DU-1: 13.0'-15.0'	SANDSTONE	A	1.979	0.512	1.290	693	693	537.2	0.78	419.4	30.2	724.8
DU-1: 13.0'-15.0'	SANDSTONE	A	1.882	1.082	2.593	485	485	187.1	0.91	170.9	12.3	295.3
DU-1: 13.0'-15.0'	SANDSTONE	A	1.620	0.945	1.949	369	369	189.3	0.86	162.2	11.7	280.3

(1) A = Axial , D = Diametral, I = Irregular Lump
(2) Based on an Index to Strength conversion factor of 24 for NX core as recommended by ASTM

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POINT LOAD STRENGTH INDEX TEST DATA (ASTM: D 5731)

Project/Project No.: 21032
Project Location: S.R. 6219, Section 050 - Somerset Co., Pa & Garrett Co., Md
Date of Testing: 4/19/23

Sample No.: Depth	RockDescription/ Lithology	Load Type [1]	Sample Diameter (in.)	Sample Length (in.)	Equiv. Core Diameter D_e^2 (in.)	Gauge Reading G	Load P (lbs.)	Point Load Strength $I_s = P/D_e^2$ (PSI)	Correction Factor F	Corrected Point Load Strength $I_{s(D)} = F*I_s$		Uniaxial Compressive Strength [2] $24*I_{s(D)}$ (TSF)
										(PSI)	(TSF)	
DU-1: 16.0'-18.0'	SANDSTONE	A	1.974	0.787	1.978	575	575	290.7	0.86	249.9	18.0	431.8
DU-1: 16.0'-18.0'	SANDSTONE	A	1.974	1.121	2.817	1,346	1,346	477.7	0.93	444.7	32.0	768.4
DU-1: 16.0'-18.0'	SANDSTONE	A	1.984	0.748	1.889	1,287	1,287	681.1	0.85	579.5	41.7	1,001.4
DU-1: 16.0'-18.0'	SANDSTONE	A	1.973	0.630	1.583	527	527	333.0	0.82	272.2	19.6	470.4
DU-1: 16.0'-18.0'	SANDSTONE	A	1.976	0.485	1.220	557	557	456.5	0.77	352.0	25.3	608.2
DU-1: 16.0'-18.0'	SANDSTONE	A	1.969	0.840	2.106	921	921	437.4	0.87	381.3	27.5	658.9
DU-1: 16.0'-18.0'	SANDSTONE	A	1.982	0.787	1.986	349	349	175.7	0.86	151.2	10.9	261.3
DU-1: 16.0'-18.0'	SANDSTONE	A	1.967	1.221	3.058	532	532	174.0	0.95	165.0	11.9	285.0
DU-1: 16.0'-18.0'	SANDSTONE	A	1.981	0.796	2.008	515	515	256.5	0.86	221.2	15.9	382.3
DU-1: 16.0'-18.0'	SANDSTONE	I	1.741	1.024	1.049	617	617	588.4	0.75	438.5	31.6	757.7

[1] A = Axial , D = Diametral, I = Irregular Lump
[2] Based on an Index to Strength conversion factor of 24 for NX core as recommended by ASTM

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ASTM: D-7012 (METHOD C)

ROCK CORE COMPRESSION TEST DATA

GMI PROJECT NO. 21032

PROJECT LOCATION: S.R. 6219, Section 050 - Somerset Co., Pa & Garrett Co., Md

Sample Location	Type of Rock	Sample Diameter (in.)	Sample Length (in.)	Load (lbs.)	Uniaxial Compressive Strength		Type of Break (1)	Remarks
					PSI	TSF		
DU-2: 16.3'-16.9'	SANDSTONE	1.984	4.225	46,460	15,028	1,082	C	
DU-2: 17.2'-17.8'	SANDSTONE	1.987	4.210	48,940	15,783	1,136	B	
DU-2: 17.8'-18.4'	SANDSTONE	1.986	4.164	54,760	17,677	1,273	B	
DU-6: 16.8'-17.4'	SANDSTONE	1.981	4.244	81,620	26,481	1,907	D	
DU-6: 17.4'-18.0'	SANDSTONE	1.979	4.142	65,840	21,405	1,541	D	
DU-6: 18.0'-18.6'	SANDSTONE	1.979	4.232	63,580	20,670	1,488	D	
E-3: 19.6'-20.0'	SANDSTONE	1.985	4.183	46,430	15,003	1,080	B	
E-3: 22.0'-22.4'	SANDSTONE	1.980	4.134	58,000	18,837	1,356	B	
E-3: 23.5'-23.9'	SANDSTONE	1.983	4.226	46,360	15,011	1,081	B	

(1) Types of Breaks:

A - 

B - 

C - 

D - 

E - 

F - 

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ASTM: D-7012 (METHOD C)

ROCK CORE COMPRESSION TEST DATA

GMI PROJECT NO. 21032

PROJECT LOCATION: S.R. 6219, Section 050 - Somerset Co., Pa & Garrett Co., Md

Sample Location	Type of Rock	Sample Diameter (in.)	Sample Length (in.)	Load (lbs.)	Uniaxial Compressive Strength		Type of Break (1)	Remarks
					PSI	TSF		
E-4: 16.0'-16.7'	SANDSTONE	1.995	4.230	48,110	15,391	1,108	C	
E-4: 16.7'-17.4'	SANDSTONE	1.995	4.177	37,440	11,977	862	B	
E-4: 18.4'-18.8'	SANDSTONE	1.996	4.179	54,030	17,267	1,243	B	
E-6: 18.0'-18.4'	SANDSTONE	1.995	4.041	41,020	13,123	945	B	
E-6: 18.6'-19.1'	SANDSTONE	1.994	4.156	39,920	12,783	920	B	
E-6: 20.3'-20.7'	SANDSTONE	1.994	4.178	42,770	13,696	986	B	

(1) Types of Breaks:

A - 

B - 

C - 

D - 

E - 

F - 

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Type of Sample:	Core SR6219	Sample # 1	
		DU-3	
Sample Taken at:	Geomechanics	15.5 - 17.5	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545920

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Slight		4/19/23	KD
	Paste pH	5.69		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.63		4/25/23	LP
	Maximum Potential Acidity	50.94	CaCO3Equiv/1000tons		
	Neutralization Potential	15.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	35.69	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 2	
		DU-3	
Sample Taken at:	Geomechanics	17.5 - 19.2	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545921

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	6.02		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	2.01		4/25/23	LP
	Maximum Potential Acidity	62.81	CaCO3Equiv/1000tons		
	Neutralization Potential	20.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	42.81	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 3	
		DU-3	
Sample Taken at:	Geomechanics	19.2 - 22.2	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545922

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	6.64		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	2.35		4/25/23	LP
	Maximum Potential Acidity	73.44	CaCO3Equiv/1000tons		
	Neutralization Potential	45.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	28.44	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 4	
		DU-3	
Sample Taken at:	Geomechanics	22.2 - 25.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545923

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.95		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	2.45		4/25/23	LP
	Maximum Potential Acidity	76.56	CaCO3Equiv/1000tons		
	Neutralization Potential	100.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	23.44	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 5	
		DU-3	
Sample Taken at:	Geomechanics	25.3 - 28	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545924

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.05		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.87		4/25/23	LP
	Maximum Potential Acidity	27.19	CaCO3Equiv/1000tons		
	Neutralization Potential	138.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	111.56	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 4	
		DU-3	
Sample Taken at:	Geomechanics	28 - 31	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545925

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.32		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/25/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	38.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	37.94	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 5	
		DU-3	
Sample Taken at:	Geomechanics	31 - 34	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545926

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.15		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/25/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	56.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	55.37	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 6	
		DU-3	
Sample Taken at:	Geomechanics	34 - 37	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545927

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.11		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.06		4/25/23	LP
	Maximum Potential Acidity	1.88	CaCO3Equiv/1000tons		
	Neutralization Potential	24.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	22.87	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 7	
		DU-3	
Sample Taken at:	Geomechanics	37 - 40	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545928

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.16		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.06		4/25/23	LP
	Maximum Potential Acidity	1.88	CaCO3Equiv/1000tons		
	Neutralization Potential	22.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	20.37	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 1, 2023
Date Received: April 18, 2023

Sample # 8
DU-3
40 - 43

PA DEP 65-03568
EPA PA-01462

Report Number: 545929

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	None		4/19/23	KD
	Paste pH	8.35		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.04		4/25/23	LP
	Maximum Potential Acidity	1.25	CaCO3Equiv/1000tons		
	Neutralization Potential	20.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	19.00	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 9	
		DU-3	
Sample Taken at:	Geomechanics	43 - 45	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545930

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.24		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.04		4/25/23	LP
	Maximum Potential Acidity	1.25	CaCO3Equiv/1000tons		
	Neutralization Potential	19.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	18.25	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 10	
		DU-3	
Sample Taken at:	Geomechanics	45 - 47.6	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545931

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.22		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/25/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	25.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	24.87	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 11 DU-3	
Sample Taken at:	Geomechanics	47.6 - 50.6	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545932

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.31		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/25/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	40.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	40.44	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 12	
		DU-3	
Sample Taken at:	Geomechanics	50.6 - 53.6	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545933

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.22		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/25/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	31.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	30.87	CaCO3Equiv/1000tons		

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05/04/23

GeoMechanics,Inc.
600 Munir Dr, PO Box 386
Elizabeth , Pa. 15037
Todd Bolin

Type of Sample:	Core SR6219	Sample # 13	
		DU-3	
Sample Taken at:	Geomechanics	53.6 - 56.6	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545934

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.15		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.07		4/25/23	LP
	Maximum Potential Acidity	2.19	CaCO3Equiv/1000tons		
	Neutralization Potential	46.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	44.31	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 14	
		DU-3	
Sample Taken at:	Geomechanics	56.6 - 59.8	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545935

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.88		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.52		4/25/23	LP
	Maximum Potential Acidity	47.50	CaCO3Equiv/1000tons		
	Neutralization Potential	42.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	5.25	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 15 DU-3	
Sample Taken at:	Geomechanics	59.8 - 62.0	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545936

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.07		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	2.03		4/25/23	LP
	Maximum Potential Acidity	63.44	CaCO3Equiv/1000tons		
	Neutralization Potential	33.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	29.69	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 16	
		DU-3	
Sample Taken at:	Geomechanics	62.0 - 63.4	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545937

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.35		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.54		4/25/23	LP
	Maximum Potential Acidity	48.13	CaCO3Equiv/1000tons		
	Neutralization Potential	22.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	25.88	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 17	
		DU-3	
Sample Taken at:	Geomechanics	63.4 - 66.4	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545938

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.79		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.81		4/25/23	LP
	Maximum Potential Acidity	25.31	CaCO3Equiv/1000tons		
	Neutralization Potential	46.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	21.19	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 18	
		DU-3	
Sample Taken at:	Geomechanics	66.4 - 69.4	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545939

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.63		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.19		4/25/23	LP
	Maximum Potential Acidity	5.94	CaCO3Equiv/1000tons		
	Neutralization Potential	35.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	29.06	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 19	
		DU-3	
Sample Taken at:	Geomechanics	69.4 - 72.4	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545940

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.78		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.25		4/25/23	LP
	Maximum Potential Acidity	7.81	CaCO3Equiv/1000tons		
	Neutralization Potential	36.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	28.94	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 1, 2023
Date Received: April 18, 2023

Sample # 20
DU-3
72.4 - 75.4

PA DEP 65-03568
EPA PA-01462

Report Number: 545941

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.48		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.23		4/25/23	LP
	Maximum Potential Acidity	7.19	CaCO3Equiv/1000tons		
	Neutralization Potential	31.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	23.81	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 21 DU-3	
Sample Taken at:	Geomechanics	75.4 - 78.5	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545942

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.59		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.16		4/25/23	LP
	Maximum Potential Acidity	5.00	CaCO3Equiv/1000tons		
	Neutralization Potential	26.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	21.00	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 22 DU-3	
Sample Taken at:	Geomechanics	78.5 - 81.6	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545943

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.03		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.14		4/25/23	LP
	Maximum Potential Acidity	4.38	CaCO3Equiv/1000tons		
	Neutralization Potential	27.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	23.12	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 23	
		DU-3	
Sample Taken at:	Geomechanics	81.6 - 84.7	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545944

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.02		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.19		4/25/23	LP
	Maximum Potential Acidity	5.94	CaCO3Equiv/1000tons		
	Neutralization Potential	56.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	50.56	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 24	
		DU-3	
Sample Taken at:	Geomechanics	84.7 - 86.1	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545945

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.11		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.23		4/25/23	LP
	Maximum Potential Acidity	38.44	CaCO3Equiv/1000tons		
	Neutralization Potential	100.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	61.56	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 25	
		DU-3	
Sample Taken at:	Geomechanics	86.1 - 89.1	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545946

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.75		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.37		4/25/23	LP
	Maximum Potential Acidity	11.56	CaCO3Equiv/1000tons		
	Neutralization Potential	115.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	103.44	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 26	
		DU-3	
Sample Taken at:	Geomechanics	89.1 - 91.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545947

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Strong		4/19/23	KD
	Paste pH	7.65		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.19		4/25/23	LP
	Maximum Potential Acidity	5.94	CaCO3Equiv/1000tons		
	Neutralization Potential	425.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	419.06	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 27 DU-3	
Sample Taken at:	Geomechanics	91.3 - 94.3	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545948

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.13		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.05		4/25/23	LP
	Maximum Potential Acidity	1.56	CaCO3Equiv/1000tons		
	Neutralization Potential	375.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	373.44	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 28	
		DU-3	
Sample Taken at:	Geomechanics	94.3 - 97.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545949

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.85		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.04		4/25/23	LP
	Maximum Potential Acidity	1.25	CaCO3Equiv/1000tons		
	Neutralization Potential	293.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	292.50	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 29	
		DU-3	
Sample Taken at:	Geomechanics	97.3 - 100.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545950

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.16		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/25/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	237.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	237.19	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 30	
		DU-3	
Sample Taken at:	Geomechanics	100.3 - 103.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545951

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.49		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/25/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	200.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	199.69	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 31	
		DU-3	
Sample Taken at:	Geomechanics	103.3 - 106.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545952

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.44		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/25/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	166.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	165.94	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 32	
		DU-3	
Sample Taken at:	Geomechanics	106.3 - 109.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545953

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.34		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/25/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	187.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	187.19	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 33	
		DU-3	
Sample Taken at:	Geomechanics	109.3 - 112.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545954

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.46		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/25/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	125.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	124.69	CaCO3Equiv/1000tons		

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05/04/23

GeoMechanics,Inc.
600 Munir Dr, PO Box 386
Elizabeth , Pa. 15037
Todd Bolin

Type of Sample:	Core SR6219	Sample # 34	
		DU-3	
Sample Taken at:	Geomechanics	112.3 - 115.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545955

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.32		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/25/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	45.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	44.37	CaCO3Equiv/1000tons		

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05/04/23

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Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 1, 2023
Date Received: April 18, 2023

Sample # 35
DU-3
115.3 - 118.3

PA DEP 65-03568
EPA PA-01462

Report Number: 545956

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.21		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/25/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	21.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	20.87	CaCO3Equiv/1000tons		

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Todd Bolin

Type of Sample:	Core SR6219	Sample # 36	
		DU-3	
Sample Taken at:	Geomechanics	118.3 - 121.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545957

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.34		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.03		4/25/23	LP
	Maximum Potential Acidity	0.94	CaCO3Equiv/1000tons		
	Neutralization Potential	15.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	14.06	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 37 DU-3	
Sample Taken at:	Geomechanics	121.3 - 124.3	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545958

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.23		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.11		4/25/23	LP
	Maximum Potential Acidity	3.44	CaCO3Equiv/1000tons		
	Neutralization Potential	17.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	13.56	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 38	
		DU-3	
Sample Taken at:	Geomechanics	124.3 - 127.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545959

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.85		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.09		4/25/23	LP
	Maximum Potential Acidity	2.81	CaCO3Equiv/1000tons		
	Neutralization Potential	20.25	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	17.44	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 39	
		DU-3	
Sample Taken at:	Geomechanics	127.3 - 130.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545960

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.84		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.08		4/25/23	LP
	Maximum Potential Acidity	2.50	CaCO3Equiv/1000tons		
	Neutralization Potential	22.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	20.00	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 40	
		DU-3	
Sample Taken at:	Geomechanics	130.3 - 133.3	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545961

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	None		4/19/23	KD
	Paste pH	8.34		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.04		4/25/23	LP
	Maximum Potential Acidity	1.25	CaCO3Equiv/1000tons		
	Neutralization Potential	24.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	23.25	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 41	
		DU-3	
Sample Taken at:	Geomechanics	133.3 - 136.0	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545962

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.13		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/25/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	20.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	20.12	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 42	
		DU-3	
Sample Taken at:	Geomechanics	136.0 - 138.0	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545963

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.23		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.06		4/25/23	LP
	Maximum Potential Acidity	1.88	CaCO3Equiv/1000tons		
	Neutralization Potential	17.50	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	15.62	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 43 DU-3	
Sample Taken at:	Geomechanics	138.0 - 140.0	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 1, 2023		
Date Received:	April 18, 2023		

Report Number: 545964

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.14		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.12		4/25/23	LP
	Maximum Potential Acidity	3.75	CaCO3Equiv/1000tons		
	Neutralization Potential	12.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	9.00	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 1	
		E-1A	
Sample Taken at:	Geomechanics	10.1 - 13.0	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 9, 2023		
Date Received:	April 18, 2023		

Report Number: 545965

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	None		4/19/23	KD
	Paste pH	6.05		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.31		4/25/23	LP
	Maximum Potential Acidity	9.69	CaCO3Equiv/1000tons		
	Neutralization Potential	7.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	1.94	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 2 E-1A	
Sample Taken at:	Geomechanics	13.0 - 16.0	
Sample Taken By:	Submitted	PA DEP 65-03568 EPA PA-01462	
Date Sampled:	February 9, 2023		
Date Received:	April 18, 2023		

Report Number: 545966

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	None		4/19/23	KD
	Paste pH	6.45		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.76		4/25/23	LP
	Maximum Potential Acidity	23.75	CaCO3Equiv/1000tons		
	Neutralization Potential	10.75	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	13.00	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 3	
		E-1A	
Sample Taken at:	Geomechanics	16.0 - 19.0	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 9, 2023		
Date Received:	April 18, 2023		

Report Number: 545967

EPA-600/2-78-054 Acid/ Base Accountability

	Fizz Rating	None		4/19/23	KD
	Paste pH	7.09		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.75		4/25/23	LP
	Maximum Potential Acidity	23.44	CaCO3Equiv/1000tons		
	Neutralization Potential	22.00	CaCO3Equiv/1000tons	4/28/23	WS
	Amount Needed	1.44	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 4
E-1A
19.0 - 22.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545968

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.16		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.95		4/26/23	LP
	Maximum Potential Acidity	60.94	CaCO3Equiv/1000tons		
	Neutralization Potential	48.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	12.19	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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05/04/23

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 5
E-1A
22.0 - 24.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545969

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	6.98		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.82		4/26/23	LP
	Maximum Potential Acidity	56.88	CaCO3Equiv/1000tons		
	Neutralization Potential	61.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	4.37	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 6
E-1A
24.5 - 27.1

PA DEP 65-03568
EPA PA-01462

Report Number: 545970

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.83		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.92		4/26/23	LP
	Maximum Potential Acidity	60.00	CaCO3Equiv/1000tons		
	Neutralization Potential	150.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	90.00	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 7
E-1A
27.1 - 29.1

PA DEP 65-03568
EPA PA-01462

Report Number: 545971

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.45		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.46		4/26/23	LP
	Maximum Potential Acidity	45.63	CaCO3Equiv/1000tons		
	Neutralization Potential	255.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	209.37	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 8
E-1A
29.1 - 31.1

PA DEP 65-03568
EPA PA-01462

Report Number: 545972

EPA-600/2-78-054 **Acid/ Base Accountability**

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.85		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.92		4/26/23	LP
	Maximum Potential Acidity	60.00	CaCO3Equiv/1000tons		
	Neutralization Potential	150.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	90.00	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 9
E-1A
31.1 - 32.9

PA DEP 65-03568
EPA PA-01462

Report Number: 545973

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.02		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	3.02		4/26/23	LP
	Maximum Potential Acidity	94.38	CaCO3Equiv/1000tons		
	Neutralization Potential	318.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	224.37	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 10
E-1A
32.9 - 36.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545974

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	6.87		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.04		4/26/23	LP
	Maximum Potential Acidity	32.50	CaCO3Equiv/1000tons		
	Neutralization Potential	302.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	270.00	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 11
E-1A
36.0 - 39.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545975

EPA-600/2-78-054 **Acid/ Base Accountability**

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	6.98		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.73		4/26/23	LP
	Maximum Potential Acidity	22.81	CaCO3Equiv/1000tons		
	Neutralization Potential	375.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	352.19	CaCO3Equiv/1000tons		

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05/04/23

GeoMechanics,Inc.
600 Munir Dr, PO Box 386
Elizabeth , Pa. 15037
Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 12
E-1A
39.0 - 42.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545976

EPA-600/2-78-054 **Acid/ Base Accountability**

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.03		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.35		4/26/23	LP
	Maximum Potential Acidity	10.94	CaCO3Equiv/1000tons		
	Neutralization Potential	300.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	289.06	CaCO3Equiv/1000tons		

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05/04/23

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Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 13
E-1A
42.0 - 45.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545977

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.21		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	291.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	290.94	CaCO3Equiv/1000tons		

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05/04/23

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Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 14
E-1A
45.0 - 48.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545978

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	6.99		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.12		4/26/23	LP
	Maximum Potential Acidity	3.75	CaCO3Equiv/1000tons		
	Neutralization Potential	262.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	258.75	CaCO3Equiv/1000tons		

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Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 15
E-1A
48.0 - 50.3

PA DEP 65-03568
EPA PA-01462

Report Number: 545979

EPA-600/2-78-054 **Acid/ Base Accountability**

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.19		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.12		4/26/23	LP
	Maximum Potential Acidity	3.75	CaCO3Equiv/1000tons		
	Neutralization Potential	311.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	307.50	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample Taken By: Submitted
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Sample # 16
E-1A
50.3 - 53.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545980

EPA-600/2-78-054 **Acid/ Base Accountability**

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.42		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.08		4/26/23	LP
	Maximum Potential Acidity	2.50	CaCO3Equiv/1000tons		
	Neutralization Potential	375.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	372.50	CaCO3Equiv/1000tons		

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Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 9, 2023
Date Received: April 18, 2023

Sample # 17
E-1A
53.0 - 56.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545981

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.61		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.03		4/26/23	LP
	Maximum Potential Acidity	0.94	CaCO3Equiv/1000tons		
	Neutralization Potential	148.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	147.81	CaCO3Equiv/1000tons		

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Sample # 18
E-1A
56.0 - 58.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545982

EPA-600/2-78-054 **Acid/ Base Accountability**

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	8.44		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/26/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	112.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	111.87	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 19
E-1A
58.0 - 60.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545983

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.65		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	73.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	73.44	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
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Date Sampled: January 10, 2023
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Sample # 1
E-10
21.0 - 24.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545984

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.43		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.06		4/26/23	LP
	Maximum Potential Acidity	1.88	CaCO3Equiv/1000tons		
	Neutralization Potential	25.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	23.12	CaCO3Equiv/1000tons		

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Sample # 2
E-10
24.0 - 26.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545985

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.54		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.16		4/26/23	LP
	Maximum Potential Acidity	5.00	CaCO3Equiv/1000tons		
	Neutralization Potential	20.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	15.25	CaCO3Equiv/1000tons		

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Sample # 3
E-10
26.5 - 29.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545986

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	6.94		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.08		4/26/23	LP
	Maximum Potential Acidity	2.50	CaCO3Equiv/1000tons		
	Neutralization Potential	18.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	16.00	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 4
E-10
29.5 - 32.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545987

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.44		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.07		4/26/23	LP
	Maximum Potential Acidity	2.19	CaCO3Equiv/1000tons		
	Neutralization Potential	17.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	15.31	CaCO3Equiv/1000tons		

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Sample # 5
E-10
32.5 - 35.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545988

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.43		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.22		4/26/23	LP
	Maximum Potential Acidity	6.88	CaCO3Equiv/1000tons		
	Neutralization Potential	5.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	1.88	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Sample # 6
E-10
35.5 - 37.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545989

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	6.55		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.19		4/26/23	LP
	Maximum Potential Acidity	5.94	CaCO3Equiv/1000tons		
	Neutralization Potential	5.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	0.94	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
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Date Sampled: January 10, 2023
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Sample # 7
E-10
37.5 - 40.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545990

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	5.98		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.25		4/26/23	LP
	Maximum Potential Acidity	7.81	CaCO3Equiv/1000tons		
	Neutralization Potential	4.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	3.31	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample # 8
E-10
Sample Taken at: Geomechanics
40.5 - 43.5

Sample Taken By: Submitted
PA DEP 65-03568
EPA PA-01462

Date Sampled: January 10, 2023

Date Received: April 18, 2023

Report Number: 545991

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.29		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.41		4/26/23	LP
	Maximum Potential Acidity	12.81	CaCO3Equiv/1000tons		
	Neutralization Potential	7.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	5.31	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: January 10, 2023
Date Received: April 18, 2023

Sample # 9
E-10
43.5 - 46.5

PA DEP 65-03568
EPA PA-01462

Report Number: 545992

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.54		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.06		4/26/23	LP
	Maximum Potential Acidity	1.88	CaCO3Equiv/1000tons		
	Neutralization Potential	16.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	14.12	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample # 10
E-10
Sample Taken at: Geomechanics
45.5 - 49.5

Sample Taken By: Submitted
PA DEP 65-03568
EPA PA-01462

Date Sampled: January 10, 2023

Date Received: April 18, 2023

Report Number: 545993

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.04		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.04		4/26/23	LP
	Maximum Potential Acidity	1.25	CaCO3Equiv/1000tons		
	Neutralization Potential	19.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	17.75	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
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Date Sampled: January 10, 2023
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Sample # 11
E-10
49.5 - 52.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545994

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.05		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.39		4/26/23	LP
	Maximum Potential Acidity	12.19	CaCO3Equiv/1000tons		
	Neutralization Potential	17.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	5.31	CaCO3Equiv/1000tons		

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Sample # 12
E-10
52.0 - 54.1

PA DEP 65-03568
EPA PA-01462

Report Number: 545995

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	6.08		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.06		4/26/23	LP
	Maximum Potential Acidity	1.88	CaCO3Equiv/1000tons		
	Neutralization Potential	9.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	7.87	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
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Date Sampled: January 10, 2023
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Sample # 13
E-10
54.1 - 57.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545996

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	5.56		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.31		4/26/23	LP
	Maximum Potential Acidity	9.69	CaCO3Equiv/1000tons		
	Neutralization Potential	7.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	2.19	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Sample # 14
E-10
57.0 - 60.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545997

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	5.45		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.34		4/26/23	LP
	Maximum Potential Acidity	41.88	CaCO3Equiv/1000tons		
	Neutralization Potential	12.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	29.38	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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05/04/23

GeoMechanics,Inc.
600 Munir Dr, PO Box 386
Elizabeth , Pa. 15037
Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: January 10, 2023
Date Received: April 18, 2023

Sample # 15
E-10
60.0 - 63.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545998

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	5.13		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.59		4/26/23	LP
	Maximum Potential Acidity	18.44	CaCO3Equiv/1000tons		
	Neutralization Potential	5.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	13.19	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: January 10, 2023
Date Received: April 18, 2023

Sample # 16
E-10
63.0 - 65.0

PA DEP 65-03568
EPA PA-01462

Report Number: 545999

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	5.65		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.12		4/26/23	LP
	Maximum Potential Acidity	3.75	CaCO3Equiv/1000tons		
	Neutralization Potential	3.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	0.50	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Todd Bolin

Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 7, 2023
Date Received: April 18, 2023

Sample # 1
E-11
35.6 - 38.3

PA DEP 65-03568
EPA PA-01462

Report Number: 546000

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	5.92		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.13		4/26/23	LP
	Maximum Potential Acidity	4.06	CaCO3Equiv/1000tons		
	Neutralization Potential	2.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	1.56	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 2
E-11
38.3 - 41.3

PA DEP 65-03568
EPA PA-01462

Report Number: 546001

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	6.44		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/26/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	7.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	7.12	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 7, 2023
Date Received: April 18, 2023

Sample # 3
E-11
41.3 - 43.3

PA DEP 65-03568
EPA PA-01462

Report Number: 546002

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.11		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/26/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	6.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	6.12	CaCO3Equiv/1000tons		

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Type of Sample:	Core SR6219	Sample # 4	
		E-11	
Sample Taken at:	Geomechanics	43.3 - 46.0	
Sample Taken By:	Submitted	PA DEP 65-03568	
		EPA PA-01462	
Date Sampled:	February 7, 2023		
Date Received:	April 18, 2023		

Report Number: 546003

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.45		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	12.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	11.94	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 7, 2023
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Sample # 5
E-11
46.0 - 49.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546004

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.66		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	5.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	5.44	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 6
E-11
49.0 - 52.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546005

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.42		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	21.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	20.94	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 7
E-11
52.0 - 55.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546006

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.59		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	52.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	52.19	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 8
E-11
55.0 - 58.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546007

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.65		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	14.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	14.44	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 9
E-11
58.0 - 61.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546008

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.88		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/26/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	18.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	17.87	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 10
E-11
61.0 - 64.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546009

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.15		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	25.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	24.69	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 11
E-11
64.0 - 67.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546010

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.84		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.03		4/26/23	LP
	Maximum Potential Acidity	0.94	CaCO3Equiv/1000tons		
	Neutralization Potential	7.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	6.31	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 12
E-11
67.0 - 70.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546011

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.63		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	7.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	7.19	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 13
E-11
70.0 - 73.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546012

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.55		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.01		4/26/23	LP
	Maximum Potential Acidity	0.31	CaCO3Equiv/1000tons		
	Neutralization Potential	7.00	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	6.69	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 7, 2023
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Sample # 14
E-11
73.0 - 75.4

PA DEP 65-03568
EPA PA-01462

Report Number: 546013

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.73		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.03		4/26/23	LP
	Maximum Potential Acidity	0.94	CaCO3Equiv/1000tons		
	Neutralization Potential	6.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	5.31	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample # 15
E-11
Sample Taken at: Geomechanics
75.4 - 78.5

Sample Taken By: Submitted

PA DEP 65-03568
EPA PA-01462

Date Sampled: February 7, 2023

Date Received: April 18, 2023

Report Number: 546014

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	8.11		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.27		4/26/23	LP
	Maximum Potential Acidity	8.44	CaCO3Equiv/1000tons		
	Neutralization Potential	5.25	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed	3.19	CaCO3Equiv/1000tons		
	Amount Excess		CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
Sample Taken By: Submitted
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Sample # 16
E-11
78.5 - 81.5

PA DEP 65-03568
EPA PA-01462

Report Number: 546015

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.22		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.13		4/26/23	LP
	Maximum Potential Acidity	4.06	CaCO3Equiv/1000tons		
	Neutralization Potential	4.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	0.44	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
Sample Taken at: Geomechanics
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Sample # 17
E-11
81.5 - 84.5

PA DEP 65-03568
EPA PA-01462

Report Number: 546016

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	None		4/19/23	KD
	Paste pH	7.84		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.02		4/26/23	LP
	Maximum Potential Acidity	0.63	CaCO3Equiv/1000tons		
	Neutralization Potential	17.75	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	17.12	CaCO3Equiv/1000tons		

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Type of Sample: Core SR6219
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Sample # 18
E-11
84.5 - 86.5

PA DEP 65-03568
EPA PA-01462

Report Number: 546017

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	6.98		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.11		4/26/23	LP
	Maximum Potential Acidity	3.44	CaCO3Equiv/1000tons		
	Neutralization Potential	22.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	19.06	CaCO3Equiv/1000tons		

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Type of Sample: Core
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Sample # 19
E-11
86.5 - 88.3

PA DEP 65-03568
EPA PA-01462

Report Number: 546018

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	7.04		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.13		4/26/23	LP
	Maximum Potential Acidity	4.06	CaCO3Equiv/1000tons		
	Neutralization Potential	77.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	73.44	CaCO3Equiv/1000tons		

Miltech Analytical Services,
Manager
Bill Smith

Miltech Analytical Services, Inc.
Sampling, Testing, Analyses
P.O. Box 470
Hunker Lumber Road
Hunker, PA 15639
724-925-1460
bsmith@miltechenergy.com

05/04/23

GeoMechanics,Inc.
600 Munir Dr, PO Box 386
Elizabeth , Pa. 15037
Todd Bolin

Type of Sample: Core
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 7, 2023
Date Received: April 18, 2023

Sample # 20
E-11
88.3 - 90.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546019

EPA-600/2-78-054 **Acid/ Base Accountability**

	Fizz Rating	Moderate		4/19/23	KD
	Paste pH	7.82		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	1.12		4/26/23	LP
	Maximum Potential Acidity	35.00	CaCO3Equiv/1000tons		
	Neutralization Potential	312.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	277.50	CaCO3Equiv/1000tons		

Miltech Analytical Services,
Manager
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724-925-1460
bsmith@miltechenergy.com

05/04/23

GeoMechanics,Inc.
600 Munir Dr, PO Box 386
Elizabeth , Pa. 15037
Todd Bolin

Type of Sample: Core
Sample Taken at: Geomechanics
Sample Taken By: Submitted
Date Sampled: February 7, 2023
Date Received: April 18, 2023

Sample # 21
E-11
90.0 - 92.0

PA DEP 65-03568
EPA PA-01462

Report Number: 546020

EPA-600/2-78-054	Acid/ Base Accountability				
	Fizz Rating	Slight		4/19/23	KD
	Paste pH	8.05		4/19/23	JW
ASTM D2492	%Pyritic Sulfur	0.45		4/26/23	LP
	Maximum Potential Acidity	14.06	CaCO3Equiv/1000tons		
	Neutralization Potential	31.50	CaCO3Equiv/1000tons	4/29/23	WS
	Amount Needed		CaCO3Equiv/1000tons		
	Amount Excess	17.44	CaCO3Equiv/1000tons		

Miltech Analytical Services,
Manager
Bill Smith

GeoMechanics, inc
Consulting Engineers/Scientists
Elizabeth, Pennsylvania

ELECTROCHEMICAL TEST RESULTS FOR WATER SAMPLES

Project No. 21032 Date: 4/2023

Project Name: S.R. 6219, Somerset Co., Pa & Garrett Co., Md.

Tested By: TAB

Sample Location	Field pH	Laboratory pH	Sulfate Content (ppm)	Chloride Content (ppm)	Minimum Resistivity (ohm-cm)	Total Bacteria (#/ml)
DU-1		6.7	<50*	<32*	6,750	
DU-2		6.9	<50*	<32*	3,100	
DU-6		6.1	<50*	<32*	26,000	
E-3		6.7	<50*	<32*	6,425	
E-4		5.7	<50*	<32*	20,750	
E-6		7.0	<50*	<32*	17,500	
E-7		6.5	<50*	<32*	28,750	
			*50=Minimum Detection Limit	*32=Minimum Detection Limit		

< Below detection limit

pH TEST RESULTS

Sample Location	Sample Source	Sample Depth (ft.)	pH (std. units)		Sample Location	Sample Source	Sample Depth (ft.)	pH (std. units)
S-1	Stream Surface Water (PA)	N/A	6.8		S-30	Stream Surface Water (PA)	N/A	7.8
S-2	Stream Surface Water (PA)	N/A	6.8		S-31	Stream Surface Water (PA)	N/A	7.3
S-2A	Stream Surface Water (PA)	N/A	6.9		S-33	Stream Surface Water (PA)	N/A	7.0
S-3	Stream Surface Water (PA)	N/A	7.3		S-38	Stream Surface Water (PA)	N/A	7.9
S-4	Stream Surface Water (PA)	N/A	7.5		S-39	Stream Surface Water (PA)	N/A	7.8
S-6	Stream Surface Water (PA)	N/A	6.6		S-40	Stream Surface Water (PA)	N/A	6.8
S-7	Stream Surface Water (PA)	N/A	7.2		S-43	Stream Surface Water (PA)	N/A	8.0
S-8	Stream Surface Water (PA)	N/A	6.0		S-48	Stream Surface Water (PA)	N/A	7.5
S-8A	Stream Surface Water (PA)	N/A	6.6		S-51	Stream Surface Water (PA)	N/A	7.4
S-9	Stream Surface Water (PA)	N/A	7.0		S-53	Stream Surface Water (PA)	N/A	7.1
S-10	Stream Surface Water (PA)	N/A	6.6		Piney Creek (DU Crossing)	Stream Surface Water (PA)	N/A	7.6
S-11	Stream Surface Water (PA)	N/A	6.3		Piney Creek (E Crossing)	Stream Surface Water (PA)	N/A	7.4
S-12	Stream Surface Water (PA)	N/A	6.9		WL007	Stream Surface Water (MD)	N/A	7.2
S-13	Stream Surface Water (PA)	N/A	6.8		WL009/WL010	Stream Surface Water (MD)	N/A	6.8
S-16	Stream Surface Water (PA)	N/A	7.2		WL012	Stream Surface Water (MD)	N/A	7.7
S-16A	Stream Surface Water (PA)	N/A	6.8		WL014	Stream Surface Water (MD)	N/A	7.6
S-16E	Stream Surface Water (PA)	N/A	7.0		W4	Wetland Surface Water (PA)	N/A	6.6
S-18	Stream Surface Water (PA)	N/A	7.1		W10	Wetland Surface Water (PA)	N/A	6.4
S-19	Stream Surface Water (PA)	N/A	6.3		W14	Wetland Surface Water (PA)	N/A	6.7
S-23	Stream Surface Water (PA)	N/A	6.9		W15	Wetland Surface Water (PA)	N/A	6.9
S-26	Stream Surface Water (PA)	N/A	6.8		W21	Wetland Surface Water (PA)	N/A	7.0
S-29	Stream Surface Water (PA)	N/A	7.0		W30	Wetland Surface Water (PA)	N/A	6.9

APPENDIX D
Reconnaissance Photographs

LIST OF PHOTOGRAPHS

Photograph 1: Typical Topography, Alignment DU/E

Photograph 2: Concrete Cistern, Alignment E, Station 2318±, Offset 25' Rt

Photograph 3: Spring with 55 Gallon Drum, Alignment E, Station 2328±, Offset 100' Lt

Photograph 4: Piney Creek Looking Upstream at Proposed Bridge Location, Alignment E

Photograph 5: Typical Pottsville Group Massive Sandstone Boulder, Alignment E

Photograph 6: Surface Mine Area on Weimer Strip & Auger Property, Alignment E, Station 2179+50±

Photograph 7: Random Spoils Piles near Station 2123+50 (Alignment E)/6122+50 (Alignment DU)

Photograph 8: Unreclaimed Strip Mine Pit Filled with Stagnant Water, Alignment E, Station 2118±, Offset 150' Rt

Photograph 9: Planted Hayfields Along Alignment E Beyond Station 2067+40

Photograph 10: Typical Punch Mine Along North Side of Piney Creek, Alignment DU

Photograph 11: Possible Punch Mine, Alignment DU, Station 6182+50±

Photograph 12: Typical Steep Topography South of Meadow Run, Alignment DU

Photograph 13: Reclaimed Strip Mine, Alignment DU, Station 6168± to 6164+60±

Photograph 14: Pasture Adjacent to PA-MD Border, Alignment DU, Station 6148±

Photograph 15: Clevenger Well, Alignment E, Station 2373±, Offset 300±' Lt

Photograph 16: Hershberger Well, Alignment E, Station 2260±, Offset 780' Rt to Bottom of Hershberger Property Driveway, Coordinates: 39.73904/-79.045657, Elevation 2260±

Photograph 17: Centerline Stake Near Hershberger Springs, Alignment E, Station 2186±

Photograph 18: Springs on Hershberger Property, Alignment E, Downslope (Offset RT) from Station 2186±

Photograph 19: Findley Spring, Approx. 0.25 Mile SE of Greenville Rd./Merbaugh Rd. Intersection, Coordinates: 39.726961/-79.051441, Elevation 2294±

Photograph 20: Water Valve at Piney Creek, Alignment DU, Station 6272+20±, Offset 80' LT

Photograph 21: Unplugged Artesian Well, Alignment DU/E, Station 2403±, Offset 1250±' LT

Photograph 22: Abandoned Limestone Deep Mine, 1400±' off Alignment E Along Piney Run Road

Photograph 23: Abandoned Lime Kiln, 1400±' East of Alignment E Along Piney Run Road. Located on Opposite Side of Limestone Mine.

APPENDIX E
Well Data

Timothy Witt

From: tina wayneswells.com <tina@wayneswells.com>
Sent: Wednesday, December 7, 2022 9:12 AM
To: Timothy Witt
Subject: Richard McKenzie
Attachments: Scan_1327.pdf

Mr. Witt,

Please see attached completion report as requested for Richard McKenzie at 4686 Chestnut Ridge Rd.

Have a great day.
Tina

Tina Tichnell
Wayne's water 'N' Wells Inc
19139 Garrett Hwy
Oakland, MD 21550
301-387-7181
Merry Christmas!

(DEP USE ONLY)

WELL COMPLETION REPORT

FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

45 DAYS AFTER WELL IS COMPLETED

COUNTY NUMBER

DEP USE ONLY
DATE RECEIVED

DATE WELL COMPLETED 10 5 03 96

Depth of Well 207 (TO NEAREST FOOT)

PERMIT A.O. FROM PERMIT TO DRILL WELL

LOCATION

OWNER Mckenzie last name Richard first name

STREET OR RFD Box 122 TOWN Greenville

SUBDIVISION SECTION

WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET FROM	FEET TO	Check if water bearing
Yellow Sandy Clay	0	12	
1" Sandstone	12	18	
Brown "	18	22	
Grey Sandstone	22	35	
Yellow Sandstone	35	37	
Grey Sandstone	37	46	
Dark Shale Soft	46	46	
1" Shale	46	66	
Grey Shale	66	98	64
Yellow Sandstone	98	99	
Grey "	99	143	
Yellow Sandstone	103	109	
Grey Shale	109	141	124
Dark Shale	141	147	
Grey Shale	147	173	
Dark "	173	175	
Grey Shale	175	207	

GROUTING RECORD

WELL HAS BEEN GROUTED (Circle Appropriate Box) yes Y no N

TYPE OF GROUTING MATERIAL

CEMENT CM BENTONITE CLAY BC

NO. OF BAGS 23 NO. OF POUNDS 2070

GALLONS OF WATER 45

DEPTH OF GROUT SEAL (to nearest foot)

from 0 ft. to 83 ft.

(enter 0 if from surface)

CASING RECORD

casing types insert appropriate code below

ST STEEL CO CONCRETE PL PLASTIC OT OTHER

MAIN CASING TYPE	Nominal diameter top (main) casing (nearest inch)	Total depth of main casing (nearest foot)
ST et	6	84

OTHER CASING (If used)

EACH CASING	diameter inch	depth (feet) from	to

SCREEN RECORD

screen type or open hole insert appropriate code below

ST STEEL BR BRASS BRONZE HO OPEN HOLE PL PLASTIC OT OTHER

C 2

EACH SCREEN	DEPTH (nearest ft.)	
1	140	83
2		
3		

SLOT SIZE 2

DIAMETER OF SCREEN (NEAREST INCH)

GRAVEL PACK from to

IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY
(NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.) W Q

TELESCOPE CASING LOG INDICATOR OTHER DATA

C 3

PUMP TEST

HOURS PUMPED (nearest hour) 2

PUMPING RATE (gal. per min. to nearest gal.) 17

METHOD USED TO MEASURE PUMPING RATE Estimate

WATER LEVEL (distance from land surface)

BEFORE PUMPING 12

WHEN PUMPING 207

TYPE OF PUMP USED (for test)

A air P piston T turbine

C centrifugal R rotary O other (describe below)

J jet S submersible

PUMP INSTALLED

DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP INSTALLED

PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE

CAPACITY GALLONS PER MINUTE (to nearest gallon)

PUMP HORSE POWER

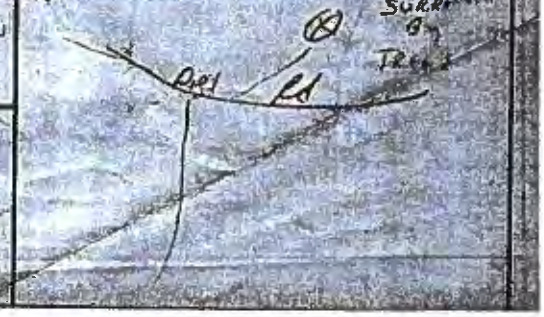
PUMP COLUMN LENGTH (nearest ft.)

CASING HEIGHT (circle appropriate box and enter casing height)

above / below LAND SURFACE (nearest foot)

LOCATION OF WELL ON LOT

SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



CIRCLE APPROPRIATE LETTER

A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

E ELECTRIC LOG OBTAINED

P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH 15CMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE

DRILLERS IDENT. NO. C 119

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (name of driller or journeyman responsible for site work if different from permittee)

E-5

ACTIVE STREAM

TREE LINE

FLOWING TRIBUTARY 7/1/22

TREE LINE

GOOD ACCESS

ALIGNMENT E SHIFT

E-1

ABANDONED STRIP MINE

FILLED WITH SPOILS

TRIBUTARY LIGHT FLOW TO INTERMITTENT FLOW 8/18/22

NUMEROUS TRACES OF CARBONACEOUS SHALE & COAL FRAGMENTS (PROSPECT ?)

PUNCH MINE

TREELINE

HAYFIELD

CORNFIELD

APPROX LIMIT

PASTURE/FIELD

TRACTOR ROAD

TREE LINE

HAYFIELD

E-2

ACTIVE STREAM

TREE LINE

ACTIVE STREAM

DENSE VEGETATION

SCATTERED APPLE TREES & MAPLE

SANDSTONE BOULDER FLOAT

PUNCH MINES WITH MOUNDS

DENSE VEGETATION

LIGHTLY WOODED WITH OCCASIONAL SANDSTONE FLOAT

HEAVILY WOODED SPARSE SANDSTONE FLOAT

BRUSHY FIELD

SOFT & WET

SANDSTONE FLOAT

WOODED

ALIGNMENT D

WOODED

NT

SOMERSET CO

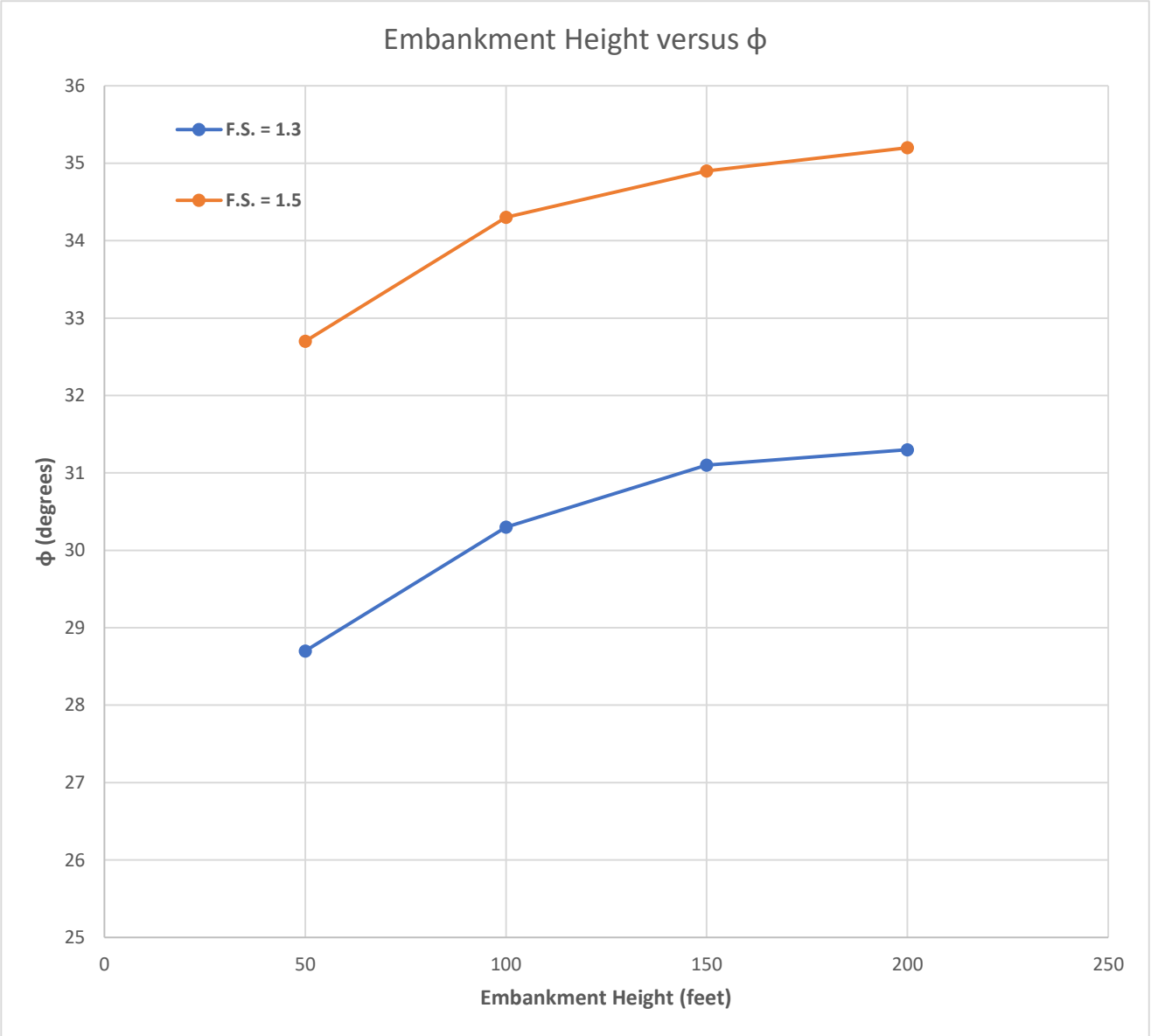
CARRETT

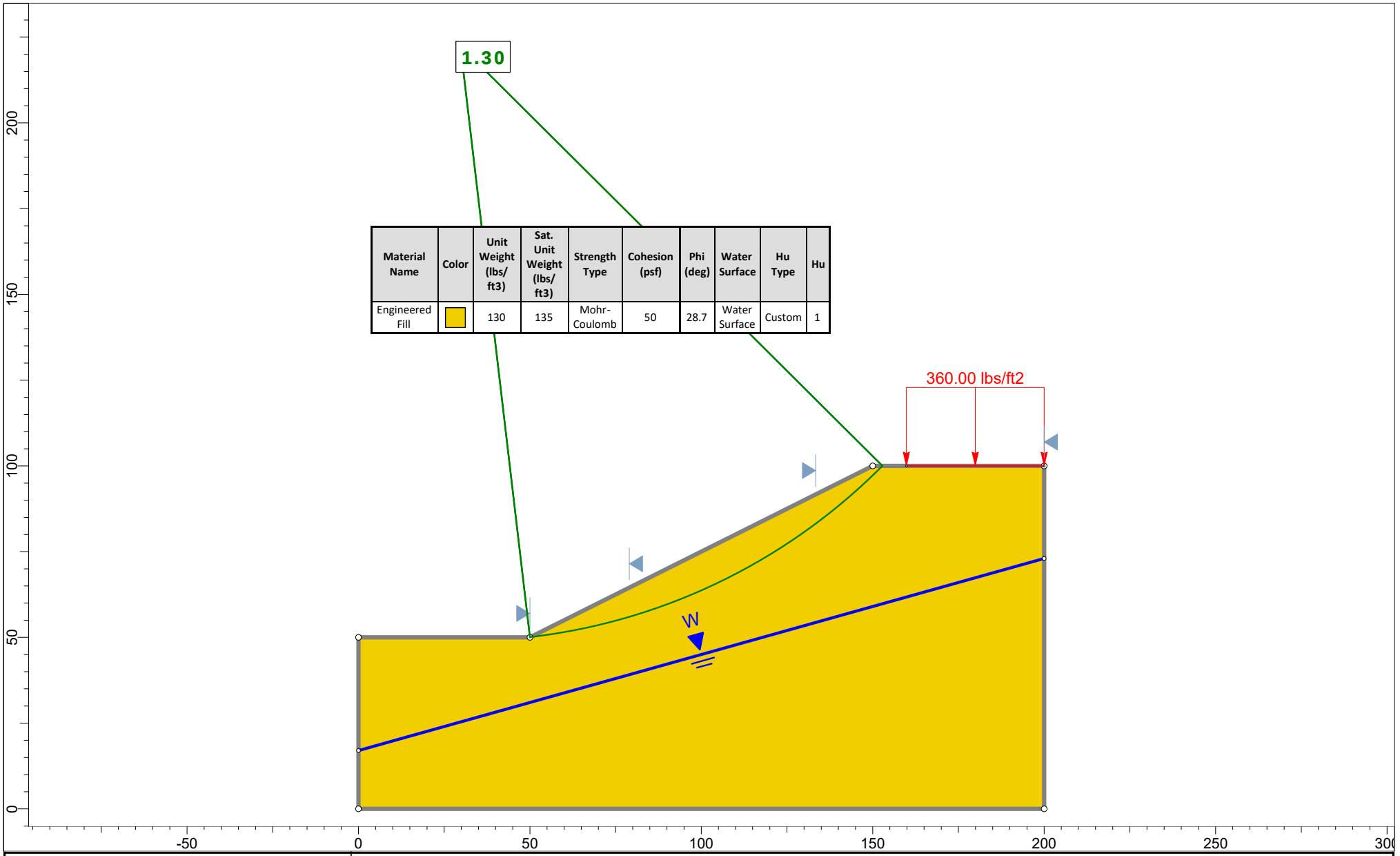

GA-08-0304

APPENDIX F
Geotechnical Analyses

Embankment Height (feet)	ϕ (degrees)	
	F.S. = 1.3	F.S. = 1.5
50	28.7	32.7
100	30.3	34.3
150	31.1	34.9
200	31.3	35.2

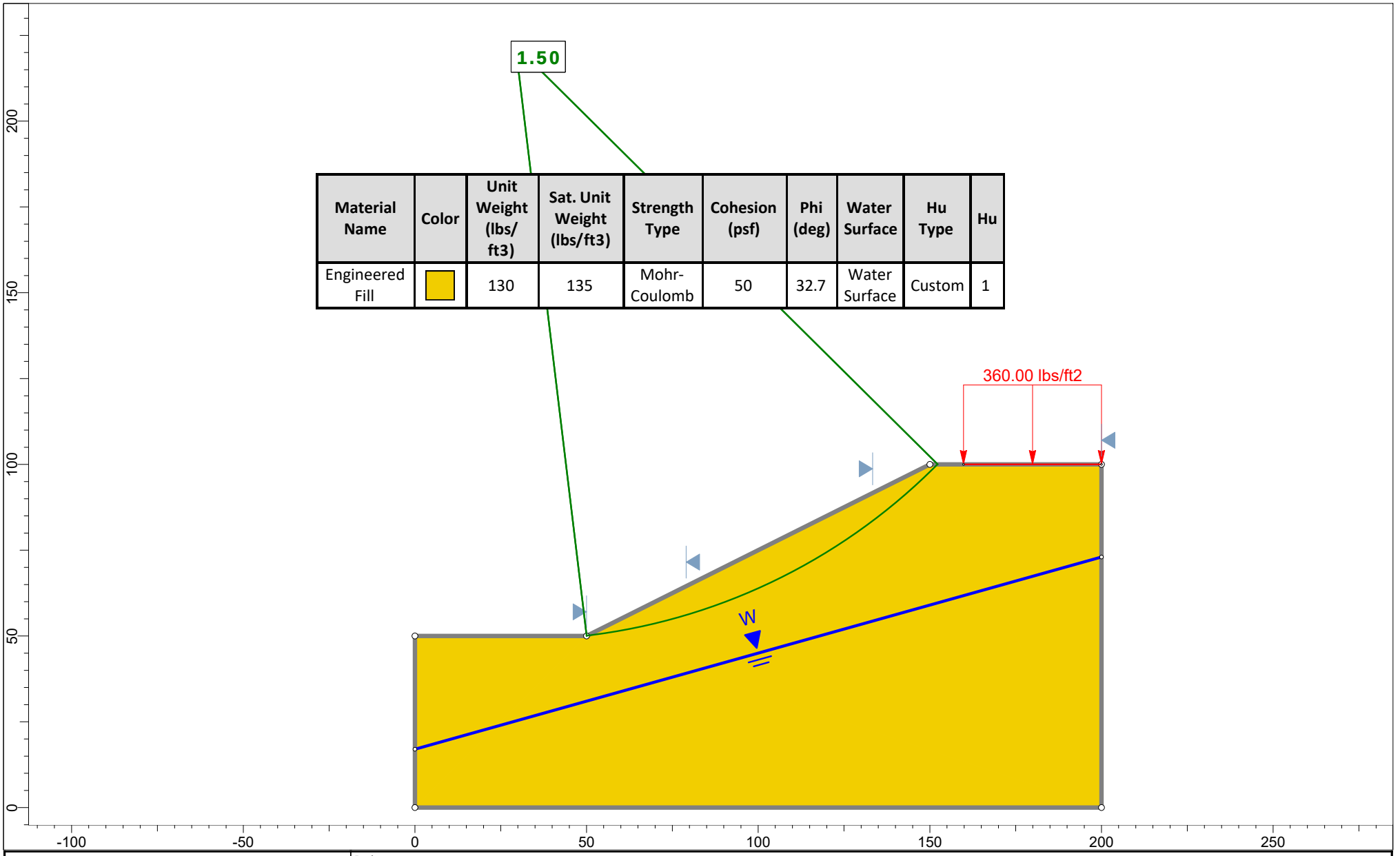
Note: A cohesion intercept of 50 psf was assumed for the embankment materials





rocscience	Project	SR 6219-050 Somerset County, PA & Garrett County, MD	
	Group	50' High Embankment, F.S = 1.3	Scenario: Master Scenario
	Drawn By	RJK	Company: GMI
	Date	6/22/2023, 8:21:40 AM	File Name: SR 6219-050 Sensitivity Stability Analysis.slmd

SLIDEINTERPRET 9.012

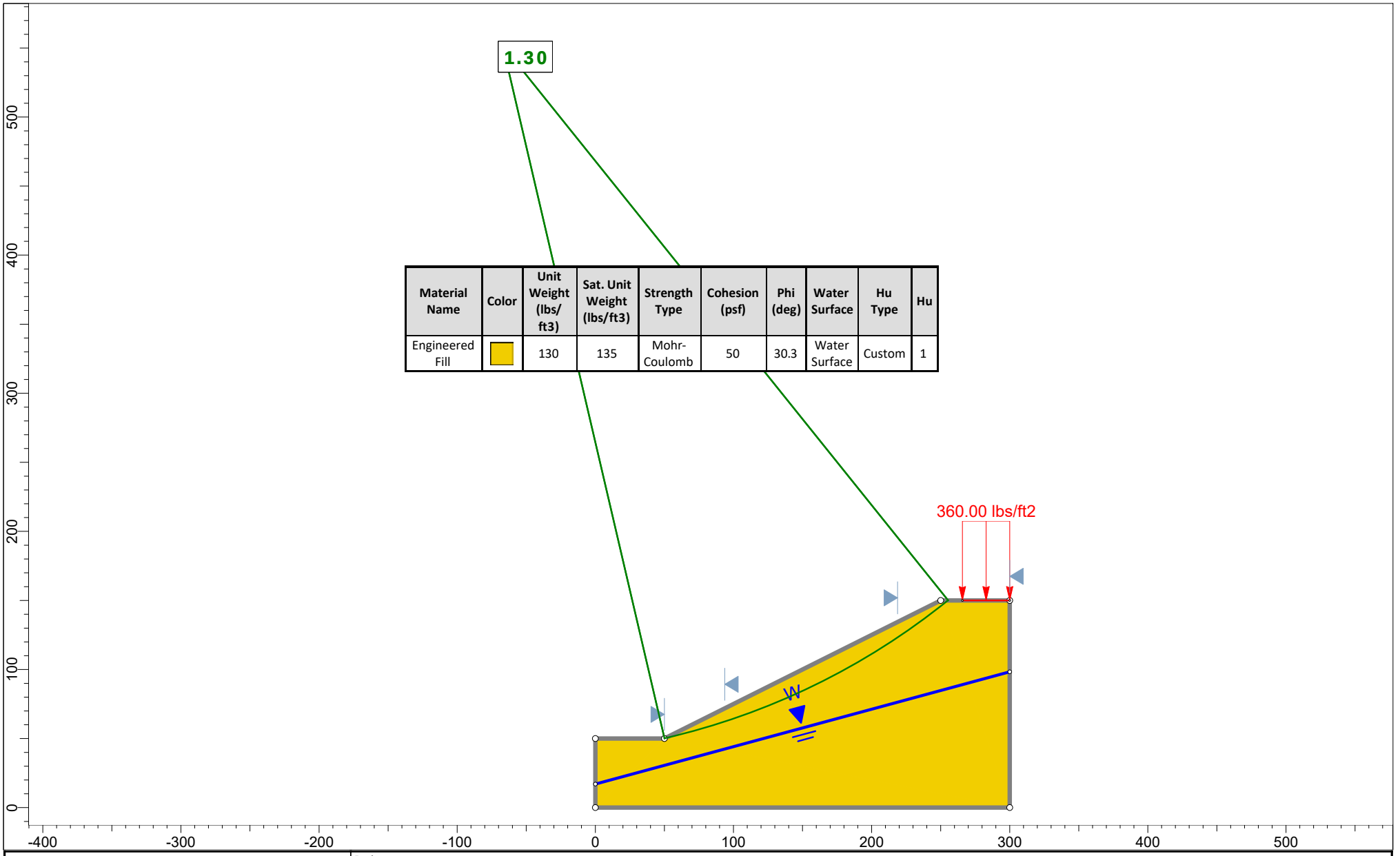


Material Name	Color	Unit Weight (lbs/ ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Engineered Fill		130	135	Mohr-Coulomb	50	32.7	Water Surface	Custom	1

rocscience

SLIDEINTERPRET 9.012

Project	SR 6219-050 Somerset County, PA & Garrett County, MD		
Group	50' High Embankment, F.S. = 1.5	Scenario	Master Scenario
Drawn By	RJK	Company	GMI
Date	6/22/2023, 8:21:40 AM	File Name	SR 6219-050 Sensitivity Stability Analysis.slmd

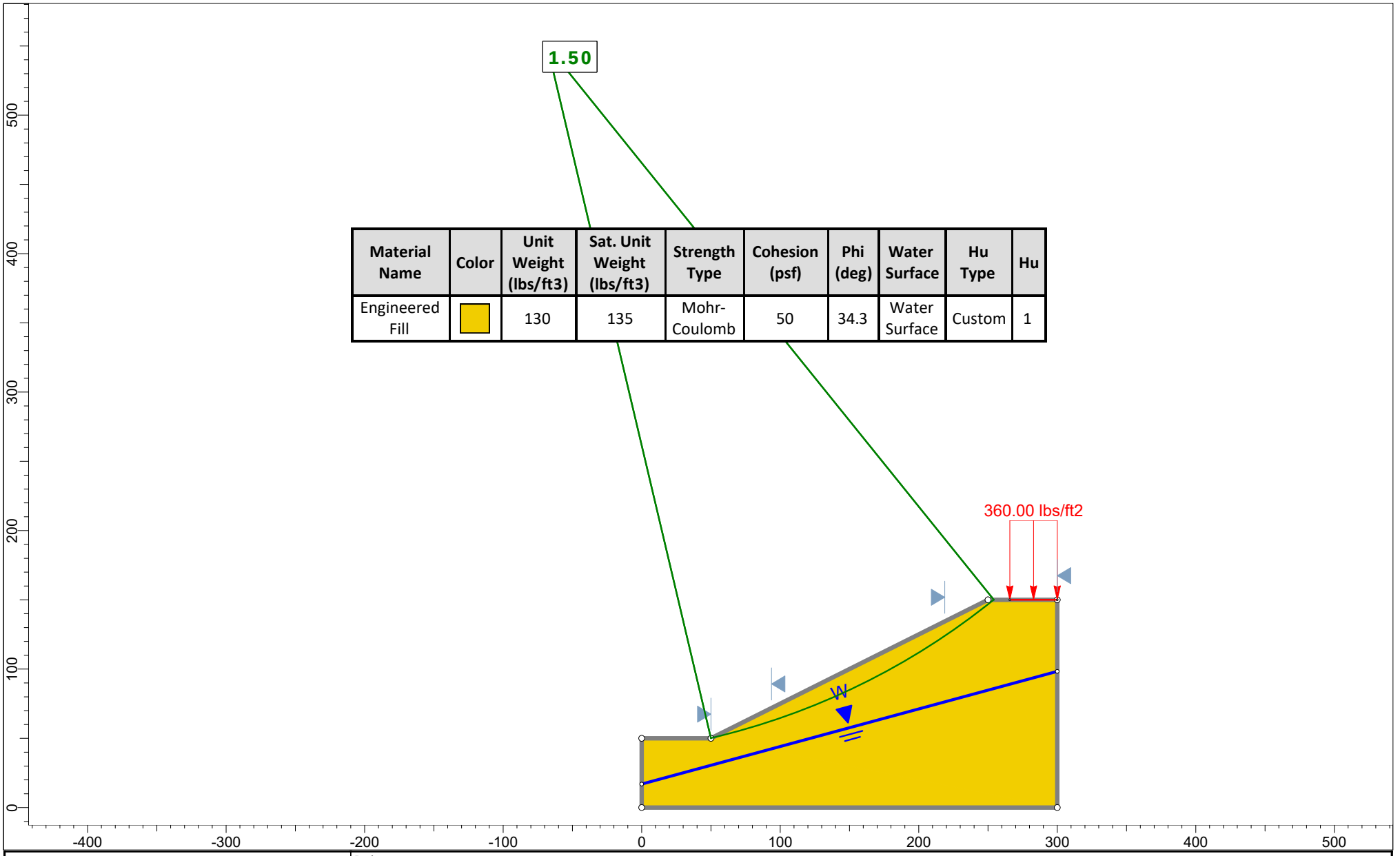


Material Name	Color	Unit Weight (lbs/ ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Engineered Fill		130	135	Mohr-Coulomb	50	30.3	Water Surface	Custom	1

rocscience

SLIDEINTERPRET 9.012

Project	SR 6219-050 Somerset County, PA & Garrett County, MD		
Group	100' High Embankment, F.S = 1.3	Scenario	Master Scenario
Drawn By	RJK	Company	GMI
Date	6/22/2023, 8:21:40 AM	File Name	SR 6219-050 Sensitivity Stability Analysis.slmd

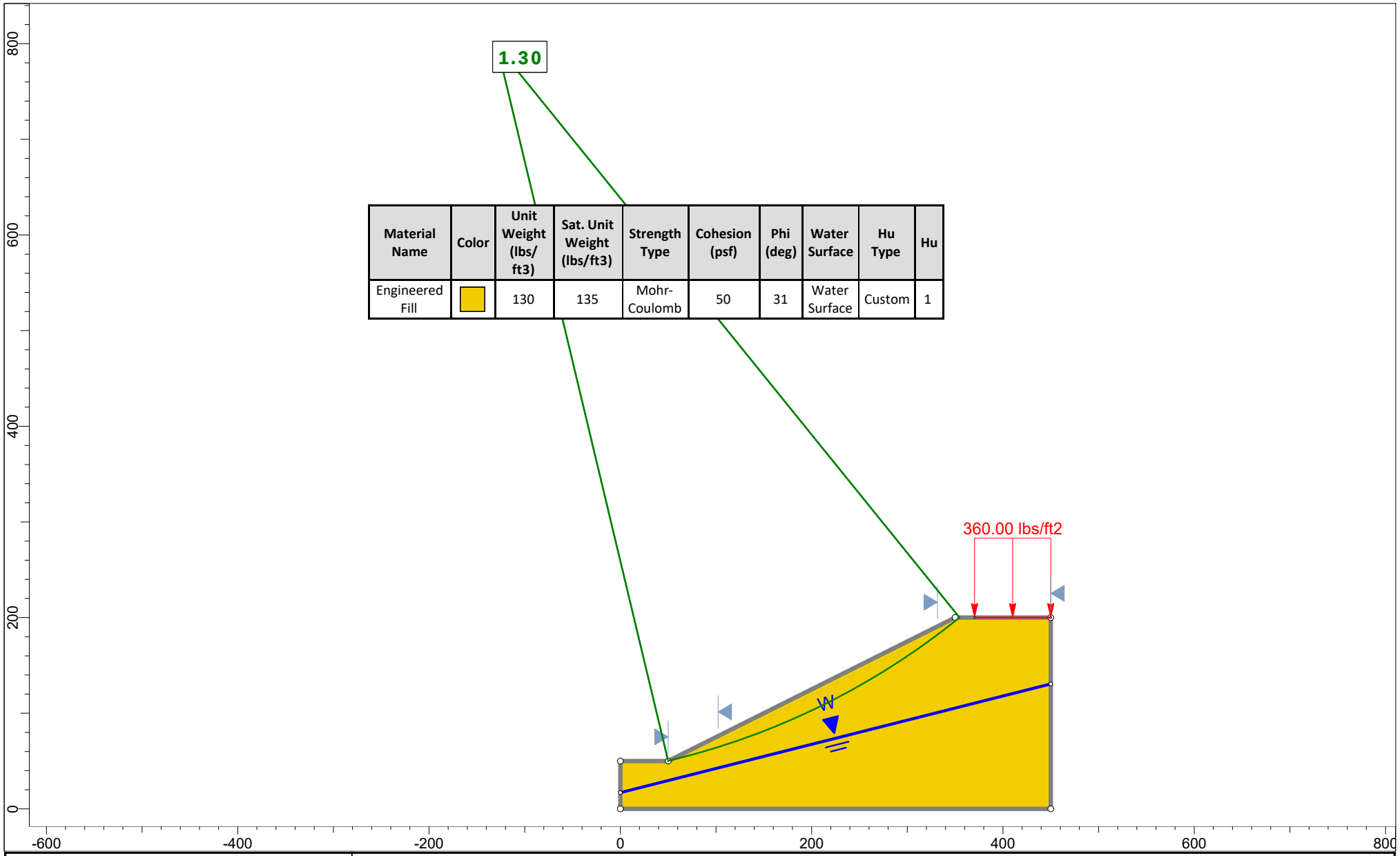


Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Engineered Fill		130	135	Mohr-Coulomb	50	34.3	Water Surface	Custom	1

rocscience

SLIDEINTERPRET 9.012

Project	SR 6219-050 Somerset County, PA & Garrett County, MD		
Group	100' High Embankment, F.S. = 1.5	Scenario	Master Scenario
Drawn By	RJK	Company	GMI
Date	6/22/2023, 8:21:40 AM	File Name	SR 6219-050 Sensitivity Stability Analysis.slmd

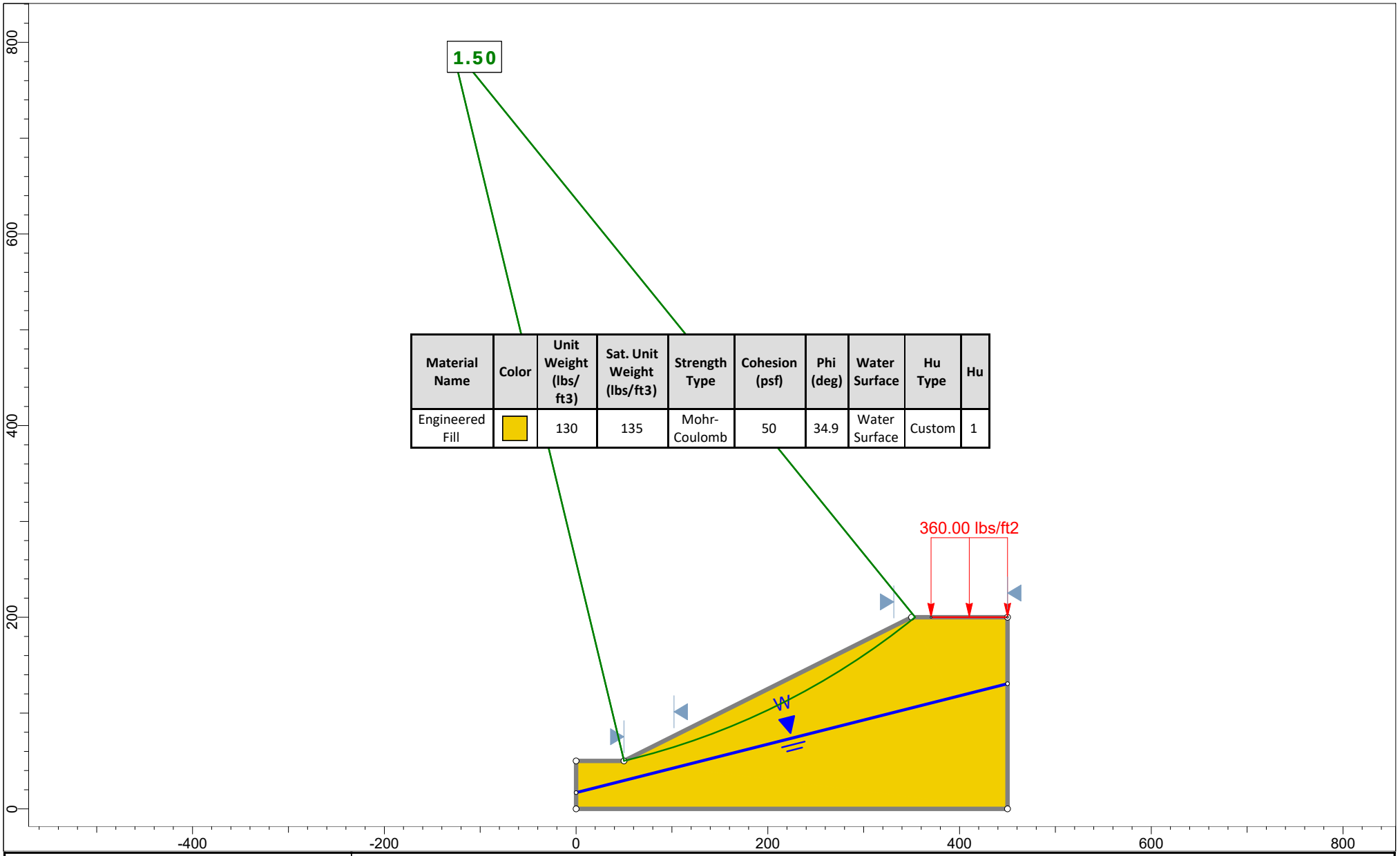


Material Name	Color	Unit Weight (lbs/ ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Engineered Fill		130	135	Mohr-Coulomb	50	31	Water Surface	Custom	1

rocscience

SLIDEINTERPRET 9.012

Project	SR 6219-050 Somerset County, PA & Garrett County, MD		
Group	150' High Embankment, F.S. = 1.3	Scenario	Master Scenario
Drawn By	RJK	Company	GMI
Date	6/22/2023, 8:21:40 AM	File Name	SR 6219-050 Sensitivity Stability Analysis.slmd

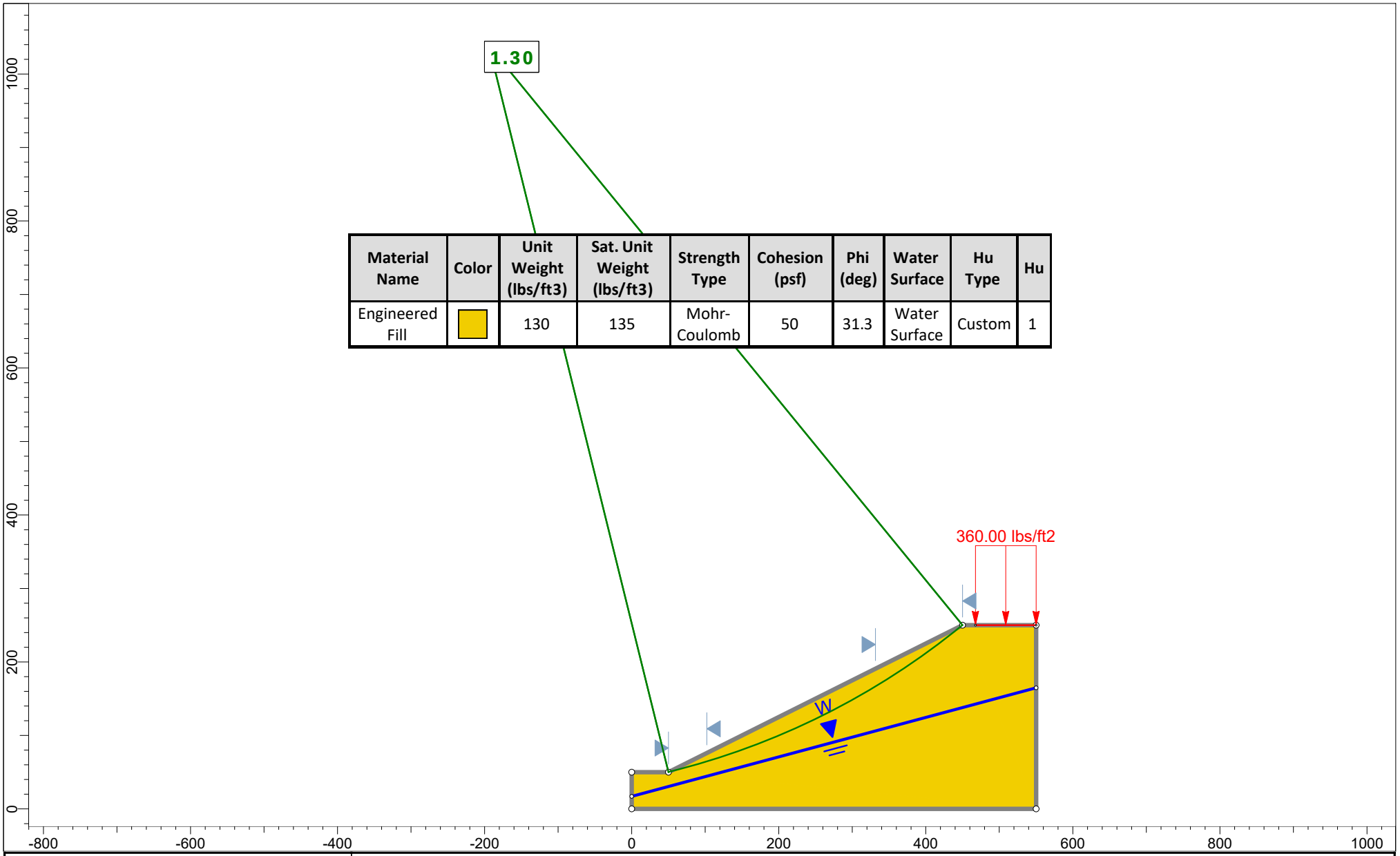


Material Name	Color	Unit Weight (lbs/ ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Engineered Fill		130	135	Mohr-Coulomb	50	34.9	Water Surface	Custom	1

rocscience

SLIDEINTERPRET 9.012

Project	SR 6219-050 Somerset County, PA & Garrett County, MD		
Group	150' High Embankment, F.S. = 1.5	Scenario	Master Scenario
Drawn By	RJK	Company	GMI
Date	6/22/2023, 8:21:40 AM	File Name	SR 6219-050 Sensitivity Stability Analysis.slmd

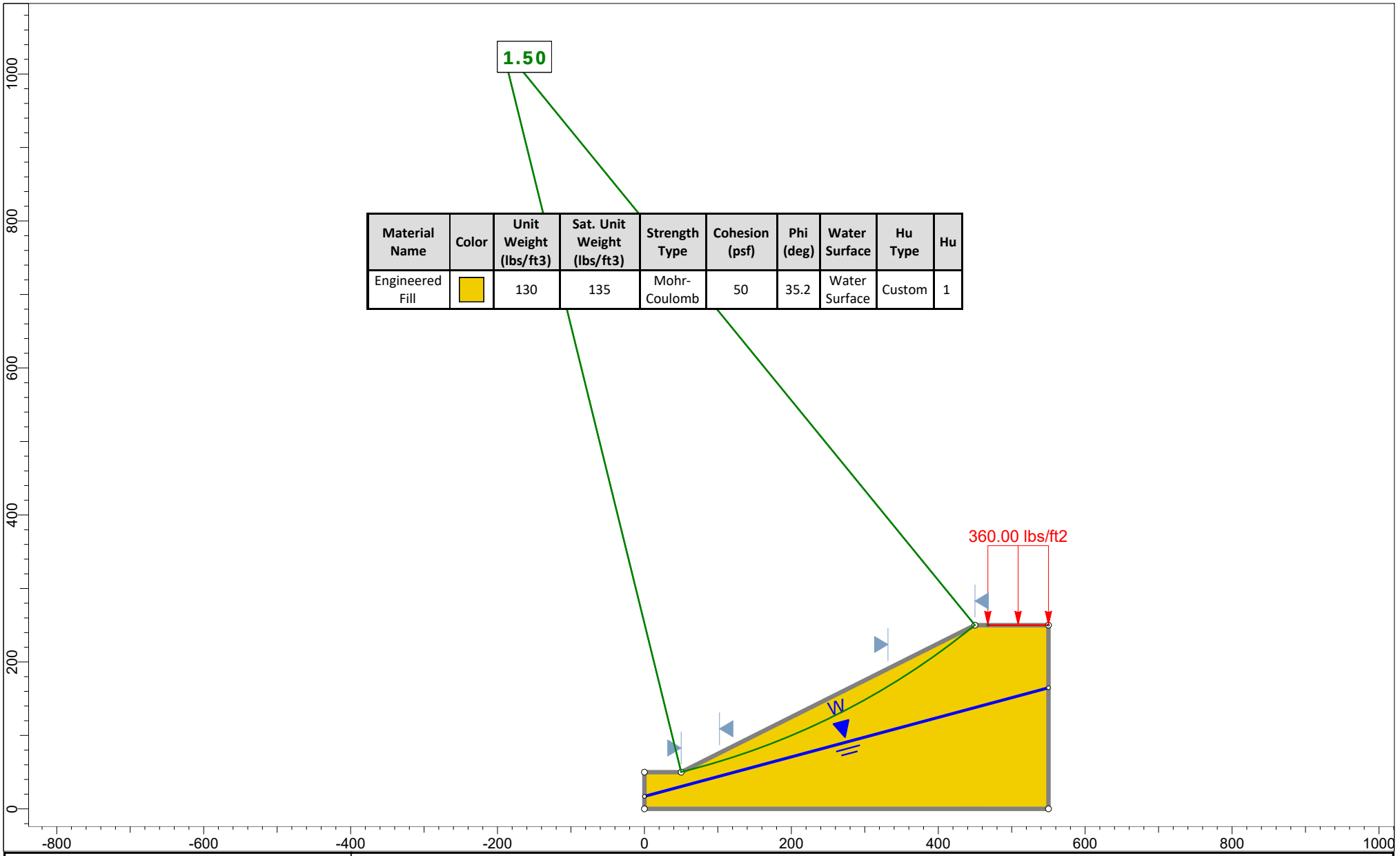


Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Engineered Fill		130	135	Mohr-Coulomb	50	31.3	Water Surface	Custom	1

rocscience

SLIDEINTERPRET 9.012

Project	SR 6219-050 Somerset County, PA & Garrett County, MD		
Group	200' High Embankment, F.S. = 1.3	Scenario	Master Scenario
Drawn By	RJK	Company	GMI
Date	6/22/2023, 8:21:40 AM	File Name	SR 6219-050 Sensitivity Stability Analysis.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
Engineered Fill		130	135	Mohr-Coulomb	50	35.2	Water Surface	Custom	1

rocscience

SLIDEINTERPRET 9.012

Project	SR 6219-050 Somerset County, PA & Garrett County, MD		
Group	200' High Embankment, F.S. = 1.5	Scenario	Master Scenario
Drawn By	RJK	Company	GMI
Date	6/22/2023, 8:21:40 AM	File Name	SR 6219-050 Sensitivity Stability Analysis.slmd

GEOTECHNICAL ALTERNATIVES ANALYSIS REPORT

SOMERSET COUNTY, PA AND GARRETT COUNTY, MD
S.R. 6219, SECTION 050

ECMS NO. E05060, PART 1

VOLUME 2 OF 2 VOLUMES

***Prepared for*:**

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 9-0,

AND

STANTEC CONSULTING SERVICES, INC.

