

Arche Solar Project

Case No. 20-0979-EL-BGN



Exhibit M

Preliminary Geotechnical Engineering Report



# Preliminary Geotechnical Engineering Report

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**Arche Fulton County Solar  
Fayette, Fulton County, Ohio**

June 22, 2020

Terracon Project No. N6195224

**Prepared for:**

7X Energy  
Austin, Texas

**Prepared by:**

Terracon Consultants, Inc.  
Parma, Ohio



June 22, 2020

7X Energy  
3809 Juniper Trace, Suite 100  
Austin, Texas 78738



Attn: Mr. Rich Clark – Senior Director, Engineering  
P: (866) 298-1632, ext. 109  
E: Rich.Clark@7x.energy

Re: Preliminary Geotechnical Engineering Report  
Arche Fulton County Solar  
Fayette, Fulton County, Ohio  
Terracon Project No. N6195224


Dear Mr. Clark:

We have completed the Preliminary Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PN6195224 dated November 13, 2019 (revised March 3, 2020). This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of solar panel foundations for the proposed project.


We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

**Terracon Consultants, Inc.**

  
Daniel R. Pratt, P.E., P.G.  
Project Engineer



  
Thomas F. McDonnell, P.E.  
Principal

SME Reviewer: Arin Barkataki, P.E. (TX)  
6/22/2020

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**Note:** This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the **GeoReport** logo will bring you back to this page. For more interactive features, please view your project online at [client.terracon.com](http://client.terracon.com).

## ATTACHMENTS

**EXPLORATION AND TESTING PROCEDURES**  
**SITE LOCATION AND EXPLORATION PLANS**  
**EXPLORATION RESULTS**  
**SUPPORTING INFORMATION**

**Note:** Refer to each individual Attachment for a listing of contents.

# Preliminary Geotechnical Engineering Report

## Arche Fulton County Solar Fayette, Fulton County, Ohio

Terracon Project No. N6195224

June 22, 2020

### INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed 100 Megawatt (MW) AC photovoltaic (PV) solar power facility to be located in Fulton County, Ohio. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface Soil Conditions
- Foundation Design and Construction
- Site Preparation and Earthwork
- Groundwater Considerations
- Seismic Site Classification per IBC
- Aggregate Surface Access Roadways

The geotechnical engineering scope of services for this project included the advancement of 50 test borings (i.e., B-01 through B-50) to a depth of 15 feet below existing site grades. Field electrical resistivity and laboratory testing for thermal resistivity and corrosion potential were also performed.

Maps showing the site and boring locations are shown in the **Site Location and Exploration Plans** section. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

The **General Comments** section provides an understanding of the report limitations.

### SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located within an approximate 1,000-acre area east of Fayette, Fulton County, Ohio. Based on output of 100MWac, we anticipate the developed area of the site will be about 700 acres. Approximate coordinates of center of site: 41.6737°, -84.2942° (See <b>Site Location</b> )

Item	Description
<b>Existing Improvements</b>	Parcels currently under consideration for development are being used primarily for agricultural purposes and are undeveloped.
<b>Current Ground Cover</b>	Crops, bare soil, or moderately wooded.
<b>Existing Topography</b>	Surface grades at the site are approximately 790 feet, MSL near the northwest corner of the planned development area and slope downward to an elevation of approximately 730 feet, MSL near the southeast corner of the planned development area.
<b>Geology</b>	<p>Our experience near the vicinity of the proposed development and our review of geologic maps indicate subsurface conditions consist of over 100 feet of predominately cohesive soils overlying Mississippian aged Coldwater Shale.</p> <p>The findings of the subsurface exploration are consistent with these expectations within the depth explored.</p>

## PROJECT DESCRIPTION

Our understanding of the project conditions is as follows:

Item	Description
<b>Information Provided</b>	An emailed request for proposal and aerial view of the preliminary site boundary was provided to Terracon from 7X on October 29, 2019. On February 24, 2020, Terracon received from 7X an email that indicated that 8 California Bearing Ratio (CBR) tests were to be added to the scope of work and the pile load testing was to be removed from the scope of work. Additionally, planned boring locations were forwarded via a Google Earth™ kmz file.
<b>Project Description</b>	Construction of an approximate 100-Megawatt (MWac) solar facility.
<b>Proposed Structures</b>	Not provided. Anticipated to be photovoltaic panels supported on steel racking system founded on wide flange piles (W6x9 or similar) or other proprietary sections. Substation location is unknown at this time and so no recommendations are provided for the substation.
<b>Maximum Loads</b>	Structural loads were not provided, but have been estimated based on our experience on projects using single-axis, tracking rack systems: Downward: 1.5 to 4 kips Lateral 1 to 3.5 kips Uplift: 1.5 kips (exclusive of frost heave loads)
<b>Grading/Slopes</b>	Finish design grades are anticipated to be within 2 feet of existing grades.

Item	Description
Estimated Start of Construction	Summer 2020

## GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	Topsoil	2" to 14" of topsoil
2	Cohesive 1	Lean to fat clay, very soft to soft
3	Cohesive 2	Lean to fat clay, medium stiff to hard
4	Granular 1	Silt, sand, and gravel, very loose to loose
5	Granular 2	Silt, sand, and gravel, medium dense to very dense

Static groundwater was measured during drilling operations and at completion of drilling. Groundwater observations are summarized in the following table.

Boring Location	Depth to Groundwater During Drilling (ft) <sup>1</sup>	Depth to Groundwater at Drilling Completion (ft) <sup>1</sup>
B-01	14	-
B-02	9.5	-
B-03	12.5	-
B-04	-	-
B-05	6	-
B-06	13	14
B-07	-	-
B-08	9	14
B-09	4.5	13
B-10	14.5	15

Boring Location	Depth to Groundwater During Drilling (ft) <sup>1</sup>	Depth to Groundwater at Drilling Completion (ft) <sup>1</sup>
B-11	14	-
B-12	9.5	10
B-13	-	-
B-14	-	-
B-15	4.5	11
B-16	-	-
B-17	13.5	-
B-18	4	7
B-19	9	-
B-20	-	-
B-21	-	-
B-22	-	-
B-23	9	-
B-24	-	-
B-25	-	-
B-26	-	-
B-27	7	-
B-28	6	-
B-29	6	11.5
B-30	-	-
B-31	6.5	12.5
B-32	3	-
B-33	3.5	-
B-34	3.5	-
B-35	14.5	-
B-36	8	-
B-37	-	-
B-38	6	-
B-39	4.5	7.5
B-40	4.5	11
B-41	6	6.5
B-42	4.5	12.5
B-43	6.5	-
B-44	4.5	-
B-45	9.5	11.5
B-46	9	-
B-47	11	13



Boring Location	Depth to Groundwater During Drilling (ft) <sup>1</sup>	Depth to Groundwater at Drilling Completion (ft) <sup>1</sup>
B-48	7.5	-
B-49	9	-
B-50	5	-

1. “-“ indicates that no groundwater was observed

These observations represent short-term groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors.

## GEOTECHNICAL OVERVIEW

50 borings were completed for the preliminary phase of the project. The subsurface conditions encountered in the preliminary borings generally consisted of glacially derived deposits extending to the maximum depth explored (i.e., 15 feet below ground surface). The consistency of native cohesive soils ranged from very soft to hard. The relative density of native granular soils ranged from very loose to very dense.

Cobbles and boulders are commonly found in glacially deposited soil. The dimensions of the sampling equipment may preclude sampling particles larger than 2-inch in diameter. Therefore, it is possible that piles driven into the overburden soils can encounter refusal (due to cobbles and boulders) on some of the parcels across the facility site, especially in the vicinity of borings B-03, B-04, and B-06 through B-08 where sampler refusal was encountered at depths of 14 to 15 feet. It is also anticipated that pre-drilling of undersized holes and backfilling with soil cuttings may be required to accommodate pile installation in areas where driving piles is difficult.

Understanding that driven piles are the preferred foundation system for a solar PV project, and the presence of cobbles and boulders within the anticipated foundation driving depth, we recommend a pile driving and testing program be developed to assess the difficulty of piles penetrating the onsite soils.

Design recommendations and construction considerations for the solar PV panel foundations are presented in the **Foundations** section of this report.

We recommend lightly-loaded ancillary equipment be supported on concrete support slabs (mat foundations) underlain by at least a 12-inch thickness of Non-Frost Susceptible (NFS) material, Structural Fill or Crushed Stone placed on either native material or compacted fill placed for site grading. Grading within the equipment pads should incorporate the limits of the proposed structures plus a minimum lateral extent of 1 foot. Design recommendations and construction considerations for the slabs are presented in the **Foundations** section of this report.

## Preliminary Geotechnical Engineering Report

Arche Fulton County Solar ■ Fayette, Fulton County, Ohio

June 22, 2020 ■ Terracon Project No. N6195224



Terracon should be retained during the final geotechnical engineering services and construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation; proof-rolling; placement and compaction of controlled compacted fill; backfilling of excavations in the completed subgrade; and for construction of foundations.

Preliminary recommendations contained in this report are based upon the data obtained from the limited number of test borings. This report does not reflect conditions between the points investigated, or between sampling intervals in test borings. The nature and extent of variations between test borings and sampling intervals may not become evident until the course of construction. A detailed subsurface geotechnical investigation should be completed prior to final design and construction to assess localized subsurface conditions at proposed structure locations.

The **General Comments** section provides an understanding of the report limitations.

## EARTHWORK

Earthwork will include clearing and grubbing as well as grading, excavation, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality control criteria as necessary to prepare the site subsurface conditions consistent with the conditions considered in our geotechnical engineering evaluation for slabs/mats, and aggregate surfaced roadways.

### Site Preparation

The sites are mostly fields with some wooded areas. It is our understanding minimal grading will be performed within the solar arrays and the proposed grades will generally follow existing natural ground elevations. Therefore, in areas where little or no regrading of the site is required it may be possible to selectively remove the trees and brush only, leaving the topsoil and grass.

In areas where placement of fill will be required, and within the future shallow foundation and roadway areas, the site should be cleared and grubbed to remove stumps, roots, grass, topsoil, organic laden soil, organic matter, and any rubble or debris encountered. When trees are removed, the entire root ball should be excavated such that the remaining roots measure 1 inch in diameter or less. The excavation created for the tree removal should be sloped to allow compaction equipment to achieve uniform backfill compaction.

Topsoil measurements were made at the boring locations and are reported on the boring logs; however, stripping depths at or between our boring locations and across the site could vary considerably. We recommend that actual stripping depths be evaluated by a representative of Terracon or other qualified geotechnical engineer during construction to aid in preventing removal of excess material.

The subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proofrolling should be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified. Excessively wet or dry material should either be removed, or moisture conditioned and recompacted.

Over-excavations should be backfilled with Structural Fill material placed and compacted in accordance with the **Earthwork** section of this report. Subgrade preparation and selection, placement, and compaction of Structural Fill should be performed under engineering-controlled conditions in accordance with the project specifications.

### Reuse of On-Site Materials

The natural moisture contents for the samples (mixtures of clay, silt, sand and gravel) tested ranged from 6 to 44 percent, with an average value of approximately 21 percent. Atterberg Limits tests indicate the plasticity of the soil tested to be low. The Proctor tests indicate optimum water contents of 10 to 22 percent required to achieve a maximum dry density of 101 to 124 pcf. Please note that the moisture tests were performed on samples obtained from the split-spoon sampler, which may not be completely representative of the in-situ material moisture content.

Silt and silty soils were encountered throughout the project site. These materials are not recommended for reuse as Structural Fill due to difficult compaction characteristics and stability issues at higher moistures. Where encountered during excavation or grading, we recommend that materials consisting primarily of silt be segregated from the more granular materials and reused in non-structural, landscaped areas.

### Fill Material Types

Fill required to achieve design grades should meet the following material property requirements:

Soil Type <sup>1</sup>	USCS Classification	Acceptable Parameters
Native Cohesive	CL, CL-ML, CH <sup>2</sup>	All locations and elevations
Native Granular <sup>3</sup>	SC-SM, SM, SP, SC, GW, ML, MH	All locations and elevations with the exception that silt (ML, MH) soils should not be used for fill within 2 feet of the slab's finished subgrade elevations due to frost heave concerns
Imported Granular Material <sup>3</sup>	GW, GM, GC, SW, SM, SC	All locations and elevations

Soil Type <sup>1</sup>	USCS Classification	Acceptable Parameters
<ol style="list-style-type: none"> <li>1. Structural fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.</li> <li>2. CH soils should not be used within 3 feet of finished grade in slab areas.</li> <li>3. Maximum particle size of 3 inches.</li> </ol>		

## Fill Compaction Requirements

Structural fill should meet the following compaction requirements.

Item	Description
Maximum fill lift thickness	<ul style="list-style-type: none"> <li>■ 8 inches or less in loose thickness when heavy, tamping foot or vibratory drum compaction equipment is used</li> <li>■ 4 inches or less in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used</li> </ul>
Minimum compaction requirements <sup>1</sup>	95% of the material's standard Proctor maximum dry density (ASTM D 698)
Moisture content – low plasticity cohesive soils	Within the range of -1% to + 3% of the optimum moisture content as determined by the standard Proctor test at the time of placement and compaction
Moisture content – well graded granular material containing little or no silt	Workable moisture contents <sup>2</sup>

1. We recommend that compacted structural fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
2. Sufficient to achieve satisfactory compaction without the material pumping when proof rolled.

## Utility Trench Backfill

Trench excavations should be made with sufficient working space to permit construction including backfill placement and compaction. As utility trenches can provide a conduit for groundwater flow, trenches should be backfilled with material that approximately matches the permeability characteristics of the surrounding soil. Consideration should be given to installing seepage collars and/or check dams to reduce the likelihood of migration of water through the trenches.

## **Grading and Drainage**

Adequate drainage should be provided at the site to reduce the likelihood of an increase in moisture content of the foundation soils. Surface drainage would likely consist of limited swales to control erosion and flow of runoff towards the equipment.

## **Earthwork Construction Considerations**

Excavations for the bearing grade of the proposed project can be achieved with conventional construction equipment. Although the exposed soil subgrade is anticipated to be relatively stable upon initial exposure, unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. Should unstable subgrade conditions develop, stabilization measures will be required.

The Civil Engineer should also consider shallow placement of underground utilities if possible, to minimize excavation costs.

Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over, or adjacent to, construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted, prior to slab construction.

As a minimum, temporary excavations should be sloped or braced, as required by Occupational Safety and Health Administration (OSHA) regulations, to provide stability and safe working conditions. The contractor is usually responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, State, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

## **Construction Observation and Testing**

A qualified testing agency should be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during subgrade preparation;

proof-rolling; placement and compaction of controlled compacted fills; backfilling of excavations in the completed subgrade; and for construction of foundations.

Each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 5,000 square feet of compacted fill in open areas and every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

## **FOUNDATIONS**

We recommend the photovoltaic panels be supported on driven steel pile foundations which should be structurally designed to resist compression, uplift, and bending forces.

Lightly-loaded ancillary equipment may be supported on concrete support slabs underlain by at least a 12-inch thickness of NFS material, Structural Fill, or Crushed Stone placed on either the native material or compacted fill placed for site grading, the surface of which should be proof-rolled. All grading within the equipment pads should incorporate the limits of the proposed structures plus a minimum lateral extent of 1 foot.

Design recommendations and construction considerations for the recommended foundation systems are presented below.

### **Driven Piles**

#### **Adfreeze Stress**

The overburden soils encountered in the borings are frost susceptible. In cold weather climates, design to resist frost heave forces exerted on foundations is often the limiting factor in the foundation design. Specifically, pile lengths will need to be long enough to counteract potential heave forces in the seasonal frost zone.

As the frost penetrates deeper into the soil and the ground swells due to freezing, the ground surface will rise due to frost heaving. The upward displacement is due to freezing water contained



in the soil voids along with the formation of ice lenses in the soil. The freezing material grips the steel pile and exerts an uplift force due to the adfreeze stress developed around the surface area of the pile. The amount of upward force depends on the following:

- The thickness of ice lenses formed in the seasonal frozen ground
- The bond between the steel pile surface and the frozen ground
- The surface area of the steel pile in the seasonally frozen ground

Based on our review of soil samples, we recommend an adfreeze stress of 1,500 psf be considered when determining the frost heave load on a pile. The box perimeter of the pile (two times the depth plus two times the flange width) acting over a maximum depth of about 2.5 feet below ground surface should be considered when determining the frost heave load on a pile.

Uplift forces will govern the design and length of the drilled and grouted piles; therefore, uplift will be the primary factor in foundation costs. The factor of safety against uplift should be determined based on discussions with the owner and design engineer considering the desired level or risk, construction costs, and the long-term maintenance program.

### **Driven Pile Construction Considerations**

Borings B-03, B-04, and B-06 through B-08 encountered sampler refusal at depths of 14 to 15 feet. Cobbles and boulders are generally found in glacially deposited soil and should be anticipated. Pile installation via conventional methods – such as driving into undisturbed soils may encounter difficulty at some locations and may result in early refusal and inadequate penetration, or else may cause excessive pile deflection, rotation or torsional rotation. We recommend a pile driving and testing program be developed to assess the difficulty of piles penetrating the soil conditions.

Auger drilling typically is unsuccessful for subgrades containing appreciable cobbles and boulders. We expect that percussive drilling methods such as ODEX or air-rotary could be necessary to complete pre-drilled holes to their design depth.

Boring B-15 encountered very soft, highly organic material at a depth of approximately 5 to 9 feet. Piles in the vicinity of the B-15 location may need to be driven to deeper than typical embedment depths.

### **Undersize Holes Design Recommendations**

In areas of driven pile refusal prior to reaching the desired pile depth, it may be appropriate to pre-drill an undersized hole. The predrilled hole may then be backfilled with the cuttings, provided cobbles and boulders are culled from the material. The objective of pre-drilling an undersized hole is to facilitate the driving of the web without disturbing the native soils supporting the flanges.

## Axial Pile Capacities

The ultimate axial capacity of the straight sided pile in compression can be determined by the following equation:

$$Q_u = Q_s + Q_p = fA_s + qA_p$$

Where:

$Q_u$  = ultimate axial capacity in compression (lb)

$Q_s$  = ultimate skin-friction resistance (lb)

$Q_p$  = ultimate end bearing (lb)

$f$  = ultimate unit stress transfer in skin friction (lb/ft<sup>2</sup>)

$q$  = ultimate unit stress transfer in end bearing (lb/ft<sup>2</sup>)

$A_s$  = side surface area of the pile (ft<sup>2</sup>)

$A_p$  = gross end area of the pile (ft<sup>2</sup>)

The ultimate unit skin friction was determined using the soil strength parameters based on our field and laboratory testing and published correlations. The following preliminary geotechnical design parameters were used to estimate the capacity of driven W-section pile foundations. These values should be revised as necessary based on the results of the detailed subsurface conditions to develop parameters suitable to prepare a full-scale pile load testing program which is recommended as part of the overall project design. Final design values will vary from the preliminary estimates below.

Description	Depth (feet bgs)	Ultimate Unit Skin Friction (psf) <sup>1</sup>	Ultimate End Bearing Capacity (lbs)
Stratum 1	0 – 2.5	N/A	N/A
Stratum 2	2.5 – 6	245	250
Stratum 3	6 – 15	600	500

1. The upper 2.5 feet should be neglected in pile design due to frost heave.

The recommended geotechnical design parameters in this table are based on average conditions encountered in our borings. Additional subsurface exploration and pile load testing should be performed to determine actual design parameters across the site.

The axial tensile (pull-out) capacity is developed from skin friction while the axial compressive capacity is developed from skin friction and end bearing. The above indicated ultimate skin friction and end bearing capacity values should be used with a FOS of 2.. The skin friction perimeter should



be calculated using the perimeter of the pile which equals twice the sum of the flange width and web depth. The upper 2.5 feet of soil should be neglected when calculating skin friction due to the frost heave depth.

Piles should have a minimum center-to-center spacing of at least 3 times their largest cross-sectional dimension to prevent reduction in the axial capacities due to group effects. If the piles are designed using the above parameters, settlements are not anticipated to exceed 1 inch.

### Lateral Analyses

Parameters for use in lateral analyses using LPILE are presented in the following table:

Description	Depth (feet bgs)	LPILE Soil Type	Effective Unit Weight (pcf)	Undrained Cohesion, c (psf)	Friction Angle (deg.)	Strain Factor, $\epsilon_{50}$
Stratum 1	0 – 2.5	Stiff Clay without Free Water (Reese)	120	500	---	default
Stratum 2	2.5 – 6	Stiff Clay without Free Water (Reese)	125	1,500	---	default
Stratum 3	6 – 10	Stiff Clay without Free Water (Reese)	68	3,500	---	default
Stratum 4	10 – 15	Stiff Clay without Free Water (Reese)	68	4,500	---	default

### Shallow Foundations

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

#### Design Parameters – Compressive Loads

Item	Description
Maximum net allowable bearing pressure <sup>1, 2</sup>	2,500 psf
Required bearing stratum <sup>3</sup>	Suitable native soils; medium stiff or better cohesive soils, medium dense or better relative density granular soils, or new, controlled fill.

Item	Description
Minimum foundation dimensions	Isolated: 30 inches Continuous: 18 inches
Ultimate passive resistance <sup>4</sup> (equivalent fluid pressures)	250 pcf
Ultimate coefficient of sliding friction <sup>5</sup>	0.30 (Concrete on approved native soils or compacted Structural Fill)
Minimum embedment below finished grade <sup>6</sup>	30 inches
Estimated total settlement from structural loads <sup>2</sup>	Less than about 1 inch

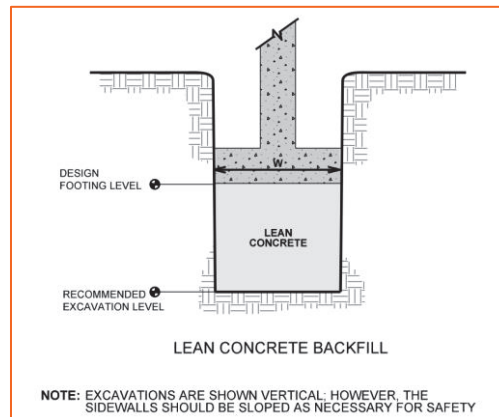
1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. The allowable bearing pressure may be increased by one-third when considering the alternative load combinations of Section 1605.3.2 of the 2015 International Building Code, however, it should not be increased when loads are determined by the basic allowable stress design load combinations of Section 1605.3.1.
2. Values provided are for maximum loads noted in **Project Description**.
3. Unsuitable or soft soils should be overexcavated and replaced according to the recommendations presented in **Earthwork**.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions. Should be neglected if passive pressure is used to resist lateral loads.
6. Embedment necessary to resist the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
- 7.

## Foundation Construction Considerations

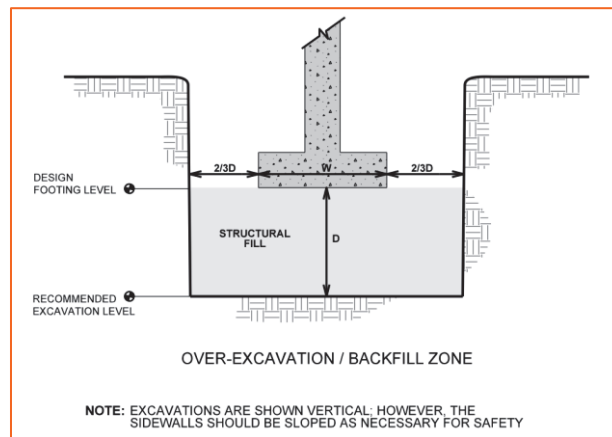
As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Any large cobbles and/or boulders encountered beneath the proposed foundations at the bearing grade elevation shall be removed from the bearing surface as necessary to avoid point-bearing, and then backfilled with properly compacted structural fill.

Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed. Placement of a lean concrete mud-mat over the bearing soils should be considered if the excavations must remain open for an extended period.

If unsuitable bearing soils are encountered at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils. The footings could then bear directly on these soils at the lower level or on lean concrete backfill placed in the excavations. This is illustrated on the sketch below.



As an alternative, the footings could also bear on properly compacted structural backfill extending down to suitable soils. Over-excavation for compacted Structural Fill placement below footings should extend laterally beyond all edges of the footings at least 8 inches per foot of over-excavation depth below footing base elevation. Over-excavation for Structural Fill placement below footings should be conducted as shown below. The over-excavation should be backfilled up to the footing base elevation as recommended in the **Earthwork** section.



## Mat Foundations

### Design Parameters – Compressive Loads

Reinforced concrete support slabs (mat foundations) are recommended to support the proposed lightly loaded ancillary equipment with small footprints. We recommend concrete slabs have thickened edges with a minimum embedment depth to the bottom edge of 12 inches below finished grade. It is our opinion the thickened edge may help in both confining the aggregate placed beneath the slab and minimizing the potential for erosion and foundation damage from storm runoff.

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable.

Item	Description
<b>Foundation Type</b>	Mat Foundation
<b>Maximum Net Allowable Bearing Pressure<sup>1, 2</sup></b>	2,500 psf
<b>Required Bearing Stratum<sup>2</sup></b>	Minimum 12-inch thickness of NFS material, Structural Fill, or Crushed Stone placed on either the native material or compacted fill placed for site grading, the surface of which should be proof-rolled. Bearing material should extend a minimum of 12 inches beyond the edges of the foundations.
<b>Foundation Dimensions</b>	<ul style="list-style-type: none"> <li>■ Mat foundations of unknown dimensions.</li> <li>■ Minimum foundation depth of 12 inches for thickened edges.</li> </ul>
<b>Ultimate Coefficient of Sliding Friction<sup>3</sup></b>	0.50
<b>Minimum Embedment below Finished Grade<sup>4</sup></b>	<ul style="list-style-type: none"> <li>■ Base of NFS material will need to be placed at least 30 inches deep to reduce the effects of freeze-thaw. Alternately, the slab (mat) could be designed to allow movement due to frost action.</li> <li>■ Minimum 12 inches for thickened edges.</li> </ul>
<b>Estimated Total Settlement from Structural Loads</b>	Less than about 1 inch

Item	Description
<ol style="list-style-type: none"> <li>1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. The allowable bearing pressure may be increased by one-third when considering the alternative load combinations of Section 1605.3.2 of the 2015 International Building Code, however, it should not be increased when loads are determined by the basic allowable stress design load combinations of Section 1605.3.1.</li> <li>2. Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the <b>Earthwork</b>.</li> <li>3. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to uplift conditions. A factor of safety of at least 1.5 should be applied to the sliding resistance.</li> <li>4. Slab foundations will move due to freeze-thaw effects. Base of NFS material will need to be placed at least 30 inches deep to significantly reduce the effects of freeze-thaw. Alternately, the slab could be designed to allow movement due to frost action.</li> </ol>	

Foundations should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. Other details including treatment of loose foundation soils, superstructure reinforcement and observation of foundation excavations as outlined in the **Earthwork** section of this report are applicable for the design and construction of a mat foundation.

For structural design of mat foundations, a Modulus of Subgrade Reaction ( $K_{v1}$ ) of 90 pounds per cubic inch (pci) may be used. The Modulus of Subgrade Reaction ( $K_v$ ) for the mat is not a constant for a given soil<sup>1</sup>. It depends on several factors, such as length and width of the foundation. Typically, the value of the  $K_v$  decreases with the width of the foundation and would vary according to the following equation:

$$\blacksquare K_v = K_{v1} * ((B+1)/(2*B))^2 \quad \text{Foundations on Structural Fill}$$

Where:  $K_v$  is the modulus for the size footing being analyzed  
 B is the width of the mat foundation.

### Mat Foundation Construction Considerations

On most sites, the site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed by foundation excavations, construction traffic, rainfall, etc. As a result, the subgrade may not be suitable for placement of fill, and corrective action will be required.

We recommend the area underlying the mat foundation be rough graded and proof-rolled with a vibratory roller or heavy plate compactor prior to final grading and placement of Structural Fill.

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<sup>1</sup> Principle of Foundation Engineering, 3<sup>rd</sup> Edition, Braja M. Das; pgs. 260-265.

Subgrades with fine-grained soils may need to be proof-rolled/compacted in static mode to avoid disturbance. Attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas previously filled or backfilled. Areas where unsuitable or unstable conditions are located should be repaired by replacing the affected material with properly compacted Structural Fill, as necessary. Surface drainage should be provided away from the edge of foundations to reduce moisture transmission into the subgrade.

## **SEISMIC CONSIDERATIONS**

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our professional opinion that the **Seismic Site Classification is D**. Subsurface explorations at this site were extended to a maximum depth of 15 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

## **PAVEMENTS**

### **General Comments**

Surficial materials below the topsoil at the site consist of very loose to loose mixtures of silt and sand or soft to medium stiff lean clays with varying fractions of sand. It is expected that the proposed site grades will be established near the existing site grades using engineered fill material similar to the surficial soils to level the planned haul road areas.

We understand that haul roads consist of aggregate sections with no asphalt or concrete surface. Recommendations are presented below for two alternative aggregate sections: one assuming the aggregate section placed over stable, proofrolled native subgrade materials; the second for the case where achieving a stabilized subgrade may be difficult or not possible due to weather conditions at the time of construction.

The access road area subgrades should be properly sloped to direct water from beneath the drive area gravel section toward the edge, and/or down gradient. Collected water should be channeled away from the access road. Adequate sloping of the gravel surface will minimize the potential for ponding of water on or within proximity to the drive area, which will shorten the life of the unpaved roadways.

The aggregate sections presented in this report are considered minimal sections based upon the expected traffic and the composite subgrade conditions; however, they are expected to function with periodic maintenance if good drainage is provided and maintained.

### **Aggregate Section Over Stable Subgrade**

The haul road subgrades should be prepared in accordance with the recommendations provided in the **Earthwork** section, above, including proof-rolling and removal/replacement of soft/unstable areas identified by the proof-rolling. These subgrades should be prepared immediately prior to the time of aggregate placement to reduce the risk of disturbance due to weather or construction vehicle traffic. If this cannot be done, the subgrades should be reevaluated by a qualified Geotechnical Engineer for disturbance or softening immediately prior to aggregate placement. For subgrades prepared in accordance with the **Earthwork** section, we recommend that the aggregate section consist of a minimum 9 inches of ODOT Item 304 Aggregate Base compacted to 98 percent of its maximum dry density as determined by the ASTM D1557 test procedure (Modified Proctor Test).

To maintain surface drainage, the subgrade should have a minimum ¼-inch per foot slope and the final grade adjacent to the road should slope down from road edges at a minimum of 2 percent.

### **Aggregate Section Over Weak Subgrades**

The requested pervious haul road could also be established over a relatively weak subgrade with California Bearing Ratio (CBR) values less than 3, which would allow placement of the roadway section over on-site soils with minimal subgrade preparation activities, without the need for proof-rolling with heavy construction equipment.

For this scenario, we recommend that the aggregate section consist of a minimum of 12 inches of compacted ODOT Item 304 Aggregate Base placed over high-performance geotextile Mirafi RS380i, or equivalent, installed over the existing subgrade. The high-performance geotextile will provide reinforcement strength to the aggregate material and will limit migration from the underlying subgrade, which may contribute to its degradation and loss of strength.

In areas where fill materials are required to level the proposed pavement subgrade, we recommend that these fill materials be compacted at least to the density of the existing subgrade soils.

### **Access Road Maintenance**

Regardless of the design, unsurfaced roadways will display varying levels of wear and deterioration. We recommend implementation of a site inspection program at a frequency of at least once per year to verify the adequacy of the roadways. Preventative measures should be applied as needed for erosion control and regrading. An initial site inspection should be completed approximately three



months following construction. For planning purposes, we recommend assuming that over time the placement of additional aggregate material will likely be required to level depressions and long-term rutting. These areas should be filled with additional aggregate rather than scalping of material from adjacent areas.

Shoulder build-up on both sides of proposed roadways should match the road surface elevation and slope outwards at a minimum grade of 10 percent for five feet. Surface drainage should be provided away from the edge of roadways to reduce lateral moisture transmission into the subgrade.

When potholes, ruts, depressions or yielding subgrades develop, they must be repaired prior to applying additional traffic loads. Typical repairs could consist of placing additional Crushed Stone in ruts or depressed areas and, in some cases, complete removal of Crushed Stone surfacing, repair of unstable subgrade, and replacement of the Crushed Stone surfacing. Potholes and depressions should not be filled by blading adjacent ridges or high areas into the depressed areas. New material should be added to the depressed areas as they develop. Failure to make timely repairs will result in more rapid deterioration of the roadways, making more extensive repairs necessary.

## CORROSION

The table below lists the results of laboratory soluble sulfate, sulfites, soluble chloride, electrical resistivity, pH, and Red-Ox testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Corrosivity Test Results Summary								
Boring	Sample Depth (feet)	Soil Description	pH	Soluble Sulfate mg/Kg	Sulfites mg/Kg	Chlorides mg/Kg	Red-Ox (mV)	Electrical Resistivity (Ω-cm)
B-01	0-4	Sandy Lean Clay	7.06	81	Nil	28	674	2,144
B-08	0-4	Sandy Lean Clay	7.16	78	Nil	55	675	1,876
B-10	0-4	Sandy Lean Clay	7.17	133	Nil	50	674	3,350
B-11	0-4	Silty Sand	7.09	34	Nil	27	680	6,700
B-13	0-4	Lean Clay with Sand	7.59	94	Nil	33	678	3,685
B-20	0-4	Sandy Lean Clay	7.47	119	Nil	58	675	1,474
B-26	0-4	Sandy Lean Clay	7.49	69	Nil	42	674	2,144
B-28	0-4	Sandy Lean Clay	7.29	79	Nil	50	676	3,551
B-32	0-4	Silty Clayey Sand	7.69	72	Nil	38	677	3,685



Corrosivity Test Results Summary								
Boring	Sample Depth (feet)	Soil Description	pH	Soluble Sulfate mg/Kg	Sulfites mg/Kg	Chlorides mg/Kg	Red-Ox (mV)	Electrical Resistivity (Ω-cm)
B-36	0-4	Sandy Lean Clay	7.44	70	Nil	37	675	1,943
B-38	0-4	Lean Clay	7.71	103	Nil	40	676	3,484
B-42	0-4	Sandy Lean Clay	7.65	165	Nil	60	675	2,479
B-45	0-4	Sandy Lean Clay	7.74	82	Nil	75	677	3,752
B-50	0-4	Sandy Lean Clay	7.68	148	Nil	40	676	2,747

As discussed in Section 10.7.5 of the AASHTO LRFD Bridge Manual, 8<sup>th</sup> Edition, 2017, the following soil or site conditions should be considered as indicative of a potential deterioration or corrosion situation for driven steel piles:

- soil electrical resistivity less than 2,000 ohm-cm
- pH less than 5.5
- pH between 5.5 and 8.5 with high organic content
- sulfate concentration greater than 1,000 ppm (mg/kg)
- chloride content greater than 500 ppm

Based upon the results of the soils tested at the site, the soil may be classified as having a low corrosion potential to steel, except at B-08, B-20, and B-36 where the electrical resistivity is less than 2,000 ohm-cm.

Results of soluble sulfate testing indicate that ASTM Type II Portland cement will be required for concrete on and below grade in the vicinity of B-42. There are no cement type restrictions for the remainder of the site. For the majority of the site, foundation concrete should be designed for a sulfate exposure class S0 in accordance with Table 19.3.1.1 of the ACI 318–14 Manual of Concrete Practice. However, the sulfate exposure class is S1 in the vicinity of B-42. Concrete should be designed in accordance with the provisions of the ACI 318, Chapters 19 and 26.

## GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the

**Preliminary Geotechnical Engineering Report**

Arche Fulton County Solar ■ Fayette, Fulton County, Ohio

June 22, 2020 ■ Terracon Project No. N6195224



absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

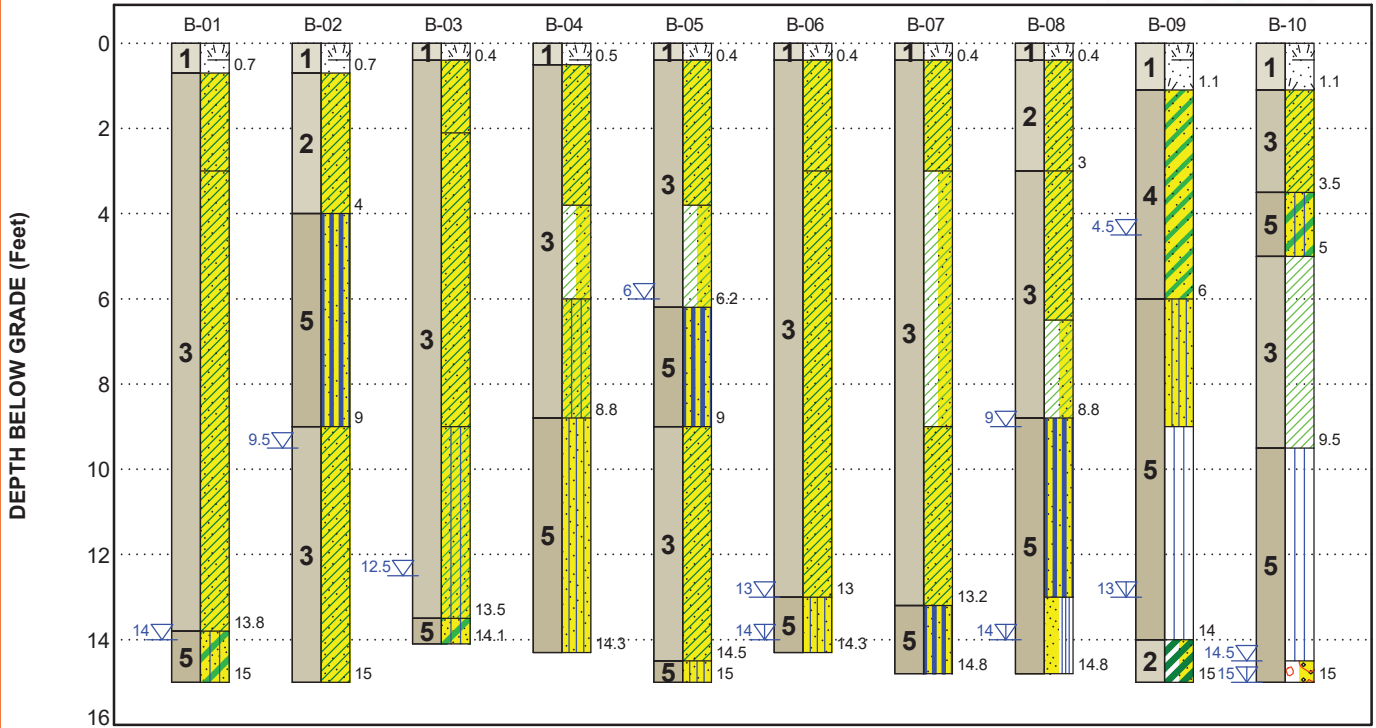
## FIGURES

### Contents:

GeoModel (5 pages)

**GEOMODEL 1**

Arche Fulton County Solar ■ Fayette, OH  
Terracon Project No. N6195224



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Topsoil	2" to 14" of topsoil
2	Cohesive 1	Lean to fat clay, very soft to soft
3	Cohesive 2	Lean to fat clay, medium stiff to hard
4	Granular 1	Silt, sand, and gravel, very loose to loose
5	Granular 2	Silt, sand, and gravel, medium dense to very dense

**LEGEND**

- Topsoil
- Sandy Silt
- Silty Sand
- Silt
- Well-graded Gravel w/sand
- Sandy Lean Clay
- Sandy Silty Clay
- Poorly-graded Sand with Silt
- Fat Clay with Sand
- Silty Clayey Sand
- Lean Clay with Sand
- Clayey Sand
- Lean Clay

- First Water Observation
- Second Water Observation

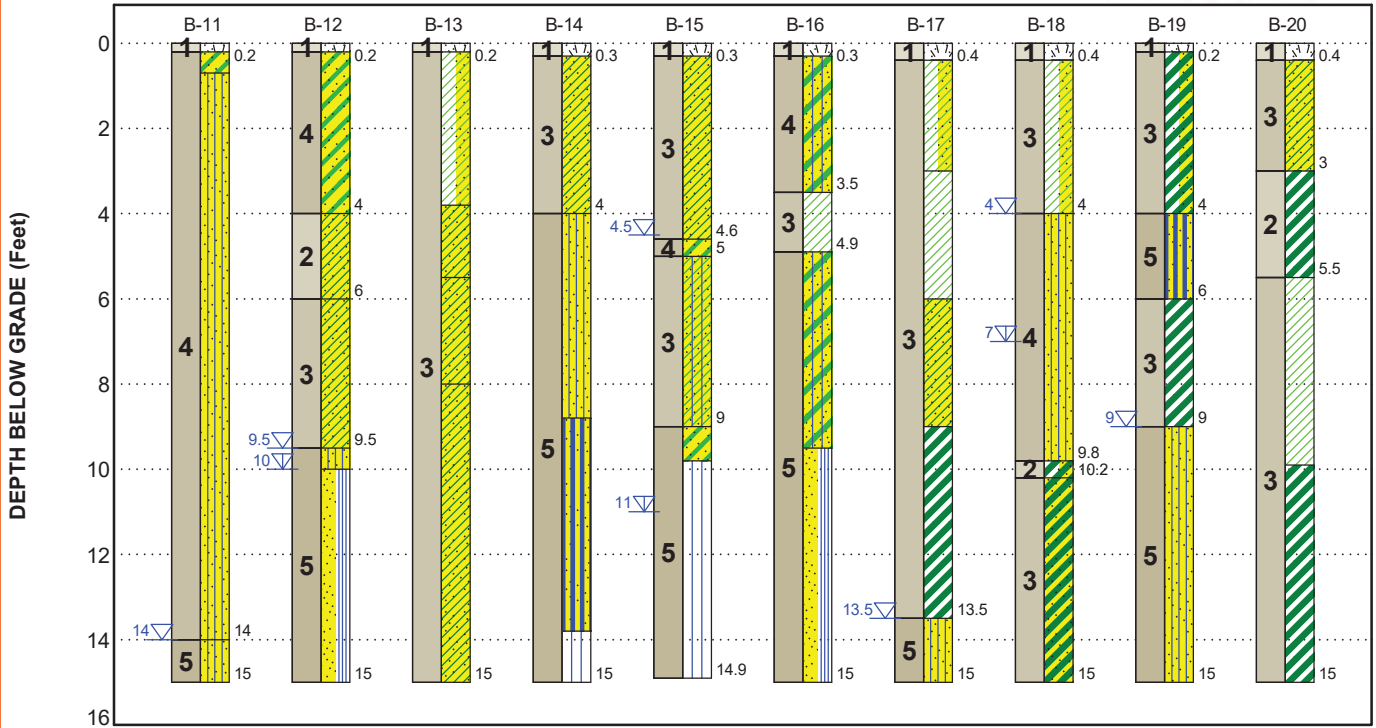
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

**NOTES:**

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

## GEOMODEL 2

Arche Fulton County Solar ■ Fayette, OH  
Terracon Project No. N6195224



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Topsoil	2" to 14" of topsoil
2	Cohesive 1	Lean to fat clay, very soft to soft
3	Cohesive 2	Lean to fat clay, medium stiff to hard
4	Granular 1	Silt, sand, and gravel, very loose to loose
5	Granular 2	Silt, sand, and gravel, medium dense to very dense

