HYDROGEOLOGIC ASSESSMENT REPORT: LUCK CHEROKEE

OLD POST ROAD
CHEROKEE COUNTY, SOUTH CAROLINA

LUCK COMPANIES

Prepared For:
Luck Companies
P.O. Box 29682
Richmond, Virginia 23242

BUNNELL-LAMMONS ENGINEERING, INC.
No. C01452

BLE Project Number 24-24056

May 12, 2025

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May 12, 2025

Luck Companies
P.O. Box 29682
Richmond, Virginia 23242

Attention: Mr. Bruce Smith
Greenfield Development Manager

Subject: **Hydrogeologic Assessment: Luck Cherokee**
Luck Companies
Cherokee County, South Carolina
BLE Project Number 24-24056

Dear Mr. Smith:

As authorized through our proposal dated October 16, 2024, Bunnell Lammons Engineering, Inc. (BLE) has prepared the Hydrogeologic Assessment Report (HAR) herein in association with the proposed Luck Companies aggregate quarry in Cherokee County, South Carolina (herein referred to as the "Site"). The report herein provides information on local and regional hydrogeologic characteristics and potential impacts to groundwater elevations in the vicinity of Luck Cherokee during quarry operations.

If you have any questions concerning this report, please contact Timothy J. Daniel at (864) 288-1265.

Sincerely,
BUNNELL LAMMONS ENGINEERING INC.

T.J. Daniel

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1.0 INTRODUCTION

1.1 Background Information and Purpose

Bunnell Lammons Engineering (BLE) has prepared the Hydrogeologic Assessment Report (HAR) herein for Luck Companies (Luck) in association with the proposed Luck Cherokee aggregate quarry. The Site is located north of Old Post Road and interstate I-85, approximately five miles west of Gaffney, Cherokee County, South Carolina (**Figure 1**), and includes portions of tax parcels 045-00-00-053.000 and 027-00-00-035.000, with anticipated parcel subdivision.

The proposed property spans approximately 567 acres, with a 347.6-acre proposed permit boundary. The proposed extraction area, to be developed in two phases, will cover approximately 120 acres.

The purpose of this HAR is to assess groundwater flow into the proposed extraction area during dewatering and to simulate potential dewatering impacts on nearby groundwater wells.

1.2 Completed Scope of Work

This HAR began with the development of a preliminary site conceptual model. This model integrated known and anticipated primary features of the Site's geology, hydrogeology, proposed extraction area location and development, and site-specific relationships between structural geology and groundwater flow. The preliminary model informed the field data collection requirements for this assessment which included geologic, geophysical, and hydrogeologic information. Site-specific data were subsequently acquired to further characterize the hydrogeologic system, and the resulting data were analyzed to refine the site conceptual model. A computer-aided mathematical model prepared by Mr. George Losonsky, PhD of Losonsky & Associates, Inc. (L&A) using MODFLOW was employed to provide predictive simulations of future mine dewatering scenarios.

The subject field work was performed between November 2024 and February 2025. The scope of work performed, including site exploration and testing, consisted of the following:

- A Freedom of Information Act (FOIA) Request was submitted to gather information regarding public and private drinking water wells and surface water intakes within an approximately 0.5-mile radius of the site (***Section 3.1***).
- A literature review and vehicular reconnaissance of the surrounding area within an approximately 0.5-mile radius of the site was conducted in September 2024 to observe public drinking water wells, private drinking water wells, and public surface water intakes (***Section 3.3***).
- A geologic reconnaissance was conducted by BLE in support of groundwater modeling efforts (***Section 4.1***).

- Geophysical surveys were performed by Collier Geophysics, LLC. (Collier) across the proposed 120-acre extraction area and in one (1) monitoring well to characterize discontinuities (i.e., fractures, joints, faults) in the underlying bedrock which may represent high-conductivity groundwater conduits (***Section 4.2***). The services performed by Collier included:

    - Five (5) Very Low Frequency (VLF) profiles;
    - Three (3) 2-dimensional Electrical Resistivity Imaging (ERI) profiles; and
    - Geophysical borehole logging of one (1) groundwater well.

- A SCDES 3736 Monitoring Well application was submitted by BLE on November 8, 2024, and approved by South Carolina Department of Environmental Service SCDES on November 18, 2024.

- Six (6) permanent groundwater wells (hollow stem auger and air rotary drilling) were installed within the proposed extraction area by BLE between November 2024 and January 2025 (***Section 4.3***).

- A variable rate aquifer pumping test was performed in which a single well was pumped at rates ranging from 1 to 8 gallons per minute (GPM) for eight (8) hours (***Section 4.4.1***).

- A constant rate aquifer pumping test was performed in which a single well was pumped at approximately 4.5 GPM for forty-eight (48) hours (***Section 4.4.2***).

- A transient groundwater model was constructed by L&A for the site to provide predictive simulations associated with future mine dewatering scenarios (***Chapter 5***).

Luck provided additional site-specific data acquired by Subhorizon Geologic Resources (SGR) who performed rock core drilling at nine (9) locations and soil borings at eight (8) locations within the proposed permit boundary.

2.0 DESCRIPTION OF SITE

The Site consists primarily of wooded land, featuring a network of unimproved roads and a soil borrow area in the southern section. Two (2) earthen impoundments (dams) are present on-site, with one associated upstream reservoir (Thicketty Creek Watershed Reservoir No. 19) located within the proposed property boundary. Thicketty Creek, along with its tributaries, crosses the central portion of the site, generally flowing from west to east. A powerline easement traverses the western portion of the site in a north-south direction.

BLE performed a Phase I Environmental Site Assessment (ESA) of the property identified as Cherokee County Parcel Numbers 027-00-00-035.000 and 045-00-00-053.000 located north of Old Post Road, east of Green River Road, and south of Shady Grove Road. The site reconnaissance for the ESA was performed on November 8, 2024.

Historical records suggest the presence of single-family residences and associated outbuildings on the property from at least the 1950s through the mid-1960s. An orchard was also located in the southern portion of the property during this period. By the 1970s, the residences were no longer visible, and the property transitioned to primarily wooded land. Thicketty Creek WCD 19 was constructed in the central portion of the property around 1971. The powerline easement appeared in the western portion of the property around 1976. The southern portion of the property was developed as a soil borrow area around 2019, and the property has remained in a similar condition since that time.

2.1 Planned Quarry Operations

The quarry operations are planned to take place south of the surface water reservoir and jurisdictional wetlands, as delineated by Hodges, Harbin, Newberry & Tribble (HHNT) ecologists in November 2024. The wetland and other aquatic resource delineations remain an opinion of HHNT until formally verified by the US Army Corps of Engineers (USACE) through a formal determination letter. HHNT, on Luck's behalf, submitted a Delineation Concurrence Request (DCR) to the USACE on April 18, 2025.

Current design plans for the Site provided by HHNT indicate that the proposed extraction area, to be developed in two (2) phases, will cover approximately 120 acres (**Appendix A**). The Phase I extraction area will encompass 82.3 acres, with initial mining activities to occur within a 71.4-acre footprint. Temporary mine facilities and process plant will occupy 10.9 acres of the Phase I footprint and will be relocated southward as Phase I expands. The Phase II extraction area will occupy the remaining 37.8 acres. A 50-foot setback will be maintained along the perimeter of the property boundary. Overburden will be stored in three (3) areas and utilized for the construction of vegetated berms near property boundaries. The proposed road entrance to the mine facility will be from the south, off Old Post Road.

Current Site plans include quarry operations moving into the Phase II extraction area after approximately 15 years.

2.2 Physiography and Topography

The subject property is located within the Gaffney 7.5-minute US Geologic Survey (USGS) Quadrangle and is in the Piedmont physiographic province. The Piedmont is characterized by rolling relief that generally slopes from northwest to southeast, toward the Atlantic Coastal Plain physiographic province.

The Site's natural topography consists of a series of low relief ridges with a primary south-north trending ridge extending from the southern property boundary to Thicketty Creek Watershed Reservoir No. 19. The highest elevation at the Site is approximately 850 feet referenced to the North American Vertical Datum of 1988 (NAVD88) near the southern and central portion of the property, and the lowest elevation is approximately 670 feet within the 100-year floodplain of Thicketty Creek (**Figure 2** and **Figure 3**). Surface water flow in the area is directed towards Thicketty Creek, which bisects the property, flowing west to east, and contributes to the regional drainage system.

2.3 Geology

The Site is within the Inner Piedmont Belt, near its boundary with the Kings Mountain Belt (*Goldsmith et. al., 1988* [**Figure 4**]). The Site is underlain by gray to dark gray, locally garnetiferous, biotite gneiss with lesser amounts of calc-silicate rock, mica schist, and amphibolite interlayered. Trace amounts of sulfide minerals (e.g., pyrite) are present in some units. Residual soils at the Site formed by the in-situ chemical weathering of the underlying bedrock.

The typical residual soil profile consists of silty and clayey soils near the surface, where weathering is more advanced, underlain by a thin horizon of micaceous sandy silts and silty sands. These residual soil zones are commonly referred to as "saprolite." The thickness of saprolite in the Piedmont can vary significantly, ranging from a few feet to over 100 feet (*Hack, 1989*).

The presence of fractures, joints, and less resistant rock types promotes weathering, resulting in an irregular and erratic profile of partially weathered rock and hard rock, even over short horizontal distances.

2.4 Hydrogeology

Groundwater in the Piedmont usually occurs as unconfined, water-table aquifers in four primary geologic zones: 1) alluvial soils deposited in flood plains of streams and rivers; 2) residual soil (saprolite); 3) partially weathered rock; and 4) fractured bedrock. These zones are typically interconnected through open fractures and pore spaces. The configuration of the water-table aquifer generally resembles the local topography.

In the alluvial/residual soil and partially weathered rock zones, groundwater is stored within the pore spaces and is released to the underlying bedrock through gravity drainage. Metamorphic rocks, such as the biotite gneiss encountered at the Site, are composed of foliated minerals and have little or no pore space to transmit groundwater. Therefore, groundwater within the bedrock zone occurs primarily in fracture voids. Generally, fractures within the bedrock are small, but may extend to several hundred feet and may intersect other fractures forming complex, interconnected fracture networks.

Groundwater within the Piedmont generally moves from topographically high areas (recharge zones) to topographically low areas within and along stream valleys (discharge areas) (*Fetter, 2001*; *Freeze and Cherry, 1979; Feaster and Guimaraes, 2017*). Thicketty Creek which flows generally east across the Site is the expected discharge zone for the shallow aquifer.

2.5 Site Conceptual Model

The materials that comprise the unconfined aquifer consist of the residual soils, partially weathered rock, and fractured metamorphic bedrock. In the lower elevation areas, the thin alluvial sediments in the drainages also makeup a small portion of the water-table aquifer. These units are hydraulically connected and thus comprise a single unconfined aquifer, although recharge rates, flow rates and specific storage differ between the units based on the unique geologic conditions of each zone.

The generally accepted model for a Piedmont aquifer is a two layered system, built on the premise of an unconsolidated layer of soil and saprolite containing an unconfined aquifer that has a relatively high storage capacity supplying water to an underlying variably fractured metamorphic bedrock aquifer that has low overall porosity and storage (*Daniel, 1997*). The low overall porosity and storage are due to the dense, somewhat impermeable nature of the metamorphic bedrock. Groundwater yields from the bedrock aquifer are primarily associated with secondary porosity and permeability provided by fractures, faults, joints and foliations. The saprolite aquifer and bedrock fracture zones are common targets for private, public, industrial and irrigation groundwater wells. It is important to emphasize that crystalline bedrock aquifers are irregular and heterogeneous in distribution, often highly localized, and often exhibit discontinuous water bearing zones.

In summary, the local aquifer system can be conceptually simplified and viewed as a two-layered system with the upper layer consisting of a shallow, unconsolidated, unconfined, porous regolith water aquifer that can supply water to surface water features and to the second layer, the underlying fractured bedrock aquifer.

Infiltration of precipitation to recharge the unconfined aquifer is primarily affected by rainfall intensity and duration, soil characteristics (lithology), pre-existing soil moisture conditions, temperature (evaporation), plant uptake (transpiration), and separation between ground surface and the depth to groundwater. Soil samples logged in the field were typically fine to medium sandy clays that graded coarser with depth. These soils indicate favorable recharge areas due to their relatively high permeability.

Widespread groundwater elevation data was not available for the site during the duration of field activities. From our experience with similar geology, it is assumed that the configuration of the water-table surface is a subdued replica of the ground surface. Groundwater is assumed to discharge from the irregular saprolite-bedrock interface into Thicketty Creek north of the proposed Phase I and Phase II extraction area. During heavy rainfall events or in months where recharge exceeds evapotranspiration, groundwater may discharge into intermittent tributaries to Thicketty Creek.

3.0 WATER WELL INVENTORY

3.1 Freedom of Information Request

On Friday, November 22, 2024, BLE submitted a Freedom of Information (FOI) request to the SCDES via the FOI Office to review the available well records for Cherokee County. On December 18, 2024, BLE received two (2) spreadsheets from FOI Senior Coordinator Jennifer Barrier: The first was the Welltrak Query.xlsx, herein referred to as the legacy database, and second was the General Query.xlsx, herein referred to as the active well database. The legacy database contained information containing well completion information between 1990 and 2005. SCDES did not require well permits prior to 2000; therefore, older nonpermitted wells installed between 1990 and 1999 were only given a log number.

The active well database has been in use since 2005. We understand the active well database only includes wells that have been reported to SCDES and should not be considered a complete inventory of all wells in Cherokee County. Due to the size of the inventory provided by SCDES in the FOI request, the databases have not been included in this report but can be submitted electronically upon request.

The legacy database included one (1) private drinking water well within a 0.5-mile radius of the proposed extraction area when imported into Google Earth® via geocoding. The active well database did not include private drinking water wells within the same 0.5-mile radius.

3.2 Regulatory Resources

No Public Water Supply Wells (PWSW) were identified within a 0.5-mile radius of the proposed extraction area during BLE's review of the SC Watershed Atlas website (https://gis.dhec.sc.gov/watersheds/). The closest PWSW identified is approximately 3,040 feet southeast of the extraction area. The well is associated with Pinecone Campground (System 1170800). A 500-ft radius low volume PWSW buffer zone has been established for the well based its current pumping rate which is the minimum required buffer zone identified in the SCDES *Wellhead Protection Area (WHPA) Delineation Guidance for New Wells* in Piedmont Region Zone 1.

The closest active Surface Water Intake (SWI) to the proposed extraction area is approximately 3.5 miles northeast [Grass Pond Water District (11WS051G01)]. The Grassy Pond Water District SWI withdraws less than 100,000 gallons per day (gpd) and is therefore not required to report its withdrawals to SCDES. The closest SWI which does exceed withdrawals of 100,000 gpd is located 7 miles west [South Pacolet River (42WS004)]. The South Pacolet River SWI is operated by the Spartanburg Commission of Public Works.

No Surface Water Protection Areas (SWPA) were identified within a 0.5-mile radius of the extraction area.

3.3 Site Reconnaissance

In September 2024, BLE performed a vehicular reconnaissance of the neighboring properties adjacent to public rights-of-way that were within 0.5 mile of the proposed extraction area. Seven (7) confirmed or suspected private drinking water wells were identified during the reconnaissance. The approximate well locations are depicted on **Figure 5**. The closest suspected well is approximately 1,530 feet southwest of the extraction area at a residence on Old Post Road. The closest confirmed well is approximately 1,580 feet southeast of the extraction area at a private residence on Old Post Road.

4.0 FIELD METHODS

4.1 Geologic Field Mapping

On November 11, 2024, a geologic reconnaissance was conducted by BLE's Thomas O'Shea to refine the site conceptual model in support of groundwater modeling efforts. Few exposed bedrock outcrops were identified at the site. Bedrock outcrops encountered along two (2) reaches of Thicketty Creek west of the proposed extraction area were identified as garnetiferous biotite gneiss. The orientation of bedrock joints and foliation were measured and are presented on **Figure 6**. Fractures observed were typically joints with planar surfaces and no discernible offset. The most prominent joint orientation dipped between 74° and 84° to the west. Foliation generally dipped between 12° and 22° (average 18°) to the north.

4.2 Geophysical Survey

While the Inner Piedmont Belt and the Kings Mountain Shear Zone have been significantly studied, much of the published literature is focused on the structural geology and unique mineralogic compositions of the associated structures (*Goldsmith et. al., 1988; Horton 1981*). No 7.5-minute geologic quadrangle fully encompasses the site. The most comprehensive geologic mapping of area was performed as part of the *Geologic Map of the Charlotte 1 Degree x 2 Degrees Quadrangle, North Carolina and South Carolina* (*Goldsmith, 1981*). Thus, geophysical investigations were performed to characterize the fractures which dominate the presumed dual porosity flow regime at the site and to inform the layout and spacing of wells used for monitoring water-level response during aquifer pumping tests.

BLE subcontracted Collier to perform geophysical surveys across the proposed 120-acre extraction area. Collier collected five (5) Very Low Frequency (VLF) profiles and three (3) 2-dimensional Electrical Resistivity Imaging (ERI) profiles to characterize discontinuities (i.e., fractures, joints, faults) in the underlying bedrock which may represent high-conductivity groundwater conduits. Following groundwater well installations, Collier returned to the site to perform Optical Televiewer (OTV) logging of the pumping well (P-1).

The VLF survey was employed for imaging discrete fractures that propagate to the bedrock surface fractures in the immediate vicinity of the proposed extraction area, and ERI was utilized to further characterize fractures identified in the VLF data and provide estimates of bedrock resistivity.

The VLF survey utilizes very low frequency radio signals to measure electrical properties of near surface soil and shallow bedrock. Features such as fractures, joints, or fault zones are generally more electrically conductive than the surrounding crystalline bedrock (*Hutchinson et al., 2001*). Analysis of the contrasting electrical conductivity data collected via VLF can be used to characterize the subsurface and identify zones which may represent high-conductivity groundwater conduits.

Collier collected data along five (5) VLF profiles covering approximately 10,000 linear feet in a rectangular grid, as depicted on **Figure A-2** within **Appendix B**. The profile locations and orientations were selected based on regional and local geologic information, information contained in boring logs prepared by SGR, as well as inferences from field observations made by BLE in November 2024.

The VLF data were collected by walking a series of lines (i.e., profiles) with a backpack VLF receiver and stopping to collect data at points at consistent intervals along each line. The location of each data point along the profile is determined and recorded using a non-survey grade GPS. The VLF method is sensitive to cultural interference from items such as pipelines, utilities, fences, and other conductive objects. No such features were observed at the time of data collection.

The ERI profiles were collected with a 5-meter spacing Advanced Geophysical Systems Inc. (AGI) Super Sting R8 8-channel multiple electrode resistivity imaging system (Sting R8). The ERI equipment consisted of a transmitter/receiver, cables capable of utilizing up to 84-takeouts for electrodes, and a marine battery for powering the system. The lines were designed to image approximately 300 feet below ground surface (bgs) (**Figure A-7** within **Appendix B**).

Following field data collection, the VLF and ERI data were post-processed. **Appendix B** contains the Collier report which includes figures illustrating the VLF and ERI profiles.

Collier returned to the site on February 3, 2025 to perform geophysical borehole logging in the pumping well (P-1) installed within the proposed extraction area. OTV was used to record and digitize a 360-degree color image of the borehole walls. The image was magnetically oriented and used to determine the orientation of fractures and bedrock foliation. Dip angle and dip direction were calculated for each feature identified. Collier's report and OTV borehole logs are included in **Appendix B**.

4.3 Drilling & Well Installations

The layout and spacing of wells for monitoring water-level response during aquifer pumping tests, and for estimating aquifer parameters, were determined based on several factors: the findings of the VLF and ERI geophysical surveys, boring records prepared by SGR, and geologic field observations by BLE. The pumping and observation wells were strategically oriented to target intersecting, communicative primary fractures in order to provide the highest feasible hydraulic conductivity to be used in L&A's groundwater model.

Drilling and well installation activities were performed between November 26, 2024 and January 9, 2025. South Atlantic Environmental Drilling and Construction Company, Inc. (SAEDACCO), a South Carolina licensed well driller, performed the well installation activities. Personnel from BLE observed the installation activities under the direction of a South Carolina licensed geologist. A registered land surveyor from Glenn Associates Surveying, Inc. of Jenkinsville, South Carolina performed the as-built surveying after completion of the drilling activities. The as-built survey data can be found in **Table 1**.

On behalf of Luck Companies, BLE obtained a well installation permit (Permit) from the SCDES Mining and Reclamation Program. The permit is included in **Appendix C**. BLE notified SCDES of the schedule for these field activities, as required by the permit.

The pumping well (P-1) was the first to be drilled and constructed. The estimated well yield during the drilling of P-1 then informed the spacing of the observation wells. In addition to hydrogeological considerations, the location of the well network also considered the anticipated placement of mining infrastructure and the potential for using one or more of the wells for future plant operations.

One (1) pumping well (P-1) and five (5) observation wells (O-1, O-2, O-3, O-4 and O-5) were installed in bedrock at the Site, each to a total depth of approximately 400 feet bgs. The borings were performed using a Gus Pech 1100D truck-mounted drill rig, employing a combination of hollow-stem auger and air-rotary drilling techniques in soil and bedrock.

Soil borings were advanced by twisting a continuous flight of steel, 12-inch outside diameter (OD), hollow-stem augers into the soil. Where competent rock was encountered, an 8-inch OD down-hole pneumatic drill hammer was first used to advance the borehole into the upper surface of the bedrock, then a 6-inch OD down-hole pneumatic drill-hammer was used to advance the borehole into bedrock to termination. The pneumatic drill-hammers advanced through the subsurface materials by rapidly striking the rock while the drill pipe was slowly rotated. The drill hammers were constructed of alloy steel with tungsten-carbide inserts that provide the chipping or cutting surfaces. An in-line oil coalescing filter was attached to the air compressor on the rig to prevent oil contamination from entering the borehole.

The soil and rock descriptions recorded on the boring logs in **Appendix C** are based on visual examination and soil laboratory results. The descriptions conform to the Unified Soil Classification System (USCS).

The depth to competent bedrock varied significantly over short horizontal distances, ranging from 50 to 140 feet (average 96 feet) bgs at the six (6) well locations. In general, the bedrock encountered became more competent with depth. The bedrock encountered consisted primarily of fresh to slightly weathered biotite gneiss.

The wells consist of 6-inch internal diameter (ID) polyvinyl chloride (PVC; Johnson Schedule 40, NSF-rated) casing with flush-threaded joints inserted in 8- to 12-inch nominal diameter boreholes to the top of competent bedrock. The well annulus was then grouted with a 5% bentonite-cement mixture to within 1 foot of the ground surface to secure the casing in place and prevent the infiltration of water from the soil residuum. The bedrock interval of each well consists of a 6-inch diameter nominal open borehole so that the transmissivity of the well is a function of the entire length of the open hole section.

The surface completion of each well consisted of an 8-inch by 8-inch standup protective steel cover painted safety yellow, with a 3-foot by 3-foot concrete pad. A vent hole was drilled in the PVC casing near the top of the well and a weep hole was drilled near the base of the steel cover. A well identification tag was secured to each locking steel cover with its corresponding well number and construction details.

The locations of the wells are shown on **Figure 2**. Survey data and drilling depths are summarized in **Table 1** and **Table 2**, respectively. Fractured rock intervals observed during the drilling and well installation activities are summarized in **Table 3**.

Water Well Records (SCDES Form 1903) are included in **Appendix C**.

4.4 Aquifer Pump Testing

4.4.1 Variable Rate (Step) Test

On January 22, 2025, BLE conducted a variable flow rate (step) aquifer pumping test on well P-1 to determine the target flow rate for a constant rate test. A 3-horsepower Grundfos 40S30-9 submersible electric pump with a 55-GPM maximum flow capacity was used for the test. The pump was connected to a 2.0-inch nominal diameter pipe and lowered to approximately 250 feet bgs. A gate valve was used to control discharge, which was monitored with a 2-inch diameter analogue flow meter. A vented Seametrics PT2X® pressure transducer/datalogger was deployed in the pumping well at approximately 225 feet bgs to record drawdown, and a Seametrics BaroSCOUT2X barometric pressure sensor was deployed nearby to compensate water level measurements.

The step test used pumping rates of 1, 2, 3.3, 5, and 8 GPM, based on field observations and estimated water yields during the drilling program. The test began at 1 GPM for 25 minutes, until drawdown in the pumping well became asymptotic. The pumping rate was then increased to 2 GPM for 60 minutes, to 3.3 GPM for 95 minutes, and to 5 GPM for 30 minutes, with each step prompted by the drawdown becoming asymptotic. The pumping rate was increased to 8 GPM for 55 minutes until it was determined that the maximum stable pumping rate had been exceeded and the pumping rate was reduced to a rate of 3.8 to 4.5 GPM for approximately 175 minutes until test completion. Drilling records and geophysics indicate a highly weathered fracture zone at approximately 121 to 123 feet bgs. During the installation and subsequent pump testing of pumping well P-1, a significant amount of loose material was removed from this zone which resulted in excess storage of groundwater and an artificially asymptotic drawdown curve for 55 minutes during the pump test. This anomaly and additional drawdown data is depicted on the step drawdown plot for pumping well P-1 in **Appendix D**.

A target flow rate of 4.5 GPM was selected for the constant rate pumping test following analysis of the drawdown data.

4.4.2 Constant Rate Test

A 48-hour constant rate aquifer pumping test was performed using well P-1 as the pumping well and wells O-1 through O-5 as observation wells. The test began on January 28, 2025, and was completed on January 30, 2025. This test was configured and conducted in a similar manner to the step test, though the pumping rate remained relatively constant at approximately 4.5 GPM. A 1-horsepower Myers 2ST102 submersible electric pump with a 7 GPM maximum flow capacity was used for the test. The pump was connected to a 2.0-inch nominal diameter pipe and lowered to approximately 350 feet bgs. The same flow control device and flow meter utilized during the step test were employed during the constant rate test.

Prior to beginning the pump test, BLE deployed Seametrics PT2X® pressure transducer/dataloggers in the pumping well (P-1) and the five (5) observation wells (O-1, O-2, O-3, O-4, and O-5) to record drawdown during the pumping test. A vented transducer was deployed to approximately 275 feet below top of casing (btoc) in the pumping well to allow for real-time drawdown monitoring. Unvented transducers were deployed to 120 feet btoc in the observation wells. The same barometric pressure sensor was used to compensate water level measurements. Manual water level readings were collected from each of the five (5) observation wells during the test. **Table 4** provides a summary of the transducer models, deployment depths, and logging intervals utilized.

The pumping phase of the constant rate pumping test lasted 48 hours. The pump rate was held generally constant throughout the test at 4.5 GPM, with a total of approximately 12,955 gallons pumped from the well during the pumping portion of the test.

After the pumping test concluded and the pump was deactivated, transducers continued to log data during the aquifer recovery phase until they were removed from the wells on February 3, 2025. No rainfall events occurred during the constant rate pumping test or within 24 hours of the test. Plots of groundwater elevation and drawdown measurements are included in **Appendix D**. The maximum drawdown for each well is provided in **Table 5**.

5.0 AQUIFER TEST ANALYSIS AND MODEL CONSTRUCTION AND CALIBRATION

5.1 Conceptual Model Design

The model simulates currently planned mining in two (2) phases as defined below:

- Phase I will reach a pit bottom elevation of 600 feet (NAVD 88) after approximately 15 (+/- 5) years of operation, removing approximately 10 million tons of aggregate at a rate of 500,000 tons per year. The depth of the Phase I pit bottom will vary with topography, ranging from approximately 90 to 230 feet bgs.
- Phase II is projected to be completed in approximately 90 to 100 years when the mining pit has reached its maximum lateral pit limits and a pit bottom elevation of 350 to 300 feet (NAVD 88). Depth of the Phase II pit bottom will range from approximately 350 to 475 feet bgs.

5.2 Numerical Modeling of Aquifer Test

The numerical model simulation of the constant-rate aquifer pumping test successfully approximated drawdown response curves measured in observation wells during the constant-rate pumping test. The model analysis applied an equivalent porous media (EPM) approach to derive aquifer parameters, including hydraulic conductivity in the horizontal (Kx, Ky) and vertical (Kz) directions, specific yield (Sy), specific storage (Ss), and storativity (S). Drawdown anisotropy, defined as the ratio of maximum to minimum distances to same drawdown, was calculated as the square root of the horizontal anisotropy ratio (Kx/Ky). An EPM approach assumes that fractured bedrock can be treated as a homogenous continuum when hydrogeologic parameters are derived from aquifer testing and other site-specific data (*Anderson and Woessner, 2015*).

Aquifer parameters developed via the calibration process are summarized in **Table 6**. Results of the numerical model can be found in **Appendix E**.

5.3 Groundwater Flow Model Design

The groundwater modeling was performed using Groundwater Vistas MODFLOW Version 6.96. Groundwater Vistas MODFLOW is pre- and post-processor graphical interface program employing the United States Geologic Survey's (USGS) MODFLOW-2005 Version 1.11.00 code. The model code is based on the finite difference method of solving partial differential equations describing groundwater flow, as described in McDonald and Harbaugh (*1989*).

