Appendix FEIR-13

Dewatering Report

DEWATERING SIMULATION AND ANALYSIS FOR TEMPORARY EXCAVATION AND UNDERGROUND PARKING STRUCTURE CONSTRUCTION

7716-7860 WEST BEVERLY BOULEVARD
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bgs	below ground surface
CEG	California Certified Engineering Geologist
CHg	California Certified Hydrogeologist
cm/sec	centimeters per second
CPT	Cone penetrometer test
DEIR	Draft Environmental Impact Report
DWR	Department of Water Resources
ft	feet
ft^3	cubic feet
ft/d	feet per day
ft/ft	feet/foot
GAMA	State Groundwater Ambient Monitoring and Assessment database
Geosyntec	Geosyntec Consultants, Inc.
Geotechnologies	Geotechnologies, Inc.
gpd	gallons per day
gpm	gallons per minute
HFB	horizontal flow barrier
HPT	hydraulic profiling tool
K	hydraulic conductivity
K_h	horizontal hydraulic conductivity
K_v	vertical hydraulic conductivity
LADWP	Los Angeles Department of Water and Power
LARWQCB	Los Angeles Regional Water Quality Control Board
LUST	Leaking Underground Storage Tank
msl	mean sea level
M	million
MTBE	methyl tert-butyl ether
NFA	Regulatory no further action
NPDES	National Pollutant Discharge Elimination System
pcf	pound-force per cubic foot
PG	California Professional Geologist
Project	TVC Project
Site	Television City Studios property
Sy	Specific yield
TPH	total petroleum hydrocarbons
TVC	Television City Studios, LLC
USGS	United States Geological Survey

1. INTRODUCTION

1.1 Terms of Reference

This Report presents the methods, assumptions, results, and limitations of a preliminary evaluation of dewatering conditions for the temporary excavation and construction of an underground parking structure, for the TVC Project (Project), prepared for informational purposes in response to comments received on the Draft Environmental Impact Report (DEIR). The results presented herein are preliminary, and additional confirmatory analysis will be required as individual Project buildings are designed and permitted as part of the City of Los Angeles' building permit process. A detailed dewatering analysis is typically performed after project entitlements are approved and its EIR is certified and would be based upon on a site-specific groundwater pumping test, which takes many months to design, permit, install, conduct, and analyze. However, in order to be as responsive as possible to the comments on the DEIR at this time, this preliminary dewatering analysis was prepared in advance of the detailed future Site dewatering testing and analysis that will occur during the City's regulatory building permit process. This Report presents the results of a preliminary dewatering simulation in Area 2, one of the proposed excavation areas, discussed further below. The Report also presents preliminary comparative estimates for dewatering quantities and drawdown for the other excavation areas. The Project is located at 7716-7860 West Beverly Boulevard, Los Angeles, California (Site). The Site location is shown on Figure 1, and existing Site facilities are shown on Figure 2. This Report, prepared on behalf of Television City Studios, LLC (TVC), was prepared by Andy Simons, PG; and Daria Akhbari, PhD; and reviewed by Richard Kraft, PG, CEG, CHg; and Jeff Thompson, PhD, PG, CHg, in accordance with Geosyntec Consultants, Inc.'s (Geosyntec's) review policy.

1.2 Overview and Purpose

The purpose of this Report is to provide a preliminary dewatering evaluation based on an example excavation and construction scenario, as discussed below:

- Use the Area 2 excavation area presented in Figure 3 of the Soil Management Plan [Geosyntec, 2021], included in Appendix G.1 of the DEIR, as an example excavation for the groundwater dewatering evaluation. The Area 2 excavation is the largest of the excavations by volume in the northern portion of the Site and where considerable subsurface soil and groundwater data are available. Area 2 also contains the largest volume of deeper excavation and dewatering (greater than 30 feet [ft] below ground surface [ft bgs]), which will allow for a representative evaluation of groundwater drawdown.

- Evaluate and present the findings from four new cone penetrometer test (CPT) and hydraulic profiling tool (HPT) borings conducted at the Site in January 2023 to obtain Site-specific vertical soil property profiles and hydraulic conductivity (K) profiles.
- Develop a Site-specific, three-dimensional computer numerical groundwater model using the industry-standard MODFLOW 2005 modeling program and the Groundwater Vistas Version 7 graphical user interface. The model was used to:
  - Estimate the quantity of groundwater contained in the Area 2 excavation and estimate the time required to lower the groundwater table to the base of the excavation. As is common practice, excavation activities will likely be initiated in the upper zones prior to complete extraction in the deeper zones;
  - Evaluate the lateral and vertical extent and depth of groundwater drawdown (i.e., groundwater cone of depression dimensions) that would result from temporary construction dewatering activities. The cone of depression refers to the cone-shaped lowering of groundwater levels around a single or group of pumping wells. The greatest degree of groundwater lowering typically occurs at the pumping wells and reduces concentrically with distance from the wells;
  - Simulate example lateral infiltration control measures;
  - Estimate the total quantity of groundwater dewatered during the excavation of Area 2; and
  - Evaluate potential temporary groundwater flow modifications to the surrounding area (i.e., groundwater elevation changes or flow direction changes) and other potential effects under neighboring properties.

As discussed in Sections IV.D, Geology and Soils, IV.F, Hazards and Hazardous Materials, and IV.G, Hydrology and Water Quality, of the DEIR, temporary dewatering would likely be necessary during construction of the Project, and the DEIR's analysis accounted for such dewatering activities. Per Project Design Feature GEO-PDF-1, which is included on pages IV.D-18 to IV.D-19 of the DEIR and in the Mitigation Monitoring Program attached to the Final EIR, permanent structures will be designed for hydrostatic pressure such that the temporary construction dewatering system will be terminated at the completion of construction. As stated in the DEIR, the temporary dewatering system would be installed and operated in accordance with a National Pollutant Discharge Elimination System (NPDES) permit requirements or an industrial sewer permit. The Project is currently in the entitlement phase, and the dewatering system, and methods will be determined during the City's building permit process. Nevertheless, this Report is provided for informational purposes and in response to comments on the DEIR. The preliminary evaluation of an example excavation using temporary construction dewatering presented herein is based on preliminary information and is intended to provide support for future dewatering planning and to confirm the conclusion in the DEIR that impacts associated with potential dewatering activities during construction would be less than significant. Additional Site characterization, hydrogeologic testing studies (i.e., groundwater pumping test), and excavation dewatering approaches, as necessary, will be considered in the future as a part of the City's regulatory building permit process.

1.3 Report Organization

The remainder of this Report is organized into the following sections:

- Section 2, *Site Background and Vicinity Description,* discusses the Site setting and surrounding land uses, pertinent prior subsurface investigations, topography, geology and hydrogeology, and Site development and use.
- Section 3, *Temporary Excavation and Construction Dewatering Technical Approach,* presents the methodology for simulating construction dewatering conditions in the Area 2 excavation area.
- Section 4, *Comparative Estimates of Dewatering Program Volumes and Drawdown*, provides preliminary comparative estimates for dewatering quantities and drawdown for the other excavation areas.
- Section 5, *Conclusions and Recommendations*, provides conclusions and recommendations from this preliminary evaluation.
- Section 6, *Limitations and Signatures,* presents limitations of this Report and the signatures of the environmental professionals who prepared and reviewed it.
- Section 7, *References,* presents a list of documents referenced in this Report.

Tables, figures, and appendices are included at the end of this Report.

2. SITE BACKGROUND

2.1 Setting and Surrounding Properties

As discussed in Section II, Project Description, of the DEIR, the Site consists of four parcels that together comprise approximately 25 acres (Figure 1). The Site is currently developed with studio-related uses and associated surface parking, as well as numerous one-story ancillary buildings and structures. Current operations at the Site include a variety of production activities focused on the creation, development, recording, broadcasting, and editing of recorded and live television programming and other audio, visual, and digital media including, but not limited to, e-sports, backlot shooting, and other forms of content creation. Such activities occur both indoors and outdoors within the Site and include basecamp areas where mobile facilities such as trucks, generators, and support vehicles related to production are temporarily staged. As is typical of studio environments, the land uses are centered around production operations, including associated parking, loading, storage, and related basecamp activities. Within the Site, basecamp activities typically occur within existing surface parking areas and other outdoor areas. The Site today includes photovoltaic canopies within the surface parking lots along Beverly Boulevard and Fairfax Avenue and perimeter security fencing with visual screening to meet safety and privacy needs.

The Site is bordered by Beverly Boulevard to the north, The Grove Drive and Broadcast Center Apartments to the east, The Original Farmers Market and The Grove shopping and entertainment center to the south, and Fairfax Avenue to the west. Currently, there is a gasoline fueling station to the north of the Site along Beverly Boulevard, and a gasoline fueling station and dry-cleaning facility to the west of the Site along Fairfax Avenue.

2.2 Topography

Topographic map coverage of the Site vicinity is provided on the Hollywood, California, Quadrangle map published by the United States Geological Survey [(USGS), 1966]. The USGS topographic map indicates that the Site is gently sloping towards the southwest and is approximately 185 to 201 ft above mean sea level (msl).

2.3 General Geology and Hydrogeology

As discussed on page IV.F-20 in Section IV.F, Hazards and Hazardous Materials, of the DEIR, the Site is located in the northern portion of the Coastal Plain of the Los Angeles Basin, which is in the northern portion of the Peninsular Ranges Geomorphic Province [California Geological Survey, 2002]. In general, geology in the Los Angeles Basin consists of thick interbedded sequences of Quaternary clay, silt, sand, and gravel. The

Site is located within the Hollywood Hydrologic Subarea (404.62) of the Interior Santa Monica Bay Hydrologic Area in the Santa Monica Bay Hydrologic Unit [LARWQCB, 1994].

The California Department of Water Resources (DWR) in California's Groundwater Bulletin 118 [California DWR, 2003 and updated 2004] and State of California Groundwater Ambient Monitoring and Assessment (GAMA) database place the Site within the boundaries of the Hollywood Subbasin (No. 4-11.02). The DWR describes the uppermost water bearing formations in the Hollywood Subbasin as: sand, silt and clay materials of the uppermost Semi-perched aquifer (defined with a maximum thickness of 60 ft) underlain by the silty-clay and clay materials of the Bellflower Aquiclude (maximum thickness 35 ft) [DWR, 2004]. An aquiclude is defined as "[a] saturated but relatively impermeable material that does not yield appreciable quantities of water to wells; clay is an example" [Todd and Mays, 2005]. The DWR also describes that the Semi-perched aquifer thins within portions of the Hollywood Subbasin causing the Bellflower Aquiclude to be found at depths shallower than 60 ft bgs in certain areas [DWR, 1961]. As described below, a number of geotechnical borings at the Site have been advanced to 70 and 80 ft bgs and thus likely intercepted materials of both the Semi-perched aquifer and the transition to the Bellflower Aquiclude. Based on a review of the State of California GeoTracker and GAMA databases in 2023, there is no record of active groundwater supply uses within one mile of the Site. See Section 3.6 for additional evaluation and discussion of the local groundwater resource and usage.

2.4 Summary of Previous Geologic and Hydrogeologic Investigations

2.4.1 Geotechnologies, Inc. Investigations

As provided in Appendix E of the DEIR, Geotechnologies, Inc. (Geotechnologies) has conducted three Site-specific subsurface investigations with individual reports: *Preliminary Geotechnical Engineering Investigation, Television City 2050 Specific Plan* [Geotechnologies, 2021a]; *Addendum I – Response to Soils Report Review Letter, Television City 2050 Specific Plan* [Geotechnologies, 2021b]; and *Addendum III – Additional Explorations and Response to DEIR Review Comments, Television City 2050 Specific Plan* [Geotechnologies, 2022]. In response to comments on the DEIR, Geotechnologies also prepared Appendix D of this Report – *Subsidence Evaluation based on Preliminary Dewatering Simulations Evaluation, Proposed TVC Project* [Geotechnologies, 2023]. The investigations included drilling, sampling, and logging 21 geotechnical borings to depths ranging from 50 to 80 ft bgs. The geotechnical boring locations are provided in Figure 4. The investigations reported the soils encountered as follows: *The soils underlying the Project Site consists of stratified layers of silty sands,*

sands, sandy silts, sandy clays and silty clays [Geotechnologies, 2022]. Pertinent Geotechnologies boring logs for the Area 2 excavation are provided in Appendix A.

2.4.2 Geosyntec Consultants Investigations

Geosyntec conducted multiple environmental Phase II investigations from 2018 through 2020. In October 2018, Geosyntec performed a limited Phase II investigation on the Site, which was followed by supplemental Phase II investigations in November 2018, August 2019, and May 2020. During these investigations, Geosyntec collected environmental soil, soil vapor, and groundwater data. These investigations are discussed in Sections 3.5.1 and 3.5.2 of the Site Summary Report [Geosyntec, 2021], which is included in Appendix G.1 of the DEIR.

As discussed in the Site Summary Report, several borings were advanced to groundwater at locations outside the existing building footprints during the Phase II investigations. First groundwater was encountered at depths ranging from 12 to 20 ft bgs. Following placement of the hydropunch, the water surface flowed upwards into the hydropunch casing, indicating potential slow recharge or limited, semi-confined or leaky-confined conditions. See the explanation in Section 2.4.4 regarding depth to groundwater data sources and time periods. Due to seasonal water level fluctuations, it is expected the depth to groundwater will vary over time.

CPT/HPT Investigation (January 2023)

In January 2023, four direct-push CPT/HPT borings were advanced from the ground surface to depths ranging between 52.33 and 52.82 ft bgs. The CPT/HPT borings support this dewatering analysis by providing vertical profiles of soil types and K (i.e., hydraulic conductivity ranges (K) ranges) to provide input information for the numerical groundwater model. K is a proportionality constant that describes the relative ease of fluid passage (such as groundwater) through a porous material such as saturated soils. If water passes easily through a soil, it is described as having a high K, if water is poorly transmitted through soil, it is described as a low K. The CPT/HPT boring locations are shown on Figure 4, and the boring logs are provided in Appendix B (ConeTec, 2023). The borings indicate that the groundwater table (reported as phreatic surface) is found at depths ranging from 9.8 to 10.8 ft bgs. Consistent with the soil descriptions provided in the Geotechnologies and Geosyntec boring logs, the CPT/HPT found predominantly interbedded fine-grained layers (i.e., clay, sandy clay, sandy silt, and silt) with clay- and silt-bearing sand mixtures, and limited and discontinuous coarser-grained layers (i.e., sands and gravelly sands without clay and silt intermixed). The estimated K values were low, less than the 0.1 ft per day (ft/d) sensitivity of the tool, for 83% (131.5 ft of the 159 ft of hydraulically-profiled soils) which were predominantly fine-grained clays, silts and mixtures of sand/silt/clay. The remaining 17% recorded generally sand zones with K values of 0.1 to 20 ft/d for approximately 18 ft of soil profiled and approximately 9.5 ft of soil profiled with a K over 20 ft/d.

CPT/HPT-2, CPT/HPT-3, and CPT/HPT-4 were located adjacent to Geotechnologies borings B9, B17, and B15, respectively. When compared, the co-located CPT/HPT and boring logs were approximately consistent as to the depth and nature of the materials encountered, although some differences were noted. The K values reported for various soil types described in the HPT logs were compared and correlated with soil types described in the Geotechnologies boring logs to assist with developing the Preliminary Site Model (Section 2.4.5)

In summary, the CPT/HPT borings identified stratified, predominantly low-K materials in the subsurface (predominantly a K of less than 0.1 ft/d). It is anticipated that potential lateral flow from the thin sand zones (with higher K values) will be controlled with the planned grout wall feature, as needed. Furthermore, based on the CPT/HPT logs, there appears to be a laterally extensive low-K basal layer of predominantly interbedded silt/clay materials at approximately 45 to 50 ft bgs into which the vertical grout walls can be keyed. While additional confirmatory Site characterization would occur during the regulatory building permit process, this low-K basal layer would likely serve to limit potential upward flow into the deeper excavations and thus reduce dewatering quantities and groundwater drawdown cone of depression dimensions.

2.4.3 Former Texaco Station Groundwater Investigations

As shown in Figure IV.F-1 in Section IV.F, Hazards and Hazardous Materials, of the DEIR, the former Texaco Station was located within the northeastern portion of the Site at 7718 Beverly Boulevard, Los Angeles, California, directly east of the Area 2 excavation area (Figure 2). As discussed in Section IV.F, Hazards and Hazardous Materials, of the DEIR, the former Texaco station contained one 10,000-gallon and three 12,000-gallon underground storage tanks, which, along with dispensers, associated piping and pump islands, were removed during station demolition in 1991. As detailed in Subsection 2.b(2)(a) in Section IV.F, Hazards and Hazardous Materials, of the DEIR, according to the Leaking Underground Storage Tank (LUST) database, a gasoline release was discovered by Texaco in December 1990, and remedial activities were performed from 1996 to 2012. Groundwater monitoring was performed from 1992 through 2012. Approximately 24 groundwater monitoring wells (CBS-, AGW- and BGW-series wells) were installed, gauged, and sampled during this period [Los Angeles Regional Water Quality Control Board (LARWQCB), 2012]. Based on subsequent sampling data, the LARWQCB issued a No Further Action (NFA) letter on November 29, 2012, which is included as Appendix A of the Site Summary Report. The LARWQCB Closure Package for the former Texaco station included detailed information on soil, soil vapor, and groundwater investigations associated with remediation of total petroleum hydrocarbons (TPH), benzene, methyl tert-butyl ether (MTBE), and other constituents that were known to remain in the subsurface in the northeastern portion of the Site. As such, Geosyntec performed environmental investigations to confirm the extent of these remaining constituents, as discussed in the Site Summary Report. Elevated concentrations of residual fuel-related constituents were detected in isolated areas in the soil and groundwater downgradient (i.e., southwest) of the former Texaco station.

2.4.4 Historical Groundwater Data

The following is a summary of groundwater gauging and gradient information from the groundwater monitoring program for the former Texaco station and other sources that were used to support the dewatering analysis and groundwater model assumptions. Due to seasonal groundwater level fluctuations in the area, the range of groundwater elevation fluctuations vary depending on the reporting period:

- The State of California database GeoTracker was accessed on February 3, 2023, [GeoTracker, 2023] and contains electronic groundwater-level data for the former Texaco station monitoring wells from 2002 through 2012 with 578 individual groundwater level gauging records. The wells were approved for decommissioning by the LARWQCB in 2012 upon receipt of case closure approval. In this dataset, the maximum and minimum depth to water are 13.43 ft bgs and 6.55 ft bgs, respectively. The mean depth to groundwater in this dataset is 10.4 ft bgs. A total of 562 of the 578 (97%) groundwater level gauging measurements recorded groundwater level depths of 8 ft bgs or greater between 2002 and 2012.
- In 2023, the ConeTec CPT/HPT investigation reported the phreatic surface (i.e., groundwater surface) to be encountered at 9.8, 10.0, 10.0, and 10.8 ft bgs for the respective investigative borings. While these data are not from monitoring wells, we conclude they provide a reasonable estimate of recent groundwater depths.
- Other reported water levels collected in hydropunch borings or temporary wells during environmental sampling may not have stabilized due to slow recharge; thus, these data may not be representative of stabilized groundwater levels measured in monitoring wells.
- Groundwater flow directions varied, but generally ranged from south-southwest to southwest with the hydraulic gradient generally ranging from 0.005 to 0.01 [Arcadis, 2012]. A groundwater monitoring report for the former Texaco Station

reported groundwater flowing south-southwesterly with a hydraulic gradient of 0.008 feet per foot (ft/ft) in January 13, 2011 [Arcadis, 2012]. This groundwater flow and gradient information was near the mid-point of recorded gradients and was considered representative and used as the initial condition for the groundwater model. Representative groundwater contour maps are provided in Appendix C.

- Hydrographs and water level measurement tables from former on-site monitoring wells have recorded annual water level fluctuations of approximately 0.5 to 2 ft and long-term water level fluctuations of approximately 3 to 6.5 ft from 1993 to 2011 [Arcadis, 2012]. Representative hydrographs and water level measurement tables for former on-site monitoring wells are provided in Appendix C.

It was noted that various groundwater remediation activities were implemented during these groundwater level gauging events and may have produced minor groundwater level fluctuations. Overall, we consider the former Texaco station groundwater monitoring data (2002 to 2012) and the 2023 ConeTec measurements, which are the most recent groundwater level data, to be representative of recent Site conditions and reliable to support the preliminary dewatering analyses, and an average of 10 ft bgs is an appropriate and conservative parameter for these analyses.

2.4.5 Preliminary Site Conceptual Model

The following describes the preliminary Site conceptual model, which is based on available Site data, including publicly available groundwater monitoring reports prepared by others for the former Texaco station, and supports the groundwater model development and simulations:

- Depth to groundwater is encountered on average at approximately 10 ft bgs, and groundwater flow is commonly from the northeast to southwest at an average gradient of approximately 0.008 ft/ft.
- The Site is underlain by stratified and interbedded soils ranging from clay, sandy clay, silts, sandy silts, silty and clayey sands and limited sands and gravelly sands.
- Four CPT/HPT borings were advanced each to depths of approximately 52 ft bgs. Approximately 83% (131.5 ft of the 159 ft of soil hydraulically profiled) recorded low K values below the tool sensitivity of 0.1 ft/d for materials generally described as clays, silts, and sand mixtures with silt and clay. The remaining 17% recorded generally sand zones with K values of 0.1 to 20 ft/d for approximately 18 ft of soil profiled and 9.5 ft of soil profiled with a K over 20 ft/d.

- For comparison purposes, CPTs-2, -3 and -4 were drilled adjacent to geotechnical borings B9, B17, and B15, respectively. Our review of the HPT and boring logs found the descriptions to be approximately consistent, although some differences were noted. The materials described in the boring logs as clay, silt, sandy clay, sandy silt, clayey sand, and silty sands generally corresponded to K values of less than 0.1 ft/d from the adjacent HPT hydraulic profile.
- For the materials that were found to have K values below the 0.1 ft/d sensitivity of the HPT tool, reference materials were used to estimate soil hydraulic properties. For example, a clay layer can have K values well below the HPT sensitivity of 0.1 ft/d, ranging from 0.0013 to 0.00003 ft/d [reported in meters/second in Domenico and Schwartz, 1990] or silt materials as low as 0.001 ft/d [reported in meters/second in Freeze and Cherry, 1979].
- Limited sand and gravelly sand zones without intermixed clays and silts were identified in the boring logs and CPT/HPT logs, with K values ranging from 0.1 ft/d to approximately 57 ft/d. These materials were likely deposited as stream channel deposits and are interpreted to generally be channelized, laterally and vertically discontinuous lenses, and bounded by lower K clay- and silt-bearing materials.
- The interbedded nature of the common clay- and silt-bearing materials suggests a strong horizontal to vertical anisotropy (i.e., platy, horizontally deposited clay and silt particles tend to impede vertical groundwater flow and migration rates as compared with higher horizontal flow rates). Thus, the horizontal hydraulic conductivity (K_h) values are likely 10 times higher or more than the vertical K (K_v) in the clay- and silt-bearing materials. Thus, K_h/K_v anisotropy of laterally extensive fine-grained layers is expected to impede upward groundwater flow rates and dewatering quantities into the base of the excavations, and the simulated grout cut-off walls will impede horizontal migration within individual layers into the excavations.
- The material properties described above are consistent with the description of the Semi-perched aquifer potentially transitioning into the Bellflower Aquiclude from approximately 50 ft to 80 ft bgs.

3. TEMPORARY EXCAVATION AND CONSTRUCTION DEWATERING ANALYSIS TECHNICAL APPROACH

3.1 General

As stated in the City of Los Angeles Department of Building and Safety Soils Report Review Letter dated May 21, 2021 (included in Appendix E.2 of the DEIR) and discussed in Sections IV.D, Geology and Soils, IV.F, Hazards and Hazardous Materials, and IV.G, Hydrology and Water Quality, of the DEIR, temporary dewatering would be needed during Project construction for the excavation of the subterranean parking levels.

As discussed in Addendum I – Response to Soils Report Review Letter prepared by Geotechnologies dated June 3, 2021 (included in Appendix E.3 of the DEIR), the Project is currently in the entitlement phase. Preliminarily, a temporary cut-off wall system may be installed for shoring and excavation of the proposed subterranean levels. Since the cut-off wall system will be utilized to support the underlying soil and groundwater, a triangular distribution of earth and hydrostatic pressure of 86 pound-force per cubic foot (pcf) may be utilized for design of a cantilever temporary cut-off wall shoring system. For a restrained condition, a trapezoidal distribution of earth pressure of 25(H), plus a triangular distribution of hydrostatic pressure of 62.4 pcf may be utilized for the design of a restrained cut-off wall shoring system, where H is the height of cut-off wall system in feet. Subsequent to the installation of the cut-off wall system, the temporary dewatering will be limited to within the cut-off wall system to draw the groundwater to approximately 2 ft below the bottom of the excavation. Therefore, dewatering within the cut-off wall system will have negligible settlement and/or deformation effects on the adjacent properties. Once the design of the proposed structures and the depth of the proposed subterranean levels achieve more definition and a dewatering consultant is engaged, the feasibility of a traditional temporary dewatering system with well points to draw down the water level may be re-evaluated. Additional dewatering and settlement analyses will be provided and submitted to the City of Los Angeles Grading Division for review and approval if the shoring and dewatering system changes from a cut-off wall system.

The objective of this preliminary temporary excavation and construction dewatering evaluation is to simulate, using a numerical groundwater model, the depth and extent of groundwater drawdown (i.e., groundwater cone of depression dimensions) and groundwater dewatering quantities based on an example method to extract groundwater and control excavation infiltration in the Area 2 excavation presented in the DEIR. The groundwater model to evaluate temporary dewatering conditions incorporates an approximation of potential lateral infiltration control measures (if needed), an approximation of dewatering groundwater extraction methods, and the stratified and variable nature of the Site soil properties. This example consists of simulating the construction of vertical, low-permeability perimeter grout cut-off walls (grout walls) to provide lateral groundwater infiltration control. However, this is only one example of a potential infiltration regulatory control measure. Other control methods and designs may be considered as additional subsurface and design information becomes available (i.e., when final construction plans are prepared following Project approval). For example, no infiltration control may be necessary for certain excavation areas and depths if low-permeability silts and clays are exclusively encountered. The groundwater model input parameters are based on the example perimeter infiltration control measures and the groundwater and soil conditions currently estimated at the Site, as well as the anticipated excavation dimensions of the Area 2 excavation.

3.2 Simulated Area 2 Excavation

This dewatering analysis uses the proposed Area 2 excavation shown in Figure 3 of the Soil Management Plan (included in Appendix G.1 of the DEIR) to provide an example scenario to evaluate dewatering and groundwater drawdown conditions. This proposed Area 2 excavation is the largest by saturated volume of the deeper excavations located along the northern perimeter of the Site (Figure 3), and thus provides a representative preliminary dewatering evaluation example. The approximate Area 2 excavation dimensions are as follows:

- East-west length – 560 ft
- North-south length – 150 ft
- Average excavation depth – 39.5 ft
- Total cubic feet (ft^3) of soil excavation – approximately 3.3 million (M) ft^3

3.3 Numerical Groundwater Model

A five-layer numerical groundwater model was developed to simulate excavation and construction dewatering conditions at the proposed Area 2 excavation location. The simulation was performed using the three-dimensional numerical groundwater modeling program, MODFLOW 2005, under the industry-standard Groundwater Vistas Version 7 graphical user interface. The model assumes dewatering will occur under unconfined conditions. The model configuration is as follows:

- Model boundary dimensions – 10,000 ft by 10,000 ft, with the simulated Area 2 excavation situated in the center. The model grid size is designed to minimize potential influence from the model simulated boundary conditions on dewatering behavior predicted in the vicinity of the simulated Area 2 excavation.

- Number of grid cells – 200 rows and 200 columns.
- Model grid cells – individual grid cells are 50 ft by 50 ft in the horizontal dimension.
- Model layers – Overall, the model encompasses five layers and simulates conditions within depths of 0 to 70 ft bgs. The number of layers were selected based on professional judgment and in order to allow for assessing vertical gradients in the vicinity of extraction wells and grout walls:
    - Layer 1 is the uppermost layer and is 30 ft thick;
    - Layer 2 is 10 ft thick with the bottom layer at 40 ft bgs;
    - Layer 3 is 5 ft thick with the bottom layer at 45 ft bgs;
    - Layer 4 is 5 ft thick with the bottom layer at 50 ft bgs; and
    - Layer 5 is 20 ft thick with the bottom layer at 70 ft bgs.
- Model hydraulic conductivity (K) – A uniform bulk K value was applied to the model domain. We reviewed CPT-1/HPT-1 and geotechnical borings B4, B5, B10 and B13 specifically for the Area 2 analyses, plus the other CPT/HPT and Geotechnologies borings for the overall Site. The CPT-1/HPT-1 profile shown in Figure 5A identified predominantly fined-grained clays, silts, silt mixtures, sand mixtures with silt and clay, and limited sands. The HPT profile for CPT-1 indicated K values of exclusively less than 0.1 ft/d for the materials encountered. Geosyntec also reviewed published K values from Freeze and Cherry (1979), Heath (2004), and Domenico and Schwartz (1990) for the dewatering analysis. For example, CPT-1 identified approximately 14 ft of clay materials that would have a K_h range of 0.0013 to 0.00003 ft/d (Domenico and Schwartz, 1990). A 15-ft, very dense, fine-grained sand zone was identified in B5 in the northeast corner, but in no other borings. This isolated sand zone may have a K range of 1 to 57 ft/d. In our professional opinion, given the predominance of low-K materials measured by the CPT/HPT borings and review of the geotechnical borings, we conclude an average bulk K_h value of 0.1 ft/d, consistent with a silt or sandy silt mixture (and higher than the measured K values for 83% of the Site soils hydraulically profiled), would be a representative intermediate K value (i.e., between clays with lower K values and sands with higher K values) to be used in the model to approximate the stratified and variable soils found at the Site.
- Horizontal to vertical anisotropy (K_x/K_z) is conservatively assumed to be 10:1 as commonly applied to deposited alluvial soils with fine-grained silt/clay mixtures material such as found at the Site [see Freeze and Cherry, 1979, pg. 32]. This

ratio results in a bulk vertical hydraulic conductivity (K_v) value of 0.01 ft/d in the model. It is noted that in Todd and Mays [2005], the K_x/K_z ratio can be 100:1 or greater where clay layers occur, such as has been identified at the Site. The likely higher K_x/K_z ratio for clay layers found at the Site would potentially impede and reduce upward inflow quantities into the base of the excavation, thus reducing actual dewatering quantities and cone of depression dimensions, as compared with the modeled findings.

- Another parameter used in the dewatering analysis modeling is the specific yield (Sy) of the water-bearing materials. Sy is defined as the ratio of (1) the volume of water a saturated rock or soil will yield by gravity to (2) the total volume of rock or soil [Johnson, 1967]. Sy is usually expressed as a percentage and is also described as drainable saturated porosity. Given the range of materials identified in the subsurface at the Site (i.e., clays, silts, silt and clay mixtures, sand/silt/clay mixtures, and limited sands), the Sy for the various materials is expected to be variable. Reference documents were consulted to estimate Sy. A primary reference document is *Specific Yield – Compilation of Specific Yields for Various Materials* [Johnson, 1967]. This is a peer-reviewed research paper prepared by the U.S Geological Survey specifically to report hydrologic properties of earth materials. The average range of reported Sy percentages for the range of primary materials found at the Site includes: 2% on average for clay, 8% on average for silt, and 21 to 27% on average for fine, medium, coarse, and gravelly sand that are assumed to correlate with the limited sands at the Site not intermixed with silt and clay. The Sy for mixtures of clays, silts and sands vary within these Sy ranges generally based on the relative percentages of the clay, silt, and sand soil types. It is noted in Johnson [1967] that the actual Sy for short-term draining, such as temporary dewatering considered here, may yield lower Sy values as compared with literature-reported long-term drainage values. Thus, given the temporary dewatering factor and the extensive occurrence and volume of clay and silt layers combined with clay, silt, and sand mixtures within the water-bearing zone simulated here, we conclude that an Sy value of 10% (in the range of a silt, sandy silt mixture, or clay-sand mixture [see Figure 1 in Johnson, 1967]), is a reasonable intermediate Sy value to be applied for use for the average bulk Sy property in the model for temporary construction dewatering. As is presented in the recommendations section, a future dewatering pumping test and analysis will confirm or refine the average bulk Sy properties for the Site as a part of the regulatory building permit process.

- The initial groundwater condition – Northeast to southwest groundwater flow direction with a gradient of 0.008 (Figure 6) was assumed, based on monitoring data from previous investigations presented in Appendix C. Groundwater flow was initialized using a constant head boundary along the model edges in each layer.

- The Area 2 excavation is simulated as a 600-ft (12 cells) by 150-ft (3 cells) by 40-ft (2 layers) area at the center of the model domain.
- Grout walls, which are a potential design identified in the DEIR, were simulated along the outer perimeter of the modeled Area 2 excavation using the horizontal flow barrier (HFB) package of MODFLOW. The barriers are simulated as 2 ft thick with a permeability of 1 x 10^{-7} centimeters per second (cm/sec) (approximately 0.0003 ft/d) and extending to a depth of 45 ft bgs.
- To simulate groundwater extraction rates and effects on water levels, extraction wells were inserted in the model within each grid cell within the Area 2 excavation (36 wells total). Wells were simulated using a well screen extending to a depth of 60 ft bgs. The number and depth of extraction wells were based on an iterative assessment to determine the necessary well configuration for dewatering the example Area 2 excavation. It is anticipated the actual configuration of dewatering wells and methods will be based on excavation-specific criteria (i.e., excavation dimensions, construction phasing, hydrogeology, schedule, etc.) and will vary among the specific excavations and during site preparation/demolition, excavation, construction phases, and dewatering contractor recommendations.

3.4 Model Simulations

The modeling approach for the dewatering analysis performed here combines: a) a steady-state simulation to approximate the pre-dewatering groundwater initial conditions that are not time-dependent such as estimated average groundwater flow gradient (0.008 ft/ft), groundwater flow direction (northeast to southwest) and depth to groundwater at the Site (approximately 10 ft bgs) at Area 2; plus b) transient model simulations to approximate temporary groundwater pumping required to lower and maintain the groundwater level depression within the Area 2 excavation during the 21-month Site demolition and preparation, excavation, and construction period. This approach follows the methodology described in Anderson and Woessner [2002], *Applied Groundwater Modeling, Simulation of Flow and Advective Transport,* for time-dependent scenarios. Anderson and Woessner [2002] state that "[t]ransient simulations are needed to analyze time-dependent problems." We concluded that the use of transient simulations for the groundwater pumping for the temporary 21-month dewatering period is a time-dependent scenario and is best simulated with a transient simulation. Anderson and Woessner [2002] go on to state that "[a] transient simulation typically begins with steady-state initial conditions and ends before or when a new steady-state is reached." Thus, Geosyntec used the approach of using a steady-state simulation to simulate the initial groundwater conditions and transient simulations for the time-dependent analysis of groundwater pumping for the 21-month dewatering program.

The transient model uses MODFLOW-NWT, the Newton formulation of MODFLOW2005. For this dewatering analysis, the transient modeling scenario is preferred, as it provides a time-dependent dewatering simulation equivalent to the estimated time period for dewatering during the Site demolition, preparation, excavation, and construction.

In our professional opinion, the combined three-dimensional steady-state and transient modeling approach used in this analysis provides a superior methodology as compared with the use of an equation-based analytical solution suggested by comments on the DEIR (specifically, comments from Shannon & Wilson) that does not allow for a time-dependent analysis or include three-dimensional factors such as regulatory infiltration migration control measures (i.e., vertical grout cut-off walls) or anisotropy in the water bearing materials. Further, we conclude that due to the assumptions and simplifications used in the Shannon & Wilson analysis, it over-estimates the dewatering quantities and drawdown. Consistent with industry practice, the transient model is used for short-term changes in the groundwater system, such as temporary pumping to dewater the groundwater, as will be done during Project construction.

Transient modeling of temporary dewatering would occur in two general phases as follows:

- Dewatering Phase 1 – Implement drawdown from static conditions. This initial dewatering phase involves pulling down (i.e., depressing) the groundwater table from the initial conditions to below the base of the final excavation using pumping from temporary groundwater wells. During this phase, high pumping rates would be used to bring down the groundwater table. This phase of work is anticipated to be initiated during the Site demolition and preparation construction phases. Certain excavation activities (such as excavation in an unsaturated zone or previously dewatered upper zones) are expected to overlap and begin before this Phase 1 dewatering is completed. Based on the pumping rate simulated in the model, the Phase 1 dewatering may require up to 8 months to completely pull the water table down to the base of the deepest portions of the Area 2 excavation.
- Dewatering Phase 2 – Maintain groundwater drawdown to support excavation completion and below-grade parking structure construction. During Phase 2 dewatering, lower pumping rates would be implemented to maintain drawdown

of the groundwater table at or near the base of the excavation, to complete excavation and structure construction. The Phase 2 period is estimated to be approximately 11 months.

The model encompasses three stress periods. A stress period is a computational time period that defines certain groundwater conditions and pumping simulations:

- Stress period 1 – This is the initial steady-state period to establish the static groundwater gradient and flow direction prior to initiating simulated dewatering activities.
- Stress period 2 – This is a transient-state stress period simulating pumping rates to pull down the water table to the base of the excavation that would be performed during Site preparation and demolition activities.
- Stress period 3 – This is a transient-state stress period simulating the lower pumping effort required to maintain dewatering to below the base of the area during the Site excavation and underground parking structure construction.

Extraction wells are only activated in the transient stress periods (stress periods 2 and 3). Due to the predominantly fine-grained nature of the Site geology, the hydrogeological parameters assumed for the model limited the achievable pumping rates. Initial pumping rates were approximately 50 gallons per minute (gpm) total across the extraction well network. As the excavation was dewatered and the water table lowered in the simulation, pumping rates were reduced to a long-term rate of approximately 5 to 10 gpm total across the extraction well network.

3.5 Model Findings

The dewatering simulation was performed based on the features described in Sections 3.3 and 3.4 above. Below is a summary of findings:

- A pumping rate ranging from 5 to 50 gpm is estimated in order to achieve and sustain an adequate groundwater level drawdown below the base of the Area 2 excavation.
- This model used a uniform initial gradient (0.008 ft/ft), bulk aquifer K_h (0.1 ft/d), K_v (0.01 ft/d) and Sy (10%) values that we consider are a representative and conservative approximation for the variable, interbedded predominantly fine-grained soil conditions found at the Site. The interbedded, heterogenous, and discontinuous soils may produce dewatering conditions that vary from the assumed model parameters. Based on the results of the simulation, the extraction

well field starts pumping at a higher rate of approximately 50 gpm (72,000 gallons per day [gpd]), and the achievable pumping rate fell as dewatering progressed. A pumping rate of 5 gpm (7,200 gpd) was found to be required to sustain the drawdown below the base of the grout walls (i.e., 45 ft bgs).

- Predicted groundwater drawdown due to the temporary dewatering of the Area 2 excavation area was found to decrease with distance from the excavation (Figures 7, 8A, and 8B). The predicted drawdown was found to be time-dependent, with both the magnitude and spatial extent of drawdown increasing as dewatering continued. The model estimated a cone of depression drawdown of approximately 10 ft extending up to approximately 50 to 75 ft from the Area 2 excavation perimeter and approximately 4 ft of drawdown at a distance of up to approximately 150 ft from the Area 2 excavation perimeter following 8 months of dewatering (Figure 8A). After the end of the 21-month simulated dewatering period, the model estimated a cone-of-depression drawdown of approximately 10 ft extending up to approximately 125 ft from the Area 2 excavation perimeter and approximately 4 ft of drawdown at a distance of up to approximately 300 ft from the Area 2 excavation perimeter (Figure 8B). The outward envelope of the simulated groundwater drawdown was contoured to 2 ft. This was considered an appropriate level of precision, given that the natural annual groundwater level fluctuations found in the area range from approximately 0.5 to 2 ft (see Section 2.4.3).
- During the entire dewatering duration, approximately 7.5 M gallons (23 acre-ft) of groundwater was simulated to be extracted from Area 2. Groundwater resources are typically described in units of acre-ft, with 1 acre-ft of groundwater equating to approximately 325,851 gallons. This amount of dewatered groundwater includes both the initial water within the Area 2 excavation soils, as well as upward inflow through the excavation base and lateral inflow through the grout walls.

3.6 Evaluation of Groundwater Basin and Usage

The following section provides information pertaining to the local groundwater basin and provides context for the estimated quantity of groundwater removed via the Area 2 excavation dewatering (7.5 M gallons or 23 acre-ft) during the temporary underground parking structure construction period. The overall estimated groundwater dewatering quantity for the Site excavations is estimated to be approximately 26.4 M gallons (Table 1 and Section 4.1), which equates to approximately 81 acre-ft. Based on a review of the California's DWR Groundwater Bulletin 118 (DWR, 2003 and updated 2004) and the State of California GAMA database, the Site lies within the boundary of the Hollywood

Subbasin (No. 4-11.02). The sub-basin surface area is approximately 16.4 square miles, and the total basin groundwater storage capacity is reported to be 200,000 acre-ft. In addition, according to the City of Los Angeles Department of Water and Power (LADWP) Urban Water Management Plan [LADWP, 2020], the Hollywood Subbasin is unadjudicated, and LADWP does not actively produce groundwater from the subbasin. A review of the State of California well database GeoTracker / GAMA (accessed February 14, 2023) found no records of groundwater supply wells, including domestic, irrigation, industrial, municipal, or other supply well types, within 1 mile of the Site. Thus, the quantity of groundwater removed via dewatering would be less than 0.05 percent of the basin storage capacity and would not interfere with any groundwater supply pumping in the Site vicinity.

Removing approximately 7.5 M gallons of water in Area 2 during excavation and construction of the underground parking structure equates to approximately 11,500 gpd, and a total of approximately 40,600 gpd for the removal of approximately 26.4 M gallons across the entire Site. In comparison, the maximum projected operational water demand for the Project is approximately 269,123 gpd (see Table IV.M.1-6 in Section IV.M.1, Utilities and Service Systems – Water Supply and Infrastructure, of the DEIR). Thus, the estimated dewatering groundwater demand is significantly less than the operational demand for the Project.

4. COMPARATIVE ESTIMATES OF DEWATERING PROGRAM VOLUMES AND DRAWDOWN

This section refers to excavation areas presented in Figure 3 of Appendix B (Soil Management Plan) to Appendix G.1 of the DEIR, which is included in Figure 3 of this Report. This section provides preliminary estimates for groundwater dewatering volumes and drawdown conditions for the other excavation areas. The estimates are based on a comparative analysis with the baseline findings from Area 2. The estimates provided below are based on initial Site hydrogeologic data and interpretations. The Project will be required to confirm the analyses and results presented herein during the City's regulatory building permit process.

4.1 Preliminary Estimates of Temporary Construction Dewatering Volumes

Table 1 lists the estimated groundwater dewatering volumes for each proposed excavation area (Figure 3 of Appendix B (Soil Management Plan) to Appendix G.1 of the DEIR). The volumes are based on a comparative analysis with the dewatering volume findings for Area 2. The quantities listed in Table 1 are based on the assumption of each excavation being dewatered on its own and not being influenced by adjacent excavation dewatering activities. In practice, dewatering of adjacent excavations simultaneously, which is anticipated to occur, would likely reduce the estimated dewatering quantities in Table 1 due to the merging and overlap of excavation cones of depression.

The methodology used to estimate dewatering volumes is summarized below:

- The Area 2 modeling analysis estimated approximately 7.5 M gallons of groundwater to be dewatered for the planned 21-month Site preparation, demolition, excavation, and construction period.
- The estimated dewatering volumes for the remaining areas were scaled from the Area 2 baseline dewatering volume calculation of 7.5 M gallons according to the ratio of respective saturated soil volumes. For example, the Area 1 excavation (located in the northwestern portion of the Site) contains slightly less than 50% of the saturated soil volume as compared to Area 2 (approximately 1.2 M ft^3 for Area 1 versus approximately 2.46 M ft^3 for Area 2). Thus, the preliminary dewatering volume of Area 1 is calculated to be approximately 3.7 M gallons, slightly less than 50% of the 7.5 M gallons simulated for Area 2. See Table 1 for preliminary estimated dewatering quantities for the other excavations areas.

The temporary Project construction dewatering is expected to include the simultaneous dewatering of adjacent excavations, which may produce merging dewatering cones of depression, and thus be expected to reduce the total dewatering quantities presented in Table 1.

4.2 Preliminary Estimates of Groundwater Drawdown

The following provides a qualitative comparative analysis for potential temporary groundwater drawdown during temporary construction dewatering. It is based on a comparative analysis with the simulated drawdown estimates for Area 2. As previously described in Section 3.5, Model Findings, after the end of the simulated 21 month dewatering period, the model estimated a drawdown of approximately 10 ft extending approximately 125 ft from the Area 2 excavation perimeter and approximately 4 ft of drawdown at a distance of up to approximately 300 ft from the Area 2 excavation perimeter (Figure 8B).

- Area 1 – As compared with the baseline Area 2 excavation, Area 1 extends into groundwater from about 10 to 37 ft bgs, which is approximately 2.5 ft less deep than Area 2. The Area 1 estimated saturated soil volume is about 50% of Area 2 due to the smaller aerial footprint. CPT-2/HPT-2, which is located in Area 1, identified an approximate 8-ft zone of elevated K material from 10 to 18 ft bgs. It is assumed that regulatory infiltration control measures will be applied, if needed. Boring logs B6, B9, and B11 were also reviewed. Given these factors and data, we estimate the anticipated drawdown cone of depression dimensions for Area 1 will be similar to slightly smaller in depth and lateral dimensions as compared with the simulated Area 2 drawdown cone of depression dimensions described in Section 3.5.
- Area 3 – As compared with the baseline Area 2 excavation, Area 3 extends into groundwater from about 10 to 40.5 ft bgs, which is about 1 ft deeper than Area 2. The Area 3 estimated saturated soil volume is about 33% less than Area 2 due to the smaller footprint. CPT-3/HPT-3, which is located in Area 3, identified a 5-ft zone of elevated K soils from 12 to 17 ft bgs, a 1-ft zone at 33 ft bgs, and another zone from 39 to 47 ft bgs. The sand zone was also identified in boring B17 at 42.5 ft to 50 ft. The base of the Area 3 excavation is at 40.5 ft bgs and may encounter this elevated K zone. It is assumed lateral infiltration control measures will be applied, as needed. Furthermore, the CPT/HPT-3 log identifies a low-K zone from 47 to 52 ft bgs that could serve to key the grout walls and impede upward groundwater flow rates and quantities. Given these factors, we preliminarily estimate the anticipated dimensions of the drawdown cone of depression for Area 3 will be comparable to the Area 2 drawdown cone of depression described in Section 3.5.

- Area 4A – This excavation is not expected to extend into groundwater, and thus no drawdown cone of depression is expected.
- Area 4B – This excavation is expected to extend approximately 1 ft into groundwater. Thus, it is expected to require a reduced dewatering effort and produce a cone of depression with dimensions shallower and of less lateral extent as compared with Area 2.
- Area 5 – This excavation is expected to extend approximately 1 ft into groundwater. Thus, it is expected to require a reduced dewatering effort and produce a cone of depression with dimensions shallower and of less lateral extent as compared with Area 2.
- Area 6 – As compared with the baseline Area 2 excavation, Area 6 extends into groundwater from approximately 10 to 27 ft bgs, which is approximately 12.5 ft less deep than Area 2. The estimated saturated soil volume is about 30% more than of Area 2 due to the larger footprint. CPT-4/HPT-4, which is located near Area 6, identified a 4-ft zone of elevated K soil from approximately 12 to 16 ft bgs. Geotechnologies boring logs B1, B2, B3, B12, and B20, which are located within the Area 6 footprint, were also reviewed. It is assumed that regulatory infiltration control measures will be applied, if needed. Given these factors and data, we estimate that the anticipated dimensions of the drawdown cone of depression for Area 6 will be shallower in depth, but potentially broader in lateral extent due to the increased size of the Area 6 excavation footprint in comparison to the simulated Area 2 drawdown cone of depression.

It is our understanding that excavation-specific distance-drawdown estimates will be evaluated, confirmed, and refined, if necessary, following the implementation of a future Site-specific dewatering pumping test and as a part of the City's regulatory building permit process once individual buildings and underground structures are designed. A sensitivity analysis of aquifer properties for calculating cone of depression dimension ranges may also be considered following completion of the dewatering pumping test as a part of this regulatory process.

5. CONCLUSIONS AND RECOMMENDATIONS

Geosyntec concludes the following, based on the example dewatering scenario modeling evaluation:

- Due to the predominantly fine-grained and low-K soils (less than 0.1 ft/d) found in the Area 2 excavation area (based on the CPT-1/HPT-1 boring and other boring logs) and throughout the Site, the model simulations estimate that a pre-excavation period will be necessary to lower the groundwater table within the saturated soils of the Area 2 excavation area.
- For the underground parking structure dewatering, excavation, and construction period (estimated for Area 2), horizontal groundwater infiltration from potential intermittent sand zones and lenses would be controlled via grout cut-off walls or similar lateral migration regulatory measures, as needed. The CPT/HPT borings indicate the likely existence of a laterally extensive low-K zone of interbedded silts and clays from approximately 45 to 50 ft bgs at the Site. This "basal" layer could serve as a good foundation layer to key with the base of the grout cut-off walls. While upwelling groundwater would continue to enter the excavation via the excavation bottom, the "basal" layer is expected to impede upward vertical migration rates and quantities into the base of the excavation. The basal silt/clay layer may represent the transition from the base of the Semi-perched water bearing materials to the upper portion of the underlying Bellflower Aquiclude.
- As expected, the predicted drawdown was found to be time-dependent, with both the magnitude and spatial extent of drawdown increasing as dewatering continued. At the completion of the underground parking structure construction (i.e., at the end of the simulated 21-month dewatering period), the model estimated drawdown of approximately 10 ft, extending approximately up to 125 ft away from the Area 2 excavation perimeter and approximately 4 ft of drawdown at a distance of approximately up to 300 ft from the Area 2 excavation perimeter. Notably, as described in Section 2.4.4, naturally occurring annual groundwater fluctuations often range between 0.5 and 2 ft, and long-term groundwater fluctuations in the Site vicinity have been found to be in the range of 3 to 6.5 ft in the Site vicinity. Furthermore, it is common to have groundwater elevation fluctuations in the range estimated for this temporary dewatering example from a variety of regulatory-approved activities, including other construction excavation dewatering projects, groundwater remediation systems, industrial supply wells, and stormwater infiltration systems.
- Based on the findings from this preliminary dewatering analysis, we conclude the analysis presented in the Shannon & Wilson (S&W) letter dated

13 September 2022 over-estimates the dimensions of the anticipated temporary groundwater dewatering drawdown cones of depression (Figures 1A and 1B of the letter) and the potential dewatering quantities. The S&W analysis, cone of depressions outputs in Figures 1A and 1B, and reported quantities rely on unrealistic assumptions (unrestrained dewatering), lack of supporting calculation details and references (silty sand and undefined high storage coefficient), and use of a simplified analytical solution (i.e., assumes isotropic water bearing materials), that combine in our professional opinion to over-estimate the anticipated dewatering conditions.

- Geotechnologies reviewed the Site groundwater conditions and preliminary temporary construction dewatering findings presented in this Report in Appendix D – *Subsidence Evaluation based on Dewatering Simulations Evaluation, Proposed TVC Project* [Geotechnologies, 2023] and concluded the following: "Given the long-term water level fluctuations ranging from 3 to 6.5 ft (due to seasonal changes and regulatory-approved activities) recorded from monitoring wells in the vicinity of the Project Site, a drawdown of 10 ft will only be an additional 3.5 to 7 ft of groundwater level change below the past recorded water levels for the Project vicinity. This small amount of groundwater drawdown will have less than significant subsidence effects on the surrounding properties adjacent to the excavation. It is anticipated that the drawdown effects, as simulated by Geosyntec, will result in less than ½ inch of settlement for areas located in the immediate surrounding vicinity of the Project. The magnitude of any potential settlement will decrease with increased distance away from the excavation. For properties located further away from the excavation, where the depth of temporary dewatering drawdown will be approximately equal to the recorded long-term groundwater level fluctuation, the anticipated subsidence effects as a result of dewatering will be negligible."
- As soon as construction of the water-tight underground parking structure is completed and dewatering ceases, groundwater conditions (groundwater elevations and flow directions) will begin to recover and are expected to generally recover to pre-construction conditions over time, although future seasonal fluctuations are to be expected to continue.
- The evaluation presented herein is preliminary and based on estimates of bulk hydrogeologic properties and modeling approximations of groundwater extraction and regulatory infiltration control measures. Additional Site characterization and dewatering analysis will be performed as the Project planning and design advances and as a part of the City's building permit process. This Report provides an evaluation, using a numerical groundwater model, of the

depth and extent of groundwater drawdown based on an example excavation and methods to extract groundwater and control excavation infiltration. In advance of construction, all shoring design and dewatering methods will be designed and submitted to the local jurisdictions for review and approval and will be performed, inspected, and monitored to comply with the applicable regulatory requirements so that construction phase dewatering will be performed in a manner that is designed to provide for less than significant impacts to neighboring properties [Geotechnologies, 2023] and regional water resource needs.

Geosyntec provides the following recommendations:

- As a part of the City's building permit process and after individual Project building planning and design proceeds and excavation locations and dimensions are finalized, Geosyntec recommends that additional CPT/HPT borings be drilled to confirm and support a more detailed and individualized understanding of subsurface soils and further inform dewatering, infiltration control, and excavation shoring planning. In addition, during the design and permitting phase, a groundwater water-level monitoring network and dewatering pumping test designed and implemented by a selected dewatering subcontractor is recommended to better assess Site-specific hydrogeologic properties and groundwater flow conditions. The groundwater extraction rates and water-level monitoring data from the dewatering pumping test can be used to compare with the estimates and projections provided in this report. Each of these recommended measures can be used to inform and support a well-managed excavation and dewatering program.
- Temporary construction dewatering will be required for excavations that will extend into the groundwater table. Per Project Design Feature GEO-PDF-1, the proposed structures will be designed to resist the hydrostatic pressure, such that a permanent dewatering system (post-construction dewatering) will not be required (DEIR, page IV.D-19). During the design and construction phase, the method of dewatering will be chosen after considering the following variables, among others: the depth of intrusion that is required for each building foundation, the hydrogeologic properties of the soils in which the excavations occur, the potential to mobilize existing groundwater contaminants, the potential for ground subsidence and/or liquefaction to occur, proximity to any existing production wells, and the volume of water to be dewatered on a daily basis. After evaluating each of these factors individually and collectively, an excavation shoring methodology and pumping strategy will be developed in consultation with a dewatering consultant. Defining these methods prior to Project entitlement

approval and the preparation of final construction plans is premature and not reasonable. The following items will be paramount in the decision-making process: the minimization of impacts to neighboring properties, and the minimization of mobilizing contaminants. The method of dewatering will be presented in an NPDES Permit application for LARWQCB or LA City Sanitation if a sanitary sewer industrial discharge permit is obtained, for review and approval. Therefore, the means and methods for dewatering will be evaluated by the Local Agency and/or the LARWQCB and conform with all applicable regulatory requirements. Accordingly, temporary construction phase dewatering will be performed in a manner that will provide for less than significant impacts to neighboring properties and regional water resource needs. All shoring design, infiltration cut-off methods, and dewatering methods will be designed and submitted to the local jurisdictions for review and approval and will be performed, inspected, and monitored to comply with the applicable regulatory requirements.

- Following collection of Site-specific hydrogeologic properties from a Site groundwater dewatering pumping test during the design and regulatory permitting phase for individual Project buildings, it is recommended a groundwater flow analysis of the final excavation and subterranean parking structure buildout design be evaluated to assess groundwater flow directions and elevations following construction.

6. LIMITATIONS AND SIGNATURES

Geosyntec's services were performed and this preliminary evaluation report has been prepared in accordance with generally accepted professional standards of care applicable to the scope of services authorized by Television City Studios, LLC, and no other warranty is provided in connection therewith. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others. Although we were not able to independently verify such data, we did evaluate it to determine whether it was consistent with other information that we developed in the course of our performance of the scope of services. Subsurface investigations and interpretations are inherently limited to data derived from samples taken or tests performed at selected locations. Due to these inherent limitations, it must be recognized the actual subsurface conditions may vary from those predicted, despite the use of professional care.

This preliminary evaluation document was prepared by the staff of Geosyntec Consultants under the supervision of persons whose signatures appear hereon. The findings or professional opinions are based upon; a) preliminary data, analyses, and interpretations of subsurface conditions, b) approximations of data collected by others, and c) the use of groundwater model simulations to preliminarily estimate and project future dewatering methods and conditions (i.e., estimated dewatering quantities and cone of depression dimensions). Thus, the actual hydrogeologic and dewatering conditions and methods used at the Site during future excavation and construction activities may vary from the interpretations, projections, and concepts presented herein. The infiltration control measures described in this analysis are among a number of potential approaches that could be considered, if regulatory control measures are deemed necessary.

The conclusions contained in this document are based solely on the analysis of the conditions as observed by Geosyntec personnel and as reported by other named sources at the time the work was performed. It is anticipated additional site hydrogeologic and geotechnical studies and testing will be performed that may alter the opinions stated herein.

No warranty, expressed or implied, is made regarding: a) the professional opinions expressed in this document by Geosyntec or the references included as appendices or cited in this document, or b) concerning the completeness of the data presented to us. If actual conditions are found to differ from those described in this document or if new information regarding the Site is obtained, Geosyntec should be notified and additional analyses or recommendations, if required, will be provided. This Report was prepared for Television City Studios, LLC. Third parties do not have the right to rely on this Report without the written agreement of Geosyntec, which shall be subject to appropriate terms and conditions.

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TABLE

Table 1 - Preliminary Excavation Dewatering Volume Estimates

Area	Figure 3 (1) - Estimated Excavation Depth (ft bgs)	Figure 3 (1) Total Estimated Excavation Area (ft^2)	Estimated Excavation Total Soil Volume (ft^3)	Estimated Thickness of Saturated Soil in Excavation (ft) (2)	Estimated Total Saturated Soil Volume (ft^3) (2)	Baseline Preliminary Groundwater Dewatering Volume Estimate (gallons)(3)	Estimated Preliminary Dewatering Volume Scaled from Area 2 Baseline Estimate (gallons) (4)(5)(6)(7)
Area 1	37	44,691	1,653,550	27	1,206,644	**	3,700,000
Area 2	39.5	83,394	3,294,063	30	2,460,123	7,500,000	7,500,000
Area 3	40.5	53,650	2,172,833	31	1,636,331	**	5,000,000
Area 4A	7.5	152,407	1,143,052	-3	Not Applicable	Not Applicable	Not Applicable
Area 4B	11	44,916	494,074	1	44,916	**	150,000
Area 5	10.5	62,490	656,147	1	31,245	**	100,000
Area 6	27	190,354	5,139,561	17	3,236,020	**	9,900,000

Source (Geosyntec, 2023)

Total 26,350,000

Sum Total (Rounded up and abbreviated in text) 26.4 M gallons

Notes:

1 Figure 3 of Appendix B (Soil Management Plan) to Appendix G.1 of the DEIR

2 Assumes average depth to groundwater of 10 feet below groundsurface

3 A preliminary dewatering analysis was performed for Area 2 as a baseline estimate of potential dewatering behavior and quantities. The baseline Area 2 preliminary volume estimate is based on a number of variable estimates and assumptions. A key assumption is perimeter infiltration regulatory control measures will be implemented, if necessary.