### LEGEND

Topsoil	Sandy Lean Clay	Sandy Silt	Silty Clayey Sand	Fat Clay with Sand
Clayey Sand	Poorly-graded Sand with Silt	Silt	Lean Clay	Sandy Fat Clay
Silty Sand	Lean Clay with Sand	Sandy Silty Clay	Fat Clay	

- First Water Observation
- Second Water Observation

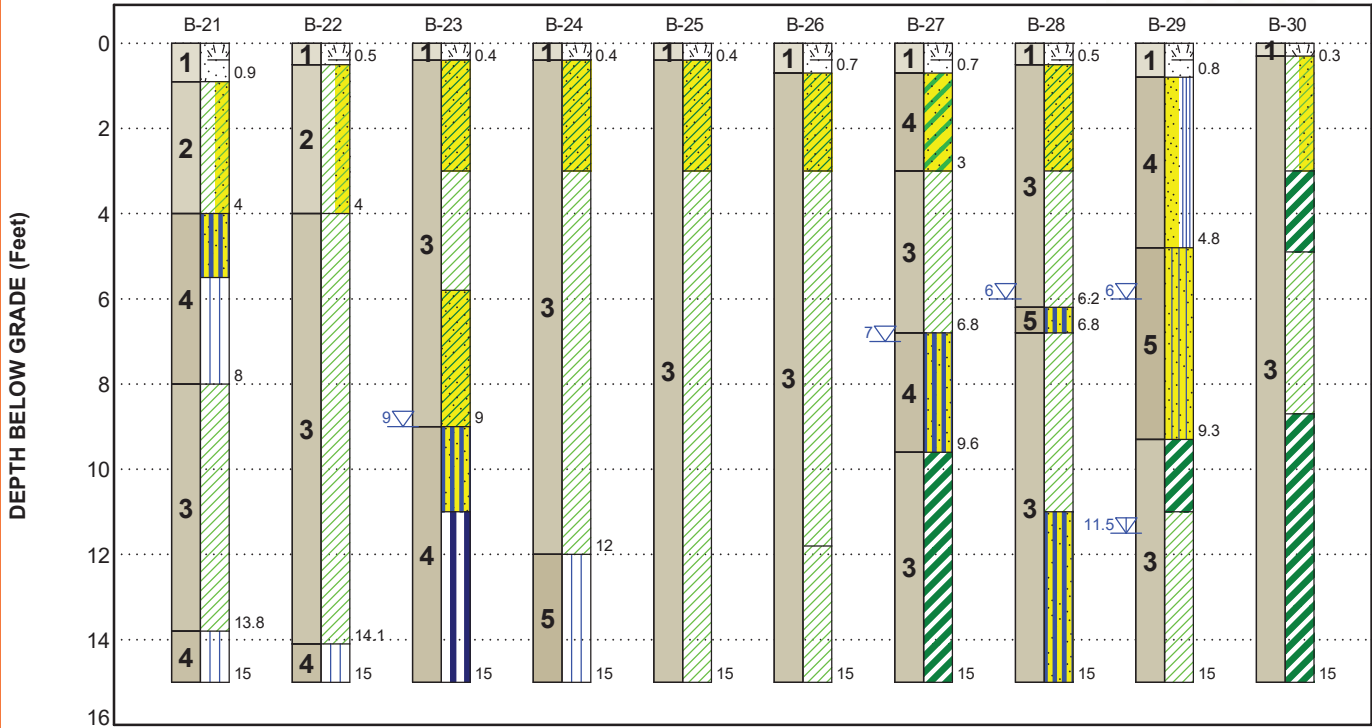
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

### NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

**GEOMODEL 3**

Arche Fulton County Solar ■ Fayette, OH  
Terracon Project No. N6195224



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Topsoil	2" to 14" of topsoil
2	Cohesive 1	Lean to fat clay, very soft to soft
3	Cohesive 2	Lean to fat clay, medium stiff to hard
4	Granular 1	Silt, sand, and gravel, very loose to loose
5	Granular 2	Silt, sand, and gravel, medium dense to very dense

**LEGEND**

- Topsoil
- Silt
- Elastic Silt
- Poorly-graded Sand with Silt
- Lean Clay with Sand
- Lean Clay
- Clayey Sand
- Silty Sand
- Sandy Silt
- Sandy Lean Clay
- Fat Clay

- First Water Observation
- Second Water Observation

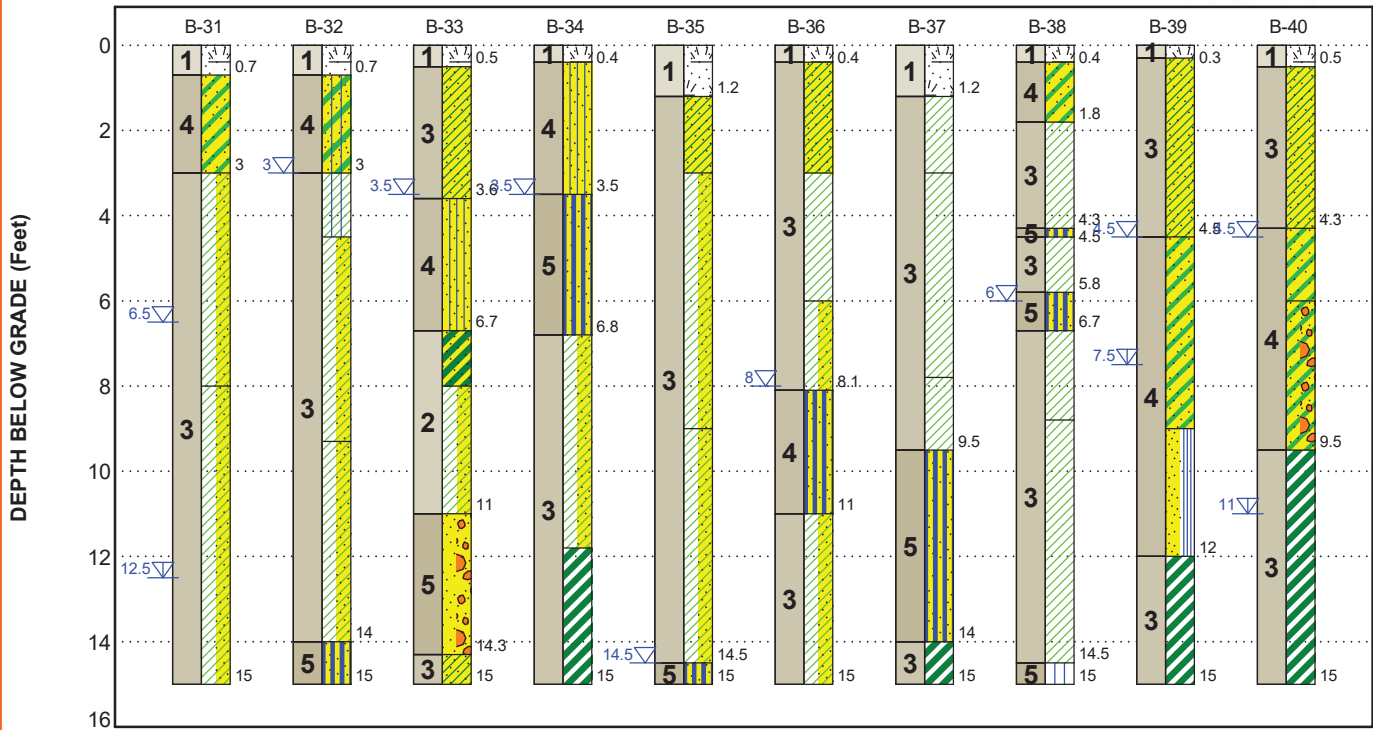
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

**NOTES:**

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

# GEOMODEL 4

Arche Fulton County Solar ■ Fayette, OH  
Terracon Project No. N6195224



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Topsoil	2" to 14" of topsoil
2	Cohesive 1	Lean to fat clay, very soft to soft
3	Cohesive 2	Lean to fat clay, medium stiff to hard
4	Granular 1	Silt, sand, and gravel, very loose to loose
5	Granular 2	Silt, sand, and gravel, medium dense to very dense

### LEGEND

- Topsoil
- Silty Clayey Sand
- Sandy Lean Clay
- Poorly-graded Sand with Gravel
- Clayey Sand
- Silty Clay
- Silty Sand
- Fat Clay
- Silt
- Lean Clay with Sand
- Sandy Silt
- Sandy Fat Clay
- Lean Clay
- Poorly-graded Sand with Silt
- Clayey Sand with Gravel

- First Water Observation
- Second Water Observation

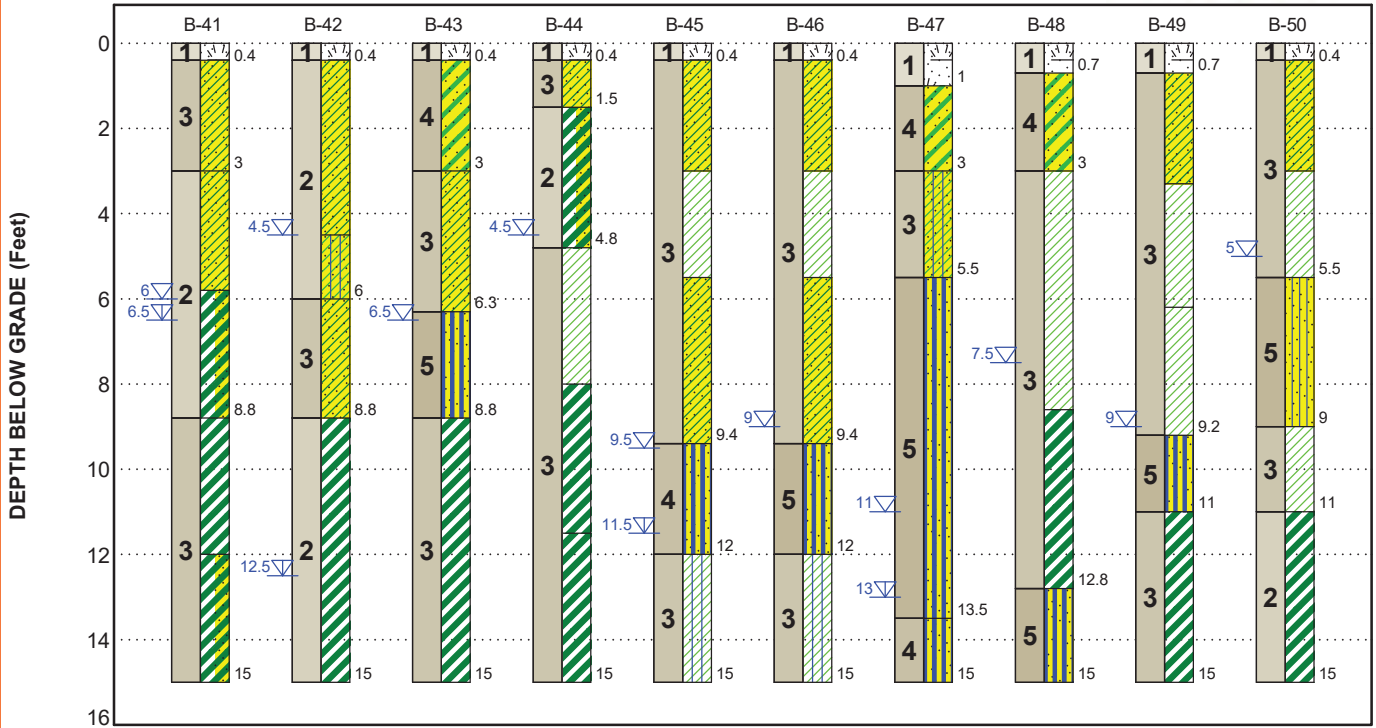
### NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

**GEOMODEL 5**

Arche Fulton County Solar ■ Fayette, OH  
Terracon Project No. N6195224



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Topsoil	2" to 14" of topsoil
2	Cohesive 1	Lean to fat clay, very soft to soft
3	Cohesive 2	Lean to fat clay, medium stiff to hard
4	Granular 1	Silt, sand, and gravel, very loose to loose
5	Granular 2	Silt, sand, and gravel, medium dense to very dense

**LEGEND**

- Topsoil
- Fat Clay
- Sandy Silt
- Silty Sand
- Sandy Lean Clay
- Sandy Silty Clay
- Lean Clay
- Fat Clay with Sand
- Clayey Sand
- Silty Clay

- First Water Observation
- Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

**NOTES:**

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.



## ATTACHMENTS

## EXPLORATION AND TESTING PROCEDURES

### Field Exploration

Number of Borings	Boring Depth (feet)	Planned Location
50	14 to 15	Within PV array areas

**Boring Layout and Elevations:** Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld recreational GPS unit (estimated horizontal accuracy of about  $\pm 10$  feet) and approximate elevations were obtained by interpolation from the Google Earth™.

**Subsurface Exploration Procedures:** We advanced the borings with a track-mounted rotary drill rig using continuous flight hollow stem augers. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings and bentonite chips upon completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

**Field (In-Situ) Electrical Resistivity:** Electrical resistivity surveys were performed at 14 locations distributed throughout the project area (see [Site Location and Exploration Plans](#)). The surveys were performed in general accordance with the Wenner Four Point method (ASTM G57). Two mutually perpendicular arrays with “a” spacing of 2, 5, 10, 20, and 40 feet were performed at each location.

## Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- ASTM 698 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort
- ASTM D1883 Standard Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils

The laboratory testing program included observation of soil samples by an engineer or geologist. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

**Corrosivity Testing:** Bulk samples of near surface soils obtained from 14 boring locations were tested in the laboratory for the following properties:

- pH Analysis
- Chloride, Sulfate, and Sulfide Content
- Oxidation-Reduction Potential
- Electrical Resistivity Testing

**Laboratory Thermal Resistivity Testing:** Thermal resistivity tests were performed at 14 locations, B-05, B-07, B-09, B-11, B-14, B-23, B-26, B-28, B-30, B-33, B-38, B-42, B-45, and B-50. At each test location, Terracon collected one bulk sample obtained between depths of 0 and 4 feet below existing grade. Additionally, an undisturbed sample was obtained at each boring location at depths of 4 feet. Each bulk sample was tested for thermal resistivity on samples remolded to 85 percent of the material's maximum dry density as determined by test method ASTM D698 (Standard Proctor) and at the material's natural water content.

## **SITE LOCATION AND EXPLORATION PLANS**

### **Contents:**

Site Location  
Exploration Plan

Note: All attachments are one page unless noted above.



**SITE LOCATION**

Arche Fulton County Solar ■ Fayette, OH ■ Terracon Project No. N6195224

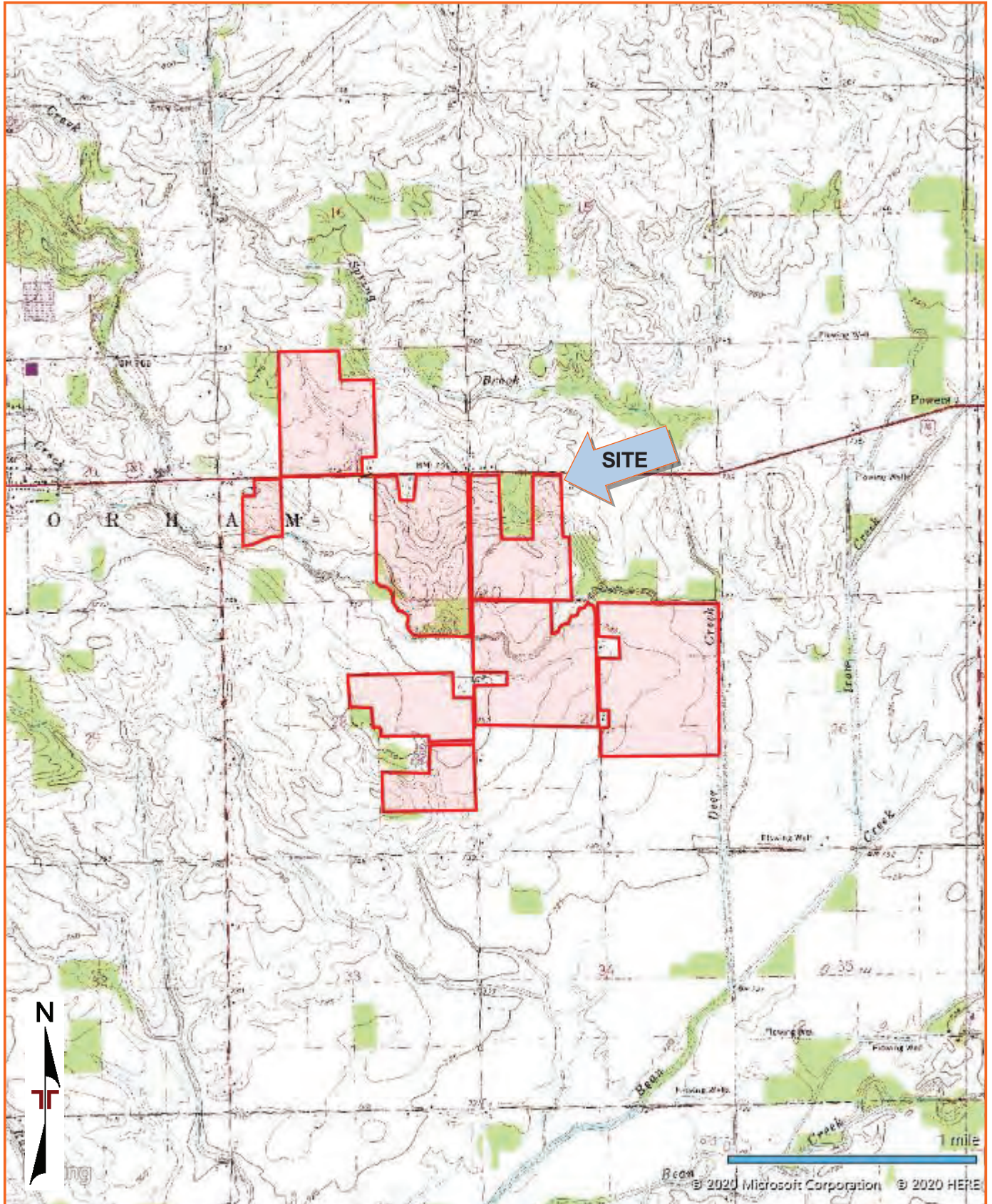


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY  
QUADRANGLES INCLUDE: FAYETTE, OH (11/1977).



# EXPLORATION PLAN

Arche Fulton County Solar ■ Fayette, OH ■ Terracon Project No. N6195224

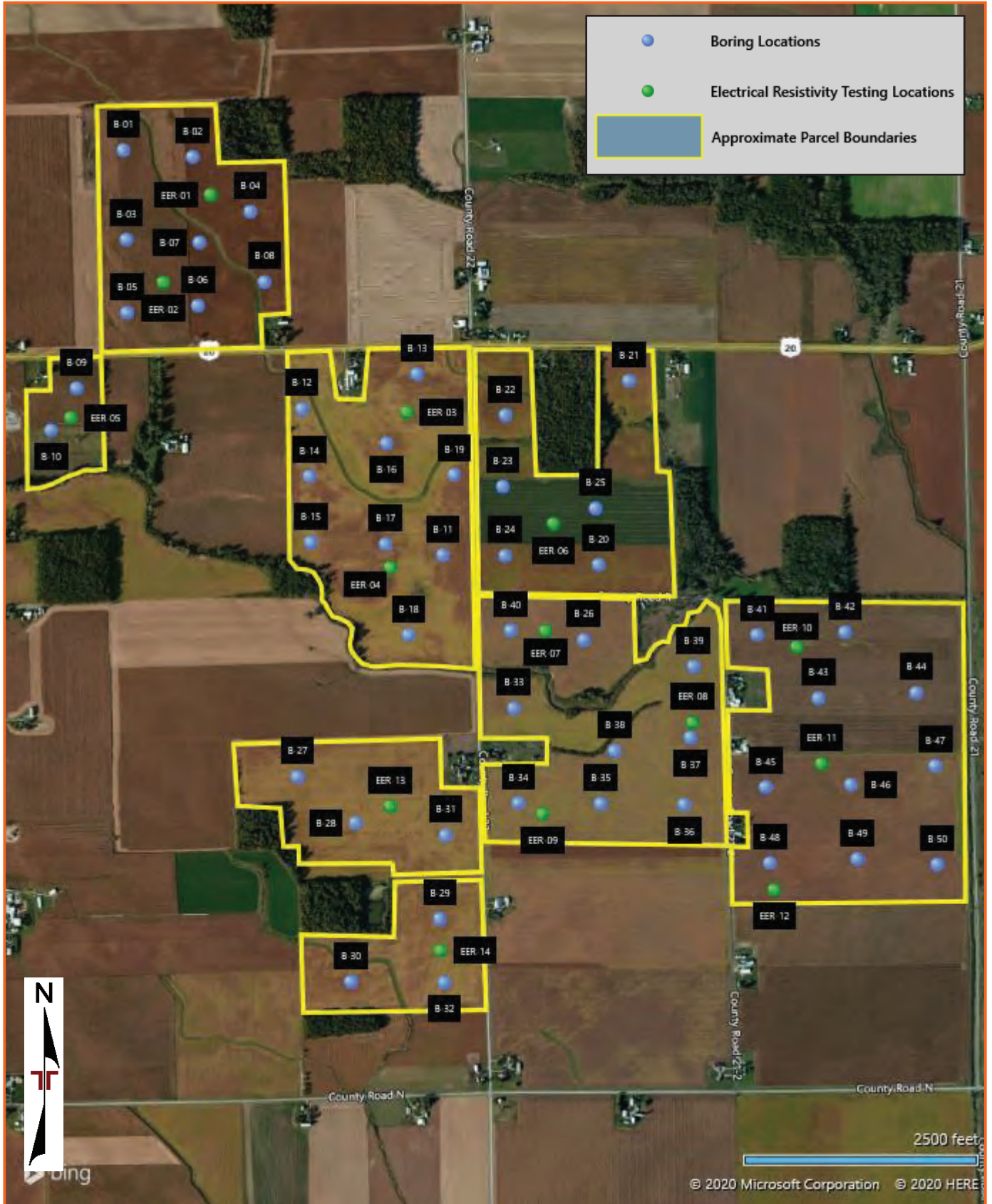


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

## **EXPLORATION RESULTS**

### **Contents:**

Boring Logs (B-01 through B-50)  
Atterberg Limits Results  
Grain Size Distribution (2 pages)  
Field Electrical Resistivity (14 pages)  
California Bearing Ratio (8 pages)  
Results of Corrosion Analysis (4 pages)  
Thermal Analysis of Native Soil Samples (17 pages)  
Moisture Density Relationship (14 pages)







Note: All attachments are one page unless noted above.

# BORING LOG NO. B-01

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6801° Longitude: -84.302°  Approximate Surface Elev.: 767 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (8")</b>	0.7 766.5+/-							
		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff, contains rootlets	3.0 764+/-		X	16	2-2-3 N=5	2.0 (HP)	18	
		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, brown, stiff to very stiff	5 764+/-		X	18	3-3-6 N=9	4.5+ (HP)	14	
			10 764+/-		X	18	11-12-15 N=27	4.5+ (HP)	14	
			15 752+/-		X	18	5-12-16 N=28	4.5+ (HP)	15	
5		<b>SILTY CLAYEY SAND (SC-SM)</b> , trace gravel, gray, dense	13.8 753+/-	▽	X	18	13-13-14 N=27		10	
		<b>Boring Terminated at 15 Feet</b>	15 752+/-							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 14' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-16-2020

Boring Completed: 04-16-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



# BORING LOG NO. B-02

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6799° Longitude: -84.2993°	DEPTH	APPROXIMATE SURFACE ELEV.: 767 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
												LL-PL-PI
1		<b>TOPSOIL (8")</b>	0.7	766.5+/-								
2		<b>SANDY LEAN CLAY (CL)</b> , brown, soft						18	2-2-2 N=4	1.0 (HP)	22	
			4.0	763+/-	5			18	7-8-11 N=19		17	
5		<b>SANDY SILT (ML)</b> , brown, medium dense						18	9-11-14 N=25		16	
			9.0	758+/-	10	▽		18	6-8-10 N=18	4.5+ (HP)	15	
3		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, gray, very stiff 2" sand seam @ 9.5'						18	5-9-11 N=20	4.5+ (HP)	15	
			15.0	752+/-	15							
<b>Boring Terminated at 15 Feet</b>												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 9.5' while drilling



Boring Started: 04-16-2020

Boring Completed: 04-16-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNGPJ\_TERRACON\_DATATEMPLATE.GDT\_6/16/20



# BORING LOG NO. B-04

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. N6195224 ARCHE FULTON COUNGPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6783° Longitude: -84.297°  Approximate Surface Elev.: 757 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1	TOPSOIL (6")		0.5							
	SANDY LEAN CLAY (CL), brown, medium stiff		756.5+/-							
	LEAN CLAY WITH SAND (CL), trace gravel, brown, very stiff		3.8			18	3-3-4 N=7	2.25 (HP)	19	
3	SANDY SILTY CLAY (CL-ML), brown, hard		6.0			18	5-4-17 N=21	4.5+ (HP)	14	
	SILTY SAND (SM), trace gravel, gray, very dense		8.8			18	17-30-30 N=60		12	
	@13.5': contains cobbles		748+/-			16	10-17-22 N=39		7	
5	Sampler Refusal at 14.3 Feet		14.3			10	25-50/4"		6	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



Boring Started: 04-15-2020

Boring Completed: 04-15-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

# BORING LOG NO. B-05

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6753° Longitude: -84.3019°  Approximate Surface Elev.: 758 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (5")</b>	0.4							
		<b>SANDY LEAN CLAY (CL)</b> , brown, medium stiff	757.5+/-							
3		<b>LEAN CLAY WITH SAND (CL)</b> , trace gravel, brown with gray, very stiff	3.8			18	3-3-3 N=6	2.0 (HP)	26	
		<b>SANDY SILT (ML)</b> , brown, very dense	6.2			16	17-21-31 N=52		16	
5		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, gray, hard	9.0			18	21-31-31 N=62	4.5+ (HP)	7	
		<b>SILTY SAND (SM)</b> , gray, very dense	14.5			18	21-24-24 N=48		13	
5		<b>Boring Terminated at 15 Feet</b>	15.0							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

6' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-16-2020

Boring Completed: 04-16-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224



# BORING LOG NO. B-07

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6774° Longitude: -84.299°  Approximate Surface Elev.: 758 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1	3.0	0.4 <b>TOPSOIL (5")</b> <b>SANDY LEAN CLAY (CL)</b> , trace gravel, brown with gray, medium stiff, contains rootlets	757.5+/-							
	3.0	<b>LEAN CLAY WITH SAND (CL)</b> , trace gravel, brown, hard	755+/-							
3	3.0	@6.0': contains rock fragments								
	9.0	<b>SANDY LEAN CLAY (CL)</b> , trace gravel, gray, hard, contains cobbles	749+/-							
	13.2	<b>SANDY SILT (ML)</b> , trace gravel, gray, very dense, contains cobbles	745+/-							
5	14.8	<b>Sampler Refusal at 14.8 Feet</b>	743+/-							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-15-2020

Boring Completed: 04-15-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. N6195224 ARCHE FULTON COUNTY. TERRACON\_DATATEMPLATE.GDT 6/16/20

# BORING LOG NO. B-08

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6762° Longitude: -84.2965°  Approximate Surface Elev.: 754 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		<b>TOPSOIL (5")</b>	0.4							
2		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, soft	3.0			18	2-2-2 N=4	1.25 (HP)	18	
3		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, brown, very stiff	6.5			16	5-9-13 N=22	4.5+ (HP)	15	
5		<b>LEAN CLAY WITH SAND (CL)</b> , trace gravel, brown with gray, hard	8.8			16	11-15-25 N=40	4.5+ (HP)	15	
		<b>SANDY SILT (ML)</b> , gray, very dense	13.0	▽		16	20-30-30 N=60		14	
		<b>POORLY GRADED SAND WITH SILT (SP-SM)</b> , gray, very dense	14.8	▽		14	22-32-50/3"		26	
		<b>Sampler Refusal at 14.8 Feet</b>	739+/-							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 9' while drilling
- ▽ 14' at drilling completion



12460 Plaza Dr  
Parma, OH

Boring Started: 04-16-2020

Boring Completed: 04-16-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNTY SOLAR TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-09

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6731° Longitude: -84.3039°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
		Approximate Surface Elev.: 772 (Ft.) +/- ELEVATION (Ft.)								
1		<b>TOPSOIL (13")</b>	1.1							
4		<b>CLAYEY SAND (SC)</b> , trace gravel, brown, very loose to loose	771+/-			18	2-2-2 N=4		14	
5		<b>SILTY SAND (SM)</b> , brown, medium dense	766+/-	▽		18	1-1-2 N=3		22	
5		<b>SILT (ML)</b> , gray, medium dense	763+/-			17	4-10-14 N=24		17	
5		<b>SILT (ML)</b> , gray, medium dense	763+/-			16	5-12-14 N=26		13	
2		<b>FAT CLAY WITH SAND (CH)</b> , trace gravel, gray, soft	758+/-			18	2-1-3 N=4	1.75 (HP)	17	
<b>Boring Terminated at 15 Feet</b>			757+/-							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 4.5' while drilling
- ▽ 13' at drilling completion



12460 Plaza Dr  
Parma, OH

Boring Started: 04-28-2020

Boring Completed: 04-28-2020

Drill Rig: Geoprobe 7822

Driller: JP

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



# BORING LOG NO. B-10

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6719° Longitude: -84.3048°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTEBERG LIMITS
										LL-PL-PI
		Approximate Surface Elev.: 762 (Ft.) +/- ELEVATION (Ft.)								
1		<b>TOPSOIL (13")</b>	1.1							
3		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, brown with gray, medium stiff, contains rootlets	3.5			18	2-2-3 N=5	1.5 (HP)	22	
5		<b>SILTY CLAYEY SAND (SC-SM)</b> , trace gravel, brown, medium dense	5.0			18	5-8-10 N=18		11	20-13-7
3		<b>LEAN CLAY (CL)</b> , brown, hard	9.5			16	14-20-24 N=44	4.5+ (HP)	15	
5		<b>SILT (ML)</b> , gray, medium dense to dense	14.5			16	5-8-21 N=29		15	
		<b>WELL GRADED GRAVEL WITH SAND (GW)</b> , gray, dense	15.0			7	25-20-29 N=49		7	
		<b>Boring Terminated at 15 Feet</b>	15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 14.5' while drilling
- ▽ 15' at drilling completion



12460 Plaza Dr  
Parma, OH

Boring Started: 04-28-2020

Boring Completed: 04-28-2020

Drill Rig: Geoprobe 7822

Driller: JP

Project No.: N6195224

# BORING LOG NO. B-11

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6682° Longitude: -84.2895°  Approximate Surface Elev.: 754 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		0.2 <b>TOPSOIL (2")</b> 754+/-								
		0.7 <b>CLAYEY SAND (SC)</b> , brown, very loose 753.5+/- <b>SILTY SAND (SM)</b> , brown, very loose to loose								
			5			18	1-1-1 N=2		13	
						18	3-3-3 N=6		19	
4						18	5-4-4 N=8		18	
						18	3-3-5 N=8		21	
		14.0 <b>SILTY SAND (SM)</b> , brown, medium dense 740+/-		▽		18	7-5-6 N=11		30	
5		15.0 739+/- <b>Boring Terminated at 15 Feet</b>	15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 14' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-24-2020

Boring Completed: 04-24-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-12

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6725° Longitude: -84.295°  Approximate Surface Elev.: 749 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (2")</b> <b>CLAYEY SAND (SC)</b> , brown, very loose	0.2 - 749+/-							
4		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, gray, soft	4.0 - 745+/-			18	1-1-2 N=3	3.5 (HP)	20	
2		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, gray, very stiff	6.0 - 743+/-			17	7-9-11 N=20	4.5+ (HP)	13	
3		<b>SILTY SAND (SM)</b> , gray, dense	9.5 - 739.5+/-	▽		17	5-20-23 N=43		20	
5		<b>WELL GRADED SAND WITH SILT (SP-SM)</b> , gray, very dense	10.0 - 739+/-	▽						
		<b>Boring Terminated at 15 Feet</b>	15.0 - 734+/-			15	12-26-38 N=64		14	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 9.5' while drilling
- ▽ 10' at drilling completion



Boring Started: 04-27-2020

Boring Completed: 04-27-2020

Drill Rig: Geoprobe 7822

Driller: JP

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNGPJ\_TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-13

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6735° Longitude: -84.2905°  Approximate Surface Elev.: 752 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		0.2' <b>TOPSOIL (2")</b>	752+/-							
		<b>LEAN CLAY WITH SAND (CL)</b> , brown, medium stiff								
		3.8' <b>SANDY LEAN CLAY (CL)</b> , brown with gray, stiff	748+/-			18	1-3-3 N=6	4.5+ (HP)	18	
		5.5' <b>SANDY LEAN CLAY (CL)</b> , trace gravel, brown, hard	746.5+/-			18	7-7-8 N=15	4.5+ (HP)	16	
		8.0' <b>SANDY LEAN CLAY (CL)</b> , trace gravel, brown, hard	744+/-			16	14-18-18 N=36	4.5+ (HP)	15	
		15.0' <b>SANDY LEAN CLAY (CL)</b> , trace gravel, gray, very stiff	737+/-			18	29-14-6 N=20	3.5 (HP)	14	
		<b>Boring Terminated at 15 Feet</b>				17	10-7-11 N=18	4.25 (HP)	13	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-27-2020

Boring Completed: 04-27-2020

Drill Rig: Geoprobe 7822

Driller: JP

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. N6195224 ARCHE FULTON COUNGPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

# BORING LOG NO. B-14

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6705° Longitude: -84.2947°	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTEMBERG LIMITS
												LL-PL-PI
1			0.3	750.5+/-								
		<b>TOPSOIL (3")</b> <b>SANDY LEAN CLAY (CL)</b> , brown, medium stiff										
3			4.0	747+/-	5			12	2-3-3 N=6	1.0 (HP)	20	
		<b>SILTY SAND (SM)</b> , brown, medium dense						16	3-5-6 N=11		15	
			8.8	742+/-				18	6-9-9 N=18		18	
5			13.8	737+/-	10			18	4-7-12 N=19		14	
		<b>SANDY SILT (ML)</b> , brownish gray, medium dense						16	12-20-33 N=53		20	
		<b>SILT (ML)</b> , trace sand, gray, very dense	15.0	736+/-	15							
		<b>Boring Terminated at 15 Feet</b>										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-27-2020

Boring Completed: 04-27-2020

Drill Rig: Geoprobe 7822

Driller: JP

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



# BORING LOG NO. B-16

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. N6195224 ARCHE FULTON COUNGPJ TERRACON DATATEMPLATE.GDT 6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6715° Longitude: -84.2917°  Approximate Surface Elev.: 759 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1	0.3	<b>TOPSOIL (4")</b> 758.5+/-								
4	3.5	<b>SILTY CLAYEY SAND (SC-SM)</b> , brown, loose 755.5+/-				16	1-2-2 N=4		13	
3	4.9	<b>LEAN CLAY (CL)</b> , brown with gray, stiff 754+/-				17	3-5-5 N=10	4.5+ (HP)	22	
5	9.5	<b>SILTY CLAYEY SAND (SC-SM)</b> , brown, medium dense 749.5+/-	5			18	10-9-10 N=19		19	
5	15.0	<b>POORLY GRADED SAND WITH SILT (SP-SM)</b> , brown, medium dense to dense  @13.5': trace rock fragments 744+/-	10			18	5-5-6 N=11		14	
		<b>Boring Terminated at 15 Feet</b>	15			6	10-20-20 N=40		18	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-27-2020

Boring Completed: 04-27-2020

Drill Rig: Geoprobe 7822

Driller: JP

Project No.: N6195224

# BORING LOG NO. B-17

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6685° Longitude: -84.2917°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
											Approximate Surface Elev.: 752 (Ft.) +/- ELEVATION (Ft.)
1			0.4	751.5+/-							
		<b>TOPSOIL (5")</b>									
		<b>LEAN CLAY WITH SAND (CL)</b> , brown, medium stiff									
			3.0	749+/-			18	3-3-3 N=6	3.0 (HP)	22	
		<b>LEAN CLAY (CL)</b> , brown with gray, stiff									
			6.0	746+/-			18	6-7-8 N=15	2.5 (HP)	23	44-20-24
3		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, hard									
			9.0	743+/-			18	8-14-16 N=30	4.5+ (HP)	20	
		<b>FAT CLAY (CH)</b> , gray, medium stiff									
			13.5	738.5+/-	▽		18	4-4-4 N=8	1.5 (HP)	32	
5		<b>SILTY SAND (SM)</b> , gray, dense									
			15.0	737+/-			18	14-15-15 N=30		18	
		<b>Boring Terminated at 15 Feet</b>									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 13.5' while drilling



Boring Started: 04-24-2020

Boring Completed: 04-24-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20



# BORING LOG NO. B-18

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6659° Longitude: -84.2908°  Approximate Surface Elev.: 739 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		0.4 <b>TOPSOIL (5")</b>	738.5+/-							
		<b>LEAN CLAY WITH SAND (CL)</b> , brown with gray, medium stiff								
3		4.0 <b>SILTY SAND (SM)</b> , brown, very loose to loose	735+/-	▽			3-3-3 N=6	1.5 (HP)	24	
4		9.8 <b>FAT CLAY WITH SAND (CH)</b> , gray, soft	729+/-	▽			2-2-2 N=4		20	
2		10.2 <b>SANDY FAT CLAY (CH)</b> , gray, stiff, contains sand seams	729+/-				1-1-1 N=2		27	
3							1-2-2 N=4	0.75 (HP)	19	
							3-7-8 N=15		16	
		15.0 <b>Boring Terminated at 15 Feet</b>	724+/-							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 4' while drilling
- ▽ 7' at drilling completion



Boring Started: 04-24-2020

Boring Completed: 04-24-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-19

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6706° Longitude: -84.289°  Approximate Surface Elev.: 747 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (2")</b>	0.2							
		<b>FAT CLAY WITH SAND (CH)</b> , brown, medium stiff								
3										
		<b>SANDY SILT (ML)</b> , brown with gray, medium dense	4.0			18	3-3-3 N=6	2.5 (HP)	30	
5										
		<b>FAT CLAY (CH)</b> , brown with gray, stiff, contains sandy silt seams	6.0			18	6-7-8 N=15		18	
3										
		<b>SILTY SAND (SM)</b> , gray, medium dense to dense	9.0	▽		18	8-7-8 N=15	0.75 (HP)	37	
5										
			15.0			18	9-8-9 N=17		17	
		<b>Boring Terminated at 15 Feet</b>	732+/-			18	11-16-17 N=33		22	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 9' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-24-2020

Boring Completed: 04-24-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. N6195224 ARCHE FULTON COUNGPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

# BORING LOG NO. B-20

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6679° Longitude: -84.2834°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
											LL-PL-PI
		Approximate Surface Elev.: 742 (Ft.) +/-									
1		<b>TOPSOIL (5")</b>	0.4	741.5+/-							
		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff									
3			3.0	739+/-			18	3-2-3 N=5	2.25 (HP)	29	
		<b>FAT CLAY (CH)</b> , brownish gray, soft									
2			5.5	736.5+/-			18	1-1-2 N=3	1.5 (HP)	25	
		<b>LEAN CLAY (CL)</b> , brown to gray, very stiff									
			9.9	732+/-			18	7-9-11 N=20	4.5+ (HP)	22	
		<b>FAT CLAY (CH)</b> , gray, stiff									
3			15.0	727+/-			18	6-8-9 N=17	4.5+ (HP)	22	
		<b>Boring Terminated at 15 Feet</b>									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-17-2020

Boring Completed: 04-17-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNGPJ\_TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-21

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6733° Longitude: -84.2822°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
		Approximate Surface Elev.: 744 (Ft.) +/- ELEVATION (Ft.)								
1		<b>TOPSOIL (11")</b>	0.9							
2		<b>LEAN CLAY WITH SAND (CL)</b> , brown to dark brown, soft	4.0			18	2-2-2 N=4	1.25 (HP)	34	
3		<b>SANDY SILT (ML)</b> , brown, loose	5.5			18	2-2-3 N=5		20	
4		<b>SILT (ML)</b> , trace gravel, brown, loose	8.0			17	3-3-4 N=7		26	
3		<b>LEAN CLAY (CL)</b> , brown, stiff	13.8			18	2-3-5 N=8	0.50 (HP)	22	
4		<b>SILT (ML)</b> , gray, loose	15.0			18	1-2-3 N=5		20	
<b>Boring Terminated at 15 Feet</b>			15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-28-2020

Boring Completed: 04-28-2020

Drill Rig: Geoprobe 7822

Driller: JP

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNTY SOLAR TERRACON\_DATATEMPLATE.GDT 6/16/20





# BORING LOG NO. B-22

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNGPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6723° Longitude: -84.287°  Approximate Surface Elev.: 749 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
DEPTH										
1		<b>TOPSOIL (6")</b>	0.5							
		<b>LEAN CLAY WITH SAND (CL)</b> , brown, soft	748.5+/-							
2					12		2-2-2 N=4	1.5 (HP)	27	
		<b>LEAN CLAY (CL)</b> , brown, stiff to very stiff	4.0							
			745+/-		14		4-7-11 N=18	4.5+ (HP)	23	
					17		13-14-15 N=29	4.25 (HP)	23	
3					18		4-5-5 N=10	4.5+ (HP)	23	
			14.1		18		2-2-2 N=4		23	
4		<b>SILT (ML)</b> , gray, loose	15.0							
<b>Boring Terminated at 15 Feet</b>			734+/-							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
2.25" Hollow Stem Auger

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

Notes:  
Bulk sample collected from 0-4'

**WATER LEVEL OBSERVATIONS**  
*Groundwater not encountered*



Boring Started: 04-28-2020	Boring Completed: 04-28-2020
Drill Rig: Geoprobe 7822	Driller: JP
Project No.: N6195224	

# BORING LOG NO. B-24

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6682° Longitude: -84.2871°  Approximate Surface Elev.: 748 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		0.4 <b>TOPSOIL (5")</b>  <b>SANDY LEAN CLAY (CL)</b> , dark brown, medium stiff, contains rootlets	747.5+/-							
3		3.0 <b>LEAN CLAY (CL)</b> , brownish gray, stiff to very stiff	745+/-				18	3-3-3 N=6	0.75 (HP)	26
5		12.0 <b>SILT (ML)</b> , gray, medium dense	736+/-				18	4-7-10 N=17	4.5+ (HP)	22
5		15.0 <b>Boring Terminated at 15 Feet</b>	733+/-				18	10-12-14 N=26	4.5+ (HP)	21
							18	3-4-5 N=9	4.0 (HP)	16
							18	10-9-9 N=18		19

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



Boring Started: 04-17-2020

Boring Completed: 04-17-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-23

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6702° Longitude: -84.2871°  Approximate Surface Elev.: 750 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		0.4 <b>TOPSOIL (5")</b>	749.5+/-							
		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff								
		3.0	747+/-			18	3-3-3 N=6	4.5+ (HP)	18	
3		<b>LEAN CLAY (CL)</b> , grayish brown, stiff								
		5.8	744+/-			18	3-5-7 N=12	4.5+ (HP)	29	
		<b>SANDY LEAN CLAY (CL)</b> , brownish gray, hard								
		9.0	741+/-	▽		18	12-16-16 N=32	1.75 (HP)	23	
		<b>SANDY SILT (ML)</b> , gray, loose								
		11.0	739+/-			18	3-3-4 N=7		18	
4		<b>ELASTIC SILT (MH)</b> , gray, loose								
		15.0	735+/-			18	2-2-2 N=4		20	
<b>Boring Terminated at 15 Feet</b>			15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 9' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-17-2020