MODFLOW solves the groundwater flow equation by dividing the model domain into blocks, or cells, within which aquifer properties are assumed to be uniform. Vertically, the model can be subdivided into layers with variable thickness. Each cell is assigned a unique flow equation, and the resulting matrix of equations describing the model domain are calculated with a solver program over a series of time steps. The solver computes flow rate and cumulative volume balances for inflow and outflow at each cell at each time step.

In preparation for development of a regional model for the simulation of site and regional effects of the proposed mine dewatering, a three-dimensional groundwater flow model was developed and calibrated to the site-specific aquifer pumping test data. Use of a discretized model to evaluate site-specific variables was essential where pit configurations were mapped. The pumping test calibration model simulated the effect of fractures over a domain limited to the area of the geophysical profiles and pumping test well locations. The purpose of the pumping test calibration model was to derive input parameters for the regional model simulations.

Following aquifer test calibration, an EPM model was developed for the purpose of simulating specific phases of the proposed mining operations over time. The EPM model applied aquifer parameters derived from the pumping test to a larger, more regional domain.

5.3.1 Model Domain, Layers, and Boundary Conditions

The model uses a 17,000-foot (east-west) by 20,000-foot (north-south) rectangular grid. The cell size of the grid in the x and y directions is 100-foot by 100-foot across the entire model domain. The model uses five (5) layers in the z direction identified as Layer 1, Layer 2, Layer 3, Layer 4, and Layer 5.

Layer 1 extends from the ground surface, defined by topographic contours, to the top of unweathered rock, defined by interpolated structure contours based on depths to bedrock encountered during the exploratory drilling program performed by SGR and the installation of the pumping and observation wells by BLE with a typical depth of 58 feet bgs. Layer 1 represents weathered residuum. Layer 2 also has variable thickness and extends to 200 feet bgs. Layer 2 represents approximately 142 feet of unweathered rock throughout most of the model domain.

Across the model domain, the upper boundary of Layer 3 varies in elevation from approximately 480 to 600 feet NAVD88. Near the proposed extraction area, the top of Layer 3 is approximately 500 feet NAVD88. The thickness of Layer 3 is approximately 100 feet thick in the vicinity of the proposed extraction area and increases to approximately 200 feet in thickness southwest of the proposed extraction area.

Layer 4 is 100 feet thick, extending from 400 feet to 300 feet NAVD88. Fracture porosity is approximately 30 percent lower in Layer 4 compared to Layers 2 and 3. Layer 5 extends from 300 feet to 100 feet NAVD88. Fracture porosity is approximately 50 percent lower in Layer 5 compared to Layers 2 and 3. Layer 5 represents approximately 200 feet of bedrock beneath the final bottom of the mine.

The hydraulic conductivity, storativity (S), specific storage (Ss), and specific yield (Sy) developed via the calibration process are summarized in **Table 6**.

The model domain provided sufficient distance between the mine and the edges of the model to avoid significant impact of the boundaries on the mining simulations. General head boundaries were therefore applied at the edges of the model, with conductance values based on the horizontal component of hydraulic conductivity in each respective model layer. The model bottom was set as a no-flow boundary, at elevation 100 feet NAVD88.

Figure 7 depicts the grid, model domain, and surface water features which were divided into five (5) categories: primary streams (i.e., perennial), intermittent streams, reservoirs, settling ponds, and outer ponds. Perennial and intermittent streams documented in HHNT's DCR and USGS HUC-12 stream data obtained for the Upper Thicketty Creek Watershed were incorporated. A sensitivity analysis was conducted to assess potential impacts on the groundwater model using surface water features identified by the USGS National Hydrography Dataset versus surface water features identified in HHNT's DCR. The sensitivity analysis demonstrated that the impacts of the different surface water configurations had a minimal impact on the simulated dewatering rates and potentiometric heads.

The perennial streams identified in HHNT's DCR and the HUC-12 stream data are used as constant head boundaries in the model. Ephemeral streams are excluded from the model based on the assumption that they have insufficient flow to serve as constant head boundaries.

Surface water bodies have the following dimensions and standard streambed conductance (K_{sb}) based on known sediment characteristics of local streams, and assumed settling pond construction:

- Primary Streams – width 10 feet; cell length 100 feet; thickness 1 foot; K_{sb} = 10 ft/day
- Intermittent Stream Reaches – width 5 feet; cell length 100 feet; thickness 1 foot; K_{sb} = 10 ft/day
- Reservoirs – width 100 feet; cell length 100 feet; thickness 1 foot; K_{sb} = 1 ft/day
- Settling Ponds – width 100 feet; cell length 100 feet; thickness 1 foot; K_{sb} = 0.0012 ft/day
- Outer Ponds – width 100 feet; cell length 100 feet; K_{sb} = 0.0012 ft/day

All five (5) surface water body categories were assumed to have 1-foot of nominal streambed thickness. Perennial streams were assumed to have a threshold of 50 feet, which is the distance below the bottom of the stream at which the leakage rate becomes independent of the position of the water table.

A series of eight (8) proposed retention ponds were selected as discharge areas for water extracted during pit dewatering. Groundwater modeling simulated discharge of dewatering water to the ponds, and ultimately to Thicketty Creek Watershed Reservoir No. 19. The model assumes that groundwater discharge from the quarry ultimately reaches the reservoir and that the discharge rate exceeds the recharge rate of the quarry to the underlying unconfined aquifer. Therefore, the static water level in Thicketty Creek Watershed Reservoir No. 19 is not anticipated to undergo significant changes from pre-mining conditions. A time-varying constant head boundary condition was applied to the individual mining stages. This boundary condition allows a specified head to change gradually over time during a model stress period.

5.4 Groundwater Flow Model Results

The results of MODFLOW model are shown in two (2) separate forms: cross sections profiles of water table contours (**Figure 8**), and drawdown contours (**Figures 9A-D**). Water table elevation contours are shown for three (3) time steps: 0 years (current), 60 years, and 100 years with a contour interval of 20 feet in **Figure 8**. Drawdown contours are shown for four (4) time steps: 15 years, 30 years, 60 years, and 100 years in **Figures 9A-D**.

The water table shows little impact outside of the proposed extraction area after 15 years of mining. After 30 years of mining, the limited impact on the water table extends southward approximately 2,000 feet, and northward to Thicketty Mountain Creek, with differences of less than 2 feet in groundwater elevation. **Figure 8** includes north-south and east-west oriented cross section profiles of the model across the mine pit. The profiles include the current water table (dashed blue curve), the depressed water table after 60 years of mining (light blue curve), and the final water table trough under the mine after 100 years (dark blue curve). The water table trough has steep sides and is largely contained within the proposed permit boundary. The water table drops by approximately 50 feet midway between the proposed extraction area and interstate I-85 to the south of the site after 60 years of mining (**Figure 8**). After 100 years of mining the impact on the water table extends southward approximately 3,000 feet (**Figure 8**). After 100 years of mining, appreciable impacts on the water table are limited to the immediate vicinity of the proposed permit area to the east and west and is largely contained by Thicketty Creek Watershed Reservoir No. 19 to the north.

Water table drawdown generally exhibits subtle variations with depth. The drawdown contours represented in **Figures 9A-D** are from Layer 3, which is representative of regional aquifer response to the proposed mining operation. Drawdown is anticipated to be greater in the southern and northern directions, following the north-south direction of horizontal anisotropy determined by the pumping test analysis (trending north-south with anisotropy ratio of 4.08 [**Appendix E**]). Some drawdown is shown at depth across Thicketty Creek Watershed Reservoir No. 19 in the model, reflecting three-dimensional groundwater flow patterns.

5.5 Groundwater Flow Model Limitations

The groundwater model is limited by the availability of regional groundwater elevation and fracture zone data. No long-term water-table elevations for any of the surrounding private drinking water wells were available. While lateral continuity of significant fracture zones identified during geophysics and drilling, as shown on **Table 3**, can be reasonably assumed, their regional extent has not been verified. The locations and spacing of the observation wells installed as part of this hydrogeological assessment targeted interconnected fractures and low electrical resistivity within the proposed extraction area based on the results of the geophysical investigation.

Perennial streams in the piedmont of South Carolina are typically “gaining” streams, meaning that groundwater is discharged to the streambed while intermittent streams are typically “losing” streams meaning that surface water recharges the underlying aquifer (*Feaster and Guimaraes, 2017*).

The estimated time to reach projected quarry depths and the footprint as currently provided to BLE in **Appendix A** are considered significant parameters to the model. If the proposed site design changes or if the USACE dissents from the DCR for the facility, then several of the model parameters may require updates. Additionally, future modifications to the groundwater model may be deemed necessary if there are changes to the proposed extraction area footprints, extraction area depth, or pit phasing. Following the installation of observation monitoring wells shown in **Appendix F**, future model calibration may be required after the facility has been in operation and actively dewatered for a sufficient period for the wells to begin observing drawdown.

The activities and evaluative approaches used in this scope of work are consistent with those normally employed for services of this type. Our services have been performed based on our understanding of the Site and the observations made during our work. Natural variations in the physical composition of the soil overburden and fractured bedrock and the resolution of the data collected limit both accuracy and precision of subsurface hydrogeologic predictions. The limitations apply to groundwater elevation, flow, and other intrinsic aquifer properties which results in some variability to groundwater models.

6.0 CONCLUSIONS

BLE completed this HAR for an approximately 567-acre Site located in Cherokee County, South Carolina. This report is intended to provide estimates of local geologic and hydrogeologic conditions and to aid in making inferences as to the impact of mining activities on the identified private drinking water wells within 0.5 mile of the extraction area and local surface water features.

The results of this HAR and the data included herein are the product of hydrogeological field testing, data analysis, and predictive numerical modeling that is consistent with industry standards and was performed by BLE and its subcontractors. The completed scope of work included activities such as geophysics (VLF, ERI, and OTV), geologic mapping, the installation of groundwater observation and pumping wells, drawdown testing, and finite-difference numerical modeling of anticipated groundwater drawdown as a function of time. Hydrogeologic input parameters of the numerical model were calibrated to drawdown observed during the aquifer pumping test (**Table 6**).

This hydrogeologic assessment relied on a process that began with the development of a preliminary site conceptual model. The preliminary model was based on known or expected main features of geology, hydrogeology, proposed extraction area location and development, and site-specific relationships between geologic structures and groundwater flow. The preliminary site conceptual model was utilized to develop field data collection needs for this assessment. Site-specific data were collected for the purpose of further characterizing the hydrogeologic system and refining the site conceptual model.

A standard computer aided three-dimensional mathematical model was then employed to provide predictive simulations of effects of future mine dewatering scenarios. The model used conservative assumptions regarding aquifer properties and was consistent with standard best practice in numerical finite-difference modeling of flow in porous and fractured media. Dr. Losonsky modeled two (2) future mine pit development phases. Phase I is projected to be completed in approximately 15 years (+/- 5 years) when accounting for a series of 50-foot lifts and 90-foot-wide travel ways. Phase II is projected to be completed in 90 to 100 years when the mining pit has reached its maximum lateral pit limits. The total depth of the groundwater model is variable, ranging from 600 to 700 feet, with a bottom elevation of 100 feet NAVD88.

The model predicts an elliptical drawdown trough with a north-south oriented major axis, reflecting the effects of both surface water recharge and anisotropic hydraulic conductivity consistent with the fracture systems observed at the subject site and imaged using geophysical tools. The drawdown ellipse is asymmetric with the northern extent limited by Thicketty Creek Watershed Reservoir No. 19.

6.1 15-year Drawdown

After 15 years, according to the model, an elliptically shaped, elongate groundwater trough develops in the north-south direction due to the anisotropy of the fractured aquifer (**Figure 9A**). The groundwater trough dips more steeply along the western and eastern edges of the pit. The conservatively estimated 5-foot drawdown contour extends approximately 3,000 feet south of the pit, and 1,000 feet north of the pit. The 5-foot drawdown contour does not extend beyond the eastern and western edges of the pit. The 5-foot drawdown projection across the Thicketty Creek Watershed Reservoir No. 19 reflects shallow homogeneous sediments with low measured hydraulic conductivity beneath the reservoir (in model Layer 1) and three-dimensional groundwater flow in the fractured aquifer (in model Layers 2 and 3).

6.2 30-year Drawdown

After 30 years, according to layer 3 of the model, the 5-foot drawdown contour extends 3,300 feet north of the pit, and 5,700 feet south of the pit. The 5-foot drawdown contour extends approximately 500 feet east and west of the pit. The 20-foot drawdown contour extends 2,500 feet north of the pit, and approximately 250 feet east and west of the pit. The 60-foot drawdown contour extends approximately 1,000 feet south and follows Thicketty Creek Watershed Reservoir No. 19 just north of the pit (**Figure 9B**).

6.3 60-year Drawdown

After 60 years, according to layer 3 of the model, the 5-foot drawdown contour extends 3,600 feet north of the pit, and 7,600 feet south of the pit. The 20-foot drawdown contour extends 2,400 feet north of the pit, and 4,000 feet south of the pit. The 20-foot drawdown contour is just inside the east and west edges of the pit. The 60-foot drawdown contour extends less than 700 feet north, and approximately 2,000 feet south of the pit. The projected extent of drawdown east and west of the pit does not change significantly between 30 and 60 years after the start of mining operations (**Figure 9C**).

6.4 100-year Drawdown

After 100 years, according to layer 3 of the model, the drawdown trough remains essentially unchanged east, west, and north of the pit between 60 and 100 years after the start of mining operations (**Figure 8**). 100 years after mining begins, the 60-foot, 20-foot, and 5-foot drawdown contours extend up to 1,000 feet farther south when compared to the same drawdown contours simulated after 60 years (**Figure 9D**). The 60-foot drawdown contour remains inside the east and west edges of the pit.

6.5 Summary

For the scenarios analyzed, the groundwater drawdown trough is elongated in the south to north direction and generally limited by the presence of Thicketty Creek Watershed Reservoir No. 19 to the north. The groundwater drawdown trough is approximately 4 times longer in the north-south direction than it is wide in the east-west direction. Drawdown increases primarily in the first 30 years of operation and continues to slowly develop to the north and south in the period between 30 and 60 years of operation. Beyond 60 years of operation, the drawdown cone remains essentially stable in the east, west, and north directions.

Limited drawdown is anticipated beyond the proposed permit boundary due to the steep drawdown ellipse and significant anisotropy in the north-south direction. Up to 60 feet of drawdown across Thicketty Creek Watershed Reservoir No. 19 and up to 80 feet of drawdown south of I-85 are anticipated based on the simulated groundwater model results with a five-layer model domain.

If stream flow impacts are minimal, impacts to bed and bank wetlands should also be limited. Potential impacts to ponds and upland wetlands are estimated to be insignificant based on the results of our model. Additionally, the static water level in Thicketty Creek Watershed Reservoir No. 19 is not anticipated to undergo significant changes from pre-mining conditions.

The activities and evaluative approaches used in this scope of work are consistent with those normally employed for services of this type. Our services have been performed based on our understanding of the project site and the observations made during our work. This evaluation is based on Site development and mine development plans made available to BLE at the time of this report. The model predictions and professional opinions contained herein may require revision or additional evaluation should future development plan updates significantly alter the model assumptions. Nevertheless, the model predictions are consistent with observed conditions at the Site. Groundwater elevation within the property boundary will be monitored monthly, as detailed in the groundwater monitoring plan in **Appendix F** of this report.

7.0 REFERENCES

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TABLES

Table 1
Groundwater Well Survey Information
Luck Cherokee - Hydrogeologic Evaluation
Cherokee County, South Carolina
BLE Project Number 24-24056

Station ID	Ground Elevation	TOC Elevation	Well Stickup (ft)	Northing	Easting	Well Description	Status as of April 2025
P-1	768.81	772.31	3.50	1,183,987.69	1,777,236.22	Pumping Well	Present
O-1	766.44	769.71	3.27	1,183,990.65	1,777,136.16	Observation Well	Present
O-2	767.67	770.98	3.31	1,183,995.61	1,777,188.07	Observation Well	Present
O-3	767.47	770.68	3.21	1,183,936.95	1,777,242.88	Observation Well	Present
O-4	764.96	768.42	3.46	1,183,887.21	1,777,243.87	Observation Well	Present
O-5	761.82	765.19	3.37	1,183,739.15	1,777,230.28	Observation Well	Present

NOTES:

1. TOC = *Top Of Casing*
2. P-1 and O-1 through O-5 were surveyed by Glenn Associates Surveying, Inc. of Jenkinsville, SC on January 14, 2025.
3. Northings and Eastings are in FEET and reference the South Carolina State Grid North by GNSS From SCVRS and the North American Datum of 1983 (NAD 83).
4. Elevations are in FEET and reference the North American Vertical Datum of 1988 (NAVD 88).

Prepared By: TAO
Checked By: ZAW

Table 2

Groundwater Well Construction Details

Luck Cherokee - Hydrogeologic Evaluation
Cherokee County, South Carolina
BLE Project Number 24-24056

Station ID	Ground Elevation	TOC Elevation	Total Well Depth	Auger Refusal		6-inch PVC Casing		Open Hole Interval		Well Description
				Depth	Elevation	Depth	Elevation	Depth	Elevation	
P-1	768.81	772.31	398.2	99	669.8	104.6	664.2	104.6 - 398.2	664.2 - 370.6	Pumping Well
O-1	766.44	769.71	400.7	85	681.4	87.1	679.3	87.1 - 400.7	679.3 - 365.7	Observation Well
O-2	767.67	770.98	389.2	140	627.7	140.7	627.0	140.7 - 389.2	627.0 - 378.5	Observation Well
O-3	767.47	770.68	398.4	96	671.5	100.0	667.5	100.0 - 398.4	667.5 - 369.1	Observation Well
O-4	764.96	768.42	400.9	92	673.5	93.8	671.2	93.8 - 400.9	671.2 - 364.1	Observation Well
O-5	761.82	765.19	400.5	45	716.8	56.3	705.5	56.3 - 400.5	705.5 - 361.3	Observation Well

NOTES:

1. Measurements are in FEET; elevations reference the North American Vertical Datum of 1988 (NAVD 88).
2. Depths were measured from ground surface.
3. TOC = *Top Of Casing*

Table 3
Observed Fractured Rock Intervals
Luck Cherokee - Hydrogeologic Evaluation
Cherokee County, South Carolina
BLE Project Number 24-24056

Well ID	Ground Surface Elevation	Observed Fracture Interval (Depth)	Observed Fracture Interval (Elevation)	Driller Estimate of Well Yield At Time of Drilling
P-1	768.81	**112 - 115**	**657 - 654**	3.5 GPM
		130 - 138	639 - 631	
		180 - 190	589 - 579	
		210 - 215	**559 - 554**	
		230 - 240	**539 - 529**	
		260 - 268	509 - 501	
		305 - 310	464 - 459	
		310 - 315	459 - 454	
		325 - 330	444 - 439	
		337 - 345	432 - 424	
		347 - 380	422 - 389	
		385 - 390	384 - 379	
O-1	766.44	110 - 120	656 - 646	0.5 GPM
		135 - 139	631 - 627	
		150 - 153	**616 - 613**	
		174 - 179	592 - 587	
		258 - 260	508 - 506	
		350 - 353	416 - 413	
O-2	767.67	145 - 165	623 - 603	0.5 GPM
		182 - 190	**586 - 578**	
		195 - 202	573 - 566	
		244 - 250	524 - 518	
		255 - 260	513 - 508	
		300 - 320	468 - 448	
		343 - 347	425 - 421	
O-3	767.47	170 - 180	597 - 587	0.5 GPM
		188 - 190	579 - 577	
		205 - 210	562 - 557	
		235 - 240	**532 - 527**	
		303 - 305	464 - 462	
		350 - 353	417 - 414	
O-4	764.96	130 - 140	635 - 625	0.5 GPM
		152 - 170	613 - 595	
		180 - 190	585 - 575	
		220 - 225	545 - 540	
		250	**515**	
O-5	761.82	**115 - 140**	**647 - 622**	0.5 GPM
		165 - 175	597 - 587	
		237 - 240	525 - 522	
		377 - 387	385 - 375	

NOTES:

1. **Bold** intervals are interpretted as laterally continuous and/or significant fracture zones identified during geophysical investigations and drilling activities.
2. Measurements are in FEET; elevations reference the North American Vertical Datum of 1988 (NAVD 88).
3. Depths were measured from ground surface.
4. GPM = *Gallons Per Minute*

Table 4
Summary of Pressure Transducer Deployment During Constant Rate Pump Test
Luck Cherokee - Hydrogeologic Evaluation
Cherokee County, South Carolina
BLE Project Number 24-24056

Well ID	Top of Casing Elevation	Pressure Transducer Depth (BTOC)	Pressure Transducer Elevation	Manufacturer and Model Description	Logging Interval
P-1	772.31	250.0	522.3	Seametrics PT2X 100 PSIA	60 Seconds
	772.31	275.9	496.5	Seametrics PT2X 100 PSIG (Vented Cable)	15 Seconds
O-1	769.71	120.0	649.7	Seametrics PT2X 50 PSIA	60 Seconds
O-2	770.98	120.0	651.0		60 Seconds
O-3	770.68	120.0	650.7		60 Seconds
O-4	768.42	120.0	648.4		60 Seconds
O-5	765.19	120.0	645.2		60 Seconds
Barometer	N/A	N/A	N/A	Seametrics BaroSCOUT2X 30 PSIA	60 Seconds

NOTES:

1. Measurements are in FEET; elevations reference the North American Vertical Datum of 1988 (NAVD 88).
2. BTOC = *Below Top of Casing*

Prepared By: TAO
Checked By: ZAW

Table 5

Summary of Maximum Drawdown

Luck Cherokee - Hydrogeologic Evaluation

Cherokee County, South Carolina

BLE Project Number 24-24056

Well ID	Maximum Drawdown (ft)
P-1	212.7
O-1	1.1
O-2	3.4
O-3	12.1
O-4	6.8
O-5	2.5

NOTES:

1. Maximum drawdown observed during the 48-hour constant rate pumping test with a target rate of 4.5 gallons per minute.

Table 6
MODFLOW Parameters
Luck Cherokee - Hydrogeologic Evaluation
Cherokee County, South Carolina
BLE Project Number 24-24056

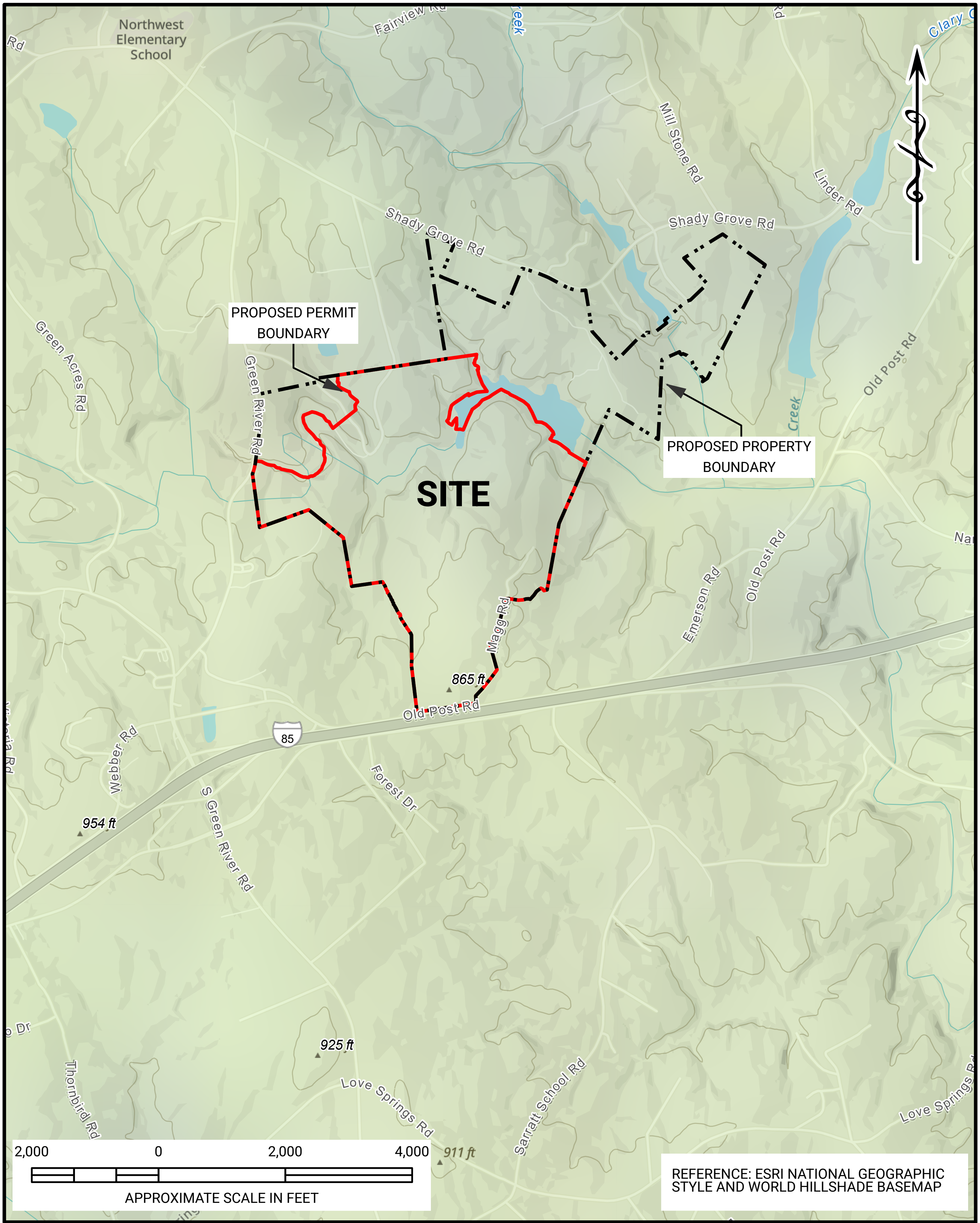
Model Layer	Layer Thickness (ft)	Bottom Elevation	Hydraulic Conductivity			Storativity (S)	Specific Storage (Ss [1/ft])	Specific Yield (Sy)
			Kx (ft/day)	Ky (ft/day)	Kz (ft/day)			
Layer 1	58 (1)	Variable (1)	1.25	2.50	0.03	Variable (1)	1.00E-06 / ft	5.00E-04
Layer 2	142 (2)	Variable (2)	0.03	0.50	0.03	Variable (2)	1.00E-06 / ft	5.00E-04
Layer 3	150 (3)	400	0.03	0.50	0.03	Variable (3)	1.00E-06 / ft	5.00E-04
Layer 4	100	300	0.02	0.33	0.03	6.00E-04	1.00E-06 / ft	5.00E-04
Layer 5	200	100	0.02	0.25	0.03	7.00E-04	1.00E-06 / ft	5.00E-04

NOTES:

1. Layer 1 extends from the ground surface to the top of unweathered rock. The layer thickness varies by location, typically 58-feet-thick.
2. Layer 2 thickness varies by location. The layer represents the first 142 feet of unweathered rock and extends to 200 feet below ground
3. Layer 3 thickness varies from 80 to 200 feet. The layer extends from 200 feet below ground surface to a flat bottom surface at 400 feet
4. Elevations are in FEET and reference the North American Vertical Datum of 1988 (NAVD 88).

