



May 19, 2025  
Revision 1

Mr. Nick Urbanowicz  
MSP Development, LLC  
P.O. Box 1567  
Beaver Falls, PA 15010

Subject: Geotechnical Investigation  
Newbury Tractor Supply  
South Fayette Township, Allegheny County, PA

Dear Mr. Urbanowicz:

KU Resources, Inc. (KU Resources) is pleased to provide you with the following summary report of the geotechnical investigation performed for the Newbury Tractor Supply property located in South Fayette Township, Allegheny County, PA (the Site). Our review of the Site Plan indicates that the proposed development will include the construction of an approximate 21,930-square foot (ft), retail building, with the associated outside display area and parking areas on an approximate 3.43-acre lot. No proposed grading plan was available at the time of the investigation.

**This assessment is prepared for the benefit of and reliance to the Developer entity that will take title to the property (*MSP Properties of Pennsylvania, L.P.*) & *Tractor Supply Company, a Delaware Corporation.***

### **Site Location**

The Site is located along Kensington Street in South Fayette Township, Allegheny County, PA and occupies parcel 197-R-30. According to historical aerial imagery, the Site was disturbed circa 2019 during construction of Top Golf. The Site is bordered to the north and east by Chartiers Creek, to the west by top golf and adjacent parking lots, and to the south by the Cigars International retail space and the Municipal Authority of South Fayette Township building. Kensington Street is the primary route of entry and exit to the Site.

Figure 1 presents a Site Location Map, Figure 2 a Street Location Map, and Figure 3 a Satellite Image for spatial reference. Figures are presented in Attachment A.

### **Site History**

An aerial review was conducted for the Site. Circa 2010, the Site was disturbed during construction of TopGolf in 2018. Uncontrolled fill was placed in the form of a berm at the edge of the TopGolf parking lot as well as an approximately 20-foot high fill pile near the proposed northern edge of the Tractor Supply footprint. Prior to this development, the Site was a cleared lot located north of the former Reichhold Chemical Inc. facility, which existed from 1928 to 2005. An aerial review prior to 1937 was not conducted.

### **Site Geology**

The Site is situated in the Waynesburg Hills Section of the Appalachian Plateaus Province. The Waynesburg Hills Section is characterized by numerous steep-sloped hills with narrow hilltops and narrow valleys. Dendritic drainage patterns are common and fluvial action from these drainages coupled with landslides are the primary mechanisms affecting the topography. The bedrock typically consists of cyclic sequences of sandstone, shale, red beds, and limestone.

The Site is underlain by the Casselman Formation, which is characterized by a few locally persistent red beds, calcareous claystones, freshwater limestones, thin sandstones, shales, siltstones, and generally thin, economically insignificant coal beds. Most of the shales overlying coals contain plant fossils, and several also contain freshwater fauna. This formation thickens in a southeasterly direction, from about 230 ft in western Washington County to about 575 ft in the Wellersburg basin (Geyer and Wilshusen, 1982; McElroy, 2001).

The bedrock in the area surrounding the Site is folded, producing dips to the bedrock. The folds take the form of anticlines (inverted U-shaped structures), synclines (U-shaped structures), and domes. Depending on the structure involved, bedrock typically dips toward (synclines) or away (anticlines) from the axis of the fold. The Site is situated proximate to the axis of the Carnegie Syncline. The bedrock structure and incised paleo-channels and their sand/gravel terrace deposits influence topography, stream patterns, and hydrogeologic flow characteristics. Subsurface geologic structure at the Site location can be reviewed in Figure 6.

### **Coal Mining**

Our review of local geology and historical coal mining information indicates that no deep mining has occurred beneath the Site.

According to USGS topographic maps, the Site sits at an approximate elevation of 815-820 ft above mean sea level (amsl). The Pittsburgh Coal is projected to be at an approximate elevation of 820 ft amsl. Our exploratory drilling program did not encounter coal, nor erosional remnants of the coal seam.

Figure 4 presents a Coal Structure Map of the Pittsburgh Coal Seam. Figure 5 presents the Pennsylvania Department of Environmental Protection Mine Subsidence Risk Map.

### **Groundwater**

Groundwater beneath the Site is most likely present in a shallow zone defined at the soil/bedrock interface and in deeper zone(s) situated in the underlying bedrock units. The first water-bearing zone, most likely, is a result of the downward percolation of surface water. Precipitation migrates vertically through the permeable soil zone and, upon reaching relatively impermeable layers, begins to move laterally. In this area, the first water-bearing zone is typically located at the soil-bedrock interface or at a contact with a relatively impermeable clay layer.

Groundwater was observed at depths ranging from 3.0 ft to 20.0 ft below ground surface (bgs) during this investigation. Variations in depth are attributable to varying site elevations from fill placement and perched groundwater within zones of the fill. Dewatering and extensive drainage systems are expected to be necessary during construction.

### **Subsurface Investigation**

Prior to initiating drilling activities, the Pennsylvania One Call System underground utility locating service was contacted to identify any conflicts with the drilling program. The Pennsylvania One Call System



contacted affected utility providers, and underground utility lines were marked. Existing utility drawings were reviewed, and no conflicts were identified.

Seven test borings (designated B-01 through B-07) were drilled at the Site by AllProbe Environmental Inc. with a truck-mounted Diedrich D-50 drill rig. Exploration depths varied from 7.5 ft to 30.5 ft bgs. Soil samples were visually examined, and boring logs were created for each location explored. Logs are presented in Attachment B. A Boring Location Map can be reviewed in Figure 7.

Borings B-01 through B-04 targeted the four boring corners. Boring B-05 targeted the eastern center of the fenced outdoor area. Borings B-06 and B-07 targeted the proposed parking lot areas.

Standard Penetration Test (SPT) values were obtained during drilling. The SPT (ASTM D-1586) gives an indication of density of granular soils and consistency of fine-grained soils. A 2-inch O.D. split-spoon sampler is driven into the earth by a 140-pound hammer dropped 30 inches. N-values (blow counts) are recorded for each 6-inch interval. The sampler is driven a total of 18 inches.

### Soil and Bedrock Conditions

Soils beneath the Site can be grouped into three unconsolidated units underlain by bedrock.

- *Unconsolidated Fill Soils* – Very soft to very stiff CLAY with intergradation and varying amounts of sands, gravels, coal fragments and organics.
- *Unconsolidated Residual Cohesive Soils* – Very soft to stiff sandy CLAY with intergradation and varying amounts of gravels and coal fragments.
- *Unconsolidated Residual Granular Soils* – Very loose silty SAND with gravel, trace coal fragments.

The soil type and consistency in the bearing zone is presented as an overview of the conditions documented:

Boring	Approx. Existing Elevation (ft asl)	Total Depth (ft bgs)	Fill Zone (ft bgs)	Residual Zone (ft bgs)	Assumed Bedrock Depth (ft bgs)	Groundwater Depth (ft bgs)
B-01	833	30.5	0.0-25.5	25.5-30.5	30.5	9.0
B-02	823	16.5	0.0-12.0	12.0-16.5	-	15.0
B-03	827	21.5	0.0-12.0	12.0-21.5	-	20.0
B-04	821	16.5	0.0-12.0	12.0-16.5	-	12.0
B-05	817	9	0.0-4.5	4.5-9.0	-	-
B-06	821	9	0.0-8.0	8.0-9.0	-	8.0
B-07	821	7.5	0.0-4.5	4.5-7.5	-	3.0

### Bedrock

Boring B-01 was positioned on the highpoint of the Site on top of a large fill pile with an approximate elevation of 833 ft amsl or 10 ft higher than the remaining sections of the Site. Auger refusal was encountered in boring B-01 at 30.5 ft bgs. We assume this is the depth of bedrock, based on nearby sites we have drilled. It could potentially be a boulder; however, even if this is the case, we anticipated



bedrock to be close to this elevation. A review of the historical bedrock data from projects near the Site shows that bedrock was found at depths ranging from 17.0 to 23.0 ft bgs.

### **Organics**

Boring B-01 had varying amounts of organics found at depths ranging from 0.0 to 25.5 ft bgs. Boring B-01 is presumed to be the largest cut section on Site. The material could be used as structural fill on Site if the material follows the structural fill requirements stated in the design parameters section below.

### **Laboratory Testing**

Five samples were sent to Geotechnics in East Pittsburgh for USCS testing and moisture content analysis (see Attachment C). Results of testing can be found in the boring logs, as well as attached to this report.

### **Foundation Selection**

According to Site plans, the construction includes the construction of an approximate 21,930-square ft, retail building, with the associated outside display area and parking areas on an approximate 3.43-acre lot. No proposed grading plan was available at the time of the investigation.

We understand the preferred construction configuration is a slab-on-grade building. In order to prepare the Site, we anticipate large sections of cut at the north end of the Site, and fill placement in the center and southern portions of the Site. We anticipated that, without remediation, the footer subgrade will be located within the fill material zone classified as brown/gray clays with varying amounts of sand, gravels, coal fragments, and miscellaneous zones of constructions debris. Foundations bearing on this zone would be susceptible to risks associated with differential settlement.

We recommend that the footer subgrade be over-excavated 1 ft below footer subgrade. The excavation should be laterally over-sized by 12 inches in each direction, as well. The over-excavated subgrade should be verified and approved by a geotechnical engineer prior to any backfilling. Backfill and compact the over-excavation with an engineer-approved stone( PennDOT 2A, AASHTO #57, approved equivalent). Foundations bearing on the trench-remediated footer can utilize a bearing capacity of 2,000 pounds per square foot. Foundations will have estimated total post-construction settlements of 1 inch or less and differential settlements of 0.5 inch or less.

### ***Floor Slab and Parking Grades***

The floor slab subgrade, travel lanes, and parking area subgrades should be proof rolled to ensure relative stability. Proof rolling should be conducted with a tandem-axle dump truck loaded to legal limit. The truck should be operated between 2-3 mph and make overlapping passes such that all of the subgrade receives load during the process. Deflection in excess of ½-inch under wheel loads will be grounds for failure. Additionally, pumping or excessive tracking (rutting), indicating an excess of moisture, will be grounds for failure of the proof roll. In the event of a failing proof roll, additional over-excavation or reworking and moisture conditioning of the subgrade will be required until such a state is achieved in which the subgrade passes the proof roll as described above. Maximum undercuts for road and parking areas could be on the order of 3 ft, although we anticipate less.



## Design Parameters

### *Structural Fill*

Site soil may be used as structural fill if they are properly moisture-conditioned and compacted. Site soil consists primarily of CLAYS with various amounts of sand, gravels, and coal fragments. Structural fill should be placed under the supervision of a representative of the Geotechnical Engineer.

### *Deleterious Materials*

The soil excavated can be potentially reused as structural fill; although, if unsuitable material is encountered such as, but not limited to, coal, carbonaceous shale, oversize rock (>6 inches); concrete, or brick, soft or wet clays, or wood, organics or other compressible materials, then the unsuitable material should be removed and replaced with an approved fill.

If feasible, construction should avoid the wet season and be scheduled for the late spring or summer seasons to avoid difficulties with compacting very wet soils. Saturated and wet Site soils may need to be allowed to dry or replaced to achieve the compaction recommendations noted below. However, if construction does occur during freezing temperatures, it should be noted that no fill soil should be placed on frozen soils and no frozen soils should be utilized as fill material.

Carbonaceous rock can be potentially expansive when exposed to air and/or humidity. If carbonaceous rock or mine refuse is encountered during construction, the rock should be evaluated by a Geotechnical Engineer and possibly tested for expansive potential by evaluating the pyritic concentrations in the rock. Expansive pyritic shales can cause floor heaving and wall movement to lightly loaded floor slabs and footings and should be excavated if encountered within building areas or roadways.

### *Seismic Parameters*

Seismic Design Parameters – A Risk Category II and Site Class D designation should be utilized for the site for seismic design considerations according to the 2015 International Building Code. The key design parameters are as follows:

Ss = 0.109 g  
S1 = 0.053 g  
Sds = 0.116 g  
Sd1 = 0.085 g

## Asphalt Pavement Design

Both standard duty (ESAL = 30,000) and heavy duty (ESAL = 88,000) asphalt pavements were evaluated. Our recommendation standard duty pavement includes a 1.5-inch wearing course, 2.5-inch binder course, and a 6-inch base course of aggregate. For heavy heavy-duty pavement, the required section is to include a 1.5-inch wearing course, 3.5-inch binder course, and a 6-inch base course of aggregate.

Prior to base rock placement and paving, the subgrade soils should be proof rolled as described above. Use material with a minimum California Bearing Ratio (CBR) of 5 for the design of asphalt pavements.

## Earthwork Requirements

Imported engineered fill (if required) is to consist of material with USCS classifications of GP, GW, GM, GC, SP, SW, SM, or SC. Soils with classifications of ML and CL are sensitive to moisture but may be suitable for use as structural fill. All structural fill placed on Site must be approved by the Engineer. No organics, coal, or carbonaceous shale shall be in the structural fill. Soils with the classification of CH



should not be utilized as structural fill due to their tendency for volumetric changes concurrent with changes in moisture content. Imported or reused structural fill is to be free of particles greater than 6 inches in diameter. A modified proctor test (ASTM-1557) should be conducted on each soil type to be used as fill. On-Site existing structural fill is suitable for reuse and due to the homogenous materials present, any reused material is to be placed to Engineer-approved visual non-movement.