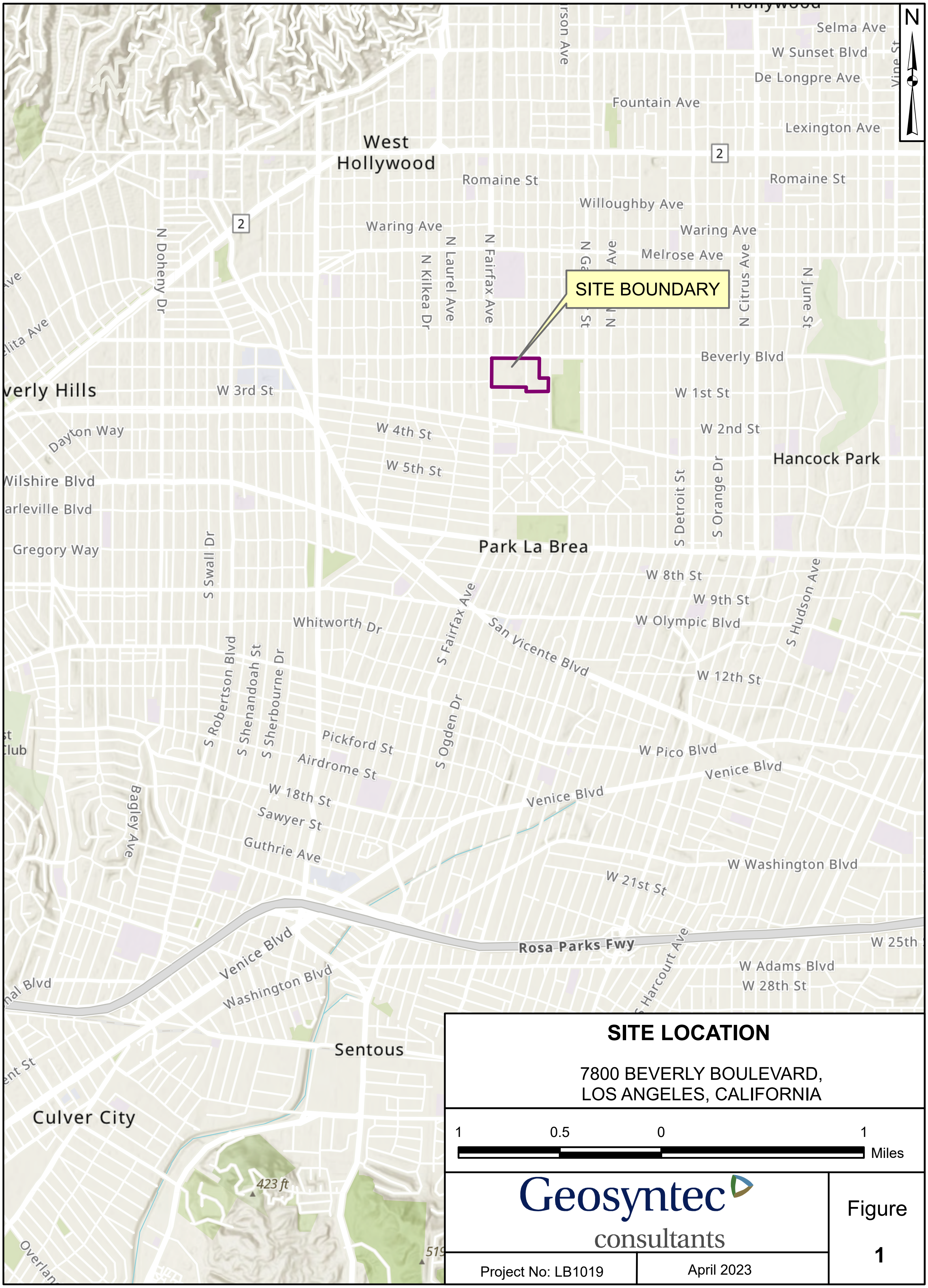
4 Preliminary groundwater dewatering volumes for Areas 1, 3, 4B, 5 and 6 are based on scaling the saturated soil volumes per excavation with the calculated baseline for Area 2 (saturated zone volume = 7,500,000 gallons dewatered).

5 The dewatering volume estimates are preliminary and will be confirmed by hydrogeologic testing studies (i.e., groundwater pumping test) as part of the City's regulatory building permit process.

6 Individual excavation estimates rounded to the nearest 50,000 gallons; the sum total is rounded up to 26.4 M gallons

7 The dewatering volume estimates are based on independent excavation dewatering. Simultaneous excavation dewatering would be expected to potentially reduce dewatering quantities due to overlapping drawdown cones of depression.

FIGURES



SITE LOCATION

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

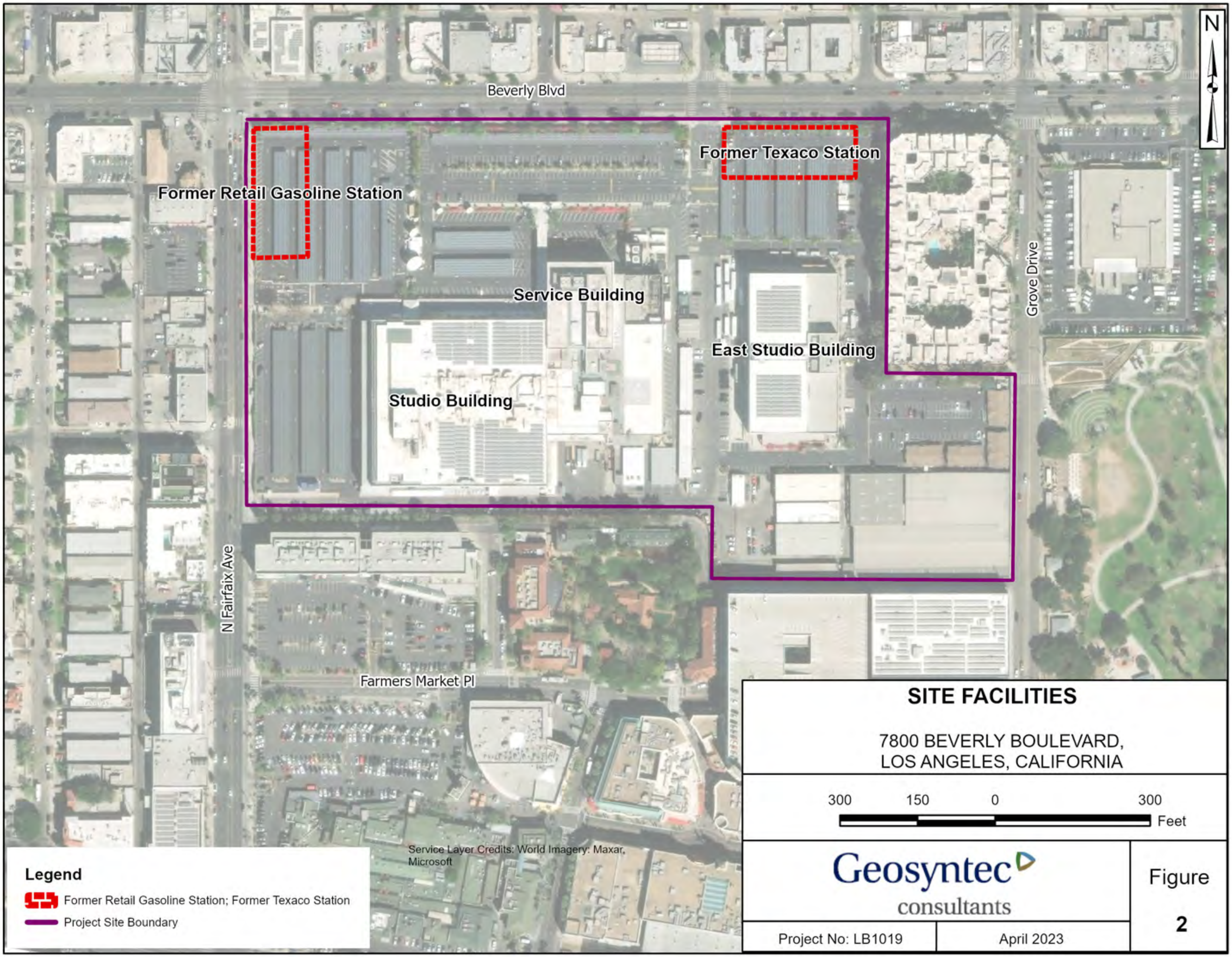
1 0.5 0 1 Miles

Geosyntec consultants

Figure 1

Project No: LB1019

April 2023



SITE FACILITIES

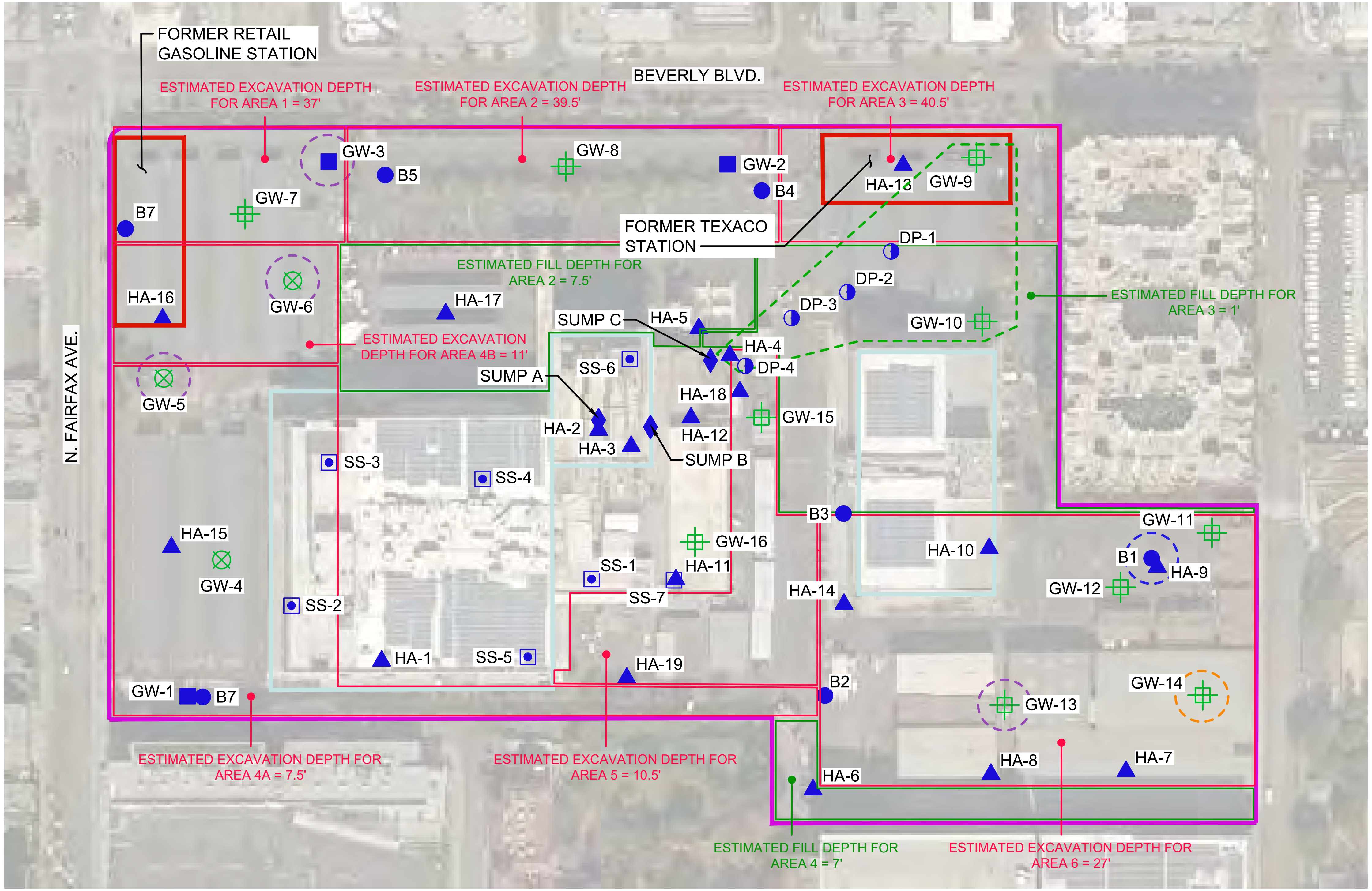
7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

Geosyntec consultants

Figure 2

Project No: LB1019

April 2023



LEGEND

- SOIL AND GROUNDWATER SAMPLING LOCATIONS (AUGUST 2019)
- DIRECT PUSH SOIL AND GROUNDWATER SAMPLING LOCATIONS (NOVEMBER 2018)
- SOIL AND VAPOR SAMPLING LOCATIONS (OCTOBER 2018)
- SOIL VAPOR SAMPLING LOCATIONS (OCTOBER 2018)
- SOIL, SOIL VAPOR, GROUNDWATER SAMPLING LOCATIONS (OCTOBER 2018)
- FORMER RETAIL GASOLINE STATION; FORMER TEXACO STATION
- EAST STUDIO BUILDING; MAIN STUDIO BUILDING; OFFICE BUILDING
- APPROXIMATE SITE BOUNDARY
- SOIL AND GROUNDWATER SAMPLING LOCATION TO 40' bgs (MAY 2020)
- SOIL AND GROUNDWATER SAMPLING LOCATION TO 17' bgs (MAY 2020)
- APPROXIMATE EXTENT OF FORMER TEXACO SERVICE STATION IMPACTS
- ELEVATED ARSENIC IN SOIL AT 1 FT BGS
- ELEVATED TPH IN SOIL AT 1-2.5 FT BGS
- TCE AND 1,2-DCE DETECTED IN GROUNDWATER ABOVE MCL

NOTE:

1. LOCATIONS ARE APPROXIMATE.

0 150'
SCALE IN FEET

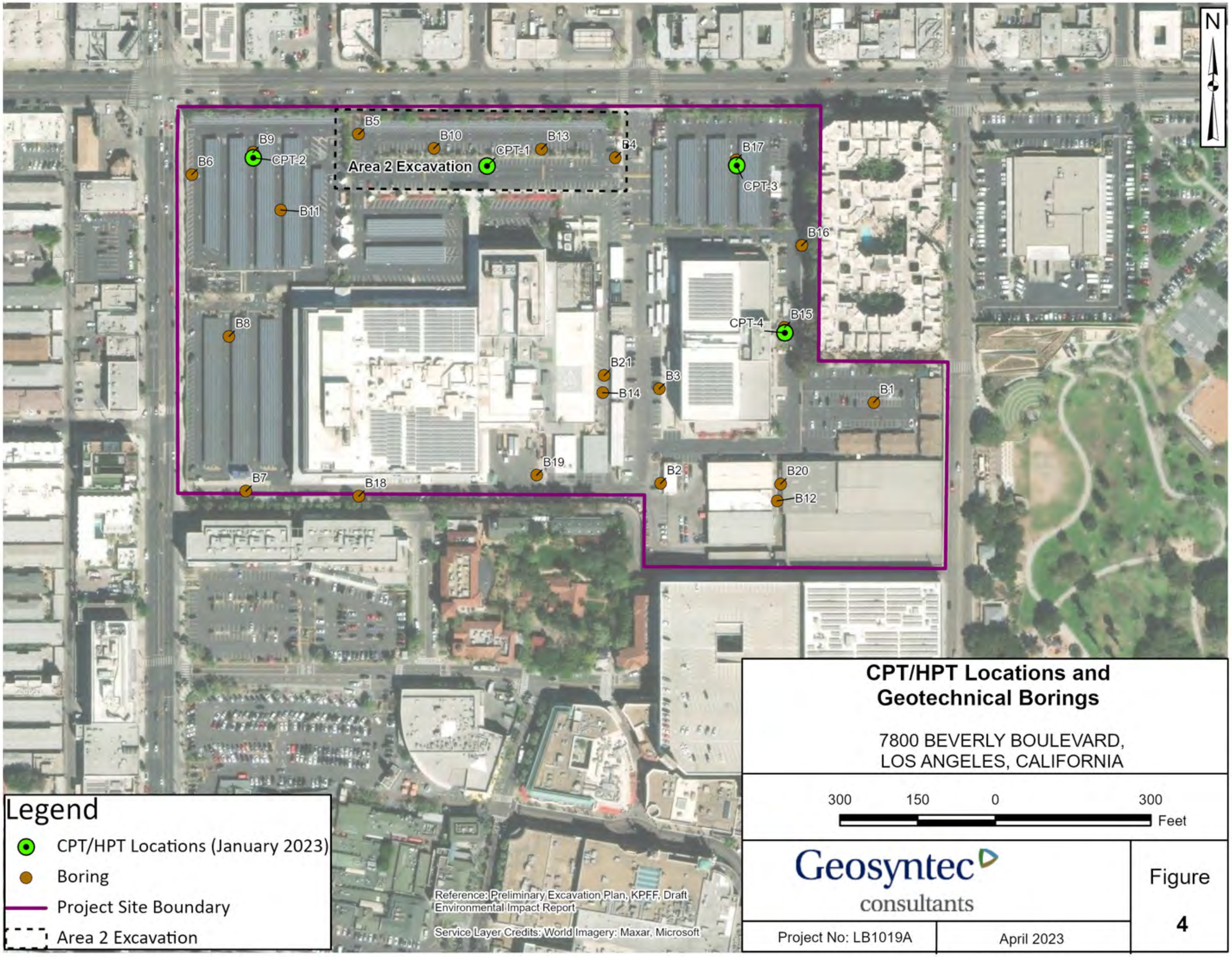
PRELIMINARY SITE SOIL GRADING AND OVER EXCAVATION PLANS

7800 BEVERLY BOULEVARD
LOS ANGELES, CALIFORNIA

Geosyntec consultants

PROJECT NO: LB1019A | April 2023

FIGURE 3



CPT/HPT Locations and Geotechnical Borings

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

300 150 0 300 Feet

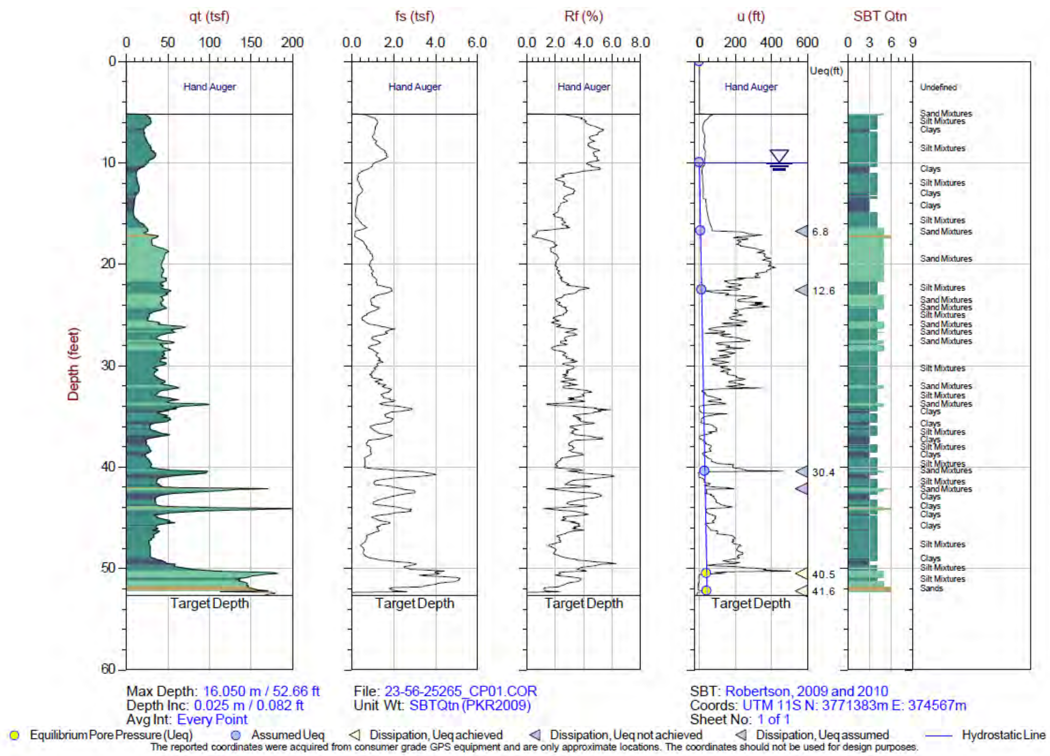
Geosyntec consultants

Figure 4

Project No: LB1019A

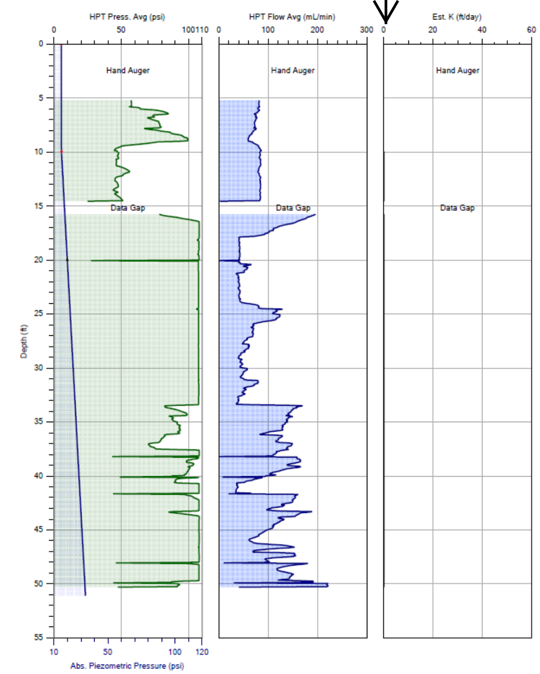
April 2023

CPT-1 Profile



HPT-1 Profile

HPT Tool Sensitivity 0.1 ft/d



Hydrogeologic Profile - CPT-1 /HPT-1

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

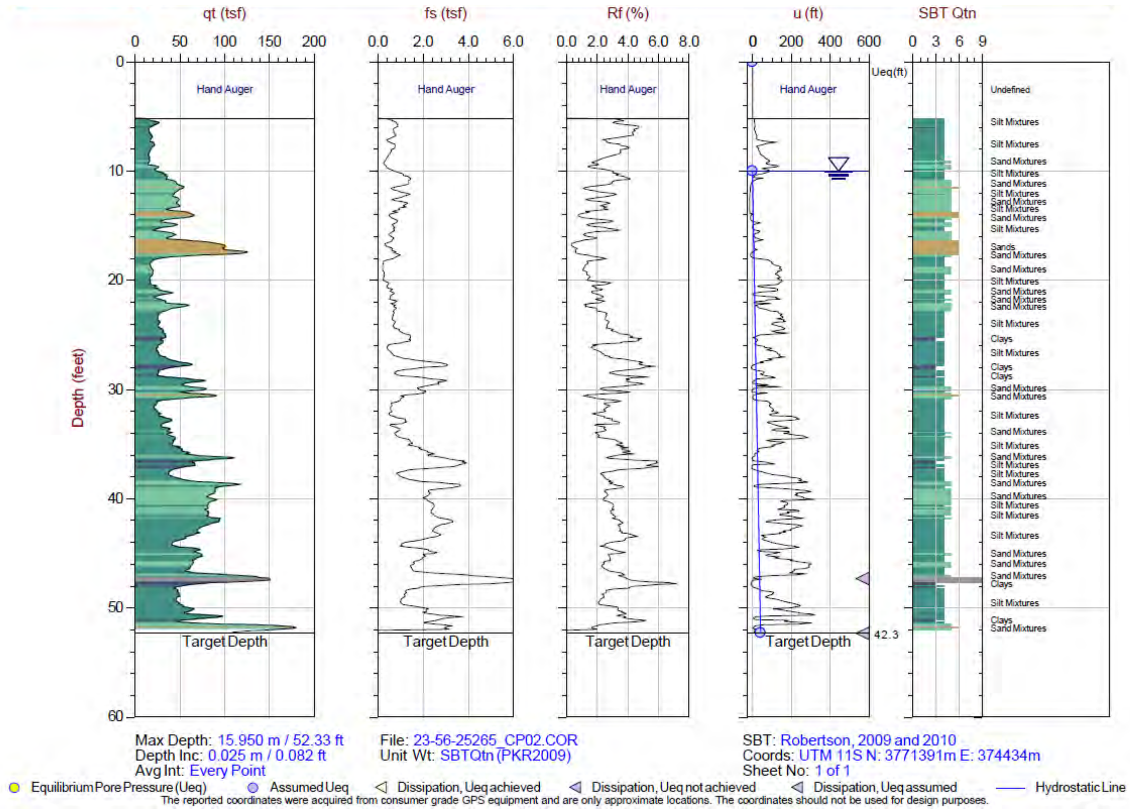
Geosyntec consultants

Figure **5A**

Project No: LB1019

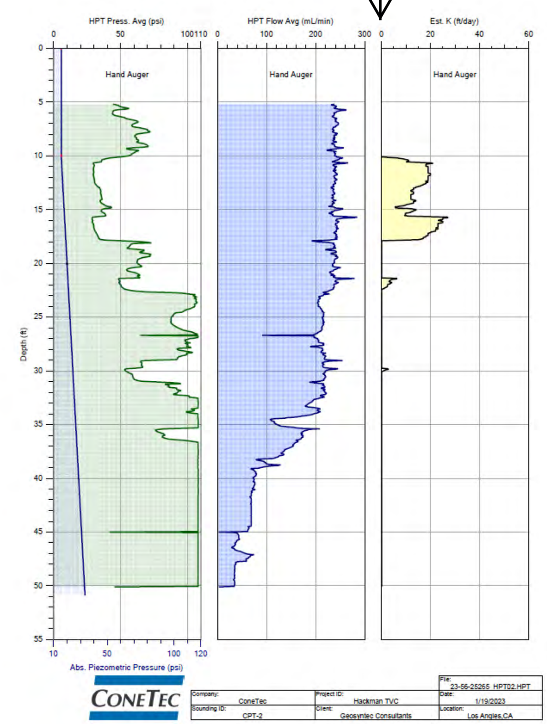
April 2023

CPT-2 Profile



HPT-2 Profile

HPT Tool Sensitivity 0.1 ft/d



Hydrogeologic Profile - CPT-2 /HPT-2

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

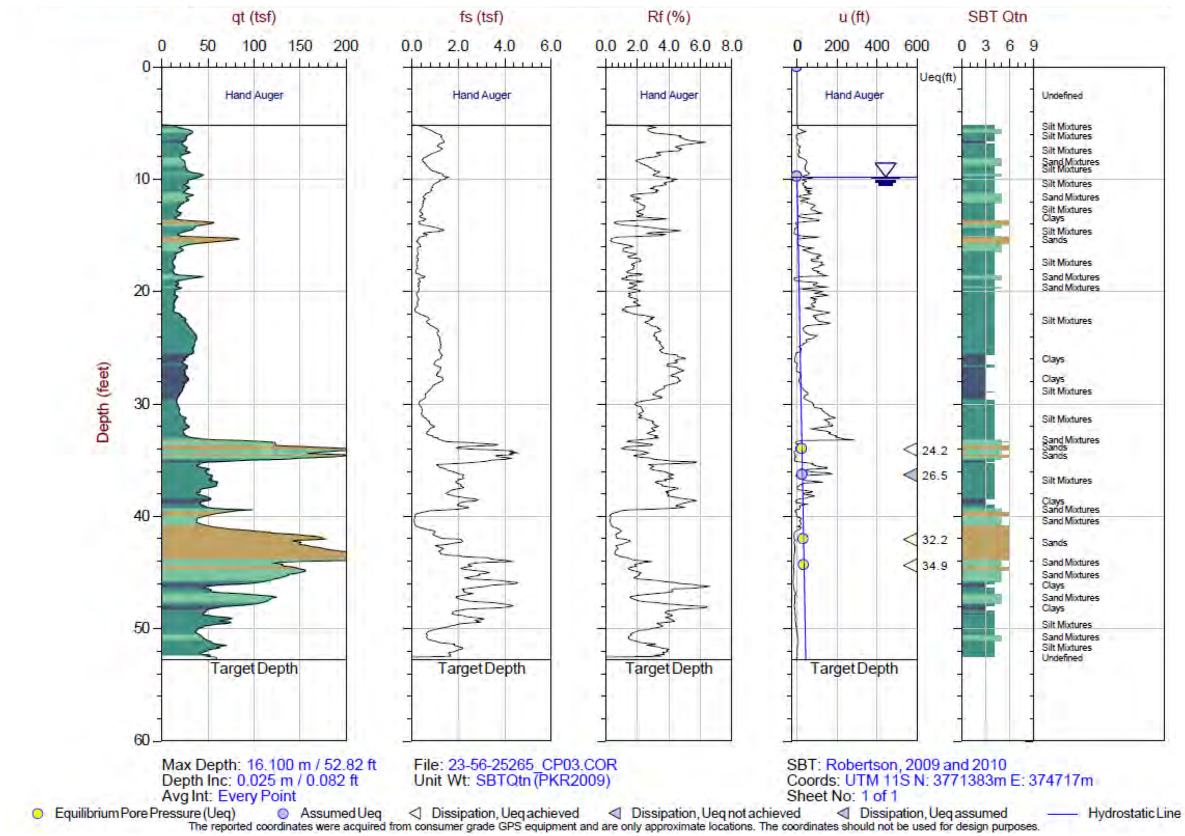
Geosyntec consultants

Figure **5B**

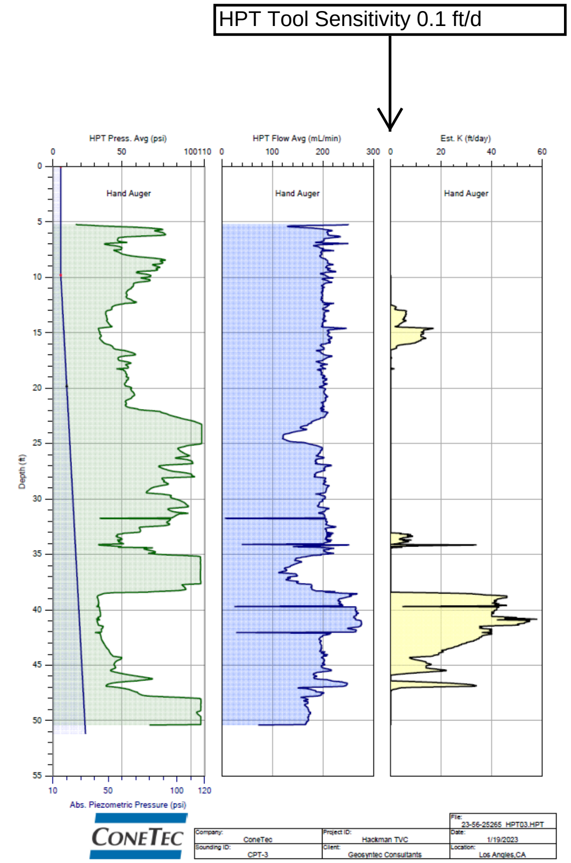
Project No: LB1019

April 2023

CPT-3 Profile



HPT-3 Profile



Hydrogeologic Profile - CPT-3 /HPT-3

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

Geosyntec consultants

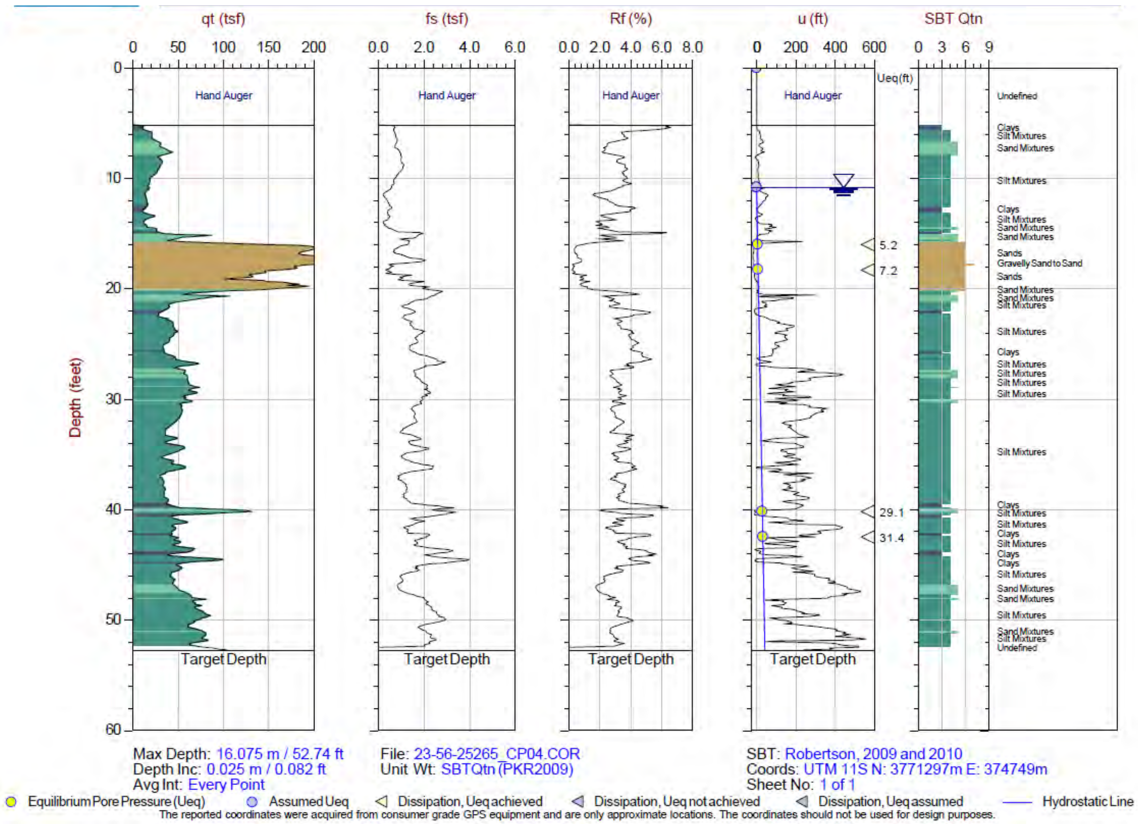
Figure

5C

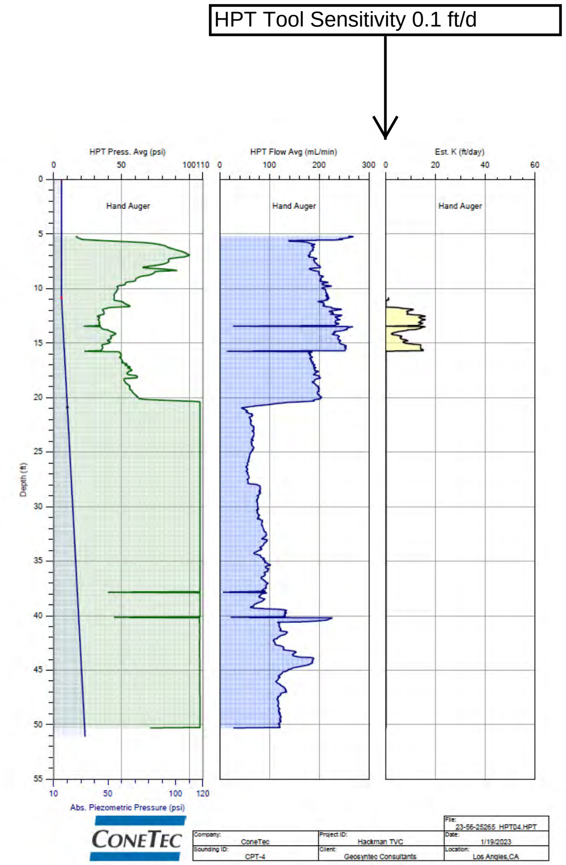
Project No: LB1019

April 2023

CPT-4 Profile



HPT-4 Profile



Hydrogeologic Profile - CPT-4 /HPT-4

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

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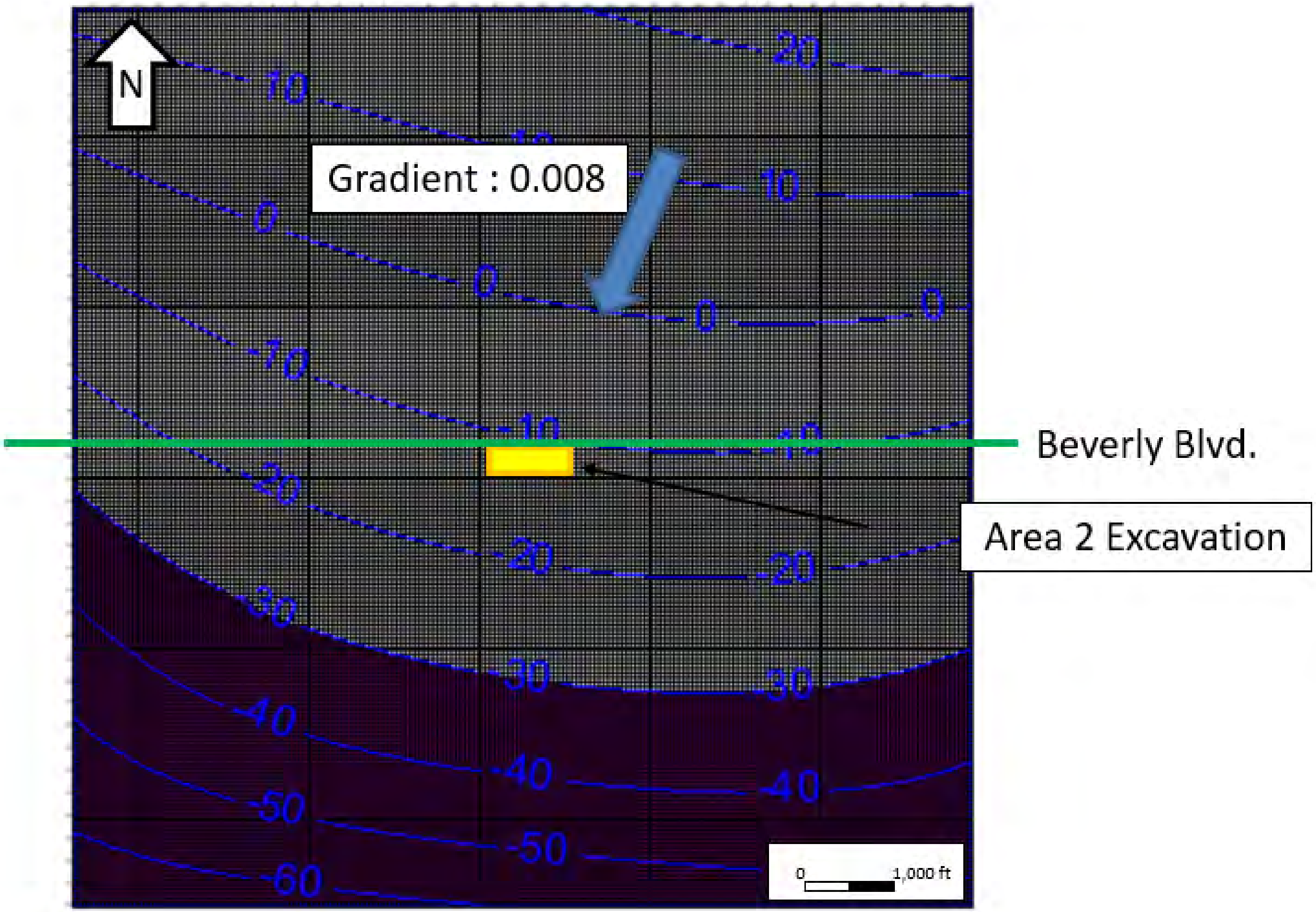
Figure **5D**

Project No: LB1019

April 2023



Groundwater Model Grid – Plan View, Initial Conditions

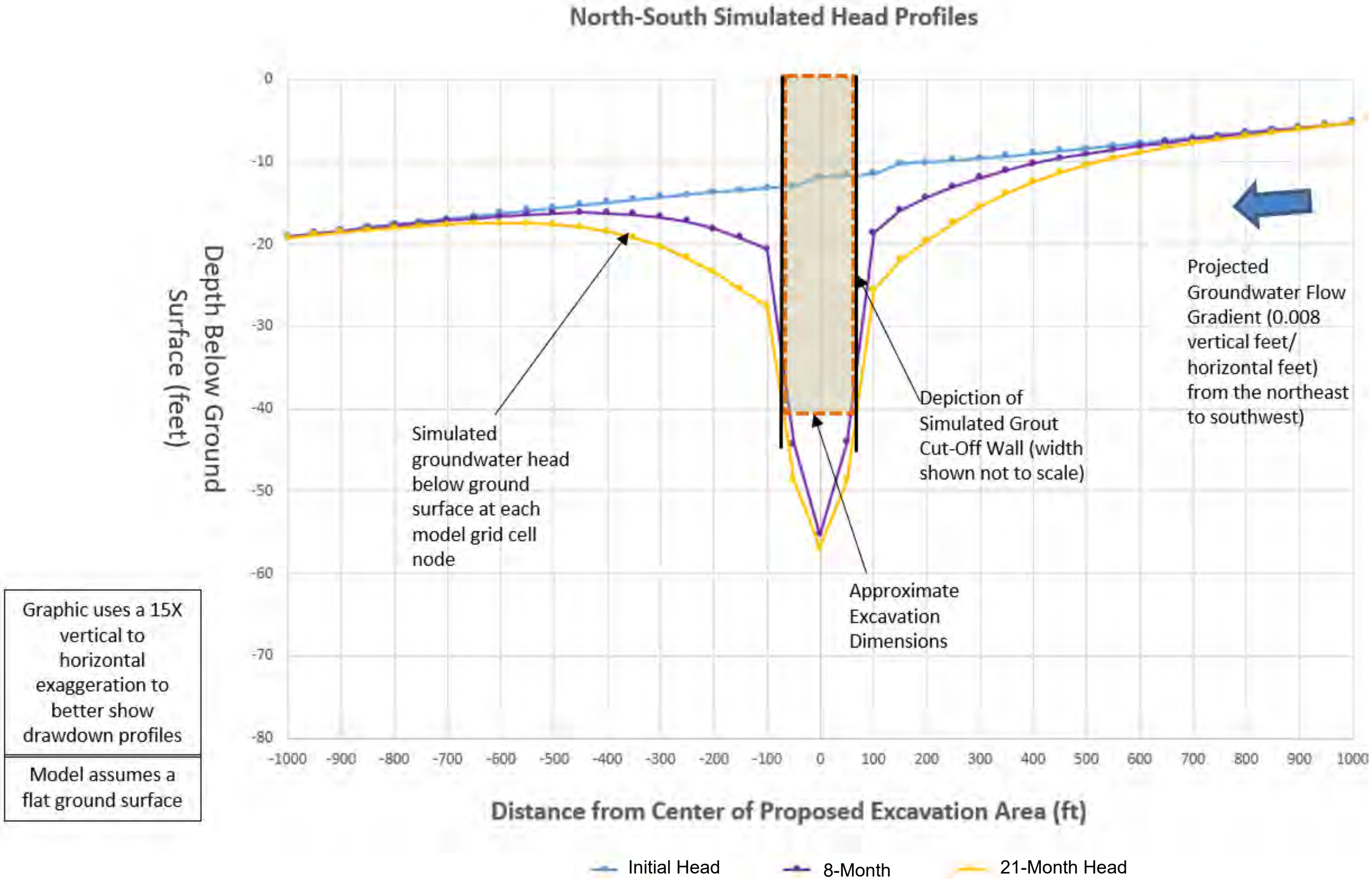
7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

Geosyntec consultants

Project No: LB1019

April 2023

Figure 6



Simulated Head Profiles - North/South Profile View

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

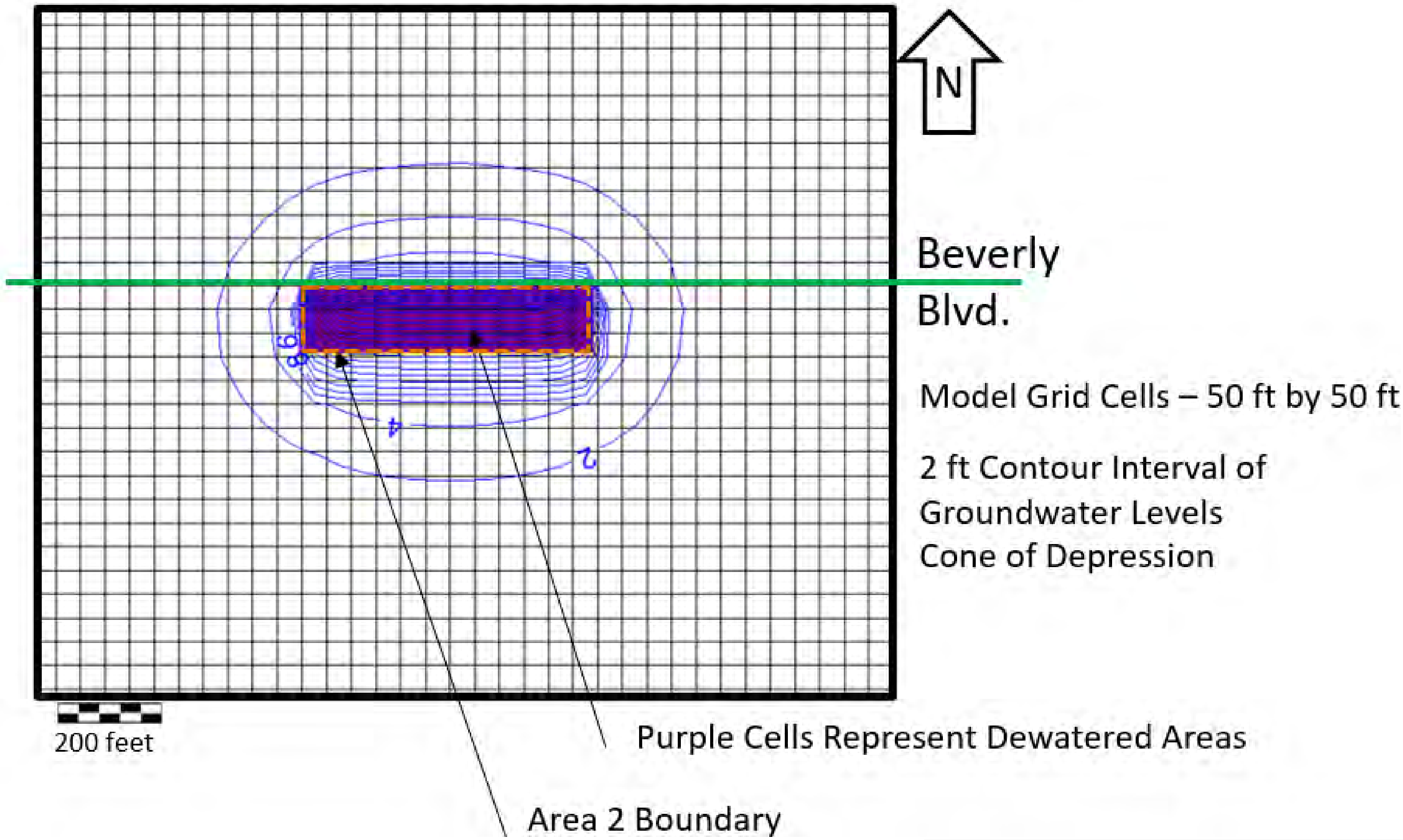
Geosyntec consultants

Figure 7

Project No: LB1019

April 2023

Note: This profile is located along the Area 2 excavation centerline between the east and west perimeters.



Transient Groundwater Drawdown Simulation (8 Months)

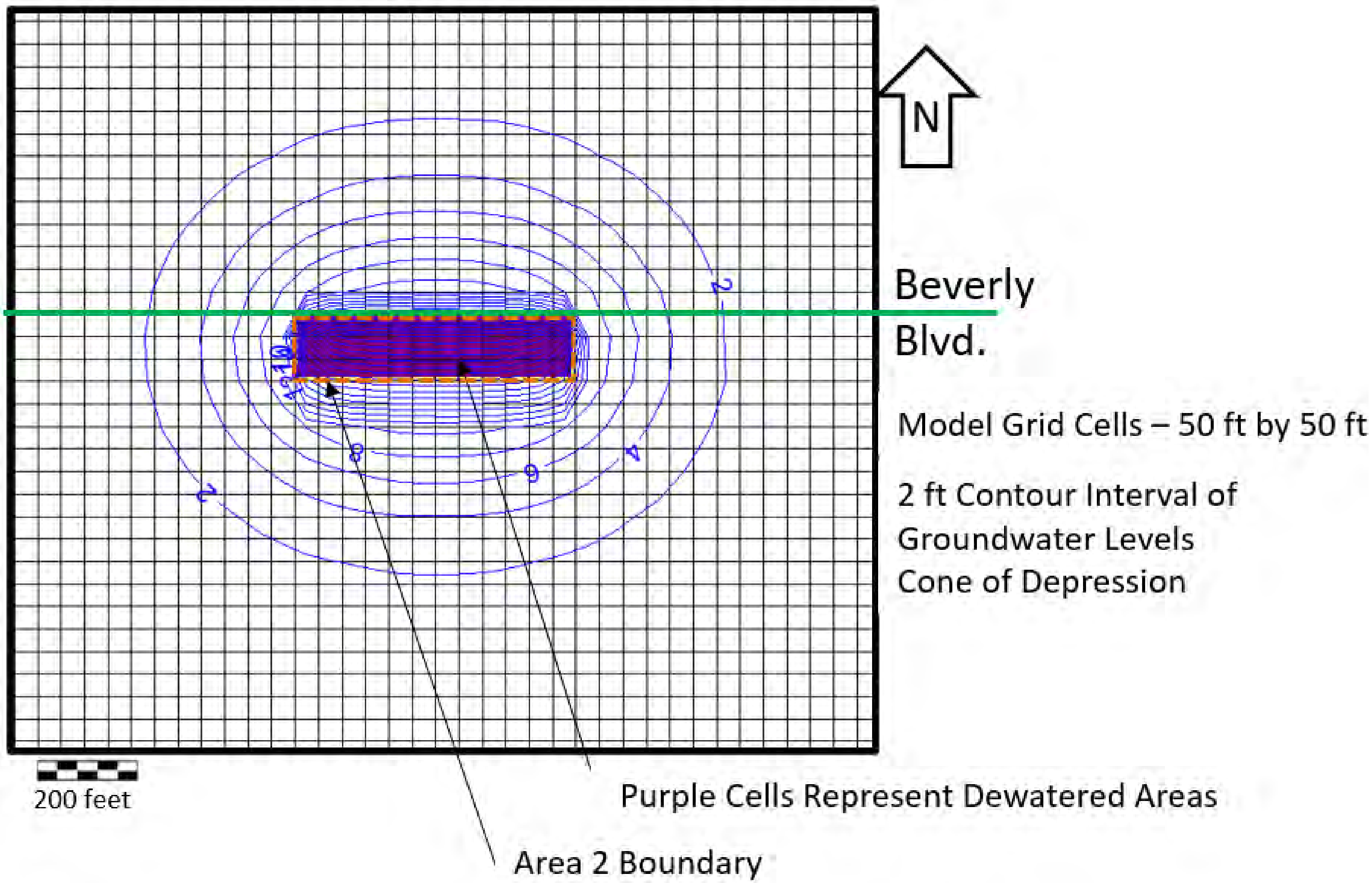
7800 BEVERLY BOULEVARD, LOS ANGELES, CALIFORNIA

Geosyntec consultants

Project No: LB1019

April 2023

Figure 8A



Transient Groundwater Drawdown Simulation (21 Months)

7800 BEVERLY BOULEVARD,
LOS ANGELES, CALIFORNIA

Geosyntec consultants

Project No: LB1019

April 2023

Figure

8B

APPENDIX A

Referenced Geotechnologies, Inc. Boring Logs

BORING LOG NUMBER 1

Television City Studios, LLC **Date: 08/17/19** **Elevation: 201.5'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0 --		3½-inch Asphalt over 4-inch Base
				1 --		FILL: Clayey Sand to Silty Clay, medium to dark brown, moist, stiff to dense
				2 --		
2.5	22	18.9	104.0			
				3 --	CH	Silty Clay, dark gray to black, moist, stiff
				4 --		
5	27	30.2	90.2	5 --		
				6 --		
				7 --		
7.5	37	19.3	112.2			
				8 --	CL	Sandy Clay, light brown to olive brown, moist, stiff to very stiff stiff
				9 --		
10	44	18.9	109.6	10 --		- - - - - - - - - - -
						Sandy Clay, grayish brown to reddish brown, moist, very stiff
				11 --		
				12 --		
				13 --		
				14 --		
15	77	9.3	125.6	15 --		
					SM/SP	Silty Sand to Sand, grayish brown, moist to wet, very dense fine to medium grained, with occasional gravel
				16 --		
				17 --		
				18 --		
				19 --		
20	74	10.9	125.0	20 --		
					SP	Sand, light brown, wet, very dense, fine to medium grained, with minor silt and gravel
				21 --		
				22 --		
				23 --		
				24 --		
25	44	4.2	113.1	25 --		
					SP/CL	Clayey Sand to Silty Clay, dark brown to reddish brown, wet, dense to stiff, fine to medium grained

BORING LOG NUMBER 1

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				27		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				28		
				29		
30	48	32.2	91.6	30	SC	Clayey Sand, grayish brown, wet, dense, fine grained,
				31		
				32		
				33		
				34		
35	44	28.6	94.3	35		
				36		
				37		
				38		
				39		
40	28	38.3	87.3	40	ML	Sandy Silt, gray, very moist to wet, medium stiff to stiff, fine grained
				41		
				42		
				43		
				44		
45	68	16.8	113.7	45	SP	Sand, gray to dark gray, wet, very dense, fine to medium grained
				46		
				47		
				48		
				49	ML	Sandy Silt, gray to dark gray, wet, stiff, fine grained
50	72	31.2	90.9	50		Total Depth 50 feet Water at 17.5 feet Fill to 3 feet

BORING LOG NUMBER 2

Television City Studios, LLC — **Date: 08/16/19** — **Elevation: 194.0'**

File No. 21699 — **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		4-inch Asphalt over 6-inch Base
				1		FILL: Sandy Silt to Silty Sand, gray to dark brown, slightly moist, medium dense to dense, fine grained
				2		
2.5	48	9.2	118.8			
				3	ML	Sandy Silt, dark brown, moist, stiff
				4		
5	24	14.2	SPT	5	SC	Clayey Sand, dark brown to reddish brown, moist, dense
				6		
				7		
7.5	68	3.2	129.5		SP	Sand, light brown, slightly moist, very dense, fine to medium grained
				8		
				9		
10	35	4.0	SPT	10		
				11		
				12		
12.5	71	7.2	117.3			Sand, grayish to yellowish brown, slightly moist, very dense, fine to medium grained
				13		
				14		
15	29	13.0	SPT	15		Sand, dark gray, wet, dense, fine to medium grained, with occasional gravel
				16		
				17		
17.5	47	20.8	106.6		ML	Sandy Silt, gray, moist, stiff to very stiff, fine grained
				18		
				19		
20	31	19.2	SPT	20		
				21		
				22		
22.5	43	20.3	107.7		SM	Silty Sand, gray, very moist, dense, fine grained
				23		
				24		
25	29	25.2	SPT	25	SM/ML	Silty Sand to Sandy Silt, dark gray to gray, very moist, dense to stiff

BORING LOG NUMBER 2

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	59	18.9	106.8			
				28		Silty Sand to Sandy Silt, gray, moist, dense to stiff, fine grained
				29		
30	27	21.1	SPT	30		
				31		Silty Sand to Sandy Silt, dark gray to gray, moist, stiff, medium dense, fine grained
				32		
32.5	90	17.8	114.3			
				33	SM/SP	Silty Sand to Sand, gray, wet, very dense, fine to medium grained
				34		
35	45	17.6	SPT	35		
				36		
				37		
37.5	98	19.0	107.3			
				38		
				39		
40	44	15.3	SPT	40		
				41		
				42		
42.5	90	32.5	88.2			
				43	SM/ML	Silty Sand to Sandy Silt, gray, very moist, very stiff
				44		
45	34	30.6	SPT	45		
					ML	Sandy Silt, gray, moist, stiff
				46		
				47		
47.5	77	28.1	93.3			
				48		
				49		
50	37	31.7	SPT	50		

BORING LOG NUMBER 2

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	90	21.5	101.1			
				53		Sandy Silt, gray, moist, stiff to very stiff
				54		
55	36	29.5	SPT	55		
				56		
				57		
57.5	45 50/5"	23.3	102.9			
				58		Sandy Silt, gray, moist, very stiff
				59		
60	37	19.8	SPT	60		
				61		
				62		
62.5	40 50/5"	25.1	99.6			
				63		
				64		
65	56	24.7	SPT	65		
						Sandy Silt to Silty Clay, gray, very moist, very stiff
				66		
				67		
67.5	40 50/4"	19.9	109.6			
				68		
				69		
					CL	Silty Clay, dark gray, very moist, very stiff
70	43	30.1	SPT	70		
						Total Depth 70 feet Water at 15½ feet Fill to 3 feet
				71		
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		
				75		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
						SPT=Standard Penetration Test

BORING LOG NUMBER 3

Television City Studios, LLC **Date: 08/20/19** **Elevation: 195.5'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt over 7-inch Base
				1		
				2		FILL: Sandy Silt to Silty Clay, gray to dark gray, moist, stiff
3	37	37.5	79.7	3		
				4	CH	Silty Clay, dark gray to black, very moist, medium stiff to stiff
5	44	24.1	96.7	5		
				6	CL	Sandy Clay, grayish brown to olive brown, moist, stiff
				7		
7.5	33	30.1	91.7			
				8	CH	Silty Clay, dark brown to grayish brown, very moist, stiff
				9		
10	24	27.3	94.5	10		
				11	CL	Sandy Clay, dark brown to grayish brown, moist, very stiff
				12		
				13		
				14		
15	38	25.4	97.5	15		
				16	SM	Silty Sand, dark to reddish brown, moist to very moist, medium stiff to dense, fine grained
				17		
				18		
				19		
20	54	13.3	115.9	20		
				21	SP	Sand, dark brown, wet, dense, fine to medium grained, occasional gravel
				22		
				23		
				24		
25	57	20.9	105.8	25		
					SM/ML	Silty Sand to Sandy Silt, grayish brown, very moist to wet, dense to stiff, fine grained

GEOTECHNOLOGIES, INC.

BORING LOG NUMBER 3

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				27		
				28		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				29		
30	65 50/5"	23.0	104.2	30	ML	Sandy Silt, gray, moist, very stiff
				31		
				32		
				33		
				34		
35	71	19.8	110.8	35	SM	Silty Sand, gray, wet, very dense, fine grained
				36		
				37		
				38		
				39		
40	84	24.5	100.3	40		
				41		
				42		
				43		
				44		
45	70	31.3	92.0	45	ML	Sandy Silt, gray, moist, stiff to very stiff
				46		
				47		
				48		
				49		
50	75	29.3	94.0	50		Total Depth 50 feet Water at 8½ feet Fill to 3 feet

BORING LOG NUMBER 4

Television City Studios, LLC **Date: 08/14/19** **Elevation: 201.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt over 7-inch Base
				1		
				2		FILL: Sandy Silt to Silty Clay, dark brown, moist, medium firm to stiff
2.5	72	10.6	128.7			
				3	ML	Sandy to Clayey Silt, dark to yellowish brown, moist, very stiff
				4		
5	81	13.9	121.5	5		
				6		
				7		
7.5	49	19.0	106.5			
				8		Sandy Silt, yellowish brown to olive brown, moist, stiff, fine grained
				9		
10	31	23.6	99.2	10		
				11		
				12		
				13		
				14		
15	28	17.2	115.0	15	CL	Sandy Clay, light brown to olive brown, moist, very stiff
				16		
				17		
				18		
				19		
20	40	27.7	99.4	20		
				21		
				22		
				23		
				24		
25	43	No Recovery		25		

BORING LOG NUMBER 4

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				27		
				28		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				29		
30	66	23.6	10105.0	30		Sandy Clay, grayish brown, moist, stiff
				31		
				32		
				33		
				34		
35	48	26.0	101.8	35	SM/ML	Silty Sand to Sandy Silt, yellowish to reddish brown, moist, dense to stiff, fine grained
				36		
				37		
				38		
				39		
40	48	26.5	95.9	40	CL	Sandy Clay, grayish to reddish brown, moist, stiff
				41		
				42		
				43		
				44		
45	65	26.6	99.3	45		
				46		
				47		
				48		
				49	SM/ML	Silty Sand to Sandy Silt, grayish to reddish brown, moist, very dense to very stiff, fine grained
50	72	21.6	107.3	50		Total Depth 50 feet Water at 8½ feet Fill to 3 feet

GEOTECHNOLOGIES, INC.