Prepared By: TAO
Checked By: TJD

FIGURES



REFERENCE: ESRI NATIONAL GEOGRAPHIC STYLE AND WORLD HILLSHADE BASEMAP

DRAWN: TAO	DATE: 4-30-25		
CHECKED: TJD	FILE: 24-24056 SLM		
APPROVED: DRL	JOB NO: 24-24056		

BLE BUNNELL LAMMONS ENGINEERING

SITE LOCATION MAP
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
1

LEGEND

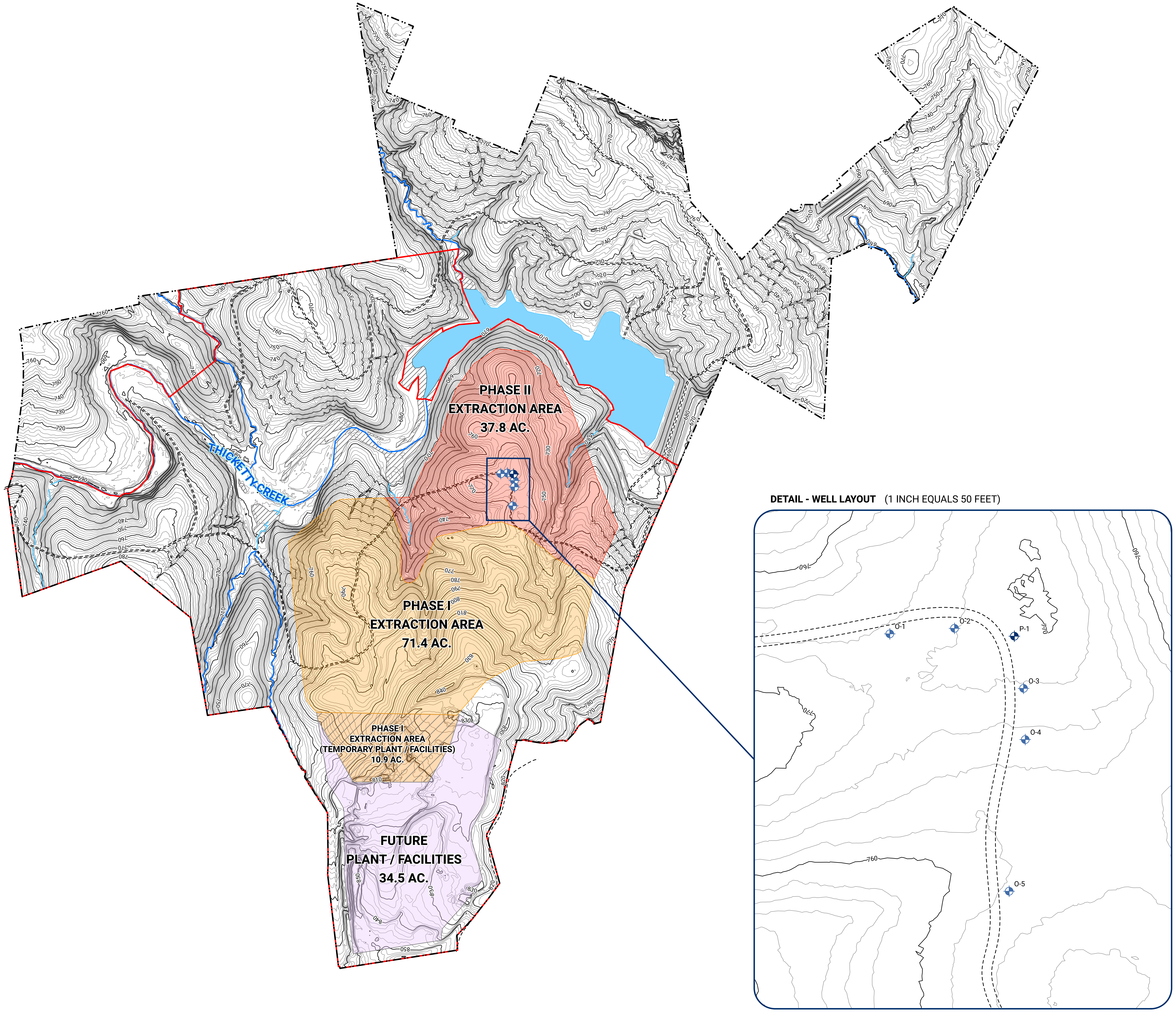
✦	OBSERVATION WELL
✦	PUMPING WELL
▭	PROPOSED PROPERTY BOUNDARY
―	PROPOSED PERMIT BOUNDARY
🟧	PHASE 1 EXTRACTION AREA
▨	PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT / FACILITIES
🟥	PHASE 2 EXTRACTION AREA
🟪	FUTURE PLANT / FACILITIES
〰	TOPOGRAPHIC CONTOUR (10-FT)
〰	TOPOGRAPHIC CONTOUR (2-FT)
┄	UNIMPROVED ROAD
〰	JURISDICTIONAL INTERMITTENT STREAM
〰	JURISDICTIONAL PERENNIAL STREAM
🟦	JURISDICTIONAL SURFACE WATER
▨	JURISDICTIONAL WETLANDS

NOTES:

1. AQUATIC RESOURCE DELINEATION PERFORMED BY HODGES, HARBIN, NEWBERRY & TRIBBLE (HHNT) ECOLOGISTS 11/11/2024 - 11/13/2024.
2. DEPICTED WATERS OF THE U.S. DELINEATION REMAINS AN OPINION OF HHNT UNTIL FORMALLY VERIFIED IN WRITING BY THE U.S. ARMY CORPS OF ENGINEERS (USACE) VIA A FORMAL DETERMINATION LETTER. HHNT SUBMITTED A WATERS OF THE U.S. DELINEATION CONCURRENCE REQUEST TO THE USACE ON APRIL 18, 2025.
3. THE AREA SHOWN WITHIN THE PROJECT BOUNDARY CONSISTS OF PORTIONS OF THE PARCELS (TMS#045-00-00-053.000, 027-00-00-035.000). SUBDIVISION OF THE PARCEL(S) IS EXPECTED.

REFERENCES:

1. PROPERTY BOUNDARY AND EXISTING TOPOGRAPHIC SURVEY PROVIDED BY GLENN ASSOCIATES SURVEYING, INC. OF JENKINSVILLE, SC IN JANUARY 2025
2. OBSERVATION AND PUMPING WELLS WERE SURVEYED BY GLENN ASSOCIATES SURVEYING, INC. OF JENKINSVILLE, SC ON JANUARY 14, 2025.



400 0 400 800 1,200

APPROXIMATE SCALE IN FEET

REVISIONS		
No.	DESCRIPTION	BY
1		

DRAWN BY: TAO
CHECKED BY: TJD
APPROVED BY: DRL

DATE: 4-30-25
FILE NAME: 24-24056 BLP
JOB NO: 24-24056

BLE BUNNELL LAMMONS ENGINEERING

SITE TOPOGRAPHY AND BORING LOCATION PLAN
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
2

LEGEND

- 🟦 FEMA 100-YEAR FLOOD ZONE (ZONE A)
- ∿ JURISDICTIONAL INTERMITTENT STREAM
- ∿ JURISDICTIONAL PERENNIAL STREAM
- — STREAM CENTERLINES FEMA
- 🟦 JURISDICTIONAL SURFACE WATER
- ▨ JURISDICTIONAL WETLANDS
- ⌐┘ PROPOSED PROPERTY BOUNDARY
- — PROPOSED PERMIT BOUNDARY
- 🟧 PHASE 1 EXTRACTION AREA
- 🟥 PHASE 2 EXTRACTION AREA
- ▨ PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT / FACILITIES
- 🟪 FUTURE PLANT / FACILITIES

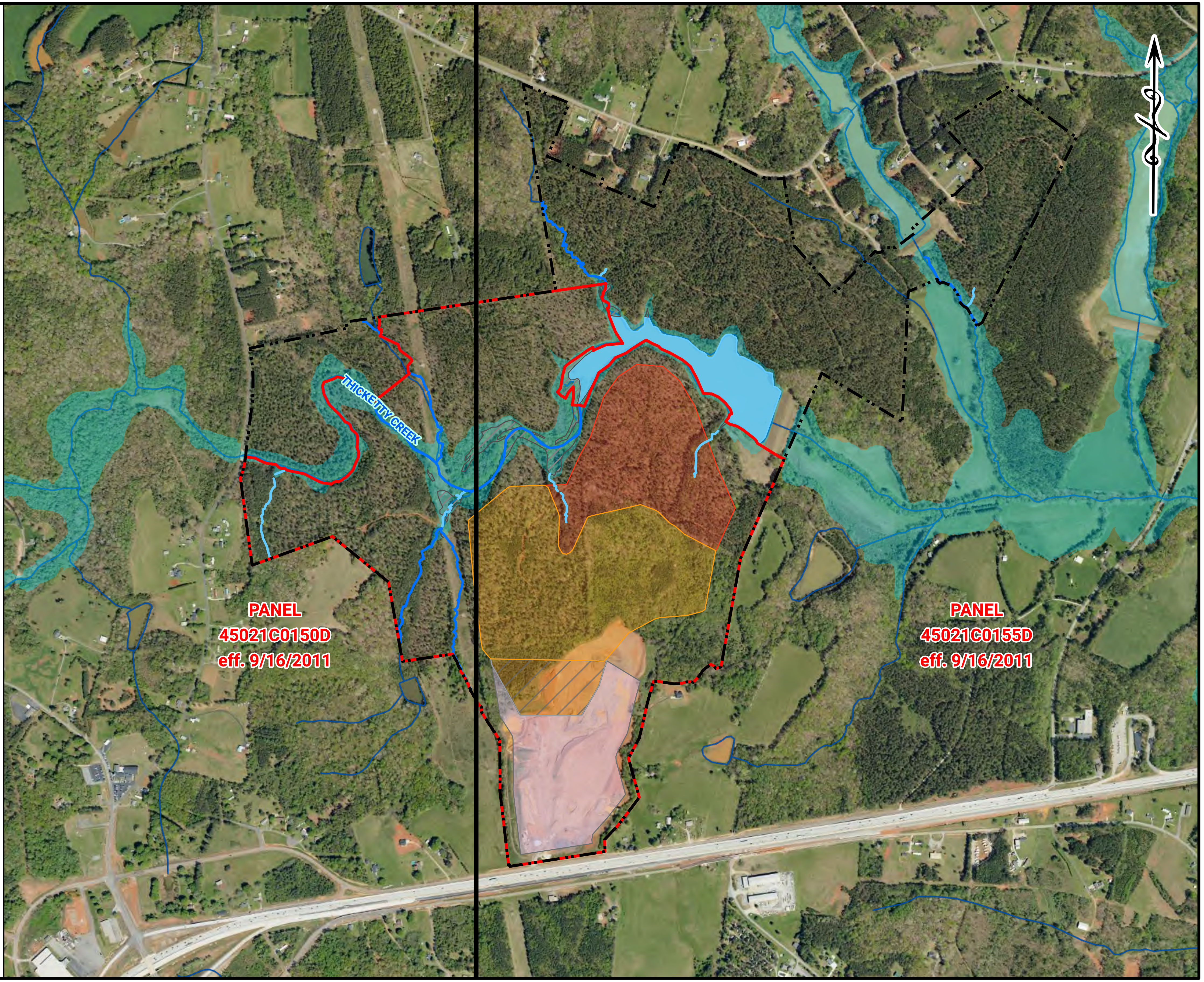
NOTES:

1. AQUATIC RESOURCE DELINEATION PERFORMED BY HODGES, HARBIN, NEWBERRY TRIBBLE HHNT ECOLOGISTS 11 11 2024 11 13 2024.
2. DEPICTED WATERS OF THE U.S. DELINEATION REMAINS AN OPINION OF HHNT UNTIL FORMALLY VERIFIED IN WRITING BY THE U.S. ARMY CORPS OF ENGINEERS USACE VIA A FORMAL DETERMINATION LETTER. HHNT SUBMITTED A WATERS OF THE U.S. DELINEATION CONCURRENCE REQUEST TO THE USACE ON APRIL 18, 2025.

REFERENCES: BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021; FEDERAL EMERGENCY MANAGEMENT AGENCY FEMA DIGITAL FLOOD INSURANCE RATE MAP PANELS 45021C0150D AND 45021C0155D

1,000 500 0 1,000 2,000

APPROXIMATE SCALE IN FEET



DRAWN BY:	TAO	DATE:	5-1-25
CHECKED BY:	TJD	FILE NAME:	24056 FLOOD
APPROVED BY:	DRL	JOB NO:	24-24056

REVISIONS

No.	DESCRIPTION	BY

BLE BUNNELL LAMMONS ENGINEERING

FEMA 100 YEAR FLOODPLAIN MAP
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
3

LEGEND

▭ PROPOSED PROPERTY BOUNDARY

€Zss **Sillimanite-mica schist**—Thin- to thick-bedded sillimanite-mica schist and gneiss, variably garnetiferous, locally pyritic. Sillimanite commonly altered to sericite. Subordinate layers and lenses of biotite gneiss (metawacke), and subordinate quartz schist, micaceous quartzite, and calc-silicate rock. Unit is heterogeneous in texture and proportions of minerals. Weathers white, pale purple, yellow and reddish orange. In part equivalent to white-mica schist (**€Zs**) but at higher metamorphic grade

€Zbg **Biotite gneiss**— Gray to dark-gray, thin- to thick-layered biotite-quartz-feldspar gneiss, in part garnetiferous, locally inequigranular and porphyroblastic. Interlayered with calc-silicate rock, sillimanite-mica schist, mica schist, and amphibolite. Locally contains small masses of granite. Gradational into and interlayered with white-mica schist (**€Zs**) and sillimanite-mica schist (**€Zss**). Unit may include some fine-grained Henderson Gneiss (**€h**)

€Zgs **Garnet-mica schist**—Light-gray to light-brownish-gray schist composed of muscovite, quartz, garnet, and minor biotite. Distinctive marker unit characterized by large garnets which average 1–2 cm and range up to 5 cm in diameter. Includes thin layers of biotite gneiss and amphibolite. Truncated at Kings Mountain shear zone

KINGS MOUNTAIN BELT

Blacksburg Formation (Late Proterozoic?)

Zbls Sericite Schist—Light- to dark-gray, fine-grained sericite schist or phyllite. Composed mainly of white mica and quartz in variable proportions. Contains beds of marble (**Zblm**), amphibolite and hornblende gneiss (**Zbla**), micaceous quartzite (**Zblq**), and stratabound concentrations of magnetite

Zblm Marble—Very light gray to medium-bluish-gray, fine- to coarse-grained marble. Composed mostly of calcite or dolomite. Contains layers and boudins of amphibolite and calc-silicate rock. Occurs as beds and lenses within sericite schist (**Zbls**). Includes the Gaffney Marble Member and other bodies which may be correlative

Battleground Formation (Late Proterozoic)

Zbs Quartz-sericite schist—Very fine to medium-grained quartz-sericite schist and phyllite. Very light gray, light-bluish-gray, light-brown, or yellowish-gray. Composed largely of quartz (typically >50%) and sericitic white mica (muscovite and paragonite). Accessory minerals may include chloritoid, biotite, pyrite, hematite, kyanite, andalusite, sillimanite, staurolite, garnet, oligoclase or albite, chlorite, tourmaline, zircon, and graphite

€Zbga **Biotite gneiss and amphibolite**—Interlayered biotite gneiss, hornblende gneiss, amphibolite, metagabbro(?), and subordinate mica schist. Locally contains much granitoid rock, forms migmatite resembling migmatitic granitoid gneiss (**O€gm**)

DOgl **Biotite monzogranite and leucogranite**—Very light to light- to yellowish-gray, medium- to coarse-grained, massive-to very weakly foliated biotite monzogranite and leucogranite southwest of Mt. Holly, N.C. Plagioclase variably saussuritized; grains fractured and strained. May be related to Salisbury Plutonic Suite

DOg **Gneissic metagranite**—Light-gray to light-greenish-gray, medium- to coarse-grained, gneissic biotite granite. Biotite is largely replaced by chlorite; sphene is common accessory. Ranges from weakly foliated to augen gneiss or blastomylonite; locally brecciated. Possibly related to the "Pacolet Mills" metagranite of Wagener (1977) which yields a Rb-Sr whole rock age of 415 ± 40 m.y. (Fullagar and Kish, 1981)

O€tg **Toluca Granite* (Early Ordovician and Cambrian)**—Light-gray, medium-grained, weakly to well-foliated biotite monzogranite and subordinate granodiorite. Garnet, monazite, and muscovite are common accessories. Forms masses generally conformable with the regional foliation

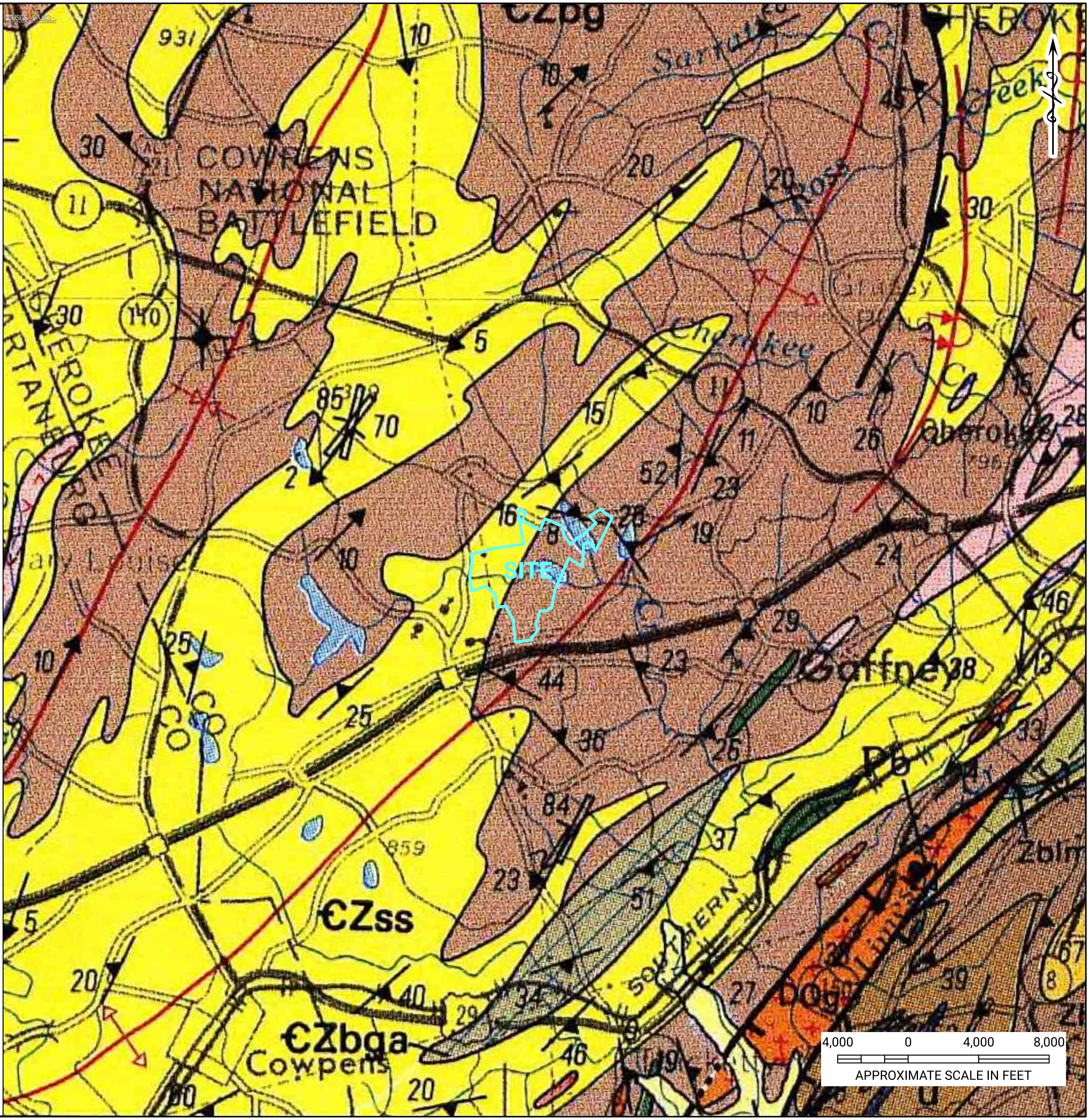
O€sg **Granite of Sandy Mush (Ordovician and Cambrian)**—Light-gray, inequigranular, gneissic biotite monzogranite containing conspicuous microcline megacrysts up to 2 cm long. Probably cogenetic with Toluca Granite (**O€tg**). Garnet is common accessory

O€gg **Granitoid gneiss (Ordovician and Cambrian)**—Gray to dark-gray, medium-grained, foliated and layered, gneissic biotite granite, biotite granodiorite, and hornblende-biotite quartz diorite. May include phases of the Toluca Granite (**O€tg**)

Ztr **Metatrondhjemite**—Very light gray to yellowish-gray, fine- to coarse-grained, metamorphosed trondhjemite with lesser amounts of tonalite and rarely granodiorite. Composed mostly of oligoclase and quartz; accessories include biotite, muscovite, chlorite, and rarely potassium feldspar. Ranges from weakly foliated to gneissic to schistose. Augen-gneiss texture is common; locally blastomylonitic. Similar to metatonalite (**Zto**) but more leucocratic. As mapped, may include some felsic metavolcanic rock (**Zbvf**)

REFERENCE:

1. GOLDSMITH, R., MILTON, D.J., HORTON, J.W. (1988); GEOLOGIC MAP OF THE CHARLOTTE 1° X 2° QUADRANGLE, NORTH CAROLINA AND SOUTH CAROLINA; U.S. GEOLOGICAL SURVEY MISCELLANEOUS INVESTIGATION SERIES MAP 1-1251-E.



No.	REVISIONS DESCRIPTION	BY

DRAWN BY: TAO

CHECKED BY: TJD

APPROVED BY: DRL

DATE: 4-2-25

FILE NAME: 24-24056 GEO

JOB NO: 24-24056

BLE | BUNNELL LAMMONS ENGINEERING

GEOLOGIC MAP OF THE CHARLOTTE 1° X 2° QUADRANGLE
(MODIFIED FROM GOLDSMITH 1988)
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
4

LEGEND

- CONFIRMED PRIVATE DRINKING WATER WELL
- SUSPECTED PRIVATE DRINKING WATER WELL
- PUBLIC WATER SUPPLY WELL PWSW
- ○ EXISTING LOW VOLUME BUFFER 500 FEET
- ▨ WATER RESERVOIR
- OBSERVATION WELL
- PUMPING WELL
- PROPOSED PROPERTY BOUNDARY
- PROPOSED PERMIT BOUNDARY
- 0.5 MILE RADIUS AROUND PROPOSED EXTRACTION AREA
- JURISDICTIONAL INTERMITTENT STREAM
- JURISDICTIONAL PERENNIAL STREAM

NOTES:

1. PRIVATE DRINKING WATER WELL LOCATIONS ARE APPROXIMATE.
2. VEHICULAR AREA RECONNAISSANCE PERFORMED BY BLE IN SEPTEMBER 2024.

REFERENCES:

POTENTIAL EXTRACTION AREA AND PROPOSED PROPERTY BOUNDARY PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE; PUBLIC WATER SUPPLY WELL AND PROTECTION ZONES SOUTH CAROLINA DEPT. OF ENVIRONMENTAL SERVICES FORMERLY SC DHEC GIS CLEARINGHOUSE; ROADS US CENSUS, TIGER 2023 ; BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

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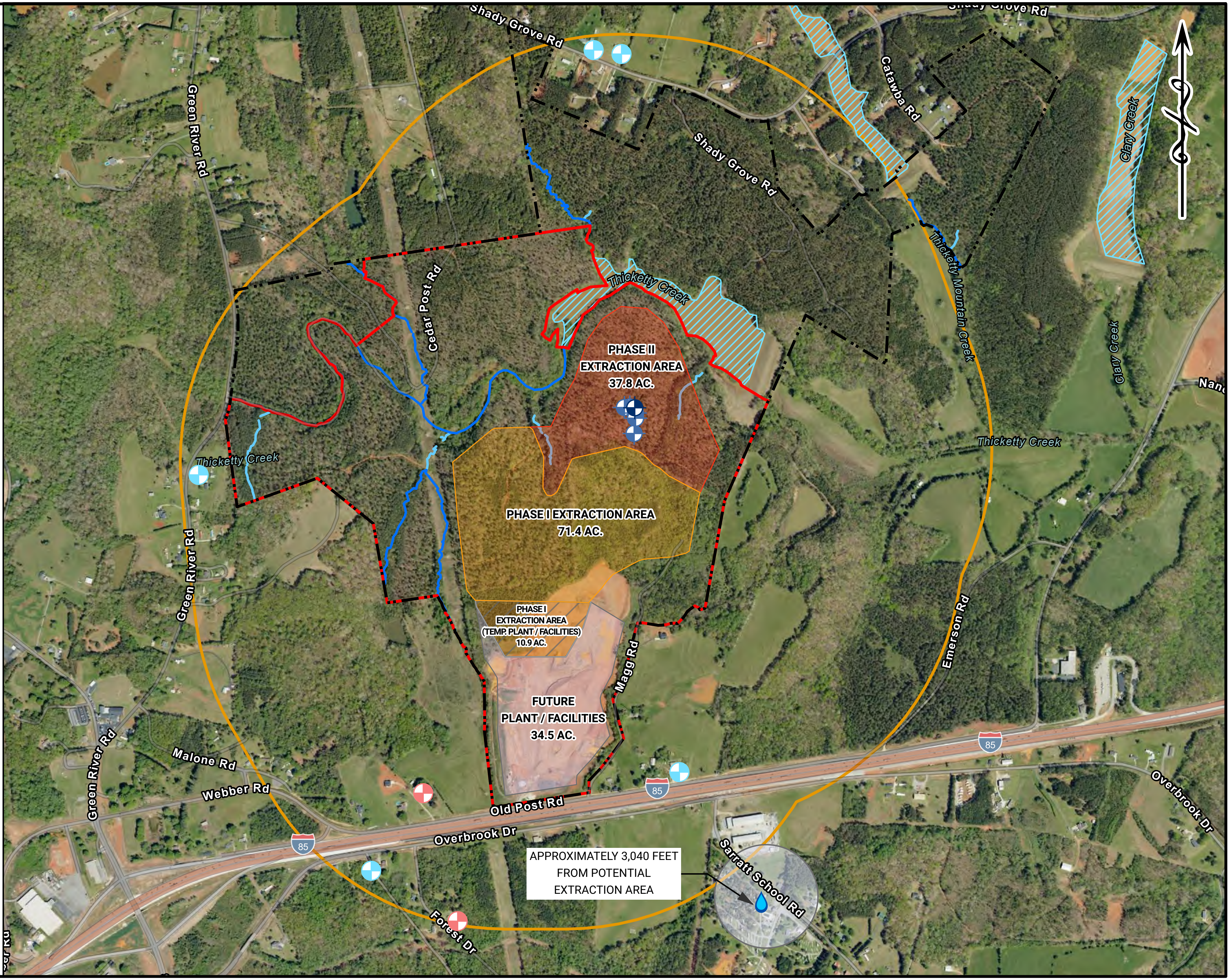
APPROXIMATE SCALE IN FEET



DRAWN BY:	TAO	DATE:	4-30-25
CHECKED BY:	TJD	FILE NAME:	24056 RECON
APPROVED BY:	DRL	JOB NO:	24-24056

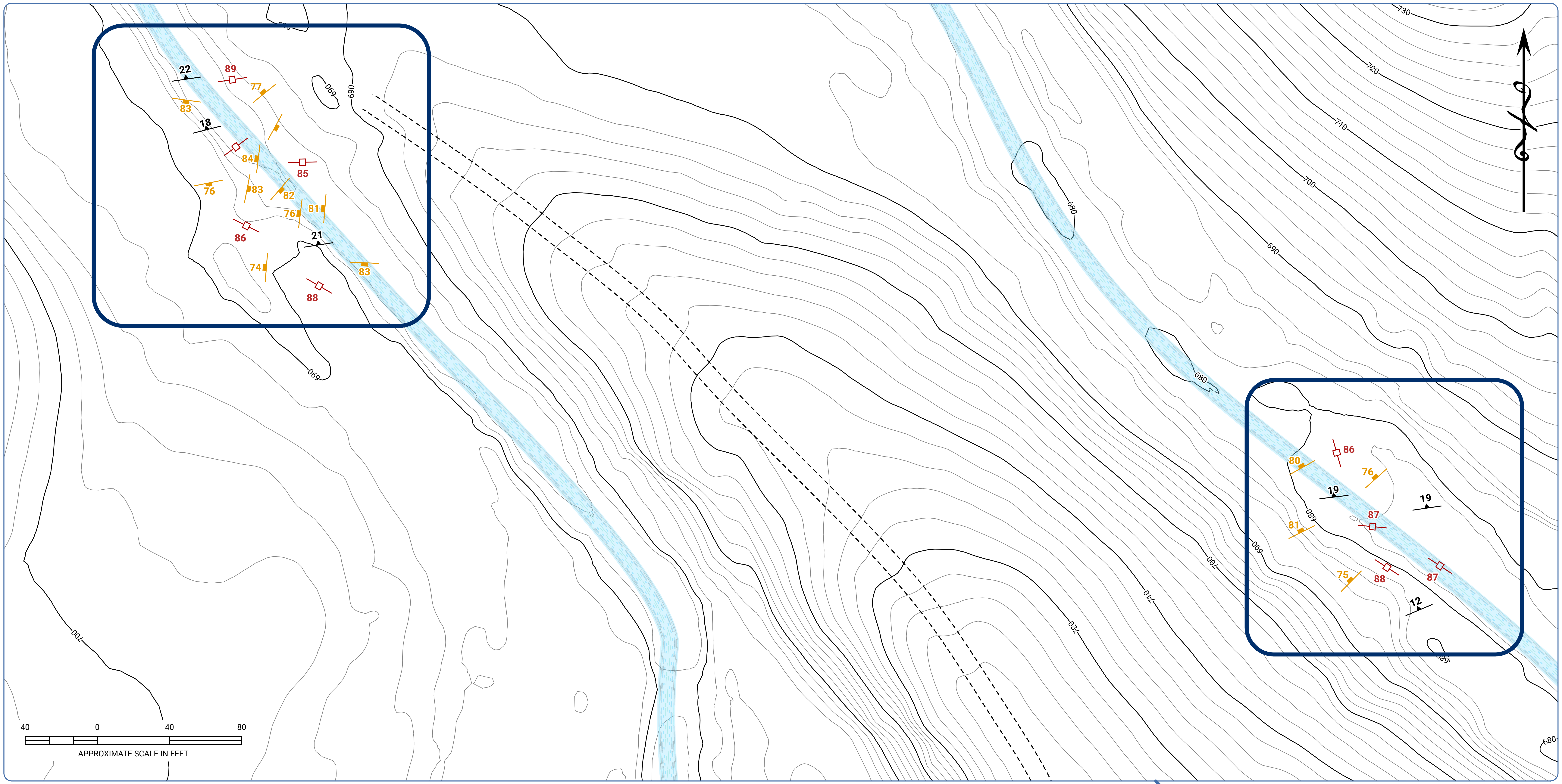
REVISIONS

No.	DESCRIPTION	BY

BLE BUNNELL LAMMONS ENGINEERING

SEPTEMBER 2024 AREA RECONNAISANCE MAP
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
5