Compaction of the material will be performed as outlined below:

- Place structural fill of cohesive materials at a minimum of 95% compaction of maximum dry density (MDD) and at moisture contents within 2% of optimum moisture content (OMC) based on a modified proctor test (ASTM D-1557). Fluctuations of the moisture content may be permitted but must be Engineer-approved.
- Place structural fill in horizontal lifts with a maximum thickness of 8 inches.
- Compact structural fill with a vibratory roller or sheepsfoot compactor in accordance with the soil type.
- Check density and moisture content throughout each lift with a nuclear density gauge (Troxler) to ensure compaction and moisture specifications are acceptable.
- Material that is wetter than 2% of OMC is to be dried prior to compaction. If material is excessively saturated, additional drying procedures may be implemented if approved by the Engineer. Field verification will be required if a compound or non-native material is added to the fill to assist in the drying process, including 1-point proctors to verify that the MDD compaction specifications are not altered.
- Material not meeting density specification or visual non-movement specification is to be recompacted until the specification is attained.
- Place all structural fill on Engineer-approved subgrades.
- Any granular fill placed on Site is to be compacted to visual non-movement with a vibratory compactor and Engineer approved.

### **Earthwork Monitoring**

Grading activities including fill placement, compaction, over-excavation, and drain installation should be monitored by qualified personnel under the direction of a Geotechnical Engineer. It is also imperative that field density tests be conducted on fill to assure that adequate compaction is being attained. The recommendations presented herein are based on such monitoring. We recommend the foundation and parking/road excavations be evaluated by a Geotechnical Engineer to ensure that the proper bearing capacity values are being developed for carrying design loads.

### **Limitations**

This report has been prepared in accordance with generally accepted soil and foundation engineering practices for the use of MSP Development, LLC, and their design consultants for design purposes. No other warranty, expressed or implied, is made as to the professional advice included in this report. In the event that conclusions or recommendations are made by others based upon the data and information provided in this report, such conclusions or recommendations are the responsibility of others.

The interpretations, conclusions, and recommendations submitted in this report are based upon the data obtained at the boring locations. This report does not reflect any variations which may occur between the borings and points of investigation. The nature and extent of variations between the borings may not become evident until excavation and earthwork is performed at the Site. If, during construction, soil, rock, and groundwater conditions appear to be different from those described herein, KU Resources should be immediately advised so that a re-evaluation of the recommendations may be addressed.



KU Resources cannot be responsible for any deviation from the intent of this report including, but not restricted to, any changes to the scheduled time of construction, the nature of the project or the specific construction methods or means indicated in this report; nor can our firm be responsible for any construction activity on sites other than the specific Site referenced in this report.

**To the best of our knowledge the field testing, laboratory testing, and preparation of this report has been prepared in general accordance with applicable ASTM Standards and state and local ordinances.**

### Summary

Soil conditions at the Site are conducive to site development. The proposed development can utilize a shallow foundation system with an undercut/backfill remediation to create a uniform bearing zone. The soil underlying the parking areas are acceptable for their proposed design usage. Expected Site dewatering and extensive drainage should be expected during construction. Earthwork should be monitored by qualified personnel under the direction of a Geotechnical Engineer and all recommendations in this report should be adhered to.

If soil conditions or design plans change, please notify our office, as additional recommendations may be necessary. KU Resources appreciates the opportunity to provide you with our services. If you have any questions about the content of this letter, please contact me at 412-469-9331, ext. 1029 or [adeluca@kuresources.com](mailto:adeluca@kuresources.com).

Respectfully submitted,



Anthony J. Deluca  
Construction Business Unit Manager



Aaron M. Cessna  
Project Engineer



Harold P. McCutcheon, P.E.  
Chief Engineer

AJD/AMC/HPM:cak

Attachments

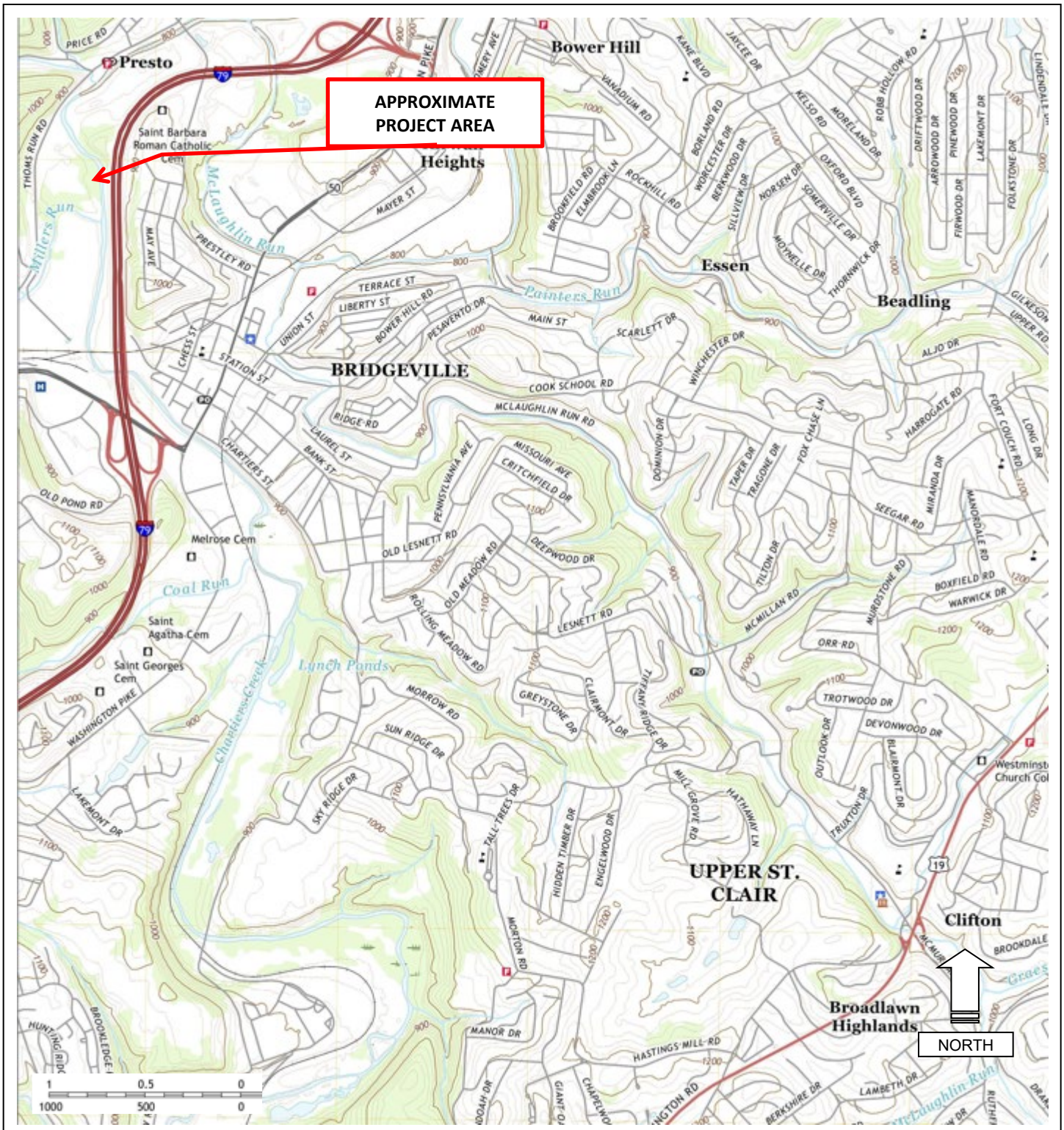


## ATTACHMENTS



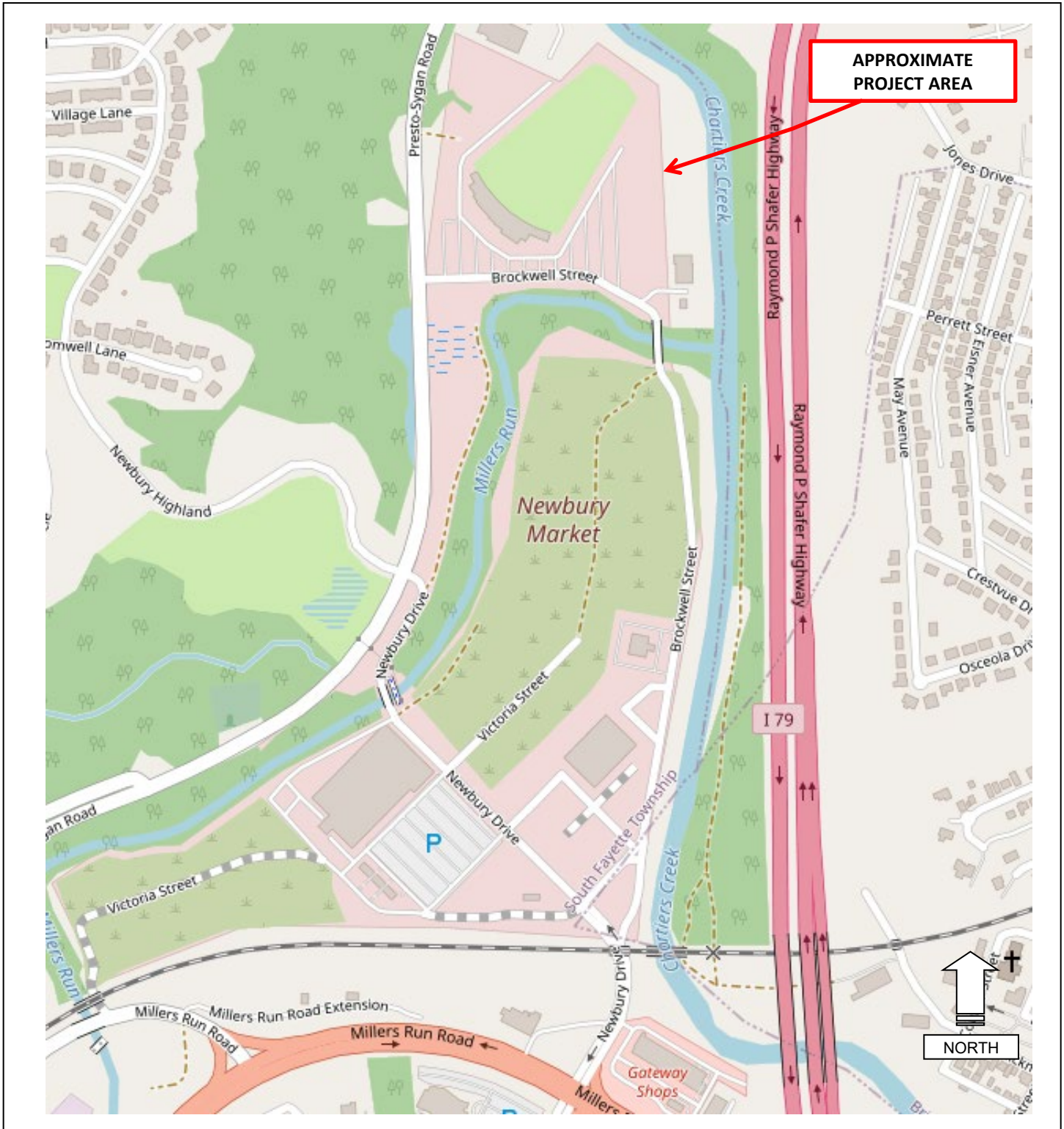
## Attachment A Figures





MAP REFERENCE: USGS BOLIVAR QUADRANGLE 2019

 <b>KU Resources, Inc.</b>	<b>SITE LOCATION MAP</b>		DRAWN BY:	AMC	4/2/25
	<b>TRACTOR SUPPLY GEOTECHNICAL INVESTIGATION</b>		CHECKED BY:	AJD	4/14/25
	<b>SOUTH FAYETTE TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA</b>		APPROVED BY:	AJD	4/14/25
	Prepared for: MSP DEVELOPMENT, LLC		DRAWING NO.	MSPD25168NTSG	
			<b>FIGURE 1</b>		