AUGUST 2023

Prepared by:

GeoMechanics, inc
Consulting Engineers/Scientists
Elizabeth, Pennsylvania

APPENDIX G
Engineer's Logs

TABLE OF CONTENTS

Somerset and Garrett Counties
S.R. 6219, Section 050

GMI Project No. 21032
July 2023

ENGINEERING GEOLOGIST'S CERTIFICATION

I, the undersigned, hereby certify that I have observed the soil samples and rock cores for this project and that the classification of materials and depths presented on the following Engineer's Logs from 2023 are, to the best of my knowledge, correct as submitted.

July 28, 2023

GEO-MECHANICS, INC.

Timothy D. Witt

Timothy D. Witt, P.G.
Engineering Geologist

TR-440 (9-22)

pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

CHAIN OF CUSTODY FOR SUBSURFACE BORING SAMPLE BOXES

Sample boxes are the responsibility of the Drilling Contractor until delivery and acceptance at the designated PennDOT storage site. The Contractor shall protect boxes from damage or vandalism, as no payment will be made for borings with damaged or lost samples. Any core boxes temporarily taken by the Consultant for further examination become the responsibility of the Consultant. The transporter (Contractor or Consultant) is responsible to properly stack and tarp boxes as required upon delivery.

Section 1 - DRILLING INSPECTOR

District: 9 | County: (Select One) SOMERSET | S.R.: 6219 | Section: 050

List each Boring ID and the number of boxes corresponding to each boring.

BORING ID	# of Boxes	BORING ID	# of Boxes	BORING ID	# of Boxes	BORING ID	# of Boxes	BORING ID	# of Boxes
E-1A	4	E-6	2	E-11	5	DU-6	11		
E-2	2	E-7	2	DU-1	2				
E-3	2	E-8	6	DU-2	2				
E-4	2	E-9	1	DU-3	9				
E-5	1	E-10	4	DU-5	5				

I confirm that the core boxes (and the sample jars contained therein) listed on this shipment have been appropriately labeled and marked according to Section 214 of the Publication 222, Geotechnical Investigation Manual.

Tabulation Supplement page (TR-440A) attached? (check applicable box) ☒ No ☐ Yes

Total number of core boxes included in the shipment (Section-1 and Section-3 combined): 60

Name TIMOTHY D. WITT | Signature Timothy D Witt | Date 2/17/23

Company GEOMECHANICS, INC | Phone 724-339-6300

Section 2 - DRILLING CONTRACTOR

X

I confirm that all sample boxes indicated in this shipment have been delivered to the designated PennDOT storage site, received in good order, and stacked and covered for long-term storage according to the contract specifications.

Name Gary Reed | Signature [signature] | Date 2-17-23

Company T&C | Phone

Site of Delivery

Section 3 - GEOTECHNICAL CONSULTANT (when applicable) ☐ (not applicable)

We accept the interim possession of the sample boxes listed in the table below (list Boring IDs and box numbers) and will forward these boxes to the designated PennDOT storage facility upon completion of our examination.

BORING ID	Box #	BORING ID	Box #	BORING ID	Box #	BORING ID	Box #	BORING ID	Box #

Name | Signature | Date

Company | Phone

Section 4 - PennDOT REPRESENTATIVE

We accept shipment of sample boxes listed in the above Section: (check applicable box) ☐ Section 1 ☐ Section 3

Name Jason Hirshberger | Signature [signature] | Date 2-17-23

Storage Location PennDOT - Maintenance Bldg. 9-2

The Consultant is responsible to forward a copy of this completed form (signed by all parties) to the District Geotechnical Engineer (DGE) within seven (7) days of the sample box delivery by the Contractor, and also when any borrowed boxes have been returned by the Consultant. For non-consultant projects, the DGE shall confirm proper box delivery.

2023 BORINGS

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-1** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative DU
Sta. 6167+83.4 Offset 1.2 ft. RT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 43' 40.8" Long. -79° 4' 35.76"
1595358.3528 E 146558.5408 N
Ground Elev. 2335.7 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2321.6 ft. Elapsed 0.0 hr.
▼ Final 2316.6 ft. Elapsed 46.0 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

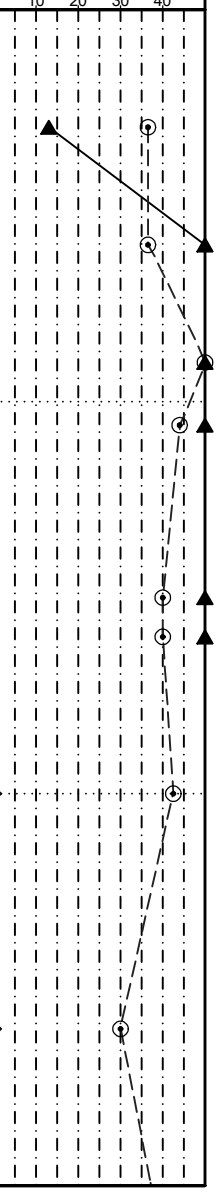
Drilling Start: 02/08/2023 11:00 am
Drilling Complete: 02/08/2023 1:30 pm
Grouting Complete: 02/10/2023 11:50 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 8.0 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: William Thiry
Inspector Cert. No. 019-97

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2335		**TOPSOIL**. 0.6'/El. 2335.1			S-1	1-2-8	13	1.1	73
		GRAVEL, some Sand, little Silt, little Clay, loose to very dense, damp, heterogeneous, poorly graded, rounded to sub-rounded, medium plastic fines, brown to orange tan, colluvium, *A-2-4(0), SC*	A-2-4 / SC	1.5	S-2	22-35-19	72	1.1	73
		.Fine to Coarse-Grained Sand.		3.0	S-3	21-43-27	93	1.5	100
		4.5'/El. 2331.2		4.5	S-4	48-50/.3'	>67	0.7	88
2330		**GRAVEL**, some Sand, little Silt, trace Clay, very dense, damp, homogeneous, well graded, non-plastic, residuum, *a-1-b, gw-gm*.	a-1-b / gw-gm	5.3	A-1				
				6.0	S-5	28-23-26	65	1.2	80
		8.0'/El. 2327.7		7.5	S-6	49-50/.0'	>67	0.4	80
		TOR		8.0	R-1		0%	1.7	85
2325		**SANDSTONE**, brown to gray, shaley, fine grained, soft to medium hard, highly weathered to slightly weathered, laminated to thin bedding with shallow dip, bedding joints, medium spacing, open joints, *.RD=5-10°* *(RQD=0%)*.		10.0	R-2		0%	1.8	60
				13.0					



PENNDOT ENGINEER'S LOG - PENNDOT_GINT_VERSION_1.2.2.3_9-21-2016.GDT - 7/26/23 16:58 - Z:\2021 JOBS\21032 - SR 6219-050, SOMERSET\BORING LOGS\BORINGLOGS.GPJ

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

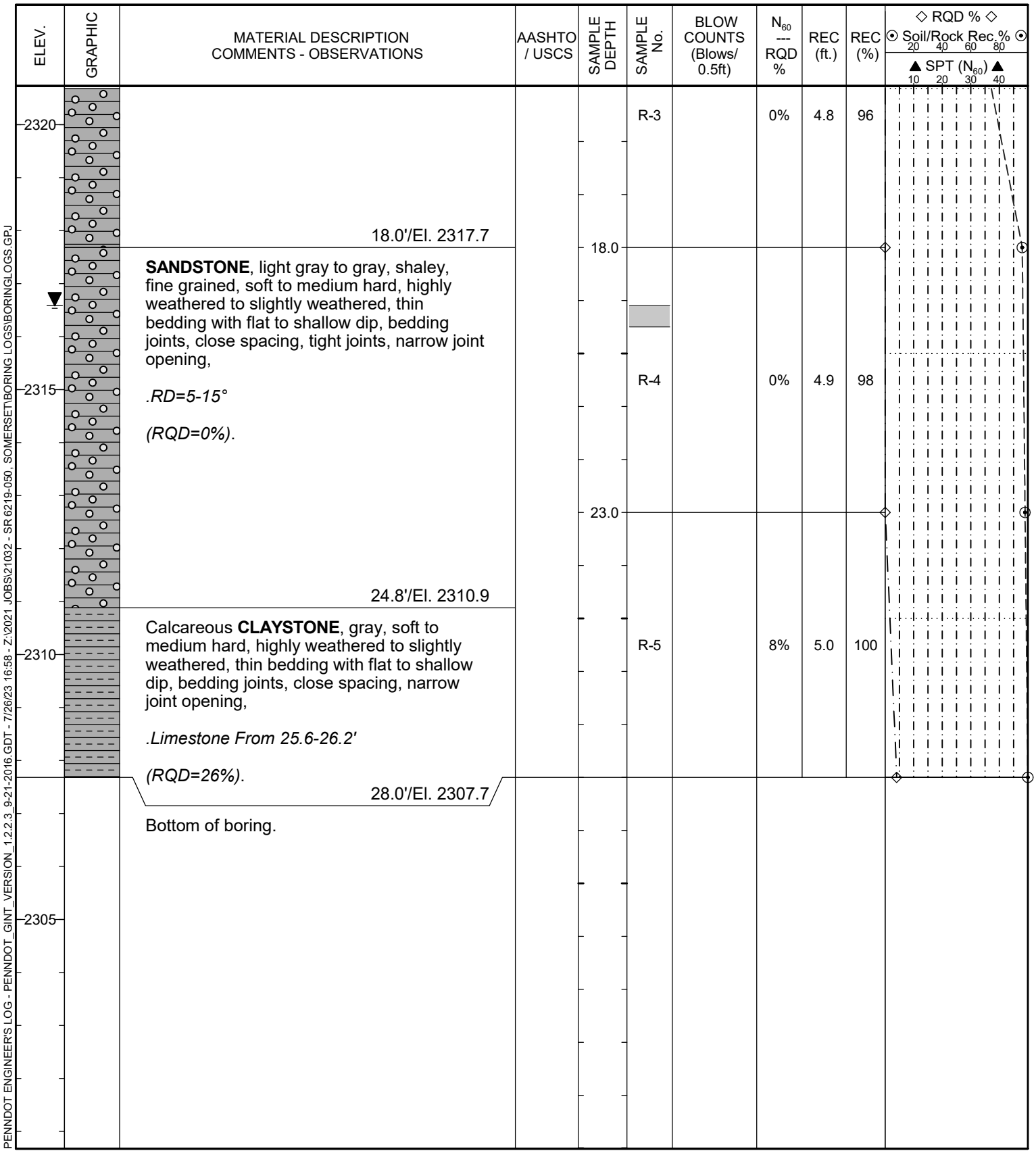
Boring **DU-1** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6167+83.4 Offset 1.2 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample



pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-2** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative DU
Sta. 6185+28.2 Offset 1.6 ft. LT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 43' 57.865" Long. -79° 4' 35.0637"
1595445.3008 E 148301.2020 N
Ground Elev. 2301.3 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2279.8 ft. Elapsed 0.0 hr.
▼ Final 2280.0 ft. Elapsed 262.5 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

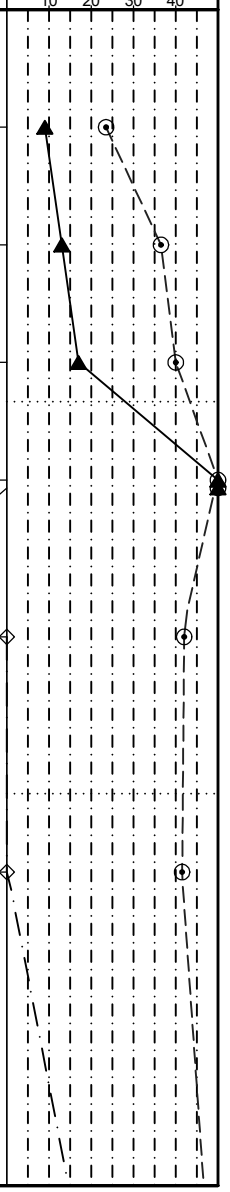
Drilling Start: 02/06/2023 9:30 am
Drilling Complete: 02/06/2023 11:30 am
Grouting Complete: _____
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 6.0 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL, *Leaf Litter*. 0.1'/El. 2301.2							
2300		**CLAY**, some Silt, little Gravel, little Sand, medium to stiff, damp, heterogeneous, poorly graded, sub-rounded, medium plastic fines, brown, colluvium, *a-6, cl*. 3.0'/El. 2298.3	a-6 / cl	1.5	S-1	1-3-4	9	0.7	47
					S-2	3-4-6	13	1.1	73
		GRAVEL, little Sand, little Clay, little Silt, medium dense to very dense, damp to wet, homogeneous, poorly graded, angular, medium plastic fines, brown, residuum, *a-2-6, gc*	a-2-6 / gc	3.0	S-3	8-6-7	17	1.2	80
				4.5	S-4	7-27-37	85	1.5	100
		.Decomposed Shale. 6.1'/El. 2295.2		6.0					
2295		***TOR***		6.1	S-5	50/.1'	>67	0.1	100
		SILTSTONE interbedded with SHALE, olive brown to brown, soft to medium hard, slightly weathered, laminated to narrow bedding with shallow dip, bedding joints, narrow to close spacing, shallow dip, tight joints,			R-1		0%	1.6	84
		.Bedding RD=8-10°		8.0					
		.Grading Towards Sandstone; Sandstone Beds From 11.3-11.9' and 13.2-14.4'			R-2		0%	2.5	83
		(RQD=19%).		11.0					
2290					R-3		36%	4.8	96



NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-2** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6185+28.2 Offset 1.6 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
		15.8'/El. 2285.5								
2285		**SANDSTONE**, gray, fine grained, medium hard, slightly weathered, narrow to moderate bedding with shallow dip, bedding joints, close to moderate spacing, tight joints,		16.0						
		.Some Micaceous Content			R-4		86%	5.0	100	
		.Brown Stains Fromm 24.7-26.0'								
		.Lost Drill Water @ 25.9'								
2280		*(RQD=72%)*.		21.0						
					R-5		60%	5.0	100	
		26.0'/El. 2275.3								
2275		Bottom of boring.								
2270										

NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-3** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative DU
Sta. 6200+45.0 Offset 314.0 ft. RT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 44' 12.6613" Long. -79° 4' 30.3003"
1595837.8870 E 149792.6740 N
Ground Elev. 2479.7 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2467.4 ft. Elapsed 0.0 hr.
▼ Final 2454.3 ft. Elapsed 114.0 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

Drilling Start: 01/31/2023 11:30 am
Drilling Complete: 02/01/2023 3:00 pm
Grouting Complete: _____
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 15.0 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL, *Leaf Litter*. 0.2'/El. 2479.5			S-1	7-4-4	11	0.3	20
		GRAVEL and **SAND**, little Silt, trace Clay, loose to very dense, damp to dry, homogeneous, poorly graded, angular, low plastic fines, brown, residuum, *a-2-4, gm*	a-2-4 / gm	1.5	S-2	5-9-17	35	0.6	40
		.Sandstone Cobble/Boulders Present on Surface.		3.0	S-3	50/.4'	>67	0.4	100
		4.5'/El. 2475.2		3.4	A-1				
2475		**SILT**, some Clay, little Gravel, trace Sand, very stiff to hard, moist, homogeneous, poorly graded, angular, medium plastic fines, gray and mottled orange brown, residuum, *A-7-6(17), CL*.		4.5	S-4	20-12-10	29	0.3	20
				6.0	S-5	6-7-12	25	0.9	60
			A-7-6 / CL	7.5	S-6	14-15-15	40	0.8	53
				9.0	S-7	4-15-24	52	1.2	80
2470				10.5	S-8	22-46-50/.4'	128	0.6	43
		11.5'/El. 2468.2		11.9	A-2				
▽		**CLAY**, some Silt, some fine Sand, trace Gravel, contains rock fragments, hard, damp, fissured, poorly graded, angular, gray and mottled orange brown, residuum, *a-7-6, cl*		12.0	S-9	22-50/.4'	>67	0.9	100
			a-7-6 / cl	12.9	A-3				
		.Carbonaceous Content From 15.0-15.5'		13.5	S-10	50/.3'	>67	0.3	100
2465		*.Decomposed Clay Shale*.		13.8	A-4				

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

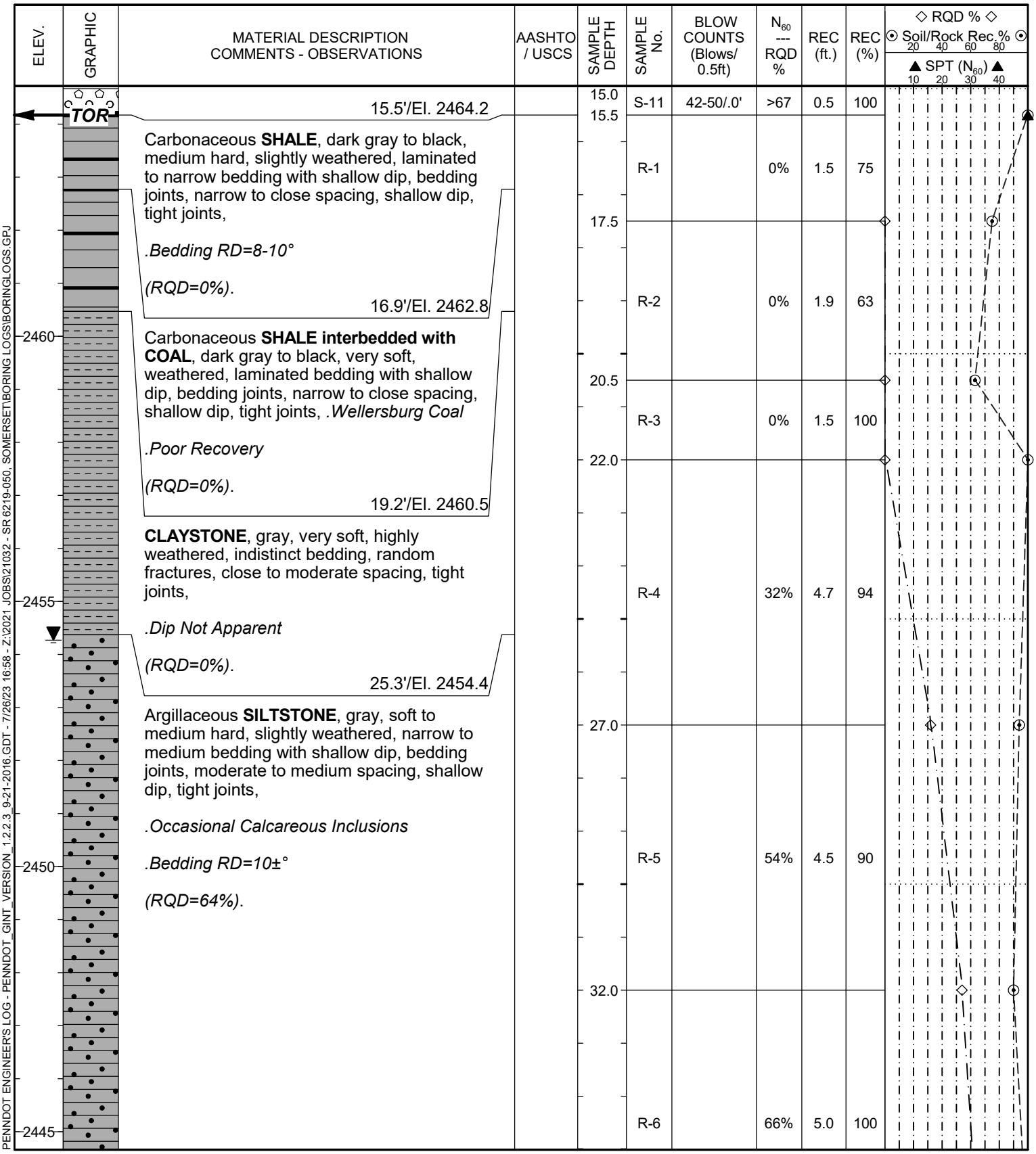
Boring **DU-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6200+45.0 Offset 314.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample



PENNDOT ENGINEER'S LOG - PENNDOT_GINT_VERSION_1.2.2.3_9-21-2016.GDT - 7/26/23 16:58 - Z:\2021 JOBS\21032 - SR 6219-050, SOMERSET\BORING LOGS\BORINGLOGS.GPJ

NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6200+45.0 Offset 314.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
		37.1'/El. 2442.6		37.0						
2440		**CLAYSTONE**, gray, slickensided, soft to medium hard, fresh, indistinct bedding, random fractures, massive to medium spacing, tight joints, *.Dip Not Apparent* *.Relatively Competent for Claystone* *(RQD=58%).*			R-7		46%	4.8	96	
2435				42.0	R-8		76%	5.0	100	
		47.6'/El. 2432.1		47.0						
2430		Argillaceous **SILTSTONE**, gray, medium hard, fresh, moderate to medium bedding with shallow dip, bedding joints, moderate to medium spacing, shallow dip, tight joints, *.Carbonaceous @ 59.8'* *(RQD=70%).*			R-9		84%	4.9	98	
				52.0						
2425					R-10		46%	4.9	98	

NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6200+45.0 Offset 314.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		Argillaceous **SILTSTONE**, gray, medium hard, fresh, moderate to medium bedding with shallow dip, bedding joints, moderate to medium spacing, shallow dip, tight joints,								
		.Carbonaceous @ 59.8'								
		(RQD=70%). *(Layer continued from the previous page.)*								
		59.8'/El. 2419.9								
2420		Carbonaceous **SHALE interbedded with COAL**, black, soft, fresh, laminated to narrow bedding with shallow dip, jointed, narrow to close spacing, sheer dip, tight joints, *.Est Coal Seam From 61.6-63.0' (Unknown Coal); Some Core Loss*		57.0	R-11		48%	5.0	100	
		.Traces of Pyrite From 63.4-70.4'								
		.Lost Water @64.5'; Return @ 68.0'								
		.Joint RD-70-90°								
2415		*(RQD=11%).*		62.0	R-12		22%	4.5	90	
		63.4'/El. 2416.3								
		SILTSTONE interbedded with SHALE, gray, medium hard, slightly weathered to fresh, laminated to moderate bedding with shallow dip, bedding joints, close to moderate spacing, shallow dip, tight joints,								
		.Traces of Pyrite								
		.Bedding RD=8-10°								
		(RQD=30%).		67.0	R-13		28%	5.0	100	
2410		70.4'/El. 2409.3								
		SHALE, light to dark gray, medium hard, fresh, laminated to narrow bedding with shallow dip, bedding joints, close to moderate spacing, shallow dip, tight joints,								
		.Bedding RD=8-10°								
		.Interbedded Light Gray Sandy Laminations and Dark Gray Silty Laminations		72.0	R-14		78%	4.8	96	
		(RQD=60%).								
2405		74.6'/El. 2405.1								

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NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6200+45.0 Offset 314.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		SHALE interbedded with SILTSTONE, gray to dark gray, medium hard, fresh, laminated to moderate bedding with shallow dip, bedding joints, close to medium spacing, shallow dip, tight joints, *.Traces of Pyrite* *.Thin Coal with Binder From 83.3-84.3' (Barton Coal)* *(RQD=61%).* *(Layer continued from the previous page.)*		77.0	R-15		78%	5.0	100	
2400				82.0	R-16		26%	3.7	74	
2395		84.7'/El. 2395.0 **CLAYSTONE**, gray, soft, fresh, indistinct bedding, random fractures, moderate spacing, tight joints, *.Dip Not Apparent* *(RQD=29%).* 86.1'/El. 2393.6 **LIMESTONE**, gray, hard, fresh, moderate bedding with shallow dip, bedding joints, moderate spacing, shallow dip, tight joints, *.Traces of Pyrite* *(RQD=52%).* 91.3'/El. 2388.4		87.0	R-17		54%	5.0	100	
2390				92.0	R-18		80%	5.0	100	
2385										

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NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6200+45.0 Offset 314.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
		Argillaceous **SILTSTONE**, gray, medium hard, fresh, narrow to medium bedding with shallow dip, bedding joints, close to medium spacing, shallow dip, tight joints, *calcareous inclusions*		97.0						
2380		*.Traces of Pyrite* *.Bedding RD=0-10°* *.Below 112.0': Rock Core has Few Calcareous Inclusions; Has Medium to Widely Spaced Discontinuities and is Competent*			R-19		66%	5.0	100	
		.Sandy Laminations Starting @ 130.6' *(RQD=82%).* *(Layer continued from the previous page.)*		102.0						
2375					R-20		50%	5.0	100	
				107.0						
2370					R-21		74%	5.0	100	
				112.0						
2365					R-22		100%	5.0	100	

NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6200+45.0 Offset 314.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		Argillaceous **SILTSTONE**, gray, medium hard, fresh, narrow to medium bedding with shallow dip, bedding joints, close to medium spacing, shallow dip, tight joints, *calcareous inclusions*								
		.Traces of Pyrite		117.0						
		.Bedding RD=0-10°								
2360		*.Below 112.0': Rock Core has Few Calcareous Inclusions; Has Medium to Widely Spaced Discontinuities and is Competent*			R-23		100%	5.0	100	
		.Sandy Laminations Starting @ 130.6'		122.0						
		(RQD=82%). *(Layer continued from the previous page.)*			R-24		100%	5.0	100	
2355				127.0						
2350		131.5'/El. 2348.2			R-25		94%	5.0	100	
				132.0						
2345					R-26		94%	5.0	100	

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NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6200+45.0 Offset 314.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2340		**SANDSTONE interbedded with SHALE**, light to dark gray, fine grained, medium hard, fresh, laminated to moderate bedding with shallow dip, bedding joints, close to medium spacing, shallow dip, tight joints, *.Shale Beds From 132.6-135.8' and 137.2-140.0'* *.Full Water Return Except From 64.5-68.0'* *(RQD=95%).* *(Layer continued from the previous page.)* 140.0'/El. 2339.7		137.0	R-27		97%	3.0	100	
		Bottom of boring.								
2335										
2330										
2325										

PENNDOT ENGINEER'S LOG - PENNDOT_GINT_VERSION_1.2.2.3_9-21-2016.GDT - 7/26/23 16:58 - Z:\2021 JOBS\21032 - SR 6219-050, SOMERSET\BORING LOGS\BORINGLOGS.GPJ

NOTE: BORING NOT GROUTED DUE TO PROPERTY OWNER REFUSAL

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-5** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative DU
Sta. 6276+57.2 Offset 9.0 ft. LT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 44' 40.7208" Long. -79° 3' 15.4336"
152544.6310 E 1601730.0437 N
Ground Elev. 2190.8 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2139.1 ft. Elapsed 0.0 hr.
▼ Final 2133.6 ft. Elapsed 17.5 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

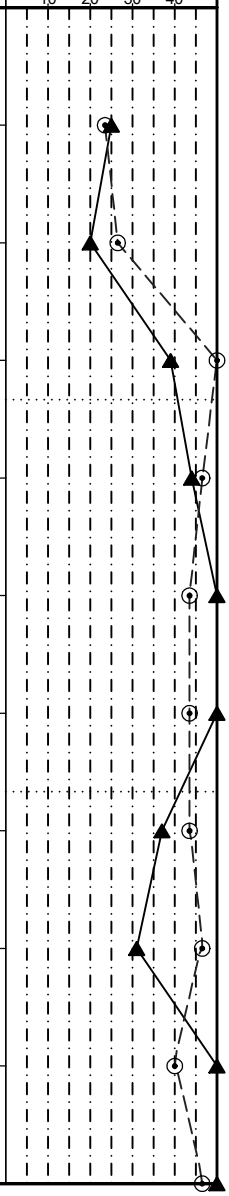
Drilling Start: 01/11/2023 12:20 pm
Drilling Complete: 01/12/2023 3:00 pm
Grouting Complete: 02/14/2023 2:40 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 21.6 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2190		**TOPSOIL**. 0.3'/El. 2190.5							
		SAND, some Gravel, little Silt, trace Clay, loose to very dense, dry to damp, heterogeneous, poorly graded, angular to sub-rounded, non-plastic, brown to gray tan, colluvium, *a-1-b, gp-gm*.	a-1-b / gp-gm	1.5	S-1	5-14-5	25	0.7	47
				3.0	S-2	5-9-6	20	0.8	53
				4.5	S-3	6-14-15	39	1.5	100
2185				6.0	S-4	9-17-16	44	1.4	93
				7.5	S-5	17-24-14	51	1.3	87
				9.0	S-6	29-25-17	56	1.3	87
				10.5	S-7	6-13-15	37	1.3	87
2180				12.0	S-8	16-13-10	31	1.4	93
				13.5	S-9	16-13-44	76	1.2	80
		15.0'/El. 2175.8			S-10	32-21-25	61	1.4	93



pennsylvania
DEPARTMENT OF TRANSPORTATION

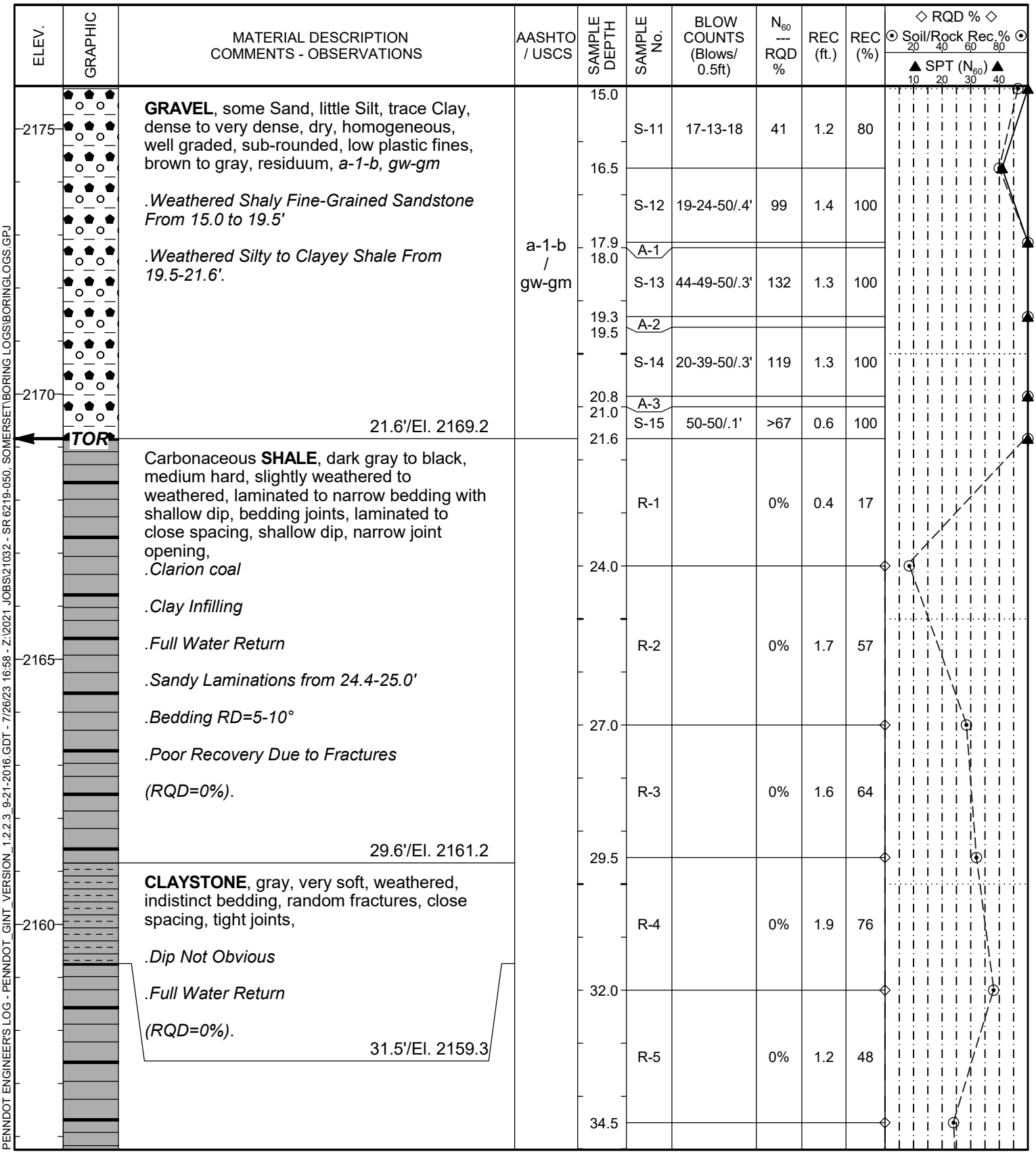
ENGINEER'S LOG

Boring **DU-5** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6276+57.2 Offset 9.0 ft. LT.

NOTE: N values and all graphical plots are for information only.



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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-5** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6276+57.2 Offset 9.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2155		Carbonaceous **SHALE**, black, soft to medium hard, weathered, laminated to narrow bedding with shallow dip, bedding joints, narrow to close spacing, shallow dip, tight joints, *.Brookville coal* *.Poor Recovery Due to Numerous Fractures* *.Bedding RD=5-10°* *.Est. Position of Coal Based on Drill water Color: 33.1-35.0' (Washed Coal Away)* *.Full Water Return* *(RQD=0%).* *(Layer continued from the previous page.)* 39.5'/El. 2151.3			R-6		0%	1.3	52	
				37.0						
					R-7		0%	1.2	48	
				39.5						
2150					R-8		60%	2.5	100	
		CLAYSTONE, gray, soft, slightly weathered, indistinct bedding, random fractures, close to moderate spacing, tight joints, *.Dip Not Obvious* *(RQD=31%).* 40.8'/El. 2150.0		42.0						
					R-9		48%	2.5	100	
		SANDSTONE, gray, fine grained, medium hard, slightly weathered, laminated to medium bedding with shallow dip, bedding joints, close to medium spacing, shallow dip, tight joints, *.Frequent Carbonaceous Laminations* *.Bedding RD=10±°* *(RQD=44%).* 47.1'/El. 2143.7		44.5						
2145					R-10		20%	2.1	84	
				47.0						
					R-11		74%	5.0	100	
2140		**SANDSTONE**, gray, hard, slightly weathered, narrow to thick bedding with shallow dip, bedding joints, close to wide spacing, shallow dip, tight joints, *.Below 52.0' Cross-Beds up to 40°* *.Rock Core is Hard, Massive and Competent* *.Fracture Zone with Orange-Brown Staining From 51.3-51.8'* *.Joints @ 57.0-57.4 and 57.7-58.0'; RD=70°* *(RQD=87%).*		52.0						
					R-12		100%	5.0	100	

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ENGINEER'S LOG

Boring **DU-5** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6276+57.2 Offset 9.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2135		**SANDSTONE**, gray, hard, slightly weathered, narrow to thick bedding with shallow dip, bedding joints, close to wide spacing, shallow dip, tight joints,								
		.Below 52.0' Cross-Beds up to 40°		57.0						
		.Rock Core is Hard, Massive and Competent			R-13		86%	5.0	100	
		.Fracture Zone with Orange-Brown Staining From 51.3-51.8'								
		.Joints @ 57.0-57.4 and 57.7-58.0'; RD=70°								
2130		*(RQD=87%).* *(Layer continued from the previous page.)*								
		62.0'/El. 2128.8		62.0						
		Carbonaceous **SILTSTONE**, black to dark gray, soft, weathered, laminated to moderate bedding with shallow dip, bedding joints, close to moderate spacing, shallow dip, tight joints,			R-14		22%	3.8	76	
		.Clay Seam From 62.8-63.3'								
		.Thin Coal From 62.5-62.8' (Wash Away)								
2125		*.Bony Coal From 66.2-66.8' (Mercer coal)*								
		(RQD=23%).								
		66.8'/El. 2124.0		67.0						
		CLAYSTONE, gray, slickensided, medium hard, fresh, indistinct bedding, random fractures, moderate to medium spacing, tight joints,			R-15		76%	5.0	100	
		.Dip Not Apparent								
		(RQD=67%).								
2120		71.0'/El. 2119.8		72.0						
					R-16		100%	5.0	100	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-5** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6276+57.2 Offset 9.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2115		**SANDSTONE interbedded with SILTSTONE**, gray, fine grained, medium hard, fresh, moderate to thick bedding with shallow dip, bedding joints, moderate to wide spacing, shallow dip, tight joints,								
		.Rock Core is Massive and Competent								
		.Bedding RD=10±°								
		.Lost Drill Water @ 83.0'								
		(RQD=92%). *(Layer continued from the previous page.)*		77.0	R-17		100%	5.0	100	
2110				82.0	R-18		68%	4.9	98	
2105				87.0	R-19		92%	5.0	100	
2100				92.0	R-20		100%	5.0	100	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-5** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6276+57.2 Offset 9.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2095		97.0'/El. 2093.8								
		Bottom of boring.								
2090										
2085										
2080										

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative DU
Sta. 6285+02.0 Offset 7.3 ft. LT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 44' 41.6871" Long. -79° 3' 4.7161"
1602568.5891 E 152630.0481 N
Ground Elev. 2356.4 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2318.3 ft. Elapsed 0.0 hr.
▼ Final 2314.0 ft. Elapsed 47.5 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

Drilling Start: 02/09/2023 2:15 pm
Drilling Complete: 02/13/2023 12:00 pm
Grouting Complete: 02/15/2023 12:00 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 16.5 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2356		**TOPSOIL**, *Leaf Litter*. 0.3'/El. 2356.1							
2355		**GRAVEL** and **SAND**, trace Silt, loose to very dense, damp to wet, homogeneous, poorly graded, sub-rounded, non-plastic, light brown to brown, colluvium, *a-1-b, gp*		1.5	S-1	1-4-3	9	0.7	47
				3.0	S-2	16-17-28	60	1.1	73
		.Numberous Surface Cobble and Boulders			S-3	38-50/.4'	>67	0.9	100
		.High Blow Counts Likely Due to Boulders		3.9	A-1				
		.Samples Wet From Advancing With Casing and Water		4.5	S-4	9-3-6	12	0.7	47
		.Lost Drill Water @ 4.0'.	a-1-b / gp	6.0	S-5	1-50/.4'	>67	0.4	44
2350				6.9	A-2				
				7.5	S-6	35-11-12	31	1.2	80
				9.0	S-7	50/.2'	>67	0.2	100
				9.2	A-3				
		10.5'/El. 2345.9							
2345		**GRAVEL**, trace Sand, contains rock fragments, medium dense to very dense, wet, fissured, poorly graded, angular, non-plastic, brown, residuum, *a-1-b, gp*		10.5	S-8	10-10-15	33	0.3	20
		.Poor Recovery Due to Spoon Bouncing on Bedrock or Possible Boulders??	a-1-b / gp	12.0	S-9	50/.2'	>67	0.0	0
		.Sandstone Fragments in S-8; Spoon Bouncing on Subsequent Samples		12.2	A-4				
				13.5	S-10	50/.1'	>67	0.0	0
		.Weathered Rock From 12.0-16.5'.		13.6	A-5				

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
			a-1-b / gp	15.0	S-11	50/.0'	>67	0.0	0	
				15.0	A-6					
2340		TOR 16.5'/El. 2339.9		16.5	S-12	50/.0'	>67	0.0	0	
		SANDSTONE, brown gray, fine grained, hard, slightly weathered, moderate to medium bedding, jointed, close to moderate spacing, sheer dip, tight joints,		16.5	R-1		92%	2.5	100	
		.No Water Return		19.0						
		.Slow Drilling Rate			R-2		40%	3.0	100	
2335		*.Bedding RD=20±; Joint RD=65-90°*								
		.Highly Fractured/Jointed With Extensive Staining From 19.0-19.9', 22.0-25.7', 26.8-27.0' and 28.0-32.0'		22.0						
		.Poor Recovery Due to Extensive Jointing/Fracturing From 27.0-32.0'			R-3		26%	5.0	100	
		(RQD=36%).								
2330				27.0						
					R-4		16%	2.3	46	
2325		32.0'/El. 2324.4		32.0						
		Carbonaceous **SHALE**, black, soft, weathered, laminated to thin bedding with moderate dip, bedding joints, laminated to narrow spacing, moderate dip, open joints, *.Clarion Coal*			R-5		36%	2.3	92	
		.Filled With Clay 1/2" Thick		34.5						

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		.Bedding RD=15-20°			R-6		0%	2.2	88	
		(RQD=0%).								
		32.7'/El. 2323.7								
2320		**SILTSTONE**, dark gray, medium hard, slightly weathered, laminated to moderate bedding with shallow dip, bedding joints, close to moderate spacing, shallow dip, tight joints,		37.0						
		.Siltstone With Sandy Laminations								
		.Bedding RD=10-15°			R-7		34%	4.9	98	
		(RQD=20%).								
		(Layer continued from the previous page.)								
		37.2'/El. 2319.2								
2315		**SANDSTONE**, gray, fine grained, medium hard to hard, slightly weathered, laminated to moderate bedding with shallow dip, bedding joints, close to moderate spacing, shallow dip, tight joints,		42.0						
		.Bedding RD=10-15°								
		.Joints From 39.0-39.5'; Stained Orange, RD=90°			R-8		58%	4.9	98	
		.Joint From 42.3-42.6' Stained Orange, RD=70°								
		(RQD=50%).								
2310		48.0'/El. 2308.4		47.0						
		SILTSTONE interbedded with SHALE, dark gray, medium hard, slightly weathered, laminated to moderate bedding with shallow dip, bedding joints, moderate spacing, shallow dip, tight joints,			R-9		32%	4.2	84	
		(RQD=23%).								
2305		55.1'/El. 2301.3		52.0						
					R-10		16%	4.0	80	

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2300		Carbonaceous **SHALE interbedded with COAL**, black, soft to medium hard, slightly weathered, laminated to narrow bedding with shallow dip, bedding joints, close spacing, shallow dip, tight joints,								
		.Coal Beds at Approximate Depths of 57.0-57.2', 60.0-60.5' and 61.9-62.8' (Estimated Due to Core Loss - Bony and Poor Quality)		57.0						
		.Brookville Coal			R-11		8%	3.3	66	
		.Binder From Approximately 57.8-60.0' (Clay)								
2295		*(RQD=5%)*.		62.0						
		63.0'/El. 2293.4								
		CLAYSTONE, gray, medium hard, fresh, indistinct bedding, random fractures, moderate spacing, tight joints,								
		.Dip Not Apparent			R-12		40%	5.0	100	
		(RQD=91%).								
		64.1'/El. 2292.3								
2290		**SANDSTONE**, gray, fine grained, medium hard, slightly weathered, laminated to medium bedding with shallow dip, bedding joints, moderate to medium spacing, shallow dip, tight joints,		67.0						
		.Bedding RD=10-15°			R-13		84%	5.0	100	
		.Vertical Fracture With Orange Stains From 64.7-65.2' and 75.4-76.2'								
		.Primarily Siltstone Grading Into Sandstone From 64.1-66.0'		72.0						
2285		*(RQD=67%)*.			R-14		68%	5.0	100	

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

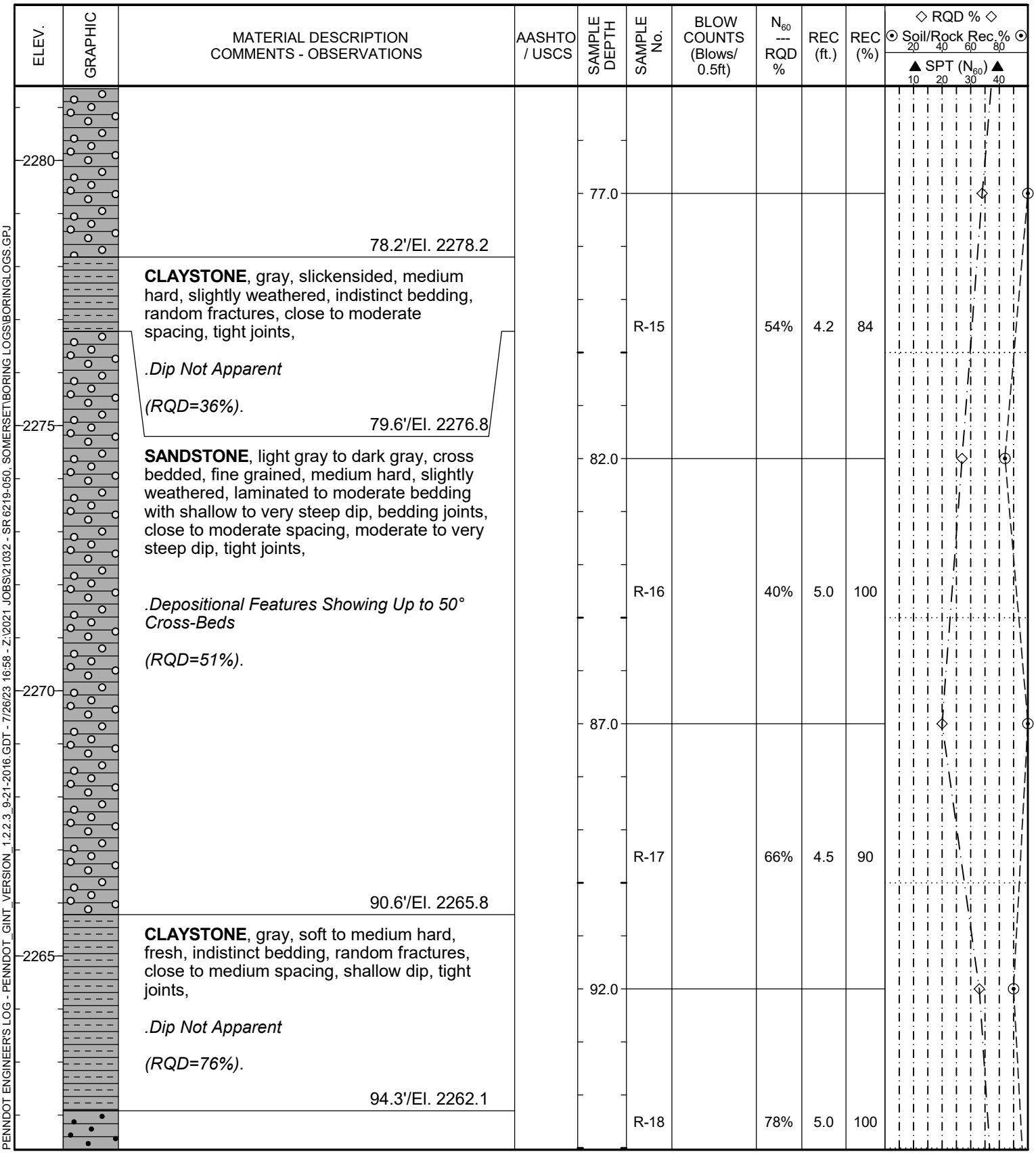
Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample



PENNDOT ENGINEER'S LOG - PENNDOT_GINT_VERSION_1.2.2.3_9-21-2016.GDT - 7/26/23 16:58 - Z:\2021 JOBS\21032 - SR 6219-050, SOMERSET\BORING LOGS\BORINGLOGS.GPJ

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2260		Carbonaceous **SILTSTONE interbedded with SHALE**, dark gray to black, medium hard, fresh, laminated to moderate bedding with shallow dip, bedding joints, moderate spacing, shallow dip, tight joints,								
		.Bedding RD-10-15°								
		.Bony Coal From 95.5-96.0' (Mercer Coal)								
		(RQD=71%).								
		(Layer continued from the previous page.)								
		96.0'/El. 2260.4		97.0						
		CLAYSTONE, gray, soft to medium hard, fresh, indistinct bedding, random fractures, moderate to medium spacing, tight joints, *.Dip Not Apparent*			R-19		84%	5.0	100	
2255		*(RQD=79%).*								
		103.2'/El. 2253.2		102.0						
		SILTSTONE, gray, graded bedding, medium hard, fresh, moderate to medium bedding with shallow dip, bedding joints, moderate to medium spacing, shallow dip, tight joints,			R-20		82%	4.9	98	
2250		*.Bedding RD=10-15°*								
		.Very Heavy Core With Visible Pyrite From 106.8-107.7'		107.0						
		(RQD=81%).			R-21		78%	5.0	100	
2245				112.0						
					R-22		76%	4.1	82	

PENNDOT ENGINEER'S LOG - PENNDOT_GINT_VERSION_1.2.2.3_9-21-2016.GDT - 7/26/23 16:58 - Z:\2021 JOBS\21032 - SR 6219-050, SOMERSET\BORING LOGS\BORINGLOGS.GPJ

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2240		117.0'/El. 2239.4		117.0						
		SANDSTONE interbedded with SILTSTONE, gray, fine grained, medium hard, fresh, moderate to thick bedding with shallow dip, bedding joints, moderate to wide spacing, shallow dip, tight joints,			R-23		90%	5.0	100	
		.Single Rock Core From 122.0-125.7'								
		.Bedding RD=10-15±°								
		(RQD=94%).		122.0						
2235					R-24		100%	5.0	100	
				127.0						
2230		128.0'/El. 2228.4			R-25		76%	5.0	100	
		SILTSTONE interbedded with SHALE, dark gray to gray, medium hard, fresh, laminated to medium bedding with shallow dip, bedding joints, moderate to wide spacing, shallow dip, tight joints,								
		.Joint From 131.2-131.7', RD=70°								
2225		*.Bedding RD=10±°*		132.0						
		Sandy From 132.2-133.5'								
		(RQD=80%).			R-26		68%	4.7	94	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2220		**SILTSTONE interbedded with SHALE**, dark gray to gray, medium hard, fresh, laminated to medium bedding with shallow dip, bedding joints, moderate to wide spacing, shallow dip, tight joints,		137.0	R-27		100%	5.0	100	
		.Joint From 131.2-131.7', RD=70°								
		.Bedding RD=10±°								
		Sandy From 132.2-133.5'								
		(RQD=80%).								
		(Layer continued from the previous page.)								
		141.1'/El. 2215.3								
2215		**SANDSTONE**, gray, fine grained, medium hard to hard, fresh, laminated to medium bedding with shallow dip, bedding joints, moderate to medium spacing, shallow dip, tight joints,		142.0	R-28		88%	4.9	98	
		.Becomes Coarser With Depth								
		.Occasional Carbonaceous Laminations								
		.Micaceous Content								
		.Coal Laminations From 157.2-158.4'								
2210		*(RQD=91%).*		147.0	R-29		88%	5.0	100	
2205				152.0	R-30		96%	5.0	100	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2200		**SANDSTONE**, gray, fine grained, medium hard to hard, fresh, laminated to medium bedding with shallow dip, bedding joints, moderate to medium spacing, shallow dip, tight joints,		157.0						
		.Becomes Coarser With Depth								
		.Occasional Carbonaceous Laminations								
		.Micaceous Content			R-31		96%	5.0	100	
		.Coal Laminations From 157.2-158.4'								
		(RQD=91%).								
		(Layer continued from the previous page.)								
2195		162.2'/El. 2194.2		162.0						
		Carbonaceous **SHALE interbedded with COAL**, black, soft, fresh, laminated to thin bedding with shallow dip, bedding joints, laminated to narrow spacing, shallow dip, tight joints,								
		.Washed Coal Away (Quakertown Coal)			R-32		36%	3.9	78	
		(RQD=0%).								
		164.1'/El. 2192.3		167.0						
2190		**CLAYSTONE interbedded with SILTSTONE**, gray, slickensided, medium hard, fresh, indistinct bedding, random fractures, moderate spacing, tight joints,								
		.Dip Not Apparent								
		(RQD=0%).			R-33		96%	5.0	100	
		165.8'/El. 2190.6								
		SANDSTONE, gray, graded bedding, fine grained, medium hard to hard, fresh, moderate to medium bedding with moderate dip, bedding joints, moderate to medium spacing, moderate dip, tight joints,								
2185		*.Bedding RD=20±°*		172.0						
		.Becomes Medium to Coarse-Grained Below 174.2'								
		."Coal" Laminations From 175.4-175.7' and Coal Lens @ 176.3'								
		(RQD=96%).			R-34		96%	5.0	100	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **DU-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 6285+02.0 Offset 7.3 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2180		177.0'/El. 2179.4								
		Bottom of boring.								
2175										
2170										
2165										

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-10** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2372+10.0 Offset 163.0 ft. RT.
Segment ____ Offset ____
Coordinates:
Lat. 39° 46' 8.1836" Long. -79° 1' 52.7244"
1608318.5760 E 161299.4520 N
Ground Elev. 2443.2 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2437.0 ft. Elapsed 0.0 hr.
▼ Final 2414.3 ft. Elapsed 17.3 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

Drilling Start: 01/10/2023 11:50 am
Drilling Complete: 01/10/2023 4:00 pm
Grouting Complete: 02/15/2023 2:50 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured ____
Hammer Calibration Date: ____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 18.0 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL. 0.4'/El. 2442.8							
		SAND, little Gravel, little Clay, little Silt, loose to medium dense, moist, heterogeneous, poorly graded, sub-angular, medium plastic fines, brown, colluvium, *a-2-6, sc*.	a-4 / sc	1.5	S-1	2-2-2	5	1.0	67
				3.0	S-2	4-10-15	33	1.2	80
2440				4.5	S-3	12-12-15	36	1.1	73
				6.0	S-4	15-15-14	39	1.0	67
▽				7.5	S-5	8-9-12	28	1.3	87
2435				9.0	S-6	11-13-13	35	1.2	80
				10.5	S-7	5-7-8	20	1.3	87
		10.5'/El. 2432.7							
		GRAVEL, some Sand, some Silt, little Clay, medium dense to very dense, damp, homogeneous, well graded, angular, medium plastic fines, brown to orange brown, residuum, *A-4(1), SC*.	A-4 / SC	12.0	S-8	7-8-6	19	1.1	73
2430				13.5	S-9	11-9-9	24	1.2	80
					S-10	10-22-29	68	1.3	87

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

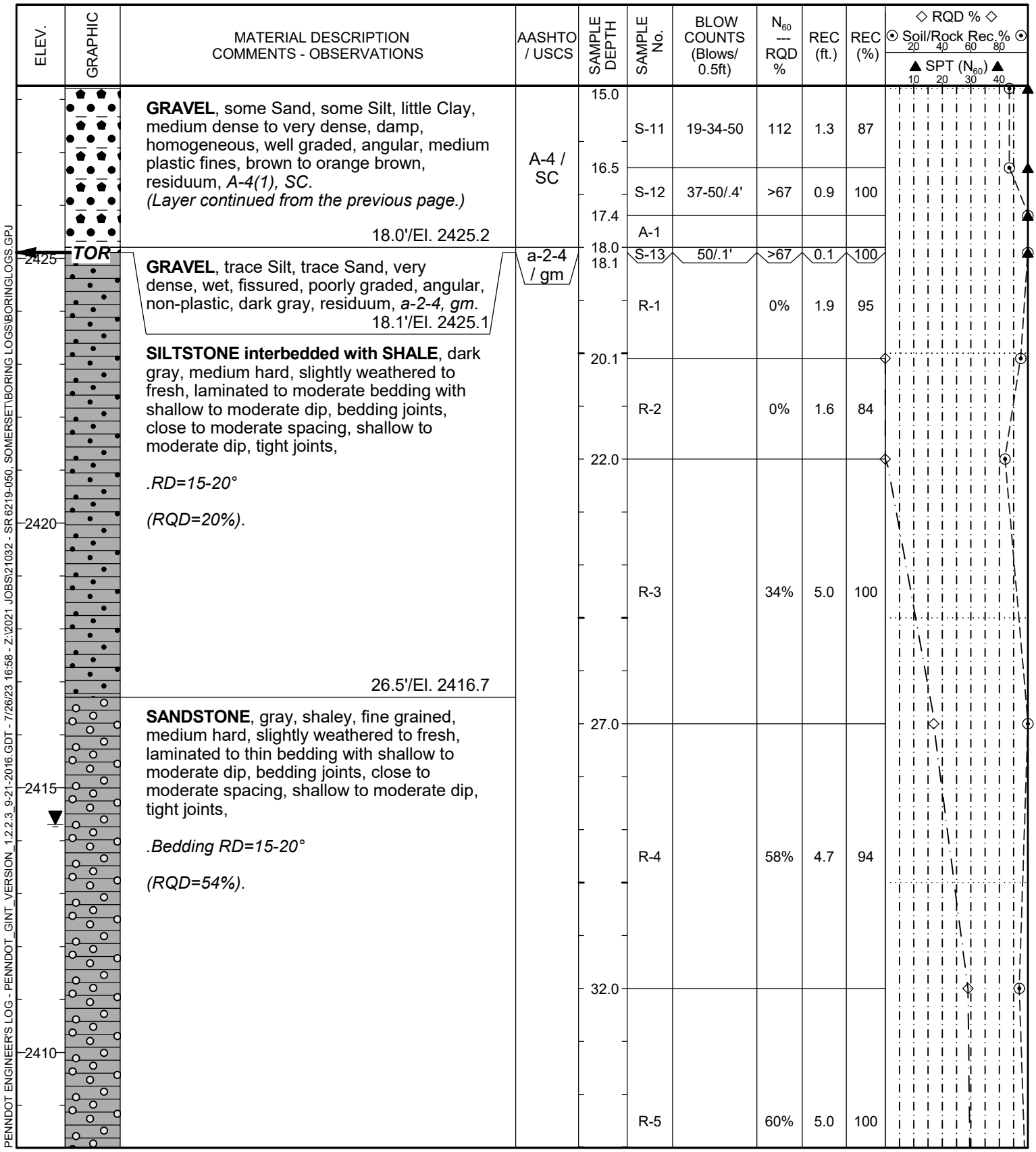
Boring **E-10** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2372+10.0 Offset 163.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample



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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-10** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2372+10.0 Offset 163.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		37.5'/El. 2405.7		37.0						
2405		**SANDSTONE**, gray, fine grained, hard, slightly weathered, moderate to medium bedding with shallow to moderate dip, bedding joints, moderate to medium spacing, shallow to moderate dip, tight joints,			R-6		72%	4.6	92	
		.Occasional Water Stains Along Bedding Surfaces								
		.RD=15-20°								
		.Fractured With Water Stains From 42.0-42.3'		42.0						
2400		*.Coarse-Grained to Conglomeratic From 42.3-42.9'*			R-7		76%	4.7	94	
		.Becomes Less Sandy and More Silty Below 52.0'								
		(RQD=70%).		47.0						
2395					R-8		78%	5.0	100	
				52.0						
2390		54.1'/El. 2389.1			R-9		48%	5.0	100	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-10** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2372+10.0 Offset 163.0 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		SHALE interbedded with SILTSTONE, gray, medium hard, slightly weathered to fresh, laminated to moderate bedding with shallow to moderate dip, bedding joints, close to massive spacing, shallow to moderate dip, tight joints,								
		.Bedding RD=15-20°								
2385		*.Shale Varies from Silty to Sandy*								
		(RQD=69%).								
		(Layer continued from the previous page.)								
		57.0'/El. 2386.2		57.0						
		SANDSTONE, gray, fine grained, medium hard, fresh, laminated to massive bedding with shallow to moderate dip, bedding joints, moderate to medium spacing, shallow to moderate dip, tight joints,			R-10		90%	5.0	100	
		.Full Water Return								
2380		*.Bedding RD=15-20°*								
		(RQD=88%).			R-11		83%	3.0	100	
		65.0'/El. 2378.2		62.0						
		Bottom of boring.								
2375										
2370										

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-11** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2405+26.4 Offset 225.2 ft. RT.
Segment ____ Offset ____
Coordinates:
Lat. 39° 46' 41.124" Long. -79° 1' 45.5892"
1608923.9660 E 164624.2403 N
Ground Elev. 2346.8 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2304.2 ft. Elapsed 0.0 hr.
▼ Final 2304.5 ft. Elapsed 17.5 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

Drilling Start: 02/07/2023 9:30 am
Drilling Complete: 02/07/2023 3:00 pm
Grouting Complete: 02/08/2023 8:50 am
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured ____
Hammer Calibration Date: ____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 35.0 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27,2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL, *Leaf Litter*. 0.2'/El. 2346.6							
2345		**GRAVEL**, little Sand, little Clay, little Silt, very loose to medium dense, damp to wet, heterogeneous, poorly graded, angular, medium plastic fines, dark brown dark gray, fill, *A-2-6(1), GC*		1.5	S-1	2-5-6	15	1.2	80
				3.0	S-2	5-8-8	21	0.7	47
		.Samples Wet From Advancing Boring With Casing Advancer and Water		4.5	S-3	4-6-7	17	1.0	67
		.Gravel Component consists of Shale, Carbonaceous Shale and Sandstone Fragments (Mine Backfill)			S-4	5-5-6	15	0.9	60
		.Occasional Traces of Coal Fines	A-2-6 / GC	6.0	S-5	2-4-4	11	0.9	60
2340		*.Lower Freeport Coal Strip Mined.*		7.5	S-6	5-4-4	11	0.6	40
				9.0	S-7	3-4-2	8	0.6	40
				10.5	S-8	3-3-3	8	0.9	60
2335		12.0'/El. 2334.8		12.0	S-9	2-2-2	5	0.4	27
			A-2-6 / GC	13.5	S-10	6-7-4	15	0.8	53

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-11** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2405+26.4 Offset 225.2 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2330		**GRAVEL**, little Sand, little Silt, trace Clay, very loose to medium dense, damp, heterogeneous, poorly graded, angular, medium plastic fines, dark gray, fill, *A-2-6(0), GC* *.Samples Wet From Advancing Boring With Casing Advancer and Water* *.Gravel Component consists of Shale, Carbonaceous Shale and Sandstone Fragments (Mine Backfill)* *.Occasional Traces of Coal Fines* *.Lower Freeport Coal Strip Mined* *.Sharp Contact @ 31.5'* *.Estimated Mine Floor @ 31.5'.* *(Layer continued from the previous page.)*	A-2-6 / GC	15.0	S-11	2-5-4	12	0.4	27
				16.5	S-12	3-4-4	11	0.3	20
				18.0	S-13	3-2-3	7	0.1	7
				19.5	S-14	2-3-4	9	0.7	47
2325				21.0	S-15	3-6-5	15	0.8	53
				22.5	S-16	3-3-11	19	1.2	80
				24.0	S-17	2-3-2	7	0.7	47
				25.5	S-18	2-2-2	5	0.5	33
2320				27.0	S-19	10-15-7	29	0.7	47
				28.5	S-20	18-11-10	28	0.5	33
				30.0	S-21	5-11-17	37	0.9	60
		31.5'/El. 2315.3		31.5	S-22	28-29-50	105	1.0	67
2315		**CLAY**, some Silt, little Sand, hard, damp, homogeneous, poorly graded, medium plastic fines, gray, residuum, *a-6, cl.*	a-6 / cl	33.0	S-23	28-30-30	80	0.7	47
				34.5					

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙
20 40 60 80
▲ SPT (N_{60}) ▲
10 20 30 40

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-11** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

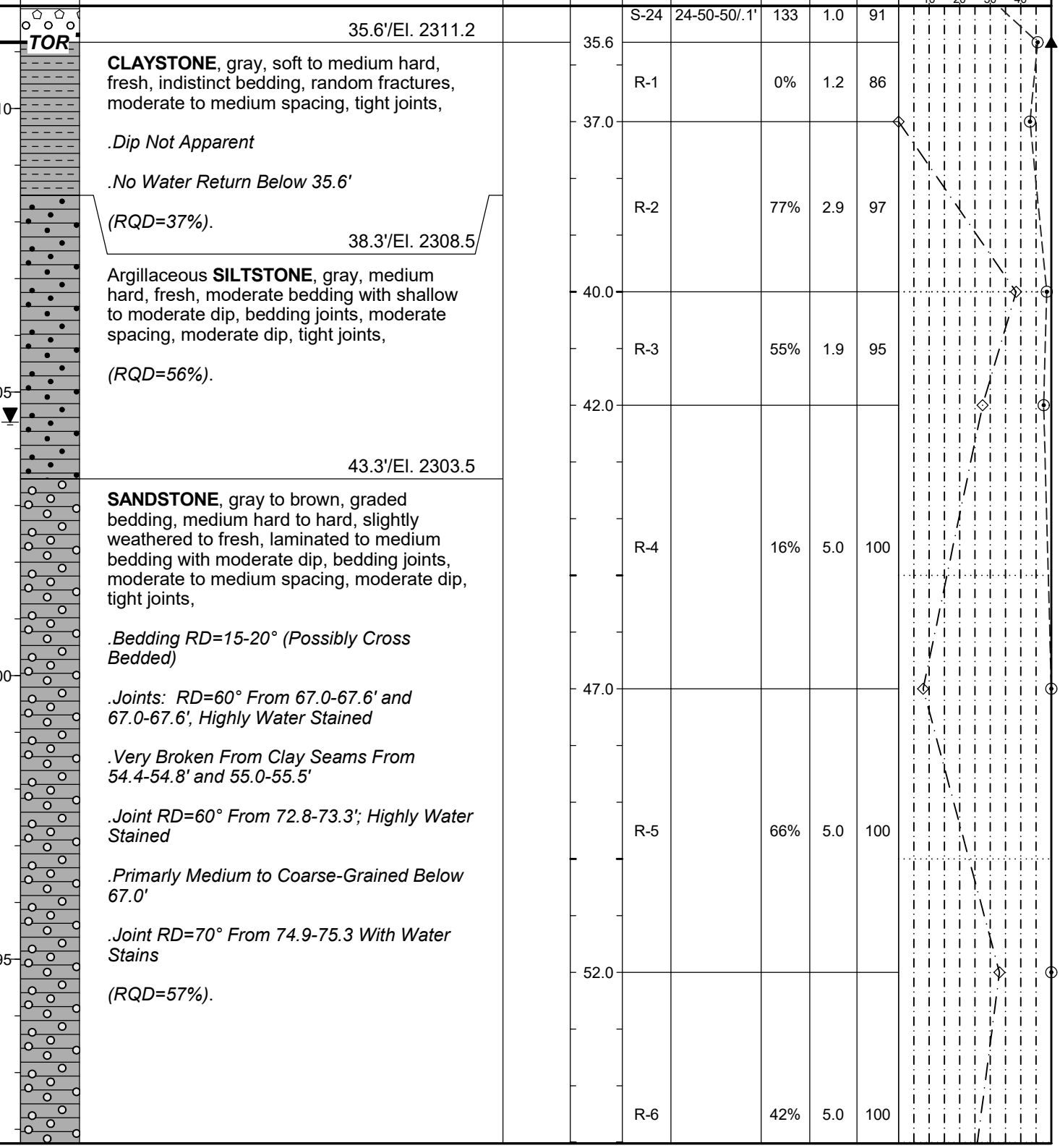
Sta. 2405+26.4 Offset 225.2 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		35.6'/El. 2311.2			S-24	24-50-50/.1'	133	1.0	91
		CLAYSTONE, gray, soft to medium hard, fresh, indistinct bedding, random fractures, moderate to medium spacing, tight joints,		35.6	R-1		0%	1.2	86
2310		*.Dip Not Apparent*		37.0	R-2		77%	2.9	97
		.No Water Return Below 35.6'							
		(RQD=37%).							
		38.3'/El. 2308.5							
		Argillaceous **SILTSTONE**, gray, medium hard, fresh, moderate bedding with shallow to moderate dip, bedding joints, moderate spacing, moderate dip, tight joints,		40.0	R-3		55%	1.9	95
2305		*(RQD=56%).*		42.0	R-4		16%	5.0	100
		43.3'/El. 2303.5							
		SANDSTONE, gray to brown, graded bedding, medium hard to hard, slightly weathered to fresh, laminated to medium bedding with moderate dip, bedding joints, moderate to medium spacing, moderate dip, tight joints,		47.0	R-5		66%	5.0	100
2300		*.Bedding RD=15-20° (Possibly Cross Bedded)*							
		.Joints: RD=60° From 67.0-67.6' and 67.0-67.6', Highly Water Stained							
		.Very Broken From Clay Seams From 54.4-54.8' and 55.0-55.5'							
		.Joint RD=60° From 72.8-73.3'; Highly Water Stained							
		.Primarly Medium to Coarse-Grained Below 67.0'							
2295		*.Joint RD=70° From 74.9-75.3 With Water Stains*		52.0	R-6		42%	5.0	100
		(RQD=57%).							