Boring Completed: 04-17-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNTY TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-25

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6696° Longitude: -84.2835°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
											Approximate Surface Elev.: 749 (Ft.) +/- ELEVATION (Ft.)
1			0.4	748.5+/-							
		<b>TOPSOIL (S')</b>									
		<b>SANDY LEAN CLAY (CL)</b> , brown, medium stiff					18	3-3-2 N=5	1.5 (HP)	25	
			3.0	746+/-							
		<b>LEAN CLAY (CL)</b> , brown with gray, very stiff					18	6-8-10 N=18	3.75 (HP)	23	48-22-26
							18	12-16-10 N=26	4.5+ (HP)	21	
							18	7-9-10 N=19	3.5 (HP)	23	
							18	6-9-9 N=18	2.5 (HP)	20	
			15.0	734+/-							
		<b>Boring Terminated at 15 Feet</b>									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-17-2020

Boring Completed: 04-17-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNGPJ TERRACON\_DATATEMPLATE.GDT 6/16/20






# BORING LOG NO. B-26

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6657° Longitude: -84.284°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
		Approximate Surface Elev.: 740 (Ft.) +/- ELEVATION (Ft.)								
1		<b>TOPSOIL (8")</b>	0.7							
		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, brown, medium stiff, contains rootlets	3.0		X	14	3-3-3 N=6	1.75 (HP)	19	
		<b>LEAN CLAY (CL)</b> , brownish gray, medium stiff to very stiff	11.8		X	18	3-3-4 N=7	4.5+ (HP)	24	
			15.0		X	18	13-13-16 N=29	4.5+ (HP)	21	
			11.8		X	18	7-8-4 N=12	4.25 (HP)	22	
			15.0		X	18	4-6-8 N=14	4.25 (HP)	19	
<b>Boring Terminated at 15 Feet</b>			15.0							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



Boring Started: 04-24-2020

Boring Completed: 04-24-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNTY. TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-27

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6617° Longitude: -84.2952°	DEPTH	APPROXIMATE SURFACE ELEV.: 756 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
												LL-PL-PI
1		<b>TOPSOIL (8")</b>	0.7	755.5+/-								
4		<b>CLAYEY SAND (SC)</b> , trace gravel, brown, loose						18	2-2-2 N=4	1.5 (HP)	19	
3		<b>LEAN CLAY (CL)</b> , brown with gray, medium stiff, contains silt seams	3.0	753+/-				18	2-2-3 N=5	1.75 (HP)	26	
4		<b>SANDY SILT (ML)</b> , brown, loose	6.8	749+/-		▽		18	6-7-8 N=15		23	
3		<b>FAT CLAY (CH)</b> , gray, stiff, contains sandy silt seams	9.6	746.5+/-				18	7-4-5 N=9	2.25 (HP)	23	
		<b>Boring Terminated at 15 Feet</b>	15.0	741+/-	15			18	3-4-5 N=9	2.0 (HP)	27	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 7' while drilling



Boring Started: 04-23-2020

Boring Completed: 04-23-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNTY SOLAR TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-28

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNTY.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6604° Longitude: -84.2929°  Approximate Surface Elev.: 753 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (6")</b>	0.5 752.5+/-							
		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff, contains rootlets								
			3.0 750+/-			14	3-3-3 N=6	2.75 (HP)	19	
3		<b>LEAN CLAY (CL)</b> , brown with gray, medium stiff, contains silty sand seams								
			6.2 747+/-			18	3-3-3 N=6	2.75 (HP)	28	49-22-27
5		<b>SANDY SILT (ML)</b> , brown, medium dense								
			6.8 746+/-			18	5-6-4 N=10		19	
		<b>LEAN CLAY (CL)</b> , gray, medium stiff, laminated, contains silt seams								
			11.0 742+/-			18	2-3-4 N=7	1.25 (HP)	29	
3		<b>SANDY SILT (ML)</b> , gray, stiff, contains clay seams								
			15.0 738+/-			18	6-4-4 N=8		19	
<b>Boring Terminated at 15 Feet</b>			15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

6' while drilling



Boring Started: 04-23-2020

Boring Completed: 04-23-2020

Drill Rig: Geoprobe 7822

Driller: C. White


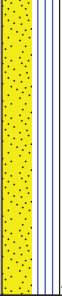
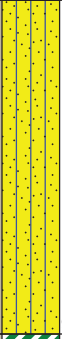


Project No.: N6195224

# BORING LOG NO. B-29

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6576° Longitude: -84.2896°  Approximate Surface Elev.: 751 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (10")</b> 0.8	750+/-							
4		<b>POORLY GRADED SAND WITH SILT (SP-SM)</b> , brown, loose 4.8	746+/-			18	2-3-3 N=6		17	
5		<b>SILTY SAND (SM)</b> , gray, medium dense 9.3	741.5+/-			18	4-7-10 N=17		25	
5		<b>FAT CLAY (CH)</b> , gray, stiff, contains silty sand seams 11.0	741.5+/-	▽		18	10-10-11 N=21		30	
3		<b>LEAN CLAY (CL)</b> , gray, stiff 15.0	740+/-	▽		18	5-3-8 N=11	1.5 (HP)	30	
		<b>Boring Terminated at 15 Feet</b> 736+/-	15			18	3-3-5 N=8	2.0 (HP)	22	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 6' while drilling
- ▽ 11.5' at drilling completion



Boring Started: 04-23-2020

Boring Completed: 04-23-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNTY TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-30

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6557° Longitude: -84.2931°  Approximate Surface Elev.: 738 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (4")</b> 737.5+/-	0.3							
		<b>LEAN CLAY WITH SAND (CL)</b> , brown, medium stiff, contains rootlets 735+/-	3.0			16	2-3-3 N=6	2.25 (HP)	23	
		<b>FAT CLAY (CH)</b> , brown with gray, stiff 733+/-	4.9			18	3-4-4 N=8	1.75 (HP)	27	
		<b>LEAN CLAY (CL)</b> , brown, stiff 729.5+/-	8.7			18	8-8-7 N=15	4.0 (HP)	25	
		<b>FAT CLAY (CH)</b> , gray, medium stiff to stiff 723+/-	15.0			18	3-3-4 N=7	1.75 (HP)	33	
		<b>Boring Terminated at 15 Feet</b>								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

Groundwater not encountered



12460 Plaza Dr  
Parma, OH

Boring Started: 04-23-2020

Boring Completed: 04-23-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-31

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.66° Longitude: -84.2894°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
		Approximate Surface Elev.: 751 (Ft.) +/- ELEVATION (Ft.)								
1		<b>TOPSOIL (8")</b>	0.7							
4		<b>CLAYEY SAND (SC)</b> , brown to dark brown, loose	3.0			18	2-2-3 N=5		20	
		<b>LEAN CLAY WITH SAND (CL)</b> , brown with gray, medium stiff to stiff	5.0			18	2-2-2 N=4	2.25 (HP)	25	
		2" sand seam @ 6.5'	6.5			18	5-5-4 N=9	3.5 (HP)	32	
		<b>LEAN CLAY WITH SAND (CL)</b> , gray, medium stiff to stiff	8.0			18	3-4-5 N=9	1.5 (HP)	21	
3		@13.5': contains sandy silt seams	13.5			18	2-2-4 N=6	3.5 (HP)	21	
		<b>Boring Terminated at 15 Feet</b>	15.0							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- 6.5' while drilling
- 12.5' at drilling completion



Boring Started: 04-23-2020

Boring Completed: 04-23-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNTY SOLAR TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-32

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6557° Longitude: -84.2894°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
		Approximate Surface Elev.: 745 (Ft.) +/- ELEVATION (Ft.)								
1		<b>TOPSOIL (7")</b>	0.7							
4		<b>SILTY CLAYEY SAND (SC-SM)</b> , trace gravel, brown, loose	3.0			16	1-2-3 N=5		18	
		<b>SILTY CLAY (CL-ML)</b> , brown with gray, stiff	4.5	3'						
		<b>LEAN CLAY WITH SAND (CL)</b> , brownish gray, very stiff, contains sandy silt seams	9.3			18	6-4-7 N=11	2.75 (HP)	25	26-19-7
3		<b>LEAN CLAY WITH SAND (CL)</b> , gray, stiff	14.0			18	7-9-13 N=22	4.5+ (HP)	19	
		<b>LEAN CLAY WITH SAND (CL)</b> , gray, stiff	15.0			18	7-5-7 N=12	2.5 (HP)	22	
5		<b>SANDY SILT (ML)</b> , gray, medium dense	15.0			18	7-11-13 N=24		19	
<b>Boring Terminated at 15 Feet</b>			15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

3' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-23-2020

Boring Completed: 04-23-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-33

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNTY SOLAR TERRACON\_DATATEMPLATE.GDT\_6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6637° Longitude: -84.2867°  Approximate Surface Elev.: 738 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		<b>TOPSOIL (6")</b>	0.5							
3		<b>SANDY LEAN CLAY (CL)</b> , dark brown, medium stiff, contains rootlets	3.6			18	3-3-3 N=6	1.25 (HP)	38	
4		<b>SILTY SAND (SM)</b> , gray, very loose	6.7	▽		16	1-1-1 N=2		20	
		<b>SANDY FAT CLAY (CH)</b> , gray, very soft	8.0			16	0-0-0 N=0	0.25 (HP)	25	
2		<b>LEAN CLAY WITH SAND (CL)</b> , gray, soft	11.0			18	1-1-2 N=3	1.25 (HP)	22	
5		<b>POORLY GRADED SAND WITH GRAVEL (SP)</b> , gray, medium dense	14.3			18	7-8-8 N=16		18	
3		<b>SANDY LEAN CLAY (CL)</b> , gray, very stiff	15.0							
		<b>Boring Terminated at 15 Feet</b>								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 3.5' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-22-2020

Boring Completed: 04-22-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224



# BORING LOG NO. B-34

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.661° Longitude: -84.2865°	DEPTH	APPROXIMATE SURFACE ELEV.: 751 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
												LL-PL-PI
1			0.4	<b>TOPSOIL (5")</b> 750.5+/-								
4				<b>SILTY SAND (SM)</b> , dark brown to grayish brown, loose, contains rootlets				18	3-3-4 N=7		11	
5			3.5	<b>SANDY SILT (ML)</b> , brown, medium dense 747.5+/-	5	▽		18	4-6-8 N=14		23	
3			6.8	<b>LEAN CLAY WITH SAND (CL)</b> , gray, stiff to very stiff 744+/-				18	9-9-9 N=18	2.25 (HP)	20	
			11.8	<b>FAT CLAY (CH)</b> , gray, stiff 739+/-	10			18	4-4-4 N=8	1.75 (HP)	22	
			15.0	<b>Boring Terminated at 15 Feet</b> 736+/-	15			18	3-5-5 N=10	2.0 (HP)	24	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 3.5' while drilling



Boring Started: 04-22-2020

Boring Completed: 04-22-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-35

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6609° Longitude: -84.2833°	DEPTH	APPROXIMATE SURFACE ELEV.: 747 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
												LL-PL-PI
1												
		<b>TOPSOIL (14")</b>										
		<b>SANDY LEAN CLAY (CL)</b> , dark brown, medium stiff, slightly organic, contains rootlets	1.2	746+/-								
		<b>LEAN CLAY WITH SAND (CL)</b> , brown with gray, medium stiff	3.0	744+/-	5							
		sand seam @ 7.1'										
		<b>LEAN CLAY WITH SAND (CL)</b> , gray, stiff	9.0	738+/-	10							
		<b>SANDY SILT (ML)</b> , gray, medium dense	14.5	732.5+/-	15							
5			15.0	732+/-								
		<b>Boring Terminated at 15 Feet</b>										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

14.5' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-22-2020

Boring Completed: 04-22-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNTY.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

# BORING LOG NO. B-36

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6609° Longitude: -84.28°  Approximate Surface Elev.: 739 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		0.4 <b>TOPSOIL (5")</b> <b>SANDY LEAN CLAY (CL)</b> , brown, medium stiff, contains rootlets	738.5+/-							
		3.0 <b>LEAN CLAY (CL)</b> , brown with gray, stiff	736+/-			18	2-3-4 N=7	3.0 (HP)	26	
3		6.0 <b>LEAN CLAY WITH SAND (CL)</b> , brown, very stiff	733+/-			18	3-4-5 N=9	4.5+ (HP)	22	
		8.1 <b>SANDY SILT (ML)</b> , brown, medium dense	731+/-	▽		18	12-13-14 N=27	4.5+ (HP)	24	
4		11.0 <b>LEAN CLAY WITH SAND (CL)</b> , gray, stiff	728+/-			18	7-11-15 N=26		22	
3		15.0 <b>LEAN CLAY WITH SAND (CL)</b> , gray, stiff	724+/-			18	3-4-5 N=9	2.0 (HP)	22	
		<b>Boring Terminated at 15 Feet</b>								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 8' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-22-2020

Boring Completed: 04-22-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-37

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6629° Longitude: -84.2798°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
		Approximate Surface Elev.: 743 (Ft.) +/- ELEVATION (Ft.)								
DEPTH										
1		<b>TOPSOIL (14")</b>								
		<b>LEAN CLAY (CL)</b> , brown, medium stiff	1.2 742+/-			18	3-3-3 N=6	3.75 (HP)	23	
		<b>LEAN CLAY (CL)</b> , brown with gray, stiff	3.0 740+/-			18	4-5-5 N=10	4.5+ (HP)	23	
3		<b>LEAN CLAY (CL)</b> , brownish gray, very stiff, contains sandy silt seams	7.8 735+/-			18	9-9-10 N=19	4.5+ (HP)	22	
		<b>SANDY SILT (ML)</b> , orangeish brown, medium dense	9.5 733.5+/-			18	5-8-12 N=20	3.0 (HP)	22	
5		<b>FAT CLAY (CH)</b> , gray, medium stiff	14.0 729+/-			18	4-3-4 N=7	1.25 (HP)	29	
3		<b>FAT CLAY (CH)</b> , gray, medium stiff	15.0 728+/-			18	4-3-4 N=7	1.25 (HP)	29	
		<b>Boring Terminated at 15 Feet</b>	15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**  
*Groundwater not encountered*



Boring Started: 04-21-2020

Boring Completed: 04-21-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

# BORING LOG NO. B-38

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6625° Longitude: -84.2828°  Approximate Surface Elev.: 748 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS  LL-PL-PI
1		<b>TOPSOIL (5")</b>	0.4							
4		<b>CLAYEY SAND (SC)</b> , brown, loose	1.8							
3		<b>LEAN CLAY (CL)</b> , brown, medium stiff	4.3			18	2-3-2 N=5	2.5 (HP)	22	
5		<b>SANDY SILT (ML)</b> , brown, medium dense	4.5			18	4-5-6 N=11	4.5+ (HP)	20	41-20-21
3		<b>LEAN CLAY (CL)</b> , brown with gray, stiff	5.8							
5		<b>SANDY SILT (ML)</b> , brown, dense	6.7			16	12-13-20 N=33	4.25 (HP)	21	
3		<b>LEAN CLAY (CL)</b> , brown, hard	8.8			18	6-6-7 N=13	4.25 (HP)	22	
3		<b>LEAN CLAY (CL)</b> , brown with gray, stiff	14.5			18	3-5-6 N=11		22	
5		<b>SILT (ML)</b> , gray, medium dense	15.0							
		<b>Boring Terminated at 15 Feet</b>								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

6' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-22-2020

Boring Completed: 04-22-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

# BORING LOG NO. B-39

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.665° Longitude: -84.2797°  Approximate Surface Elev.: 735 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
1		<b>TOPSOIL (4")</b> <b>SANDY LEAN CLAY (CL)</b> , brownish gray, medium stiff, trace organic matter	0.3 734.5+/-							
3		<b>CLAYEY SAND (SC)</b> , brownish gray, very loose	4.5 730.5+/-	▽		X	3-2-3 N=5	1.75 (HP)	27	
4		<b>POORLY GRADED SAND WITH SILT (SP-SM)</b> , dark gray, loose, contains wood fragments	9.0 726+/-	▽		X	1-1-1 N=2		20	
3		<b>FAT CLAY (CH)</b> , gray, medium stiff	12.0 723+/-			X	0-1-1 N=2		28	
		<b>Boring Terminated at 15 Feet</b>	15.0 720+/-			X	1-1-3 N=4		26	
						X	3-3-3 N=6	1.0 (HP)	24	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 4.5' while drilling
- ▽ 7.5' at drilling completion



Boring Started: 04-21-2020

Boring Completed: 04-21-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUNTY TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-40

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.666° Longitude: -84.2868°	DEPTH	APPROXIMATE SURFACE ELEV.: 737 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
												LL-PL-PI
1			0.5	736.5+/-								
3		<b>SANDY LEAN CLAY (CL)</b> , dark gray, medium stiff, trace organic matter						18	3-3-2 N=5	1.75 (HP)	23	
			4.3	732.5+/-	5			18	1-1-1 N=2		21	
		<b>CLAYEY SAND (SC)</b> , brown with gray, very loose						18	1-1-1 N=2		18	
4		<b>CLAYEY SAND WITH GRAVEL (SC)</b> , brown, very loose		731+/-				18	6-6-7 N=13	2.25 (HP)	26	
			9.5	727.5+/-	10			18	3-4-5 N=9	0.75 (HP)	28	
3		<b>FAT CLAY (CH)</b> , gray, stiff										
			15.0	722+/-	15							
<b>Boring Terminated at 15 Feet</b>												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- 4.5' while drilling
- 11' at drilling completion



12460 Plaza Dr  
Parma, OH

Boring Started: 04-24-2020

Boring Completed: 04-24-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUN.GPJ\_TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-41

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6659° Longitude: -84.2772°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
											Approximate Surface Elev.: 732 (Ft.) +/- ELEVATION (Ft.)
1			0.4	731.5+/-							
		<b>TOPSOIL (5")</b>									
		<b>SANDY LEAN CLAY (CL)</b> , brownish gray, medium stiff, contains rootlets									
3			3.0	729+/-			18	3-3-3 N=6	2.0 (HP)	40	
		<b>SANDY LEAN CLAY (CL)</b> , trace gravel, brownish gray, soft									
			5.8	726+/-			18	1-1-2 N=3	0.25 (HP)	23	
2					▽						
		<b>FAT CLAY WITH SAND (CH)</b> , brownish gray, very soft									
			8.8	723+/-			18	1-1-1 N=2	0.25 (HP)	23	
		<b>FAT CLAY (CH)</b> , gray, medium stiff									
			12.0	720+/-			18	1-2-3 N=5	3.5 (HP)	29	
3											
		<b>FAT CLAY WITH SAND (CH)</b> , trace gravel, gray, medium stiff									
			15.0	717+/-			18	2-2-3 N=5	1.25 (HP)	26	
		<b>Boring Terminated at 15 Feet</b>									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 6' while drilling
- ▽ 6.5' at drilling completion



Boring Started: 04-21-2020

Boring Completed: 04-21-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL. N6195224 ARCHE FULTON COUNGPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



# BORING LOG NO. B-42

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.666° Longitude: -84.2737°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
											LL-PL-PI
1	[Symbol]		0.4	728.5+/-							
		<b>TOPSOIL (5")</b>									
	[Symbol]	<b>SANDY LEAN CLAY (CL)</b> , brownish gray, soft									
2	[Symbol]		4.5	724.5+/-	▽		18	2-2-2 N=4	1.75 (HP)	24	
	[Symbol]	<b>SANDY SILTY CLAY (CL-ML)</b> , brownish gray, soft									
3	[Symbol]		6.0	723+/-			18	2-2-4 N=6	0.75 (HP)	27	
	[Symbol]	<b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff									
2	[Symbol]		8.8	720+/-			18	5-6-7 N=13	4.25 (HP)	28	
	[Symbol]	<b>FAT CLAY (CH)</b> , gray, soft to stiff									
	[Symbol]		15.0	714+/-	▽		18	1-1-2 N=3	0.5 (HP)	28	
		<b>Boring Terminated at 15 Feet</b>									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

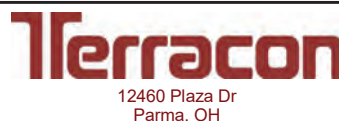
Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 4.5' while drilling
- ▽ 12.5' at drilling completion



Boring Started: 04-21-2020

Boring Completed: 04-21-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20

# BORING LOG NO. B-43

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.664° Longitude: -84.2748°	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
											LL-PL-PI
1			0.4	734.5+/-							
		<b>TOPSOIL (5")</b>									
4		<b>CLAYEY SAND (SC)</b> , brown, loose					18	2-2-2 N=4		19	
			3.0	732+/-							
3		<b>SANDY LEAN CLAY (CL)</b> , brown, medium stiff					18	2-2-3 N=5	4.5+ (HP)	29	
			6.3	728.5+/-							
5		<b>SANDY SILT (ML)</b> , brown, medium dense					18	5-7-7 N=14		24	
			8.8	726+/-							
3		<b>FAT CLAY (CH)</b> , gray, medium stiff to stiff					18	4-3-4 N=7	0.50 (HP)	26	
			15.0	720+/-			18	7-7-7 N=14	0.50 (HP)	25	
		<b>Boring Terminated at 15 Feet</b>									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

6.5' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-21-2020

Boring Completed: 04-21-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE FULTON COUN.GPJ\_TERRACON\_DATATEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-44

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6642° Longitude: -84.2709°  Approximate Surface Elev.: 728 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		<b>TOPSOIL (5")</b>	0.4							
3		<b>SANDY LEAN CLAY (CL)</b> , dark brown, medium stiff, contains sand seams	1.5							
2		<b>FAT CLAY WITH SAND (CH)</b> , brown, very soft to medium stiff	4.8			18	3-2-3 N=5	2.0 (HP)	21	
5		<b>LEAN CLAY (CL)</b> , brown, medium stiff	8.0	▽		18	1-1-1 N=2	0.75 (HP)	28	
3		<b>FAT CLAY (CH)</b> , black, stiff	11.5			18	2-3-3 N=6	1.5 (HP)	28	
3		<b>FAT CLAY (CH)</b> , gray, stiff	15.0			18	7-6-5 N=11	1.0 (HP)	29	
		<b>Boring Terminated at 15 Feet</b>	15.0			18	3-4-5 N=9	1.0 (HP)	32	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 4.5' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-21-2020

Boring Completed: 04-21-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

# BORING LOG NO. B-45

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6614° Longitude: -84.2768°  Approximate Surface Elev.: 736 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		0.4 <b>TOPSOIL (5")</b>	735.5+/-							
		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff, contains rootlets								
		3.0	733+/-			18	3-3-3 N=6	3.0 (HP)	18	
		<b>LEAN CLAY (CL)</b> , brown with gray, stiff								
		5.5	730.5+/-			18	3-3-6 N=9	4.25 (HP)	24	
		<b>SANDY LEAN CLAY (CL)</b> , brown, very stiff								
		9.4	726.5+/-			18	11-12-13 N=25	4.5+ (HP)	21	
		<b>SANDY SILT (ML)</b> , brown, medium dense, contains clay seams								
		12.0	724+/-			18	4-7-11 N=18		31	
		<b>SILTY CLAY (CL-ML)</b> , gray, stiff								
		15.0	721+/-			18	6-5-7 N=12	0.5 (HP)	22	
<b>Boring Terminated at 15 Feet</b>			15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- 9.5' while drilling
- 11.5' at drilling completion



Boring Started: 04-20-2020

Boring Completed: 04-20-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-46

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6615° Longitude: -84.2735°  Approximate Surface Elev.: 733 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		0.4 <b>TOPSOIL (5")</b> <b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff, contains rootlets	732.5+/-							
		3.0 <b>LEAN CLAY (CL)</b> , brown with gray, very stiff	730+/-			18	3-3-3 N=6	2.25 (HP)	21	
3		5.5 <b>SANDY LEAN CLAY (CL)</b> , brown, hard	727.5+/-			18	7-10-10 N=20	4.25 (HP)	24	44-21-23
		9.4 <b>SANDY SILT (ML)</b> , brown, medium dense, contains clay seams	723.5+/-	▽		18	13-16-16 N=32	4.5+ (HP)	22	
5		12.0 <b>SILTY CLAY (CL-ML)</b> , gray, medium stiff	721+/-			18	5-9-12 N=21		25	
3		15.0 <b>Boring Terminated at 15 Feet</b>	718+/-			18	3-3-3 N=6	1.0 (HP)	22	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 9' while drilling



Boring Started: 04-20-2020

Boring Completed: 04-20-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNTY TERRACON\_DATATEMPLATE.GDT 6/16/20

# BORING LOG NO. B-47

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6621° Longitude: -84.2702°	DEPTH	APPROXIMATE SURFACE ELEV.: 729 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
												LL-PL-PI
1		<b>TOPSOIL (12")</b>	1.0	728+/-								
4		<b>CLAYEY SAND (SC)</b> , brown, loose	3.0	726+/-				18	2-2-2 N=4		16	
3		<b>SANDY SILTY CLAY (CL-ML)</b> , brown, stiff	5.5	723.5+/-	5			18	3-5-5 N=10	2.0 (HP)	23	
5		<b>SANDY SILT (ML)</b> , brown, medium dense			10			18	9-11-13 N=24		23	
						▽						
						▽						
4		<b>SANDY SILT (ML)</b> , gray, loose	13.5	715.5+/-				18	4-7-9 N=16		27	
			15.0	714+/-	15			18	2-2-2 N=4		25	
		<b>Boring Terminated at 15 Feet</b>										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

- ▽ 11' while drilling
- ▽ 13' at drilling completion



Boring Started: 04-20-2020

Boring Completed: 04-20-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224






THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNTY. TERRACON\_DATATEMPLATE.GDT 6/16/20

# BORING LOG NO. B-48

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6592° Longitude: -84.2767°  Approximate Surface Elev.: 735 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
DEPTH										
1		<b>TOPSOIL (8")</b>	0.7							
4		<b>CLAYEY SAND (SC)</b> , brown, loose	3.0		X	18	3-3-3 N=6		15	
3		<b>LEAN CLAY (CL)</b> , brown, very stiff  @6.0': contains silt seams	8.6		X	18	5-7-9 N=16	4.5+ (HP)	21	
5		<b>FAT CLAY (CH)</b> , gray, stiff	12.8	▽	X	18	10-10-10 N=20	4.5+ (HP)	25	
5		<b>SANDY SILT (ML)</b> , gray, medium dense	15.0		X	18	4-4-4 N=8	1.5 (HP)	25	
<b>Boring Terminated at 15 Feet</b>			720+/-							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 7.5' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-20-2020

Boring Completed: 04-20-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224\_ARCHE\_FULTON\_COUNTY\_SOLAR\_TERRACON\_DATA\_TEMPLATE.GDT\_6/16/20

# BORING LOG NO. B-49

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6593° Longitude: -84.2732°	DEPTH	APPROXIMATE SURFACE ELEV.: 731 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
												LL-PL-PI
1		<b>TOPSOIL (8")</b>	0.7	730.5+/-								
		<b>SANDY LEAN CLAY (CL)</b> , brown, medium stiff	3.3	727.5+/-				18	3-2-3 N=5	2.25 (HP)	20	
3		<b>LEAN CLAY (CL)</b> , brown with gray, stiff	6.2	725+/-	5			18	3-3-5 N=8	1.5 (HP)	23	
		<b>LEAN CLAY (CL)</b> , brown, very stiff, contains silt seams	9.2	722+/-				18	7-8-8 N=16	3.75 (HP)	23	
5		<b>SANDY SILT (ML)</b> , gray, medium dense	11.0	720+/-	10	▽		18	8-8-8 N=16		22	
3		<b>FAT CLAY (CH)</b> , gray, medium stiff	15.0	716+/-	15			18	2-2-3 N=5	0.5 (HP)	36	
<b>Boring Terminated at 15 Feet</b>												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 9' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-20-2020

Boring Completed: 04-20-2020

Drill Rig: Geoprobe 7822

Driller: C. White

Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUNTY TERRACON\_DATATEMPLATE.GDT 6/16/20



# BORING LOG NO. B-50

**PROJECT:** Arche Fulton County Solar

**CLIENT:** 7x Energy, Inc.  
Austin, TX

**SITE:** US Route 20  
Fayette, OH

MODEL LAYER	GRAPHIC LOG	LOCATION See <a href="#">Exploration Plan</a> Latitude: 41.6592° Longitude: -84.2701°  Approximate Surface Elev.: 728 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS
										LL-PL-PI
1		<b>TOPSOIL (8")</b> 727.5+/-								
		<b>SANDY LEAN CLAY (CL)</b> , brown with gray, medium stiff								
3		<b>LEAN CLAY (CL)</b> , brown, stiff, contains silt seams 725+/-				18	3-3-3 N=6	1.5 (HP)	21	
		<b>LEAN CLAY (CL)</b> , brown, stiff, contains silt seams								
		<b>SILTY SAND (SM)</b> , brown, medium dense 722.5+/-	5	▽						
5		<b>SILTY SAND (SM)</b> , brown, medium dense				18	9-9-9 N=18		24	
		<b>LEAN CLAY (CL)</b> , gray, stiff 719+/-								
3		<b>LEAN CLAY (CL)</b> , gray, stiff				18	4-6-6 N=12	2.75 (HP)	27	
		<b>FAT CLAY (CH)</b> , gray, soft 717+/-								
2		<b>FAT CLAY (CH)</b> , gray, soft				18	1-2-2 N=4	0.75 (HP)	29	
		<b>Boring Terminated at 15 Feet</b> 713+/-	15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
3.25" Hollow Stem Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Bulk sample collected from 0-4'  
Offset and collected Shelby tube from 2.5-4.5'

Abandonment Method:  
Boring backfilled with Auger Cuttings and Bentonite Chips

See [Supporting Information](#) for explanation of symbols and abbreviations.

Elevation obtained from Google Earth

**WATER LEVEL OBSERVATIONS**

▽ 5' while drilling



12460 Plaza Dr  
Parma, OH

Boring Started: 04-20-2020

Boring Completed: 04-20-2020

Drill Rig: Geoprobe 7822

Driller: C. White

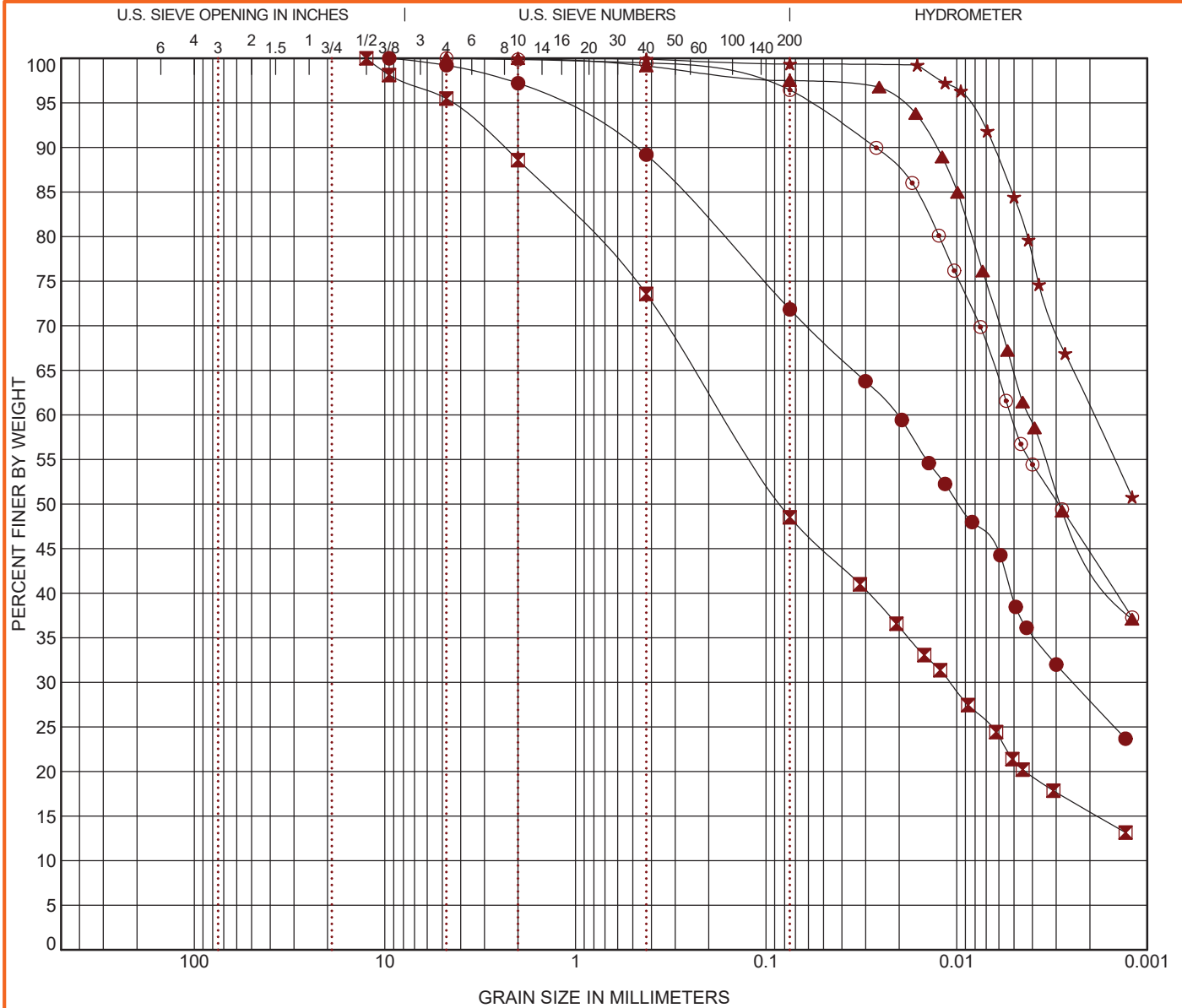
Project No.: N6195224

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



# GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY			
	coarse	fine	coarse	medium	fine				

Boring ID	Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
● B-07	3.5 - 5	LEAN CLAY with SAND (CL)	15	26	16	10		
⊠ B-10	3.5 - 5	SILTY, CLAYEY SAND (SC-SM)	11	20	13	7		
▲ B-17	3.5 - 5	LEAN CLAY (CL)	23	44	20	24		
★ B-25	3.5 - 5	LEAN CLAY (CL)	23	48	22	26		
⊙ B-28	3.5 - 5	LEAN CLAY (CL)	28	49	22	27		

Boring ID	Depth	D <sub>100</sub>	D <sub>60</sub>	D <sub>30</sub>	D <sub>10</sub>	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
● B-07	3.5 - 5	9.5	0.021	0.002		0.0	0.8	27.4	32.8		39.1
⊠ B-10	3.5 - 5	12.5	0.166	0.011		0.0	4.5	47.0	27.3		21.2
▲ B-17	3.5 - 5	4.75	0.004			0.0	0.0	2.5	32.7		64.8
★ B-25	3.5 - 5	2	0.002			0.0	0.0	0.6	14.9		84.4
⊙ B-28	3.5 - 5	4.75	0.005			0.0	0.0	3.5	37.5		59.0

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATA TEMPLATE.GDT 6/16/20

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



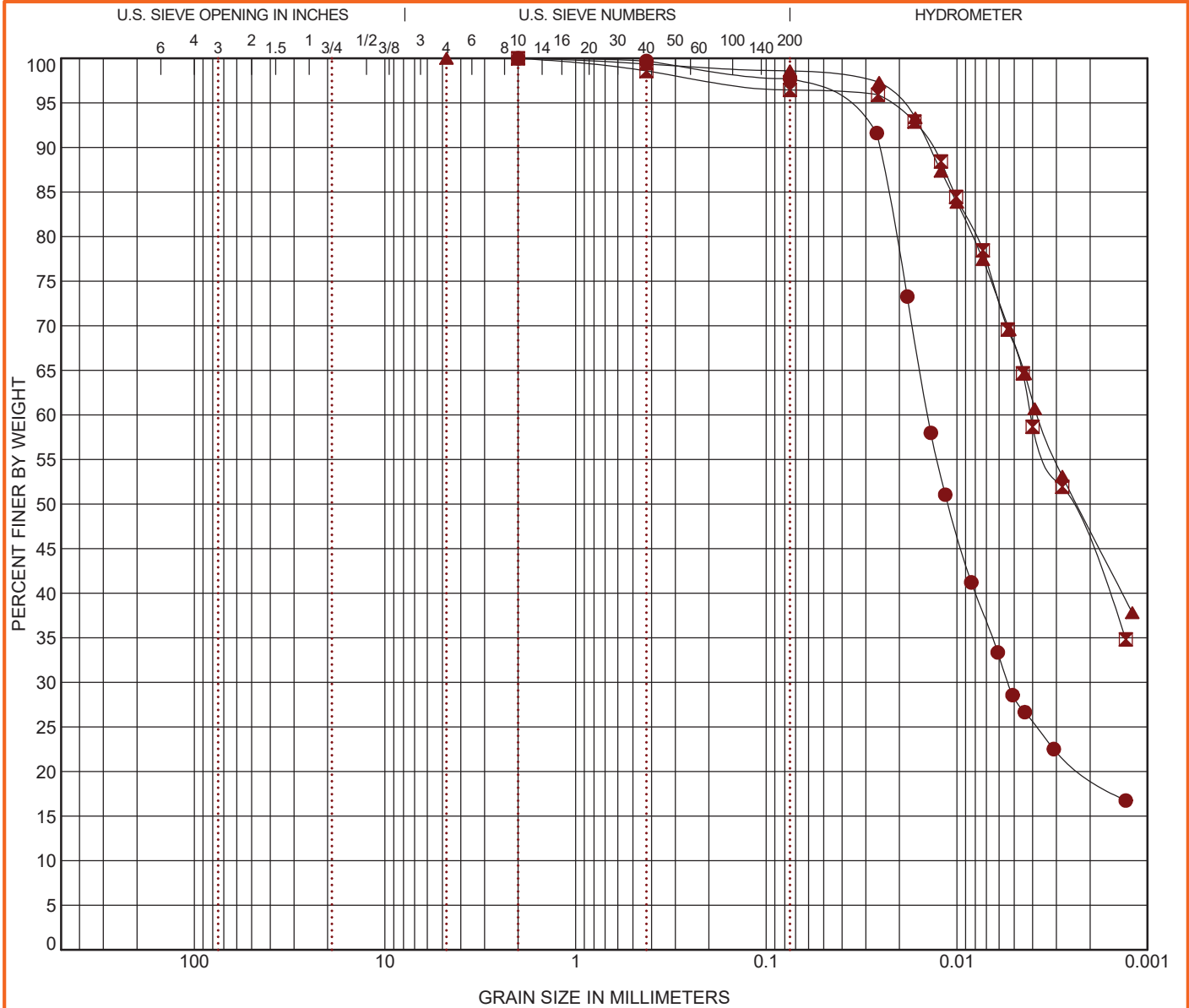
12460 Plaza Dr  
Parma, OH

PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID	Depth	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
● B-32	3.5 - 5	SILTY CLAY (CL-ML)	25	26	19	7		
■ B-38	3.5 - 5	LEAN CLAY (CL)	20	41	20	21		
▲ B-46	3.5 - 5	LEAN CLAY (CL)	24	44	21	23		

Boring ID	Depth	D <sub>100</sub>	D <sub>60</sub>	D <sub>30</sub>	D <sub>10</sub>	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
● B-32	3.5 - 5	2	0.014	0.005		0.0	0.0	2.3	69.4		28.3
■ B-38	3.5 - 5	2	0.004			0.0	0.0	3.5	29.0		67.5
▲ B-46	3.5 - 5	4.75	0.004			0.0	0.0	1.4	30.6		68.0

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATA TEMPLATE.GDT 6/16/20

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

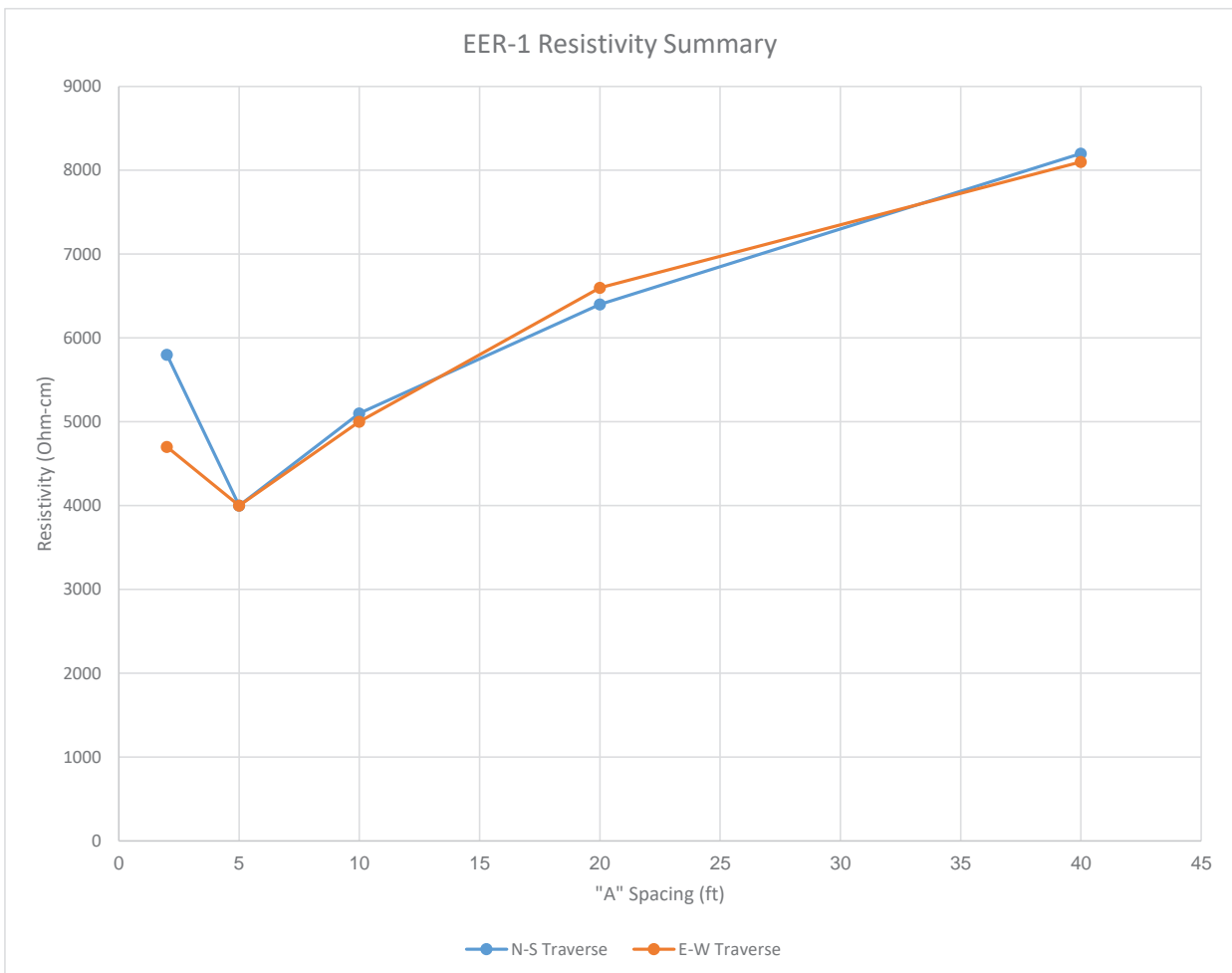
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 15, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Cover crop
Test Location	41.6788 N -84.2986 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	15.27	5800	12.24	4700
5	6	4.19	4000	4.22	4000
10	6	2.640	5100	2.620	5000
20	12	1.680	6400	1.712	6600
40	12	1.066	8200	1.062	8100