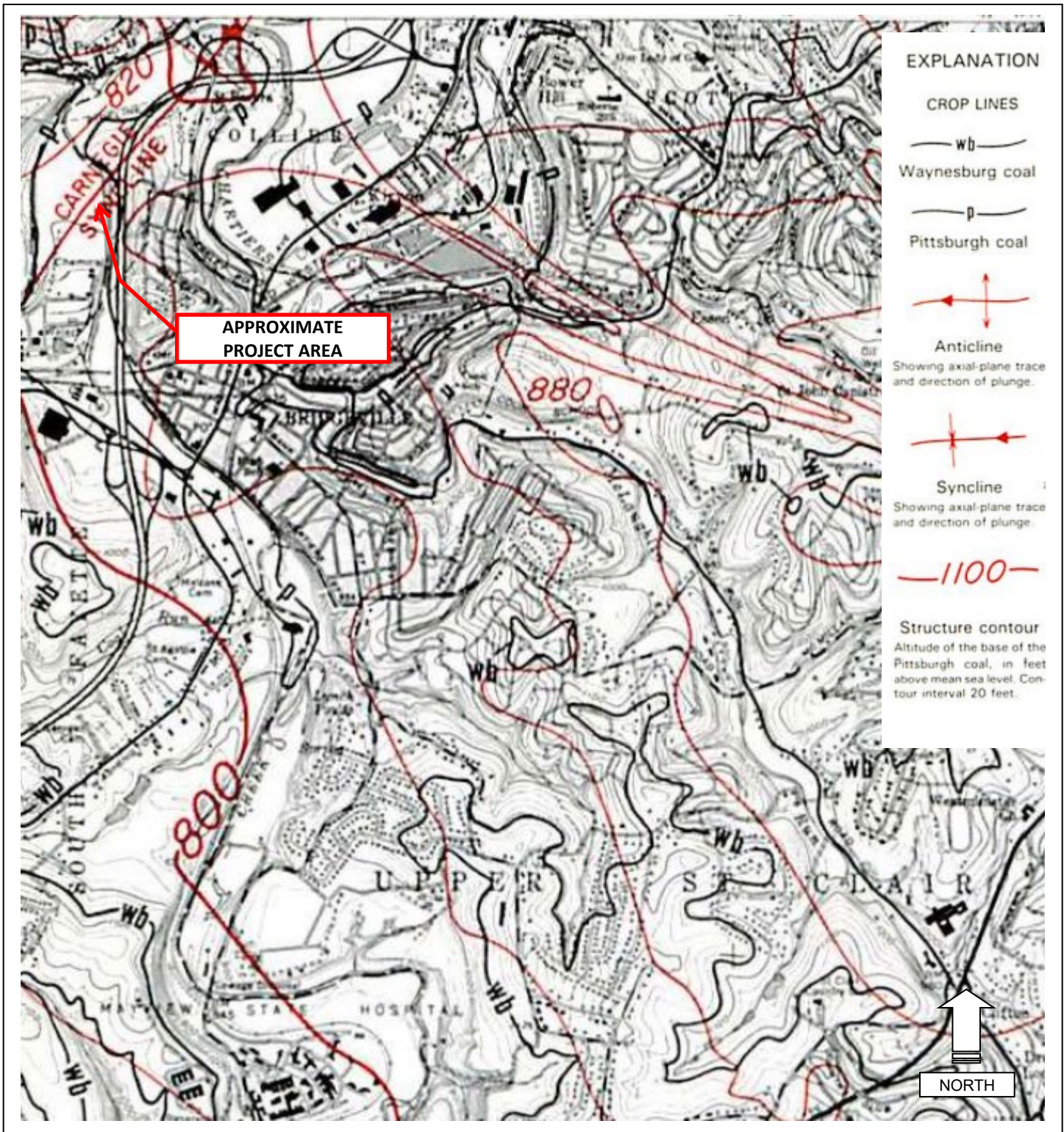
MAP REFERENCE: [www.OpenStreetMap.org](http://www.OpenStreetMap.org)

 <b>KU Resources, Inc.</b>	<b>STREET LOCATION MAP</b>		DRAWN BY:	AMC	4/2/25	
	<b>TRACTOR SUPPLY GEOTECHNICAL INVESTIGATION</b>		CHECKED BY:	AJD	4/14/25	
	<b>SOUTH FAYETTE TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA</b>		APPROVED BY:	AJD	4/14/25	
	Prepared for: MSP DEVELOPMENT, LLC		DRAWING NO.	MSPD25168NTSG		
			<b>FIGURE 2</b>			



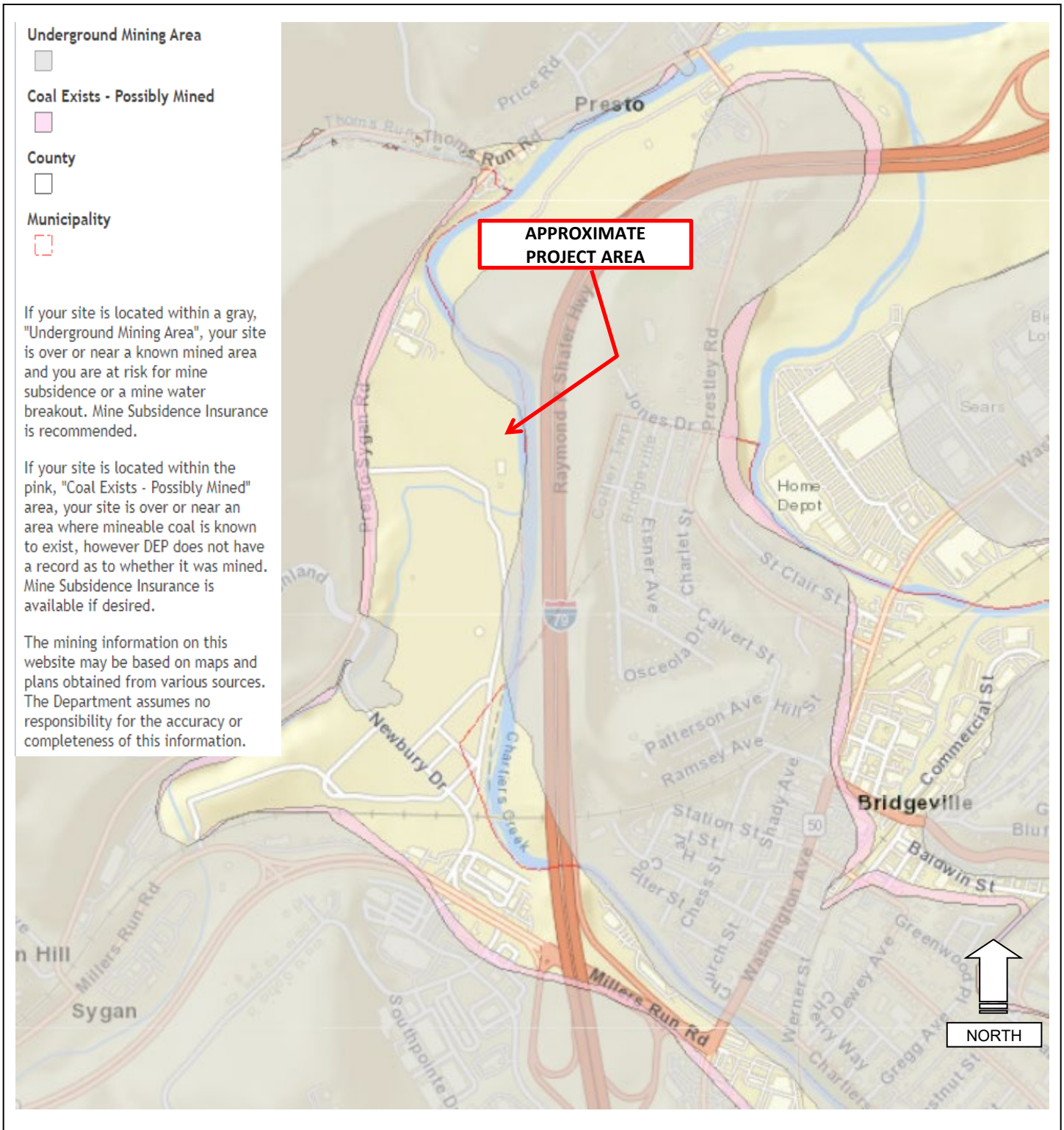
MAP REFERENCE: Google Earth Pro

 <b>KU Resources, Inc.</b>	<b>SATELLITE IMAGE</b>		
	<b>TRACTOR SUPPLY GEOTECHNICAL INVESTIGATION</b>		
	<b>SOUTH FAYETTE TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA</b>		
	<small>Prepared for: MSP DEVELOPMENT, LLC</small>		
	DRAWN BY:	AMC	4/2/25
CHECKED BY:	AJD	4/14/25	
APPROVED BY:	AJD	4/14/25	
DRAWING NO.	MSPD25168NTSG		
<b>FIGURE 3</b>			




MAP REFERENCE: COAL RESOURCES OF ALLEGHENY COUNTY, PENNSYLVANIA PART 1. COAL CROP LINES, MINED-OUT AREAS, AND STRUCTURE CONTOURS; PA DER MINERAL RESOURCES REPORT 98 (1996)

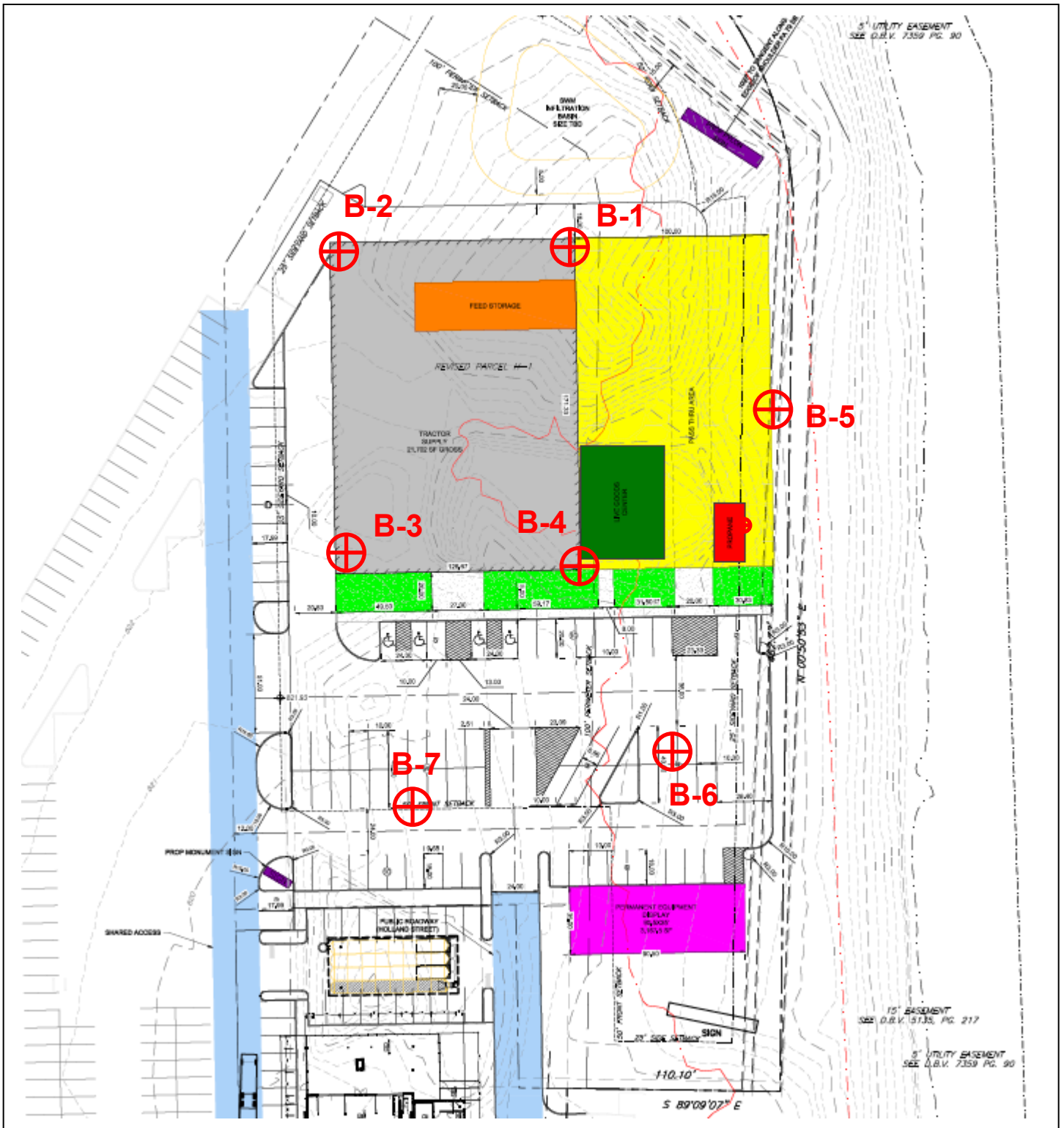
 <b>KU Resources, Inc.</b>	<b>COAL STRUCTURE MAP – UPPER FREEPORT</b>		DRAWN BY:	AMC	4/2/25	
	<b>TRACTOR SUPPLY GEOTECHNICAL INVESTIGATION</b>		CHECKED BY:	AJD	4/14/25	
	<b>SOUTH FAYETTE TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA</b>		APPROVED BY:	AJD	4/14/25	
	Prepared for: MSP DEVELOPMENT, LLC		DRAWING NO.	MSPD25168NTSG		
			<b>FIGURE 4</b>			




MAP REFERENCE: <https://gis.dep.pa.gov/msiRisk/>

 <b>KU Resources, Inc.</b>	<b>COAL MINE SUBSIDENCE MAP</b>		DRAWN BY:	AMC	4/2/25
	<b>TRACTOR SUPPLY GEOTECHNICAL INVESTIGATION</b>		CHECKED BY:	AJD	4/14/25
	<b>SOUTH FAYETTE TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA</b>		APPROVED BY:	AJD	4/14/25
	Prepared for: MSP DEVELOPMENT, LLC		DRAWING NO.	MSPD25168NTSG	
			<b>FIGURE 5</b>		





MAP REFERENCE: KU RESOURCES BORING PLAN MAP

 <b>KU Resources, Inc.</b>	<b>BORING LOCATION MAP</b>		DRAWN BY:	AMC	4/2/25
	<b>TRACTOR SUPPLY GEOTECHNICAL INVESTIGATION</b>		CHECKED BY:	AJD	4/14/25
	<b>SOUTH FAYETTE TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA</b>		APPROVED BY:	AJD	4/14/25
	Prepared for: MSP DEVELOPMENT, LLC		DRAWING NO.	MSPD25168NTSG	
			<b>FIGURE 7</b>		

**Attachment B**  
**Boring Logs**



# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 833  
 Date Drilled: 4/7/25

Boring No. B-01  
 Bottom of Boring (ft) 30.5  
 Groundwater (ft) 9.0  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description	
0				Ground Surface	
	S-1	WOH 3 3	1.0	<b>FILL:</b> Medium stiff, brown/grey, sandy lean CLAY (CL) , with varying amounts gravels, coal fragments and organics, damp.	Boring 1 located at the Northeast corner of the proposed building footprint. Estimated boring elevation is at 833 feet asl.  MC= 21.5%
	S-2	1 2 3	1.5		
5	S-3	1 1 1	0.6	Soft	
10	S-4	WOH WOH WOH	1.5	<b>FILL:</b> Very soft, sandy lean CLAY with gravel (CL), wet	MC= 21.5%
	S-5	4 4 3	0.0	Medium stiff, no recovery	Estimated Footer subgrade elevation 820 feet asl
15	S-6	4 3 2	0.3	Damp	
	S-7	3 2 4	1.5		
20					