BORING LOG NUMBER 5

Television City Studios, LLC **Date: 08/14/19** **Elevation: 196.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		7-inch Asphalt over 7-inch Base
				1		
						FILL: Sandy Silt, dark brown, moist, stiff
				2		
2.5	43	20.9	103.3			
				3		
					ML/CL	Clayey Silt to Silty Clay, dark and light brown mottling, moist, stiff
				4		
5	45	17.3	108.1	5		
					ML/SC	Sandy Silt to Clayey Sand, yellowish brown, moist, dense to stiff, with occasional gravel
				6		
				7		
7.5	17	35.2	85.2			
				8	CH	Silty Clay, light brown, very moist, soft to medium firm
				9		
10	17	33.8	88.8	10		
				11		
				12		
				13		
				14		
15	25	35.7	85.4	15		
					ML	Sandy Silt, dark brown, very moist, soft to medium firm, fine grained
				16		
				17		
				18		
				19		
20	44	19.4	106.5	20		
					SM	Silty Sand, yellowish to reddish brown, moist, dense, fine grained
				21		
				22		
				23		
				24		
25	52	21.7	105.1	25		
						Silty Sand, yellowish to reddish brown, moist, dense, fine grained

BORING LOG NUMBER 5

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual. Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				27		
				28		
				29		
30	60	21.5	106.4	30	SM/SP	Silty Sand to Sand, dark gray, very moist to wet, dense, fine grained, with occasional gravel
				31		
				32		
				33		
				34		
35	72	10.4	110.8	35	SP	Sand, gray to dark gray, wet, very dense, fine grained
				36		
				37		
				38		
				39		
40	18 50/5"	13.9	113.4	40		
				41		
				42		
				43		
				44		
45	80	18.4	114.5	45	SM/SP	Sand, gray to dark gray, wet, very dense, fine grained
				46		
				47		
				48		
				49		
50	40 50/5"	26.7	96.9	50		Total Depth 50 feet Water at 9½ feet Fill to 3 feet

BORING LOG NUMBER 6

Television City Studios, LLC — **Date: 08/13/19** — **Elevation: 191.5'**

File No. 21699 — **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		6-inch Asphalt over 8-inch Base
				1		FILL: Silty Clay, dark gray to black, moist, medium firm to stiff
				2		
2.5	49	20.3	106.9			
				3	CL	Sandy Clay, dark gray and yellowish brown, moist, stiff
				4		
5	14	20.1	SPT	5		Sandy Clay, dark and grayish brown, moist, stiff
				6		
				7		
7.5	49	22.3	108.3			Sandy Clay, light brown to olive brown, moist, stiff
				8		
				9		
10	45	26.6	SPT	10	SC	Clayey Sand, light brown to light gray, moist, dense, fine grained
				11		
				12		
12.5	52	28.2	92.5		CL	Sandy Clay, gray, moist, very stiff
				13		
				14		
15	16	24.8	SPT	15		
				16		
				17		
17.5	60	24.1	105.5			
				18		
				19		
20	46	20.1	SPT	20	SC	Clayey Sand, gray, moist, dense to very dense, fine grained, with occasional gravel
				21		
				22		
22.5	72	25.8	99.8		SM	Silty Sand, gray, moist, very dense, fine grained
				23		
				24		
25	35	27.8	SPT	25		

BORING LOG NUMBER 6

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	44	36.3	87.8			
				28	CL	Sandy Clay, gray, moist, stiff, fine grained
				29		
30	19	31.5	SPT	30		
				31		
				32		
32.5	33	30.9	91.0			
				33	SP/SM	Sand to Silty Sand, dark gray to gray, wet, medium dense, fine grained
				34		
35	28	23.0	SPT	35		
					ML	Sandy Silt, gray, moist, stiff, fine grained
				36		
				37		
37.5	81	21.7	106.6			
				38		
				39		
40	44	35.4	SPT	40		
						Sandy Silt, gray, moist, stiff
				41		
				42		
42.5	69	19.8	112.3			
				43	SM	Silty Sand, gray, very moist, very dense
				44		
45	21	24.6	SPT	45		
					SC	Clayey Sand, dark gray, moist, dense, fine grained
				46		
				47		
47.5	83	20.2	109.2			
				48	ML	Sandy Silt, gray, moist, stiff, fine grained
				49		
50	38	28.7	SPT	50		

BORING LOG NUMBER 6

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	78	28.1	96.7			
				53		Sandy Silt, dark gray, very moist, very stiff, fine grained
				54		
55	44	29.0	SPT	55		
				56		
				57		
57.5	82	30.0	90.6			
				58	SP/ML	Sand to Sandy Silt, gray to dark gray, wet, very dense, fine grained
				59		
60	48	28.5	SPT	60		
				61		
				62		
62.5	81	23.7	105.3			
				63	SM	Silty Sand, gray, wet, very dense, fine grained
				64		
65	27	24.4	SPT	65		
				66		
				67		
67.5	40 50/5"	18.0	103.0			
				68		
				69		
					ML	Sandy Silt, gray, wet, stiff, fine grained
70	46	40.9	SPT	70		
				71		Total Depth 70 feet Water at 15½ feet Fill to 3 feet
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		
				75		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
						SPT=Standard Penetration Test

BORING LOG NUMBER 7

Television City Studios, LLC **Date: 08/15/19** **Elevation: 186.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt over 7-inch Base
				1		
				2		FILL: Silty Sand to Sandy Clay, brown to orangish brown, moist, medium dense to stiff
2.5	64	16.7	112.3			
				3	SM/ML	Silty Sand to Sandy Silt, brown, moist, dense to stiff, fine grained
				4		
5	21	15.0	SPT	5		
				6		
				7		
7.5	48	16.9	112.3			
				8	SM	Silty Sand, medium brown to reddish brown, moist, dense, fine grained
				9		
10	22	13.0	SPT	10	SP	Sand, reddish brown, moist, dense, fine grained grained
				11		
				12		
12.5	68	18.9	114.1			
				13	SM	Silty Sand, brown, very moist, dense, fine grained
				14		
15	14	30.4	SPT	15	MH	Clayey Silt, gray to dark gray, moist, stiff
				16		
				17		
17.5	63	25.0	102.7			
				18		
				19		
20	19	24.7	SPT	20		
				21		
				22		
22.5	65	21.4	106.6			
				23	SM	Silty Sand, gray, very moist, very dense, fine grained
				24		
25	21	23.5	SPT	25		Silty Sand to Silt with Clay, dark gray to gray, moist, stiff

BORING LOG NUMBER 7

Television City Studios, LLC

File No. 21699
km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	72	13.6	122.7			
				28	SM/SP	Silty Sand to Sand, gray, wet, very dense, fine to coarse grained, with gravel
				29		
30	27	22.4	SPT	30		
					ML	Sandy Silt, gray, moist, stiff, fine grained dense, fine grained, stiff
				31		
				32		
32.5	68 50/5"	25.6	96.3			
				33	SP/SM	Sand to Silty Sand, gray, wet, very dense, fine grained
				34		
35	34	20.8	SPT	35		
				36		
				37		
37.5	78	22.4	102.5			
				38	SM/ML	Silty Sand to Sandy Silt, gray, moist, very dense to stiff, fine grained
				39		
40	41	24.2	SPT	40		
				41		
				42		
42.5	83	17.7	107.5			
				43	ML	Sandy Silt, gray to dark gray, moist, stiff
				44		
45	44	24.4	SPT	45		
						Sandy Silt, gray, moist, stiff
				46		
				47		
47.5	36 50/5"	17.4	104.7			
				48	SM	Silty Sand, gray to dark gray, moist, very dense, fine grained
				49		
50	48	16.4	SPT	50		
					SM/SP	Sand to Silty Sand, gray to dark gray, moist, medium dense, fine grained

BORING LOG NUMBER 7

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	40 50/5"	24.0	95.9	53	SM/ML	Silty Sand to Sandy Silt, dark gray to gray, moist, very dense, fine grained, very stiff
				54		
55	54	18.5	SPT	55	ML	Sandy to Clayey Silt, dark gray to gray, moist, stiff, odor
				56		
				57		
57.5	28 50/5"	24.9	98.3	58	ML/CL	Clayey Silt to Silty Clay, gray to dark gray, moist, very stiff
				59		
60	56	27.3	SPT	60	ML	Sandy to Clayey Silt, dark gray to gray, minor tar
				61		
				62		
62.5	90	21.6	105.2	63		Sandy Silt, gray to dark gray, moist, stiff
				64		
65	36	21.6	SPT	65	ML/CL	Clayey Silt to Silty Clay, gray to dark gray, moist, stiff, more tar
				66		
				67		
67.5	39 50/5"	21.0	99.2	68		Clayey Silt to Silty Clay, gray to dark gray, moist, stiff, abundant tar
				69		
70	57	20.5	SPT	70		Total Depth 70 feet Water at 15 feet Fill to 3 feet
				71		
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		
				75		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted SPT=Standard Penetration Test

BORING LOG NUMBER 8

Television City Studios, LLC — **Date: 12/23/19** — **Elevation: 186.0'**

File No. 21699 — **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		FILL: Silty Clay, dark brown, moist, stiff
				1		
				2		
2.5	39	25.7	90.7			
				3		Silty Clay, dark gray, moist, stiff
				4		
5	25	29.2	88.3	5		
				6		Silty Clay, dark gray, moist to wet, stiff, occasional brick and rock fragments
				7		
7.5	19	19.3	78.1			
				8		Silty Clay, dark gray, wet, stiff, occasional brick fragments
				9		
10	21	24.5	85.0	10		
				11		Silty Sand to Silty Clay, gray to dark gray, wet, medium dense to firm, fine grained
				12		
12.5	14	19.8	91.5			
				13		Silty Sand to Silty Clay, gray to dark gray, wet, medium dense to stiff, fine grained, minor wood fragments
				14		
15	11	16.4	104.9	15		
				16		Sand , gray, wet, medium dense, fine to medium grained
				17		
17.5	12	20.8	98.3			
				18		Silty Sand to Sandy Silt, gray, wet, medium dense to firm, fine grained
				19		
20	43	14.1	116.1	20		
					SM/SP	Silty Sand to Sand, gray, wet, dense, fine to medium grained, occasional cobbles
				21		
				22		
				23		
				24		
25	72	31.0	90.2	25		
					CL	Sandy Clay, gray, moist to wet, stiff, fine to medium grained

BORING LOG NUMBER 8

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				27		
				28		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				29		
30	64	18.7	110.9	30	ML	Sandy Silt, gray, moist, stiff, fine grained
				31		
				32		
				33		
				34		
35	68	22.8	102.9	35		
				36		
				37		
				38		
				39		
40	72	25.4	102.6	40	SC	Clayey Sand, gray, moist, very dense, fine grained
				41		
				42		
				43		
				44		
45	83	28.6	95.0	45	ML	Sandy Silt, gray, moist, stiff, fine grained
				46		
				47		
				48		
				49		
50	65	30.1	96.4	50		Total Depth: 50 feet Water at 8 feet Fill to 20 feet

BORING LOG NUMBER 9

Television City Studios, LLC **Date: 12/16/19** **Elevation: 193.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt, No Base
				1		FILL: Sandy Silt to Silty Clay, dark gray to brown, moist, stiff
				2		
2.5	25	27.0	96.7			
				3	CL	Sandy Clay, dark gray, moist, stiff
				4		
5	11	22.7	SPT	5		
				6		
				7		
7.5	35	19.7	107.5			
				8	SC	Clayey Sand, dark gray to gray, moist to wet, medium dense, fine grained
				9		
10	24	23.1	SPT	10		
				11		
				12		
12.5	27	18.9	105.8			
				13		
				14		
15	28	22.5	SPT	15		
						Clayey Sand, gray to dark gray, wet, medium dense, fine grained
				16		
				17		
17.5	28	28.9	95.3			
				18	CL	Sandy Clay, gray, wet, firm, fine grained
				19		
20	11	26.0	SPT	20		
				21		
				22		
22.5	44	24.4	99.2			
				23	SM	Silty Sand, gray, moist, medium dense, fine grained
				24		
25	28	25.6	SPT	25		

BORING LOG NUMBER 9

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	28	28.6	94.4	28		Silty Sand, gray to dark gray, wet, dense, fine grained
				29		
30	44	30.8	SPT	30	CL	Sandy Clay, dark gray, very moist, stiff
				31		
				32		
32.5	62	23.6	105.3	33	ML	Sandy Silt, dark gray, moist, stiff
				34		
35	30	28.8	SPT	35		
				36		
				37		
37.5	72	19.1	106.9	38	SM	Silty Sand, dark gray, wet, very dense, fine grained
				39		
40	48	21.7	SPT	40	ML	Sandy Silt, dark gray, very moist, stiff, fine grained
				41		
42	75	30.7	94.8	42		
				43		
				44		
45	41	26.1	SPT	45		
				46		
				47		
47.5	78	28.9	94.9	48		
				49		
50	27	38.7	SPT	50		Sandy Silt, dark to yellowish brown, very moist, stiff, fine grained

BORING LOG NUMBER 9

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	85	34.5	89.7			
				53		Sandy Silty, gray, wet, very stiff, fine grained
				54		
55	30	21.7	SPT	55		
				56		
				57		
57.5	45 50/4"	27.2	98.4			
				58	SM/SP	Silty Sand to Sand, gray to dark gray, wet, very dense, fine grained
				59		
60	42	20.5	SPT	60		
				61		
				62		
62.5	45 50/5"	17.1	111.9			
				63	SP	Sand, gray to dark gray, wet, very dense, fine to medium grained
				64		
65	34	19.2	SPT	65		
				66		
				67		
67.5	94	27.5	93.3			
				68	SP/ML	Sandy to Clayey Silt, dark gray, moist, very dense to stiff
				69		
70	46	26.3	SPT	70		
						Total Depth 70 feet Water at 8½ feet Fill to 3 feet
				71		
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		
				75		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
						SPT=Standard Penetration Test

BORING LOG NUMBER 10

Television City Studios, LLC | **Date: 12/12/19** | **Elevation: 198.5'**

File No. 21699 | **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		3 ½-inch Asphalt over 5 ½-inch Base
				1		FILL: Sandy Silt to Silty Clay, dark brown, moist, stiff
				2		
2.5	47	25.0	97.3			
				3		Sandy Silt to Silty Clay, dark gray, moist, stiff, occasional cobbles
				4		
5	11	20.5	SPT	5		
						Silty Clay, gray to dark gray, moist, medium firm to stiff
				6		
				7		
7.5	57	33.8	82.9			
				8	CH	Silty Clay, dark gray to gray, moist, stiff
				9		
10	7	30.6	SPT	10		
				11		
				12		
12.5	35	31.8	90.6			
				13		
				14		
15	16	29.1	SPT	15		
						Silty Clay, gray to dark gray, moist, stiff
				16		
				17		
17.5	52	24.2	104.5			
				18		
				19		
20	21	21.6	SPT	20		
				21		
				22		
22.5	57	20.4	105.8			
				23	SC	Clayey Sand, gray to dark gray, moist, dense, fine grained
				24		
25	18	20.1	SPT	25		

BORING LOG NUMBER 10

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
27.5	49	27.7	96.3	27		
				28	ML	Sandy Silt, dark gray to gray, moist, stiff
				29		
30	26	21.1	SPT	30		
				31	SM/ML	Silty Sand, dark gray to gray, very moist, dense, fine grained
				32		
32.5	50	22.6	106.3			
				33		
				34		
35	29	27.1	SPT	35		
				36	ML	Sandy Silt, gray to dark gray, very moist, stiff
				37		
37.5	74	31.5	---			
				38		
				39		
40	40	23.9	SPT	40		
				41	SM/ML	Silty Sand to Sandy Silt, dark gray to gray, very moist, dense to stiff, fine grained
				42		
42.5	96	21.3	102.9			
				43	SM	Silty Sand, gray to dark gray, moist, very dense, fine grained
				44		
45	36	22.3	SPT	45		
				46		
				47		
47.5	40 50/5"	16.6	114.8			
				48		Silty Sand, gray to dark gray, moist, very dense, fine grained
				49		
50	36	25.3	SPT	50		
					SM/SP	Silty Sand to Sand, gray to dark gray, wet, dense, fine grained

BORING LOG NUMBER 10

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	85	21.2	101.1	53	SM	Silty Sand, dark gray, very moist, very dense, fine grained
				54		
55	35	28.5	SPT	55	SM/ML	Silty Sand to Sandy Silt, gray, moist, dense to stiff
				56		
				57		
57.5	45 50/4"	14.3	111.2	58	SP	Sand, dark gray, wet, very dense, fine grained
				59		
60	42	26.2	SPT	60	SM/ML	Silty Sand to Sandy Silt, gray, moist, dense to stiff
				61		
				62		
62.5	45 50/5"	19.5	109.3	63		Silty Sand to Sandy Silt, gray to dark gray, moist, very dense to very stiff, fine grained
				64		
65	31	23.2	SPT	65		
				66		
				67		
67.5	45 50/5"	28.5	93.5	68	CL	Silty Clay, dark gray, moist, very stiff
				69		
70	38	29.7	SPT	70		Total Depth 70 feet Water at 11.5 feet Fill to 7.5 feet
				71		
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		
				75		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted SPT=Standard Penetration Test

BORING LOG NUMBER 11

Television City Studios, LLC **Date: 12/13/19** **Elevation: 191.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt, No Base
				1		FILL: Clayey Silt to Silty Clay, dark gray, moist, stiff
				2		
2.5	44	21.1	92.6			
				3		Silty Clay, dark gray, very moist, soft to stiff
				4		
5	9	28.5	SPT	5		
				6		
				7		
7.5	39	22.8	106.1			
				8	CH	Silty Clay, gray, moist, stiff
				9		
10	19	25.4	SPT	10		
				11		
				12		
12.5	35	29.6	94.0			
				13		Silty Clay, gray, moist to wet, stiff
				14		
15	12	21.5	SPT	15		
				16		
				17		
17.5	52	20.9	107.4			
				18		
				19		
20	26	18.5	SPT	20		
					SC	Clayey Sand, gray to dark gray, moist, dense, fine grained
				21		
				22		
22.5	60	21.6	100.5			
				23		
				24		
25	29	21.1	SPT	25		

BORING LOG NUMBER 11

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	70	16.9	110.4			
				28	SM/SP	Silty Sand to Sand, gray to dark gray, wet, dense, fine grained
				29		
30	28	18.9	SPT	30		
				31	SM/ML	Silty Sand to Sandy Silt, dark gray, moist, dense to stiff, fine grained
				32		
32.5	67	19.0	112.9			
				33		
				34		
35	22	25.4	SPT	35		
				36	ML	Clayey Silt, gray to dark gray, very moist, stiff, fine grained
				37		
37.5	79	21.4	105.8			
				38	SM	Silty Sand, dark gray, wet, very dense, fine grained
				39		
40	39	21.0	SPT	40		
				41		
42.5	79	18.4	109.9	42		
				43		Silty Sand, dark gray, moist, very dense, fine grained
				44		
45	34	22.0	SPT	45		
				46		
				47		
47.5	45 50/4"	27.4	89.6			
				48	ML	Sandy Silt, gray, very moist, very stiff, fine grained
				49		
50	40	24.5	SPT	50		

BORING LOG NUMBER 11

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
52.5	40 50/5"	30.1	90.2	51 52 53 54		
55	31	23.7	SPT	55 56 57	SM/ML	Silty Sand to Sandy Silt, dark gray, very moist, dense to stiff, fine grained
57.5	45 50/5"	18.9	106.9	58 59	SM	Silty Sand, dark gray, wet, very dense, fine grained
60	32	22.3	SPT	60 61 62	SM/ML	Silty Sand to Sand Silt, dark gray, very moist, dense to stiff, fine grained
62.5 65 67.5	45 50/4" 43 40 50/5"	28.7 27.8 31.9	97.0 SPT 90.8	63 64 65 66 67 68 69	ML	Clayey Silt, dark gray, very moist, very stiff
70	46	34.9	SPT	70 71 72 73 74 75		Total Depth 70 feet Water at 13½ feet Fill to 6 feet NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual. Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted SPT=Standard Penetration Test

BORING LOG NUMBER 12

Television City Studios, LLC | **Date: 12/20/19** | **Elevation: 199.5'**

File No. 21699 | **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		6-inch Asphalt, No Base
				1		FILL: Silty Sand to Sandy Silt, dark brown, very moist, medium dense to stiff, fine grained, with brick and tile fragments
				2		
				3		
				4		
5	10	17.4	SPT	5		
				6		Clayey Silt to Silty Clay, dark brown and gray, moist, stiff, occasional brick and asphalt fragments
				7		
7.5	46	16.4	114.4			
				8	SC	Clayey Sand, dark to medium brown, moist, dense, fine grained
				9		
10	0	20.2	SPT	10		
				11		
12.5	59	10.6	125.4	12		
				13	SM/SP	Silty Sand to Sandy, dark brown, moist, dense, fine to medium grained
				14		
15	19	15.9	SPT	15		
				16		
				17		
17.5	49	18.6	109.0			
				18	SP	Sand, dark brown, wet, dense, fine to medium grained
				19		
20	51	10.7	SPT	20		
				21	SP/SW	Sand to Gravelly Sand, dark brown, wet, dense, fine to coarse grained
				22		
22.5	63	25.8	98.3			
				23	SM/ML	Silty Sand to Sandy Silt, dark brown and gray, wet, dense to stiff, fine to medium grained
				24		
25	29	19.3	SPT	25		

BORING LOG NUMBER 12

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	29	31.1	91.8			
				28		Sand to Sandy Silt, dark brown to gray, wet, dense to stiff, fine to medium grained
				29		
30	28	34.9	SPT	30		
					ML	Clayey Silt, gray, wet, stiff
				31		
				32		
32.5	55	29.3	91.9			
				33		
				34		
35	19	38.9	SPT	35		
					CH	Silty Clay, gray, wet, stiff
				36		
37.5	51	20.2	107.7	37		
				38	SP	Sand, dark brown, wet, dense, fine to medium grained
				39		
40	26	24.6	SPT	40		
				41		
				42		
42.5	90	15.9	117.3			
				43		
				44		
45	25	22.3	SPT	45		
					SM/SP	Silty Sand to Sand, gray to dark gray, wet, dense, fine grained
				46		
				47		
47.5	45 50/4"	18.6	111.9			
				48		
				49		
50	28	23.0	SPT	50		
						Silty Sand to Sand, gray to dark gray, wet, dense, fine to medium grained, occasional cobbles

BORING LOG NUMBER 12

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	75	22.5	102.6			
				53	SP	Sand, dark gray, wet, very dense, fine to medium grained
				54		
55	39	28.6	SPT	55		
				56	SP/ML	Sand to Clayey Silt, dark gray to gray, wet, dense to stiff, fine grained
				57		
57.5	88	19.9	105.8			
				58	SM/SP	Silty Sand to Sand, dark gray, wet, very dense, fine to medium grained
				59		
60	36	25.1	SPT	60		
				61		
				62		
62.5	45 50/5"	20.0	106.6			
				63	ML	Sandy Silt, gray to dark gray, moist, very stiff
				64		
65	46	24.1	SPT	65		
				66		
				67		
67.5	46 50/2"	12.9	119.5			
				68	SM	Silty Sand, dark gray to gray, wet, very dense, fine grained
				69		
70	46	19.7	SPT	70		
				71		Total Depth 70 feet Water at 15 feet Fill to 7.5 feet
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		
				75		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted SPT=Standard Penetration Test

BORING LOG NUMBER 13

Television City Studios, LLC | **Date: 12/13/19** | **Elevation: 201.0'**

File No. 21699 | **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt over 6-inch base
				1		FILL: Sandy Silt, dark brown, moist, stiff
2.5	46	20.7	102.2	2		
				3	CL	Sandy Clay, dark brown to black, moist, stiff
				4		
5	11	13.1	SPT	5		
				6		
7.5	29	24.3	99.2	7		
				8		Sandy Clay, dark to yellowish brown, moist, stiff, minor caliche
				9		
10	3	30.8	SPT	10		Sandy Clay, yellow to dark brown, moist, soft, minor caliche
				11		
12.5	19	31.1	90.0	12		
				13		
				14		
15	5	22.9	SPT	15		Sandy Clay, dark to yellowish brown, moist to very moist, soft to medium firm, minor caliche
				16		
17.5	31	24.4	101.2	17		
				18		Sandy Clay, yellowish brown, moist, stiff
				19		
20	14	26.0	SPT	20	CH	Silty Clay, yellowish brown, moist, stiff
				21		
22.5	36	22.4	94.8	22		
				23	CL	Sandy Clay, gray, moist, stiff
				24		
25	20	21.7	SPT	25		

BORING LOG NUMBER 13

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	68	24.8	101.6			
				28	ML	Sandy Silt, dark gray to gray, moist, very stiff
				29		
30	22	28.0	SPT	30		
				31		
				32		
32.5	49	20.4	104.8			
				33	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, wet, dense to stiff, fine grained, occasional cobbles
				34		
35	28	20.2	SPT	35		
				36		
				37		
37.5	54	22.4	103.7			
				38	SM	Silty Sand, dark gray, wet, dense, fine grained
				39		
40	29	25.4	SPT	40		
				41		
				42		
42.5	78	17.5	108.3			
				43	ML/SP	Sandy Silt to Sand, gray to dark gray, moist to wet, very stiff to very dense, fine grained
				44		
45	31	26.0	SPT	45		
				46		
				47		
47.5	90	29.8	96.9			
				48	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, wet, very dense to very stiff, fine grained
				49		
50	49	30.2	SPT	50		

BORING LOG NUMBER 13

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
52	45 50/5"	19.5	110.1	52 53 54	SM	Silty Sand, dark gray, wet, very dense, fine grained
55	54	26.3	SPT	55 56 57	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, wet, dense to stiff, fine grained
57.5	45 50/5"	20.8	105.4	58 59	SM/SP	Silty Sand to Sand, gray to dark gray, wet, very dense, fine to medium grained
60	37	27.4	SPT	60 61 62	ML	Sandy Silt, gray to dark gray, very moist, stiff
62.5	88	31.8	92.6	63 64	SM/ML	Silty Sand to Sandy Silt, dark gray, moist, very dense to very stiff, fine grained
65	37	31.0	SPT	65 66 67		
67.5	45 50/4"	31.5	83.6	68 69	ML	Sandy Silt, gray to dark gray, very moist , very stiff
70	28	29.2	SPT	70 71 72 73 74 75		Total Depth 70 feet Water at 17 feet Fill to 3 feet NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual. Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted SPT=Standard Penetration Test

BORING LOG NUMBER 14

Television City Studios, LLC | **Date: 12/23/19** | **Elevation: 194.5'**

File No. 21699 | **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		9-inch Asphalt over 4-inch Base
				1		FILL: Sandy to Clayey Silt, dark brown, moist, stiff
				2		
2.5	22	23.6	88.1			
				3	CH	Silty Clay, dark gray, moist, stiff
				4		
5	13	31.5	SPT	5		
				6		
				7		
7.5	38	23.0	101.9			
				8	SC	Clayey Sand, dark to yellowish brown, moist, dense, fine grained
				9		
10	16	21.8	SPT	10		Clayey Sand, dark brown, moist to wet, medium dense, fine grained
				11		
				12		
12.5	38	26.5	92.6			
				13	SM/ML	Silty Sand to Sandy Silt, dark brown, wet, dense to stiff, fine grained
				14		
15	23	25.3	SPT	15	SM/SP	Silty Sand to Sand, dark brown, wet, dense, fine grained
				16		
				17		
17.5	42	25.3	101.1			
				18		
				19		
20	20	20.0	SPT	20	SC	Clayey Sand, dark brown, wet, dense, fine to medium grained
				21		
				22		
22.5	48	14.2	123.3			
				23	SP	Sand, dark and yellowish brown, wet, dense, fine to medium grained
				24		
25	20	19.9	SPT	25	SM/SP	Silty Sand to Sand, dark grayish brown, wet, dense, fine to medium grained

BORING LOG NUMBER 14

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	80	21.7	104.9	28	ML	Sandy Silt, gray, moist, very stiff, fine grained
				29		
30	26	24.2	SPT	30		
				31		
				32		
32.5	72	14.7	106.4	33	SP	Sand, gray to dark gray, wet, very dense, fine grained
				34		
35	31	20.0	SPT	35	SM	Silty Sand, gray to dark gray, wet, dense, fine grained
				36		
				37		
37.5	78	22.3	100.7	38	ML	Sandy Silt, gray to dark gray, moist, stiff, fine grained
				39		
40	44	26.4	SPT	40		
				41		
				42		
42.5	83	19.0	110.0	43	SM	Silty Sand, dark gray, wet, dense, fine grained, occasional cobbles
				44		
45	30	19.0	SPT	45		
				46		
				47		
47.5	88	30.8	93.8	48	ML	Clayey Silt, gray, moist
				49		
50	29	35.3	SPT	50		

BORING LOG NUMBER 14

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	63	22.4	105.6			
				53	SM/CL	Silty Sand to Silty Clay, gray, wet, dense to stiff, fine grained
				54		
55	29	22.3	SPT	55		
				56		
				57		
57.5	85	31.4	88.9			
				58	CL	Silty Clay, gray, very moist, very stiff, fine grained
				59		
60	27	35.7	SPT	60		
				61		
				62		
62.5	40 50/5"	29.6	94.7			
				63		
				64		
65	38	22.0	SPT	65		
				66	SM/SP	Silty Sand to Sand, dark gray to gray, wet, dense, fine grained
				67		
67.5	45 50/5"	19.8	110.5			
				68		
				69		
70	47	23.1	SPT	70		
				71		Total Depth 70 feet Water at 15 feet Fill to 3 feet
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				75		SPT=Standard Penetration Test

BORING LOG NUMBER 15

Television City Studios, LLC **Date: 12/27/19** **Elevation: 201.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		7.5-inch Asphalt over 3-inch Base
				1		FILL: Sandy Silt, dark brown, moist, stiff
				2		
2.5	41	13.8	107.7			
				3		Silty Sand, yellowish brown, moist, medium dense, fine grained
				4		
5	9	35.6	SPT	5	CH	Silty Clay, dark gray, moist, stiff
				6		
				7		
7.5	28	21.7	106.3			
				8		
				9		
10	10	21.5	SPT	10		
				11		
				12		
12.5	24	20.9	108.7			
				13	SM/ML	Silty Sand to Sandy Silt, dark brown, moist to wet, medium dense to stiff, fine grained
				14		
15	17	17.0	SPT	15	SM	Silty Sand, dark brown, wet, medium dense, fine to medium grained
				16		
				17		
17.5	28	13.9	116.5			
				18	SM/SP	Silty Sand to Sand, dark brown, wet, dense, fine to medium grained, with cobbles
				19		
20	19	21.8	SPT	20	CL	Sandy Clay, dark brown, very moist, stiff, fine grained
				21		
				22		
22.5	47	25.3	100.5			
				23		
				24		
25	20	24.9	SPT	25		

BORING LOG NUMBER 15

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	59	25.3	102.1			- - - - - - - - - - - - - -
				28		Sandy Clay, gray to dark gray, very moist, stiff, fine grained
				29		
30	21	28.9	SPT	30		
				31		
				32		
32.5	68	28.8	96.1			
				33	SM	Silty Sand, gray, very moist, very dense, fine grained
				34		
35	22	21.4	SPT	35		
				36		
				37		
37.5	68	28.1	96.9			- - - - - - - - - - - - - -
				38		Silty Sand, dark gray, moist, dense, fine grained, stiff
				39		
40	23	26.2	SPT	40		
				41		
				42		
42.5	68	29.1	97.7			- - - - - - - - - - - - - -
				43		Silty Sand, gray to dark gray, wet, dense, fine grained
				44		
45	27	29.8	SPT	45		
				46		
				47		
47.5	72	24.7	103.4			
				48	ML	Sandy Silt, gray, moist, stiff
				49		
50	34	30.7	SPT	50		

BORING LOG NUMBER 15

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	85	26.8	100.2			
				53	SM	Silty Sand, gray to dark gray, wet, very dense, fine grained
				54		
55	40	31.6	SPT	55		
					ML	Sandy to Clayey Silt, gray, moist, stiff
				56		
				57		
57.5	90	35.1	90.3			
				58		
				59		
60	44	33.0	SPT	60		
				61		
				62		
62.5	42 50/5"	21.7	107.3			
				63	SP	Sand, dark gray, wet, very dense, fine grained
				64		
65	48	20.6	SPT	65		
				66		
				67		
67.5	100/9"	23.3	101.9			
				68		Sand, dark gray, wet, very dense, fine grained
				69		
70	76	23.3	SPT	70		
						Total Depth: 70 feet Water at 12.5 feet Fill to 5 feet
				71		
				72		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				73		
				74		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				75		
						SPT=Standard Penetration Test

BORING LOG NUMBER 16

Television City Studios, LLC | **Date: 12/26/19** | **Elevation: 200.0'**

File No. 21699 | **Method: 8-inch Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		3-inch Asphalt over 6-inch Base
				1		FILL: Silty Clay, dark brown, moist, stiff
				2		
2.5	57	25.7	99.6			
				3	CL	Sandy Clay, dark gray, moist, stiff
				4		
5	61	16.9	109.0	5		
				6		
				7		
				8		
				9		
10	49	19.7	109.3	10	SM/SP	Silty Sand to Sand, dark to yellowish brown, wet, dense, fine to medium grained
				11		
				12		
				13		
				14		
15	29	27.1	97.2	15	SM/ML	Silty Sand to Sandy Silt, dark brown, wet, dense, fine grained
				16		
				17		
				18		
				19		
20	72	11.1	125.1	20	SP	Sand, dark brown, wet, dense, fine to medium grained, occasional cobbles
				21		
				22		
				23		
				24		
25	65	19.3	111.4	25		Sand, dark brown, wet, dense, fine to medium grained

BORING LOG NUMBER 16

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
				28		
				29		
30	40 50/5"	22.6	106.4	30	SM/ML	Silty Sand to Sandy Silt, dark grayish brown, very moist, very dense to very stiff, fine grained
				31		
				32		
				33		
				34		
35	85	22.8	104.6	35		
				36		
				37		
				38		
				39		
40	39 50/5"	27.0	104.5	40	SM/SP	Silty Sand to Sand, gray to dark gray, wet, very dense, fine grained
				41		
				42		
				43		
				44		
45	82	29.1	95.2	45	ML	Sandy Silt, gray, moist, very stiff
				46		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				47		
				48		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				49		
50	82	26.0	99.5	50		Total Depth: 50 feet Water at 10.5 feet Fill to 3 feet

BORING LOG NUMBER 17

Television City Studios, LLC **Date: 12/27/19** **Elevation: 201.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		3-inch Asphalt over 5-inch Base
				1		FILL: Silty Clay, dark brown, moist, stiff
				2		
2.5	38	26.1	98.6			
				3	CL	Sandy Clay, dark gray to medium brown, moist, stiff, minor caliche
				4		
5	14	16.2	SPT	5		Sandy Clay, dark to yellowish brown, moist, stiff
				6		
				7		
7.5	48	19.5	110.4			
				8		
				9		
10	12	19.1	SPT	10		Sandy Clay, gray, moist, stiff, fine grained
				11		
				12		
12.5	27	23.1	102.1			
				13		
				14		
15	7	29.7	SPT	15		
				16		
				17		
17.5	23	27.8	87.5			
				18	SC	Clayey Sand, gray to dark gray, wet, medium dense, fine grained
				19		
20	17	20.9	SPT	20		
				21		
				22		
22.5	36	28.9	95.4			
				23	CL	Sandy Clay, dark brown to gray, moist, stiff
				24		
25	20	31.2	SPT	25		

BORING LOG NUMBER 17

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	54	27.6	96.3			- - - - - - - - - - - - -
				28		Sandy Clay, dark to grayish brown, moist, stiff
				29		
30	22	28.7	SPT	30		
				31		
				32		
32.5	48	16.3	118.3			
				33	SM/SP	Silty Sand to Sand, dark brown, wet, dense, fine to medium grained
				34		
35	26	20.3	SPT	35		
				36	SP/CL	Sand to Sandy Clay, dark brown, wet, dense to stiff, fine grained
				37		
37.5	55	24.7	102.3			
				38		
				39		
40	33	20.1	SPT	40		
				41		
				42		
42.5	82	16.5	120.8			
				43	SP	Sand, dark brown, wet, very dense, fine to medium grained
				44		
45	40	16.4	SPT	45		
				46		
				47		
47.5	40 50/5"	22.1	108.0			- - - - - - - - - - - - -
				48		Sand, dark, wet, very dense, fine grained
				49		
50	35	23.5	SPT	50		
					ML	Sandy Silt, gray, moist, stiff

BORING LOG NUMBER 17

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	83	16.8	114.1			
				53	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, moist, dense to stiff, fine grained
				54		
55	37	20.2	SPT	55		
				56		
				57		
57.5	70	17.7	107.4			
				58	ML	Sandy Silt, gray, moist, stiff
				59		
60	43	28.6	SPT	60		
				61	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, moist, dense to stiff, fine grained
				62		
62.5	98	35.3	85.4			
				63	CL	Sandy Clay, gray, moist, very stiff
				64		
65	35	29.4	SPT	65		
				66		
				67		
67.5	85	23.6	101.2			
				68	ML	Sandy Silt, gray, moist, stiff to very stiff
				69		
70	39	24.9	SPT	70		
				71		Total Depth: 70 feet Water at 11.5 feet Fill to 3 feet
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop
				75		Modified California Sampler used unless otherwise noted SPT=Standard Penetration Test

BORING LOG NUMBER 18

Television City Studios, LLC **Date: 12/19/19** **Elevation: 187.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		5-inch Asphalt over 6-inch Base
				1		FILL: Silty Sand, dark brown, moist, dense, fine grained
2.5	72	8.3	131.3	2		
				3	SM	Silty Sand, dark brown, slightly moist, dense, fine grained
				4		
5	45 50/4"	8.5	128.5	5		Silty Sand, dark brown, slightly moist, very dense, fine grained
				6		
				7		
				8		
				9		
10	90	19.2	108.6	10	SM/CL	Silty Sand to Sandy Clay, dark brown to gray, moist, very dense to very stiff, fine grained
				11		
				12		
				13		
				14		
15	50	24.7	100.5	15	ML	Sandy Silt, dark brown to gray, moist, stiff
				16		
				17		
				18		
				19		
20	53	18.6	111.6	20		Sandy Silt, gray to dark gray, moist, stiff
				21		
				22		
				23		
				24		
25	37	22.8	104.9	25		

BORING LOG NUMBER 18

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				28		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				29		
30	48	19.4	110.8	30	SM	Silty Sand, gray to dark gray, wet, dense, fine grained
				31		
				32		
				33		
				34		
35	52	22.9	104.6	35	ML	Sandy Silt, gray, moist, stiff
				36		
				37		
				38		
				39		
40	73	24.4	102.2	40	SM	Silty Sand, gray, wet, very dense, fine grained
				41		
				42		
				43		
				44		
45	51	24.9	92.1	45	SM/ML	Silty Sand to Sandy Silt, gray, wet, dense to stiff, fine grained
				46		
				47		
				48		
				49	SM/SP	Silty Sand to Sand, gray to dark gray, wet, dense, fine grained
50	81	19.3	101.3	50		Total Depth 50 feet Water at 14 feet Fill to 3 feet

BORING LOG NUMBER 19

Television City Studios, LLC — **Date: 12/19/19** — **Elevation: 194.5'**

File No. 21699 — **Method: 8-inch diameter Hollow Stem Auger**

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt
				0		8-inch Asphalt over 8-inch Base
				1		
				2		FILL: Sandy Silt, dark gray, moist, stiff
2.5	27	17.0	115.7			
				3		Sandy Silt, gray to dark gray, moist, stiff
				4		
5	13	18.6	SPT	5		
				6		Sandy Clay, dark gray to dark brown, moist, medium firm to stiff
				7		
7.5	63	14.0	108.8			
				8		
				9	SM/ML	Silty Sand to Sandy Silt, dark brown and yellowish brown, moist, dense, fine grained, stiff
10	10	19.8	SPT	10		
				11	CL	Sandy Clay, dark brown, moist, stiff, fine grained
				12		
12.5	20	27.9	94.2			
				13		
				14		
15	17	23.3	SPT	15		
				16	SC	Clayey Sand, light brown, wet, dense
				17		
17.5	30	27.2	97.2			
				18		Sandy Clay, yellowish brown to gray, moist, stiff
				19		
20	15	26.1	SPT	20		
				21		
				22		
22.5	30	21.2	108.7			
				23	SM/SP	Silty Sand to Sand, gray to yellowish brown, wet, dense, fine grained
				24		
25	44	20.5	SPT	25		

BORING LOG NUMBER 19

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	79	17.2	116.7			- - - - - - - - - - - -
				28		Silty Sand to Sand, gray, wet, very dense, fine grained
				29		
30	28	22.9	SPT	30		
					ML	Sandy Silt, gray, moist, stiff
				31		
				32		
32.5	72	26.5	96.5			
				33		
				34		
35	33	26.8	SPT	35		
				36		
37.5	83	21.0	109.5	37		
				38	SM/ML	Silty Sand to Sandy Silt, gray to dark gray, moist, dense to stiff, fine grained
				39		
40	35	21.3	SPT	40		
				41		
				42		
42.5	74	19.2	112.2			- - - - - - - - - - - -
				43		Silty Sand to Sandy Silt, dark gray, moist, dense to stiff, fine grained
				44		
45	31	25.5	SPT	45		
				46		
				47		
47.5	43 50/5"	17.0	111.4			
				48	SM	Silty Sand, dark gray, wet, very dense, fine grained
				49		
50	35	31.2	SPT	50		
					ML	Sandy Silt, gray, very moist, stiff

BORING LOG NUMBER 19

Television City Studios, LLC

File No. 21699

dy/km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
52.5	45 50/5"	18.8	109.9	53	SM	Silty Sand, dark gray, wet, very dense, fine grained
				54		
55	50	25.6	SPT	55		
				56	ML	Sandy Silt, dark gray, moist, stiff
				57		
57.5	45 50/4"	23.8	103.7	58	SM/ML	Silty Sand to Sandy Silt, dark gray, moist, very dense to very stiff, fine grained
				59		
60	44	33.9	SPT	60		
				61	ML	Sandy Silt, dark gray, moist, stiff
				62		
62.5	89	28.6	95.6	63		
				64		
65	52	32.8	SPT	65		
				66		
				67		
67.5	45 50/5"	20.7	107.2	68		
				69		
70	58	15.6	SPT	70		
				71		Total Depth 70 feet Water at 13.5 feet Fill to 8 feet
				72		
				73		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				74		
				75		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted SPT=Standard Penetration Test

BORING LOG NUMBER 20

Television City Studios, LLC **Date: 11/04/22** **Elevation: 200.0'**

File No. 21699 **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for Driveway
				0 --		4½-inch Asphalt, No Base
				-		
				1 --		FILL: Sandy Clay, dark brown, moist, stiff, occasional brick fragments
				-		
				2 --		
				-		
				3 --		
				-		
				4 --		
				-		
5	12	19.4	SPT	5 --		
				-		Sandy Clay, dark brown to gray, moist, stiff, with occasional brick fragments
				6 --		
				-		
				7 --		
7.5	31	22.2	0.3.1	-		
				8 --	CL	Sandy Clay, dark to yellowish brown, moist, stiff, fine grained
				-		
				9 --		
				-		
10	20	21.9	SPT	10 --		
				-		Sandy Clay, dark brown, moist, stiff
				11 --		
				-		
				12 --		
12.5	49	17.6	106.7	-		
				13 --	SM	Silty Sand, dark brown, moist, dense, fine grained
				-		
				14 --		
				-		
15	25	5.6	SPT	15 --		
				-	SP	Sand, dark brown, slightly moist, medium dense to dense, fine to medium grained
				16 --		
				-		
				17 --		
17.5	43	18.0	108.5	-		
				18 --		Sand, dark to yellowish brown, wet, dense to very dense, fine to medium grained
				-		
				19 --		
				-		
20	53	22.4	SPT	20 --		
				-		Sand, dark and yellowish brown, wet, dense, fine to medium grained
				21 --		
				-		
				22 --		
22.5	60	23.7	104.1	-		
				23 --	SC	Clayey Sand, dark gray, very moist, dense, fine grained
				-		
				24 --		
				-		
25	30	22.2	SPT	25 --		
				-		

GEOTECHNOLOGIES, INC.

BORING LOG NUMBER 20

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
27.5	36	26.3	98.8	-		
				28 --		Clayey Sand, dark brown, very moist, dense, fine grained
				-		
				29 --		
				-		
30	32	34.3	SPT	30 --		
				-		
				31 --		
				-		
				32 --		
32.5	60	28.6	92.4	-		
				33 --		Clayey Sand, dark brown, very moist, dense, fine grained
				-		
				34 --		
				-		
35	18	35.7	SPT	35 --		
				-	CH	Silty Clay, dark grayish brown, very moist, stiff
				36 --		
				-		
				37 --		
37.5	72	26.9	97.9	-		
				38 --	SM	Silty Sand, dark grayish brown, very moist to wet, very dense, fine grained
				-		
				39 --		
				-		
40	38	23.2	SPT	40 --		
				-		Silty Sand, dark grayish brown, wet, dense, fine to medium grained
				41 --		
				-		
				42 --		
42.5	69	19.1	108.6	-		
				43 --		
				-		
				44 --		
				-		
45	38	19.9	SPT	45 --		
				-		Silty Sand, dark grayish brown, wet, dense, fine to medium grained
				46 --		
				-		
				47 --		
47.5	69	20.9	106.6	-		
				48 --		
				-		
				49 --		
				-		
50	29	26.7	SPT	50 --		
				-	SC	Clayey Sand, gray to dark gray, wet, dense, fine to medium grained

BORING LOG NUMBER 20

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51 --		
				52 --		
52.5	72	22.9	105.0	-		
				53 --	SM	Silty Sand, gray, wet, very dense, fine to medium grained
				54 --		
55	68	20.3	SPT	55 --		
				56 --		
				57 --		
57.5	75	21.3	103.7	-		
				58 --	SP	Sand, gray, wet, very dense, fine to medium grained
				59 --		
60	47	20.1	SPT	60 --		
				61 --		
				62 --		
62.5	38 50/3"	20.1	111.2	-		
				63 --		Sand, gray, wet, very dense, fine grained
				64 --		
65	62	25.9	SPT	65 --		
				-	CL	Silty Clay, dark gray, moist, stiff, fine grained
				66 --		
				67 --		
67.5	92	18.5	114.9	-		
				68 --	SM	Silty Sand, dark gray, moist, very dense, fine grained
				69 --		
70	46	26.8	SPT	70 --		
				-	CH	Silty Clay, dark gray, very moist, stiff to very stiff
				71 --		
				72 --		
72.5	45 50/5"	35.2	88.6	-		
				73 --		
				74 --		
75	73	35.1	SPT	75 --		

BORING LOG NUMBER 20

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				76 --		
				-		
				77 --		
77.5	46	15.3	115.5	-		
	50/5"			78 --	SM	Silty Sand, dark gray, wet, very dense, fine grained
				-		
				79 --		
				-		
80	80	15.2	SPT	80 --		
				-		Total Depth 80 feet
				81 --		Water at 17 feet
				-		Fill to 7½ feet
				82 --		
				-		
				83 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
				84 --		
				-		Used 8-inch diameter Hollow-Stem Auger
				85 --		140-lb. Automatic Hammer, 30-inch drop
				-		Modified California Sampler used unless otherwise noted
				86 --		
				-		SPT=Standard Penetration Test
				87 --		
				-		
				88 --		
				-		
				89 --		
				-		
				90 --		
				-		
				91 --		
				-		
				92 --		
				-		
				93 --		
				-		
				94 --		
				-		
				95 --		
				-		
				96 --		
				-		
				97 --		
				-		
				98 --		
				-		
				99 --		
				-		
				100 --		
				-		

BORING LOG NUMBER 21

Television City Studios, LLC | **Date: 11/03/22** | **Elevation: 195.0'**

File No. 21699 | **Method: 8-inch diameter Hollow Stem Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for Driveway
				0 --		7-inch Asphalt over 5-inch Base
				-		
				1 --		
				-		FILL: Sandy Silt to Silty Clay, dark brown, moist, stiff
				2 --		
2.5	19	35.1	82.3	-		
				3 --		
				-	CH	Silty Clay, dark gray, moist, stiff
				4 --		
				-		
5	14	27.4	SPT	5 --		
				-		Silty Clay, dark and yellowish brown, moist, stiff
				6 --		
				-		
				7 --		
7.5	41	25.5	100.5	-		
				8 --	SC	Clayey Sand, dark to yellowish brown, moist, dense, fine grained
				-		
				9 --		
				-		
10	26	22.3	SPT	10 --		
				-		
				11 --		
				-		
				12 --		
12.5	40	17.0	116.1	-		
				13 --	SP	Sand, dark to yellowish brown, wet, dense, fine to medium grained
				-		
				14 --		
				-		
15	25	17.0	SPT	15 --		
				-		Sand, yellowish brown, wet, dense, fine to medium grained
				16 --		
				-		
				17 --		
17.5	41	20.9	106.6	-		
				18 --	SM	Silty Sand, yellowish brown, wet, dense, fine grained
				-		
				19 --		
				-		
20	39	15.1	SPT	20 --		
				-	SP	Sand, yellowish brown, wet, dense, fine to medium grained occasional gravel and cobbles
				21 --		
				-		
				22 --		
22.5	46	23.7	99.0	-		
				23 --	SM	Silty Sand, gray to dark gray, very moist to wet, dense, fine grained
				-		
				24 --		
				-		
25	37	22.6	SPT	25 --		
				-		

BORING LOG NUMBER 21

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	66	27.1	99.4			
				28	CL	Sandy Clay, grayish brown, very moist, very stiff
				29		
30	30	26.2	SPT	30		
				31		
				32		
32.5	81	10.5	127.4			
				33	SP	Sand, gray to dark gray, wet, very dense, fine grained, with gravel
				34		
35	38	22.3	SPT	35		
					SM	Silty Sand, gray to dark gray, wet, dense, fine grained, with occasional cobbles
				36		
				37		
37.5	72	30.7	96.3			
				38	CL	Sandy Clay, gray to dark gray, very moist, very stiff, fine grained
				39		
40	36	31.5	SPT	40		
				41		
				42		
42.5	68	26.8	99.7			
				43	SM	Silty Sand, gray to dark gray, wet, dense, fine grained, with occasional gravel and cobbles
				44		
45	34	22.0	SPT	45		
				46		
				47		
47.5	81	28.7	95.8			
				48	CH	Silty Clay, dark gray, very moist, very stiff, fine grained
				49		
50	33	29.2	SPT	50		

BORING LOG NUMBER 21

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				51 --		
				-		
				52 --		
52.5	74	23.9	99.5	-		
				53 --	SC	Clayey Sand, dark gray, very moist, very dense, fine grained
				-		
				54 --		
				-		
55	30	19.2	SPT	55 --		
				-		
				56 --		
				-		
				57 --		
57.5	45	26.8	97.8	-		
	50/4"			58 --		Clayey Sand, dark gray, very moist, very dense, fine grained
				-		
				59 --		
				-		
60	42	36.6	SPT	60 --		
				-	CH	Silty Clay, dark gray, very moist, very stiff
				61 --		
				-		
				62 --		
62.5	45	35.4	85.6	-		
	50/4"			63 --		
				-		
				64 --		
				-		
65	37	34.7	SPT	65 --		
				-		Silty Clay, dark gray, very moist, stiff to very stiff
				66 --		
				-		
				67 --		
67.5	38	38.4	87.1	-		
	50/5"			68 --		
				-		
				69 --		
				-		
70	45	19.7	SPT	70 --		
				-	SC	Clayey Sand, dark gray, moist, dense to very dense, fine grained
				71 --		
				-		
				72 --		
72.5	45	17.8	114.1	-		
	50/4"			73 --		
				-		
				74 --		
				-		
75	41	18.8	SPT	75 --		
				-	CL	Sandy Clay, dark gray, moist, stiff

BORING LOG NUMBER 21

Television City Studios, LLC

File No. 21699

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				76 --		
				-		
				77 --		
77.5	45	21.1	102.3	-		
	50/4"			78 --	SM	Silty Sand, dark gray, moist to very moist, very dense, fine grained
				-		
				79 --		
				-		
80	50	26.0	SPT	80 --		
				-		Total Depth 80 feet
				81 --		Water at 8 feet
				-		Fill to 3 feet
				82 --		
				-		
				83 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
				84 --		
				-		Used 8-inch diameter Hollow-Stem Auger
				85 --		140-lb. Automatic Hammer, 30-inch drop
				-		Modified California Sampler used unless otherwise noted
				86 --		
				-		SPT=Standard Penetration Test
				87 --		
				-		
				88 --		
				-		
				89 --		
				-		
				90 --		
				-		
				91 --		
				-		
				92 --		
				-		
				93 --		
				-		
				94 --		
				-		
				95 --		
				-		
				96 --		
				-		
				97 --		
				-		
				98 --		
				-		
				99 --		
				-		
				100 --		
				-		

APPENDIX B

ConeTec Report - CPT / HPT Logs (March 2023)

CONETEC

PRESENTATION OF SITE INVESTIGATION RESULTS

TVC

Prepared for:

Geosyntec Consultants

ConeTec Job No: 23-56-25265

Report Date: 2023-Mar-07

Prepared by:

ConeTec Inc.

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ABOUT THIS REPORT

The enclosed report presents the results of the site investigation program conducted by ConeTec, Inc. The program consisted of Seismic Piezocone Penetration Testing, Pore Pressure Dissipation Testing, and a Geoprobe Systems® Hydraulic Profiling Tool (HPT) was used in conjunction with CPTu testing at all the soundings. Please note that this report, which also includes all accompanying data, are subject to the 3rd Party Disclaimer and Client Disclaimer that follow in the ‘Limitations’ section of this report.

Project Information	
Client	Geosyntec Consultants
Project	TVC
ConeTec Project Number	23-56-25265
Rig Description	30-ton Truck CPT Rig (C-17)

Coordinates	
Collection Method	USB/Serial GPS
EPSG Number	4326 (WGS / 84 LatLong)

Cone Penetration Test (CPTu)	
Depth Reference	Existing ground surface at the time of the investigation
Tip and sleeve data offset	0.100 meters. This has been accounted for in the CPT data files.
Tip to resistivity data offset	0.275 meters. This has been accounted for in the CPT data files.
Additional Comments	Permeability (k) is plotted as a log10 value of k on the plots. Permeability is in scientific notion on the calculated parameters. CPTu data point recorded every 0.025 meters.

Hydraulic Profiling Tool and Equipment for this Project	
Component	HPT Probe and Array with Top Dipole
Manufacturer	Geoprobe Systems®
Model Number	K6050

Calculated Geotechnical Parameters Tables

Additional Information	The Normalized Soil Behaviour Type Chart based on Q_{tn} (SBT Q_{tn}) (Robertson, 2009) was used to classify the soil for this project. A detailed set of calculated CPTu parameters have been generated and are provided in Excel format files in the release folder. The CPTu parameter calculations are based on values of corrected tip resistance (q_t) sleeve friction (f_s) and pore pressure (u_2). Effective stresses are calculated based on unit weights that have been assigned to the individual soil behaviour type zones and the assumed equilibrium pore pressure profile. Soils were classified as either drained or undrained based on the Q_{tn} Normalized Soil Behaviour Type Chart (Robertson, 2009). Calculations for both drained and undrained parameters were included for materials that classified as silt mixtures (zone 4).

Hydraulic Profiling Tool (HPT)

Depth Reference	Existing ground surface at the time of the investigation
CPT tip to HPT Data Offset	0.725 meters. This has been accounted for int the data files.
Estimated Hydraulic Conductivity (Est. K)	The ratio of the flow to corrected pressure is used to calculate estimated hydraulic conductivity. Estimated hydraulic conductivity is only plotted below the assumed phreatic surface.
Depth Reference	Calculated by subtracting the absolute hydrostatic pressure from the average HPT pressure at each depth increment.
Depth	HPT data point recorded every 0.05 feet
Additional Comments	Estimated Hydraulic Conductivity was calculated using Geoprobe Systems® Direct Image® software.

Please refer to the list of attached documents following the text of this report. A test summary, location map, and plots are included. Thank you for the opportunity to work on this project.

LIMITATIONS

3rd Party Disclaimer

- The “Report” refers to this report titled TVC
- The Report was prepared by ConeTec for Geosyntec Consultants

The Report is confidential and may not be distributed to or relied upon by any third parties without the express written consent of ConeTec. Any third parties gaining access to the Report do not acquire any rights as a result of such access. Any use which a third party makes of the Report, or any reliance on or decisions made based on it, are the responsibility of such third parties. ConeTec accepts no responsibility for loss, damage and/or expense, if any, suffered by any third parties as a result of decisions made, or actions taken or not taken, which are in any way based on, or related to, the Report or any portion(s) thereof.

Client Disclaimer

- ConeTec was retained by Geosyntec Consultants
- The “Report” refers to this report titled TVC
- ConeTec was retained to collect and provide the raw data (“Data”) which is included in the Report.

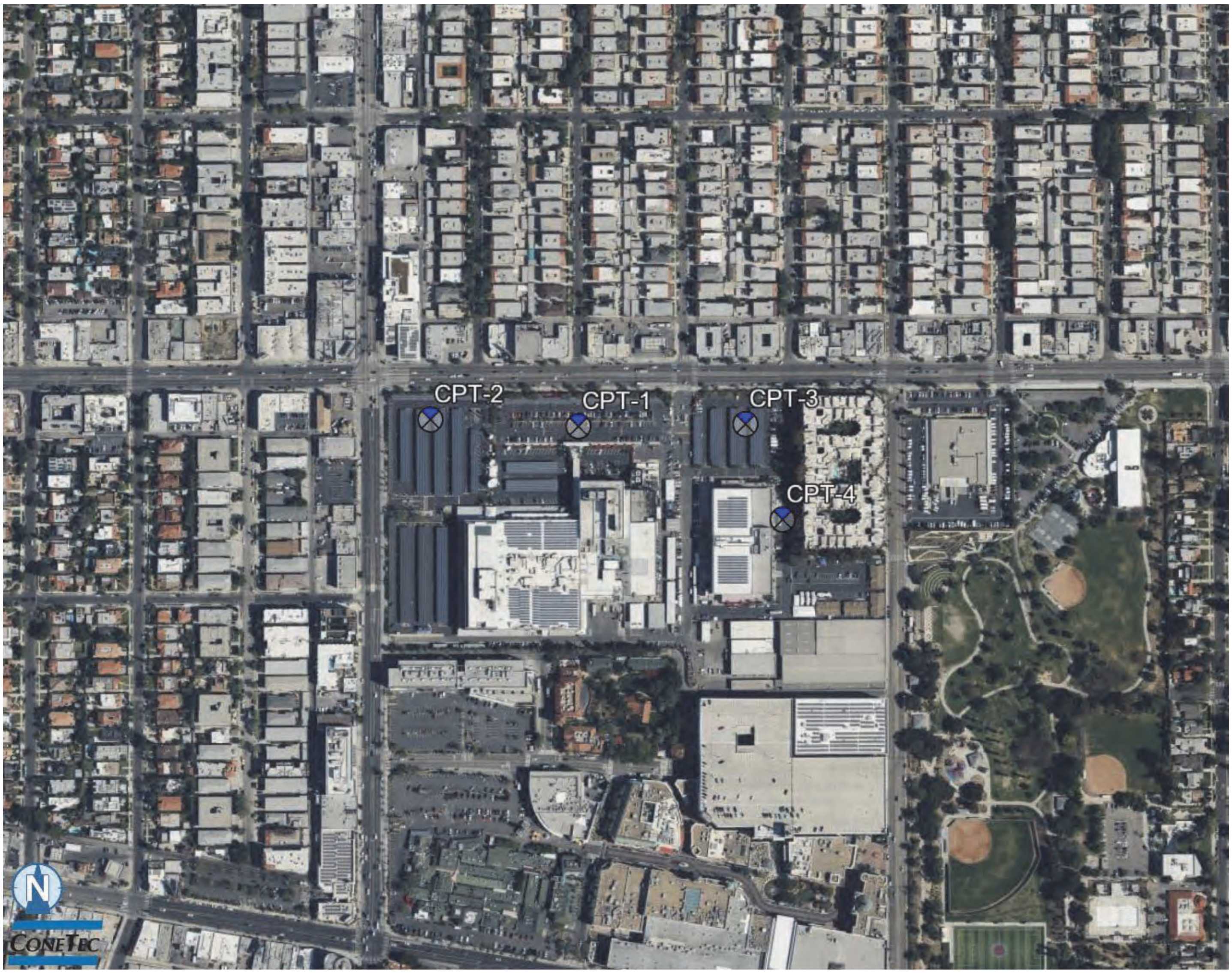
ConeTec has collected and reported the Data in accordance with current industry standards. No other warranty, express or implied, with respect to the Data is made by ConeTec. In order to properly understand the Data included in the Report, reference must be made to the documents accompanying and other sources referenced in the Report in their entirety. Other than the Data, the contents of the Report (including any Interpretations) should not be relied upon in any fashion without independent verification and ConeTec is in no way responsible for any loss, damage or expense resulting from the use of, and/or reliance on, such material by any party.