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

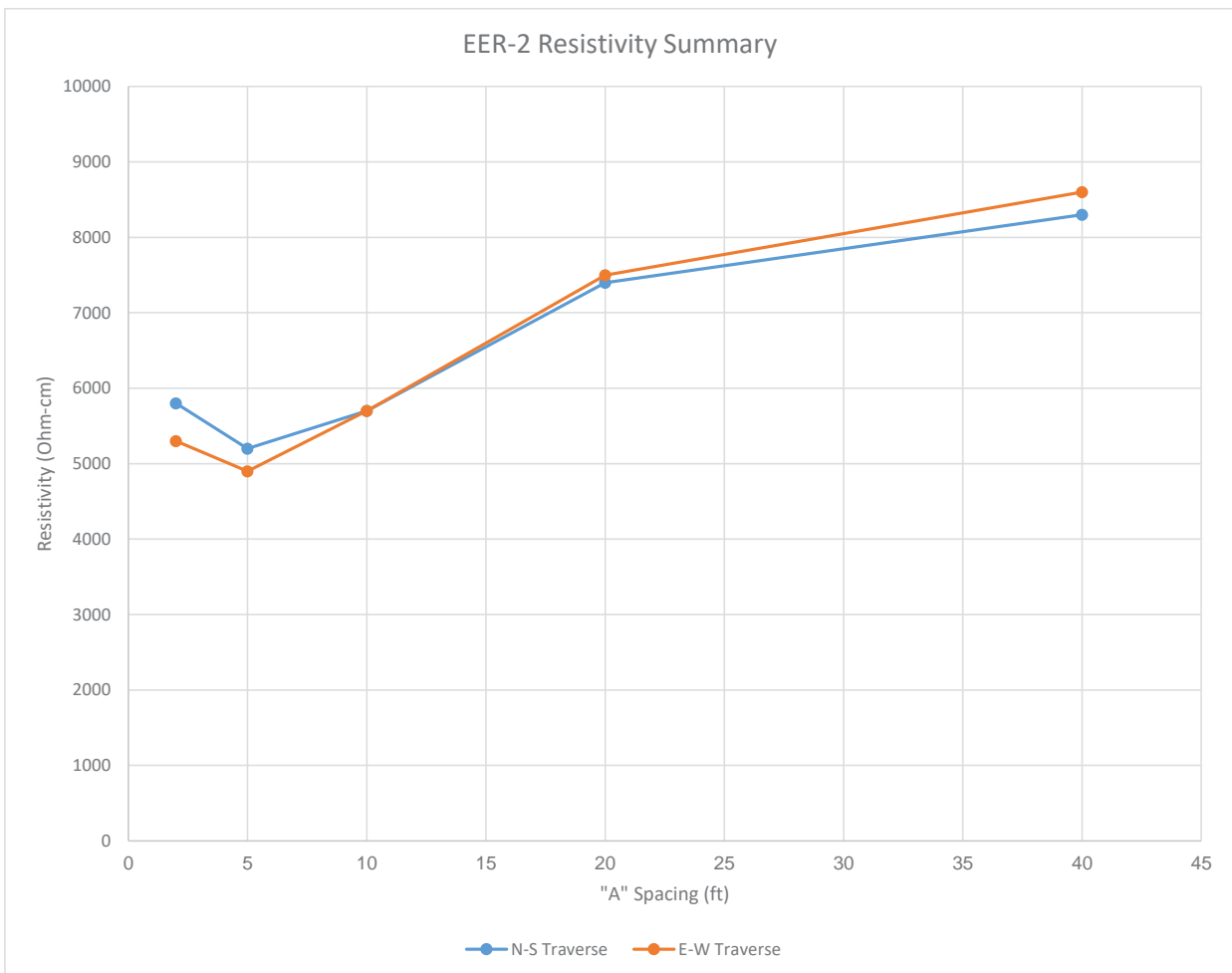
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 15, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	flat, Cover Crop
Test Location	41.6762 N -84.3004 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	15.24	5800	13.92	5300
5	6	5.47	5200	5.10	4900
10	6	2.970	5700	2.960	5700
20	12	1.940	7400	1.946	7500
40	12	1.082	8300	1.124	8600



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

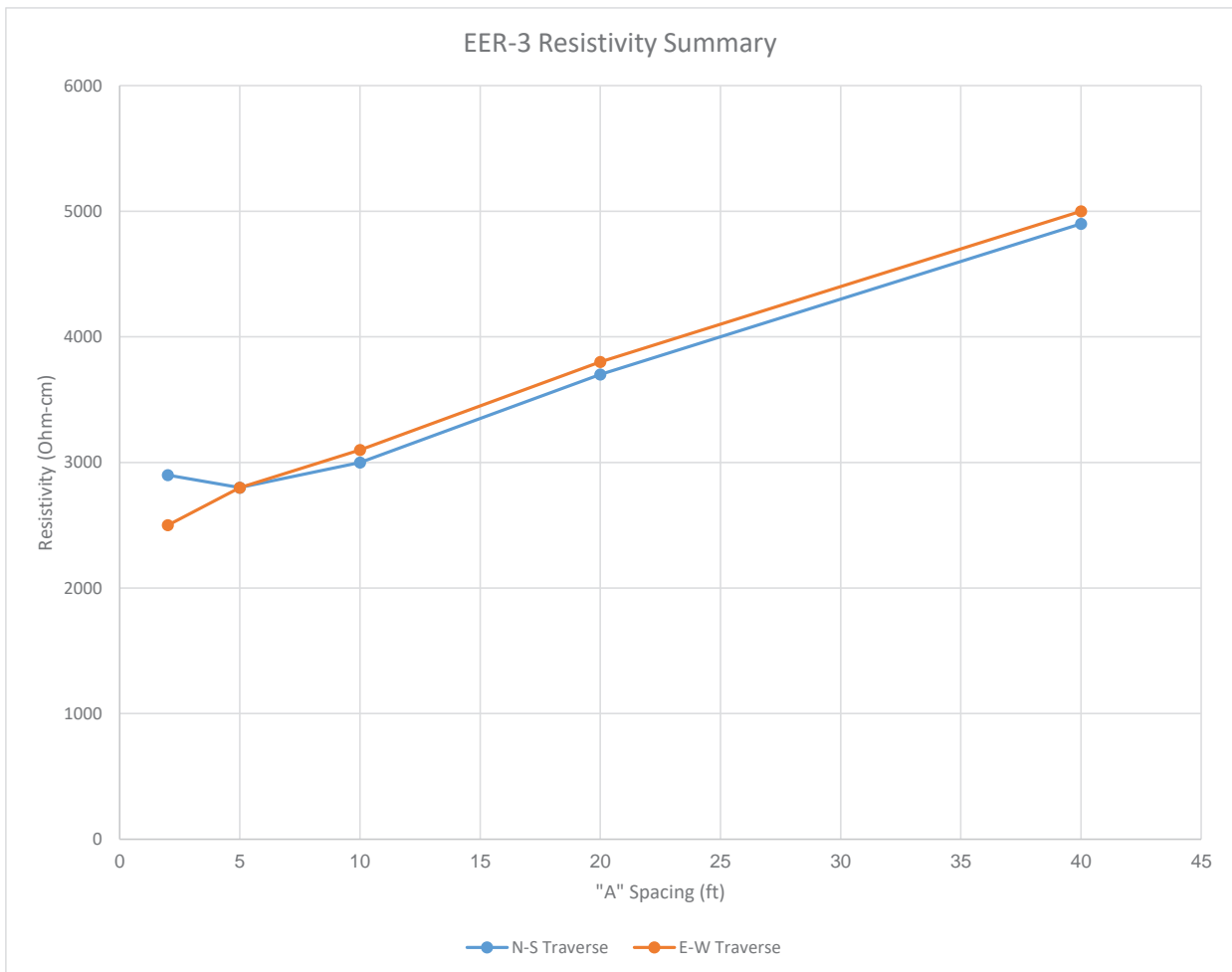
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 15, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Bean field
Test Location	41.6724 N -84.2909 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	7.63	2900	6.50	2500
5	6	2.90	2800	2.90	2800
10	6	1.576	3000	1.614	3100
20	12	0.958	3700	0.980	3800
40	12	0.644	4900	0.658	5000



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

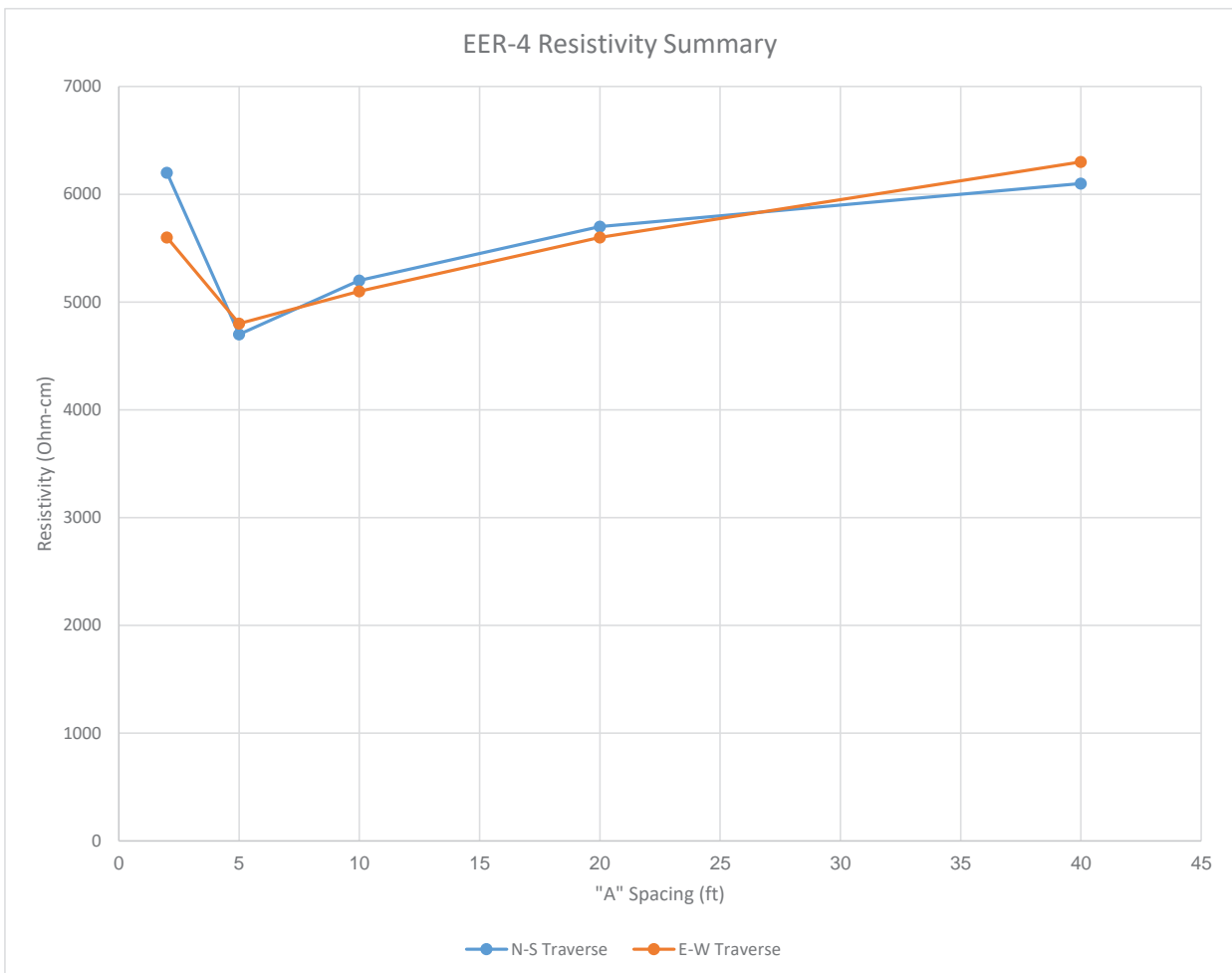
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 15, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Rolling hills, Terrain Slopes up towards west
Test Location	41.6679 N -84.2915 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	16.08	6200	14.57	5600
5	6	4.90	4700	5.02	4800
10	6	2.710	5200	2.670	5100
20	12	1.482	5700	1.468	5600
40	12	0.802	6100	0.816	6300





# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

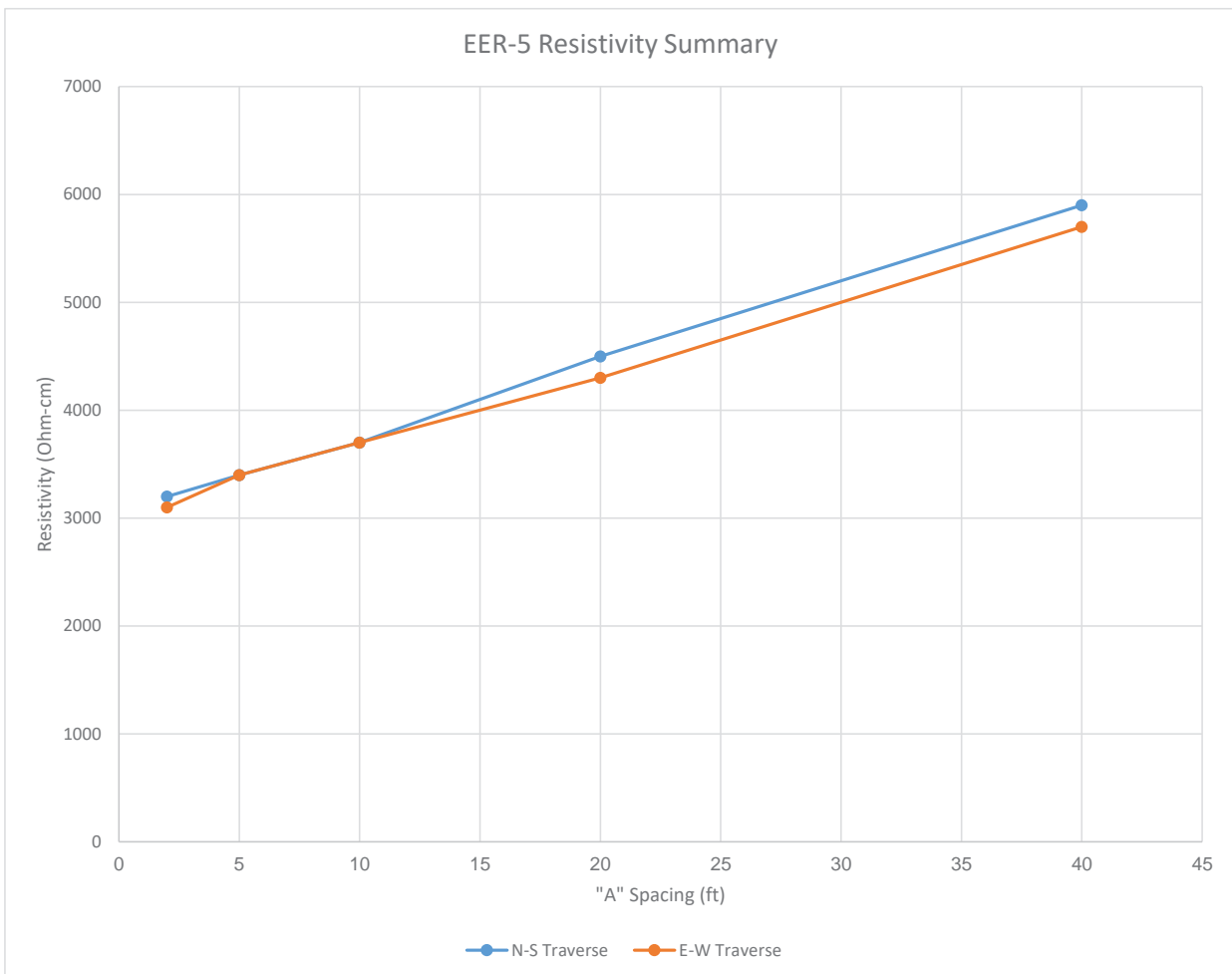
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Sloped Terrain, Slopes up to West
Test Location	41.6736 N -84.2828 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	8.44	3200	7.98	3100
5	6	3.57	3400	3.57	3400
10	6	1.916	3700	1.952	3700
20	12	1.162	4500	1.130	4300
40	12	0.764	5900	0.750	5700



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

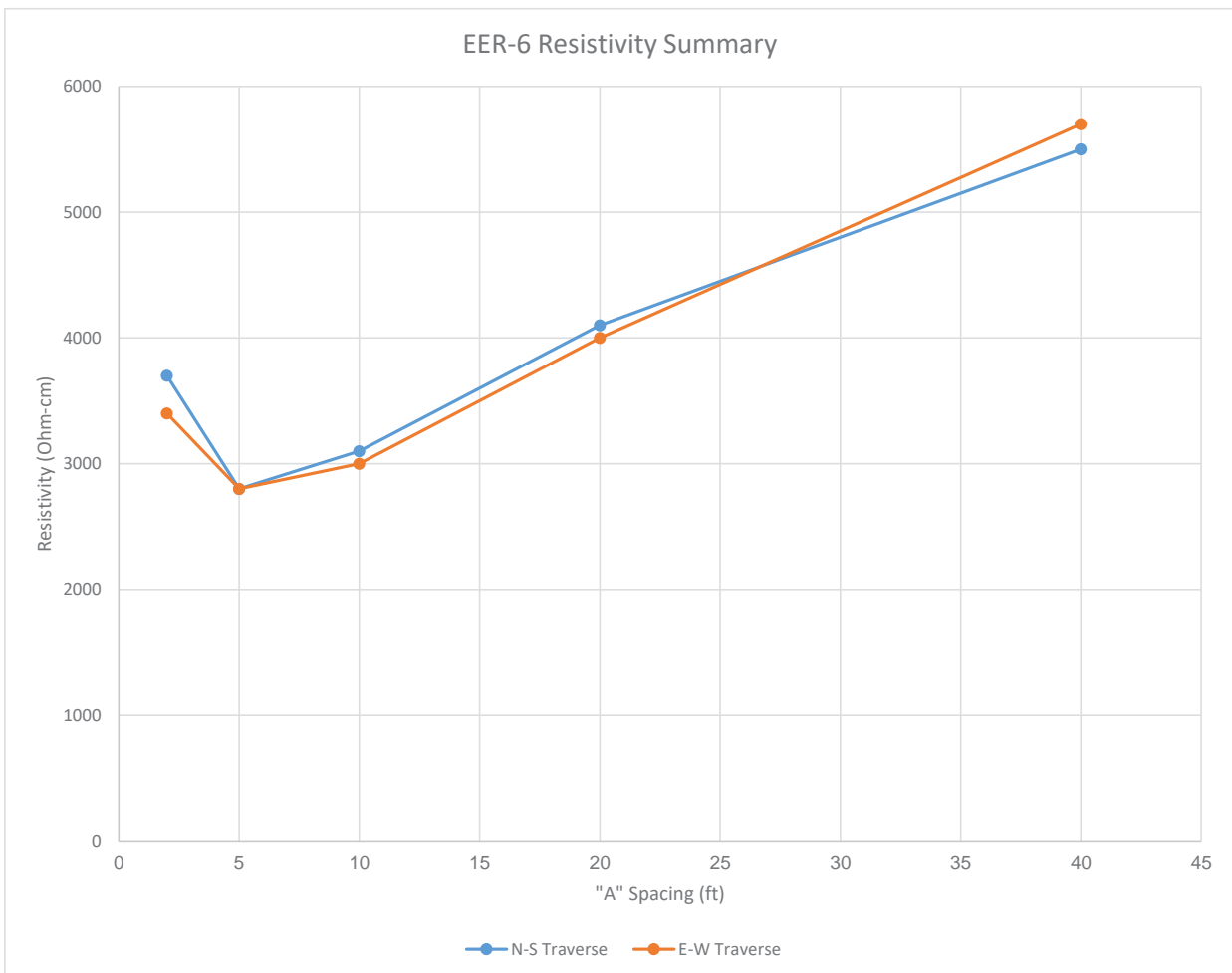
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Bean Field
Test Location	41.6691 N -84.2852 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	9.57	3700	8.81	3400
5	6	2.89	2800	2.89	2800
10	6	1.610	3100	1.566	3000
20	12	1.066	4100	1.056	4000
40	12	0.716	5500	0.742	5700



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

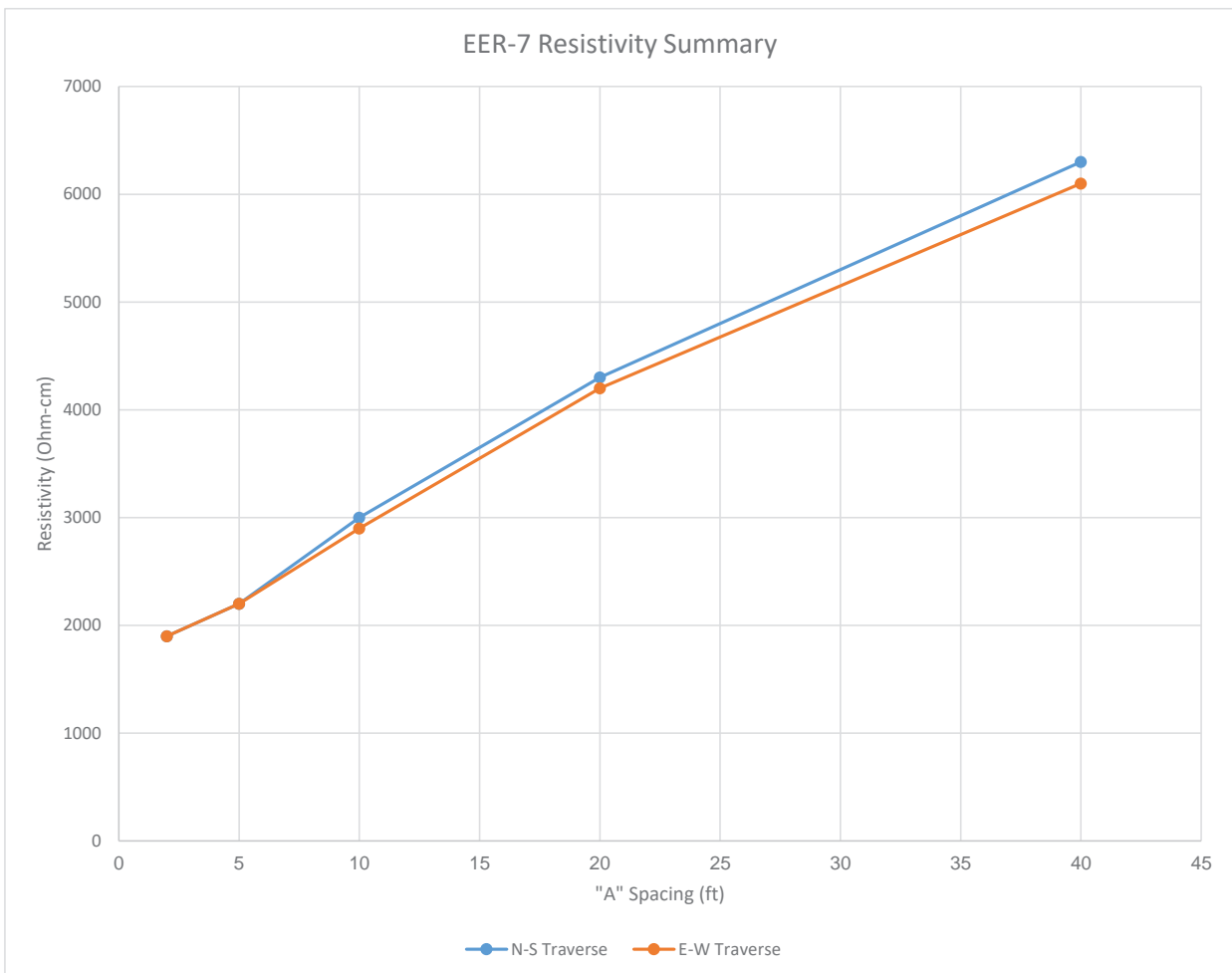
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Corn Field, Slopes up to East
Test Location	41.6660 N -84.28552 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	4.92	1900	4.90	1900
5	6	2.32	2200	2.26	2200
10	6	1.564	3000	1.522	2900
20	12	1.112	4300	1.106	4200
40	12	0.818	6300	0.802	6100



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

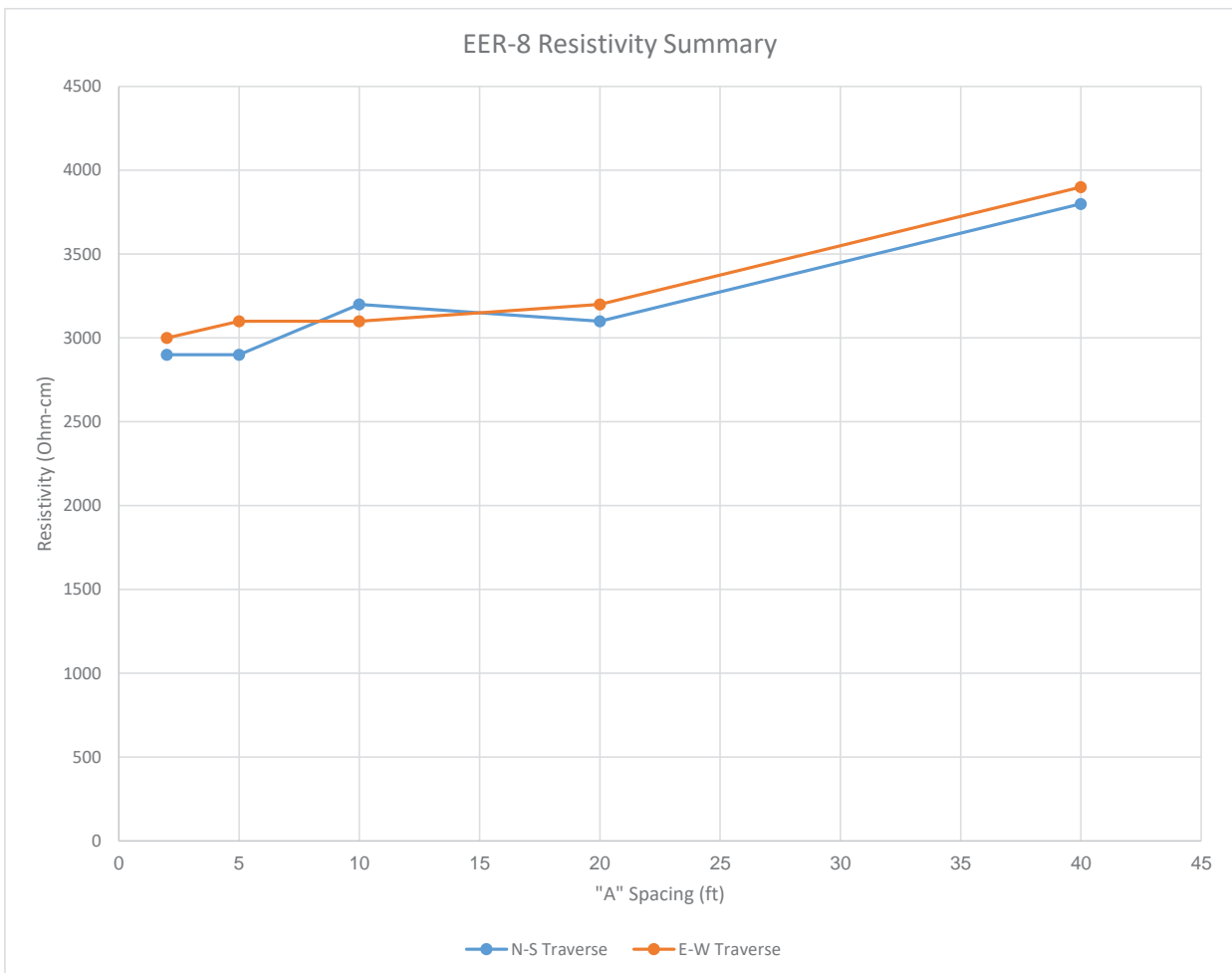
Fulton Co. OH  
Project No. N6195224



**Field Electrical Resistivity Test Summary:**

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Corn Field
Test Location	41.6633 N -84.2797 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	7.65	2900	7.77	3000
5	6	3.07	2900	3.28	3100
10	6	1.648	3200	1.632	3100
20	12	0.818	3100	0.842	3200
40	12	0.500	3800	0.506	3900



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

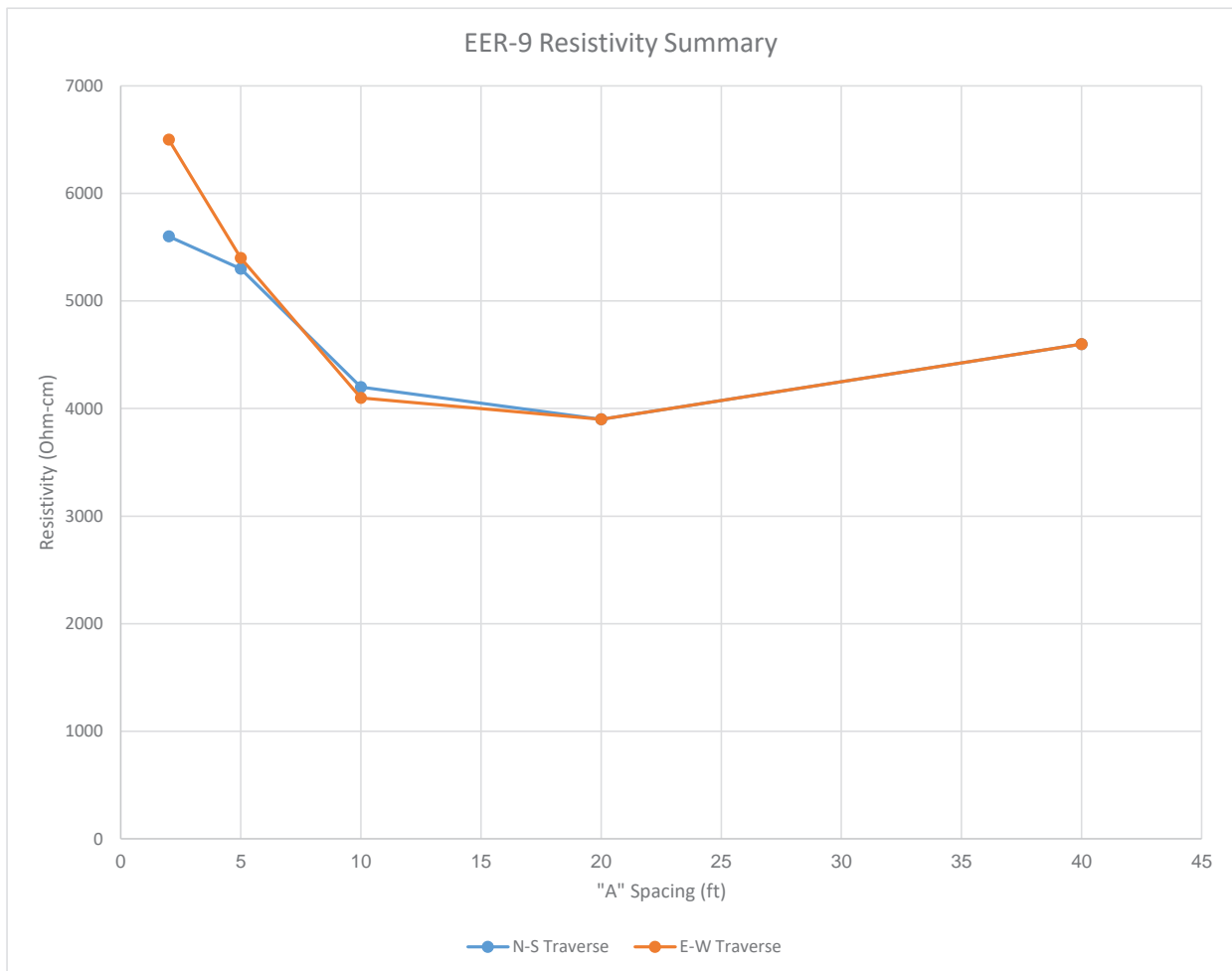
Project No. N6195224



**Field Electrical Resistivity Test Summary:**

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Corn Field
Test Location	41.6606 N -84.2856 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	14.61	5600	16.95	6500
5	6	5.55	5300	5.60	5400
10	6	2.170	4200	2.150	4100
20	12	1.024	3900	1.030	3900
40	12	0.596	4600	0.604	4600



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

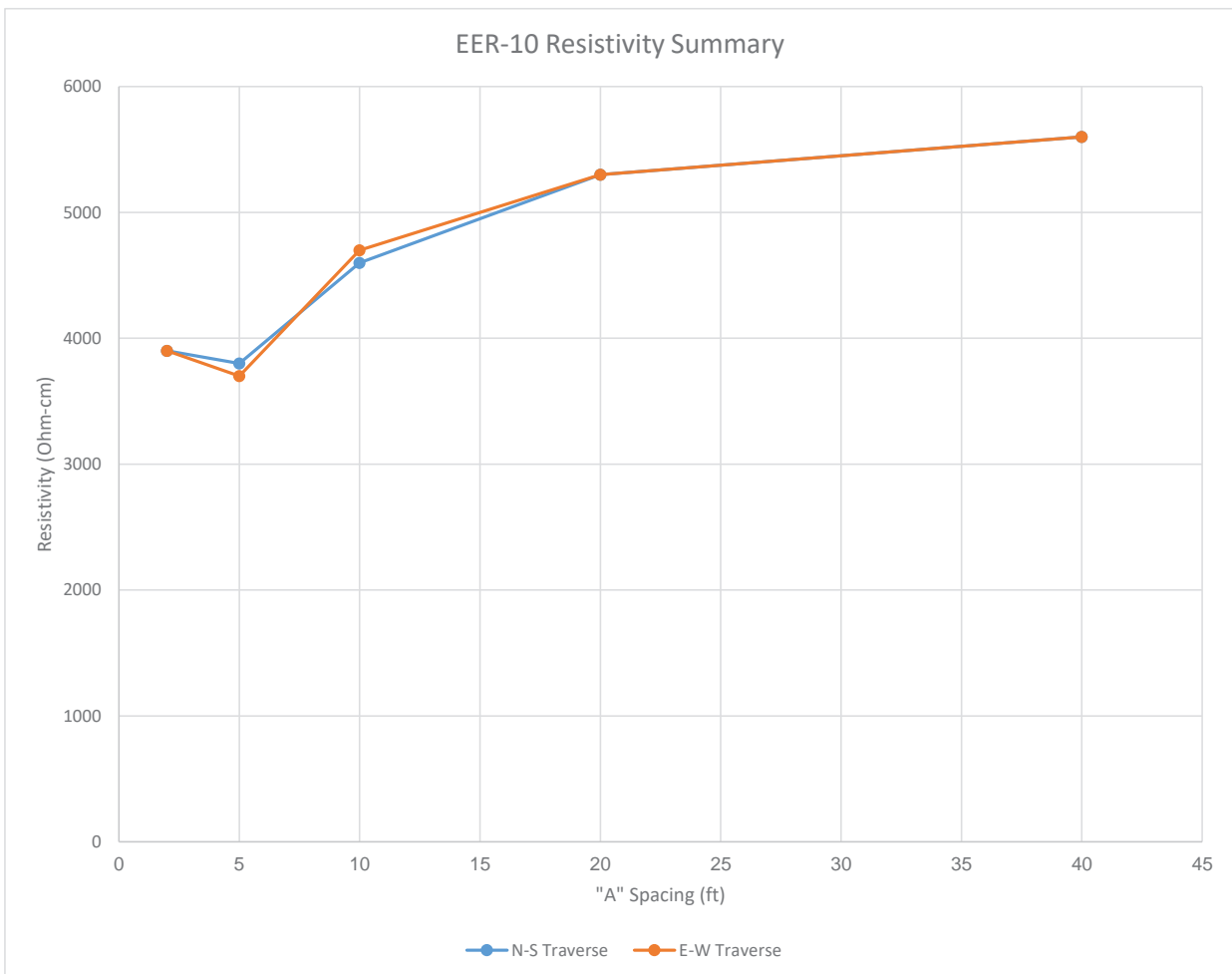
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Bean Field
Test Location	41.6655 N -84.2756 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	10.31	3900	10.23	3900
5	6	3.92	3800	3.88	3700
10	6	2.380	4600	2.480	4700
20	12	1.372	5300	1.378	5300
40	12	0.736	5600	0.728	5600



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

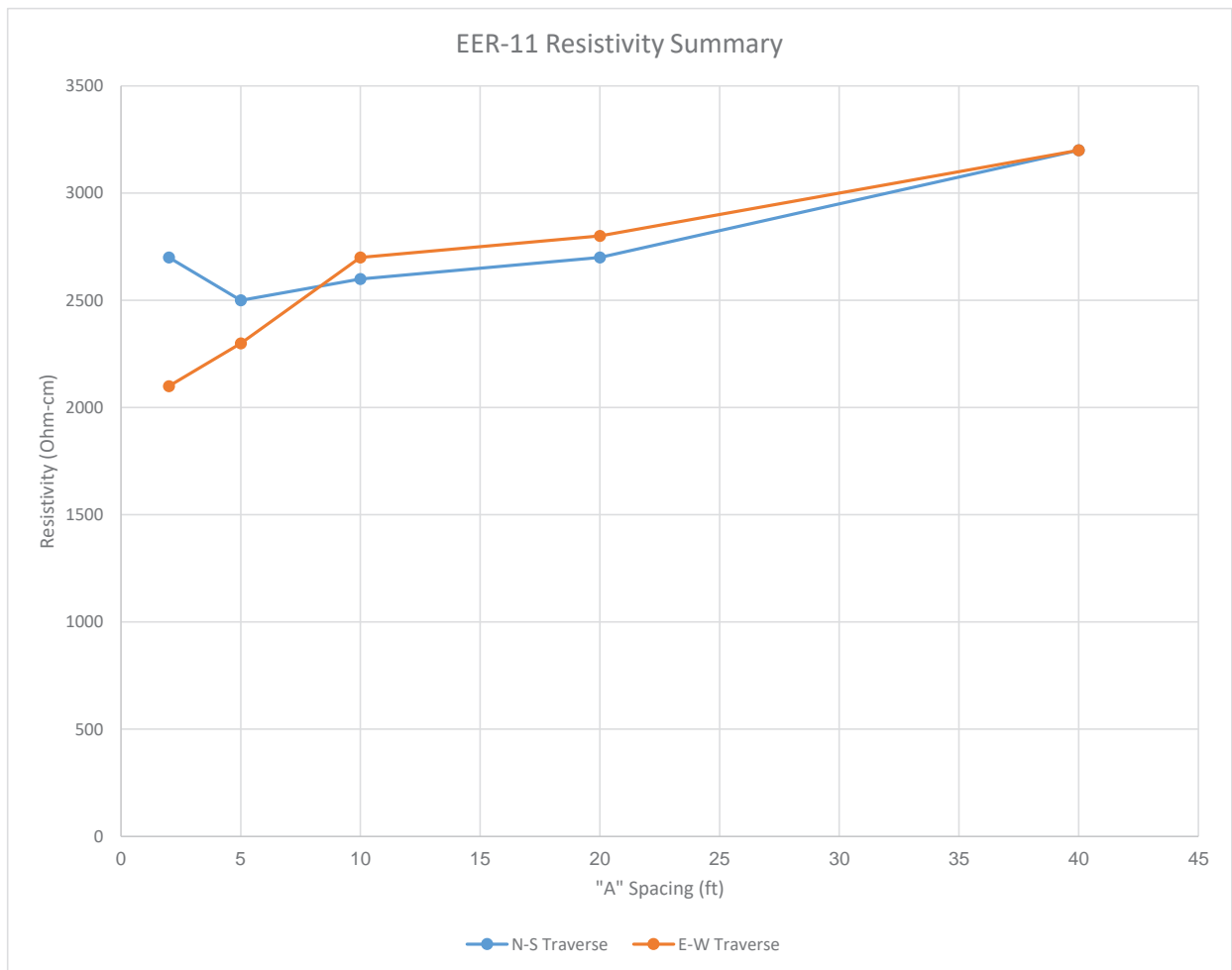
Project No. N6195224



## Field Electrical Resistivity Test Summary:

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Cover Crop
Test Location	41.6621 N -84.2747 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	6.99	2700	5.46	2100
5	6	2.58	2500	2.40	2300
10	6	1.342	2600	1.410	2700
20	12	0.698	2700	0.736	2800
40	12	0.422	3200	0.414	3200



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

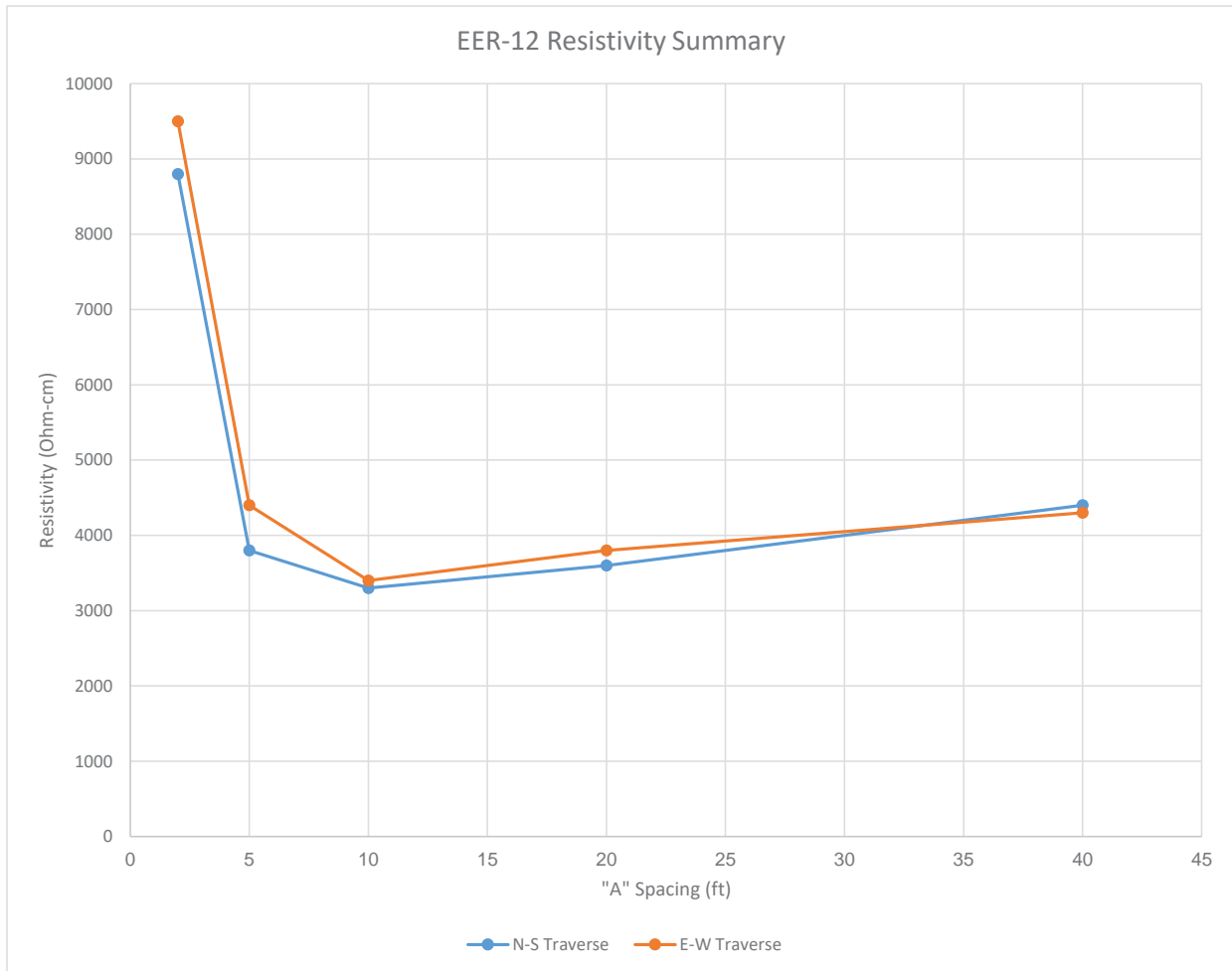
Fulton Co. OH  
Project No. N6195224



**Field Electrical Resistivity Test Summary:**

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Cover Crop
Test Location	41.6584 N -84.2765 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	22.90	8800	24.70	9500
5	6	3.98	3800	4.54	4400
10	6	1.716	3300	1.777	3400
20	12	0.940	3600	0.990	3800
40	12	0.568	4400	0.558	4300





# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

Fulton Co. OH

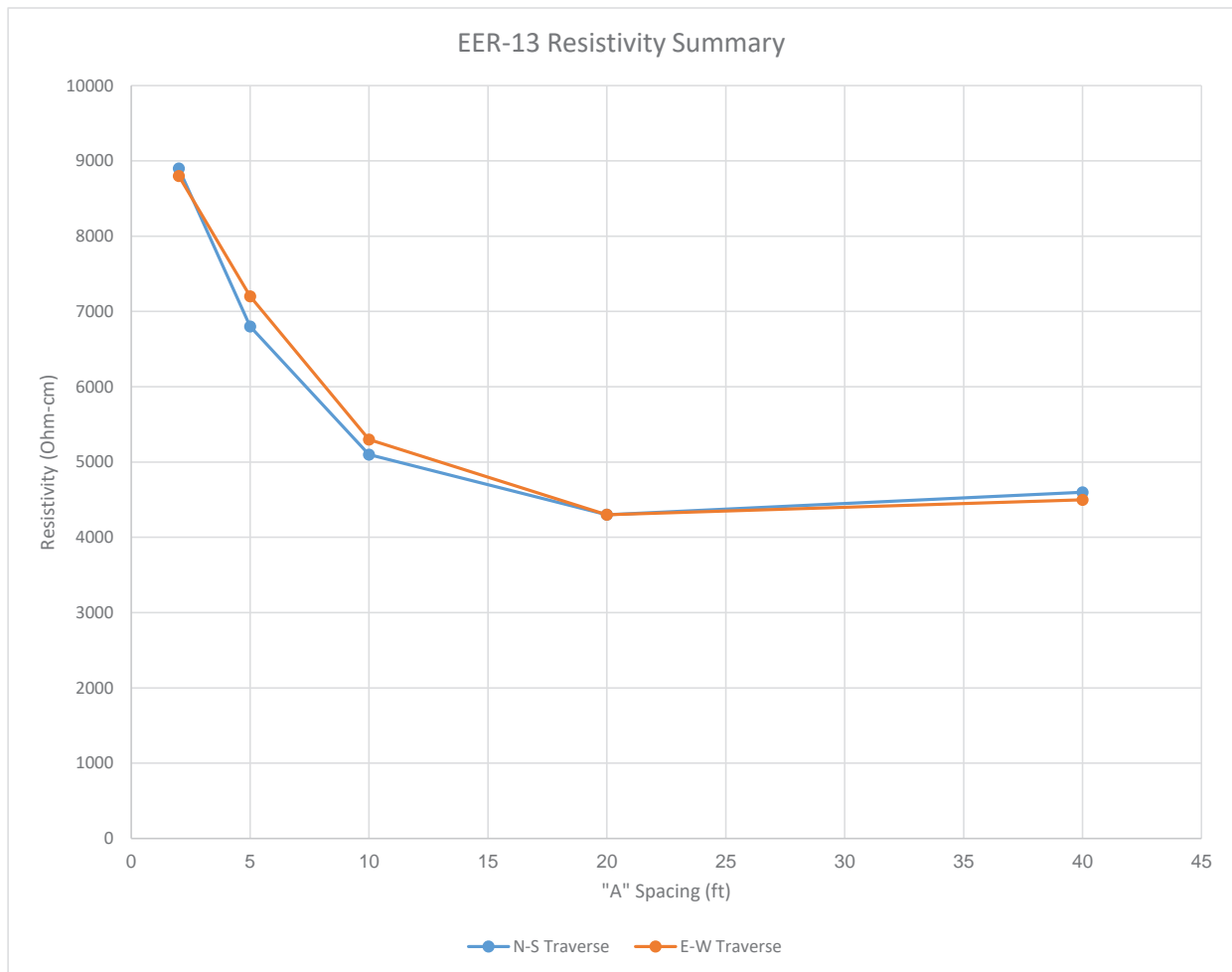
Project No. N6195224



**Field Electrical Resistivity Test Summary:**

Date	April 15, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Corn Field, Recently Plowed
Test Location	41.66099 N -84.2916 W

Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	23.30	8900	23.00	8800
5	6	7.14	6800	7.57	7200
10	6	2.668	5100	2.754	5300
20	12	1.128	4300	1.125	4300
40	12	0.599	4600	0.585	4500



# FIELD ELECTRICAL RESISTIVITY TEST RESULTS

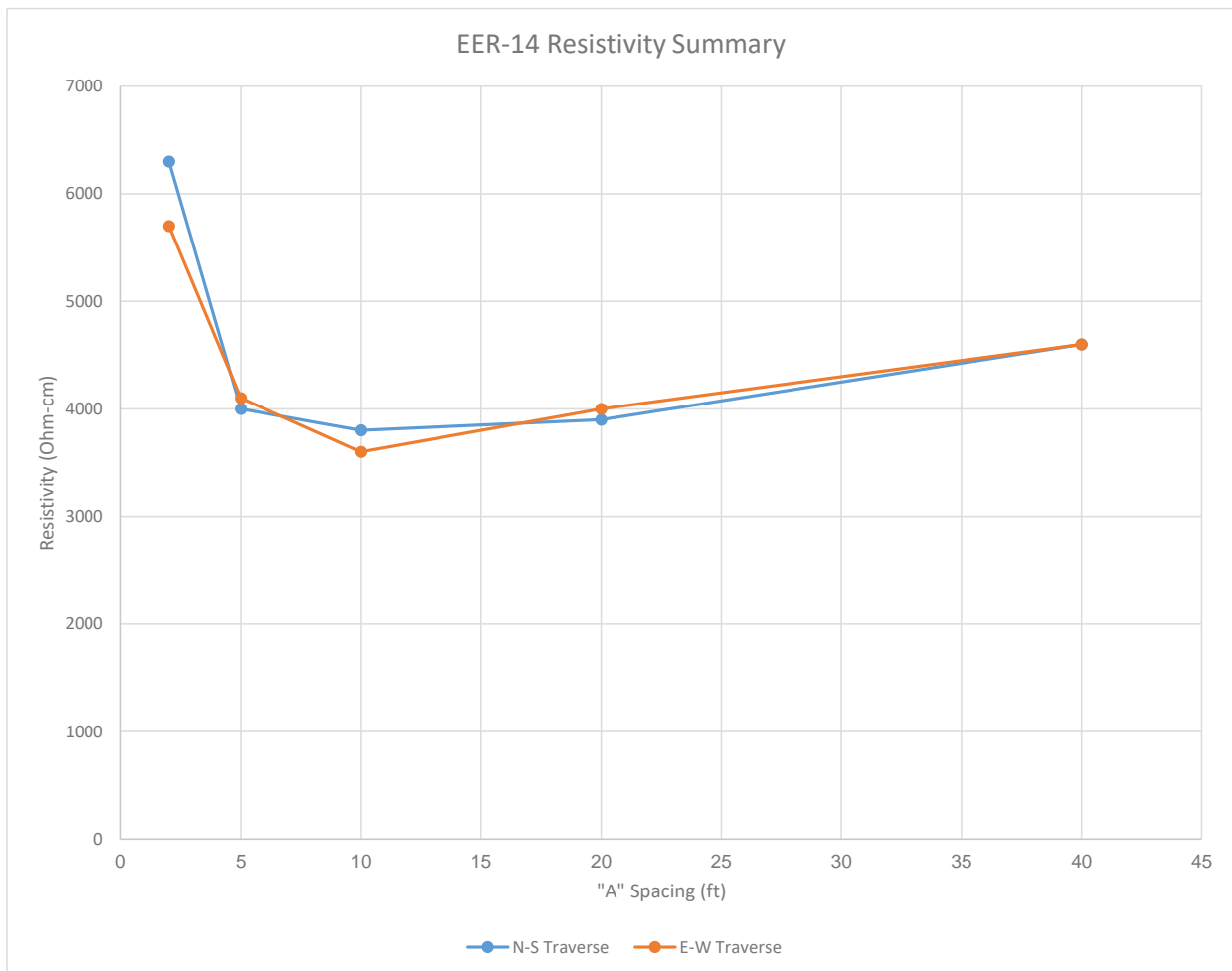
Fulton Co. OH  
Project No. N6195224



**Field Electrical Resistivity Test Summary:**

Date	April 16, 2020
Weather (recent days)	Snow/rain up to 1/4"
Brief Description of Terrain	Flat, Corn Field, Recently Plowed
Test Location	41.6566 N -84.2896 W

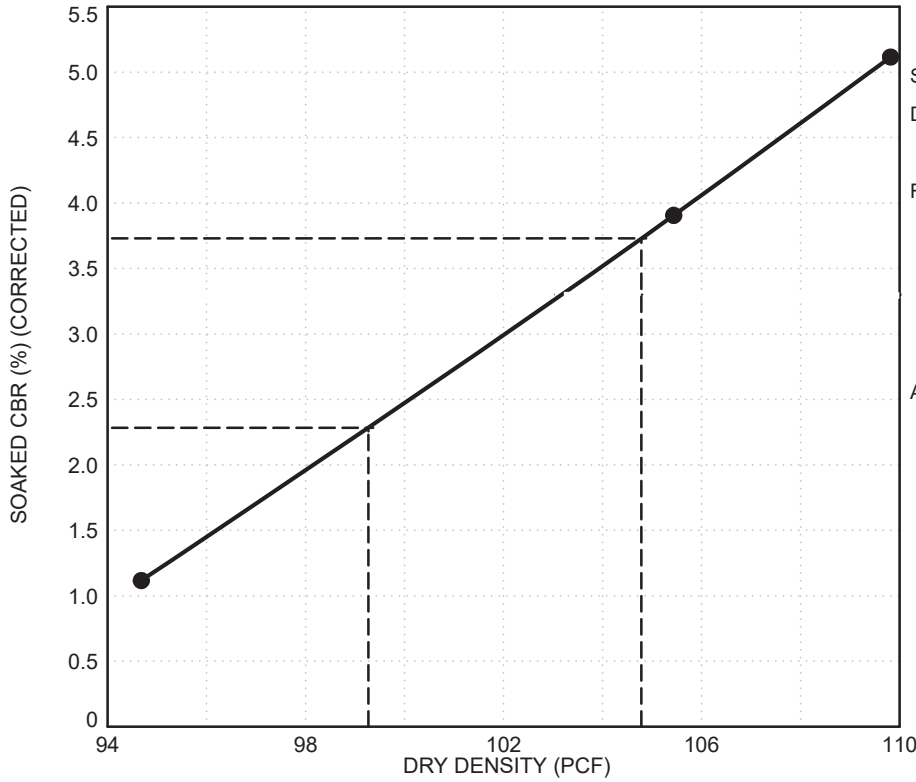
Current-Potential Pin Spacing (feet)	Electrode Depth (inches)	North-South Traverse		East-West Traverse	
		Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)	Apparent Resistance (Ohms)	Apparent Resistivity (Ohm-cm)
2	6	16.33	6300	14.97	5700
5	6	4.19	4000	4.27	4100
10	6	2.004	3800	1.890	3600
20	12	1.017	3900	1.038	4000
40	12	0.600	4600	0.602	4600



# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CBR 3PT REPORT N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



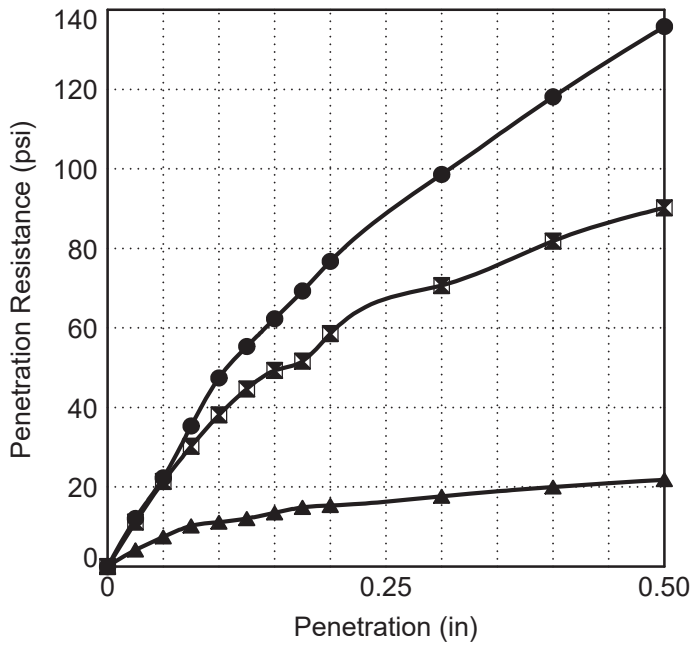
Source of Material B-01 Bulk 0.0

Description of Material Sandy Lean Clay

Remarks: \_\_\_\_\_

Percent Fines \_\_\_\_\_ %

Atterberg Limits LL PL PI



Sample No.	1	2	3
Sample Condition			
Compaction Method	ASTM 698A		
Maximum Dry Density, (pcf)	110.3	110.3	110.3
Optimum Moisture Content, (%)	15.5	15.5	15.5
Dry Density before Soaking, (pcf)	109.82	105.44	94.68
Moisture Content, (%)			
After Compaction	15.2	15.3	15.1
Top 1" After Soaking	23.7	26.1	27.6
Surcharge, (lbs)	10.02	10.07	9.93
Swell, (%)	1.33	1.34	1.55
Bearing Ratio, (%)	4.7	3.8	1.1

Dry Density @ 90% 99.3 pcf                      CBR @ 90% Density 2.3

Dry Density @ 95% 104.8 pcf                      CBR @ 95% Density 3.7

Dry Density @ 100% 110.3 pcf                      CBR @ 100% Density NA

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH

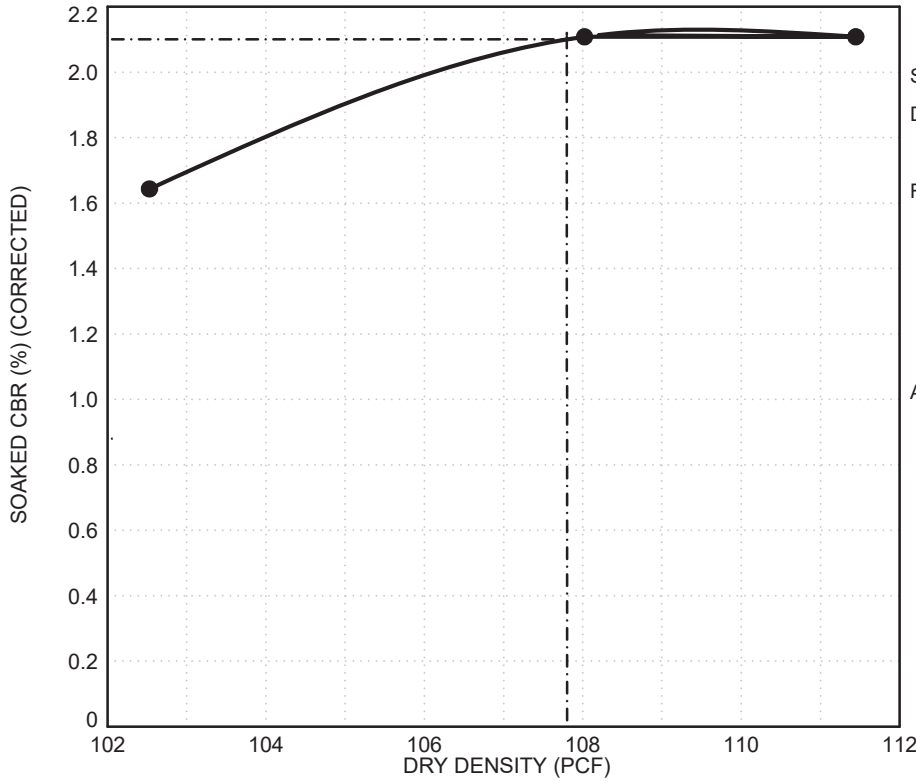


PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>



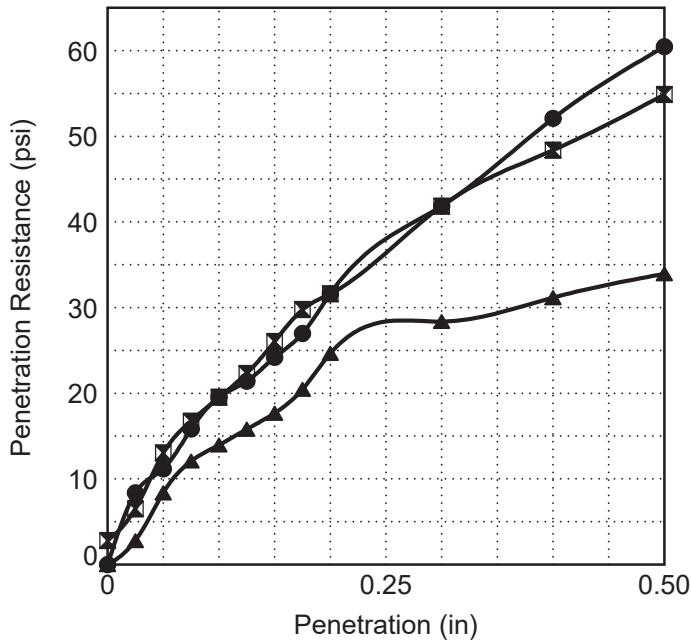
Source of Material B-08 Bulk 0.0

Description of Material Sandy Lean Clay

Remarks: \_\_\_\_\_

Percent Fines \_\_\_\_\_ %

Atterberg Limits LL PL PI



Sample No.	1	2	3
Sample Condition	Soaked		
Compaction Method	ASTM 698A		
Maximum Dry Density, (pcf)	107.8	107.8	107.8
Optimum Moisture Content, (%)	16.8	16.8	16.8
Dry Density before Soaking, (pcf)	111.45	108.02	102.53
Moisture Content, (%)			
After Compaction	17.4	17.3	15.6
Top 1" After Soaking	19.6	21.1	24.1
Surcharge, (lbs)	10.09	10.00	9.98
Swell, (%)	0.28	0.31	0.61
Bearing Ratio, (%)	2.1	2.1	1.6

Dry Density @ 90% 97.0 pcf

Dry Density @ 95% 102.4 pcf

Dry Density @ 100% 107.8 pcf

CBR @ 90% Density NA

CBR @ 95% Density NA

CBR @ 100% Density 2.1

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH

## Terracon

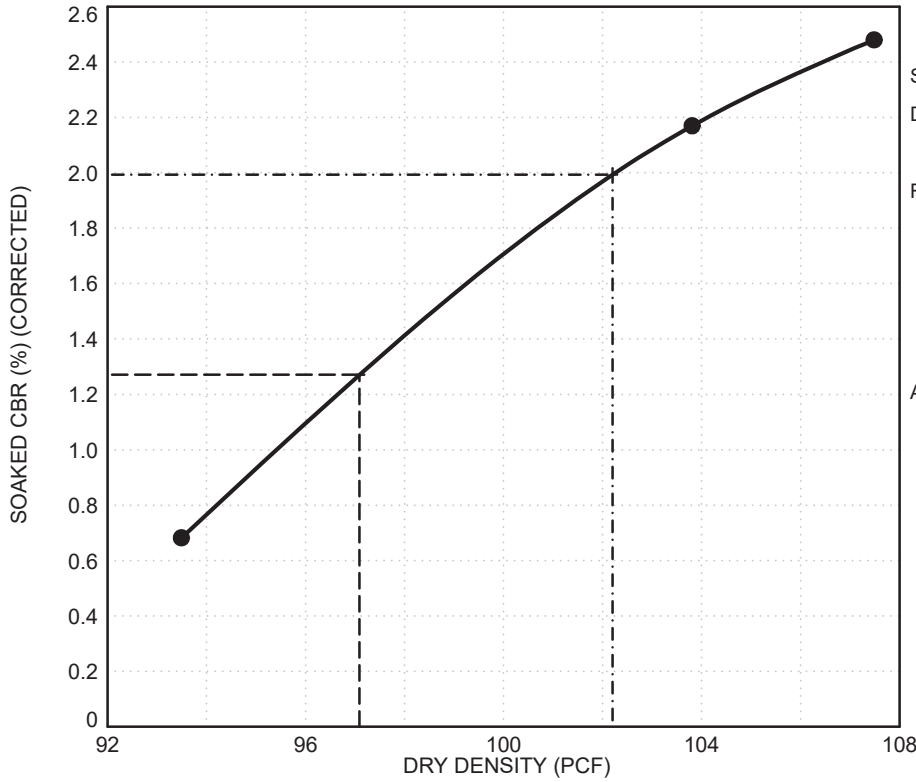
12460 Plaza Dr  
Parma, OH

PROJECT NUMBER: N6195224

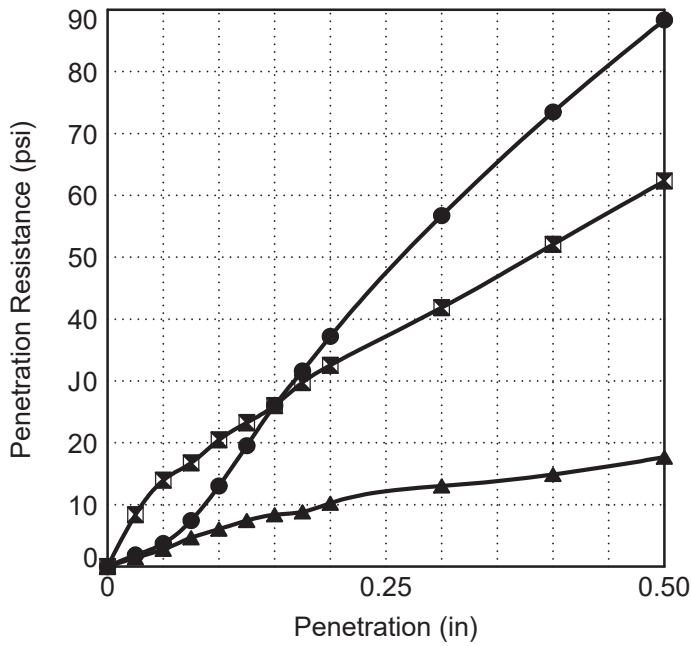
CLIENT: 7x Energy, Inc.  
Austin, TX

# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>



Source of Material B-13 Bulk 0.0  
 Description of Material Lean Clay with Sand  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Percent Fines \_\_\_\_\_ %  
 Atterberg Limits LL PL PI



Sample No.	1	2	J
Sample Condition	Soaked		
Compaction Method	ASTM 698A		
Maximum Dry Density (pcf)	102.2	102.2	102.2
Optimum Moisture Content (%)	18.9	18.9	18.9
Dry Density before Soaking (pcf)	107.48	101.81	99.49
Moisture Content (%)			
After Compaction	19.1	18.7	18.6
Top 1" After Soaking	24.1	28.2	29.4
Surcharge (lbs)	9.95	10.07	10.01
Swell (%)	0.79	0.96	1.11
Bearing Ratio (%)	2.5	2.2	0.7

Dry Density @ 90% 92.0 pcf  
 Dry Density @ 95% 97.1 pcf  
 Dry Density @ 100% 102.2 pcf

CBR @ 90% Density NA  
 CBR @ 95% Density 1.1  
 CBR @ 100% Density 2.0

PROJECT: Arche Fulton County Solar

SITE: S Route 20  
Fayette MO



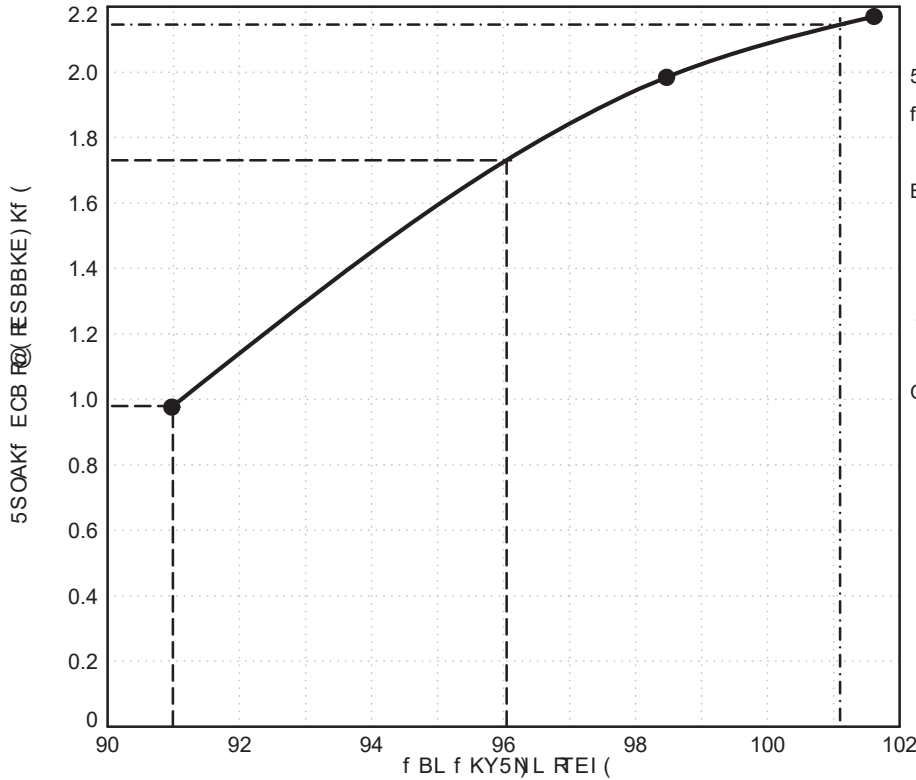
PROJECT NUMBER: N6195224

CLIENT: TX Energy Inc.  
Austin TX

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CBR JPT REPORT N6195224 ARCHE FULTON CO. N.3 PU TERRACON DATATEMPLATE.3.DT 6/10/20

# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>



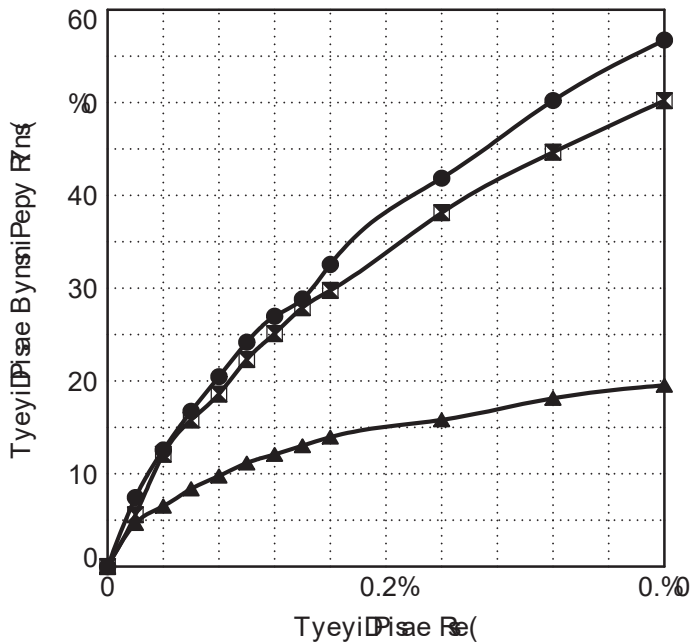
5aFDy acu PfyDPM **B-22 Bulk 0.0**

f ynpDzise acu PfyDPM **Lean Clay with Sand**

Byl PDK

TyDyei l seyn \_\_\_\_\_ %

OiyDyD os in oo To TN



5Pl 7M Ya.	1	2	3
5Pl 7M Eaedise	5aPnyd		
Eal 7Ppise u yihad	O5) u 698O		
u Pxs Fl f D f yensr, R'pd	101.1	101.1	101.1
S7is Fl u asniFDy Eaeiyei, R'pd	21.8	21.8	21.8
f D f yensr : ycaDy 5aPnseb, R'pd	101.61	98.4g	90.9g
u asniFDy Eaeiyei, R'pd			
OiyDEal 7Ppise	22.0%	20.9	21.6
) a7 1" OiyD5aPnseb	26.0%	31.3	32.2
5FDhPDy, R'n(	10.00	10.04	9.99
5wyMIR'pd	0.8%	0.92	0.8g
CyP'pab BPise, R'pd	2.0	1.9	1.0

f D f yensr t 90@ 91.0 7pc

ECB t 90@f yensr 1.0

f D f yensr t 9@ 96.0 7pc

ECB t 9@f yensr 1.g

f D f yensr t 100@ 101.1 7pc

ECB t 100@f yensr 2.1

TBSJKE) k ODhy I Flae EaFeir 5aM

TBSJKE) YUu CKBk Y619%224

5N Kk U5 BaFiy 20  
I Pryiiy, SH

## Terracon

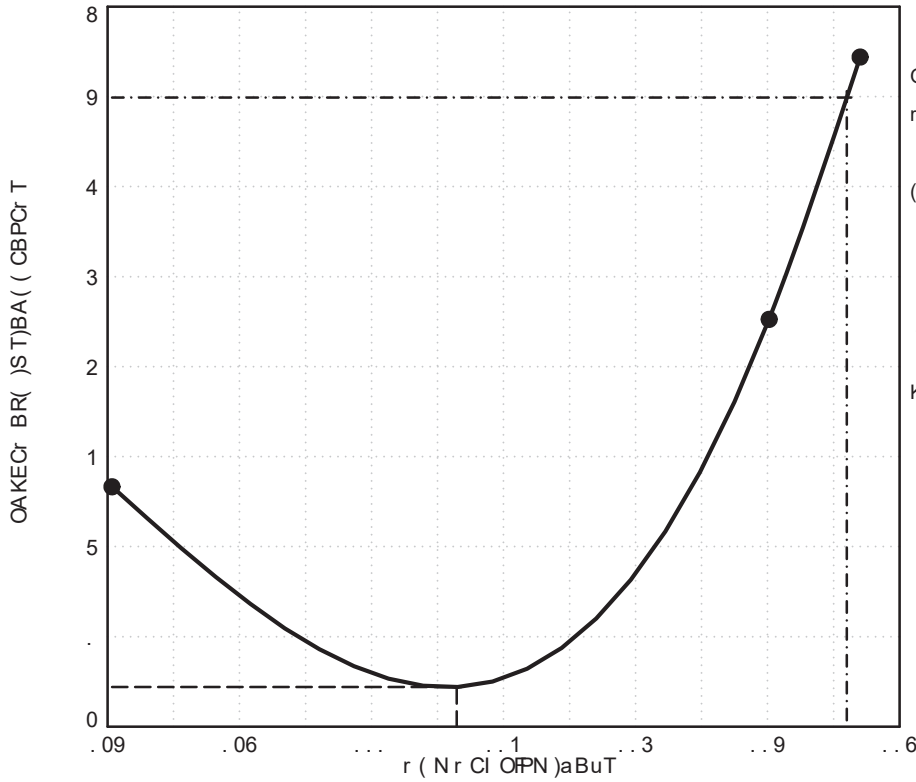
12460 TmzPf D  
TPD P, SH

EoNKY) k gx KeyDr, Np.  
OFnise, ) X

cOCSBO) SBL) (K5) 5 OEBK YS) VOOni Ni 5(KTObO) Kf I BSu SBnWCo BKTSB) ECB 3T) BKTSB) Y619%224 OBEHK I Uo) SY ESUY.GTJ ) KBBOSY\_f O) O) Ku ToO) K.Gf ) 6/10/20

# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>



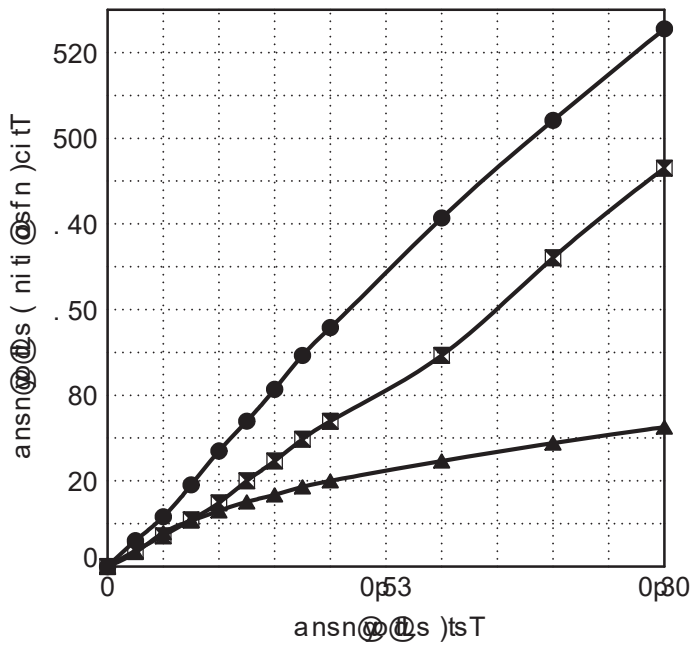
OLMf n LDl o@tom **B-29 Bulk 0.0**  
 r ni f ytc@s LDl o@tom **Poorly Graded Sand with Silt**

( nk oy i b The best fit curve generated by the software indicates a CBR @ 95% Density of 0.4 however we believe the CBR @ 95% density is approximately 3.6

anyf ns@tsni \_\_\_\_\_ %

K@gny7 Ytk t@ YY aY aF

YKRA( KPA( NIPCPOK( C I AP VKYF( F( OcaK( KPCr ur( AI( A( f3f KY( CsaA( Pp BR( 1aP( CsaA( P I 4. 63552( K( BHC uUYPAl BAUI pBaJ PC( ( KBAI\_r KPKPCI aYKPCGr P 4/. 4/50



Ook cm l Lp	. 5	1
Ook cm BLsdT@s	OLO: nd	
BLk cof @s l n@ld	KOPI 468R	
l oxtk Mk r yer nsi t@ )cf D'	. . 8p	. . 8p . . 8p
Ac@ Mk l Lt i @n BLs@s@ST	. 5p	. 5p . 5p
r yer nsi t@gnD yn OLO: ts7, )cf D'	. 8p20	. . 9p05 . 09p09
l Lt i @n BLs@s@ST		
K@y BLk cof @s	. 5p	. 5p4 . 5p
PLc . " K@y OLO: ts7	. 3	. 3p . 8p
OMf hoy7n,p)rgi T	. 0p00	. 0p00 . 0p00
Owmn)ST		
Rnoyt7 ( o@, )ST	9p2	2p . 5p

r ye r nsi t@% 60S . 04p cf D  
 r ye r nsi t@% 63S . . 5p cf D  
 r ye r nsi t@% . 00S . . 8p cf D

BR( % 60S r nsi t@ NA  
 BR( % 63S r nsi t@ 0p2  
 BR( % . 00S r nsi t@ 9p

a( AJCBPb Kyf hn uM@s BLM@OLroy



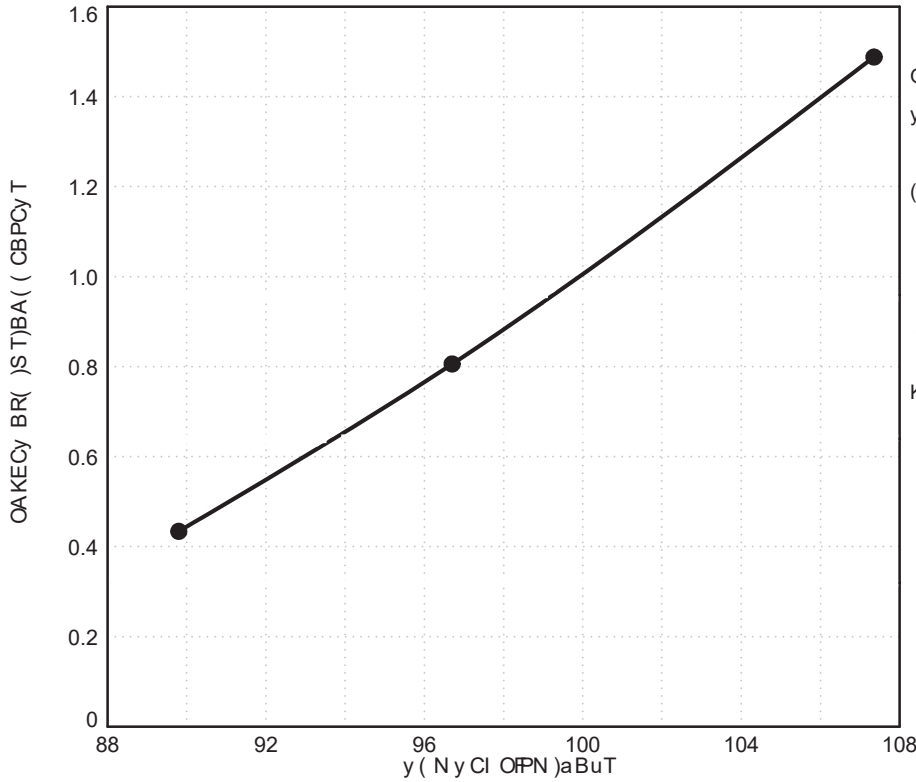
a( AJCBP l UI RC( b l 4. 63552

OPCb UO( LM@50  
uoen@ AH

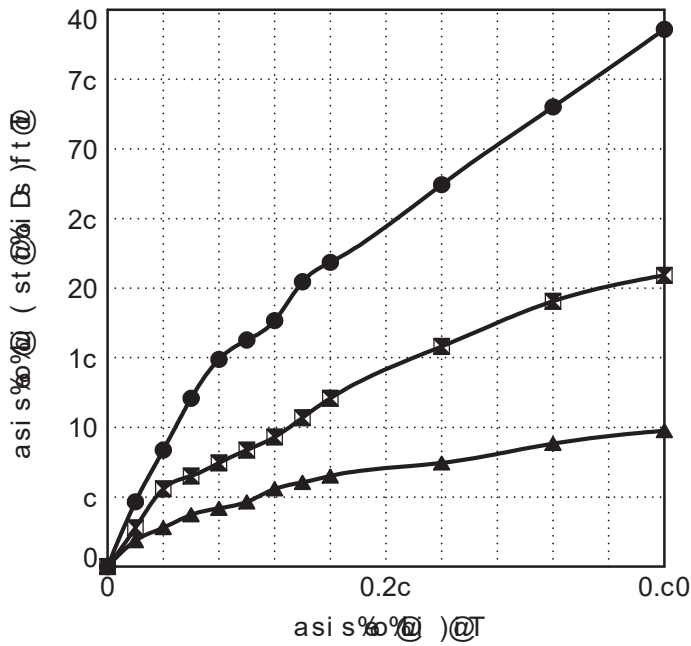
BYFCI Pb 9x Csn7e, f3f p  
KM @, PX

# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>



OLMDs Lr l o%em **B-31 Buak 0.0**  
 yst D@L Lr l o%em **Gandy Snel**  
 ( sk oet b \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 as dsi %u@st \_\_\_\_\_ %  
 K%egsel Y@ @ \_\_\_\_\_ YY \_\_\_\_\_ aY \_\_\_\_\_ aF \_\_\_\_\_



Ook f r s l L.	1	2	7
Ook f r s BLi d @	OLO: sd		
BLk f o D @ l s %Ld	KOPI 698K		
l o X @ M k y en y s i t @ H f DT	127.p	127.p	127.p
Af % @ M k l L @ M s BLi % i % )ST	9.6	9.6	9.6
y en y s i t @ g s r L e s O L o : @ H f DT	10p.7c	96.p0	89.80
l L @ M s BLi % i % )ST			
Kr % e BLk f o D @	10.7	10.9	10.c
PLf 1" Kr % e O L o : @			
OM E h o e l s H ) r g t T	10.10	10.06	9.97
O w s n n ) S T	7.74	2.84	1.61
R s o e @ j ( o % @ ) S T	1.c	0.8	0.4

y en y s i t @ 5 90S 111.7 f D  
 y en y s i t @ 5 9cS 11p.c f D  
 y en y s i t @ 5 100S 127.p f D

BR( 5 90S y s i t @ NA  
 BR( 5 9cS y s i t @ NA  
 BR( 5 100S y s i t @ NA

a ( AUCBPb K e D s u M % i BLM % O L r o e



a ( AUCBP l , l RC( b l 619c224

OFPCb , O ( LM % 20 uons % H A h

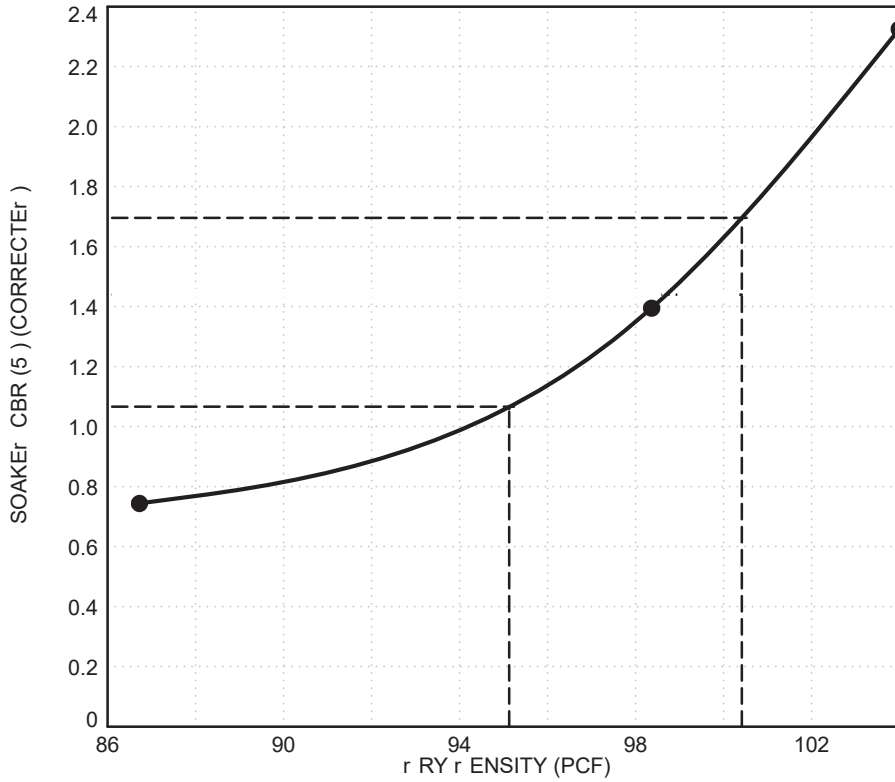
BYFCI Pb p X Ci s e l n H f D KM % @ P z