**KU Resources, Inc.**  
 22 South Linden Street  
 Duquesne, PA 15110  
 412.469.9331  
 412.469.9336 fax  
 www.kuresources.com

# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 833  
 Date Drilled: 4/7/25

Boring No. B-01  
 Bottom of Boring (ft) 30.5  
 Groundwater (ft) 9.0  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description
20				Ground Surface
	S-8	4 4 7	1.5	Very stiff
25	S-9	2 3 2	0.8	<b>Residual:</b> Medium stiff, brown/grey, sandy CLAY with trace gravel and coal fragments, damp.
30	S-10	WOH 50/1	0.0	<b>Assumed Bedrock</b> , auger refusal, possible boulder
35				Boring terminated at 30.5 ft bgs due to auger refusal on assumed bedrock. Groundwater was observed at 9.0 ft bgs at the time of drilling.
40				



# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 823  
 Date Drilled: 4/7/25

Boring No. B-02  
 Bottom of Boring (ft) 16.5  
 Groundwater (ft) 15.0  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description	
0				Ground Surface	
	S-1	4 3 3	0.0	Medium stiff, no recovery, wet	<p>Estimated Footer subgrade elevation 820 feet asl</p> <p>Boring 2 located at the Northwest corner of the proposed building footprint. Estimated boring elevation is at 823 feet asl.</p> <p>MC= 24.1%</p>
	S-2	6 14 10	0.8	<b>Fill:</b> Very stiff, brown/grey, CLAY, with varying amounts of sand, gravels, and coal fragments, damp.	
	S-3	12 14 10	1.5		
5	S-4	6 6 6	0.0	Stiff, no recovery	
	S-5	9 50/4	0.2	Boulder, auger refusal, moved boring 5 feet south, 5 feet east	
	S-6	4 6 4	1.5	<b>Fill:</b> Medium dense, red/brown, GRAVELS, with varying bricks, sands and coal fragments, damp.	
10	S-7	7 6 7	1.5		
	S-8	1 2 1	1.5	<b>Residual:</b> Soft, brown/grey, sandy lean CLAY (CL) with trace gravel and coal fragments, damp.	
15	S-9	4 4 4	1.5	Medium stiff, wet	
				Boring terminated at 16.5 ft bgs. Groundwater was observed at 15.0 ft bgs at the time of drilling.	
20					

# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 827  
 Date Drilled: 4/7/25

Boring No. B-03  
 Bottom of Boring (ft) 21.5  
 Groundwater (ft) 20.0  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description	
0				Ground Surface	
	S-1	2 3 2	1.0	<b>Fill:</b> Medium stiff, brown/grey, sandy lean CLAY with gravel (CL), trace coal fragments, damp.	Boring 3 located at the Southwest corner of the proposed building footprint. Estimated boring elevation is at 827 feet asl.  MC= 18.6%  <hr style="border-top: 1px dashed red;"/> Estimated Footer subgrade elevation 820 feet asl
	S-2	4 3 4	1.5		
5	S-3	3 4 3	1.5		
	S-4	4 5 5	1.5	Stiff	
	S-5	1 4 6	1.5	<b>Residual:</b> Stiff, brown/grey, sandy CLAY with trace gravel and coal fragments, damp.	
15	S-6	2 2 2	1.5	Medium stiff	
20	S-7	WOH WOH WOH	1.5	Very soft, wet	

Boring terminated at 21.5 ft bgs. Groundwater was observed at 20.0 ft bgs at the time of drilling.



# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 821  
 Date Drilled: 4/7/25

Boring No. B-04  
 Bottom of Boring (ft) 16.5  
 Groundwater (ft) 12.0  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description	
0				Ground Surface	
	S-1	2 1 1	1.5	<b>Fill:</b> Soft, brown/grey, CLAY, with varying amounts of sand, gravels, and coal fragments, damp.	<p style="color: red;">-----</p> <p style="color: red;">Estimated Footer subgrade elevation 820 feet asl</p> <p>Boring 4 located at the Southwest corner of the proposed building footprint. Estimated boring elevation is at 821 feet asl.</p>
	S-2	50/3	0.0	Boulder, auger refusal, moved boring 5 feet south	
	S-3	3 4 5	1.5	<b>Fill:</b> Stiff, brown/grey, CLAY, with varying amounts of sand, gravels, and coal fragments, damp.	
5	S-4	3 2 4	0.0		
	S-5	10 10 10	0.2	Very stiff	
	S-6	2 3 2	1.5	Medium stiff	
10	S-7	4 3 2	1.5		
	S-8	WOH WOH WOH	1.5	<b>Residual:</b> Very loose, brown/grey, silty SAND with gravel (SM), trace coal fragments, damp.	
15	S-9	4 3 3	1.5	Medium stiff, and gravel, wet	MC= 15.6%
20				Boring terminated at 16.5 ft bgs. Groundwater was observed at 12.0 ft bgs at the time of drilling.	



**KU Resources, Inc.**  
 22 South Linden Street  
 Duquesne, PA 15110  
 412.469.9331  
 412.469.9336 fax  
 www.kuresources.com

# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 817  
 Date Drilled: 4/7/25

Boring No. B-05  
 Bottom of Boring (ft) 9.0  
 Groundwater (ft) n/a  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description	
0				Ground Surface	
	S-1	3 3 3	1.5	<b>Fill:</b> Medium stiff, brown/grey, CLAY, with varying amounts of sand, gravels, and coal fragments, damp.	Boring 4 located at the center point of the East side of the fenced outdoor display area
	S-2	6 6 6	1.5	Stiff	
	S-3	8 6 4	1.5		
5	S-4	2 2 2	1.5	<b>Residual:</b> Medium stiff, brown/grey, sandy CLAY with trace gravel and coal fragments, damp.	
	S-5	3 4 5	1.5	Stiff	
	S-6	5 4 5	1.5		
10				Boring terminated at 9.0 ft bgs. Groundwater was not observed at the time of drilling.	
15					
20					



**KU Resources, Inc.**  
 22 South Linden Street  
 Duquesne, PA 15110  
 412.469.9331  
 412.469.9336 fax  
 www.kuresources.com

# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 821  
 Date Drilled: 4/7/25

Boring No. B-06  
 Bottom of Boring (ft) 9.0  
 Groundwater (ft) 8.0  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description	
0				Ground Surface	
	S-1	2 3 3	1.5	<b>Fill:</b> Medium stiff, brown/grey, CLAY, with varying amounts of sand, gravels, and coal fragments, damp.  Stiff	Boring 4 located within the Eastern side of the proposed parking lot.
	S-2	3 4 8	1.5		
	S-3	3 4 7	1.5		
5	S-4	5 4 6	0.5		
	S-5	7 6 6	1.5		
	S-6	3 2 1	1.5		
10				Boring terminated at 9.0 ft bgs. Groundwater was not observed at the time of drilling.	
15					
20					



**KU Resources, Inc.**  
 22 South Linden Street  
 Duquesne, PA 15110  
 412.469.9331  
 412.469.9336 fax  
 www.kuresources.com

# BORING LOG

Client MSP Development, LLC  
 Site Tractor Supply Geotech  
 Location Bridgeville, PA  
 Project No. MSPD25168NTSG

Driller AllProbe Environmental  
 Method 3-1/4" HSA w/ 2" OD Split Barrel  
 Equip. Geoprobe 7822 DT  
 Surface Elevation (ft) approx. 821  
 Date Drilled: 4/7/25

Boring No. B-07  
 Bottom of Boring (ft) 7.5  
 Groundwater (ft) 3.0  
 Field Scientist A. Cessna  
 Checked By : A. Deluca

Depth (ft)	Sample No. and Type	SPT COUNT	Sample Recovery (ft)	Lithologic Description	
0				Ground Surface	
	S-1	1 1 1	1.5	<b>Fill:</b> Soft, brown/grey, CLAY, with varying amounts of sand, gravels, and coal fragments, damp.	Boring 4 located within the Eastern side of the proposed parking lot.
	S-2	3 5 4	1.5	Stiff	
	S-3	3 6 6	1.5	<b>Fill:</b> Medium dense, brown, GRAVELS, with sands and coal fragments, some clay, wet.	
5	S-4	3 2 2	1.5	<b>Residual:</b> Medium stiff, brown/grey, sandy CLAY with trace gravel and coal fragments, damp.	
	S-5	8 8 34	1.5	SAA to assumed boulder, auger refusal	
10				Boring terminated at 7.5 ft bgs due to auger refusal. Groundwater was observed at 3.0 bgs at the time of drilling.	
15					
20					

**Attachment C  
Laboratory Results**





April 25, 2025

Project No. 2025-239-001

Tony Deluca  
KU Resources, Inc.  
22 South Linden Street  
Duquesne, PA 15110

**Transmittal**  
**Laboratory Test Results**  
**Bridgeville Tractor Supply**

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens that were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectfully submitted,  
**Geotechnics, Inc.**

Nathan Melaro  
Director of Operations

***We understand that you have a choice in your laboratory services  
and we thank you for choosing Geotechnics.***

## MOISTURE CONTENT

ASTM D 2216-19

Client: KU Resources, Inc.  
 Client Reference: Bridgeville Tractor Supply  
 Project No.: 2025-239-001

Lab ID:	001	002	003	004	005
Boring No.:	B-01	B-01	B-02	B-03	B-04
Depth (ft):	3.0-4.5'	9.0-10.5'	12.0-13.5'	3.0-4.5'	15.0-16.5'
Sample No.:	S-1	S-2	S-3	S-4	S-5
Tare Number	67	56	27	70	98
Wt. of Tare & Wet Sample (g)	17.77	16.57	17.93	17.70	18.75
Wt. of Tare & Dry Sample (g)	15.20	14.20	15.08	15.43	16.67
Weight of Tare (g)	3.23	3.20	3.27	3.24	3.35
Weight of Water (g)	2.57	2.37	2.85	2.27	2.08
Weight of Dry Sample (g)	11.97	11.00	11.81	12.19	13.32
<b>Water Content (%)</b>	<b>21.5</b>	<b>21.5</b>	<b>24.1</b>	<b>18.6</b>	<b>15.6</b>

Notes :

*Tested By*    *JW*                      *Date*            *4/14/25*      *Checked By*    *EG*                      *Date*            *4/15/25*

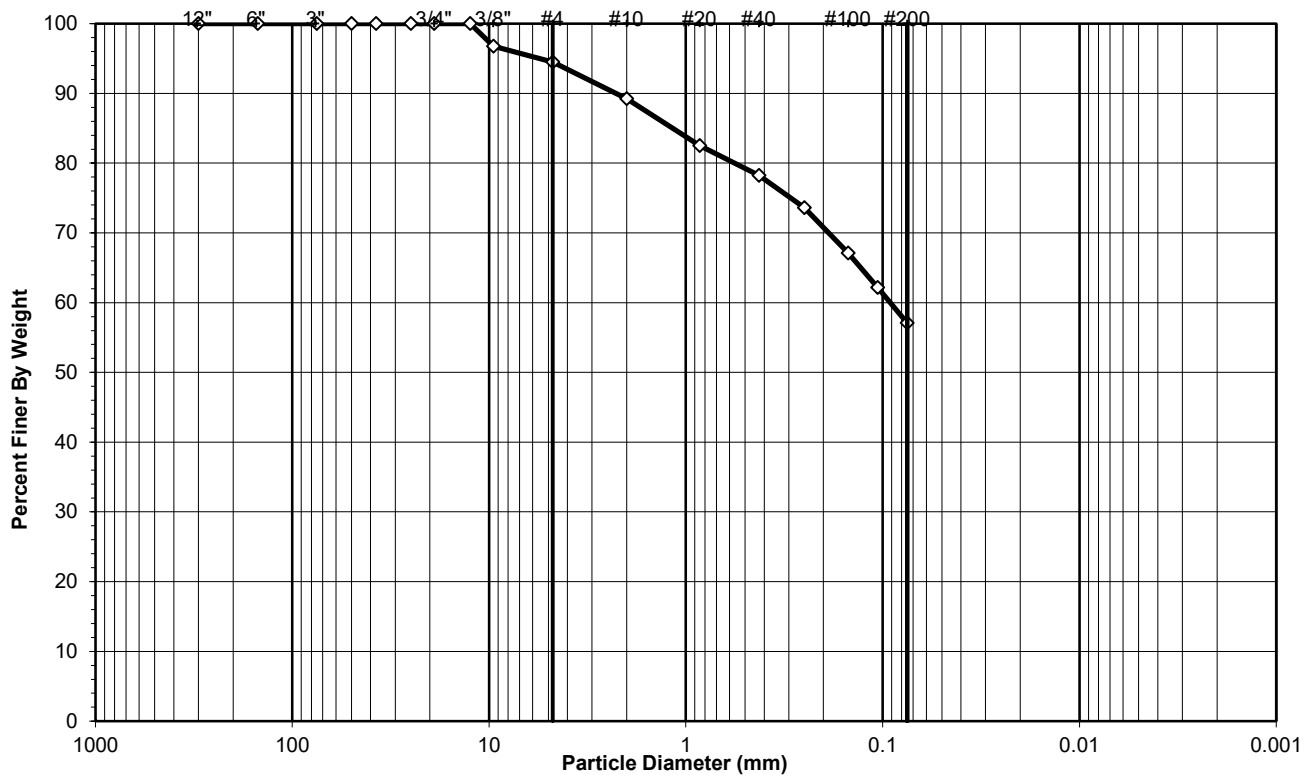
page 1 of 1    DCN: CT-S1    DATE: 3/18/13    REVISION: 4

## SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client:	KU Resources, Inc.	Boring No.:	B-01
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	3.0-4.5'
Project No.:	2025-239-001	Sample No.:	S-1
Lab ID:	2025-239-001-001	Soil Color:	Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



Sieve Size		Percentage (%)
Greater than #4	<i>Gravel</i>	5.51
#4 to #200	<i>Sand</i>	37.42
Finer than #200	<i>Silt &amp; Clay</i>	57.07

**USCS Symbol:**  
**CL, TESTED**

**USCS Classification:**  
**SANDY LEAN CLAY**

Tested By	DF	Date	4/22/25	Checked By	EG	Date	4/23/25
-----------	----	------	---------	------------	----	------	---------

**WASH SIEVE ANALYSIS**  
ASTM D6913-17

Client:	KU Resources, Inc.	Boring No.:	B-01
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	3.0-4.5'
Project No.:	2025-239-001	Sample No.:	S-1
Lab ID:	2025-239-001-001	Soil Color:	Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1545	Tare No.:	NA				
Wt. of Tare & Wet Sample (g):	332.80	Weight of Tare & Wet Sample (g):	NA				
Wt. of Tare & Dry Sample (g):	332.80	Weight of Tare & Dry Sample (g):	NA				
Weight of Tare (g):	177.66	Weight of Tare (g):	NA				
Weight of Water (g):	0.00	Weight of Water (g):	NA				
Weight of Dry Soil (g):	155.14	Weight of Dry Soil (g):	NA				
<b>Moisture Content (%):</b>	<b>0.0</b>	<b>Moisture Content (%):</b>	<b>0.0</b>				
Dry Weight of Sample (g):	NA	Total Dry Weight of Sample (g):	155.14				
Tare No. (Sub-Specimen)	1545	Wet Weight of +3/4" Sample (g):	0.00				
Wt. of Tare & Wet Sub-Specimen (g):	332.80	Dry Weight of + 3/4" Sample (g):	0.00				
Weight of Tare (g):	177.66	Dry Weight of - 3/4" Sample (g):	155.14				
Sub-Specimen Wet Weight (g):	155.14	Dry Weight -3/4" +3/8" Sample (g):	5.05				
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	150.09				
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA				
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA				
Sub-Specimen -3/8" Wet Weight (g):	NA						

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	<b>100</b>
6"	150	0.00	0.00	0.00	100.00	<b>100</b>
3"	75	0.00	0.00	0.00	100.00	<b>100</b>
2"	50	0.00	( *)	0.00	100.00	<b>100</b>
1 1/2"	37.5	0.00	0.00	0.00	100.00	<b>100</b>
1"	25	0.00	0.00	0.00	100.00	<b>100</b>
3/4"	19	0.00	0.00	0.00	100.00	<b>100</b>
1/2"	12.5	0.00	( ** )	0.00	100.00	<b>100</b>
3/8"	9.5	5.05	3.26	3.26	96.74	<b>97</b>
#4	4.75	3.50	2.26	5.51	94.49	<b>94</b>
#10	2	8.16	5.26	10.77	89.23	<b>89</b>
#20	0.85	10.39	( ** )	17.47	82.53	<b>83</b>
#40	0.425	6.67	4.30	21.77	78.23	<b>78</b>
#60	0.25	7.15	4.61	26.38	73.62	<b>74</b>
#100	0.15	10.13	6.53	32.91	67.09	<b>67</b>
#140	0.106	7.64	4.92	37.83	62.17	<b>62</b>
#200	0.075	7.91	5.10	42.93	57.07	<b>57</b>
Pan	-	88.54	57.07	100.00	-	-

**Notes :** ( \* ) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
 ( \*\* ) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DF Date 4/22/25 Checked By EG Date 4/23/25

## ATTERBERG LIMITS

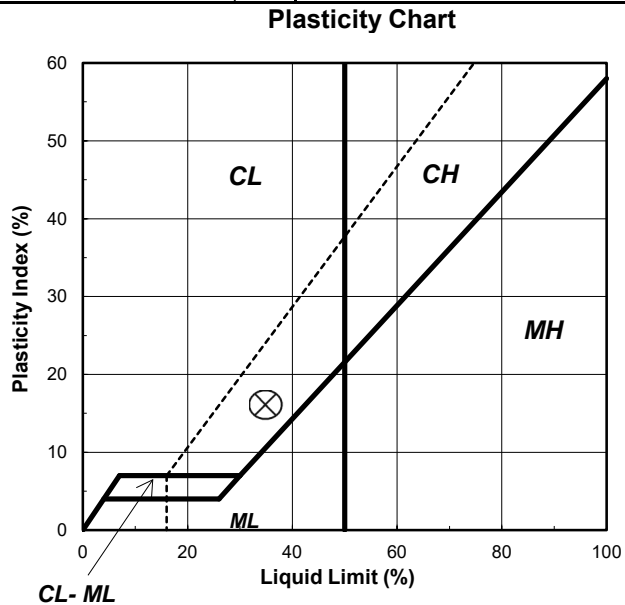
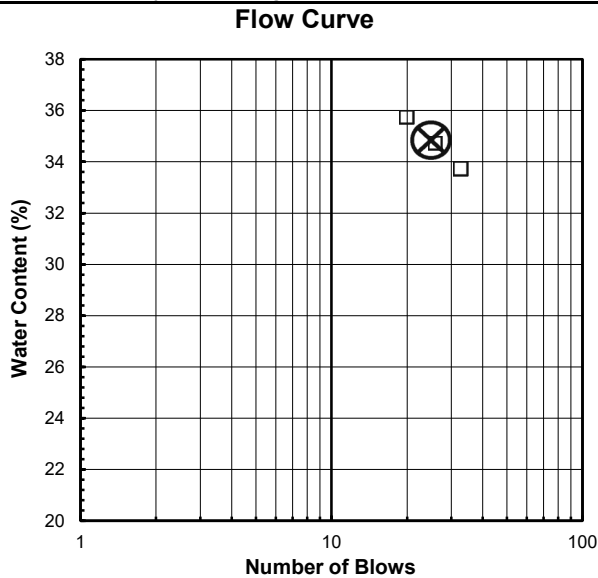
ASTM D 4318-17

Client: KU Resources, Inc.	Boring No.: B-01
Client Reference: Bridgeville Tractor Supply	Depth (ft): 3.0-4.5'
Project No.: 2025-239-001	Sample No.: S-1
Lab ID: 2025-239-001-001	Soil Description: BROWN LEAN CLAY

**Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.** (Minus #40 sieve material, Air dried)

As Received Moisture Content ASTM D2216-19	Liquid Limit Test			
	1	2	3	M
Tare Number:	67	124	193	203
Wt. of Tare & Wet Sample (g):	17.77	39.88	39.50	42.27
Wt. of Tare & Dry Sample (g):	15.20	34.59	33.69	36.23
Weight of Tare (g):	3.23	18.90	16.95	19.32
Weight of Water (g):	2.6	5.3	5.8	6.0
Weight of Dry Sample (g):	12.0	15.7	16.7	16.9
Was As Received MC Preserved:	<b>Yes</b>			
<b>Moisture Content (%):</b>	<b>21.5</b>	<b>33.7</b>	<b>34.7</b>	<b>35.7</b>
<b>Number of Blows:</b>	<b>33</b>	<b>26</b>	<b>20</b>	

Plastic Limit Test	1	2	Range	Test Results
Tare Number:	207	250		<b>Liquid Limit (%): 35</b>
Wt. of Tare & Wet Sample (g):	24.89	23.68		<b>Plastic Limit (%): 19</b>
Wt. of Tare & Dry Sample (g):	23.82	22.68		<b>Plasticity Index (%): 16</b>
Weight of Tare (g):	18.36	17.49		<b>USCS Symbol: CL</b>
Weight of Water (g):	1.1	1.0		
Weight of Dry Sample (g):	5.5	5.2		
<b>Moisture Content (%):</b>	<b>19.6</b>	<b>19.3</b>	<b>0.3</b>	
<i>Note: The acceptable range of the two Moisture Contents is ± 1.12</i>				



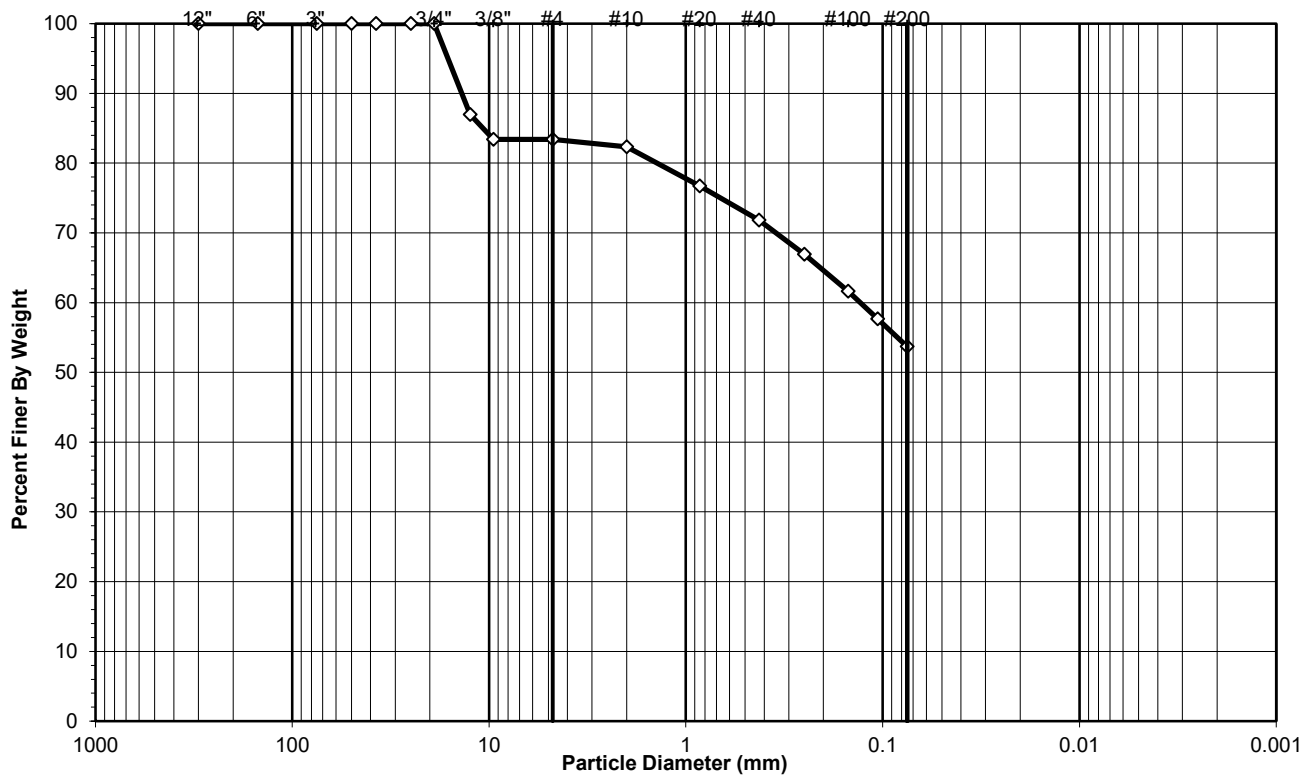
Tested By **BS** Date **4/18/25** Checked By **EG** Date **4/21/25**

## SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client:	KU Resources, Inc.	Boring No.:	B-01
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	9.0-10.5'
Project No.:	2025-239-001	Sample No.:	S-2
Lab ID:	2025-239-001-002	Soil Color:	Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



Sieve Size		Percentage (%)
Greater than #4	<i>Gravel</i>	16.61
#4 to #200	<i>Sand</i>	29.70
Finer than #200	<i>Silt &amp; Clay</i>	53.69

**USCS Symbol:**  
**CL, TESTED**

**USCS Classification:**  
**SANDY LEAN CLAY WITH GRAVEL**

Tested By	DF	Date	4/23/25	Checked By	EG	Date	4/24/25
-----------	----	------	---------	------------	----	------	---------

**WASH SIEVE ANALYSIS**  
ASTM D6913-17

Client:	KU Resources, Inc.	Boring No.:	B-01
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	9.0-10.5'
Project No.:	2025-239-001	Sample No.:	S-2
Lab ID:	2025-239-001-002	Soil Color:	Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1529	Tare No.:	NA				
Wt. of Tare & Wet Sample (g):	273.85	Weight of Tare & Wet Sample (g):	NA				
Wt. of Tare & Dry Sample (g):	273.85	Weight of Tare & Dry Sample (g):	NA				
Weight of Tare (g):	145.70	Weight of Tare (g):	NA				
Weight of Water (g):	0.00	Weight of Water (g):	NA				
Weight of Dry Soil (g):	128.15	Weight of Dry Soil (g):	NA				
<b>Moisture Content (%):</b>	<b>0.0</b>	<b>Moisture Content (%):</b>	<b>0.0</b>				
Dry Weight of Sample (g):	NA	Total Dry Weight of Sample (g):	128.15				
Tare No. (Sub-Specimen)	1529	Wet Weight of +3/4" Sample (g):	0.00				
Wt. of Tare & Wet Sub-Specimen (g):	273.85	Dry Weight of + 3/4" Sample (g):	0.00				
Weight of Tare (g):	145.70	Dry Weight of - 3/4" Sample (g):	128.15				
Sub-Specimen Wet Weight (g):	128.15	Dry Weight -3/4" +3/8" Sample (g):	21.29				
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	106.86				
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA				
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA				
Sub-Specimen -3/8" Wet Weight (g):	NA						