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙
20 40 60 80
▲ SPT (N_{60}) ▲
10 20 30 40



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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-11** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2405+26.4 Offset 225.2 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2290		**SANDSTONE**, gray to brown, graded bedding, medium hard to hard, slightly weathered to fresh, laminated to medium bedding with moderate dip, bedding joints, moderate to medium spacing, moderate dip, tight joints,		57.0						
		.Bedding RD=15-20° (Possibly Cross Bedded)			R-7		64%	4.8	96	
		.Joints: RD=60° From 67.0-67.6' and 67.0-67.6', Highly Water Stained								
		.Very Broken From Clay Seams From 54.4-54.8' and 55.0-55.5'								
2285		*.Joint RD=60° From 72.8-73.3'; Highly Water Stained*		62.0						
		.Primarly Medium to Coarse-Grained Below 67.0'			R-8		80%	5.0	100	
		.Joint RD=70° From 74.9-75.3 With Water Stains								
2280		*(RQD=57%).* *(Layer continued from the previous page.)*		67.0						
					R-9		64%	4.8	96	
2275				72.0						
					R-10		64%	4.5	90	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-11** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2405+26.4 Offset 225.2 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		75.4'/El. 2271.4								
2270		**CLAYSTONE**, dark gray, slickensided, soft to medium hard, fresh, indistinct bedding, moderate spacing, tight joints,		77.0						
		.Dip Not Apparent								
		Trace Coal Fines From 75.4-75.6'								
		(RQD=74%).								
		78.5'/El. 2268.3								
		SANDSTONE, gray, fine grained, medium hard to hard, fresh, laminated to moderate bedding with moderate dip, bedding joints, moderate to medium spacing, moderate dip, tight joints,			R-11		90%	5.0	100	
2265		*.Bedding RD=20°*		82.0						
		(RQD=97%).								
					R-12		100%	5.0	100	
2260				87.0						
		88.3'/El. 2258.5								
		CLAYSTONE interbedded with SILTSTONE, dark gray to gray, medium hard, fresh, narrow to moderate bedding with moderate dip, bedding joints, close to moderate spacing, moderate dip, tight joints,			R-13		54%	5.0	100	
		.Bedding RD=20±°								
2255		*.Traces of Pyrite From 88.3-89.3'*								
		(RQD=38%).								
		92.0'/El. 2254.8								
		Bottom of boring.								

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-1A** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2104+08.0 Offset 165.5 ft. RT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 42' 43.4125" Long. -79° 5' 11.8843"
1592454.8700 E 140871.6000 N
Ground Elev. 2687.2 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2674.6 ft. Elapsed 0.0 hr.
▼ Final 2674.6 ft. Elapsed 1.0 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

Drilling Start: 02/08/2023 11:30 am
Drilling Complete: 02/09/2023 10:30 am
Grouting Complete: 02/09/2023 12:45 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 10.1 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: William Thiry
Inspector Cert. No. 019-97

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL. 0.5'/El. 2686.7			S-1	2-3-3	8	1.2	80
2685		**CLAY**, some Silt, some Sand, trace Gravel, medium to very stiff, damp to dry, heterogeneous, uniformly graded, rounded to sub-rounded, medium plastic fines, mottled brown to gray, colluvium, *a-7-6, cl*.	a-7-6 / cl	1.5	S-2	3-6-7	17	1.1	73
				3.0	S-3	8-11-11	29	1.3	87
		4.5'/El. 2682.7		4.5	S-4	7-8-10	24	1.2	80
		SILT, some Clay, some Sand, trace Gravel, very stiff to hard, damp, homogeneous, well graded, rounded to sub-rounded, medium plastic fines, brown to dark gray, residuum, *A-7-6(13), CL*		6.0	S-5	8-13-24	49	1.0	67
2680		*.Weathered Shale*.	A-7-6 / CL	7.5	S-6	19-23-27	67	1.5	100
				9.0	S-7	37-50-50/.1'	133	1.0	91
		10.1'/El. 2677.1		10.1					
		TOR			R-1		0%	0.6	32
		Carbonaceous **SHALE**, dark gray to black, very soft to medium hard, weathered to highly weathered, thin to narrow bedding with flat dip, bedding joints, close spacing, open joints,		12.0	R-2		0%	1.1	55
2675 ▽ ▼		*(RQD=0%)*.		14.0					

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-1A** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2104+08.0 Offset 165.5 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
		Carbonaceous **SHALE**, dark gray to black, very soft to medium hard, weathered to highly weathered, thin to narrow bedding with flat dip, bedding joints, close spacing, open joints, *(RQD=0%)*. *(Layer continued from the previous page.)*			R-3		0%	1.6	80	
2670				16.0						
					R-4		0%	1.7	68	
		18.9'/El. 2668.3		18.5						
		SHALE, gray to dark gray, soft to medium hard, weathered to slightly weathered, thin to narrow bedding with flat to shallow dip, bedding joints, close spacing, open joints, *(RQD=0%)*.			R-5		0%	2.5	100	
2665				21.0						
					R-6		0%	2.3	92	
		27.1'/El. 2660.1		23.5						
2660		Fossiliferous **LIMESTONE**, gray, shaley, hard, slightly weathered to fresh, narrow to moderate bedding with flat dip, bedding joints, close to moderate spacing, tight joints, *.Ames Limestone* *(RQD=83%)*.			R-7		0%	1.6	64	
				26.0						
					R-8		66%	5.0	100	
		31.1'/El. 2656.1		31.0						
		Carbonaceous **SHALE interbedded with COAL**, dark gray to black, soft, highly weathered, thin bedding with flat dip, bedding joints, close spacing, open joints, *.Ames Coal* *(RQD=0%)*.			R-9		8%	3.8	76	
2655		32.9'/El. 2654.3								

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-1A** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2104+08.0 Offset 165.5 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2650		Calcareous **CLAYSTONE**, gray, slickensided, soft to medium hard, moderately weathered to slightly weathered, narrow bedding with moderate dip, bedding joints, close spacing, open joints, *(RQD=11%).* *(Layer continued from the previous page.)*		36.0	R-10		14%	4.9	98	
2645		42.3'/El. 2644.9 Calcareous **CLAYSTONE**, gray, soft to hard, highly weathered to fresh, moderate bedding with moderate to steep dip, close to moderate spacing, narrow joint opening, *.RD=25-40°* *.Vertical Fracture From 46.9-47.0'* *(RQD=63%).*		41.0	R-11		40%	4.6	92	
2640		50.3'/El. 2636.9 **SANDSTONE**, light gray to gray, fine grained, hard, slightly weathered to fresh, laminated to thin bedding with flat dip, bedding joints, close spacing, tight joints, *(RQD=71%).*		46.0	R-12		74%	5.0	100	
2635				51.0	R-13		82%	4.8	96	

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-1A** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2104+08.0 Offset 165.5 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2630		**SANDSTONE**, light gray to gray, fine grained, hard, slightly weathered to fresh, laminated to thin bedding with flat dip, bedding joints, close spacing, tight joints, *(RQD=71%)*. *(Layer continued from the previous page.)*		56.0	R-14		52%	4.0	100	
		60.0'/El. 2627.2								
2625		Bottom of boring.								
2620										
2615										

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-2** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2129+85.0 Offset 213.0 ft. LT.
Segment ____ Offset ____
Coordinates:
Lat. 39° 43' 7.3731" Long. -79° 4' 59.7742"
1593437.8250 E 148223.4070 N
Ground Elev. 2421.7 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2409.0 ft. Elapsed 0.0 hr.
▼ Final 2409.4 ft. Elapsed 72.0 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

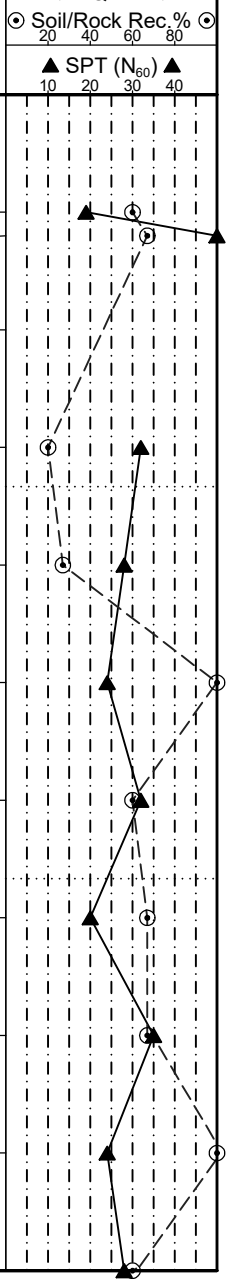
Drilling Start: 02/06/2023 12:30 pm
Drilling Complete: 02/07/2023 10:00 am
Grouting Complete: 02/10/2023 10:00 am
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured ____
Hammer Calibration Date: ____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 28.5 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: William Thiry
Inspector Cert. No. 019-97

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL. 0.7'/El. 2421.0			S-1	7-6-8	19	0.9	60
2420		**SAND**, little Gravel, little Silt, trace Clay, medium dense to very dense, dry to moist, heterogeneous, poorly graded, rounded to sub-rounded, non-plastic, tan orange brown, colluvium, *a-2-6, sc*		1.5	S-2	50/.3'	>67	0.2	67
				1.8	A-1				
		.Fine to Coarse-Grained.		3.0	S-3	15-14-10	32	0.3	20
			a-2-6 / sc	4.5	S-4	9-9-12	28	0.4	27
2415				6.0	S-5	7-8-10	24	1.5	100
				7.5	S-6	13-12-12	32	0.9	60
		9.0'/El. 2412.7		9.0					
		GRAVEL, some Sand, little Clay, little Silt, medium dense, damp, heterogeneous, well graded, rounded to sub-rounded, medium plastic fines, tan orange brown, colluvium, *a-2-6, gc*.			S-7	6-7-8	20	1.0	67
				10.5	S-8	9-11-15	35	1.0	67
2410			a-2-6 / gc	12.0	S-9	8-9-9	24	1.5	100
				13.5	S-10	12-12-9	28	0.9	60
		15.0'/El. 2406.7							



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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-2** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2129+85.0 Offset 213.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2405		**CLAY**, some Silt, some Sand, trace Gravel, stiff to very stiff, dry to damp, heterogeneous, well graded, rounded to sub-rounded, high plastic fines, brown, colluvium, *a-6, cl*.	a-6 / cl	15.0	S-11	3-5-7	16	1.0	67
				16.5	S-12	4-5-7	16	1.3	87
				18.0	S-13	7-9-11	27	0.8	53
				19.5	S-14	7-8-10	24	1.1	73
		21.0'/El. 2400.7							
2400		Fine **SAND**, little Gravel, little Clay, little Silt, medium dense to very dense, damp to moist, homogeneous, medium plastic fines, tan orange brown, residuum, *a-2-6, sc*.	a-2-6 / sc	21.0	S-15	10-13-21	45	1.5	100
				22.5	S-16	25-31-24	73	1.3	87
				24.0	S-17	11-9-10	25	1.5	100
				25.5	S-18	14-15-33	64	1.5	100
2395				27.0	S-19	26-50/.1'	>67	0.6	100
				27.6	A-2				
		28.5'/El. 2393.2							
		TOR		28.5	S-20	50/.0'	>67	0.0	0
		SANDSTONE, brown, fine grained, soft to hard, highly weathered to slightly weathered, laminated to thin bedding with shallow dip, bedding joints, close to medium spacing, tight joints,		28.5	R-1		20%	1.8	90
		.Bedding RD=10°		30.5					
2390		*.Easily Broken With Hand Pressure*			R-2		30%	2.7	90
		.Water Stained @ Joints							
		(RQD=13%).		33.5					

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙
20 40 60 80
▲ SPT (N_{60}) ▲
10 20 30 40

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-2** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2129+85.0 Offset 213.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2385		38.5'/El. 2383.2			R-3		0%	3.7	74	
		Bottom of boring.								
2380										
2375										
2370										

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-3** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2157+13.0 Offset 0.0 ft. CL
Segment _____ Offset _____
Coordinates:
Lat. 39° 43' 24.494" Long. -79° 4' 33.1609"
1595543.2530 E 144922.5410 N
Ground Elev. 2369.6 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2357.0 ft. Elapsed 0.0 hr.
▼ Final 2355.1 ft. Elapsed 71.3 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

Drilling Start: 02/07/2023 11:00 am
Drilling Complete: 02/07/2023 1:00 pm
Grouting Complete: 02/10/2023 12:50 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 13.5 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: William Thiry
Inspector Cert. No. 019-97

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL. 0.5'/El. 2369.1			S-1	1-2-3	7	1.2	80
		SAND, little Gravel, little Clay, trace Silt, damp, heterogeneous, poorly graded, rounded to sub-rounded, medium plastic fines, brown to tan, colluvium, *a-2-6, sc*.		1.5	S-2	9-11-11	29	1.3	87
				3.0	S-3	13-11-11	29	1.5	100
2365			a-2-6 / sc	4.5	S-4	16-17-11	37	0.9	60
				6.0	S-5	7-9-10	25	1.2	80
				7.5	S-6	6-7-12	25	1.1	73
		9.0'/El. 2360.6		9.0					
2360		**GRAVEL**, some Sand, trace Silt, trace Clay, very dense, moist, homogeneous, poorly graded, sub-rounded, non-plastic, brown to tan, residuum, *a-1-b, gp-gm*		10.5	S-7	35-27-25	69	1.4	93
		.50% Lost Water @ 13.1'.	a-1-b / gp-gm		S-8	9-25-50/.2'	100	1.0	83
	▽			11.7	A-1				
				12.0	S-9	50/.3'	>67	0.3	100
				12.3	A-2				
		13.5'/El. 2356.1		13.5	S-10	50/.0'	>67	0.0	0
	TOR			13.5					
2355	▼				R-1		0%	2.2	88

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-3** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2157+13.0 Offset 0.0 ft. CL

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
		SANDSTONE, brown to tan, graded bedding, medium hard to hard, slightly weathered to fresh, medium bedding with shallow dip, bedding joints, close to medium spacing, open joints,		16.0						
		.Bedding RD=10°			R-2		8%	4.2	84	
		.Soft, Completely Weathered Clay Seams From 19.9-20.0', 20.6-20.8' and 23.5-23.7'		21.0						
2350		*.Water Stained Joints*			R-3		54%	5.0	100	
		(RQD=49%).		26.0						
2345		*(Layer continued from the previous page.)*			R-4		86%	5.0	100	
2340				31.0						
					R-5		96%	2.5	100	
		33.5'/El. 2336.1								
2335		Bottom of boring.								

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-4** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2167+20.5 Offset 1.4 ft. RT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 43' 28.325" Long. -79° 4' 21.2621"
1596478.7211 E 145296.2232 N
Ground Elev. 2370.5 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2345.2 ft. Elapsed 0.0 hr.
▼ Final 2339.0 ft. Elapsed 68.2 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

Drilling Start: 01/23/2023 10:00 am
Drilling Complete: 01/23/2023 1:30 pm
Grouting Complete: 02/14/2023 10:15 am
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 13.5 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2370		**TOPSOIL**, *Leaf Litter and Roots*. 0.5'/El. 2370.0			S-1	1-2-2	5	0.5	33
		GRAVEL, some Sand, trace Silt, trace Clay, loose to dense, damp to wet, heterogeneous, well graded, angular to sub-angular, non-plastic, brown, colluvium, *A-1-a, GW-GM*		1.5	S-2	3-5-6	15	1.1	73
		.Some Cobbles/Boulders		3.0	S-3	15-12-26	51	1.0	67
		.No Water Return During Casing Advancement	A-1-a / GW-GM	4.5	S-4	12-14-12	35	0.6	40
2365		*.Samples Wet From Drill Water*.		6.0	S-5	12-11-20	41	0.7	47
				7.5	S-6	15-11-15	35	1.2	80
		9.0'/El. 2361.5		9.0					
		GRAVEL, some Sand, trace Silt, dense to very dense, wet, fissured, poorly graded, angular, non-plastic, brown, residuum, *a-1-a, gw-gm*.			S-7	20-29-19	64	1.1	73
2360				10.5	S-8	50/.4'	>67	0.4	100
			a-1-a / gw-gm	10.9	A-1				
				12.0	S-9	50/.3'	>67	0.3	100
				12.3	A-2				
		13.6'/El. 2356.9		13.5					
		TOR		13.6	S-10	50/.1'	>67	0.1	100
					R-1		75%	1.8	75

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-4** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2167+20.5 Offset 1.4 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
2355		**SANDSTONE**, brown to brown gray, graded bedding, fine grained, hard, slightly weathered, narrow to massive bedding with shallow dip, bedding joints, close to medium spacing, shallow dip, tight joints,		16.0						
		.Sharp Contact @ 24.3'			R-2		82%	5.0	100	
		(RQD=74%). *(Layer continued from the previous page.)*								
2350				21.0						
					R-3		40%	3.8	76	
		24.3'/El. 2346.2								
2345		**CLAYSTONE**, dark brown gray, very soft, highly weathered, indistinct bedding,		26.0						
		.Traces of Coal (Upper Freeport Coal)								
		.Poor Recovery; Boundary Estimated			R-4		0%	1.3	43	
		.Near Soil State								
		Dip Not Apparent								
		.Clay Infill		29.0						
		(RQD=0%).			R-5		0%	0.7	35	
		28.0'/El. 2342.5								
2340		**CLAYSTONE**, gray, very soft, highly weathered, indistinct bedding, random fractures, close spacing,		31.0						
		.Bedding Dip Not Apparent								
		.Near Soil State			R-6		0%	1.8	60	
		.Grading to Silstone Below 33.0'								
		(RQD=0%).								
		34.0'/El. 2336.5								
		Bottom of boring.								

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-5** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2179+20.0 Offset 153.0 ft. LT.
Segment ____ Offset ____
Coordinates:
Lat. 39° 43' 34.3062" Long. -79° 4' 7.8613"
1597534.7530 E 145885.7260 N
Ground Elev. 2399.8 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2351.5 ft. Elapsed 0.0 hr.
▼ Final 2363.2 ft. Elapsed 42.5 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

Drilling Start: 01/23/2023 2:30 pm
Drilling Complete: 01/24/2023 3:00 pm
Grouting Complete: 02/10/2023 3:30 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured ____
Hammer Calibration Date: ____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 48.0 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL, *Grass Roots*. 0.1'/El. 2399.7							
		GRAVEL, little Silt, little Sand, little Clay, very loose to medium dense, damp, heterogeneous, poorly graded, angular, medium plastic fines, dark brown gray, fill, *A-2-6(1), GC*		1.5	S-1	4-6-5	15	1.5	100
		.Fill/Strip Mine Backfill		3.0	S-2	9-6-5	15	0.7	47
		.Contains Numerous Lithologies Including Carbonaceous Shale Fragments		4.5	S-3	3-4-3	9	0.8	53
2395		*.Samples Wet From Advancing Boring With Casing and Water*		6.0	S-4	3-3-3	8	1.1	73
		.Middle Kittanning Coal Strip Mined.		7.5	S-5	3-2-3	7	0.0	0
			A-2-6 / GC	9.0	S-6	5-5-5	13	1.1	73
2390				10.5	S-7	2-3-2	7	1.1	73
				12.0	S-8	4-2-2	5	0.3	20
				13.5	S-9	2-2-2	5	0.7	47
2385					S-10	2-2-2	5	0.9	60

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-5** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2179+20.0 Offset 153.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
			A-2-6 / GC	15.0	S-11	2-2-2	5	1.0	67
				16.5	S-12	2-2-3	7	0.7	47
		18.0'/El. 2381.8		18.0					
2380		**SAND**, some Clay, little Silt, little Gravel, very loose to loose, wet, heterogeneous, poorly graded, angular, medium plastic fines, dark brown gray, fill, *a-2-6, sc* *.Strip Mine Backfill* *.Middle Kittanning Coal Strip Mined* *.Medium Dense From 18.0-19.5' (Likely Boulder/Cobble)*.	a-2-6 / sc		S-13	5-8-8	21	1.3	87
				19.5	S-14	2-2-3	7	0.9	60
				21.0	S-15	WOH-2-2	5	0.6	40
				22.5	S-16	WOH-WOH-3	4	0.6	40
2375				24.0	S-17	2-2-2	5	0.7	47
		25.5'/El. 2374.3		25.5					
		GRAVEL, some Sand, some Clay, little Silt, loose to medium dense, heterogeneous, poorly graded, angular, medium plastic fines, dark brown gray, fill, *a-2-b, gc* *.Strip Mine Backfill* *.Middle Kittanning Coal Strip Mined* *.Traces of Wood Fragments in Spoon Tip @ 33.0'* *.Includes Numerous Lithologies Including Carbonaceous Shale Fragments* *.Very Dense From 43.5-45.0' and 46.5-47.4'* *.High Blow Counts Likely Due to Presence of Cobbles/Boulders*.			S-18	3-3-5	11	1.0	67
				27.0	S-19	2-2-3	7	1.1	73
				28.5	S-20	3-3-5	11	1.0	67
2370			a-2-6 / gc	30.0	S-21	3-2-3	7	0.7	47
				31.5	S-22	2-3-3	8	0.7	47
				33.0	S-23	3-5-8	17	1.2	80
2365				34.5					

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙
20 40 60 80
▲ SPT (N_{60}) ▲
10 20 30 40

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-5** ECMS E05060 District: 9 County: Somerset

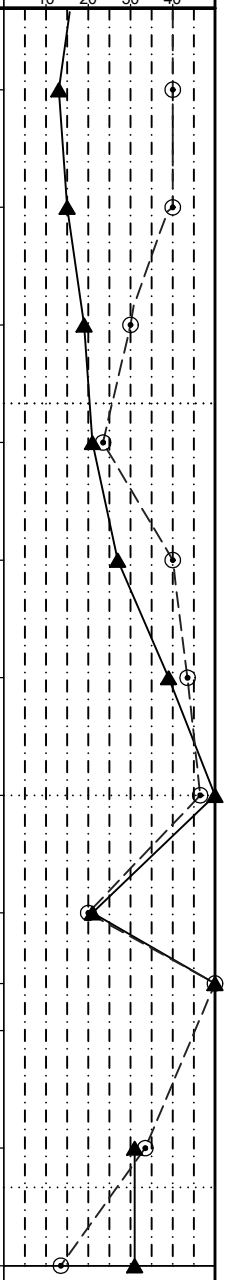
SR 6219 Section 050

Sta. 2179+20.0 Offset 153.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		GRAVEL, some Sand, some Clay, little Silt, loose to medium dense, heterogeneous, poorly graded, angular, medium plastic fines, dark brown gray, fill, *a-2-b, gc*			S-24	2-4-6	13	1.2	80
				36.0	S-25	8-4-7	15	1.2	80
		.Strip Mine Backfill		37.5	S-26	4-5-9	19	0.9	60
		.Middle Kittanning Coal Strip Mined		39.0	S-27	7-7-9	21	0.7	47
2360		*.Traces of Wood Fragments in Spoon Tip @ 33.0'*		40.5	S-28	14-12-8	27	1.2	80
		.Includes Numerous Lithologies Including Carbonaceous Shale Fragments		42.0	S-29	5-11-18	39	1.3	87
		.Very Dense From 43.5-45.0' and 46.5-47.4'	a-2-6 / gc	43.5	S-30	10-12-40	69	1.4	93
2355		*.High Blow Counts Likely Due to Presence of Cobbles/Boulders.*		45.0	S-31	2-8-8	21	0.6	40
		(Layer continued from the previous page.)		46.5	S-32	8-50/.4'	>67	0.9	100
				47.4	A-1				
				48.0	S-33	43-14-9	31	1.0	67
2350		51.0'/El. 2348.8		49.5	S-34	7-10-13	31	0.4	27
		Bottom of boring.							
2345									



pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-6** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2215+89.2 Offset 1.8 ft. RT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 43' 53.2635" Long. -79° 3' 29.2913"
1600576.5405 E 147758.9787 N
Ground Elev. 2392.8 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2363.1 ft. Elapsed 0.0 hr.
▼ Final 2362.9 ft. Elapsed 244.0 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

Drilling Start: 01/18/2023 3:15 pm
Drilling Complete: 01/20/2023 10:30 am
Grouting Complete: 02/14/2023 11:20 am
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 13.5 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL, *Leaf Litter*. 0.2'/El. 2392.6							
		GRAVEL, some Sand, little Silt, trace Clay, medium dense to dense, dry to damp, homogeneous, poorly graded, angular, low plastic fines, brown, colluvium, *a-1-b, gp*		1.5	S-1	3-9-3	16	0.6	40
				3.0	S-2	4-12-46	77	0.8	53
2390		*.High Blow Counts Likely Due to Presence of Sandstone Cobbles/Boulders*.			S-3	35-17-15	43	1.0	67
			a-1-b / gp	4.5					
					S-4	7-11-13	32	0.5	33
				6.0					
					S-5	6-6-10	21	0.6	40
				7.5					
2385					S-6	13-13-15	37	0.8	53
		9.0'/El. 2383.8							
		GRAVEL, some Sand, trace Silt, trace Clay, very dense, dry, fissured, poorly graded, angular, brown, residuum, *a-1-b, gp*.		9.0	S-7	24-21-29	67	1.0	67
				10.5					
			a-1-b / gp		S-8	38-40-50/.4'	120	1.4	100
				11.9	A-1				
				12.0					
2380					S-9	35-49-50/.4'	132	1.1	79
		13.6'/El. 2379.2		13.4	A-2				
	TOR			13.5	S-10	50/.1'	>67	0.1	100
				13.6					
					R-1		18%	1.7	85

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-6** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2215+89.2 Offset 1.8 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		SANDSTONE, brown to gray, graded bedding, fine grained, medium hard to hard, slightly weathered, moderate to medium bedding with moderate dip, bedding joints, close to medium spacing, moderate dip, tight joints,		15.6						
2375		*.Shaly From 24.2-24.4'*			R-2		13%	2.7	90	
		.Bedding RD=15-20±°		18.6						
		.Some Massive Beds Below 27.0'			R-3		74%	3.4	100	
		.Joint 29.5-29.7; RD=65°								
		.Water Staining Throughout								
		.Occasional Carbonaceous Laminations		22.0						
2370		*.No Water Return From Start of Coring*			R-4		30%	4.7	94	
		(RQD=50%).								
		(Layer continued from the previous page.)								
				27.0						
2365					R-5		80%	5.0	100	
				32.0						
2360					R-6		70%	3.0	100	
		35.0'/El. 2357.8								

Bottom of boring.

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-7** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2230+51.0 Offset 0.0 ft. CL
Segment ____ Offset ____
Coordinates:
Lat. 39° 44' 4.6939" Long. -79° 2' 21.4135"
1601487.4350 E 148902.2630 N
Ground Elev. 2320.3 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2284.6 ft. Elapsed 0.0 hr.
▼ Final 2286.3 ft. Elapsed 67.0 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

Drilling Start: 01/13/2023 10:15 am
Drilling Complete: 01/13/2023 2:00 pm
Grouting Complete: 02/14/2023 1:42 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured ____
Hammer Calibration Date: ____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 30.0 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2320		**TOPSOIL**, *Leaf Litter*. 0.2'/El. 2320.1							
		SAND, little Gravel, little Clay, little Silt, loose to dense, damp, heterogeneous, poorly graded, rounded to sub-rounded, medium plastic fines, orange brown, colluvium, *a-2-4,sc-sm*	a-2-6 / sc	1.5	S-1	2-4-5	12	1.5	100
				3.0	S-2	7-24-13	49	1.5	100
		.Possible Cobbles/Boulders.		4.5	S-3	11-12-18	40	0.8	53
2315		5.5'/El. 2314.8			S-4	12-16-13	39	1.2	80
		GRAVEL, some Sand, some Silt, little Clay, medium dense to dense, damp, heterogeneous, well graded, sub-rounded, low plastic fines, orange brown, colluvium, *A-2-4(0), SC-SM*	A-2-4 / SC-SM	6.0	S-5	8-16-15	41	1.3	87
		Gravel is Subrounded and Randomly Oriented in Soil		7.5	S-6	16-14-12	35	0.8	53
		.Numerous Lithologies in Soil		9.0	S-7	7-12-11	31	0.4	27
2310		*.Samples Wet From Advancing Boring With Casing and Water*		10.5	S-8	17-37-12	65	1.2	80
		.High Blow Counts Likely Due to Presence of Cobbles/Boulders. 12.0'/El. 2308.3		12.0	S-9	7-13-12	33	0.7	47
			A-4 / SC	13.5	S-10	9-15-16	41	1.3	87

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-7** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2230+51.0 Offset 0.0 ft. CL

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
2305		**SILT**, some Gravel, some Sand, little Clay, medium dense to dense, moist, heterogeneous, well graded, sub-rounded, medium plastic fines, orange brown, colluvium, *A-4(1), SC*		15.0	S-11	5-19-18	49	1.2	80
		.Gravel is Subrounded and Randomly Oriented in Soil		16.5	S-12	18-23-14	49	0.6	40
		.Numerous Lithologies in Soil		18.0	S-13	5-8-9	23	0.9	60
		.Samples Wet From Advancing Boring With Casing and Water		19.5	S-14	10-13-23	48	1.2	80
2300		*.High Blow Counts Likely Due to Presence of Cobbles/Boulders*		21.0	S-15	5-8-10	24	0.9	60
		.Primarily Silty Clay in Sample 19, 27.0-28.5 (Lacks Fabric) - Colluvium. *(Layer continued from the previous page.)*	A-4 / SC	22.5	S-16	16-13-14	36	1.2	80
				24.0	S-17	8-20-50/.1'	93	1.1	100
2295				25.1	A-1				
				25.5	S-18	13-27-13	53	0.6	40
				27.0	S-19	7-13-11	32	1.0	67
		28.5'/El. 2291.8		28.5	S-20	11-11-50/.4'	81	0.4	29
		GRAVEL, trace Sand, trace Silt, very dense, wet, fissured, poorly graded, angular, non-plastic, gray, colluvium, *a-1-b, gp*.	a-1-b / gp	29.9	A-2 S-21	50/.0'	>67	0.0	0
		30.0'/El. 2290.3		30.0					
	TOR			30.0	R-1		65%	2.0	100
2290		**SANDSTONE**, gray, fine grained, medium hard to hard, slightly weathered, medium bedding with shallow dip, bedding joints, medium spacing, shallow dip, tight joints,		32.0	R-2		0%	3.0	100
		.Cross Beds							
		.Likely Boulders							
		(RQD=100%).							
		31.3'/El. 2289.0							

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙
20 40 60 80
▲ SPT (N_{60}) ▲
10 20 30 40

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-7** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2230+51.0 Offset 0.0 ft. CL

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
2285 ▽		**CLAYSTONE**, tan to red, very soft, highly weathered, indistinct bedding, random fractures, close to medium spacing, tight joints,		35.0						
		.Dip Not Apparent			R-3		0%	3.0	60	
		.Can Break Rock Core With Hand Pressure								
		.Sharp Contact @ 31.3'								
		.Mauch Chunk Formation								
		(RQD=0%).								
2280		*(Layer continued from the previous page.)* 40.0'/El. 2280.3								
		Bottom of boring.								
2275										
2270										

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DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-8** ECMS E05060
District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2246+72.6 Offset 235.9 ft. RT.
Segment ____ Offset ____
Coordinates:
Lat. 39° 44' 17.139" Long. -79° 3' 4.2349"
1602569.5765 E 150145.7509 N
Ground Elev. 2469.8 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2388.4 ft. Elapsed 0.0 hr.
▼ Final 2388.6 ft. Elapsed 193.3 hr.
Driller: Gary Peel
Company: TRC Engineers, Inc.

Drilling Start: 01/16/2023 12:30 pm
Drilling Complete: 01/18/2023 12:00 pm
Grouting Complete: 02/14/2023 12:45 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured ____
Hammer Calibration Date: ____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 16.5 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

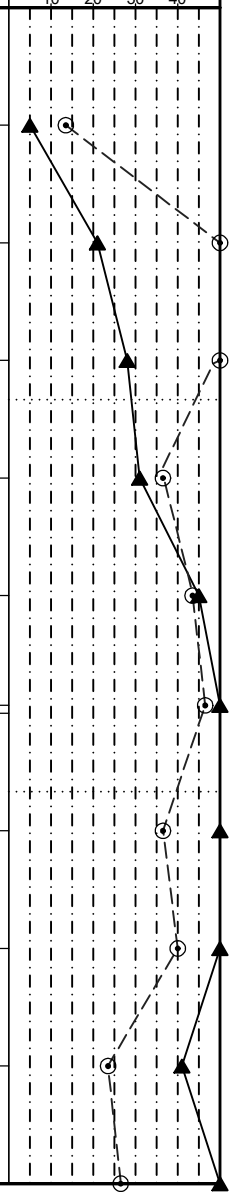
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
		TOPSOIL, *.Leaf Litter.* 0.2'/El. 2469.6							
		SAND, some Gravel, little Silt, trace Clay, loose to very dense, damp, heterogeneous, poorly graded, rounded to sub-rounded, low plastic fines, brown to orange brown, colluvium, *A-1-b, SC-SM*		1.5	S-1	2-2-2	5	0.4	27
				3.0	S-2	4-8-8	21	1.5	100
		.Traces of Quartz Pebbles		4.5	S-3	8-9-12	28	1.5	100
2465		*.Generally Lacks Fabric*	A-1-b / SC-SM	6.0	S-4	9-11-12	31	1.1	73
		.High Blow Counts Likely Encountered Cobble/Boulder.		7.5	S-5	10-16-18	45	1.3	87
				8.9	S-6	20-29-50/.4'	105	1.3	93
2460		10.0'/El. 2459.8		9.0	A-1 S-7	16-15-23	51	1.1	73
		GRAVEL, some Sand, little Silt, trace Clay, contains rock fragments, dense to very dense, damp, fissured, poorly graded, angular, low plastic fines, brown to brown gray, residuum, *a-2-4, gm*		10.5	S-8	17-22-29	68	1.2	80
		.Decomposed Sandstone	a-2-4 / gm	12.0	S-9	9-17-14	41	0.7	47
		.Lost Drill Water @ 15.0'		13.5	S-10	8-24-15	52	0.8	53
		.No Water Return.							
2455									

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙ (20 40 60 80)
▲ SPT (N_{60}) ▲ (10 20 30 40)



pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-8** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2246+72.6 Offset 235.9 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ (20 40 60 80) ▲ SPT (N_{60}) ▲ (10 20 30 40)
			a-2-4 / gm	15.0	S-11	50-50/.2'	>67	0.6	86	
				15.7	A-2					
		16.5'/El. 2453.3		16.5	S-12	50/.0'	>67	0.0	0	
		TOR		16.5						
		SANDSTONE, gray to brown, graded bedding, hard, slightly weathered, narrow to moderate bedding with shallow to moderate dip, bedding joints, close to moderate spacing, shallow to moderate dip, tight joints,			R-1		43%	1.8	90	
		.Bedding RD=15-20°		18.5						
2450		*.Downward Coarsening in Grain Size*			R-2		80%	2.8	93	
		(RQD=68%).		21.5						
					R-3		78%	4.9	98	
2445		25.9'/El. 2443.9								
		SANDSTONE interbedded with CONGLOMERATE, gray to brown, coarse grained, hard, slightly weathered, moderate to medium bedding with shallow dip, bedding joints, massive to medium spacing, shallow dip, tight joints,		26.5						
		.Bedding RD=10-15°			R-4		80%	4.9	98	
2440		*.Joint 26.5-26.7'; RD=65°*								
		.Clay Seam From 35.3-35.4'								
		.Joint 37.2-37.5'; RD=70°		31.5						
		.Joint 39.7-39.9'; RD=60°								
		.Carbonaceous Laminations From 55.8-55.9'								
		.Sharp Contact in Grain Size @ 56.9'								
		(RQD=81%).			R-5		90%	5.0	100	
2435										

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-8** ECMS E05060 District: 9 County: Somerset Sheet 3 of 6

SR 6219 Section 050

Sta. 2246+72.6 Offset 235.9 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		SANDSTONE interbedded with CONGLOMERATE, gray to brown, coarse grained, hard, slightly weathered, moderate to medium bedding with shallow dip, bedding joints, massive to medium spacing, shallow dip, tight joints,								
		.Bedding RD=10-15°								
		.Joint 26.5-26.7'; RD=65°		36.5	R-6		52%	4.5	90	
2430		*.Clay Seam From 35.3-35.4'*								
		.Joint 37.2-37.5'; RD=70°								
		.Joint 39.7-39.9'; RD=60°		41.5	R-7		96%	5.0	100	
		.Carbonaceous Laminations From 55.8-55.9'								
2425		*.Sharp Contact in Grain Size @ 56.9'*								
		(RQD=81%).		46.5	R-8		84%	4.9	98	
		(Layer continued from the previous page.)								
2420				51.5	R-9		76%	4.9	98	
2415										

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-8** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2246+72.6 Offset 235.9 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		56.9'/El. 2412.9		56.5						
2410		**SANDSTONE**, gray to brown, fine grained, medium hard, slightly weathered, laminated to moderate bedding with shallow to moderate dip, bedding joints, close to medium spacing, shallow to moderate dip, tight joints,			R-10		16%	5.0	100	
		.Joint 57.2-57.4'; RD=90°								
		.Bedding RD=15-20°								
		.Joint 60.6-60.8'; RD=90°								
		.Joint 62.4-62.7'; RD=70°		61.5						
		.Joint/Fracture 64.1-65.0'; RD=90°								
		.Joint 67.7-68.5'; RD=70°			R-11		28%	4.5	90	
2405		*.Shaly From 56.9-61.3'; Abundant Carbonaceous Laminations*								
		.Sharp Contact @ 77.3'								
		.Down Pressure Increased From 600 to 1000 lbs. to Cut Rock		66.5						
		(RQD=36%).			R-12		38%	4.9	98	
2400										
				71.5						
					R-13		60%	5.0	100	
2395										

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-8** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2246+72.6 Offset 235.9 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		77.3'/El. 2392.5		76.5						
2390		**CONGLOMERATE**, light brown, hard to very hard, slightly weathered, moderate to medium bedding with shallow dip, bedding joints, moderate to medium spacing, shallow dip, tight joints, *.Quartz Pebbles up to 1/2" Diameter* *.Slightly Water Stained* *.Driller Reported Using 600-1000 lbs. Down Pressure to Cut Rock* *.Sharp Contact @ 81.0'* *(RQD=97%).*			R-14		84%	4.5	90	
		81.0'/El. 2388.8		81.5						
2385		**CLAYSTONE**, brown to gray, very soft, highly weathered, indistinct bedding, random fractures, close to moderate spacing, *.Dip Not Apparent* *.Near Soil State* *.Mauch Chunk Formation* *.Rods Dropped From 81.0-81.5' (Clay)* *(RQD=0%).*			R-15		0%	1.1	73	
		85.9'/El. 2383.9		83.0						
					R-16		11%	1.9	54	
2380		**SILTSTONE**, gray to red, medium hard, slightly weathered to fresh, narrow to medium bedding with shallow to moderate dip, bedding joints, close to medium spacing, shallow to moderate dip, tight joints, *.Clay Seam From 88.6-88.9'* *.Turns Red @ 91.5'* *(RQD=47%).*		86.5						
					R-17		24%	4.0	80	
				91.5						
					R-18		34%	4.3	86	
2375										

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-8** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2246+72.6 Offset 235.9 ft. RT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
		SILTSTONE, gray to red, medium hard, slightly weathered to fresh, narrow to medium bedding with shallow to moderate dip, bedding joints, close to medium spacing, shallow to moderate dip, tight joints,		96.5						
		.Clay Seam From 88.6-88.9'								
		.Turns Red @ 91.5'			R-19		94%	3.5	100	
		(RQD=47%). *(Layer continued from the previous page.)*								
2370		100.0'/El. 2369.8								
		Bottom of boring.								
2365										
2360										
2355										

pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-9** ECMS E05060

District: 9 County: Somerset
SR 6219 Section 050
Baseline: Alternative E
Sta. 2325+92.0 Offset 180.0 ft. LT.
Segment _____ Offset _____
Coordinates:
Lat. 39° 45' 28.0871" Long. -79° 2' 21.4135"
1606019.3310 E 157275.1340 N
Ground Elev. 2436.6 ft.
Water Level Elev./Elapsed Time:
▽ Initial 2436.6 ft. Elapsed 0.0 hr.
▼ Final 2436.2 ft. Elapsed 388.8 hr.
Driller: Rich Crum
Company: TRC Engineers, Inc.

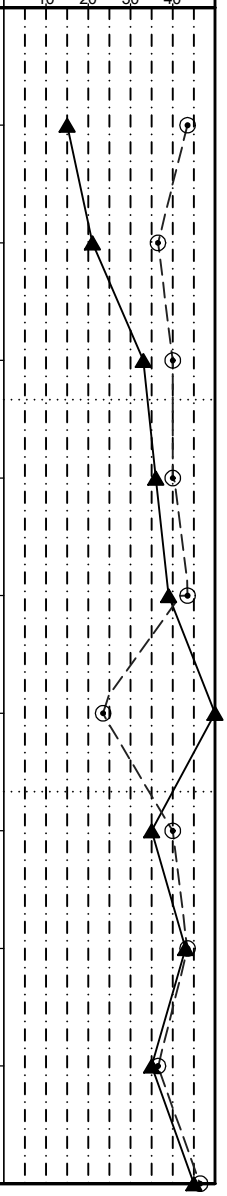
Drilling Start: 01/30/2023 8:30 am
Drilling Complete: 01/30/2023 11:00 am
Grouting Complete: 02/15/2023 4:10 pm
Rig: Acker Soil Max Track Rig
Hammer Type: Automatic
SPT Hammer Efficiency:
Assumed 0.8 Measured _____
Hammer Calibration Date: _____
Hole Type: Continuous SPT - Rock Core
Casing Type: Flush Joint Casing - Spun
Casing I.D.: 3.00 in Casing Depth: 22.5 ft.
Rock Core Method: Double Tube Wire Line-NQ
Inspector: Timothy Witt
Inspector Cert. No. 016-96

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WALTER M. LORENCE
ENGINEER No. 21074-E
2023-07-27
PG/PE Seal, Signature and Date

Final Log Checked and Approved
By: Walter Lorence
Date: July 27, 2023

Lab Testing Performed on Sample
NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
▽		**TOPSOIL**, *Leaf Litter*. 0.1'/El. 2436.5							
2435		**SAND**, little Gravel, little Clay, little Silt, medium dense, damp to wet, heterogeneous, poorly graded, sub-angular, medium plastic fines, brown to orange brown, colluvium, *a-2-6, sc*	a-2-6 / sc	1.5	S-1	5-5-6	15	1.3	87
				3.0	S-2	6-7-9	21	1.1	73
		.Thin Clay Layer From 2.9-3.0'.		4.5	S-3	7-13-12	33	1.2	80
		4.5'/El. 2432.1							
2430		**GRAVEL**, some Sand, little Silt, trace Clay, medium dense, damp, heterogeneous, poorly graded, sub-angular, non-plastic, brown to orange brown, colluvium, *A-1-b, GM*.	A-1-b / GM	6.0	S-4	10-12-15	36	1.2	80
		7.5'/El. 2429.1		7.5	S-5	17-15-14	39	1.3	87
		SAND, some Gravel, little Clay, little Silt, medium dense to very dense, wet, heterogeneous, poorly graded, sub-angular, medium plastic fines, brown to orange brown, colluvium, *a-2-6, sc*.	a-2-6 / sc	9.0	S-6	9-50-29	105	0.7	47
				10.5	S-7	18-14-12	35	1.2	80
2425				12.0	S-8	12-13-19	43	1.3	87
				13.5	S-9	20-11-15	35	1.1	73
					S-10	16-17-17	45	1.4	93



pennsylvania
DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **E-9** ECMS E05060 District: 9 County: Somerset

SR 6219 Section 050

Sta. 2325+92.0 Offset 180.0 ft. LT.

NOTE: N values and all graphical plots are for information only.

Lab Testing Performed on Sample

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)
			a-2-6 / sc	15.0	S-11	34-30-15	60	1.1	73
		16.0'/El. 2420.6							
2420		**GRAVEL**, some Sand, little Clay, little Silt, contains rock fragments, very dense, wet, fissured, poorly graded, angular, medium plastic fines, brown gray, residuum, *a-2-6, gc*.		16.5	S-12	29-29-34	84	1.2	80
				18.0	S-13	28-27-30	76	1.0	67
			a-2-6 / gc	19.5	S-14	22-23-50	97	0.6	40
				21.0	S-15	25-14-50/.2'	85	0.8	67
2415		22.5'/El. 2414.1		22.2	A-1				
		TOR		22.5	S-16	50/.0'	>67	0.0	0
		SANDSTONE, gray to brown, graded bedding, hard, slightly weathered, narrow to moderate bedding with moderate dip, bedding joints, close to moderate spacing, moderate dip, tight joints,		22.5	R-1		35%	1.9	95
		.Joint/Fracture From 23.2-23.6' RD=90°		24.5	R-2		80%	2.6	87
		Bedding RD=20±°							
		.Full Water Return							
2410		*(RQD=58%).*		27.5	R-3		51%	3.3	94
		31.0'/El. 2405.6							
2405		Bottom of boring.							

◇ RQD % ◇
⊙ Soil/Rock Rec.% ⊙
20 40 60 80
▲ SPT (N_{60}) ▲
10 20 30 40

2004 BORINGS

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-5R
SHEET	1 OF 6
DATE: START	5/10/04
O.G. END	5/12/04
ELEV.	2471.63

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 10.6' **WATER: DEPTH:** 94.9 **TIME:** 1430 **DATE:** 5/12/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 79.8 **TIME:** 0830 **DATE:** 5/13/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 1 2	1.5			sp-sm	M	**0.0-0.4': TOPSOIL/LEAF Litter**	
1.5								2471.2 **0.4-3.0': Poorly Graded SAND With SILT (sp-sm), Brown, Moist, Very Loose @ Surface; Dense Elsewhere; Homogeneous**	
	S-2	2 18 22	1.1				M		
3.0						a-2-4		**(Residual)**	
	S-3	31 29 50/.2	1.2			sp	M	2468.6 **3.0-10.6': Poorly Graded SAND With ROCK FRAGMENTS (sp), Brown, Moist, Very Dense, Homogeneous**	.Auger Cuttings Appear to be "Clean Sand"
4.2									
4.5									
	S-4	36 50 42	1.5				M		
6.0									
6.4	S-5	50/.4	0.4				M	**.Completely Weathered Sandstone**	
7.5									
	S-6	23 27 25	1.5				M	**(Residual)**	
9.0									
	S-7	31 50/.3	0.8				M		
9.8									
10.5						a-3		2461.0	
10.6	S-8	50/.1	0.1	50			M	**10.6-29.6': Fine to Medium-Grained SANDSTONE, Light Brown, Medium Hard to Hard But Fractured With Friable Zones, Moderately to Highly Weathered, Thinly Bedded, RD=15-25° (Very Wavy - Questionable), Extremely Close to Closely Spaced Fractures, RD=15-90°**	Top of Rock @ 10.6'
	R-1		0.7	0					
12.0									
	R-2		1.3	62 0					
14.1									
	R-3		3.1	62 22				**(RQD=14%)**	Stopped Drilling @ 19.1'; 1630 hrs.; 5/10/04 Resumed Drilling 0730 hrs.; 5/11/04
19.1				74				2451.6	

GMI Project No. 02037

EAST: 1597192.4 NORTH: 152032.9

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-5R
SHEET	2 OF 6
DATE: START	5/10/04
O.G. END	5/12/04
ELEV.	2471.63

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 10.6' **WATER: DEPTH:** 94.9 **TIME:** 1430 **DATE:** 5/12/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 79.8 **TIME:** 0830 **DATE:** 5/13/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-4		3.7	32				.Fracture RD=70° From 19.4-19.7' .Fracture RD=90° From 14.7-15.3' and 18.8-19.1'	
24.1									.Lost Water @ 24.1'
	R-5		0.0	0 / 0				.Highly to Completely Weathered Rock From 24.1-29.1' (Most Probably Reduced to Sand/Soil) .Highly Weathered From 29.1-31.6'	
29.1								2442.0	
	R-6		0.7	28 / 0				29.6-45.0': SILTY Very Fine-Grained SANDSTONE, Dark Gray, Medium Hard, Slightly Weathered, Very Thinly to Thinly Bedded, RD=8-10°, Very Closely to Closely Spaced Fractures, RD=80-90°	.Sharp Color & Grain-Size Change @ 29.6' (Est. Due to Poor Recovery)
31.6	R-8		2.3	92 / 13				.Thin Coal Lamination @ 37.3'	
34.1	R-8		5.0	100 / 8				.Fracture RD=80° From 33.5-33.8' .Fracture RD=90° From 35.0-35.3', 36.0-36.6' and 40.0-40.5' (RQD=16%)	
39.1				100				2431.6	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-5R
SHEET	3 OF 6
DATE: START	5/10/04
O.G. END	5/12/04
ELEV.	2471.63

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 10.6' **WATER: DEPTH:** 94.9 **TIME:** 1430 **DATE:** 5/12/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 79.8 **TIME:** 0830 **DATE:** 5/13/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-9		5.0	36				.Becomes More Argillaceous With Depth	
44.1								2426.6	
	R-10		4.0	80 / 0				**45.0-50.6': CLAYSTONE, Gray, Very Soft to Soft, Moderately Weathered to Highly Weathered, Indiscernible Bedding With Slickensides, RD=N/A, Extremely Close to Very Closely Spaced Fractures, RD=50° Along Slickensides** (RQD=0%)	.Driller Reported Very Soft Zone From 53.0-54.0'
49.1								2421.0	
	R-11		3.0	60 / 0				**50.6-56.3': SILTY To CLAYEY SHALE, Gray, Soft to Medium Hard, Moderately to Slightly Weathered, Very Intensely Laminated, RD=5-8°, Very Closely to Closely Spaced Fractures, RD=5-8°** (RQD=0%)	
54.1								2415.3	
	R-12		1.7	68 / 0				**56.3-57.2': COAL And Carbonaceous SHALE, Black, Soft and Friable (Poor Recovery)** .Trace Pyrite (RQD=0%)	.Boundaries Est. Due to Poor Recovery
56.6								2414.4	
	R-13		1.9	76 / 0				**See Next Page**	
59.1								2411.6	
				100					

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-5R
SHEET	4 OF 6
DATE: START	5/10/04
O.G. END	5/12/04
ELEV.	2471.63

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 10.6' **WATER: DEPTH:** 94.9 **TIME:** 1430 **DATE:** 5/12/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 79.8 **TIME:** 0830 **DATE:** 5/13/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
64.1	R-14		5.0	0				57.2-66.5': Predominantly CLAYSTONE With Occasional SILTSTONE Beds, Gray, Very Soft to Medium Hard, Highly Weathered From 57.2-59.4'; Slightly Weathered Elsewhere, Indiscernible Bedding With Frequent Slickensides, RD=N/A, Extremely Close to Closely Spaced Fractures, RD=40-70° Along Slickensides .Trace Pyrite (RQD=0%)	Stopped Drilling @ 59.1'; 1230 hrs.; 5/11/04 Resumed Drilling 0730 hrs.; 5/12/04
				86				2405.1	
69.1	R-15		4.3	36				66.5-74.3': Argillaceous SILTSTONE With Calcareous Streaks and Nodules, Gray, Medium Hard, Becoming Hard With Depth, Slightly Weathered to Fresh, Thinly to Medium Bedded, RD=8-10°, Closely to Medium Spaced Fractures, RD=8-10° (Along Bedding) .Sandy Laminations Beginning @ 69.1' (RQD=56%)	
	R-16		4.0	80					
74.1				53				2397.3	
	R-17		5.0	100				74.3-79.3': SILTY Fine-Grained SANDSTONE, Gray, Medium Hard, Slightly Weathered to Fresh, Intensely Laminated to Thinly Bedded, RD=8-12° (Wavy), Closely to Medium Spaced Fractures, RD=8-35° (RQD=82%)	
79.1				82				2392.3	
				90				See Next Page	
								2391.6	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-5R
SHEET	5 OF 6
DATE: START	5/10/04
O.G. END	5/12/04
ELEV.	2471.63

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 10.6' **WATER: DEPTH:** 94.9 **TIME:** 1430 **DATE:** 5/12/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 79.8 **TIME:** 0830 **DATE:** 5/13/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
84.1	R-18		4.5	28				79.3-84.9': Interbedded CLAYSTONE And LIMESTONE, Gray, Very Soft to Very Hard, Slightly to Moderately Weathered, Indiscernible Bedding (Claystone); Thinly to Medium Bedded Limestone; RD=N/A (Too Uneven/ Irregular); Very Closely to Medium Spaced Fractures, RD=30-90° .Vertical Fracture With Stains From 81.6-82.7' .Claystone From 79.3-80.8' .Limestone From 80.8-84.9' (RQD=39%)	
89.1	R-19		5.0	100 / 28				2386.7 84.9-91.4': CLAYSTONE, Gray, Very Soft, Moderately Weathered, Indiscernible Bedding, RD=N/A, Very Closely Spaced Fractures, RD=15-20° (RQD=9%)	
94.1	R-20		5.0	100 / 13				2380.2 91.4-101.6': SILTSTONE, Gray, Medium Hard, Slightly Weathered To Fresh, Very Thinly to Thinly Bedded, RD=8-10°, Very Closely to Closely Spaced Fractures, RD=8-20° .Traces of Pyrite (RQD=33%)	
99.1	R-21		5.0	100 / 17				2371.6	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-5R
SHEET	6 OF 6
DATE: START	5/10/04
O.G. END	5/12/04
ELEV.	2471.63

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 10.6' **WATER: DEPTH:** 94.9 **TIME:** 1430 **DATE:** 5/12/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 79.8 **TIME:** 0830 **DATE:** 5/13/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
								2370.0	
	R-22		5.0	64				**101.6-113.0': Fine-Grained Laminated SANDSTONE, Light and Dark Gray (Laminations), Medium Hard, Slightly Weathered to Fresh, Very Intensely to Intensely Laminated, RD=8-10°, Very Closely to Closely Spaced Fractures, RD=8-80°**	
104.1									
	R-23		5.0	100 / 60				**.RD=80° From 106.3-106.6' and 107.1-107.6'**	**.Drill Water Returned @ 107.0'**
109.1								**.Trace Pyrite**	
	R-24		5.0	100 / 66				**(RQD=58%)**	
								2358.6	
114.1								**113.0-116.6': Medium-Grained SAND-STONE, Gray, Hard, Fresh, Thinly to Medium Bedded, RD=10°, Cross-Bedded up to 25°, Closely to Medium Spaced Fractures, RD=10-55°**	
	R-25		2.4	96 / 83				**.Sandstone is Massive and Competent From 113.0-116.6'**	
								.55° Fracture From 116.4-116.6'	
								(RQD=83%)	
								2355.0	
								Bottom of Boring @ 116.6'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-10
SHEET 1 OF 3
DATE: START 4/07/04
O.G. END 4/07/04
ELEV. 2392.11

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Tom A. Highman DRILLERS NAME/COMPANY R. Maiolie/AWK Drilling, Inc.
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Wireline Rock Core
CASING: SIZE: 4-1/4" I.D. DEPTH: 14.0' WATER: DEPTH: 13.0 TIME: 1745 DATE: 4/07/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 2.2 TIME: 1200 DATE: 4/08/04
NOT ENCOUNTERED □

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	3 11 11	0.7			gp a-1-a	M	**0.0-1.5': Poorly Graded ROCK FRAGMENTS With SAND (gp), Gray, Moist, Medium Dense, Homogeneous (Residual)**	
1.5								2390.6	
	S-2	5 8 23	0.6			sc	W	**1.5-7.5': CLAYEY SAND (sc), Reddish Brown, Moist to Wet, Medium Dense to Very Dense, Homogeneous**	
3.0									
	S-3	11 14 13	1.3				M	**.Clay Lenses From 3.0-4.5'**	
4.5									
	S-4	21 22 30	1.5				M	**.With Sandstone Fragments From 4.5-7.5'**	
6.0									
	S-5	14 25 27	1.3				M	**(Residual-Weathered Sandstone)**	
7.5						a-2-6		2384.6	
	S-6	44 31 19	1.0			gm a-1-b	M	**7.5-9.0': SILTY SANDSTONE FRAGMENTS With SAND (gm), Tan, Moist, Dense, Homogeneous (Residual)**	
9.0								2383.1	
	S-7	5 19 20	1.2			cl	M	**9.0-11.0': SILTY CLAY With SAND (cl), Brown, Moist, Hard, Homogeneous (Residual)**	
10.5						a-6		2381.1	
	S-8	25 29 50/.3	0.8			gm-gc	M	**11.0-14.0': SILTY To CLAYEY SANDSTONE FRAGMENTS With SAND (gm-gc), Brown to Gray, Moist to Wet, Very Dense, Homogeneous**	
11.8									
12.0									
	S-9	44 50/.3	0.8				M		
12.8									
13.5									
14.0	S-10	41 50/.0	0.1			a-1-b a-2-6	W		.Wet @ 13.5'
								(Residual)	Top of Rock @ 14.0'
	R-1		2.2	88 0				2378.1 **14.0-42.2': Fine-Grained SANDSTONE, Gray, Medium Hard to Hard, Fresh to Moderately Weathered, Very Thinly to Thickly Bedded, RD=5-12°, Very Closely to Medium Spaced Fractures, RD=5-12°, 30° and 65°**	
16.5									
	R-2		2.0	100 40					
18.5									
				98				**(RQD=69%)**	
								2372.1	

GMI Project No. 02037

EAST: 1606401.0 NORTH: 158840.7

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-10
SHEET	2 OF 3
DATE: START	4/07/04
O.G. END	4/07/04
ELEV.	2392.11

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Tom A. Highman **DRILLERS NAME/COMPANY** R. Maiolie/AWK Drilling, Inc.
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Wireline Rock Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 14.0' **WATER: DEPTH:** 13.0 **TIME:** 1745 **DATE:** 4/07/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 2.2 **TIME:** 1200 **DATE:** 4/08/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-3		4.9	32					
23.5								.Very Thinly to Thinly Bedded From 14.0-21.7'	
				98					
	R-4		4.9					.Moderately Weathered From 14.0-16.9'	
								.Slightly Weathered to Fresh @ 16.9'	
28.5				98				.Water Stained Fractures and Bedding Planes From 14.0-32.3'	
				100					
	R-5		5.0					.High Angle Fractures, RD=65° From 20.3-20.5'	
								.Thickly Bedded From 25.4-27.7'	
33.5				96				.Carbonaceous Laminations @ 29.1', 30.3-30.5', 31.9', 32.3', 34.7', 36.0', 36.5-36.8', 38.9', 40.8 and 41.8'	
				100					
	R-6		5.0						
38.5				86					
				94					

2352.1

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-10
SHEET	3 OF 3
DATE: START	4/07/04
O.G. END	4/07/04
ELEV.	2392.11

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Tom A. Highman **DRILLERS NAME/COMPANY** R. Maiolie/AWK Drilling, Inc.
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Wireline Rock Core
CASING: SIZE: 4-1/4" I.D. **DEPTH:** 14.0' **WATER: DEPTH:** 13.0 **TIME:** 1745 **DATE:** 4/07/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 2.2 **TIME:** 1200 **DATE:** 4/08/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-7		4.7	60				2349.9 **42.2-42.7': Carbonaceous SHALE, Black, Soft to Medium Hard, Moderately Weathered, Intensely Laminated, RD=5-8°, Very Closely Spaced Fractures, RD=5-8° and 90° .Thin Coal Partings (RQD=0%)**	
43.5	R-8		5.0	100 / 82				2349.4 **42.7-48.5': SILTSTONE With Thin SANDSTONE/SANDY SHALE Partings, Gray, Medium Hard, Slightly Weathered, Thinly to Medium Bedded, RD=10-18°, Closely to Medium Spaced Fractures, RD=10-18° .Clay Seams From 42.7-43.7' (RQD=71%)**	
								2343.6 **Bottom of Boring @ 48.5'**	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-11
SHEET	1 OF 6
DATE: START	3/23/04
O.G. END	3/24/04
ELEV.	2336.20

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** R. Naiolie/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 10.5' **WATER: DEPTH:** 49.3 **TIME:** 1400 **DATE:** 3/24/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 49.5 **TIME:** 1400 **DATE:** 3/25/04
NOT ENCOUNTERED □

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	3 8 20	0.4			gp	D	**0.0-10.5': Poorly Graded GRAVEL (Rock Fragments) With SAND (gp), Light Brown, Dry, Medium Dense @ Surface; Very Dense Elsewhere, Homogeneous**	.Very Poor Topsoil Conditions (Grass on Sandstone Fragments)
1.5									
	S-2	12 43 45	1.0				D		
3.0									
	S-3	12 37 50/.3	0.7				D	**.Weathered Sandstone @ 4.3'**	
4.3									
4.5									
	S-4	18 37 43	0.8				D		
6.0									
6.8	S-5	21 50/.3	0.7				D		
7.5								**(Decomposed Sandstone)**	
7.8	S-6	50/.3	0.3				D		
9.0									
	S-7	50/.4	0.4				D		
9.9									
10.5						a-1-b		2325.7	
10.5	S-8	50/.0	0.0	100			--	**10.5-18.7': Fine to Medium-Grained SANDSTONE, Gray With Brown Stains, Medium Hard to Hard, Slightly Weathered, Thinly to Medium Bedded, RD=12-15°; Cross-Beds Up to 30°; Very Closely to Medium Spaced Fractures, RD=12-30° Along Bedding**	Top of Rock @ 10.5'
	R-1		1.5	0					
12.0									.Lost Water @ 12.0'
	R-2		2.0	100 90					
14.0									
	R-3		4.7	94 36				**(RQD=44%)**	
19.0				72				2317.5 **See Next Page** 2316.2	

GMI Project No. 02037

EAST: 1608744.8 NORTH: 164622.8

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-11
SHEET	2 OF 6
DATE: START	3/23/04
O.G. END	3/24/04
ELEV.	2336.20

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** R. Naiolie/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 10.5' **WATER: DEPTH:** 49.3 **TIME:** 1400 **DATE:** 3/24/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 49.5 **TIME:** 1400 **DATE:** 3/25/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-4		3.6	0				18.7-22.6': SILTY To CLAYEY SHALE, Very Soft, Highly to Completely Weathered, Very Intensely Laminated, RD=10-12°, Very Closely Spaced Fractures, RD=10-12° (RQD=0%) 2313.6	.No Drill Water Return
24.0									
	R-5		3.7	74 / 0				22.6-23.5': Carbonaceous SHALE, Black, Very Soft, Highly to Completely Weathered, Very Intensely Laminated, RD=10°, Very Closely Spaced Fractures, RD=10° (RQD=0%) 2312.7	
								23.5-27.8': CLAYSHALE, Brown, Very Soft, Completely Weathered, Very Intensely Laminated, RD=10-12°, Very Closely Spaced Fractures, RD=10-12° (RQD=0%) 2308.4	.Very Poor Recovery Through Coal Seam
29.0									.Coal Seam Depths Estimated Due to Poor Recovery
	R-6		4.4	88 / 0				27.8-29.7': COAL, Black, Soft, Very Poor Recovery (RQD=0%) 2306.5	
								29.7-32.4': CLAYSTONE, Gray, Very Soft, Moderately to Highly Weathered, Indiscernible Bedding, RD=N/A .Near Soil State (RQD=0%) 2303.8	
34.0									
	R-7		4.3	86 / 0				32.4-45.5': Interbedded SILTY And SANDY SHALE, Occasional Thin SANDSTONE Bed, Light and Dark Gray With Carbonaceous Laminations Throughout, Very Soft to Medium Hard, Highly Weathered, Very Intensely Laminated, RD=10-12°, Very Closely Spaced Fractures, RD=10-90°	
39.0								.Vertical Fracture From 37.7-38.6'	
				86					

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-11
SHEET	3 OF 6
DATE: START	3/23/04
O.G. END	3/24/04
ELEV.	2336.20

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** R. Naiolie/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 10.5' **WATER: DEPTH:** 49.3 **TIME:** 1400 **DATE:** 3/24/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 49.5 **TIME:** 1400 **DATE:** 3/25/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								(RQD=3%) 2296.2	."Rod Chatter" Starting @ 44.0'
	R-8		4.3	0				Continued From Previous Page .Dark Gray in Color Below 39.6' .Numerous Clay Seams	.Dry Hole @ 44.0'
44.0								.Clay Seams From 34.3-34.4', 34.5-35.0', 37.9-38.0', 39.0-39.1', 40. 2-40.3', 41.4-41.6', 42.4-42.5', 42.9-43.0' and 44.2-44.7'	
	R-9		1.5	30 / 8				.Vertical Fracture and Highly Stained From 40.8-41.4' 2290.7	.Void In Roof
49.0								45.5-47.5': VOID 2288.7 47.5-49.5': Soft CLAY, Pushed Tools through Debris 2286.7	.Broken/Soft Roof
	R-10		0.2	4 / 0				49.5-54.0': Broken Dark Gray SHALE, Very Poor Recovery (Roof Collapse?) or (Mine Gob) 2282.2	.Roof Collapse Into Mine?
54.0	R-11		2.5	100 / 0				54.0-58.6': CLAY And CLAYSTONE, Gray, Very Soft, Highly to Completely Weathered, Indiscernible Bedding, RD=N/A, Extremely Close to Very Closely Spaced Fractures, RD=N/A	.Underclay
56.5	R-12		2.5	100 / 0				(RQD=0%) 2277.6	
59.0				56				See Next Page 2276.2	.Tripped Out @ 59.1' -- Caved @ 50.0'

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-11
SHEET	4 OF 6
DATE: START	3/23/04
O.G. END	3/24/04
ELEV.	2336.20

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** R. Naiolie/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 10.5' **WATER: DEPTH:** 49.3 **TIME:** 1400 **DATE:** 3/24/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 49.5 **TIME:** 1400 **DATE:** 3/25/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
64.0	R-13		2.8	0				58.6-65.0': Argillaceous Fine-Grained SANDSTONE With Occasional Thin CLAY Seams, Gray, Medium Hard With Occasional Soft Clay Seams, Slightly to Moderately Weathered, Very Thinly Bedded, RD=12-15°; Very Closely Spaced Fractures, RD=12-15°	.Int. WL = Dry to 50' (1700 hrs.; 2/23/04)
66.0	R-14		1.7	85 / 0				(RQD=0%) 2271.2	WL @ 0700 3/24/04; Dry to 50'
69.0	R-15		2.8	93 / 47				65.0-92.7': Fine-Grained SANDSTONE, Gray, Medium Hard to Hard, Slightly Weathered to Fresh, Very Thinly to Medium Bedded, RD=12-13°, Closely to Medium Spaced Fractures, RD=12-13°	.Core Barrel Continually Blocking Off @ 59-61', Bore Hole Taped After Pulling Rods -- Depth = 50±', Put Rods Back in Borehole -- Had to Ream Rods From 50-60' (Caving In @ 50±' .Sounded Borehole For Water @ 66.0' - While NQ Rods in Hole. WL=50'
74.0	R-16		4.8	96 / 86				.Brown Clay Seam From 75.0-75.4'	
79.0	R-17		4.5	90 / 34				.Sandstone Becomes Less Argillaceous and More Competent @ 65.0'	
				100				(RQD=67%) 2256.2	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-11
SHEET 5 OF 6
DATE: START 3/23/04
O.G. END 3/24/04
ELEV. 2336.20

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY R. Naiolie/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 10.5' WATER: DEPTH: 49.3 TIME: 1400 DATE: 3/24/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 49.5 TIME: 1400 DATE: 3/25/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-18		5.0	80				.Shaly Bed From 82.3-84.0'	
84.0									
	R-19		5.0	100 / 66				.Becomes Medium-Grained @ 85.5'	
								.Bedding RD=40° @ 89.4'	
89.0								.Fracture RD=60° @ 91.3'	
	R-20		4.3	86 / 78				2243.5 92.7-95.0': Carbonaceous SHALE And SILTSTONE, Dark Gray to Black, Very Soft, Highly Weathered, Very Intensely Laminated to Very Thinly Bedded, RD= 20-30°, Very Closely to Closely Spaced Fractures, RD=20-30° .Thin Clay Seam From 92.7-92.8'	.Sharp Contact
94.0								(RQD=0%) 2241.2	.Shale Has Steep Wavy Bedding
	R-21		5.0	100 / 64				95.0-95.8': CLAYSTONE, Gray, Very Soft, Moderately Weathered, Indiscernible Bedding, RD=N/A, Closely Spaced Fractures, RD=N/A (RQD=0%) 2240.4	
								95.8-99.0': Fine-Grained SANDSTONE,	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-11
SHEET	6 OF 6
DATE: START	3/23/04
O.G. END	3/24/04
ELEV.	2336.20

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** R. Naiolie/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 10.5' **WATER: DEPTH:** 49.3 **TIME:** 1400 **DATE:** 3/24/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 49.5 **TIME:** 1400 **DATE:** 3/25/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Gray, Hard, Fresh, Intensely Laminated to Thinly Bedded, RD=10-20°, Medium Spaced Fractures, RD=10-12° .Occasional Small Vugs - No Reaction w/HCl (RQD=100%) 2237.2	
								Bottom of Boring @ 99.0'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	1 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 5 5	1.2			gm	M	**0.0-0.3': TOPSOIL** 2444.7	
1.5	S-2	3 21 50	1.2				D	**0.3-7.1': SILTY ROCK FRAGMENTS With SAND (gm), Brown, Moist to Dry, Loose @ Surface, Very Dense Below 1.5', Homogeneous**	
3.0	S-3	45 50 50	1.5				D	**(Weathered Sandstone)**	
4.5	S-4	19 31 49	1.5				D		
6.0	S-5	22 50 50/.1	1.1			a-1-b	D	2437.9	
7.1	R-1		2.4	96 / 0				**7.1-17.3': Fine-Grained SANDSTONE, Olive-Brown, Medium Hard, Slightly to Moderately Weathered, Very Thinly to Thinly Bedded, RD= 10-12°, Cross-Beds Up To 30°, Very Closely to Closely Spaced Fractures, RD=10-12°**	Top of Rock @ 7.1'
9.6	R-2		4.1	89 / 0				**.RD=90° From 7.1-8.1' and 11.1-11.3'** **(RQD=0%)**	
14.2	R-3		4.7	94 / 8				2427.7 **See Next Page**	
19.2				84				2425.0	

GMI Project No. 02037

EAST: 1600337.0 NORTH: 152064.5

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	2 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-4		4.2	0				**17.3-30.7': SILTSTONE AND SILTY SHALE, Olive-Brown, Soft to Medium Hard, Slightly Weathered, Very Intensely Laminated to Thinly Bedded, RD=8-12°, Very Closely to Closely Spaced Fractures, RD=8-90°** **.RD=90° From 24.8-25.4'** **.RD=40° From 26.8-27.0'** **.Sandy From 24.2-26.6'** **.Clay Seam From 30.5-30.7'**	
24.2									
	R-5		5.0	100 / 18				**(RQD=10%)**	
29.2									
	R-6		5.0	100 / 17					**.Stopped Drilling @ 29.2'; 1630 hrs.; 5/13/04** **Resumed Drilling 0900 hrs.; 5/14/04**
34.2									
	R-7		5.0	100 / 16					
39.2									
				100					
								2414.3 **30.7-54.8': SILTY SHALE With SILTSTONE Beds, Dark Gray, Soft to Medium Hard, Slightly Weathered, Very Intensely Laminated to Very Thinly Bedded, RD= 10-12°, Very Closely to Closely Spaced Fractures, RD=10-30°** **(RQD=20%)** 2405.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	3 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 7.1' **WATER: DEPTH:** 78.7 **TIME:** 1530 **DATE:** 5/20/04
CHECKED BY: John P.Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 136.5 **TIME:** 0800 **DATE:** 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-8		5.0	42					
44.2									
	R-9		4.7	94 / 10					
49.2									
	R-10		4.8	96 / 36					
54.2									
	R-11		4.7	94 / 12					
59.2									
				80					
								2390.2	
								54.8-56.3': Fossiliferous LIMESTONE, Dark Gray, Medium Hard to Hard, Slightly Weathered, Thinly Bedded, RD= 10°, Closely to Medium Spaced Fractures, RD=20-80° **(RQD=40%)**	
								2388.7	
								See Next Page	
								2385.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	4 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 7.1' **WATER: DEPTH:** 78.7 **TIME:** 1530 **DATE:** 5/20/04
CHECKED BY: John P.Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 136.5 **TIME:** 0800 **DATE:** 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
64.2	R-12		4.0	0				56.3-60.1': SILTY SHALE, Dark Gray, Medium Hard, Slightly Weathered, Very Intensely Laminated, RD=10-12°, Very Closely to Closely Spaced Fractures, RD=10-12° (RQD=0%) 2384.9	
69.2	R-13		4.9	98 / 48				60.1-62.5': Carbonaceous SHALE With Traces of Coal and Pyrite, Black, Medium Hard But Fractured, Slightly Weathered, Very Intensely Laminated, RD=10°, Extremely Close to Very Closely Spaced Fractures, RD=90° .Vertical Fracture Through Entire Unit Possible Coal From 61.5-62.5' (Washed Away) (RQD=0%) 2382.5	
74.2	R-14		5.0	100 / 86				62.5-64.2': CLAY Becoming Calcareous CLAY, Very Soft (Near Soil State) (RQD=0%) 2380.8	
79.2	R-15		5.0	100 / 84				64.2-70.0': LIMESTONE, Gray, Hard to Very Hard, Slightly Weathered to Fresh, Thinly to Medium Bedded, RD= 12°, Closely to Medium Spaced Fractures, RD=30-70° .RD=70° From 72.8-73.2' (RQD=41%) 2375.0	
				100				70.0-81.8': SILTSTONE With Calcareous Streaks and Nodules, Hard, Slightly Weathered to Fresh, Thinly Bedded, RD= 12°, Closely to Medium Spaced Fractures, RD=30-90° .Some Sandy Beds .Fracture, RD=90° From 79.7-81.3' (RQD=84%) 2365.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-12R
SHEET 5 OF 14
DATE: START 5/13/04
O.G. END 5/20/04
ELEV. 2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT ____ OFFSET ____
STATION ____ OFFSET FROM CENTERLINE ____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-16		5.0	48				2363.2 **81.8-108.3': Argillaceous SILTSTONE With CLAYSTONE, Gray, Medium Hard When Fresh; Soft When Weathered, Fresh, Indiscernible Bedding With Slickensides, RD=N/A, Very Closely to Closely Spaced Fractures, RD=15-30° Along Slickensides**	
84.2									
	R-17		4.5	90 40				**.Fracture, RD=60° From 93.8-94.0'**	
89.2									
	R-18		5.0	100 38				**(RQD=37%)**	
94.2									
	R-19		4.8	96 39					
99.2									
				100				2345.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-12R
SHEET 6 OF 14
DATE: START 5/13/04
O.G. END 5/20/04
ELEV. 2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT ____ OFFSET ____
STATION ____ OFFSET FROM CENTERLINE ____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-20		5.0	42				.Calcareous From 103.0-104.2' .Vertical Fracture and Moderately Weathered From 102.6-104.2'	
104.2									
	R-21		5.0	100 34					
								2336.7	
109.2								108.3-120.5': Fine-Grained SANDSTONE, Light Gray, Hard, Fresh to Slightly Weathered, Thinly Bedded, RD=10-12°, Closely Spaced Fractures, RD=10-12° (Along Bedding)	
	R-22		5.0	100 86				.Competent Rock (RQD=88%)	
114.2									
	R-23		5.0	100 80					
119.2									
				100					
								2325.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-12R
SHEET 7 OF 14
DATE: START 5/13/04
O.G. END 5/20/04
ELEV. 2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT ____ OFFSET ____
STATION ____ OFFSET FROM CENTERLINE ____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
								2324.5	
	R-24		5.0	100				120.5-161.3': Medium-Grained SANDSTONE, Light Gray, Hard to Very Hard, Fresh, Thinly to Thickly Bedded With Cross-Laminations, RD=10-30° (Cross Beds), Medium to Widely Spaced Fractures, RD=10-30°	
124.2									
	R-25		5.0	100 / 100				.Massive and Competent .Core Sticks Up to 4.0' Long .Highly Quartzose	
129.2									
	R-26		5.0	100 / 100				(RQD=91%)	
134.2									
	R-27		5.0	100 / 94					
139.2				100					
								2305.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-12R
SHEET 8 OF 14
DATE: START 5/13/04
O.G. END 5/20/04
ELEV. 2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT ____ OFFSET ____
STATION ____ OFFSET FROM CENTERLINE ____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-28		5.0	100				**.Fracture, RD=65° From 147.8-148.2'**	
144.2									
	R-29		5.0	100 / 68				**.Fracture, RD=90° From 148.3-149.2'**	
149.2								**.Fracture, RD=65° From 153.2-153.6' With Water Stains**	
	R-30		5.0	100 / 88					
154.2									
	R-31		5.0	100 / 78					
159.2									
				100				2285.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	9 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 7.1' **WATER: DEPTH:** 78.7 **TIME:** 1530 **DATE:** 5/20/04
CHECKED BY: John P.Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 136.5 **TIME:** 0800 **DATE:** 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
								2283.7	
	R-32		5.0	88				**161.3-168.4': SILTY Fine-Grained SANDSTONE, Gray to Dark Gray, Hard, Fresh, Medium Bedded Becoming Intensely Laminated With Depth, RD=12-15°; Closely to Medium Spaced Fractures, RD=12-55°**	
164.2								**(RQD=93%)**	
	R-33		4.5	90 / 80					
								2276.6	
169.2								**168.4-169.6': Carbonaceous SHALE and COAL, Black, Soft**	
								.Coal is Bright and Well Cleated	
								(RQD=0%)	
								2275.4	
	R-34		3.4	68 / 32				**169.6-173.0': SILTSTONE and CLAYSTONE With Clay Seams, Gray, Very Soft Clay, Medium Hard Siltstone, Highly to Moderately Weathered, Irregular Bedding, RD= N/A, Extremely Close to Very Closely Spaced Fractures, RD=5-60°**	
174.2								**.Clay Seam @ 172.0'**	
								(RQD=46%)	
								2272.0	
	R-35		5.0	100 / 74				**173.0-183.6': SILTSTONE With Frequent Sandy Laminations, Dark Gray to Black, Medium Hard, Slightly Weathered, Intensely Laminated to Very Thinly Bedded, RD=4-8°, Very Closely to Closely Spaced Fractures, RD=4-110°**	
179.2								**.Sandstone Seams From 179.9-180.3' and 180.6-180.8'**	
				100					