KRA( KPA( N P C P O K( C I A P G K Y f u O c a K( K P C y u r A l A ( B f K Y( C a A( P. BR( 7 a P( C a A( P. I 619c224 K( B h C u. Y P A l B A. I . 3 a U P C( ( K B A l \_ y K P K P C l a Y K P C. 3 y P 6/10/20



# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>



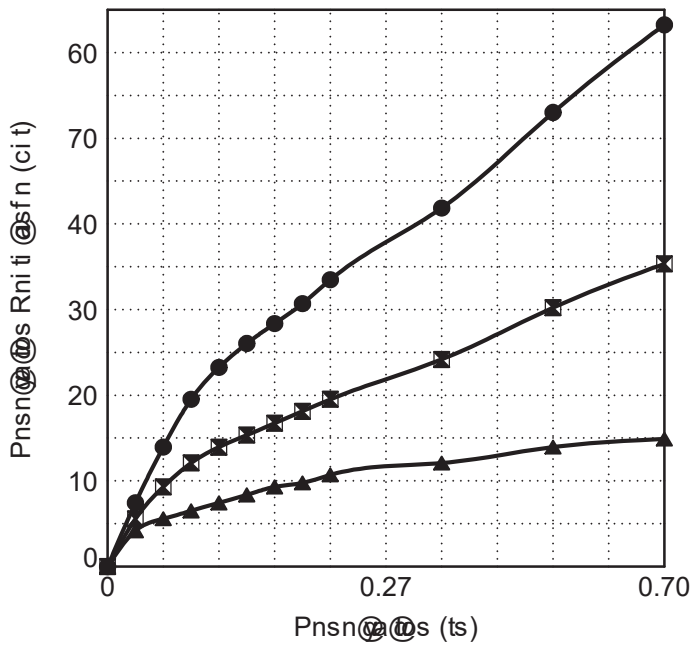
Soyf n oDMA@tal B-39 Bulk 0.0

r ni f ytc@s oDMA@tal Sandy Lean Clay

Rnmayki : \_\_\_\_\_

Phyf ns@tsni \_\_\_\_\_ %

A@bnyg Ltmt@ LL PL PI



Samcln No.	1	2	3
Samcln Cosdt@s	Soaknd		
Comcaf@s Mn@bd	ASTM 698A		
Maxtmum r ye r nsi t@ (cf D)	107.p	107.p	107.p
Oc@um Moti @n Cos@s@5 )	1p.7	1p.7	1p.7
r ye r nsi t@bnDyn Soaktsg, (cf D)	103.99	98.36	86.p2
Moti @n Cos@s@5 )			
Al@y Comcaf@s	18.1	18.7	18.3
Toc 1" Al@y Soaktsg	30.3	31.p	34.7
Suyf haygn., (lbi )	10.07	10.10	10.01
Swnll, (5 )	1.90	1.92	1.94
Bnaytsq Ra@, (5 )	2.3	1.4	0.p

r ye r nsi t@% 905 97.1 cf D

r ye r nsi t@% 975 100.4 cf D

r ye r nsi t@% 1005 107.p cf D

CBR % 905 r nsi t@ 1.1

CBR % 975 r nsi t@ 1.p

CBR % 1005 r nsi t@ NA

PROJECT: Ayf hn Ful@s Cous@Solya

SITE: US Rou@20  
Faen@ OH



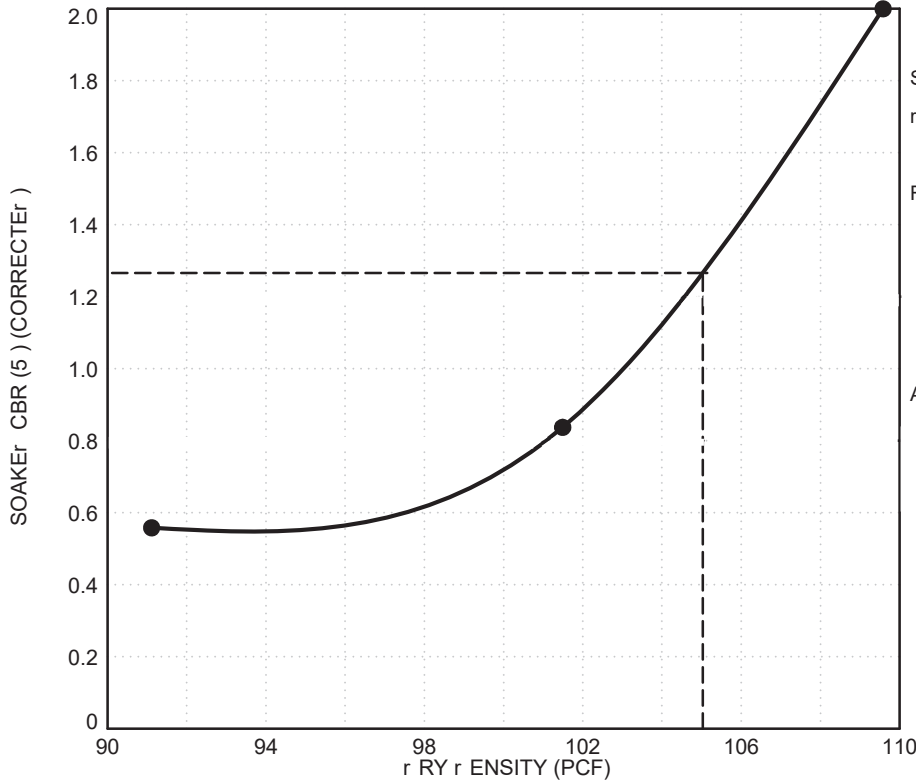
PROJECT NUMBER: N6197224

CLIENT: px Esnyge, Isf .  
Aui @, TX

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CBR 3PT REPORT N6197224 ARCHE FULTON COUN.GPJ TERRACON\_r ATATEMPLATE.Gr T 6/10/20

# CALIFORNIA BEARING RATIO

ASTM D1883-07<sup>2</sup>



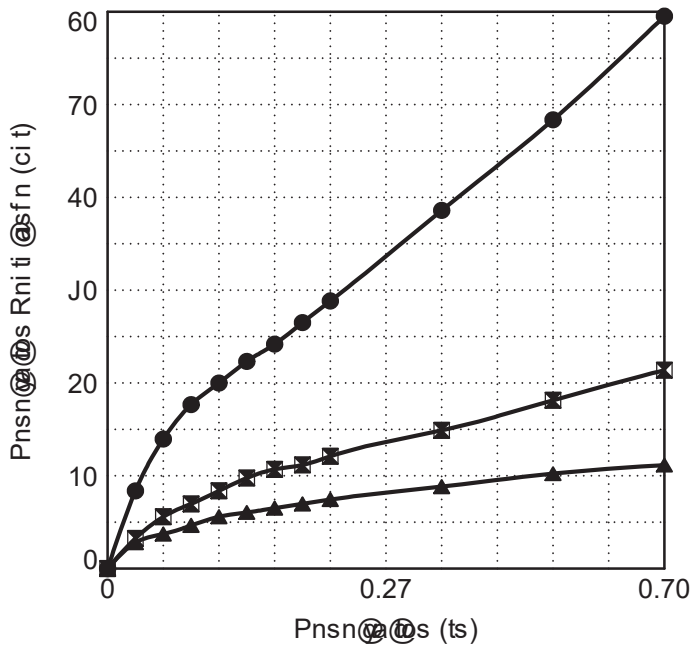
Souy f n oDMA@tal B-44 Bulk 0.0

r ni f ytc@s oDMA@tal Fat Clay with Sand

Rnmayki : \_\_\_\_\_

Phyf ns@tsni \_\_\_\_\_ %

A@bnyg Ltmt@ LL PL PI



Samcln No.	1	2	J
Samcln Cosdt@s	Soaknd		
Comcaf@s Mn@pd	ASTM 698A		
MaXtmum r yer r nsi t@H(cf D)	116.p	116.p	116.p
Oc@um Moti @n Cos@s@5 )	1J.2	1J.2	1J.2
r yer r nsi t@bnDn SoaktsgH(cf D)	109.78	101.49	91.11
Moti @n Cos@s@5 )			
Al@y Comcaf@s	1J.6	1J.6	1J.6
Toc 1" Al@y Soaktsg	27.9	2p.p	27.p
SuyfhaygnH(lbi )	10.00	10.06	9.99
SwnllH(5 )	2.J6	2.p9	1.p2
Bnaytsg Ra@H(5 )	2.0	0.8	0.6

r yer r nsi t@% 905 107.0 cfD

r yer r nsi t@% 975 110.9 cfD

r yer r nsi t@% 1005 116.p cfD

CBR % 905 r nsi t@ 1.J

CBR % 975 r nsi t@ NA

CBR % 1005 r nsi t@ NA

PROEJECT: Ayfhn Ful@s Cous@Soly

SITE: , S Rou@20  
Faen@HOh



12460 PlaVa r y  
PaymahOh

PROEJECT N, MBER: N6197224

CLIENT: pXEsngeHsf.  
Aui @HTz

LABORATORY TESTS ARE NOT CALI: IF SEPARATE: FROM ORI3 INAL REPORT. CBR JPT REPORT N6197224 ARChE F. LTON CO. N.3.PU TERRACON\_r ATATEMPLATE.3.r T. 6/10/20

**Client**

7x Energy, Inc.  
Austin, TX

**Project**

Arche Fulton County Solar

**Sample Submitted By:** Terracon (N6)

**Date Received:** 5/20/2020

**Lab No.:** 20-0579

**Results of Corrosion Analysis**

	Sample Number	--	--	--	--
	Sample Location	B-01	B-08	B-10	B-11
	Sample Depth (ft.)	0.0-4.0	0.0-4.0	0.0-4.0	0.0-4.0
pH Analysis, ASTM G 51		7.06	7.16	7.17	7.09
Water Soluble Sulfate (SO <sub>4</sub> ), ASTM C 1580 (ppm)		81	78	133	34
Sulfides, AWWA 4500-S D, (mg/kg)		Nil	Nil	Nil	Nil
Chlorides, ASTM D 512, (ppm)		28	55	50	27
Red-Ox, ASTM G 200, (mV)		+674	+675	+674	+680
Resistivity, ASTM G 187, (ohm-cm)		2144	1876	3350	6700

**Analyzed By:**



Trisha Campo  
Chemist

**Client**

7x Energy, Inc.  
Austin, TX

**Project**

Arche Fulton County Solar

**Sample Submitted By:** Terracon (N6)

**Date Received:** 5/20/2020

**Lab No.:** 20-0579

**Results of Corrosion Analysis**

Sample Number	--	--	--	--
Sample Location	B-13	B-20	B-26	B-28
Sample Depth (ft.)	0.0-4.0	0.0-4.0	0.0-4.0	0.0-4.0
pH Analysis, ASTM G 51	7.59	7.47	7.49	7.29
Water Soluble Sulfate (SO <sub>4</sub> ), ASTM C 1580 (ppm)	94	119	69	79
Sulfides, AWWA 4500-S D, (mg/kg)	Nil	Nil	Nil	Nil
Chlorides, ASTM D 512, (ppm)	33	58	42	50
Red-Ox, ASTM G 200, (mV)	+678	+675	+674	+676
Resistivity, ASTM G 187, (ohm-cm)	3685	1474	2144	3551

**Analyzed By:**



Trisha Campo  
Chemist

**Client**

7x Energy, Inc.  
Austin, TX

**Project**

Arche Fulton County Solar

**Sample Submitted By:** Terracon (N6)

**Date Received:** 5/20/2020

**Lab No.:** 20-0579

**Results of Corrosion Analysis**

	Sample Number	--	--	--	--
	Sample Location	B-32	B-36	B-38	B-42
	Sample Depth (ft.)	0.0-4.0	0.0-4.0	0.0-4.0	0.0-4.0
pH Analysis, ASTM G 51		7.69	7.44	7.71	7.65
Water Soluble Sulfate (SO <sub>4</sub> ), ASTM C 1580 (ppm)		72	70	103	165
Sulfides, AWWA 4500-S D, (mg/kg)		Nil	Nil	Nil	Nil
Chlorides, ASTM D 512, (ppm)		38	37	40	60
Red-Ox, ASTM G 200, (mV)		+677	+675	+676	+675
Resistivity, ASTM G 187, (ohm-cm)		3685	1943	3484	2479

**Analyzed By:**



Trisha Campo  
Chemist

The tests were performed in general accordance with applicable ASTM and AWWA test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

**Client**

7x Energy, Inc.  
Austin, TX

**Project**

Arche Fulton County Solar

**Sample Submitted By:** Terracon (N6)

**Date Received:** 5/20/2020

**Lab No.:** 20-0579

**Results of Corrosion Analysis**

Sample Number	--	--
Sample Location	B-45	B-50
Sample Depth (ft.)	0.0-4.0	0.0-4.0
pH Analysis, ASTM G 51	7.74	7.68
Water Soluble Sulfate (SO <sub>4</sub> ), ASTM C 1580 (ppm)	82	148
Sulfides, AWWA 4500-S D, (mg/kg)	Nil	Nil
Chlorides, ASTM D 512, (ppm)	75	40
Red-Ox, ASTM G 200, (mV)	+677	+676
Resistivity, ASTM G 187, (ohm-cm)	3752	2747

**Analyzed By:**



Trisha Campo  
Chemist



21239 FM529 Rd., Bldg. F  
 Cypress, TX 77433  
 Tel: 281-985-9344  
 Fax: 832-427-1752  
[info@geothermusa.com](mailto:info@geothermusa.com)  
<http://www.geothermusa.com>

June 10, 2020

**Terracon Consultants**  
 12460 Plaza Drive  
 Cleveland, OH 44130  
**Attn: Daniel R. Pratt, P.E., P.G.**

**Re: Thermal Analysis of Native Soil Samples  
Arche Fulton County Solar Project – Fayette, OH (Project No. N6195224)**

The following is the report of thermal dryout characterization tests conducted on fourteen (14) Shelby tube samples and fourteen (14) bulk samples of native soil from the referenced project sent to our laboratory.

**Thermal Resistivity Tests:** The tube samples were tested “as is”. The bulk samples were tested at the ‘optimum’ moisture content and at 85% of the maximum dry density ***provided by Terracon.*** The tests were conducted in accordance with the IEEE standard 442-2017. The results are tabulated below and the thermal dry out curves are presented in **Figures 1 to 14.**

**Sample ID, Description, Thermal Resistivity, Moisture Content and Density**

Sample ID	Compaction Effort (%)	Description (Terracon)	Thermal Resistivity (°C-cm/W)		Moisture Content (%)	Dry Density (lb/ft <sup>3</sup> )
			Wet	Dry		
B-5	85	Brown, Sandy Lean Clay	86	214	16	94
	Tube		71	168	19	103
B-7	85	Brown, Sandy Lean Clay	89	239	17	92
	Tube		73	171	14	102
B-9	85	Brown, Sandy Lean Clay	86	237	17	93
	Tube		71	161	22	104

**Sample ID, Description, Thermal Resistivity, Moisture Content and Density**

Sample ID	Compaction Effort (%)	Description (Terracon)	Thermal Resistivity (°C-cm/W)		Moisture Content (%)	Dry Density (lb/ft <sup>3</sup> )
			Wet	Dry		
B-11	85	Brown, Sandy Lean Clay	94	258	17	91
	Tube		85	165	17	104
B-14	85	Brown, Sandy Lean Clay	89	285	19	87
	Tube		70	141	19	109
B-23	85	Brown, Fat Clay	97	291	22	86
	Tube		88	180	22	102
B-26	85	Brown, Sandy Lean Clay	108	266	17	90
	Tube		90	201	22	99
B-28	85	Brown, Sandy Lean Clay	91	190	13	100
	Tube		90	229	28	95
B-30	85	Brown, Sandy Lean Clay	90	184	13	101
	Tube		70	167	25	102
B-33	85	Brown, Sandy Lean Clay	102	263	17	90
	Tube		79	150	20	107
B-38	85	Brown, Sandy Silty Clay	100	250	18	91
	Tube		82	169	21	105
B-42	85	Brown, Lean Clay with Sand	85	266	18	90
	Tube		78	175	28	101
B-45	85	Brown, Sandy Lean Clay	98	186	13	100
	Tube		82	178	24	101
B-50	85	Brown, Sandy Lean Clay	95	197	13	99
	Tube		84	236	28	95





**Comments:** The thermal characteristic depicted in the dryout curves apply for the soils at their respective test dry density.

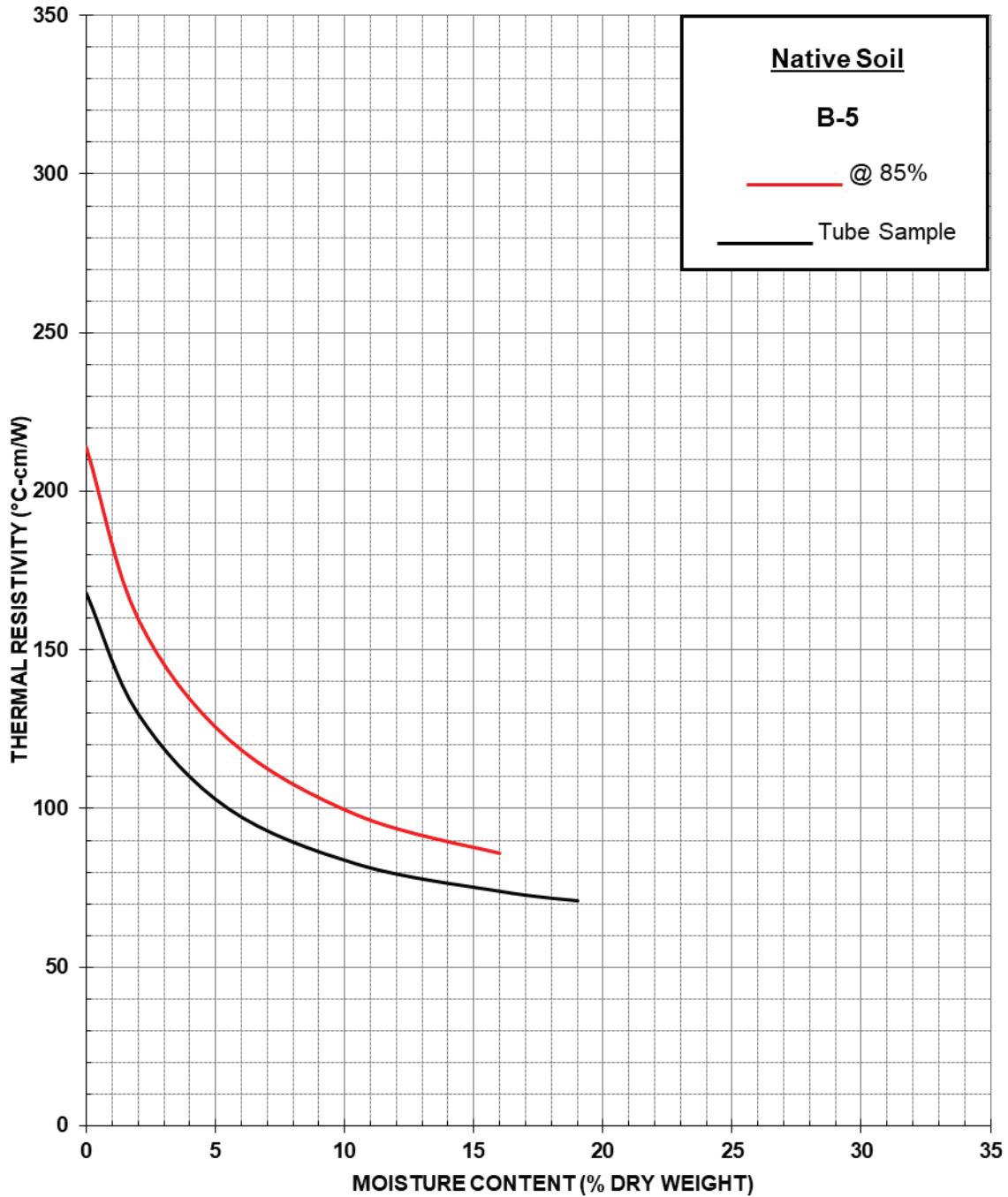
Please contact us if you have any questions or if we can be of further assistance.

***Geotherm USA***

A handwritten signature in black ink, appearing to read "Nimesh Patel", is written over the printed name.

Nimesh Patel

### THERMAL DRYOUT CURVES

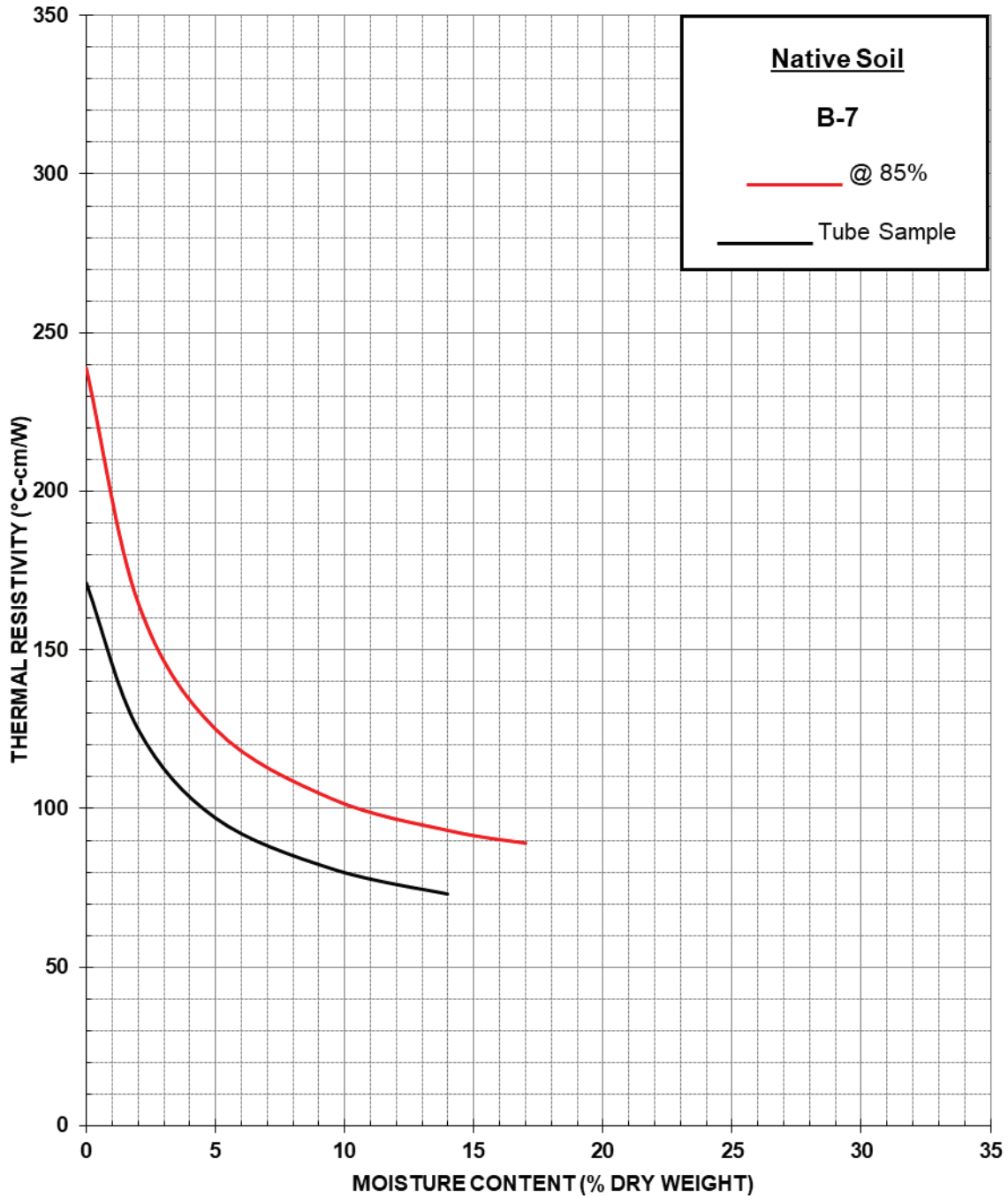


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

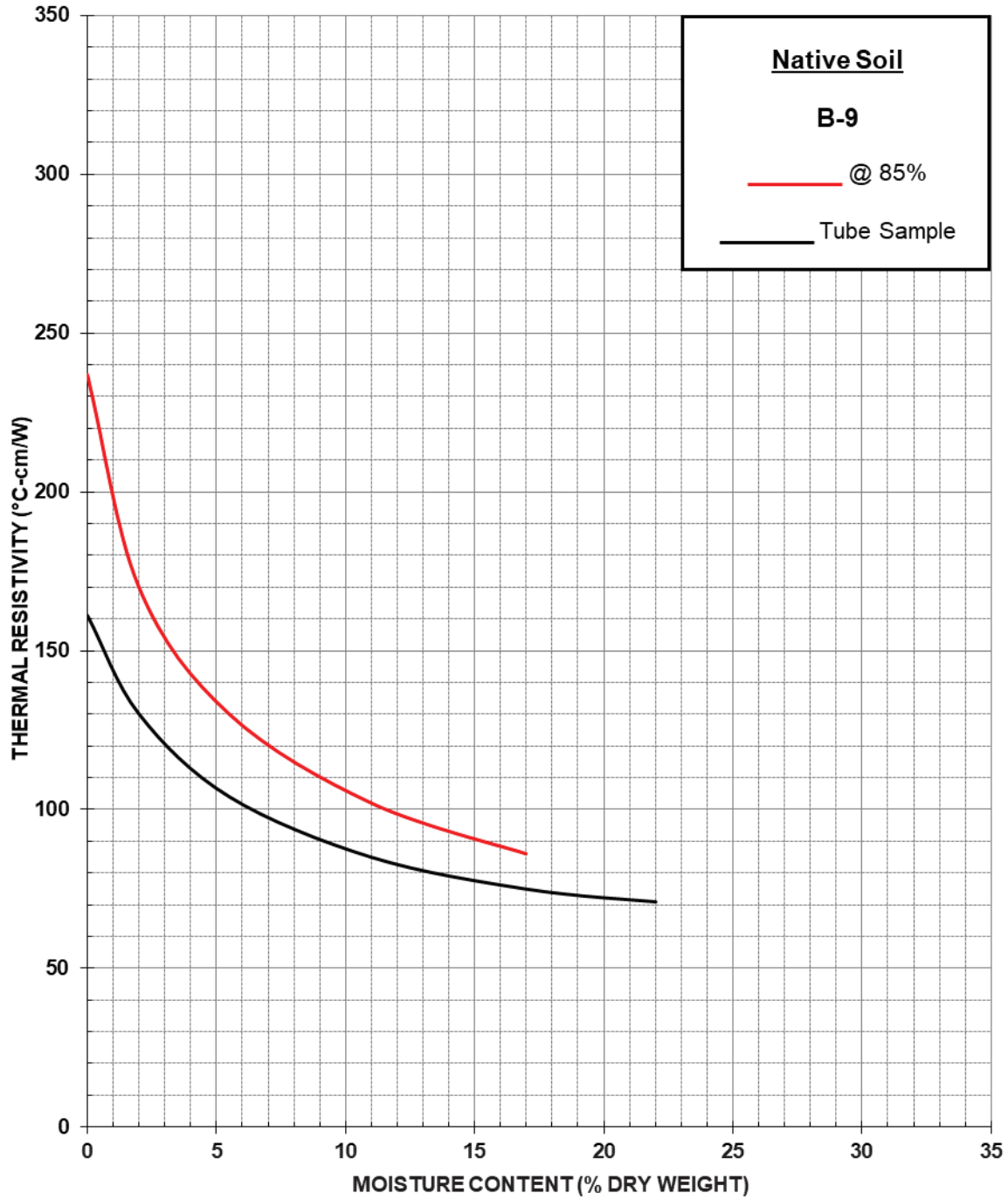


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

**THERMAL DRYOUT CURVES**

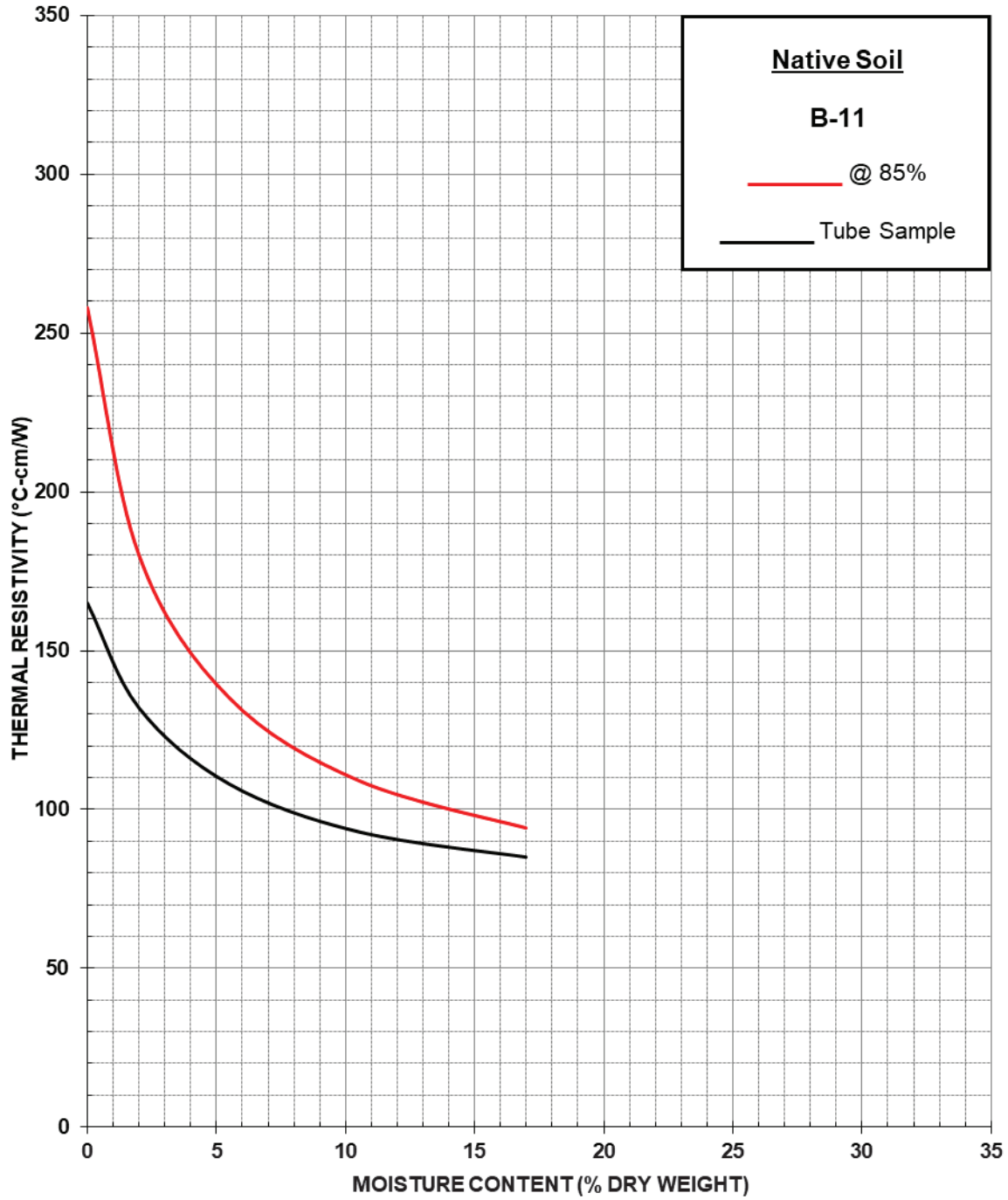


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

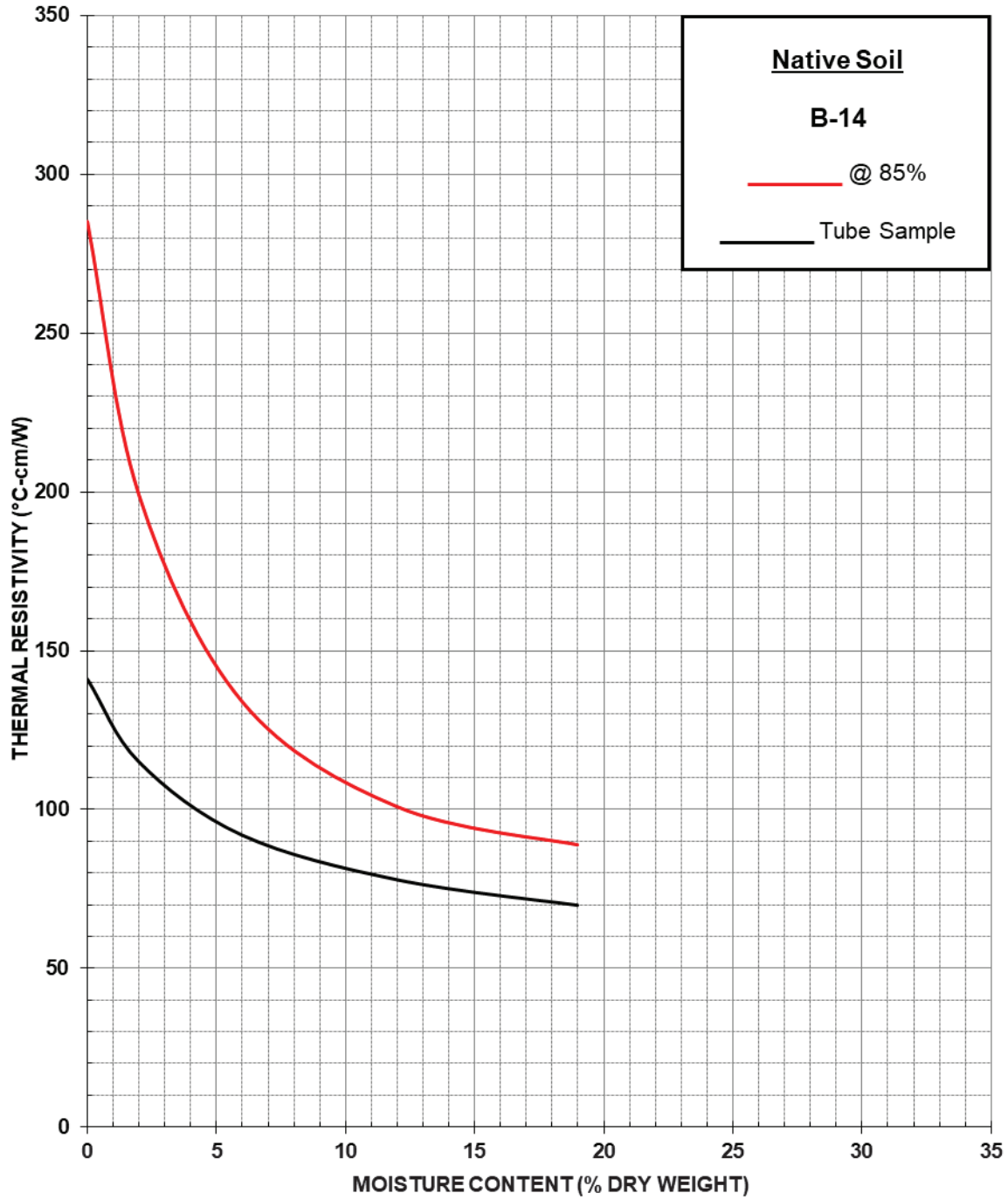


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

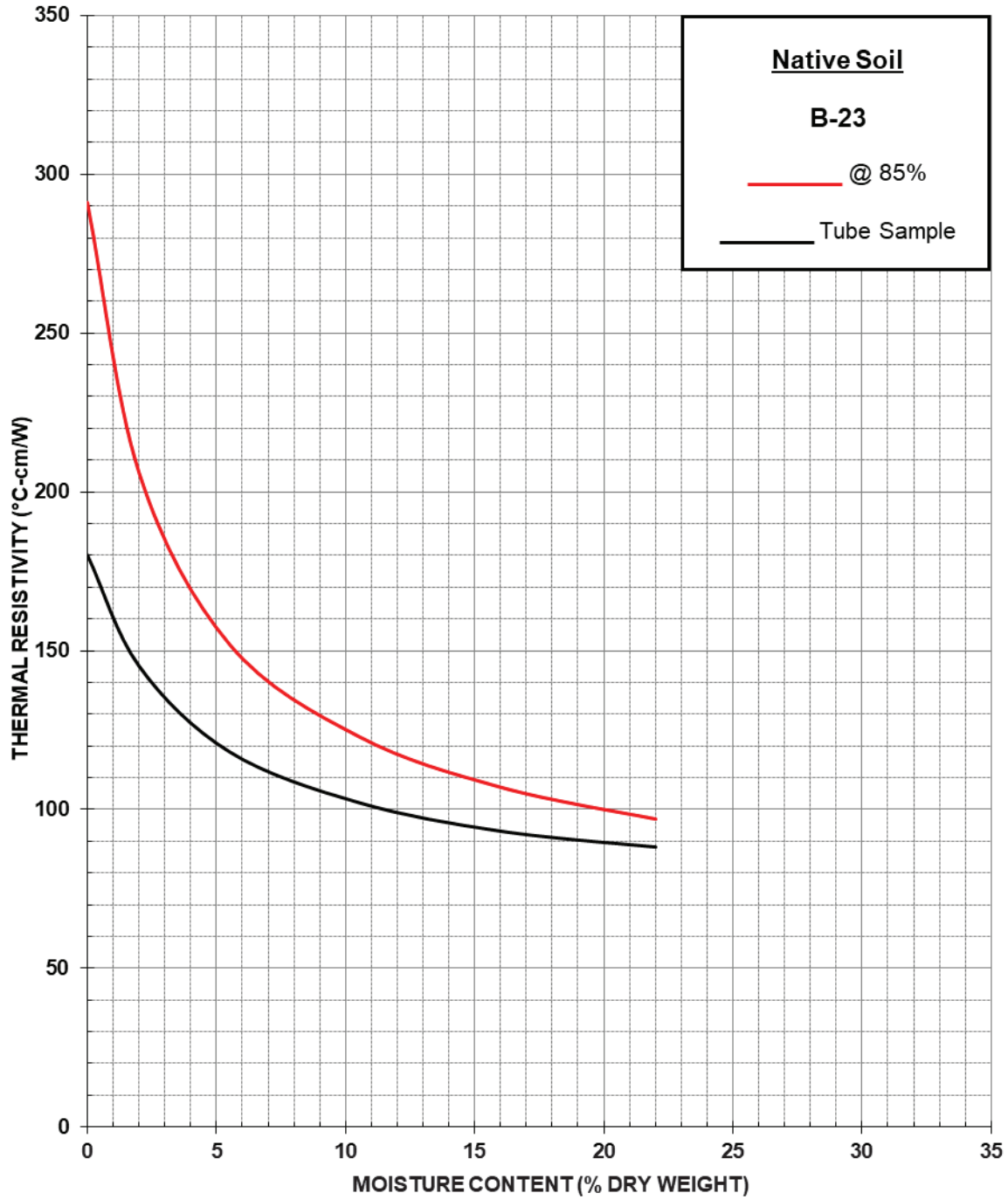


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

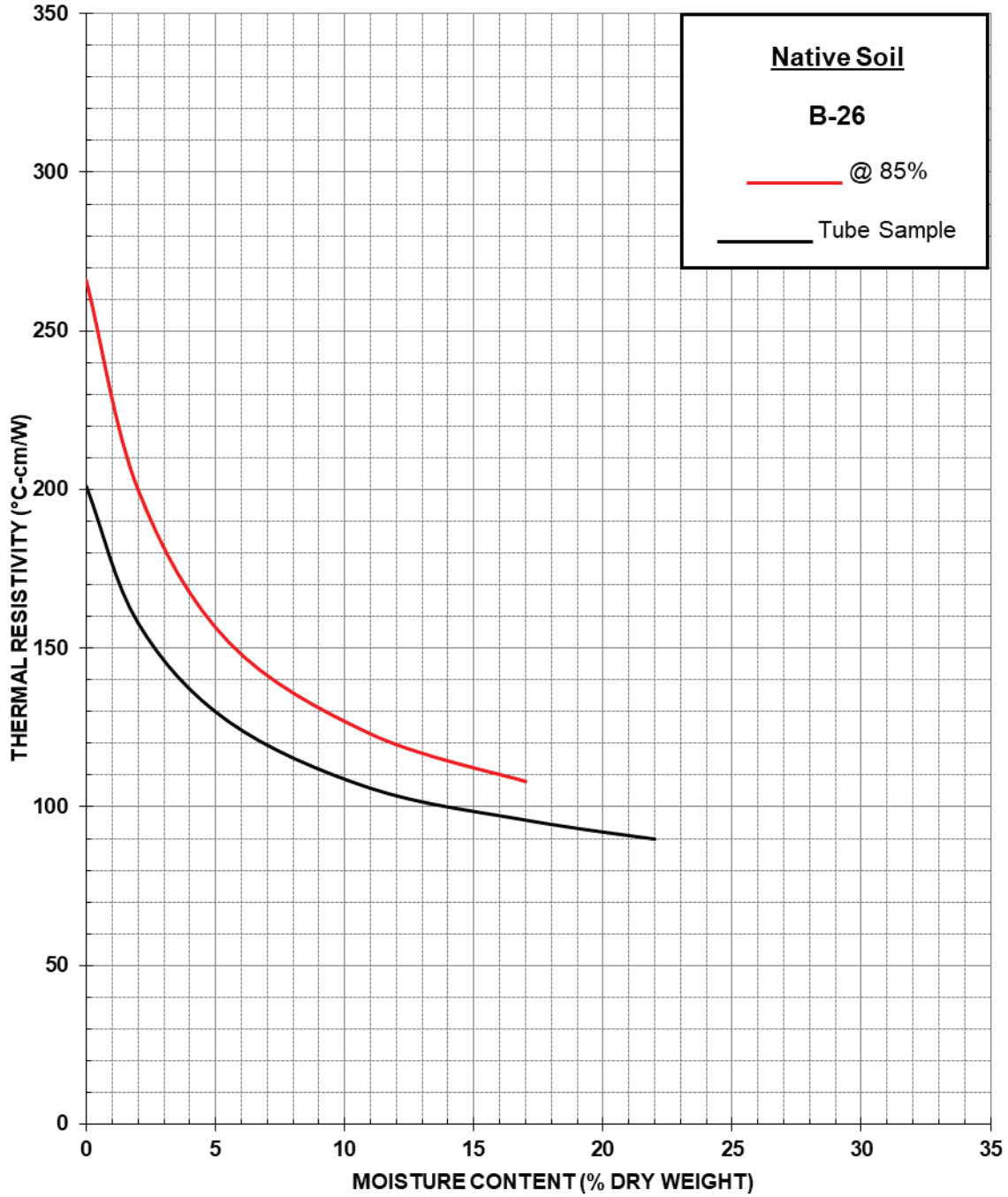


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES



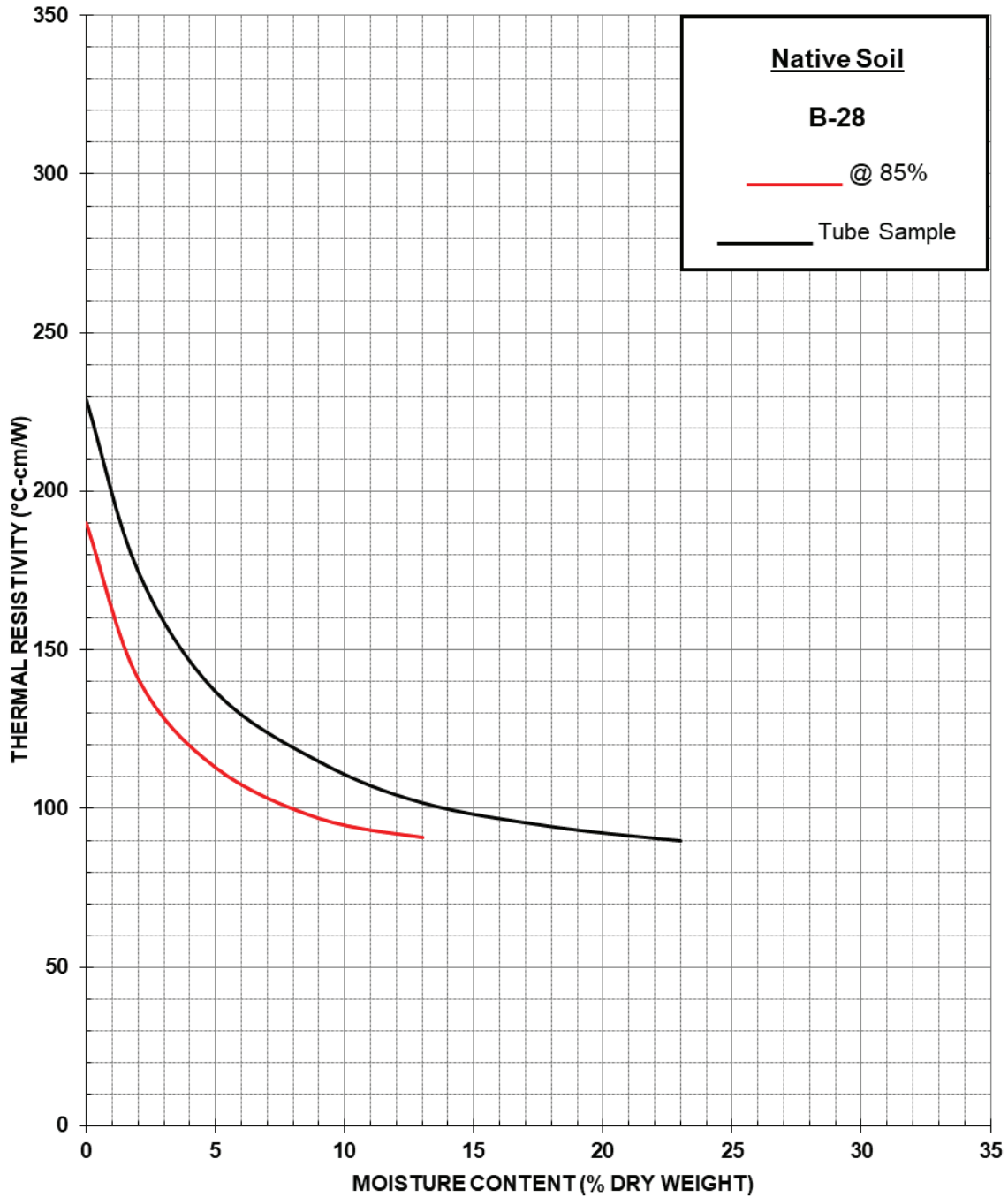
Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH



### THERMAL DRYOUT CURVES

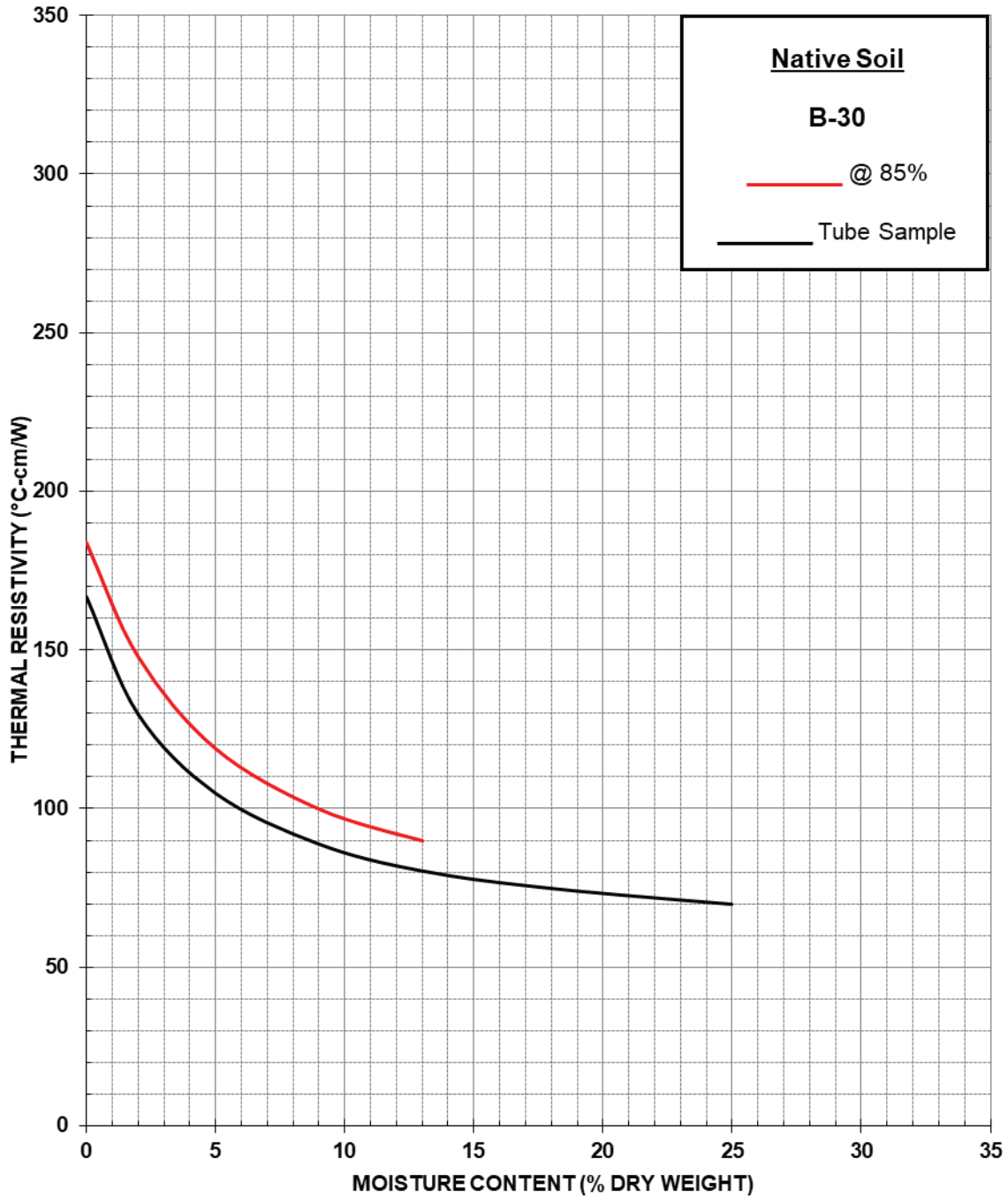


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

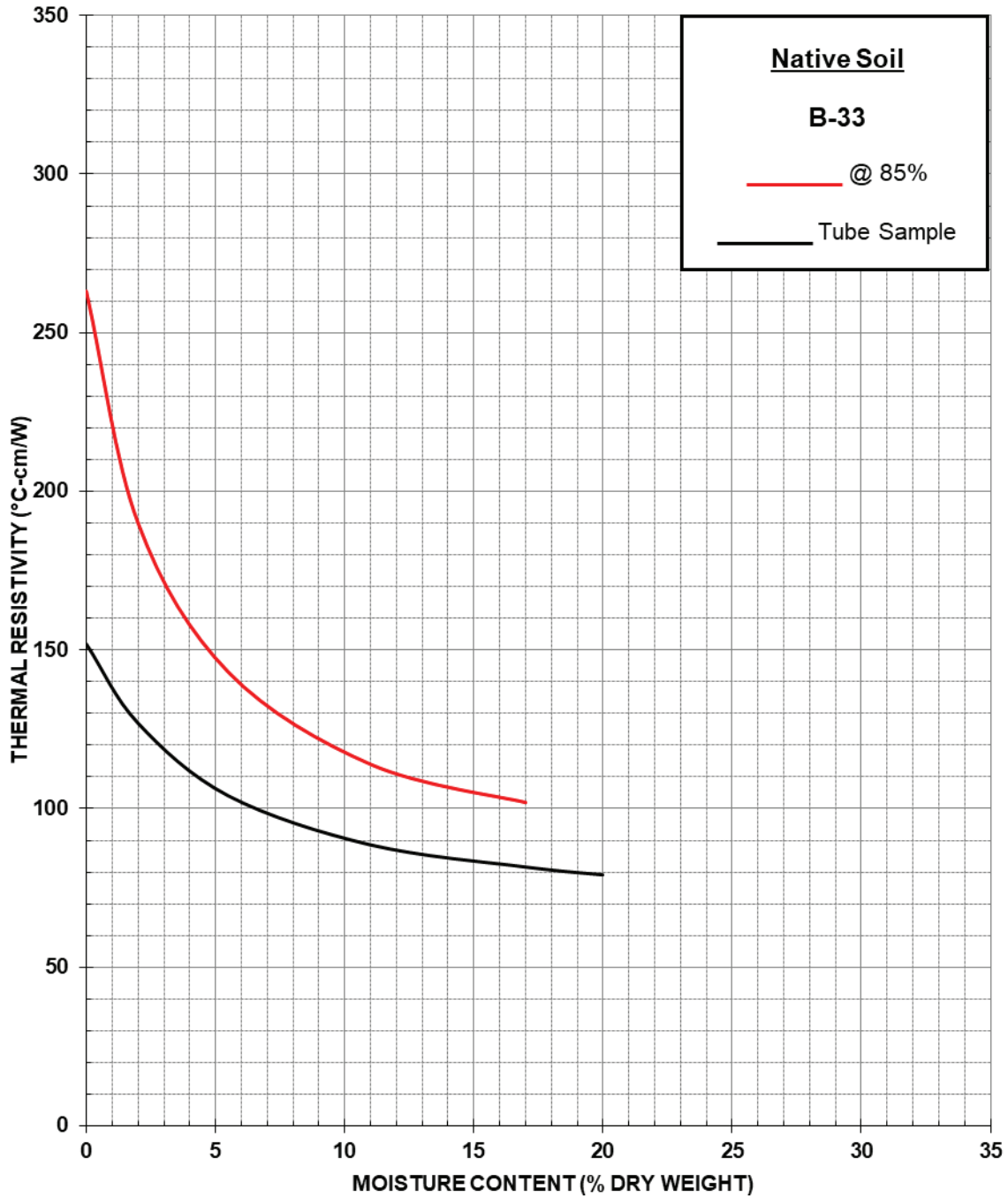


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

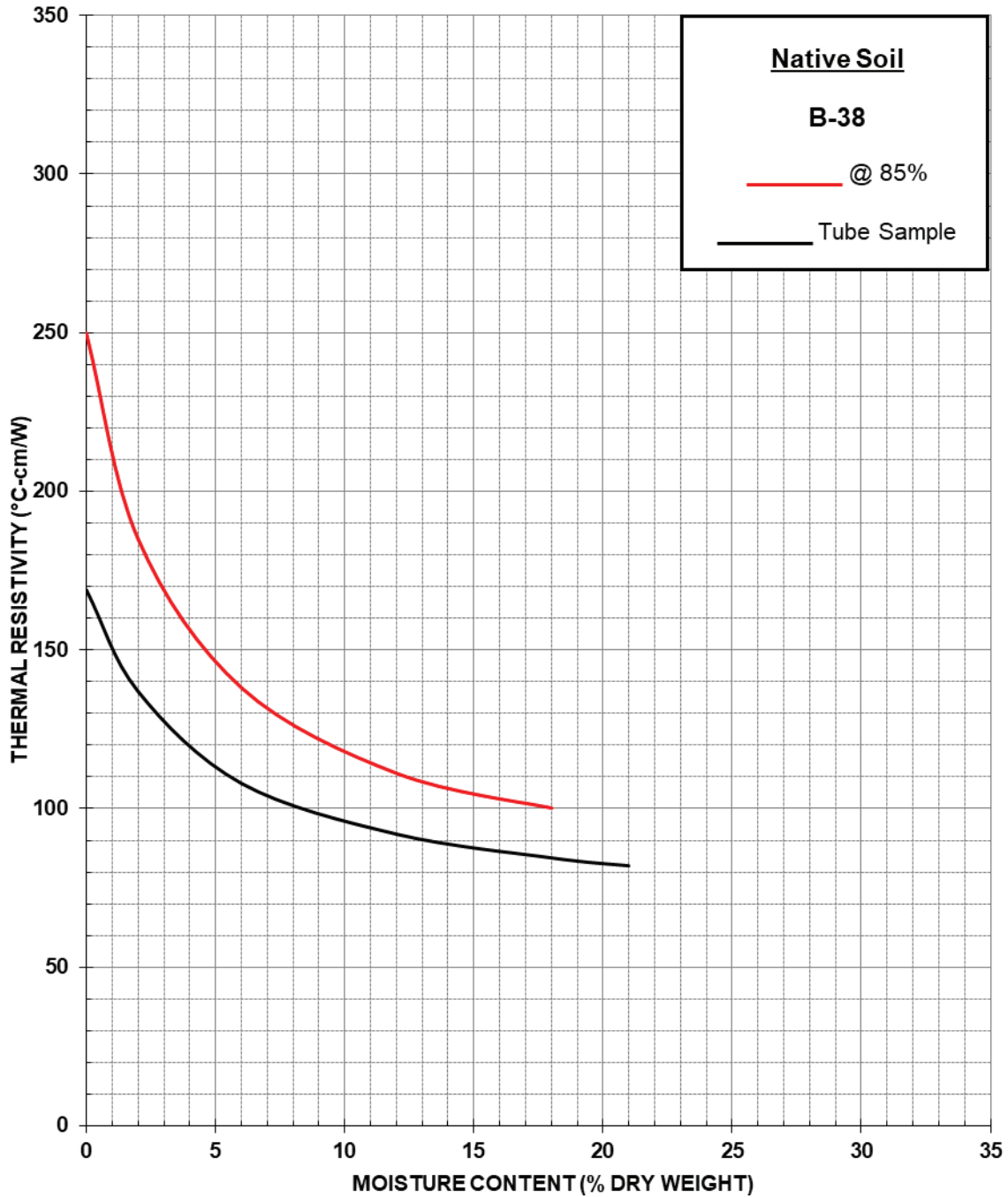


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

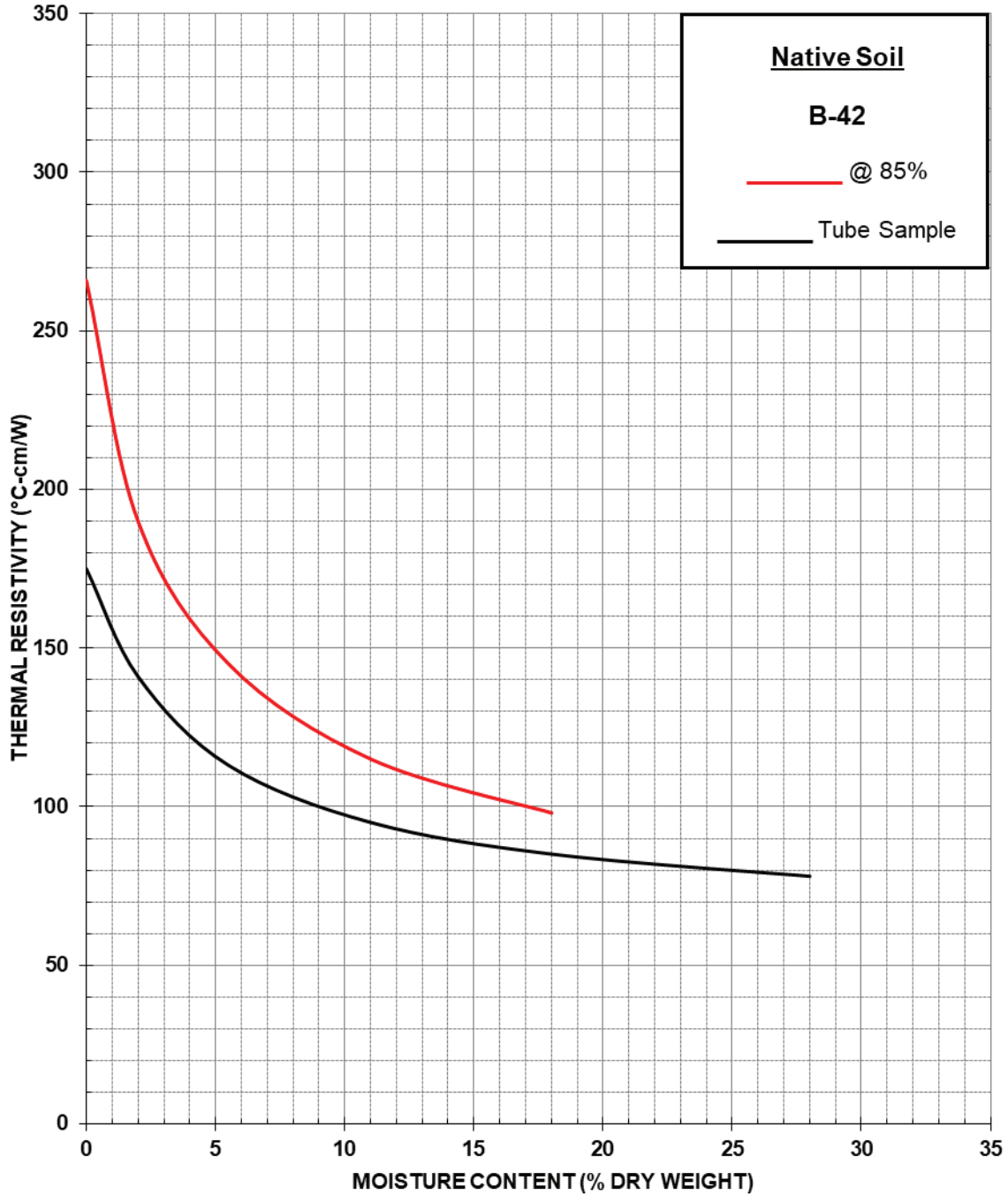


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

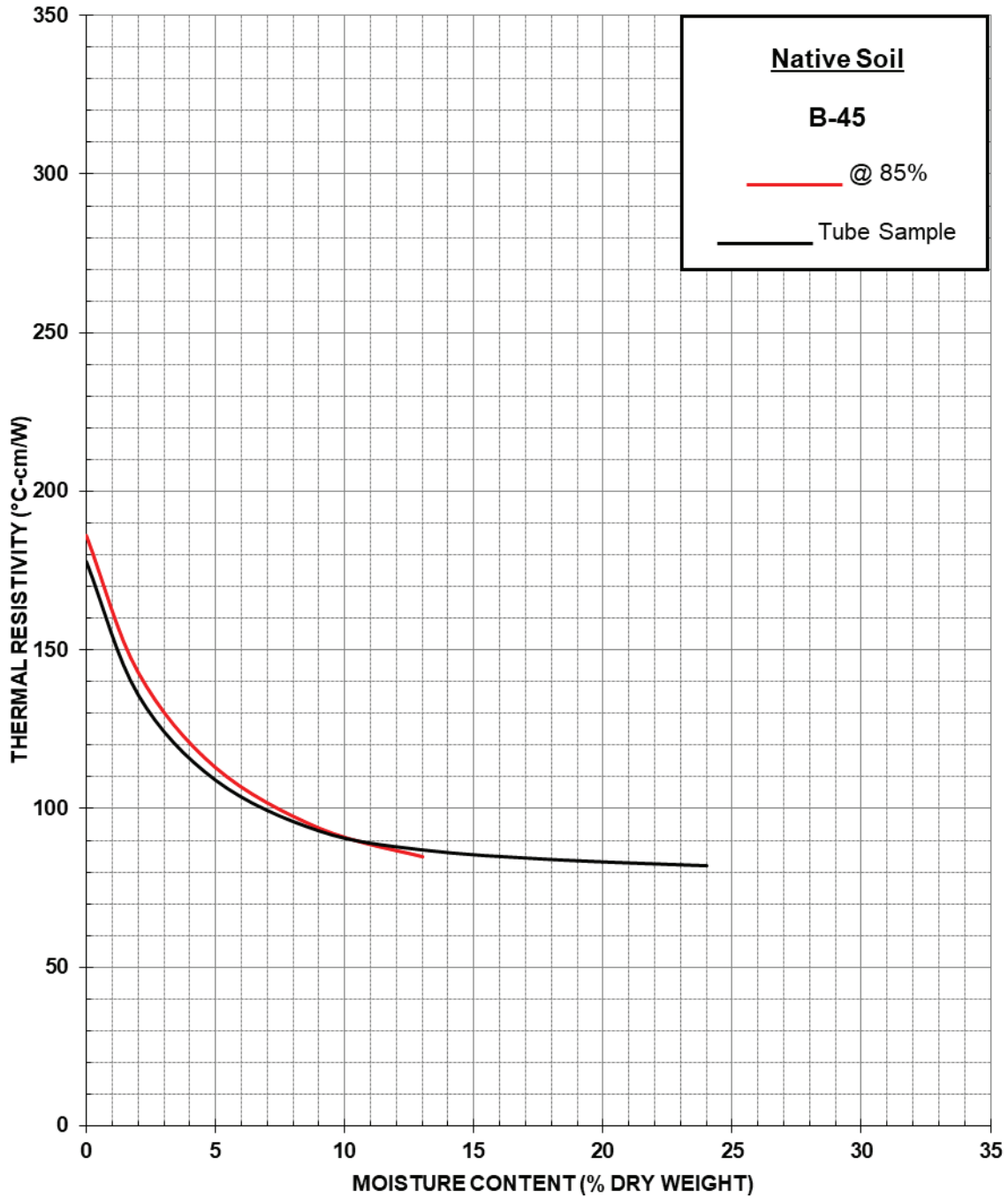


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES

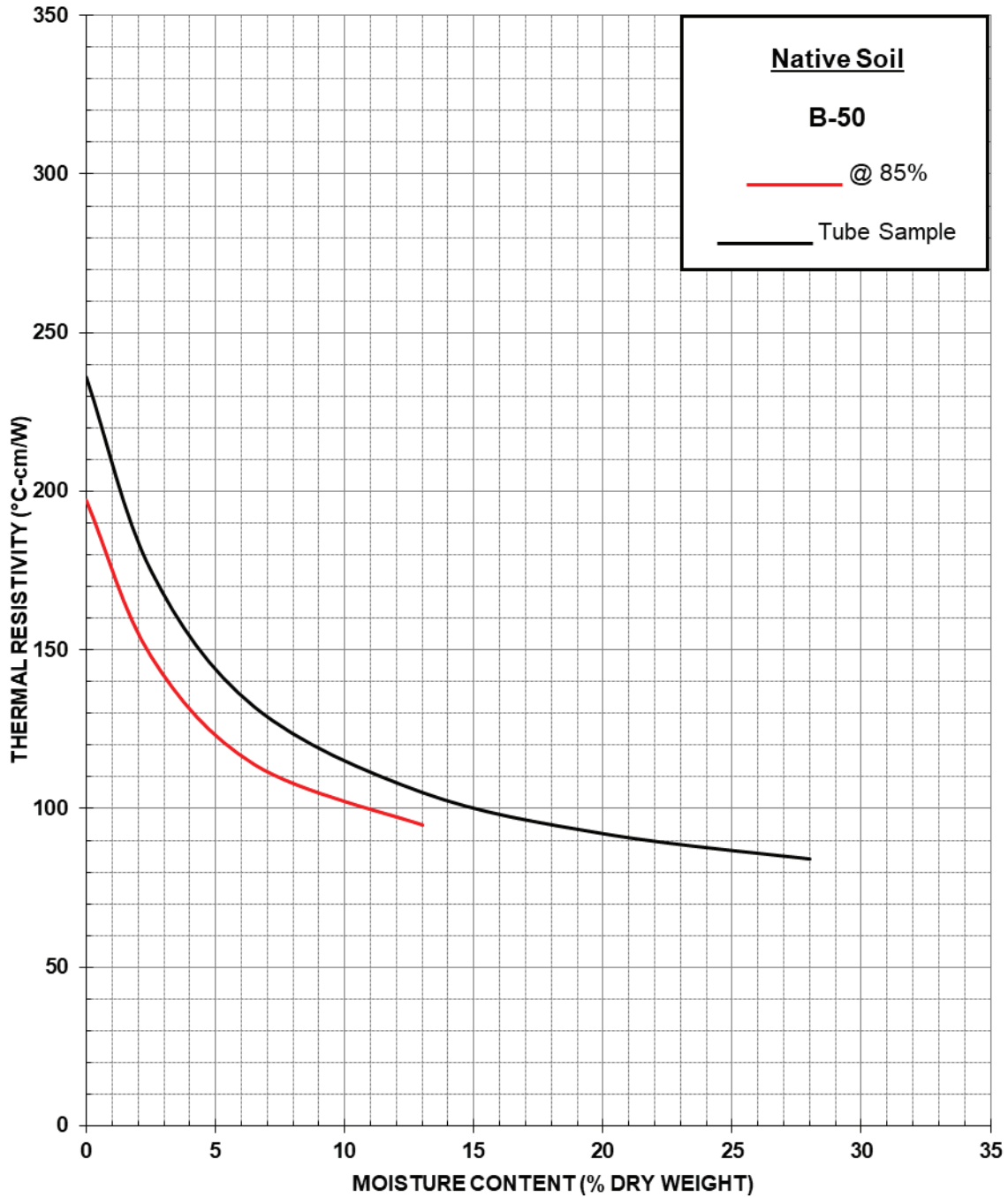


Terracon Consultants, Inc. (Project No. N6195224)

Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

### THERMAL DRYOUT CURVES



Terracon Consultants, Inc. (Project No. N6195224)

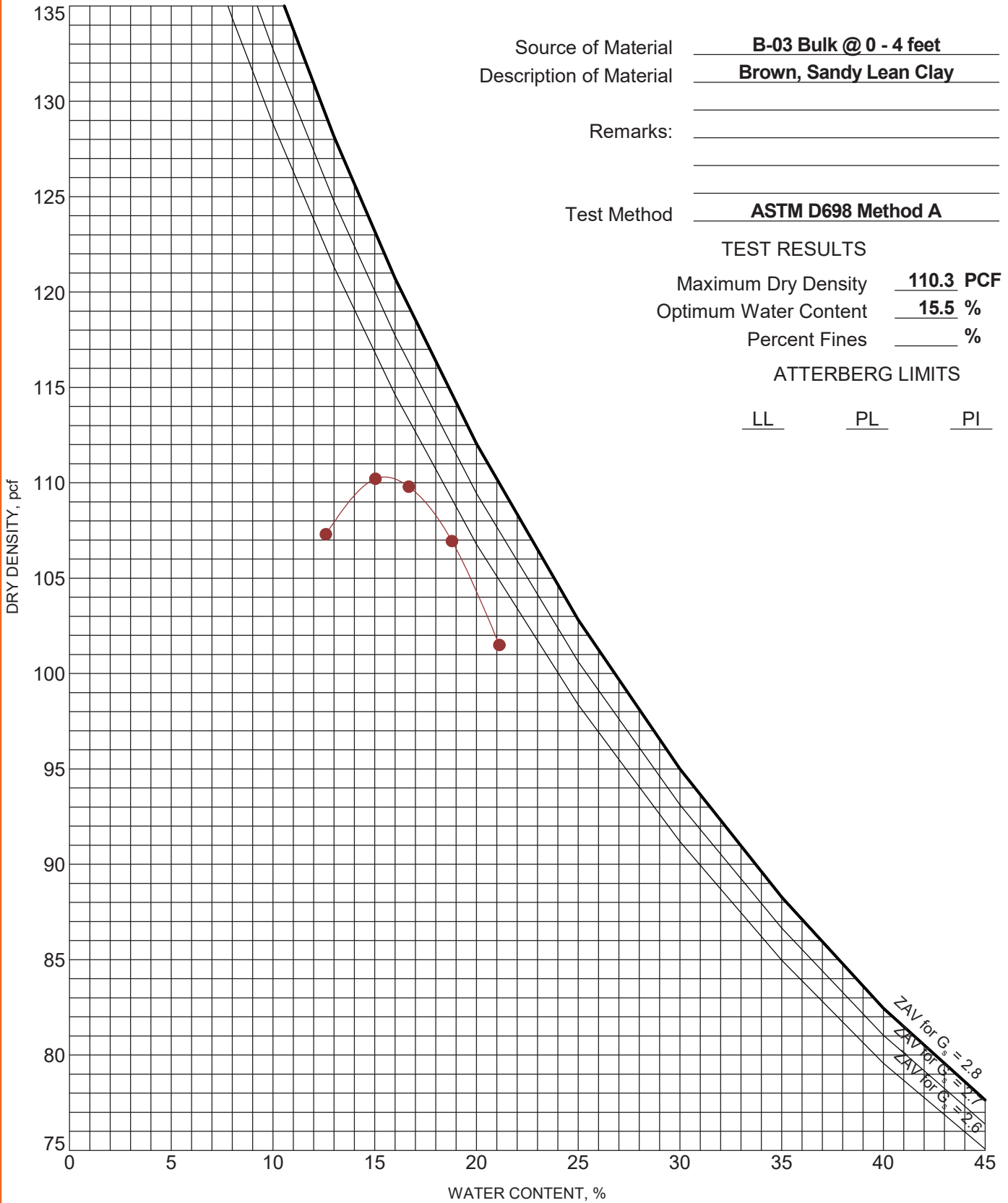
Thermal Analysis of Native Soil Samples

Arche Fulton County Solar Project – Fayette, OH

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



PROJECT NUMBER: N6195224

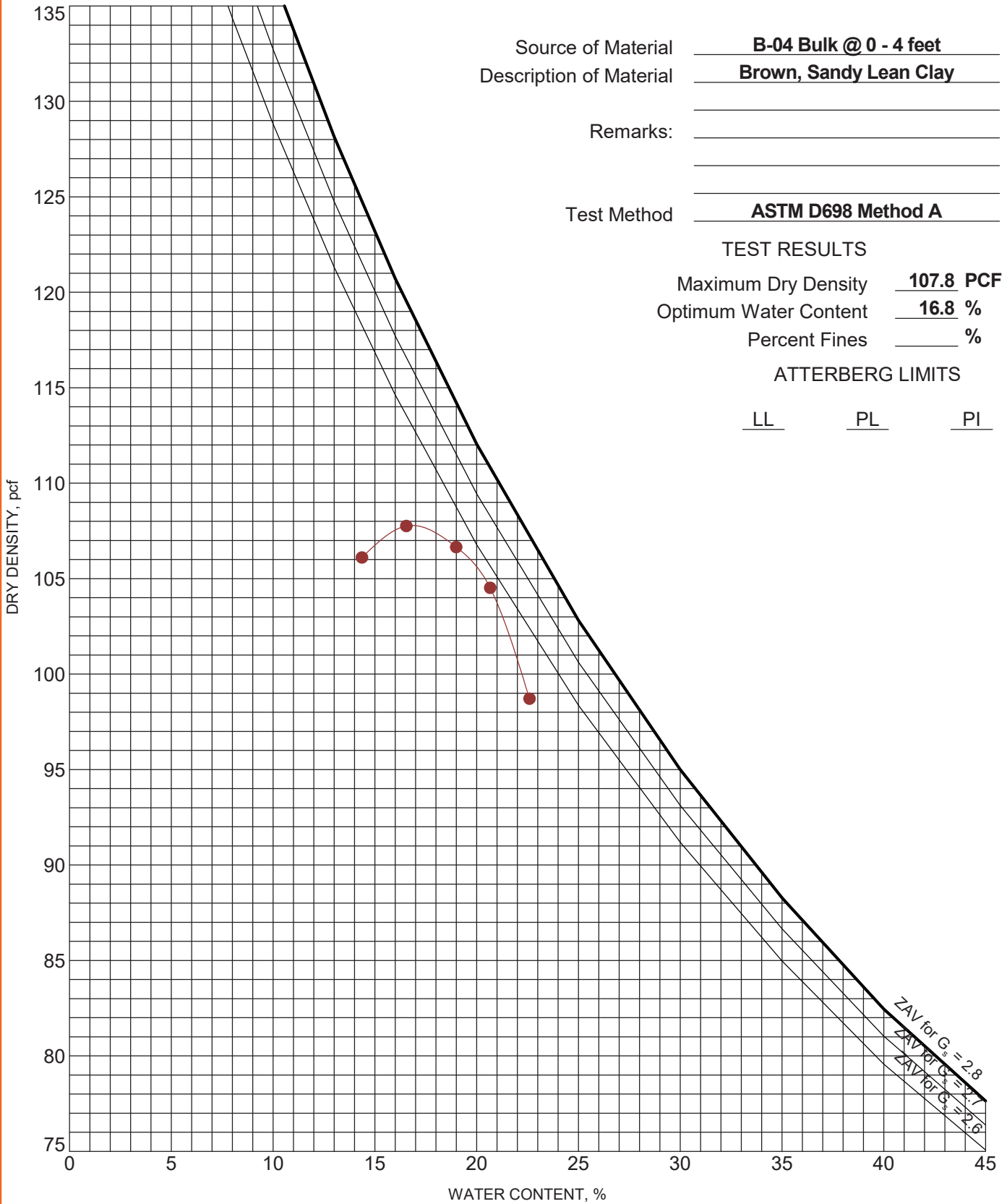
CLIENT: 7x Energy, Inc.  
Austin, TX



# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-04 Bulk @ 0 - 4 feet  
 Description of Material Brown, Sandy Lean Clay  
 Remarks: \_\_\_\_\_  
 Test Method ASTM D698 Method A

**TEST RESULTS**

Maximum Dry Density 107.8 PCF  
 Optimum Water Content 16.8 %  
 Percent Fines \_\_\_\_\_ %

**ATTERBERG LIMITS**

LL      PL      PI

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

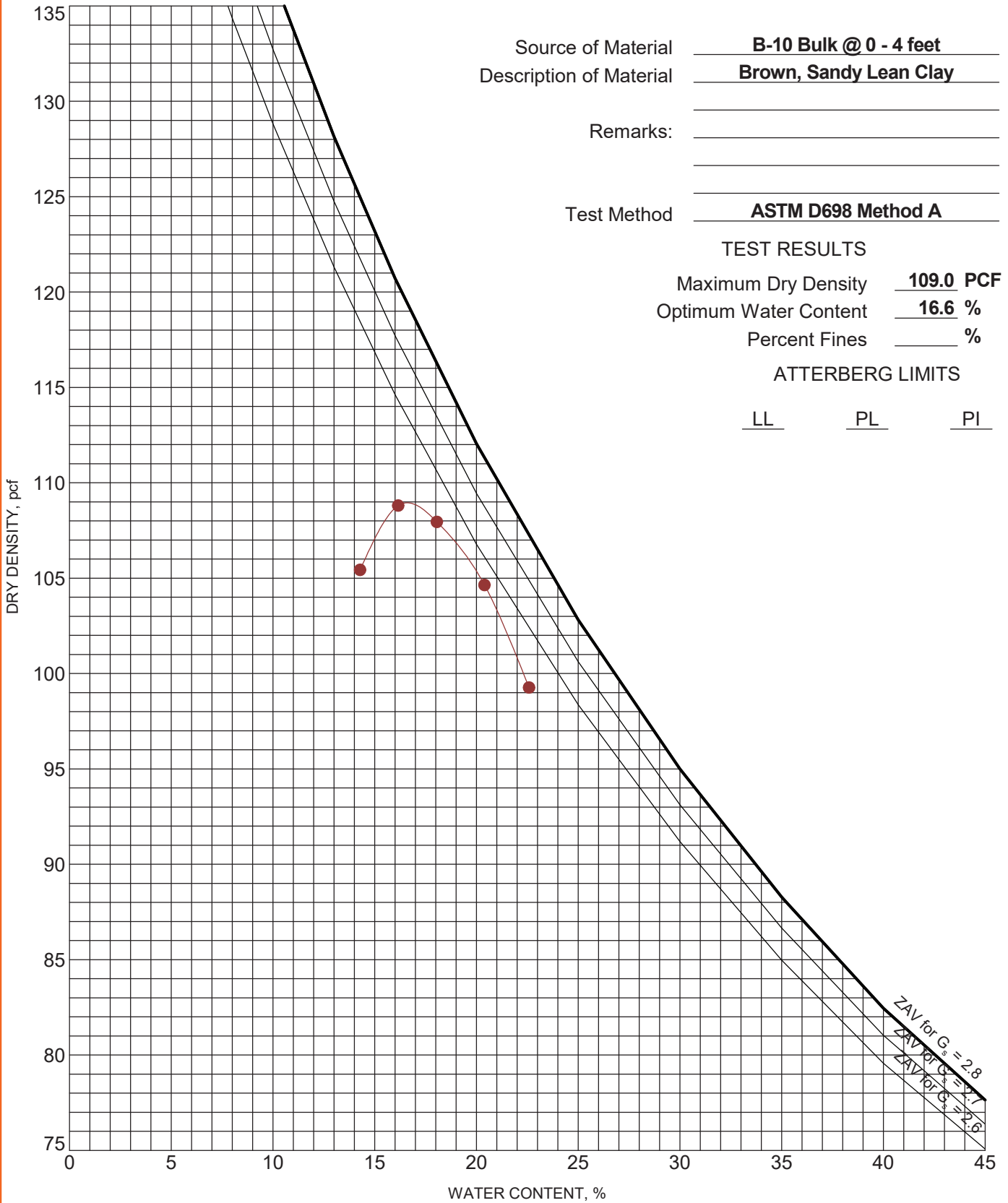
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

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PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

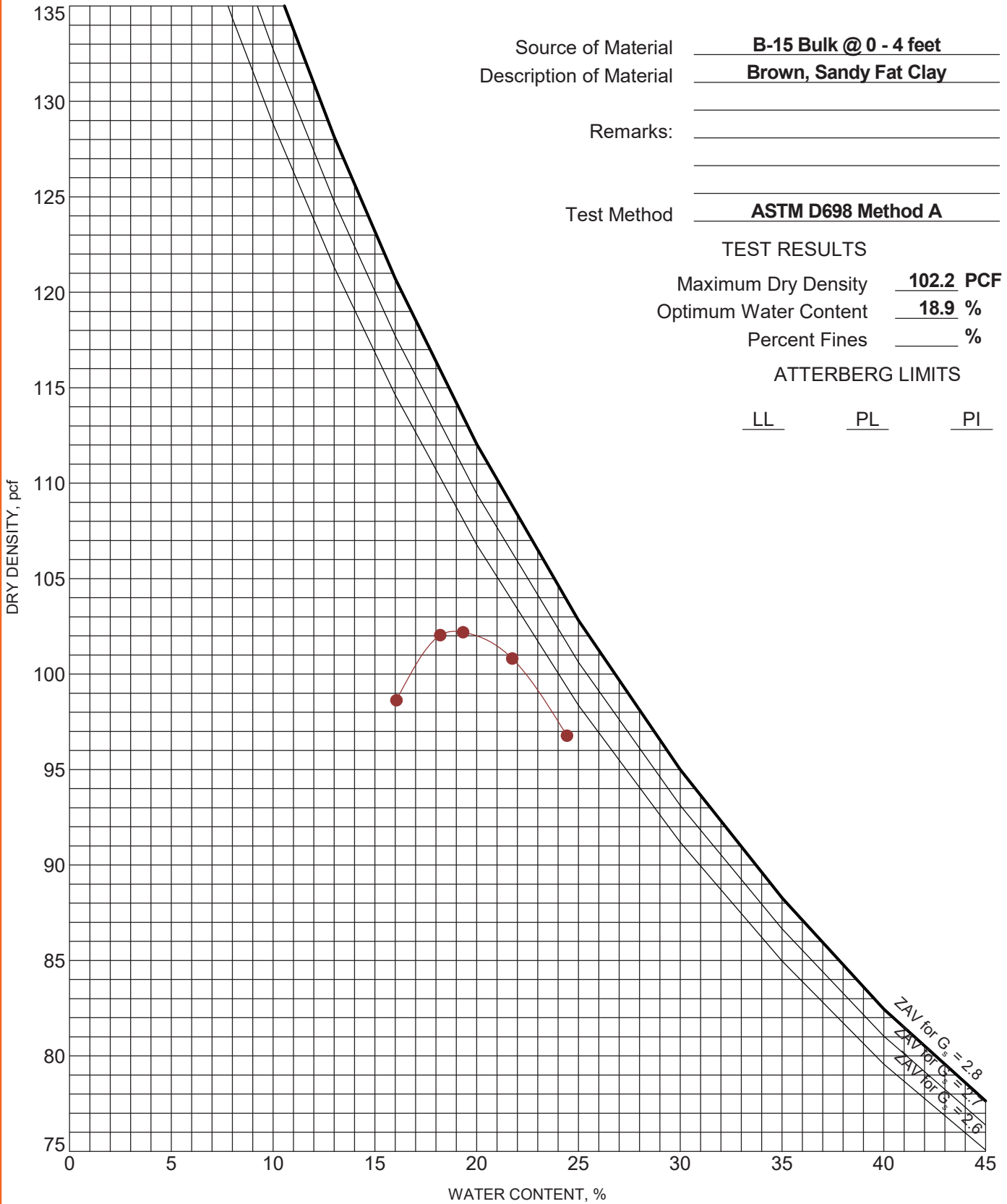
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

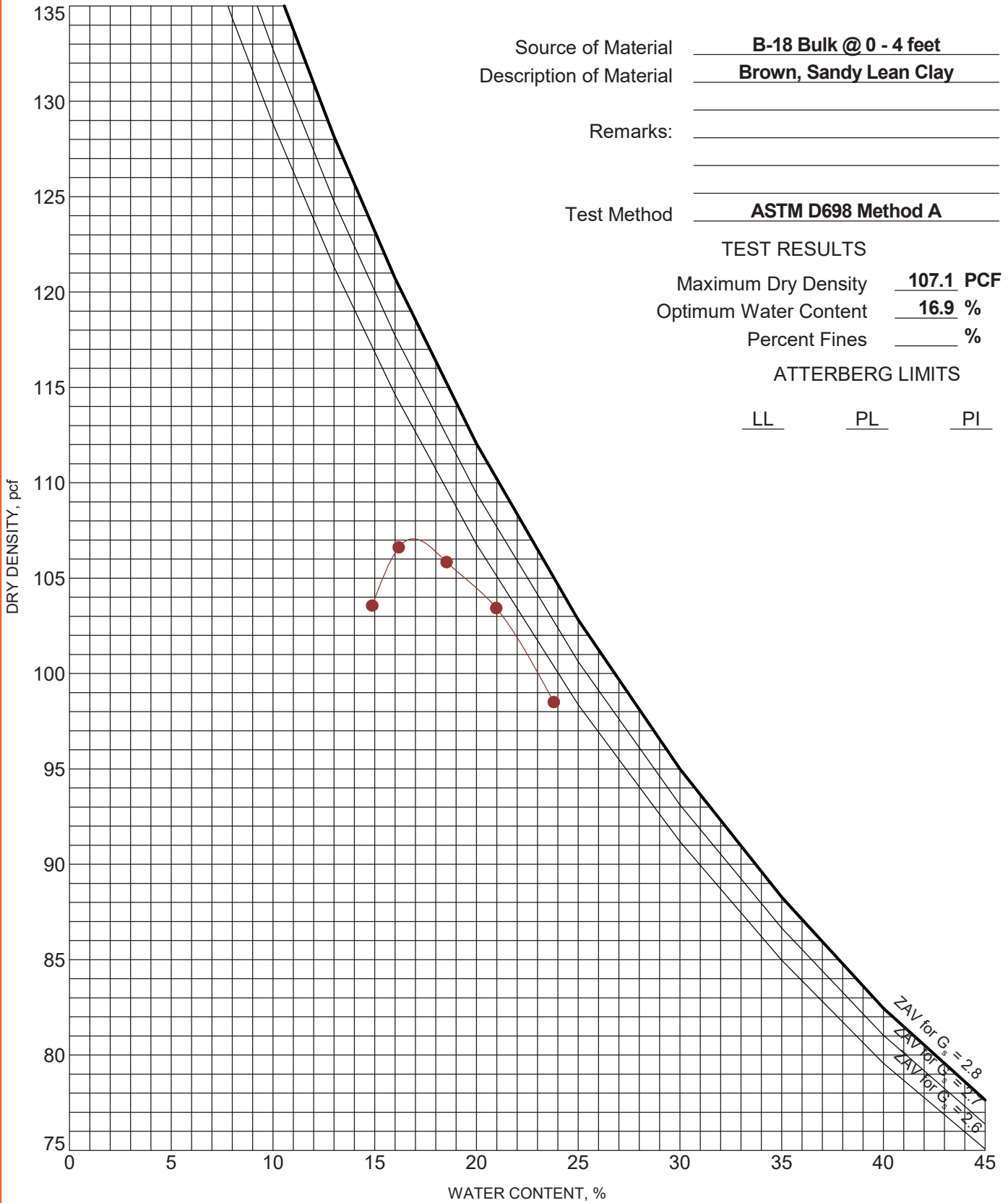
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