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	( *)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	16.69	( ** )	13.02	86.98	87
3/8"	9.5	4.60	3.59	16.61	83.39	83
#4	4.75	0.00	0.00	16.61	83.39	83
#10	2	1.33	1.04	17.65	82.35	82
#20	0.85	7.21	( ** )	23.28	76.72	77
#40	0.425	6.26	4.88	28.16	71.84	72
#60	0.25	6.31	4.92	33.09	66.91	67
#100	0.15	6.79	5.30	38.38	61.62	62
#140	0.106	5.08	3.96	42.35	57.65	58
#200	0.075	5.08	3.96	46.31	53.69	54
Pan	-	68.80	53.69	100.00	-	-

**Notes :** ( \* ) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
( \*\* ) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DF Date 4/23/25 Checked By EG Date 4/24/25

## ATTERBERG LIMITS

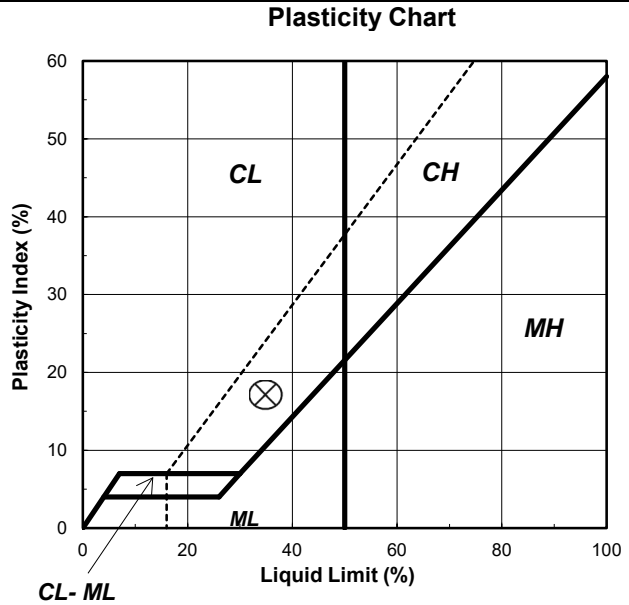
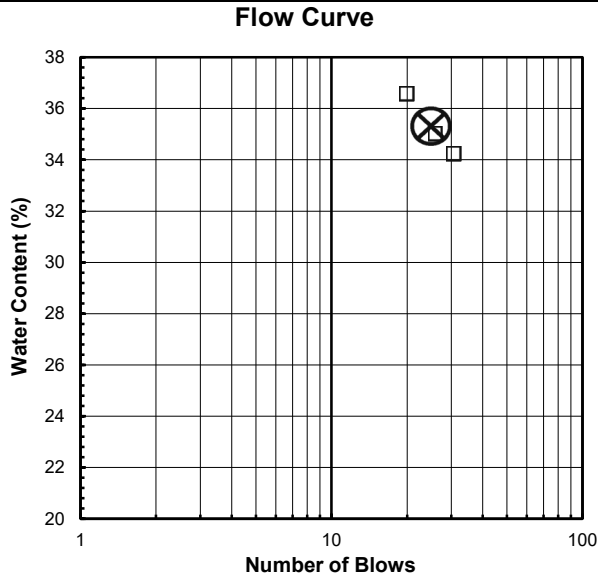
ASTM D 4318-17

Client: KU Resources, Inc.	Boring No.: B-01
Client Reference: Bridgeville Tractor Supply	Depth (ft): 9.0-10.5'
Project No.: 2025-239-001	Sample No.: S-2
Lab ID: 2025-239-001-002	Soil Description: BROWN LEAN CLAY

**Note: The USCS symbol used with this test refers only to the minus No. 40** (Minus #40 sieve material, Air dried) **sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.**

As Received Moisture Content ASTM D2216-19	Liquid Limit Test			
	1	2	3	M
Tare Number:	56	44	162	276
Wt. of Tare & Wet Sample (g):	16.57	38.60	39.01	41.25
Wt. of Tare & Dry Sample (g):	14.20	33.20	33.43	34.82
Weight of Tare (g):	3.20	17.42	17.48	17.23
Weight of Water (g):	2.4	5.4	5.6	6.4
Weight of Dry Sample (g):	11.0	15.8	16.0	17.6
Was As Received MC Preserved:	<b>Yes</b>			
<b>Moisture Content (%):</b>	<b>21.5</b>	<b>34.2</b>	<b>35.0</b>	<b>36.6</b>
<b>Number of Blows:</b>	<b>31</b>	<b>26</b>	<b>20</b>	

Plastic Limit Test	1	2	Range	Test Results
Tare Number:	286	302		<b>Liquid Limit (%): 35</b>
Wt. of Tare & Wet Sample (g):	21.88	25.34		<b>Plastic Limit (%): 18</b>
Wt. of Tare & Dry Sample (g):	20.89	24.41		<b>Plasticity Index (%): 17</b>
Weight of Tare (g):	15.59	19.33		<b>USCS Symbol: CL</b>
Weight of Water (g):	1.0	0.9		
Weight of Dry Sample (g):	5.3	5.1		
<b>Moisture Content (%):</b>	<b>18.7</b>	<b>18.3</b>	<b>0.4</b>	
<i>Note: The acceptable range of the two Moisture Contents is <math>\pm</math></i>				<i>1.12</i>



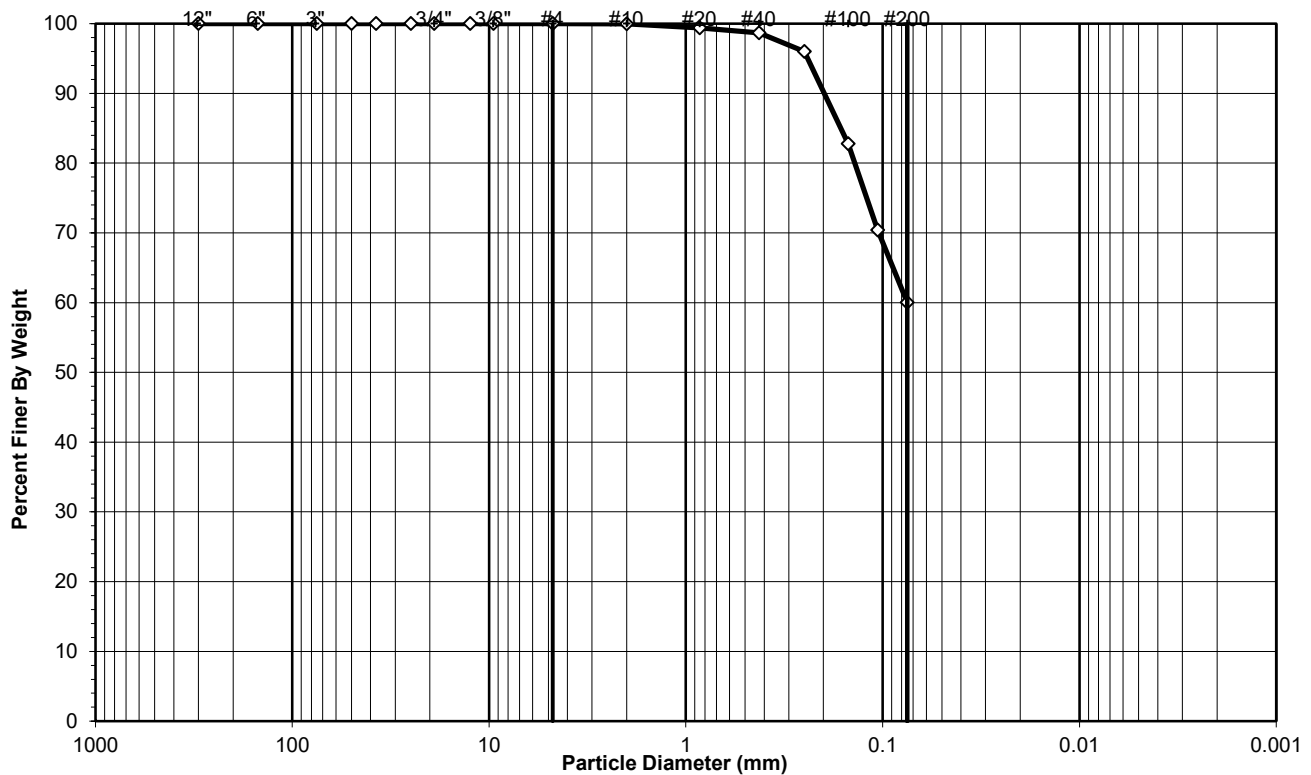
Tested By **BS**      Date **4/21/25**      Checked By **EG**      Date **4/22/25**

## SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client:	KU Resources, Inc.	Boring No.:	B-02
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	12.0-13.5'
Project No.:	2025-239-001	Sample No.:	S-3
Lab ID:	2025-239-001-003	Soil Color:	Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



Sieve Size		Percentage (%)
Greater than #4	<i>Gravel</i>	0.00
#4 to #200	<i>Sand</i>	39.97
Finer than #200	<i>Silt &amp; Clay</i>	60.03

**USCS Symbol:**  
**CL, TESTED**

**USCS Classification:**  
**SANDY LEAN CLAY**

Tested By	DF	Date	4/23/25	Checked By	EG	Date	4/24/25
-----------	----	------	---------	------------	----	------	---------

## WASH SIEVE ANALYSIS

ASTM D6913-17

Client:	KU Resources, Inc.	Boring No.:	B-02
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	12.0-13.5'
Project No.:	2025-239-001	Sample No.:	S-3
Lab ID:	2025-239-001-003	Soil Color:	Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:		1450		Tare No.:		NA	
Wt. of Tare & Wet Sample (g):		288.84		Weight of Tare & Wet Sample (g):		NA	
Wt. of Tare & Dry Sample (g):		288.84		Weight of Tare & Dry Sample (g):		NA	
Weight of Tare (g):		144.31		Weight of Tare (g):		NA	
Weight of Water (g):		0.00		Weight of Water (g):		NA	
Weight of Dry Soil (g):		144.53		Weight of Dry Soil (g):		NA	
<b>Moisture Content (%):</b>		<b>0.0</b>		<b>Moisture Content (%):</b>		<b>0.0</b>	
Dry Weight of Sample (g):		NA		Total Dry Weight of Sample (g):		144.53	
Tare No. (Sub-Specimen)		1450		Wet Weight of +3/4" Sample (g):		0.00	
Wt. of Tare & Wet Sub-Specimen (g):		288.84		Dry Weight of + 3/4" Sample (g):		0.00	
Weight of Tare (g):		144.31		Dry Weight of - 3/4" Sample (g):		144.53	
Sub-Specimen Wet Weight (g):		144.53		Dry Weight -3/4" +3/8" Sample (g):		0.00	
Tare No. (-3/8" Sub-Specimen):		NA		Dry Weight of -3/8" Sample (g):		144.53	
Wt. of Tare & Wet -3/8" Sub-Specimen (g):		NA		J - Factor (% Finer than 3/4"):		NA	
Weight of Tare (g):		NA		J - Factor (% Finer than 3/8"):		NA	
Sub-Specimen -3/8" Wet Weight (g):		NA					
Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)	
12"	300	0.00	0.00	0.00	100.00	<b>100.0</b>	
6"	150	0.00	0.00	0.00	100.00	<b>100.0</b>	
3"	75	0.00	0.00	0.00	100.00	<b>100.0</b>	
2"	50	0.00	( *)	0.00	100.00	<b>100.0</b>	
1 1/2"	37.5	0.00	0.00	0.00	100.00	<b>100.0</b>	
1"	25	0.00	0.00	0.00	100.00	<b>100.0</b>	
3/4"	19	0.00	0.00	0.00	100.00	<b>100.0</b>	
1/2"	12.5	0.00	( ** )	0.00	100.00	<b>100.0</b>	
3/8"	9.5	0.00	0.00	0.00	100.00	<b>100.0</b>	
#4	4.75	0.00	0.00	0.00	100.00	<b>100.0</b>	
#10	2	0.07	0.05	0.05	99.95	<b>100.0</b>	
#20	0.85	0.84	( ** )	0.63	99.37	<b>99.4</b>	
#40	0.425	1.00	0.69	1.32	98.68	<b>98.7</b>	
#60	0.25	3.88	2.68	4.01	95.99	<b>96.0</b>	
#100	0.15	19.09	13.21	17.21	82.79	<b>82.8</b>	
#140	0.106	17.92	12.40	29.61	70.39	<b>70.4</b>	
#200	0.075	14.97	10.36	39.97	60.03	<b>60.0</b>	
Pan	-	86.76	60.03	100.00	-	-	

**Notes :** ( \* ) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
 ( \*\* ) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DF Date 4/23/25 Checked By EG Date 4/24/25