CONTENTS

The following listed below are included in the report:

- **Site Map**
- **Cone Penetration Test Summary and Standard Cone Penetration Test Plots**
- **Advanced Cone Penetration Test Plots**
- **Resistivity Cone Penetration Test Plots**
- **Standard Cone Penetration Test Plots with Hydraulic Profiling Tool (HPT) Plots**
- **Permeability Cone Penetration Test Plots**
- **Soil Behavior Type (SBT) Scatter Plots**
- **Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots**
- **Hydraulic Profiling Tool (HPT) Summary and Plots**
- **Hydraulic Profiling Tool (HPT) Dissipation Test Plots**
- **Methodology Statements and Data File Formats**

SITE MAP



ConeTec Job Number: 23-56-25265

Client: Geosyntec Consultants

Project: TVC

Report Date: 2023-Mar-07

Sounding Location

All sounding locations are approximate

Cone Penetration Test Summary and Standard Cone Penetration Test Plots

CONETEC	**Job No:**	23-56-25265
	Client:	Geosyntec Consultants
	Project:	TVC
	Start Date:	17-Jan-2023
	End Date:	19-Jan-2023

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Cone Area (cm^2)	Assumed Phreatic Surface[1] (ft)	Final Depth (ft)	Northing[2]	Easting[2]	Elevation[3] (ft)	Refer to Notation Number
CPT-1	23-56-25265_CP01	17-Jan-2023	EC956:T1500F15U35	15	10.0	52.66	3771383	374567	198	4
CPT-2	23-56-25265_CP02	19-Jan-2023	EC956:T1500F15U35	15	10.0	52.33	3771391	374434	194	5
CPT-3	23-56-25265_CP03	19-Jan-2023	EC956:T1500F15U35	15	9.8	52.82	3771383	374717	201	
CPT-4	23-56-25265_CP04	19-Jan-2023	EC956:T1500F15U35	15	10.8	52.74	3771297	374749	199	

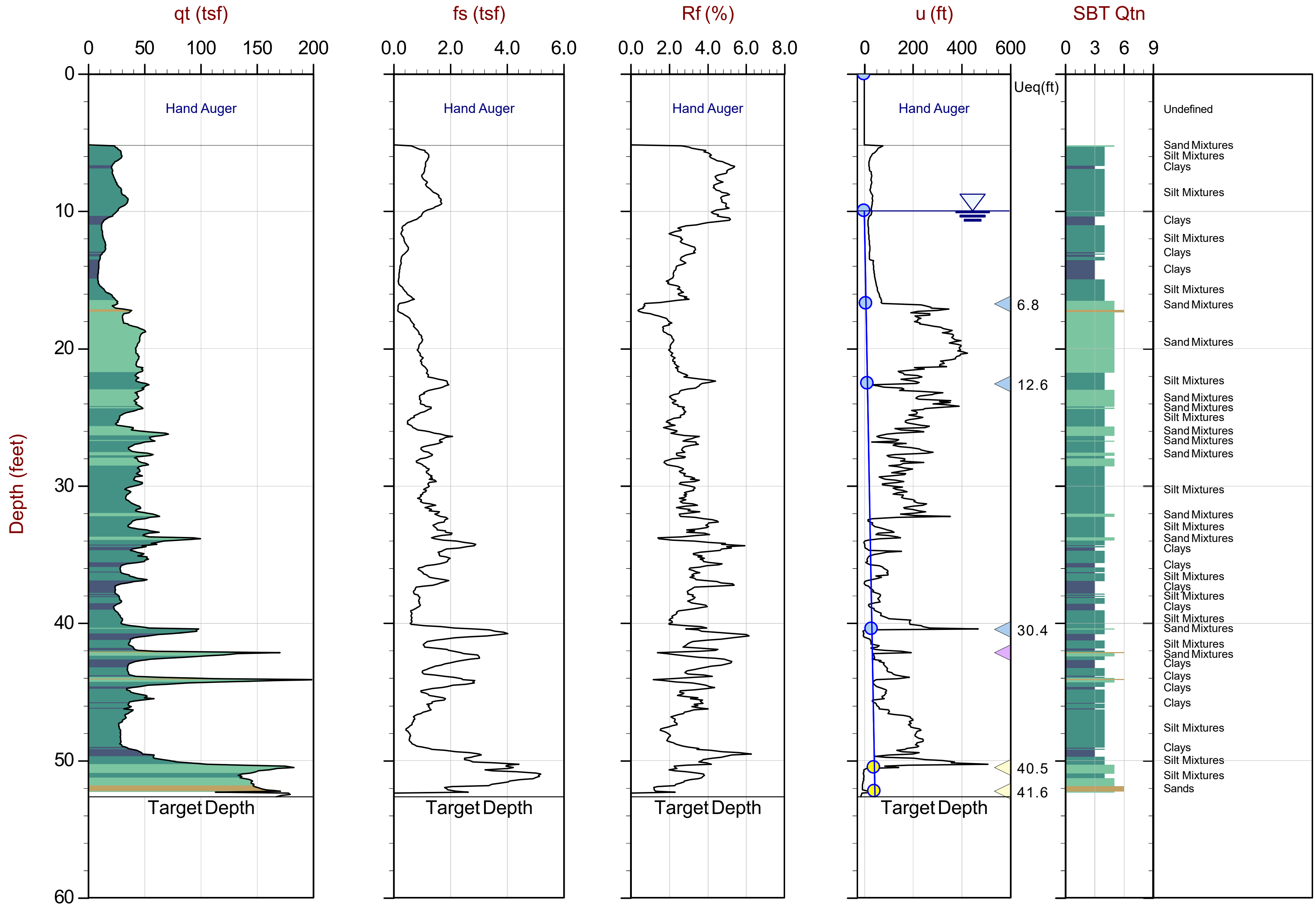
1. The assumed phreatic surface was based on the pore pressure dissipation tests performed within the CPTu sounding. Hydrostatic conditions are assumed for the calculated parameters.
2. The coordinates were acquired using consumer grade GPS equipment, datum: WGS 1984 / UTM Zone 11S.
3. Elevations are referenced to the ground surface and were acquired from the Google Earth Elevation for the recorded coordinates.
4. The sounding took place over two days.
5. The assumed phreatic surface is based on the pore pressure dissipation test to reach equilibrium at nearby soundings.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-17 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35



Max Depth: 16.050 m / 52.66 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374567m
Sheet No: 1 of 1

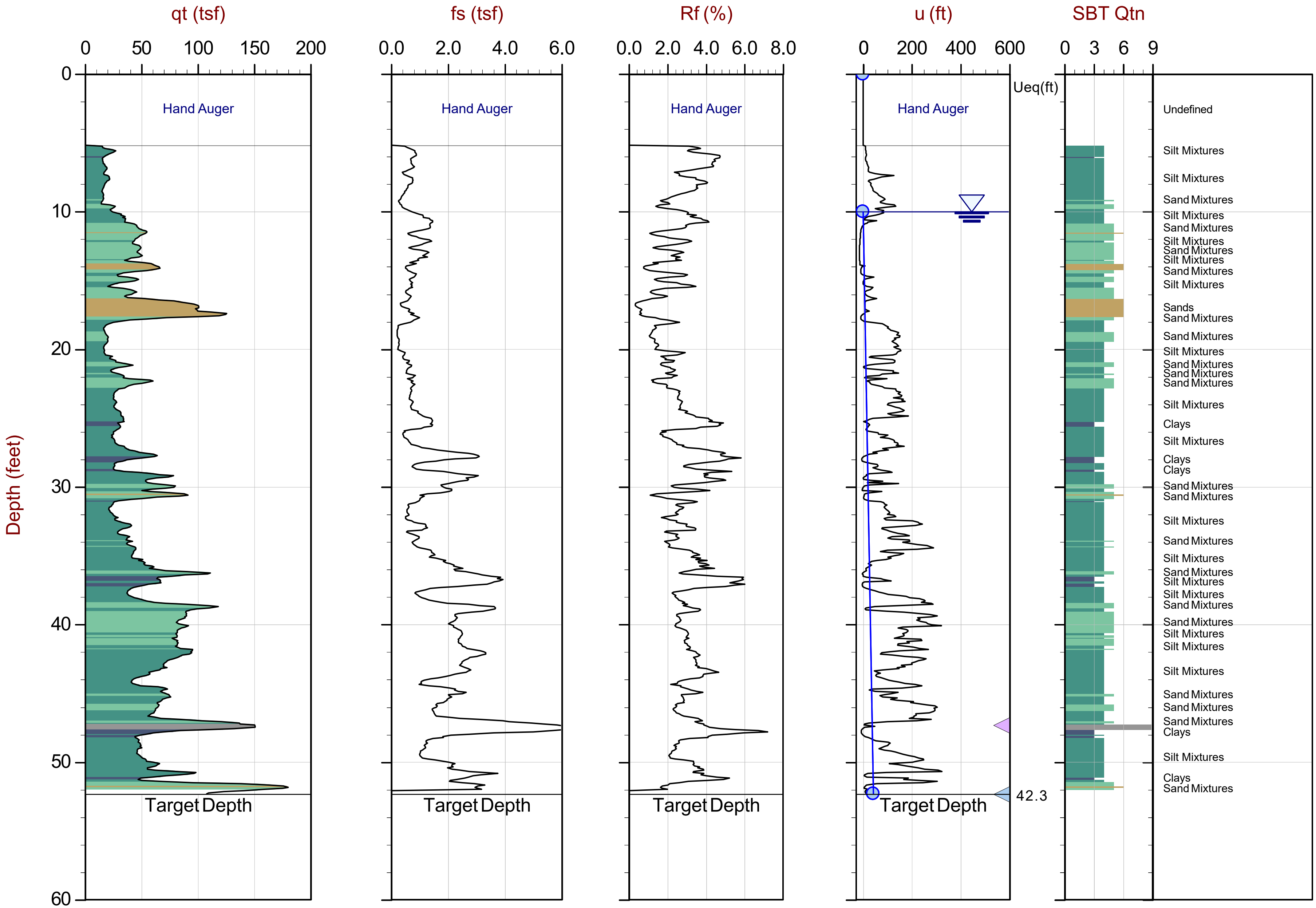
Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 07:22
Site: TVC

Sounding: CPT-2
Cone: 956:T1500F15U35



Max Depth: 15.950 m / 52.33 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771391m E: 374434m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) · Assumed Ueq · Dissipation, Ueq achieved · Dissipation, Ueq not achieved · Dissipation, Ueq assumed · Hydrostatic Line

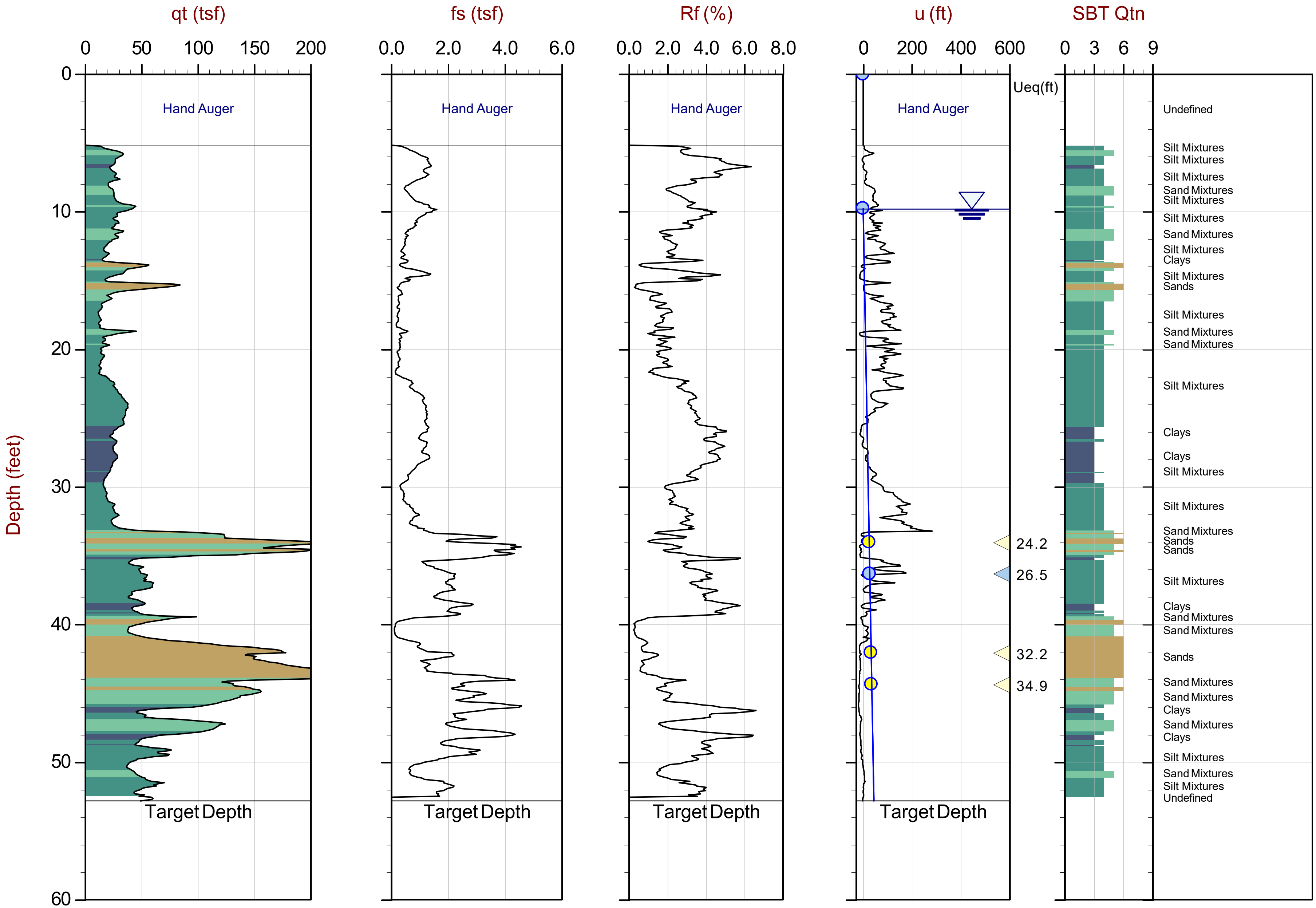
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 09:42
Site: TVC

Sounding: CPT-3
Cone: 956:T1500F15U35



Max Depth: 16.100 m / 52.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374717m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

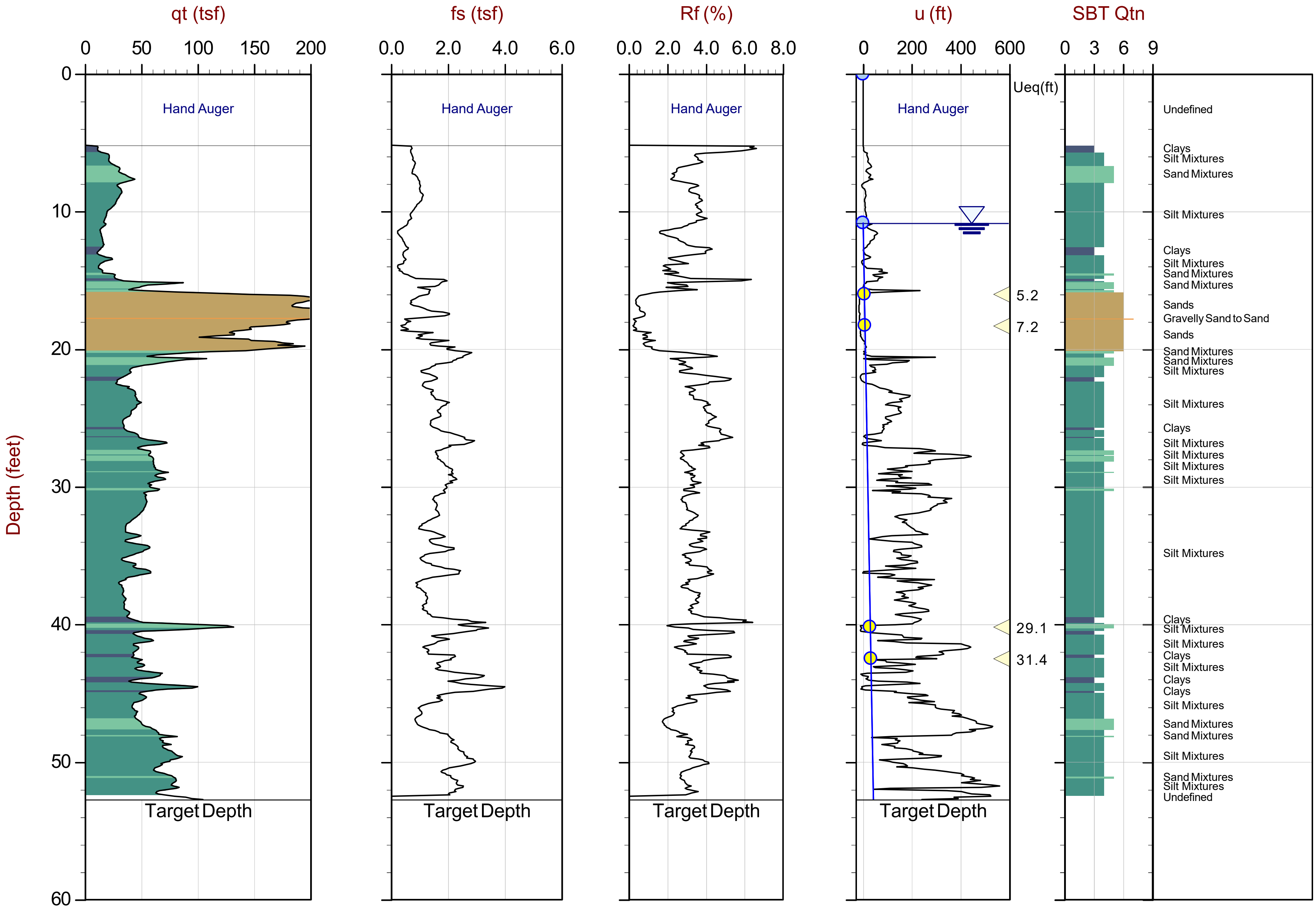
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35



Max Depth: 16.075 m / 52.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771297m E: 374749m
Sheet No: 1 of 1

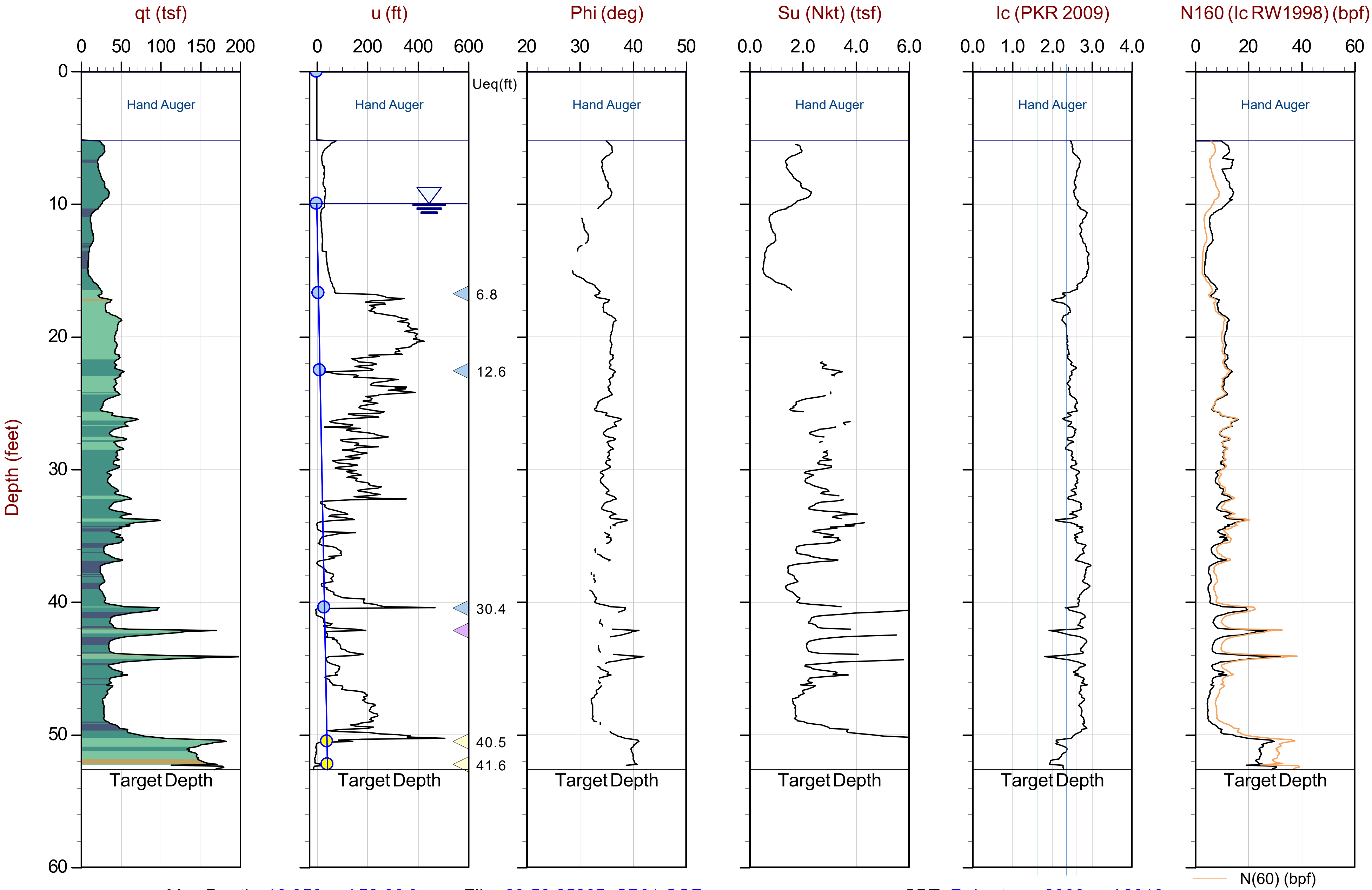
Equilibrium Pore Pressure (Ueq) Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Advanced Cone Penetration Test Plots

Job No: 23-56-25265
Date: 2023-01-17 11:40
Site: TVC
Sounding: CPT-1
Cone: 956:T1500F15U35

Geosyntec Consultants



Max Depth: 16.050 m / 52.66 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374567m

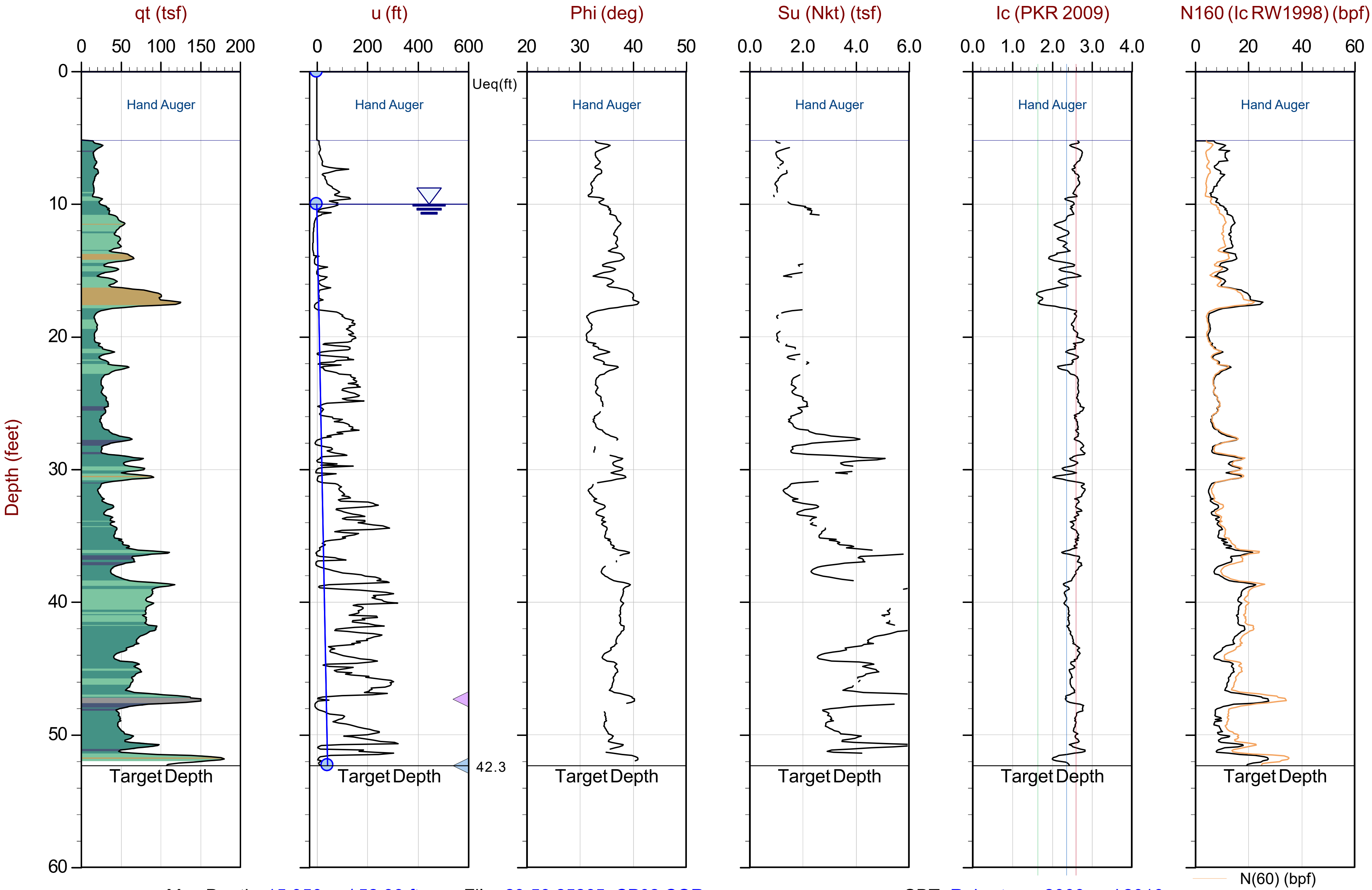
Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 07:22
Site: TVC

Sounding: CPT-2
Cone: 956:T1500F15U35



Max Depth: 15.950 m / 52.33 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771391m E: 374434m

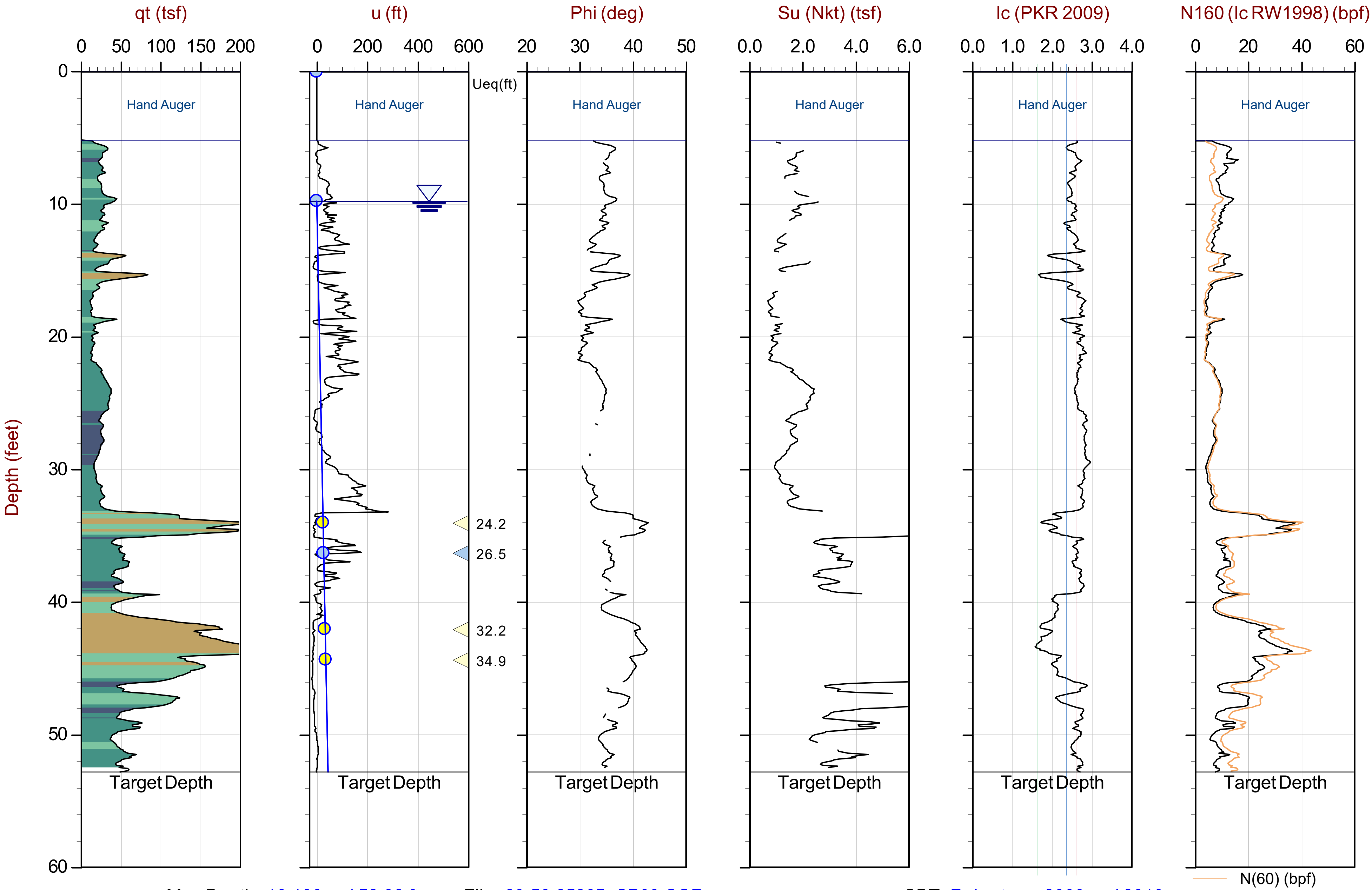
Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 09:42
Site: TVC
Sounding: CPT-3
Cone: 956:T1500F15U35



Max Depth: 16.100 m / 52.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP03.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374717m

Equilibrium Pore Pressure (Ueq) · Assumed Ueq · Dissipation, Ueq achieved · Dissipation, Ueq not achieved · Dissipation, Ueq assumed · Hydrostatic Line

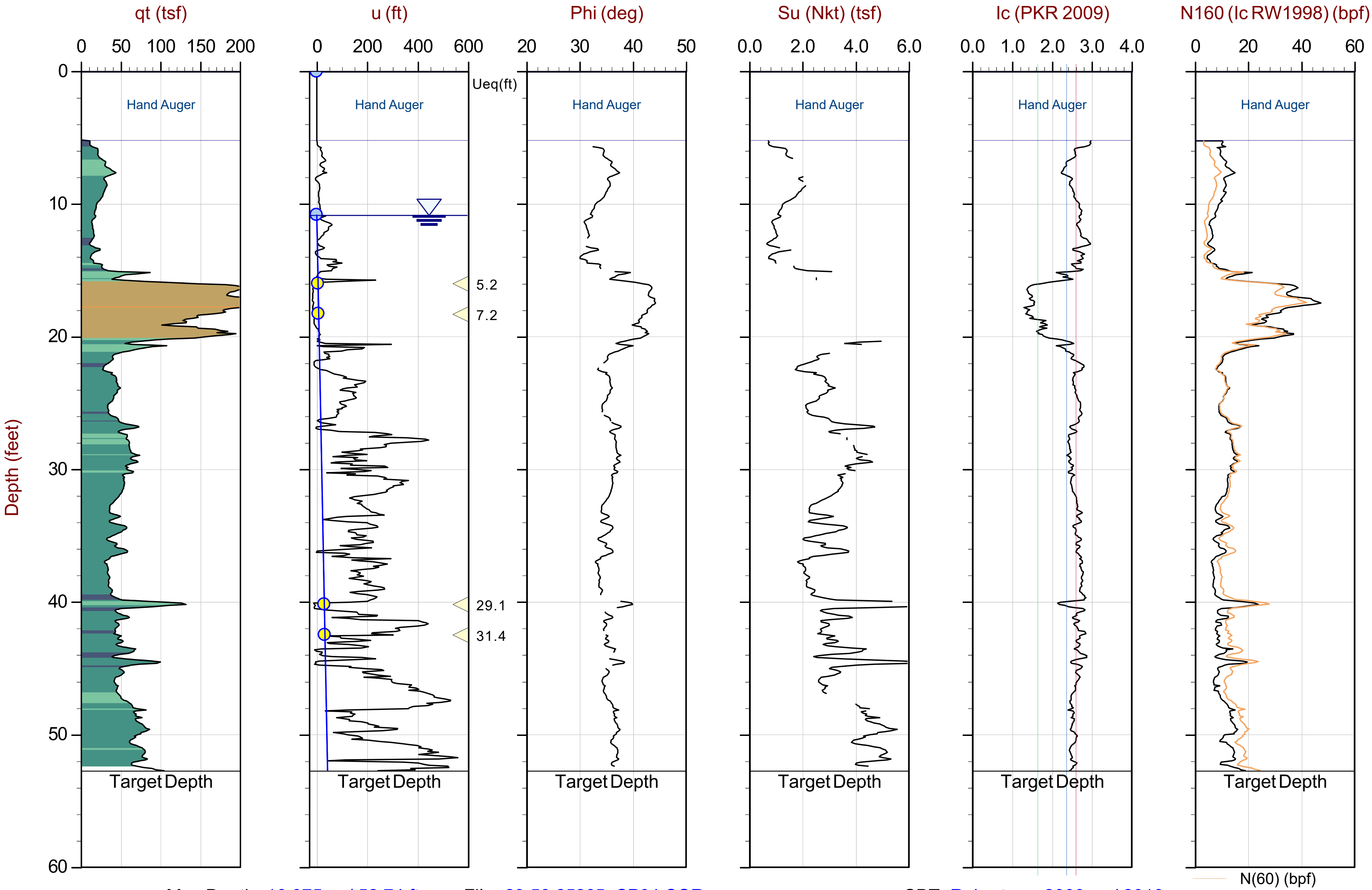
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35



Max Depth: 16.075 m / 52.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP04.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt: 15.0

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771297m E: 374749m

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

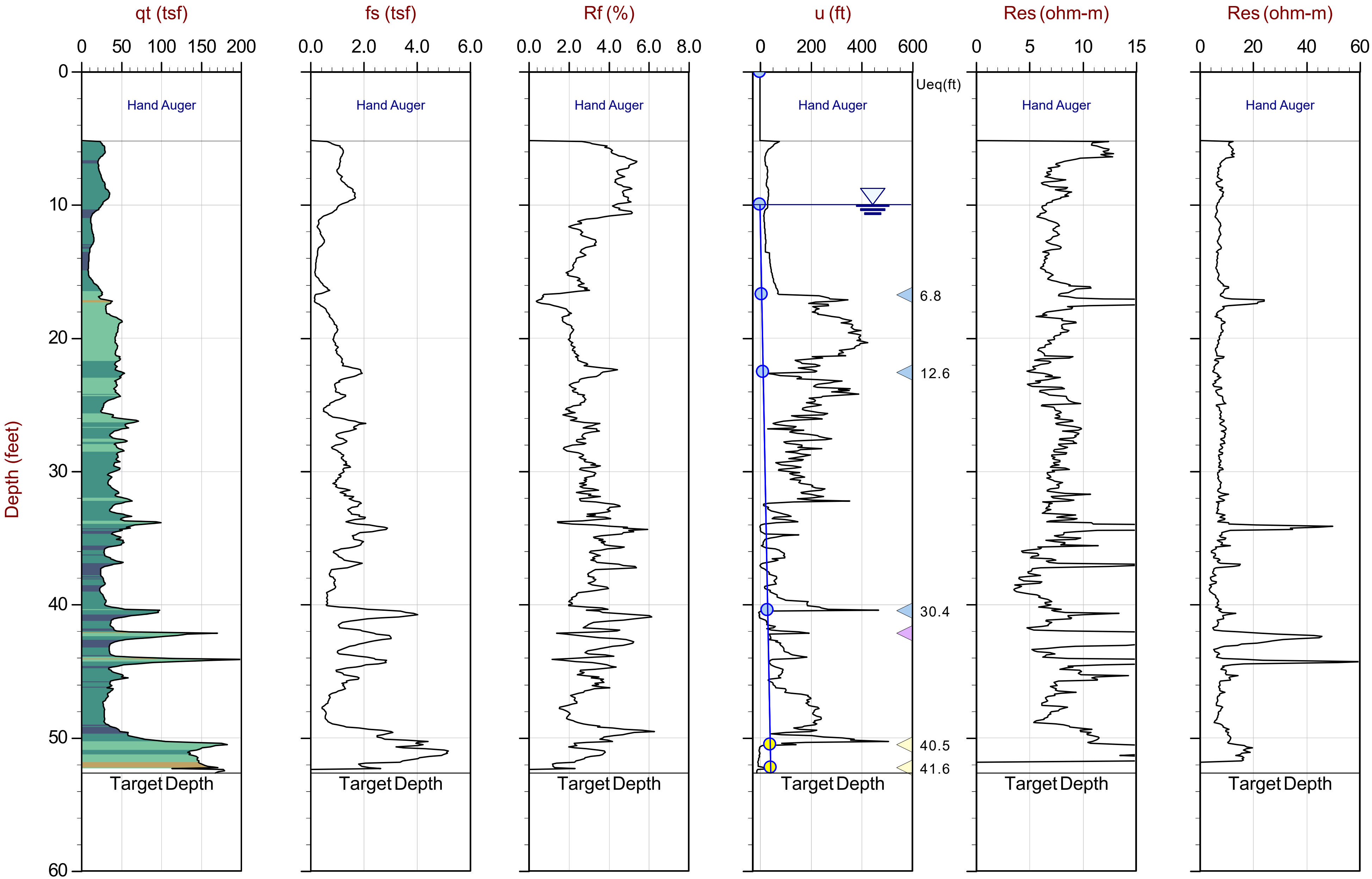
Resistivity Cone Penetration Test Plots

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-17 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35



Max Depth: 16.050 m / 52.66 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374567m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

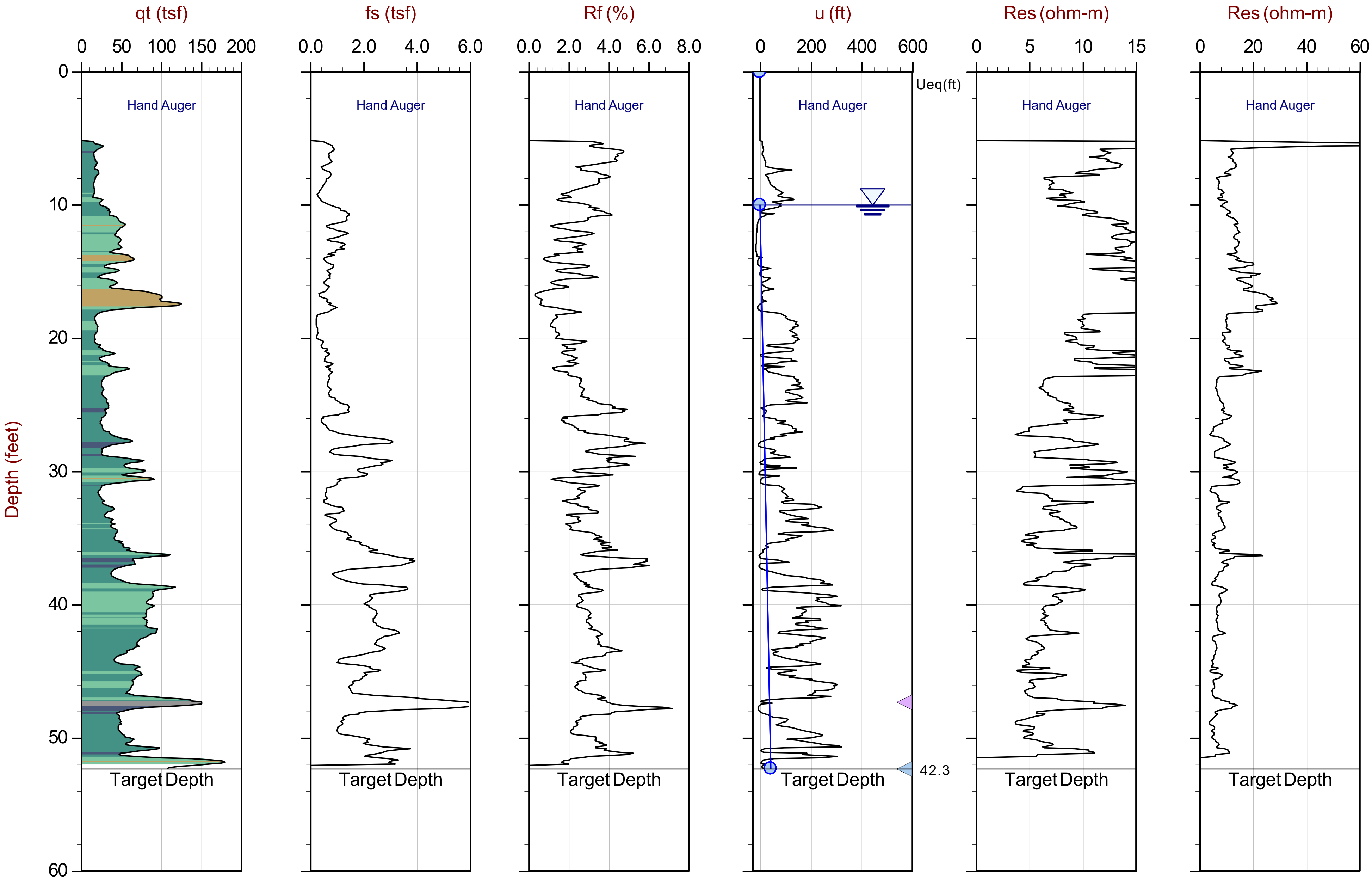
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 07:22
Site: TVC

Sounding: CPT-2
Cone: 956:T1500F15U35



Max Depth: 15.950 m / 52.33 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771391m E: 374434m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

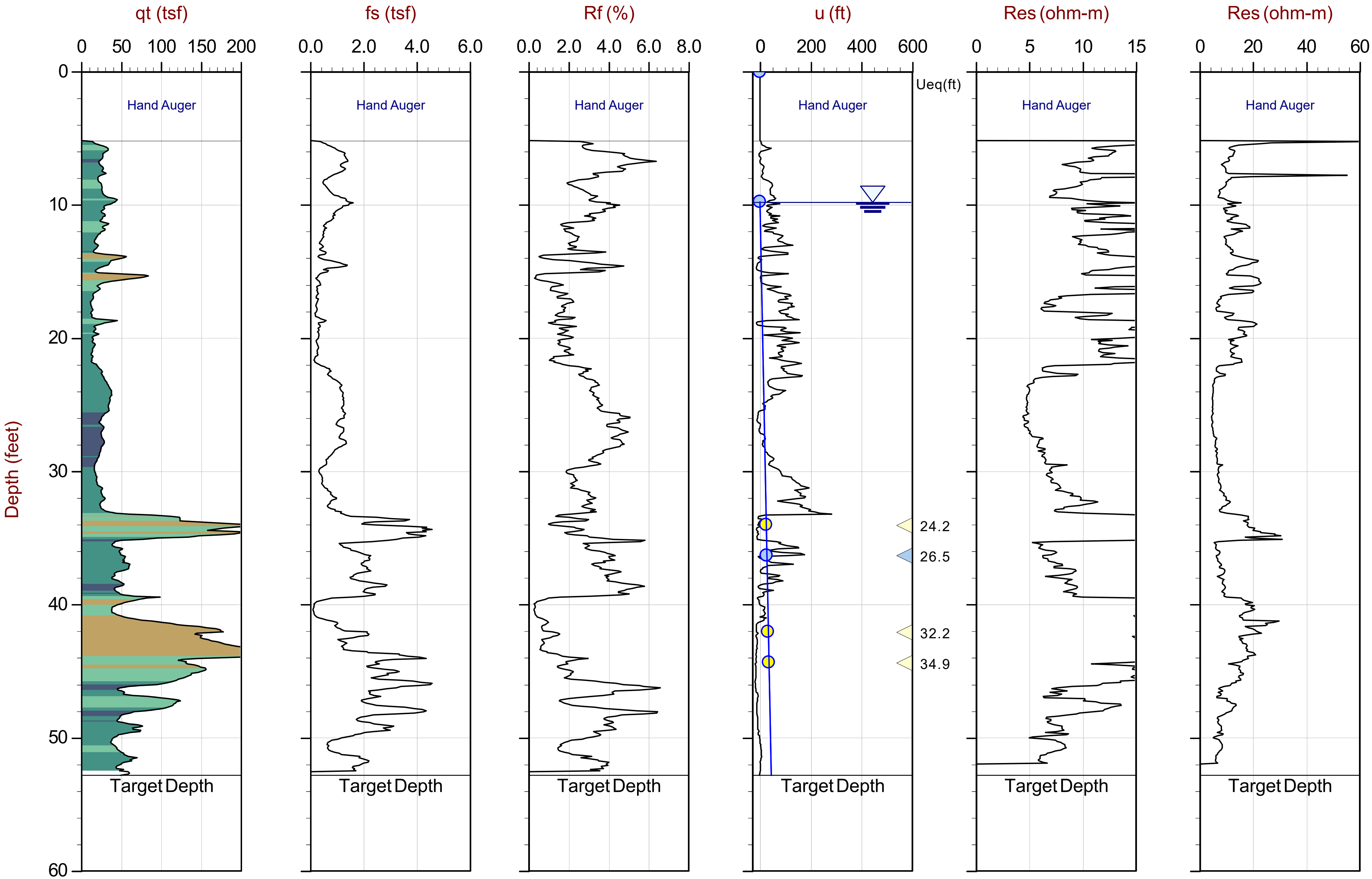
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 09:42
Site: TVC

Sounding: CPT-3
Cone: 956:T1500F15U35



Max Depth: 16.100 m / 52.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374717m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

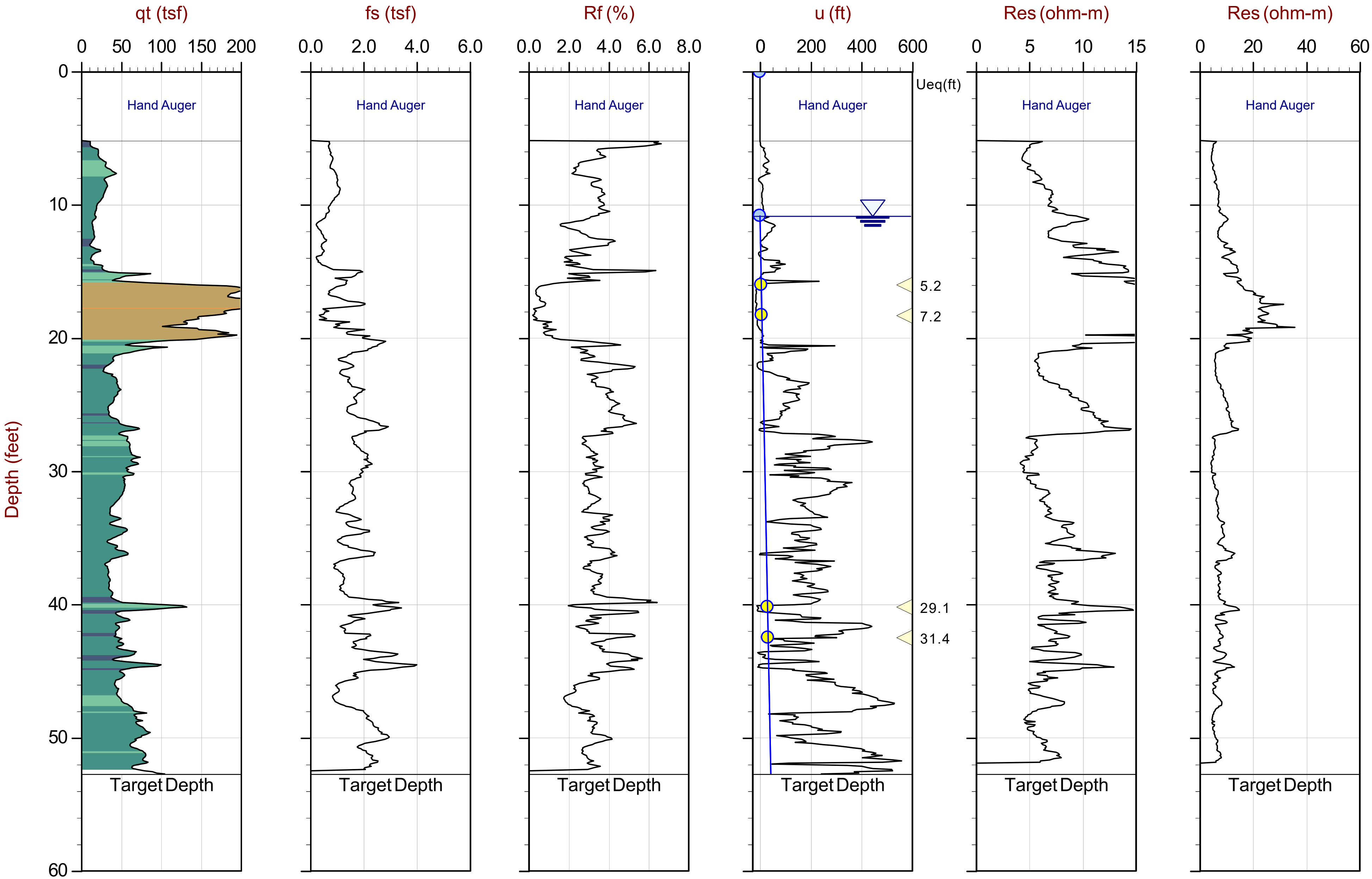
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35



Max Depth: 16.075 m / 52.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771297m E: 374749m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

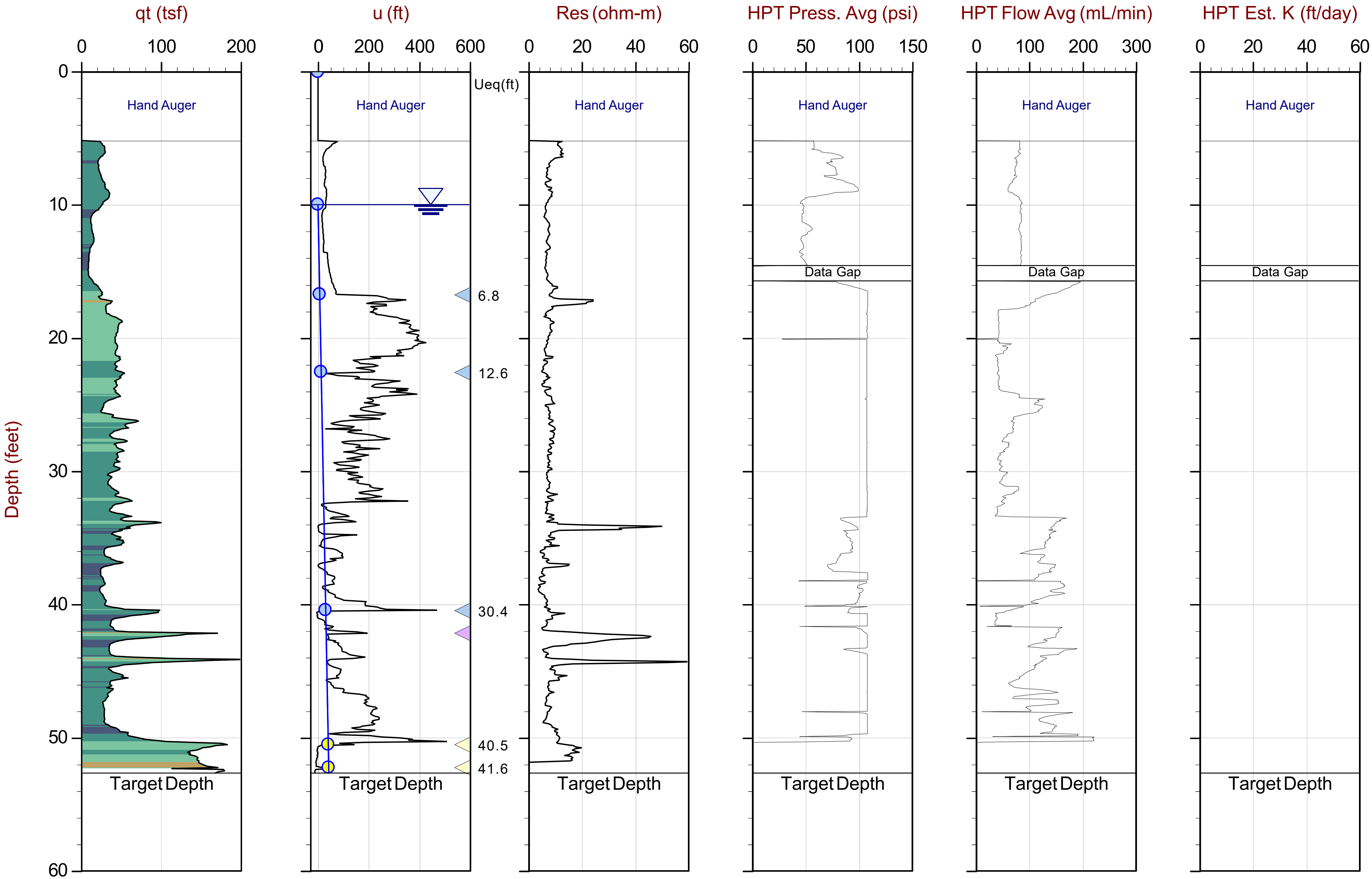
Standard Cone Penetration Test Plots with Hydraulic Profiling Tool (HPT) Plots

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-17 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35



Max Depth: 16.050 m / 52.66 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374567m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

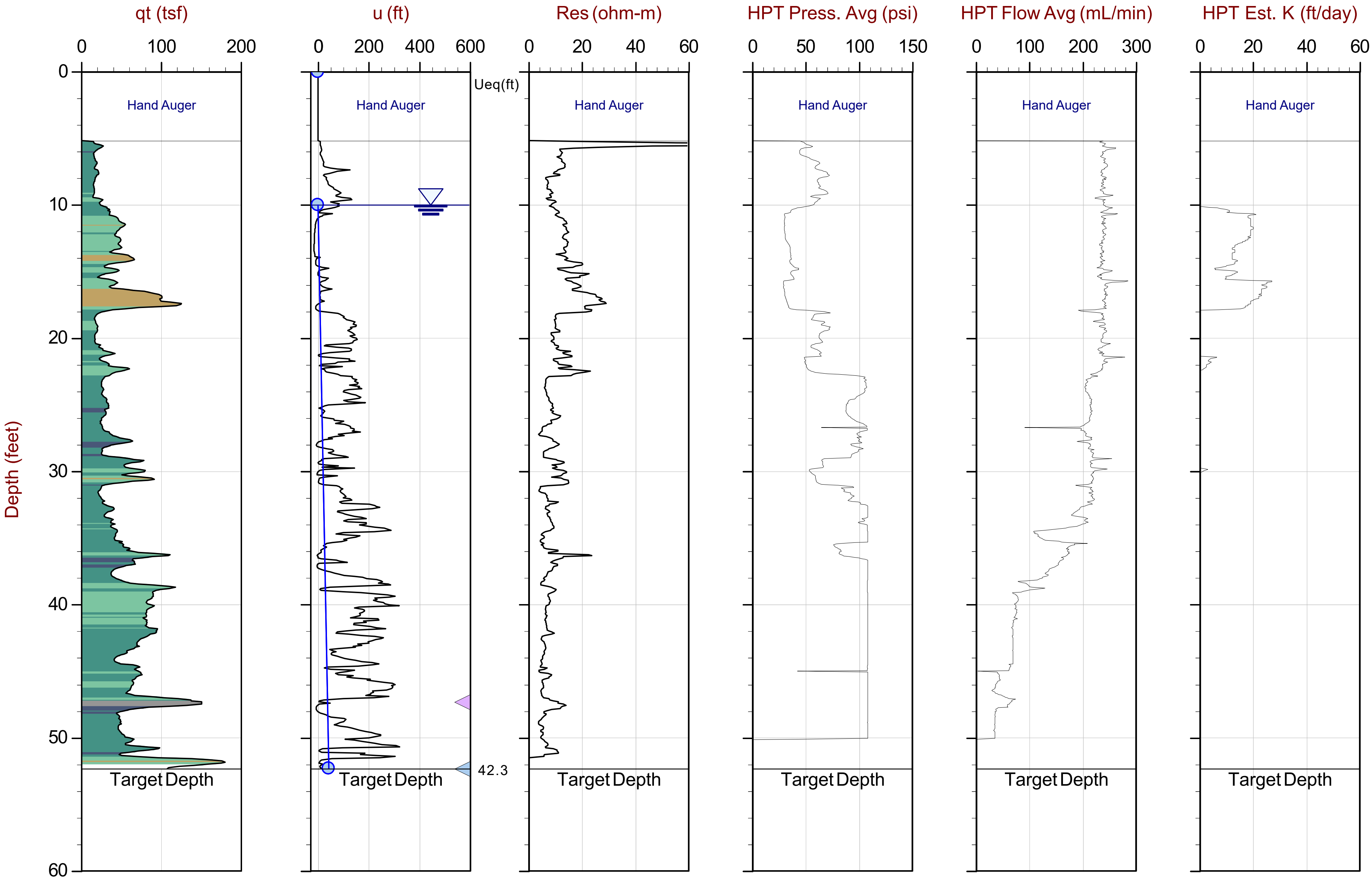
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 07:22
Site: TVC

Sounding: CPT-2
Cone: 956:T1500F15U35



Max Depth: 15.950 m / 52.33 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771391m E: 374434m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

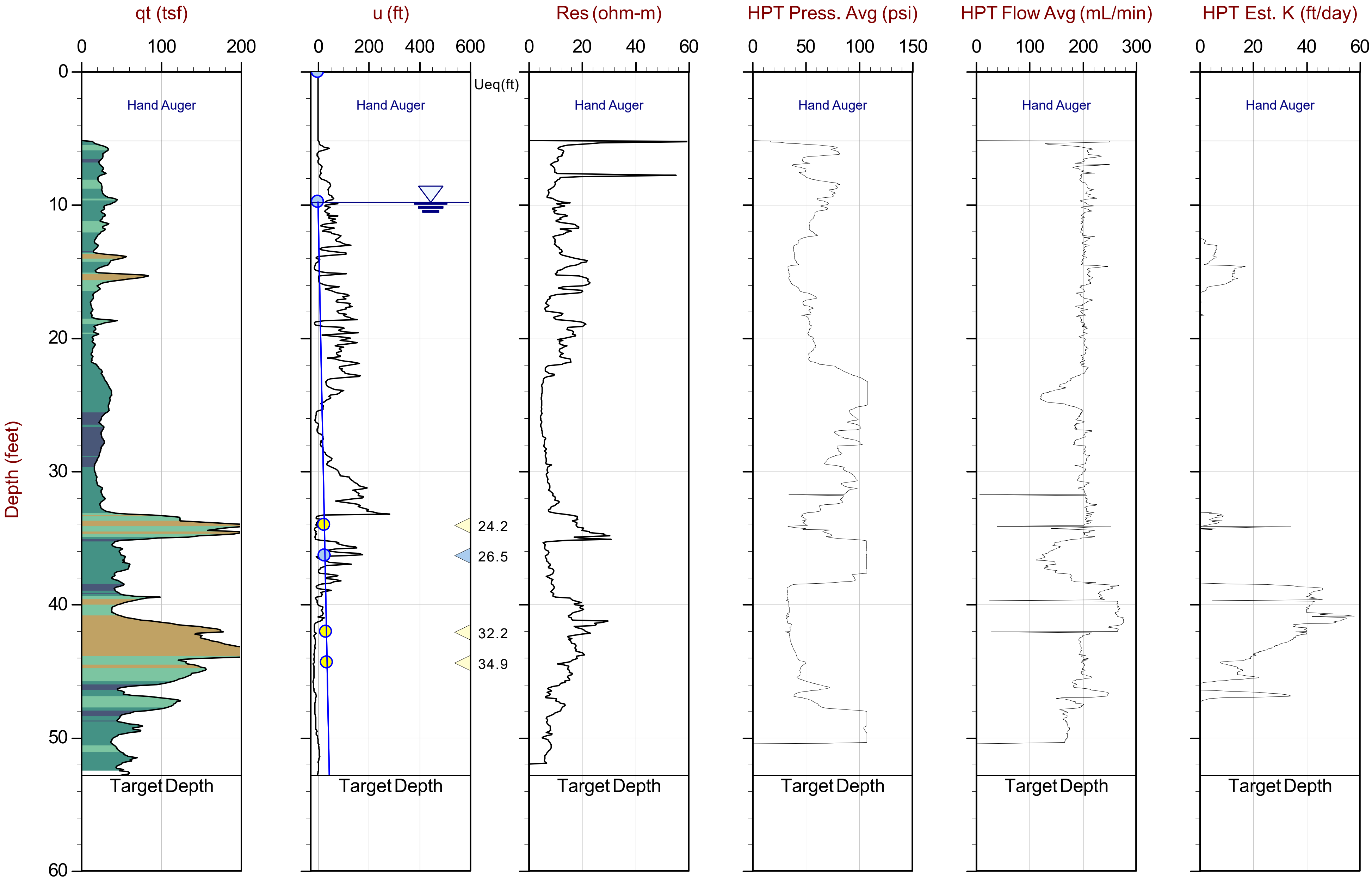
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