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	10 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								(RQD=82%) 2265.0	
								Continued From Previous Page	
	R-36		5.0	76				.Occasional Carbonaceous Laminations	
								.Thin Clay Seams @ 181.6 and 182.5' 2261.4	
184.2								183.6-188.0': SHALY SILTSTONE, Dark Gray to Black, Soft to Medium Hard, Moderately Weathered, Intensely Laminated to Very Thinly Bedded, RD=9-12°, Extremely Close to Very Closely Spaced Fractures, RD=9-70°	
	R-37		5.0	100 / 22				.Carbonaceous From 187.0-188.0'	
								(RQD=25%) 2257.0	
189.2								188.0-190.3': COAL, Black, Soft	
				84				.Siltstone Binder From 189.3-189.7'	
	R-38		4.2	36				.Pyrite Lens	
								(RQD=0%) 2254.7	
								190.3-193.3': SILTY CLAYSTONE, Gray, Very Soft to Soft, Moderately Weathered, Irregular Bedding, RD=N/A, Very Closely Spaced Fractures, RD=5-10°	
194.2								.Occasional Slickensides	
				100				(RQD=55%) 2251.7	
	R-39		5.0	70				193.3-199.2': LIMESTONE, Gray, Hard, Slightly to Moderately Weathered, Thinly to Medium Bedded, RD=8°, Very Closely to Closely Spaced Fractures, RD=8-70°	
								.Few Thin Argillaceous Siltstone Seams	
199.2								(RQD=59%) 2245.8	
				88				See Next Page	
								2245.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	11 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								199.2-206.0': Argillaceous SILTSTONE, Gray, Soft to Medium Hard, Moderately Weathered, Irregular Bedding, RD=N/A, Very Closely to Closely Spaced Fractures, RD=5-50°	
	R-40		4.4	76				.Few Calcareous Streaks .Occasional Sandy Laminations and Seams From 202.0-206.0'	
204.2								(RQD=71%)	
				100				2239.0 206.0-229.5': Very Fine SILTY SANDSTONE, Gray, Medium Hard to Hard, Moderately to Slightly Weathered, Intensely Laminated to Very Thinly Bedded, RD=5-12°, Very Closely to Widely Spaced Fractures, RD=12-70°	
	R-41		5.0	78					
209.2									
				100				.Siltstone Seam From 208.6-210.0'	
	R-42		5.0	80				.Gray to Dark Gray With Calcareous Streaks; Black From 209.6-210.0'	
214.2									
				100				.Very Broken From 215.0-216.5'	
	R-43		5.0	68				(RQD=63%)	
219.2									
				96				2225.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	12 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 7.1' **WATER: DEPTH:** 78.7 **TIME:** 1530 **DATE:** 5/20/04
CHECKED BY: John P.Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 136.5 **TIME:** 0800 **DATE:** 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-44		4.8	64				.Siltstone With Calcareous Nodules From 222.0-222.2'	
224.2								.Medium Grained From 222.2-227.2'	
	R-45		5.0	100 / 86				.Thin Siltstone Seams @ 227.2' With Calcareous Streaks	
229.2								.Calcite in Several Fractures <1/ 16"	
								2215.5	
	R-46		4.8	96 / 36				229.5-231.4': Argillaceous SILTSTONE, Gray, Medium Hard, Slightly Weathered, Irregular Bedding, RD=N/A With Slickensides, Very Closely to Closely Spaced Fractures, RD=2-20° (RD=89%)	
234.2								2213.6	
	R-47		3.6	72 / 8				231.4-233.8': COAL and Carbonaceous SHALE, Black, Soft .White Calcareous Streaks at Top of Coal .Binder From 232.7-232.9' .Black Carbonaceous Shale From 233.0-233.8' (RQD=31%)	
								2211.2	
239.2				100				233.8-234.6': LIMESTONE, Black, Hard, Slightly Weathered, Irregular Bedding, RD=N/A, Very Closely to Closely Spaced Fractures, RD=5-80° (RQD=0%)	
								2210.4	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	13 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
244.2	R-48		5.0	58				234.6-240.6': CLAYSTONE, Gray, Very Soft to Soft, Moderately Weathered, Irregular Bedding, RD= N/A, Extremely Close to Very Closely Spaced Fractures, RD=5-70° .Occasional Calcareous Nodules .Vertical Fracture From 236.6-237.4' .Very Soft Clay From 238.5-239.2' .Limestone Seam, Hard From 239.2-239.8' .Occasional Slickensides and Pyrite Streaks (RQD=0%) 2204.4	
249.2	R-49		5.0	100 / 74				240.6-251.7': Fine to Medium-Grained SANDSTONE, Gray, Intensely Laminated to Thinly Bedded, RD=5-11°, Closely to Medium Spaced Fractures, RD=5-11° .Calcareous Nodules From 244.5-244.6', 245.0-245.1' and 247.2-247.3' .Silty Seam From 247.9-248.2' (RQD=80%) 2193.3	
254.2	R-50		4.0	80 / 46				251.7-259.7': Carbonaceous SILTSTONE/ SHALE, Black, Medium Hard, Moderately Weathered, Intensely Laminated, RD= 10°, Extremely Close to Very Closely Spaced Fractures, RD=9-40° .Interbedded Sandy Seams From 253. 3-254.3' .Occasional Pyrite Lenses .Shaly With 1/8" to 1/4" Coal Streaks @ 255.0' .Intersecting High Angle Fractures From 255.6-256.8' With White Stains .Coal Seam, Very Broken From 251.9-252.1'	
259.2	R-51		4.5	90 / 26					
				70				2185.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-12R
SHEET	14 OF 14
DATE: START	5/13/04
O.G. END	5/20/04
ELEV.	2445±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: 7.1' WATER: DEPTH: 78.7 TIME: 1530 DATE: 5/20/04
CHECKED BY: John P.Campbell, Jr. DATE: 07/02/04 DEPTH: 136.5 TIME: 0800 DATE: 6/18/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-52		3.5	0				259.7-261.2': COAL, Black, Soft, Very Broken (RQD=0%) .Pyrite Lenses .Binder From 260.8-261.0'	
								2183.8	
264.2								261.2-264.0': Carbonaceous SHALE, Coal Streaks, Black, Soft to Medium Hard, Moderately Weathered, Intensely Laminated, RD=10°, Extremely Close Spaced Fractures, RD=N/A .Claystone Seam From 263.6-264.0'	
	R-53		5.0	100 / 88				(RQD=0%)	
								2181.0	
								264.0-269.2': Argillaceous LIMESTONE, Dark Gray to Gray, Hard, Slightly Weathered, Irregular Bedding, RD=N/A, Very Close to Closely Spaced Fractures, RD=5-20° .Occasional Siltstone Interbeds Below 267.0, Medium Hard	
								(RQD=85%)	
								2175.8	
								Bottom of Boring @ 269.2'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-13R
SHEET 1 OF 1
DATE: START 5/25/04
O.G. END 5/25/04
ELEV. 2110±*

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: _____ WATER: DEPTH: Abandoned TIME: _____ DATE: _____
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED □

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 2 2	1.0			gm-gc	W	**0.0-0.4': TOPSOIL** 2109.6	Boring Moved Due to Flooding and Poor Access to Boring Location
1.5								**0.4-9.0': SILTY To CLAYEY GRAVEL With SAND (gm-gc), Brown to Brown and Greenish Gray Mottling, Wet, Very Loose @ Surface; Medium Dense to Very Dense Elsewhere; Homogeneous**	
	S-2	1 1 2	0.0				W		
3.0								**.Frequent Boulders**	
	S-3	12 8 15	0.5				W		
4.5								**(Alluvial)**	
	S-4	11 43 28	0.6				W		
6.0									Very Difficult Augering From 6.0-9.0'
	S-5	13 9 12	1.5				W		
7.5									
	S-4	21 23 23	0.7			a-2-4 a-2-6	W	2101.0	
								Boring Abandoned @ 9.0'	

GMI Project No. 02037

EAST: 1601323.5 NORTH: 152543.5

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-13RA
SHEET	1 OF 3
DATE: START	5/25/04
O.G. END	5/28/04
ELEV.	2110±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: _____ WATER: DEPTH: 0.0 TIME: 0930 DATE: 5/28/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 4 3	0.8			gm	D	**0.0-0.2': TOPSOIL** 2109.8	Boring Moved Due to Excessive Boulders @ Original Location
1.5	S-2	3 2 3	0.5				D	**0.2-4.0': SILTY ROCK FRAGMENTS With SAND (gm), Red and Black, Dry to Moist, Loose, Homogeneous**	
3.0	S-3	4 3 1	1.0			a-2-4	D	**.Reddog and Carbonaceous Shale** 2106.0	
4.5	S-4	1 2 2	0.6			sm	W	**4.0-8.4': SILTY SAND With GRAVEL (sm), Brown, Dry to Wet, Very Loose to 6.0'; Medium Dense Below 6.0'; Homogeneous**	
6.0	S-5	2 3 13	0.4				D	**.Refusal on Boulder**	
7.5	S-6	23 50/.4	0.9			a-2-4	W	**(Alluvial)** 2101.6	
8.4	R-1		0.5	45 / 44		gm		**8.4-9.0': SANDSTONE Cobble/Boulder, Light Gray, Hard to Very Hard (RQD=36%)** 2101.0	Auger Refusal @ 8.4'; Cored to 9.5'
9.5	S-7	11 20 20	1.2				W	**9.0-11.5': SILTY GRAVEL With SAND (gm), Brown, Wet, Dense, Homogeneous (Alluvial)**	
11.0	S-8	34 50/.3	0.8			a-2-4	D	**.Well Rounded Gravel** 2098.5	Top of Rock @ 11.8'
11.8	R-2		1.7	100 / 47		gm a-2-4		**11.5-11.8': SILTY ROCK FRAGMENTS With SAND (gm), Dark Gray, Dry, Very Dense, Fissured (Weathered Carbonaceous Shale)** 2098.2	
13.5	R-3		4.4	88 / 0				**11.8-15.0': SILTY SHALE, Dark Gray With Carbonaceous Laminations, Medium Hard, Fresh, Very Intensely Laminated, RD=10-12°, Very Closely to Closely Spaced Fractures, RD=10-12° (RQD=25%)** 2095.0	.Drill Water Black From 16.7-17.3'
18.5				70				**15.0-16.7': CLAYSTONE, Gray, Very Soft, Moderately Weathered, Indiscernible Bedding, RD=N/A, Very Closely Spaced Fractures, RD=N/A (RQD=0%)** 2093.3	

GMI Project No. 02037

EAST: 1601323.5 NORTH: 152543.5

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-13RA
SHEET 2 OF 3
DATE: START 5/25/04
O.G. END 5/28/04
ELEV. 2110±

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: _____ WATER: DEPTH: 0.0 TIME: 0930 DATE: 5/28/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-4		3.5	0				16.7-17.3': COAL, Black, Soft (No Recovery) (RQD=0%)	
23.5								2092.7	
								17.3-19.9': CLAYSTONE, Gray, Soft, Slightly Weathered, Indiscernible Bedding, RD=N/A, Very Closely Spaced Fracture, RD= N/A .Slickensided (RQD=0%)	4"-7" Coal Seams Separated By Carbonaceous Shale and Bony Coal
								2090.1	
	R-5		4.9	98 / 70				19.9-23.5': COAL and BONY COAL, Black, Soft (RQD=0%)	
28.5								2086.5	
								23.5-24.5': Carbonaceous SHALE, Black, Medium Hard, Slightly Weathered, Very Intensely Laminated, RD=10-12°, Extremely Close to Very Closely Spaced Fractures, RD=10-12° (RQD=0%)	
								2085.5	
	R-6		5.0	100 / 70				24.5-32.2': SILTSTONE Grading to Fine-Grained SANDSTONE With Dark Gray Laminations, Light and Dark Gray, Medium Hard, Fresh, Slightly Weathered From 31.7-32.0'; Very Intensely Laminated to Thinly Bedded, RD=10-12°, Closely to Medium Spaced Fractures, RD=10-12°, RD=60° From 31.7-32.0' .Water Stained Fracture From 31.7-32.0'	.Artesian Flow After Run 6. WL=8' Above Ground Inside Augers
33.5								(RQD=79%)	
								2077.8	
	R-7		5.0	100 / 96				32.2-43.5': Fine to Medium-Grained QUARTZOSE SANDSTONE, Light Gray, Very Hard, Fresh, Thinly to Medium Bedded, RD=10-12°, Closely to Medium Spaced Fractures, RD=10-12° .Some Cross-Bedding up to 35° .Occasional Thin Carbonaceous Laminations .Thin Beds of Conglomerate	
38.5									
				100				(RQD=91%)	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-13RA
SHEET	3 OF 3
DATE: START	5/25/04
O.G. END	5/28/04
ELEV.	2110±

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** _____ **WATER: DEPTH:** 0.0 **TIME:** 0930 **DATE:** 5/28/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** _____ **TIME:** _____ **DATE:** _____
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								2070.0	
	R-8		5.0	90				Continued From Previous Page	
								2066.5	
								Bottom of Boring @ 43.5'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	1 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 2 3	0.8				W	**0.0-1.0': TOPSOIL**	
1.5						gm		2474.5 **1.0-13.6': SILTY SANDSTONE And SHALE FRAGMENTS With SAND (gm), Brown, Moist to Wet, Dense to Very Dense, Homogeneous**	
	S-2	9 15 22	1.0				M		
3.0									
	S-3	22 45 50/.2	1.2				W		
4.2									
4.5									
	S-4	33 45 50/.4	1.2				W	**.Decomposed Shaly Sandstone**	
5.9									
6.0	S-5	23 50/.4	0.9				M		
6.9									
7.5									
	S-6	9 15 17	1.3				M	**.Coal Material Found From 3.0-4.2'**	
9.0									
	S-7	20 24 33	1.4				M		
10.5									
	S-8	20 24 37	1.5				M	**(Residual)**	
12.0									
12.2	S-9	50/.2	0.0				M		
13.5						a-1-b		2461.9	
13.6	S-10	50/.1	0.0	100			M	**13.6-14.5': SANDY SHALE, Dark Gray, Medium Hard, Moderately Weathered, Intensely Laminated, RD=0-3°, Very Closely Spaced Fractures, RD=0-90°**	Top of Rock @ 13.6'
	R-1		2.0	0				**.Very Broken From 13.6-13.8'**	
15.6				100				**(RQD=0%)**	
								2461.0	
	R-2		3.4					**14.5-28.0': Fine-Grained SANDSTONE, Dark Gray to Gray, Medium Hard, Moderately Weathered, Thinly Bedded, RD=0-3°, Very Closely to Closely Spaced Fractures, RD=0-90°**	
19.0				0				**(RQD=13%)**	
				96				2455.5	

GMI Project No. 02037

EAST: 1603292.9 NORTH: 151642.9

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	2 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-3		4.8	16				.Water Stained Throughout .Highly Weathered From 15.6-15.9' .Vertical Fractures From 15.2-15.3', 15.9-16.1', 19.0-19.3' and 20.4-20.8'	
24.0								.Occasional Clay Seams .Sandstone Contains Carbonaceous Shale and Coal Laminations @ Base	
	R-4		4.2	84 / 20				2447.5 28.0-28.3': COAL, Black, Soft (RQD=0%)	
29.0								2447.2 28.3-29.7': Carbonaceous SHALE With COAL Laminations, Black, Medium Hard, Moderately Weathered, Intensely Laminated, RD=N/A, Extremely Close Spaced Fractures, RD=N/A; Very Broken (RQD=0%)	
	R-5		4.3	86 / 38				2445.8 29.7-30.2': Argillaceous SILTSTONE, Gray, Medium Hard, Moderately Weathered, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-30° (RQD=0%)	
34.0								2445.3 30.2-39.5': Fine-Grained SANDSTONE And SILTSTONE Interbedded, Gray, Medium Hard, Slightly Weathered, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-60°	
	R-6		4.2	84 / 34				(RQD=39%)	
39.0								2436.0	
				88					

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-14
SHEET 3 OF 10
DATE: START 4/6/04
O.G. END 4/14/04
ELEV. 2475.51

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Christine M. Wing DRILLERS NAME/COMPANY R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" DEPTH: 13.6' WATER: DEPTH: 0.0 TIME: 1400 DATE: 4/14/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 0.0 TIME: 1400 DATE: 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-7		4.4	62				39.5-81.5': Fine-Grained SANDSTONE, Gray, Hard to Very Hard, Fresh, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-30°	
44.0									
	R-8		5.0	100 / 68				.Coal Laminations From 44.0-44.6', 48.4-48.6' and 49.0-54.0' .Occasional Water Staining .Vertical Fracture From 48.4-48.6'	
49.0									
	R-9		4.7	94 / 62				.Water Stained From 54.5-56.8'	
54.0									
	R-10		5.0	100 / 78				(RQD=93%)	
59.0				100				2415.5	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	4 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-11		5.0	92					
64.0									Stopped Drilling @ 64.0'; 4/7/04
				98					
	R-12		4.9					.Thin Coal Laminations @ 72.0'	Resumed Drilling @ 64.0'; 4/8/04
69.0				80					
				100					
	R-13		5.0						
74.0				90					
				100					
	R-14		5.0						
79.0				88					
				92					
								2395.5	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	5 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
								2394.0	
	R-15		4.6	92				81.5-84.2': Quartzitic SANDSTONE, Gray, Medium Hard, Fresh to Moderately Weathered, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-30° (RQD=73%)	
84.0								2391.3	
	R-16		4.7	94 / 86				84.2-86.7': Fine-Grained SANDSTONE With COAL Laminations, Hard, Fresh, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-30° (RQD=88%)	
89.0								2388.8	
	R-17		5.0	100 / 72				86.7-92.5': Quartzitic SANDSTONE, Gray, Medium Hard to Hard, Fresh, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-20° (RQD=62%)	
94.0								2383.0	
	R-18		4.9	98 / 58				92.5-102.8': Very Fine-Grained SANDSTONE, Gray, Fresh to Highly Weathered, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-30° .Highly Weathered From 92.5-93.0' (RQD=48%)	
99.0				92				2375.5	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	6 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-19		4.6	70				2372.7	
104.0								102.8-122.7': SILTSTONE And SANDSTONE Interbedded, Reddish Brown and Gray, Medium Hard, Fresh, Thinly Bedded, RD= 0-3°, Closely Spaced Fractures, RD=0-90°	
	R-20		4.9	98 / 50				.Vertical Fractures From 110.7-111.0'	
109.0									
	R-21		4.7	94 / 86				.Soft and Very Broken From 111.0-111.1' and 113.5-114.0'	
114.0								(RQD=69%)	
	R-22		5.0	100 / 56					
119.0									
				94				2355.5	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	7 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-23		4.7	40				2352.8	
124.0								**122.7-129.0': Very Fine to Fine-Grained SANDSTONE, Gray, Medium Hard to Hard, Fresh, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-70°**	
	R-24		5.0	100 / 100				**(RQD=95%)**	
129.0								2346.5	
	R-25		4.8	96 / 58				**129.0-144.8': SILTSTONE And Fine Grained SANDSTONE Interbedded, Reddish Brown and Gray, Medium Hard, Fresh to Moderately Weathered, Thinly Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=0-90°**	
134.0								**.Slickensides**	
	R-26		4.5	90 / 16				**.Numerous Vertical Fractures and High Angle Fractures From 134.0-139.0'**	
139.0								**.Very Broken From 138.5-139.0'**	
				100				**(RQD=35%)**	
								2335.5	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	8 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-27		5.0	82					
144.0								2330.7	
	R-28		5.0	100 / 52				**144.8-164.5': Argillaceous SILTSTONE And CLAYSTONE Interbedded, Reddish-Brown, Medium Hard, Fresh, Thinly Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=0-90°**	
149.0									
	R-29		4.8	96 / 14				**.Very Broken From 147.2-147.7'**	
								.Slickensides Throughout	
154.0								**.Very Broken and High Angle Fractures From 154.0-159.0'**	
	R-30		4.8	96 / 30				**(RQD=64%)**	
159.0									
				96					
								2315.5	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	9 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-31		4.8	60					
164.0								2311.0	
	R-32		5.0	100 / 74				**164.5-167.7': Very Fine-Grained SANDSTONE, Gray Turning Red @ Base, Medium Hard, Fresh, Thinly Bedded, RD= 0-3°, Closely Spaced Fractures, RD=0-70°** **(RQD=69%)**	
169.0								2307.8	
	R-33		4.6	92 / 0				**167.7-188.5': Argillaceous SILTSTONE And CLAYSTONE Interbedded, Reddish-Brown, Soft to Medium Hard, Moderately to Highly Weathered, Very Thinly to Thinly Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD= 0-85°** **.Very Soft and Very Broken From 173.1-174.0'**	
174.0									
	R-34		5.0	100 / 64				**.Numerous High Angle Fractures From 167.7-174.0'** **(RQD=35%)**	
179.0				94				2295.5	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-14
SHEET	10 OF 10
DATE: START	4/6/04
O.G. END	4/14/04
ELEV.	2475.51

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 13.6' **WATER: DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 0.0 **TIME:** 1400 **DATE:** 4/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-35		4.7	20				.Slickensides Present Throughout	
184.0									
	R-36		5.0	100 / 54				.Turning Gray @ 189.0'	
								2287.0	
189.0								188.5-197.0': Fine-Grained SANDSTONE, Gray, Medium Hard to Hard, Fresh, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-20°	
	R-37		5.0	100 / 96				(RQD=95%)	
194.0									
	R-38		3.0	100 / 93				2278.5	
								Bottom of Boring @ 197.0'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	1 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	4 8 15	0.9				M	**0.0-1.0': TOPSOIL** 2587.9	
1.5	S-2	9 50/.2	0.6			gm a-1-b	M	**1.0-2.6': SILTY GRAVEL With SAND (gm), Brown, Moist, Medium Dense to Very Dense, Homogeneous (Residual)** 2586.3	Auger Refusal @ 2.6'
2.4 2.6	R-1		1.9	95 75				**2.6-19.4': QUARTZITIC SANDSTONE, Light Brown to Brownish White, Slightly Weathered, Hard, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-90°**	
4.6	R-2		2.9	97 30				**.Occasional Coal Laminations**	
7.6	R-3		1.6	80 20				**.Vertical Fractures From 4.6-4.9', 6.4-6.6', 13.9-14.5' and 14.6 to 15.8'**	
9.6	R-4		4.1	82 24				**.Numerous Vertical Fractures From 15.8-16.6'** **.Very Soft and Completely Weathered From 17.4-18.4'** **.Water Stained Throughout**	
14.6	R-5		4.9	98 18				**(RQD=35%)** 2569.5	Stopped Drilling @ 14.6'; 3/23/04 Resumed Drilling @ 14.6'; 3/24/04
19.6				26					

GMI Project No. 02037

EAST: 1604318.3 **NORTH:** 153133.8

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-15
SHEET 2 OF 13
DATE: START 3/23/04
O.G. END 4/05/04
ELEV. 2588.87

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Christine M. Wing DRILLERS NAME/COMPANY R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. DEPTH: 2.6' WATER: DEPTH: 16.5 TIME: 1200 DATE: 4/05/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 23.8 TIME: 1700 DATE: 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
24.6	R-6		1.3	0				19.4-24.6': SILTY To SANDY SHALE With Carbonaceous SHALE And COAL Laminations, Gray to Brownish Gray, Soft to Medium Hard, Moderately to Highly Weathered, Very Intensely Laminated, RD=0-3°, Very Closely Spaced Fractures, RD=0-90° (RQD=17%) 2564.3	.Lost Water @ 22.1'
26.6	R-7		1.0	50 / 0				24.6-26.6': CLAYSTONE, Gray, Very Soft, Highly Weathered, Indiscernible Bedding, RD=N/A, Closely Spaced Fractures, RD=N/A (RQD=0%) 2562.3	
29.6	R-8		2.2	73 / 0				26.6-32.6': SILTY To SANDY SHALE, Gray to Dark Gray, Very Soft to Medium Hard, Slightly to Highly Weathered, Thinly Laminated, RD=0-3°, Very Closely to Closely Spaced Fractures, RD=0-90° .Becoming Carbonaceous From 31.6-32.6' (RQD=0%) 2556.3	
31.6	R-9		1.5	75 / 0					
34.6	R-10		2.7	90 / 37					
39.6	R-11		3.3	66 / 16				32.6-41.3': Argillaceous SILTSTONE, Gray to Dark Gray, Very Soft to Medium Hard, Moderately to Highly Weathered, Thinly to Indiscernible Bedding, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=0-90° .Very Soft and Highly Weathered From 34.6-36.0' and 37.7-40.0' .Carbonaceous Shale From 40.0-40.2' (RQD=40%) 2548.9	
				90					

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	3 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-12		1.8	40				.Shale From 40.2-40.5'	
41.6								2547.6	
	R-13		3.0	100 / 90				41.3-44.6': Fine-Grained SANDSTONE, Gray and Dark Gray, Medium Hard to Hard, Fresh to Slightly Weathered, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-90°	
44.6								.Clay Seams .Vertical Fracture From 43.4-43.6' and Water Stained Along Fractures (RQD=94%) 2544.3	
	R-14		4.8	96 / 64				44.6-62.0': Fine-Grained SANDSTONE With SILTSTONE Interbedded, Gray and Dark Gray, Medium Hard to Hard, Slightly to Moderately Weathered, Thinly Bedded, RD=0-3°, Very Closely to Closely Spaced Fractures, RD=0- 90°	
49.6									
	R-15		5.0	100 / 74				.Water Stained Throughout	
54.6									
	R-16		5.0	100 / 50				(RQD=70%)	
59.6									
				90				2528.9	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	4 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
61.6	R-17		1.8	0				2526.9	
	R-18		3.0	100 / 0				**62.0-69.6': SILTSTONE With Fine-Grained SANDSTONE Interbedded, Gray and Dark Gray, Medium Hard, Slightly to Moderately Weathered, Thinly Bedded, RD=0-3°, Very Closely to Closely Spaced Fractures, RD=0-90°**	
64.6	R-19		3.7	74 / 40				**.Water Stained Throughout** **.Numerous Vertical Fractures From 62.0-65.0'** **.Carbonaceous Shale and Coal From 67.2-67.4' and 67.9-68.1'**	**Stopped Drilling @ 64.6'; 3/25/04** **Resumed Drilling @ 64.6'; 3/26/04**
69.6	R-20		3.0	60 / 0				**(RQD=26%)** 2519.3 **69.6-79.6': Very Fine to Fine-Grained SANDSTONE With Occasional SILTSTONE Interbedded, Gray, Medium Hard, Moderately Weathered, Thinly Bedded, RD=0-3°, Very Closely to Closely Spaced Fractures, RD=0-90°**	
74.6	R-21		1.3	65 / 0				**.Very Broken Zone From 70.8-71.2' and 74.6-76.6'**	
76.6	R-22		2.1	70 / 0				**(RQD=46%)**	
79.6				100				2509.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-15
SHEET 5 OF 13
DATE: START 3/23/04
O.G. END 4/05/04
ELEV. 2588.87

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Christine M. Wing DRILLERS NAME/COMPANY R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. DEPTH: 2.6' WATER: DEPTH: 16.5 TIME: 1200 DATE: 4/05/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 23.8 TIME: 1700 DATE: 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								79.6-124.6': Fine-Grained SANDSTONE, Gray, Hard, Fresh, Thinly Bedded, RD= 0-3°, Closely Spaced Fractures, RD=0-90°	
	R-23		5.0	92					
84.6									
				100					
	R-24		5.0	98				.Micaceous	
89.6									
				100					
	R-25		5.0	100				(RQD=81%)	
94.6									
				100					Stopped Drilling @ 94.6'; 3/25/04
	R-26		5.0						Resumed Drilling @ 94.6'; 3/26/04
99.6				92					
				100				2488.9	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-15
SHEET 6 OF 13
DATE: START 3/23/04
O.G. END 4/05/04
ELEV. 2588.87

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Christine M. Wing DRILLERS NAME/COMPANY R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. DEPTH: 2.6' WATER: DEPTH: 16.5 TIME: 1200 DATE: 4/05/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 23.8 TIME: 1700 DATE: 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-27		5.0	94					
104.6									
				100				.Small Clay Seam From 107.6-107.8'	
	R-28		5.0	68					
109.6									
				96					
	R-29		4.8	72					
114.6									
				100					
	R-30		5.0	60					
119.6									
				94				2468.9	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	7 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-31		4.7	70				2464.3	
124.6				96				**124.6-138.6': SILTSTONE With SANDSTONE Interbedded, Gray, Hard, Fresh, Thinly to Medium Bedded, RD=0-3°, Closely to Widely Spaced Fractures, RD=0-90°**	Stopped Drilling @ 124.6; 3/26/04 Resumed Drilling @ 124.6; 3/29/04
	R-32		4.8	86					
129.6				100				**.Vertical Fractures From 126.4-126.8', 129.6-130.6', 132.2-132.4' and 134.4-134.6'**	
	R-33		5.0	96				**(RQD=86%)**	
134.6				90					
	R-34		4.5	76				2450.3	
139.6				100				**138.6-139.6': COAL, Black, Soft (RQD=0%)**	
								2449.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	8 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-35		5.0	72				139.6-141.0': Carbonaceous SHALE with Thin COAL Laminations, Black, Fresh, Intensely Laminated, RD=0-3°, Very Closely Spaced Fractures, RD=0-3° (RQD=0%) 2447.9	
144.6								141.0-161.6': Fine-Grained SANDSTONE With Occasional SILTSTONE Interbedded, Gray, Hard to Very Hard, Fresh, Thinly to Medium Bedded, RD=0-3°, Closely to Widely Spaced Fractures, RD=0-5°	
	R-36		4.7	94 / 78				.Occasional Coal Laminations	
149.6									
	R-37		5.0	100 / 96				.Micaceous (RQD=93%)	
154.6									
	R-38		5.0	100 / 98					
159.6				80				2428.9	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-15
SHEET 9 OF 13
DATE: START 3/23/04
O.G. END 4/05/04
ELEV. 2588.87

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Christine M. Wing DRILLERS NAME/COMPANY R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. DEPTH: 2.6' WATER: DEPTH: 16.5 TIME: 1200 DATE: 4/05/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 23.8 TIME: 1700 DATE: 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
								2427.3	
	R-39		4.0	38				**161.6-162.3': Carbonaceous SHALE With COAL Laminations, Black, Medium Hard, Fresh, Intensely Laminated, RD=0-3°, Very Closely Spaced Fractures, RD=0-90°**	
164.6								**(RQD=0%)**	
	R-40		2.0	100 / 100				2426.6	
166.6								**162.3-185.9': QUARTZITIC SANDSTONE With Carbonaceous SHALE And COAL Laminations, Gray and Black, Medium Hard to Hard, Fresh, Thinly Bedded, RD=0-3°, Closely to Widely Spaced Fractures, RD=0-3°**	
	R-41		2.9	97 / 98					
169.6									
	R-42		4.9	98 / 98				**(RQD=72%)**	
174.6									
	R-43		5.0	100 / 98					
179.6				100				2408.9	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	10 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-44		5.0	100					
184.6								2403.0	Stopped Drilling @ 184.6; 3/29/04
	R-45		4.7	94 / 38				**185.9-187.5': SILTSTONE With Slickensides, Gray, Medium Hard, Fresh, Very Thinly to Thinly Bedded, RD=0-3°, Very Closely Spaced Fractures, RD=0-80° .Numerous High Angle Fractures Throughout (RQD=0%)**	Resumed Drilling @ 184.6; 3/30/04
189.6								2401.4	
	R-46		4.8	96 / 80				**187.5-191.0': QUARTZITIC SANDSTONE, Gray, Medium Hard to Hard, Fresh, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-60° .Coal and Pyrite Crystals Along the Fracture @ 189.8' (RQD=63%)**	
194.6								2397.9	
	R-47		5.0	100 / 100				**191.0-206.2': Fine-Grained SANDSTONE, Gray, Medium Hard to Hard, Thinly to Medium Bedded, RD=0-3°, Widely to Closely Spaced Fractures, RD=0-30° .Large Quartz Crystals Throughout @ 196.8' (RQD=61%)**	
199.6								2388.9	
				100					

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	11 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-48		5.0	100					
204.6				94					
								2382.7	
	R-49		4.7					**206.2-214.6': SILTSTONE, Gray, Medium Hard, Fresh, Thinly Bedded, RD=0-3°, Closely Spaced Fractures, RD=0-30°**	
209.6				78					
	R-50		5.0	100				**(RQD=73%)**	
214.6				76				2374.3	
	R-51		5.0	100				**See Next Page**	
219.6				96					
				94				2368.9	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	12 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-52		4.7	92				214.6-228.0': Very Fine-Grained SANDSTONE, Gray and Reddish Brown, Hard to Very Hard, Fresh, Thinly Bedded, RD=0-3°, Very Closely to Closely Spaced Fractures, RD=0-80°	
224.6								.Starts Turning Reddish Brown From 222.5-223.7' and 225.0-227.0'	
	R-53		4.9	98 / 84				(RQD=93%)	
229.6								2360.9	
	R-54		5.0	100 / 30				228.0-244.6': SILTSTONE With CLAYSTONE Interbedded, Reddish Brown, Medium Hard, Very Thinly to Thinly Bedded, RD=0-3°, Very Closely to Closely Spaced Fractures, RD=0-80°	.Gray From 227.3-240.0'
234.6								(RQD=37%)	
	R-55		4.6	92 / 36					
239.6				100				2348.9	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-15
SHEET	13 OF 13
DATE: START	3/23/04
O.G. END	4/05/04
ELEV.	2588.87

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Split Barrel Core
CASING: SIZE: 3" O.D. **DEPTH:** 2.6' **WATER: DEPTH:** 16.5 **TIME:** 1200 **DATE:** 4/05/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 23.8 **TIME:** 1700 **DATE:** 4/06/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-56		5.0	36					
2344.3								**Bottom of Boring @ 244.6'**	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-16
SHEET	1 OF 3
DATE: START	4/14/04
O.G. END	4/14/04
ELEV.	2692.6±

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 15.0' **WATER: DEPTH:** 0.5 **TIME:** 1630 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 9.4 **TIME:** 1300 **DATE:** 4/16/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	2 3 4	1.1			cl	M	**0.0-0.4': TOPSOIL** 2692.2	
1.5								**0.4-9.0': SILTY CLAY With SAND (cl), Brown and Olive-Gray, Moist, Medium Stiff to Hard, Homogeneous**	
	S-2	4 5 11	0.8				M		
3.0									
	S-3	5 10 11	1.1				M		
4.5									
	S-4	19 25 21	1.5				M	**(Residual)**	
6.0									
	S-5	6 8 11	1.1				M		
7.5									
	S-6	10 11 15	1.5			a-6	M	2683.6	
9.0									
	S-7	8 17 33	1.5			sc	M	**9.0-15.0': CLAYEY SAND (Shale Fragments), (sc), Brown to Gray, Moist, Very Dense, Laminated**	
10.5									
	S-8	30 50/.4	0.9				M		
11.4									
12.0									
	S-9	20 50/.4	0.9				M	**(Decomposed Shale)**	
12.9									
13.5									
	S-10	24 50/.3	0.8				M		
14.3									
15.0						a-2-6		2677.6	
15.0	S-11	50/.0	0.0	94			--	**15.0-29.4': SILTY To CLAYEY SHALE With Occasional SILTSTONE Beds, Gray, Soft to Medium Hard, Slightly Weathered, Very Intensely Laminated to Thinly Bedded, RD=4-5°, Extremely Close to Closely Spaced Fractures, RD=4-90°**	Top of Rock @ 15.0'
	R-1		3.3						
18.5				0				**(RQD=14%)**	
				96				2672.6	

GMI Project No. 02037

EAST: 1591563.1 NORTH: 140506.8

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-16
SHEET	2 OF 3
DATE: START	4/14/04
O.G. END	4/14/04
ELEV.	2692.6±

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 15.0' **WATER: DEPTH:** 0.5 **TIME:** 1630 **DATE:** 4/14/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 9.4 **TIME:** 1300 **DATE:** 4/16/04
NOT ENCOUNTERED □

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-2		4.8	0					
23.5								.Vertical Fracture With Stains From 25.0-25.9' and 27.4-28.1'	
	R-3		5.0	100 / 32					
28.5								2663.2	
	R-4		5.0	100 / 42				29.4-38.8': Fine-Grained SANDSTONE With Occasional SHALE Beds, Gray, Medium Hard to Hard, Slightly Weathered, Very Intensely Laminated to Thinly Bedded, RD=4-5°, Very Closely to Closely Spaced Fractures, RD=4-90°	
33.5								.Sandstone Has Light and Dark Gray Laminations	
	R-5		5.0	100 / 40				.Vertical Fracture With Stains From 31.2-32.1'	
								.Shale Beds From 31.2-32.1' and 33.4-35.0'	
38.5								(RQD=39%)	
				98				2653.8	
								See Next Page	
								2652.6	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-16
SHEET	3 OF 3
DATE: START	4/14/04
O.G. END	4/14/04
ELEV.	2692.6±

PROJECT NAME: U.S. 219 Improvements
COUNTY: Somerset, PA & Garrett, MD
STATE RT. NO.: 6219 SECT.: 019 SEGMENT: OFFSET:
STATION: OFFSET FROM CENTERLINE:
INSPECTOR (SIGNED): Timothy D. Witt
DRILLERS NAME/COMPANY: J. Bush/AWK Drilling
EQUIPMENT USED: CME-550 ATV
DRILLING METHODS: 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 3-1/4" DEPTH: 15.0' WATER: DEPTH: 0.5 TIME: 1630 DATE: 4/14/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 9.4 TIME: 1300 DATE: 4/16/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
43.5	R-6		4.9	20				38.8-51.8': SILTY SHALE, Dark Gray With Occasional Carbonaceous Beds, Medium Hard, Slightly Weathered to Fresh, Very Intensely Laminated, RD= 5°, Very Closely to Closely Spaced Fractures, RD=5-10°	
48.5	R-7		4.6	92 / 54				.Traces of Pyrite Lenses .Highly Carbonaceous From 51.4-51.8' (RQD=34%)	
53.5	R-8		4.5	90 / 14				2640.8 51.8-52.1': COAL, Black, Soft (RQD=0%) 2640.5	
	R-9		3.0	100 / 0				52.1-56.5': CLAYSTONE, Gray, Very Soft, Highly Weathered, Indiscernible Bedding, RD=N/A, Very Closely Spaced Fractures, RD=N/A .Very Soft, Breaks With Finger Pressure (RQD=0%) 2636.1 Bottom of Boring @ 56.5'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-18
SHEET	1 OF 8
DATE: START	4/26/04
O.G. END	5/5/04
ELEV.	2522.31

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** _____ **WATER: DEPTH:** 12.5 **TIME:** 1300 **DATE:** 5/5/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 16.9 **TIME:** 1100 **DATE:** 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	2 3 3	1.3			cl	M	**0.0-0.2': TOPSOIL** 2522.1 **0.2-5.0': SILTY CLAY With SAND (cl), Light Brown, Moist, Medium Stiff to Very Stiff, Homogeneous**	
1.5	S-2	2 5 11	0.6				M		
3.0	S-3	10 13 16	1.2				M	**(Residual)**	
4.5	S-4	32 50 50	1.0			a-6	D	2517.3	
6.0	S-5	20 48 50/.2	1.2			gm	D	**5.0-8.5': SILTY ROCK FRAGMENTS With SAND (gm), Gray, Very Dense, Fissured**	
7.2 7.5 7.7	S-6	50/.2	0.2				D	**(Weathered Sandstone)**	
8.5						a-2-4		2513.8	
	R-1		2.3	70 12				**8.5-24.0': SHALY Fine-Grained SANDSTONE, Light and Dark Gray, Laminated, Medium Hard, Slightly to Moderately Weathered, Very Intensely Laminated to Very Thinly Bedded, RD= 15-20°, Cross-Beds Up To 30°, Extremely Close to Closely Spaced Fractures, RD=15-90°**	**Stopped Drilling @ 8.5'; 1530 hrs.; 4/26/04** **Resumed Drilling 1000 hrs.; 4/27/04** **Auger Refusal @ 8.5' (Top of Rock)**
11.8	R-2		0.2	10 0					
13.8	R-3		0.1	4 0				**.Clay Seam From 18.8-23.0'**	
16.3	R-4		1.3	52 0				**(RQD=3%)**	**Boring Stopped @ 18.3'; 1200 hrs.,; 4/27/04** **Resumed Drilling 0900 hrs.,; 4/28/04**
18.8				54				2502.3	

GMI Project No. 02037

EAST: 1600088.1 NORTH: 146989.9

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-18
SHEET	2 OF 8
DATE: START	4/26/04
O.G. END	5/5/04
ELEV.	2522.31

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** _____ **WATER: DEPTH:** 12.5 **TIME:** 1300 **DATE:** 5/5/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 16.9 **TIME:** 1100 **DATE:** 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-5		2.7	0					
23.8								2498.3	
	R-6		3.9	78 / 0				**24.0-33.4': SILTY/SANDY SHALE With Thin SILTSTONE Beds, Dark Gray, Medium Hard, Slightly to Moderately Weathered, Very Intensely Laminated to Thinly Bedded, RD=10-18°, Cross-Beds Up To 30°, Very Closely to Closely Spaced Fractures, RD=10-30°**	
28.8								**.Carbonaceous Bed From 30.8-31.0'**	
	R-7		4.7	94 / 0				**(RQD=0%)**	
								2488.9	
33.8								**33.4-34.0': Carbonaceous SHALE With Thin COAL Laminations, Black, Soft, Slightly Weathered, Very Intensely Laminated, RD=N/A°, Extremely Close Spaced Fractures, RD=N/A° (Too Broken)**	.Sharp Contact With Carbonaceous Rock and Massive Sandstone @ 34.0'
	R-8		5.0	100 / 90				**(RQD=0%)**	
								2488.3	
38.8								**See Next Page**	
				100				2482.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-18
SHEET 3 OF 8
DATE: START 4/26/04
O.G. END 5/5/04
ELEV. 2522.31

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: _____ WATER: DEPTH: 12.5 TIME: 1300 DATE: 5/5/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 16.9 TIME: 1100 DATE: 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
43.8	R-9		5.0	80				34.0-76.0': Fine to Medium-Grained SANDSTONE With Frequent Carbonaceous and "COALY" Lenses and Laminations, Light Gray, Hard to Very Hard, Slightly Weathered to Fresh, Thickly Bedded From 34.0-37.0', Thinly to Medium Bedded, Elsewhere, RD=10-15°, Closely to Medium Spaced Fractures, RD=10-90°	
48.8	R-10		5.0	100 / 82				.Frequent Coal Laminations and Lenses 1/4-1/2" Thick .Water Stained High Angle Fractures From 60.5-61.2'	
53.8	R-11		5.0	100 / 68				.Carbonaceous With Convoluted Bedding (Approx. 20°) From 63.5-64.5' .Clay Seam(s) From 64.5-64.6' and 73.5-73.8'	
58.8	R-12		5.0	100 / 72				.Coal Stringers (<0.01') @ 71.8' 72.0', 72.6' and 72.8'	Boring Stopped @ 58.8'; 1630 hrs.; 4/28/04
				100				(RQD=74%)	
								2462.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-18
SHEET 4 OF 8
DATE: START 4/26/04
O.G. END 5/5/04
ELEV. 2522.31

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT ____ OFFSET ____
STATION ____ OFFSET FROM CENTERLINE ____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: ____ WATER: DEPTH: 12.5 TIME: 1300 DATE: 5/5/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 16.9 TIME: 1100 DATE: 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-13		5.0	42					
63.8				92					
	R-14		4.6	34					
68.8				100					
	R-15		5.0	86					
73.8				100					
	R-16		5.0	70					
78.8				100					
								2446.3 **76.0-77.3': SILTSTONE With Argillaceous SILTSTONE/CLAYSTONE, Soft to Medium Hard, Slightly Weathered, Indiscernibly Bedded, RD=N/A, Very Closely to Closely Spaced Fractures, RD=10-18°** **(RQD=0%)** 2445.0	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-18
SHEET	5 OF 8
DATE: START	4/26/04
O.G. END	5/5/04
ELEV.	2522.31

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** _____ **WATER: DEPTH:** 12.5 **TIME:** 1300 **DATE:** 5/5/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 16.9 **TIME:** 1100 **DATE:** 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								See Next Page	
								2442.3	
	R-17		5.0	14				77.3-83.5': CLAYSTONE, Gray, Medium Hard When Fresh, Becomes Soft With Addition of Water, Slightly Weathered, Indiscernible Bedding With Slickensides, RD=N/A, Very Closely to Closely Spaced Fractures, RD=N/A (Uneven Fractures)	
83.8								.Numerous Slickensides Throughout	
	R-18		5.0	100 / 50				(RQD=6%)	
88.8								2438.8	
	R-19		5.0	100 / 64				83.5-91.8': SILTSTONE With SILTY SHALE Beds, Gray to Dark Gray, Medium Hard, Fresh, Very Intensely Laminated to Thinly Bedded, RD=12°, Very Closely to Closely Spaced Fractures, RD=12-18°	
93.8								.Carbonaceous Content With Traces of Pyrite "Somewhat Cleated" From 86.2-87.2'	
	R-20		5.0	100 / 76				(RQD=52%)	
98.8								2430.5	
				100				91.8-100.6': SILTY Fine-Grained SANDSTONE, Gray, Medium Hard, Slightly Weathered to Fresh, Intensely Laminated to Thinly Bedded, RD=17-18°, Closely to Medium Spaced Fractures, RD=17-65°	Stopped Drilling @ 93.8'; 4/29/04
								.RD=65° @ 96.2'	Resumed Drilling @ 1030 hrs.; 5/4/04
								.Becomes Silty and Shaly With Depth	
								(RQD=82%)	
								2422.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-18
SHEET 6 OF 8
DATE: START 4/26/04
O.G. END 5/5/04
ELEV. 2522.31

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: _____ WATER: DEPTH: 12.5 TIME: 1300 DATE: 5/5/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 16.9 TIME: 1100 DATE: 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
								2421.7	
	R-21		5.0	64				100.6-102.4': Carbonaceous SHALE, Dark Gray to Black, Medium Hard, Fresh, Very Intensely Laminated to Very Thinly Bedded, RD=10-15°, Very Closely Spaced Fractures, RD=10-15° (RQD=22%)	
103.8								2419.9	
	R-22		5.0	100 / 84				102.4-109.0': SILTSTONE Interbedded With Laminated SILTY Fine-Grained SANDSTONE, Gray, Medium Hard, Fresh, Very Intensely Laminated to Thinly Bedded, RD=8-15°, Closely to Medium Spaced Fractures, RD=8-15°, RD=70° From 103.8-104.5' (RQD=80%)	
108.8								2413.3	
	R-23		5.0	100 / 92				109.0-143.7': SILTSTONE With SILTY SHALE Beds, Gray to Dark Gray, Medium Hard, Fresh, Very Intensely Laminated to Medium Bedded, RD=10-15°, Closely to Medium Spaced Fractures, RD=10-15°, Occasionally Near Horizontal	
113.8								.Shaly Beds Mostly 10°	Stopped Drilling @ 113.8'; 1400 hrs.; 5/4/04
	R-24		5.0	100 / 80				(RQD=67%)	
118.8				100				2402.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-18
SHEET	7 OF 8
DATE: START	4/26/04
O.G. END	5/5/04
ELEV.	2522.31

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** _____ **WATER: DEPTH:** 12.5 **TIME:** 1300 **DATE:** 5/5/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 16.9 **TIME:** 1100 **DATE:** 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-25		5.0	74					
123.8									
				100				.Becoming Sandy Below 130.0' (Sandy Beds and Laminations)	
	R-26		5.0						
128.8				40					
				100				.Frequent Silty/Sandy Shale Beds From 133.8-143.7'	
	R-27		5.0						
133.8				64					
				100					
	R-28		5.0						
138.8				60					
				100					
								2382.3	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. P-18
SHEET 8 OF 8
DATE: START 4/26/04
O.G. END 5/5/04
ELEV. 2522.31

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Timothy D. Witt DRILLERS NAME/COMPANY J. Bush/AWK Drilling
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" DEPTH: _____ WATER: DEPTH: 12.5 TIME: 1300 DATE: 5/5/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 16.9 TIME: 1100 DATE: 5/6/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-29		4.9	59					
								2378.6	
								Bottom of Boring @ 143.7'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-19
SHEET	1 OF 2
DATE: START	4/15/04
O.G. END	4/16/04
ELEV.	2214.05

PROJECT NAME U.S. 219 Improvements COUNTY Somerset, PA & Garrett, MD
STATE RT. NO. 6219 SECT. 019 SEGMENT _____ OFFSET _____
STATION _____ OFFSET FROM CENTERLINE _____
INSPECTOR (SIGNED) Christine M. Wing DRILLERS NAME/COMPANY R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Wireline Core
CASING: SIZE: 3-1/4" DEPTH: 8.3' WATER: DEPTH: 3.0 TIME: 1200 DATE: 4/16/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: 15.8 TIME: 0830 DATE: 4/19/04
NOT ENCOUNTERED □

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 2 5	0.2			gm	W	**0.0-0.1': TOPSOIL**	
								2214.0	
1.5	S-2	7 17 30	1.2				M	**0.1-8.3': SILTY SANDSTONE FRAGMENTS With SAND (gm), Brownish Gray, Moist to Wet, Loose to Very Dense, Homogeneous**	
3.0	S-3	27 28 37	0.8				M	**.Loose and Wet Probably From Weather From 0.0-1.5'**	
4.5	S-4	20 30 39	1.1				M	**.Dense to Very Dense From 1.5-8.3'**	
6.0	S-5	22 50 50/.1	1.0				M	**(Residual)**	
7.1									
7.5									
7.6	S-6	50/.1	0.1				M		
8.3						a-1-b		2205.8	
	R-1		2.0	100 20				**8.3-14.8': Fine-Grained SANDSTONE, Brownish Gray Turning Gray, Medium Hard, Slightly to Moderately Weathered, Very Thinly to Thinly Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=0-90°**	**Top of Rock @ 8.3'**
10.3	R-2		3.0	100 50				**.Very Thin Clay Seam @ 9.8' .Vertical Fracture From 9.1-9.3' .Carbonaceous Shale and Coal Laminations From 10.3-11.2' and 13.3-14.8' .Water Stained Throughout**	**Auger Refusal @ 8. 3'**
13.3	R-3		1.3	87 0				**(RQD=29%)**	
14.8								2199.3	
	R-4		5.0	100 0				**14.8-20.3': SILTSTONE And Very Fine-Grained SANDSTONE Interbedded, Gray, Medium Hard, Slightly to Moderately Weathered, Thinly Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=0-90° (RQD=0%) .Water Stained Throughout .Numerous Vertical Fractures and Very Broken From 14.8-15.5', 19.4-19.8' and 19.8-20.1'**	
19.8									

GMI Project No. 02037

EAST: 1601205.4 NORTH: 148273.2

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-19
SHEET	2 OF 2
DATE: START	4/15/04
O.G. END	4/16/04
ELEV.	2214.05

PROJECT NAME U.S. 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Christine M. Wing **DRILLERS NAME/COMPANY** R. Gaydar/AWK Drilling
EQUIPMENT USED SIMCO Track Rig
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ Wireline Core
CASING: SIZE: 3-1/4" **DEPTH:** 8.3' **WATER: DEPTH:** 3.0 **TIME:** 1200 **DATE:** 4/16/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 15.8 **TIME:** 0830 **DATE:** 4/19/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								.Vertical Fractures From 19.8-20.1'	
								2193.8	
	R-5		4.8	96 / 48				20.3-27.2': Fine-Grained SANDSTONE, Gray, Medium Hard, Slightly Weathered, Thinly Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=0-90°	
24.8								.Vertical Fractures From 21.8-22.2' and 24.3-24.4'	
	R-6		4.1	82 / 14				.Water Stained Along Fractures Throughout	
								(RQD=50%)	
								2186.9	
29.8								27.2-38.3': Interbedded Argillaceous SILTSTONE And CLAYSTONE, Reddish Brown, Soft to Medium Hard, Very Thinly to Thinly Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=0-90°	
	R-7		4.3	86 / 0				.Claystone Can be Broken by Hand	
								.Slickensides Along Fractures	
34.8								.Very Broken With Numerous High Angle and Vertical Fractures	
	R-8		3.5	100 / 20				.Vertical Fractures From 27.3-27.5' and 29.6-29.8'	
								(RQD=13%)	
								2175.8	
								Bottom of Boring @ 38.3'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-21
SHEET	1 OF 6
DATE: START	6/10/04
O.G. END	6/12/04
ELEV.	2670.22

PROJECT NAME US 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** 16.1' **WATER: DEPTH:** 14.3 **TIME:** 1630 **DATE:** 6/12/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** 48.3 **TIME:** 1200 **DATE:** 6/15/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 3 3	1.1			cl	M	**0.0-0.4': TOPSOIL**	
								2669.8	
1.5								**0.4-4.5': SILTY CLAY (cl), Brown, Moist, Medium Stiff to Hard, Homogeneous**	
	S-2	3 10 35	1.4				M		
3.0								**(Residual)**	
	S-3	13 14 15	1.3				M		
4.5						a-6		2665.7	
	S-4	17 23 16	1.5			cl	M	**4.5-16.1': SILTY CLAY With ROCK FRAGMENTS (cl), Brown and Reddish Brown, Moist, Very Stiff to Hard, Homogeneous**	
6.0									
	S-5	9 13 16	1.5				M		
7.5									
	S-6	11 15 15	1.4				M		
9.0								**.Decomposed Shale and Claystone**	
	S-7	6 9 10	1.2				M		
10.5								**.Reddish in Color From 10.5-12.0'**	
	S-8	8 10 16	1.5				M		
12.0									
	S-9	8 12 26	1.5				M		
13.5									
	S-10	39 50/.3	0.8				M		
14.3									
15.0									
	S-11	23 50 50/.1	1.1				M		
16.1						a-6		2654.1	
	R-1		2.6	100 0				**16.1-17.0': CLAYSTONE, Brown, Very Soft, Highly Weathered, Indiscernible Bedding, RD=N/A, Extremely Close Spaced Fractures, RD=N/A**	**Top of Rock @ 16.1'** **.No Drill Water Return**
18.7								**(RQD=0%)**	
				92				2653.2	
								See Next Page	
								2650.2	

GMI Project No. 02037

EAST: 1589132.3 NORTH: 133895.8

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-22
SHEET	1 OF 1
DATE: START	6/16/04
O.G. END	6/16/04
ELEV.	2415.78

PROJECT NAME US 219 Improvements **COUNTY** Somerset, PA & Garrett, MD
STATE RT. NO. 6219 **SECT.** 019 **SEGMENT** _____ **OFFSET** _____
STATION _____ **OFFSET FROM CENTERLINE** _____
INSPECTOR (SIGNED) Timothy D. Witt **DRILLERS NAME/COMPANY** J. Bush/AWK
EQUIPMENT USED CME-550 ATV
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 Wireline Core
CASING: SIZE: 4-1/4" **DEPTH:** _____ **WATER: DEPTH:** Dry **TIME:** 1500 **DATE:** 6/16/04
CHECKED BY: John P. Campbell, Jr. **DATE:** 07/02/04 **DEPTH:** Dry **TIME:** 1500 **DATE:** 6/17/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	2 5 6	1.4			cl	M	**0.0-0.3': TOPSOIL** 2415.5 **0.3-7.5': SILTY CLAY With ROCK FRAGMENTS (cl), Brown, Moist, Stiff to Hard, Homogeneous**	
1.5									
	S-2	6 8 13	1.0				M		
3.0									
	S-3	9 13 18	0.7				M	**(Residual)**	
4.5									
	S-4	20 15 21	0.9				M		
6.0									
	S-5	7 13 18	1.5				M		
7.5						a-6		2408.3	
	S-6	15 15 23	1.1			gc	M	**7.5-9.7': CLAYEY ROCK FRAGMENTS With SAND (gc), Brown, Moist, Dense to Very Dense, Homogeneous**	
9.0									
	S-7	50 50/.2	0.7			a-2-6	M	**(Weathered Shale)** 2406.1 **Abandoned Boring @ 9.7'**	

GMI Project No. 02037

EAST: 1595267.4 NORTH: 144277.7

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-22A
SHEET	1 OF 1
DATE: START	6/17/04
O.G. END	6/17/04
ELEV.	2432±

PROJECT NAME: US 219 Improvements
COUNTY: Somerset, PA & Garrett, MD
STATE RT. NO.: 6219 SECT.: 019 SEGMENT: OFFSET:
STATION: OFFSET FROM CENTERLINE:
INSPECTOR (SIGNED): Timothy D. Witt
DRILLERS NAME/COMPANY: J. Bush/AWK
EQUIPMENT USED: CME-550 ATV
DRILLING METHODS: 2" Split Spoon; Hollow Stem Augers
CASING: SIZE: 4-1/4" DEPTH: WATER: DEPTH: Dry TIME: 1030 DATE: 6/17/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: Dry TIME: 1030 DATE: 6/17/04
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	3 3 5	1.1			cl	M	0.0-0.2': TOPSOIL 2431.8	
1.5	S-2	2 3 6	1.5				M	0.2-10.5': Gravelly CLAY (cl), Dark Brown and Gray, Moist, Medium Stiff to Stiff, Homogeneous	
3.0	S-3	5 5 4	1.2				M	(Mine Spoil/Mine Backfill)	
4.5	S-4	6 6 4	1.4				M	.Coal Fines @ 10.5'	
6.0	S-5	3 4 4	1.5				M		
7.5	S-6	3 2 3	1.0				M		
9.0	S-7	8 8 8	1.5			a-6	M	2421.5	
10.5	S-8	8 10 11	0.7			cl	M	10.5-18.9': SILTY CLAY With SAND (cl), Brown and Gray, Moist to Wet, Stiff to Hard, Homogeneous	
12.0	S-9	5 4 8	1.5				M		
13.5	S-10	10 11 18	1.5				W	(Residual/Decomposed Claystone)	
15.0	S-11	4 5 21	1.5				M		
16.5	S-12	18 21 50/.3	1.3				M		
17.8									
18.0	S-13	34 50/.4	0.9			a-6	M	2413.1	
								Bottom of Boring @ 18.9'	

GMI Project No. 02037
EAST: 1595093.3 NORTH: 144179.6

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO.	P-22B
SHEET	1 OF 1
DATE: START	6/17/04
O.G. END	6/17/04
ELEV.	2435±

PROJECT NAME: US 219 Improvements
COUNTY: Somerset, PA & Garrett, MD
STATE RT. NO.: 6219 SECT.: 019 SEGMENT: OFFSET:
STATION: OFFSET FROM CENTERLINE:
INSPECTOR (SIGNED): Timothy D. Witt
DRILLERS NAME/COMPANY: J. Bush/AWK
EQUIPMENT USED: CME-550 ATV
DRILLING METHODS: 2" Split Spoon; Hollow Stem Augers
CASING: SIZE: 4-1/4" DEPTH: WATER: DEPTH: Dry TIME: 1230 DATE: 6/17/04
CHECKED BY: John P. Campbell, Jr. DATE: 07/02/04 DEPTH: Dry TIME: 1230 DATE: 6/18/04
NOT ENCOUNTERED □

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	Recovery (%) / RQD (%)	POCKET PENET or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	2 10 12	1.5			sm	M	**0.0-0.3': TOPSOIL**	
1.5								2434.7	
	S-2	10 15 18	1.2				M	**0.3-9.0': SILTY SAND With SANDSTONE FRAGMENTS (sm), Brown, Moist, Medium Dense to Very Dense, Homogeneous**	
3.0									
	S-3	10 12 31	1.5				M	**(Residual)**	
4.5									
	S-4	34 36 41	1.2				M		
6.0									
	S-5	10 13 21	1.5				M		
7.5									
	S-6	6 8 8	1.2				M		
9.0						a-2-4		2426.0	
	S-7	7 12 22	1.5			gm	D	**9.0-10.9': SILTY ROCK FRAGMENTS With SAND (gm), Brown to Gray, Dense to Very Dense, Fissured**	
10.5								**(Weathered Sandstone)**	
	S-8	50/.4	0.4			a-1-b	D	2424.1	
								Bottom of Boring @ 10.9'	

GMI Project No. 02037
EAST: 1594853.0 NORTH: 144066.4

1995 BORINGS

FORM HDC D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-1
SHEET 1 OF 1
DATE: START 5/22/95
O.C. END 5/22/95
ELEV. 2199.81

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 45' Lt.
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY D. Myers/Lambert
EQUIPMENT USED Diedrich D-25 Skid Mount
DRILLING METHODS 2" Split Spoon; Rotary Casing, NQ2 Wireline Core
CASING: SIZE: 3" ID ; DEPTH: 12.3' ; WATER: DEPTH: 10.0' TIME: 1415 DATE: 5/22/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: 11.5' TIME: 1400 DATE: 5/23/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
0.5	S-1	6 50/.0	0.4					0.0-0.5': Topsoil	
	C O R E D					gw / a-1	D	0.5-3.0': Sandstone Cobbles and Boulders (gw), Light Gray and Brown .Cored Cobbles and Boulders From 0.5-3.0' (Colluvial)	
3.0									
4.5	S-2	3 4 6	0.6			GC		3.0-12.3': Gravel With Clay, Silt and Sand (GC), Brown, Moist, Loose to Very Dense, Homogeneous	
6.0									
7.5	S-3	21 31 50	1.0				M	(Colluvial/Residual)	
9.0									
9.8	S-4	31 50/.3	0.8						
12.0									
12.3	S-5	50/.3	0.3			A-2-4(0)			Top of Rock @ 12.3'
	R-1		1.4	70 / 0				12.3-18.0': Sandstone, Gray and Brown-Gray, Fine to Medium Grained, Very Soft to Medium Hard, Highly to Slightly Weathered, Very Thinly to Thinly Bedded With Shaly Interbeds, RD=5°, Extremely Close to Closely Spaced Fractures, RD-5-75° .Few Very Soft Clay Seams (RQD=7%)	
14.3									
15.0	R-2		0.7	100 / 0					
	R-3		2.9	97 / 13					
18.0								Bottom of Boring @ 18.0'	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 1 OF 16
DATE: START 6/6/95
O.C. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
0.0	S-1	2 3 3	1.5				M	0.0-1.0': Topsoil	
1.5						sw			
3.0	S-2	8 11 16	1.5				M	1.0-10.0': Sand With Gravel (sw), Brown, Moist, Loose to Very Dense, Homogeneous	
4.5									
6.0	S-3	15 16 9	1.5				M		
7.5								(Residual)	
9.0	S-4	20 17 39	1.5			a-1-b	M		
10.5						gw		10.0-15.0': Sandy Gravel (Rock Fragments) (gw), Brown, Moist, Dense, Layered	
12.0	S-5	12 22 10	1.5				M	(Residual)	
13.5									
15.0	S-6	50/.0	0.0			a-1-a			Top of Rock @ 15.0
15.5	R-1		0.5	100 / 0				15.0-25.3': Sandstone, Fine-Grained, Tan, Hard to Very Hard, Moderately to Slightly Weathered, Thinly to Medium Cross-Bedded, Closely Spaced Fractures, RD=5-70°	
				87					
	R-2		8.7					(RQD=39%)	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 2 OF 16
DATE: START 6/6/95
O. C. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-2		8.7					.Clay Filled Fracture, RD=70° From 22.6-23.0' and 23.4-23.9'	
								.Intensively Water-Stained, Diagonal Fractures and Clay From 22.2-22.6' and 24.6-24.8'	
25.5				40 / 97					
	R-3		9.7					25.3-48.2': Clayey to Sandy Shale, Rusty-Brown to Light Gray, Very Soft to Medium Hard, Completely Weathered to Fresh, Laminated to Thinly Bedded, RD=5°, Extremely Close to Medium Spaced Fractures, RD=15-35°	
								.Intensively Water-Stained, Completely to Highly Weathered, Rusty-Brown, Very Soft to Soft From 25.3-35.5'	
35.5				51 / 98					
	R-4		9.8					(RQD=64%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 3 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-4		9.8					.Gray to Light Gray, Moderately Weathered to Fresh, Medium Hard From 35.5-48.2'	
								.Vertical Fracture, Water-Stained From 39.1-39.4'	
45.5				76 / 100					
	R-5		10.0					48.2-91.1': Sandstone, Fine to Medium Grained, Light Gray, Very Hard, Fresh, Thinly Cross-Bedded to Undistinguishably Bedded, Closely to Widely Spaced Fractures, RD=0-50°	
55.5				74 / 100				.Water-Stained, Rusty-Brown, Broken, Medium Hard From 65.0-65.5'	
	R-6		10.0					(RQD=91%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 4 OF 16
DATE: START 6/6/95
O. C. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED): Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-6		10.0	87				Continued From Previous Page	
65.5				100					
	R-7		10.0					.High Angle (RD=70-85°) Water-Stained Fractures From 62.1-62.4', 63.7-63.9' and 76.0-76.8'	
75.5				100					
	R-8		10.0	100					

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 5 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-8		10.0						
85.5				91 / 100				.Carbonaceous Claystone, Dark Gray, Very Soft From 86.0-86.3'	
								.Siltstone, Gray, Soft to Medium hard From 86.3-87.3'	
	R-9		10.0						
								91.1-97.0': Siltstone, Gray to Dark Gray, Soft to Medium Hard, Fresh, Undistinguishably Bedded, Closely to Medium Spaced Fractures, RD=20°	
95.5				92 / 90				(RQD=86%)	
	R-10		9.0					97.0-97.8': Coal, Black With Medium Bright Luster, Attrital, Well-Developed Cleat Parallel and Perpendicular to Bedding, Very Broken .Shale Parting From 97.3-97.4' (Upper Kittanning Rider Coal) (RQD=0%)	
								See Next Page	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 6 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								97.8-100.2': Claystone, Sandy, Carbonaceous, Dark Gray, Soft to Medium Hard, Fresh, Thinly Bedded, RD=15°, Closely to Medium Spaced Fractures, RD=10-35° (RQD=88%)	
	R-10		9.0						
105.5				75 / 100				100.2-116.8': Siltstone With Thin Laminations of Very Fine-Grained Sandstone, Dark Gray, Medium Hard, Thinly Laminated to Thinly Bedded, RD=10°, Closely to Medium Spaced Fractures, RD=10-15°	
	R-11		10.0					(RQD=93%)	
115.5				100 / 82					
	R-12		8.2					116.8-120.0': Coal, Black, Medium Bright to Bright Luster, Attrital, Well-Developed Cleat Parallel and Perpendicular to Bedding, Very Broken, Rec. 1.5' (Upper Kittanning Coal) (RQD=0%)	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 7 OF 16
DATE: START 6/6/95
Q.C. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED): Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-12		8.2	49				120.0-138.9': Claystone Grading to Sandy Claystone and Siltstone, Dark Gray to Gray, Soft to Hard, Fresh, Thickly Bedded, RD=Undetermined, Closely to Widely Spaced Fractures, RD=0-35°	
125.5				100					
	R-13		10.0	86				Corresponds to Johnstown Limestone)	
135.5									
	R-14		10.0					(RQD=95%)	
								See Next Page	

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 8 OF 16
DATE: START 6/6/95
O. C. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID ; DEPTH: 15.0' ; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-14		10.0					138.9-163.4': Sandstone, Bluish Gray to Gray, Hard to Very Hard, Fresh, Laminated to Thickly Bedded, RD=25°, Closely to Widely Spaced Fractures, RD=20-35°	
145.5				97 / 100					
								.Clay Seam, Very Soft From 154.4-154.5'	
	R-15		10.0					.Multiple Coal Stringers From 161.0-163.4'	
155.5				97 / 100					
	R-16		10.0					(RQD=98%)	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 9 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-16		10.0					163.4-163.9': Carbonaceous Shale, Dark Gray, Medium Hard, Fresh, Closely Spaced Slickensides Along Bedding, RD=30° (RQD=0%)	
165.5				94 / 100					
	R-17		10.0					163.9-176.9': Siltstone With Laminations and Thin Beds of Very Fine Grained Sandstone, Gray, Hard, Fresh, Medium Hard to Hard, Laminated to Thinly Bedded, RD=10-15°, Closely to Widely Spaced Fractures, RD=10-15° (RQD=99%)	
175.5				100 / 100					
	R-18		10.0					176.9-177.8': Coal, Black, Dull, Attrital, Well Developed Cleat Along Bedding, RD=15° (RQD=88%) (Middle Kittanning Coal)	
								177.8-179.5': Carbonaceous Siltstone With Coal Stringers (Vitrarin), Dark Gray, Medium Hard, Fresh, Laminated, RD=15°, Closely Spaced Fractures Along Bedding, RD=15° (RQD=94%)	
								See Next Page	

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 10 OF 16
DATE: START 6/6/95
O. C. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-18		10.0					179.5-199.9': Siltstone With Laminations and Very Thin Beds of Very Fine-Grained Sandstone and Rare Laminations of Claystone, Gray to Light Gray, Medium Hard to Hard, Fresh, Laminated, RD=Cross-Bedded to 15°, Closely to Medium Spaced Fractures, RD=10-35°	
185.5				98 / 100					
	R-19		10.0					(Lower Worthington Sandstone)	
195.5				97 / 100				.Diagonal Fractures With Slickensides, RD=50-60° From 198.6-198.7' and 198.9-199.0'	
	R-20							(RQD=99%)	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 11 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN'T or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-20			87 / 100				199.9-211.4': Limestone, Shaly, Gray, Hard to Very Hard, Fresh, Undistinguishably Bedded, Closely to Widely Spaced Fractures, RD=5-50°	
205.5									
	R-21		10.0	100				(RQD=94%)	
215.5								211.4-225.5': Siltstone With Laminations and Thin Beds of Very Fine Grained Sandstone and Claystone, Gray to Light Gray, Medium Hard to Hard, Fresh, Laminated to Thickly Bedded, RD=10-15°, Closely to Widely Spaced Fractures, RD=10°	
	R-22		10.0					(RQD=100%)	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 12 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED): Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-22		10.0	100					
225.5				100				225.5-235.5': Carbonaceous Siltstone and Very Fine Grained Sandstone, Dark Gray, Hard, Fresh, Undistinguishably Bedded, Medium to Widely Spaced Fractures, RD=0-20°	
	R-23		10.0	100				(RQD=100%)	
235.5				100				235.5-241.3': Sandstone, Fine-Grained With Coal Stringers and Thin Beds of Carbonaceous Siltstone, Light Gray, Very Hard, Fresh, Medium to Thickly Bedded, RD=20-30°, Closely to Medium Spaced Fractures, RD=10-30°	
	R-24		10.0					(RQD=100%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 13 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED): Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3½" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-24		10.0					241.3-241.7': Coal, Black, Medium Luster to Dull, Attrital, Well-Developed Cleat Along Bedding (RQD=0%) (Lower Kittanning Coal)	
								241.7-243.7': Siltstone, Slightly Carbonaceous, Gray, Hard, Fresh, Undistinguishably Bedded, No Fractures (RQD=100%)	
245.5				90 / 100				243.7-254.6': Sandstone, Very Fine-Grained to Fine-Grained, Light Gray, Very Hard, Fresh, Laminated to Thinly Bedded, RD=10-12°, Closely to Widely Spaced Fractures, RD=10-12°	
	R-25		10.0					.Clay Seam, Very Soft From 248.2-248.4'	
								(RQD=98%)	
255.5				97 / 100				254.6-262.8': Siltstone Grading to Carbonaceous Claystone, Gray to Dark Gray, Medium Hard, Fresh, Laminated to Thinly Bedded, RD=10-12°, Moderately to Widely Spaced Fractures, RD=10-12°	
	R-26		10.0					(RQD=100%)	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 14 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-26		10.0					262.8-264.5': Coal, Black, Dull, Mostly Fusain, Well-Developed Cleat Along Bedding, Poorly Developed Cleat Perpendicular to Bedding (RQD=53%) (Scrubgrass Coal)	
265.5				80 / 100				264.5-270.0': Sandy Claystone, Gray, Soft, Fresh, Undistinguishably Bedded, Extremely Close to Closely Spaced Fractures, RD=0-70° (RQD=9%)	
	R-27		10.0					270.0-285.5': Sandstone, Very Fine-Grained to Fine-Grained, Gray to Light Gray, Hard to Very Hard, Fresh, Laminated to Medium Bedded, RD=Cross Bedded, Medium to Widely Spaced Fractures, RD=5-35°	
275.5				60 / 100					
	R-28		10.0					(RQD=100%	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 15 OF 16
DATE: START 6/6/95
O. C. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED): Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-28		10.0	100 / 100					
285.5									
								285.5-315.5': Sandstone, Carbonaceous and Shaly, Gray to Very Dark Gray, Hard, Fresh, Laminated to Thinly Bedded, RD=Cross-Bedded, Closely to Widely Spaced Fractures, RD=5-15°	
	R-29		10.0	100 / 100					
295.5									
	R-30		10.0					(RQD=100%)	

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-2
SHEET 16 OF 16
DATE: START 6/6/95
O. G. END 6/9/95
ELEV. 2215.53