LEGEND

STRIKE AND DIP OF JOINT

STEEP (73 - 85 DEGREES)

VERTICAL (85 - 90 degrees)

STRIKE AND DIP OF FOLIATION

247 - 263 DEGREES

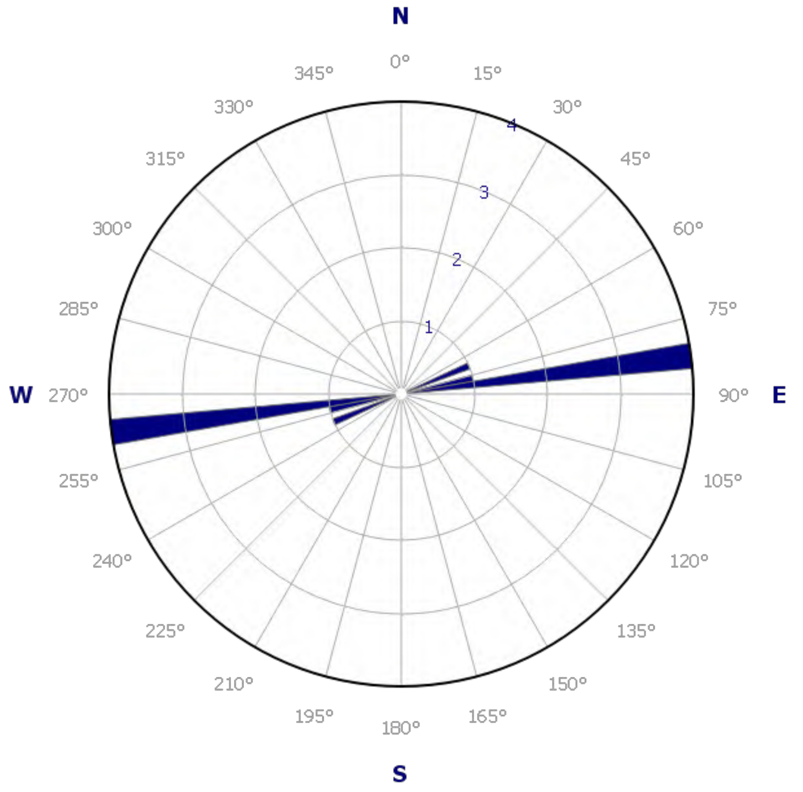
THICKETTY CREEK

UNIMPROVED ROAD

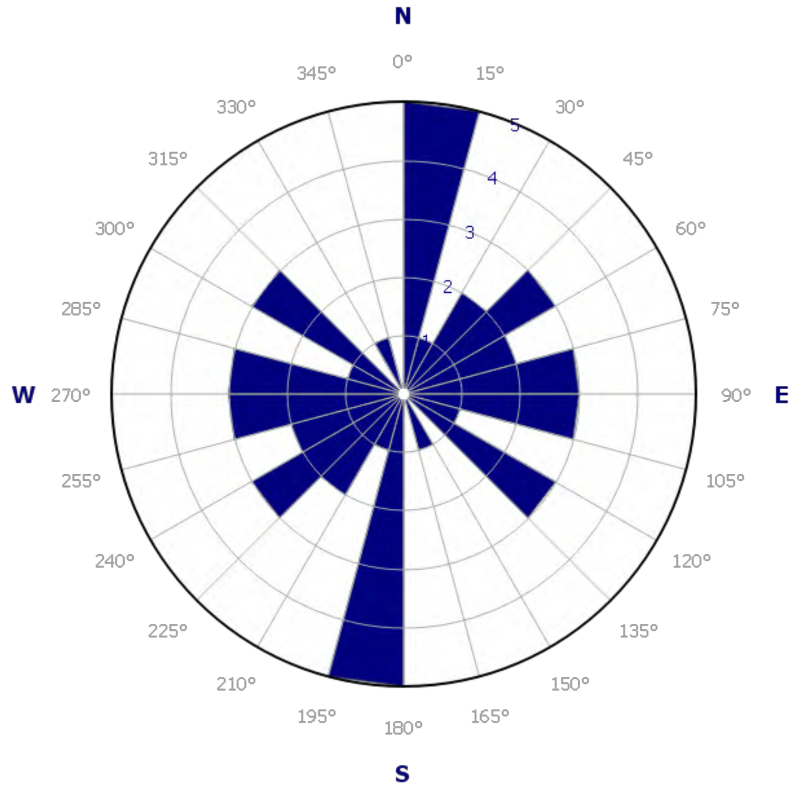
TOPOGRAPHIC CONTOUR (2-FT)

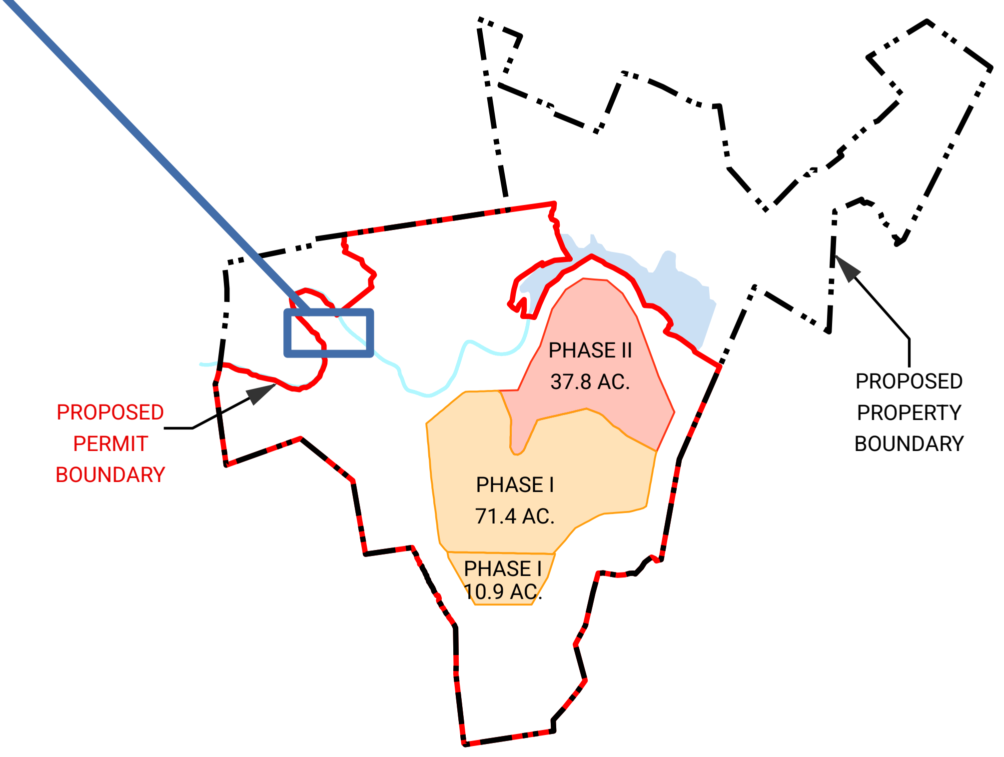
TOPOGRAPHIC CONTOUR (10-FT)

STRIKE OF FOLIATION (N=6)



STRIKE OF JOINTS (N=24)





No.	REVISIONS DESCRIPTION	BY

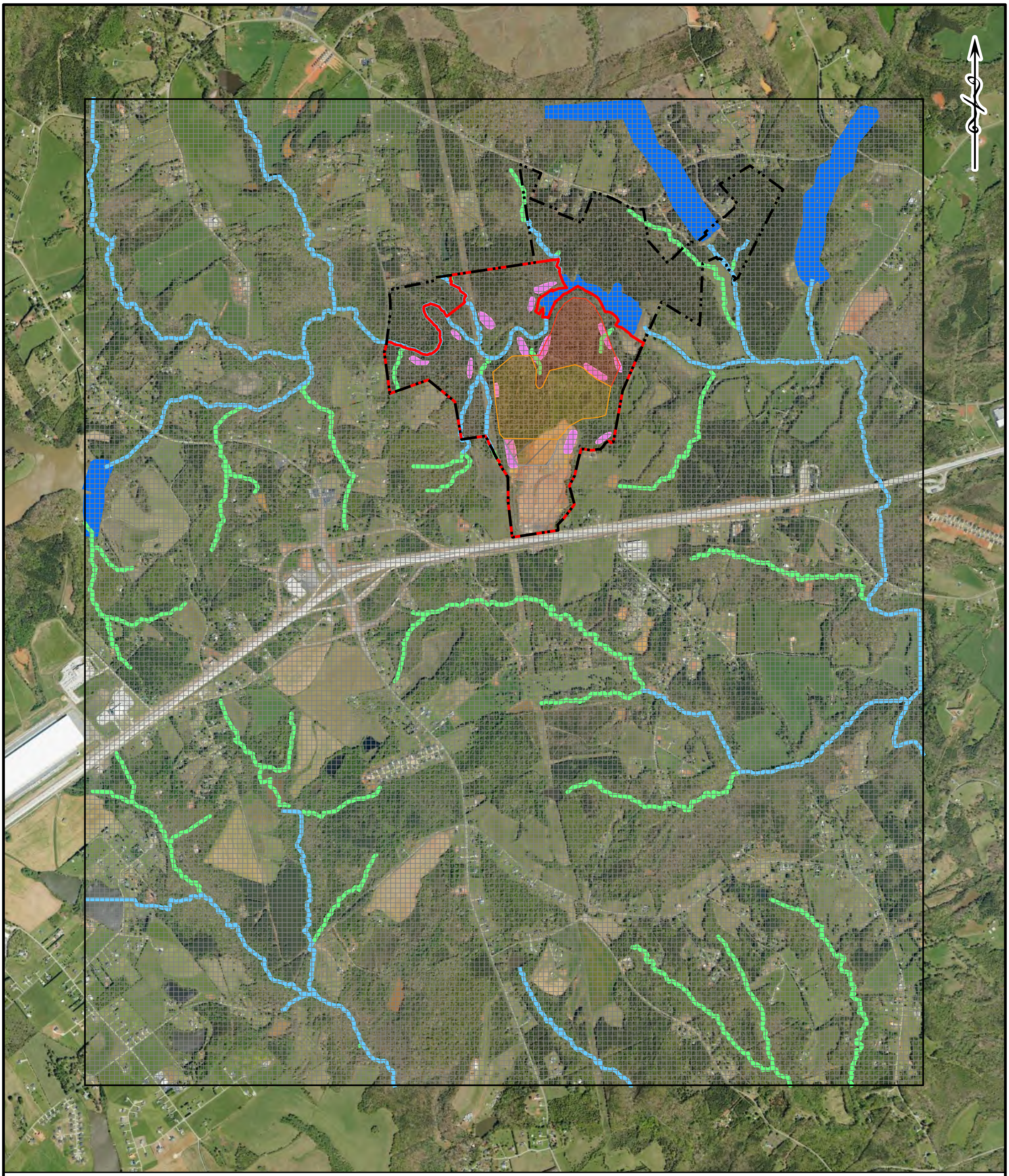
DRAWN BY: TAO
CHECKED BY: TJD
APPROVED BY: DRL

DATE: 5-1-25
FILE NAME: 24056 SITE GEO
JOB NO: 24-24056

BUNNELL LAMMONS ENGINEERING

GEOLOGIC FIELD MAPPING - NOVEMBER 11, 2024
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
6



LEGEND

- — MODEL GRID
- 🟦 RESERVOIRS
- 〰 INTERMITTENT STREAMS
- 〰 PERENNIAL STREAMS
- 🟪 PONDS
- ⌐⌐ PROPOSED PROPERTY BOUNDARY
- — PROPOSED PERMIT BOUNDARY
- 🟧 PHASE 1 EXTRACTION AREA
- ▨ PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT FACILITIES
- 🟥 PHASE 2 EXTRACTION AREA

REFERENCES:
PROPOSED SITE BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE (HHNT); STREAM REACHES WERE SELECTIVELY CHOSEN BASED ON US GEOLOGICAL SURVEY HUC 12 HYDROGRAPHY DATA FOR THE UPPER THICKETTY CREEK WATERSHED AND HHNT'S DELINEATION CONCURRENCE REQUEST SUBMITTED TO THE US ARMY CORPS OF ENGINEERS; BASEMAP- US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

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APPROXIMATE SCALE IN FEET

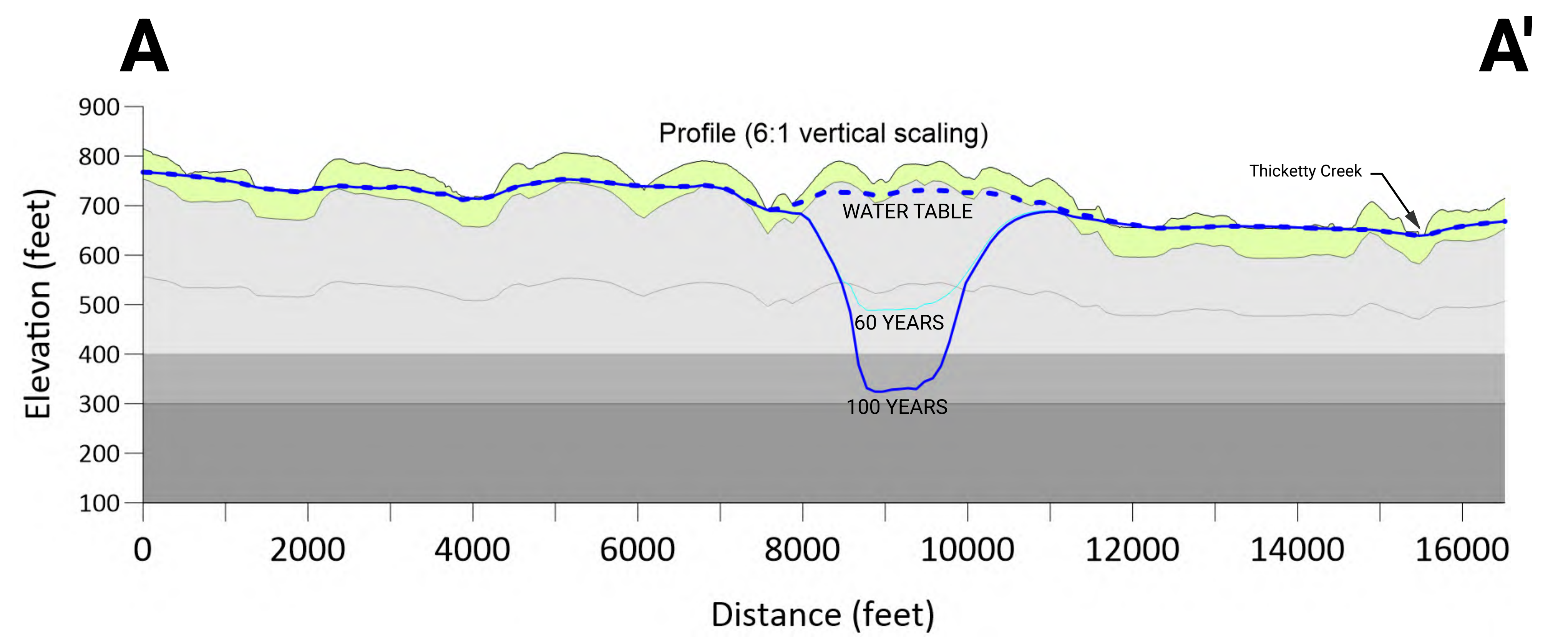
DRAWN BY: TAO
CHECKED BY: TJD
APPROVED BY: DRL

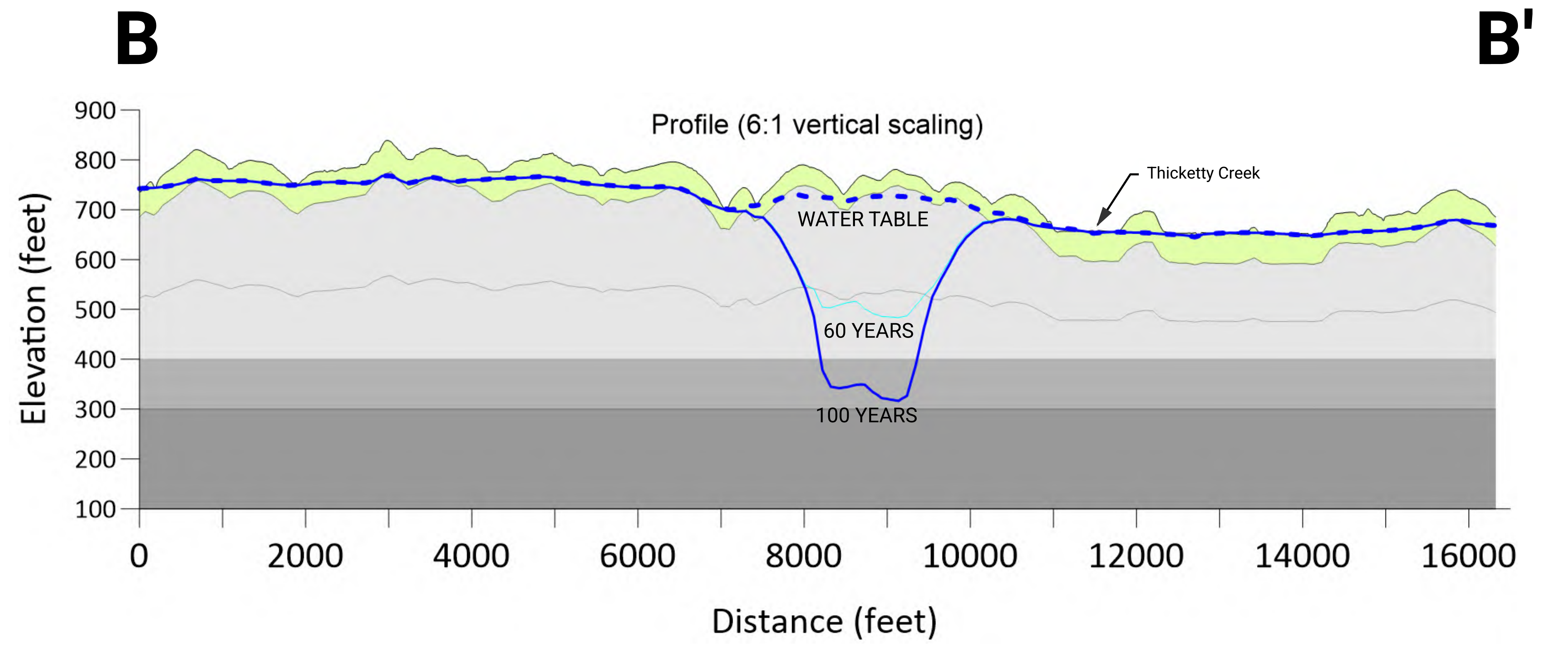
DATE: 5-9-25
FILE NAME: 24056-GRID
JOB NO: 24-24056

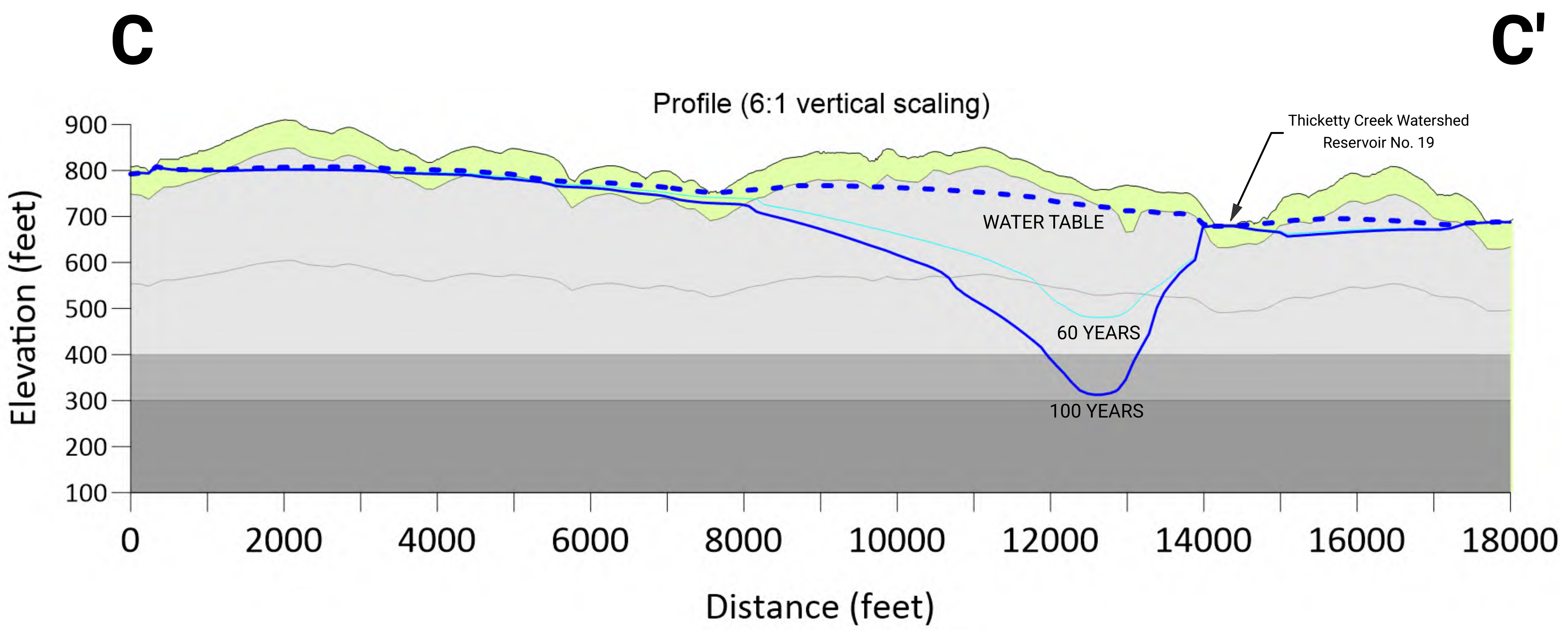
BLE BUNNELL LAMMONS ENGINEERING

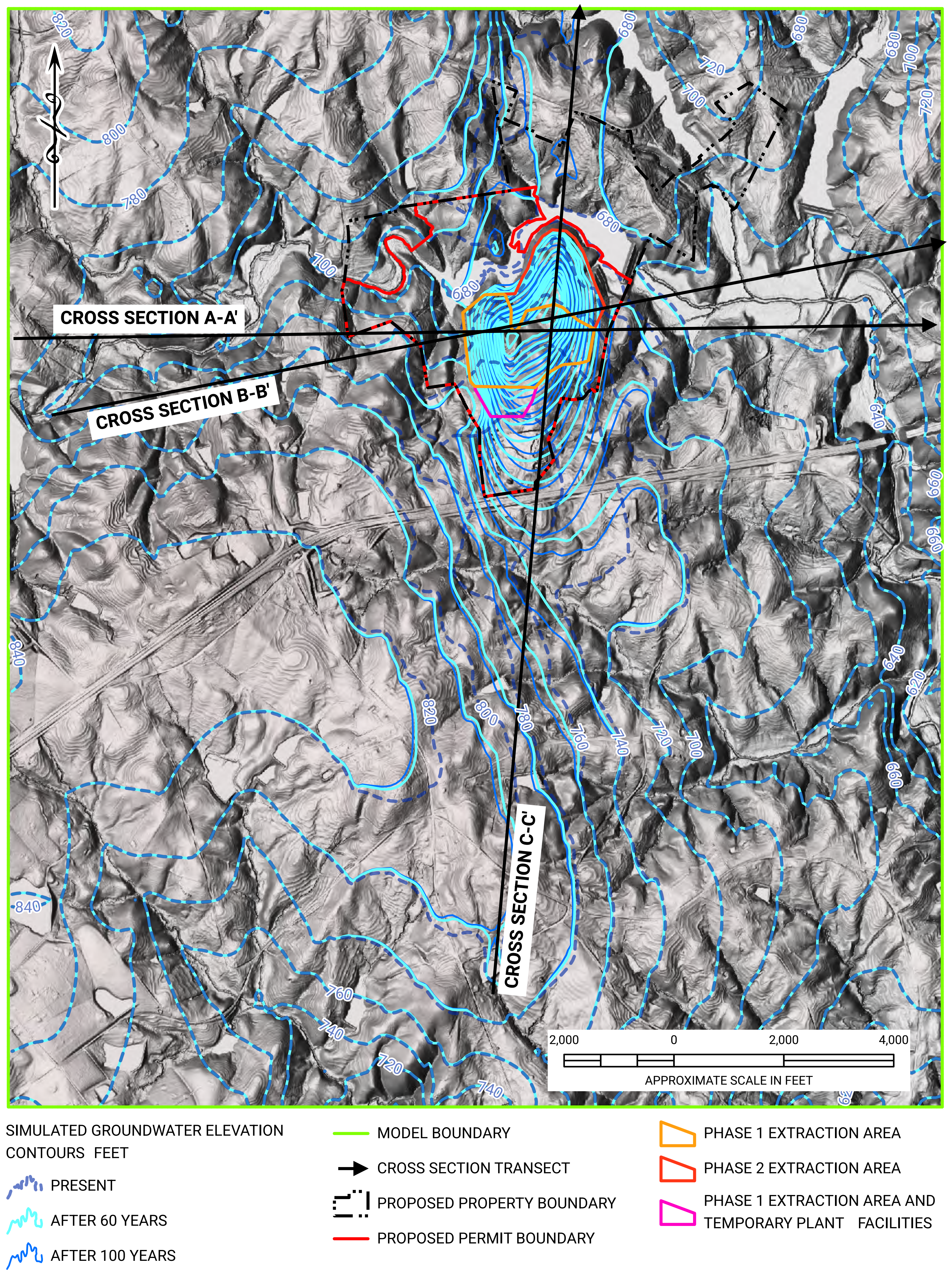
GROUNDWATER MODEL DOMAIN
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
7









NOTE: ELEVATIONS REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 NAVD88

REFERENCES:
GROUNDWATER MODELING WAS PERFORMED BY LOSONSKY AND ASSOCIATES, INC.; PROPOSED SITE BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE HHNT ; MULTIDIRECTIONAL HILLSHADE BASE MAP WITH 6.1 VERTICAL EXAGERATION WAS PREPARED USING 5 FOOT RESOLUTION DIGITAL ELEVATION MODEL 2020 SC DNR LIDAR DEM: 5 COUNTY CHEROKEE, CHESTER, FAIRFIELD, LANCASTER, UNION , SC

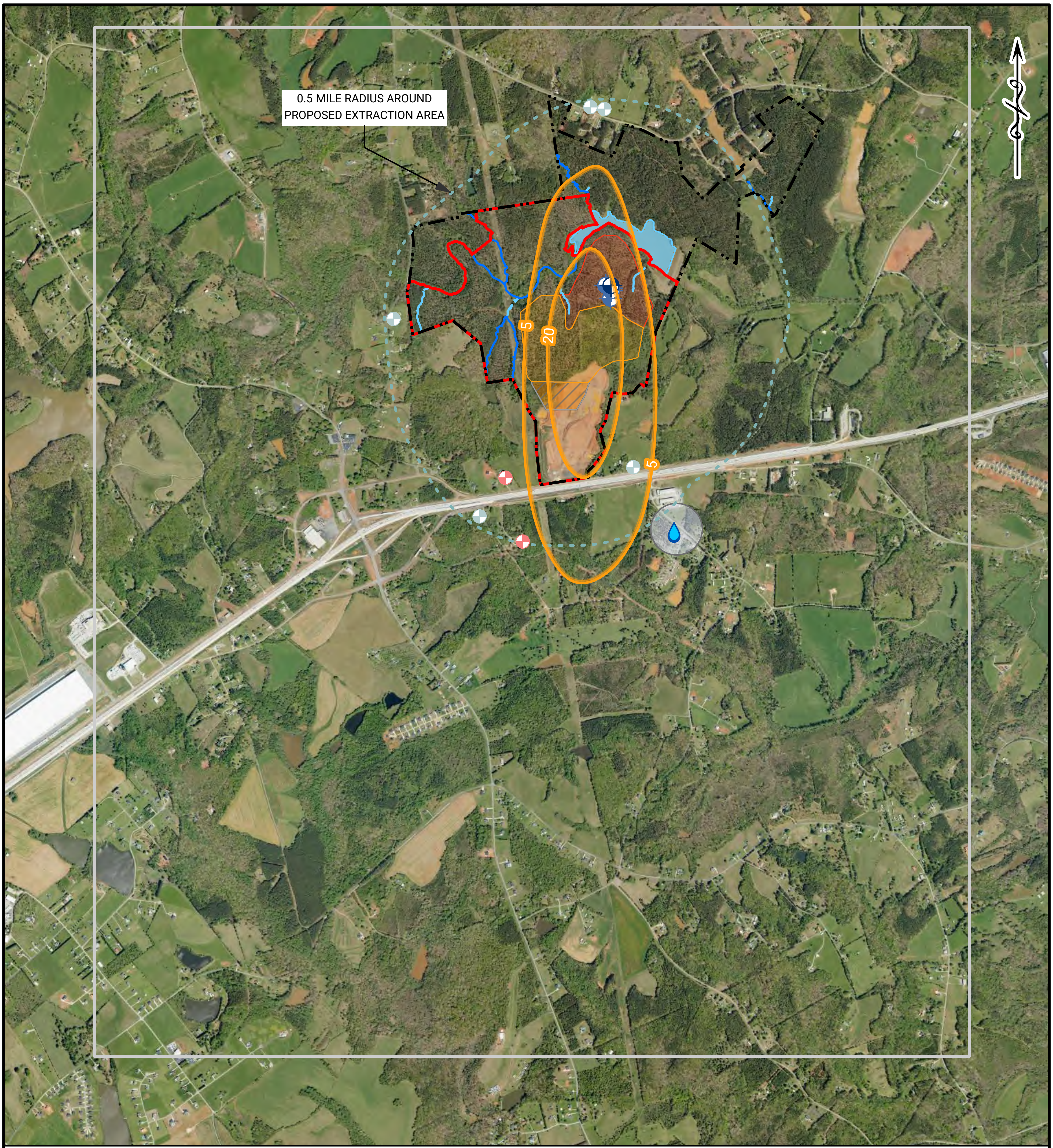
No.	REVISIONS DESCRIPTION	BY

DRAWN BY: TAO
CHECKED BY: TJD
APPROVED BY: DRL
DATE: 5-9-25
FILE NAME: 24056 GW ELEV
JOB NO: 24-24056

BLE BUNNELL LAMMONS ENGINEERING

CROSS SECTIONS: PREDICTED WATER TABLE ELEVATION AFTER 0, 60, AND 100 YEARS
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
8



LEGEND

- DRAWDOWN AFTER 15 YEARS FEET
- MODEL BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PHASE 1 EXTRACTION AREA
- PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT FACILITIES
- PHASE 2 EXTRACTION AREA
- OBSERVATION WELL
- PUMPING WELL
- 0.5 MILE RADIUS AROUND PROPOSED EXTRACTION AREA
- PUBLIC WATER SUPPLY WELL PWSW
- EXISTING LOW VOLUME BUFFER 500 FEET
- CONFIRMED PRIVATE DRINKING WATER WELL
- SUSPECTED PRIVATE DRINKING WATER WELL
- JURISDICTIONAL INTERMITTENT STREAM
- JURISDICTIONAL PERENNIAL STREAM
- JURISDICTIONAL SURFACE WATER

NOTES:
1. DRAWDOWN CONTOURS PRESENTED FOR GROUNDWATER MODEL LAYER 3.
2. PRIVATE DRINKING WATER WELL LOCATIONS ARE APPROXIMATE.
3. VEHICULAR AREA RECONNAISSANCE PERFORMED BY BLE IN SEPTEMBER 2024.