## ATTERBERG LIMITS

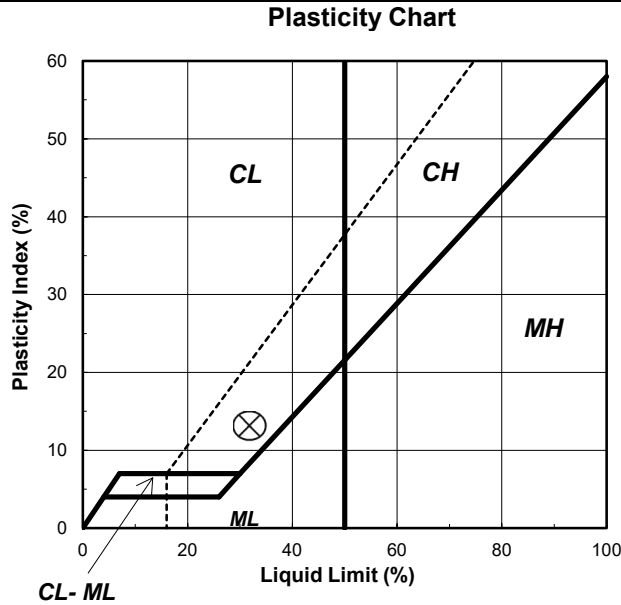
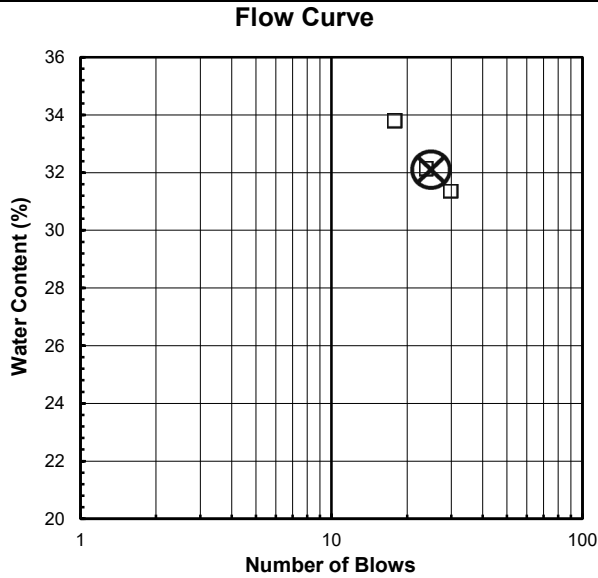
ASTM D 4318-17

Client: KU Resources, Inc.	Boring No.: B-02
Client Reference: Bridgeville Tractor Supply	Depth (ft): 12.0-13.5'
Project No.: 2025-239-001	Sample No.: S-3
Lab ID: 2025-239-001-003	Soil Description: BROWN LEAN CLAY

**Note: The USCS symbol used with this test refers only to the minus No. 40** (Minus #40 sieve material, Air dried) **sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.**

As Received Moisture Content ASTM D2216-19	Liquid Limit Test			
	1	2	3	M
Tare Number:	27	346	681	697
Wt. of Tare & Wet Sample (g):	17.93	40.89	41.53	42.22
Wt. of Tare & Dry Sample (g):	15.08	36.03	36.49	37.08
Weight of Tare (g):	3.27	20.52	20.79	21.86
Weight of Water (g):	2.9	4.9	5.0	5.1
Weight of Dry Sample (g):	11.8	15.5	15.7	15.2
Was As Received MC Preserved:	<b>Yes</b>			
<b>Moisture Content (%):</b>	<b>24.1</b>	<b>31.3</b>	<b>32.1</b>	<b>33.8</b>
<b>Number of Blows:</b>	<b>30</b>	<b>24</b>	<b>18</b>	<b>T</b>

Plastic Limit Test	1	2	Range	Test Results
Tare Number:	2289	523		<b>Liquid Limit (%): 32</b>
Wt. of Tare & Wet Sample (g):	26.57	25.71		<b>Plastic Limit (%): 19</b>
Wt. of Tare & Dry Sample (g):	25.56	24.71		<b>Plasticity Index (%): 13</b>
Weight of Tare (g):	20.41	19.35		<b>USCS Symbol: CL</b>
Weight of Water (g):	1.0	1.0		
Weight of Dry Sample (g):	5.2	5.4		
<b>Moisture Content (%):</b>	<b>19.6</b>	<b>18.7</b>	<b>1.0</b>	
<i>Note: The acceptable range of the two Moisture Contents is ± 1.12</i>				



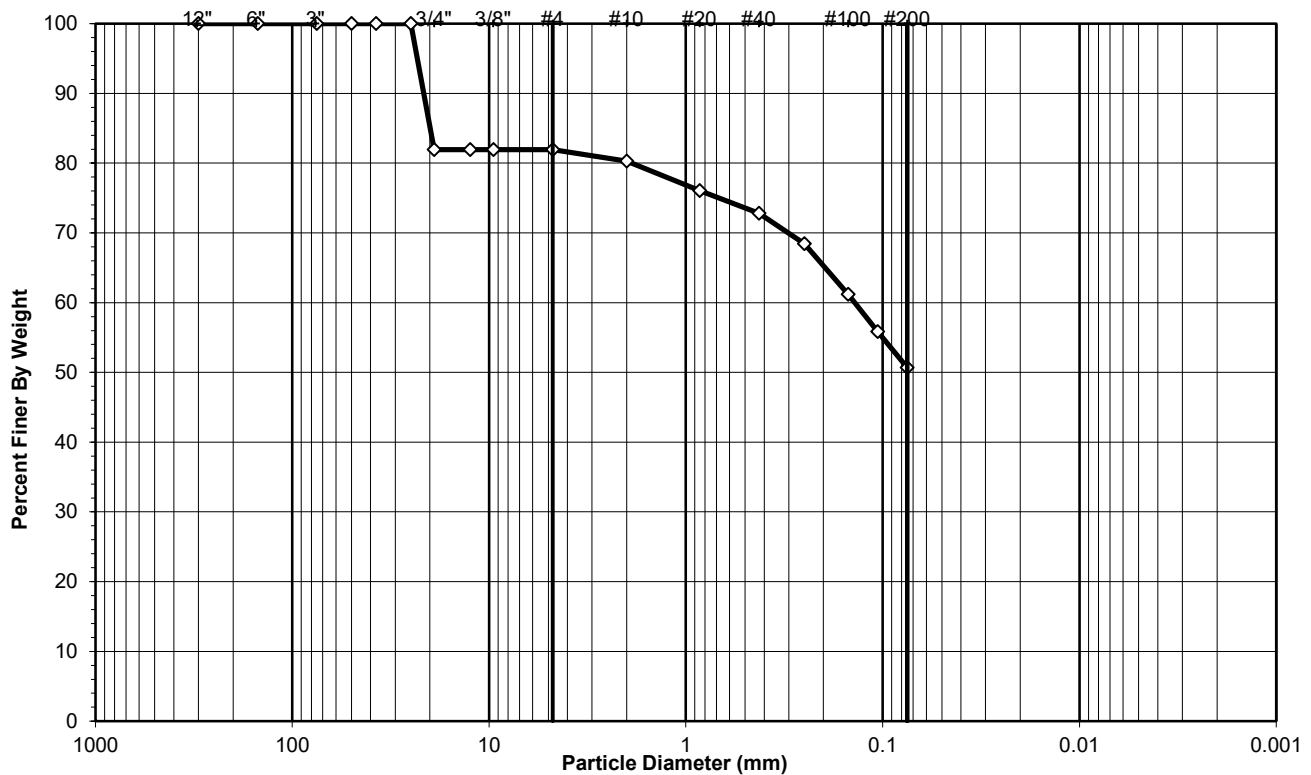
Tested By **FS** Date **4/21/25** Checked By **EG** Date **4/22/25**

## SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client:	KU Resources, Inc.	Boring No.:	B-03
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	3.0-4.5'
Project No.:	2025-239-001	Sample No.:	S-4
Lab ID:	2025-239-001-004	Soil Color:	Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



Sieve Size		Percentage (%)
Greater than #4	<i>Gravel</i>	18.05
#4 to #200	<i>Sand</i>	31.27
Finer than #200	<i>Silt &amp; Clay</i>	50.69

**USCS Symbol:**  
**CL, TESTED**

**USCS Classification:**  
**SANDY LEAN CLAY WITH GRAVEL**

Tested By	DF	Date	4/23/25	Checked By	EG	Date	4/24/25
-----------	----	------	---------	------------	----	------	---------

**WASH SIEVE ANALYSIS**  
ASTM D6913-17

Client:	KU Resources, Inc.	Boring No.:	B-03
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	3.0-4.5'
Project No.:	2025-239-001	Sample No.:	S-4
Lab ID:	2025-239-001-004	Soil Color:	Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1452	Tare No.:	NA				
Wt. of Tare & Wet Sample (g):	295.16	Weight of Tare & Wet Sample (g):	NA				
Wt. of Tare & Dry Sample (g):	295.16	Weight of Tare & Dry Sample (g):	NA				
Weight of Tare (g):	142.60	Weight of Tare (g):	NA				
Weight of Water (g):	0.00	Weight of Water (g):	NA				
Weight of Dry Soil (g):	152.56	Weight of Dry Soil (g):	NA				
<b>Moisture Content (%):</b>	<b>0.0</b>	<b>Moisture Content (%):</b>	<b>0.0</b>				
Dry Weight of Sample (g):	NA	Total Dry Weight of Sample (g):	152.56				
Tare No. (Sub-Specimen)	1452	Wet Weight of +3/4" Sample (g):	27.53				
Wt. of Tare & Wet Sub-Specimen (g):	295.16	Dry Weight of + 3/4" Sample (g):	27.53				
Weight of Tare (g):	142.60	Dry Weight of - 3/4" Sample (g):	125.03				
Sub-Specimen Wet Weight (g):	152.56	Dry Weight -3/4" +3/8" Sample (g):	0.00				
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	125.03				
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA				
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA				
Sub-Specimen -3/8" Wet Weight (g):	NA						

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	( *)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	27.53	18.05	18.05	81.95	82
1/2"	12.5	0.00	( ** )	18.05	81.95	82
3/8"	9.5	0.00	0.00	18.05	81.95	82
#4	4.75	0.00	0.00	18.05	81.95	82
#10	2	2.53	1.66	19.70	80.30	80
#20	0.85	6.48	( ** )	23.95	76.05	76
#40	0.425	4.92	3.22	27.18	72.82	73
#60	0.25	6.65	4.36	31.54	68.46	68
#100	0.15	11.11	7.28	38.82	61.18	61
#140	0.106	8.13	5.33	44.15	55.85	56
#200	0.075	7.88	5.17	49.31	50.69	51
Pan	-	77.33	50.69	100.00	-	-

**Notes :** ( \* ) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
 ( \*\* ) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DF Date 4/23/25 Checked By EG Date 4/24/25

## ATTERBERG LIMITS

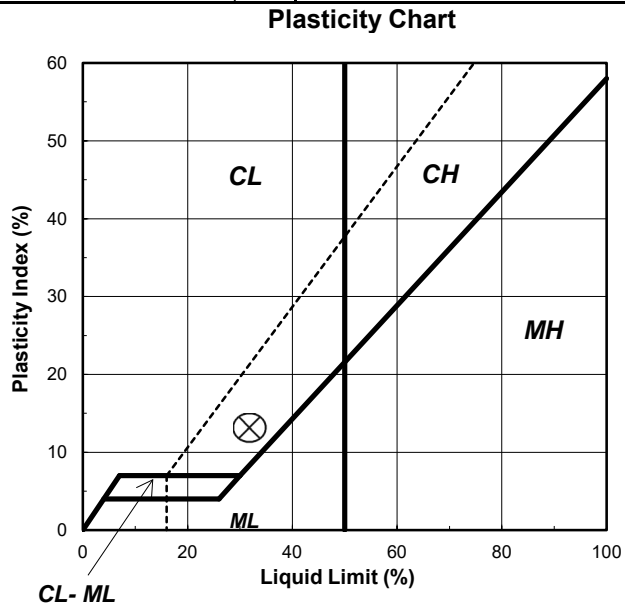
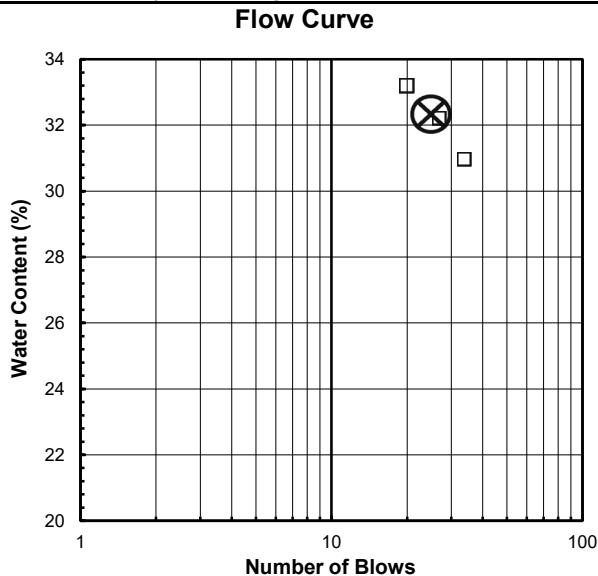
ASTM D 4318-17

Client: KU Resources, Inc.	Boring No.: B-03
Client Reference: Bridgeville Tractor Supply	Depth (ft): 3.0-4.5'
Project No.: 2025-239-001	Sample No.: S-4
Lab ID: 2025-239-001-004	Soil Description: BROWN LEAN CLAY

**Note: The USCS symbol used with this test refers only to the minus No. 40** (Minus #40 sieve material, Air dried) **sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.**

As Received Moisture Content ASTM D2216-19	Liquid Limit Test			
	1	2	3	M
Tare Number:	70	300	543	345
Wt. of Tare & Wet Sample (g):	17.70	44.49	39.46	40.74
Wt. of Tare & Dry Sample (g):	15.43	39.74	34.55	35.68
Weight of Tare (g):	3.24	24.39	19.30	20.43
Weight of Water (g):	2.3	4.8	4.9	5.1
Weight of Dry Sample (g):	12.2	15.4	15.3	15.3
Was As Received MC Preserved:	<b>Yes</b>			
<b>Moisture Content (%):</b>	<b>18.6</b>	<b>30.9</b>	<b>32.2</b>	<b>33.2</b>
<b>Number of Blows:</b>	<b>34</b>	<b>27</b>	<b>20</b>	<b>T</b>