ConeTec

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 09:42
Site: TVC

Sounding: CPT-3
Cone: 956:T1500F15U35



Max Depth: 16.100 m / 52.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374717m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

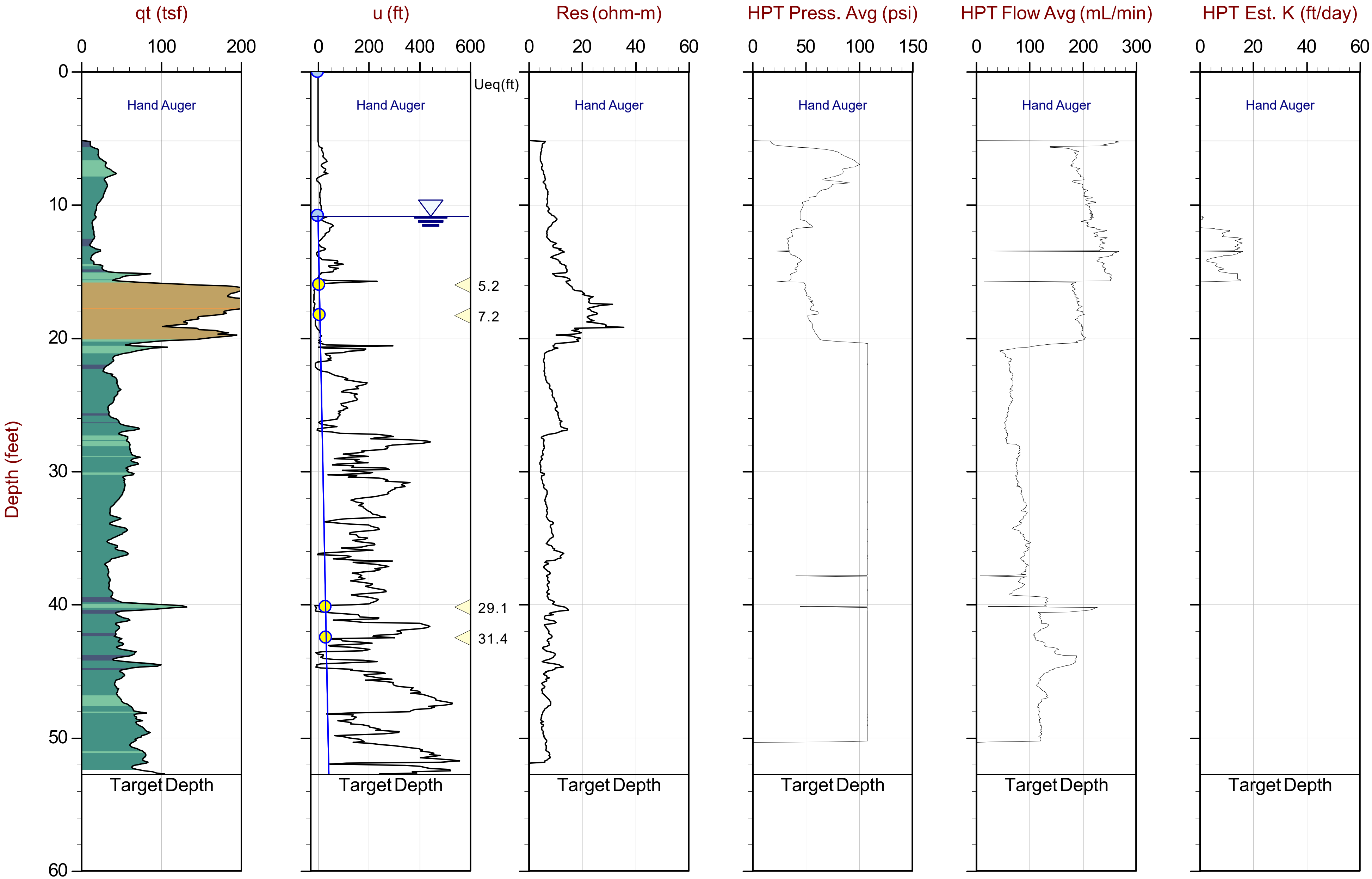
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35



Max Depth: 16.075 m / 52.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771297m E: 374749m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

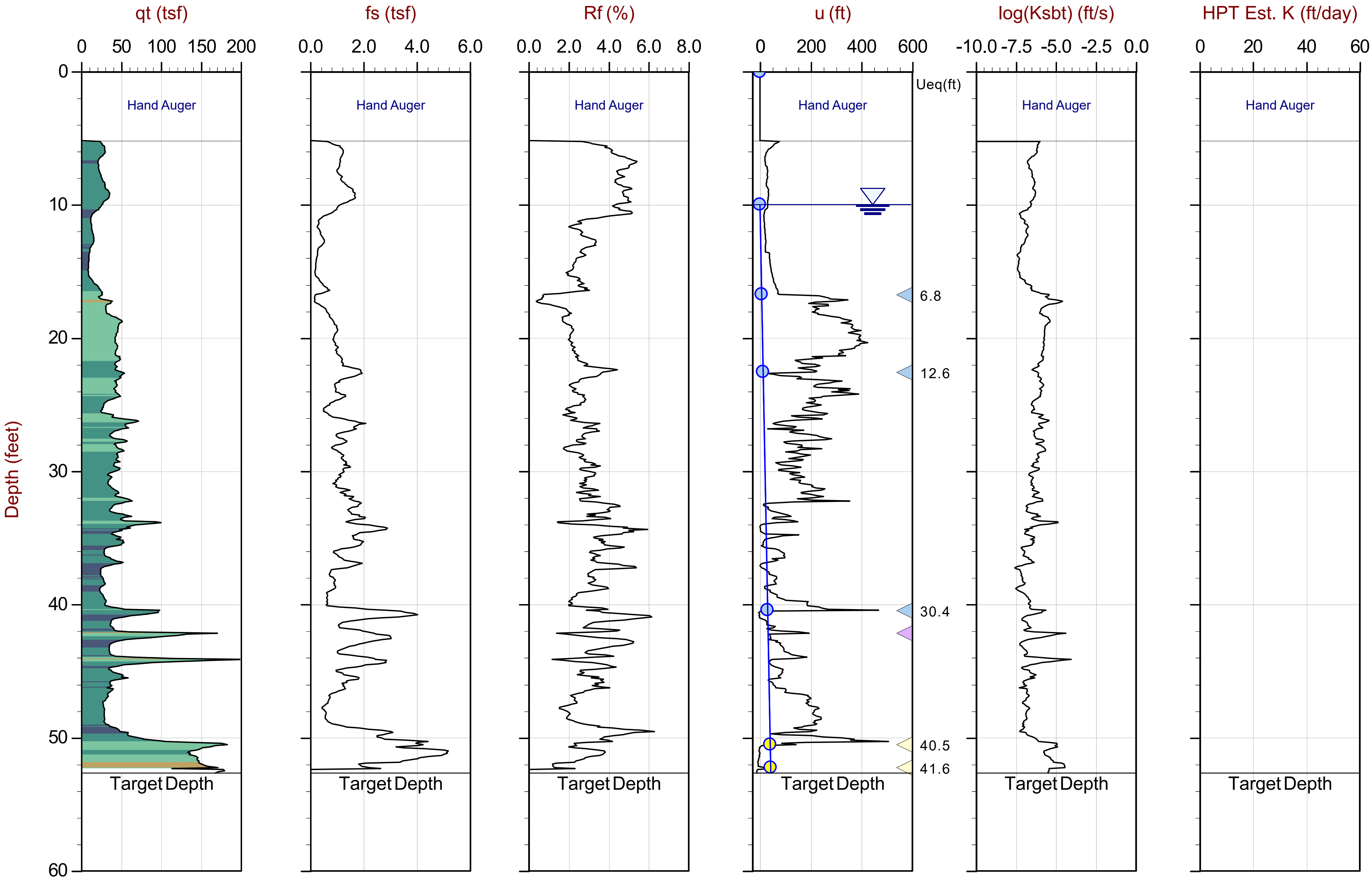
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Permeability Cone Penetration Test Plots

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-17 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35



Max Depth: 16.050 m / 52.66 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374567m
Sheet No: 1 of 1

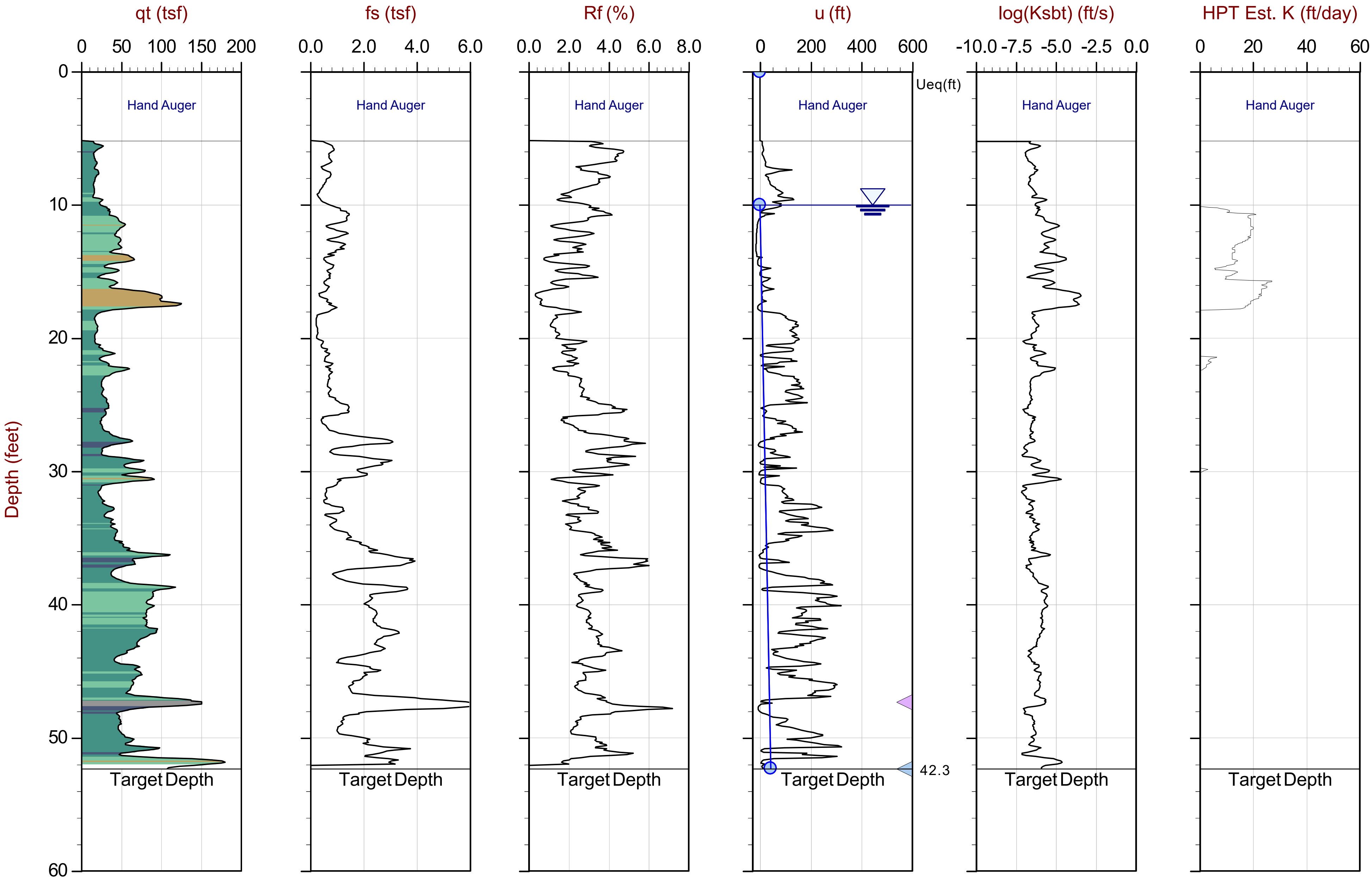
Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 07:22
Site: TVC

Sounding: CPT-2
Cone: 956:T1500F15U35



Max Depth: 15.950 m / 52.33 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771391m E: 374434m
Sheet No: 1 of 1

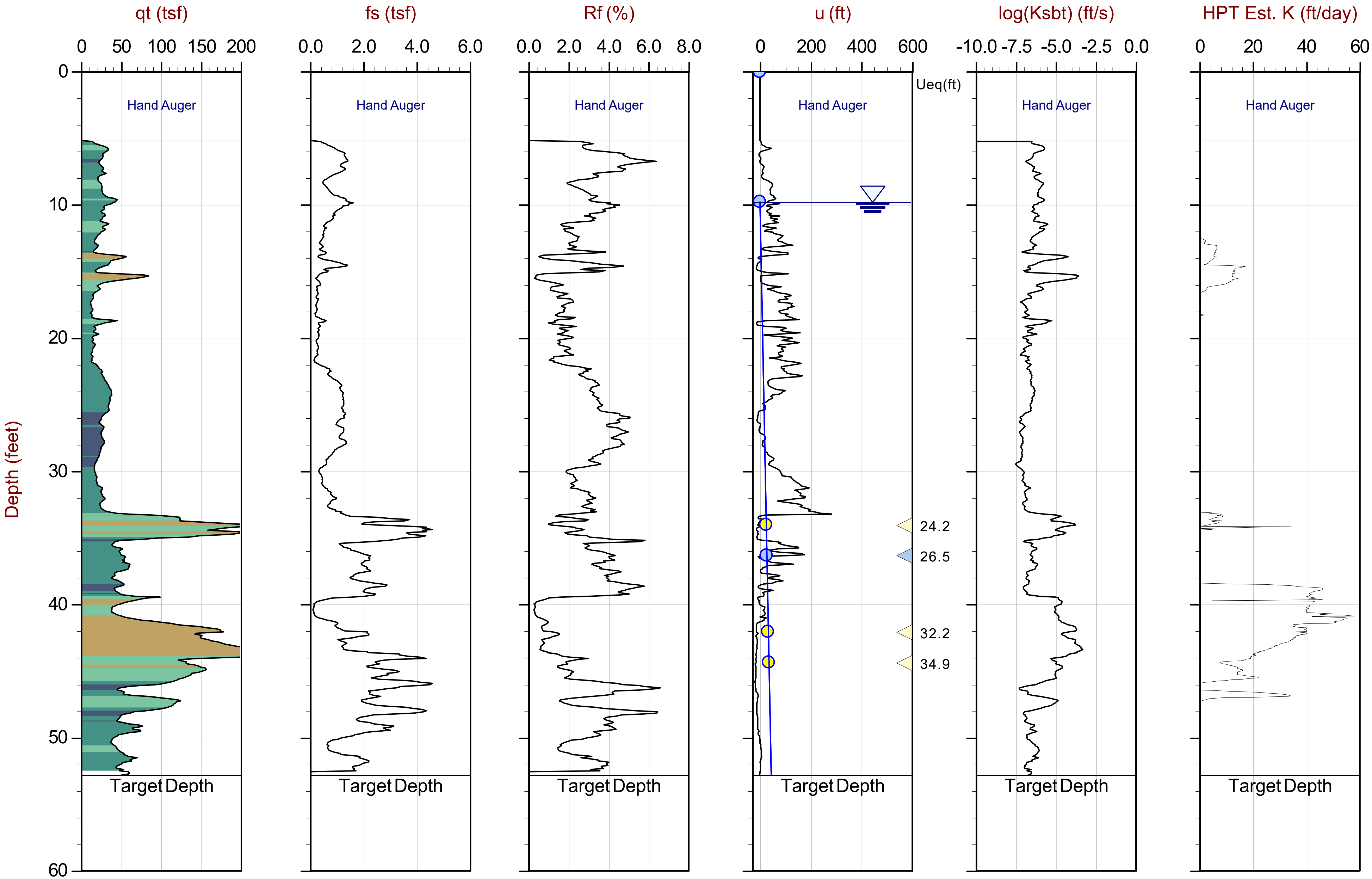
Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 09:42
Site: TVC

Sounding: CPT-3
Cone: 956:T1500F15U35



Max Depth: 16.100 m / 52.82 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771383m E: 374717m
Sheet No: 1 of 1

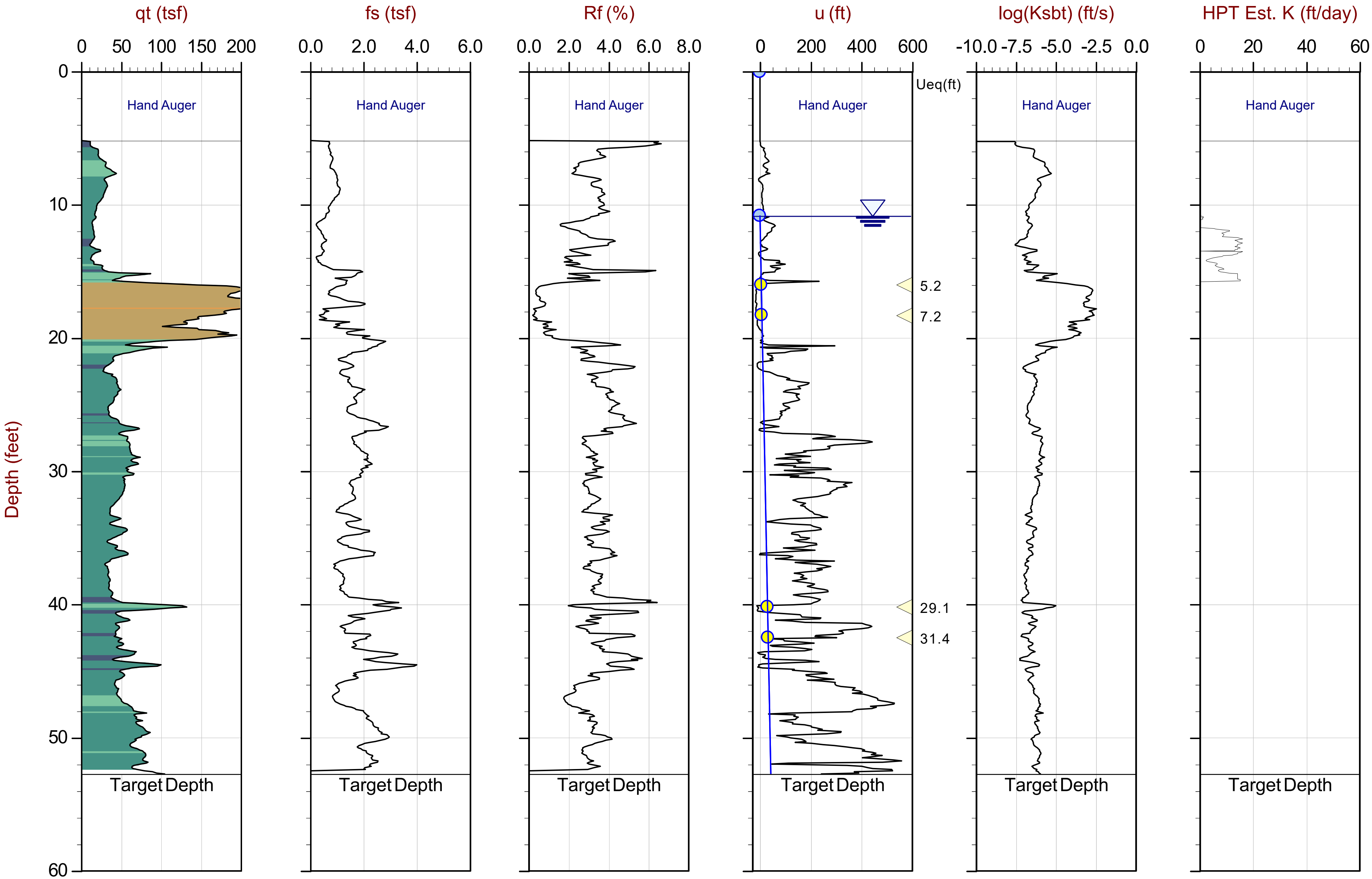
Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35



Max Depth: 16.075 m / 52.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 23-56-25265_CP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM 11S N: 3771297m E: 374749m
Sheet No: 1 of 1

Equilibrium Pore Pressure (Ueq) | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Soil Behavior Type (SBT) Scatter Plots

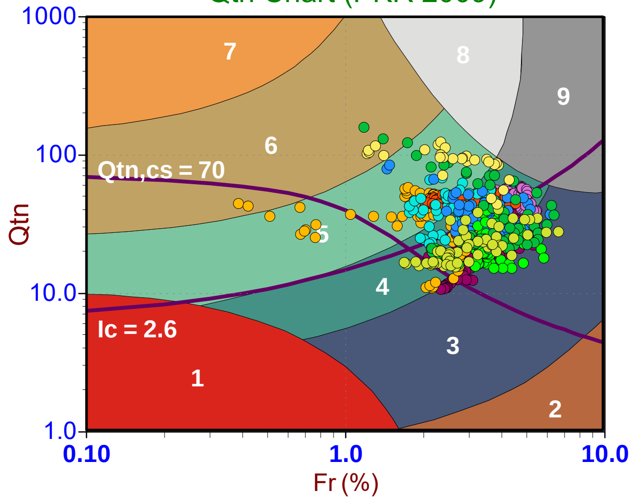
CONETEC

Geosyntec Consultants

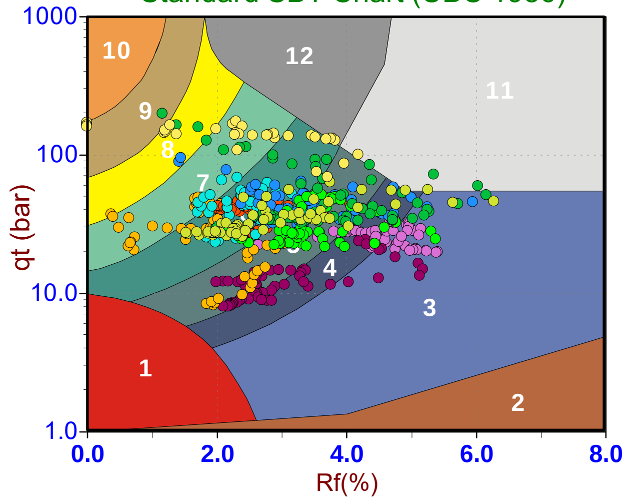
Job No: 23-56-25265
Date: 2023-01-17 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35

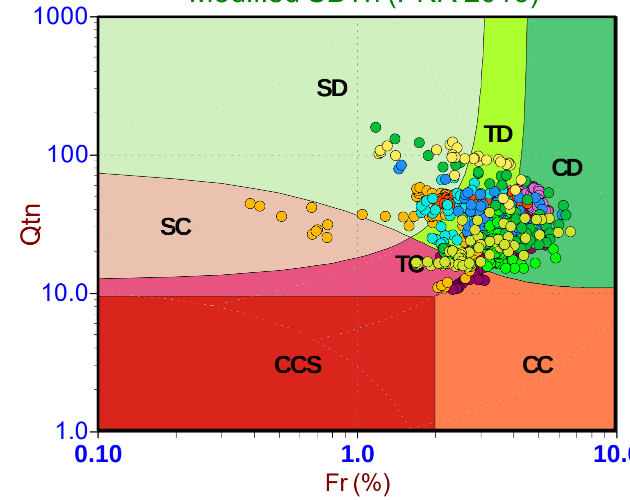
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

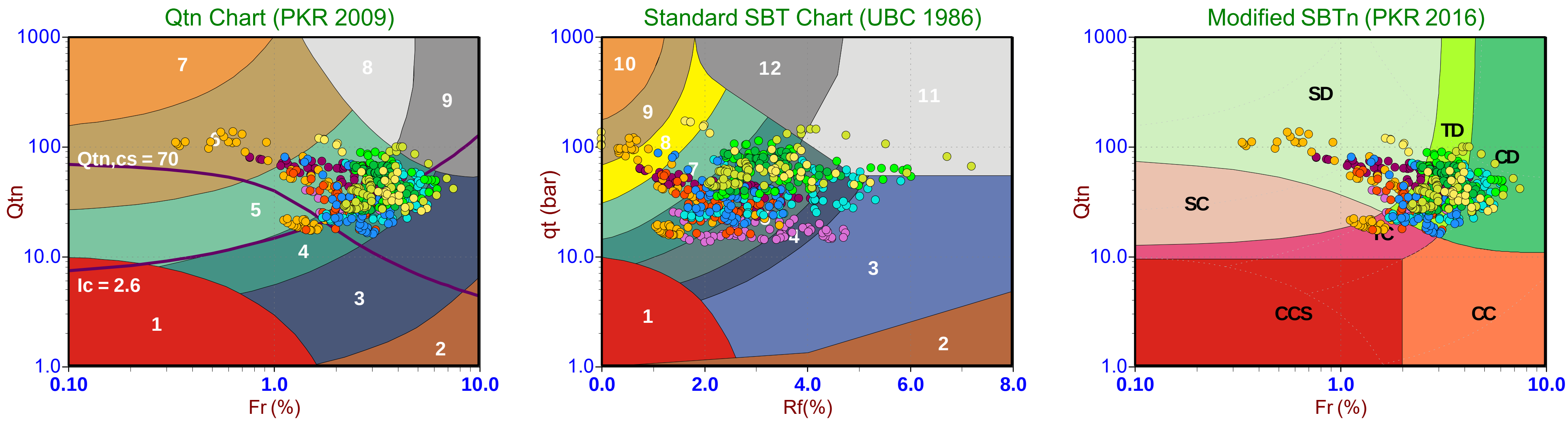
Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 07:22
Site: TVC

Sounding: CPT-2
Cone: 956:T1500F15U35



Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

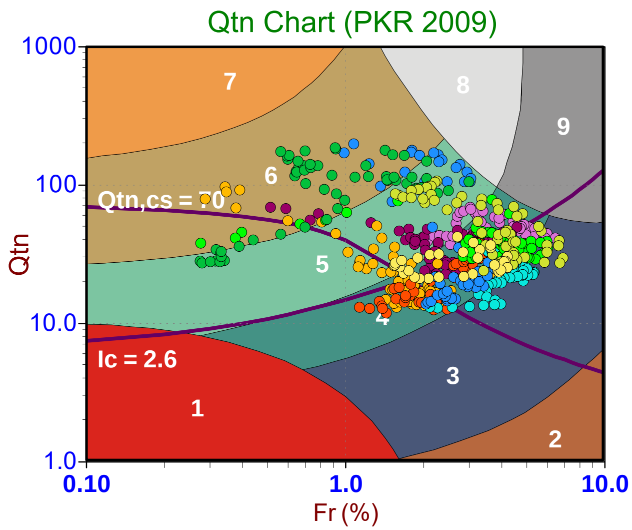
Legend
- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

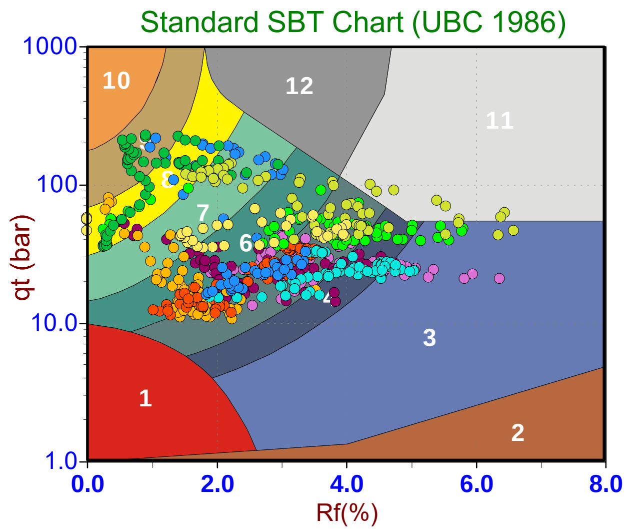
CONETEC

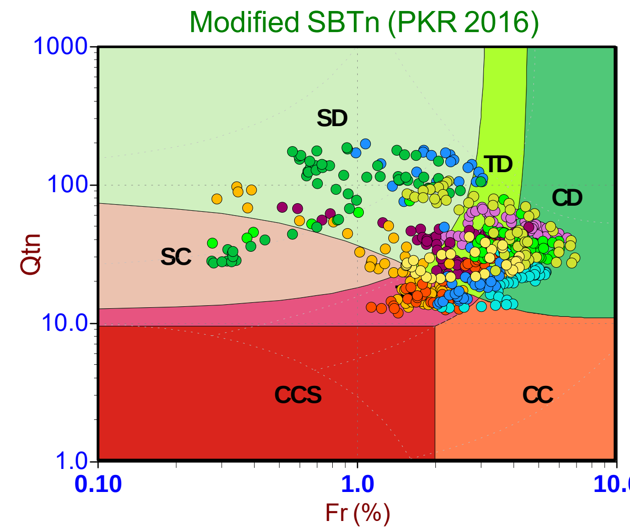
Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 09:42
Site: TVC

Sounding: CPT-3
Cone: 956:T1500F15U35







Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

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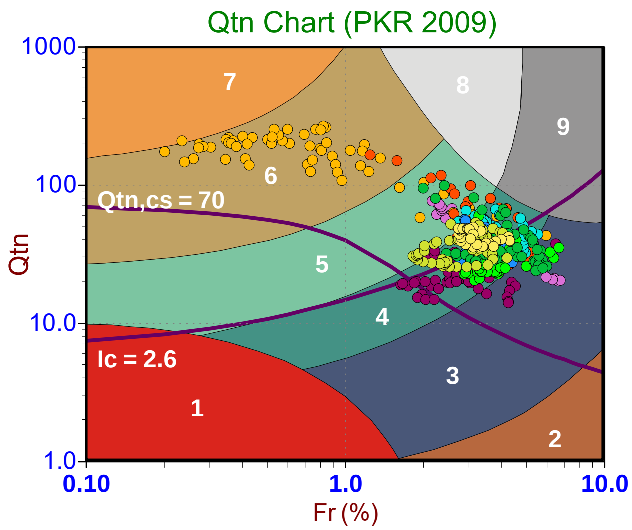
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

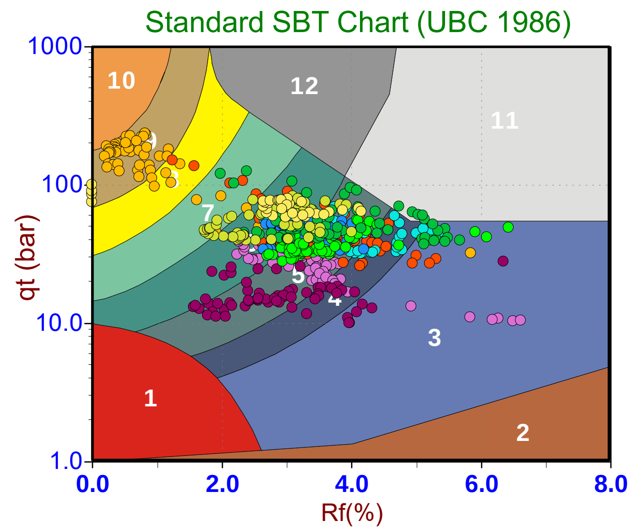
CONETEC

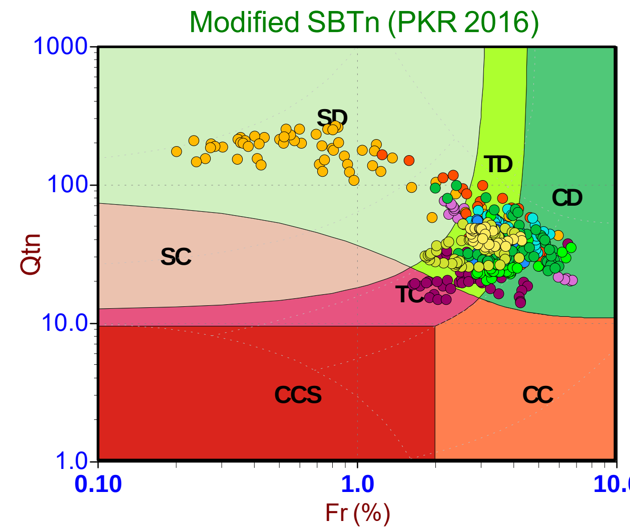
Geosyntec Consultants

Job No: 23-56-25265
Date: 2023-01-19 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35







Depth Ranges
- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend
- Sensitive, Fine Grained
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- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend
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- Organic Soil
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- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

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- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

Job No:	23-56-25265
Client:	Geosyntec Consultants
Project:	TVC
Start Date:	17-Jan-2023
End Date:	19-Jan-2023

CPTu PORE PRESSURE DISSIPATION SUMMARY

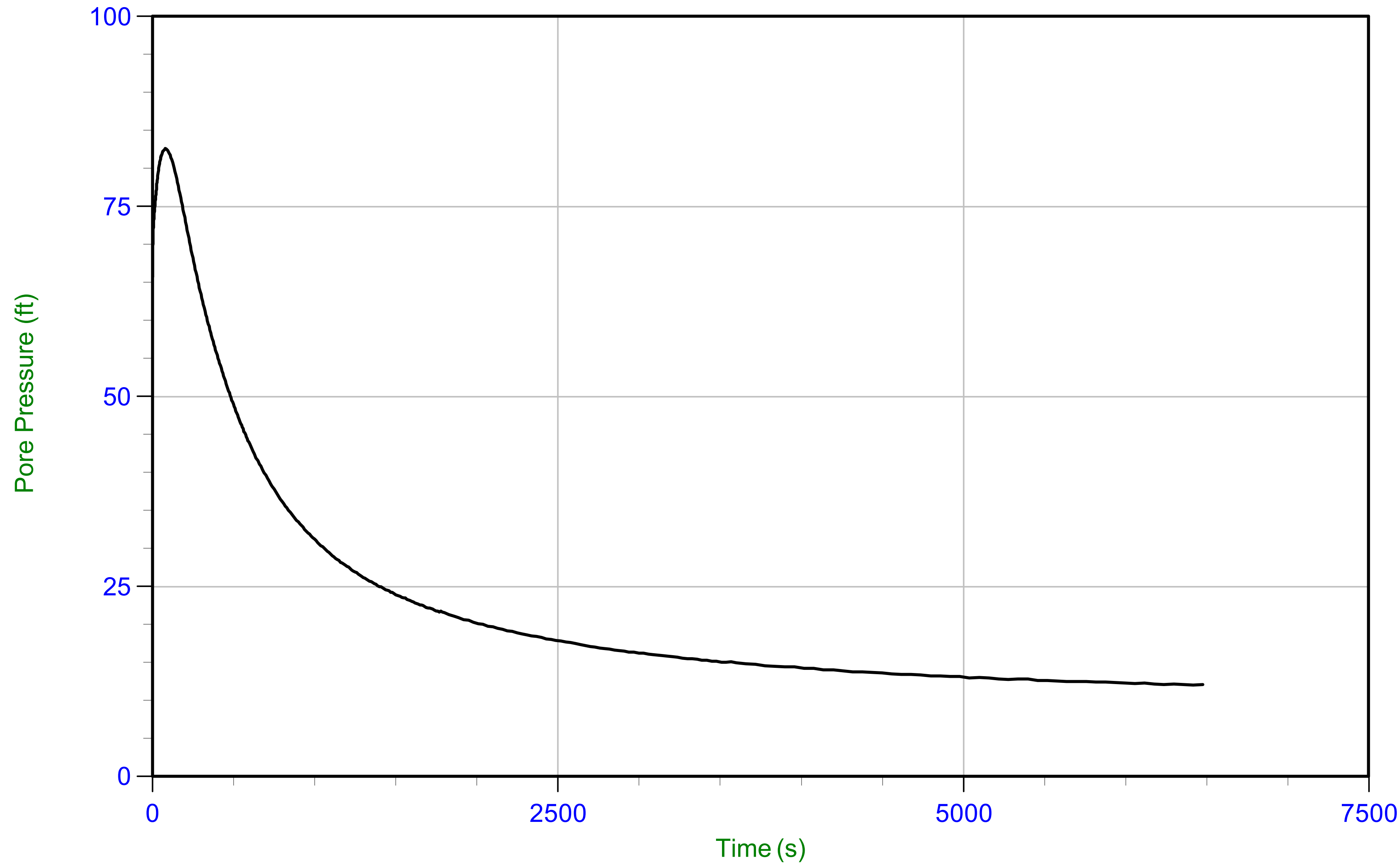
Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)	Estimated Phreatic Surface (ft)	t_{50}[1] (s)	Assumed Rigidity Index (I_r)	c_h[2] (cm^2/min)	Refer to Notation Number
CPT-1	23-56-25265_CP01	15	6480	16.73	6.8		10.0	501	100	1.4	3
CPT-1	23-56-25265_CP01	15	9540	22.56	12.6		10.0	499	100	1.4	3
CPT-1	23-56-25265_CP01	15	6060	40.44	30.5		10.0	291	100	2.4	3
CPT-1	23-56-25265_CP01	15	305	42.16							
CPT-1	23-56-25265_CP01	15	300	50.52	40.6	10.0					
CPT-1	23-56-25265_CP01	15	400	52.25	41.7	10.6					
CPT-2	23-56-25265_CP02	15	530	47.33							
CPT-2	23-56-25265_CP02	15	1130	52.33	42.3		10.0	37	100	19.0	4
CPT-3	23-56-25265_CP03	15	300	34.04	24.3	9.8					
CPT-3	23-56-25265_CP03	15	680	36.33	26.6		9.8	268	100	2.6	3
CPT-3	23-56-25265_CP03	15	300	42.08	32.2	9.9					
CPT-3	23-56-25265_CP03	15	455	44.37	34.9	9.5					
CPT-4	23-56-25265_CP04	15	315	15.99	5.2	10.8					
CPT-4	23-56-25265_CP04	15	850	18.29	7.2	11.1					
CPT-4	23-56-25265_CP04	15	300	40.19	29.1	11.1					
CPT-4	23-56-25265_CP04	15	1250	42.49	31.4	11.0		21	100	33.8	

1. Time is relative to where U_{max} occurred.
2. Houlsby and Teh, 1991.
3. The estimated phreatic surface was based on the shallowest pore pressure dissipation test to reach equilibrium within the sounding.
4. The estimated phreatic surface was based on the pore pressure dissipation test to reach equilibrium at the nearby soundings.

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/17/2023 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP01.ppd2
Depth: 5.100 m / 16.732 ft
Duration: 6480.0 s

u Min: 12.1 ft
u Max: 82.6 ft
u Final: 12.1 ft

WT: 3.038 m / 9.967 ft
Ueq: 6.8 ft
U(50): 44.69 ft

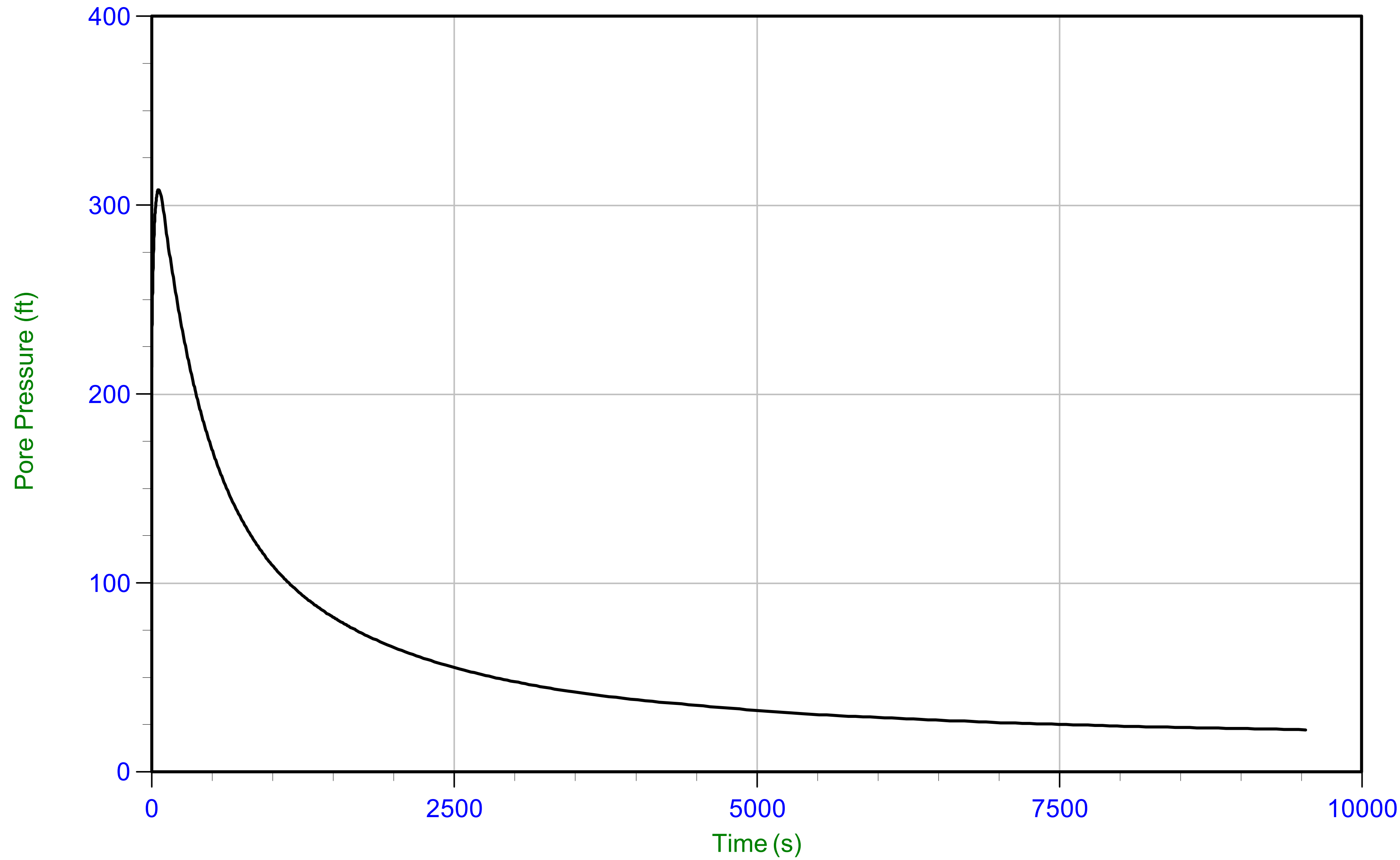
T(50): 500.6 s
Ir: 100
Ch: 1.4 cm²/min

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/17/2023 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP01.ppd2
Depth: 6.875 m / 22.556 ft
Duration: 9540.0 s

u Min: 22.4 ft
u Max: 308.2 ft
u Final: 22.4 ft

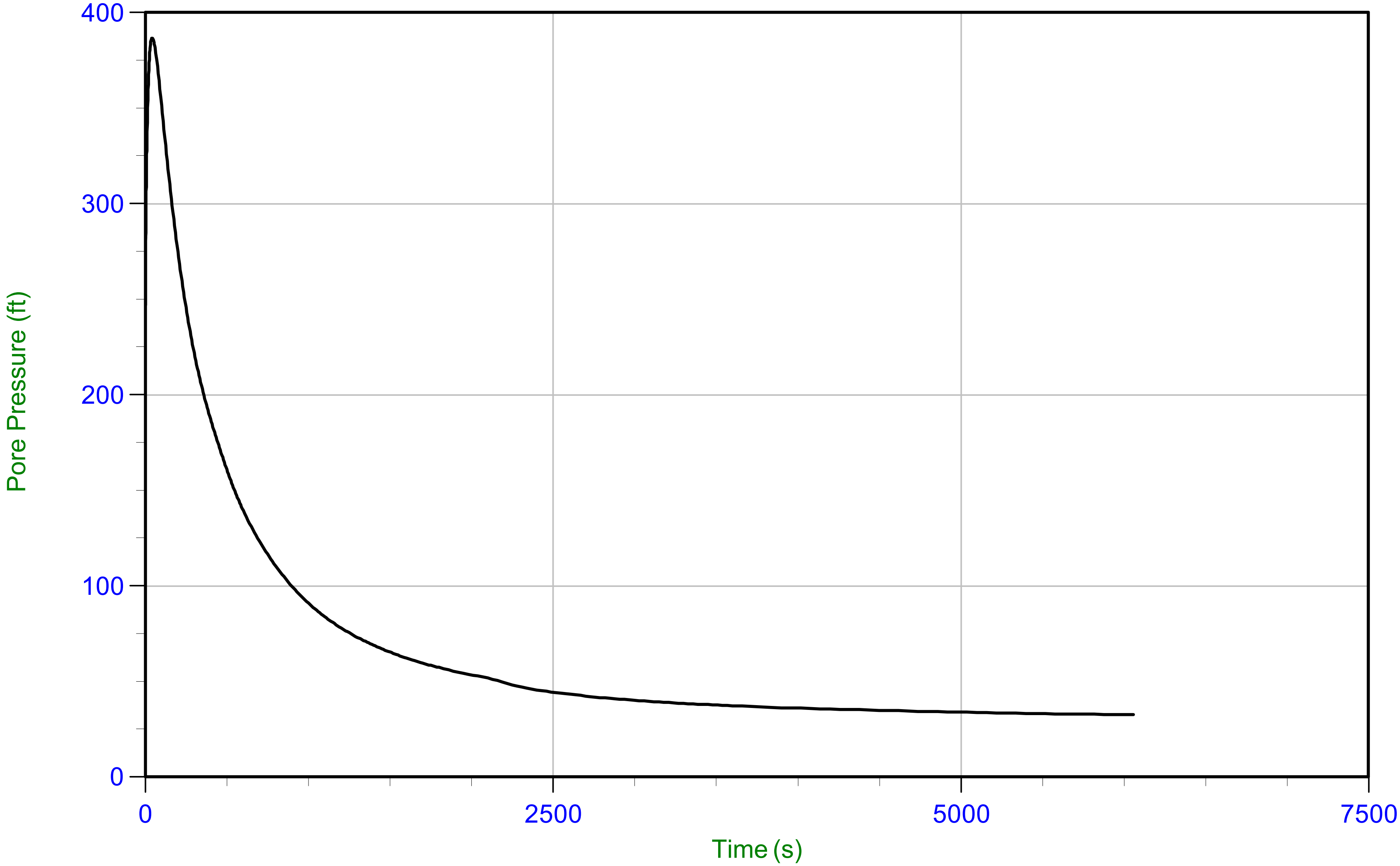
WT: 3.038 m / 9.967 ft
Ueq: 12.6 ft
U(50): 160.39 ft

T(50): 499.3 s
Ir: 100
Ch: 1.4 cm²/min

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/17/2023 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

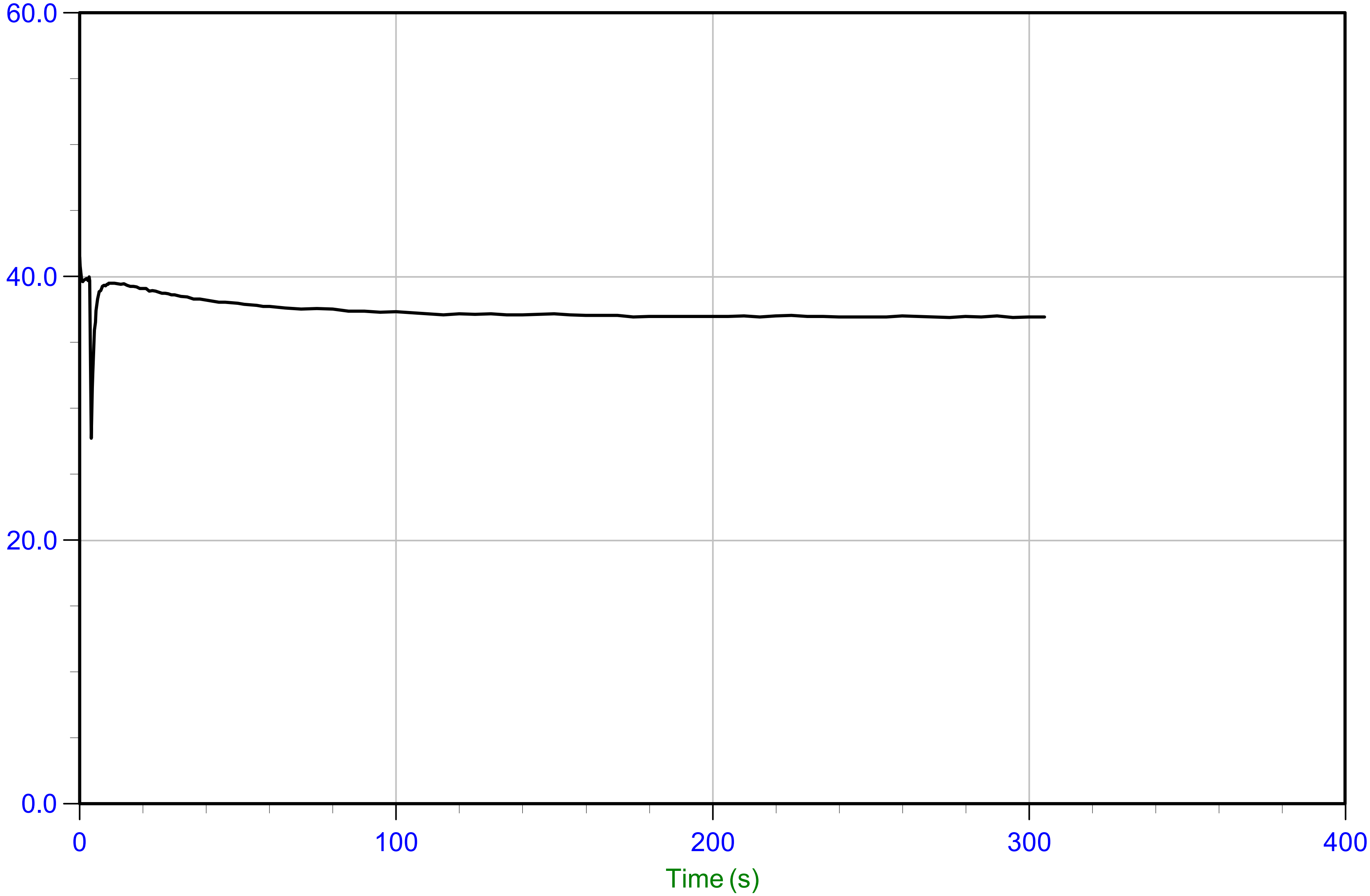
Filename: 23-56-25265_CP01.ppd2
Depth: 12.325 m / 40.436 ft
Duration: 6060.0 s

u Min: 32.6 ft
u Max: 386.6 ft
u Final: 32.6 ft

WT: 3.038 m / 9.967 ft
Ueq: 30.5 ft
U(50): 208.56 ft

T(50): 290.6 s
Ir: 100
Ch: 2.4 cm²/min

Geosyntec Consultants	Job No: 23-56-25265 Date: 01/17/2023 11:40 Site: TVC	Sounding: CPT-1 Cone: 956:T1500F15U35 Area=15 cm²

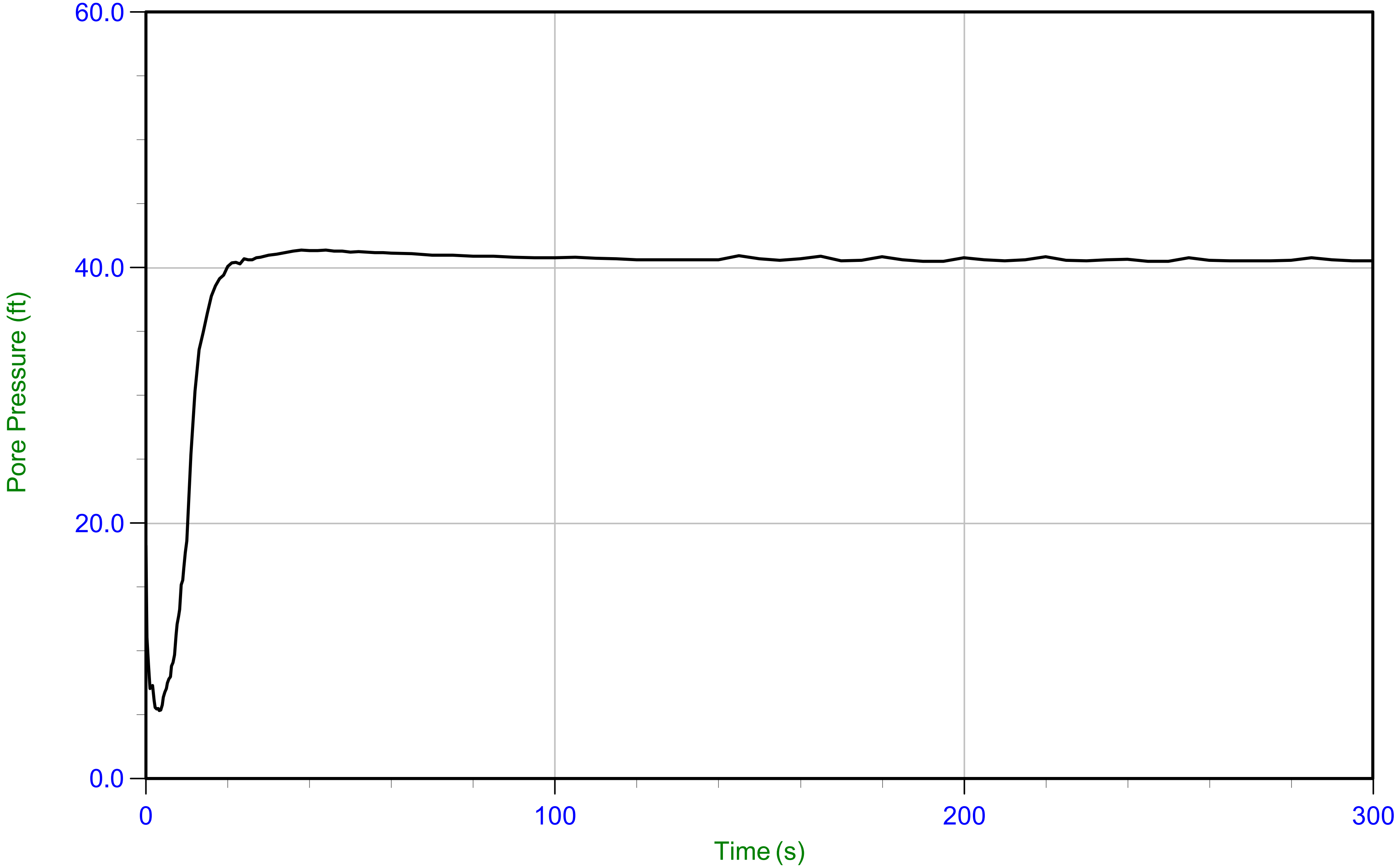


Trace Summary:

Filename: 23-56-25265_CP01.ppd2
Depth: 12.850 m / 42.158 ft
Duration: 305.0 s

u Min: 27.7 ft
u Max: 41.5 ft
u Final: 36.9 ft

Geosyntec Consultants	Job No: 23-56-25265 Date: 01/17/2023 11:40 Site: TVC	Sounding: CPT-1 Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP01.ppd2
Depth: 15.400 m / 50.524 ft
Duration: 300.0 s

u Min: 5.4 ft
u Max: 41.4 ft
u Final: 40.5 ft

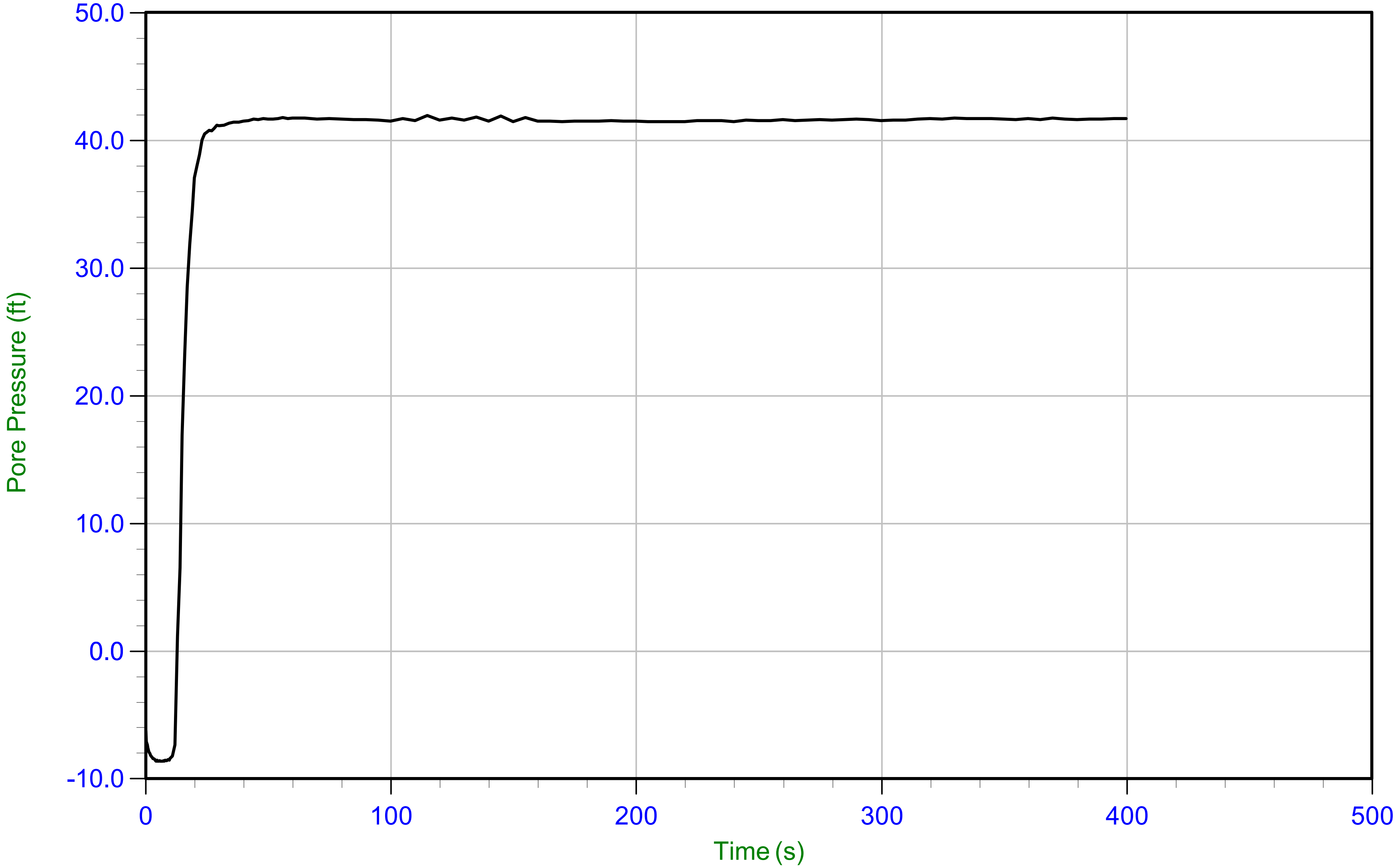
WT: 3.038 m / 9.967 ft
Ueq: 40.6 ft

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/17/2023 11:40
Site: TVC

Sounding: CPT-1
Cone: 956:T1500F15U35 Area=15 cm²



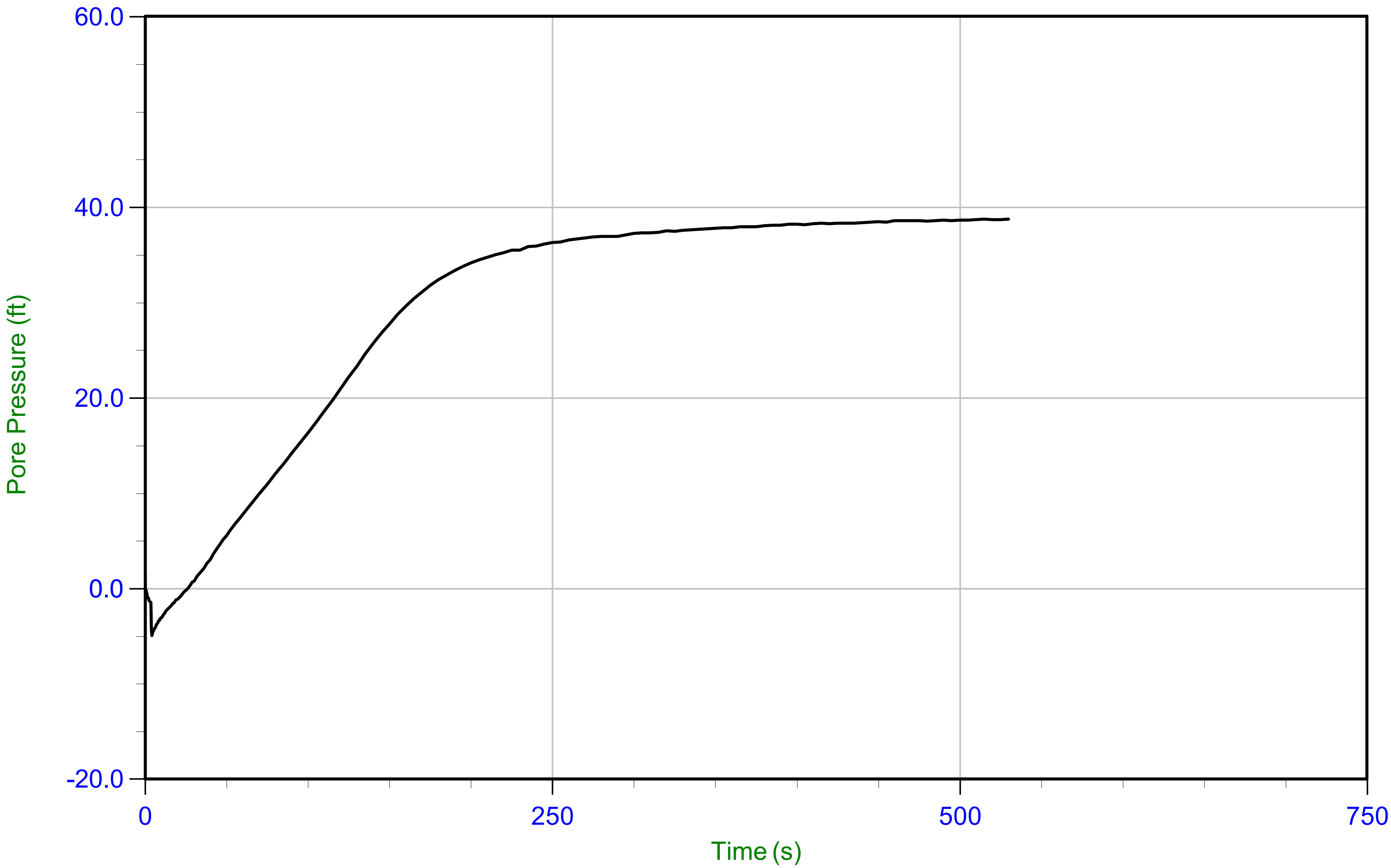
Trace Summary:

Filename: 23-56-25265_CP01.ppd2
Depth: 15.925 m / 52.247 ft
Duration: 400.0 s

u Min: -8.6 ft
u Max: 41.9 ft
u Final: 41.7 ft

WT: 3.229 m / 10.594 ft
Ueq: 41.7 ft

CONETEC	Geosyntec Consultants	Job No: 23-56-25265 Date: 01/19/2023 07:22 Site: TVC	Sounding: CPT-2 Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP02.ppd2
Depth: 14.425 m / 47.326 ft
Duration: 530.0 s

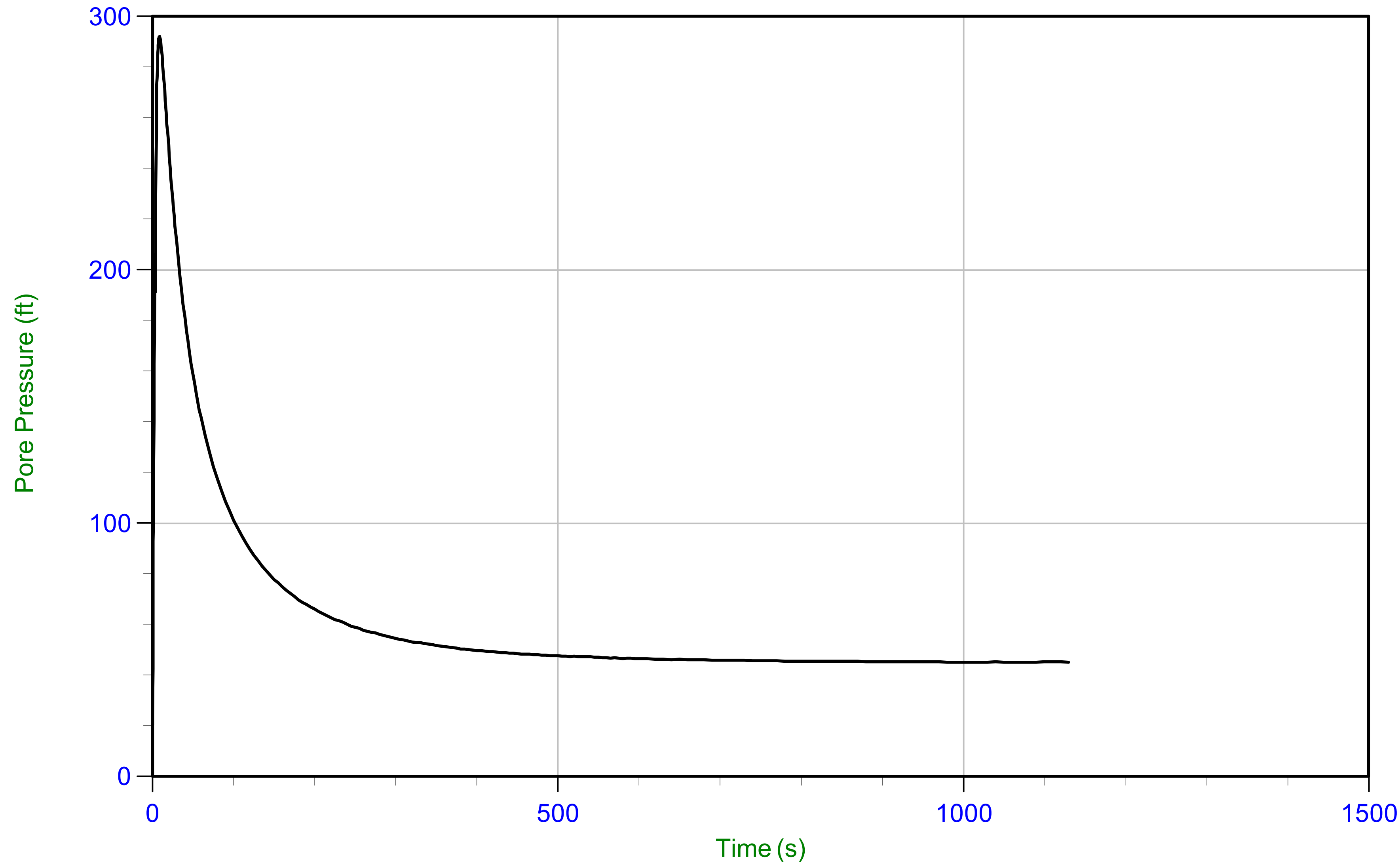
u Min: -4.9 ft
u Max: 38.8 ft
u Final: 38.8 ft

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/19/2023 07:22
Site: TVC

Sounding: CPT-2
Cone: 956:T1500F15U35 Area=15 cm²



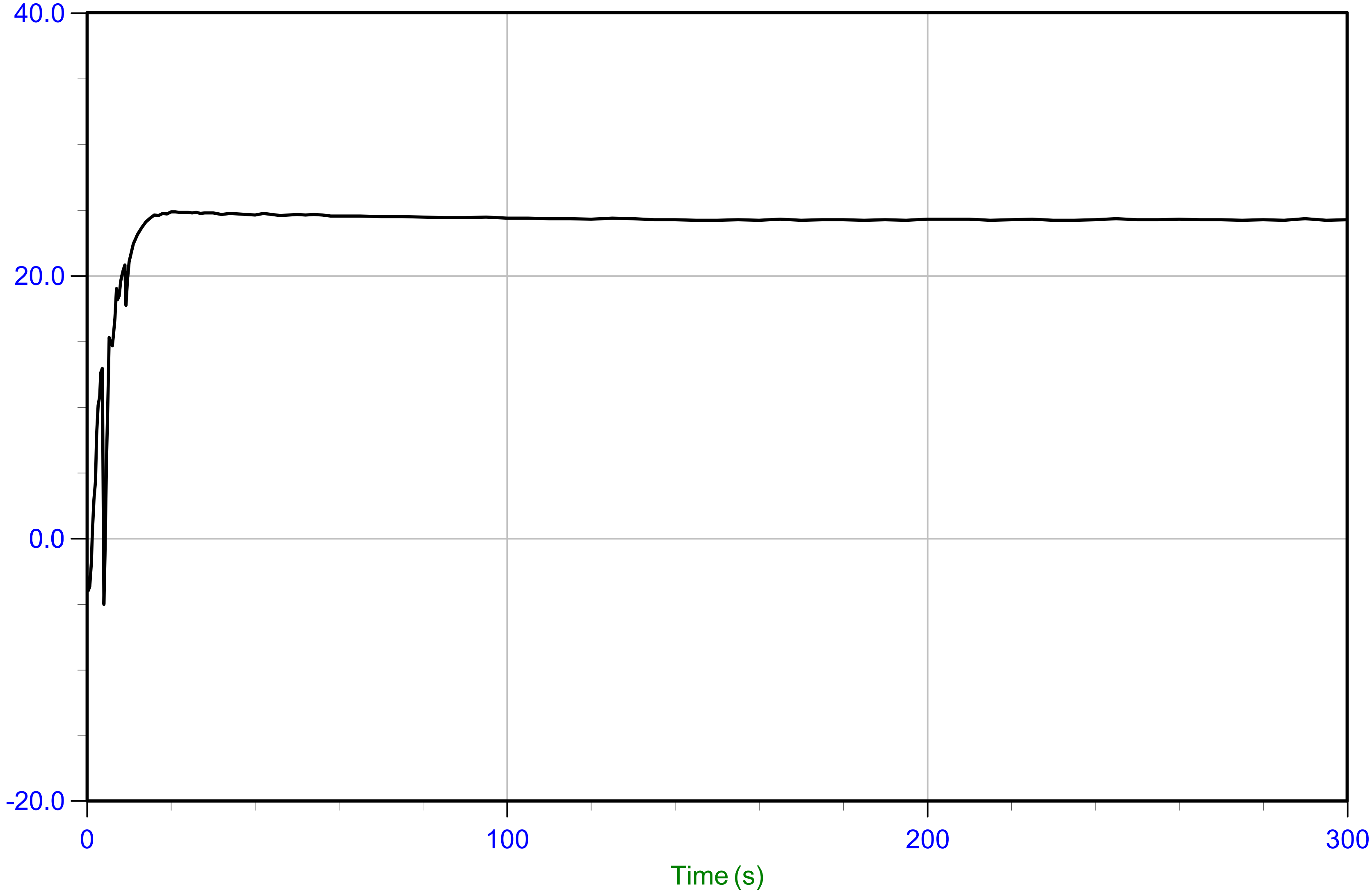
Trace Summary:

Filename: 23-56-25265_CP02.ppd2	u Min: 20.3 ft	WT: 3.048 m / 10.000 ft	T(50): 37.0 s
Depth: 15.950 m / 52.329 ft	u Max: 292.1 ft	Ueq: 42.3 ft	Ir: 100
Duration: 1130.0 s	u Final: 45.1 ft	U(50): 167.20 ft	Ch: 19.0 cm²/min

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/19/2023 09:42
Site: TVC

Sounding: CPT-3
Cone: 956:T1500F15U35 Area=15 cm²



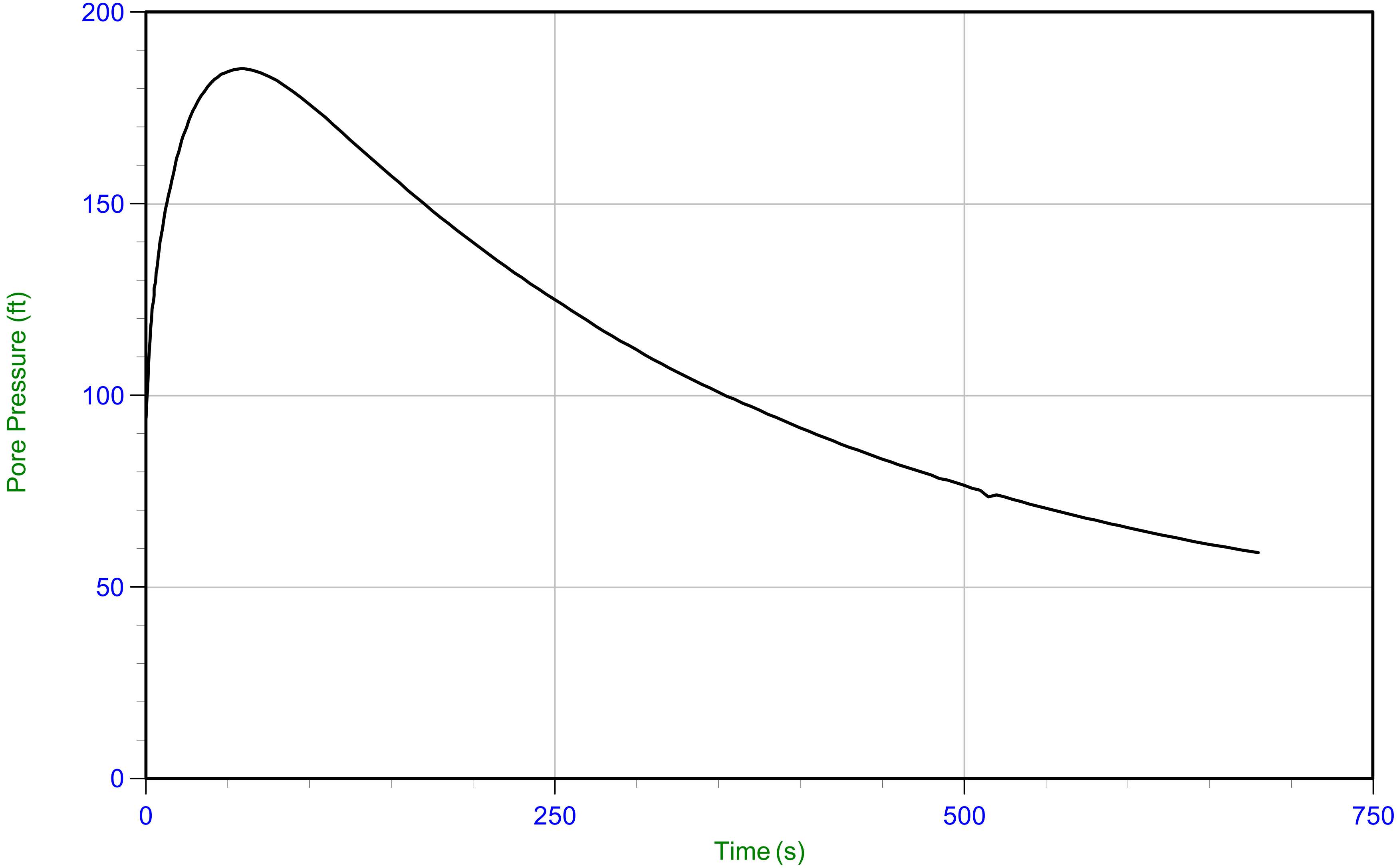
Trace Summary:

Filename: 23-56-25265_CP03.ppd2
Depth: 10.375 m / 34.038 ft
Duration: 300.0 s

u Min: -5.0 ft
u Max: 24.8 ft
u Final: 24.3 ft

WT: 2.980 m / 9.777 ft
Ueq: 24.3 ft

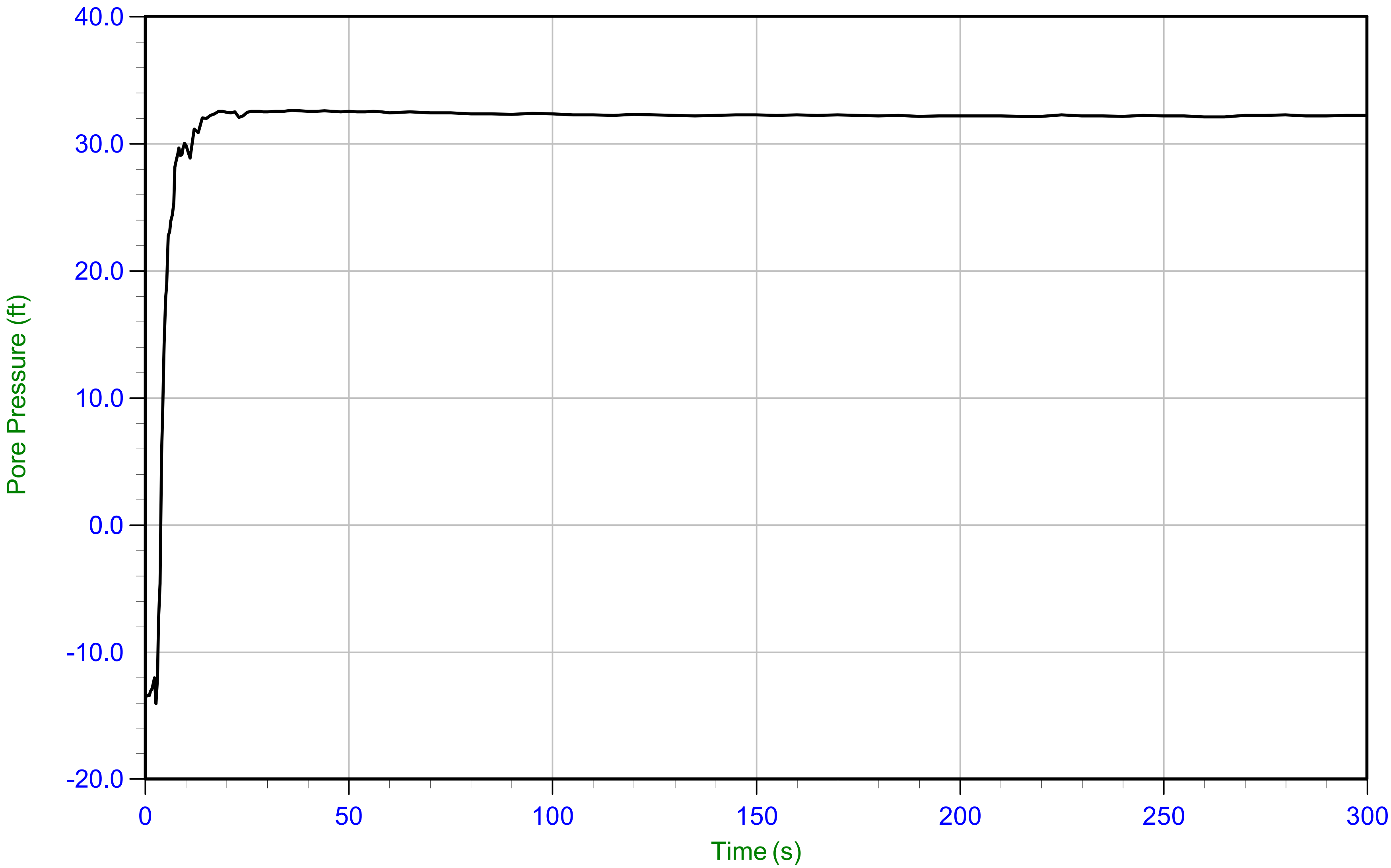
Geosyntec Consultants	Job No: 23-56-25265 Date: 01/19/2023 09:42 Site: TVC	Sounding: CPT-3 Cone: 956:T1500F15U35 Area=15 cm²	



Trace Summary:

Filename: 23-56-25265_CP03.ppd2	u Min: 59.0 ft	WT: 2.980 m / 9.777 ft	T(50): 267.8 s
Depth: 11.075 m / 36.335 ft	u Max: 185.2 ft	Ueq: 26.6 ft	Ir: 100
Duration: 680.0 s	u Final: 59.0 ft	U(50): 105.89 ft	Ch: 2.6 cm²/min

Geosyntec Consultants	Job No: 23-56-25265 Date: 01/19/2023 09:42 Site: TVC	Sounding: CPT-3 Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

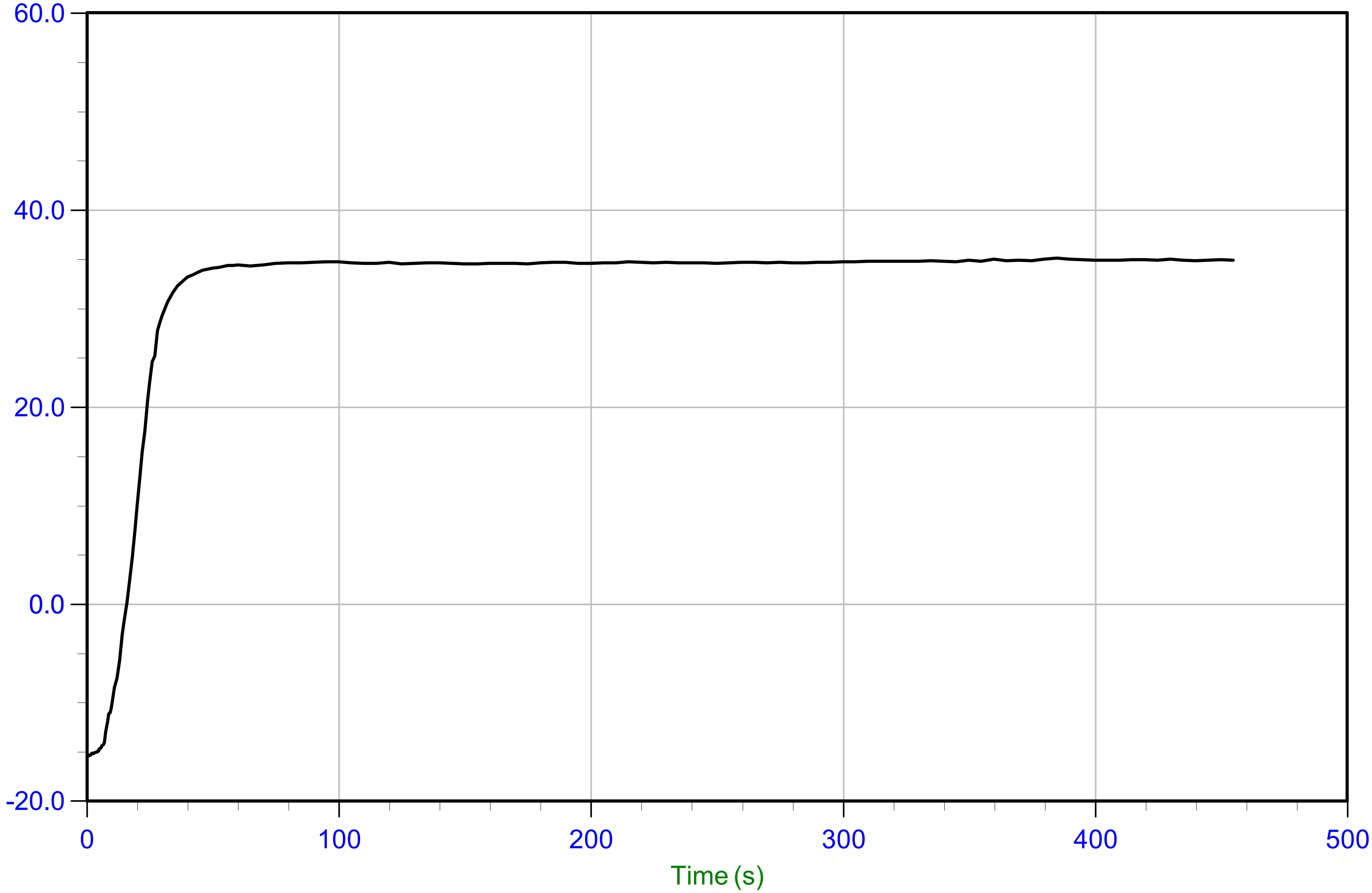
Filename: 23-56-25265_CP03.ppd2	u Min: -14.1 ft	WT: 3.016 m / 9.895 ft
Depth: 12.825 m / 42.076 ft	u Max: 32.6 ft	Ueq: 32.2 ft
Duration: 300.0 s	u Final: 32.2 ft	

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/19/2023 09:42
Site: TVC

Sounding: CPT-3
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP03.ppd2
Depth: 13.525 m / 44.373 ft
Duration: 455.0 s

u Min: -15.4 ft
u Max: 35.1 ft
u Final: 34.9 ft

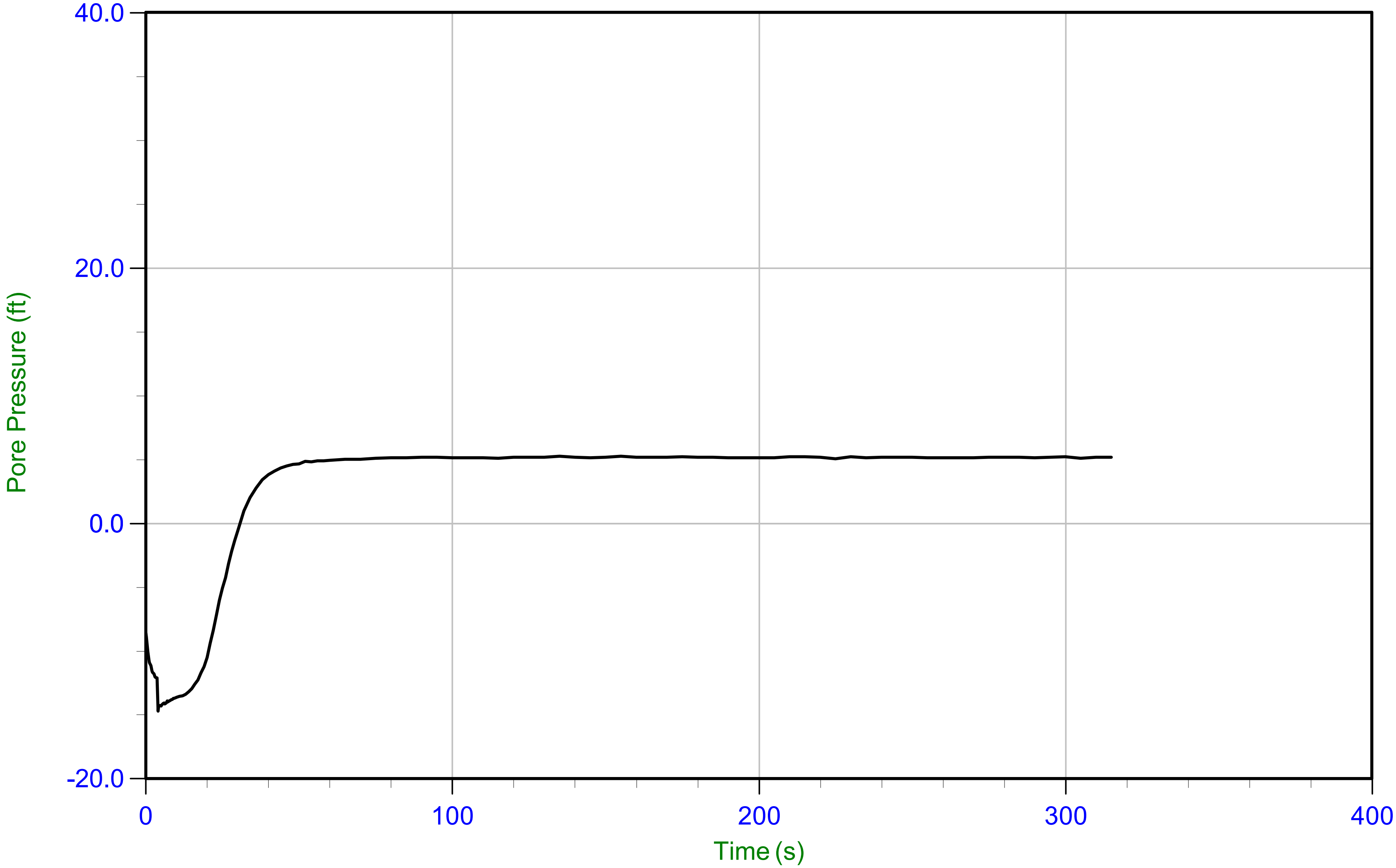
WT: 2.886 m / 9.468 ft
Ueq: 34.9 ft

CONETEC

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/19/2023 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP04.ppd2
Depth: 4.875 m / 15.994 ft
Duration: 315.0 s

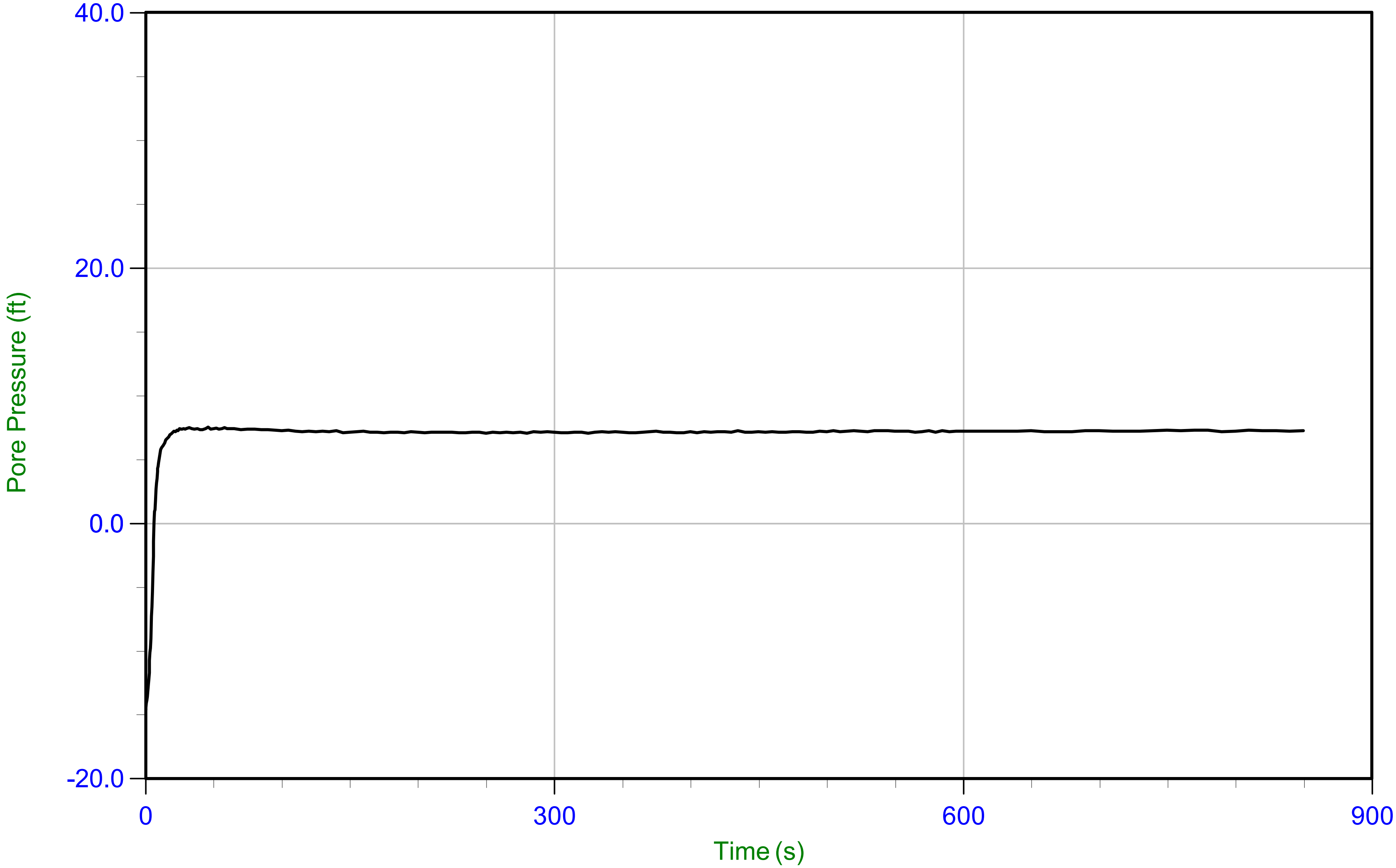
u Min: -14.7 ft
u Max: 5.3 ft
u Final: 5.2 ft

WT: 3.300 m / 10.827 ft
Ueq: 5.2 ft

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/19/2023 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP04.ppd2
Depth: 5.575 m / 18.290 ft
Duration: 850.0 s

u Min: -14.6 ft
u Max: 7.5 ft
u Final: 7.3 ft

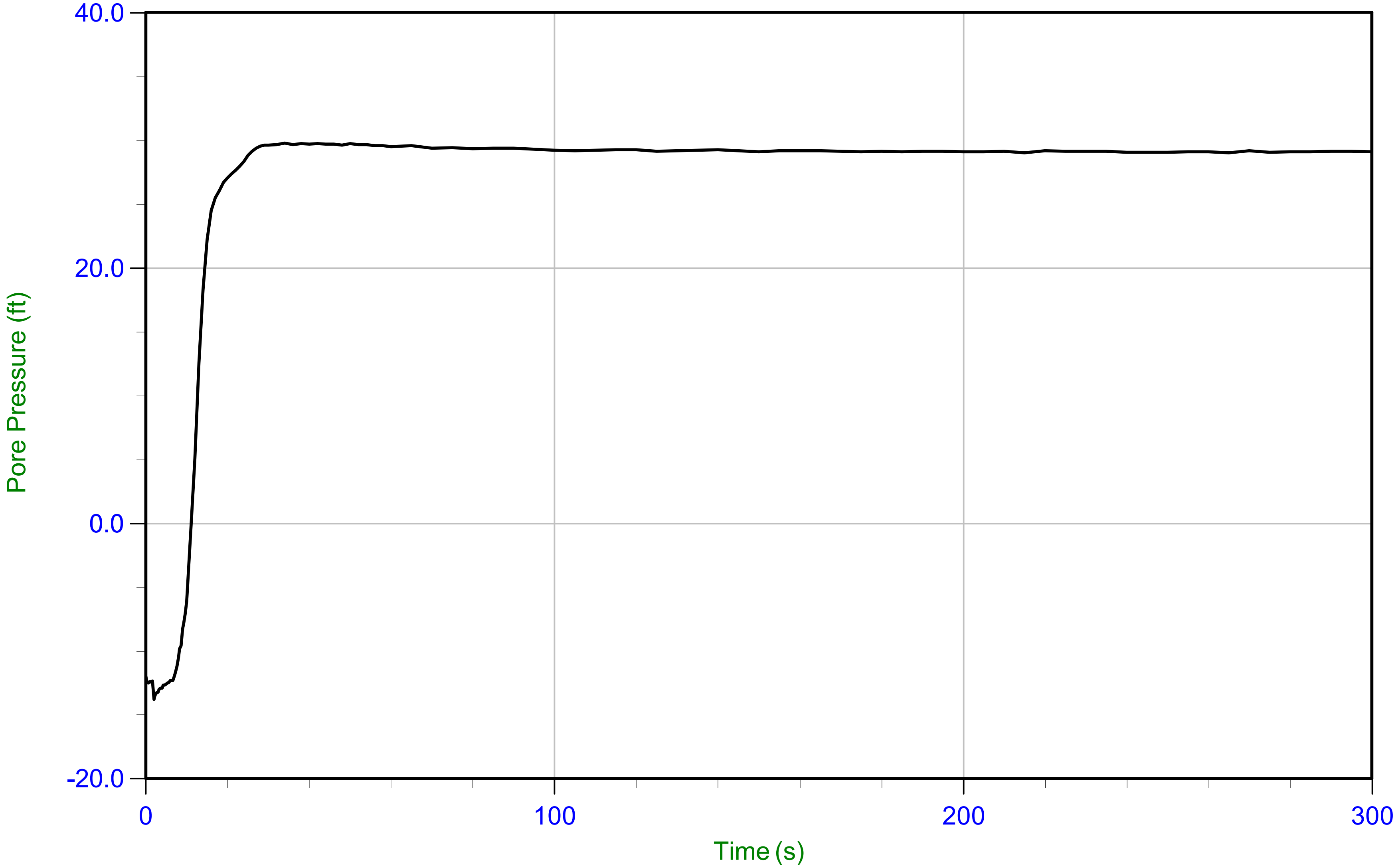
WT: 3.370 m / 11.056 ft
Ueq: 7.2 ft

ConeTec

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/19/2023 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP04.ppd2
Depth: 12.250 m / 40.190 ft
Duration: 300.0 s

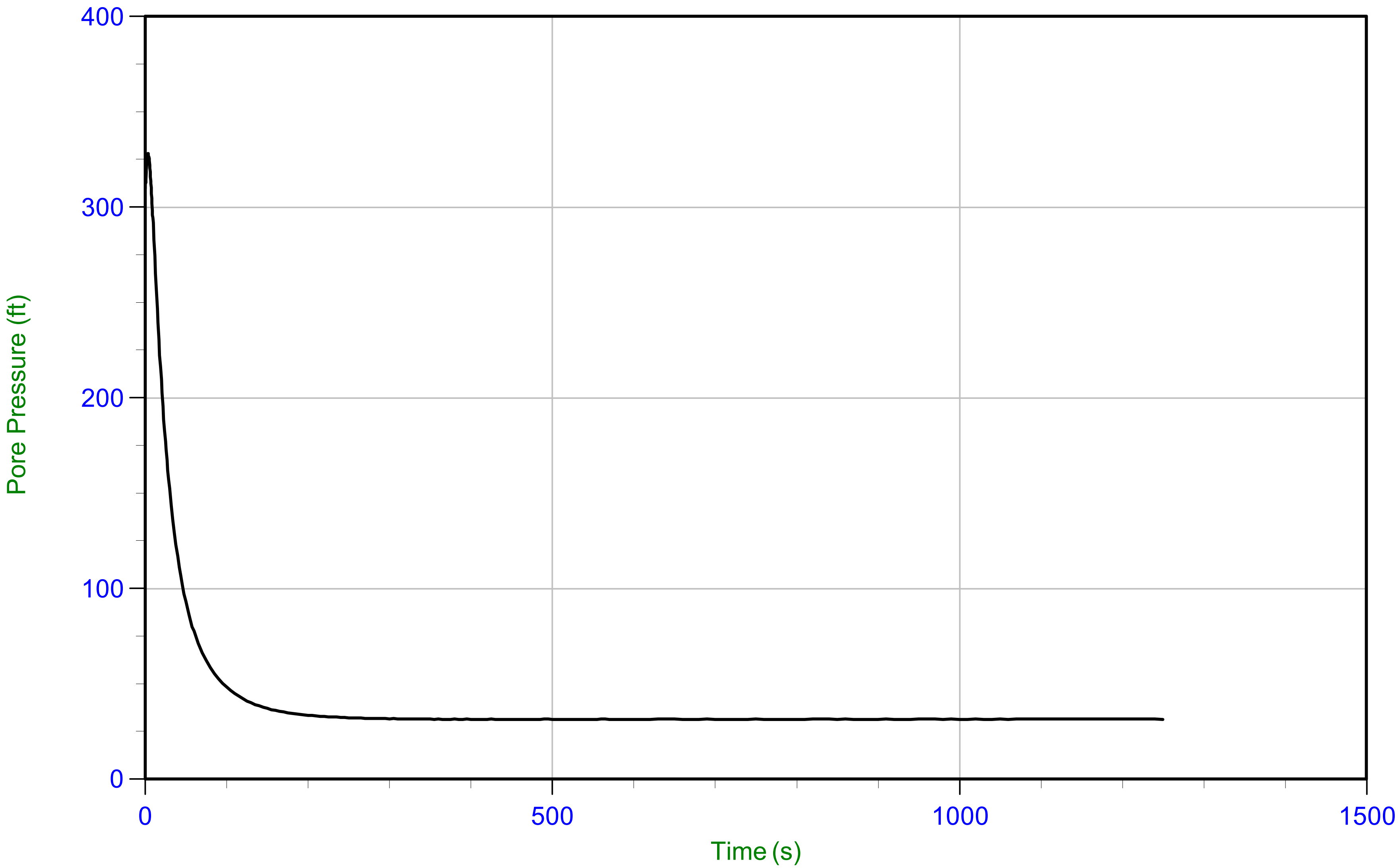
u Min: -13.8 ft
u Max: 29.8 ft
u Final: 29.1 ft

WT: 3.387 m / 11.112 ft
Ueq: 29.1 ft

Geosyntec Consultants

Job No: 23-56-25265
Date: 01/19/2023 11:42
Site: TVC

Sounding: CPT-4
Cone: 956:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 23-56-25265_CP04.ppd2
Depth: 12.950 m / 42.486 ft
Duration: 1250.0 s

u Min: 31.3 ft
u Max: 328.2 ft
u Final: 31.4 ft

WT: 3.364 m / 11.037 ft
Ueq: 31.5 ft
U(50): 179.83 ft

T(50): 20.8 s
Ir: 100
Ch: 33.8 cm²/min

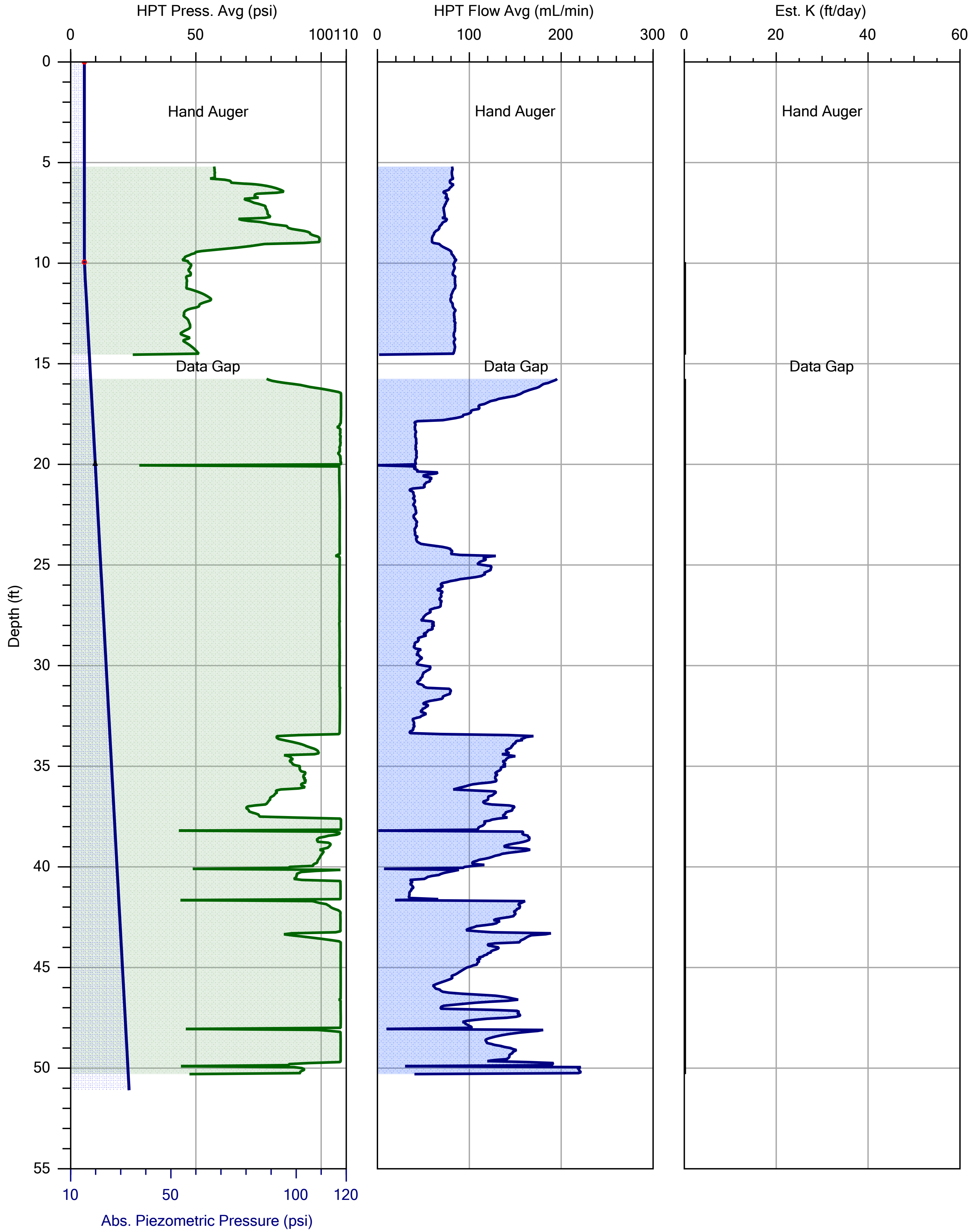
Hydraulic Profiling Tool (HPT) Summary and Plots

CONETEC	**Job No:**	23-56-25265
	Client:	Geosyntec Consultants
	Project:	TVC
	Start Date:	17-Jan-2023
	End Date:	19-Jan-2023

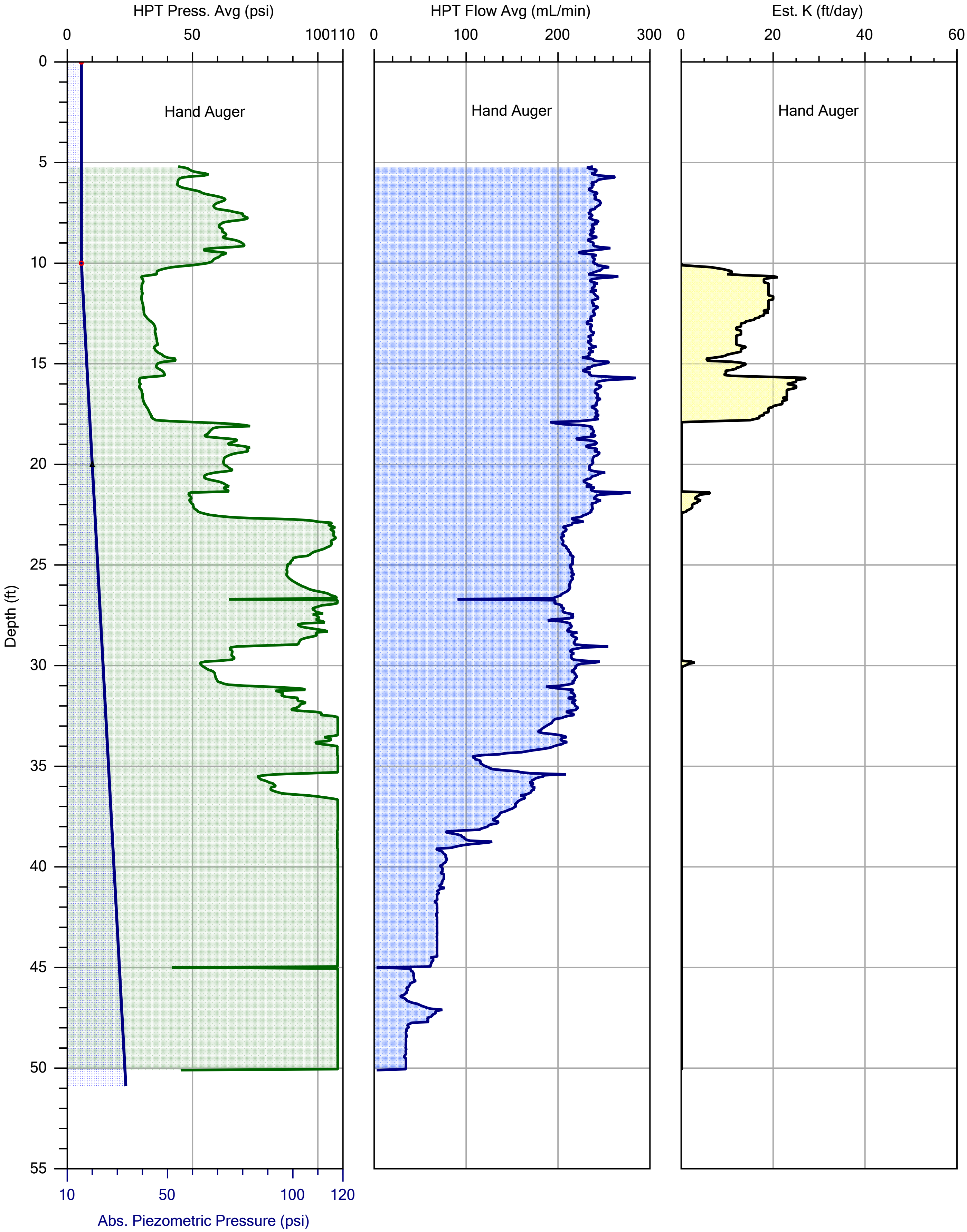
HYDRAULIC PROFILING TOOL (HPT) SUMMARY

HPT Sounding ID	HPT File Name	Date	Absolute Hydrostatic Pressure (psi)	Assumed Phreatic Surface[1] (ft)	Final Depth (ft)	Northing[2]	Easting[2]	Elevation[3] (ft)	Refer to Notation Number
CPT-1	23-56-25265_HPT01	17-Jan-2023	15.487	10.0	50.30	3771383	374567	198	4
CPT-2	23-56-25265_HPT02	19-Jan-2023	15.653	10.0	50.10	3771391	374434	194	5
CPT-3	23-56-25265_HPT03	19-Jan-2023	15.596	9.8	50.40	3771383	374717	201	
CPT-4	23-56-25265_HPT04	19-Jan-2023	15.695	10.8	50.35	3771297	374749	199	

1. The assumed phreatic surface was based on the pore pressure dissipation tests performed within the CPTu sounding. Hydrostatic conditions are assumed for the calculated parameters.
2. The coordinates were acquired using consumer grade GPS equipment, datum: WGS 1984 / UTM Zone 11S.
3. Elevations are referenced to the ground surface and were acquired from the Google Earth Elevation for the recorded coordinates.
4. The sounding took place over two days. Due to the 0.7 meter offset between cone tip and HPT sensor, there is a data gap where the sounding ended the first day, and where data started the second day.
5. The assumed phreatic surface is based on the pore pressure dissipation test to reach equilibrium at nearby soundings.