REFERENCES:
PROPOSED SITE BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE HHNT ; PUBLIC WATER SUPPLY WELL AND PROTECTION ZONES SOUTH CAROLINA DEPT. OF ENVIRONMENTAL SERVICES FORMERLY SC DHEC GIS CLEARINGHOUSE; BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

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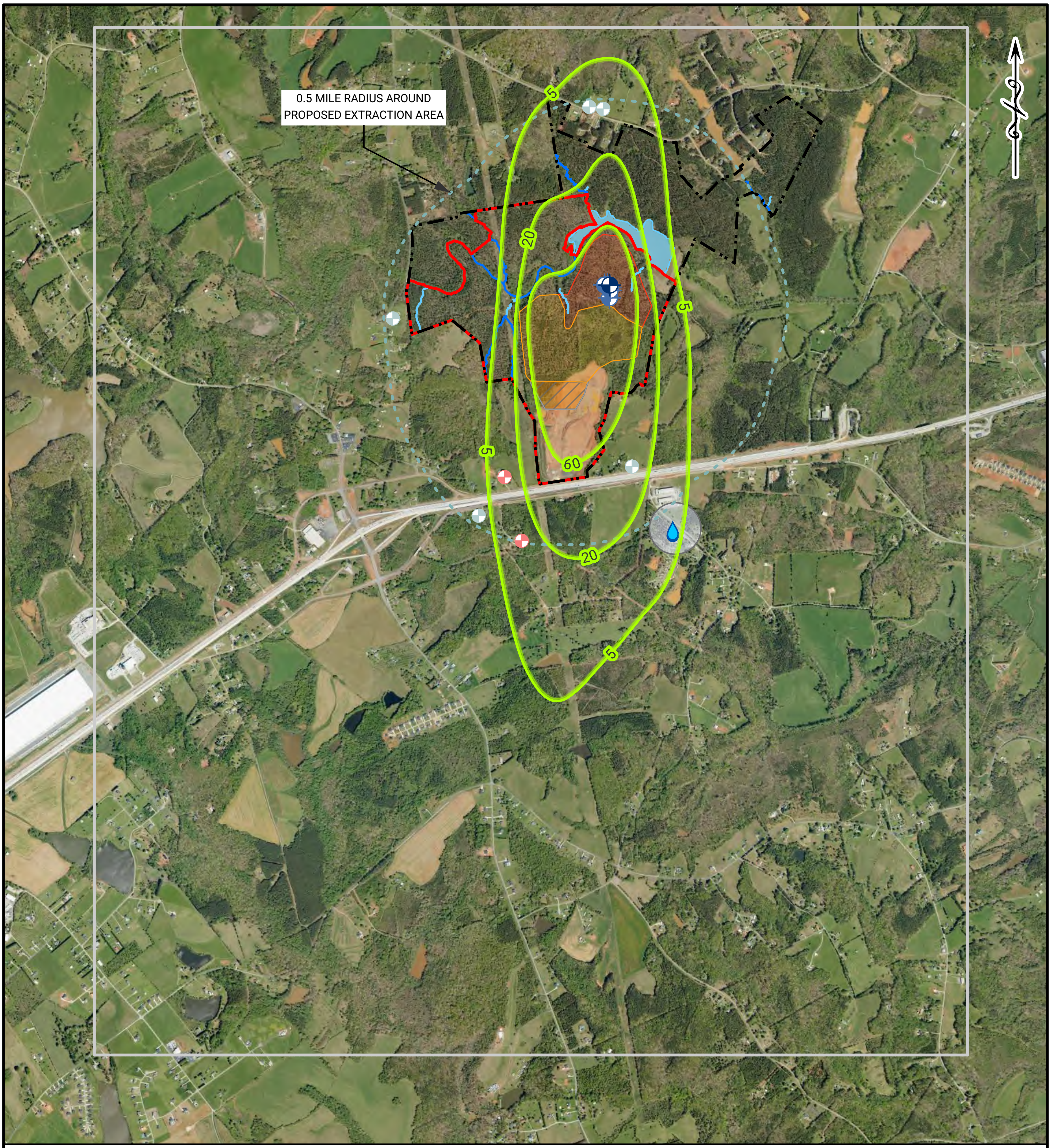
APPROXIMATE SCALE IN FEET

DRAWN BY:	TAO	DATE:	5-9-25
CHECKED BY:	TJD	FILE NAME:	24056 DRAW
APPROVED BY:	DRL	JOB NO:	24-24056

BLE BUNNELL LAMMONS ENGINEERING

GROUNDWATER DRAWDOWN
SIMULATED AT 15 YEARS
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
9A



LEGEND

- DRAWDOWN AFTER 30 YEARS FEET
- MODEL BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PHASE 1 EXTRACTION AREA
- PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT FACILITIES
- PHASE 2 EXTRACTION AREA
- OBSERVATION WELL
- PUMPING WELL
- 0.5 MILE RADIUS AROUND PROPOSED EXTRACTION AREA
- PUBLIC WATER SUPPLY WELL PWSW
- EXISTING LOW VOLUME BUFFER 500 FEET
- CONFIRMED PRIVATE DRINKING WATER WELL
- SUSPECTED PRIVATE DRINKING WATER WELL
- JURISDICTIONAL INTERMITTENT STREAM
- JURISDICTIONAL PERENNIAL STREAM
- JURISDICTIONAL SURFACE WATER

NOTES:
1. DRAWDOWN CONTOURS PRESENTED FOR GROUNDWATER MODEL LAYER 3.
2. PRIVATE DRINKING WATER WELL LOCATIONS ARE APPROXIMATE.
3. VEHICULAR AREA RECONNAISSANCE PERFORMED BY BLE IN SEPTEMBER 2024.

REFERENCES:
PROPOSED SITE BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE HHNT ; PUBLIC WATER SUPPLY WELL AND PROTECTION ZONES SOUTH CAROLINA DEPT. OF ENVIRONMENTAL SERVICES FORMERLY SC DHEC GIS CLEARINGHOUSE; BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

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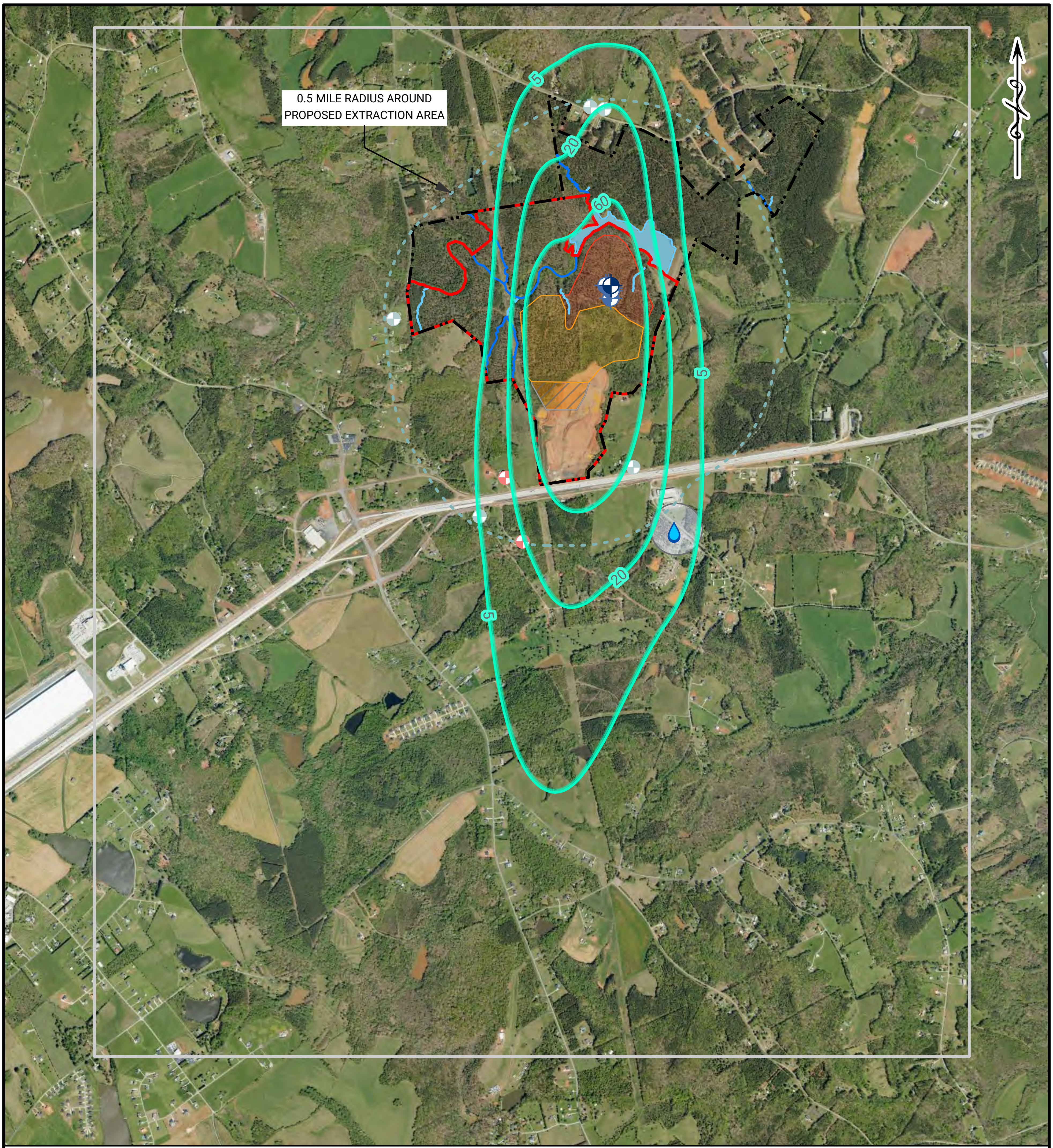
APPROXIMATE SCALE IN FEET

DRAWN BY:	TAO	DATE:	5-9-25	BLE BUNNELL LAMMONS ENGINEERING	GROUNDWATER DRAWDOWN SIMULATED AT 30 YEARS PROPOSED LUCK CHEROKEE CHEROKEE COUNTY, SOUTH CAROLINA
CHECKED BY:	TJD	FILE NAME:	24056 DRAW		
APPROVED BY:	DRL	JOB NO:	24-24056		

FIGURE
9B



LEGEND

- DRAWDOWN AFTER 60 YEARS FEET
- MODEL BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PHASE 1 EXTRACTION AREA
- PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT FACILITIES
- PHASE 2 EXTRACTION AREA
- OBSERVATION WELL
- PUMPING WELL
- 0.5 MILE RADIUS AROUND PROPOSED EXTRACTION AREA
- PUBLIC WATER SUPPLY WELL PWSW
- EXISTING LOW VOLUME BUFFER 500 FEET
- CONFIRMED PRIVATE DRINKING WATER WELL
- SUSPECTED PRIVATE DRINKING WATER WELL
- JURISDICTIONAL INTERMITTENT STREAM
- JURISDICTIONAL PERENNIAL STREAM
- JURISDICTIONAL SURFACE WATER

NOTES:
1. DRAWDOWN CONTOURS PRESENTED FOR GROUNDWATER MODEL LAYER 3.
2. PRIVATE DRINKING WATER WELL LOCATIONS ARE APPROXIMATE.
3. VEHICULAR AREA RECONNAISSANCE PERFORMED BY BLE IN SEPTEMBER 2024.

REFERENCES:
PROPOSED SITE BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE HHNT ; PUBLIC WATER SUPPLY WELL AND PROTECTION ZONES SOUTH CAROLINA DEPT. OF ENVIRONMENTAL SERVICES FORMERLY SC DHEC GIS CLEARINGHOUSE; BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

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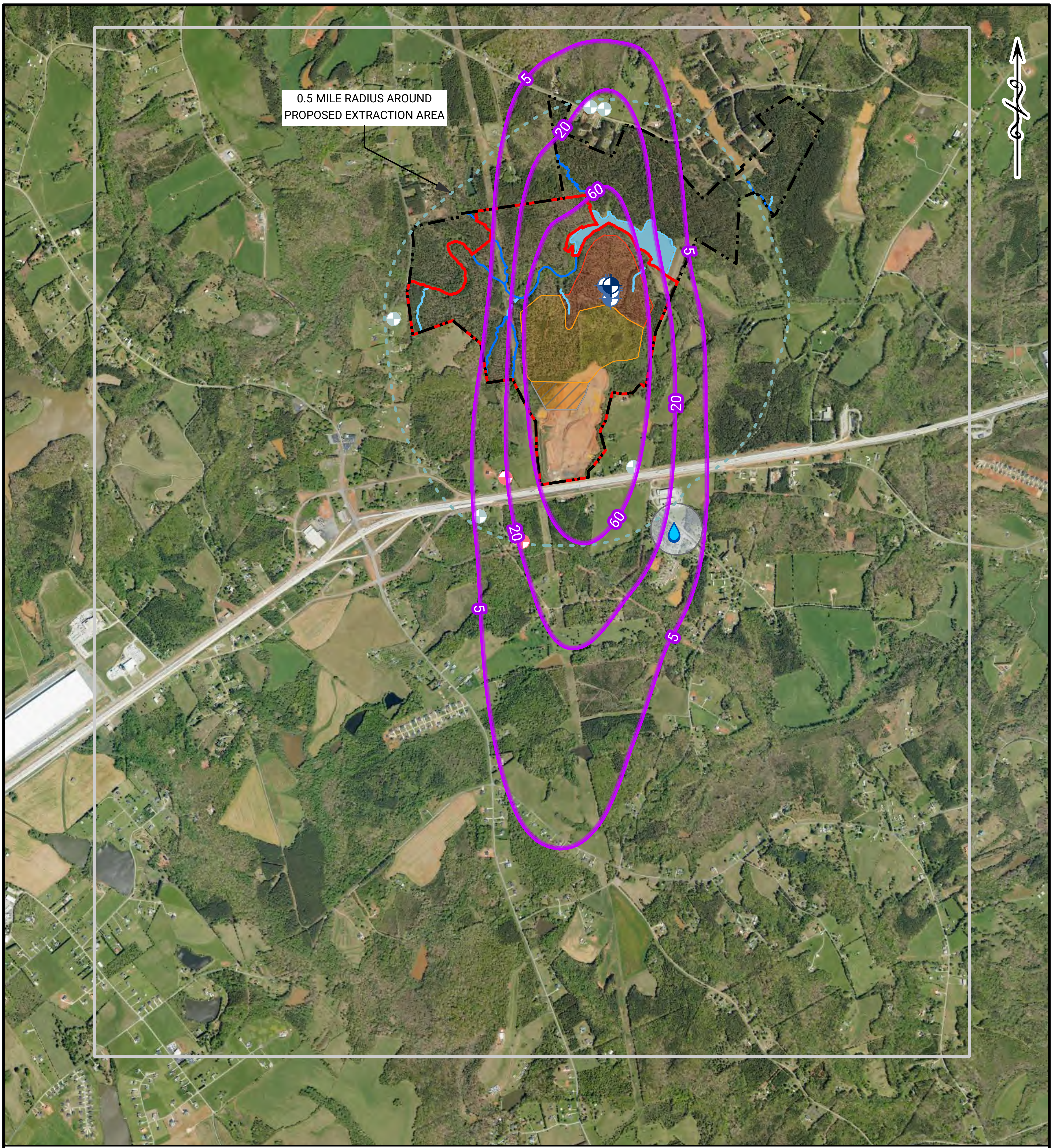
APPROXIMATE SCALE IN FEET

DRAWN BY:	TAO	DATE:	5-9-25	GROUNDWATER DRAWDOWN SIMULATED AT 60 YEARS PROPOSED LUCK CHEROKEE CHEROKEE COUNTY, SOUTH CAROLINA
CHECKED BY:	TJD	FILE NAME:	24056 DRAW	
APPROVED BY:	DRL	JOB NO:	24-24056	

BLE BUNNELL LAMMONS ENGINEERING

FIGURE

9C



LEGEND

- DRAWDOWN AFTER 100 YEARS FEET
- MODEL BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PHASE 1 EXTRACTION AREA
- PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT FACILITIES
- PHASE 2 EXTRACTION AREA
- OBSERVATION WELL
- PUMPING WELL
- 0.5 MILE RADIUS AROUND PROPOSED EXTRACTION AREA
- PUBLIC WATER SUPPLY WELL PWSW
- EXISTING LOW VOLUME BUFFER 500 FEET
- CONFIRMED PRIVATE DRINKING WATER WELL
- SUSPECTED PRIVATE DRINKING WATER WELL
- JURISDICTIONAL INTERMITTENT STREAM
- JURISDICTIONAL PERENNIAL STREAM
- JURISDICTIONAL SURFACE WATER

NOTES:
1. DRAWDOWN CONTOURS PRESENTED FOR GROUNDWATER MODEL LAYER 3.
2. PRIVATE DRINKING WATER WELL LOCATIONS ARE APPROXIMATE.
3. VEHICULAR AREA RECONNAISSANCE PERFORMED BY BLE IN SEPTEMBER 2024.

REFERENCES:
PROPOSED SITE BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE HHNT ; PUBLIC WATER SUPPLY WELL AND PROTECTION ZONES SOUTH CAROLINA DEPT. OF ENVIRONMENTAL SERVICES FORMERLY SC DHEC GIS CLEARINGHOUSE; BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

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APPROXIMATE SCALE IN FEET

DRAWN BY: TAO	DATE: 5-9-25	BLE BUNNELL LAMMONS ENGINEERING	GROUNDWATER DRAWDOWN SIMULATED AT 100 YEARS PROPOSED LUCK CHEROKEE CHEROKEE COUNTY, SOUTH CAROLINA	FIGURE	
CHECKED BY: TJD	FILE NAME: 24056 DRAW			9D	
APPROVED BY: DRL	JOB NO: 24-24056				

APPENDIX A
Kennedy Consulting Services – Luck Cherokee Mine Map

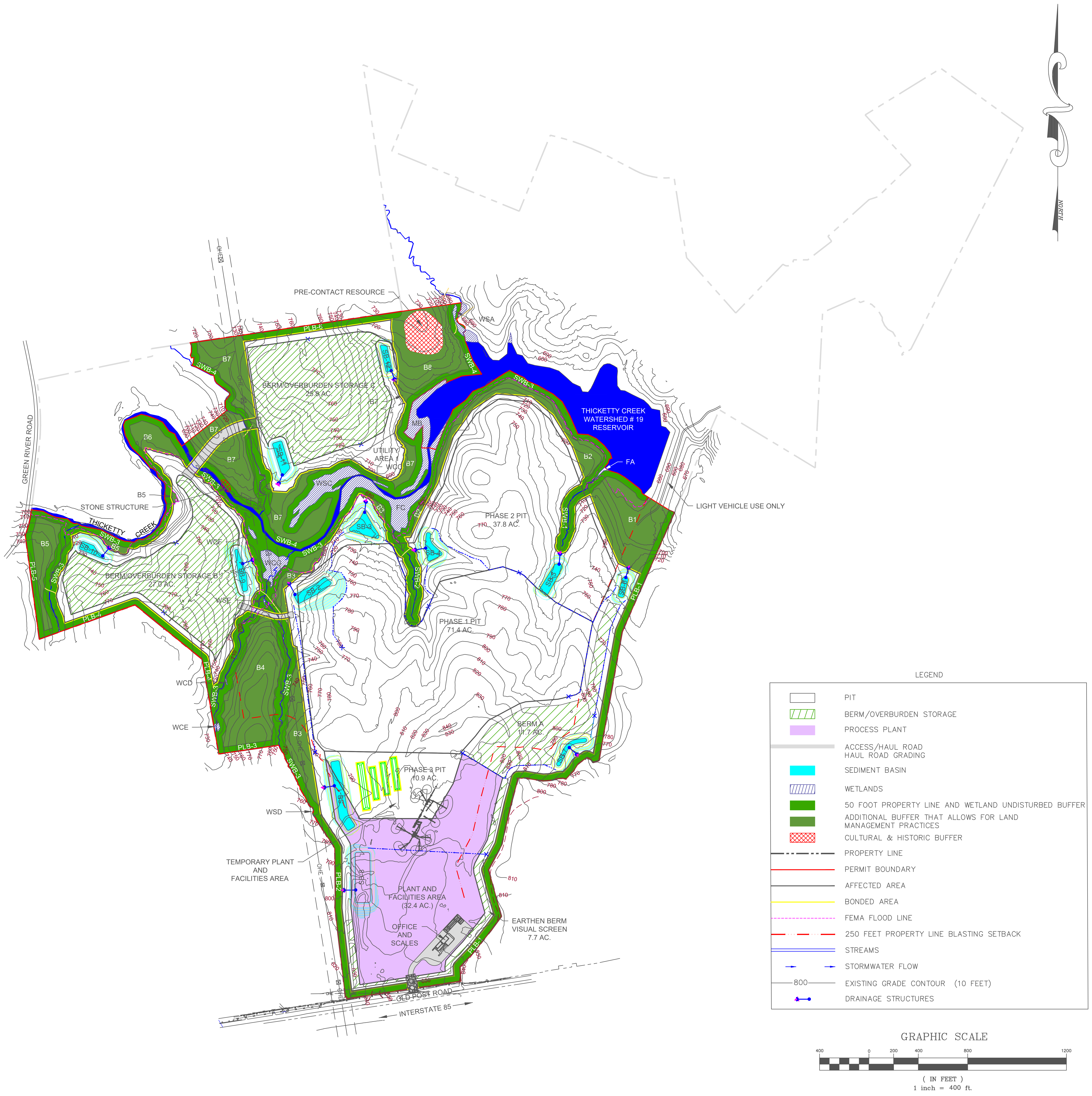
ACREAGE SUMMARY TABLE – LUCK CHEROKEE				
CATEGORY	**CURRENT ACREAGE**	**AMENDED ACREAGE**	**UPDATED TOTAL ACREAGE**	**NOTES**
AFFECTED				
Open Pit Segments	120.1			
Overburden storage/berms	72.2			
Processing plant	32.4			
Other	28.6			
AFFECTED TOTAL	253.3			
BUFFER AREAS	94.3			
FUTURE IMPACT AREAS	0.0			
TOTAL PERMIT AREA	347.6			
BONDED ACREAGE	253.3			

Notes:

1. Processing Plant – A temporary processing plant area is located within Phase 3 Pit.
2. “Other” category includes office, haul roads and sediment basins.

NOTES

1. PARCEL LINES, FLOODPLAIN, POWER LINE EASEMENTS AND EXISTING TOPOGRAPY PROVIDED BY GLENN ASSOICATES SURVEYING, INC.
2. THE MINE PERMIT AREA INCLUDES111.68 ACRES OF PARCEL TMS# 045-00-00-053.000 AND 235.76 ACRES OF PARCEL TMS# 027-00-00-035.000.
3. AQUATIC RESOURCES DELINEATION PROVIDED BY HODGES, HARBIN, NEWBERRY & TRIBBLE, INC.
4. STORMWATER SEDIMENT BASINS AND DIVERSIONS ARE AS PROVIDED BY HODGES, HARBIN, NEWBERRY & TRIBBLE, INC. IN CONJUNCTION WITH THE EROSION AND SEDIMENT CONTROL PLAN.
5. SURROUNDING PARCEL DATA ARE FROM CHEROKEE COUNTY GEOGRAPHIC INFORMATION SYSTEM (GIS) DEPARTMENT.
6. HAUL ROAD STREAM CROSSINGS TO BERM/OVERBURDEN STORAGE AREAS B & C ARE TEMPORARY.
7. MINE DESIGN PROVIDED BY LUCK STONE CORPORATION
8. THE DWARF-FLOWERED HEARTLEAF PLANT LOCATIONS ARE SHOWN IN HHNT’S *THREATENED AND ENDANGERED SPECIES ASSESSMENT AND SURVEY* ON FIGURE 5. SECTION 5, PAGE 8 OF THE REPORT STATES THERE WILL BE, *“…A 50-FOOT UNDISTURBED VEGETATIVE BUFFER AROUND ALL EXISTING PLANTS POPULATIONS…”*



REVISIONS

Description	Date	By

Kennedy Consulting Services, LLC

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Luck Cherokee
Mine Map
Prepared for
Luck Stone Corporation
Cherokee County, South Carolina

Project No.: KCS 24-220
Date: 04-24-25
Approved by: RCK
Drawn by: B.C.
Scale: 1"=400'

Sheet No.
1
of
3

APPENDIX B
Geophysical Methods and Results

COLLIER GEOPHYSICS
Locate · Delineate · Characterize

April 15, 2025

Bunnell Lammons Engineering, Inc.

6004 Ponders Court
Greenville, SC 29615

Attn: Thomas O'Shea, P.G.
thomas.oshea@blecorp.com
(864) 535 - 4069

RE: Geophysical Letter Report | Project # 240324
Proposed Quarry Site, VLF and ERI Survey
Gaffney, SC

Collier Geophysics, LLC (Collier) conducted a geophysical investigation on behalf of Bunnell Lammons Engineering, Inc. (BLE), at a proposed quarry site located near Gaffney, SC (**Figure 1**). The objective of the investigation was to inform the placement of several observation and dewatering wells around the proposed site by identifying potential water permissive joints and fractures in the bedrock. First, a Very Low Frequency (VLF) survey was performed along select lines at the site, and the data was analyzed for anomalies consistent with water permissive joints and fractures. After potential anomalies were identified from the VLF method, a focused survey was conducted using the electrical resistivity imaging (ERI) method to further assess depth, orientation, and other characteristics of target anomalies (**Figure 2**).