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 68+00 OFFSET FROM CENTERLINE 43' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek & G. Jones/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼" ID; DEPTH: 15.0'; WATER: DEPTH: flows TIME: 1000 DATE: 6/9/95
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: flows TIME: 0800 DATE: 6/12/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. OR SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-30		10.0					Continued From Previous Page	
305.5				100 / 100					
	R-31		10.0						
315.5				100				Bottom of Boring @ 315.5'	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 1 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. OR SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
1.5	S-1	3 2 2	0.6			GC-SC	M	0.0-0.7: Topsoil	
3.0								0.7-10.0': Gravel (Rock Fragments) and Sand With Silt and Clay (GC-SC), Light Brown, Moist, Very Dense, Laminated	
4.5	S-2	25 35 16	1.3						
6.0							M		
7.5	S-3	22 18 45	1.3					(Residual)	
9.0									
9.1 10.0	S-4 AUGERED	50/.1	0.1			A-6(4)			Top of Rock @ 10.0'
12.0	R-1		1.5	75 0				10.0-17.4': Sandy Shale With Thin Beds of Very Fine-Grained Sandstone, Rusty-Brown to Tan, Very Soft to Medium Hard, Completely to Highly Weathered, Thinly Laminated to Thinly Bedded, RD=7°, Extremely Close to Very Closely Spaced Fractures, RD=7-90°	
15.0	R-2		2.7	90 0					
	R-3		6.5	100				(RQD=0%)	
								See Next Page	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 2 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
21.5	R-3		6.5	63					
				97					
	R-4		3.4					17.4-44.8': Siltstone With Thin Beds of Claystone, Gray to Dark Gray, Soft to Medium Hard, Slightly Weathered to Fresh, Laminated to Medium Bedded, RD=0-7°, Extremely Close to Medium Spaced Fractures, RD=7-35°	
25.0				60					
				94					
	R-5		4.7					.Clay Seam From 21.7-21.8'	
30.0				52				.Very Broken From 24.6-25.8' and 28.8-30.0'	
				100					
	R-6		5.0					.Vertical Fractures From 27.3-27.5' and 40.4-40.5'	
35.0				94					
				100					
	R-7		10.0					.Carbonaceous Claystone From 25.7-26.0', 40.3-40.5' and 44.5-44.8'	
								(RQD=74%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 3 OF 20
DATE: START 5/30/95
O.C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-7		10.0					Continued From Previous Page	
45.0				69 / 100				44.8-45.8': Carbonaceous Shale, Dark Gray, Fresh, Laminated, RD=7°, Extremely Close Spaced Fractures Along Bedding, RD=7°, Some With Iron Hydroxide Growth (RQD=0%) 45.8-46.8': Coal, Bony With Multiple Shale Partings, Vitrain-Rich, Fractured Along Bedding, RD=7° and Also by Subvertical Cleat Within the Coal Bands (RQD=0%) (Upper Freeport Coal)	
	R-8		10.0					46.8-74.5': Sandstone, Very Fine-Grained With Laminations and Thin Beds of Siltstone and Sandy Claystone, Gray, Medium Hard to Hard, Fresh, Laminated to Medium Bedded, RD=7-10° and Cross Bedded, Closely to Medium Spaced Fractures, RD=3-35°	Stopped Drilling 5/30/95 5:00 PM GWL 30.0'
55.0				74 / 100				.Highly Carbonaceous Shale Grading to Bony Coal From 55.8-56.6' (Corresponds to Lower Freeport Rider Coal)	Resumed Drilling 5/31/95 8:00 AM GWL 45.0'
	R-9		10.0					(Butler Sandstone) (RQD=91%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 4 OF 20
DATE: START 5/30/95
O. C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-9		10.0	85				Continued From Previous Page	
65.0				100					
	R-10		10.0						
75.0				92				74.5-74.7': Coal, Black, Attrital With Vertical and Horizontal Cleat, Very Broken (RQD=0%) (Lower Freeport Coal)	
				100				74.7-85.0': Sandy Claystone Grading to Very Fine-Grained Clayey Sandstone, Gray and Light Gray, Soft to Medium Hard, Laminated to Medium Bedded, RD=3-7°, Very Closely to Medium Spaced Fractures, RD=3-45° .Very Soft From 75.9-77.4' (RQD=76%)	
	R-11		10.0						

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 5 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-11		10.0	80				.Vertical Fractures From 81.7-82.4'	
85.0				100					
								85.0-180.4': Sandstone, Very Fine to Fine-Grained, Light Gray, Hard to Very Hard, Laminated to Very Thickly Bedded, RD=0-5°, Closely to Very Widely Spaced Fractures, RD=0-35°	
	R-12		10.0						
95.0				90				.Sandy Claystone, Soft From 100.4-102.5'	
				100					
	R-13		10.0					(RQD=93%)	

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 6 OF 20
DATE: START 5/30/95
O.C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-13		10.0					.Hit Artesian Flow @ 101.0'	
105.0				78 / 100					
								.Diagonal Fracture, RD=75° From 129.3-130.0'	
	R-14		10.0					.Closely to Very Closely Spaced Fractures, RD=75° From 153.4-155.0'	
115.0				100 / 100					
								(Freeport Sandstone)	
	R-15		10.0						

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 7 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-15		10.0	93 / 100				Continued From Previous Page	
125.0									
	R-16		10.0	91 / 100					
135.0									
	R-17		10.0						

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 8 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-17		10.0	100				Continued From Previous Page	
145.0				100					
	R-18		10.0	79					
155.0				100					
	R-19		10.0						

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 9 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-19		10.0	100 / 100				Continued From Previous Page	
165.0									
	R-20		10.0	100 / 100					
175.0									
	R-21		10.0						

GMI Project No. 9507

FORM NO: D-401
(12/85)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 10 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-21		10.0	100				180.4-185.3': Siltstone, Carbonaceous, Black With Thin Laminations of Very Fine-Grained Gray Sandstone, Hard, Fresh, Laminated to Thinly Bedded, RD=5-7°, Closely to Medium Spaced Fractures, RD=5-7° (RQD=100%)	
185.0									
	R-22		10.0	100				185.3-187.0': Coal, Black, Attrital With Bony Parting From 186.2-186.4', Subhorizontal and Subvertical Cleat, RD=15° and 75°, Respectively (RQD=0%) (Upper Kittanning Rider Coal)	
								187.0-189.3': Sandy Claystone, Gray to Light Gray, Soft to Medium Hard, Undistinguishably Bedded, Medium Spaced Fractures, RD=20° (RQD=91%)	
								189.3-204.2': Siltstone, Carbonaceous, Dark Gray to Black With Laminations and Thin Beds of Very Fine-Grained Gray Sandstone, Hard, Fresh, Laminated to Thinly Bedded, RD=3-7°, Closely to Medium Spaced Fractures, RD=3-10°	
195.0				80					
	R-23		10.0	100				.Diagonal Fractures, RD=75° From 203.4-203.8' (RQD=90%)	

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 11 OF 20
DATE: START 5/30/95
O.C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.6 FT. OR SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-23		10.0					Continued From Previous Page	
205.0				78 / 97				204.2-207.5': Coal, Black, Attritions, Well-Developed Subhorizontal, RD=5° and Subvertical, RD=80-85°, Cleat .Shaly Parting From 205.5-206.0' (Upper Kittanning Coal) (RQD=0%)	
	R-24		9.7					207.5-211.2': Claystone, Carbonaceous, Dark Gray, Soft, Fresh, Undistinguishably Bedded, Medium Spaced Fractures, RD=15° .Clay Below 209.2' (RQD=100%)	
215.0				79 / 100				211.2-217.9': Limestone With Medium Beds of Calcareous Claystone, Light Gray, Medium Hard to Hard, Fresh, Undistinguishably Bedded, Closely to Medium Spaced Fractures, RD=5-35° (Johnstown Limestone) (RQD=100%)	
	R-25		10.0					See Next Page	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 12 OF 20
DATE: START 5/30/95
O.G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-25		10.0	97				217.9-244.3': Sandstone, Very Fine Grained to Fine-Grained, Light Gray, Hard to Very Hard, Laminated to Very Thickly Bedded, RD=0-5°, Closely to Widely Spaced Fractures, RD=0-35°	
225.0				100					
	R-26		10.0					.Vertical Fracture From 229.3-229.8'	
235.0				90					
				100					
	R-27		10.0					(RQD=95%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 13 OF 20
DATE: START 5/30/95
O. C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT. OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-27		10.0	96 / 100					
245.0								244.3-245.9': Claystone, Gray, Soft, Fresh, Undistinguishably Bedded, Very Closely to Closely Spaced Fractures, RD=0° (RQD=31%)	
	R-28		10.0	95 / 100				245.9-254.5': Sandstone, Very Fine-Grained With Laminations and Thin Beds of Siltstone, Gray, Hard, Fresh, Laminated to Thinly Bedded, RD=3-5°, Closely to Medium Spaced Fractures, RD=0-15°	
255.0								254.5-264.1': Siltstone, Gray to Dark Gray, Carbonaceous With Thin Laminations of Very Fine-Grained Sandstone, Hard, Fresh, Laminated, RD=3°, Medium Spaced Fractures, RD=0-5° (RQD=100%)	
	R-29		10.0						

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 14 OF 20
DATE: START 5/30/95
O.C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-29		10.0						
265.0				92 / 100				264.1-264.9': Highly Carbonaceous Siltstone Grading to Bony Coal, Black, Medium Hard (Middle Kittanning Coal)	
								264.9-312.5': Sandstone, Fine to Very Fine-Grained, Gray to Light Gray, Hard to Very Hard, Fresh, Laminated to Medium Bedded, RD=5-7° to Cross-Bedded), Closely to Widely Spaced Fractures, RD=0-35°	
	R-30		10.0						
								.Highly Carbonaceous, Black to Dark Gray From 264.9-266.4'	
275.0				100 / 100				(Lower Worthington Sandstone)	
	R-31		10.0						
								(RQD=91%)	

GMI Project No. 9507

FORM NO: D-401
(12/85)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 15 OF 20
DATE: START 5/30/95
O. C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-31		10.0						
285.0				91					
								.Soft Clay Seam From 291.7-292.3'	
	R-32		10.0						
295.0				92					
				100					
	R-33		10.0						

GMI Project No. 9507

FORM NO: D-401
(12/85)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 16 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-33		10.0	74				Continued From Previous Page	
305.0				100					
	R-34		10.0	100					
315.0				100				315.5-220.8': Sandstone, Carbonaceous and Shaly, Gray to Very Dark Gray, Hard, Fresh, Laminated to Thinly Bedded, RD=Cross-Bedded, Closely to Medium Spaced Fractures, RD=5-45° (Corresponds to Lower Kittanning Coal Group) (RQD=100%)	
	R-35		10.0						

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 17 OF 20
DATE: START 5/30/95
O. C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4½" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-35		10.0	100 / 100				320.8-344.9': Sandstone, Very Fine-Grained, Light Gray, Very Hard, Fresh, Laminated to Thickly Bedded, RD=5° to Cross-Bedded, Closely to Widely Spaced Fractures, RD=3-50°	
325.0									
	R-36		10.0	72 / 100				(Kittanning Sandstone)	
335.0									
	R-37		10.0					(RQD=86%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 18 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-37		10.0	96				Continued From Previous Page	
345.0				100				344.9-350.0': Shaly Sandstone, Carbonaceous, Black to Very Dark Gray, Medium Hard to Hard, Fresh, Laminated to Thinly Bedded, RD=7°, Medium to Widely Spaced Fractures, RD=7-15° (Corresponds to Scrubgrass Coal) (RQD=100%)	
	R-38		10.0					350.0-357.0': Sandstone, Very Fine Grained, Light Gray, Very Hard, Fresh, Laminated to Thinly Bedded, RD=Cross-Bedded, Medium to Widely Spaced Fractures, RD=0-60° (RQD=100%)	
355.0				100					
	R-39		10.0	100				357.0-361.0': Siltstone, Gray, Hard, Fresh, Thinly to Medium Bedded, RD=6°, Medium to Widely Spaced Fractures, RD=6-12° .Carbonaceous From 359.0-360.2' .Extremely Close Spaced Fractures With Slickensides From 359.7-360.1' (RQD=85%)	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 19 OF 20
DATE: START 5/30/95
O. G. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID : DEPTH: 10.0' : WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi : DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-39		10.0						
365.0				96 / 100				361.0-395.0': Sandstone, Very Fine-Grained to Fine-Grained, Light Gray to Gray, Very Hard, Fresh, Laminated to Thinly Bedded, RD=7° and Locally Cross-Bedded), Closely to Widely Spaced Fractures, RD=0-40°	
	R-40		10.0					.Vertical Water Stained Fractures From 368.1-368.3'	
375.0				100 / 100				.High Angle Fractures From 374.2-374.5' and 380.3-380.5'	
	R-41		10.0					(RQD=94%)	

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3
SHEET 20 OF 20
DATE: START 5/30/95
O. C. END 6/5/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 78' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED D-50 Trailer
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 4¼" ID ; DEPTH: 10.0' ; WATER: DEPTH: flows TIME: 1400 DATE: 6/5/95
CHECKED BY: Pervaiz M. Alvi ; DATE 8/2/95 DEPTH: flows TIME: 1400 DATE: 6/7/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-41		10.0	89 / 100				Continued From Previous Page	
385.0									
	R-42		10.0	89 / 100					
395.0								395.0-400.0': Sandstone, Very Fine-Grained With Laminations and Thin Beds of Carbonaceous Siltstone, Dark Gray, Hard to Very Hard, Fresh, Laminated to Thinly Bedded, RD=5-7° and Cross-Bedded, Widely Spaced Fractures, RD=5-7°	
	R-43		5.0	100 / 100				(RQD=100%)	
400.0								Bottom of Boring @ 400.0'	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-3A
SHEET 1 OF 1
DATE: START 7/7/95
O. G. END 7/7/95
ELEV. 2261.04

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 85' Lt.
INSPECTOR (SIGNED): Richard Lehman DRILLERS NAME/COMPANY J. McDaniel/Lambert
EQUIPMENT USED Davey-Kent DK-90RG
DRILLING METHODS Hollow Stem Auger
CASING: SIZE: 3¼" ID; DEPTH: 10.0'; WATER: DEPTH: TIME: DATE:
CHECKED BY: Pervaiz M. Alvi; DATE 8/2/95 DEPTH: TIME: DATE:
NOT ENCOUNTERED ☒

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
1.5								0.0-1.5': Unsampled	
	B-1					GC-SC	M	1.5-10.0': Gravel and Sand With Silt and Clay (GC-SC), Light Brown, Moist	Bag Sample From 1.5-6.0'
6.0	B-2								Bag Sample From 6.0-10.0'
10.0						A-6(4)		Bottom of Boring @ 10.0'	

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-4
SHEET 1 OF 3
DATE: START 5/16/95
END 5/16/95
O. G. ELEV. 2271.28

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 110' Rt.
INSPECTOR (SIGNED): Richard Lehman DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED Diedrich D-50 Truck Mount
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID; DEPTH: 16.2'; WATER: DEPTH: 6.3' TIME: 1700 DATE: 5/16/95
CHECKED BY: Pervaiz M. Alvi; DATE 10/11/95 DEPTH: 6.3' TIME: 0930 DATE: 5/17/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								0.0-0.5': Topsoil	
1.5	S-1	1 2 4	1.5			CL			
3.0								0.5-16.2': Silty Clay (CL) With Sand and Gravel, Tan to Tan-Gray, Moist, Medium Stiff to Hard, Homogeneous	
4.5	S-2	7 10 10	1.5						
6.0									
7.5	S-3	8 8 6	1.5				M		
9.0								.Weathered Claystone	
10.5	S-4	18 20 21	1.3						
12.0									
13.5	S-5	31 32 21	1.4					(Residual)	
15.0									
16.2	S-6	32 38 50/.2	1.1			A-7-6 (6)			Top of Rock @ 16.2'
	R-1		4.2	84				16.2-21.2': Claystone With Some Clay-shale, Carbonaceous, Dark Gray to Black, Very Soft to Soft, Moderately to Slightly Weathered, Intensely Laminated to Medium Bedded, RD=0-3°, Extremely Close to Closely Spaced Fractures, RD=Variable (RQD=0%)	

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-4
SHEET 2 OF 3
DATE: START 5/16/95
O. G. END 5/16/95
ELEV. 2271.28

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 110' Rt.
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED Diedrich D-50 Truck Mount
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID; DEPTH: 16.2'; WATER: DEPTH: 6.3' TIME: 1700 DATE: 5/16/95
CHECKED BY: Pervaiz M. Alvi; DATE 10/11/95 DEPTH: 6.3' TIME: 0930 DATE: 5/17/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-1		4.2	0				Continued From Previous Page	
21.2				100					
	R-2		5.0	28				21.2-25.0': Claystone, Tan-Gray, Very Soft to Soft, Moderately to Slightly Weathered, Disrupted Bedding, Very Closely to Medium Spaced Fractures, RD=Indeterminate (RQD=37%)	
26.2				100					
	R-3		5.0	42				25.0-41.2': Alternating Beds of Siltstone and Claystone, Gray to Dark Gray, Moderately to Slightly Weathered, Thinly to Medium Bedded With Disrupted Bedding in Claystone, RD=0-5°, Very Closely to Medium Spaced Fractures, RD Along Bedding Planes With Very Few 75-90° Fractures	
31.2				100					
	R-4		5.0	52					
36.2				100				(RQD=44%)	
	R-5		5.0						

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-4
SHEET 3 OF 3
DATE: START 5/16/95
O. G. END 5/16/95
ELEV. 2271.28

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE 110' Rt.
INSPECTOR (SIGNED): Richard Lehman DRILLERS NAME/COMPANY K. Dernosek/Lambert
EQUIPMENT USED Diedrich D-50 Truck Mount
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID : DEPTH: 16.2' : WATER: DEPTH: 6.3' TIME: 1700 DATE: 5/16/95
CHECKED BY: Pervaiz M. Alvi : DATE 10/11/95 DEPTH: 6.3' TIME: 0930 DATE: 5/17/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	R-5		5.0	/ 48				Continued From Previous Page	
41.2								Bottom of Boring @ 41.2'	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-4A
SHEET 1 OF 1
DATE: START 7/10/95
O. G. END 7/10/95
ELEV. 2271.28

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 74+00 OFFSET FROM CENTERLINE CL
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY J. McDaniel/Lambert
EQUIPMENT USED Davey Kent DK90RG
DRILLING METHODS Hollow Stem Auger
CASING: SIZE: ____ ; DEPTH: ____ ; WATER: DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: Pervaiz M. Alvi ; DATE 10/11/95 DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED ⊠

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								0.0-1.5': Unsampled	
	B.1					CL / A-7-6 (6)		1.5-4.5': Silty Clay (CL) With Sand and Gravel, Tan-Gray, Moist	Bag Sample From 1.5-4.5'
4.5								Bottom of Boring @ 4.5'	

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-5
SHEET 1 OF 1
DATE: START 5/16/95
O. G. ELEV. END 5/16/95 2238.11

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 79+71 OFFSET FROM CENTERLINE CL
INSPECTOR (SIGNED): Alex Heiphetz DRILLERS NAME/COMPANY G. Jones/Lambert
EQUIPMENT USED Mobile 40
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 3¼" ID ; DEPTH: 9.8' ; WATER: DEPTH: 3.6' TIME: 1050 DATE: 5/16/95
CHECKED BY: Pervaiz M. Alvi ; DATE 10/11/95 DEPTH: 6.6' TIME: 900 DATE: 5/17/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								0.0-0.3': Topsoil	
1.5	S-1	2 3 6	1.0			GC		0.3-7.0': Clayey Gravel (Angular Rock Fragments), (GC) With Sand and Silt, Brown, Moist, Loose to Very Dense, Homogeneous	
3.0							M		
4.4	S-2	9 10 50/.4	1.3					.Gravel and Cobbles From 4.0-5.5'	
5.5								(Residual)	Auger Refusal @ 5.5'
7.0	S-3	42 15 23	1.5			A-2-4 (0)			
						gp		7.0-9.8': Gravel (Angular Rock Fragments) (gp), Light Brown to Light Gray, Dry, Fissured	
9.0								(Residual)	
9.8	S-4	25 50/.3				a-2-4	D		Top of Rock @ 9.8'
10.3	R-1		0.5	100 / 0				9.8-14.8': Sandy to Clayey Shale, Rusty-Brown, Very Soft to Medium Hard, Highly to Medium Weathered, Laminated, RD=0-5°, Extremely Close to Closely Spaced Fractures, RD=0-15°	
	R-2		4.5	100				(RQD=32%)	
14.8				36				Bottom of Boring @ 14.8'	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-6
SHEET 1 OF 2
DATE: START 5/24/95
O. G. END 5/24/95
ELEV. 2180.75

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 85+50 OFFSET FROM CENTERLINE 100' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY G. Jones/Lambert
EQUIPMENT USED Mobile 40
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 3¼" ID ; DEPTH: 25.0' ; WATER: DEPTH: Dry TIME: 1800 DATE: 5/24/95
CHECKED BY: Pervaiz M. Alvi ; DATE 10/11/95 DEPTH: 14.4' TIME: 1000 DATE: 5/25/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
1.5	S-1	2 2 3	1.3			CL		0.0-0.5': Topsoil	
3.0								0.5-7.5': Silty Clay (CL) With Sand, Little Gravel, Light Brown to Brown With Small Gray Streaks, Moist, Medium to Very Stiff, Homogeneous	
4.5	S-2	7 7 10	1.1				M	.Rock Fragments and Gravel Below 6.0'	
6.0								(Colluvial)	
7.5	S-3	7 8 12	1.4			A-6(5)			
9.0						gc			
10.5	S-4	6 7 6	1.2				M		
12.0								7.5-25.0': Gravel (Weathered Shale Fragments) With Clay (gc), Dark Brown, Moist, Medium to Very Dense, Laminated	
13.5	S-5	7 13 15	1.3				M		
15.0								(Residual)	
16.5	S-6	10 15 19	1.2				M		
18.0									
19.5	S-7	10 15 25	1.3				M		

GMI Project No. 9507

FORM NO. D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-6
SHEET 2 OF 2
DATE: START 5/24/95
O. G. END 5/24/95
ELEV. 2180.75

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 85+50 OFFSET FROM CENTERLINE 100' Lt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY G. Jones/Lambert
EQUIPMENT USED Mobile 40
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 3¼" ID ; DEPTH: 25.0' ; WATER: DEPTH: Dry TIME: 1800 DATE: 5/24/95
CHECKED BY: Pervaiz M. Alvi ; DATE 10/11/95 DEPTH: 14.4' TIME: 1000 DATE: 5/25/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. OR SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
21.0									
	S-8	30 30 39	1.4				M	Continued From Previous Page	
22.5									
24.0									
25.0	S-9	45 50	1.0			a-2-6	M		
								Bottom of Boring @ 25.0'	

GMI Project No. 9507

FORM NO. D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-7
SHEET 1 OF 1
DATE: START 5/25/95
O. G. ELEV. END 5/25/95 2165.85

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 85+42 OFFSET FROM CENTERLINE 130' Rt.
INSPECTOR (SIGNED) Alex Heiphetz DRILLERS NAME/COMPANY G. Jones/Lambert
EQUIPMENT USED Mobile 40
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline
CASING: SIZE: 3¼"ID ; DEPTH: 15.8' ; WATER: DEPTH: 7.0' TIME: 1150 DATE: 5/25/95
CHECKED BY: Pervaiz M. Alvi ; DATE 10/11/95 DEPTH: 5.2' TIME: 1100 DATE: 5/26/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
0.0								0.0-0.5': Topsoil	
1.5	S-1	2 2 3	1.1			SC			
3.0								0.5-12.0': Clayey Sand (SC) With Silt, Little Angular Rock Fragments, Light Brown, Moist to Wet, Loose to Dense, Homogeneous	
4.5	S-2	7 14 18	1.0						
6.0							M		
7.5	S-3	13 14 18	1.2					(Colluvial)	
9.0									
10.5	S-4	11 13 12	1.0					.Perched Water From 6.0-6.5'	
12.0						A-4 (1)			
13.5	S-5	5 11 14	0.8			gw	W M	12.0-15.8': Sandy Gravel (Rock Fragments) With Clay (gw), Light Brown, Moist to Wet, Medium Dense, Homogeneous .Perched Water From 12.0-12.5' (Residual)	
15.0									
15.8	S-6	15 50/.3	0.8			a-1-a	M		Top of Rock @ 15.8'
17.8	R-1		1.4	70 0				15.8-17.3': Sandstone, Brown, Very Soft, Completely Weathered (RQD=0%)	
20.0	R-2		2.0	91 55				17.3-20.0': Sandstone, Gray, Hard to Very Hard, Slightly Weathered to Fresh, Undetermined Bedding, Extremely Close to Closely Spaced Fractures, RD=10" .High Angle Waterstained Fractures From 19.2-19.4' and 19.9-20.0' (RQD=45%)	

Bottom of Boring @ 20.0'

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-8
SHEET 1 OF 2
DATE: START 5/16/95
O. G. END 5/16/95
ELEV. 2161.00

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 97+50 OFFSET FROM CENTERLINE 30' Lt.
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY D. Kemerer/Lambert
EQUIPMENT USED Davey Kent DK50FB (Track)
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID DEPTH: 18.8' WATER: DEPTH: 7.8' TIME: 1630 DATE: 5/16/95
CHECKED BY: Pervaiz M. Alvi DATE 10/11/95 DEPTH: 13.1' TIME: 1615 DATE: 5/22/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								0.0-0.5': Topsoil	
1.5	S-1	2 3 2	1.3			cl			
3.0							M	0.5-6.0': Silty Clay With Sand (cl), Brown, Moist, Medium Stiff to Stiff, Homogeneous	
4.5	S-2	4 5 7	1.5					(Residual)	
6.0						a-6			
7.5	S-3	5 6 7	1.2			GC			
9.0								6.0-15.0': Clayey Gravel (GC) (Rock Fragments) With Sand and Silt, Dark Brown to Black, Moist, Medium Dense to Dense, Homogeneous	
10.5	S-4	6 8 9	1.5				M		
12.0								(Residual)	
13.5	S-5	11 27 12	1.4						
15.0						A-2-6 (0)			
16.5	S-6	11 27 31	1.1				D	15.0-16.5': Weathered Coal, Black, Dry, Very Dense, Homogeneous (Residual)	
18.0						cl	M	16.5-18.8': Calcareous Silty Clay (cl), Tan, Moist, Hard, Homogeneous (Residual)	
18.8	S-7	7 50/.3	0.8			a-6			Top of Rock @ 18.8'
	R-1		1.2	57				See Next Page	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-8
SHEET 2 OF 2
DATE: START 5/16/95
O. G. END 5/16/95
ELEV. 2161.00

PROJECT NAME: Meyersdale Bypass COUNTY: Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT: OFFSET:
STATION 97+50 OFFSET FROM CENTERLINE 30' Lt.
INSPECTOR (SIGNED): Richard Lehman DRILLERS NAME/COMPANY: D. Kemerer/Lambert
EQUIPMENT USED: Davey Kent DK50FB (Track)
DRILLING METHODS: 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID; DEPTH: 18.8'; WATER: DEPTH: 7.8' TIME: 1630 DATE: 5/16/95
CHECKED BY: Pervaiz M. Alvi; DATE: 10/11/95 DEPTH: 13.1' TIME: 1615 DATE: 5/22/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
20.9	R-1		1.2	0				18.8-23.9': Limestone, Gray, Medium Hard to Hard, Moderately Weathered to Fresh, Medium Bedded, RD=3-5°, Very Closely to Closely Spaced Fractures, RD=Variable	
	R-2		2.7	90 / 33				.Some Fine Fractures With Calcite Filling .Moderately Weathered From 23.3-33.9' (RQD=20%)	
23.9								Bottom of Boring @ 23.9'	

GMI Project No. 9507

FORM NO: D-401
(12/83)

ENGINEERS FIELD BORING LOG

BORING NO. GM-9
SHEET 1 OF 2
DATE: START 5/22/95
O. C. END 5/22/95
ELEV. 2124.25

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 105+00 OFFSET FROM CENTERLINE CL
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY D. Kemerer/Lambert
EQUIPMENT USED Davey Kent DK50FB (Track)
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4½" ID; DEPTH: 16.4'; WATER: DEPTH: 13.4' TIME: 1145 DATE: 5/22/95
CHECKED BY: Pervaiz M. Alvi; DATE 10/11/95 DEPTH: 8.8' TIME: 1700 DATE: 5/24/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								0.0-0.5': Topsoil	
1.5	S-1	1 3 4	1.5			cl			
3.0								0.5-9.0': Silty to Sandy Clay With Gravel (cl), Brown, Moist, Medium to Very Stiff, Homogeneous	
4.5	S-2	8 8 10	1.4				M		
6.0								(Colluvial)	
7.5	S-3	3 4 6	1.3						
9.0						a-6			
10.5	S-4	4 6 14	1.4			cl-gc		9.0-15.0': Silty to Sandy Clay and Gravel (Shale Fragments), (cl-gc), Brown to Black, Dry to Moist, Very Stiff to Hard or Medium to Very Dense, Fissured	
12.0									
12.7	S-5	22 50/.2	0.7				D-M	(Residual)	
15.0						a-6			
16.4	S-6	30 37 50/.4	1.2			cl a-6	M	15.0-16.4': Silty Clay (cl), Gray, Moist, Hard, Homogeneous (Residual)	Top of Rock @ 16.4'
	R-1		1.9	38				16.4-21.6': Claystone, Gray, Very Soft, Moderately Weathered, Indeterminate Bedding and Spacing (RQD=0%)	

GMI Project No. 9507

FORM NO. D-401
(12/85)

ENGINEERS FIELD BORING LOG

BORING NO. GM-9
SHEET 2 OF 2
DATE: START 5/22/95
O. C. END 5/22/95
ELEV. 2124.25

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 105+00 OFFSET FROM CENTERLINE CL
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY D. Kemerer/Lambert
EQUIPMENT USED Davey Kent DK50FB (Track)
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID; DEPTH: 16.4'; WATER: DEPTH: 13.4' TIME: 1145 DATE: 5/22/95
CHECKED BY: Pervaiz M. Alvi; DATE 10/11/95 DEPTH: 8.8' TIME: 1700 DATE: 5/24/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. OR SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
21.4	R-1		1.9	0					
	R-2		1.7	85 / 38				21.6-24.4': Claystone, Gray, Soft, Slightly Weathered, Thinly to Medium Bedded, RD=0°, Thinly to Medium Spaced Fractures, RD=0° (RQD=34%)	
23.4	R-3		2.6	87 / 15				24.4-26.4': Sandstone, Gray, Fine-Grained, Medium Hard to Hard, Slightly Weathered to Fresh, Thinly to Medium Bedded, RD=0°, Very Thinly to Medium Spaced Fractures, RD=75-90° (RQD=23%)	
26.4								Bottom of Boring @ 26.4'	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-10
SHEET 1 OF 1
DATE: START 5/22/95
O. C. END 5/22/95
ELEV. 2064.78

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 112+00 OFFSET FROM CENTERLINE 140' Lt.
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY D. Kemerer/Lambert
EQUIPMENT USED Davey Kent DK50FB (Track)
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID; DEPTH: 10.3'; WATER: DEPTH: 2.6' TIME: 1345 DATE: 5/22/95
CHECKED BY: Pervaiz M. Alvi; DATE 10/11/95 DEPTH: 4.0' TIME: 1700 DATE: 5/24/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT OR TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
1.5	S-1	1 1 2	1.1					0.0-1.5': Topsoil	
3.0						CL			
4.5	S-2	6 7 11	1.5					1.5-10.3': Silty Clay (CL), Brown with Gray Mottles to All Gray, Moist, Very Stiff to Hard, Homogeneous	
6.0							M		
7.5	S-3	7 9 12	1.5					(Residual)	
9.0									
10.3	S-4	12 27 50/.3	1.1			A-6(18)			Top of Rock @ 10.3'
11.4	R-1		0.8	73 / 0				10.3-15.3': Claystone With Some Siltstone, Gray, Very Soft to Medium Hard (Siltstone), Moderately to Slightly Weathered, Very Thinly to Thinly Bedded With Some Disrupted Bedding (Claystone), RD=0°, Extremely Close to Closely Spaced Fractures, RD= Variable	
15.3	R-2		3.8	97 / 0				(RQD=0%)	
								Bottom of Boring @ 15.3'	

GMI Project No. 9507

FORM NO: D-401
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. GM-11
SHEET 1 OF 1
DATE: START 5/22/95
O. C. END 5/22/95
ELEV. 2064.83

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 112+00 OFFSET FROM CENTERLINE 130' Rt.
INSPECTOR (SIGNED) Richard Lehman DRILLERS NAME/COMPANY D. Kemerer/Lambert
EQUIPMENT USED Davey Kent DK50FB (Track)
DRILLING METHODS 2" Split Spoon; Hollow Stem Auger; NQ2 Wireline Core
CASING: SIZE: 4¼" ID; DEPTH: 9.9'; WATER: DEPTH: 3.0' TIME: 1540 DATE: 5/22/95
CHECKED BY: Pervaiz M. Alvi; DATE 10/11/95 DEPTH: 10.9' TIME: 1700 DATE: 5/24/95
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
	S-1	1 2 4	1.3					0.0-1.0': Topsoil	
1.5						cl			
3.0								1.0-9.0': Silty Clay (cl), Yellow-Brown to Brown, Moist, Hard, Homogeneous	
	S-2	8 13 17	1.5				M		
4.5									
6.0								(Residual)	
	S-3	11 13 19	1.5						
7.5									
9.0						a-6			
	S-4	22 50/.4	0.9			ml a-4	D	9.0-9.9': Micaceous Sandy Silt With Gravel (Rock Fragments), Brown, Dry, Hard, Fissured (Residual)	Top of Rock @ 9.9'
9.9				53					
	R-1		1.0	0				9.9-15.8': Sandstone, Brown and Gray, Very Fine to Fine-Grained, Soft to Medium Hard, Highly to Slightly Weathered, Very Thinly to Thinly Bedded, RD=3-5°, Extremely Close to Closely Spaced Fractures, RD=3-90°	
11.8				95					
	R-2		3.8	0				Few Vertical Fractures (RQD=0%)	
15.8								Bottom of Boring @ 15.8'	

GMI Project No. 9507

1993 BORINGS

FORM NO. D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. WT-1
SHEET 1 OF 2
DATE: START 10/27/93
O. C. END 10/28/93
ELEV. 2143.4

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 89+75 OFFSET FROM CENTERLINE 190' Rt.
INSPECTOR (SIGNED) Keith Henn DRILLERS NAME/COMPANY M. Coy/Kimball Environmental
EQUIPMENT USED CME-45C
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 W/L Core
CASING: SIZE: 3-3/4" ; DEPTH: 25.2' ; WATER: DEPTH: 8.2 TIME: 10:50am DATE: 10/28/93
CHECKED BY: Pervaiz M. Alvi ; DATE 11/9/93 DEPTH: 6.3 TIME: 4:00pm DATE: 10/29/93
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
1.5	S-1	3 4 5	0.4					0.0-1.4': Topsoil	
3.0						CL	M	1.4-8.8': Silty Clay With Sand and Gravel (Sandstone and Coal Rock Fragments) (CL), Orange-Brown With Yellow-Brown Streaks, Moist, Medium Stiff to Stiff, Lensed	
4.5	S-2	2 2 4	0.6						
6.0								(Alluvial)	
7.5	S-3	5 6 10	1.5						
9.0						A-4			
10.5	S-4	9 10 20	1.3			SM		8.8-13.0': Silty Sand With Gravel (SM), Yellowish-Brown to Reddish-Brown, Moist, Medium Dense	
12.0							M	(Alluvial)	
13.5	S-5	10 10 17	0.8			A-2-4			Hit Water @ 13.5'
15.0						gm		13.0-20.5': Silty Gravel With Sand (gm), Brown to Brownish-Red, Wet, Medium Dense, Homogeneous	
16.5	S-6	7 10 12	1.1				W		
18.0								(Alluvial)	
19.5	S-7	9 9 10	0.3						

FORM NO. D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. WT-1
SHEET 2 OF 2
DATE: START 10/27/93
O. G. END 10/28/93
ELEV. 2143.4

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 89+75 OFFSET FROM CENTERLINE 190' Rt.
INSPECTOR (SIGNED) Keith Henn DRILLERS NAME/COMPANY M. Coy/Kimball Environmental
EQUIPMENT USED CME-45C
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 W/L Core
CASING: SIZE: 3-3/4" ; DEPTH: 25.2' ; WATER: DEPTH: 8.2 TIME: 10:50am DATE: 10/28/93
CHECKED BY: Pervaiz M. Alvi ; DATE 11/9/93 DEPTH: 6.3 TIME: 4:00pm DATE: 10/29/93
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / ROD (%)	POCKET PEN. or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
						A-2-4		Continued From Previous Page	
21.0						CL			
	S-8	4 5 9	0.9				W	20.5-25.2': Silty Clay With Gravel (Shale Fragments) (CL), Grayish Brown to Brown, Wet, Stiff to Very Stiff.	
22.5									
24.0								(Residual)	
	S-9	12 13 50/.2	1.0			A-6			Top of Rock @ 25.2'
25.2				5 / 0				25.2-27.2': Medium-Grained Sandstone, Brown, Very Soft; Highly Weathered, Indeterminate Bedding and Spacing .Very Poor Recovery (RQD=0%)	
	R-1		0.1						
27.2				100 / 0				27.2-29.5': Very Fine to Fine-Grained Sandstone, Dark Gray, Soft, Fresh to Slightly Weathered, Intensely Laminated to Very Thinly Bedded, RD=1-10°, Extremely Close Spaced Fractures .Carbonaceous Sandy Shale From 29.3-29.5' (RQD=0%)	
	R-2		2.0						
29.2				100 / 60				29.5-36.2': Claystone, Gray, Soft, Slightly to Moderately Weathered, Very Thinly to Thinly Bedded, RD=1-10°, Medium Spaced Fractures	
	R-3		5.0						
34.2				95 / 85				.Red Mottling From 35.8-36.2' (RQD=70%)	
	R-4		1.9						
36.2								Bottom of Boring @ 36.2'	

FORM NO: D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. WT-4
SHEET 1 OF 2
DATE: START 11/2/93
O.G. END 11/2/93
ELEV. 2068.2

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 111+95 OFFSET FROM CENTERLINE 23' Rt.
INSPECTOR (SIGNED) Timothy Witt DRILLERS NAME/COMPANY F. Harris/Kimball Environmental
EQUIPMENT USED SIMCO 4000
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 W/L Core
CASING: SIZE: 3-3/4" ; DEPTH: 16.0' ; WATER: DEPTH: 2.7 TIME: 1:00pm DATE: 11/2/93
CHECKED BY: Pervaiz M. Alvi ; DATE 11/9/93 DEPTH: 6.6 TIME: 1:00pm DATE: 11/3/93
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
0.0								0.0-0.3': Topsoil	
1.5	S-1	1 2 3	1.0			sm a-4	M to W	0.3-2.0': Silty Fine Sand With Clay (sm), Brown, Moist to Wet, Loose, Homogeneous (Residual)	
3.0						CL			
4.5	S-2	5 10 19	1.2					2.0-12.5': Silty Clay With Gravel (CL), Brown, Very Stiff, Fissured, Dry to Moist	
6.0							D to M		
7.5	S-3	6 7 12	1.5						
9.0									
10.5	S-4	6 10 12	1.5					(Residual)	
12.0									
13.5	S-5	19 32 32	1.3			A-7-6			
15.0						gm a-1-b	D	12.5-14.0': Poorly-Graded Silty Rock Fragments (Decomposed Shale) With Sand (gm), Brown, Dry, Very Dense, Fissured (Residual)	
16.0	S-6	8 19 50/.0	1.0			cl a-6	M	14.0-16.0': Silty Clay With Fine Sand (cl), Brown and Gray, Moist, Very Stiff, Fissured (Decomposed Shale) (Residual)	Top of Rock @ 16.0'
19.1	R-1		2.8	90 / 23				16.0-20.9': Very Fine Sandy and Silty Shale, Gray, Soft to Medium Hard, Moderately to Slightly Weathered, Very Intensely Laminated to Very Thinly Bedded, RD=5°, Very Closely to Closely Spaced Fractures, RD=5° .Vertical Fractures From 17.9-18.2' and 20.4-20.7'	
	R-2		4.8	96				(RQD=14%)	

FORM NO. D-481
(12/89)

ENGINEERS FIELD BORING LOG

BORING NO. WT-4
SHEET 2 OF 2
DATE: START 11/2/93
O. G. END 11/2/93
ELEV. 2068.2

PROJECT NAME Meyersdale Bypass COUNTY Somerset
STATE RT. NO. 6219 SECT. B08 SEGMENT OFFSET
STATION 111+95 OFFSET FROM CENTERLINE 23' Rt.
INSPECTOR (SIGNED) Timothy Witt DRILLERS NAME/COMPANY T. Harris/Kimball Environmental
EQUIPMENT USED SIMCO 4000
DRILLING METHODS 2" Split Spoon; Hollow Stem Augers; NQ2 W/L Core
CASING: SIZE 4-3/4" ; DEPTH: 16.0' ; WATER: DEPTH: 2.7 TIME: 1:00pm DATE: 11/2/93
CHECKED BY: Pervaiz M. Alvi ; DATE 11/9/93 DEPTH: 6.6 TIME: 1:00pm DATE: 11/3/93
NOT ENCOUNTERED ☐

DEPTH (FT.)	SAMPLE NO. AND TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Inches or Ft.)	RECOVERY (%) / RQD (%)	POCKET PENT or TORVANE (TSF)	USCS / AASHTO	H_2O CONTENT	DESCRIPTION	REMARKS
								Continued From Previous Page	
	R-2		4.8	34				20.9-26.1': Fine-Grained Sandstone, Gray, Hard, Slightly Weathered, Very Thinly to Thinly Bedded, RD=0-5°, Very Closely to Closely Spaced Fractures, RD=0-5°	
24.1								.Vertical Fracture From 22.9-23.4'	
	R-3		1.9	95 / 63				.Brown Stain on Fractures (RQD=57%)	
26.1								Bottom of Boring @ 26.1'	

1974 BORINGS

GEO-MECHANICS, INC.

TEST BORING RECORD

Driller: Dale Martin

Water Level: 0-Hr. 17.2 24 Hrs.

Casing Hammer Wt. ..... lbs. Drop ..... in.

Sampler Hammer Wt. 140 lbs. Drop 30 in.

Sampler Size 2 in. O.D. Casing Size 4 in.

Boring No. TB-1 Surface Elevation 2176.0 Sheet No. 1 of 2 sheets

For: Westmoreland Engineering Co., Inc.

Location: Sta. 100+90, 105' LT.

Started 2-12-74 Completed 2-26-74 Job No. L.R. 1022

Section 8

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☐ Geologist's Log ☒	BLOWS ON SAMPLER INTERV.	BOTTOM DEPTH OF SAMPLE	REMARKS CORE DATA
	1.0		Topsoil	2-4		
				8	1.5	
			Brown Shale Fragments, Little Clay, Very Dense, Damp	33-32		
				19	4.5	
	6.9		Top of Rock @ 6.9 Ft.	37-50/4	6.9	Run - Re
			Brown Silty Shale and Clay Seams, Badly Broken, Soft			RQD= 0%
					10.0	3.1 - 1.
						RQD= 0%
					15.0	5.0 - 4.
	18.0					RQD= 0%
	19.5		Black Carbonaceous Silty Shale, Broken, Soft		20.0	5.0 - 2.
			Gray Clayshale, Badly Broken to Slightly Broken, Soft to Medium Hard			RQD= 0%
					25.0	5.0 - 1.8
						RQD= 78%
	29.0				30.0	5.0 - 5.(
			Gray Fine Grained Shaly Sandstone Interbedded with Shaly Siltstone, Slightly Broken, Medium Hard to Hard			RQD= 78%
			- Water-Stained from 33.0' to 37.0'		35.0	5.0 - 5.(
						RQD= 58%
					40.0	5.0 - 5.(
						RQD= 12%
					45.0	5.0 - 1.
						RQD=
					50.0	5.0

GEO-MECHANICS, INC.

TEST BORING RECORD

Driller: Dale Martin

Water Level: 0-Hr. 17.2 24 Hrs.

Casing Hammer Wt. ____ lbs. Drop ____ in.

Sampler Hammer Wt. 140 lbs. Drop 30 in.

Sampler Size 2 in. O.D. Casing Size 4 in.

Boring No. TB-1 Surface Elevation 2176.0 Sheet No. 2 of 2 sheets

For Westmoreland Engineering Co., Inc.

Location Sta. 100+90, 105' LT.

Started ____ Completed ____ Job No. L.R. 1022 Section 8

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☐ Geologist's Log ☒	BLOWS ON SAMPLER / INTERV.	BOTTOM DEPTH OF SAMPLE	REMARKS CORE DATA
						RQD= 20%
			- D.F. @ 63.0', 63.3', 64.0', 67.0' and 67.5'		55.0	5.0 - 5.(
			- Slickensided Along Fracture Planes			RQD= 25%
					60.0	5.0 - 4.(
						RQD= 20%
					65.0	5.0 - 4.8
						RQD= 33%
	68.0		(Lower Grafton Sandstone)			
			Dark Gray Silty Shale Interbedded with Shaly Siltstone, Slightly Broken, Hard		70.0	5.0 - 5.(
						RQD= 35%
					75.0	5.0 - 4.8
						RQD= 50%
	80.0				80.0	5.0 - 5.(
			End of Boring @ 80.0'			

GEO-MECHANICS, INC.

TEST BORING RECORD

Driller Dale Martin

Water Level: 0-Hr. 27.0 24 Hrs. 32.0

Casing Hammer Wt. ..... lbs. Drop ..... in.

Sampler Hammer Wt. 140 lbs. Drop 30 in.

Sampler Size 2 in. O.D. Casing Size 4 in.

Boring No. TB-2 Surface Elevation 2189.0 Sheet No. 1 of 2 sheets

For Westmoreland Engineering Co., Inc.

Location STA. 101+00, 105' RT.

Started ..... Completed ..... Job No. L.R. 1022 Section 8

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☐ Geologist's Log ☒	BLOWS ON SAMPLER / INTERV.	BOTTOM DEPTH OF SAMPLE	REMARKS CORE DATA
	1.0		Topsoil	5-3		
			Brown Sandy Clay, Some Shale Fragments, Stiff to Hard, Moist	4	1.5	
				10-16		
				18	4.5	
	6.1		Top of Rock @ 6.1 Ft.	50/.1	6.1	Run - Re
			Brown Sandy Shale, Badly Broken, Soft			RQD= 0%
					10.0	3.9 - 0.
						RQD= 0%
					15.0	5.0 - 0.
	18.0					RQD= 0%
			Gray Clayshale and Clay Seams, Badly Broken, Soft		20.0	5.0 - 1.
						RQD= 0%
	25.0				25.0	5.0 - 2.
			Gray Fine Grained Shaly Sandstone Interbedded with Shaly Siltstone Slightly Broken, Massive, Hard			RQD= 60%
					30.0	5.0 - 5.
						RQD= 83%
					35.0	5.0 - 5.
						RQD= 81%
					40.0	5.0 - 5.
						RQD= 73%
					45.0	5.0 - 4.
			(Lower Grafton Sandstone)			RQD= 70%
					50.0	5.0 - 4.

GEO-MECHANICS, INC.

TEST BORING RECORD

Driller Dale Martin

Water Level: 0-Hr. 27.0 24 Hrs. 32.0

Casing Hammer Wt. ..... lbs. Drop ..... in.

Sampler Hammer Wt. 140 lbs. Drop 30 in.

Sampler Size 2 in. O.D. Casing Size 4 in.

Boring No. TB-2 Surface Elevation 2189.0 Sheet No. 2 of 2 sheets

For Westmoreland Engineering Co., Inc.

Location STA. 101+00, 105' RT.

Started ..... Completed ..... Job No L. R. 1022 Section 8

ELEVATION	DEPTH	Casing Hammer Blows	Driller's Log ☐ Geologist's Log ☒	BLOWS ON SAMPLER / INTERV.	BOTTOM DEPTH OF SAMPLE	REMARKS CORE DATA
	52.5					RQD= 35%
			Dark Gray Silty Shale Interbedded with Shaly Siltstone, Moderately Broken to Slightly Broken, Medium Hard to Hard		55.0	5.0 - 4.
						RQD= 33%
			- VF from 67.0' to 68.0' 72.0' to 73.0'		60.0	5.0 - 4.
						RQD= 40%
					65.0	5.0 - 5.
						RQD= 37%
					70.0	5.0 - 5.
						RQD= 55%
	74.0				75.0	5.0 - 5.
			Dark Gray Shaly Limestone, Massive, Hard			RQD= 89%
					80.0	5.0 - 5.
			(Ames Limestone)			RQD= 91%
					85.0	5.0 - 5.
	86.5					RQD= 40%
	87.5		Bony Coal (Ames Limestone)			
			Gray Limestone, Massive, Hard		90.0	5.0 - 4.
			- D.F. @ 89.5', 94.0', 97.5', and 98.0'			RQD= 95%
			- Slickensided along Fracture Planes		95.0	5.0 - 5.
						RQD= 98%
			(Lavansville Limestone)			
	100.0		Boring Terminated @ 100.0 Ft.		100.0	5.0 - 5.

APPENDIX H
Driller's Logs

LIST OF BORINGS

2023 BORINGS

- **DU-1 through DU-3, DU-5 and DU-6**
- **E-1A through E-11**

TRC TEST BORING LOG

PROJECT: SR219 SKA 616)+83.4
LOCATION: Somerset Co off 1.2mi

BORING DU-1
G.S. ELEV. 2335.68
PROJ. # 524386
SHEET 1 OF 1

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: R. McCann
HELPER: Dylan Cann
INSPECTOR: B. Ill

WATER: DEPTH: 14.1 TIME: DATE: 2-8
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

START DATE: 2-8-23
END DATE: 2-8-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
	S1	1-2-8	1.1	0.0 brown tan sand gravel silt + clay		
5	S2	22-35-19	1.1			
	S3	21-43-27	1.5			
	S4	48-50/3	0.7			
	S5	28-23-26	1.2			
	S6	49-50/0	0.4			
	R1	1.7	ϕ	8.0 brown-grey shaley sandstone		
10	R2	1.8	ϕ			
15	R3	4.8	ϕ			
20	R4	4.9	ϕ			
25	R5	5.0	0.5	24.8 grey claystone w/ limestone		DAY RATE MOB MPT L/S or Days UNSAMPLED BULK SAMPLE TUBE SAMPLE CONT. SAMPLING 8.0 INT. SAMPLING ROCK CORING 20.0 GROUT 28.0 P.I.K. STAND-BY
30				EOB 28.0ft		
35						
40						

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd
DRILLING METHOD: NW 3" casing
EQUIPMENT USED: XLS CASING SIZE: 3" DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING DU-2
G.S. ELEV.
PROJ. # 574386
SHEET 1 OF 1

DRILLER: Roger Cirum
HELPER: Don Carpenter
INSPECTOR: Tim Wolf

START DATE: 02-06-23
END DATE:

DEPTH	A	BLOWS	REC	DESCRIPTION	Wn	REMARKS
0.0	SS1	1-3-4	0.7	brown sand + gravel		STA
1.5						OFF ℄
3.0	SS2	3-4-6	1.1			ELEV 2301.25
4.5	SS3	5-6-7	1.7			CO Somerset
5				5.0		
6.0	SS4	7-27-37	1.5	6.1 weathered shale		
6.1	ESC	50/0.1				
8.0	R1	REC 1.6	RQD 0.0	brown shale		
				some gray sandstone bands		
10	R2	2.5	0.0			
11.0						
	R3					
15		4.8	1.8	16.0		
16.0						
	R4			gray sandstone brown		
20		5.0	4.3			
21.0						
	R5			AD H_2O 21.5'		
25		5.0	3.0	26.0		
26.0						
30						
35						
40						

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING 6.1
INT. SAMPLING
ROCK CORING 19.9
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to old Salisbury Road
DRILLING METHOD: NW3" Casing
EQUIPMENT USED: XLS CASING SIZE: 3 DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING: DU-3
G.S. ELEV.:
PROJ. #: 524386
SHEET 1 OF 4

DRILLER: Gary Reel
HELPER: Don Carpenter
INSPECTOR: Tim Witt

START DATE: 1-31-23
END DATE: 02-01-23

DEPTH	A	BLOWS	REC	DESCRIPTION	Wn	REMARKS
0.0	SS1	7-4-4	0.3	0.0 Sand + gravel		SHA 6200+43
1.5	SS2	5-9-17	0.6			
3.0	SS3	50/0.4	0.1			offset 314' RT
3.4	X	Advanced to 4.5'	X			
4.5	SS4	20-12-10	0.3	6.0		Elev. 2479.67
6.0	SS5	6-7-12	0.9	yellow + brown clay		Co Somerset
7.5	SS6	14-15-15	0.8			
9.0	SS7	4-15-24	1.2			
10.5	SS8	22-46-50/0.4	0.6			
11.9	X	Advanced to 12.0'	X			
12.0	SS9	22-50/0.4	0.9	13.5		
12.9	X	Advanced to 13.5'	X			
13.5	SS10	50/0.3	0.3	gray weathered claystone		
13.8	X	Advanced to 15.0'	X			
15.0	SS11	42-50/0.0	0.5	15.5		
15.5	R1	REC 1.5	RQD 0.0	gray shale 17.0		
17.5	R2	1.9	0.0	coal 18.6		
20.0				gray claystone		
20.5	R3	1.5	0.0			
22.0	R4	4.7	1.6	25.3 gray clay shale		
27.0	R5	4.5	2.7			
32.0	R6	5.0	3.3			
37.0	R7	4.8 next page	2.3			
40						

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING 15.5
INT. SAMPLING
ROCK CORING 124.5
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to old Salisbury Road
DRILLING METHOD: NW 3" Casing NQII
EQUIPMENT USED: _____ CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DH-3
G.S. ELEV. _____
PROJ. # 524386
SHEET 2 OF 4

DRILLER: Gary Peel
HELPER: Ron Carpenter
INSPECTOR: Tim Witt

START DATE: 01-31-23
END DATE: 02-01-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
420	R 7	REC 4.8	RQD 2.3	gray clay shale 420		
470	R 8	5.0	3.8	gray shale some clay		
520	R 9	4.9	4.2			
570	R 10	4.9	2.3			
620	R 11	5.0	2.4	616 630 COAL		
670	R 12	4.5	1.1	sandy shale		
720	R 13	5.0	1.3			
770	R 14	4.8	3.9			
40	R 15	next page				

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR6219 sect 050
LOCATION: Meyersdale to Old Salisbury Rd

DRILLING METHOD: _____
EQUIPMENT USED: _____ CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DU-3
G.S. ELEV. _____
PROJ. # 524386
SHEET 3 OF 4

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim Witt

START DATE: 01-31-23
END DATE: 02-01-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
82.0	R 15	5.0	3.9	gray Sandy shale		
5	R 16	3.7	1.3	83.3 84.3 coal 86.2 gray claystone limestone		
87.0	R 17	5.0	2.7	90.5 gray limeatic claystone		
92.0	R 18	5.0	4.0			
97.0	R 19	5.0	3.3	99.5 100.5 limestone gray limey claystone		
102.0	R 20	5.0	2.5			
107.0	R 21	5.0	3.7	108.0 gray Sandy shale		
112.0	R 22	5.0	5.0			
117.0	R 23	next page				
40						

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd

DRILLING METHOD: _____
EQUIPMENT USED: _____ CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DU-3
G.S. ELEV. _____
PROJ. # 524380
SHEET 4 OF 4

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim Witt

START DATE: 01-31-23
END DATE: 02-01-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
120	R 23	5.0	5.0	gray sandy shale		
5	R 24	5.0	5.0			
127.0						
10	R 25	5.0	4.7			
132.0						
15	R 26	5.0	4.7			
137.0						
140.0	R 27	3.0	2.9	140.0 AD H_2O 12.3'		
25						DAY RATE _____
						MOB _____
						MPT L/S or Days _____
						UNSAMPLED _____
30						BULK SAMPLE _____
						TUBE SAMPLE _____
						CONT. SAMPLING _____
						INT. SAMPLING _____
						ROCK CORING _____
35						GROUT _____
						P.I.K. _____
						STAND-BY _____
40						

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050 Myersdale to Old Salisbury Rd
LOCATION: Meyersdale PA

DRILLING METHOD: 3" casing
EQUIPMENT USED: Acker XES CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DU-5
G.S. ELEV. _____
PROJ. # 524386
SHEET 1 OF 3

DRILLER: Gary Peel
HELPER: Don Carpenter
INSPECTOR: _____

START DATE: 01-11-23
END DATE: 01-12-23

DEPTH		A	BLOWS	REC	0.0 DESCRIPTION	Wn	REMARKS
0.0		SS1	5-14-5	0.7	Brown sandy clay some silt + boulder fragments		STA 6276+60 OFF $\mathcal{L}$ ELEV 2192 Co Somerset
1.5		SS2	5-4-6	0.8			
3.0		SS3	6-15-14	1.5	4.5		
4.5 5		SS4	9-17-16	1.4	Brown clay w/some sand + silt some gravel		
6.0		SS5	17-24-14	1.3			
7.5		SS6	24-28-17	1.3			
9.0		SS7	6-13-15	1.3	10.5		
10 10.5		SS8	16-13-10	1.4	Brown sand + gravel little clay		
12.0		SS9	16-13-48	1.2			
13.5		SS10	32-21-25	1.4			
15.0		SS11	17-13-18	1.2			
16.5		SS12	19-24-50/04	1.4	17.5		
17.9 18.0		~~SS13~~	~~Advanced to 18.0'~~	~~X~~	weathered shale		
19.3 19.5 20		SS13	44-39-50/03	1.3			
			Advanced to 19.5'	X			
20.8 21.0		SS14	20-39-50/03	1.3			
		~~SS15~~	~~Advanced to 21.0'~~	~~X~~	21.6		
21.6		R1	REC 0.4	RQD 0.0	gray shale (broken)		
24.0 25		R2	1.7	0.0			
27.0		R3	1.6	0.0			
29.5 30		R4	1.9	0.0	29.7 gray claystone 30.5 gray shale (broken)		
32.0		R5	1.2	0.0	33.2 coal		
34.5 35		R6	1.3	0.0	35.0 gray shale (broken)		
37.0		R7	1.2	0.0	39.5		
39.5							

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR6219 Sect 050 Meyersdale to Old Salisbury Rd
LOCATION: Meyersdale PA
DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING D4-5
G.S. ELEV.
PROJ. # 524386
SHEET 2 OF 3

DRILLER: Gary Peel
HELPER: Don Carpenter
INSPECTOR: Tim

START DATE: 01-11-23
END DATE: 01-12-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
39.5	R8	REC 2.5	ROD 1.5	sandy shale		
42.0	R9	2.5	1.2			
44.5	R10	2.4	0.5	47.0		
47.0	R11	5.0	3.7	gray sandstone		
52.0	R12	5.0	5.0			
57.0	R13	5.0	4.3	62.5		
62.0	R14	3.8	1.3	63.0 coal; 63.6 clay stone; gray shale; 67.0		
67.0	R15	5.0	3.8	sandy claystone; 72.0		
72.0	R16	5.0	5.0	Sandy Shale		
77.0	R17	next page				

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR6219 Sect 050 Meyersdale to Old Salisbury Rd
LOCATION: Meyersdale PA

DRILLING METHOD: _____
EQUIPMENT USED: _____ CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DU-5
G.S. ELEV. _____
PROJ. # 524386
SHEET _____ OF _____

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim

START DATE: 01-11-23
END DATE: 01-12-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
82.0	R 17	REC 5.0	RQD 50	sandy shale		
87.0	R 16	4.9	3.4			
92.0	R 19	5.0	4.6			
97.0	R 20	5.0	5.0	97.0 AD H_2O 3:00 pm 51.7'		

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Myersdale to old Salisbury Rd

DRILLING METHOD: 3" NW Casing
EQUIPMENT USED: Acker XLS CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DU-6
G.S. ELEV. _____
PROJ. # 524386
SHEET 1 OF 5

DRILLER: Gary Reel
HELPER: Don Carpenter
INSPECTOR: Tim Witt

START DATE: 02-09-23
END DATE: 02-13-23

DEPTH	A	BLOWS	REC	DESCRIPTION	Wn	REMARKS
0.0	SS1	1-4-3	0.7	brown sand + gravel w/ sandstone boulder fragments		STA 6285+02 offset 7.29' LT
1.5	SS2	16-17-28	1.1			
3.0	SS3	38-50/0.4		(Lost H2O 4.0')		Elev 2459.94
3.9	X	Advanced to 4.5'	X			
4.5	SS4	9-3-6	0.7			AD H2O 38.1'
5						
6.0	SS5	1-50/0.4	0.4			
6.9	X	Advanced to 7.5'	X			
7.5	SS6	35-11-12	1.2			
9.0	SS7	50/0.4	0.0	9.0		
9.2	X	Advanced to 10.5	X			
10	SS8	10-10-15	0.3	sandstone boulders		
10.5						
12.0	SS9	50/0.2	0.0			
12.2	X	Advanced to 13.5	X			
13.5	SS10	50/0.1	0.0			
13.6	X	Advanced to 15.0	X			
15.0	SS11	50/0.0	0.0			
15.0	X	Advanced to 16.5'	X			
16.5	SS12	50/0.0	0.0	16.5		
16.5	R1	2.5	2.3	brown sandstone		
19.0						
20	R2	3.0	1.2			
22.0						
25	R3	5.0	1.3			
27.0						
30	R4	2.3	.8			
32.0				32.0		
	R5	2.3	.9	Shale		
35	R6	2.2	0			
37.0				37.0		
40	R7	4.9 next page	1.7	Sandy Shale		

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING 16.5
INT. SAMPLING _____
ROCK CORING 160.5
GROUT 177.8'
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd

BORING BH-6
G.S. ELEV.
PROJ. # 52438.1
SHEET 2 OF 5

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

START DATE: 02-09-23
END DATE: 02-13-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
42.6	R 7	4.9	1.7	Sandy shale		
5	R 8	4.9	2.9			
47.0						
10	R 9	4.2	1.6			
52.0						
15	R 10	4.0	0.8			
57.0				57.0 coal		
20	R 11	3.3	0.4	58.5 shale 60.0 coal 61.0 shale binder 62.3 coal 63.3 shale		
62.0				sandy claystone		
25	R 12	5.0	2.0	66.0		
67.0				sandy shale		
30	R 13	5.0	4.2			
72.0						
35	R 14	5.0	3.4			
77.0				78.0		
40	R 15	next page		sandy claystone 80.0		

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 6219 Sec 1050
LOCATION: Meyersdale to Old Salisbury Rd

DRILLING METHOD: _____
EQUIPMENT USED: _____ CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DU-6
G.S. ELEV. _____
PROJ. # 524380
SHEET 3 OF 5

DRILLER: Gary
HELPER: Dan
INSPECTOR: Tim

START DATE: 02-09-23
END DATE: 02-13-23

DEPTH	A	B	C	80.0 DESCRIPTION	Wn	REMARKS
82.0	R 15	4.0	2.7	sandy shale		
87.0	R 16	5.0	2.0			
90.0	R 17	4.5	3.3	90.3 sandy claystone		
97.0	R 18	5.0	3.9	94.3 sandy shale 96.0 sandy claystone		
102.0	R 19	5.0	4.2			
107.0	R 20	4.9	4.1	106.3 sandy shale		
112.0	R 21	5.0	3.9			
117.0	R 22	4.1	3.8			
	R 23					

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd

BORING D4-6
G.S. ELEV.
PROJ. # 524386
SHEET 4 OF 5

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

START DATE: 02-09-23
END DATE: 02-13-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
120.0	R 23	5.0	4.5	sandy shale		
5 / 127.0	R 24	5.0	5.0			
10 / 132.0	R 25	5.0	3.8			
15 / 137.0	R 26	4.7	3.4			
20 / 142.0	R 27	5.0	5.0			
25 / 147.0	R 28	4.9	4.4			
30 / 152.0	R 29	5.0	4.4			
35 / 157.0	R 30	5.0	4.8			
40	R 31	5.0 next page	4.8	1' /		

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd

DRILLING METHOD: _____
EQUIPMENT USED: _____ CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING DU-6
G.S. ELEV. _____
PROJ. # 524386
SHEET 5 OF 5

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim

START DATE: 02-09-23
END DATE: 02-13-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
162.0	R 31	5.0	4.8	Sandy Shale 162.3		
	R 32	3.8	1.8	164.0 Coal with Shale Sandy Clay Stone		
167.0				167.0		
	R 33	5.0	4.8	gray Sandstone		
172.0						
	R 34	5.0	4.8	177.0		
177.0						

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 219 SNA 2104408
LOCATION: Garrett Co MD off 165 Rt

BORING E-1A
G.S. ELEV. 2687.22
PROJ. # 524386
SHEET 1 OF 2

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: Rich Cum
HELPER: Dylan Cum
INSPECTOR: Bill

WATER: DEPTH: 12.6 TIME: DATE: 2-9-23
DEPTH: 12.6 TIME: DATE: 2-9-23
DEPTH: TIME: DATE:

START DATE: 2-8-23
END DATE: 2-9-23

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
		S1	2-3-3	1.5	0.0 brown gry clay silt sand & gravel		
		S2	3-6-7	1.5			
		S3	8-11-11	1.5			
5		S4	7-8-10	1.5			
		S5	8-13-24	1.5			
		S6	19-23-37	1.5			
10		S7	37-50-50/.1	1.1			
		R1	0-6	ϕ	10.1 dk gry black shale		
		R2	1.1	ϕ			
15		R3	1.6	ϕ			
		R4	1.7	ϕ			
20		R5	2.5	ϕ			
		R6	2.3	ϕ			
		R7	1.6	ϕ	27.1 dk gry shale & limestone		
25		R8	5.0	3.3			
30					31.1 black coal		
		R9	3.8	0.4	32.4 gry claystone		
35		R10	4.9	0.7			
40							

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING 10.1
INT. SAMPLING
ROCK CORING 49.9
GROUT 60.0
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SNP 2104408
LOCATION: OFF 165 RT

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING E-1A
G.S. ELEV. 2687.22
PROJ. # 524386
SHEET 2 OF 2

DRILLER: R. McCrum
HELPER: Dylan Crum
INSPECTOR: B. Ill

START DATE: 2-8-23
END DATE: 2-9-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
40	R-10	4.9	0.7			
45	R11	4.6	2.0	gry clayston		
	R12	5.0	3.7			
50						
				51.0		
	R13	4.8	4.1	gry silty sandston		
55						
	R14	4.0	2.1			
60						
				EOB 60.0 ft		
65						
70						
75						
80						

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

BORING E-2
G.S. ELEV. 2421.12
PROJ. # 524386
SHEET 1 OF 1

PROJECT: SR 219 SKA 2129 + 85
LOCATION: Barnett Co Rd off 213 LT

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: Richmond
HELPER: Dylan Cox
INSPECTOR: Bill

WATER: DEPTH: 12.7 TIME: DATE: 2-7-23
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

START DATE: 2-7-23
END DATE: 2-7-23

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
		S1	7-6-8	0.5	0.0		
		S2	50/3	0.3			
		S3	15-14-10	0.3	brown tan sand gravel silt & clay		
5		S4	9-9-12	0.4			
		S5	7-8-10	1.5			
		S6	13-12-12	0.9			
10		S7	6-7-8	1.0			
		S8	9-11-15	1.0			
		S9	8-9-9	1.5			
		S10	12-12-9	0.9			
15		S11	3-5-7	1.0	15.0 brown tan silty clay & sand-lgravel		
		S12	4-5-7	1.3			
		S13	7-9-11	0.8			
20		S14	7-8-10	1.1			
		S15	10-13-21	1.5	21.0 tan brown sand gravel clay & silt		
		S16	25-31-24	1.3			
25		S17	11-9-10	1.5			DAY RATE
		S18	17-15-33	1.5			MOB
		S19	48-50/1.1	0.6			MPT L/S or Days
		S20	50/0	0			UNSAMPLED
		R1	1-8	0.4	28.5 brown grey silty sandstone		BULK SAMPLE
30							TUBE SAMPLE
		R2	2.7	0.9			CONT. SAMPLING 28.5
							INT. SAMPLING
							ROCK CORING 10.0
35		R3	3.7	0			GROUT 38.5
							P.I.K.
							STAND-BY
					EOB 38.5 ft		
40							

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR219 SXT 2157+13
LOCATION: Somerset Co off ℄

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

WATER: DEPTH: 12.6 TIME: DATE: 2-7-23
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING E-3
G.S. ELEV. 2369.56
PROJ. # 524386
SHEET 1 OF 1

DRILLER: Rich Crum
HELPER: Dylan C
INSPECTOR: Bill

START DATE: 2-7-23
END DATE: 2-7-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
	S1	1-2-3	1.2	0.0		
	S2	9-11-11	1.3	brown-tan sand gravel silt clay		
	S3	13-11-11	1.5			
5	S4	16-17-11	0.9			
	S5	7-9-10	1.2			
	S6	6-7-12	1.1			
10	S7	35-27-25	1.4			
	S8	9-25-50/.2	1.0			
	S9	50/.3	0.3			
	S10	50/.0	ϕ			
15	R1	2.2	ϕ	13.5		
	R2	4.2	0.4	brown-gray sandstone		
20						
	R3	5.0	2.7			
25						DAY RATE
	R4	5.0	4.3			MOB
30						MPT L/S or Days
	R5	2.5	2.4			UNSAMPLED
						BULK SAMPLE
35				EOB 33.5 ft		TUBE SAMPLE
						CONT. SAMPLING 13.5
						INT. SAMPLING
						ROCK CORING 20.0
						GROUT 33.5
						P.I.K.
						STAND-BY
40						

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 219 SR1 2167+20.5
LOCATION: Somerset Co. off 6-YRT

BORING E-4
G.S. ELEV. 2370.48
PROJ. # 527386
SHEET 1 OF 1

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: Rich Cwon
HELPER: Dylan C.
INSPECTOR: Tim

WATER: DEPTH: 25.9 TIME: DATE: 1-23-23
DEPTH: 31.5 TIME: DATE: 1-26-23
DEPTH: TIME: DATE:

START DATE: 1-23-23
END DATE: 1-23-23

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
		S1	1-2-2	0.5	0.0 brown gravel sand silt+clay		
		S2	3-5-6	1.1			
		S3	19-12-26	1.0			
5		S4	12-14-12	0.6			
		S5	12-11-20	0.7			
		S6	15-15-15	1.2			
10		S7	20-29-19	1.1	9.0 brown gravel sand +silt		
		S8	50/.4	0.4			
		S9	50/.3	0.3			
		S10	50/.1	0.1			
15		R1	1-8	1.8	13.6		
		R2	5-0	4.1	brown gray sandstone		
20							
		R3	3.8	2.0			
25					24.3		
		R4	1-3	0	brown gray claystone		
		R5	0.7	0			
30		R6	1-8	0			
					EOB 34.0		
35							
40							

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING 13.6
INT. SAMPLING
ROCK CORING 20.4
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR219 SMP 2179+20
LOCATION: Somerset Co P. off 153 LT

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

WATER: DEPTH: 48.3 TIME: DATE: 1-24-23
DEPTH: 36.6 TIME: DATE: 1-26-23
DEPTH: TIME: DATE:

BORING E-5
G.S. ELEV. 2399.25
PROJ. # 524386.0000
SHEET 1 OF 2

DRILLER: Rich/Dylan
HELPER: Don C
INSPECTOR: Tim

START DATE: 1-23-23
END DATE: 1-24-23

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
		S1	4-6-5	1.5	0.0		
		S2	9-6-5	0.7			
		S3	3-4-3	0.8			
5		S4	3-3-3	1.1			
		S5	3-2-3	∅			
		S6	5-5-5	1.1	brown gry gravel clay sand & silt boulders (mine spoil back fill)		
10		S7	2-3-2	1.1			
		S8	4-2-2	0.3			
		S9	2-2-2	0.7			
15		S10	2-2-2	0.9			
		S11	2-2-2	1.0			
		S12	2-2-3	0.7			
		S13	5-8-8	1.3			
20		S14	2-2-3	0.9			
		S-15	WH-2-2	0.6			
		S16	WH-WH-2	0.6			
25		S17	2-2-2	0.7			
		S-18	3-3-5	1.5			
		S19	2-2-3	1.1			
30		S20	3-3-5	1.0			
		S21	3-2-3	0.7			
		S22	2-3-3	0.7			
		S23	3-5-8	1.2			
35		S24	2-4-6	1.2			
		S25	8-4-7	1.2			
		S26	4-5-9	0.9			
40		S27	7-7-9	0.7			

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING S1.0
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.

TRC TEST BORING LOG

PROJECT: SXA 2179+20
LOCATION: OFA 153 LT

BORING E-5
G.S. ELEV. 2399.75
PROJ. # 524386
SHEET OF

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: Dylan C.
HELPER: Doug C.
INSPECTOR: Tim

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

START DATE: 1-23-23
END DATE: 1-24-23

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
40		S-27	3-2-9	0.7			
		S-28	14-12-8	1.2	brown gravel clay sand silt + boulders (boil fill)		
		S-29	5-11-18	1.3			
45		S-30	10-12-40	1.8			
		S-31	2-8-8	0.6			
		S-32	8-50/.4	0.9			
		S-33	43-14-9	1.0			
50		S-34	7-10-13	0.4			
					EOB 51.0 ft		
55							
60							
65							
70							
75							
80							

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR8219 sect 050
LOCATION:

DRILLING METHOD: 3" Casing NQII
EQUIPMENT USED: XLS CASING SIZE: DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING E-6
G.S. ELEV.
PROJ. # 524386
SHEET 1 OF

DRILLER: Gary Peel
HELPER: Dylan Crum
INSPECTOR: Tim W.H

START DATE: 1-18-23
END DATE: 1-19-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
1.5	SS-1	3-9-3	.6	Brown Sandy Clay Sand Stone Boulders		sta 2215+81
3.0	SS-2	4-12-4C	.8			offset 1.8 RT
4.5	SS-3	35-17-15	1.0			Elev 2392.81
6.0	SS-4	7-11-13	.5			
7.5	SS-5	6-6-10	.6			
9.0	SS-6	13-13-15	.8			
10.5	SS-7	24-21-29	1.0			
12.0	SS-8	35-40-50/4	1.4			
13.5	SS-9	35-49-50/4	1.1			
13.6	SS-10	50/1	.1	13.6		
15.6	R-1	1.7	.3	Brown Sand Stone		
18.6	R-2	2.7	.4			
20	R-3	3.4	2.5			
22.0	R-4	4.7	1.5			
27.0	R-5	5.0	4.0			
32.0	R-6	3.0	2.1			
35						
40						

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING 13.6
INT. SAMPLING
ROCK CORING 21.4
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR6219 Sect 050 Meyersdale to Old Salisbury Rd
LOCATION: Meyersdale PA

DRILLING METHOD: 3" casing
EQUIPMENT USED: Acker XL5 CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING E-7
G.S. ELEV. _____
PROJ. # 5243860
SHEET 1 OF 1

DRILLER: Gary Peel
HELPER: Don Carpenter
INSPECTOR: _____

START DATE: 01-13-23
END DATE: 01- -23

DEPTH	A	BLOWS	REC	DESCRIPTION	Wn	REMARKS
0.0				0.0		
1.5	SS1	2-4-5	1.5	brown sand & gravel		STA 2230+51
3.0	SS2	7-24-13	1.5			OFF ℄
4.5	SS3	11-12-18	0.9			ELEV 2320.25
5						CO Somerset
6.0	SS4	12-16-13	1.2	6.0		
7.5	SS5	8-16-15	1.3	brown sand some clay w/ boulder fragments		
9.0	SS6	16-14-12	0.8			
10	SS7	7-12-11	0.4			
10.5						
12.0	SS8	17-37-12	1.2			
13.5	SS9	7-13-10	0.7			
15.0	SS10	9-15-16	1.3			
16.5	SS11	5-14-18	1.2			
18.0	SS12	18-23-14	0.6			
19.5	SS13	6-8-9	0.9			
20						
21.0	SS14	10-13-23	1.2			
22.5	SS15	5-8-10	0.9			
24.0	SS16	16-13-14	1.2			
25.1	SS17	8-20-50/0.1	1.1			
25.5	X	Advanced to 25.5'	X			
27.0	SS18	13-27-13	0.6			
28.5	SS19	7-13-11	1.0			
29.9	SS20	11-11-50/0.4	0.4	30.0		
30.0	SS21	Advanced to 30.0	0.0	31.3 brown sandstone weathered claystone		
32.0	R1	50/0.2 REC 2.0	RQD 1.3			
	R2	3.0	0.0	33.5 red weathered claystone		
35.0						
	R3	3.0	0.0	AD H_2O		
40				40.0		

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR6219 Sect 050 Meyersdale to old Salisbury Road
LOCATION:

DRILLING METHOD: 3" Casing & NQII
EQUIPMENT USED: XLS CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING E-8
G.S. ELEV. _____
PROJ. # 524386
SHEET 1 OF 3

DRILLER: Gary Peel
HELPER: Dylan Crum
INSPECTOR: _____

START DATE: 1-16-23
END DATE: _____

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
1.5	SS-1	2-2-2	.4	Brown Sandy Clay Sand Stone Frag		STA 2246+22.6 offset Elev 2469.77 Somerset Co.
3.0	SS-2	4-8-8	1.5			
4.5	SS-3	8-9-12	1.5			
6.0	SS-4	9-11-12	1.1			
7.5	SS-5	20-16-18	1.3			
8.8 9.0	SS-6	20-29-50/4	1.3	8.9		
10	SS-7	16-15-29	1.1	Brown Sandy Clay Sand stone Boulder		
10.5	SS-8	17-22-29	1.2			
12.0	SS-9	9-17-14	.7			
13.5	SS-10	8-24-15	.8			
15	SS-11	50-50/2	.6			
16.5	SS-12	50/0	0.0	16.5		
	R-1	1.8	.8	Sand Stone Hard		
20	R-2	2.8	2.4			
21.5	R-3	4.9	3.9			Rain day 1-17-23
26.5	R-4	4.9	4.0			
30						
31.5	R-5	5.0	4.5			
36.5	R-6	4.6	2.6			
40						

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 6219 sect 050 meyersdale to old salisbury rd
LOCATION:

DRILLING METHOD: 3" Casing
EQUIPMENT USED: XLS CASING SIZE: DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING B-8
G.S. ELEV.
PROJ. # 524386
SHEET 2 OF 3

DRILLER: Gary Peel
HELPER: Dylan Crum
INSPECTOR:

START DATE: 1-16-23
END DATE:

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
41.5		R6	4.6	2.6			
5		R-7	5.0	4.8	Hard Sand Stone		
47.5							
10		R8	4.9	4.2			
51.5							
15		R9	4.9	3.8			
56.5							
20		R10	5.0	.8			
61.5							
25		R11	4.5	1.4			
66.5							
30		R12	4.9	1.9			
71.5							
35		R13	5.0	3.0			
76.5							
40		R14	4.5	4.2			

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 0219 Sect 050 Meyersdale to Old Salisbury rd
LOCATION:
DRILLING METHOD: 3" Casing
EQUIPMENT USED: XCS CASING SIZE: DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING E-8
G.S. ELEV.
PROJ. # 524386
SHEET 3 OF 3

DRILLER: Gary
HELPER: Dylan
INSPECTOR: Tim W.