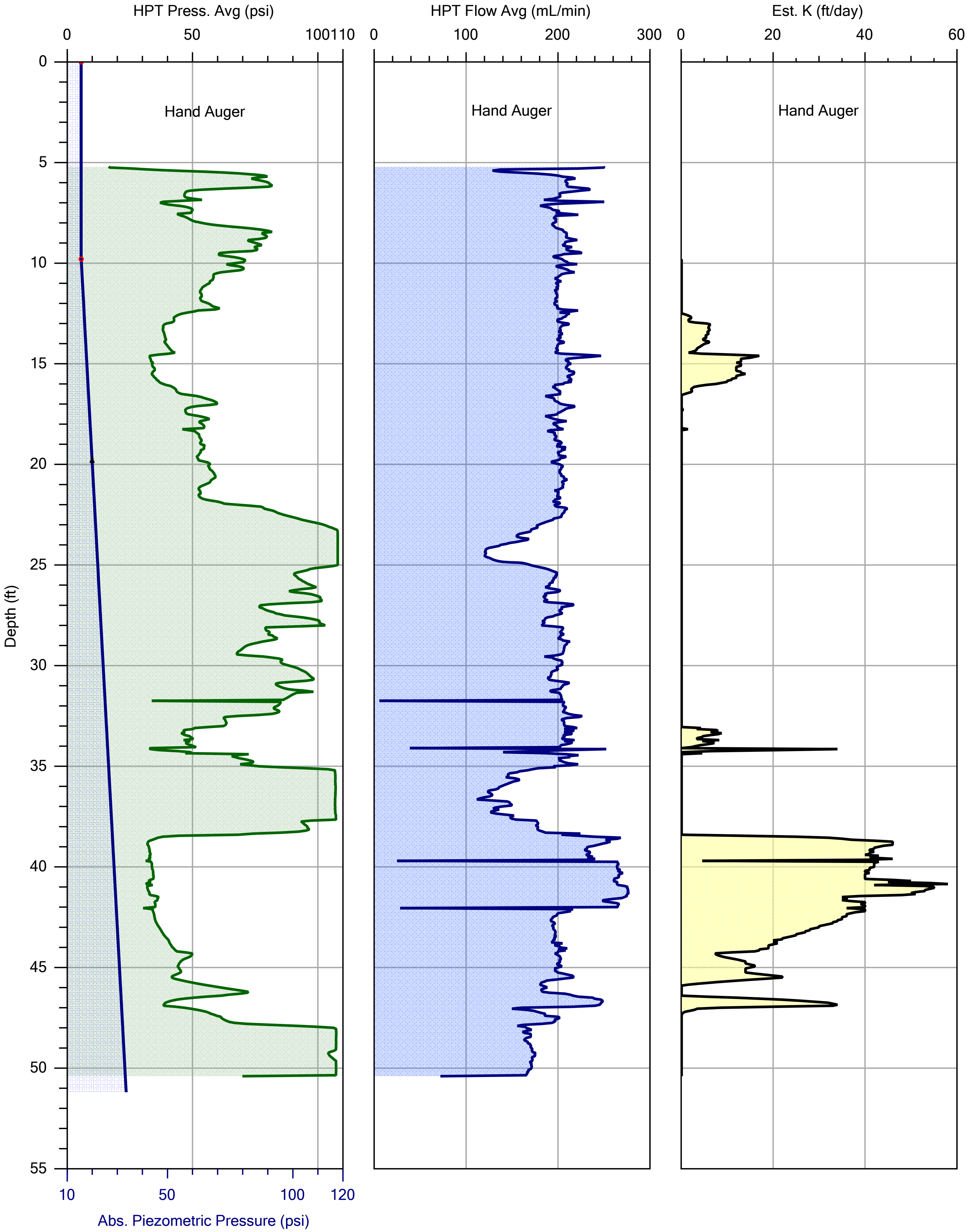


		File: 23-56-25265_HPT01.HPT
Company: ConeTec	Project ID: TVC	Date: 1/17/2023
Sounding ID: CPT-1	Client: Geosyntec Consultants	Location: Los Angles,CA

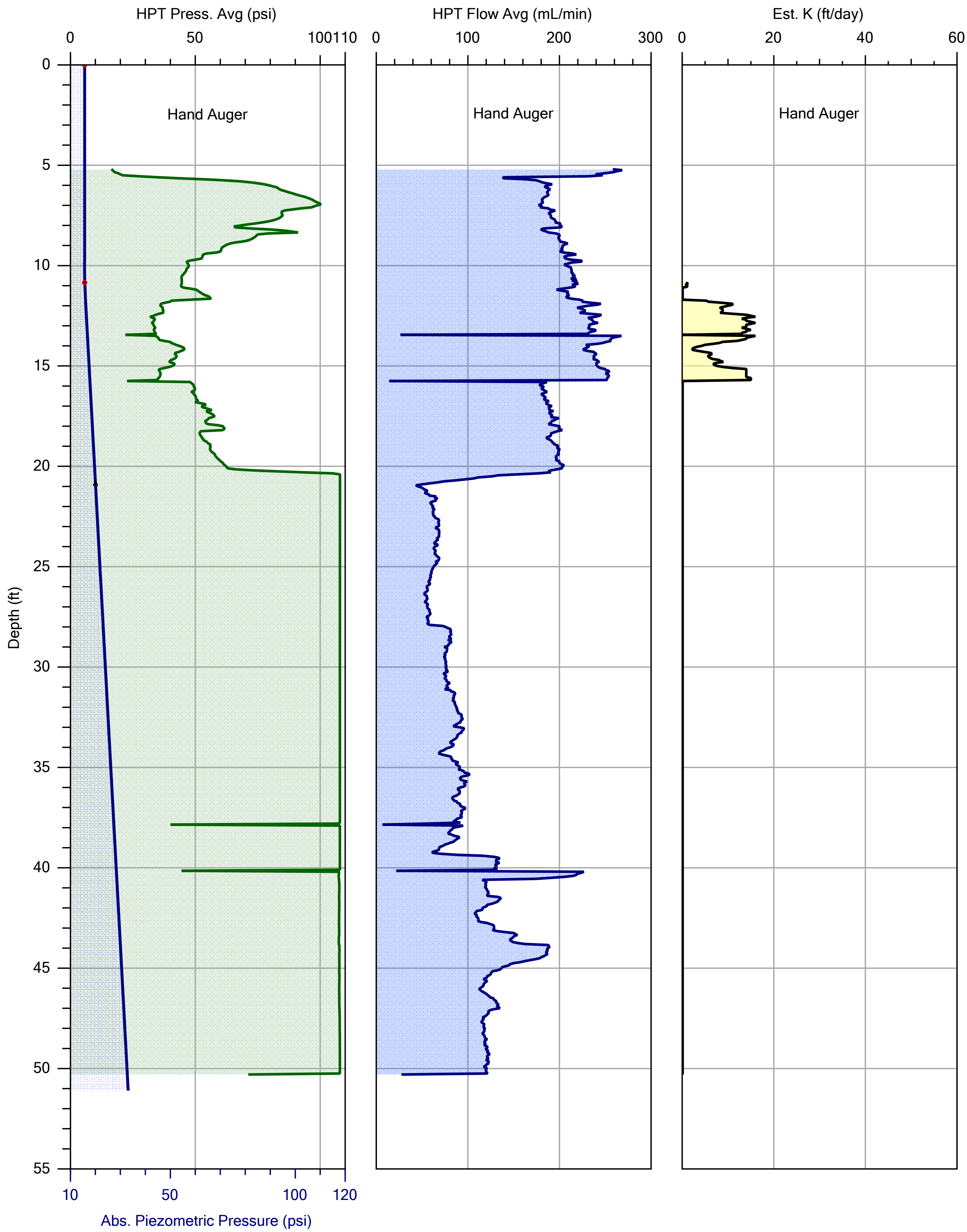


CONETEC

Company: ConeTec	Project ID: TVC	File: 23-56-25265_HPT02.HPT
		Date: 1/19/2023
Sounding ID: CPT-2	Client: Geosyntec Consultants	Location: Los Angles,CA



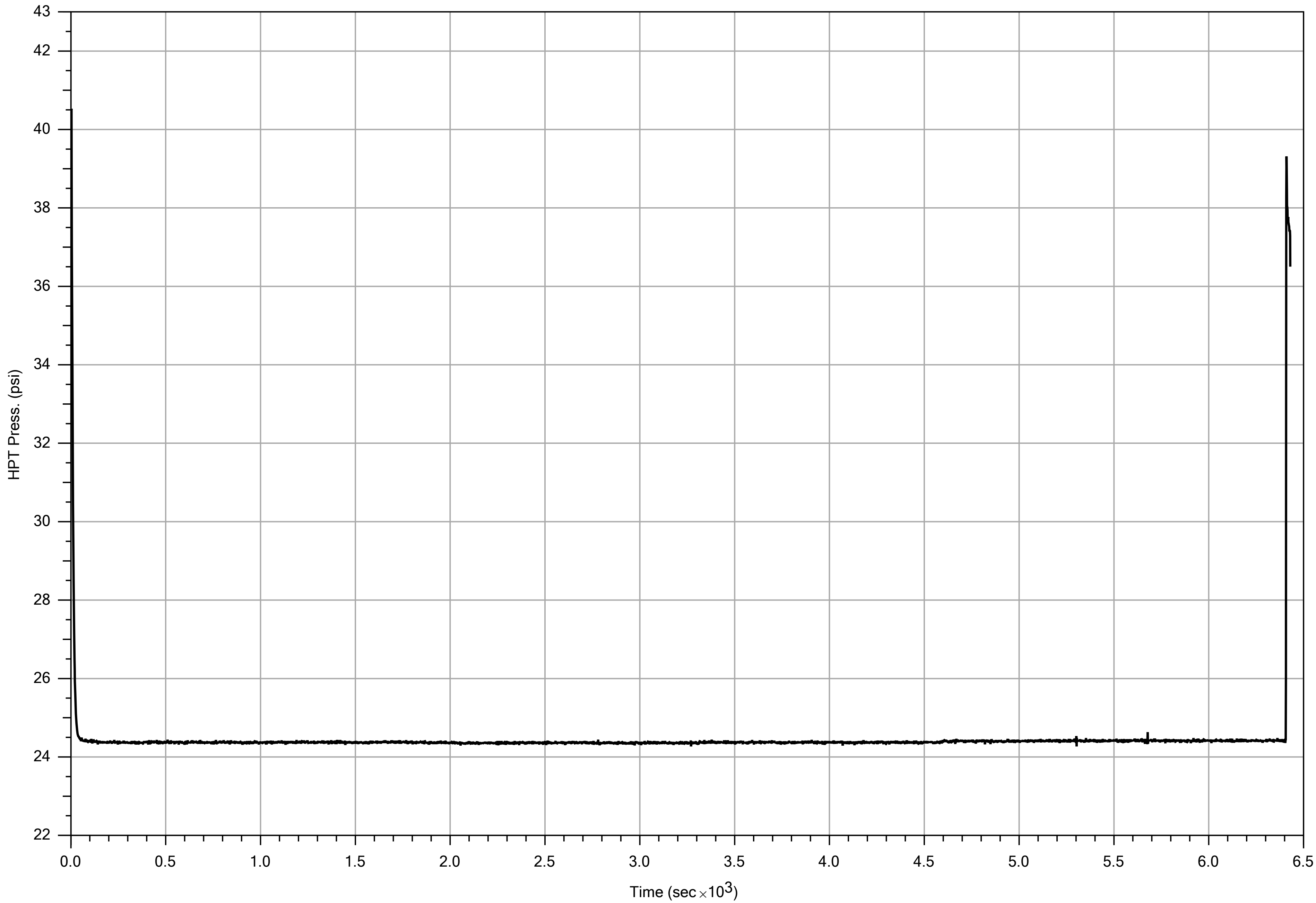
		File: 23-56-25265_HPT03.HPT
Company: ConeTec	Project ID: TVC	Date: 1/19/2023
Sounding ID: CPT-3	Client: Geosyntec Consultants	Location: Los Angles,CA



CONETEC

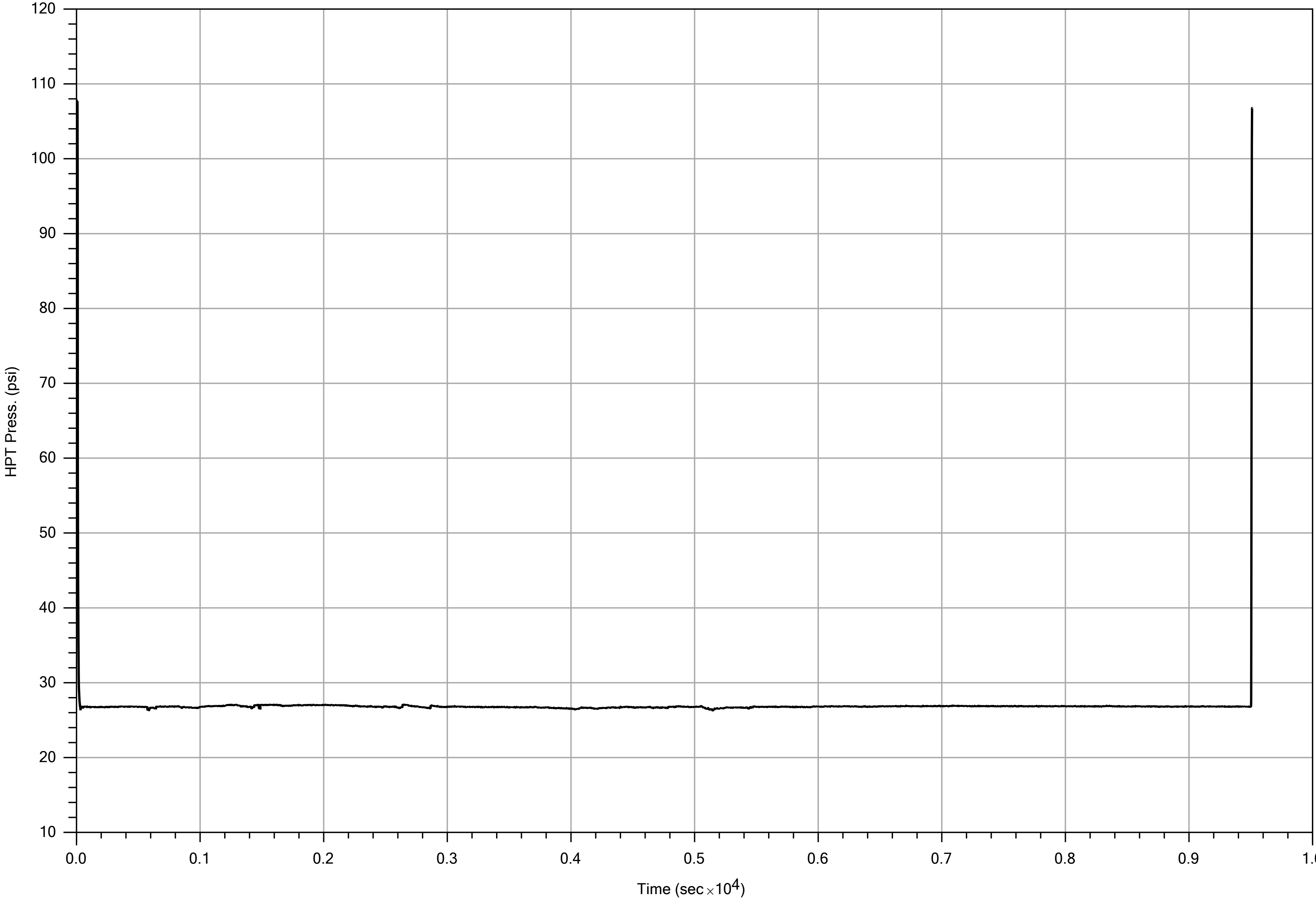
		File: 23-56-25265_HPT04.HPT
Company: ConeTec	Project ID: TVC	Date: 1/19/2023
Sounding ID: CPT-4	Client: Geosyntec Consultants	Location: Los Angles,CA

Hydraulic Profiling Tool (HPT) Dissipation Test Plots



HPT DISSIPATION (SINGLE CASE)

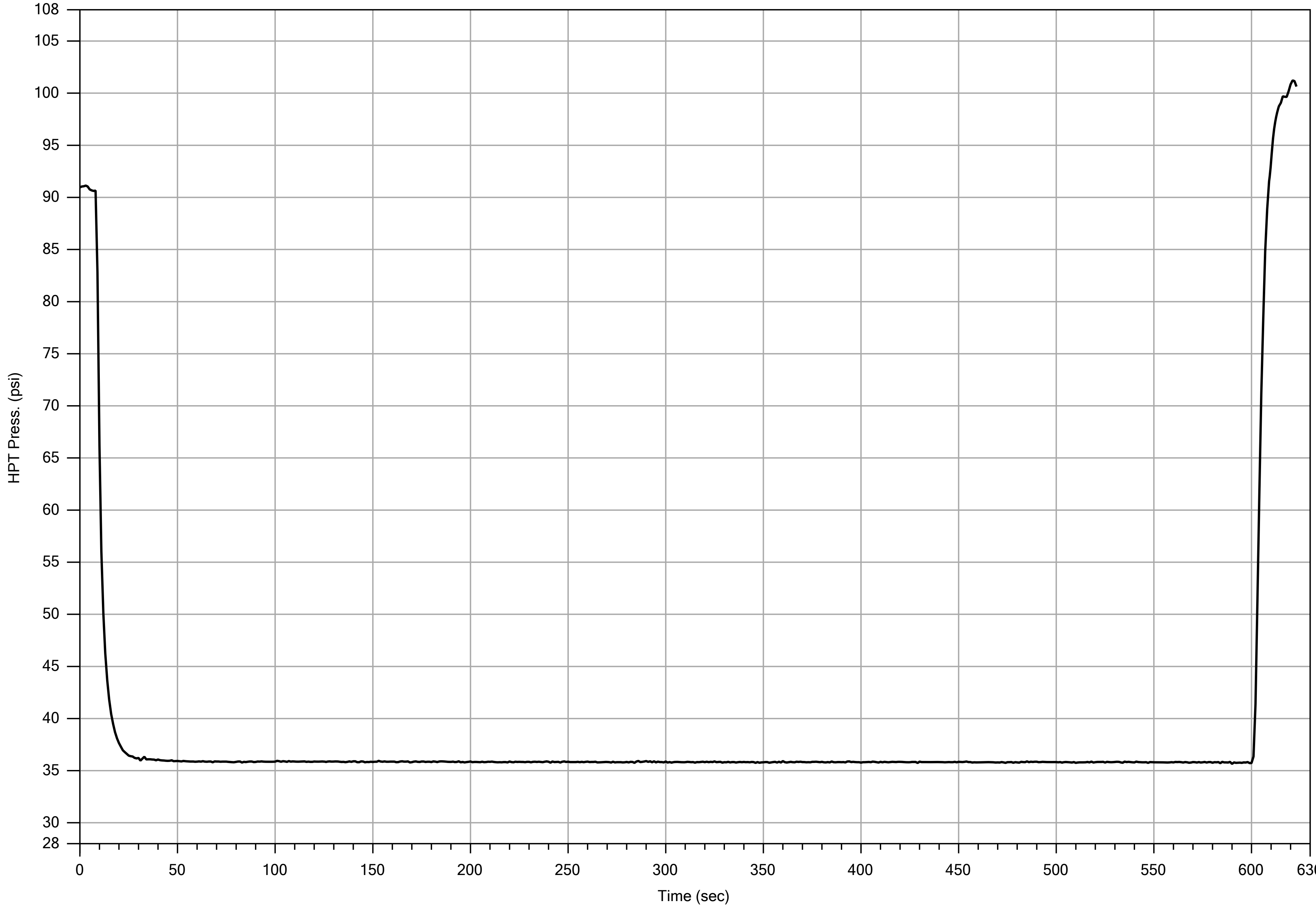
		File: 23-56-25265_HPT01.TIM	Date: 1/17/2023
Company: ConeTec	Project ID: TVC	Location:	Sensor: HPT Press.
Sounding ID: CPT-1	Client: Geosyntec Consultants	Depth: 14.55 ft	Test: 1



CONETEC

HPT DISSIPATION (SINGLE CASE)

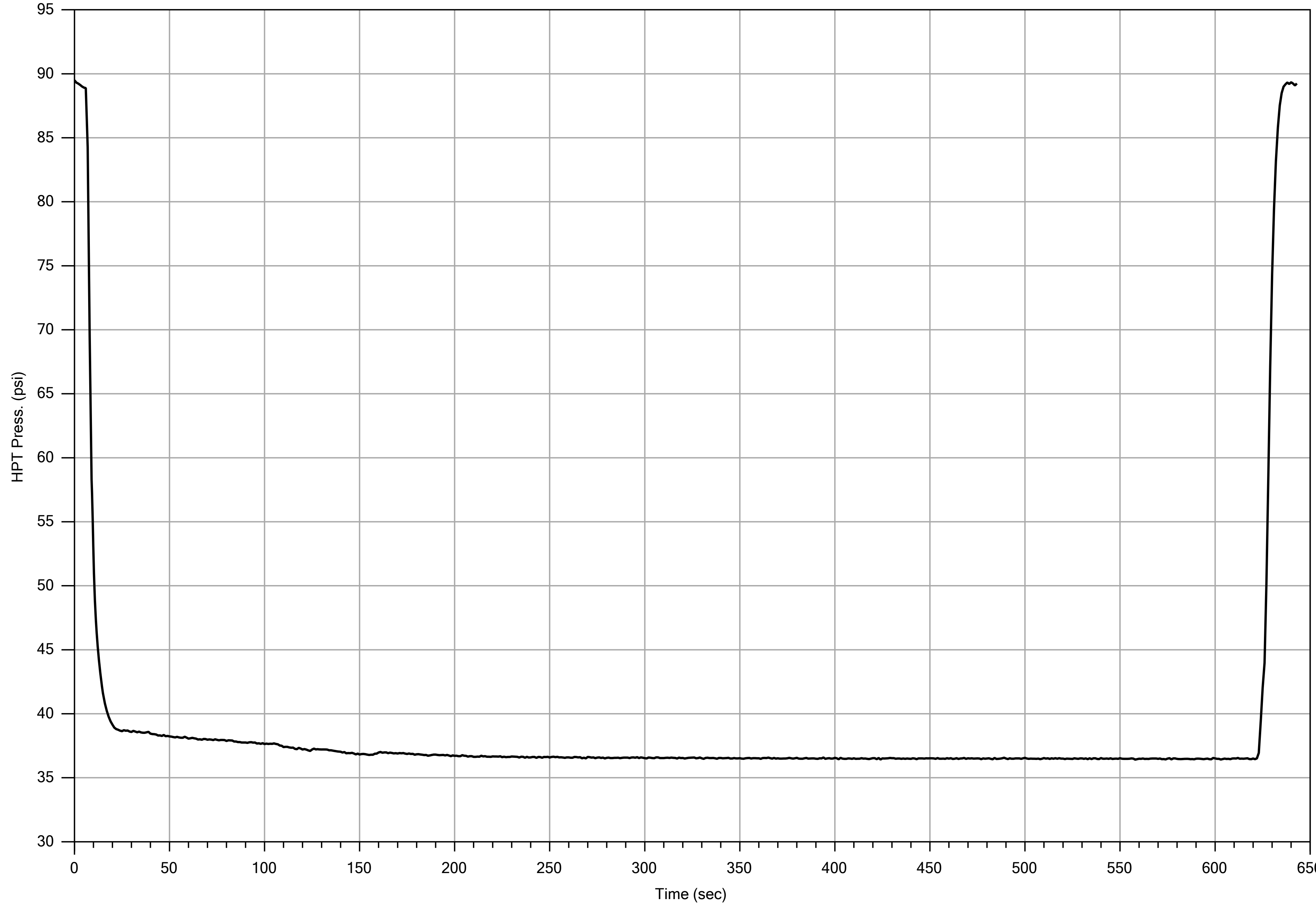
Company: ConeTec	Project ID: TVC	File: 23-56-25265_HPT01.TIM	Date: 1/17/2023
Sounding ID: CPT-1	Client: Geosyntec Consultants	Location:	Sensor: HPT Press.
		Depth: 20.05 ft	Test: 1



CONETEC

HPT DISSIPATION (SINGLE CASE)

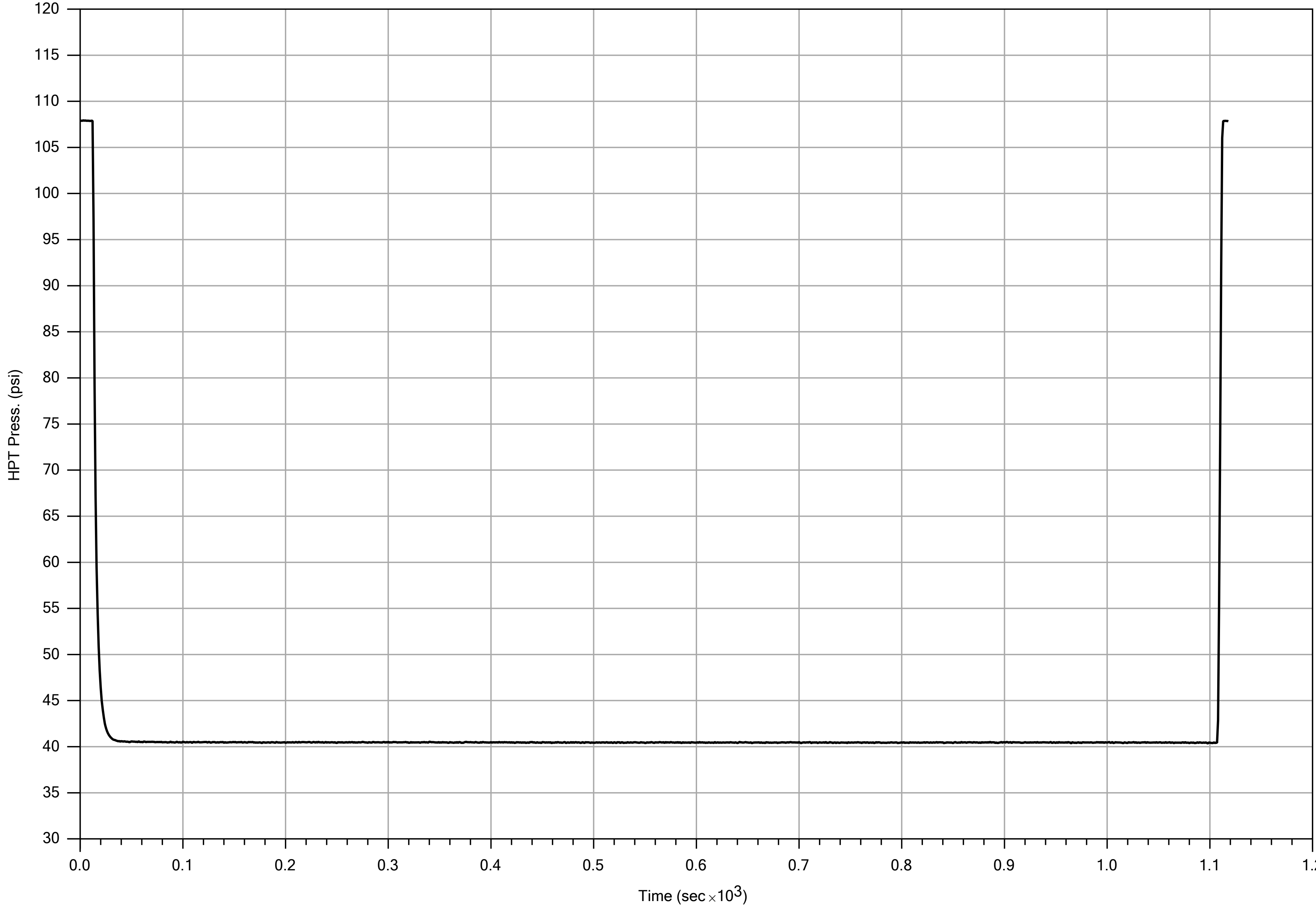
Company: ConeTec	Project ID: TVC	File: 23-56-25265_HPT01.TIM	Date: 1/17/2023
Sounding ID: CPT-1	Client: Geosyntec Consultants	Location:	Sensor: HPT Press.
		Depth: 41.65 ft	Test: 1



CONETEC

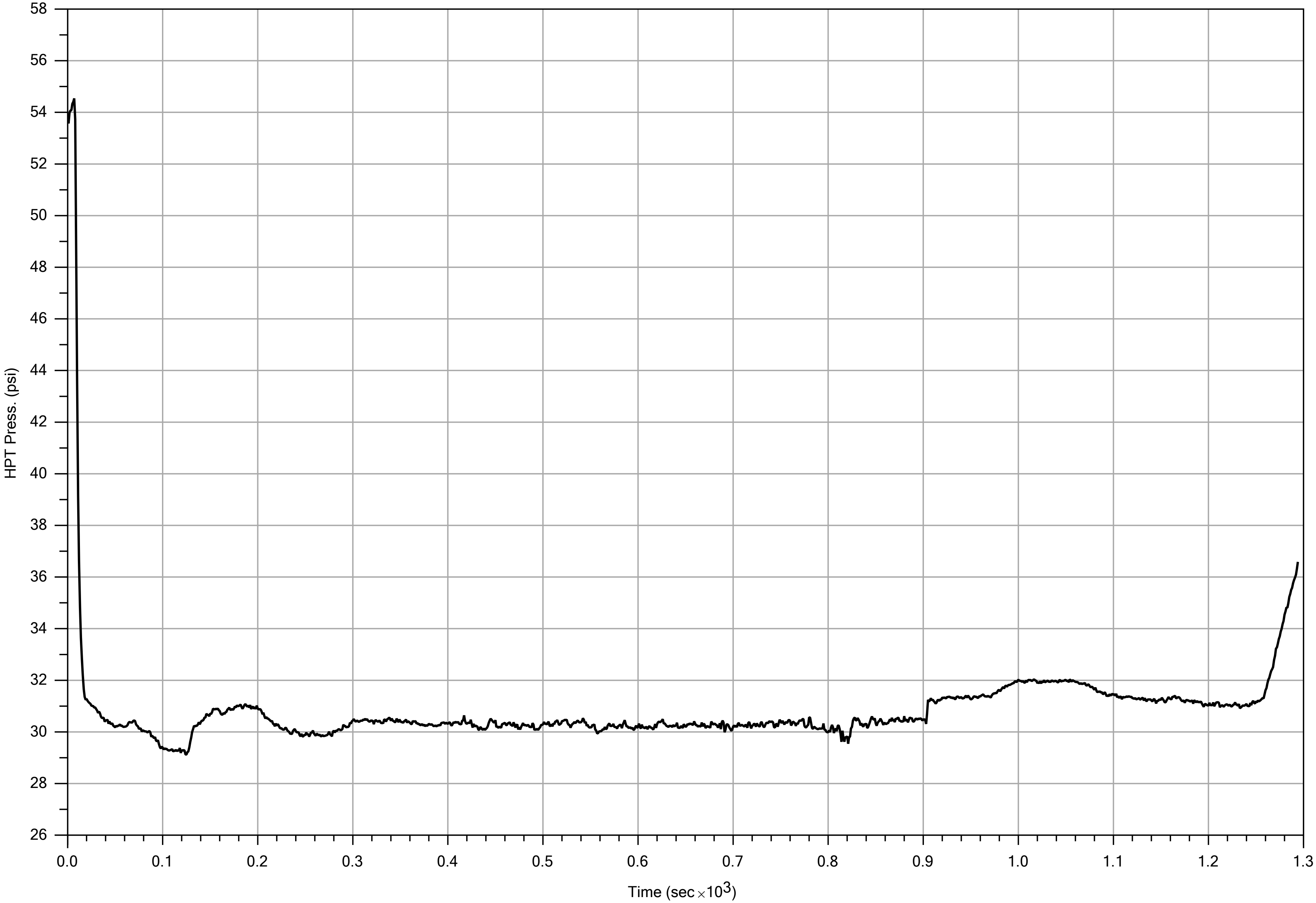
HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Project ID: TVC	File: 23-56-25265_HPT01.TIM	Date: 1/17/2023
Sounding ID: CPT-1	Client: Geosyntec Consultants	Location:	Sensor: HPT Press.
		Depth: 49.90 ft	Test: 1



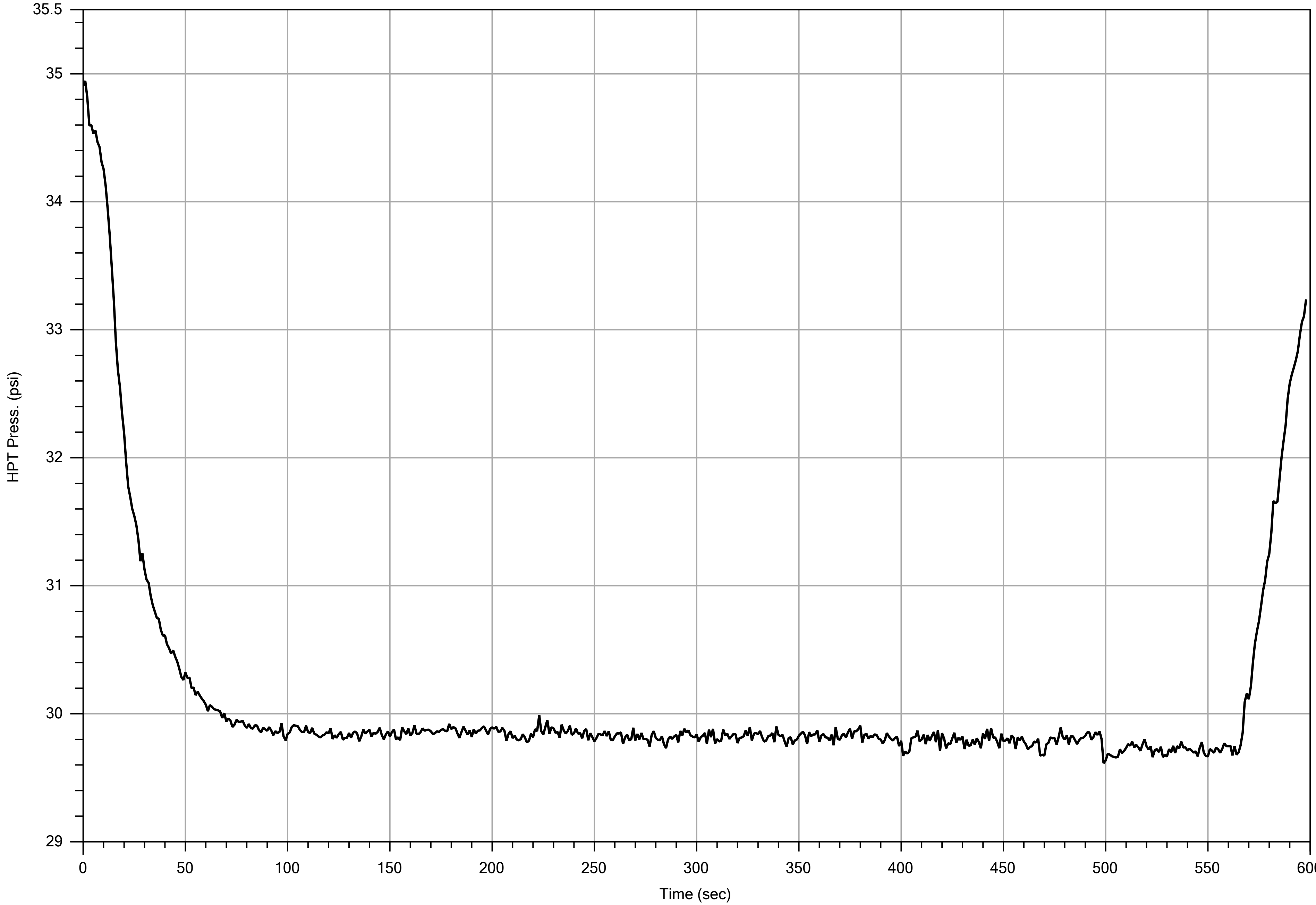
HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Project ID: TVC	File: 23-56-25265_HPT02.TIM	Date: 1/19/2023
Sounding ID: CPT-2	Client: Geosyntec Consultants	Location:	Sensor: HPT Press.
		Depth: 50.10 ft	Test: 1

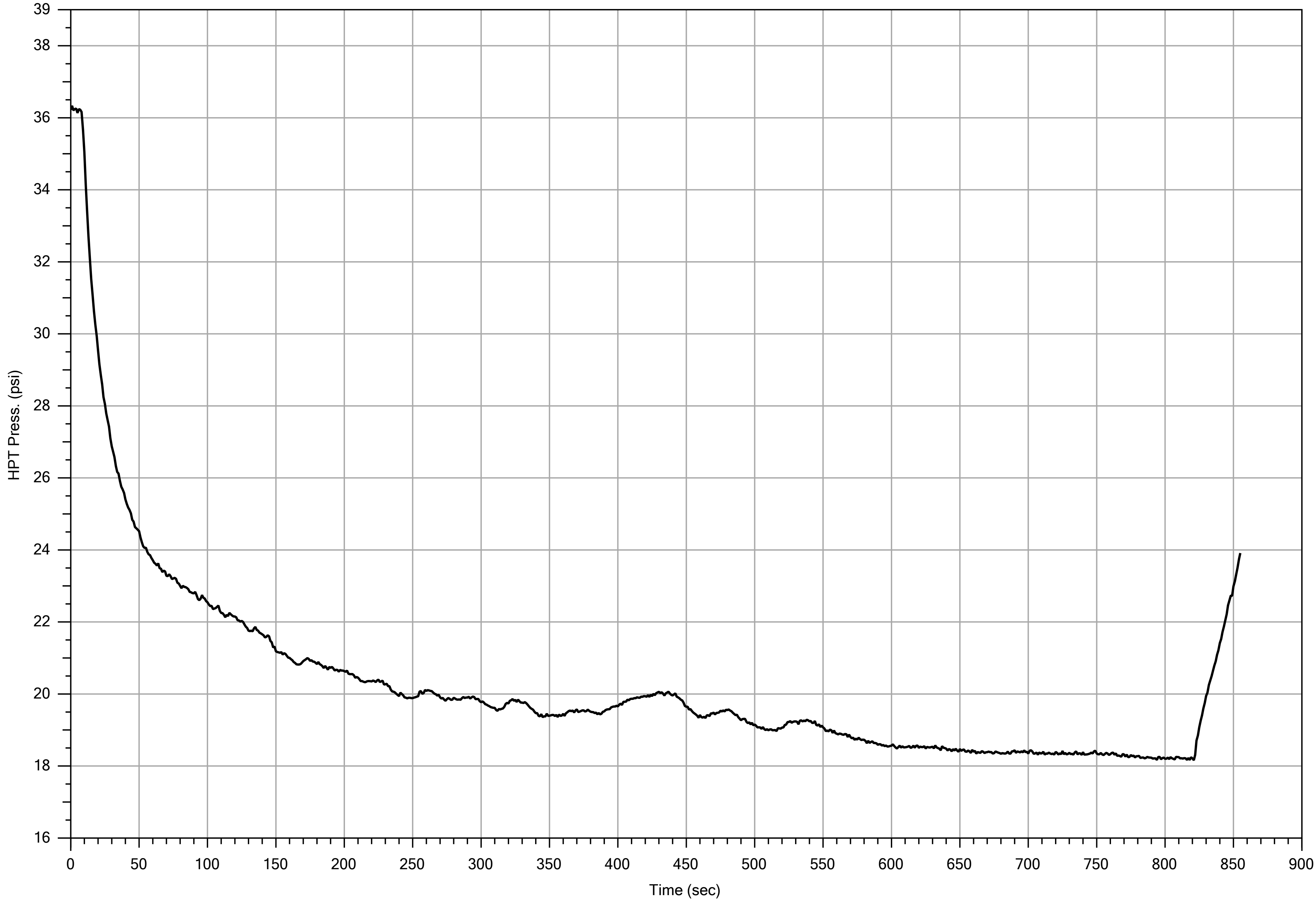


HPT DISSIPATION (SINGLE CASE)

		File: 23-56-25265_HPT03.TIM	Date: 1/19/2023
Company: ConeTec	Project ID: TVC	Location:	Sensor: HPT Press.
Sounding ID: CPT-3	Client: Geosyntec Consultants	Depth: 34.10 ft	Test: 1

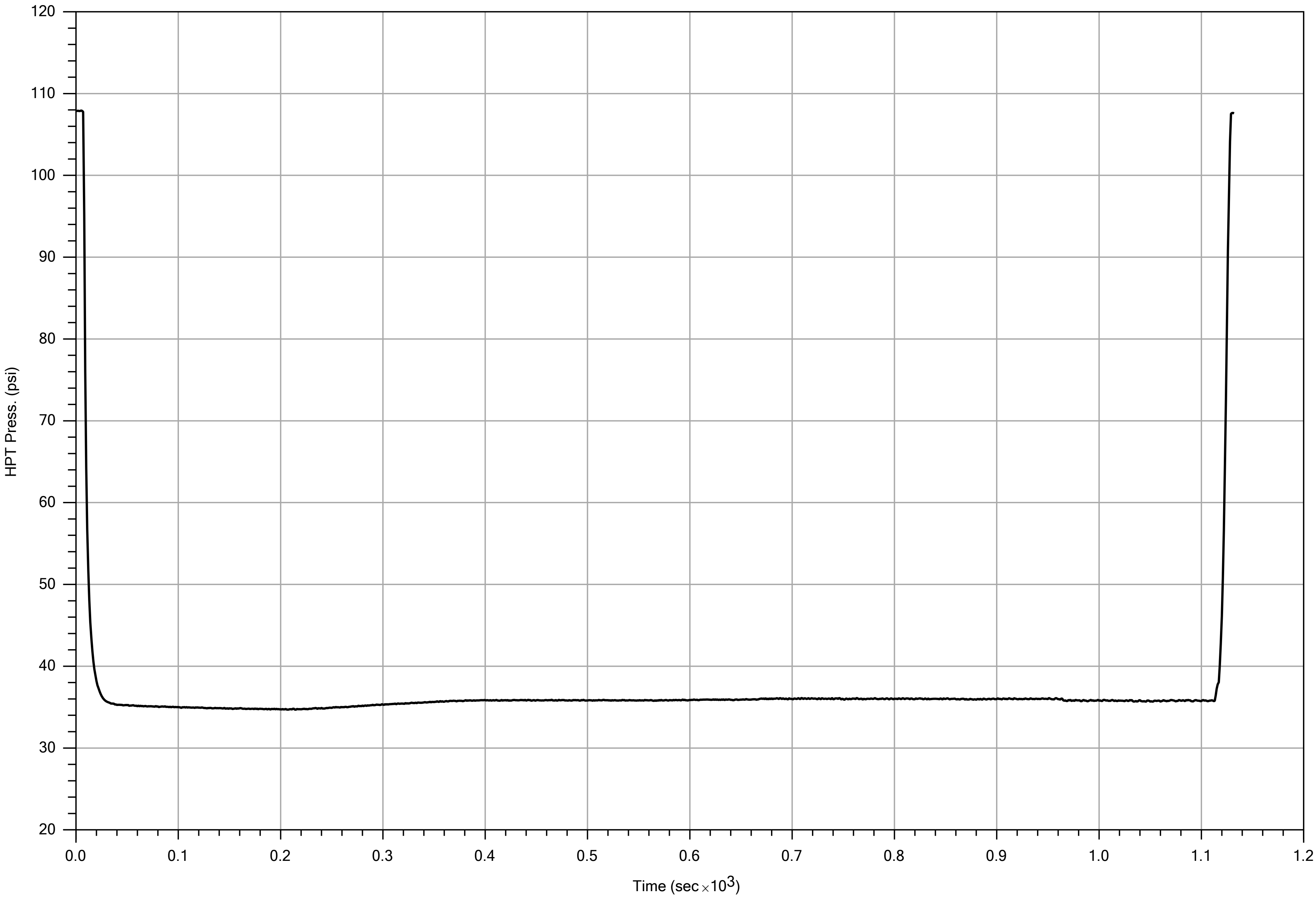


ConeTec	HPT DISSIPATION (SINGLE CASE)	File: 23-56-25265_HPT03.TIM	Date: 1/19/2023
Company: ConeTec	Project ID: TVC	Location:	Sensor: HPT Press.
Sounding ID: CPT-3	Client: Geosyntec Consultants	Depth: 42.05 ft	Test: 1



HPT DISSIPATION (SINGLE CASE)

File: 23-56-25265_HPT04.TIM	Date: 1/19/2023		
Company: ConeTec	Project ID: TVC	Location:	Sensor: HPT Press.
Sounding ID: CPT-4	Client: Geosyntec Consultants	Depth: 15.75 ft	Test: 1



HPT DISSIPATION (SINGLE CASE)

		File: 23-56-25265_HPT04.TIM	Date: 1/19/2023
Company: ConeTec	Project ID: TVC	Location:	Sensor: HPT Press.
Sounding ID: CPT-4	Client: Geosyntec Consultants	Depth: 40.15 ft	Test: 1

Methodology Statements and Data File Formats

Cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd., a subsidiary of ConeTec.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and two geophone sensors for recording seismic signals. All signals are amplified and measured with minimum sixteen-bit resolution down hole within the cone body, and the signals are sent to the surface using a high bandwidth, error corrected digital interface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first appendix. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 millimeters diameter over a length of 32 millimeters with tapered leading and trailing edges) located at a distance of 585 millimeters above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is six millimeters thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meets or exceeds those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

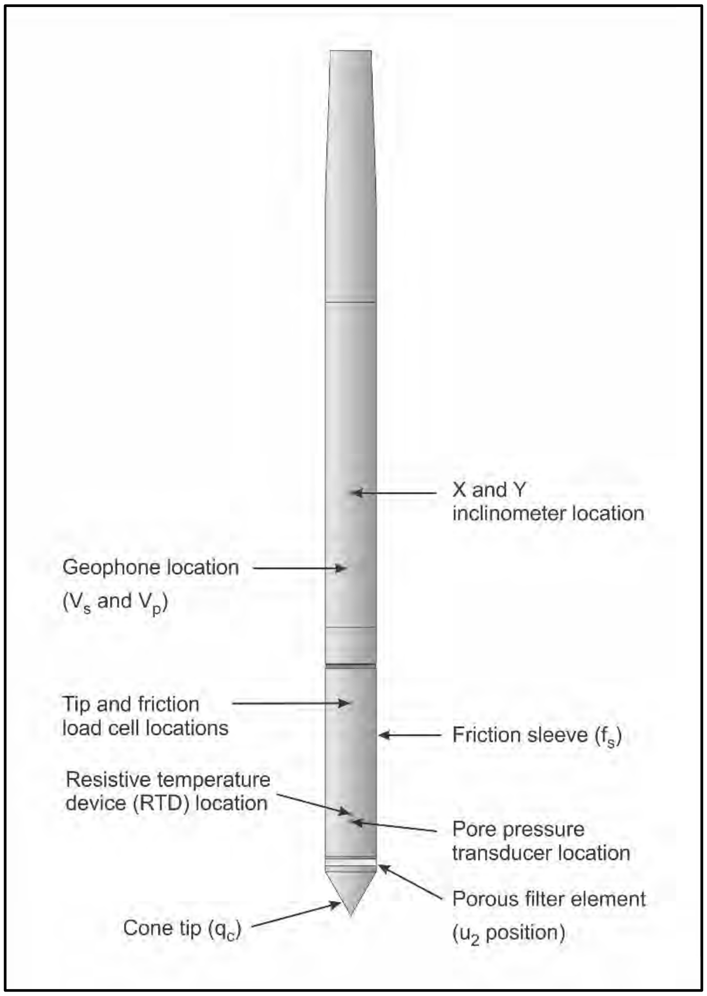


Figure CPTu. Piezocone Penetrometer (15 cm^2)

The ConeTec data acquisition systems consist of a Windows based computer and a signal interface box and power supply. The signal interface combines depth increment signals, seismic trigger signals and the downhole digital data. This combined data is then sent to the Windows based computer for collection and presentation. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording interval is 2.5 centimeters; custom recording intervals are possible.

The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPTu operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of two centimeters per second, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches (38.1 millimeters) are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil under vacuum pressure prior to use
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson et al. (1986) and Robertson (1990, 2009). It should be noted that it is not always possible to accurately identify a soil behavior type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al. (1986):

$$q_t = q_c + (1-a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (R_f) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of files with calculated geotechnical parameters were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the methods used is also included in the data release folder.

For additional information on CPTu interpretations and calculated geotechnical parameters, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

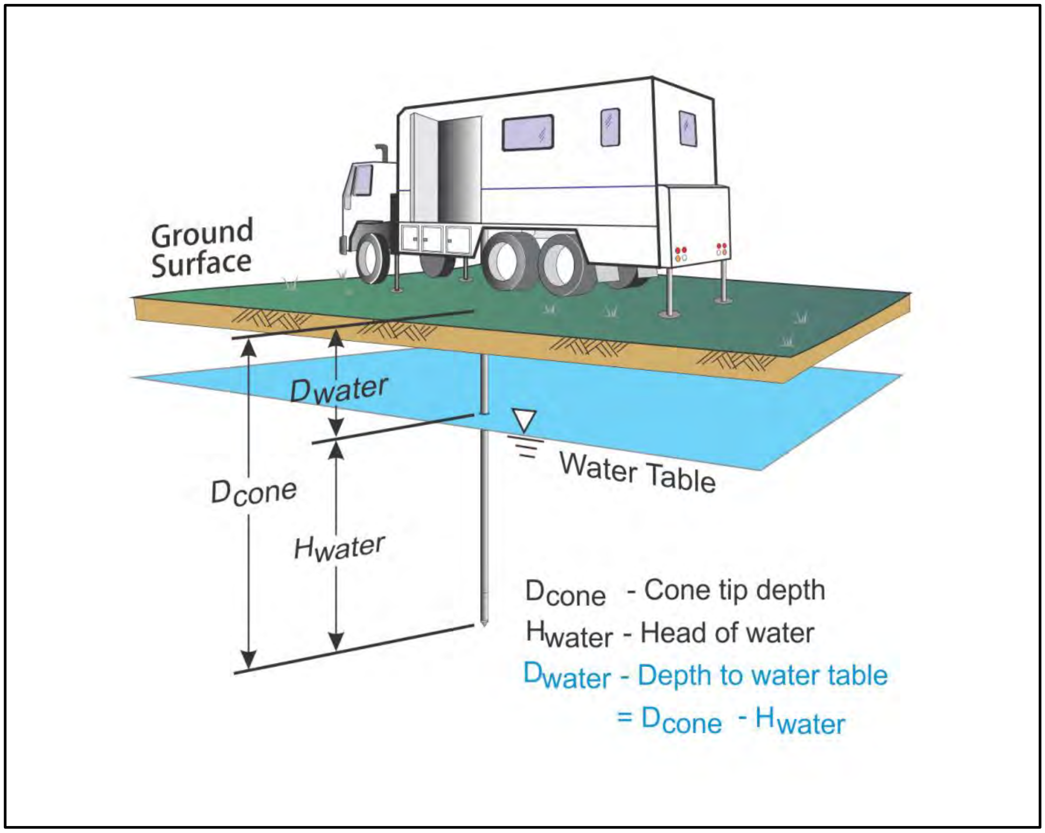


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

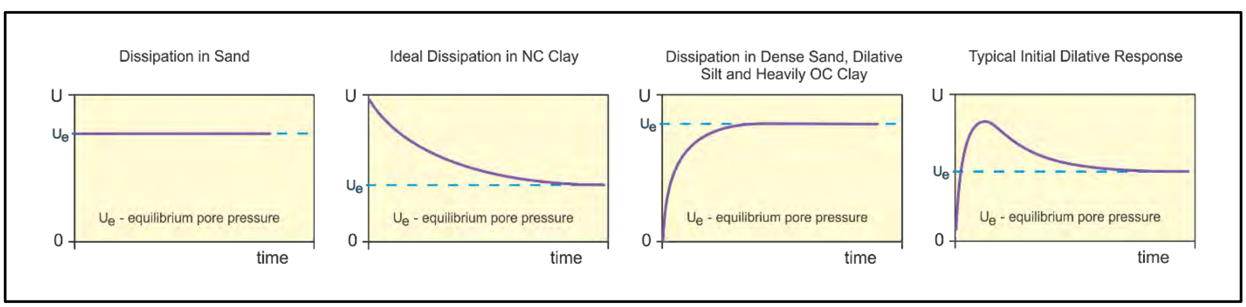


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve in Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100}. In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100}. A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:
T* is the dimensionless time factor (Table Time Factor)
a is the radius of the cone
I_r is the rigidity index
t is the time at the degree of consolidation

Table Time Factor. T* versus degree of dissipation (Teh and Houlsby (1991))

Degree of Dissipation (%)	20	30	40	50	60	70	80
T* (u_2)	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50}, dissipation tests must be taken to a pressure less than u_{50}. The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100}. To estimate u_{50}, both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby (1991)), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50}. In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r, the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50}, other methods should be applied to confirm the results for c_h.

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM International, West Conshohocken, PA. DOI: 10.1520/D5778-12.

Burns, S.E. and Mayne, P.W., 1998, “Monotonic and dilatory pore pressure decay during piezocone tests”, Canadian Geotechnical Journal 26 (4): 1063-1073. DOI: 1063-1073/T98-062.

Burns, S.E. and Mayne, P.W., 2002, “Analytical cavity expansion-critical state model cone dissipation in fine-grained soils”, Soils & Foundations, Vol. 42(2): 131-137.

Jones, G.A. and Van Zyl, D.J.A., 1981, “The piezometer probe: a useful investigation tool”, Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, “Cone Penetration Testing in Geotechnical Practice”, Blackie Academic and Professional.

Mayne, P.W., 2013, “Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests”, Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420. DOI: 10.1061/9780784412770.027.

Mayne, P.W. and Peuchen, J., 2012, “Unit weight trends with cone resistance in soft to firm clays”, Geotechnical and Geophysical Site Characterization *4,* Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Mayne, P.W., 2014, “Interpretation of geotechnical parameters from seismic piezocone tests”, CPT’14 Keynote Address, Las Vegas, NV, May 2014.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, “Use of Piezometer Cone Data”, Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., 1990, “Soil Classification Using the Cone Penetration Test”, Canadian Geotechnical Journal, Volume 27: 151-158. DOI: 10.1139/T90-014.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, “Estimating coefficient of consolidation from piezocone tests”, Canadian Geotechnical Journal, 29(4): 539-550. DOI: 10.1139/T92-061.

Robertson, P.K., 2009, “Interpretation of cone penetration tests – a unified approach”, Canadian Geotechnical Journal, Volume 46: 1337-1355. DOI: 10.1139/T09-065.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, “An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils”, Canadian Geotechnical Journal, 36(2): 369-381. DOI: 10.1139/T98-105.

Teh, C.I., and Houlsby, G.T., 1991, “An analytical study of the cone penetration test in clay”, Geotechnique, 41(1): 17-34. DOI: 10.1680/geot.1991.41.1.17.

CONE PENETRATION DIGITAL FILE FORMATS - eSeries

CPT Data Files (COR Extension)

ConeTec CPT data files are stored in ASCII text files that are readable by almost any text editor. ConeTec file names start with the job number (which includes the two digit year number) an underscore as a separating character, followed by two letters based on the type of test and the sounding ID. The last character position is reserved for an identifier letter (such as b, c, d etc) used to uniquely distinguish multiple soundings at the same location. The CPT sounding file has the extension COR. As an example, for job number 21-02-00001 the first CPT sounding will have file name 21-02-00001_CP01.COR

The sounding (COR) file consists of the following components:

1. Two lines of header information
2. Data records
3. End of data marker
4. Units information

Header Lines

Line 1: Columns 1-6 may be blank or may indicate the version number of the recording software
Columns 7-21 contain the sounding Date and Time (Date is MM:DD:YY)
Columns 23-38 contain the sounding Operator
Columns 51-100 contain extended Job Location information

Line 2: Columns 1-16 contain the Job Location
Columns 17-32 contain the Cone ID
Columns 33-47 contain the sounding number
Columns 51-100 may contain extended sounding ID information

Data Records

The data records contain 4 or more columns of data in floating point format. A comma and spaces separate each data item:

Column 1: Sounding Depth (meters)
Column 2: Tip (q_c), recorded in units selected by the operator
Column 3: Sleeve (f_s), recorded in units selected by the operator
Column 4: Dynamic pore pressure (u), recorded in units selected by the operator
Column 5: Empty or may contain other requested data such as Gamma, Resistivity or UVIF data

End of Data Marker

After the last line of data there is a line containing an ASCII 26 (CTL-Z) character (small rectangular shaped character) followed by a newline (carriage return / line feed). This is used to mark the end of data.

Units Information

The last section of the file contains information about the units that were selected for the sounding. A separator bar makes up the first line. The second line contains the type of units used for depth, q_c, f_s and u. The third line contains the conversion values required for ConeTec's software to convert the recorded data to an internal set of base units (bar for q_c, bar for f_s and meters for u). Additional lines intended for internal ConeTec use may appear following the conversion values.

CPT Data Files (XLS Extension)

Excel format files of ConeTec CPT data are also generated from corresponding COR files. The XLS files have the same base file name as the COR file with a -BSC suffix. The information in the file is presented in table format and contains additional information about the sounding such as coordinate information, and tip net area ratio.

The BSCI suffix is given to XLS files which are enhanced versions of the BSC files and include the same data records in addition to inclination data collected for each sounding.

CPT Dissipation Files (XLS Extension)

Pore pressure dissipation files are provided in Excel format and contain each dissipation trace that exceeds a minimum duration (selected during post-processing) formatted column wise within the spreadsheet. The first column (Column A) contains the time in seconds and the second column (Column B) contains the time in minutes. Subsequent columns contain the dissipation trace data. The columns extend to the longest trace of the data set.

Detailed header information is provided at the top of the worksheet. The test depth in meters and feet, the number of points in the trace and the particular units are all presented at the top of each trace column.

CPT Dissipation files have the same naming convention as the CPT sounding files with a "–PPD" suffix.

Data Records

Each file will contain dissipation traces that exceed a minimum duration (selected during post-processing) in a particular column. The dissipation pore pressure values are typically recorded at varying time intervals throughout the trace; rapidly to start and increasing as the duration of the test lengthens. The test depth in meters and feet, the number of points in the trace and the trace number are identified at the top of each trace column.

Cone Type Designations

Cone ID	Cone Description	Tip Cross Sect. Area (cm^2)	Tip Capacity (bar)	Sleeve Area (cm^2)**	Sleeve Capacity (bar)	Pore Pressure Capacity (bar)
EC###	A15T1500F15U35	15	1500	225	15	35
EC###	A15T375F10U35	15	375	225	10	35
EC###	A10T1000F10U35	10	1000	150	10	35

refers to the Cone ID number
**Outer Cylindrical Area

To determine the electrical resistivity of the soil (the inverse of electrical conductivity), resistivity measurements are performed in conjunction with piezocone penetration testing (RCPTu) using a resistivity cone. An illustration of the resistivity piezocone penetrometer is presented in Figure RCPTu.

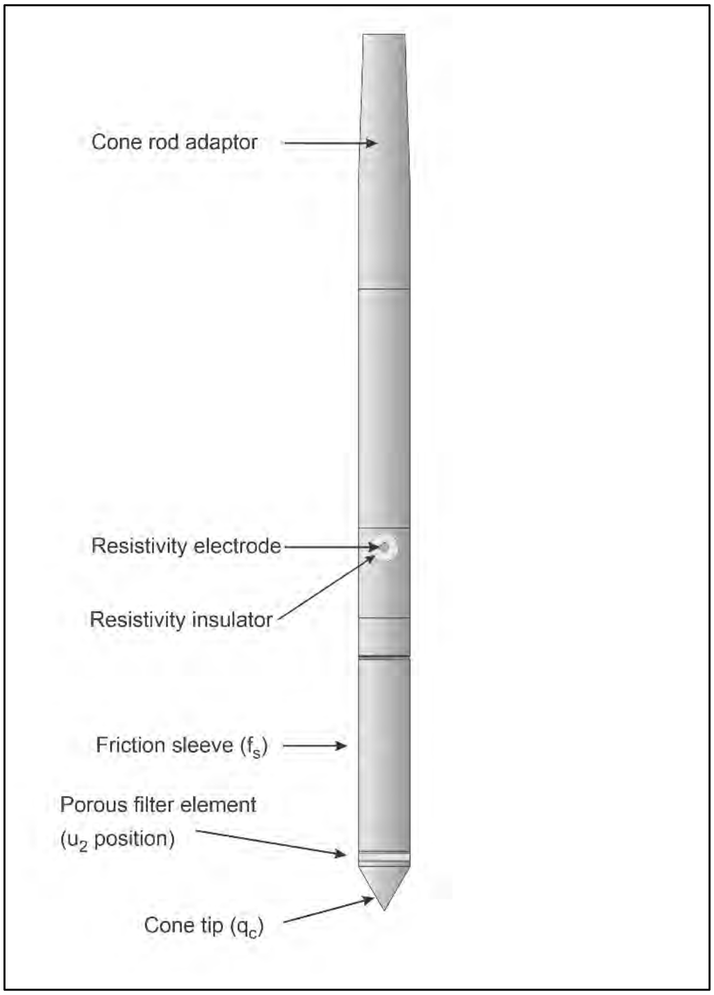


Figure RCPTu. Resistivity piezocone penetrometer (15 cm^2)

The resistivity cone has a single, wear resistant, 8 mm diameter stainless steel electrode set within a 25 mm diameter Delrin plastic insulator. The measurement of resistivity is confined to the region of soil in contact with the electrode and the cone body just beyond the boundary of the insulator. The configuration of the electrode provides vertical resolution of resistivity changes of approximately 25 mm.

The electrical resistance is determined by measuring the voltage drop and current applied across the soil in contact with the electrode and cone body. A 960 hertz alternating current source is used to avoid polarization of the electrode. Polarization is the process where ions accumulate at the electrode thus increasing the measured resistance.

Electrical resistance is not a material property, it is a function of the resistivity of the material being measured, and the electrode configuration. To convert from resistance (ohm) to resistivity (ohm-m) a lab calibration is necessary. Resistivity cones are calibrated in a water tank with solutions of known resistivity. The resistance across the electrode and ground is measured in the various solutions and a calibration curve is generated. It is necessary to assume that the calibration factors determined in the homogeneous isotropic medium do not vary significantly as the cone is advanced into the ground through soil.

Prior to the start of a test, the procedures described in the cone penetration test section are followed and the resistivity output is verified using various resistors. The resistivity measurements are recorded on a continuous basis at the same time as the tip, friction, and pore pressure measurements. Due to the vertical offset between the cone tip and the electrode, resistivity data is not available for the last 0.275 meters of each profile.

The resistivity of soil is for the most part influenced by the resistivity of the pore fluid, which in turn is a measure of the groundwater chemical composition. Electrical conduction in saturated sandy soils is largely by electrolytic conduction in the pore fluid whereas for clayey soils, ion exchange contributes significantly within the soil skeleton. Resistivity measurements will increase as the saturation of the soil decreases. For additional information on resistivity cone penetration testing, refer to Campanella and Weemees (1990).

Resistivity CPTu plots are presented in the relevant appendix.

References

Campanella, R.G. and Weemees, I., 1990, “Development and Use of an Electrical Resistivity Cone for Groundwater Contamination Studies”, Canadian Geotechnical Journal, Vol. 27 No. 5: 557-567. DOI: 10.1139/T90-071.

The Hydraulic Profiling Tool (HPT) system developed by Geoprobe Systems®, is a logging tool designed to evaluate the hydraulic behavior of unconsolidated materials. The HPT probe has an electrical conductivity (EC) array built into it that records bulk formation EC data for lithologic interpretation. HPT testing is performed as a standalone test or in conjunction with Geoprobe®'s Membrane Interface Probe (MIP). The combined testing is referred to as MiHPT.

There are four main components of the HPT system: Field Instrument, HPT Flow Controller, trunk line and probe assembly. A schematic of the HPT system configuration is presented in Figure HPT-1 and an image of the HPT system components is presented in Figure HPT-2.

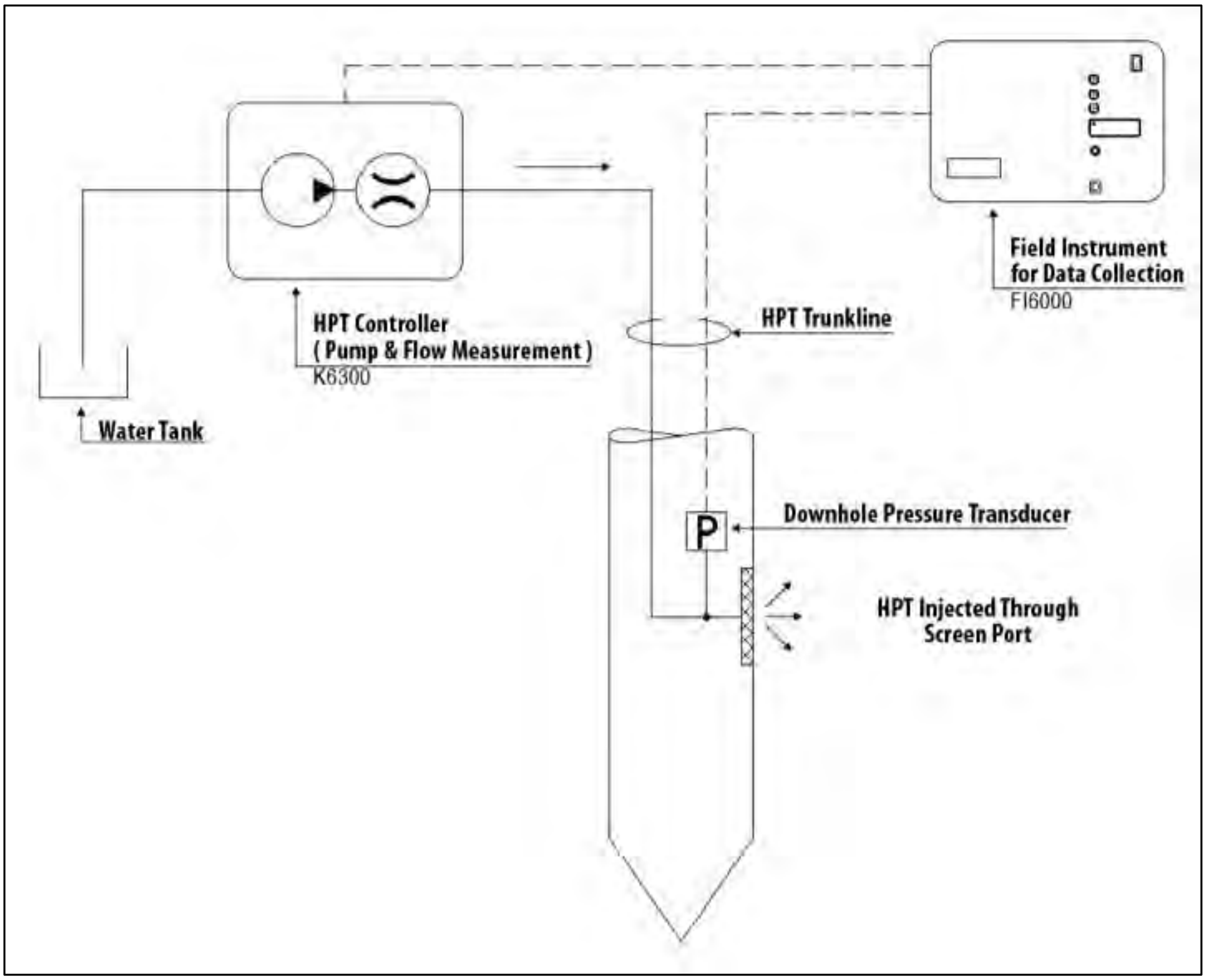


Figure HPT-1. HPT system configuration (courtesy of Geoprobe Systems®)

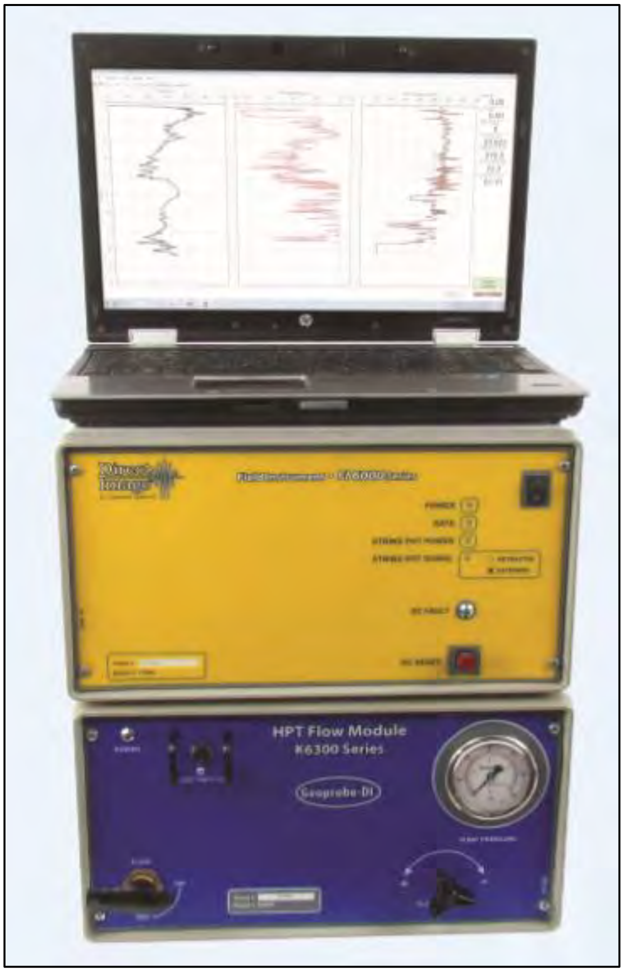


Figure HPT-2. HPT system components (courtesy of Geoprobe Systems®)

The probe assembly consists of the HPT probe and connection tube section. The downhole HPT absolute pressure transducer, water and electrical connections are housed inside the connection tube section and the injection screen and electrical conductivity array are located on the body of the probe. An image of the HPT probe is presented in Figure HPT-3.