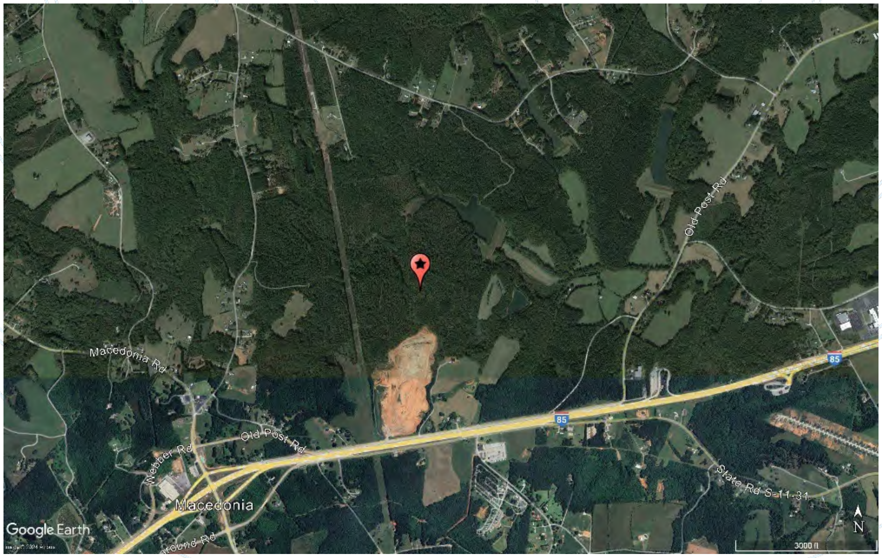


Figure 1: Site location shown by *red marker. Imagery source: Google Earth, 2024.*

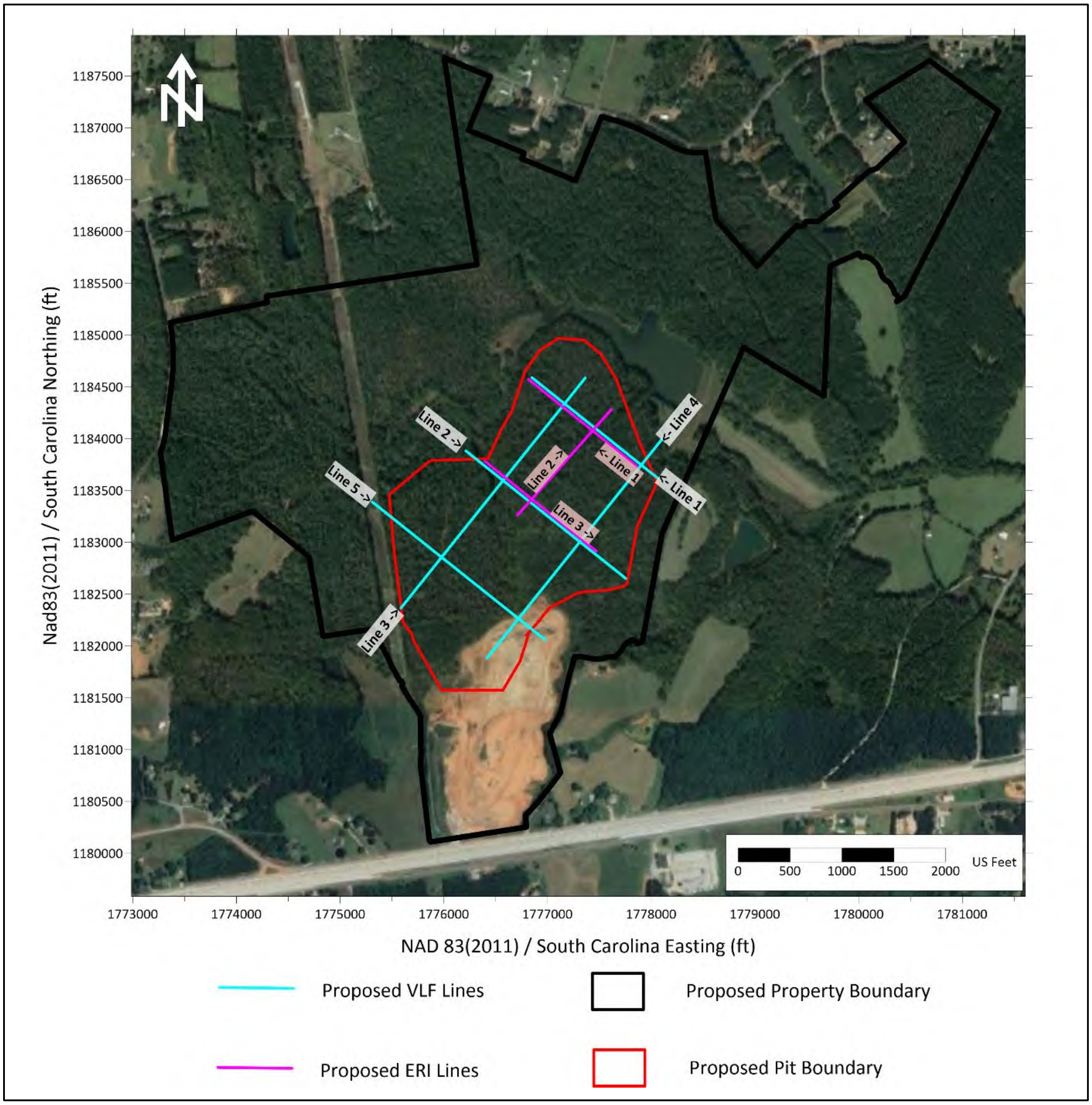


Figure 2: Site map modified from the provided map by BLE illustrating the proposed VLF and ERI lines, as well as approximate property boundaries.

Overview

Field work was conducted in two mobilizations. Collier geophysicist Jordan Rajcok and geophysical technician Erick Pirayesh conducted the VLF surveys across the site between November 4-6, 2024 and geophysicists Austin Riggs and Jordan Rajcok conducted the ERI surveys between November 11-12, 2024. The following report presents results from the VLF and ERI investigations and summarizes the site conditions, field methods, data acquisition, and interpretation procedures.

The proposed survey and extraction area covers approximately 110 acres of land. Most of the site was comprised of three ridges with moderate to dense vegetation growth. The maturity of the forest varied across the site ranging from mature forest with little to no undergrowth to immature forest with many small trees and vines. Smaller ridges and ravines created by streams and runoff cut through the northeastern side of the site. Off roading trails crossed through the site allowing multiple access points to the proposed lines. The weather was cloudy and rainy during the first mobilization causing slippery conditions. During the second mobilization it was sunny and cool in the morning, reaching warmer temperatures by mid-afternoon. Field staff used careful navigation to minimize risks such as slips, trips, and falls across the site. See **Figure 3** for photographs of the site conditions at the time of the surveys.

Figure 3: Site conditions at the time of the survey.

Methods

Collier utilized multiple tools to conduct the investigation: a Geonics Limited EM16 VLF-EM Receiver, an AGI R8 Supersting system with 84 electrodes, and an Emlid Reach RS2 GNSS Receiver pair with RTK corrections.

VLF Method

A total of five VLF lines were collected at the site totaling approximately 10,000 feet, with two trending northeast-southwest and three trending northwest-southeast. Line positions are shown in **Figure 2**. Collier utilized an Emlid Reach RS2 GNSS Receiver pair with RTK corrections to locate and guide the lines.

Electromagnetic (EM) methods rely on the measurement of secondary fields generated by conducting bodies in the ground when subjected to a primary EM signal, either generated actively or passively. Active methods, such as those performed by the R8 SuperSting, employ transportable transmitters to deploy an EM signal into the subsurface. Active methods often use frequencies in the range of 400 to 5000 Hz, which are able to image the near subsurface with very high resolution. However, due to the high energy carried by the high frequency EM signals, the signals are only able to penetrate at most the upper couple hundred feet before attenuating entirely. Additionally, they struggle to discriminate between bodies of marginally different conductivities. To be able to view deeper into the subsurface, much lower energy, and thus much lower frequency, are needed.

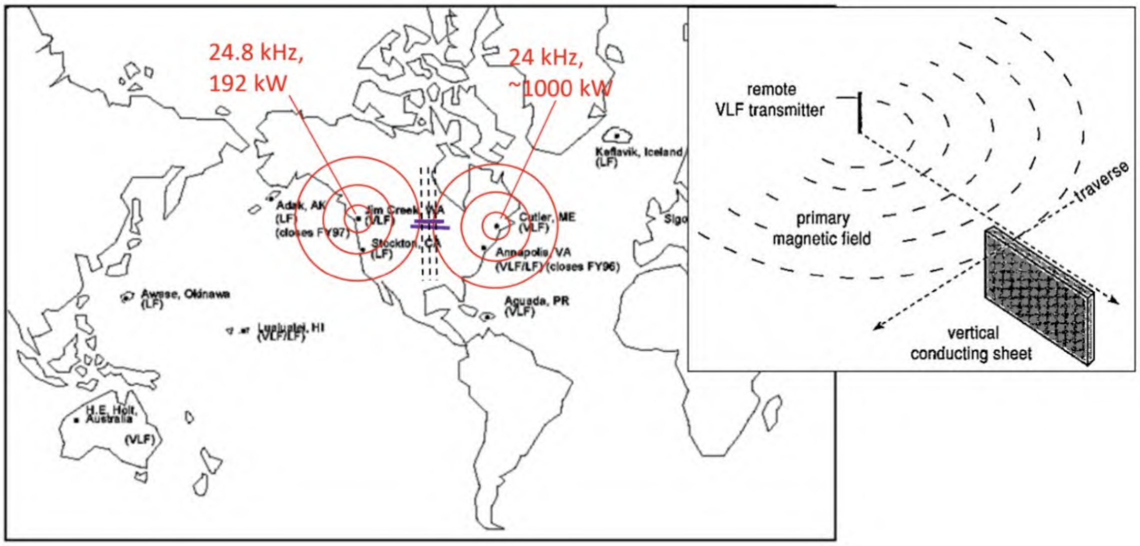


Figure 4: (Left) Map showing the locations of the VLF stations used for this survey. The Jim Creek station was upgraded since this image was created to a power output of ~1200 kW. (Right) Diagram showing the propagation of the VLF signal in relation to a conductor and the orientation of the profile line (tranverse). Images obtained from Michigan Tech, 2021.

To be able to view deeper, a new technology was developed in the 1960s that employed the use of powerful military radio transmitters stationed around the globe as the primary signal. The military transmitters are designed to be able to communicate and direct submarines stationed around the globe without the need for the sub to surface fully to receive the communications. In order to penetrate deep into the water, a very low frequency (VLF) of 15 to 30 kHz would need to be used. Many of these stations would be built around the world during the Cold War. Many of the original stations built then no longer exist, however VLF is still used by major world superpowers such as the US, Russia, and China to communicate with their fleets. Stations still active in the US include Cutler, Maine (NAA); Jim Creek, Washington (NLK); Lamoure, North Dakota (NML); Lualualei, Hawaii (NPM); and Aguada, Puerto Rico (NAU).

The transmitted signals from the stations carry both electric and magnetic components that travel in three modes: through the sky, through space, and through the ground. The bulk of the signal carried through the groundwave is the magnetic component. As the signal reaches conductive materials below the surface, it induces an eddy current within the material, generating its own primary and secondary electromagnetic field. This induced electromagnetic field is observable on the surface by using a specialized radio receiver tuned to the specific frequency of the induced field. However, the signal is only observable if the correct station is chosen for the survey. For ideal results, the direction to the station used is parallel to the orientation of the conductive material, and the survey is performed perpendicular to both the material and the station (See **Figure 4**). If the orientation of the conductive material is unknown, then two different stations should be used so the survey line directions are roughly perpendicular to each other.

The VLF survey was performed using a Geonics Limited EM16 VLF-EM receiver tuned to both the Cutler (NAA) and Jim Creek (NLK) stations. Since the orientation of the fractures and joints wasn't known prior to the survey, two stations creating a right angle to each other over the survey area were used. The station locations are shown in **Figure 4.**

ERI Method

The ERI method is used to characterize subsurface lithology and/or materials in terms of electrical resistivity. ERI incorporates the injection of an electrical current into the ground through a pair of electrodes (current electrodes) while simultaneously measuring the potential or voltage between an offset electrode pair (potential electrodes). The subsurface apparent resistivity is then calculated from the measured voltages, according to electrode geometry. This measured apparent resistivity represents the bulk resistivity of earth materials where the majority of injected current flows. The geometry between 2 current electrodes and 2 or more potential electrodes defines an array. The distance between the potential electrodes is directly related to resistivity measurements with depth. The amount of current injected and distance between the current electrodes determines the investigation depth, i.e., larger spacing forces more available current to flow at depth. Calculated apparent resistivity values for a set of measurements are then used in a tomographic inverse modeling scheme to build a best fit model of the true resistivity distribution of the subsurface.

Electrical resistivity (the reciprocal of conductivity) is a material property which is diagnostic of the type of geologic material present. Unsaturated soils have higher resistivity (lower conductivity) than saturated soils. Sand and gravel with minimal silt/clay content have higher resistivities than soils with high silt/clay content. Sandstone, limestone, and granite typically have higher resistivity values than shale and siltstone. Materials saturated with saline or brine waters have very low resistivity values and can be analogous to highly conductive clays. ERI data are susceptible to interference from objects that act as subsurface conductors and draw injected current away from the ERI array in ways not related to geologic structures. Grounded above-ground metallic objects, and buried subsurface utilities are typically the primary source of noise in ERI measurements.

The ERI survey was performed using an Advanced Geophysical Systems Inc. (AGI) Super Sting R8 8-channel multiple electrode resistivity imaging system (Sting R8). The survey equipment consisted of a transmitter/receiver, cables capable of utilizing up to 84-takeouts for electrodes, and a marine battery for powering the system.

ERI surveys were conducted along two lines as shown on **Figure 2**: All surveys utilized 84 electrodes at 5 m interval spacing. The electrodes and cables for each line were connected to the Sting R8, which was always positioned in the middle of the array for each test along the line (between electrodes 42 and 43). The ERI surveying for this project utilized a dipole-dipole array. The dipole-dipole array is more sensitive to lateral changes in the subsurface. A contact resistance test was performed before each data acquisition to ensure adequate ground contact for each electrode. Some electrodes installed in areas along gravel trails required watering with a conductive solution to reduce contact resistance. GPS positions were recorded at the ends of each line and along several intermediate points using the Emlid Reach RS2 GPS System with RTK corrections. Elevations along each line were derived from a provided topographic map.

Data Processing

VLF

[The collected VLF data was processed using a series of formulas in Excel and the program KHFFILT by Markku Pirttijärvi. Each location where data was collected gave two data points, being the in-phase and out-of-phase component. Both are recorded in the form of a percentage relating the recorded value to the horizontal value. See **Figure A-2** for the collection points. A series of processes were then performed on the data. The data was converted from a percent to an angle of dip, and then was transformed using a Fraser Filter. The filter was designed to help process VLF data to emphasize proper cross-over points and eliminate false cross-overs, as well as allow the data to be gridded using Surfer. See **Figure A-6** for the Fraser Filtered grid.

ERI

The collected ERI data were processed in EarthImager by AGI using a standard workflow to remove erroneous and noisy data and prepare the raw apparent resistivity values for tomographic inversion. A topographic map and DEM was used for elevation corrections in the ERI inversion. Resistivity data was inverted in EarthImager to generate a 2D resistivity cross-section for each line (see example in **Figure 5** below). Inversion was performed to maximize resolution and provide good fit between modeled and measured resistivity data. In the figures, the top x-axis describes length along the line in feet, and the y-axis displays depth or elevation in feet. The color scale illustrates more resistive (red) and more conductive (blue) resistivity values in Ohm-meters (Ohm-m). The resulting 2D ERI cross sections obtained for each line were interpreted for anomalous resistivity zones using Surfer.

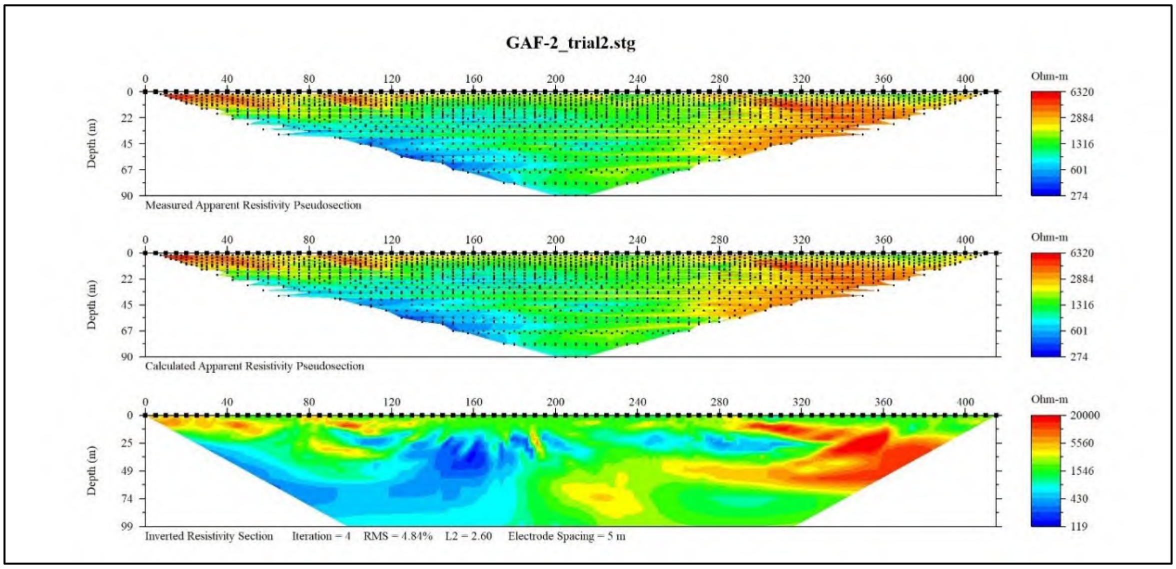


Figure 5. Line 2: Measured Apparent Resistivity (Top), Calculated Apparent Resistivity (Middle), and Inverted Resistivity Section with RMS=4.84% (Bottom).

Results and Discussion

Borehole data (provided by BLE) was used to correlate the geophysical findings. Borehole locations are shown on **Figure A-1,** and the borehole logs are shown on ERI Lines 2 and 3 (**Figures A-8 and A-9**). Note that some borings are offset 40-200 feet from the ERI lines and may not reflect conditions at the location of the lines.

When analyzing VLF data, the key areas of suspicion are areas where the in-phase component goes from a positive percentage to a negative percentage. That indicates the survey line went directly over some sort of conductive material centered under the crossing point, known as a true crossover. However, when moving towards a second conductor, the in-phase component can swing from a negative percentage to a positive percentage, called false crossovers. Those don't indicate any material below, but instead a general shift possibly related to the general trend of the area. The Fraser Filter causes the true crossovers to become strong positive maxima, and the false crossovers to become strong negative maxima. It also can show possible weaker anomalies that in the raw data were only negative slopes but never had a proper crossover. These could indicate some sort of weaker anomaly, or could be related to the general topography or background signal of the area.

Multiple crossovers were identified in the area concentrated primarily along lines 1 and 2 (see the plots on **Figure A-3** through **Figure A-5**). The strongest anomaly happens along Line 1 in the northeastern corner of the survey area. The overall shape and pattern of the anomaly is consistent between Line 1 and 2, which could indicate the anomalies are caused by a similar anomaly. A rough estimate on the strength and style of the anomaly can be determined based on the shape and nature of the out-of-phase, or quadrature, data. If the quadrature data follows a similar trend to the in-phase component, such as going from positive to negative, then that could indicate a somewhat less conductive material such as a fault or fracture. If the out-of-phase component mirrors the in-phase component, such as when the in-phase goes from positive to negative the quadrature goes from negative to positive, then that could indicate a more conductive material such as a magnetic body. In the case of the anomaly observed here, the quadrature mirrors the in-phase, potentially indicating the anomaly here is caused by some sort of strong conductive material. Part of the anomalous area identified lies along the northwest side of line 5. This anomalous area could be due to interference from the power lines running along the edge of the site near the beginning of this line.

The anomaly area is also visible in the Fraser filtered grid (area marked with a light blue rectangle on **Figure A-6** running roughly northeast-southwest). To help further delineate characteristics of this anomaly, three ERI lines were proposed to target the area. Two running parallel along the previous VLF lines 1 and 2, and one crossing perpendicular to those lines following the trend of the interpreted VLF anomaly. The resistivity cross-sections and VLF data collected along or in the vicinity of the ERI lines are shown in **Figure A-7** through **Figure A-9**. The ERI data was moderately useful in determining changes in subsurface lithology. The black dashed line shows the interpreted top of rock. At some locations, there is a reduction in resistivity at the overburden-to-rock interphase. However, at other areas there appear to be overlapping resistivity, and the interphase is not visible in the ERI data. Several linear conductive features in the rock were identified in the ERI data, marked with red dashed lines. These anomalies exhibited much lower resistivities than the surrounding interpreted bedrock (less than 1000 Ohm-m) and have been identified as potential fracture zones. The zones range from depths from 50 to 300 feet and seem to have highly variable strike angles. Borehole data is limited within the ERI survey area, and none overlap with the identified anomalies. Without borehole data through the anomaly, it is hard to say definitively what is causing it.

Closure

The geophysical methods used in this investigation, like any remote sensing technique, require the subjective interpretation of indirect methods of measurement. As such, there is an inherent margin of error, which is unavoidable. Our methods of data acquisition and interpretation for this project are complete as is reasonably possible, and have been successfully applied by Collier geophysicists to investigations of similar size and nature. We believe the results presented herein to be a reasonable representation of the subsurface conditions. However, due to the subjective nature of any type of interpretation, we cannot guarantee that our results are accurate in all areas. In addition, all subsurface features present at the site may not have been detected or identified.

If you have any questions regarding the field procedures, data analysis, or the results presented herein, please do not hesitate to contact us. For further information regarding the details of the VLF and ERI techniques, Collier can submit a more detailed method addendum upon request. We appreciate working with you and look forward to providing you with geophysical services in the future.

Respectfully Submitted,

Collier Geophysics, LLC

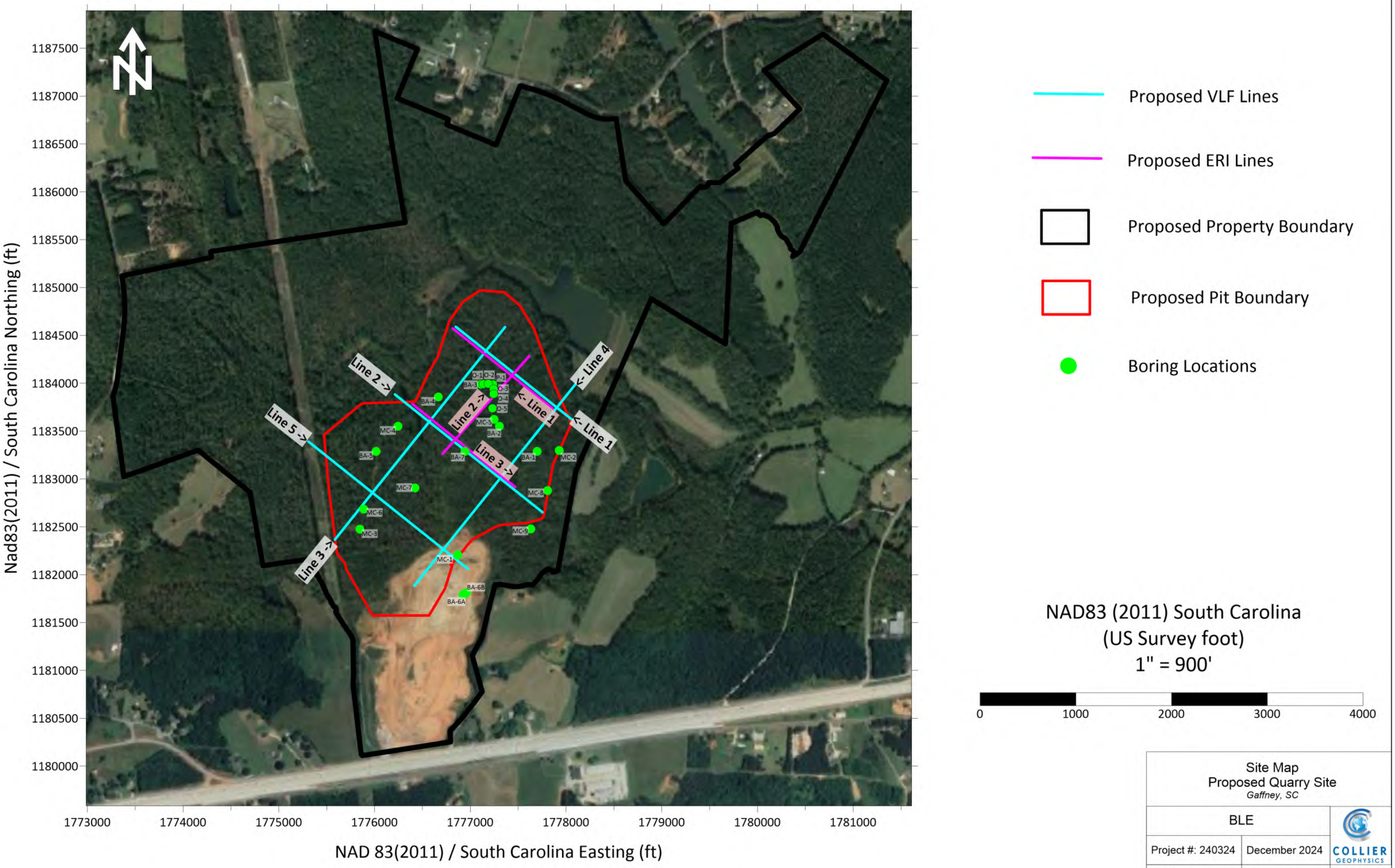
Jordan Rajcok
Geophysicist

Jorgen Bergstrom, P.G., P.Gp.
Senior Geophysicist

Austin Riggs, G.I.T.
Geophysicist

(1 copy e-mailed PDF format)

FIGURES



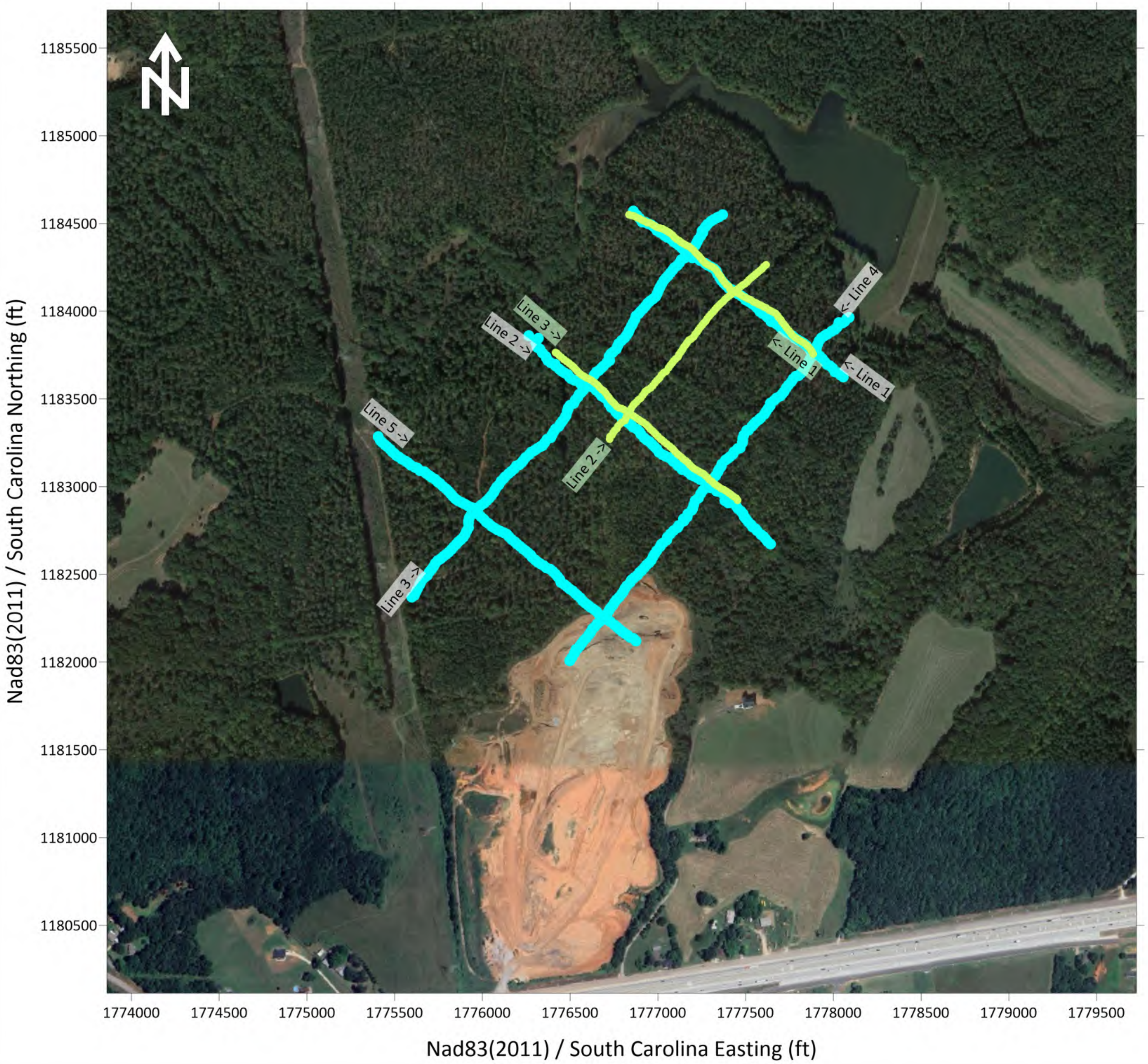
Site Map
Proposed Quarry Site
Gaffney, SC