START DATE: 1-16-23
END DATE: 1-13-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
81.5	R 14	4.5	4.2	81.0 Hard Sand Stone		
				83.0 Clay Seam		
5	R 15	4.0	1.2	Weathered Clay Stone		
86.5				86		
	R 16	4.0	1.2	Sandy Shale		
10 91.5						
	R 17	4.3	1.9			
15 96.5						
	R 18	3.5	3.3			
100.0 20				TD 100.0		
25						
30						
35						
40						

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 219 SM 2325+92
LOCATION: Somerset Co off 180 LT

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

WATER: DEPTH: surface TIME: DATE: 1-30-23
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING E-9
G.S. ELEV. 2436.61
PROJ. # 524386
SHEET 1 OF 1

DRILLER: Rich C.
HELPER: Don C.
INSPECTOR: Tim

START DATE: 1-30-23
END DATE: 1-30-23

DEPTH		A	B	C	DESCRIPTION	Wn	REMARKS
		S1	5-5-6	1.3	0.0 brown sand gravel clay silt		
		S2	6-7-9	1.1			
		S3	7-13-12	1.2			
5		S4	10-12-15	1.2	4.5 brown gravel sand clay silt		
		S5	17-15-14	1.3			
		S6	9-50-29	0.7			
10		S7	18-14-12	1.2			
		S8	12-13-19	1.3			
		S9	20-11-15	1.1			
		S10	16-17-17	1.4			
15		S11	34-30-15	1.1			
		S12	32-29-34	1.2			
		S13	28-27-30	1.0			
20		S14	22-23-50	0.6			
		S15	25-14-50/2	0.8			
		S16	50/0	0			
		R1	1.9	0.7	22.5 gray sandstone		
25		R2	2.6	2.4			DAY RATE
							MOB
							MPT L/S or Days
							UNSAMPLED
							BULK SAMPLE
30		R3	3.3	1.8			TUBE SAMPLE
							CONT. SAMPLING 2
					EOB 31.0 Ft		INT. SAMPLING
							ROCK CORING 8.
35							GROUT
							P.I.K.
							STAND-BY
40							

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050 Myersdale to Old Salisbury Rd
LOCATION: Meyersdale, PA

DRILLING METHOD: 3" Casing
EQUIPMENT USED: Acker YCS CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING: E-10
G.S. ELEV.: _____
PROJ. #: 524386
SHEET 1 OF 2

DRILLER: Gary Peel
HELPER: Don Carpenter
INSPECTOR: Tim Witt

START DATE: 01-10-23
END DATE: 01-10-23

DEPTH	A	BLOWS	REC	DESCRIPTION	Wn	REMARKS
0.0				0.0		
1.5	SS1	2-2-2	1.0	Brown sand, some clay, trace silt		STA: 2370+10
3.0	SS2	4-10-15	1.2			OFF: 163' RT
4.5	SS3	12-12-15	1.1			ELEV: 2443.21
5 6.0	SS4	15-15-14	1.0			CO. Somerset
7.5	SS5	8-9-12	1.3			
9.0	SS6	11-13-13	1.2	10.5		
10 10.5	SS7	5-7-8	1.3	residual clay w/weathered shale fragments		
12.0	SS8	7-8-6	1.2	12.0		
12.5	SS9	11-9-9	1.2	sand w/weathered shale		
15.0	SS10	10-22-29	1.3			
16.5	SS11	19-34-50	1.3			
17.4	SS12	37-50/0.4				
18.0	SS13	Advanced to 180 50/0.4	X	18.1		
18.1	R1	REC 1.9	Rock 0.0	gray shale		
20.1	R2	1.6	0.0			
22.0	R3	5.0	2.7			
25				26.0		
27.0	R4	5.0	2.9	Sandy Shale		
30						
32.0	R5	5.0	3.0			
35				37.0		
37.0	R6	Next page		Hard sandstone		
40						

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050 Meyersdale to Old Salisbury Rd
LOCATION: Meyersdale PA

BORING E-10
G.S. ELEV.
PROJ. # 524380
SHEET 2 OF 2

DRILLING METHOD:
EQUIPMENT USED: CASING SIZE: DEPTH:

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

START DATE: 01-10-23
END DATE: 01-10-23

DEPTH	A	REC B	C	DESCRIPTION	Wn	REMARKS
42.0	R6	4.6	3.6	Hard Sandstone		
47.0	R7	4.7	3.8			
52.0	R8	5.0	3.9	52.0		
57.0	R9	4.9	2.4	Sandy shale 55.5 57.0 gray shale		
62.0	R10	5.0	4.5	Sandy shale		
65.0	R11	3.0	2.0	65.0		10-11-23 1120 9:00AM 28.9'
70						
75						
80						

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING
INT. SAMPLING
ROCK CORING
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd
DRILLING METHOD: NW. 3" casing
EQUIPMENT USED: Acker XLS CASING SIZE: 3" DEPTH:

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

BORING E-11
G.S. ELEV. 2346.77
PROJ. # 524386
SHEET 1 OF 3

DRILLER: Gary Peel
HELPER: Don Carpenter
INSPECTOR: Tim Witt

START DATE: 02-07-23
END DATE: 02-07-23

DEPTH		A	BLOWS	REC	0.0 DESCRIPTION	Wn	REMARKS
0.0		SS1	2-5-6	1.2	gray + brown sand + gravel (f.11) + clay		STA 2405+26.4
1.5		SS2	5-8-8	0.7			OFF ℄ 225.23 LT
3.0		SS3	4-6-7	1.0			ELEV 2346.77
4.5		SS4	5-5-6	0.9			CO Somerset
5							
6.0		SS5	2-4-4	0.9			AD H_2O
7.5		SS6	5-4-4	0.6			42.6'
9.0		SS7	3-4-2	0.6			
10							
10.5		SS8	3-3-3	0.9			
12.0		SS9	2-2-2	0.4			
13.5		SS10	6-7-4	0.8			
15.0		SS11	2-5-4	0.4			
16.5		SS12	3-4-4	0.3			
18.0		SS13	3-2-3	0.1			
19.5		SS14	2-3-4	0.7			
20		SS15	3-6-5	0.8			
21.0		SS16	3-3-11	1.2			
22.5		SS17	2-3-2	0.7			
24.0		SS18	2-2-2	0.5			
25		SS19	10-15-7	0.7			
25.5		SS30	18-11-10	0.5			
27.0		SS31	5-11-17	0.9	31.5		
28.5		SS32	28-29-50	1.0	weathered gray claystone		
30.0		SS33	28-30-30	0.7			
31.5		SS34	24-50-50/0.1	1.0			
33.0		R1	REC 1.0	RQD 0.0	gray claystone		
34.5							
35		R					
35.6		2	2.9	2.3	39.0 gry sandy shale		
37.0							
40.0							

DAY RATE
MOB
MPT L/S or Days
UNSAMPLED
BULK SAMPLE
TUBE SAMPLE
CONT. SAMPLING 35.6
INT. SAMPLING
ROCK CORING 56.4
GROUT
P.I.K.
STAND-BY

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

TRC TEST BORING LOG

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd
DRILLING METHOD: 3" NW casing
EQUIPMENT USED: Acker XL5 CASING SIZE: _____ DEPTH: _____

WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____

BORING E-11
G.S. ELEV. _____
PROJ. # 524386
SHEET 2 OF 3

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim Wilt

START DATE: 02-07-23
END DATE: 02-07-23

DEPTH		A	B REC	RQD	DESCRIPTION	Wn	REMARKS
40.0		R3			gray sandy shale		
42.0			1.9	1.1			
		R4					
5							
47.0			5.0	0.8			
					48.0		
		R5			gray sandstone some shale beddings		
10							
52.0			5.0	3.3			
		R6			54.5		
15					55.5 brown silty clay		
57.0			5.0	2.1	gray Sandstone w/some shale beddings		
		R7					
20							
62.0			4.8	3.2			
		R8					
25							
67.0			5.0	4.0	66.5		
		R9			gray sandstone brown		
30							
72.0			4.8	3.2			
		R10					
35					75.5		
77.0			4.5	3.2	77.0 gray Sandy shale		
		R11			78.5 gray claystone		
40			next page		gray sandy shale		

DAY RATE _____
MOB _____
MPT L/S or Days _____
UNSAMPLED _____
BULK SAMPLE _____
TUBE SAMPLE _____
CONT. SAMPLING _____
INT. SAMPLING _____
ROCK CORING _____
GROUT _____
P.I.K. _____
STAND-BY _____

FIELD COPY - PRELIMINARY DATA ONLY

DRN. _____
CKD. _____

TRC TEST BORING LOG

BORING E-11
G.S. ELEV.
PROJ. # 5243860
SHEET 3 OF 3

PROJECT: SR 6219 Sect 050
LOCATION: Meyersdale to Old Salisbury Rd

DRILLING METHOD: 3¼" NW casing
EQUIPMENT USED: Acker X65 CASING SIZE: DEPTH:

DRILLER: Gary
HELPER: Don
INSPECTOR: Tim

WATER: DEPTH: TIME: DATE:
DEPTH: TIME: DATE:
DEPTH: TIME: DATE:

START DATE: 02-07-23
END DATE: 02-07-23

DEPTH	A	B	C	DESCRIPTION	Wn	REMARKS
82.0	R11	5.0	4.5	gray sandy shale		
5	R12	5.0	5.0			
87.0	R13			AD H_2O		
89.9				42.6		
10						
92.0		5.0	2.7	92.0 gray Siltstone		
15						
20						
25						DAY RATE MOB MPT L/S or Days UNSAMPLED BULK SAMPLE TUBE SAMPLE CONT. SAMPLING INT. SAMPLING ROCK CORING GROUT P.I.K. STAND-BY
30						
35						
40						

FIELD COPY - PRELIMINARY DATA ONLY

DRN.
CKD.

APPENDIX I
Core Box Photographs

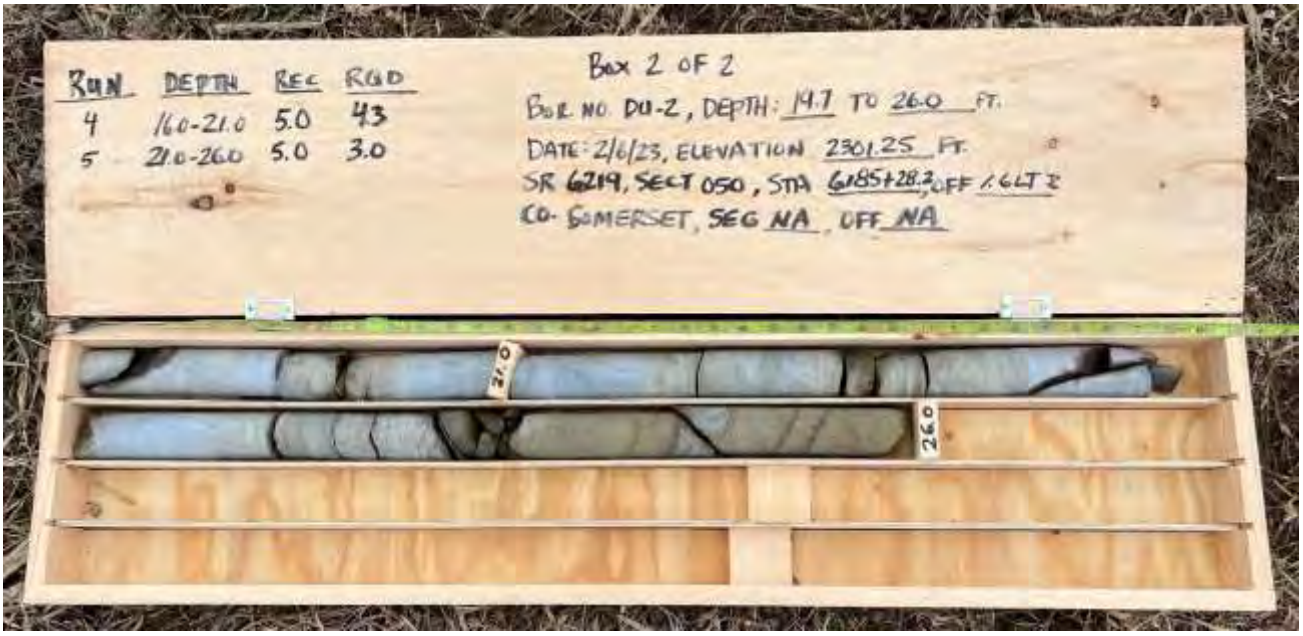
LIST OF PHOTOGRAPHS

- **DU-1 (2)**
- **DU-2 (2)**
- **DU-3 (9)**
- **DU-5 (5)**
- **DU-6 (11)**
- **E-1A (4)**
- **E-2 (2)**
- **E-3 (2)**
- **E-4 (2)**
- **E-5 (1)**
- **E-6 (2)**
- **E-7 (2)**
- **E-8 (6)**
- **E-9 (1)**
- **E-10 (4)**
- **E-11 (5)**

DU-1, Box 1 of 2

DU-1, Box 2 of 2

DU-2, Box 1 of 2



DU-2, Box 2 of 2

DU-3, Box 1 of 9

DU-3, Box 2 of 9

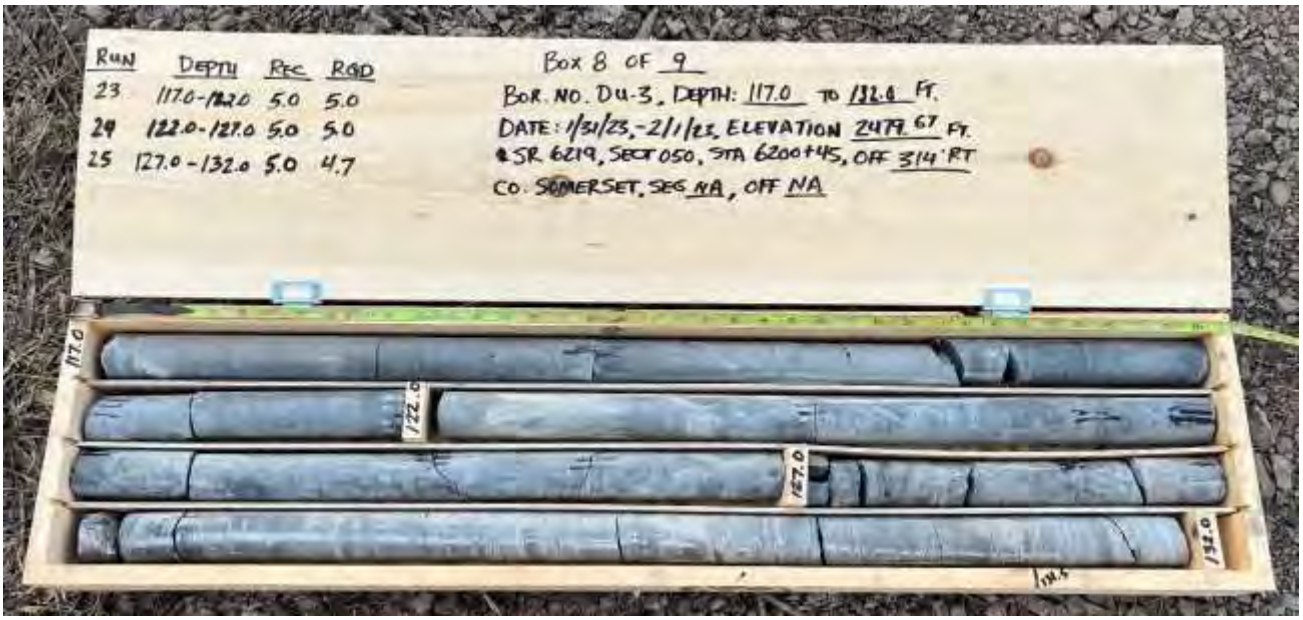
DU-3, Box 3 of 9

DU-3, Box 4 of 9

DU-3, Box 5 of 9

DU-3, Box 6 of 9

DU-3, Box 7 of 9



DU-3, Box 8 of 9

DU-3, Box 9 of 9

DU-5, Box 1 of 5

DU-5, Box 2 of 5

DU-5, Box 3 of 5

DU-5, Box 4 of 5

DU-5, Box 5 of 5

DU-6, Box 1 of 11

DU-6, Box 2 of 11

DU-6, Box 3 of 11

DU-6, Box 4 of 11

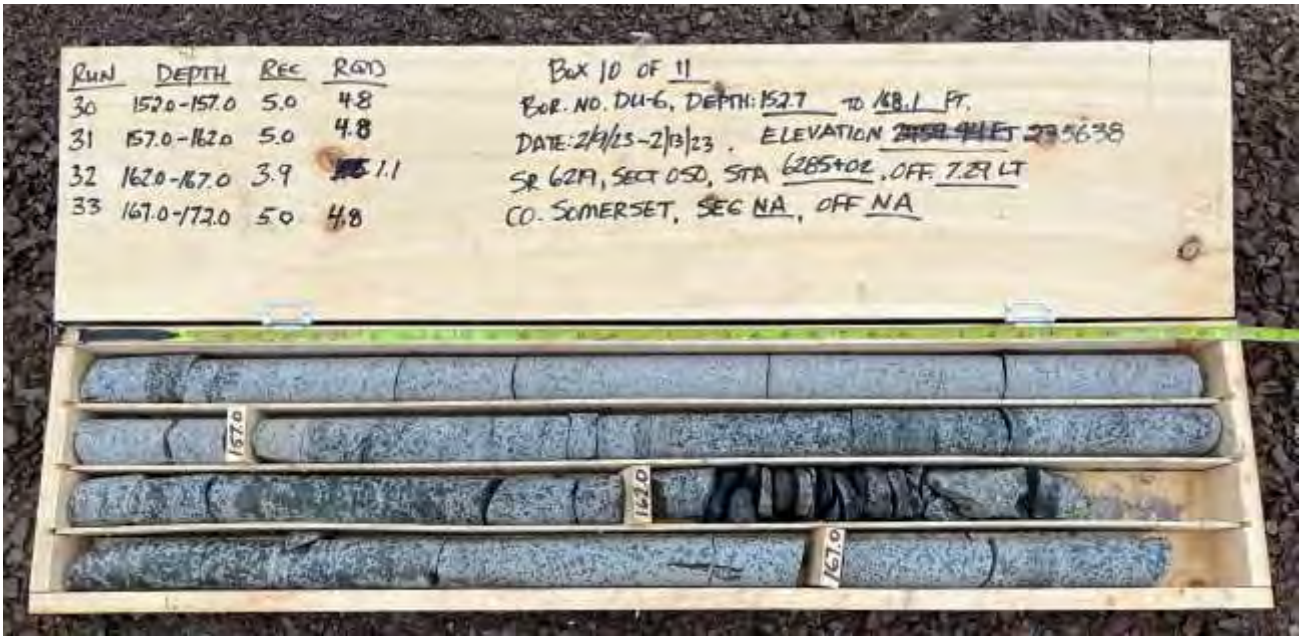
DU-6, Box 5 of 11

DU-6, Box 6 of 11

DU-6, Box 7 of 11

DU-6, Box 8 of 11

DU-6, Box 9 of 11



DU-6, Box 10 of 11

DU-6, Box 11 of 11

E-1A, Box 1 of 4

Run No	DEPTH	Recovery	RQD
8	26.0-31.0	5.0	3.3
9	31.0-36.0	3.8	0.4
10	36.0-41.0	4.9	0.7
11	41.0-46.0	9.6	2.0

E-1A, Box 2 of 4

Run No	DEPTH	Recovery	RQD
11	41.0-46.0	9.6	2.0
12	46.0-51.0	5.0	3.7
13	51.0-56.0	4.8	4.1
14	56.0-60.0	9.0	7.1

E-1A, Box 3 of 4

E-1A, Box 4 of 4

E-2, Box 1 of 2

E-2, Box 2 of 2

E-3, Box 1 of 2

E-3, Box 2 of 2

E-4, Box 1 of 2

E-4, Box 2 of 2

E-5, Box 1 of 1

E-6, Box 1 of 2

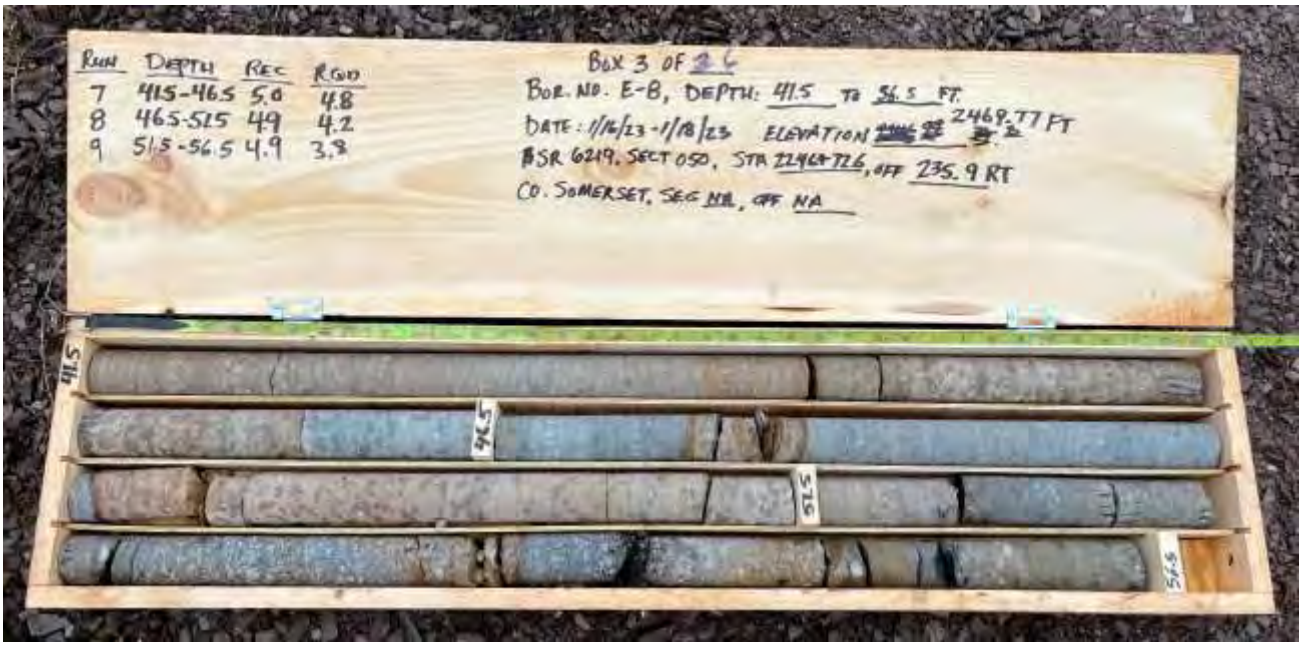
E-6, Box 2 of 2

E-7, Box 1 of 2

E-7, Box 2 of 2

E-8, Box 1 of 6

E-8, Box 2 of 6



E-8, Box 3 of 6

E-8, Box 4 of 6

E-8, Box 5 of 6

E-8, Box 6 of 6

E-9, Box 1 of 1

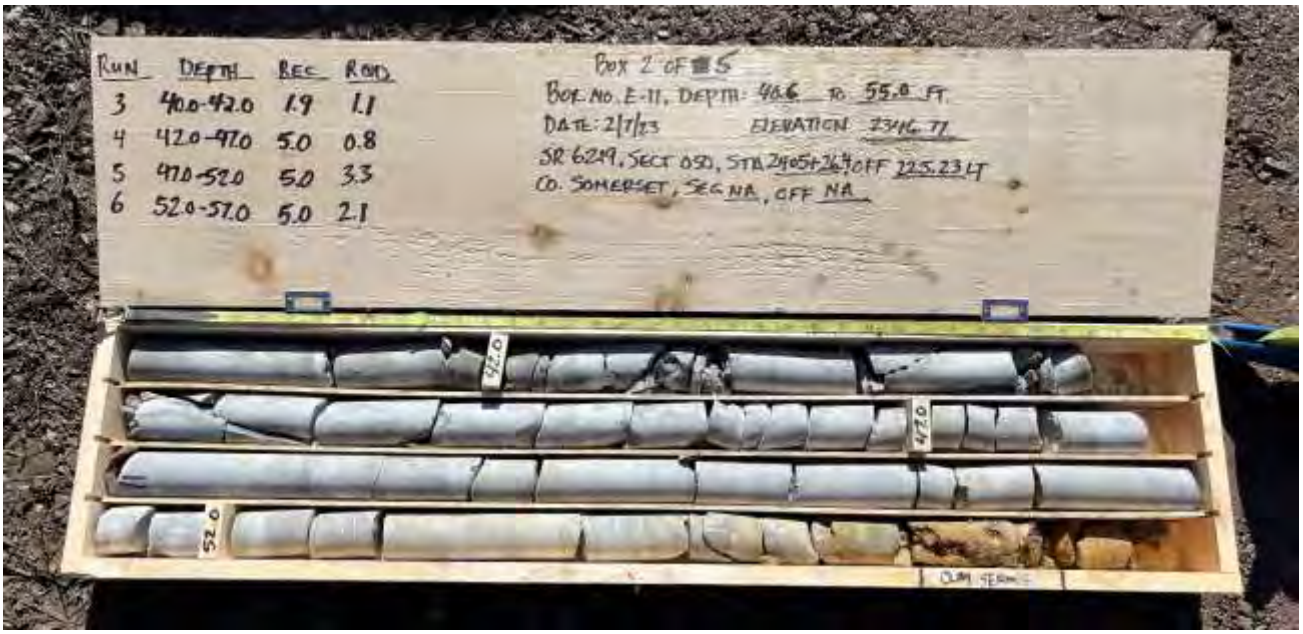
E-10, Box 1 of 4

E-10, Box 2 of 4

E-10, Box 3 of 4

E-10, Box 4 of 4

E-11, Box 1 of 5



E-11, Box 2 of 5

E-11, Box 3 of 5

E-11, Box 4 of 5

E-11, Box 5 of 5

APPENDIX J
Subsurface Plans, Profiles, and Cross Sections

TABLE OF CONTENTS

ALIGNMENT E
SUBSURFACE PLAN, PROFILE, AND CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

P-20

P-21

ALIGNMENT E

MATCH LINE STA. 2077+50

FILL WITH RUBBLE AND TRASH

LEDGE CREEK BED

SANDSTONE AND CLAYSTONE AND BLACK SHALE IN CREEK BED

CHURCH

SOYBEAN FIELD

HAYFIELD/ CORNFIELD

CATTAILS/ SOFT & WET

STANDING WATER

TREATMENT/ SETTLING POND

POSSIBLE RECLAIMATION

CORNFIELD

T.V. TOWER

UNRECLAIMED STRIP MINE

PARKING

GRASS FIELD

HAYFIELD

WETLAND

STREAM

2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB- PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM- PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 2077+50

MATCH LINE STA. 2135+00

ALIGNMENT E

WOODED

THICK UNDERBRUSH SPARSELY WOODED RECENT LOGGING WITH SANDSTONE FLOAT

2080

2085

2090

2095

2100

2105

2110

2115

2120

2125

2130

TREE LINE

TRACTOR ROAD

B-16

PASTURE/FIELD

HAYFIELD

BRUSHY FIELD

SOFT & WET

WOODED

SANDSTONE FLOAT

DENSE VEGETATION

HEAVILY WOODED SPARSE SANDSTONE FLOAT

LIGHTLY WOODED WITH OCCASIONAL SANDSTONE FLOAT

416 (MD)

HAYFIELD RECLAIMED STRIP MINE

PUNCH MINES WITH MOUNDS

HEAVILY WOODED WITH SANDSTONE FLOAT

SANDSTONE BOULDER FLOAT

E-2

SCATTERED SAPLING MAPLE TREE LINES

SPRING WITH AMD

ACTIVE STREAM

SANDSTONE BOULDER PILE

OPEN WOODS WITH OCCASIONAL SANDSTONE FLOAT

& GRASS

TRACTOR ROAD

CORNFIELD

APPROX LIMIT

E-1A

TREE LINE

HAYFIELD RECLAIMED STRIP MINE

HEAVILY WOODED OCCASIONAL SANDSTONE FLOAT

SPOILS

FILLED WITH WATER

ABANDONED STRIP MINE

NUMEROUS TRACES OF CARBONACEOUS SHALE & COAL FRAGMENTS (PROSPECT ?)

TRIBUTARY LIGHT FLOW TO INTERMITENT FLOW 8/18/22

PUNCH MINE

TREELINE

HAYFIELD

PASTURE/FIELD

LEGEND

E- TEST BORING (DRILLED 2023)

DU-

P– PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT– PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

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GM– PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
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HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 2192+50

MATCH LINE STA. 2135+00

56880111 (PA)

18062

DU-1

E-3

E-4

E-5

P-22B

P-22A

P-22

PLANTED FIELD

SPRING

VERY WET FLAGGY INSTREAM

SHALE FLOAT ON GAS RIM

HEAVILY WOODED WITH SANDSTONE FLOAT

TREE LINE

OVERGROWN PASTURE/ POSSIBLE STRIP MINE

PASTURE/ FIELD

PUNCH PROJECTED MINE

AGRICULTURAL FIELD

DENSE TREES LIGHT SANDSTONE FLOAT

PONDED WATER

STREAM BANK

STREAM MEANDERS

DENSELY WOODED WITH SANDSTONE FLOAT

STEEP WITH LEDGE & HEMLOCKS

SANDSTONE COBBLE MOUND POSSIBLE SPOIL

PENN COAL LAND RECLAIMED STRIP MINE GRASS FIELD WITH BOULDER FLOAT

SEDIMENTATION POND FOR WASTE FROM MINE DISCHARGE TREATMENT PONDS

ACTIVE STREAM

SANDSTONE FRAGMENTS, CARBONACEOUS SHALE FLOAT STARTS)

POSSIBLE PUNCH MINE & MOUNDS

HEAVILY WOOD WITH SANDST FLOAT (PREVIOUSLY LO

PREVIOUS CLEAR CU (YEAR 200

TREE LINE

FLOWING TRIBUTARY 7/1/22

VERTICAL PVC PIPES

NUMEROUS SANDSTONE BOULDERS

SPRINGS

OLD RAIL LINE ENTRANCE TO MINE

COLLAPSED DEEP MINE ENTRY

ACTIVE STREAM

MARSHY

SCATTERED COAL FRAGMENTS

RECLAIMED STRIP MINE WITH SANDSTONE FLOAT

GAS RIM

WOODED

LIGHTLY WOODED WITH OCCASIONAL SANDSTONE FLOAT

OPEN FIELD WITH WEEDS

TREE LINE

OPEN WOODS

POSSIBLE SURFACE MINE

HEAVILY WOODED UPPER END

WELL ROUNDED GRAVEL & COBBLE STREAM BED

ALONG MEADOW CREEK

HEAVILY WOODED WITH SANDSTONE FLOAT IN MOUNTAIN LAUREL

BOULDER PILE

TREE LINE

GAS RIM

TREELINE

WOODED WITH OCCASIONAL SANDSTONE FLOAT

GOOD TRAM ROAD

MOUND OF SANDSTONE BOULDERS

MARKOWITZ PROPERTY

BARN

HOUSE

HAYFIELD RECLAIMED STRIP MINE

HIGHWALL AND MINE PIT WITH STANDING WATER

MINE SPOIL PILES

SANDSTONE AND CARBONACEOUS SHALE MINE SPOIL

2135

2140

2145

2150

2155

2160

2165

2170

2175

2180

2185

2190

LEGEND

E- TEST BORING (DRILLED 2023)

DU- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB- PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

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NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 2192+50

MATCH LINE STA. 2250+00

HEAVILY WOODED WITH SANDSTONE FLOAT

MULTIPLE NEWLY CLEARED PATHS

DENSE WOODS YOUNG TREES WITH SANDSTONE FLOAT, PREVIOUSLY LOGGED

SANDSTONE FLOAT

LARGE SANDSTONE BOULDER FLOAT

HEAVILY WOODED SANDSTONE FLOAT PREVIOUSLY LOGGED

STEEP TOPOGRAPHY

BROWN ROAD

SOIL COVERED BOULDER SLOPES

ALLUVIAL BENCH WELL GRAVEL AND COBBLES

SANDSTONE OUTCROP

RECENT LOGGING

OPEN PIT

GOOD ACCESS ROAD

GOOD ACCESS ROAD

GOOD ACCESS ROAD

GOOD ACCESS ROAD

GOOD ACCESS ROAD

GOOD ACCESS ROAD

HEAVILY WOODED WITH SANDSTONE FLOAT

HEAVILY WOODED WITH SANDSTONE FLOAT (PREVIOUSLY LOGGED)

GENTLE TOPO (PREVIOUSLY LOGGED)

HEAVILY WOODED SANDSTONE FLOAT (PREVIOUSLY LOGGED)

HEAVILY WOODED DENSE VEGETATION

SANDSTONE & LIMESTONE BOULDERS IN CREEK

OUTCROP CONTACT SANDSTONE OVER RED CLAY SHALE

FLOWING TRIBUTARY 6-30-22

DRY TRIBUTARY 6-30-22

PINEY CREEK

ALLUVIUM

COLLUVIUM WITH SANDSTONE BOULDERS

HEAVILY WOODED WITH CONGLOMERATE SANDSTONE FLOAT

HEAVILY WOODED WITH SANDSTONE FLOAT

HEAVILY WOODED WITH SANDSTONE FLOAT

SILTY SANDY SHALE ORANGE-BROWN (MAUCH?)

FLAGGY SANDSTONE OUTCROP BEDDING 13° NW

MASSIVE CONGLOMERATE SANDSTONE BOULDERS (POTTSVILLE?)

HEAVILY WOODED WITH YOUNG TREES, OCCASIONAL SANDSTONE FLOAT

LARGE CONGLOMERATE BOULDERS

BENCH

STEEP TOPOGRAPHY

VERY STEEP TOPO (POTTSVILLE OUTCROP?)

CROSSES TRAIL CONGLOMERATE SANDSTONE FLOAT (POTTSVILLE)

ABANDONED LIMESTONE MINE ENTRANCE

P-18

P-19

E-6

E-7

E-8

15514

8737

2195

2200

2205

2210

2215

2220

2225

2230

2235

2240

2245

LEGEND

E-DU- TEST BORING (DRILLED 2023)

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NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

W.P.A. 10-1-3

40A76SM8

DU-5

DU-6

P-14

P-15

MATCH LINE STA. 2250+00

MATCH LINE STA. 2307+50

DENSELY WOODED WITH SANDSTONE FLOAT, YOUNG TREES, PREVIOUSLY LOGGED

DENSE VEGETATION

HEAVILY WOODED YOUNG TREES, THICK BRUSH, OCCASIONAL SANDSTONE FLOAT

TRIBUTARY WITH RUNNING WATER

PREVIOUSLY AND RECENTLY LOGGED

HEAVILY WOODED YOUNG TREES, THICK BRUSH, OCCASIONAL SANDSTONE FLOAT

HEAVILY WOODED, THICK BRUSH, WITH SANDSTONE FLOAT

PREVIOUSLY LOGGED

SANDSTONE BOULDER FIELD

SANDSTONE BOULDERS

YOUNG STREAM CROSSING OF

APPROXIMATE ORANGE IN VEGETATION

HEAVILY WOODED WITH MATURE TREES AND SANDSTONE FLOAT

YOUNG TREES WITH THICK BRUSH & SANDSTONE FLOAT

HEAVILY WOODED DENSE VEGETATION

WELL DEVELOPED TRAIL

DENSE UNDERBRUSH LOW VISABILITY CARBONACEOUS SHALE & SANDSTONE ON DIRT ROAD

DENSELY WOODED LIGHT UNDERBRUSH WITH SANDSTONE FLOAT

CURRENT INACTIVE/ NON PERSISTENT STREAM

DENSELY WOODED WITH SANDSTONE FLOAT

YOUNG TREES LOW VISABILITY

SANDSTONE BOULDERS STEEP TOPOGRAPHY THIN BEDDED POSSIBLE BEDROCK CONTACT

DENSELY WOODED WITH TREES AND SANDSTONE FLOAT

CURRENTLY INACTIVE STREAM WITH BANKS 4-6' HIGH

CURRENT INACTIVE STREAM

BOULDER FIELD

FLAGGY SANDSTONE OUTCROP

GOOD ACCESS

STEEP TO MODERATE TOPOGRAPHY WITH POSSIBLE SANDSTONE BEDROCK CONTACT

SHALE DIFFERENTIAL WEATHERING

STEEP TOPO POSSIBLE SANDSTONE BEDROCK CONTACT

TRUE TO SCALE WELL DEFINED STREAM

ARTESIAN FLOW CONCENTRATION AT 7.5FA

HEAVILY WOODED WITH MASSIVE SANDSTONE BOULDERS

PANTHER HOLE DID NOT LOCATE

CAMP SITE

STRAY SHALE & COAL FRAGMENTS

CARBONACEOUS SHALE & COAL FRAGMENTS

HEAVILY WOODED WITH SANDSTONE BOULDERS

DENSELY WOODED WITH SANDSTONE FLOAT

HEAVILY WOODED WITH SANDSTONE FLOAT

CURRENTLY INACTIVE STREAM WITH BANKS 4-6' HIGH

SUBROUNDED SANDSTONE GRAVEL & COBBLES IN CHANNEL

INACTIVE STREAM

INACTIVE STREAM/ MARSHY

CURRENT INACTIVE STREAM

2250 2255 2260 2265 2270 2275 2280 2285 2290 2295 2300 2305

LEGEND

E- DU- TEST BORING (DRILLED 2023)

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NOTE:
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HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

463M127

4071BSM2

P-9/9A

4071BSM2

4073SM1

HAYFIELD/PASTURE

UNRECLAIMED STRIP MINE

SPOIL

EXCAVATION

SILTSTONE EXPOSURE

SPOIL

HEAVILY WOODED WITH SANDSTONE FLOAT

CULVERT UNDER DIRT ROAD

UNKNOWN BENCH

STREAM

DENSELY WOODED WITH SANDSTONE FLOAT

P-10

E-9

55 GAL. DRUM TAPPED INTO SPRING

DENSELY WOODED WITH SANDSTONE FLOAT

ACTIVE DAYLIGHTING SPRING

MOUND

DAYLIGHTING UNDERGROUND SPRING

RECLAIMED STRIP MINE, BOUNDARIES UNKNOWN

APPROXIMATE BOUNDRY

LARGE MOUND

FLAT MOUND

OVAL MOUNDS

STRIP MINED

DENSELY WOODED WITH DENSE SANDSTONE FLOAT

NOT STRIP MINED

ACTIVE UNDERGROUND SPRINGS

DAYLIGHTING SPRINGS IN A BOULDER MATRIX

DENSELY WOODED WITH SANDSTONE FLOAT

MATCH LINE STA. 2307+50

MATCH LINE STA. 2365+00

2310 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360

CISTERN WATER SUPPLY ?

HEAVILY WOODED WITH SANDSTONE MASIVE FLOAT

HEAVILY WOODED WITH SANDSTONE FLOAT

STREAM

TRAIL

LINEAR SHAPED CHANNEL WITH HARD SANDSTONE BOULDERS

DENSELY WOODED WITH SANDSTONE FLOAT

POSSIBLE SLUMP NOT FIELD VERIFIED

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

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NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 2365+00

MATCH LINE STA. 2422+50

4073SM1

8638

467M022

4073SM21

4073SM23

467M019

E-10

E-17

PUNCHMINE

PUNCHMINE

ESTIMATED LOCATION OF CLEVENGER WELL

RECLAIMED STRIP MINE

DENSELY WOODED WITH HARD SANDSTONE BOULDERS

2370

2375

2380

2385

2390

2395

2400

2405

2410

2415

2420

MAIN CHANNEL

ACTIVE SPRINGS

SANDSTONE BOULDER TRAIL

BOULDER WALL

LINEAR TRENCH

ACTIVE UNDERGROUND SPRINGS

HEAVILY BOULDERED

HEAVILY WOODED WITH SANDSTONE FLOAT

BOULDER PILE

SEEP FROM POND

UNDERGROUND STREAMS

STRIP MINE UNRECLAIMED

POND

ARTESIAN CONDITIONS FROM UNPLUGGED WELL

SANDSTONE AND CARBONACEOUS SHALE FLOAT

CARBONACEOUS SHALE AND SANDSTONE FLOAT (POSSIBLY STRIP MINE)

PIEZOMETER AT P-11 (2004)

GRASS FIELD

CLEARING WITH SEVERAL SHALLOW PITS

DISTURBED GROUND APPROX. 10' DEEP (PUNCH MINE)

MARSHY

BARACADE

SANDSTONE BOULDERS

SANDSTONE BOULDERS

MINE DISCHARGE

SANDSTONE LINED RUNOFF CHANNEL (DRY)

YARD

YARD

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P– PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT– PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB– PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM– PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

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MATCH LINE STA. 2422+50

CASSELMAN RIVER

ATHLETIC FIELD

MARKED WETLAND

CULVERT PIPE

EXISTING CULVERT

ORANGE MINE WATER

CORRUGATED PIPE

WETLAND

MINE SURVEY SIGN

GAS PIPELINE

TALUS WITH CARBONACEOUS SHALE

EXISTING EMBANKMENT-WELL VEGETATED

SHALE TALUS

YARD

EXISTING EMBANKMENT-WELL VEGETATED

SOME MINE SPOIL POSSIBLE IN CUT

EXISTING CUT

PASTURE/GRASS FIELD

RADIO TATION

PRIVATE FENCE

PASTURE

40A77SM5

2425 2430 2435 2440 2445 2450 2455 2460 2465 2470 2475 2480

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P– PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT– PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB– PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM– PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

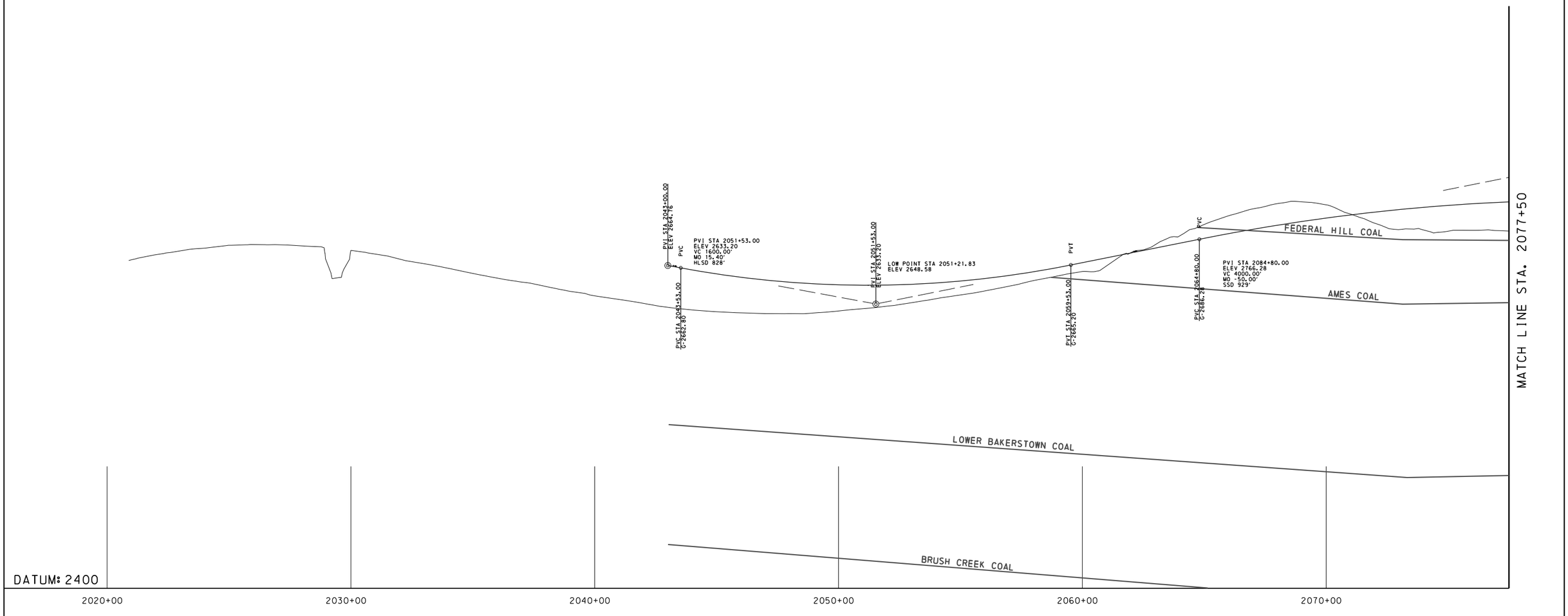
HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY



VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

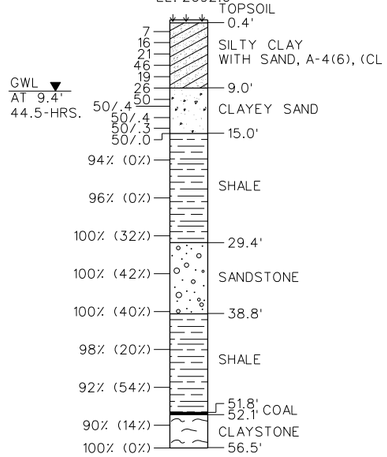
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E PROFILE

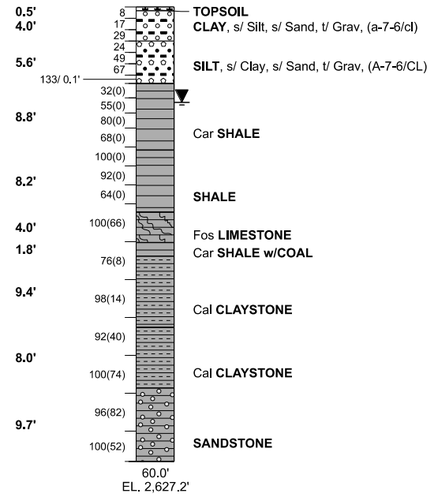
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

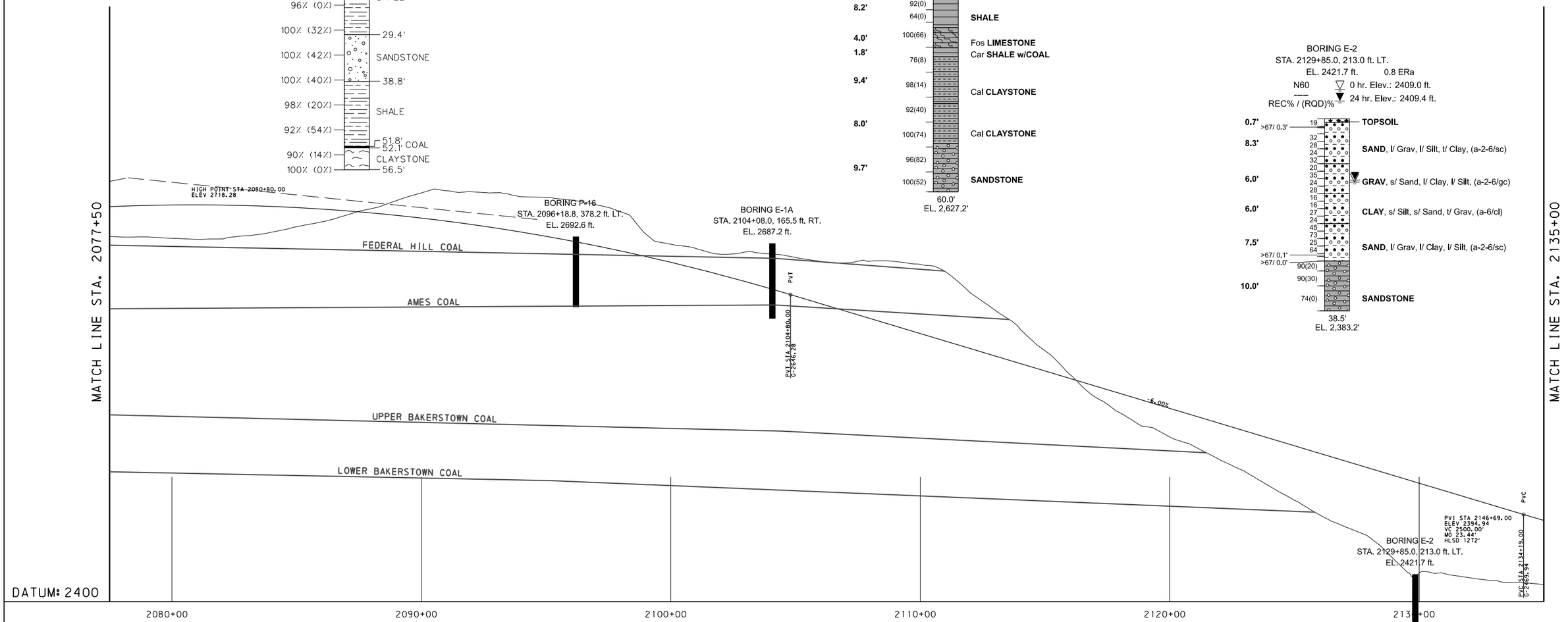
P-16
STA. 2096+18.8
S.R. 6219
378.2 LT., LINE E
EL. 2692.6



BORING E-1A
STA. 2104+08.0, 165.5 ft. RT.
EL. 2687.2 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2674.6 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2674.6 ft.



BORING E-2
STA. 2129+85.0, 213.0 ft. LT.
EL. 2421.7 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2409.0 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2409.4 ft.



LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
P-16	2096+18.8 378.2 ft. LT.	S-3 to 6	3.0 to 9.0	15.8	9.1	21.9	8.9	13.0	69.0	37.1	31.9	A-4(6)	CL		33	23	10					
E-1A	2104+08.0 165.5 ft. RT.	S-5 to 6	6.0 to 9.0	14.4	8.8	21.8	14.4	7.4	69.4	35.8	33.6	A-7-6	CL		44	24	20					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

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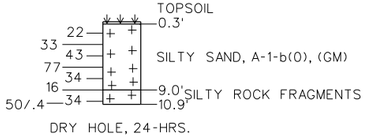
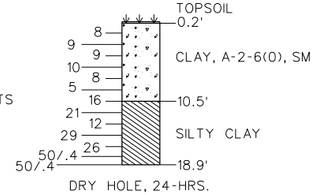
P-22B
STA. 2146+12.1
S.R. 6219
468.1' RT., LINE E
EL. 2435



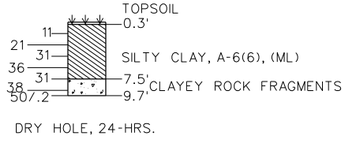
DRY HOLE, 24-HRS.

P-22A
STA. 2149+48.7
S.R. 6219
510.0' RT., LINE E
EL. 2432



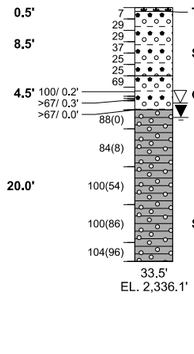
DRY HOLE, 24-HRS.

P-22
STA. 2151+90.7
S.R. 6219
500.1' RT., LINE E
EL. 2415.8



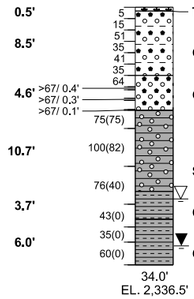
DRY HOLE, 24-HRS.

BORING E-3
STA. 2157+13.0, 0.0 ft. CL
EL. 2369.6 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2357.0 ft.
REC% / (RQD)% ▽ 24 hr. Elev.: 2355.1 ft.



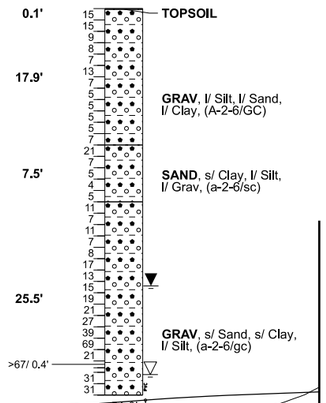
33.5'
EL. 2,336.1'

BORING E-4
STA. 2167+20.5, 1.4 ft. RT.
EL. 2370.5 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2345.2 ft.
REC% / (RQD)% ▽ 24 hr. Elev.: 2339.0 ft.

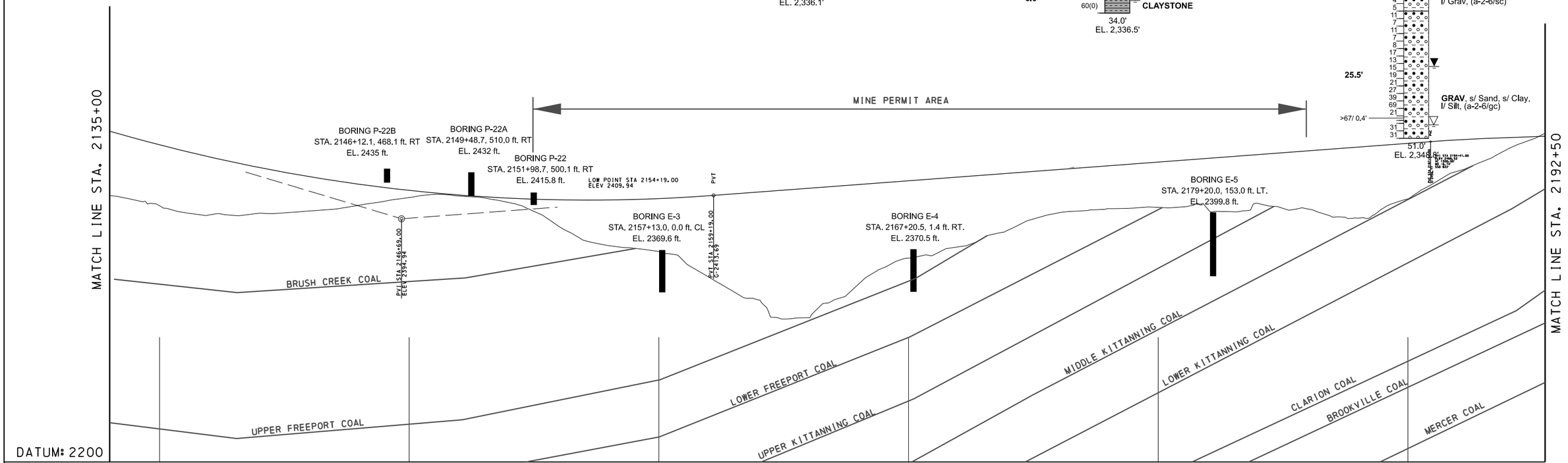


34.0'
EL. 2,336.5'

BORING E-5
STA. 2179+20.0, 153.0 ft. LT.
EL. 2399.8 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2351.5 ft.
REC% / (RQD)% ▽ 24 hr. Elev.: 2363.2 ft.



51.0'
EL. 2,348.8'



LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-4	2167+20.5 1.4 ft. RT.	S-5 to 7	6.0 to 9.0	17.2	68.4	22.4	5.7	16.7	9.2	7.3	1.9	A-1-a	GW-GM		NP	NP	NP					
E-5	2179+20.0 153 ft. LT.	S-4 to 6	4.5 to 9.0	11.9	48.8	16.3	10.4	5.9	34.9	20.0	14.9	A-2-6	GC		33	20	13					
E-5	2179+20.0 153 ft. LT.	S-9 to 10	12.0 to 15.0	11.4	50.8	16.6	10.7	5.9	32.6	19.7	12.9	A-2-6	GC		33	20	13					
P-22	2151+90.7 500.1 ft. RT.	S-2 to 5	1.5 to 7.5	18.7	21.1	16.0	10.0	6.0	62.9	30.3	32.6	A-6	ML		38	26	12					
P-22A	2149+48.7 510.0 ft. RT.	S-4 to 6	4.5 to 9.0	14.2	44.9	21.7	13.7	8.0	33.4	17.4	16.0	A-2-6	SM		37	26	11					
P-22B	2146+12.1 468.1 ft. RT.	S-2 to 5	1.5 to 7.5	8.6	45.7	35.6	5.6	29.0	18.7	9.4	9.3	A-1-b	GM		NP	NP	NP					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E PROFILE

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P-18
STA. 2206+96.8
S.R. 6219
135.5' RT., LINE E
EL. 2522.3

6	TOPSOIL 0.2'	
16	SILTY CLAY, A-6(4), (CL) 5.0'	
29		
100	ROCK FRAGMENTS 8.5'	
50/.2		
50/.2		
70% (12%)	SHALY SANDSTONE GWL AT 16.9' 24-HRS.	
10% (0%)		
4% (0%)		
52% (0%)		
54% (0%)	24.0'	
78% (0%)	SANDY SHALE 33.4'	
94% (0%)	CARBONACEOUS SHALE 34.0'	
100% (90%)		
100% (80%)		
100% (82%)	SANDSTONE	
100% (68%)		
100% (72%)		
100% (42%)		
92% (34%)		
100% (86%)	76.0'	
100% (70%)	SILTSTONE 77.3'	
100% (14%)	CLAYSTONE 83.5'	
100% (50%)	SILTSTONE	
100% (64%)	91.8' SILTY SANDSTONE	
100% (76%)	100.6' CARBONACEOUS SHALE	
100% (64%)	102.4' SILTSTONE	
100% (84%)	109.0'	
100% (92%)		
100% (80%)		
100% (74%)	SILTSTONE	
100% (40%)		
100% (64%)		
100% (60%)		
100% (59%)	143.7'	

P-19
STA. 2223+85.2
S.R. 6219
179.1' RT., LINE E
EL. 2214.1

7	TOPSOIL 0.1'	
47	SANDSTONE FRAGMENTS, A-2-6(0), (GC) 8.3'	
65		
69		
50/.1		
50/.1		
100% (20%)	SANDSTONE	
100% (50%)		
87% (0%)	14.8' SILTSTONE GWL AT 15.8' 24-HRS.	
100% (0%)	20.3'	
96% (48%)	SANDSTONE	
82% (14%)	27.2' INTERBEDDED SILTSTONE AND CLAYSTONE	
96% (0%)		
100% (20%)	38.3'	

BORING E-6
STA. 2215+89.2, 1.8 ft. RT.
EL. 2392.8 ft. 0.8 ERa
N60 0 hr. Elev.: 2363.1 ft.
24 hr. Elev.: 2362.9 ft.
REC% / (RQD)%

0.2'	16	TOPSOIL
8.8'	77	
	43	GRAV, s/ Sand, l/ Silt, t/ Clay, (a-1-b/gp)
	32	
	21	
	37	
4.6'	67	GRAV, s/ Sand, t/ Silt, t/ Clay, (a-1-b/gp)
	120/ 0.4'	
	132/ 0.4'	
	>67/ 0.1'	
	85(18)	
	90(13)	
	100(74)	
21.4'	94(30)	
	100(80)	SANDSTONE
	100(70)	
	35.0'	
	EL. 2,357.8'	

BORING E-7
STA. 2230+51.0, 0.0 ft. CL
EL. 2320.3 ft. 0.8 ERa
N60 0 hr. Elev.: 2284.6 ft.
24 hr. Elev.: 2286.3 ft.
REC% / (RQD)%

0.2'	12	TOPSOIL
5.3'	49	SAND, l/ Grav, l/ Clay, l/ Silt, (a-2-6/sc)
	40	
	39	
	41	
6.5'	35	GRAV, s/ Sand, s/ Silt, l/ Clay, (A-2-4/SC-SM)
	31	
	65	
	33	
	41	
	49	
	49	
16.5'	23	SILT, s/ Grav, s/ Sand, l/ Clay, (A-4/SC)
	48	
	24	
	36	
	93/ 0.1'	
	53	GRAV, t/ Sand, t/ Silt (a-1-b/gp)
	32	
1.5'	81/ 0.4'	
1.3'	>67/ 0.0'	SANDSTONE
	100(65)	
	100(0)	
8.7'		CLAYSTONE
	60(0)	
	40.0'	
	EL. 2,280.3'	

BORING E-8
STA. 2246+72.6, 235.9 ft. RT.
EL. 2469.8 ft. 0.8 ERa
N60 0 hr. Elev.: 2388.4 ft.
24 hr. Elev.: 2388.6 ft.
REC% / (RQD)%

0.2'	5	TOPSOIL
9.8'	21	SAND, s/ Grav, l/ Silt, t/ Clay, (A-1-b/SC-SM)
	28	
	31	
	45	
	105/ 0.4'	
	51	GRAV, s/ Sand, l/ Silt, t/ Clay, (a-2-4/gm)
6.5'	68	
	41	
	52	
	>67/ 0.2'	
	>67/ 0.0'	
	90(43)	
9.4'	93(80)	SANDSTONE
	98(78)	
	98(80)	
	100(90)	
31.0'	90(52)	
	100(96)	
	98(84)	SANDSTONE w/CONGLOMERATE
	98(76)	
	100.0'	
	EL. 2,369.8'	

20.4'	100(16)	SANDSTONE
	90(28)	
	98(38)	
	100(60)	
3.7'	90(84)	CONGLOMERATE
4.9'	73(0)	CLAYSTONE
	54(11)	
	80(24)	
14.1'	86(34)	SILTSTONE
	100(94)	

BORING E-8
STA. 2246+72.6, 235.9 ft. RT.
EL. 2469.8 ft.

BORING P-18
STA. 2206+96.8, 135.5 ft. RT.
EL. 2522.3 ft.

HIGH POINT STA 2192+60.88
ELEV 2460.29

MATCH LINE STA. 2192+50

LOWER KITTANNING COAL
CLARION COAL
BROOKVILLE COAL
MERCER COAL
QUAKERTOWN COAL
MAUCH CHUNK

PVT STA 2200+91.00
G -2449.29

-2.65%

BORING E-6
STA. 2215+89.2, 1.8 ft. RT.
EL. 2392.8 ft.

PVI STA 2237+29.00
ELEV 2352.89
VC 1375.00'
MO 11.43'
HSD 824'

PVC

LOW POINT STA 2235+89.43
ELEV 2363.85

PVI STA 2237+29.00
ELEV 2352.89

PVT

PVC STA 2230+41.50

BORING E-7
STA. 2230+51.0, 0.0 ft. CL
EL. 2320.3 ft.

PVC STA 2230+41.50

PVT STA 2244+16.50
G -2380.39

BORING P-19
STA. 2223+85.2, 179.1 ft. RT.
EL. 2214.1 ft.

MATCH LINE STA. 2250+00

DATUM: 2100

2195+00 2205+00 2215+00 2225+00 2235+00 2245+00

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-7	2230+51.0 0 ft. CL	S-5 to 6	6.0 to 9.0	9.0	33.8	30.8	11.8	19.0	35.4	23.7	11.7	A-2-4	SC-SM		22	15	7					
E-7	2230+51.0 0 ft. CL	S-9 to 10	12.0 to 15.0	15.1	28.1	25.4	11.3	14.1	46.5	30.1	16.4	A-4	SC		27	17	10					
E-8	2246+72.6 235.9 ft. RT.	S-3 to 5	3.0 to 7.5	6.4	30.5	44.6	20.0	24.6	24.9	15.9	9.0	A-1-b	SC-SM		17	12	5					
P-18	2206+96.8 135.5 ft. RT.	S-1 to 3	0.2 to 4.5	16.7	26.8	19.7	5.7	14.0	53.5	23.5	30.0	A-6	CL		34	23	11					
P-19	2223+85.2 179.1 ft. RT.	S-2 to 5	1.5 to 7.1	6.6	53.0	21.9	7.9	14.0	25.1	14.6	10.5	A-2-6	GC		28	17	11					

VERTICAL 40' 0 40'

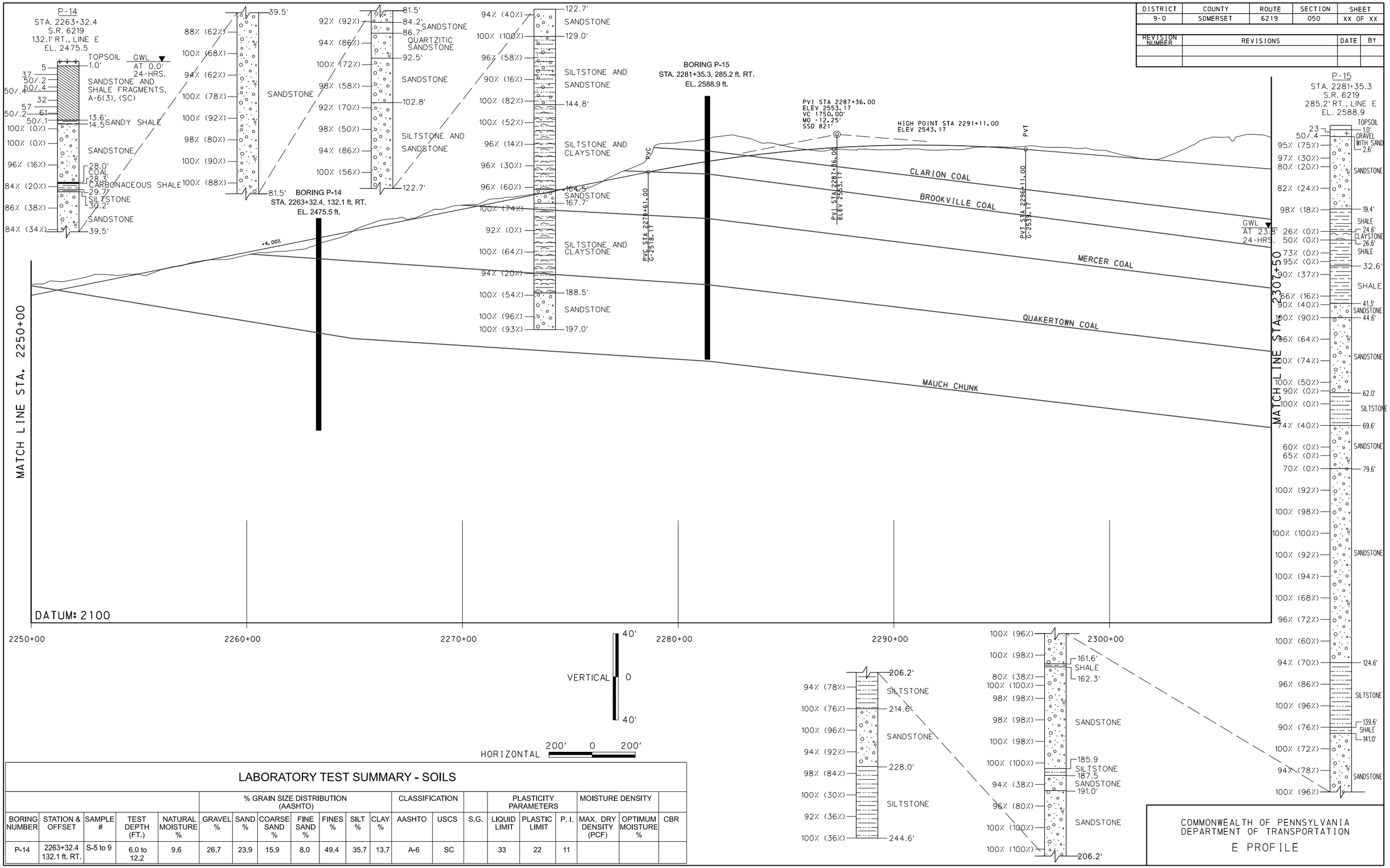
HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY



LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			MOISTURE DENSITY		
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	MAX. DRY DENSITY (PCF)	OPTIMUM MOISTURE %	CBR
P-14	2263+32.4 132.1 ft. RT.	S-5 to 9	6.0 to 12.2	9.6	26.7	23.9	15.9	8.0	49.4	35.7	13.7	A-6	SC		33	22	11			

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

BORING E-9
STA. 2325+92.0, 180.0 ft. LT.
EL. 2436.6 ft. 0.8 ERa
N60 — 0 hr. Elev.: 2436.6 ft.
REC% / (RQD)% — 24 hr. Elev.: 2436.2 ft.

0.1'	15		TOPSOIL
4.4'	21		SAND, l/ Grav, l/ Clay, l/ Silt, (a-2-6/sc)
	33		
3.0'	36		GRAV, s/ Sand, l/ Silt, t/ Clay, (A-1-b/GM)
	39		
	105		
	35		
8.5'	43		SAND, s/ Grav, l/ Clay, l/ Silt, (a-2-6/sc)
	35		
	45		
	60		
	84		
6.5'	76		GRAV, s/ Sand, l/ Clay, l/ Silt, (a-2-6/gc)
	97		
	85/ 0.2'		
	>67/ 0.0'	95(35)	
8.5'		87(80)	SANDSTONE
		94(51)	

31.0'
EL. 2,405.6'

P-10
STA. 2341+69.4
S.R. 6219
501.3' LT., LINE E
EL. 2392.1

			ROCK FRAGMENTS WITH SAND
GWL AT 2.2' 18-HRS.	22	1.5'	
	31		CLAYEY SAND
	27	7.5'	
	52		SANDSTONE FRAGMENTS WITH SAND
	52	9.0'	
	50		SILTY CLAY WITH SAND
	50/.3	11.0'	
	50/.3		
	50/.0		SANDSTONE FRAGMENTS WITH SAND
88% (0%)		14.0'	
100% (40%)			
98% (32%)			SANDSTONE
98% (98%)			

98% (98%)		
100% (96%)		
100% (86%)		
	42.2'	SHALE
94% (60%)	42.7'	
		SILTSTONE
100% (82%)	48.5'	

MATCH LINE STA. 2307+50

MATCH LINE STA. 2365+00

-1.60%

CLARION COAL

BROOKVILLE COAL

MERCER COAL

QUAKERTOWN COAL

MAUCH CHUNK

BORING E-9
STA. 2325+92.0, 180.0 ft. LT.
EL. 2436.6 ft.

BORING P-10
STA. 2341+69.4, 501.3 ft. LT.
EL. 2392.1 ft.