Figure HPT-3. HPT Probe (courtesy of Geoprobe Systems®)

The HPT system generates fast, continuous real-time profiles of soil hydraulic properties in both fine-grained and coarse-grained soils. As the probe is pushed or hammered into the subsurface, water is injected into the formation through a screen on the side of the probe at a controlled flow rate. The probe's downhole pressure transducer measures the pressure response (injection pressure) of the soil which is plotted with depth in real time. Large coarse-grained material will typically have a relatively low-pressure response which is indicative of the ability to easily transmit water. Whereas a relatively high-pressure response would indicate a relatively small grain size and the lack of ability to transmit water. At discrete depths during the logging process, the probe can also collect static water pressure data under zero-flow conditions. The data can be used to generate a piezometric pressure profile for the log and to estimate the depth of the water table or phreatic surface.

Since the HPT pressure response is analogous to relative changes in the ability to transmit water (and therefore the relative change in dominant grain size), the HPT system can be used to identify potential contaminant migration pathways. Similarly, it can help identify zones for remedial material injection or provide qualitative guidance on how difficult injection may be in different zones of the formation.

The HPT system response is evaluated prior to and upon completion of each HPT push location. The purpose of quality assurance and quality control (QA/QC) testing is to ensure that the instrument is capable of generating high quality data, to prove that the instrumentation operates properly throughout the course of the log and that the logs are performed in accordance with established standards.

A reference test is performed on the HPT pressure sensor by submerging the HPT probe into a reference tube filled with water. A two-step test is performed to verify that the pressure sensor is providing the correct measurement (0.216 psi/1.49kPa) for a defined length (6 inches/15.2 cm) of water column. If the result is more than ± 10% out of range, the transducer will fail the test. Occasionally, the HPT screen becomes clogged or damaged after a test and must be removed and cleaned or replaced to obtain a successful QA test.

The QA/QC testing is conducted in accordance with Geoprobe Systems® standard operating procedures (SOP), Geoprobe® (2015), and in general accordance with the current ASTM D8037M standard.

HPT testing is conducted at a steady rate of approximately 2 cm/s. Typically, one meter length rods with an outer diameter of 1.75 inches are added to advance the HPT probe to the log termination depth. Geoprobe®'s data acquisition program Direct Image® (DI) Acquisition displays the data in real time and records the following parameters to a storage media during penetration:

- Depth
- Transducer pressure
- Flow rate
- Electrical conductivity (EC)

All testing is performed in accordance to Geoprobe Systems® standard operating procedures (SOP), Geoprobe® (2015).

An image of an HPT log with EC measurements and images from the probe is presented in Figure HPT-4.

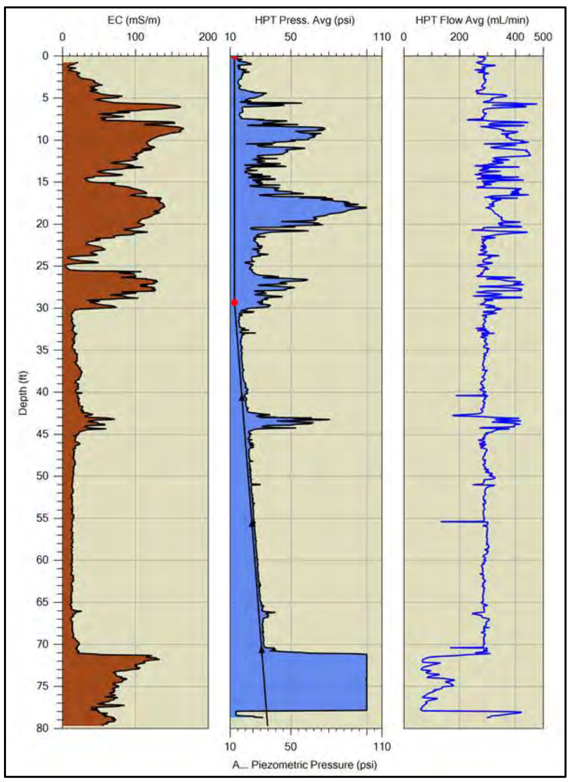


Figure HPT-4. HPT Log (courtesy of Geoprobe Systems®)

If static water pressure data is collected during a log, the static water level can be calculated using the static pressure and depth data from response testing, as well as the pre- and post-test response data measured at the top of the reference tube at zero flow. The pre- and post-test data must be corrected to reference atmospheric pressure as the HPT system uses an absolute pressure transducer to measure in-situ pressures. The piezometric profile can be used to calculate the corrected HPT pressure. This data along with the flow rate can then be used to calculate an estimate of hydraulic conductivity (K) in the saturated formation.

A summary of the HPT logs along with test details and individual plots are provided in the relevant appendix. Summaries of the HPT sensor data and HPT response data are provided in the relevant appendix and the data files are provided in the data release folder.

For additional information on the HPT system, refer to the Geoprobe Systems® website, https://geoprobe.com/hpt-hydraulic-profiling-tool or Geoprobe® (2010).

References

ASTM D8037/D8037M-16, 2016, “Standard Practice for Direct Push Hydraulic Logging for Profiling Variations of Permeability in Soils”, ASTM International, West Conshohocken, PA, 2016. DOI: 10.1520/D8037_D8037M-16.

Geoprobe®, 2010, “Tech Guide for Calculation of Estimated Hydraulic Conductivity (Est. K) Log from HPT Data”: Geoprobe Systems, November 2010, 20 p.
https://geoprobe.com/sites/default/files/storage/pdfs/tech_guide_estk_v5_0_0.pdf

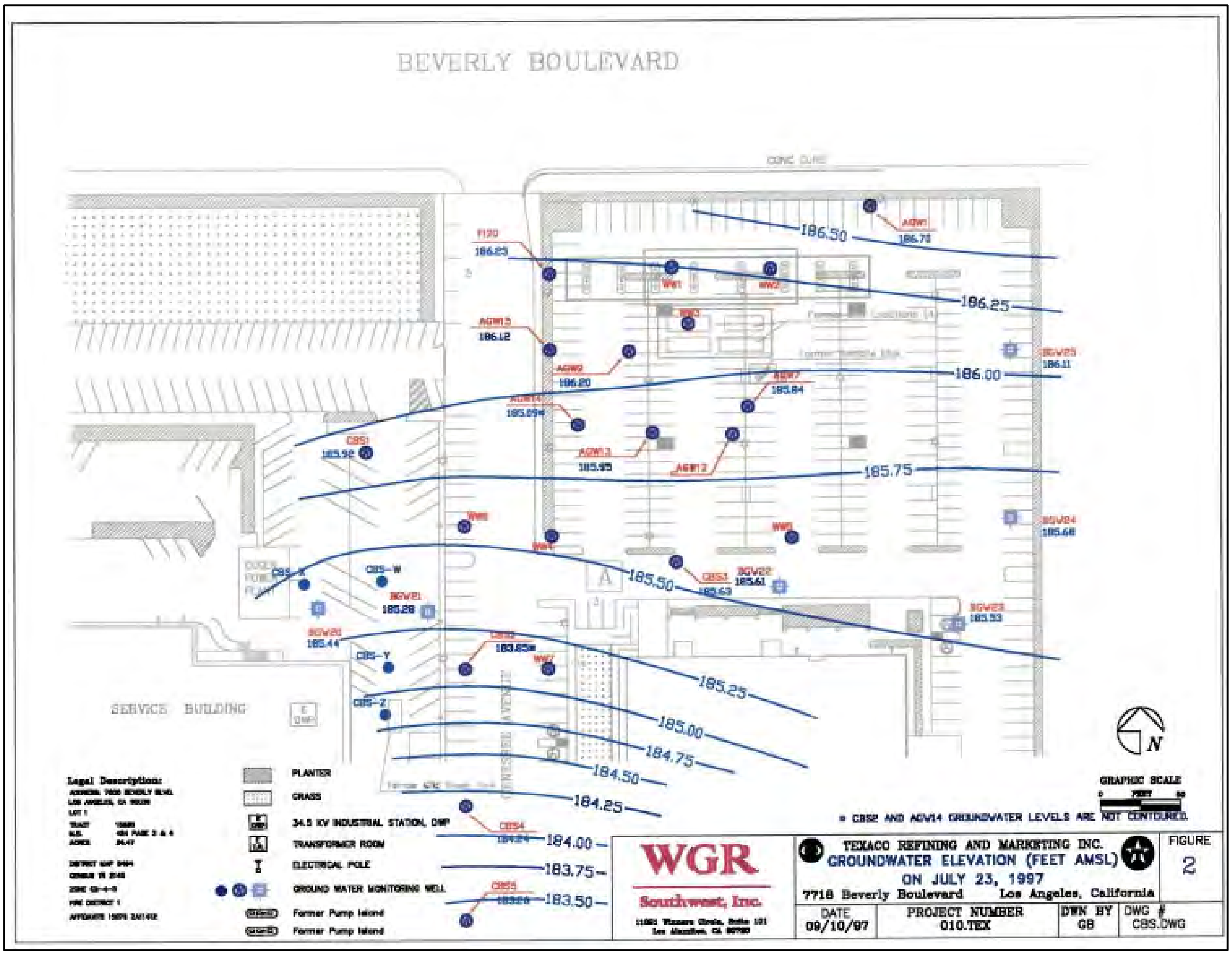
Geoprobe®, 2015, “Geoprobe® Hydraulic Profiling Tool (HPT) System, Standard Operating Procedure”; Technical Bulletin No. MK3137: Geoprobe Systems, January 2015, 22 p.
https://geoprobe.com/sites/default/files/storage/pdfs/HPT_SOP_mk3010_0115_0.pdf

APPENDIX C

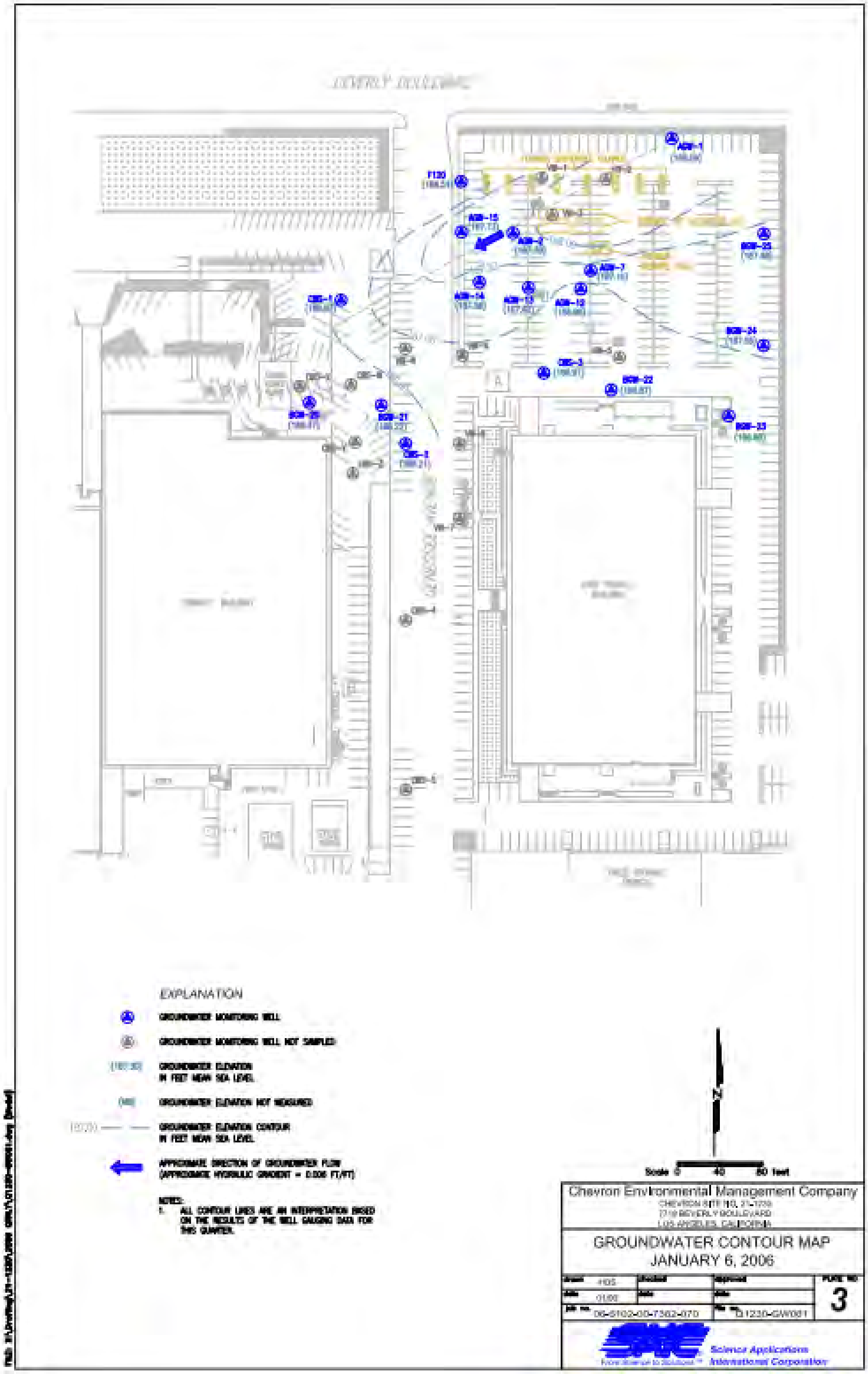
Representative Groundwater Contour Maps, Hydrographs and Water Level Tables – Previous Investigations

1. Former Texaco Station Groundwater Monitoring, 7718 Beverly Blvd., Los Angeles, CA

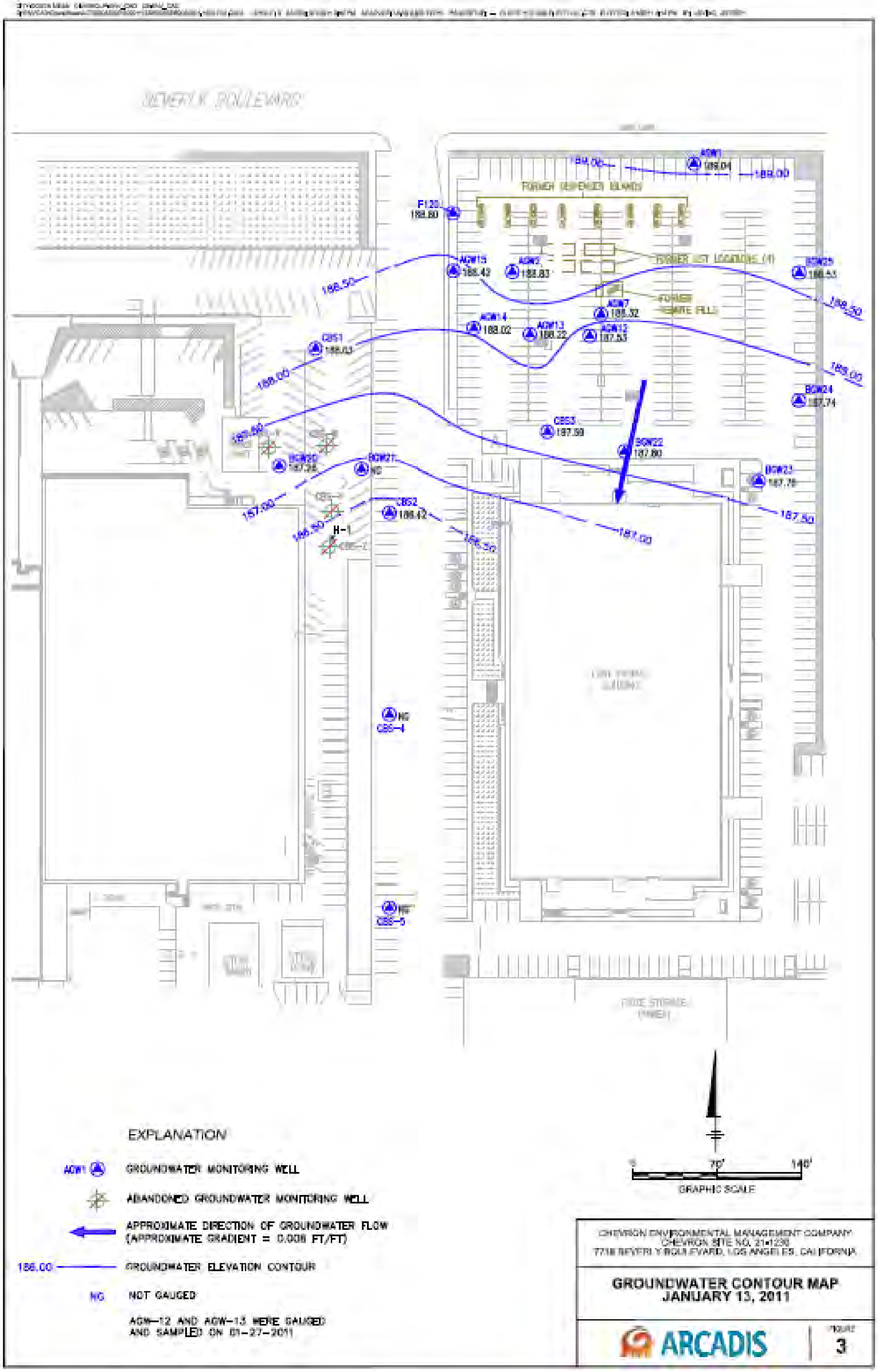
Former Texaco Station – Groundwater Contour Map (July 23, 1997) WGR Southwest



Former Texaco Station – Groundwater Contour Map (January 6, 2006) SAIC / Gradient – 0.006 ft/ft

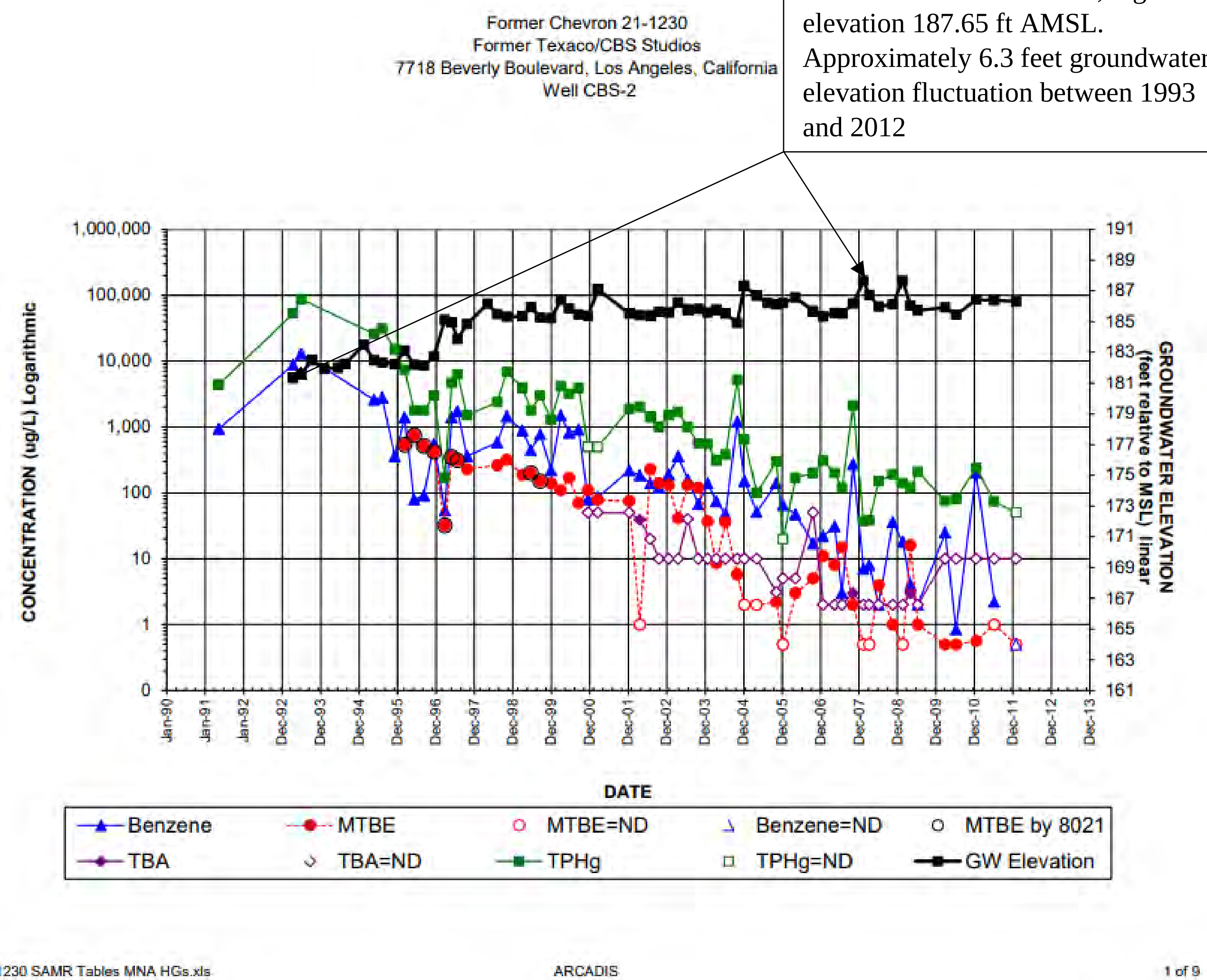


Former Texaco Station – Groundwater Contour Map (January 13, 2011) Arcadis / Gradient – 0.008 ft/ft



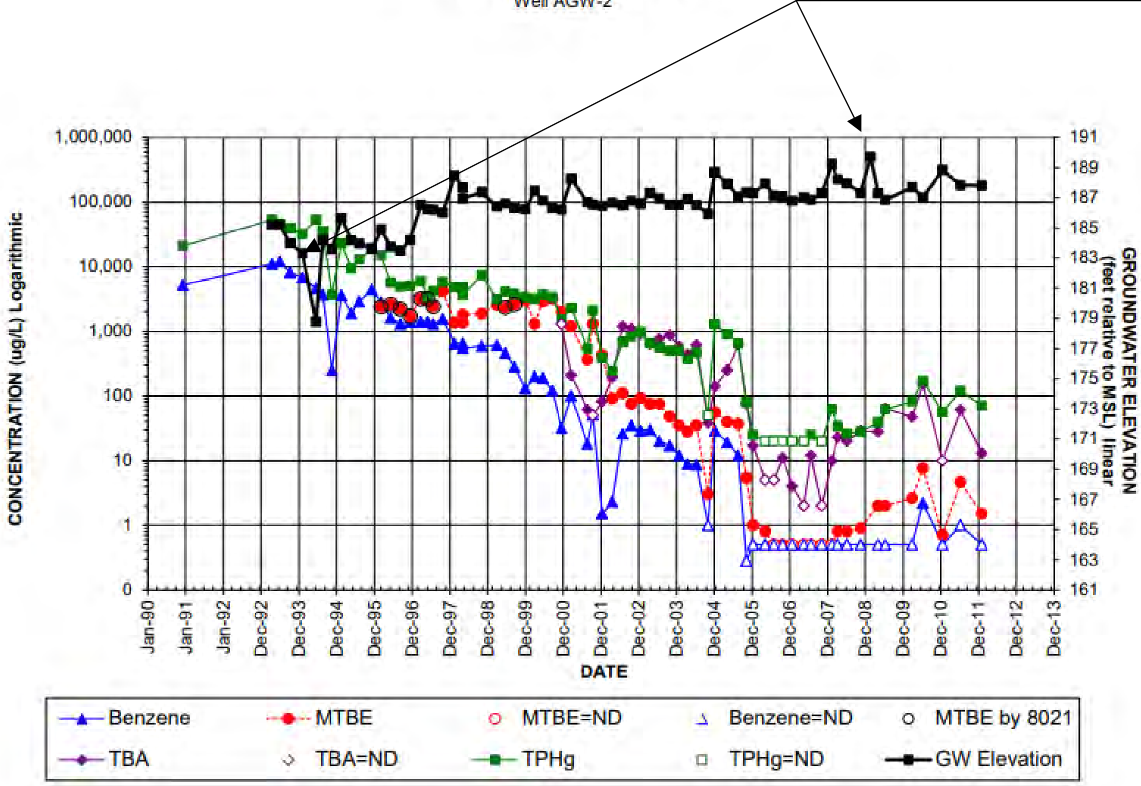
2. Representative Hydrographs - Former Texaco Station – Arcadis (March 23, 2012) (see Arcadis Figure 3 above for well locations)

Note: CBS-2 lowest groundwater elevation 181.31 ft AMSL, highest elevation 187.65 ft AMSL. Approximately 6.3 feet groundwater elevation fluctuation between 1993 and 2012



Note: AGW-2 - Lowest groundwater elevation 183.32 ft AMSL, highest elevation 189.72 ft AMSL. Approximately 6.4 feet groundwater elevation fluctuation between 1993 and 2012. Single low outlier measurement not included.

Former Chevron 21-1230
Former Texaco/CBS Studios
7718 Beverly Boulevard, Los Angeles, California
Well AGW-2



3. Representative Water Level Tables – From Table 2, Former Texaco Station – Arcadis (March 23, 2012) (see Arcadis Figure 3 above for well locations)

Well AGW-1 Water Levels

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
AGW-1	10/7/1993	5-20	196.67	12.52	--	184.15
AGW-1	2/3/1994	5-20	196.67	13.15	--	183.52
AGW-1	6/16/1994	5-20	196.67	13.16	--	183.51
AGW-1	8/18/1994	5-20	196.67	13.08	--	183.59
AGW-1	11/17/1994	5-20	196.67	13.13	--	183.54
AGW-1	2/16/1995	5-20	196.67	11.53	--	185.14
AGW-1	5/22/1995	5-20	196.67	10.31	--	186.36
AGW-1	8/8/1995	5-20	196.67	13.04	--	183.63
AGW-1	12/5/1995	5-20	196.67	13.11	--	183.56
AGW-1	3/6/1996	5-20	196.67	12.14	--	184.53
AGW-1	6/5/1996	5-20	196.67	13.05	--	183.62
AGW-1	9/5/1996	5-20	196.67	13.11	--	183.56
AGW-1	12/11/1996	5-20	196.67	12.62	--	184.05
AGW-1	3/24/1997	5-20	199.77	13.00	--	186.77
AGW-1	5/28/1997	5-20	199.77	13.03	--	186.74
AGW-1	7/23/1997	5-20	199.77	13.07	--	186.70
AGW-1	10/22/1997	5-20	199.77	13.13	--	186.64
AGW-1	2/12/1998	5-20	199.77	11.20	--	188.57
AGW-1	5/5/1998	5-20	199.77	12.05	--	187.72
AGW-1	8/4/1998	5-20	199.77	12.69	--	187.08
AGW-1	11/2/1998	5-20	199.77	12.86	--	186.91
AGW-1	3/30/1999	5-20	199.77	12.80	--	186.97
AGW-1	6/18/1999	5-20	199.77	12.76	--	187.01
AGW-1	9/16/1999	5-20	199.77	13.02	--	186.75
AGW-1	12/28/1999	5-20	199.77	12.88	--	186.89
AGW-1	3/29/2000	5-20	199.77	11.92	--	187.85
AGW-1	6/16/2000	5-20	199.77	12.50	--	187.27
AGW-1	9/15/2000	5-20	199.77	12.82	--	186.95
AGW-1	12/13/2000	5-20	199.77	--	--	--
AGW-1	3/16/2001	5-20	199.77	11.34	--	188.43
AGW-1	8/20/2001	5-20	199.77	12.81	--	186.96
AGW-1	10/12/2001	5-20	199.77	12.82	--	186.95
AGW-1	1/8/2002	5-20	199.77	12.66	--	187.11
AGW-1	4/18/2002	5-20	199.77	12.74	--	187.03
AGW-1	7/26/2002	5-20	199.77	12.90	--	186.87
AGW-1	10/17/2002	5-20	199.77	12.43	--	187.34
AGW-1	1/17/2003	5-20	199.77	12.61	--	187.16
AGW-1	4/17/2003	5-20	199.77	12.25	--	187.52
AGW-1	7/16/2003	5-20	199.77	12.35	--	187.42
AGW-1	10/24/2003	5-20	199.77	12.64	--	187.13
AGW-1	1/23/2004	5-20	199.77	12.75	--	187.02
AGW-1	4/13/2004	5-20	199.77	12.58	0	187.19
AGW-1	7/9/2004	5-20	199.77	12.70	0	187.07
AGW-1	10/29/2004	5-20	199.77	13.32	0	186.45
AGW-1	1/5/2005	5-20	199.77	10.99	0	188.78
AGW-1	5/2/2005	5-20	199.77	11.55	0	188.22
AGW-1	8/16/2005	5-20	199.77	11.91	0	187.86
AGW-1	11/4/2005	5-20	199.77	12.13	0	187.64
AGW-1	1/6/2006	5-20	199.77	11.68	0	188.09

Well AGW-1 Water Levels (cont.)

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
AGW-1	5/5/2006	5-20	199.77	11.52	0	188.25
AGW-1	7/28/2006	5-20	199.77	11.23	0	188.54
AGW-1	10/20/2006	5-20	199.77	11.71	0	188.06
AGW-1	1/22/2007	5-20	199.77	11.74	0	188.03
AGW-1	5/11/2007	5-20	199.77	12.19	0	187.58
AGW-1	7/20/2007	5-20	199.77	12.31	0	187.46
AGW-1	11/2/2007	5-20	199.77	12.02	0	187.75
AGW-1	2/8/2008	5-20	199.77	10.52	0	189.25
AGW-1	4/4/2008	5-20	199.77	11.31	0	188.46
AGW-1	7/2/2008	5-20	199.77	11.70	0	188.07
AGW-1	11/13/2008	5-20	199.77	11.61	0	188.16
AGW-1	2/16/2009	5-20	199.77	11.36	0	188.41
AGW-1	4/30/2009	5-20	199.77	12.18	0	187.59
AGW-1	7/8/2009	5-20	199.77	12.28	0	187.49
AGW-1	3/25/2010	5-20	199.77	11.70	0	188.07
AGW-1	7/6/2010	5-20	199.77	12.19	0	187.58
AGW-1	1/13/2011	5-20	199.77	10.73	0	189.04
AGW-1	7/5/2011	5-20	199.77	11.43	0	188.34
AGW-1	1/26/2012	5-20	199.77	11.68	0	188.09

Well CBS-1 Water Levels

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
CBS-1	5/10/1991	4.5-19.5	195.59	--	--	--
CBS-1	4/15/1993	4.5-19.5	195.59	9.20	--	186.39
CBS-1	7/1/1993	4.5-19.5	195.59	9.03	--	186.56
CBS-1	10/7/1993	4.5-19.5	195.59	11.40	--	184.19
CBS-1	2/3/1994	4.5-19.5	195.59	12.95	--	182.64
CBS-1	6/16/1994	4.5-19.5	195.59	12.31	--	183.28
CBS-1	8/18/1994	4.5-19.5	195.59	12.13	--	183.46
CBS-1	11/17/1994	4.5-19.5	195.59	12.73	--	182.86
CBS-1	2/16/1995	4.5-19.5	195.59	10.41	--	185.18
CBS-1	5/22/1995	4.5-19.5	195.59	--	--	--
CBS-1	8/8/1995	4.5-19.5	195.59	12.40	--	183.19
CBS-1	12/5/1995	4.5-19.5	195.59	12.40	--	183.19
CBS-1	3/6/1996	4.5-19.5	195.59	11.19	--	184.40
CBS-1	6/5/1996	4.5-19.5	195.59	12.53	--	183.06
CBS-1	9/5/1996	4.5-19.5	195.59	12.77	--	182.82
CBS-1	12/11/1996	4.5-19.5	195.59	11.95	--	183.64
CBS-1	3/24/1997	4.5-19.5	198.72	12.65	--	186.07
CBS-1	5/28/1997	4.5-19.5	198.72	12.75	--	185.97
CBS-1	7/23/1997	4.5-19.5	198.72	12.80	--	185.92
CBS-1	10/22/1997	4.5-19.5	198.72	13.70	--	185.02
CBS-1	2/12/1998	4.5-19.5	198.72	9.91	--	188.81
CBS-1	5/5/1998	4.5-19.5	198.72	11.61	--	187.11
CBS-1	8/4/1998	4.5-19.5	198.72	11.56	--	187.16
CBS-1	11/2/1998	4.5-19.5	198.72	12.65	--	186.07
CBS-1	3/30/1999	4.5-19.5	198.72	12.63	--	186.09
CBS-1	6/18/1999	4.5-19.5	198.72	12.35	--	186.37
CBS-1	9/16/1999	4.5-19.5	198.72	12.60	--	186.12
CBS-1	12/28/1999	4.5-19.5	198.72	12.82	--	185.90
CBS-1	3/29/2000	4.5-19.5	198.72	11.65	--	187.07
CBS-1	6/16/2000	4.5-19.5	198.72	12.04	--	186.68
CBS-1	9/15/2000	4.5-19.5	198.72	12.62	--	186.10
CBS-1	12/13/2000	4.5-19.5	198.72	--	--	--
CBS-1	3/16/2001	4.5-19.5	198.72	10.96	--	187.76
CBS-1	8/20/2001	4.5-19.5	198.72	12.48	--	186.24
CBS-1	10/12/2001	4.5-19.5	198.72	12.60	--	186.12
CBS-1	1/8/2002	4.5-19.5	198.72	12.76	--	185.96
CBS-1	4/18/2002	4.5-19.5	198.72	12.48	--	186.24
CBS-1	7/26/2002	4.5-19.5	198.72	12.57	--	186.15
CBS-1	10/17/2002	4.5-19.5	198.72	12.46	--	186.26
CBS-1	1/17/2003	4.5-19.5	198.72	12.61	--	186.11
CBS-1	4/17/2003	4.5-19.5	198.72	11.90	--	186.82
CBS-1	7/16/2003	4.5-19.5	198.72	12.10	--	186.62
CBS-1	10/24/2003	4.5-19.5	198.72	12.52	--	186.20
CBS-1	1/23/2004	4.5-19.5	198.72	12.65	--	186.07
CBS-1	4/13/2004	4.5-19.5	198.72	12.33	0	186.39
CBS-1	7/9/2004	4.5-19.5	198.72	12.61	0	186.11
CBS-1	10/29/2004	4.5-19.5	198.72	13.21	0	185.51
CBS-1	1/5/2005	4.5-19.5	198.72	10.04	0	188.68
CBS-1	5/2/2005	4.5-19.5	198.72	11.44	0	187.28

Well CBS-1 Water Levels (cont.)

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
CBS-1	8/16/2005	4.5-19.5	198.72	12.02	0	186.70
CBS-1	11/4/2005	4.5-19.5	198.72	12.40	0	186.32
CBS-1	1/6/2006	4.5-19.5	198.72	11.75	0	186.97
CBS-1	5/5/2006	4.5-19.5	198.72	11.58	0	187.14
CBS-1	7/28/2006	4.5-19.5	198.72	12.14	0	186.58
CBS-1	10/20/2006	4.5-19.5	198.72	12.04	0	186.68
CBS-1	1/22/2007	4.5-19.5	198.72	12.59	0	186.13
CBS-1	5/11/2007	4.5-19.5	198.72	12.21	0	186.51
CBS-1	7/20/2007	4.5-19.5	198.72	11.96	0	186.76
CBS-1	11/2/2007	4.5-19.5	198.72	11.88	0	186.84
CBS-1	2/8/2008	4.5-19.5	198.72	10.25	0	188.47
CBS-1	4/4/2008	4.5-19.5	198.72	11.11	0	187.61
CBS-1	7/2/2008	4.5-19.5	198.72	11.47	0	187.25
CBS-1	11/13/2008	4.5-19.5	198.72	11.99	0	186.73
CBS-1	2/16/2009	4.5-19.5	198.72	10.85	0	187.87
CBS-1	4/30/2009	4.5-19.5	198.72	12.02	0	186.70
CBS-1	7/8/2009	4.5-19.5	198.72	12.24	0	186.48
CBS-1	3/25/2010	4.5-19.5	198.72	11.65	0	187.07
CBS-1	7/6/2010	4.5-19.5	198.81	12.34	0	186.47
CBS-1	1/13/2011	4.5-19.5	198.81	10.78	0	188.03
CBS-1	7/5/2011	4.5-19.5	198.81	11.66	0	187.15
CBS-1	1/26/2012	4.5-19.5	198.81	11.68	0	187.13

Well CBS-4 Water Levels

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
CBS-4	5/10/1991	5-20	--	--	--	--
CBS-4	8/8/1991	5-20	189.33	--	--	--
CBS-4	7/1/1993	5-20	189.33	11.60	--	177.73
CBS-4	10/7/1993	5-20	189.33	7.60	--	181.73
CBS-4	2/3/1994	5-20	189.33	7.90	--	181.43
CBS-4	6/16/1994	5-20	189.33	8.93	--	180.40
CBS-4	8/18/1994	5-20	189.33	7.80	--	181.53
CBS-4	11/17/1994	5-20	189.33	7.89	--	181.44
CBS-4	2/16/1995	5-20	189.33	6.21	--	183.12
CBS-4	5/22/1995	5-20	189.33	7.45	--	181.88
CBS-4	8/8/1995	5-20	189.33	7.62	--	181.71
CBS-4	12/5/1995	5-20	189.33	7.76	--	181.57
CBS-4	3/6/1996	5-20	189.33	6.79	--	182.54
CBS-4	6/5/1996	5-20	189.33	7.73	--	181.60
CBS-4	9/5/1996	5-20	189.33	7.77	--	181.56
CBS-4	12/11/1996	5-20	189.33	6.99	--	182.34
CBS-4	3/24/1997	5-20	--	7.65	--	--
CBS-4	5/28/1997	5-20	--	7.30	--	--
CBS-4	7/23/1997	5-20	192.14	7.90	--	184.24
CBS-4	10/22/1997	5-20	192.14	--	--	--
CBS-4	2/12/1998	5-20	192.14	6.10	--	186.04
CBS-4	5/5/1998	5-20	192.14	6.64	--	185.50
CBS-4	8/4/1998	5-20	192.14	7.28	--	184.86
CBS-4	11/2/1998	5-20	192.14	7.41	--	184.73

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
CBS-4	3/30/1999	5-20	192.14	--	--	--
CBS-4	6/18/1999	5-20	192.14	--	--	--
CBS-4	9/16/1999	5-20	192.14	--	--	--
CBS-4	12/28/1999	5-20	192.14	--	--	--
CBS-4	3/29/2000	5-20	192.14	--	--	--
CBS-4	6/16/2000	5-20	192.14	--	--	--
CBS-4	9/15/2000	5-20	192.14	--	--	--
CBS-4	12/13/2000	5-20	192.14	7.65	--	184.49
CBS-4	3/16/2001	5-20	192.14	--	--	--
CBS-4	3/25/2010	5-20	192.14	--	--	--
CBS-4	7/6/2010	5-20	192.14	--	--	--

Well CBS-5 Water Levels

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
CBS-5	8/8/1991	5-20	187.38	--	--	--
CBS-5	4/15/1993	5-20	187.38	9.42	--	177.96
CBS-5	7/1/1993	5-20	187.38	9.61	--	177.77
CBS-5	10/7/1993	5-20	187.38	7.01	--	180.37
CBS-5	2/3/1994	5-20	187.38	7.33	--	180.05
CBS-5	6/16/1994	5-20	187.38	--	--	--
CBS-5	8/16/1994	5-20	187.38	7.90	--	179.48
CBS-5	11/17/1994	5-20	187.38	--	--	--
CBS-5	2/16/1995	5-20	187.38	5.53	--	181.85
CBS-5	5/22/1995	5-20	187.38	6.61	--	180.77
CBS-5	8/8/1995	5-20	187.38	7.03	--	180.35
CBS-5	12/5/1995	5-20	187.38	7.25	--	180.13
CBS-5	3/6/1996	5-20	187.38	--	--	--
CBS-5	6/5/1996	5-20	187.38	7.08	--	180.30
CBS-5	9/5/1996	5-20	187.38	7.17	--	180.21
CBS-5	3/24/1997	5-20	--	--	--	--
CBS-5	5/28/1997	5-20	--	--	--	--
CBS-5	7/23/1997	5-20	190.56	7.30	--	183.26
CBS-5	10/22/1997	5-20	190.56	--	--	--
CBS-5	2/12/1998	5-20	190.56	5.34	--	185.22
CBS-5	5/5/1998	5-20	190.56	5.74	--	184.82
CBS-5	8/4/1998	5-20	190.56	6.68	--	183.88
CBS-5	11/2/1998	5-20	190.56	6.81	--	183.75
CBS-5	3/30/1999	5-20	190.56	--	--	--
CBS-5	6/18/1999	5-20	190.56	--	--	--
CBS-5	9/16/1999	5-20	190.56	--	--	--
CBS-5	12/28/1999	5-20	190.56	--	--	--
CBS-5	3/29/2000	5-20	190.56	--	--	--
CBS-5	6/16/2000	5-20	190.56	--	--	--
CBS-5	9/15/2000	5-20	190.56	--	--	--
CBS-5	12/13/2000	5-20	190.56	--	--	--
CBS-5	3/16/2001	5-20	190.56	--	--	--
CBS-5	3/25/2010	5-20	190.56	--	--	--
CBS-5	7/6/2010	5-20	190.56	--	--	--

Well AGW-13 Water Levels

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
AGW-13	12/5/1990	5-20	194.39	--	--	--
AGW-13	4/15/1993	5-20	194.39	9.57	--	184.82
AGW-13	7/1/1993	5-20	194.39	9.55	--	184.84
AGW-13	10/7/1993	5-20	194.39	11.10	--	183.29
AGW-13	2/3/1994	5-20	194.39	11.17	--	183.22
AGW-13	6/16/1994	5-20	194.39	10.88	--	183.51
AGW-13	8/18/1994	5-20	194.39	10.65	--	183.74
AGW-13	11/17/1994	5-20	194.39	11.04	--	183.35
AGW-13	2/16/1995	5-20	194.39	9.00	--	185.39
AGW-13	5/22/1995	5-20	194.39	--	--	--
AGW-13	8/8/1995	5-20	194.39	10.72	--	183.67
AGW-13	12/5/1995	5-20	194.39	11.03	--	183.36
AGW-13	3/6/1996	5-20	194.39	9.67	--	184.72
AGW-13	6/5/1996	5-20	194.39	10.84	--	183.55
AGW-13	9/5/1996	5-20	194.39	11.06	--	183.33
AGW-13	12/11/1996	5-20	194.39	9.90	--	184.49
AGW-13	3/24/1997	5-20	--	10.82	--	--
AGW-13	5/28/1997	5-20	--	11.10	--	--
AGW-13	7/23/1997	5-20	197.05	11.10	--	185.95
AGW-13	10/22/1997	5-20	197.05	11.75	--	185.30
AGW-13	2/12/1998	5-20	197.05	9.05	--	188.00
AGW-13	5/5/1998	5-20	197.05	9.83	--	187.22
AGW-13	8/4/1998	5-20	197.05	10.36	--	186.69
AGW-13	11/2/1998	5-20	197.05	10.83	--	186.22
AGW-13	3/30/1999	5-20	197.05	10.65	--	186.40
AGW-13	6/18/1999	5-20	197.05	10.52	--	186.53
AGW-13	9/16/1999	5-20	197.05	10.83	--	186.22
AGW-13	12/28/1999	5-20	197.05	10.95	--	186.10
AGW-13	3/29/2000	5-20	197.05	9.75	--	187.30
AGW-13	6/16/2000	5-20	197.05	10.45	--	186.60
AGW-13	9/15/2000	5-20	197.05	10.85	--	186.20
AGW-13	12/13/2000	5-20	197.05	10.95	--	186.10
AGW-13	3/16/2001	5-20	197.05	8.85	--	188.20
AGW-13	8/20/2001	5-20	197.05	10.60	--	186.45
AGW-13	10/12/2001	5-20	197.05	10.72	--	186.33
AGW-13	1/8/2002	5-20	197.05	10.74	--	186.31
AGW-13	4/18/2002	5-20	197.05	10.65	--	186.40
AGW-13	7/26/2002	5-20	197.05	10.82	--	186.23
AGW-13	10/17/2002	5-20	197.05	10.54	--	186.51
AGW-13	1/17/2003	5-20	197.05	10.69	--	186.36
AGW-13	4/17/2003	5-20	197.05	9.98	--	187.07
AGW-13	7/16/2003	5-20	197.05	10.40	--	186.65
AGW-13	10/24/2003	5-20	197.05	10.62	--	186.43
AGW-13	1/23/2004	5-20	197.05	10.68	--	186.37
AGW-13	4/13/2004	5-20	197.05	10.44	0	186.61
AGW-13	7/9/2004	5-20	197.05	10.73	0	186.32
AGW-13	10/29/2004	5-20	197.05	9.08	0	187.97
AGW-13	1/5/2005	5-20	197.05	8.95	0	188.10
AGW-13	5/2/2005	5-20	197.05	9.50	0	187.55
AGW-13	8/16/2005	5-20	197.05	10.09	0	186.96
AGW-13	12/6/2005	5-20	197.05	10.21	0	186.84
AGW-13	1/6/2006	5-20	197.05	9.63	0	187.42
AGW-13	5/5/2006	5-20	197.05	9.52	0	187.53

Well AGW-13 (cont.)

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
AGW-13	7/28/2006	5-20	197.05	10.16	0	186.89
AGW-13	10/20/2006	5-20	197.05	10.18	0	186.87
AGW-13	1/22/2007	5-20	197.05	10.56	0	186.49
AGW-13	5/11/2007	5-20	197.05	10.03	0	187.02
AGW-13	7/20/2007	5-20	197.05	10.07	0	186.98
AGW-13	11/2/2007	5-20	197.05	9.80	0	187.25
AGW-13	2/8/2008	5-20	197.05	7.93	0	189.12
AGW-13	4/4/2008	5-20	197.05	8.95	0	188.10
AGW-13	7/2/2008	5-20	197.05	8.68	0	188.37
AGW-13	11/13/2008	5-20	197.05	9.77	0	187.28
AGW-13	2/16/2009	5-20	197.05	8.57	0	188.48
AGW-13	4/30/2009	5-20	197.05	9.66	0	187.39
AGW-13	7/8/2009	5-20	197.05	10.12	0	186.93
AGW-13	3/25/2010	5-20	196.94	9.83	0	187.11
AGW-13	7/6/2010	5-20	197.18	10.52	0	186.66
AGW-13	1/27/2011	5-20	197.18	8.96	0	188.22
AGW-13	7/5/2011	5-20	197.18	9.39	0	187.79
AGW-13	1/26/2012	5-20	197.18	9.48	0	187.70

<u>Well F120 Water Levels</u>

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
F120	12/26/1990	--	195.38	--	--	--
F120	4/15/1993	--	195.38	10.34	--	185.04
F120	7/1/1993	--	195.38	10.38	--	185.00
F120	2/3/1994	--	195.38	8.77	--	186.61
F120	6/16/1994	--	195.38	11.42	--	183.96
F120	8/18/1994	--	195.38	6.85	--	188.53
F120	11/17/1994	--	195.38	11.58	--	183.80
F120	2/16/1995	--	195.38	9.54	--	185.84
F120	5/22/1995	--	195.38	11.40	--	183.98
F120	8/8/1995	--	195.38	11.64	--	183.74
F120	12/5/1995	--	195.38	--	--	--
F120	3/6/1996	--	195.38	--	--	--
F120	6/5/1996	--	195.38	--	--	--
F120	12/11/1996	--	195.38	--	--	--
F120	3/24/1997	--	--	--	--	--
F120	5/28/1997	--	--	11.68	--	--
F120	7/23/1997	--	197.95	11.72	--	186.23
F120	10/22/1997	--	197.95	12.00	--	185.95
F120	2/12/1998	--	197.95	9.21	--	188.74
F120	5/5/1998	--	197.95	10.39	--	187.56
F120	8/4/1998	--	197.95	11.03	--	186.92
F120	11/2/1998	--	197.95	10.65	--	187.30
F120	3/30/1999	--	197.95	11.44	--	186.51
F120	6/18/1999	--	197.95	11.36	--	186.59
F120	9/16/1999	--	197.95	11.73	--	186.22
F120	12/28/1999	--	197.95	11.77	--	186.18
F120	3/29/2000	--	197.95	10.45	--	187.50
F120	6/16/2000	--	197.95	11.20	--	186.75
F120	9/15/2000	--	197.95	11.77	--	186.18
F120	12/13/2000	--	197.95	--	--	--
F120	3/16/2001	--	197.95	9.70	--	188.25
F120	8/20/2001	--	197.95	--	--	--
F120	10/12/2001	--	197.95	11.80	--	186.15

Well F120 Water Levels (cont.)

Well ID	Date Sampled	Screen Interval (ft bgs)	TOC (ft MSL)	DTGW (ft bgs)	NAPL Thickness (feet)	GW Elevation (ft MSL)
F120	1/8/2002	--	197.95	12.07	--	185.88
F120	4/18/2002	--	197.95	11.18	--	186.77
F120	7/26/2002	--	197.95	11.49	--	186.46
F120	10/17/2002	--	197.95	11.19	--	186.76
F120	1/17/2003	--	197.95	11.85	--	186.10
F120	4/17/2003	--	197.95	11.05	--	186.90
F120	7/16/2003	--	197.95	11.15	--	186.80
F120	10/24/2003	--	197.95	12.06	--	185.89
F120	1/23/2004	--	197.95	12.15	--	185.80
F120	4/13/2004	--	197.95	10.61	0	187.34
F120	7/9/2004	--	197.95	12.83	0	185.12
F120	10/29/2004	--	197.95	13.43	0	184.52
F120	1/5/2005	--	197.95	13.43	0	184.52
F120	5/2/2005	--	197.95	10.89	0	187.06
F120	8/16/2005	--	197.95	11.69	0	186.26
F120	11/4/2005	--	197.95	11.78	0	186.17
F120	1/6/2006	--	197.95	11.41	0	186.54
F120	5/5/2006	--	197.95	10.83	0	187.12
F120	7/28/2006	--	197.95	11.67	0	186.28
F120	10/20/2006	--	197.95	11.65	0	186.30
F120	1/22/2007	--	197.95	11.82	0	186.13
F120	5/11/2007	--	197.95	11.12	0	186.83
F120	7/20/2007	--	197.95	11.44	0	186.51
F120	11/2/2007	--	197.95	11.39	0	186.56
F120	2/8/2008	--	197.95	9.47	0	188.48
F120	4/4/2008	--	197.95	10.44	0	187.51
F120	7/2/2008	--	197.95	10.60	0	187.35
F120	11/13/2008	--	197.95	11.47	0	186.48
F120	2/16/2009	--	197.95	10.41	0	187.54
F120	4/30/2009	--	197.95	11.21	0	186.74
F120	7/8/2009	--	197.95	11.75	0	186.20
F120	3/25/2010	--	197.95	10.94	0	187.01
F120	7/6/2010	--	198.70	11.57	0	187.13
F120	1/13/2011	--	198.70	9.90	0	188.80
F120	7/5/2011	--	198.70	10.22	0	188.48
F120	1/26/2012	--	198.70	10.84	0	187.86

APPENDIX D

Geotechnologies 2023 Technical Memorandum – *Subsidence Evaluation based on Dewatering Simulations Evaluation, Proposed TVC Project*

Geotechnologies, Inc.
Consulting Geotechnical Engineers

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Glendale, California 91201-2837
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April 28, 2023
File No. 21699

Television City Studios, LLC
7800 Beverly Boulevard
Los Angeles, California 90036

Subject: Subsidence Evaluation based on Dewatering Simulations Evaluation
TVC Project
7800 West Beverly Boulevard, Los Angeles, California
(Including 7716 – 7860 West Beverly Boulevard, Los Angeles, California)

References: *Reports by Geotechnologies, Inc.:*
Preliminary Geotechnical Engineering Investigation, revised April 22, 2021;
Addendum I – Response to Soils Report Review Letter, dated June 3, 2021;
Addendum II – Additional Geotechnical Comments, dated August 26, 2021;
Addendum III – Additional Explorations & Response to DEIR Review Comments, dated December 7, 2022.

City of Los Angeles, Department of Building and Safety:
Soils Report Review Letter (Log # 117112), dated May 21, 2021;
Soils Report Approval Letter (Log # 117112-01), dated August 4, 2021.

Report by Geosyntec Consultants:
Preliminary Evaluation – Dewatering Simulation and Analysis for Temporary Excavation and Underground Parking Structure Construction (Project Number: LB1019A), dated April 28, 2023.

This report has been prepared for informational purposes in response to comments on the Draft EIR (DEIR) regarding potential subsidence due to temporary dewatering during excavation and construction of the proposed subterranean parking structure. This evaluation is based on the results of explorations performed by this firm and a review of the referenced preliminary evaluation report prepared by Geosyntec Consultants (Geosyntec).

The Project is currently in the entitlement phase and not the building permit process. As stated in the referenced Addendum I report, which is included in Appendix E.3 of the DEIR, a temporary cut-off wall system was preliminarily recommended for shoring and excavation of the proposed subterranean parking structure. The addendum report was submitted and approved by the City of Los Angeles Department of Building and Safety Grading Division (LADBS Grading) under Log # 117112-01.

Detailed discussions of a simulation and evaluation of an example excavation and temporary construction dewatering using a sample method of extracting groundwater and controlling excavation infiltration using the low-permeability grout cut-off wall are presented in the referenced Geosyntec report.

This simulation evaluated the Area 2 excavation presented in the DEIR using numerical groundwater modeling. The Area 2 excavation is the largest by volume of the deeper excavations located along the northern perimeter of the Project Site, and, therefore, provides a representative preliminary dewatering evaluation example. The Geosyntec report also presents preliminary comparative estimates for dewatering quantities and drawdown for the other excavation areas.

According to the groundwater extraction simulation by Geosyntec, the predicted groundwater drawdown due to the temporary dewatering of the Area 2 excavation area was found to decrease with distance from the excavation. The predicted drawdown was found to be time-dependent, with both the magnitude and spatial extent of drawdown increasing as dewatering continued. The model estimated a cone of depression drawdown of approximately 10 ft extending up to approximately 50 to 75 ft from the Area 2 excavation perimeter and approximately 4 ft of drawdown at a distance of up to approximately 150 ft from the Area 2 excavation perimeter following 8 months of dewatering. After the end of the 21-month simulated dewatering period, the model estimated a cone of depression drawdown of approximately 10 ft extending up to approximately 125 ft from the Area 2 excavation perimeter and approximately 4 ft of drawdown at a distance of up to approximately 300 ft from the Area 2 excavation perimeter. The numerical model and groundwater drawdown simulation and analyses are described in detail in the referenced Geosyntec report.

Since the Area 2 excavation represents the largest by volume of the deeper excavations of the Project, approximately the same groundwater cone of depression could be anticipated to extend radially from the edges of the overall excavation if all excavation areas presented in the DEIR are dewatered simultaneously with the implementation of regulatory groundwater infiltration control measures and shoring techniques, as presented in the Geosyntec report.

Based on research performed by Geosyntec, the hydrograph records from individual monitoring wells in the vicinity of the Project Site have recorded long-term water level fluctuations ranging from approximately 3 to 6.5 ft. It is our experience that it is common to have groundwater elevation fluctuations in the range estimated for this dewatering example from a variety of regulatory-approved activities, including other construction excavation dewatering projects, groundwater remediation systems, industrial supply wells, and stormwater infiltration systems.

Given the long-term water level fluctuations ranging from 3 to 6.5 ft (due to seasonal changes and regulatory-approved activities) recorded from monitoring wells in the vicinity of the Project Site, a drawdown of 10 ft will only be an additional 3.5 to 7 ft of groundwater level change below the past recorded water levels for the Project vicinity. This small amount of groundwater drawdown will have less than significant subsidence effects on the surrounding properties adjacent to the excavation. It is anticipated that the drawdown effects, as simulated by Geosyntec, will result in less than ½ inch of settlement for areas located in the immediate surrounding vicinity of the Project. The magnitude of any potential settlement will decrease with increased distance away from the excavation. For properties located further away from the excavation, where the depth of temporary dewatering drawdown will be approximately equal to the recorded long-term groundwater level fluctuation, the anticipated subsidence effects as a result of dewatering will be negligible.

Section 1812 of the California Building Code (CBC) presents the regulatory requirements for the design and inspections of earth retaining shoring system for Office of Statewide Health Planning and Development (OSHPD) projects. Section 1812.6 of the CBC states that, "[i]f the total cumulative horizontal or vertical movement (from start of construction) of the existing buildings reaches ½ inch or soldier piles movement reaches 1 inch all excavation activities shall be suspended. The geotechnical and shoring design engineers shall determine the cause of movement, if any, and recommend corrective measures, if necessary, before excavation continues."

Even though this section of the CBC is a requirement for OSHPD projects, the City of Los Angeles Department of Building and Safety (LADBS) has adopted the same ½ inch deflection requirement for all shoring system where a structure is located within a 1:1 surcharge plane (45-degree angle) projected up from the base of the excavation. Where there are no structures located within a 1:1 surcharge plane extending up from the base of the excavation, the maximum lateral deflection of 1 inch at the top of the shoring system is accepted by LADBS. The Project would be required to comply with this requirement and all other applicable regulatory requirements related to the temporary dewatering.

One half inch of horizontal or vertical movement is widely accepted and adopted by design professionals and construction industry standard of acceptance and is considered to be well within the structural tolerance of a well-designed structure.

The existing historic Rancho La Brea Adobe building is located to the south of the Project. Specifically, the Rancho La Brea Adobe is approximately 115 ft south of the southern property line. The majority of the proposed excavations along the south side of the Project (Area 4a and Area 5) are only up to 10.5 ft deep, except for the proposed parking structure planned at the southeast corner of the Project (Area 6) where excavation will extend up to 27 ft deep. Since the proposed excavations along the south side of the Project are less deep requiring significantly less dewatering and the existing adobe structure is located over approximately 150 ft from the deeper parking structure excavation in the southeastern portion of the Project Site, it is anticipated that the cone of depression and subsidence effects on the historic building will be negligible and less than significant with the implementation of regulatory groundwater infiltration control measures and shoring techniques, as discussed in the Geosyntec report.

As part of the regulatory requirements for temporary shoring and excavation, construction surveying and monitoring of the surrounding properties immediately surrounding the Project are required for compliance with this industry standard.

Through the dewatering simulation discussed above, Geosyntec has demonstrated that with the implementation of regulatory groundwater infiltration control measures and shoring techniques, as necessary, the depth and extent of groundwater drawdown would be reduced and result in less than significant impacts and subsidence effects on the surrounding properties and structures.

The simulation and modeling presented by Geosyntec is only one example of a potential regulatory infiltration control measure, based on the groundwater and soil conditions found at the Project Site and the anticipated excavation dimensions of the Area 2 excavation. Once the individual Project buildings are designed and permitted, a dewatering consultant and a shoring engineer will be engaged, and the method of temporary dewatering system and shoring system will be evaluated as part of the City's regulatory building permit process to ensure that any impact on the surrounding development is less than significant.

Additional confirmatory hydrogeologic testing studies will be performed, and excavation dewatering approaches and methods, as necessary, will be evaluated in the future as part of the City's regulatory building permit process. Other regulatory control methods and designs may be considered as additional subsurface and design information becomes available (i.e., when individual building construction plans are prepared following Project entitlement approval). For example, infiltration control may not be necessary for certain excavation areas and depths if low-permeability silts and clays are exclusively encountered. The final dewatering system methods, and shoring design, which are subject to regulatory control for safety and subsidence, will be submitted to LADBS for review and approval as part of the building permit processes prior to construction.

Should you have any questions please contact this office.

Respectfully submitted,
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