BLE

Project #: 240324	December 2024
Drafted by: J. Rajcok	Checked by: J. Bergstrom

COLLIER GEOPHYSICS

Figure A-1



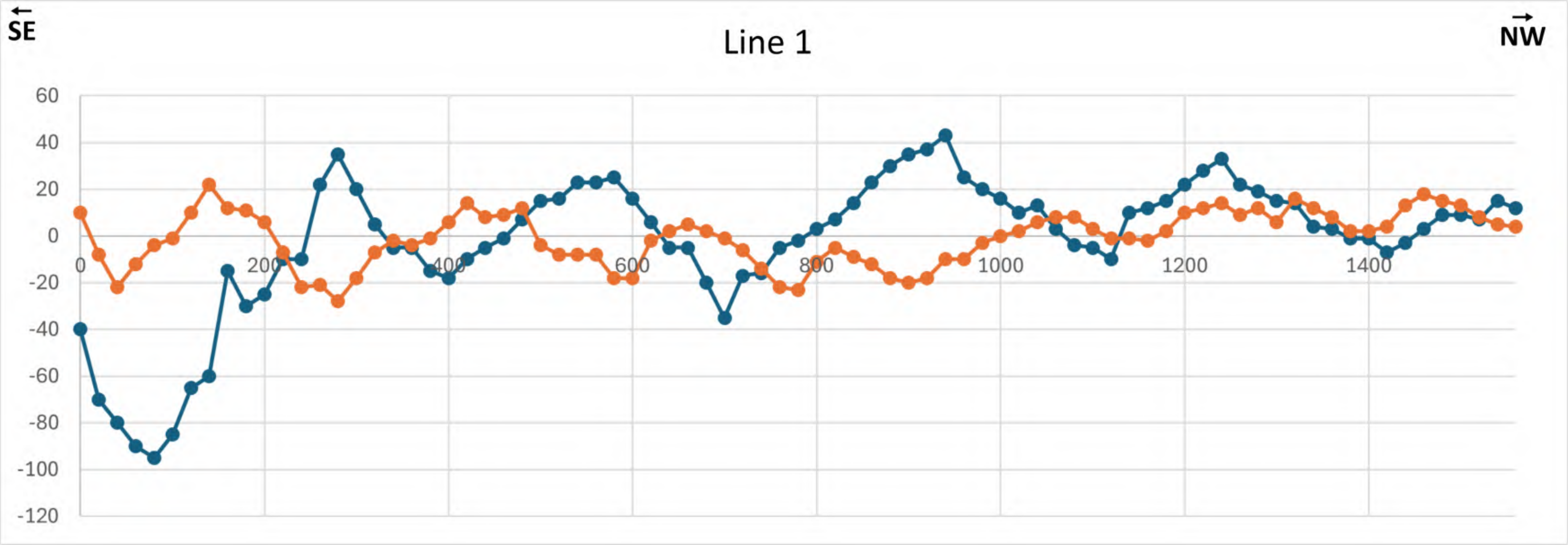
● VLF GPS Coordinates

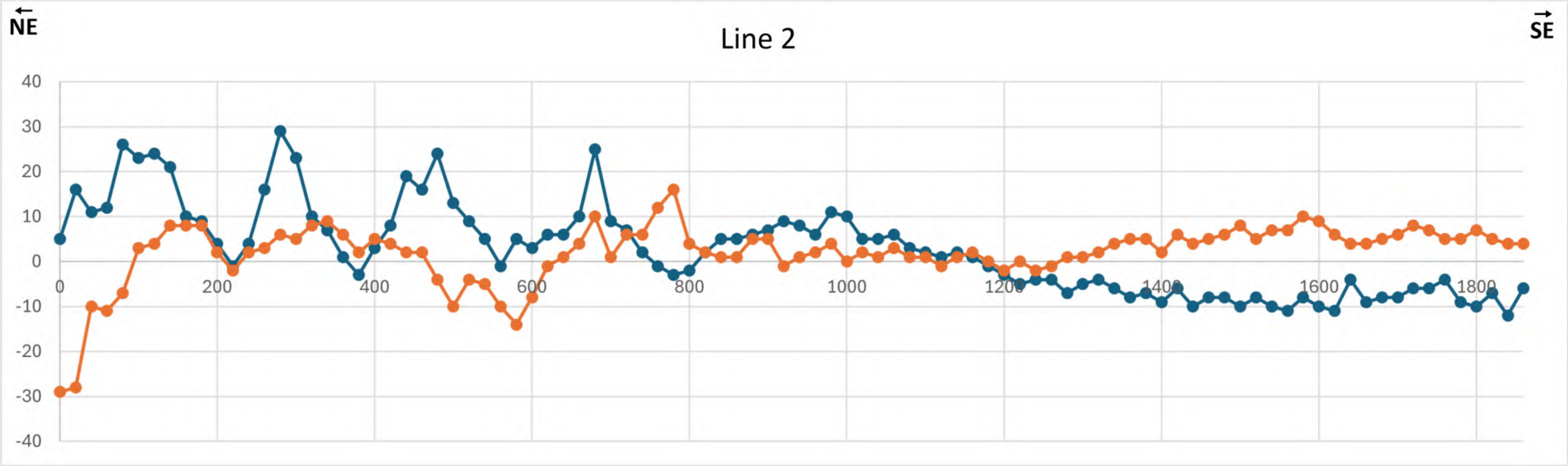
● ERI GPS Coordinates

NAD83 (2011) South Carolina
(US Survey foot)
1' = 600'

0 500 1000 1500 2000

VLF and ERI Survey Coverage Proposed Quarry Site *Gaffney, SC*	
BLE	COLLIER GEOPHYSICS
Project #: 240324	December 2024
Drafted by: J. Rajcok	Checked by: J. Bergstrom
Figure A-2	





In-phase Component

Out-of-Phase Component

Vertical Axes are the **percentage** of variation in dip angle compared to horizontal
Horizontal Axes are the **distance** along the line in **feet**

VLF Graphs
Proposed Quarry Site
Gaffney, SC

BLE

Project #: 240324

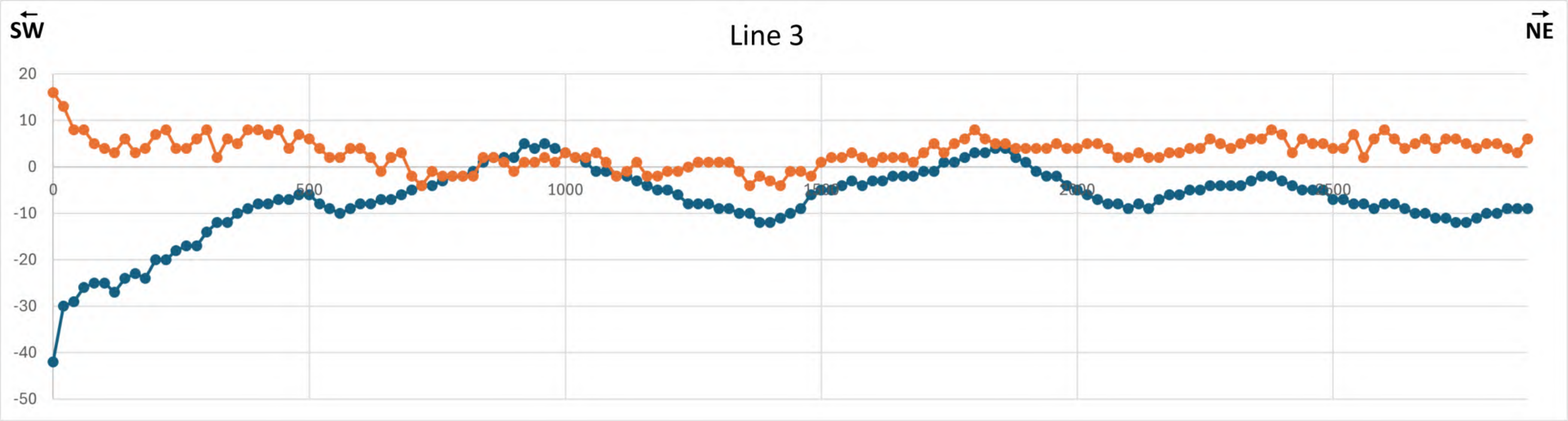
December 2024

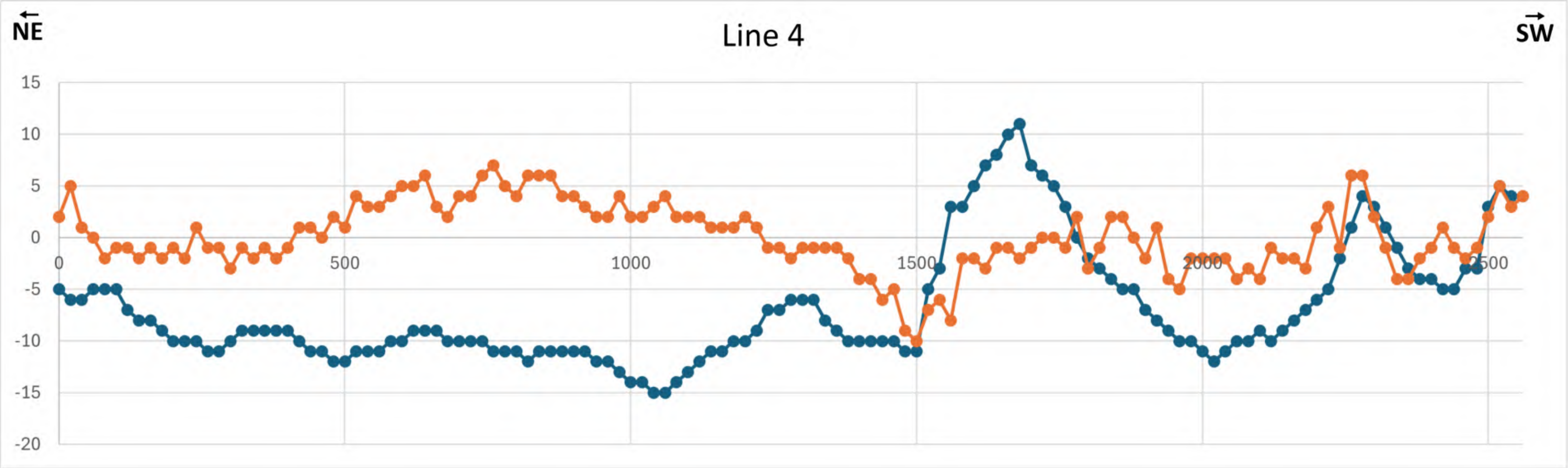
COLLIER GEOPHYSICS

Drafted by: A. Riggs

Checked by: J. Bergstrom

Figure A-3


Line 3


Line 4

— In-phase Component

— Out-of-Phase Component

Vertical Axes are the **percentage** of variation in dip angle compared to horizontal
Horizontal Axes are the **distance** along the line in **feet**

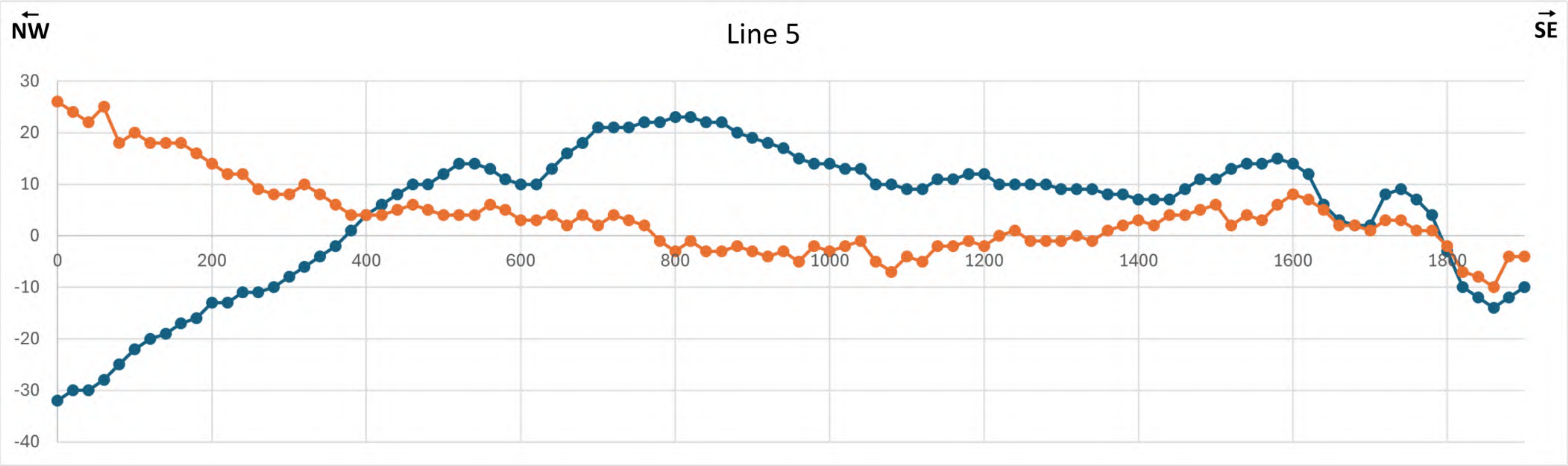
VLF Graphs
Proposed Quarry Site
Gaffney, SC

BLE

Project #: 240324 | December 2024

Drafted by: A. Riggs | Checked by: J. Bergstrom | Figure A-4

COLLIER
GEOPHYSICS



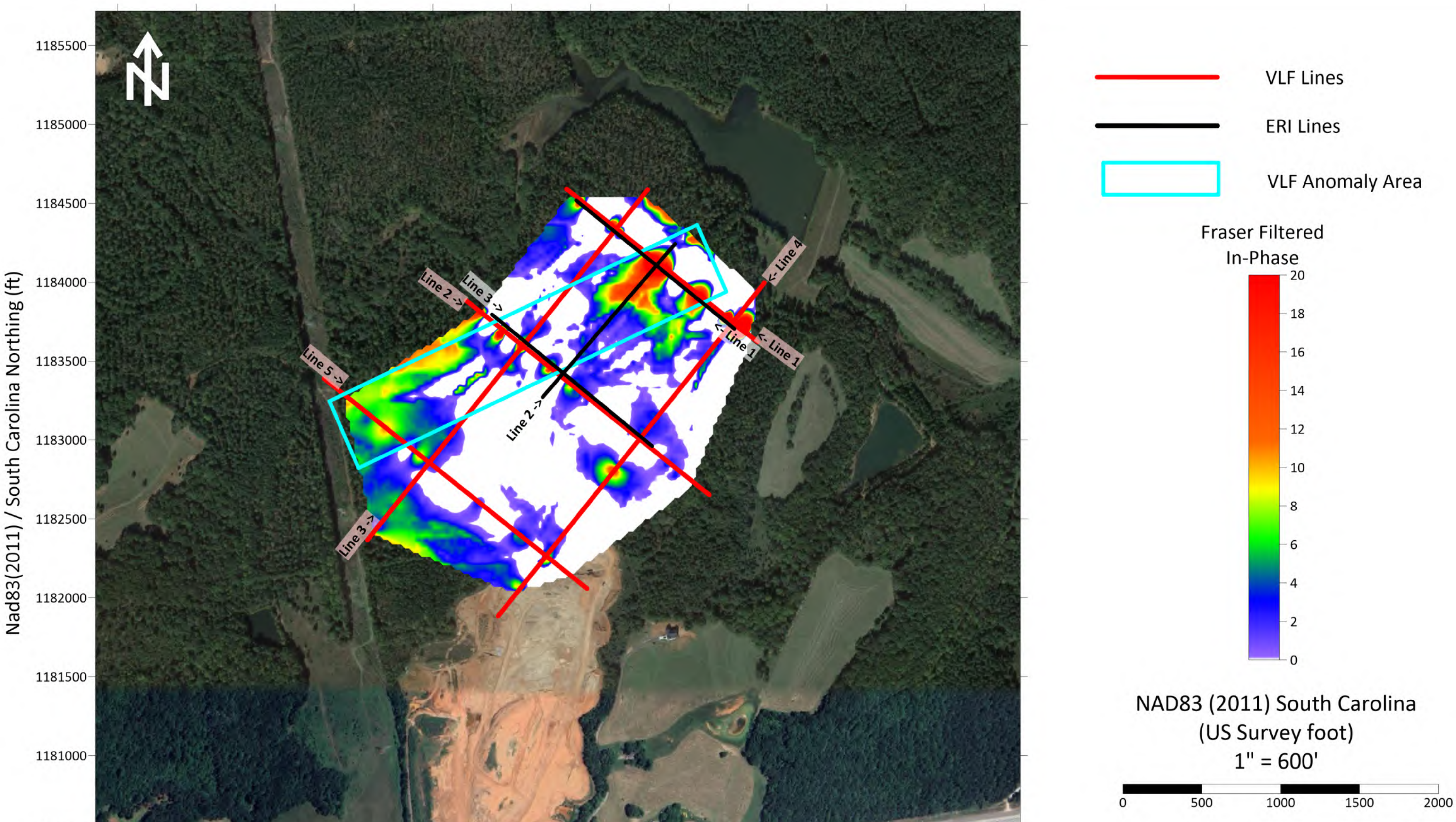
— In-phase Component — Out-of-Phase Component

Vertical Axes are the **percentage** of variation in dip angle compared to horizontal
Horizontal Axes are the **distance** along the line in **feet**

VLF Graphs
Proposed Quarry Site
Gaffney, SC

BLE

Project #: 240324	December 2024	COLLIER GEOPHYSICS
Drafted by: A. Riggs	Checked by: J. Bergstrom	Figure A-5



VLF Filtered
Proposed Quarry Site
Gaffney, SC

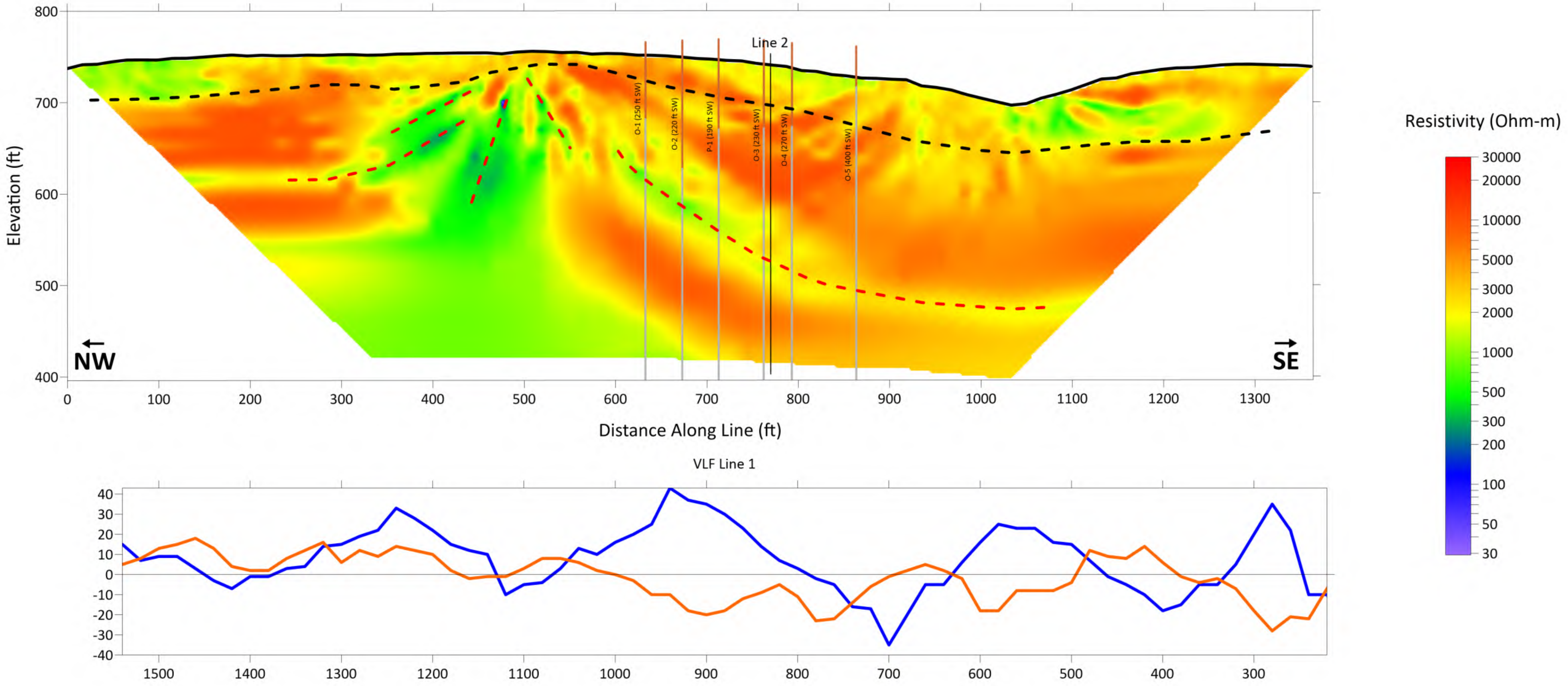
BLE

Project #: 240324
December 2024

COLLIER
GEOPHYSICS

Drafted by: J. Rajcok
Checked by: J. Bergstrom
Figure A-6

ERI Line 1



Borehole Logs
(Provided by BLE)

🟫 Overburden	⬜ Biotite Gneiss
🟧 Weathered Rock	🟪 Felsic-Biotite Gneiss
🟦 Fault Zone	

- - - - - Interpreted Top of Rock

- - - - - Potential Fracture Zone

— In Phase

— Out of Phase

ERI Results
Proposed Quarry Site
Gaffney, SC

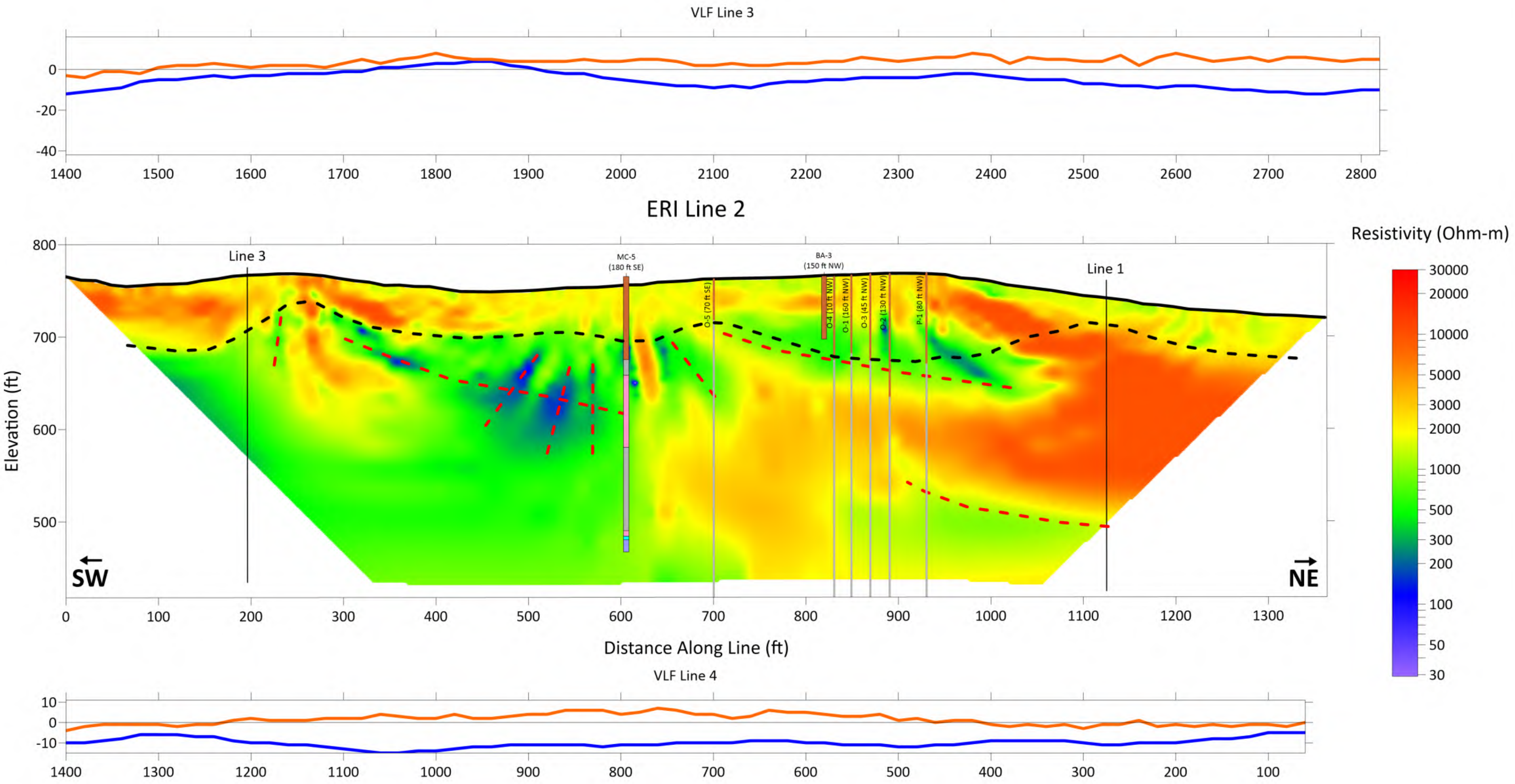
BLE

Project #: 240324
December 2024

Drafted by: J. Rajcok
Checked by: J. Bergstrom

COLLIER GEOPHYSICS

Figure A-7



Borehole Logs
(Provided by BLE)

- ▬ ▬ ▬ Interpreted Top of Rock
- ▬ ▬ ▬ Potential Fracture Zone

🟫 Overburden	⬜ Biotite Gneiss
🟧 Weathered Rock	🟪 Felsic-Biotite Gneiss
🟦 Fault Zone	

- ▬ In Phase
- ▬ Out of Phase

ERI Results
Proposed Quarry Site
Gaffney, SC

BLE

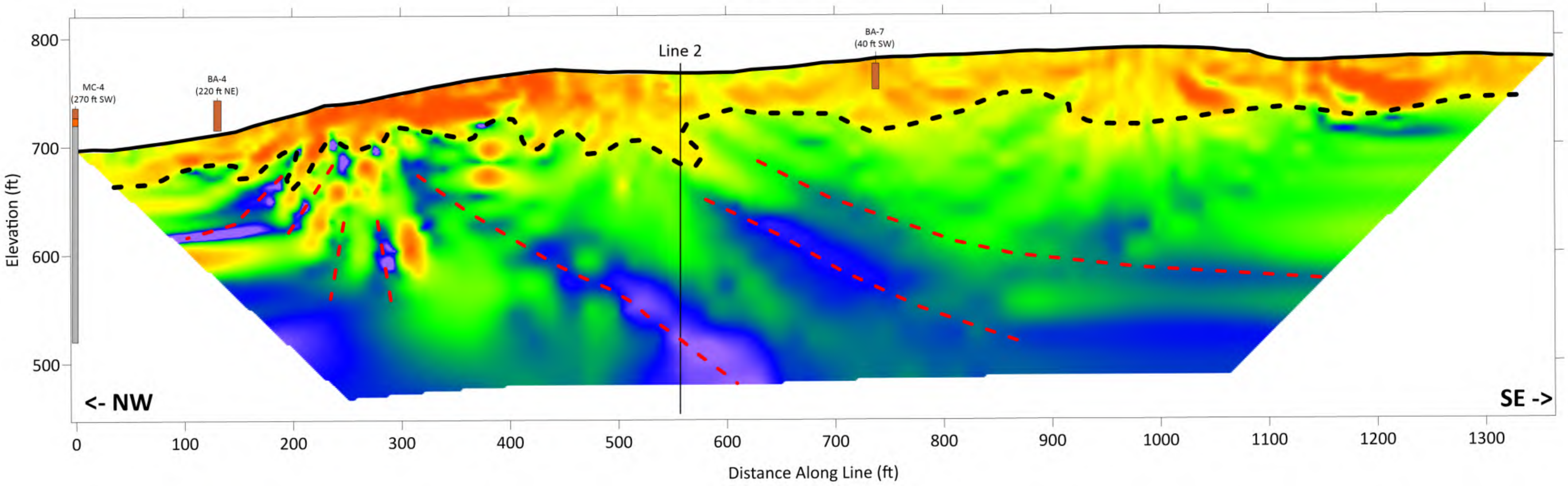
Project #: 240324
December 2024

Drafted by: J. Rajcok
Checked by: J. Bergstrom

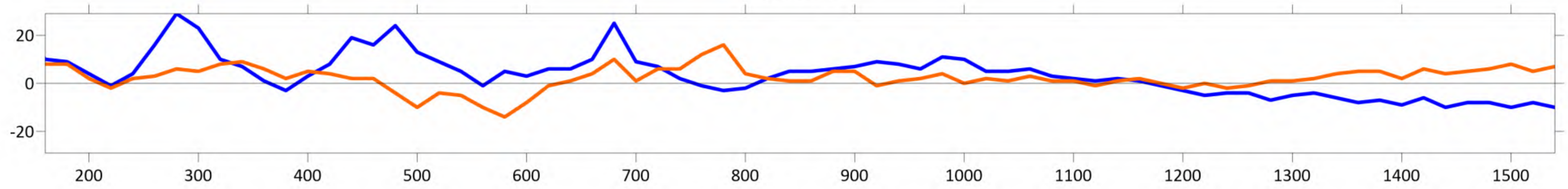
COLLIER GEOPHYSICS

Figure A-8

ERI Line 3



VLF Line 2



Borehole Logs
(Provided by BLE)

- 🟫 Overburden
- 🟧 Weathered Rock
- 🟦 Fault Zone
- ⬜ Biotite Gneiss
- 🟪 Felsic-Biotite Gneiss

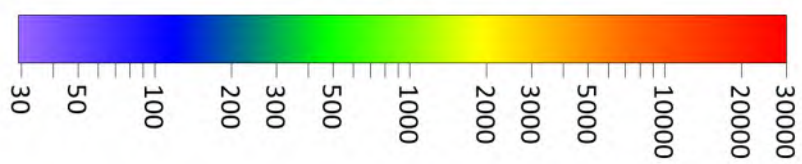
— In Phase

— Out of Phase

- - - - Interpreted Top of Rock

- - - - Potential Fracture Zones

Resistivity (Ohm-m)



ERI Results
Proposed Quarry Site
Gaffney, SC

BLE

Project #: 240324

December 2024

Drafted by: A. Riggs

Checked by: J. Bergstrom

COLLIER
GEOPHYSICS

Figure A-9

April 23, 2025

Thomas O'Shea, P.G.
Bunnell-Lammons Engineering
6004 Ponders Court
Greenville, South Carolina 29615

RE: Geophysical Letter Report | Project #240334
Geophysical Borehole Logging P-1, Gaffney, SC

Collier Geophysics, LLC. (Collier) performed geophysical borehole logging services on behalf of BLE in one borehole near Gaffney, South Carolina. The field investigation was performed on February 3. This investigation was conducted to aid BLE in evaluating bedrock conditions and identifying potential pathways for groundwater migration through fractured bedrock. The geophysical logs consisted of optical televiewer (OTV). The survey was led by Collier geophysicist Ian Matthews. The logging data was analyzed to determine the location and orientation of fractures. Dip, azimuth (dip direction), and aperture were calculated for each detected fracture based on the televiewer datasets.