PVC

PVC STA 2349+35.00
ELEV 2435.02

PVI STA 2369+95.00
ELEV 2421.02
VC 4000.00'
MO -12.00'
SSD 1897'

DATUM: 2140

2310+00 2320+00 2330+00 2340+00 2350+00 2360+00

LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-9	2325+92.0 180.0 ft. LT.	S-3 to 5	4.5 to 7.5	7.9	50.4	28.6	7.4	21.2	21.0	15.8	5.2	A-1-b	GM		NP	NP	NP					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

BORING E-10
STA. 2372+10.0, 163.0 ft. RT.
EL. 2443.2 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2437.0 ft.
--- ▽ 24 hr. Elev.: 2414.3 ft.
REC% / (RQD)%

0.4' TOPSOIL
10.1' SAND, l/ Grav, l/ Clay, l/ Silt, (a-4/sc)
7.5' GRAV, s/ Sand, s/ Silt, l/ Clay, (A-4/SC)
0.1' GRAV, t/ Silt, t/ Sand (a-2-4/gm)
8.4' SILTSTONE w/SHALE
11.0' SANDSTONE
16.6' SANDSTONE
2.9' SHALE w/SILTSTONE
8.0' SANDSTONE
65.0'
EL. 2,378.2'

BORING E-11
STA. 2405+26.4, 225.2 ft. LT.
EL. 2346.8 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2304.2 ft.
--- ▽ 24 hr. Elev.: 2304.5 ft.
REC% / (RQD)%

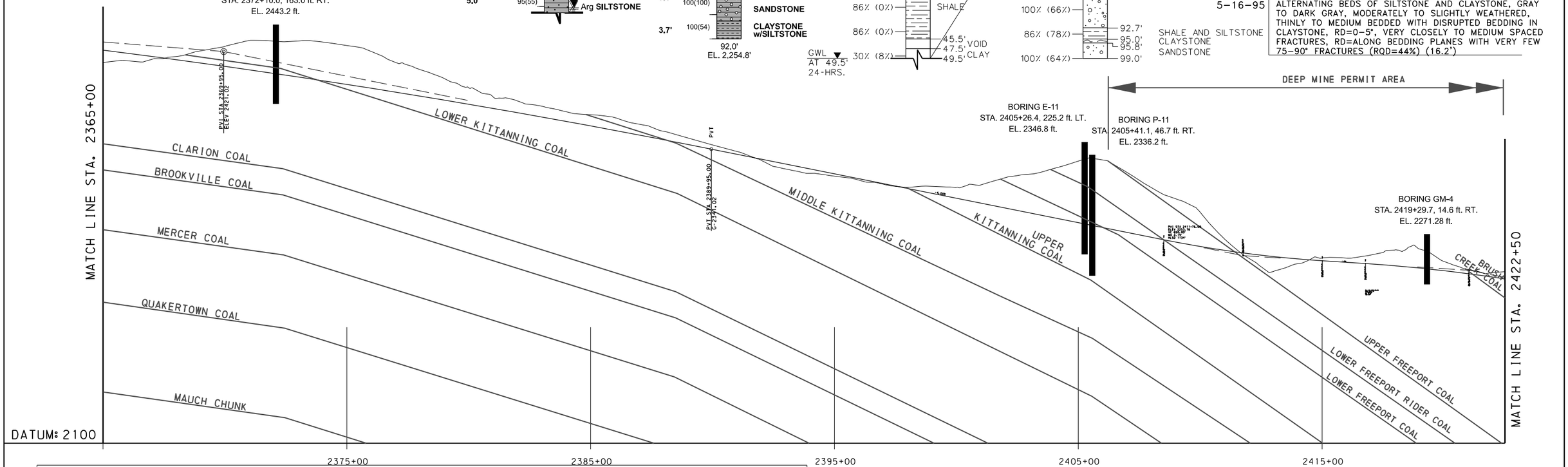
0.2' TOPSOIL
11.8' GRAV, l/ Sand, l/ Clay, l/ Silt, (A-2-6/GC)
19.5' GRAV, l/ Sand, l/ Silt, t/ Clay, (A-2-6/GC)
4.1' CLAY, s/ Silt, l/ Sand (a-6/cl)
2.7' CLAYSTONE
5.0' Arg SILTSTONE
32.1' SANDSTONE
3.1' CLAYSTONE
9.8' SANDSTONE
3.7' CLAYSTONE w/SILTSTONE
92.0'
EL. 2,254.8'

P-11
STA. 2405+41.1
S.R. 6219
46.7' RT., LINE E
EL. 2336.2

GRAVEL WITH SAND, A-1-b(0), (GM)
10.5' SANDSTONE
18.7' SHALE
22.6' SHALE
23.5' CLAYSHALE
28.9' COAL
29.7' CLAYSTONE
32.4' SHALE
45.5' VOID
47.5' CLAY
49.5'
GWL AT 49.5' 24-HRS.
49.5' SHALE
54.0' CLAYSTONE
58.6' SANDSTONE
65.0' SHALE AND CLAYSTONE SANDSTONE
92.7'
95.0'
95.8'
99.0'

GM-4
STA. 2419+29.7
14.6'RT., LINE E
EL. 2271.28
G.W.L. 6.3', 24-HRS. 5-17-95
41.2' 5-16-95

TOPSOIL (0.5')
SILTY CLAY (CL)WITH SAND AND GRAVEL, TAN TO TAN-GRAY, MOIST, MED. STIFF TO HARD, HOMOGENEOUS *WEATHERED CLAYSTONE (RESIDUAL) (15.7'), A-7-6(6), GM-4A-1
CLAYSTONE WITH SOME CLAYEY SHALE, CARBONACEOUS, DARK GRAY TO BLACK, VERY SOFT TO SOFT, MODERATELY TO SLIGHTLY WEATHERED, INTENSELY LAMINATED TO MEDIUM BEDDED, RD=0-3*, EXTREMELY CLOSE TO CLOSELY SPACED FRACTURES, RD=VARIABLE (RQD=0%) (5.0')
CLAYSTONE, TAN-GRAY, VERY SOFT TO SOFT, MODERATELY TO SLIGHTLY WEATHERED, DISRUPTED BEDDING, VERY CLOSELY TO MEDIUM SPACED FRACTURES, RD=INDETER-MINATED (RQD=37%) (3.8')
ALTERNATING BEDS OF SILTSTONE AND CLAYSTONE, GRAY TO DARK GRAY, MODERATELY TO SLIGHTLY WEATHERED, THINLY TO MEDIUM BEDDED WITH DISRUPTED BEDDING IN CLAYSTONE, RD=0-5*, VERY CLOSELY TO MEDIUM SPACED FRACTURES, RD=ALONG BEDDING PLANES WITH VERY FEW 75-90* FRACTURES (RQD=44%) (16.2')



LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-10	2372+10.0 163 ft. RT.	S-8 to 9	10.5 to 13.5	11.7	31.1	27.8	16.4	11.4	41.1	30.1	11.0	A-4	SC		30	21	9					
E-11	2405+26.4 225.23 ft. RT.	S-5 to 8	6.0 to 12.0	8.5	55.6	11.8	7.4	4.4	32.6	18.9	13.7	A-2-6	GC		31	18	13					
E-11	2405+26.4 225.23 ft. RT.	S-9 to 14	12.0 to 21.0	10.5	61.3	13.9	9.5	4.4	24.7	16.9	7.8	A-2-6	GC		29	18	11					
P-11	2405+41.1 46.7 ft. RT.		1.5 to 6.8	3.9	51.6	32.7	25.7	7.0	15.7	10.7	5.0	A-1-b	GM		NP	NP	NP					
GM-4	2419+29.7 14.6 ft. RT.	S-2 to 3	1.5 to 4.5	13.1	20.0	27.5	18.8	8.7	52.5	36.0	16.5	A-7-6	CL		41	25	16					

VERTICAL 40' 0 40'
HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
E PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

GM-5
STA. 2425+17.3
40.3' LT., LINE E
EL. 2238.11

N.B.	S.D.	
9	1.5	
50/4	4.4	
38	7.0	
50/3	9.8	
100	36	
100	36	

G.W.L. 6.6',24-HRS. 5-17-95

TOPSOIL (0.3')
CLAYEY GRAVEL (ANGULAR ROCK FRAGMENTS) (GC), W/SAND AND SILT, BROWN, MOIST, LOOSE TO VERY DENSE, HOMOGENEOUS (RESIDUAL), (6.7')
A-2-4(0), GM-5-1 *GRAVEL & COBBLES FROM 4.0'-5.5'
GRAVEL (ANGULAR ROCK FRAGMENTS) (gp), LIGHT BROWN TO LIGHT GRAY, DRY, FISSURED (RESIDUAL),(2.8')
A-2-4, SEE GM-1-1
SANDY TO CLAYEY SHALE, RUSTY-BROWN, VERY SOFT TO MEDIUM WEATHERED, LAMINATED, RD=0-5*, EXTREMELY CLOSE TO CLOSELY SPACED FRACTURES, RD=0-15* (RQD=32%), (5.0')

14.8'
5/16/95

GM-8
STA. 2442+84.5
22.4' LT., LINE E
EL. 2161.00

N.B.	S.D.	
5	1.5	
12	4.5	
13	7.5	
39	13.5	
58	6.5	
50/3	8.8	
57	0	
90	33	

G.W.L. 13.1',24-HRS. 5-22-95

TOPSOIL (0.5')
SILTY CLAY WITH SAND (cl), BROWN, MOIST, MEDIUM STIFF TO STIFF, HOMOGENEOUS (RESIDUAL) (5.5')
CLAYEY GRAVEL (GC), (ROCK FRAGMENTS) WITH SAND AND SILT, DARK BROWN TO BLACK, MOIST, MEDIUM DENSE TO DENSE, HOMOGENEOUS (RESIDUAL) (9.0'), A-2-6(0), GM-8-1
WEATHERED COAL, BLACK, DRY, VERY DENSE, HOMOGENEOUS (RESIDUAL) (1.5')
CALCAREOUS SILTY CLAY (cl), TAN, MOIST, HARD, HOMOGENEOUS (RESIDUAL) (2.3')
LIMESTONE, GRAY, MEDIUM HARD TO HARD, MODERATELY WEATHERED TO FRESH, MEDIUM BEDDED, RD=3-5*, VERY CLOSELY TO CLOSELY SPACED FRACTURES, RD=VARIABLE
*SOME FINE FRACTURES WITH CALCITE FILLING
*MODERATELY WEATHERED FROM 23.3-33.9' (RQD=20%) (5.1')

23.9'
5-16-95

GM-9
STA. 2450+37.6
11.4' RT., LINE E
EL. 2124.25

N.B.	S.D.	
7	1.5	
18	4.5	
10	7.5	
20	10.5	
50/2	12.7	
50/4	16.4	
38	0	
85	38	
87	15	

G.W.L. 8.8',24-HRS. 5-24-95

TOPSOIL (0.5')
SILTY TO SANDY CLAY WITH GRAVEL (cl), BROWN, MOIST, MEDIUM TO VERY STIFF, HOMOGENEOUS (COLLUVIAL) (8.5'), A-6, SEE WT-5-1
SILTY TO SANDY CLAY AND GRAVEL (SHALE FRAGMENTS) (cl-gc), BROWN TO BLACK, DRY TO MOIST, VERY STIFF TO HARD OR MEDIUM TO VERY DENSE, FISSURED (RESIDUAL) (6.0'), A-7-6, SEE WT-4-1
SILTY CLAY (cl), GRAY, MOIST, HARD, HOMOGENEOUS (RESIDUAL) (1.4')
CLAYSTONE, GRAY, VERY SOFT, MODERATELY WEATHERED, INDETERMINATE BEDDING AND SPACING (RQD=0%) (5.2')
CLAYSTONE, GRAY, SOFT, SLIGHTLY WEATHERED, THINLY TO MEDIUM SPACED FRACTURES, RD=0* (RQD=34%) (2.8')
SANDSTONE, GRAY, FINE-GRAINED, MEDIUM HARD TO HARD, SLIGHTLY WEATHERED, THINLY TO MEDIUM BEDDED, RD=0*, VERY THINLY TO MEDIUM SPACED FRACTURES, RD=75-90* (RQD=23%) (2.0')

26.4'
5-22-95

GM-13
STA. 2475+04.5
12.6' RT., LINE E
2022.33

N.B.	S.D.	
6	1.5	
50/2	3.7	
50/0	5.5	
100	20	
100	34	

G.W.L. 1.3',24-HRS. 5-23-95

TOPSOIL (0.5')
SILTY CLAY WITH GRAVEL (cl), BROWN, MOIST, MEDIUM STIFF (RESIDUAL) (1.5'), A-7-6, SEE WT-4-1
WEATHERED SANDSTONE FRAGMENTS (gp), LIGHT BROWN, DRY (RESIDUAL) (3.5')
SANDSTONE, VERY FINE-GRAINED, TAN TO GRAY, HARD TO VERY HARD, MEDIUM WEATHERED TO FRESH, LAMINATED TO THINLY CROSS-BEDDED, EXTREMELY CLOSE TO MEDIUM SPACED FRACTURES, RD=5-20*
*VERTICAL WATER STAINED FRACTURE FROM 9.6-12.2' (RQD=30%) (6.7')

12.2'
5-22-95

DEEP MINE PERMIT AREA

BORING GM-5
STA. 2425+17.3, 40.3 ft. LT.
EL. 2238.11 ft.

BORING GM-8
STA. 2442+84.5, 22.4 ft. LT.
EL. 2161.00 ft.

BORING GM-9
STA. 2450+37.6, 11.4 ft. LT.
EL. 2124.25 ft.

BORING GM-13
STA. 2475+04.5, 12.6 ft. RT.
EL. 2022.33 ft.

PVT STA 2425+28.00
ELEV 2224.73

PVI STA 2466+96.33
ELEV 2058.00

MATCH LINE STA. 2422+50

BRUSH CREEK COAL
LOWER BAKERSTOWN COAL
UPPER BAKERSTOWN COAL
AMES COAL
FEDERAL HILL COAL
BARTON COAL
WELLERSBURG COAL
UPPER FREEPORT COAL
LOWER FREEPORT RIDER COAL
LOWER FREEPORT COAL
UPPER KITTANNING COAL
MIDDLE KITTANNING COAL
LOWER KITTANNING COAL

DATUM: 1900

2425+00 2435+00 2445+00 2455+00 2465+00 2475+00

LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
GM-5	2425+17.3 40.3 ft. LT.	S-3 to 5	3.0 to 7.0	6.3	57.5	20.8	11.4	9.4	21.7	15.3	6.4	A-2-4	GC		27	19	8					
GM-8	2442+84.5 22.4 ft. LT.	S-5 to 9	6.0 to 13.5	12.4	61.2	22.2	15.1	7.1	16.6	12.2	4.4	A-2-6	GC		35	22	13					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E PROFILE

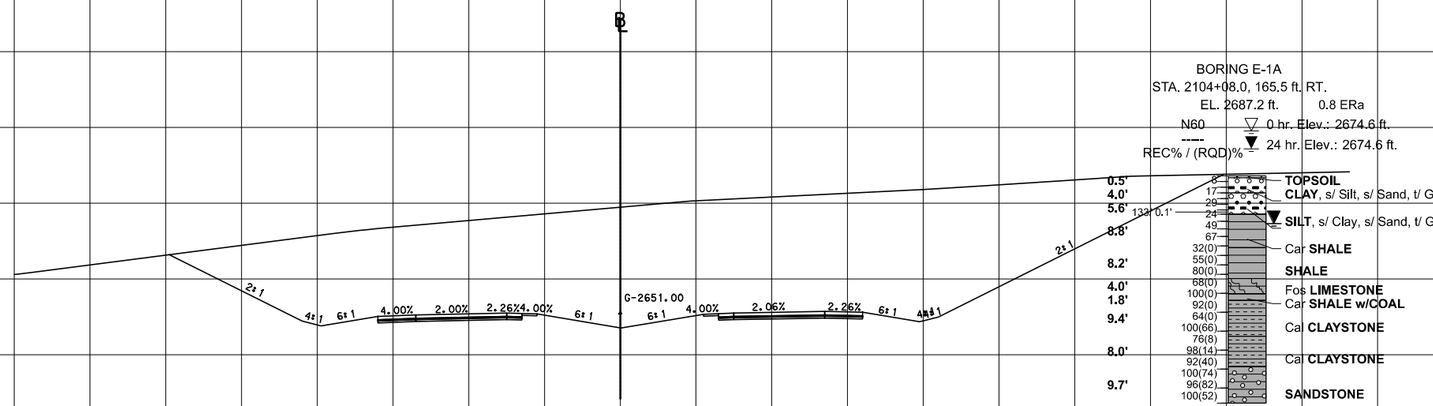
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

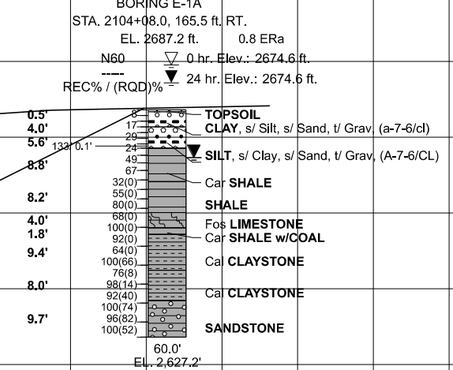
CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-1A	2104+08.0 165.5 ft. RT.	S-5 to 6	6.0 to 9.0	14.4	8.8	21.8	14.4	7.4	69.4	35.8	33.6	A-7-6	CL		44	24	20					





CROSS SECTION AT STA 2104+00.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

-320 -300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320

2500 2480 2460 2440 2420 2400 2380 2360 2340 2320 2300

℄

BORING E-2
STA. 2129+85.0, 213.0 ft. LT.
EL. 2421.7 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2409.0 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2409.4 ft.

0.7'	>67/ 0.3'	19 32	**TOPSOIL**
8.3'		28 24	**SAND**, l/ Grav, l/ Silt, t/ Clay, (a-2-6/sc)
6.0'		32 20	**GRAV**, s/ Sand, l/ Clay, l/ Silt, (a-2-6/gc)
6.0'		35 24	**CLAY**, s/ Silt, s/ Sand, t/ Grav, (a-6/cl)
7.5'	>67/ 0.1'	28 16	**SAND**, l/ Grav, l/ Clay, l/ Silt, (a-2-6/sc)
10.0'	>67/ 0.0'	16 27 24 45	**SANDSTONE**
		38.5'	
		73 25	EL. 2,383.2'
		64	
		90(20)	
		90(30)	
		74(0)	

CROSS SECTION AT STA 2129+85.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

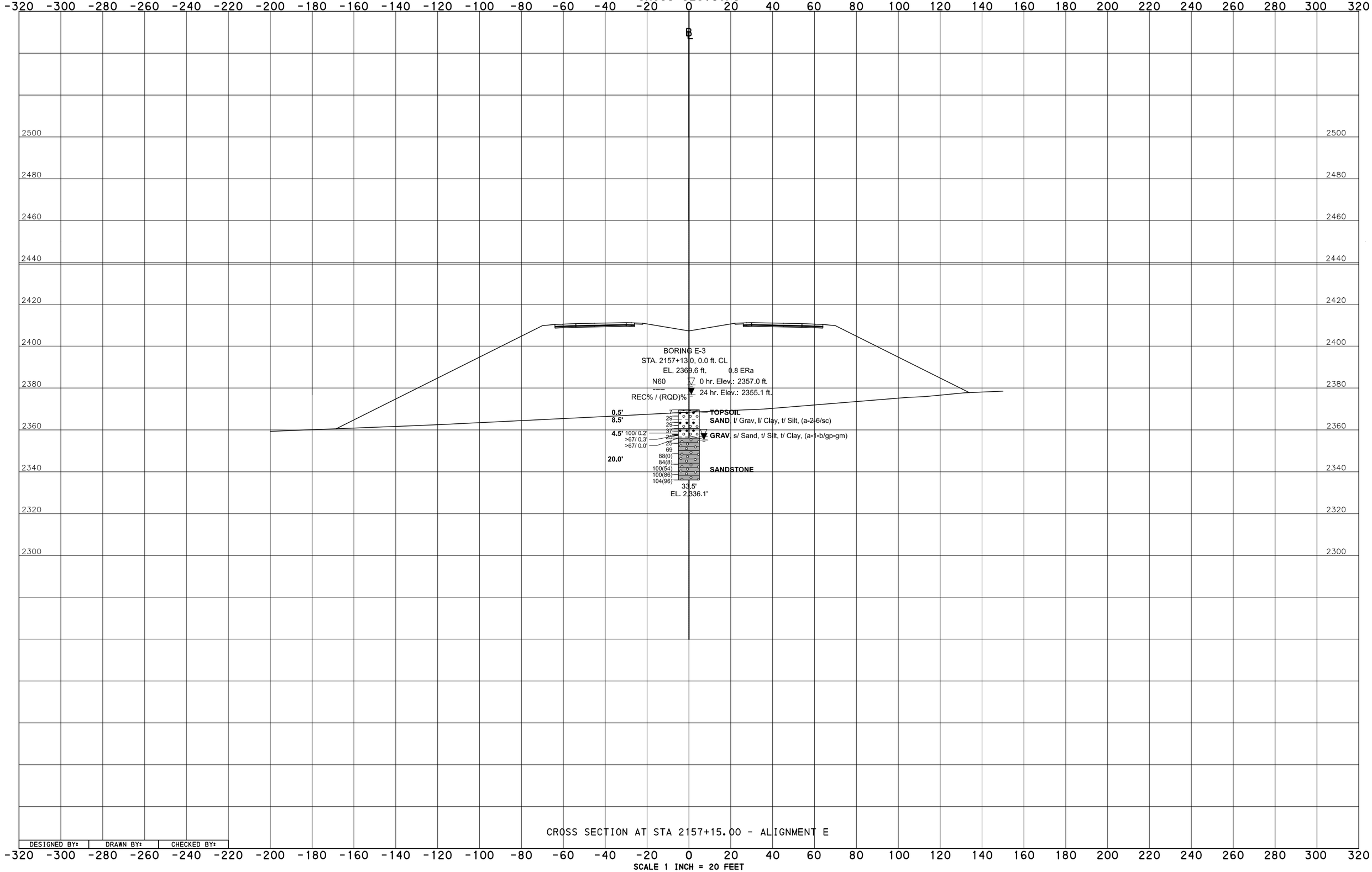
-320 -300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320

SCALE 1 INCH = 20 FEET

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF



CROSS SECTION AT STA 2157+15.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

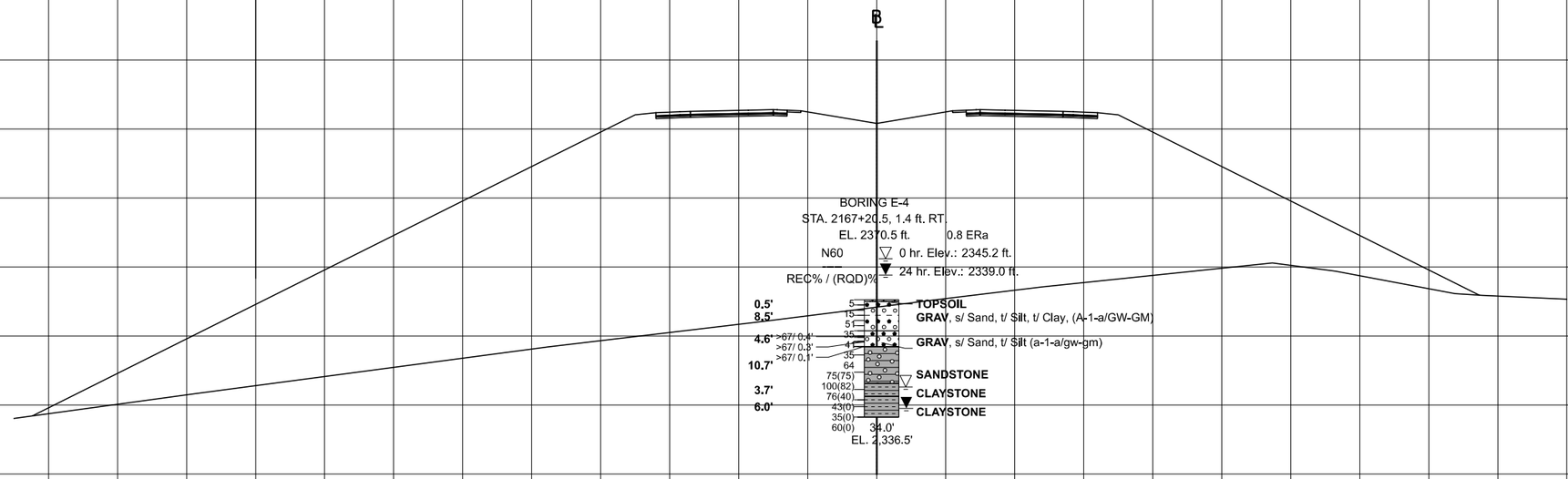
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-4	2167+20.5 1.4 ft. RT.	S-5 to 6	6.0 to 9.0	17.2	68.4	22.4	5.7	16.7	9.2	7.3	1.9	A-1-a	GW-GM		NP	NP	NP					



CROSS SECTION AT STA 2167+15.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

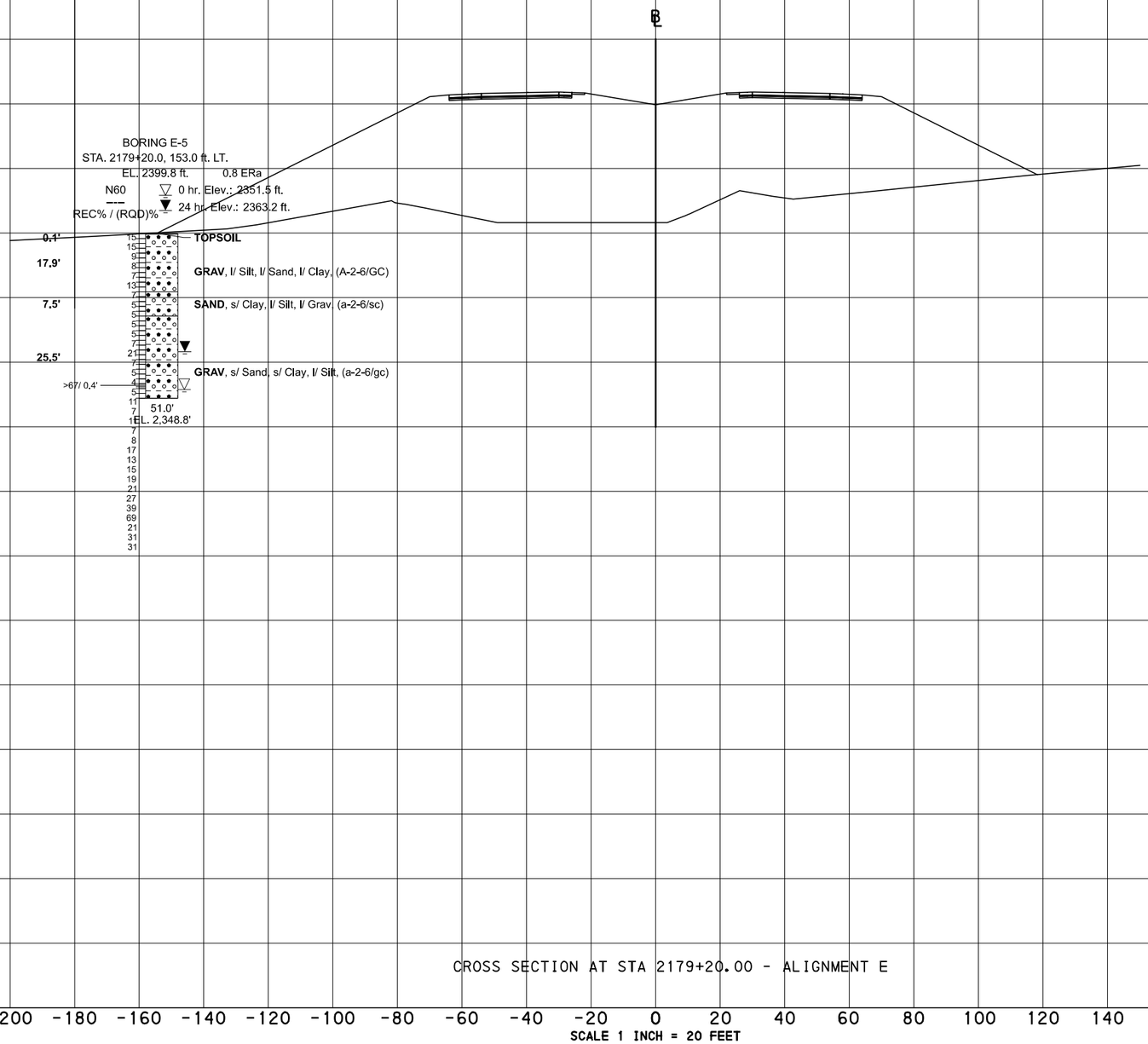
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-5	2179+20.0 153 ft. LT.	S-4 to 6	4.5 to 9.0	11.9	48.8	16.3	10.4	5.9	34.9	20.0	14.9	A-2-6	GC		33	20	13					
E-5	2179+20.0 153 ft. LT.	S-9 to 10	12.0 to 15.0	11.4	50.8	16.6	10.7	5.9	32.6	19.7	12.9	A-2-6	GC		33	20	13					



CROSS SECTION AT STA 2179+20.00 - ALIGNMENT E

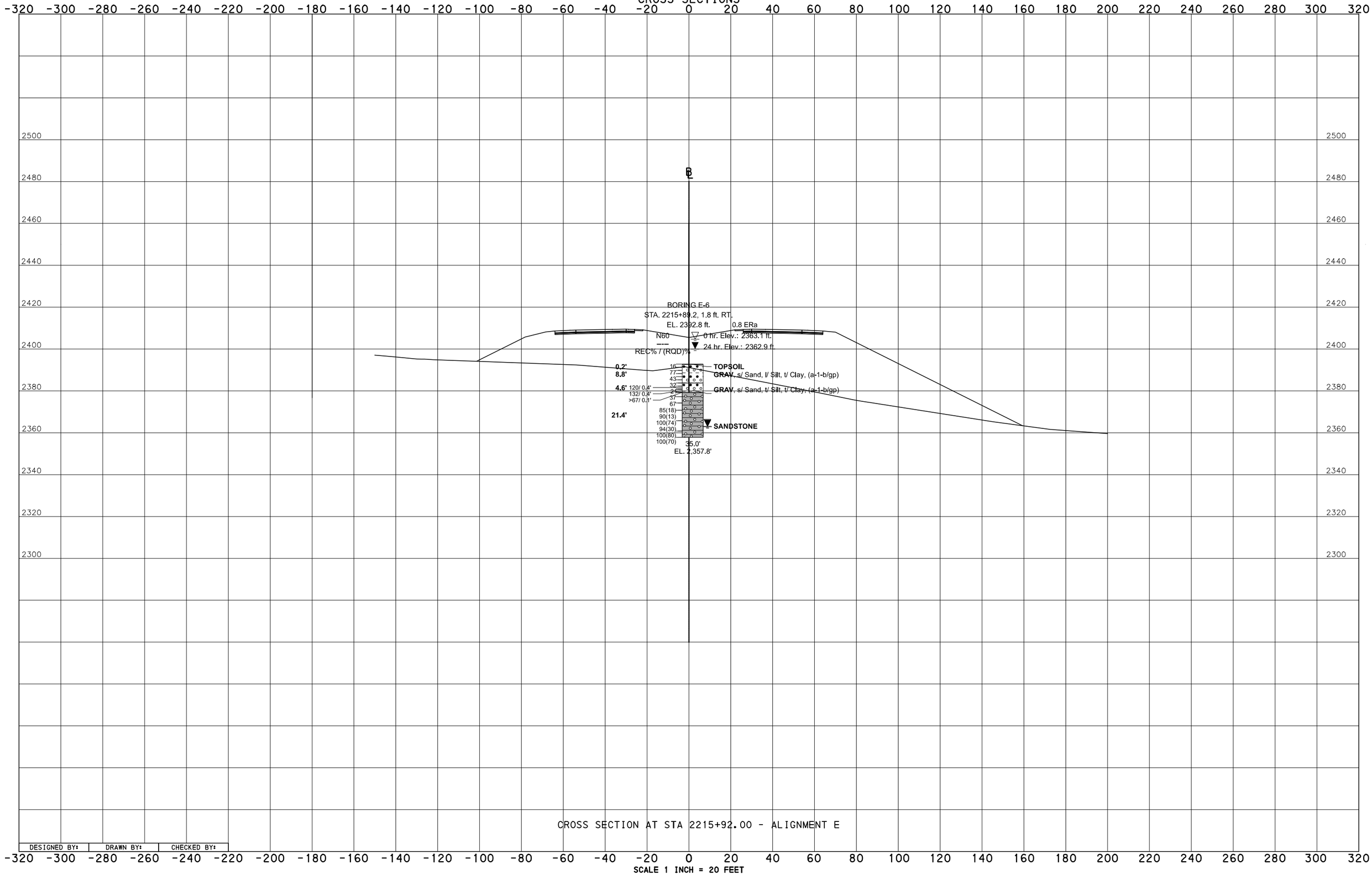
DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF



CROSS SECTION AT STA 2215+92.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

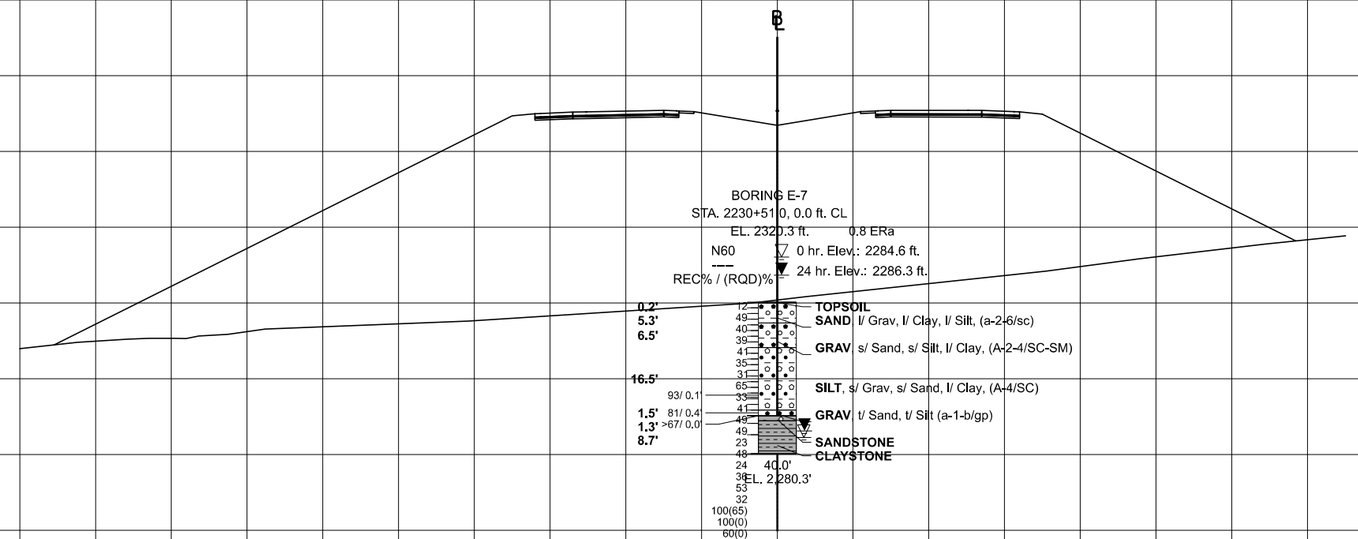
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-7	2230+51.0 0 ft. CL	S-5 to 6	6.0 to 9.0	9.0	33.8	30.8	11.8	19.0	35.4	23.7	11.7	A-2-4	SC-SM		22	15	7					
E-7	2230+51.0 0 ft. CL	S-9 to 10	12.0 to 15.0	15.1	28.1	25.4	11.3	14.1	46.5	30.1	16.4	A-4	SC		27	17	10					



CROSS SECTION AT STA 2230+51.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

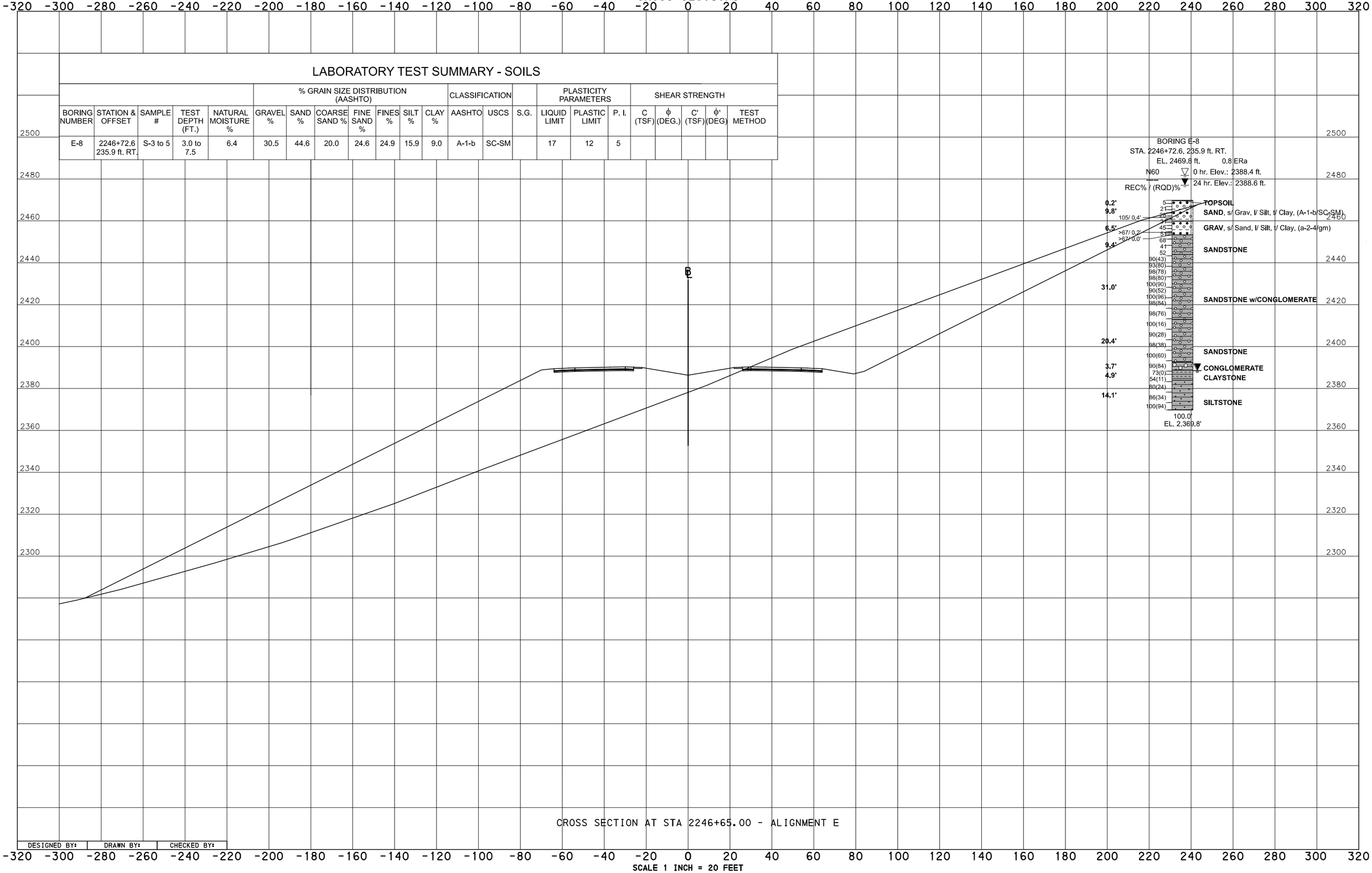
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-8	2246+72.6 235.9 ft. RT.	S-3 to 5	3.0 to 7.5	6.4	30.5	44.6	20.0	24.6	24.9	15.9	9.0	A-1-b	SC-SM		17	12	5					



CROSS SECTION AT STA 2246+65.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

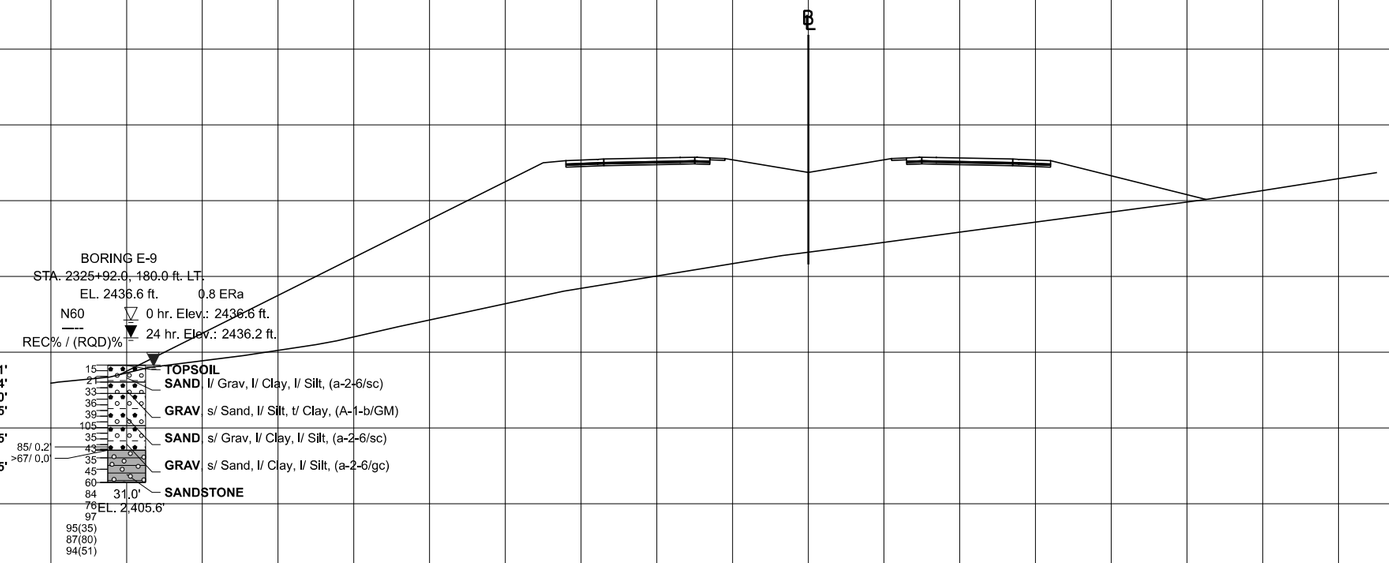
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-9	2325+92.0 180 ft. LT.	S-4 to 5	4.5 to 7.5	7.9	50.4	28.6	7.4	21.2	21.0	15.8	5.2	A-1-b	GM		NP	NP	NP					



CROSS SECTION AT STA 2325+92.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

-320 -300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320

SCALE 1 INCH = 20 FEET

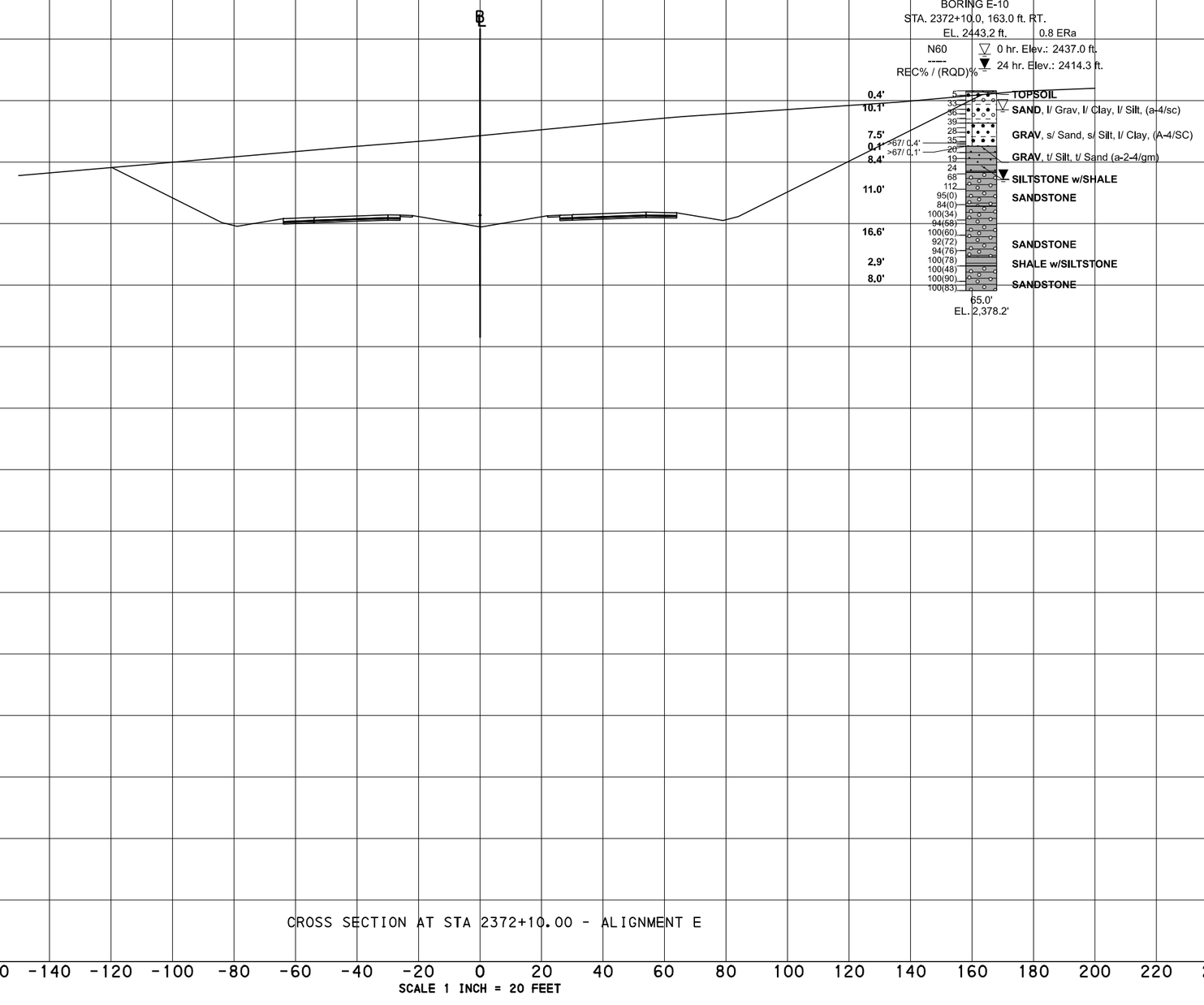
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-10	2372+10.0 163 ft. RT.	S-8 to 9	10.5 to 13.5	11.7	31.1	27.8	16.4	11.4	41.1	30.1	11.0	A-4	SC		30	21	9					



CROSS SECTION AT STA 2372+10.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

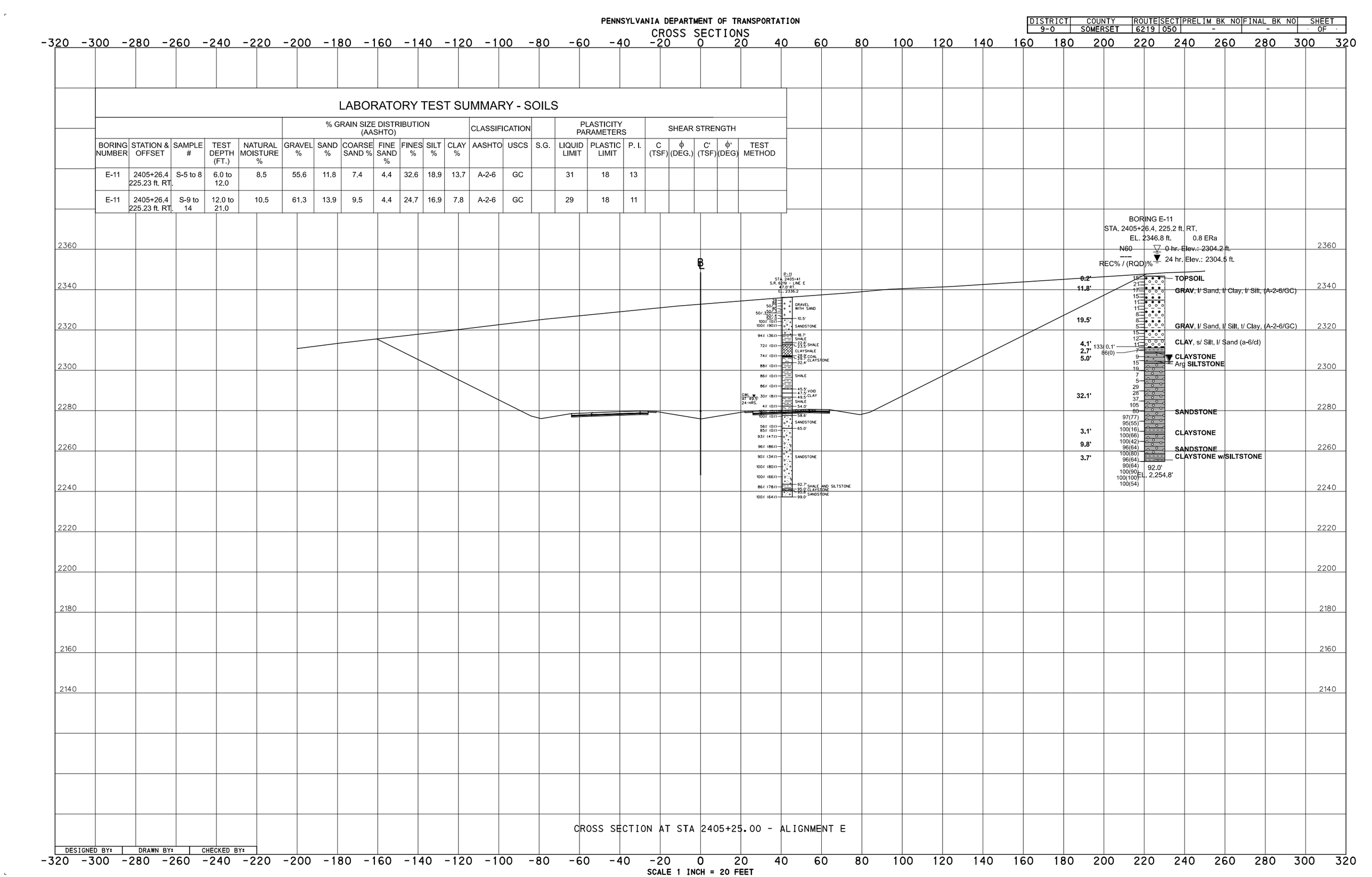
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-11	2405+26.4 225.23 ft. RT.	S-5 to 8	6.0 to 12.0	8.5	55.6	11.8	7.4	4.4	32.6	18.9	13.7	A-2-6	GC		31	18	13					
E-11	2405+26.4 225.23 ft. RT.	S-9 to 14	12.0 to 21.0	10.5	61.3	13.9	9.5	4.4	24.7	16.9	7.8	A-2-6	GC		29	18	11					



CROSS SECTION AT STA 2405+25.00 - ALIGNMENT E

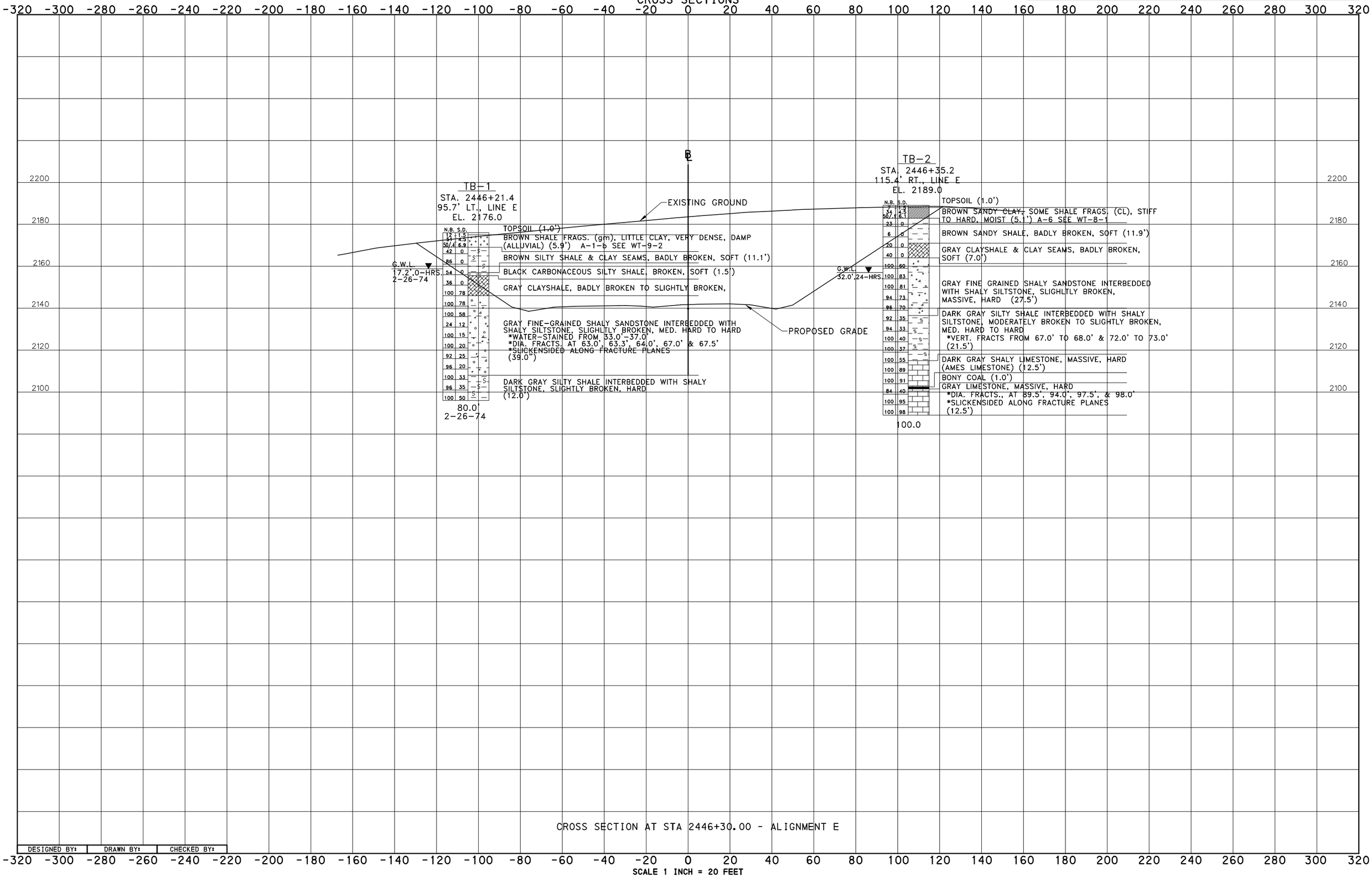
DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF



CROSS SECTION AT STA 2446+30.00 - ALIGNMENT E

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

ALIGNMENT DU
SUBSURFACE PLAN, PROFILE, AND CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

P-20

P-21

FILL WITH RUBBLE AND TRASH

LEDGE CREEK BED

SANDSTONE AND CLAYSTONE AND BLACK SHALE IN CREEK BED

ALIGNMENT

CHURCH

SOYBEAN FIELD

HAYFIELD/ CORNFIELD

MATCH LINE STA. 607+50

PARKING

CATTAILS, SOFT & WET

STANDING WATER

TREATMENT/ SETTLING POND

POSSIBLE RECLAIMATION

GRASS FIELD

HAYFIELD

CORNFIELD

P.L. LOWER

UNRECLAIMED STRIP MINE

6020 6025 6030 6035 6040 6045 6050 6055 6060 6065 6070 6075

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB- PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM- PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 6076+50

MATCH LINE STA. 6134+00

ALIGNMENT DU

WOODED

WOODED

THICK UNDERBRUSH SPARSELY WOODED RECENT LOGGING WITH SANDSTONE FLOAT

6080

6085

6090

6095

6100

6105

6110

6115

6120

6125

6130

TREE LINE

TRACTOR ROAD

B-16

PASTURE/FIELD

HAYFIELD

BRUSHY FIELD

SOFT & WET

SANDSTONE FLOAT

DENSE VEGETATION

HEAVILY WOODED SPARSE SANDSTONE FLOAT

LIGHTLY WOODED WITH OCCASIONAL SANDSTONE FLOAT

416 (MD)

HAYFIELD RECLAIMED STRIP MINE

PUNCH MINES WITH MOUNDS

HEAVILY WOODED WITH SANDSTONE FLOAT

SANDSTONE BOULDER FLOAT

E-2

SCATTERED RED MAPLE TREE LINES

ACTIVE STREAM

SPRING WITH AMD

SANDSTONE BOULDER PILE

OPEN WOODS WITH OCCASIONAL SANDSTONE FLOAT

HEAVILY WOODED OCCASIONAL SANDSTONE FLOAT

PUNCH MINE

NUMEROUS TRACES OF CARBONACEOUS SHALE & COAL FRAGMENTS (PROSPECT ?)

TRIBUTARY LIGHT FLOW TO INTERMITENT FLOW 8/18/22

SPOILS

FILLED WITH WATER

ABANDONED STRIP MINE

& GRASS

TRACTOR ROAD

CORNFIELD

APPROX LIMIT

E-1A

PASTURE/FIELD

TREE LINE

HAYFIELD

LEGEND

E- DU- TEST BORING (DRILLED 2023)

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

56880111 (PA)
463M122
462M109
462M117
18057
4072SM2
MATCH LINE STA. 6134+00
MATCH LINE STA. 6191+50
PLANTED FIELD
SPRING
VERY WET FLAGGY SANDSTONE IN STREAM
SHALE FLOAT ON GAS R/W
HEAVILY WOODED WITH SANDSTONE FLOAT
ACTIVE STREAM
COLLAPSED DEEP MINE ENTRY
OLD RAIL LINE ENTRANCE TO MINE
ACIDIC WATER
MARSHY
SCATTERED COAL FRAGMENTS
WOODED
RECLAIMED STRIP MINE WITH SANDSTONE FLOAT
GAS R/W
TREELINE
GOOD TRAM ROAD
MOUND OF SANDSTONE BOULDERS
WOODED WITH OCCASIONAL SANDSTONE FLOAT
MARKOWITZ PROPERTY
BARN
HAYFIELD RECLAIMED STRIP MINE
LIGHTLY WOODED WITH OCCASIONAL SANDSTONE FLOAT
P-22B
P-22A
P-22
HIGHWALL AND MINE PIT WITH STANDING WATER
PASTURE/ FIELD
OVERGROWN PASTURE/ (POSSIBLE STRIP MINE)
TREE LINE
OPEN WOODS
OPEN FIELD WITH WEEDS
PUNCH PROPECTED MINE
E-3
AGRICULTURAL FIELD
DENSE TREES LIGHT SANDSTONE FLOAT
PONDED WATER
STREAM BANK
STREAM MEANDERS
STEEP WITH THICK HEMLOCKS
HEAVILY WOODED UPPER GROWTH WELL ROUNDED GRAVEL & COBBLES ALONG STREAM
DENSELY WOODED WITH SANDSTONE FLOAT
STEEP TOPOGRAPHY HEAVILY WOODED WITH OCCASIONAL SANDSTONE FLOAT
HEAVILY WOODED INSIDE TREE LINES
ACID DISCHARGE ENCOUNTERED
HEAVILY WOODED WITH SANDSTONE FLOAT
FLAT FEATURE TRIBUTARY DISSAPEARS
POSSIBLE PUNCH MINE
DU-2
TRIBUTARY
WELL DEVELOPED TRIBUTARY WITH LIGHT FLOW
NUMEROUS SPRINGS & INTERMITTENT CHANNELS
STANDING WATER
DU-1
STREAM DEPOSITS ROUNDED GRAVEL AND COBBLES
OVERGROWN PASTURE/
HEAVILY WOODED WITH SANDSTONE FLOAT
6130
6135
6140
6145
6150
6155
6160
6165
6170
6175
6180
6190

LEGEND

E- TEST BORING (DRILLED 2023)

DU- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

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NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

DU-3

P-5R

HEMLOCK WITH SANDSTONE FLOAT

RESIDENTIAL PROPERTIES

HEAVILY WOODED WITH SANDSTONE FLOAT

HEAVILY WOODED WITH SANDSTONE FLOAT

MASSIVE SANDSTONE BOULDERS NEAR UTILITY R/W

POWER LINE R/W

SHEETLAND WETLAND

WETLAND

GREENVILLE ROAD

FIELD ACCESS TRAIL

PASTURE/ FIELD

PASTURE/ FIELD

POSSIBLE PUNCH MINE OR PROSPECT PIT

SANDSTONE ROOTED OR RECLAIMED STRIP MINE

WASH OUT OR PUNCH MINE POSSIBLY PROSPECT PIT

HEAVILY WOODED WITH SANDSTONE FLOAT

6195 6200 6205 6210 6215 6220 6225 6230 6235 6240 6245

MATCH LINE STA. 6191+50

MATCH LINE STA. 6249+00

LEGEND

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 6249+00

MATCH LINE STA. 6306+50

W.P.A. 10-75

SHAFT

SHAFT

40A76SM8

P-15

P-14

P-13R/13RA

P-12R

DU-5

DU-6

RANDOM SPOIL PILE

VERY SOFT CLAY, WET

HEAVILY WOODED THICK BRUSH

PASTURE, POSSIBLY STRIPPED

SANDSTONE OUTCROP

STEEP HILLSIDE WITH SANDSTONE BOULDERS

LOGGING ROADS

WATER VALVE

ARTESIAN FLOW WITH IRON CONCENTRATION AT P-13RA

HEAVILY WOODED WITH MASSIVE SANDSTONE BOULDERS

"PANTHER HOLE" DID NOT LOCATE

CAMP SITE STRAY CARBONACEOUS SHALE & COAL FRAGMENTS

PASTURE, FENCED

DENSELY WOODED YOUNG TREES SANDSTONE FLOAT

STEEP, POSSIBLY DUE TO SANDSTONE LEDGE UNDERCUT BY WEAKER ROCK

STEEP TOPO WITH SANDSTONE FLOAT, POSSIBLE SANDSTONE LEDGE, DIFFERENTIAL WEATHERING

DENSE SANDSTONE FLOAT

CURRENTLY INACTIVE UNDERGROUND SPRING RUNNING UNDER SANDSTONE BOULDER FLOAT

HEAVILY WOODED WITH SANDSTONE FLOAT

HEAVILY WOODED WITH MASSIVE SANDSTONE BOULDERS

CURRENTLY INACTIVE STREAM 7/11/22 STREAM BANKS 3'-4' HIGH

DENSELY WOODED WITH HEAVY UNDERBRUSH AND SANDSTONE FLOAT

BOULDER FIELD

GOOD ACCESS

FLAGGY SANDSTONE ON TRAIL

HEAVILY WOODED WITH SANDSTONE FLOAT, SOME MASSIVE

SANDSTONE BOULDERS STEEP TOPOGRAPHY THIN BEDDED POSSIBLE BEDROCK CONTACT

SANDSTONE BOULDER FIELD

SANDSTONE BOULDERS

SUBROUNDED SANDSTONE COBBLES & GRAVEL IN CHANNEL

INACTIVE STREAM

INACTIVE STREAM MARSH

CURRENT INACTIVE STREAM

HEAVILY WOODED THICK BRUSH WITH SANDSTONE FLOAT, PREVIOUSLY LOGGED

HEAVILY WOODED YOUNG TREES THICK BRUSH OCCASIONAL SANDSTONE FLOAT, PREVIOUSLY AND RECENTLY LOGGED

TRIBUTARY WITH RUNNING WATER

DENSELY WOODED SANDSTONE FLOAT, YOUNG TREES, PREVIOUSLY LOGGED

HEAVILY WOODED YOUNG TREES, THICK BRUSH, SANDSTONE FLOAT

WETLAND W42

WETLAND W50

WETLAND W51

WETLAND W52

WETLAND W36

STREAM S32

STREAM S33

STREAM S34

STREAM S35

STREAM S41

STREAM S42

STREAM S43

STREAM S44

STREAM S45

STREAM S23

STREAM S24

STREAM S25

STREAM S26

STREAM S27

STREAM S28

6250 6255 6260 6265 6270 6275 6280 6285 6290 6295 6300 6305

LEGEND

E- TEST BORING (DRILLED 2023)

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HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

W.P.A. 10-7.3

P-9/94

P-10

HAYFIELD/PASTURE

UNRECLAIMED STRIP MINE

SPOIL

EXCAVATION

SILTSTONE EXPOSURE

SPOIL

HEAVILY WOODED WITH SANDSTONE FLOAT

DENSELY WOODED WITH SANDSTONE FLOAT

UNKNOWN BENCH

STREAM

E-9 55 GAL. DRUM TAPPED INTO SPRING

DENSELY WOODED WITH SANDSTONE FLOAT

ACTIVE DAYLIGHTING SPRING

MOUND

DAYLIGHTING UNDERGROUND SPRING

YOUNG TREES LOW VISABILITY

CURRENT INACTIVE/ NON PERSISTENT STREAM

DENSELY WOODED LIGHT UNDERBRUSH WITH SANDSTONE FLOAT

DENSE UNDERBRUSH LOW VISABILITY CARBONACEOUS SHALE & SANDSTONE ON DIRT ROAD

DIRT ROAD LINED WITH TALL 4' MOUNDS

CULVERT UNDER DIRT ROAD

YOUNG STREAM CROSSING

APPROXIMATE CHANGE IN VEGETATION

YOUNG TREES WITH THICK BRUSH & SANDSTONE FLOAT

WELL DEVELOPED TRAIL

HEAVILY WOODED WITH MATURE TREES AND SANDSTONE FLOAT

HEAVILY WOODED DENSE VEGETATION

HEAVILY WOODED WITH SANDSTONE MASIVE FLOAT

CISTERN WATER SUPPLY ?

STREAM

HEAVILY WOODED WITH SANDSTONE FLOAT

TRAIL

LINEAR SHAPED CHANNEL WITH HARD SANDSTONE BOULDERS

DENSELY WOODED WITH SANDSTONE FLOAT

POSSIBLE SLUMP NOT FIELD VERIFIED

MATCH LINE STA. 6306+50

MATCH LINE STA. 6364+00

6310 6315 6325 6330 6335 6340 6345 6350 6355

LEGEND

E-DU- TEST BORING (DRILLED 2023)

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NOTE:
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HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 6364+00

MATCH LINE STA. 6421+50

4073SM1

4073SM1

4073SM1

4073SM1

4073SM2

RECLAIMED STRIP MINE, BOUNDARIES UNKNOWN

LARGE MOUND

FLAT MOUND

OVAL MOUNDS

STRIP MINED

APPROXIMATE BOUNDRY

DENSELY WOODED WITH DENSE SANDSTONE FLOAT

NOT STRIP MINED

ACTIVE UNDERGROUND SPRINGS

DAYLIGHTING SPRINGS IN A BOULDER MATRIX

DENSELY WOODED WITH SANDSTONE FLOAT

PUNCHMINE

PUNCHMINE

RECLAIMED STRIP MINE

ESTIMATED LOCATION OF CLEVENGER WELL

DENSELY WOODED WITH HARD SANDSTONE BOULDERS

SANDSTONE BOULDER PILE

BOULDER WALL

LINEAR TRENCH

MAIN CHANNEL

ACTIVE SPRINGS

DENSELY WOODED WITH HARD SANDSTONE BOULDERS

ACTIVE UNDERGROUND SPRINGS

HEAVILY BOULDERED

HEAVILY WOODED WITH SANDSTONE FLOAT

BOULDER PILE

SEEP FROM POND

UNDERGROUND STREAMS

POND

STRIP MINE UNRECLAIMED

DENSELY WOODED WITH HARD SANDSTONE BOULDERS

E-10

6375

6380

6385

6390

6395

6400

6405

6410

6415

6420

LEGEND

E-
DU- TEST BORING (DRILLED 2023)

P– PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT– PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB– PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM– PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 6421+50

MATCH LINE STA. 6479+00

ARTESIAN CONDITIONS FROM UNPLUGGED WELL

SANDSTONE AND CARBONACEOUS SHALE FLOAT

8638

70SM21

CLEARING WITH SEVERAL SHALLOW PITS

DISTURBED GROUND APPROX. 10' DEEP (PUNCH MINE)

MARSHY

BARACADE

GM-13

GM-12

GM-11

GM-10

GM-9

GM-8

GM-7

GM-6

SHALE TALUS

MARKED WETLAND

CULVERT PIPE

ORANGE MINE WATER

EXISTING CULVERT

CORRUGATED PIPE

WETLAND

MINE SURVEY SIGN

GAS PIPELINE

TALUSED WITH CARBONACEOUS SHALE

EXISTING EMBANKMENT-WELL VEGETATED

EXISTING EMBANKMENT-WELL

SOME MINE SPOIL POSSIBLE IN CUT

EXISTING CUT

PASTURE/GRASS FIELD

6425 6430 6435 6440 6445 6450 6455 6460 6465 6470 6475

SANDSTONE BOULDERS

MINE DISCHARGE

YARD

SANDSTONE BOULDERS

YARD

YARD

RADIO STATION

PRIVATE FENCE

YARD

FARM POND

PASTURE

CARBONACEOUS SHALE AND SANDSTONE FLOAT, POSSIBLY STRIP MINE

PIEZOMETER AT P-11 (2004)

SANDSTONE LINED RUNOFF CHANNEL (DRY)

467M019

P-11

GRASS FIELD

40A77SM5

POND

POND

18354

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB- PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM- PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 6421+50

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB- PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM- PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

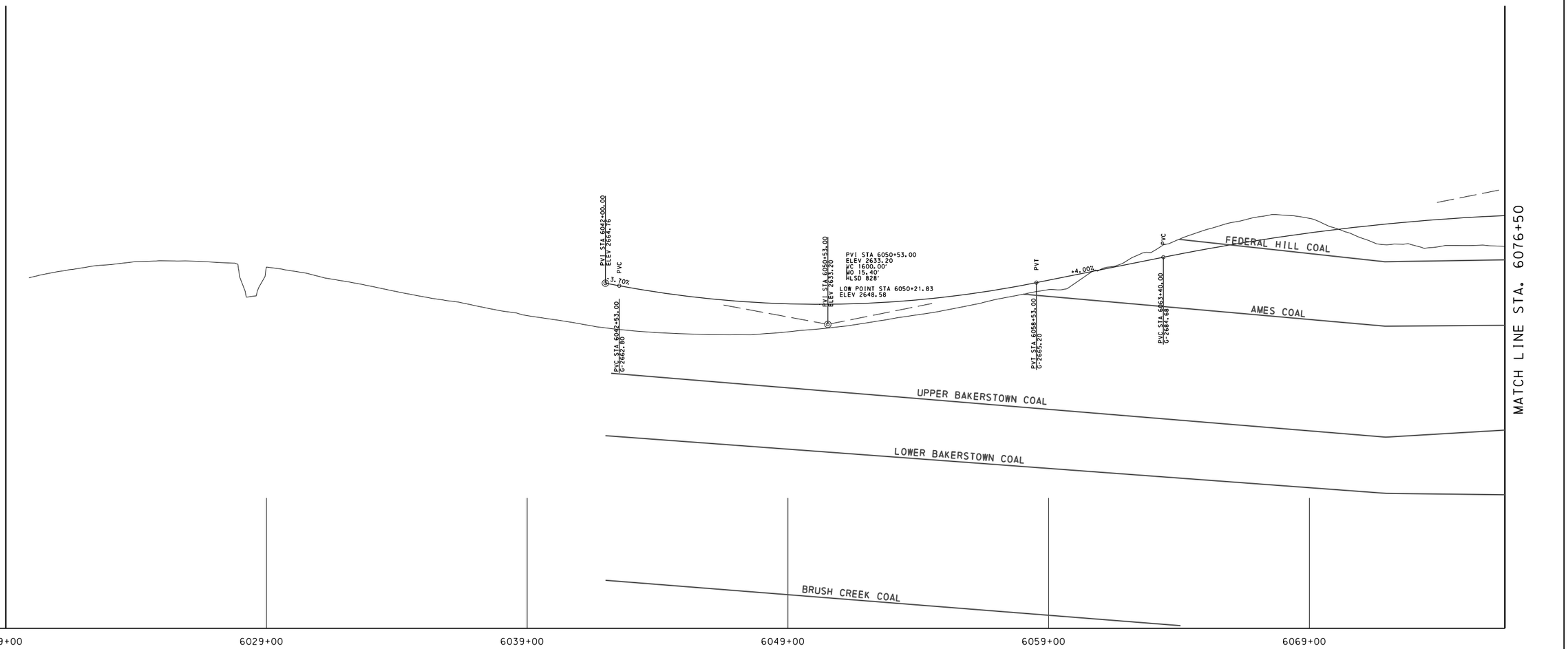
HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY



VERTICAL 40' 0 40'

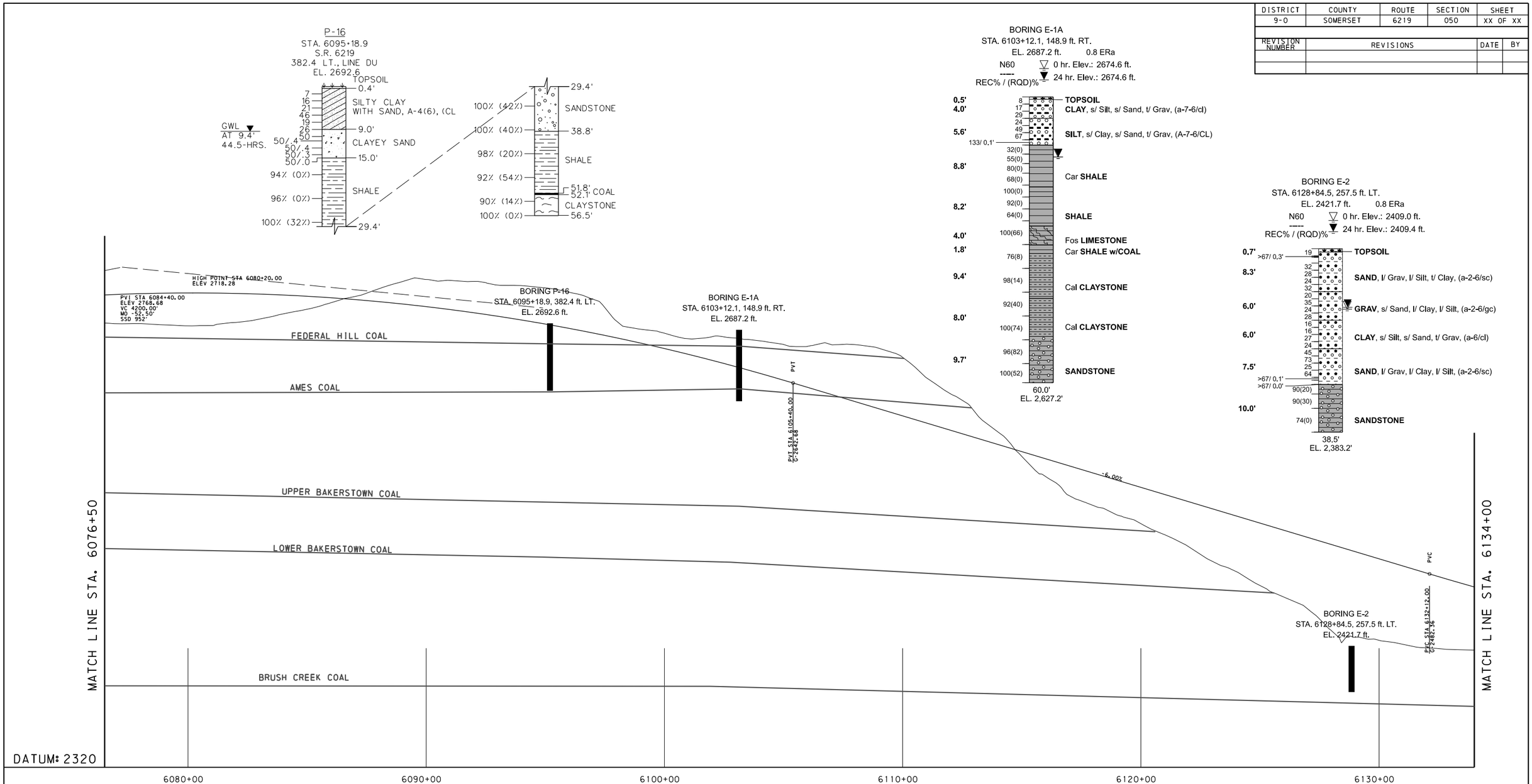
HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY



LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
P-16	6095+18.9 382.4 ft. LT.	S-3 to 6	3.0 to 9.0	15.8	9.1	21.9	8.9	13.0	69.0	37.1	31.9	A-4(6)	CL		33	23	10					
E-1A	6103+12.1 148.9 ft. RT.	S-5 to 6	6.0 to 9.0	14.4	8.8	21.8	14.4	7.4	69.4	35.8	33.6	A-7-6	CL		44	24	20					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

BORING DU-1
STA. 6167+83.4, 1.2 ft. RT.
EL. 2335.7 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2321.6 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2316.6 ft.

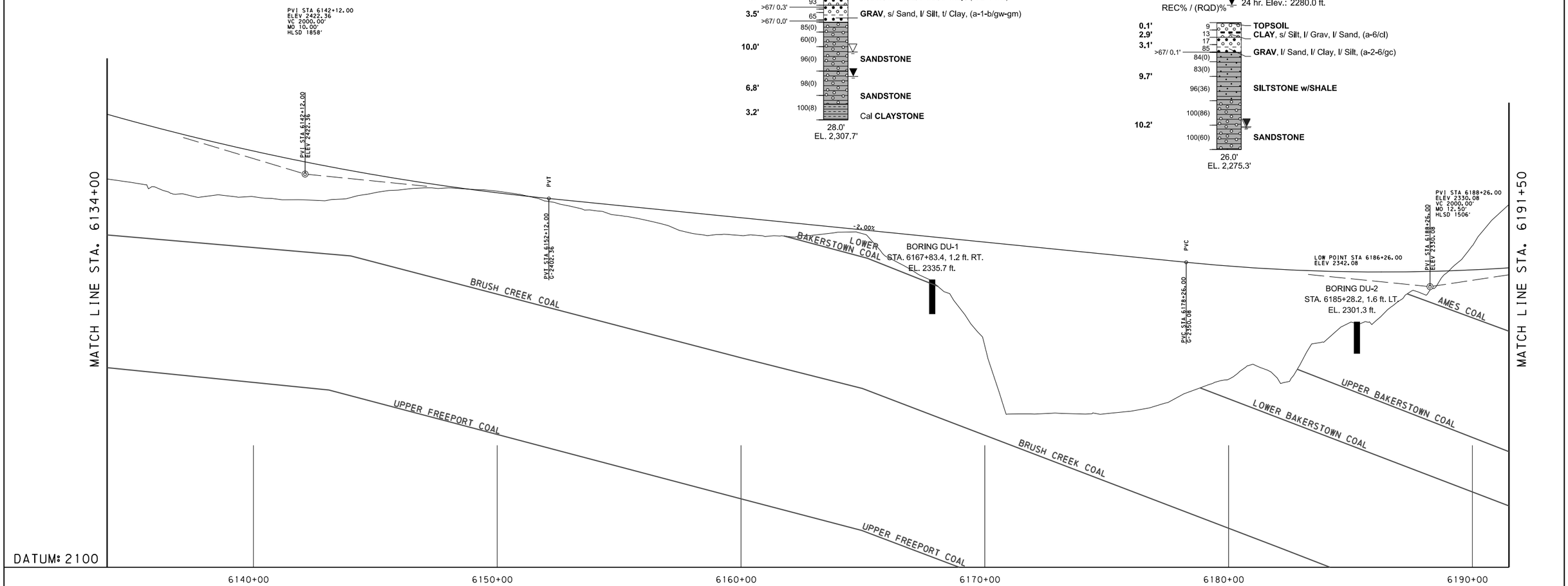
0.6'	13	**TOPSOIL**
3.9'	72 93	**GRAV**, s/ Sand, l/ Silt, l/ Clay, (A-2-4/SC)
	>67/ 0.3'	
3.5'	>67/ 0.0' 65	**GRAV**, s/ Sand, l/ Silt, t/ Clay, (a-1-b/gw-gm)
	85(0)	
	60(0)	
10.0'	96(0)	**SANDSTONE**
	98(0)	
6.8'		**SANDSTONE**
3.2'	100(8)	Cal **CLAYSTONE**

28.0'
EL. 2,307.7'

BORING DU-2
STA. 6185+28.2, 1.6 ft. LT.
EL. 2301.3 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2279.8 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2280.0 ft.