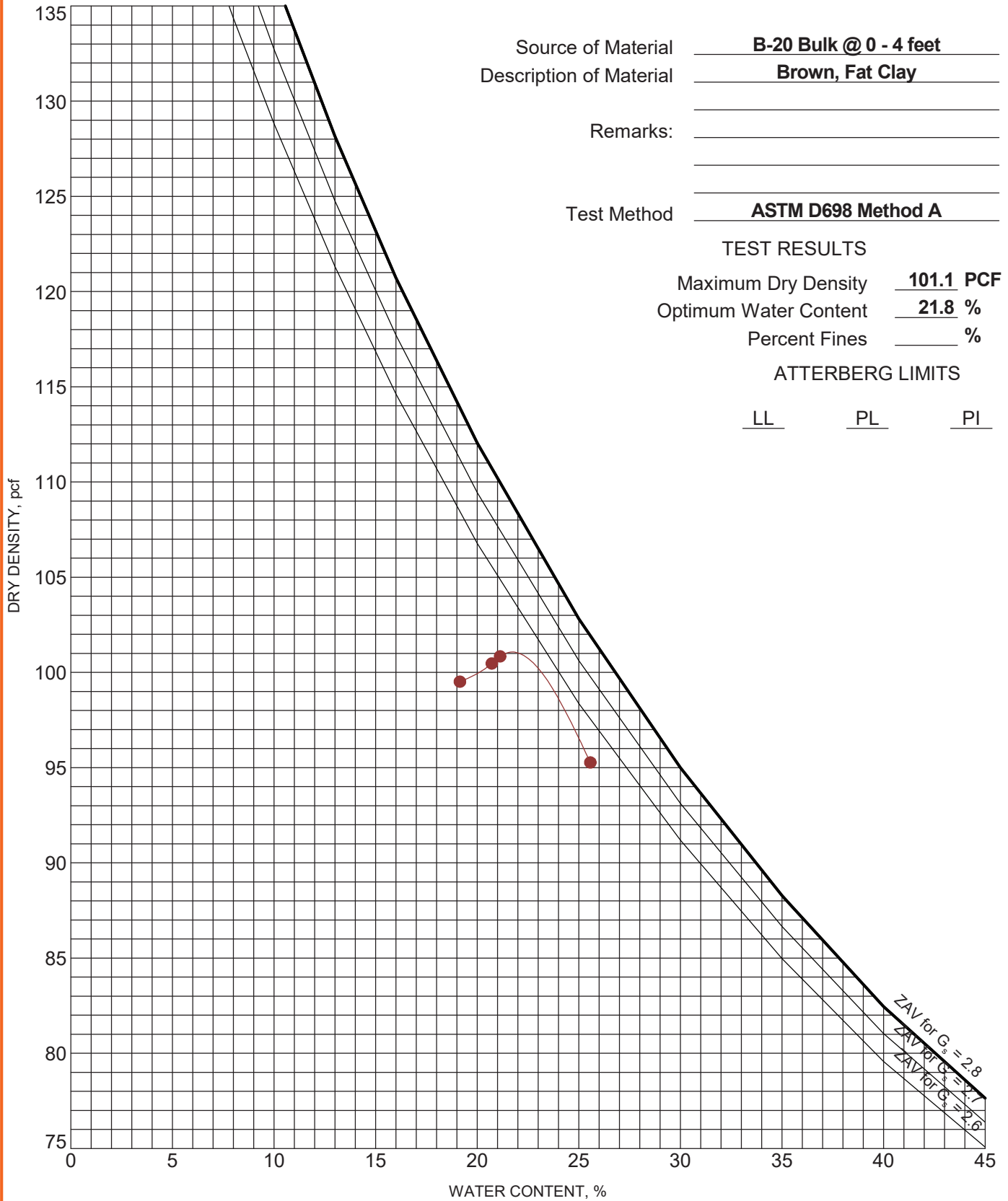
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-20 Bulk @ 0 - 4 feet  
 Description of Material Brown, Fat Clay  
 Remarks: \_\_\_\_\_  
 Test Method ASTM D698 Method A

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



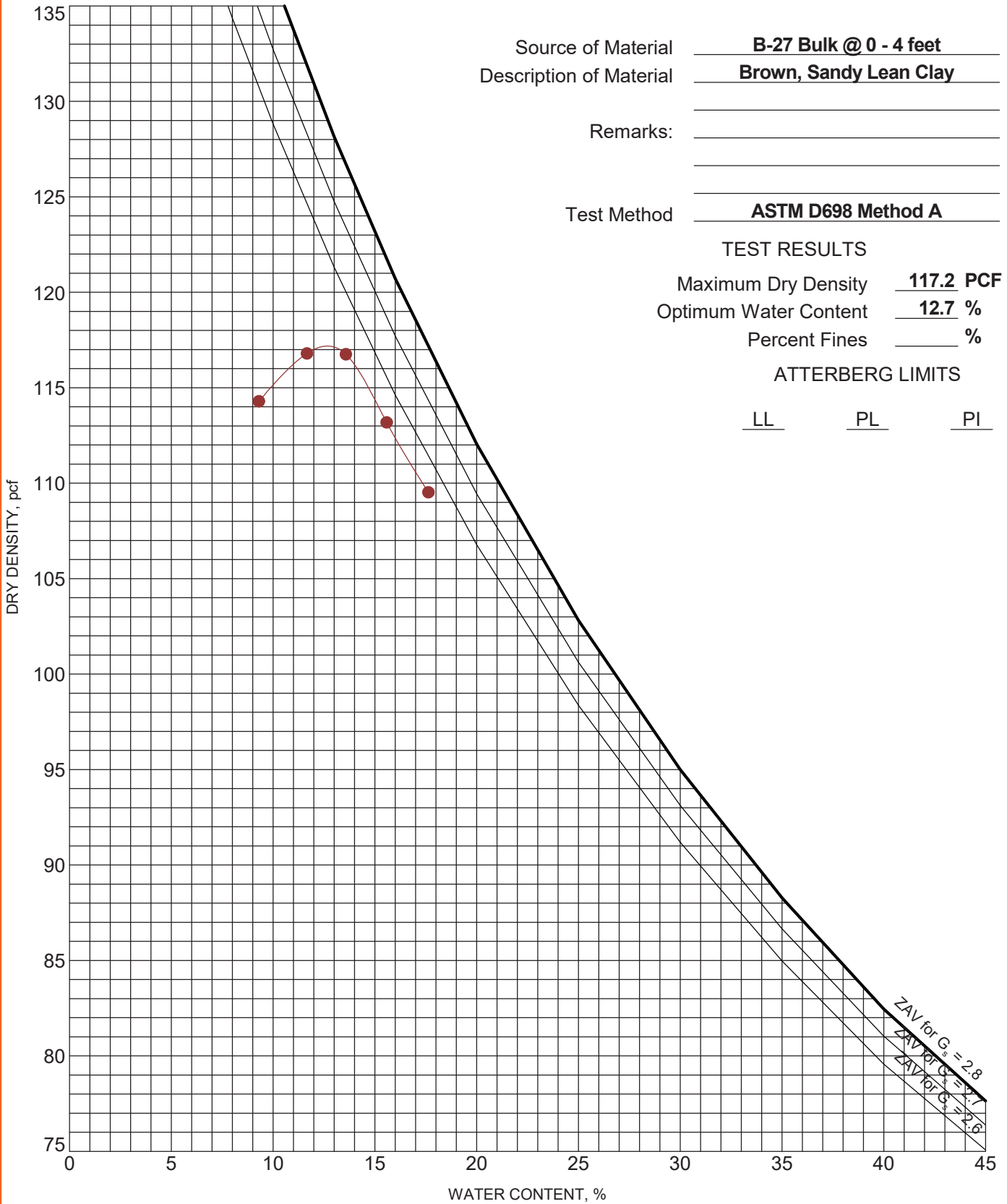
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-27 Bulk @ 0 - 4 feet  
 Description of Material Brown, Sandy Lean Clay  
 Remarks: \_\_\_\_\_  
 Test Method ASTM D698 Method A

**TEST RESULTS**

Maximum Dry Density 117.2 PCF  
 Optimum Water Content 12.7 %  
 Percent Fines \_\_\_\_\_ %

**ATTERBERG LIMITS**

LL      PL      PI

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

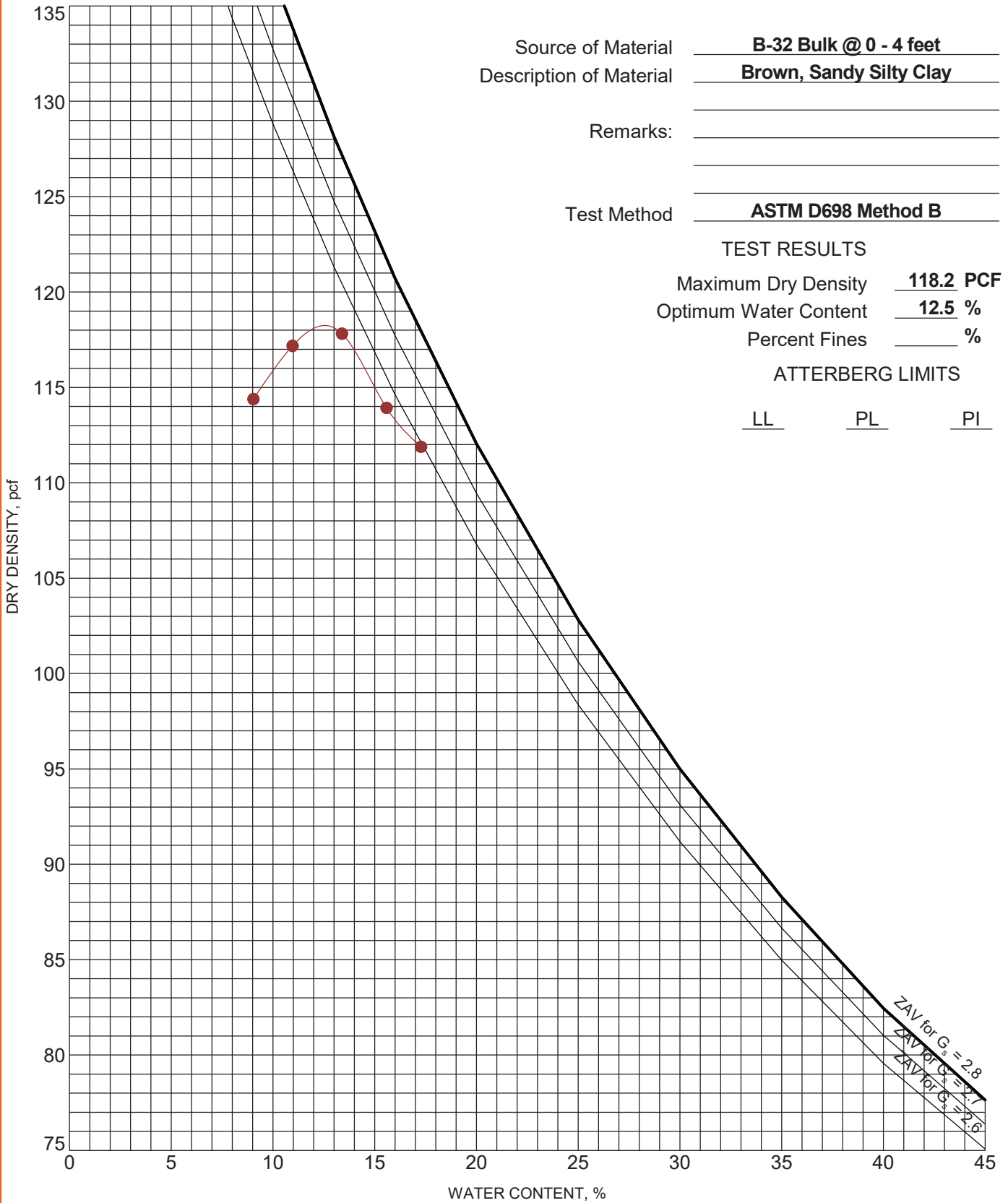
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-32 Bulk @ 0 - 4 feet  
 Description of Material Brown, Sandy Silty Clay

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Test Method ASTM D698 Method B

**TEST RESULTS**

Maximum Dry Density 118.2 PCF  
 Optimum Water Content 12.5 %  
 Percent Fines \_\_\_\_\_ %

**ATTERBERG LIMITS**

LL      PL      PI

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

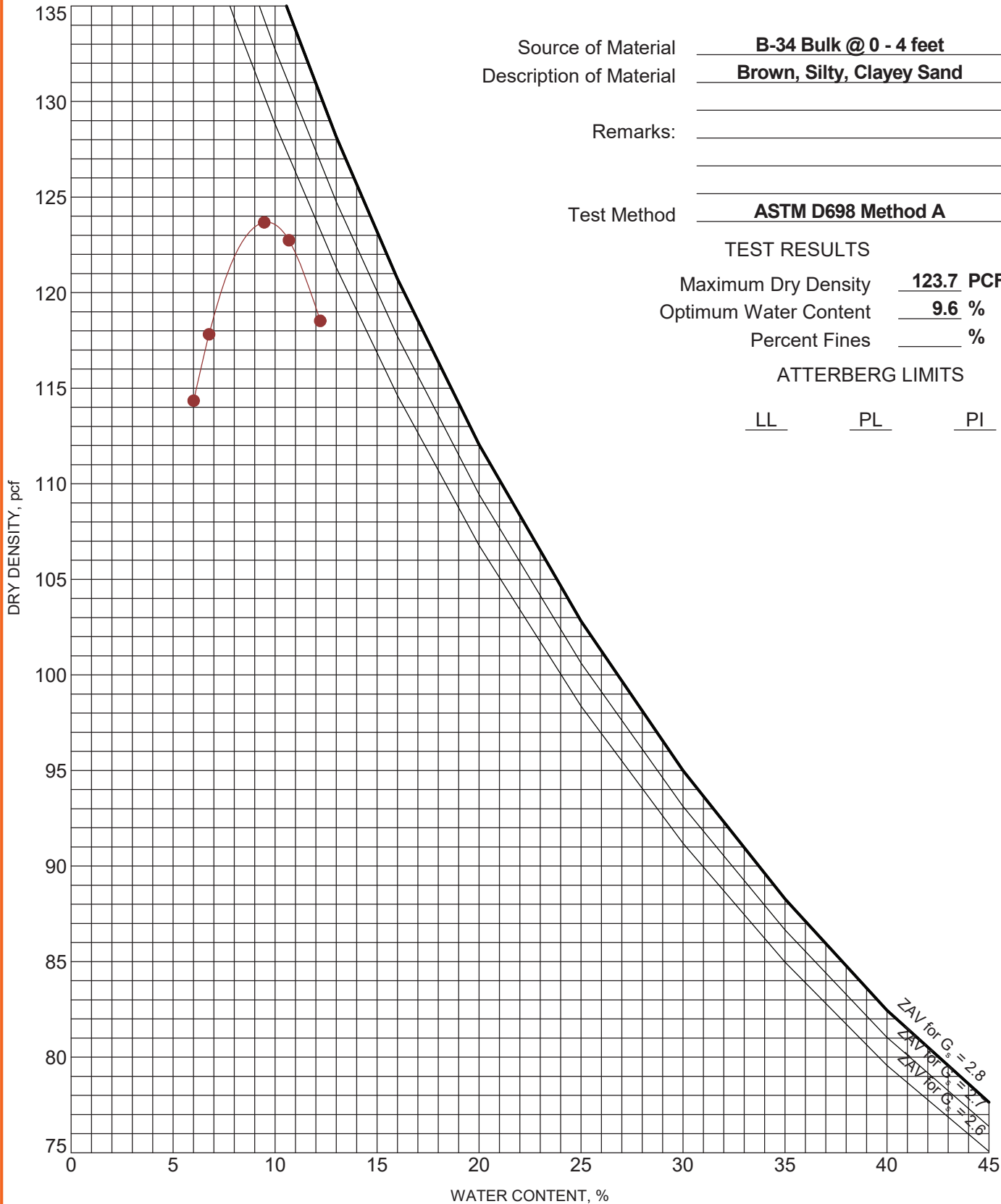
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-34 Bulk @ 0 - 4 feet  
 Description of Material Brown, Silty, Clayey Sand  
 Remarks: \_\_\_\_\_  
 Test Method ASTM D698 Method A

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



PROJECT NUMBER: N6195224

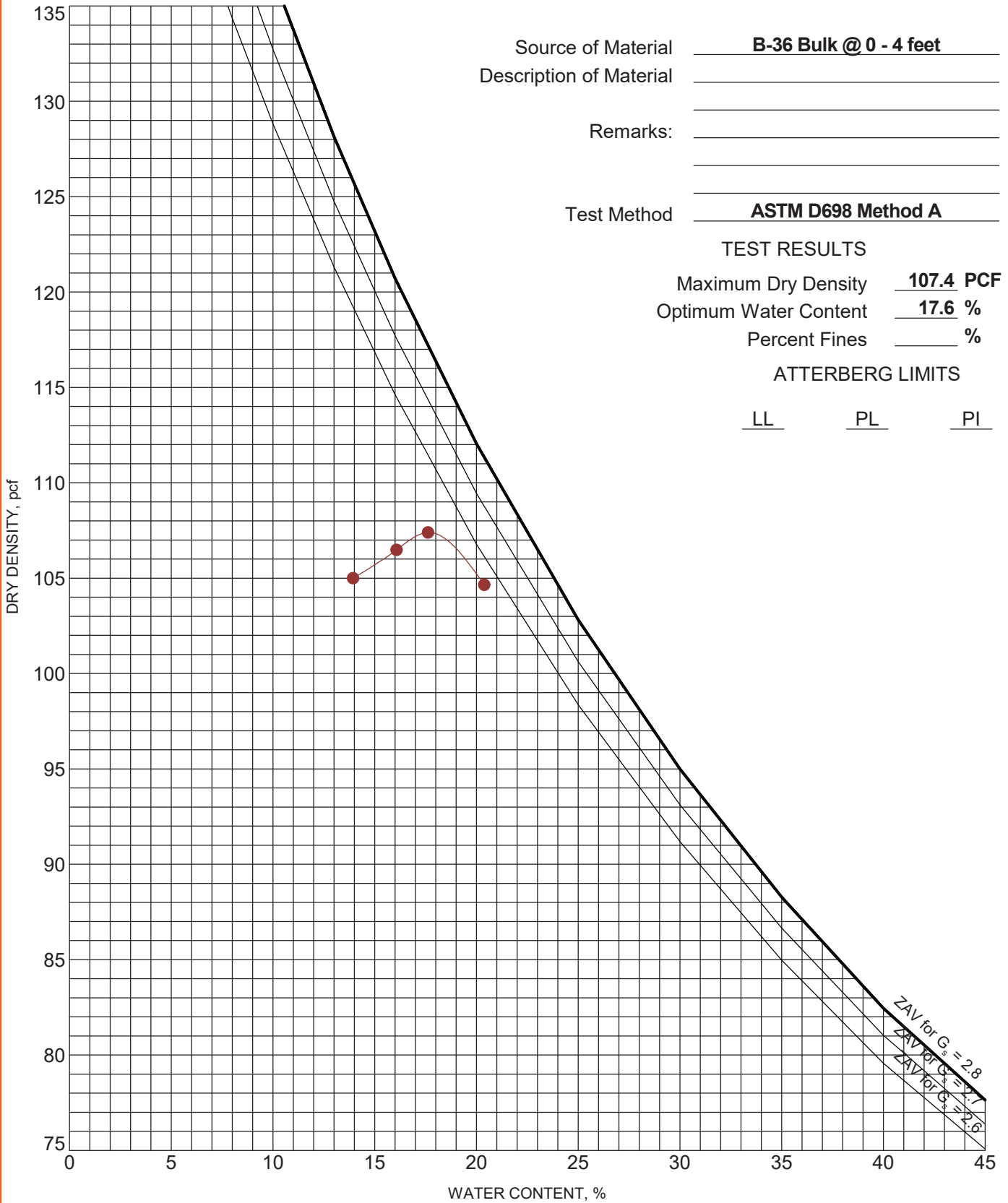
CLIENT: 7x Energy, Inc.  
Austin, TX



# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-36 Bulk @ 0 - 4 feet  
 Description of Material \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 Test Method ASTM D698 Method A

**TEST RESULTS**

Maximum Dry Density 107.4 PCF  
 Optimum Water Content 17.6 %  
 Percent Fines \_\_\_\_\_ %

**ATTERBERG LIMITS**

LL      PL      PI

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

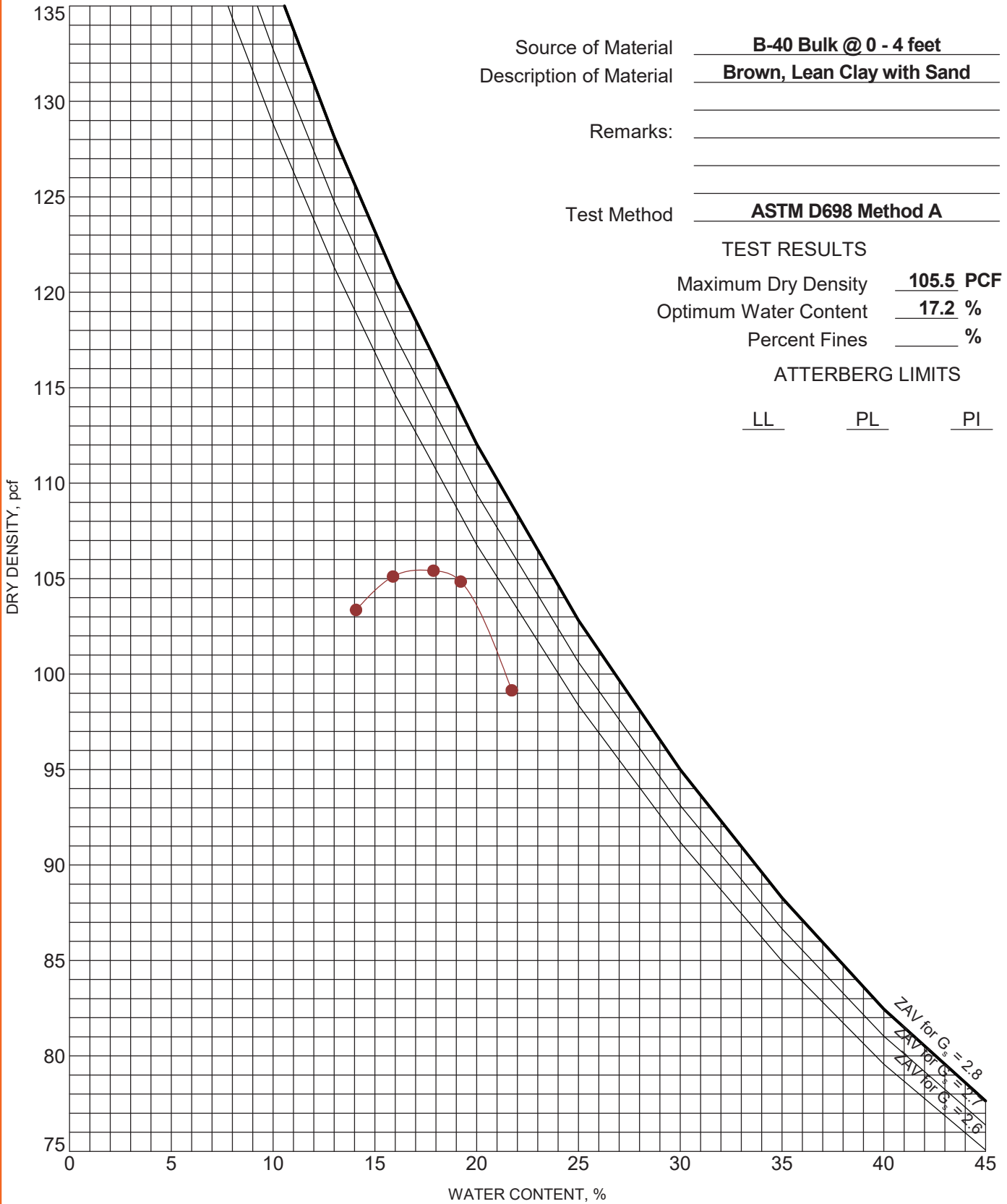
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

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Source of Material B-40 Bulk @ 0 - 4 feet  
 Description of Material Brown, Lean Clay with Sand  
 Remarks: \_\_\_\_\_  
 Test Method ASTM D698 Method A

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



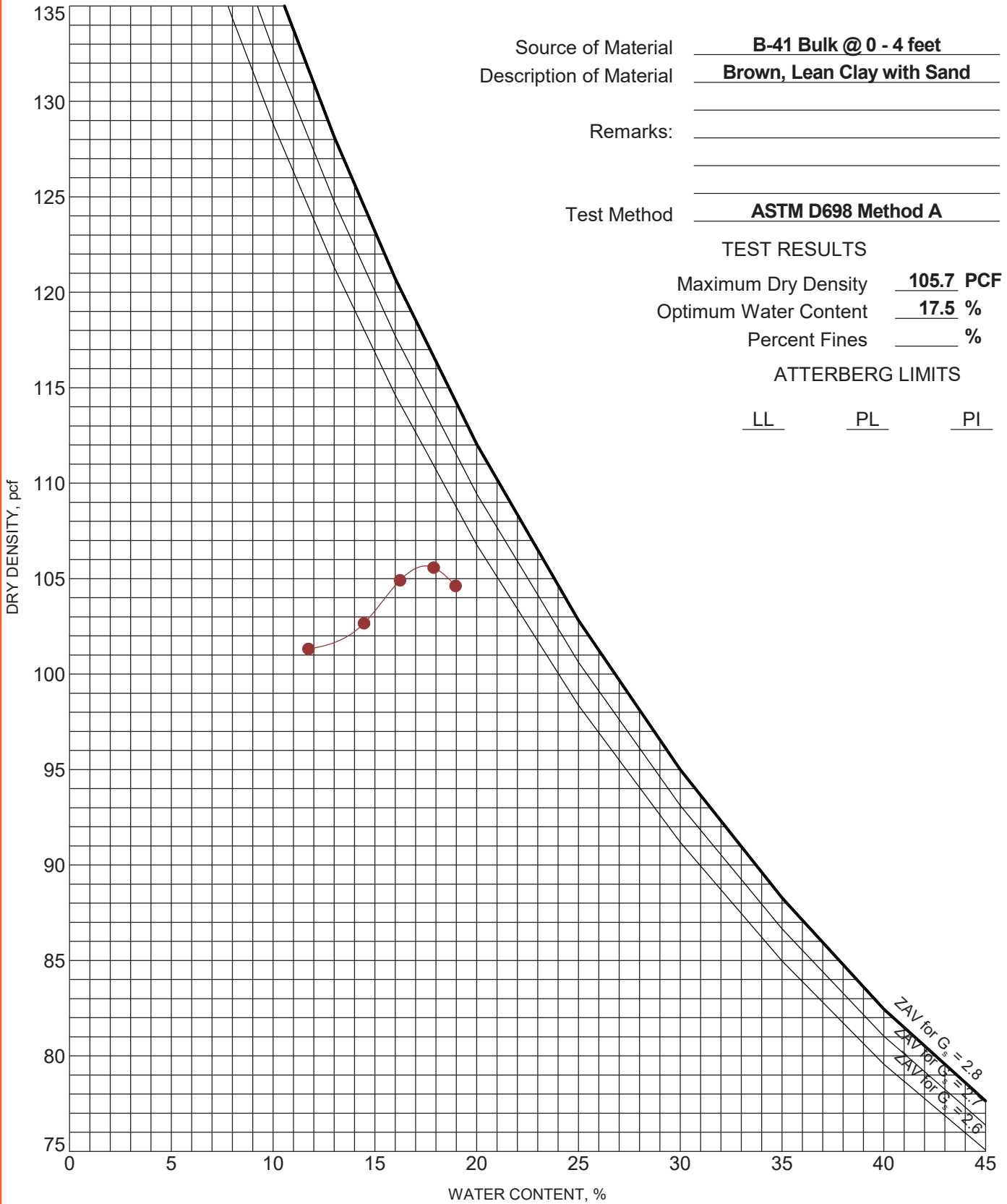
PROJECT NUMBER: N6195224

CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-41 Bulk @ 0 - 4 feet  
 Description of Material Brown, Lean Clay with Sand  
 Remarks: \_\_\_\_\_  
 Test Method ASTM D698 Method A

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



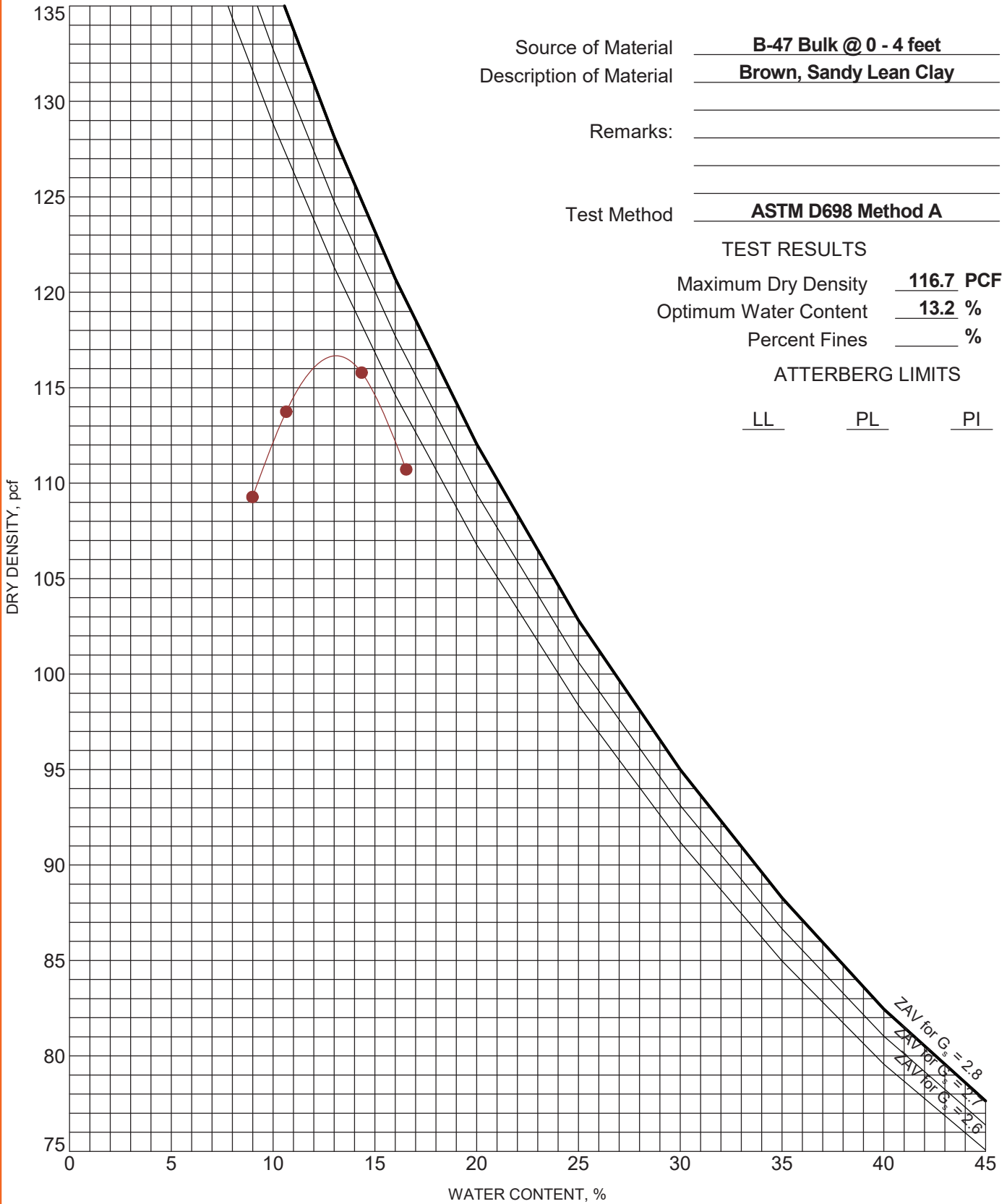
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CLIENT: 7x Energy, Inc.  
Austin, TX

# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-47 Bulk @ 0 - 4 feet  
 Description of Material Brown, Sandy Lean Clay

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Test Method ASTM D698 Method A

### TEST RESULTS

Maximum Dry Density 116.7 PCF  
 Optimum Water Content 13.2 %  
 Percent Fines \_\_\_\_\_ %

### ATTERBERG LIMITS

LL      PL      PI

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



12460 Plaza Dr  
Parma, OH

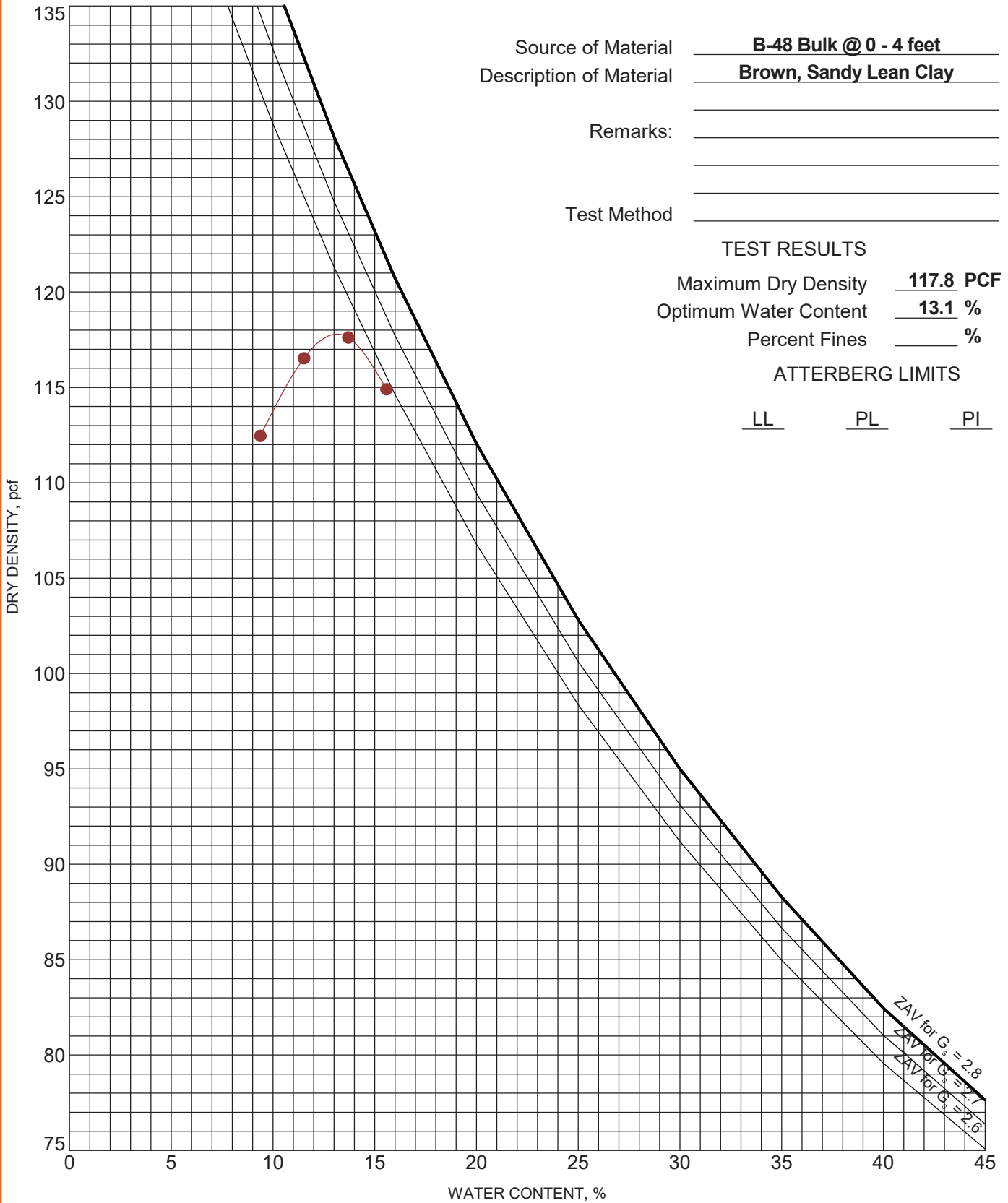
PROJECT NUMBER: N6195224

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# MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 N6195224 ARCHE FULTON COUN.GPJ TERRACON\_DATATEMPLATE.GDT 6/16/20



Source of Material B-48 Bulk @ 0 - 4 feet  
 Description of Material Brown, Sandy Lean Clay  
 Remarks: \_\_\_\_\_  
 Test Method \_\_\_\_\_

PROJECT: Arche Fulton County Solar

SITE: US Route 20  
Fayette, OH



PROJECT NUMBER: N6195224

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## **SUPPORTING INFORMATION**

### **Contents:**

General Notes

Unified Soil Classification System






Note: All attachments are one page unless noted above.

# GENERAL NOTES

## DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Arche Fulton County Solar ■ Fayette, OH

Terracon Project No. N6195224

SAMPLING	WATER LEVEL	FIELD TESTS
 Split Spoon	 Water Initially Encountered  Water Level After a Specified Period of Time  Water Level After a Specified Period of Time  Cave In Encountered  Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.)  (HP) Hand Penetrometer  (T) Torvane  (DCP) Dynamic Cone Penetrometer  UC Unconfined Compressive Strength  (PID) Photo-Ionization Detector  (OVA) Organic Vapor Analyzer

**DESCRIPTIVE SOIL CLASSIFICATION**

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

**LOCATION AND ELEVATION NOTES**

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See [Exploration and Testing Procedures](#) in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

**STRENGTH TERMS**

RELATIVE DENSITY OF COARSE-GRAINED SOILS <small>(More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance</small>		CONSISTENCY OF FINE-GRAINED SOILS <small>(50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance</small>		
Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength Qu, (tsf)	Standard Penetration or N-Value Blows/Ft.
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

**RELEVANCE OF SOIL BORING LOG**

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests <sup>A</sup>				Soil Classification		
				Group Symbol	Group Name <sup>B</sup>	
<b>Coarse-Grained Soils:</b> More than 50% retained on No. 200 sieve	<b>Gravels:</b> More than 50% of coarse fraction retained on No. 4 sieve	<b>Clean Gravels:</b> Less than 5% fines <sup>C</sup>	$Cu \geq 4$ and $1 \leq Cc \leq 3$ <sup>E</sup>	GW	Well-graded gravel <sup>F</sup>	
			$Cu < 4$ and/or $[Cc < 1 \text{ or } Cc > 3.0]$ <sup>E</sup>	GP	Poorly graded gravel <sup>F</sup>	
		<b>Gravels with Fines:</b> More than 12% fines <sup>C</sup>	Fines classify as ML or MH	GM	Silty gravel <sup>F, G, H</sup>	
			Fines classify as CL or CH	GC	Clayey gravel <sup>F, G, H</sup>	
	<b>Sands:</b> 50% or more of coarse fraction passes No. 4 sieve	<b>Clean Sands:</b> Less than 5% fines <sup>D</sup>	$Cu \geq 6$ and $1 \leq Cc \leq 3$ <sup>E</sup>	SW	Well-graded sand <sup>I</sup>	
			$Cu < 6$ and/or $[Cc < 1 \text{ or } Cc > 3.0]$ <sup>E</sup>	SP	Poorly graded sand <sup>I</sup>	
		<b>Sands with Fines:</b> More than 12% fines <sup>D</sup>	Fines classify as ML or MH	SM	Silty sand <sup>G, H, I</sup>	
			Fines classify as CL or CH	SC	Clayey sand <sup>G, H, I</sup>	
<b>Fine-Grained Soils:</b> 50% or more passes the No. 200 sieve	<b>Silts and Clays:</b> Liquid limit less than 50	<b>Inorganic:</b>	$PI > 7$ and plots on or above "A"	CL	Lean clay <sup>K, L, M</sup>	
			$PI < 4$ or plots below "A" line <sup>J</sup>	ML	Silt <sup>K, L, M</sup>	
		<b>Organic:</b>	Liquid limit - oven dried	< 0.75	OL	Organic clay <sup>K, L, M, N</sup>
			Liquid limit - not dried			Organic silt <sup>K, L, M, O</sup>
	<b>Silts and Clays:</b> Liquid limit 50 or more	<b>Inorganic:</b>	$PI$ plots on or above "A" line	CH	Fat clay <sup>K, L, M</sup>	
			$PI$ plots below "A" line	MH	Elastic Silt <sup>K, L, M</sup>	
		<b>Organic:</b>	Liquid limit - oven dried	< 0.75	OH	Organic clay <sup>K, L, M, P</sup>
			Liquid limit - not dried			Organic silt <sup>K, L, M, Q</sup>
	<b>Highly organic soils:</b>	Primarily organic matter, dark in color, and organic odor			PT	Peat

<sup>A</sup> Based on the material passing the 3-inch (75-mm) sieve.

<sup>B</sup> If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

<sup>C</sup> Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

<sup>D</sup> Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

$$E \quad Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

<sup>F</sup> If soil contains  $\geq 15\%$  sand, add "with sand" to group name.

<sup>G</sup> If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

<sup>H</sup> If fines are organic, add "with organic fines" to group name.

<sup>I</sup> If soil contains  $\geq 15\%$  gravel, add "with gravel" to group name.

<sup>J</sup> If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

<sup>K</sup> If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

<sup>L</sup> If soil contains  $\geq 30\%$  plus No. 200 predominantly sand, add "sandy" to group name.

<sup>M</sup> If soil contains  $\geq 30\%$  plus No. 200, predominantly gravel, add "gravelly" to group name.

<sup>N</sup>  $PI \geq 4$  and plots on or above "A" line.

<sup>O</sup>  $PI < 4$  or plots below "A" line.

<sup>P</sup>  $PI$  plots on or above "A" line.

<sup>Q</sup>  $PI$  plots below "A" line.