Plastic Limit Test	1	2	Range	Test Results
Tare Number:	687	245		<b>Liquid Limit (%): 32</b>
Wt. of Tare & Wet Sample (g):	24.66	23.45		<b>Plastic Limit (%): 19</b>
Wt. of Tare & Dry Sample (g):	23.67	22.50		<b>Plasticity Index (%): 13</b>
Weight of Tare (g):	18.39	17.31		<b>USCS Symbol: CL</b>
Weight of Water (g):	1.0	0.9		
Weight of Dry Sample (g):	5.3	5.2		
<b>Moisture Content (%):</b>	<b>18.8</b>	<b>18.3</b>	<b>0.4</b>	
<i>Note: The acceptable range of the two Moisture Contents is <math>\pm</math></i>				1.12



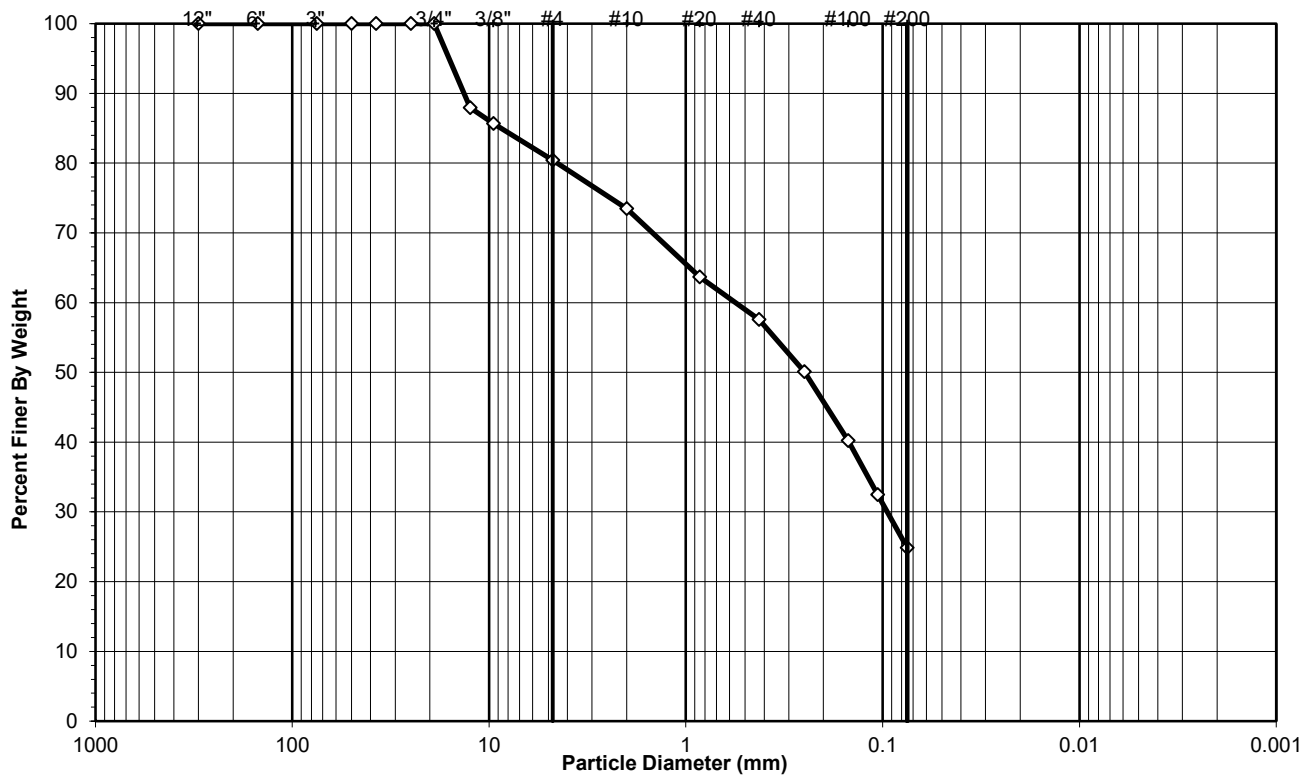
Tested By **FS** Date **4/21/25** Checked By **EG** Date **4/22/25**

## SIEVE AND HYDROMETER ANALYSIS

ASTM D6913 / D7928

Client:	KU Resources, Inc.	Boring No.:	B-04
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	15.0-16.5'
Project No.:	2025-239-001	Sample No.:	S-5
Lab ID:	2025-239-001-005	Soil Color:	Brown

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



Sieve Size		Percentage (%)
Greater than #4	<i>Gravel</i>	19.57
#4 to #200	<i>Sand</i>	55.58
Finer than #200	<i>Silt &amp; Clay</i>	24.85

**USCS Symbol:**  
**SM, TESTED**

**D50 = 0.25**

**USCS Classification:**  
**SILTY SAND WITH GRAVEL**  
**(NON-PLASTIC FINES)**

Tested By	DF	Date	4/24/25	Checked By	KC	Date	4/25/25
-----------	----	------	---------	------------	----	------	---------

**WASH SIEVE ANALYSIS**  
ASTM D6913-17

Client:	KU Resources, Inc.	Boring No.:	B-04
Client Reference:	Bridgeville Tractor Supply	Depth (ft):	15.0-16.5'
Project No.:	2025-239-001	Sample No.:	S-5
Lab ID:	2025-239-001-005	Soil Color:	Brown

Moisture Content of Passing 3/4" Material				Moisture Content of Retained 3/4" Material			
Tare No.:	1494	Tare No.:	NA				
Wt. of Tare & Wet Sample (g):	388.24	Weight of Tare & Wet Sample (g):	NA				
Wt. of Tare & Dry Sample (g):	388.24	Weight of Tare & Dry Sample (g):	NA				
Weight of Tare (g):	149.97	Weight of Tare (g):	NA				
Weight of Water (g):	0.00	Weight of Water (g):	NA				
Weight of Dry Soil (g):	238.27	Weight of Dry Soil (g):	NA				
<b>Moisture Content (%):</b>	<b>0.0</b>	<b>Moisture Content (%):</b>	<b>0.0</b>				
Dry Weight of Sample (g):	NA	Total Dry Weight of Sample (g):	238.27				
Tare No. (Sub-Specimen)	1494	Wet Weight of +3/4" Sample (g):	0.00				
Wt. of Tare & Wet Sub-Specimen (g):	388.24	Dry Weight of + 3/4" Sample (g):	0.00				
Weight of Tare (g):	149.97	Dry Weight of - 3/4" Sample (g):	238.27				
Sub-Specimen Wet Weight (g):	238.27	Dry Weight -3/4" +3/8" Sample (g):	34.18				
Tare No. (-3/8" Sub-Specimen):	NA	Dry Weight of -3/8" Sample (g):	204.09				
Wt. of Tare & Wet -3/8" Sub-Specimen (g):	NA	J - Factor (% Finer than 3/4"):	NA				
Weight of Tare (g):	NA	J - Factor (% Finer than 3/8"):	NA				
Sub-Specimen -3/8" Wet Weight (g):	NA						

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100
6"	150	0.00	0.00	0.00	100.00	100
3"	75	0.00	0.00	0.00	100.00	100
2"	50	0.00	( *)	0.00	100.00	100
1 1/2"	37.5	0.00	0.00	0.00	100.00	100
1"	25	0.00	0.00	0.00	100.00	100
3/4"	19	0.00	0.00	0.00	100.00	100
1/2"	12.5	28.76	( ** )	12.07	87.93	88
3/8"	9.5	5.42		14.35	85.65	86
#4	4.75	12.45		19.57	80.43	80
#10	2	16.54		26.51	73.49	73
#20	0.85	23.36	( ** )	36.32	63.68	64
#40	0.425	14.54		42.42	57.58	58
#60	0.25	17.86		49.91	50.09	50
#100	0.15	23.53		59.79	40.21	40
#140	0.106	18.44		67.53	32.47	32
#200	0.075	18.17		75.15	24.85	25
Pan	-	59.20		100.00	-	-

**Notes :** ( \* ) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample  
 ( \*\* ) The - 3/4" and - 3/8" sieve analysis is based on the Weight of the Dry Specimen

Tested By DF Date 4/24/25 Checked By KC Date 4/25/25

## ATTERBERG LIMITS

ASTM D 4318-17

Client: KU Resources, Inc.  
Client Reference: Bridgeville Tractor Supply  
Project No.: 2025-239-001  
Lab ID: 2025-239-001-005

Boring No.: B-04  
Depth (ft): 15.0-16.5'  
Sample No.: S-5  
Color: Brown  
(Minus No. 40 sieve material)

### As Received Water Content

Tare Number	98
Wt. of Tare & Wet Sample (g)	18.75
Wt. of Tare & Dry Sample (g)	16.67
Weight of Tare (g)	3.35
Weight of Water (g)	2.08
Weight of Dry Sample (g)	13.32

**Water Content (%)**                      **15.6**

# NON - PLASTIC MATERIAL

*Tested By*    *BS*                      *Date*    *4/21/25*                      *Checked By*                      *EG*                      *Date*    *4/22/25*

page 1 of 1    DGN: CT-S4C, DATE: 4/27/17, REVISION : 4e

# **APPENDIX D**

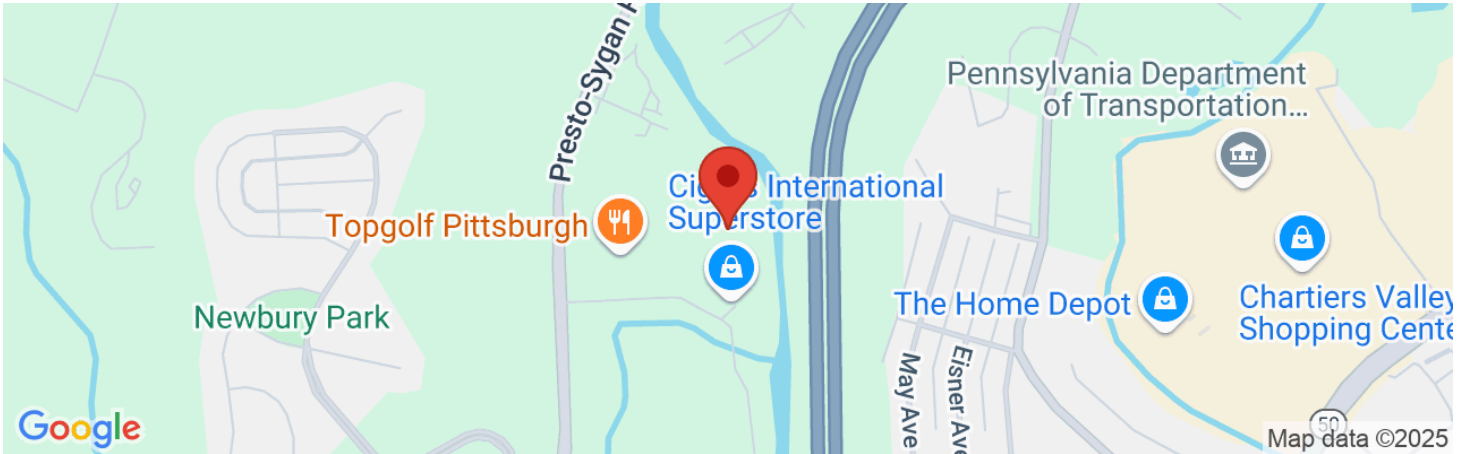
## **SEISMIC DESIGN CRITERIA**



USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.  
 USGS web services are now operational so this tool should work as expected.



Latitude, Longitude: 40.36720117, -80.12081048



<b>Date</b>	4/10/2025, 12:33:22 PM
<b>Design Code Reference Document</b>	IBC-2015
<b>Risk Category</b>	II
<b>Site Class</b>	D - Stiff Soil

Type	Value	Description
$S_S$	0.109	$MCE_R$ ground motion. (for 0.2 second period)
$S_1$	0.053	$MCE_R$ ground motion. (for 1.0s period)
$S_{MS}$	0.175	Site-modified spectral acceleration value
$S_{M1}$	0.127	Site-modified spectral acceleration value
$S_{DS}$	0.116	Numeric seismic design value at 0.2 second SA
$S_{D1}$	0.085	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
$F_a$	1.6	Site amplification factor at 0.2 second
$F_v$	2.4	Site amplification factor at 1.0 second
PGA	0.05	$MCE_G$ peak ground acceleration
$F_{PGA}$	1.6	Site amplification factor at PGA
$PGA_M$	0.08	Site modified peak ground acceleration
$T_L$	12	Long-period transition period in seconds
$S_{sRT}$	0.109	Probabilistic risk-targeted ground motion. (0.2 second)
$S_{sUH}$	0.12	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
$S_{sD}$	1.5	Factored deterministic acceleration value. (0.2 second)
$S_{1RT}$	0.053	Probabilistic risk-targeted ground motion. (1.0 second)
$S_{1UH}$	0.057	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S_{1D}$	0.6	Factored deterministic acceleration value. (1.0 second)
$PGAd$	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)
$PGA_{UH}$	0.05	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
$C_{RS}$	0.913	Mapped value of the risk coefficient at short periods

Type	Value	Description
$C_{R1}$	0.922	Mapped value of the risk coefficient at a period of 1 s
$C_V$		Vertical coefficient

## DISCLAIMER

While the information presented on this website is believed to be correct, SEAOC / OSHPD and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in this web application should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. SEAOC / OSHPD do not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the seismic data provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the search results of this website.