0.1'	9	**TOPSOIL**
2.9'	13 17	**CLAY**, s/ Silt, l/ Grav, l/ Sand, (a-6/cl)
3.1'	85 >67/ 0.1'	**GRAV**, l/ Sand, l/ Clay, l/ Silt, (a-2-6/gc)
	84(0)	
	83(0)	
9.7'	96(36)	**SILTSTONE w/SHALE**
	100(86)	
10.2'	100(60)	**SANDSTONE**

26.0'
EL. 2,275.3'



LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
DU-1	6167+83.4 1.2 ft. RT.	S-2 to 3	1.5 to 4.5	6.2	44.8	30.3	18.4	11.9	24.9	14.5	10.4	A-2-4	SC		29	19	10					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

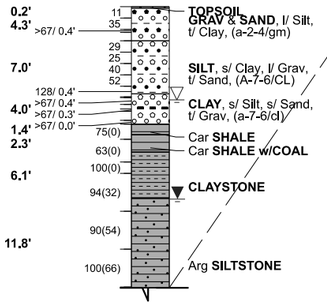
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

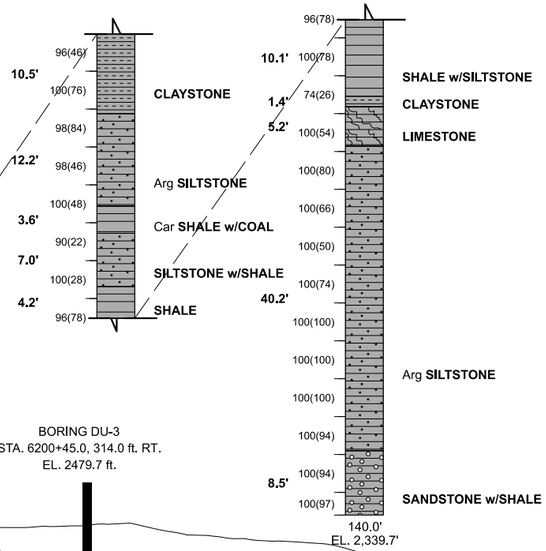
DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

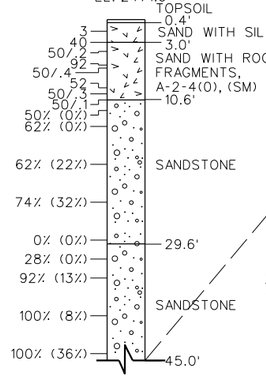
REVISION NUMBER	REVISIONS	DATE	BY

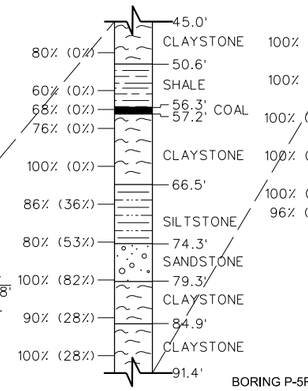
BORING DU-3
STA. 6200+45.0, 314.0 ft. RT.
EL. 2479.7 ft. 0.8 ERa
N60 0 hr. Elev.: 2467.4 ft.
REC% / (RQD)% 24 hr. Elev.: 2454.3 ft.

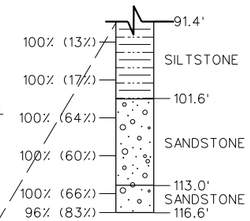




P-5R
STA. 6230+15.7
S.R. 6219
138.8' RT., LINE DU
EL. 2471.6

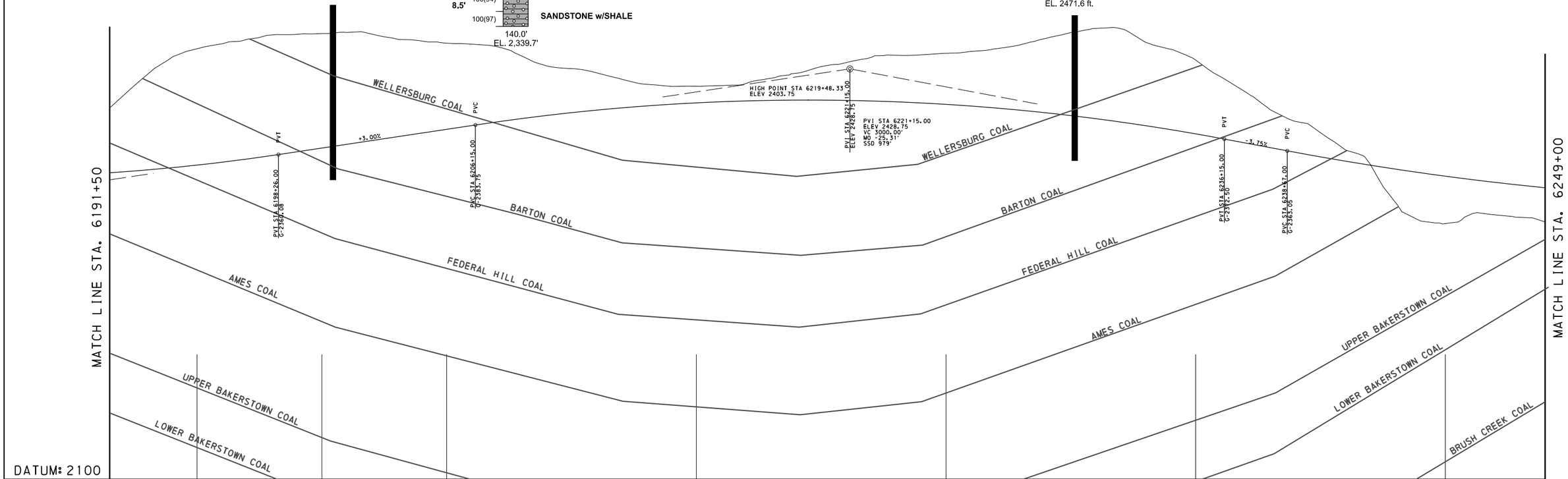






BORING P-5R
STA. 6230+15.7, 138.8 ft. RT.
EL. 2471.6 ft.

BORING DU-3
STA. 6200+45.0, 314.0 ft. RT.
EL. 2479.7 ft.



LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
DU-3	6200+45.0 314 ft. RT.	S-5 to 6	6.0 to 9.0	15.8	12.2	6.3	4.2	2.1	81.5	47.4	34.1	A-7-6	CL		42	22	20					
P-5R	6230+15.7 138.8 ft. RT.	S-3 to 6	3.0 to 9.0	7.1	24.4	42.6	9.6	33.0	33.0	17.2	15.8	A-2-4	SM		NP	NP	NP					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

P-12R
STA. 6262+60.2
S.R. 6219
449.2' RT., LINE DU
EL. 2445.0

TOPSOIL 0.3'
SILTY ROCK FRAGMENTS WITH SAND, A-1-b(0), (GM) 7.1'
SANDSTONE 17.3'
SILTSTONE AND SILTY SHALE 30.7'
SILTY SHALE WITH SILTSTONE 54.8'
LIMESTONE 56.3'
SILTY SHALE 60.1'
62.5' CLAY
64.2'
LIMESTONE 70.0'
SILTSTONE 81.8'

SILTSTONE WITH CLAYSTONE 108.3'
SANDSTONE 120.5'
GWL AT 156.5' 664/5-HRS.
SANDSTONE 161.3'

SANDSTONE 168.4'
SHALE AND COAL 169.6'
SILTSTONE AND CLAYSTONE 173.0'
SILTSTONE 183.6'
SILTSTONE 188.0'
COAL 190.3'
CLAYSTONE 193.3'
LIMESTONE 199.2'
SILTSTONE 206.0'
SANDSTONE 229.5'
SILTSTONE 231.4'
COAL 233.8'
LIMESTONE 234.6'
CLAYSTONE 240.6'
SANDSTONE 251.7'
SILTSTONE/ SHALE 259.7'
COAL 261.2'
COAL 264.0'
LIMESTONE 269.2'
161.3'

P-13RA
STA. 6272+60.0
S.R. 6219
1.1' LT., LINE DU
EL. 2110.0'

GWL AT 0.0' 0-HRS.
TOPSOIL 0.2'
ROCK FRAGMENTS WITH SAND 4.0'
SILTY SAND WITH GRAVEL, A-1-b(0), SM 8.4'
SANDSTONE 9.0'
SILTY GRAVEL WITH SAND 11.5'
ROCK FRAGMENTS W/SAND 11.8'
SILTY SHALE 15.0'
CLAYSTONE 16.7'
COAL 17.3'
CLAYSTONE 19.9'
COAL AND BONY COAL 23.5'
SHALE 24.5'
SILTSTONE 32.2'
SANDSTONE 43.5'

BORING P-12R
STA. 6262+60.2, 449.2 ft. RT.
EL. 2445.0 ft.

PVI STA 6261+17.00
ELEV 2278.67
VC 4500.00'
MO 43.59'
HLSD 2141'

LOW POINT STA 6260+44.42
ELEV 2322.22

PVI STA 6257+17.00
ELEV 2278.67

BORING DU-5
STA. 6276+57.2, 9.0 ft. LT.
EL. 2190.8 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2139.1 ft.
REC% / (RQD)% ▽ 24 hr. Elev.: 2133.6 ft.

TOPSOIL 0.3'
SAND, s/ Grav, l/ Silt, t/ Clay, (a-1-b/gp-gm) 14.7'
GRAV, s/ Sand, l/ Silt, t/ Clay, (a-1-b/gw-gm) 6.6'
Car SHALE 8.0'
CLAYSTONE 1.9'
Car SHALE 8.0'
CLAYSTONE 1.3'
SANDSTONE 6.3'
Car SILTSTONE 4.8'

CLAYSTONE 4.2'
SANDSTONE w/SILTSTONE 26.0'
97.0'
EL. 2,093.8'

BORING DU-6
STA. 6285+02.0, 7.3 ft. LT.
EL. 2356.4 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2318.3 ft.
REC% / (RQD)% ▽ 24 hr. Elev.: 2314.0 ft.

TOPSOIL 0.3'
GRAV & SAND, t/ Silt (a-1-b/gp) 10.2'
GRAV, t/ Sand (a-1-b/gp) 6.0'
SANDSTONE 15.5'
Car SHALE 0.7'
SILTSTONE 4.5'
SANDSTONE 10.8'
SILTSTONE w/SHALE 7.1'
Car SHALE w/COAL 7.9'
CLAYSTONE 1.1'
SANDSTONE 14.1'
CLAYSTONE 1.4'
SANDSTONE 11.0'

CLAYSTONE 3.7'
Car SILTSTONE w/SHALE 1.7'
CLAYSTONE 7.2'
SILTSTONE 13.8'
SANDSTONE w/SILTSTONE 11.0'
SILTSTONE w/SHALE 13.1'
SANDSTONE 21.1'
Car SHALE w/COAL 1.9'
CLAYSTONE w/SILTSTONE 1.7'
SANDSTONE 11.2'
177.0'
EL. 2,179.4'

BORING DU-6
STA. 6285+02.0, 7.3 ft. LT.
EL. 2356.4 ft.

BORING DU-5
STA. 6276+57.2, 9.0 ft. LT.
EL. 2190.8 ft.

BORING P-13RA
STA. 6272+60.0, 1.1 ft. LT.
EL. 2110.0 ft.

+4.00%

CLARION COAL
MERCER COAL
QUAKERTOWN COAL
BROOKVILLE COAL
MAUCH CHUNK
LOWER BAKERSTOWN COAL
BRUSH CREEK COAL
UPPER FREEPORT COAL
LOWER FREEPORT COAL
UPPER KITTANNING COAL
MIDDLE KITTANNING COAL
LOWER KITTANNING COAL

MATCH LINE STA. 6249+00
MATCH LINE STA. 6306+50

DATUM: 2050

VERTICAL 40' 0 40'
HORIZONTAL 200' 0 200'

6255+00 6265+00 6275+00 6285+00 6295+00 6305+00

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	MOISTURE DENSITY MAX. DRY DENSITY (PCF)	OPTIMUM MOISTURE %	CBR
P-12R	6262+60.2 449.2 ft. RT.	S-2 to 4	1.5 to 6.0	5.0	29.3	24.8	7.8	17.0	15.9	9.8	6.1	A-1-b	GM		46	37	9			
P-13RA	6272+60.0 1.1 ft. LT.	S-4 to 6	4.5 to 8.4	12.9	41.9	40.9	20.9	20.0	17.2	10.5	6.7	A-1-b	SM		NP	NP	NP			

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

BORING E-9
STA. 6345+60.6, 180.2 ft. LT.
EL. 2436.6 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2436.6 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2436.2 ft.

0.1'	15	**TOPSOIL**
4.4'	21	**SAND**, l/ Grav, l/ Clay, l/ Silt, (a-2-6/sc)
	33	
3.0'	36	**GRAV**, s/ Sand, l/ Silt, t/ Clay, (A-1-b/GM)
	39	
	105	
8.5'	35	**SAND**, s/ Grav, l/ Clay, l/ Silt, (a-2-6/sc)
	43	
	35	
	45	
	60	
	84	
6.5'	76	**GRAV**, s/ Sand, l/ Clay, l/ Silt, (a-2-6/gc)
	97	
	85/ 0.2'	
	>67/ 0.0'	95(35)
8.5'	87(80)	
	94(51)	**SANDSTONE**

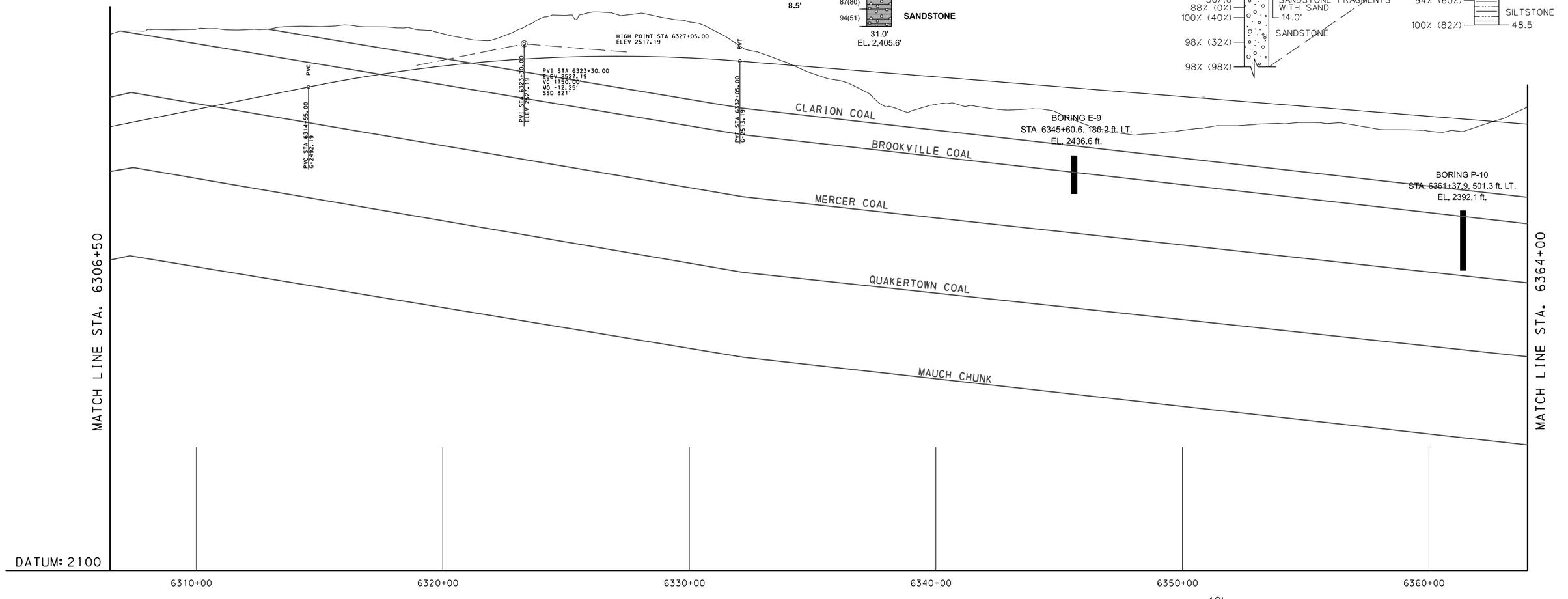
31.0'
EL. 2,405.6'

P-10
STA. 6361+37.9
S.R. 6219
501.3' LT., LINE DU
EL. 2392.1

GWL AT 2.2' 18-HRS.

22	ROCK FRAGMENTS WITH SAND	1.5'
31	CLAYEY SAND	7.5'
27	SANDSTONE FRAGMENTS WITH SAND	9.0'
52	SILTY CLAY WITH SAND	11.0'
52	SANDSTONE FRAGMENTS WITH SAND	14.0'
50	SANDSTONE	
50/.3		
50/.3		
50/.0		
88% (0%)		
100% (40%)		
98% (32%)		
98% (98%)		

98% (98%)		
100% (96%)		
100% (86%)		
94% (60%)	SILTSTONE	42.2' SHALE 42.7'
100% (82%)		48.5'



LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-9	6345+60.6 180.2 ft. LT.	S-4 to 5	4.5 to 7.5	7.9	50.4	28.6	7.4	21.2	21.0	15.8	5.2	A-1-b	GM		NP	NP	NP					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

BORING E-10
STA. 6391+78.2, 163.3 ft. RT.
EL. 2443.2 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2437.0 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2414.3 ft.

0.4'	5	TOPSOIL
10.1'	33, 36, 39, 28, 35, 20, 19, 24	SAND, l/ Grav, l/ Clay, l/ Silt, (a-4/sc)
7.5'	68, 112	GRAV, s/ Sand, s/ Silt, l/ Clay, (A-4/SC)
0.1'	>67/ 0.4'	
	>67/ 0.1'	GRAV, t/ Silt, t/ Sand (a-2-4/gm)
8.4'	95(0), 84(0), 100(34)	SILTSTONE w/SHALE
11.0'	94(58), 100(60)	SANDSTONE

16.6'	92(72), 94(76), 100(78)	SANDSTONE
2.9'	100(48)	SHALE w/SILTSTONE
8.0'	100(90), 100(83)	SANDSTONE

65.0'
EL. 2,378.2'

BORING E-10
STA. 6391+78.2, 163.3 ft. RT.
EL. 2443.2 ft.

PVC STA 6363+62.00
E-2451.08

PVI STA 6389+62.00
ELEV 2421.08
VC 4000.00'
MO -12.00'
SSD 1897'

PVI STA 6389+62.00
ELEV 2421.08

PVT

PVI STA 6409+62.00
E-2391.08

-4.00%

CLARION COAL
BROOKVILLE COAL
MERCER COAL
QUAKERTOWN COAL
MAUCH CHUNK
LOWER KITTANNING COAL
MIDDLE KITTANNING COAL
UPPER KITTANNING COAL

MATCH LINE STA. 6364+00

MATCH LINE STA. 6421+50

DATUM: 2050

6367+00 6377+00 6387+00 6397+00 6407+00 6417+00

LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
E-10	6391+78.2 163.3 ft. RT.	S-8 to 9	10.5 to 13.5	11.7	31.1	27.8	16.4	11.4	41.1	30.1	11.0	A-4	SC		30	21	9					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

BORING E-11
STA. 6423+79.7, 225.2 ft. RT.
EL. 2346.8 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2304.2 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2304.5 ft.

0.2' TOPSOIL
11.8' GRAV, l/ Sand, l/ Clay, l/ Silt, (A-2-6/GC)
19.5' GRAV, l/ Sand, l/ Silt, t/ Clay, (A-2-6/GC)
4.1' CLAY, s/ Silt, l/ Sand (a-6/cl)
2.7' CLAYSTONE
5.0' Arg SILTSTONE

BORING E-11
STA. 6423+79.7, 225.2 ft. RT.
EL. 2346.8 ft.

P-11
STA. 6425+09.6
S.R. 6219
46.7' RT., LINE DU
EL. 2336.2

32.1' SANDSTONE
3.1' CLAYSTONE
9.8' SANDSTONE
3.7' CLAYSTONE w/SILTSTONE
92.0'

BORING P-11 EL. 2,254.8'
STA. 6425+09.6, 46.7 ft. RT.
EL. 2336.2 ft.

GRAVEL WITH SAND, A-1-b(0), (GM) 10.5'
100% (90%) SANDSTONE 18.7'
94% (36%) SHALE 22.6'
23.5' SHALE
72% (0%) CLAYSHALE 28.9'
74% (0%) COAL 29.7'
CLAYSTONE 32.4'
88% (0%) SHALE 45.5'
86% (0%) VOID 47.5'
86% (0%) CLAY 49.5'
30% (8%)

GWL AT 49.5' 24-HRS.

4% (0%) SHALE 49.5'
100% (0%) CLAYSTONE 54.0'
100% (0%) SANDSTONE 58.6'
56% (0%) 65.0'
85% (0%)
93% (47%)
96% (86%)
90% (34%) SANDSTONE
100% (80%)
100% (66%) SHALE AND SILTSTONE 92.7'
86% (78%) CLAYSTONE 95.0'
SANDSTONE 95.8'
100% (64%) 99.0'

GM-4
STA. 6438+98.3
14.6'RT., LINE DU
EL. 2271.28

G.W.L. 6.3',24-HRS. 5-17-95

N.B.	S.D.	
6	1.5	
20	4.5	
14	7.5	
24	10.5	
53	13.5	
50/1	16.2	
84	0	
100	28	
100	42	
100	52	
100	48	

41.2'
5-16-95

TOPSOIL (0.5')
SILTY CLAY (CL)WITH SAND AND GRAVEL, TAN TO TAN-GRAY, MOIST, MED. STIFF TO HARD, HOMOGENEOUS *WEATHERED CLAYSTONE (RESIDUAL) (15.7'), A-7-6(6), GM-4A-1
CLAYSTONE WITH SOME CLAYEY SHALE, CARBONACEOUS, DARK GRAY TO BLACK, VERY SOFT TO SOFT, MODERATELY TO SLIGHTLY WEATHERED, INTENSELY LAMINATED TO MEDIUM BEDDED, RD=0-3*, EXTREMELY CLOSE TO CLOSELY SPACED FRACTURES, RD=VARIABLE (RQD=0%) (5.0')
CLAYSTONE, TAN-GRAY, VERY SOFT TO SOFT, MODERATELY TO SLIGHTLY WEATHERED, DISRUPTED BEDDING, VERY CLOSELY TO MEDIUM SPACED FRACTURES, RD=INDETER-MINATED (RQD=37%) (3.8')
ALTERNATING BEDS OF SILTSTONE AND CLAYSTONE, GRAY TO DARK GRAY, MODERATELY TO SLIGHTLY WEATHERED, THINLY TO MEDIUM BEDDED WITH DISRUPTED BEDDING IN CLAYSTONE, RD=0-5*, VERY CLOSELY TO MEDIUM SPACED FRACTURES, RD=ALONG BEDDING PLANES WITH VERY FEW 75-90* FRACTURES (RQD=44%) (16.2')

GM-5
STA. 6444+85.9
40.4' LT., LINE DU
EL. 2238.11

G.W.L. 6.6',24-HRS. 5-17-95

N.B.	S.D.	
9	1.5	
50/4	4.4	
38	7.0	
50/3	9.8	
100	36	
100	36	

14.8'
5/16/95

TOPSOIL (0.3')
CLAYEY GRAVEL (ANGULAR ROCK FRAGMENTS) (GC), W/SAND AND SILT, BROWN, MOIST, LOOSE TO VERY DENSE, HOMOGENEOUS (RESIDUAL), (6.7') A-2-4(0), GM-5-1 *GRAVEL & COBBLES FROM 4.0'-5.5'
GRAVEL (ANGULAR ROCK FRAGMENTS) (gp), LIGHT BROWN TO LIGHT GRAY, DRY, FISSURED (RESIDUAL),(2.8') A-2-4, SEE GM-1-1
SANDY TO CLAYEY SHALE, RUSTY-BROWN, VERY SOFT TO MEDIUM WEATHERED, LAMINATED, RD=0-5*, EXTREMELY CLOSE TO CLOSELY SPACED FRACTURES, RD=0-15* (RQD=32%), (5.0')

DEEP MINE PERMIT AREA

BORING GM-4
STA. 6438+98.3, 14.6 ft. RT.
EL. 2271.28 ft.

BORING GM-5
STA. 6444+85.9, 40.4 ft. LT.
EL. 2238.11 ft.

BORING GM-8
STA. 6462+53.1, 22.5 ft. LT.
EL. 2161.00 ft.

BORING GM-9
STA. 6470+06.3, 11.3 ft. RT.
EL. 2124.25 ft.

PVC STA 6428+19.00 ELEV 2266.80
PVI STA 6431+44.00 ELEV 2253.80 VC 650.00' VG 2.19% HCSD 1134'
PVI STA 6431+44.00 ELEV 2255.80
PVT STA 6434+63.00 ELEV 2248.68
PVC STA 6436+46.00 ELEV 2241.28
PVI STA 6440+71.00 ELEV 2241.75 VC 850.00' VG -2.87% SSD 824'
PVI STA 6440+71.00 ELEV 2241.75
PVT STA 6444+96.00 ELEV 2224.75
-1.30%
-4.90%

MATCH LINE STA. 6421+50

MERCER COAL
BROOKVILLE COAL
CLARION COAL
LOWER KITTANNING COAL
MIDDLE KITTANNING COAL
UPPER KITTANNING COAL
LOWER FREEPORT COAL
LOWER FREEPORT RIDER COAL
UPPER FREEPORT COAL
BRUSH CREEK COAL
LOWER BAKERSTOWN COAL
UPPER BAKERSTOWN COAL
AMES COAL
FEDERAL HILL COAL
BARTON COAL

MATCH LINE STA. 6479+00

DATUM: 1970

6425+00 6435+00 6445+00 6455+00 6465+00 6475+00

GM-8
STA. 6462+53.1
22.5' LT., LINE DU
EL. 2161.00

G.W.L. 13.1',24-HRS. 5-22-95

N.B.	S.D.	
5	1.5	
12	4.5	
13	7.5	
17	10.5	
39	13.5	
58	16.5	
50/1	18.8	
57	0	
90	33	

23.9'
5-16-95

TOPSOIL (0.5')
SILTY CLAY WITH SAND (cl), BROWN, MOIST, MEDIUM STIFF TO STIFF, HOMOGENEOUS (RESIDUAL) (5.5')
CLAYEY GRAVEL (GC), (ROCK FRAGMENTS) WITH SAND AND SILT, DARK BROWN TO BLACK, MOIST, MEDIUM DENSE TO DENSE, HOMOGENEOUS (RESIDUAL) (9.0'), A-2-6(0), GM-8-1
WEATHERED COAL, BLACK, DRY, VERY DENSE, HOMOGENEOUS (RESIDUAL) (1.5')
CALCAREOUS SILTY CLAY (cl), TAN, MOIST, HARD, HOMOGENEOUS (RESIDUAL) (2.3')
LIMESTONE, GRAY, MEDIUM HARD TO HARD, MODERATELY WEATHERED TO FRESH, MEDIUM BEDDED, RD=3-5*, VERY CLOSELY TO CLOSELY SPACED FRACTURES, RD=VARIABLE *SOME FINE FRACTURES WITH CALCITE FILLING *MODERATELY WEATHERED FROM 23.3-33.9' (RQD=20%) (5.1')

GM-9
STA. 6470+06.3
11.3' RT., LINE DU
EL. 2124.25

G.W.L. 8.8',24-HRS. 5-24-95

N.B.	S.D.	
7	1.5	
18	4.5	
10	7.5	
20	10.5	
50/2	12.7	
50/4	16.4	
38	0	
85	38	
87	15	

26.4'
5-22-95

TOPSOIL (0.5')
SILTY TO SANDY CLAY WITH GRAVEL (cl), BROWN, MOIST, MEDIUM TO VERY STIFF, HOMOGENEOUS (COLLUVIAL) (8.5'), A-6, SEE WT-5-1
SILTY TO SANDY CLAY AND GRAVEL (SHALE FRAGMENTS) (cl-gc), BROWN TO BLACK, DRY TO MOIST, VERY STIFF TO HARD OR MEDIUM TO VERY DENSE, FISSURED (RESIDUAL) (6.0'), A-7-6, SEE WT-4-1
SILTY CLAY (cl), GRAY, MOIST, HARD, HOMOGENEOUS (RESIDUAL) (1.4')
CLAYSTONE, GRAY, VERY SOFT, MODERATELY WEATHERED, INDETERMINATE BEDDING AND SPACING (RQD=0%) (5.2')
CLAYSTONE, GRAY, SOFT, SLIGHTLY WEATHERED, THINLY TO MEDIUM SPACED FRACTURES, RD=0* (RQD=34%) (2.8')
SANDSTONE, GRAY, FINE-GRAINED, MEDIUM HARD TO HARD, SLIGHTLY WEATHERED, THINLY TO MEDIUM BEDDED, RD=0*, VERY THINLY TO MEDIUM SPACED FRACTURES, RD=75-90* (RQD=23%) (2.0')

VERTICAL 40' 0 40'
HORIZONTAL 200' 0 200'

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
P-11	6425+09.6 46.7 ft. RT.	S-2 to 6	1.5 to 6.8	3.9	51.6	32.7	25.7	7.0	15.7	10.7	5.0	A-1-b	GM		NP	NP	NP					
GM-4	6438+98.3 14.6 ft. RT.	S-2 to 3	1.5 to 4.5	13.1	20.0	27.5	18.8	8.7	52.5	36.0	16.5	A-7-6	CL		41	25	16					
GM-5	6444+85.9 40.4 ft. LT.	S-3 to 5	3.0 to 7.0	6.3	57.5	20.8	11.4	9.4	21.7	15.3	6.4	A-2-4	GC		27	19	8					
GM-8	6462+53.1 22.5 ft. LT.	S-5 to 9	6.0 to 13.5	12.4	61.2	22.2	15.1	7.1	16.6	12.2	4.4	A-2-6	GC		35	22	13					
E-11	6423+79.7 225.2 ft. RT.	S-5 to 8	6.0 to 12.0	8.5	55.6	11.8	7.4	4.4	32.6	18.9	13.7	A-2-6	GC		31	18	13					
E-11	6423+79.7 225.2 ft. RT.	S-9 to 14	12.0 to 21.0	10.5	61.3	13.9	9.5	4.4	24.7	16.9	7.8	A-2-6	GC		29	18	11					

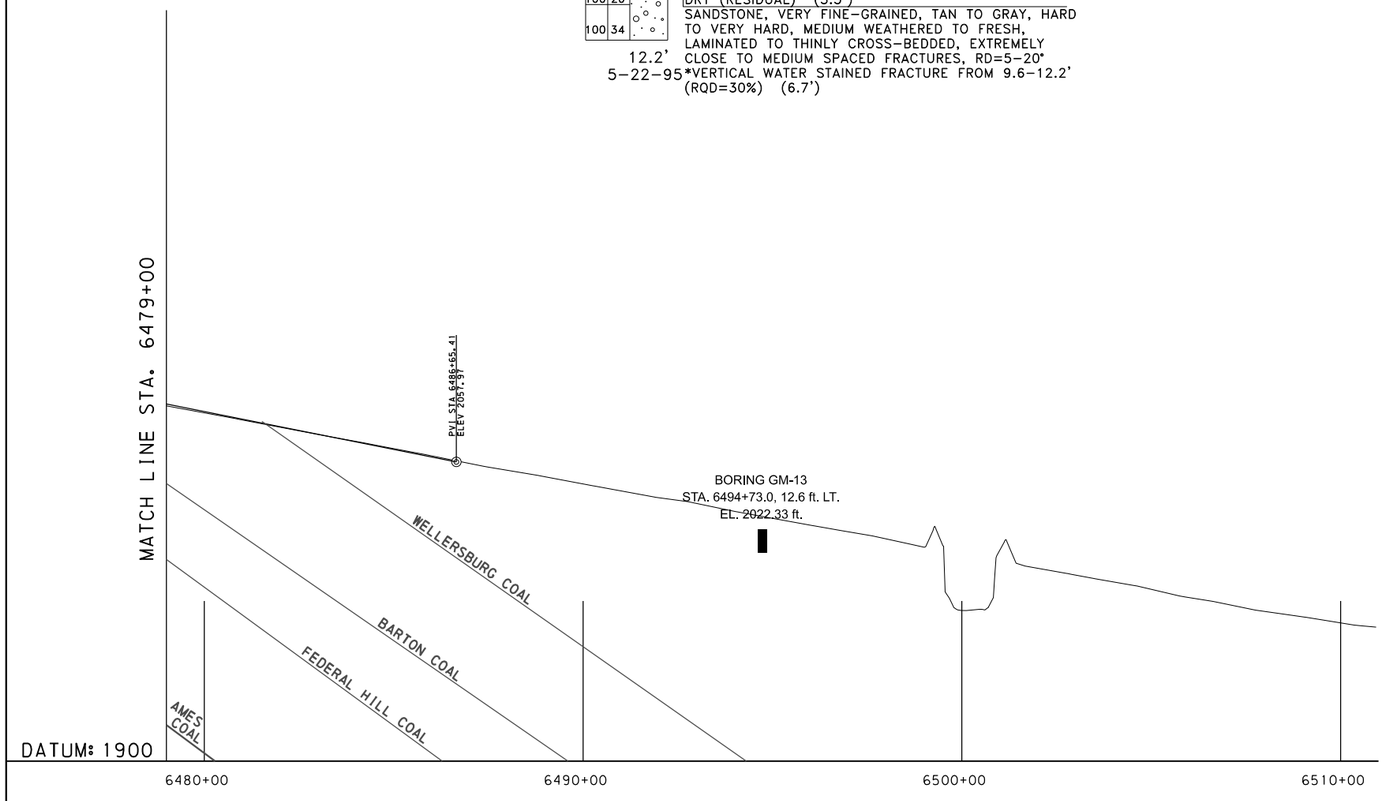
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
DU PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

GM-13
STA. 6494+73.0
12.6' RT., LINE DU
2022.33

G.W.L.	N.B.S.D.			
1.3',24-HRS. 5-23-95	6	1.5		TOPSOIL (0.5') SILTY CLAY WITH GRAVEL (cl), BROWN, MOIST, MEDIUM STIFF (RESIDUAL) (1.5'), A-7-6, SEE WT-4-1
	50/3	3.7	# #	WEATHERED SANDSTONE FRAGMENTS (gp), LIGHT BROWN, DRY (RESIDUAL) (3.5')
	50/0	5.5	# #	
	100	20		SANDSTONE, VERY FINE-GRAINED, TAN TO GRAY, HARD TO VERY HARD, MEDIUM WEATHERED TO FRESH, LAMINATED TO THINLY CROSS-BEDDED, EXTREMELY CLOSE TO MEDIUM SPACED FRACTURES, RD=5-20*
12.2' 5-22-95	100	34		*VERTICAL WATER STAINED FRACTURE FROM 9.6-12.2' (RQD=30%) (6.7')



VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DU PROFILE

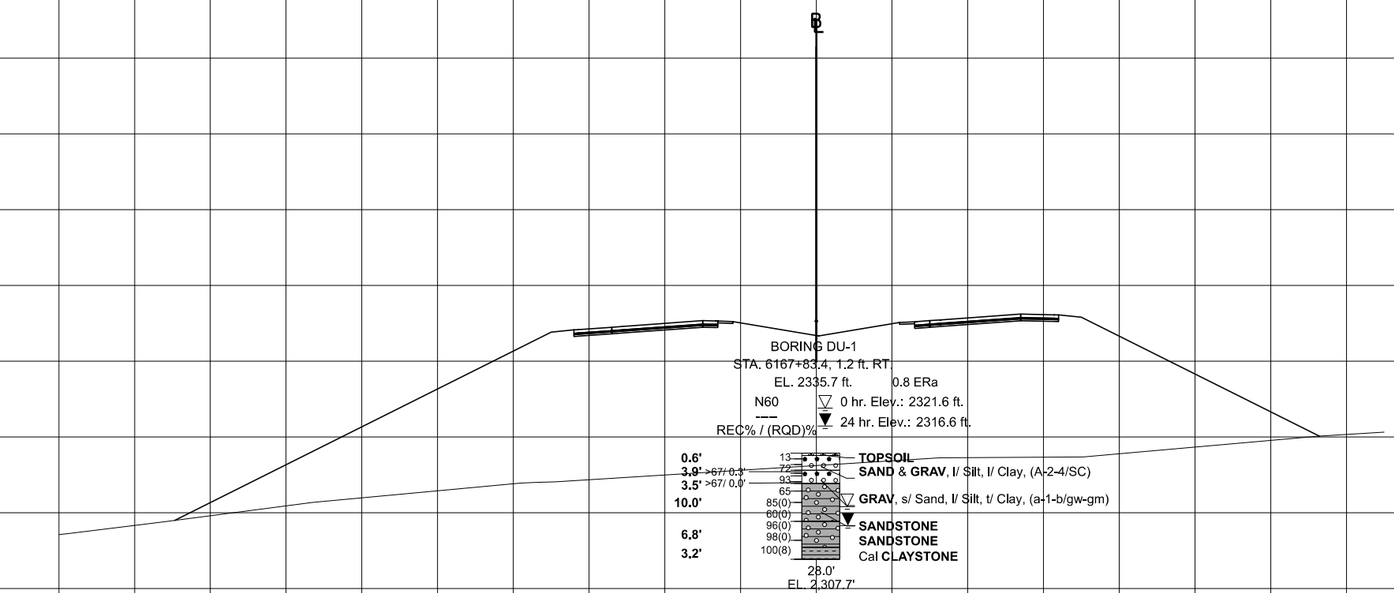
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
DU-1	6167+83.4 1.2 ft. RT.	S-2 to 3	1.5 to 4.5	6.2	44.8	30.3	18.4	11.9	24.9	14.5	10.4	A-2-4	SC		29	19	10					



CROSS SECTION AT STA 6167+95.00 - ALIGNMENT DU

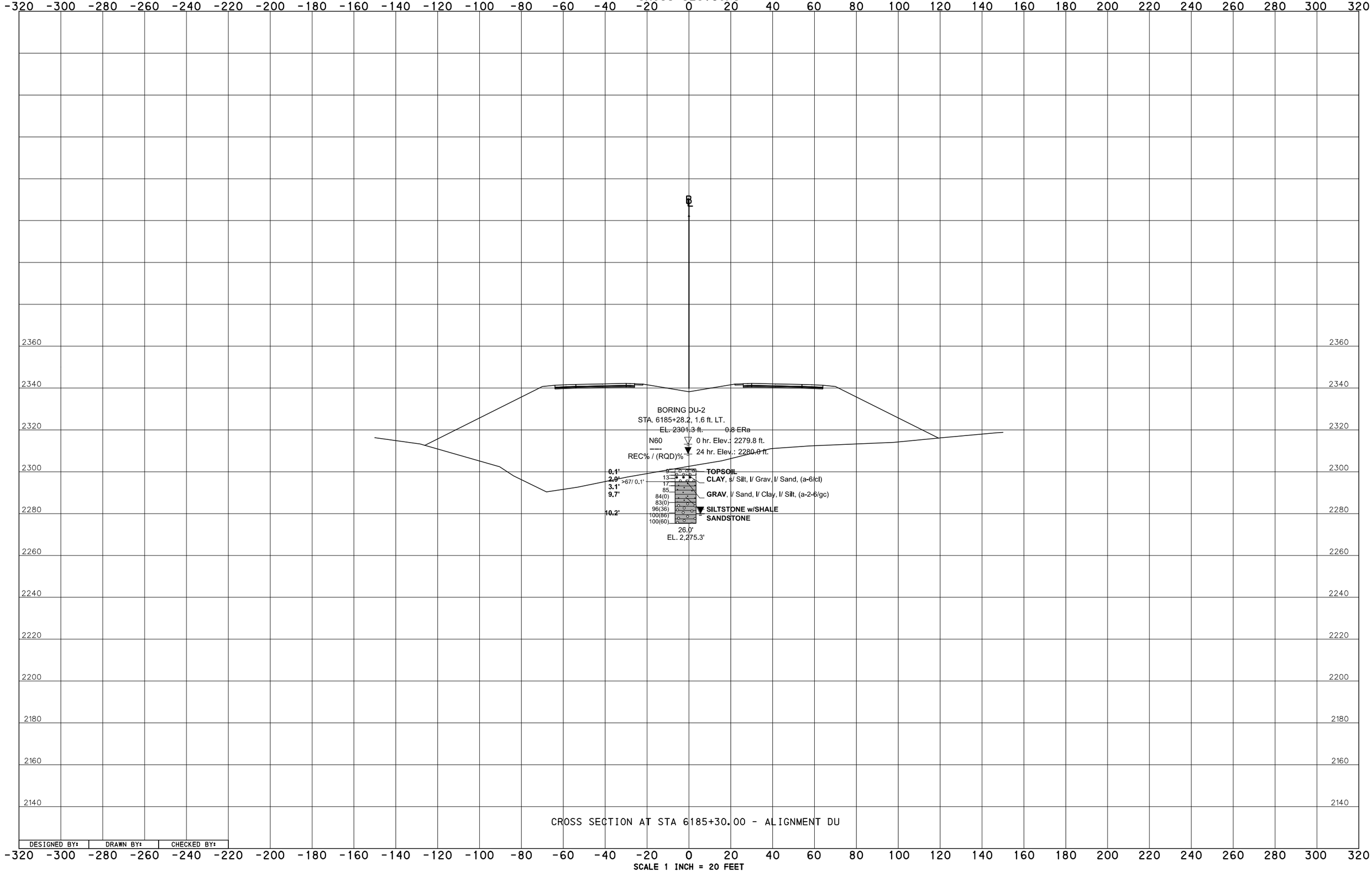
DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF



CROSS SECTION AT STA 6185+30.00 - ALIGNMENT DU

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

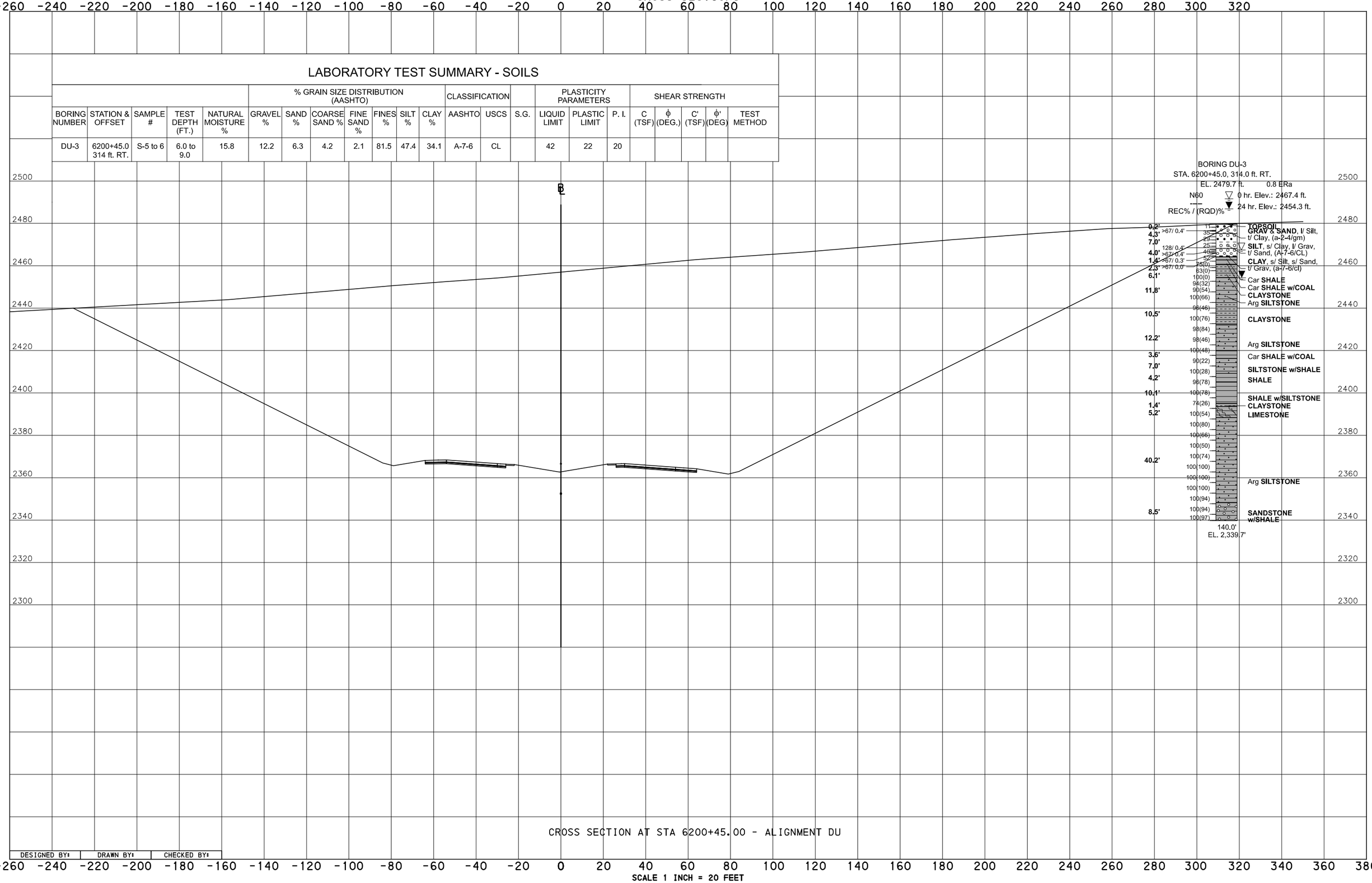
PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

LABORATORY TEST SUMMARY - SOILS

BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	% GRAIN SIZE DISTRIBUTION (AASHTO) GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	CLASSIFICATION AASHTO	USCS	S.G.	PLASTICITY PARAMETERS LIQUID LIMIT	PLASTIC LIMIT	P. I.	SHEAR STRENGTH C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
DU-3	6200+45.0 314 ft. RT.	S-5 to 6	6.0 to 9.0	15.8	12.2	6.3	4.2	2.1	81.5	47.4	34.1	A-7-6	CL		42	22	20					



CROSS SECTION AT STA 6200+45.00 - ALIGNMENT DU

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF

-320 -300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320

2360 2340 2320 2300 2280 2260 2240 2220 2200 2180 2160 2140

℄

BORING DU-5
STA. 6276+57.2, 9.0 ft. LT.
EL. 2190.8 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2139.1 ft.
--- ▼ 24 hr. Elev.: 2133.6 ft.
REC% / (RQD)%

0.3'	25	**TOPSOIL**
	20	
14.7'	39	**SAND**, s/ Grav, l/ Silt, t/ Clay, (a-1-b/gp-gm)
	44	
	51	
6.6'	56	**GRAV**, s/ Sand, l/ Silt, t/ Clay, (a-1-b/gw-gm)
	37	
	31	
8.0'	76	Car **SHALE**
1.9'	61	**CLAYSTONE**
	41	
8.0'	17(0)	Car **SHALE**
	57(0)	
1.3'	64(0)	**CLAYSTONE**
6.3'	76(0)	**SANDSTONE**
	48(0)	
	52(0)	
	48(0)	
14.9'	100(60)	
	100(48)	**SANDSTONE**
	84(20)	
4.8'	100(74)	Car **SILTSTONE**
4.2'	100(100)	**CLAYSTONE**
	100(86)	
	76(22)	
	100(76)	
	100(100)	
	100(100)	
26.0'	98(68)	
	100(92)	**SANDSTONE w/SILTSTONE**
	100(100)	

99/ 0.4'
132/ 0.3'
119/ 0.3'
>67/ 0.1'

97.0'
EL. 2,093.8'

CROSS SECTION AT STA 6276+60.00 - ALIGNMENT DU

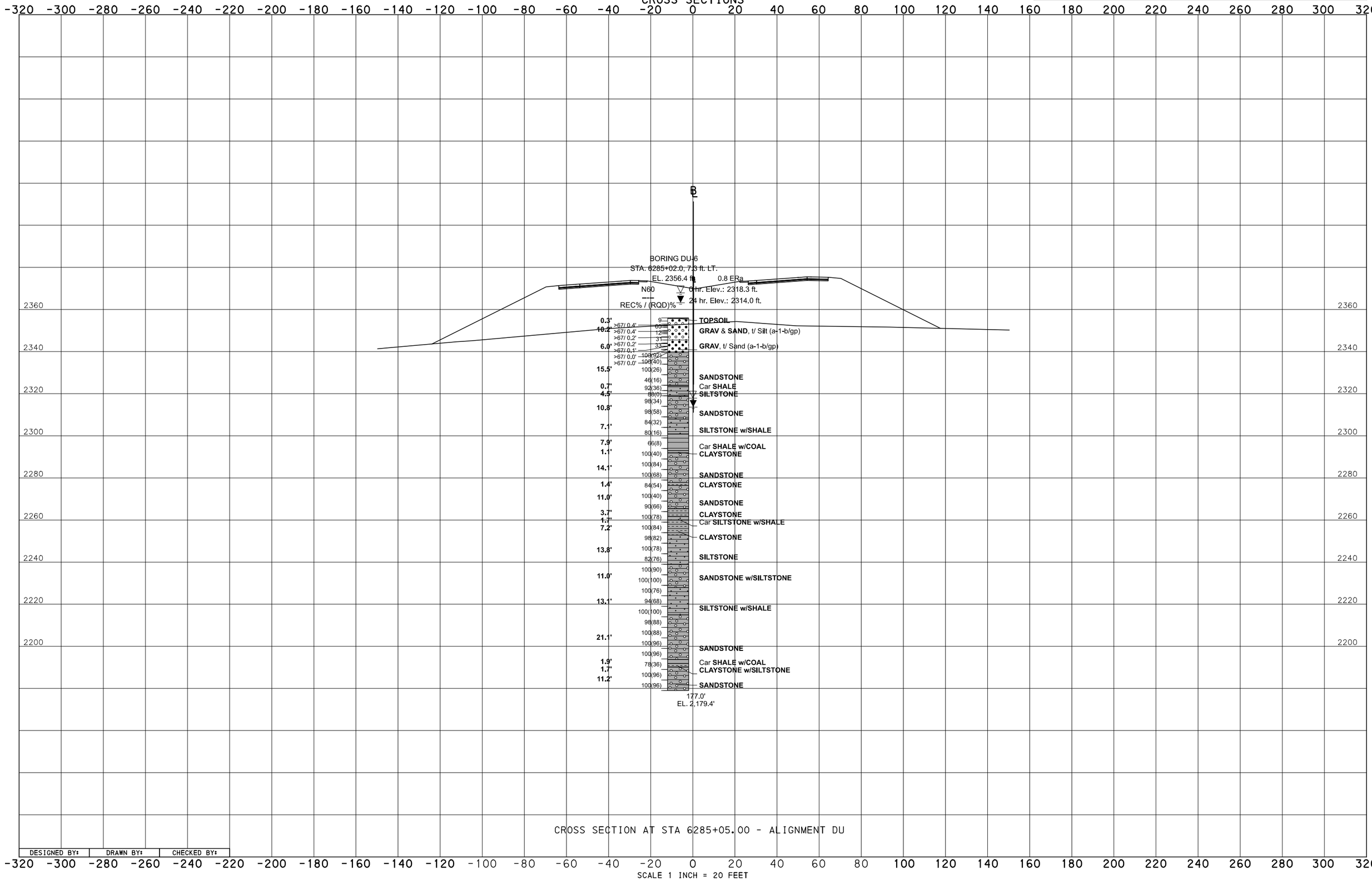
DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS

DISTRICT	COUNTY	ROUTE	SECT	PRELIM BK NO	FINAL BK NO	SHEET
9-0	SOMERSET	6219	050	-	-	OF



CROSS SECTION AT STA 6285+05.00 - ALIGNMENT DU

DESIGNED BY:	DRAWN BY:	CHECKED BY:

SCALE 1 INCH = 20 FEET

ALIGNMENT E-SHIFT
SUBSURFACE PLAN AND PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

P-20

P-19

DISTURBED/ EXCAVATED

FILL WITH RUBBLE AND TRASH

LEDGE CREEK BED

SANDSTONE AND CLAYSTONE AND BLACK SHALE IN CREEK BED

ALIGNMENT E SHIFT

CHURCH

SOYBEAN FIELD

HAYFIELD/ CORNFIELD

MATCH LINE STA. 2077+50

PARKING

PARKING

2050

2045

2055

2060

2065

2070

2075

2040

2035

2030

2025

2021

CATTAILS, SOFT & WET

STANDING WATER

GRASS FIELD

HAYFIELD

CORNFIELD

CORNFIELD & GRASS

T.V. TOWER

TREATMENT/ SETTLING POND

POSSIBLE RECLAIMATION

UNRECLAIMED STRIP MINE

STREAM

WETLAND

P-21

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB- PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM- PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E SHIFT PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 2077+50

ALIGNMENT E SHIFT

E-1A

E-2

P-16

416 (MD)

HAYFIELD RECLAIMED STRIP MINE

WOODED

THICK UNDERBRUSH SPARSELY WOODED RECENT LOGGING WITH SANDSTONE FLOAT

SOFT & WET

SANDSTONE FLOAT

DENSE VEGETATION

HEAVILY WOODED WITH SANDSTONE FLOAT

PUNCH MINES WITH MOUNDS

SANDSTONE BOULDER FLOAT

TREE LINE

TRACTOR ROAD

PASTURE/FIELD

HAYFIELD

BRUSHY FIELD

HEAVILY WOODED SPARSE SANDSTONE FLOAT

LIGHTLY WOODED WITH OCCASIONAL SANDSTONE FLOAT

ACTIVE STREAM

SCATTERED RAPID MAPLE TREE LINES

SPRING WITH AMD

SLIGHTLY ACID WATER

MARSHY

OPEN WOODS WITH OCCASIONAL SANDSTONE FLOAT

HEAVILY WOODED OCCASIONAL SANDSTONE FLOAT

NUMEROUS TRACES OF CARBONACEOUS SHALE & COAL FRAGMENTS (PROSPECT ?)

PUNCH MINE

TRIBUTARY LIGHT FLOW TO INTERMITENT FLOW 8/18/22

SPOILS

FILLED WITH WATER

ABANDONED STRIP MINE

CORNFIELD

APPROX LIMIT

TREELINE

WOODED WITH OCCASIONAL SANDSTONE FLOAT

HOUSE

BARN

2080 2085 2090 2095 2100 2105 2110 2115 2120 2125 2130 2135

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

TB- PREVIOUSLY DRILLED TEST BORING (DRILLED 1974)

GM- PREVIOUSLY DRILLED TEST BORING (DRILLED 1995)

NOTE:
PLAN BASED ON LINE AND GRADE FILES RECEIVED AUGUST 2022

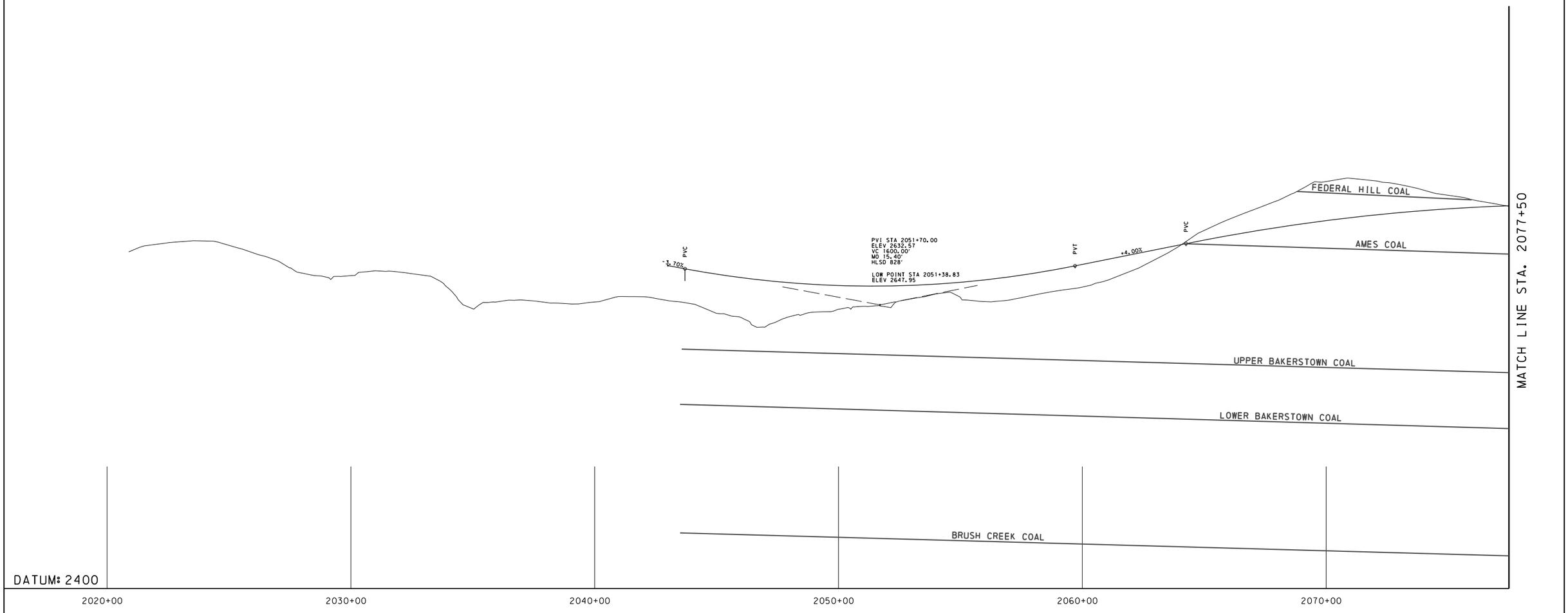
HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT E SHIFT PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY



VERTICAL 40' 0 40'

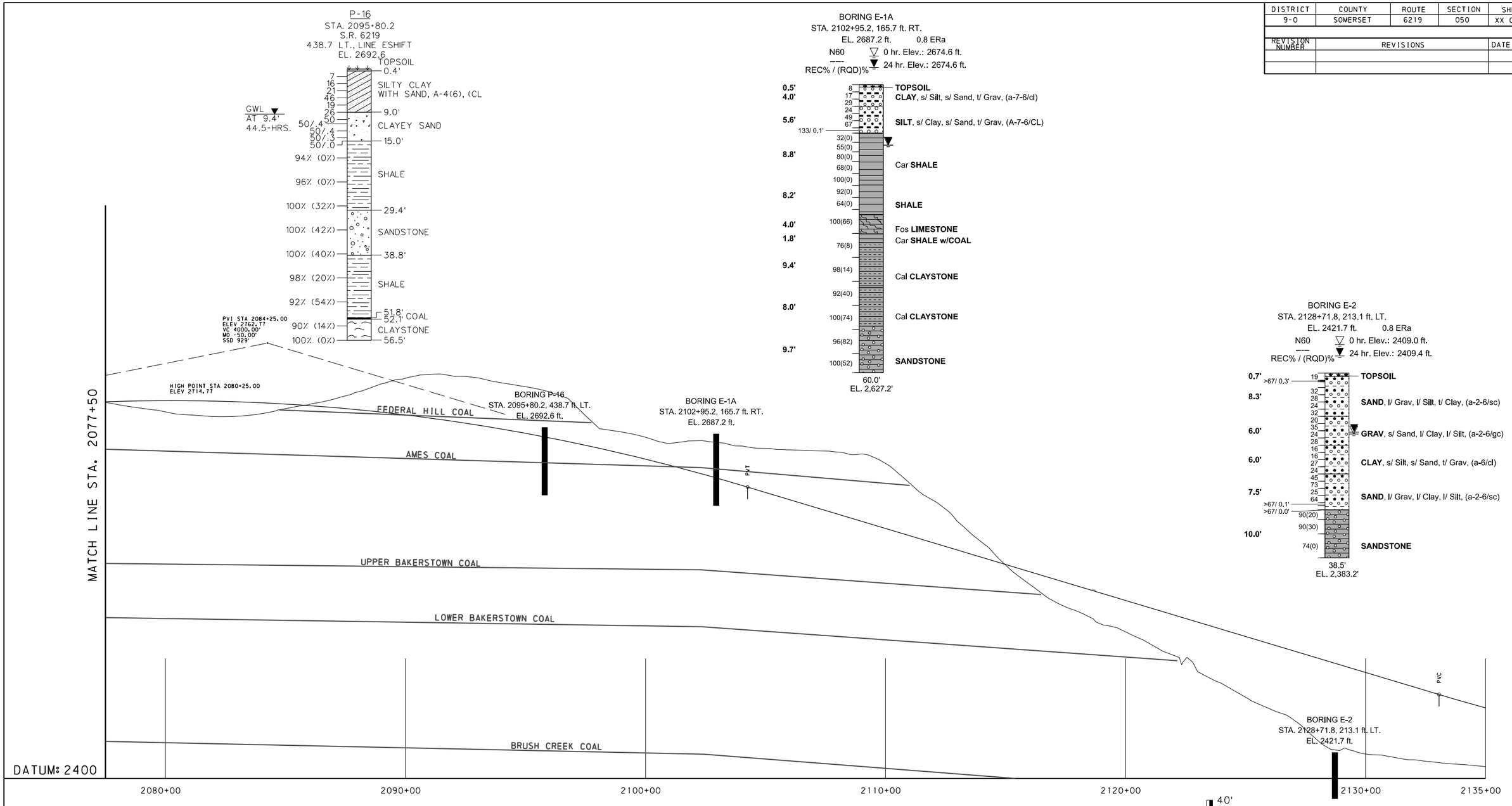
HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E SHIFT PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY



BORING E-1A
STA. 2102+95.2, 165.7 ft. RT.
EL. 2687.2 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2674.6 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2674.6 ft.

0.5'	8	**TOPSOIL**
4.0'	17, 29, 24, 49, 67	**CLAY**, s/ Silt, s/ Sand, t/ Grav, (a-7-6/cl)
5.6'	133/ 0.1'	**SILT**, s/ Clay, s/ Sand, t/ Grav, (A-7-6/CL)
8.8'	32(0), 55(0), 80(0), 68(0), 100(0)	Car **SHALE**
8.2'	92(0), 64(0)	**SHALE**
4.0'	100(66)	Fos **LIMESTONE**
1.8'	76(8)	Car **SHALE w/COAL**
9.4'	98(14), 92(40)	Cal **CLAYSTONE**
8.0'	100(74)	Cal **CLAYSTONE**
9.7'	96(82), 100(52)	**SANDSTONE**

60.0'
EL. 2,627.2'

BORING E-2
STA. 2128+71.8, 213.1 ft. LT.
EL. 2421.7 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2409.0 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2409.4 ft.

0.7'	>67/ 0.3'	**TOPSOIL**
8.3'	19, 32, 28, 24	**SAND**, l/ Grav, l/ Silt, t/ Clay, (a-2-6/sc)
6.0'	32, 20, 35, 24	**GRAV**, s/ Sand, l/ Clay, l/ Silt, (a-2-6/gc)
6.0'	28, 16, 16, 27	**CLAY**, s/ Silt, s/ Sand, t/ Grav, (a-6/cl)
7.5'	24, 45, 73, 25, 64	**SAND**, l/ Grav, l/ Clay, l/ Silt, (a-2-6/sc)
10.0'	>67/ 0.1', >67/ 0.0', 90(20), 90(30)	
	74(0)	**SANDSTONE**

38.5'
EL. 2,383.2'

LABORATORY TEST SUMMARY - SOILS

					% GRAIN SIZE DISTRIBUTION (AASHTO)							CLASSIFICATION			PLASTICITY PARAMETERS			SHEAR STRENGTH				
BORING NUMBER	STATION & OFFSET	SAMPLE #	TEST DEPTH (FT.)	NATURAL MOISTURE %	GRAVEL %	SAND %	COARSE SAND %	FINE SAND %	FINES %	SILT %	CLAY %	AASHTO	USCS	S.G.	LIQUID LIMIT	PLASTIC LIMIT	P. I.	C (TSF)	ϕ (DEG.)	C' (TSF)	ϕ' (DEG)	TEST METHOD
P-16	2095+80.2 438.7 ft. LT.	S-3 to 6	3.0 to 9.0	15.8	9.1	21.9	8.9	13.0	69.0	37.1	31.9	A-4(6)	CL		33	23	10					
E-1A	2102+95.2 165.7 ft. RT.	S-5 to 6	6.0 to 9.0	14.4	8.8	21.8	14.4	7.4	69.4	35.8	33.6	A-7-6	CL		44	24	20					

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

E SHIFT PROFILE

ALIGNMENT DU-SHIFT
SUBSURFACE PLAN AND PROFILE

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

P-20

P-21

ALIGNMENT DU SHIFT

FILL WITH RUBBLE AND TRASH

LEDGE CREEK BED

SANDSTONE AND CLAYSTONE AND BLACK SHALE IN CREEK BED

CHURCH

SOYBEAN FIELD

HAYFIELD/ CORNFIELD

MATCH LINE STA. 6076+50

CATTAILS, SOFT & WET

STANDING WATER

TREATMENT/ SETTLING POND

POSSIBLE RECLAIMATION

UNRECLAIMED STRIP MINE

CORNFIELD & GRASS

E.V. TOWER

PARKING

GRASS FIELD

HAYFIELD

WETLAND

STREAM

6020 6025 6030 6035 6040 6045 6050 6055 6060 6065 6070 6075

LEGEND

E-DU- TEST BORING (DRILLED 2023)

P- PREVIOUSLY DRILLED TEST BORING (DRILLED 2004)

WT- PREVIOUSLY DRILLED TEST BORING (DRILLED 1993)

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NOTE:
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HORIZONTAL 200′ 0 200′

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

ALIGNMENT DU SHIFT PLAN

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	6219	050	XX OF XX

REVISION NUMBER	REVISIONS	DATE	BY

MATCH LINE STA. 6076+50

ALIGNMENT DU SHIFT

WOODED

THICK UNDERBRUSH SPARSELY WOODED RECENT LOGGING WITH SANDSTONE FLOAT

TREE LINE

TRACTOR ROAD

DB-16

PASTURE/FIELD

HAYFIELD

BRUSHY FIELD

SOFT & WET

SANDSTONE FLOAT

DENSE VEGETATION

HEAVILY WOODED SPARSE SANDSTONE FLOAT

LIGHTLY WOODED WITH OCCASIONAL SANDSTONE FLOAT

416 (MD)

HAYFIELD RECLAIMED STRIP MINE

PUNCH MINES WITH MOUNDS

HEAVILY WOODED WITH SANDSTONE FLOAT

SANDSTONE BOULDER FLOAT

DENSE VEGETATION

ACTIVE STREAM

E-2

SCATTERED RED MAPLE TREE LINES

SPRING WITH AMD

SANDSTONE BOULDER PILE

OPEN WOODS WITH OCCASIONAL SANDSTONE FLOAT

MARSHY

COLL DEEP EN

6080 6085 6090 6095 6100 6105 6110 6115 6120 6125 6130 6135

TRACTOR ROAD

CORNFIELD

APPROX LIMIT

E-1A

TRACTOR ROAD

TREE LINE

HAYFIELD RECLAIMED STRIP MINE

HEAVILY WOODED OCCASIONAL SANDSTONE FLOAT

SPOILS FILLED WITH WATER

ABANDONED STRIP MINE

NUMEROUS TRACES OF CARBONACEOUS SHALE & COAL FRAGMENTS (PROSPECT ?)

TRIBUTARY LIGHT FLOW TO INTERMITENT FLOW 8/18/22

PUNCH MINE

TREELINE

PASTURE/FIELD

WOODED WITH OCCASIONAL SANDSTONE FLOAT

HAYFIELD

HOUSE

BARN

LEGEND

E-DU- TEST BORING (DRILLED 2023)

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ALIGNMENT DU SHIFT PLAN

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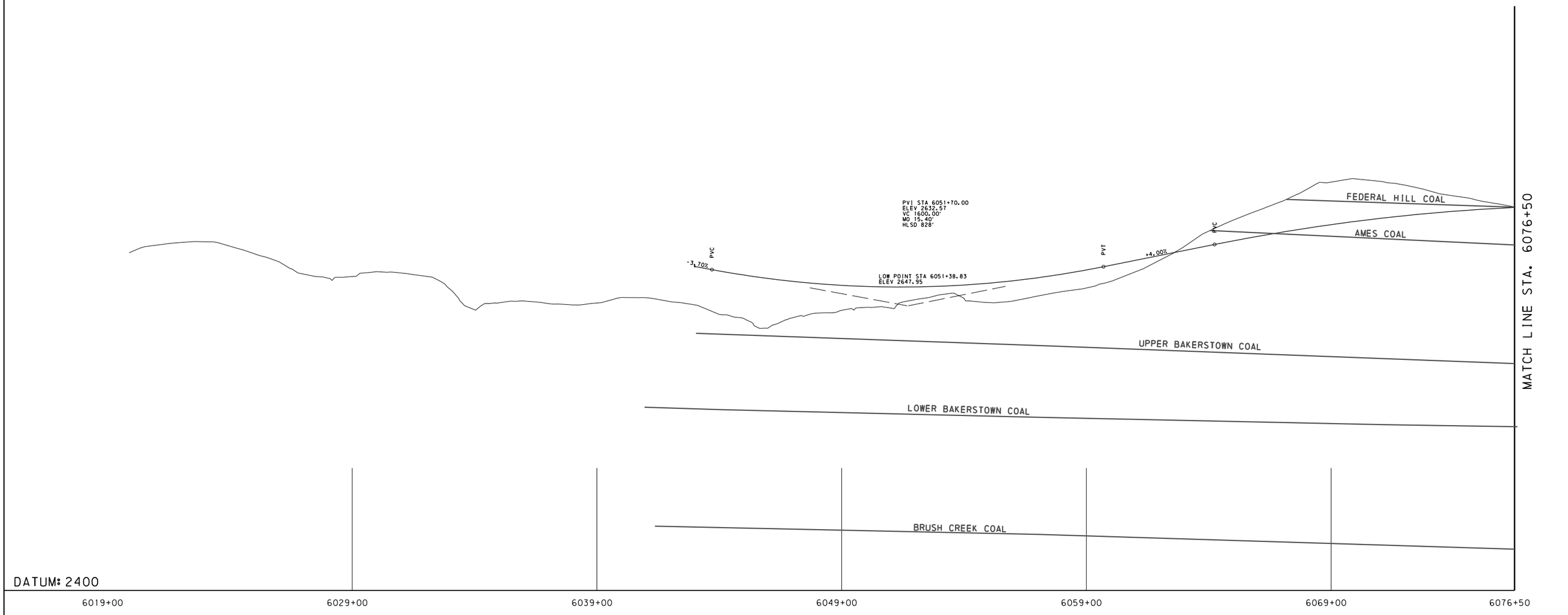

VERTICAL 40' 0 40'

HORIZONTAL 200' 0 200'

COMMONWEALTH OF PENNSYLVANIA
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DU SHIFT PROFILE

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9-0	SOMERSET	6219	050	XX OF XX

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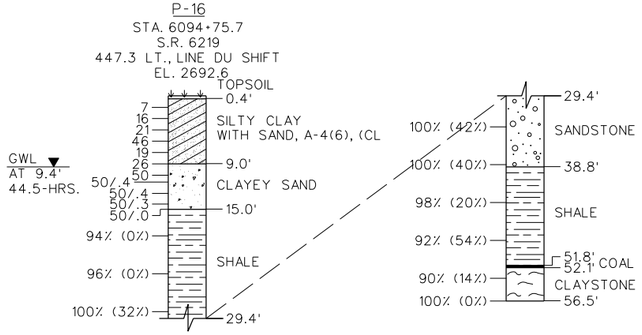
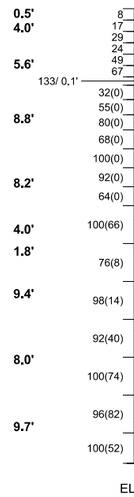
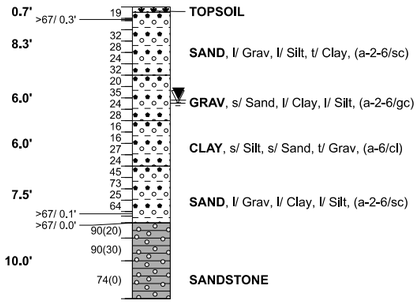
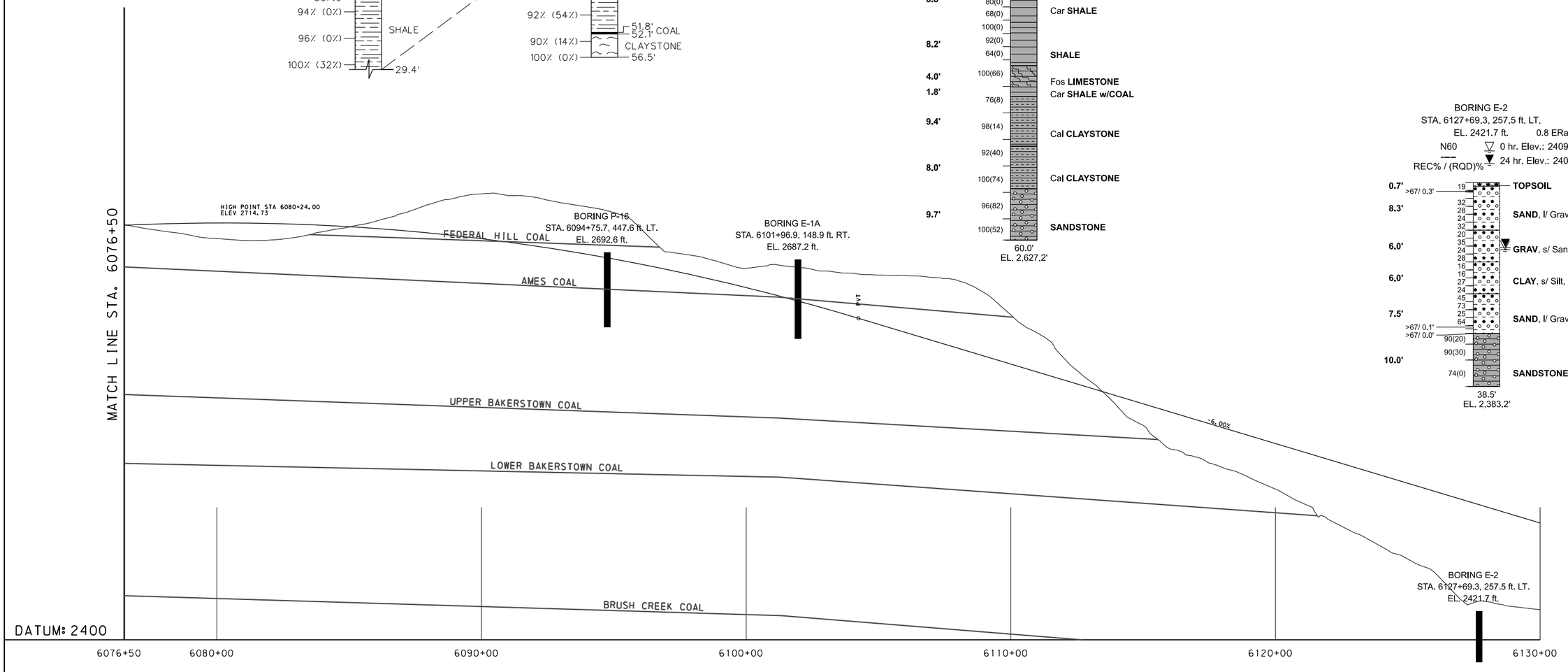


BORING E-1A
STA. 6101+96.9, 148.9 ft. RT.
EL. 2687.2 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2674.6 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2674.6 ft.



BORING E-2
STA. 6127+69.3, 257.5 ft. LT.
EL. 2421.7 ft. 0.8 ERa
N60 ▽ 0 hr. Elev.: 2409.0 ft.
REC% / (RQD)% ▼ 24 hr. Elev.: 2409.4 ft.





LABORATORY TEST SUMMARY - SOILS

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E-1A	6101+96.9 148.9 ft. RT.	S-5 to 6	6.0 to 9.0	14.4	8.8	21.8	14.4	7.4	69.4	35.8	33.6	A-7-6	CL		44	24	20					

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HORIZONTAL 200' 0 200'

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DU SHIFT PROFILE