The following report presents results from the geophysical investigation and summarizes the site conditions, field methods, data acquisition, and interpretation procedures.

Equipment Methodology

Optical Televiewer

Optical televiewer (OTV) logging is used to record and digitize a 360-degree color image of the borehole wall. Planar features such as fractures, foliation, and lithologic contacts can be identified directly on the images. The tool is magnetically oriented in order to determine the strike and dip of features. OTV has a vertical resolution of 2mm. As a result, it is able to see features other tools may not resolve. Optical images can be collected above or below the water surface, provided the water is sufficiently clear for viewing the borehole wall.

Boring Descriptions

A summary of the logged borehole is presented in the table below. All depths are referenced from ground surface.

Table 1

Boring ID:	P-1
Date Logged:	02/03/25
Casing Material:	PVC
Open Hole Diameter (in):	6
Open Hole Interval Below Ground Surface (ft):	104.75-396.50
Ambient Ground Water Level (ft):	54.0

Field Methodology

Collier Geophysics used a Robertson Geo logging system to collect all geophysical borehole data. Data was collected within the entire open section of the borehole where practical. No data was collected in the bottom 2 feet of the borehole due to a significant amount of settled sediment.

Results and Discussion

The logs were analyzed for fractures and bedrock foliation using WellCAD software, manufactured by Advanced Logic Technology. Fractures were interpreted through a complete data analysis of all logs. Dip and azimuth (dip direction) were calculated for each detected fracture. The fracture data was corrected from apparent to true dip and azimuth using deviation logs included with the televiewer dataset, and from magnetic north to true north by rotating the fracture azimuths 7.4° counter-clockwise. Magnetic north is 7.4° west of true north at the site (according to National Oceanic and Atmospheric Administration). The reported azimuth is measured clockwise from true north. Fracture and Bedding Structure summary table including fracture attributes is provided in Appendix 1. Schmidt stereonets (lower hemisphere) with fracture/foliation characteristics and fracture/foliation rose diagrams are presented on Appendix 2. All logs are shown in Appendix 3. All depth measurements are referenced from ground surface.

The image quality in this borehole was generally good, however, during data collection, errors in data transmission between the optical televiewer and surface control unit caused some sections of the log data to be lost or corrupted. These sections appear as black bands across the log and are most prevalent between 312 and 336 feet below ground surface where a significant amount of data was lost.

Closure

Geophysical borehole logging, like any non-intrusive investigation methods, requires the subjective interpretation of indirect measurements. As such, there is an inherent margin of error, which is unavoidable. Our methods of data acquisition and interpretation for this project are complete as is reasonably possible, and have been successfully applied by Collier geophysicists to investigations of similar size and nature. We believe the results presented herein to be a reasonable representation of the subsurface conditions. However, due to the subjective nature of any type of interpretation, we cannot guarantee that our results are accurate in all areas. In addition, all subsurface features present at the site may not have been detected or identified.

If you have any questions regarding the field procedures, data analyses, or the interpretive results presented herein, please do not hesitate to contact us. We appreciate working with you and look forward to providing BLE with geophysical services in the future.

Respectfully Submitted,

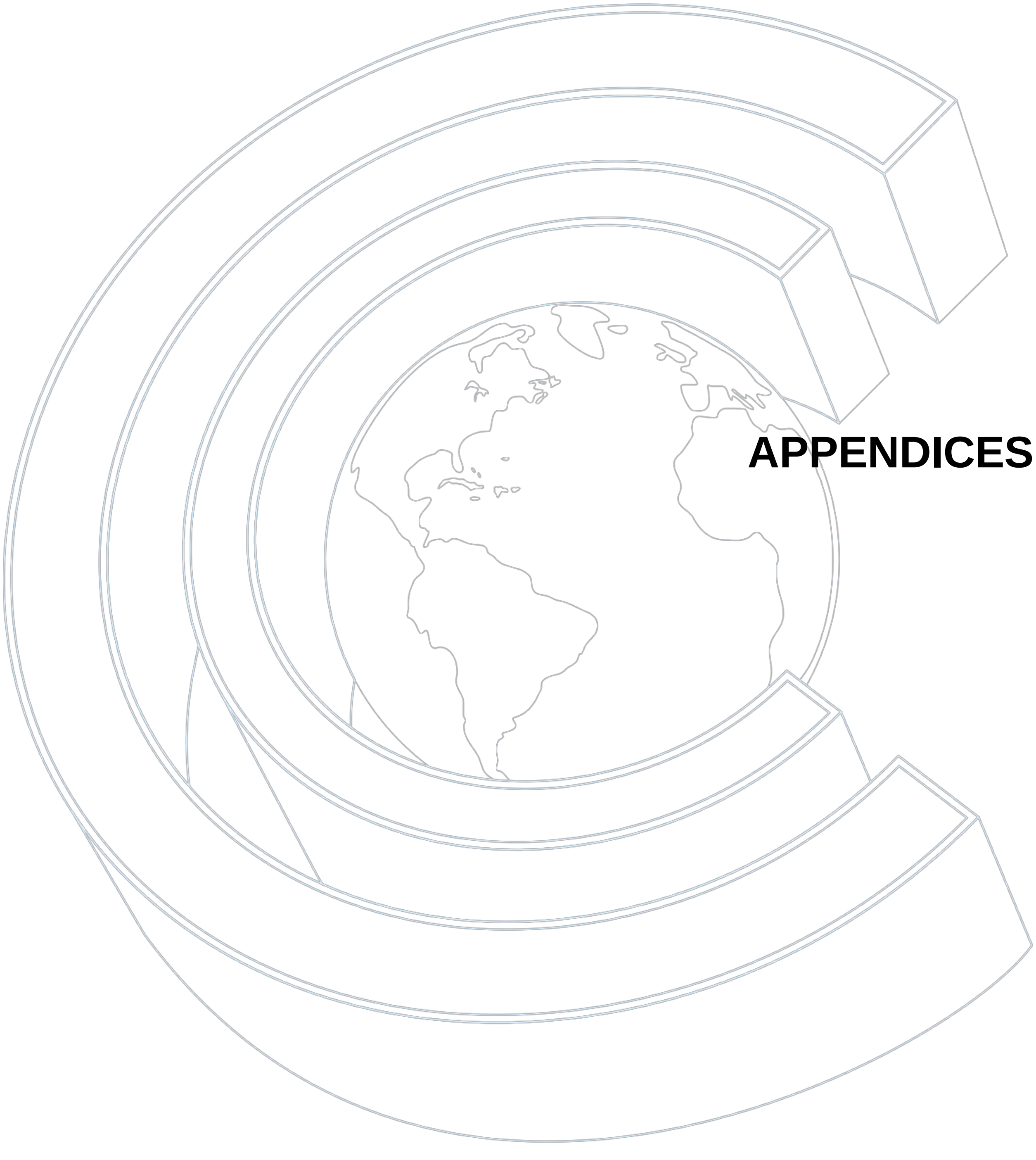
Collier Consulting, Inc.

Ian Matthews Nicholas Rebman

Ian Matthews
Geophysicist

Nicholas Rebman
Geophysicist

(1 copy e-mailed PDF format)



APPENDICES

APPENDIX I: Tabular Fracture/Foliation Data

P-1 Foliation

Depth	Azimuth	Dip
ft	deg	deg
107.0	33	31
115.1	38	26
120.3	15	21
127.2	19	20
134.0	83	23
140.1	359	32
151.6	15	21
159.7	123	16
164.0	59	15
173.4	341	40
181.2	319	38
188.7	333	24
197.6	112	13
203.6	98	15
210.6	27	11
214.9	110	8
223.2	128	47
227.0	132	42
232.1	139	73
239.5	320	54
242.5	315	40
251.3	313	20
255.6	320	19
259.1	313	29
263.1	5	29
269.4	34	20
280.4	30	11
287.4	322	52
299.1	320	26
306.6	323	25
324.7	325	9
340.2	332	23
356.7	311	23
372.3	295	10
378.4	292	29
389.2	251	16
394.9	177	37

P-1 Fractures

Depth	Azimuth	Dip	Aperture
ft	deg	deg	mm
113.1	**345**	**69**	**1**
117.2	**327**	**64**	**1**
121.6	***200***	***21***	***360***
123.2	***4***	***53***	***238***
129.8	153	80	1
143.7	105	69	1
147.9	269	67	1
149.3	267	73	1
150.1	290	78	1
154.6	90	66	1
154.9	98	60	1
155.0	94	51	1
155.3	117	50	1
156.4	121	68	1
156.6	117	72	1
156.9	114	76	1
157.9	110	63	1
158.0	240	66	1
165.1	136	76	1
166.8	259	75	1
178.7	129	67	1
182.1	133	69	1
182.5	171	53	1
187.3	131	68	1
187.4	130	69	1
188.3	131	72	1
188.5	179	1	1
188.7	135	71	1
189.3	308	71	1
222.6	135	60	1
270.8	346	77	1
271.8	359	81	1
272.1	297	72	1
273.7	116	87	1
280.7	115	77	1
280.9	121	71	1
281.0	122	68	1
285.2	122	45	1
289.1	311	73	1
291.5	176	78	1
302.6	124	79	1
314.0	131	65	1
325.6	**309**	**15**	**1**
336.0	131	61	1
342.2	115	43	1

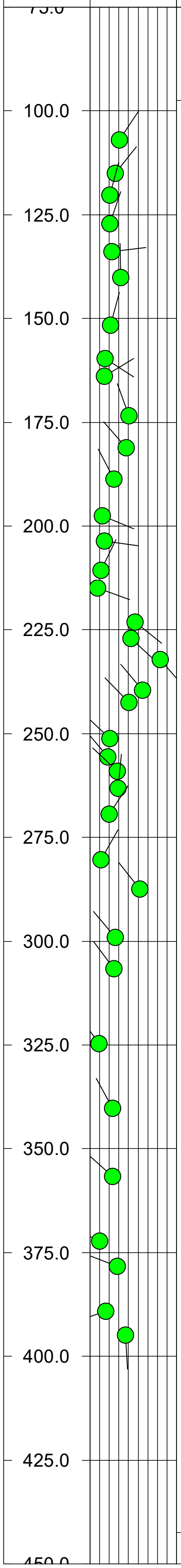
Depth	Azimuth	Dip	Aperture
ft	deg	deg	mm
347.2	130	82	1
352.9	103	78	1
353.5	149	72	1
353.6	311	30	1
361.4	306	66	1
372.9	68	1	1
384.3	123	31	1

Bold-Minor Fracture
Bold/Highlight-Major Fracture

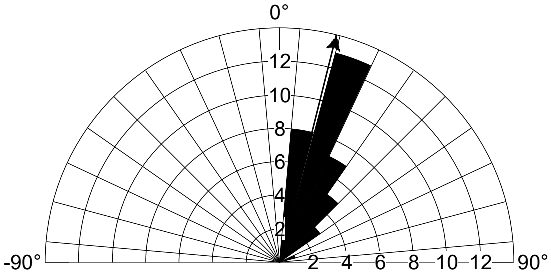
APPENDIX II: Rose Diagrams and Schmidt Plots

P-1 Rose Diagram: Foliations

Depth 1ft:500ft	Foliations 0 90	Rose Diagram - Dip Angle Dip Count - Absolute (Count)	Rose Diagram - Dip Direction Azimuth - Absolute (Count)

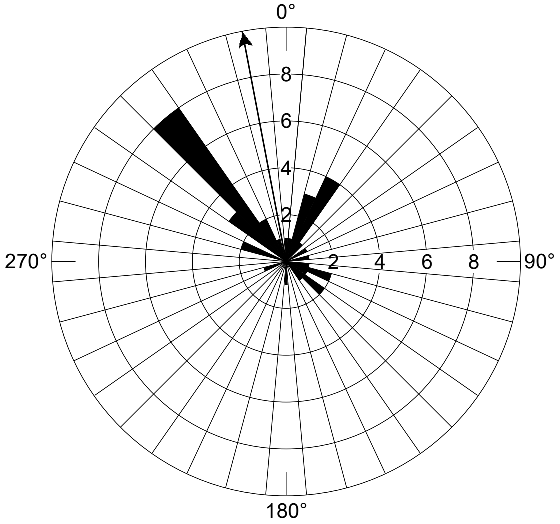


Dip Count - Absolute (Count)
Depth: 97.50 [ft] to 442.50 [ft]



Counts:	37.00
Mean (3D):	14.10
Min:	7.68
Max:	73.06

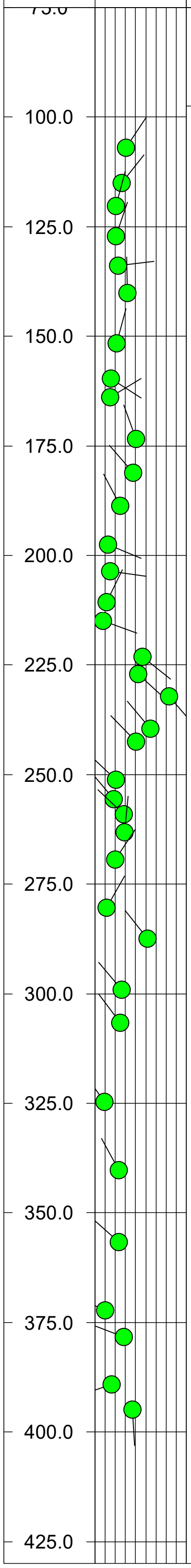
Azimuth - Absolute (Count)
Depth: 97.50 [ft] to 442.50 [ft]



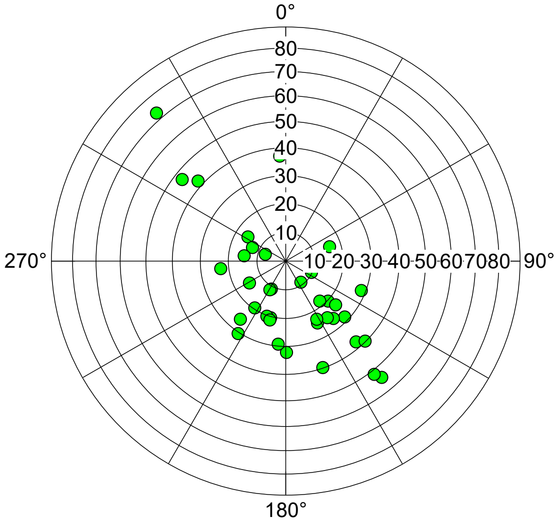
Components:	Azimuth
Counts:	37.00
Mean (3D):	349.20
Min:	5.18
Max:	359.15

P-1 Schmidt Diagram: Foliation

Depth 1ft:500ft	Foliations 0 90	Rose Diagram - Poles (Dip) Schmidt Plot - LH - Type	Rose Diagram - Great Circles (Strike) Schmidt Plot (Strike) - LH - Type

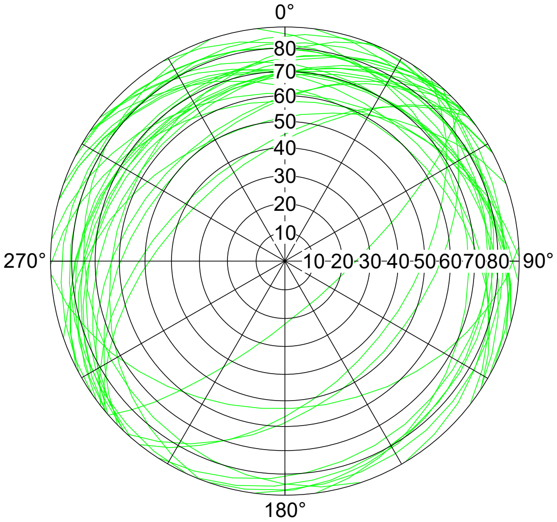


Schmidt Plot - LH - Type
Depth: 97.50 [ft] to 442.50 [ft]



	Counts	Dip[deg]	Azi[deg]
Mean	37	14.10	349.20
●	37	14.10	349.20

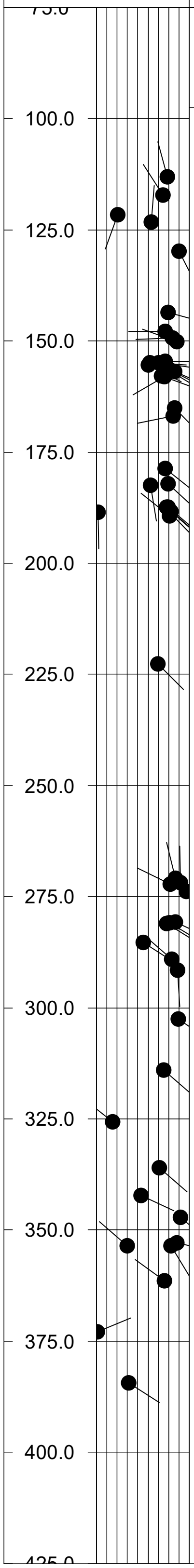
Schmidt Plot (Strike) - LH - Type
Depth: 97.50 [ft] to 442.50 [ft]



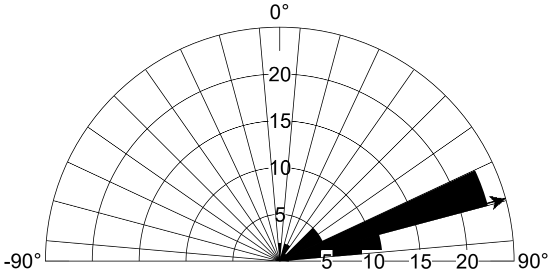
	Counts	Dip[deg]	Strike[deg]
Mean	37	14.10	259.20
●	37	14.10	259.20

P-1 Rose Diagram: Fractures

Depth 1ft:500ft	Fractures	Rose Diagram - Dip Angle	Rose Diagram - Dip Direction
	0 90	Dip Count - Absolute (Count)	Azimuth - Absolute (Count)

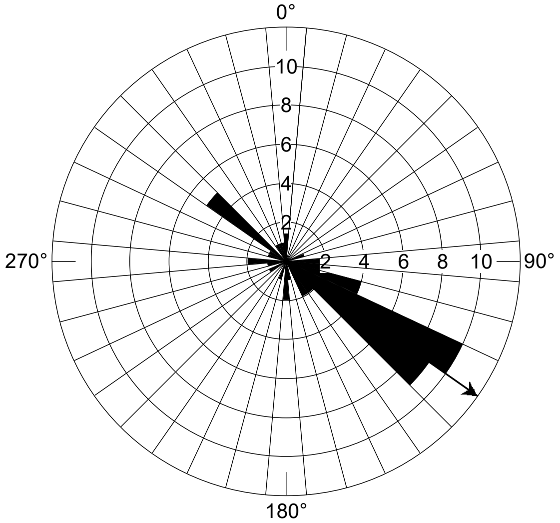


Dip Count - Absolute (Count)
Depth: 97.50 [ft] to 437.50 [ft]



Counts:	52.00
Mean (3D):	74.43
Min:	0.57
Max:	87.11

Azimuth - Absolute (Count)
Depth: 97.50 [ft] to 437.50 [ft]



Components:	Azimuth
Counts:	52.00
Mean (3D):	125.05
Min:	4.03
Max:	358.70

Depth
1ft:500ft

P-1 Schmidt Diagram: Fractures

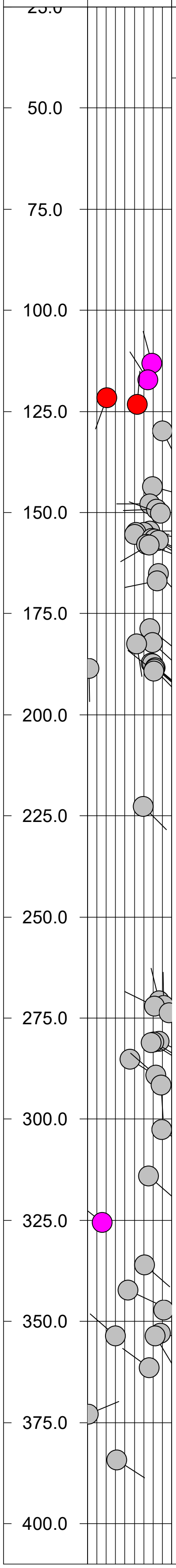
Fractures
0 90

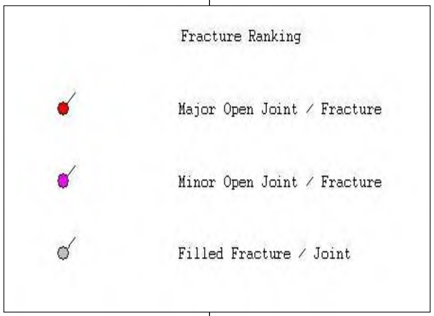
Rose Diagram - Poles (Dip)

Schmidt Plot - LH - Type

Rose Diagram - Great Circles (Strike)

Schmidt Plot (Strike) - LH - Type



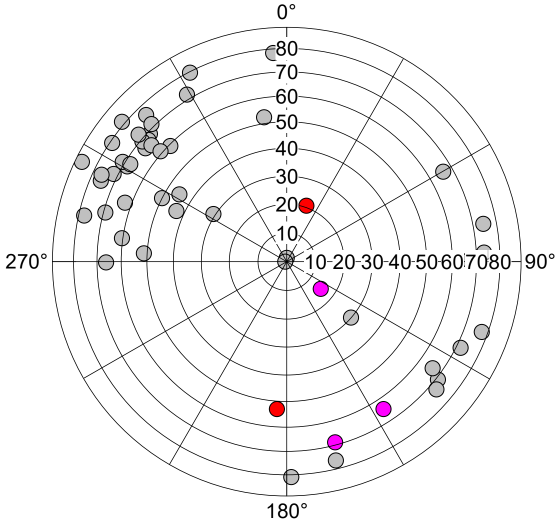

Fracture Ranking

🔴 Major Open Joint / Fracture

🟣 Minor Open Joint / Fracture

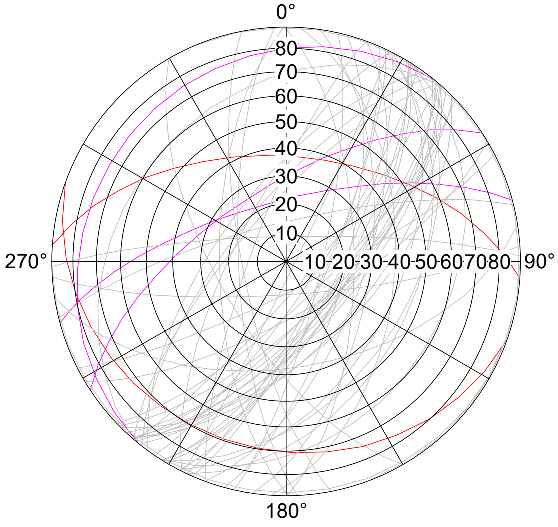
⚪ Filled Fracture / Joint

Schmidt Plot - LH - Type
Depth: 42.50 [ft] to 412.50 [ft]



	Counts	Dip[deg]	Azi[deg]
Mean	52	74.43	125.05
🟣	3	51.65	332.95
🔴	2	16.94	352.37
⚪	47	73.14	123.28

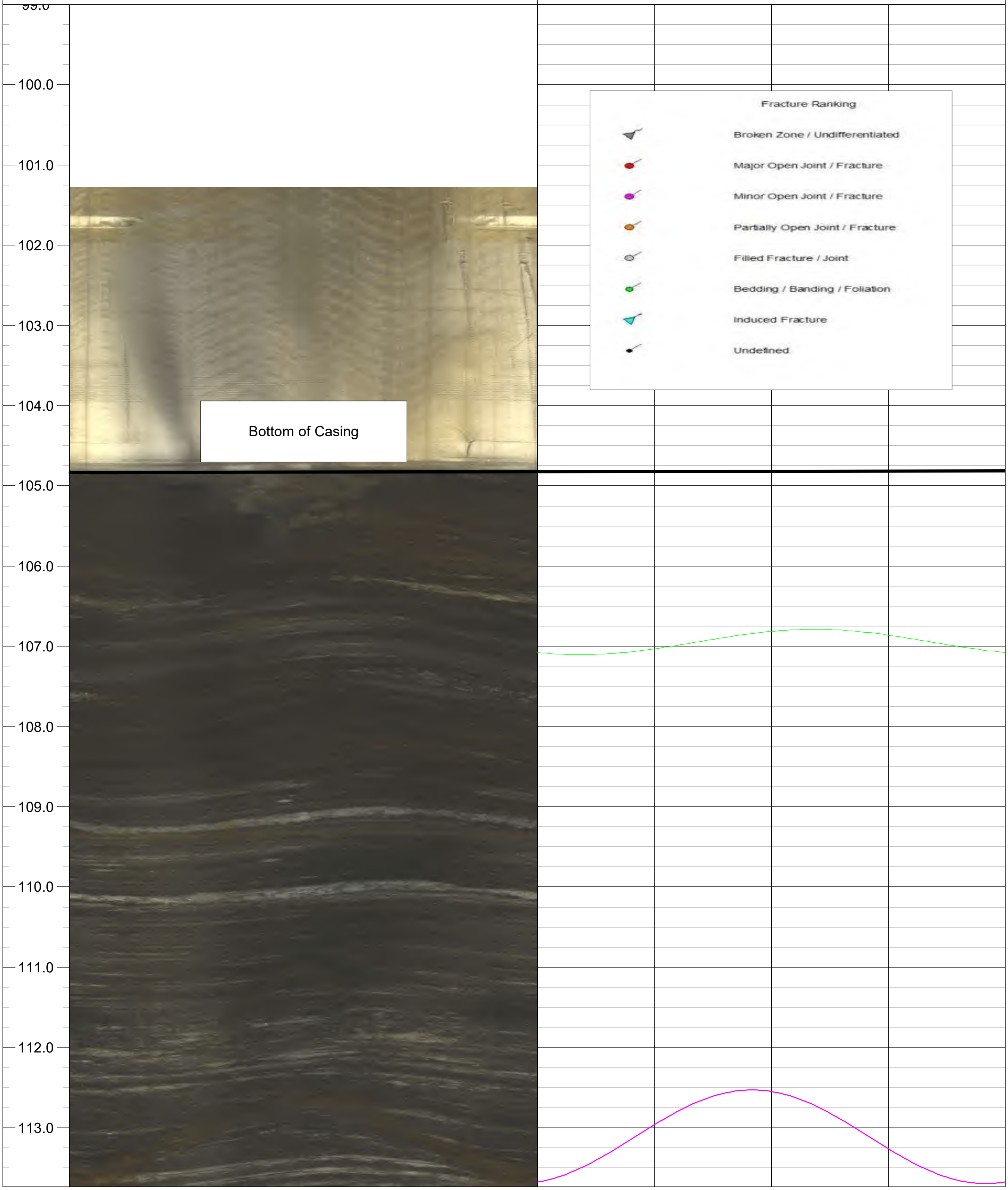
Schmidt Plot (Strike) - LH - Type
Depth: 42.50 [ft] to 412.50 [ft]



	Counts	Dip[deg]	Strike[deg]
Mean	52	74.43	35.05
🟣	3	51.65	242.95
🔴	2	16.94	262.37
⚪	47	73.14	33.28

APPENDIX III: Logs and Interpretations

Depth 1ft:20ft	**P-1 Televiewer Log**	
	OTV - Image raw 0° 90° 180° 270° 0°	Foliations 0° 90° 180° 270° 0°
		Fractures 0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

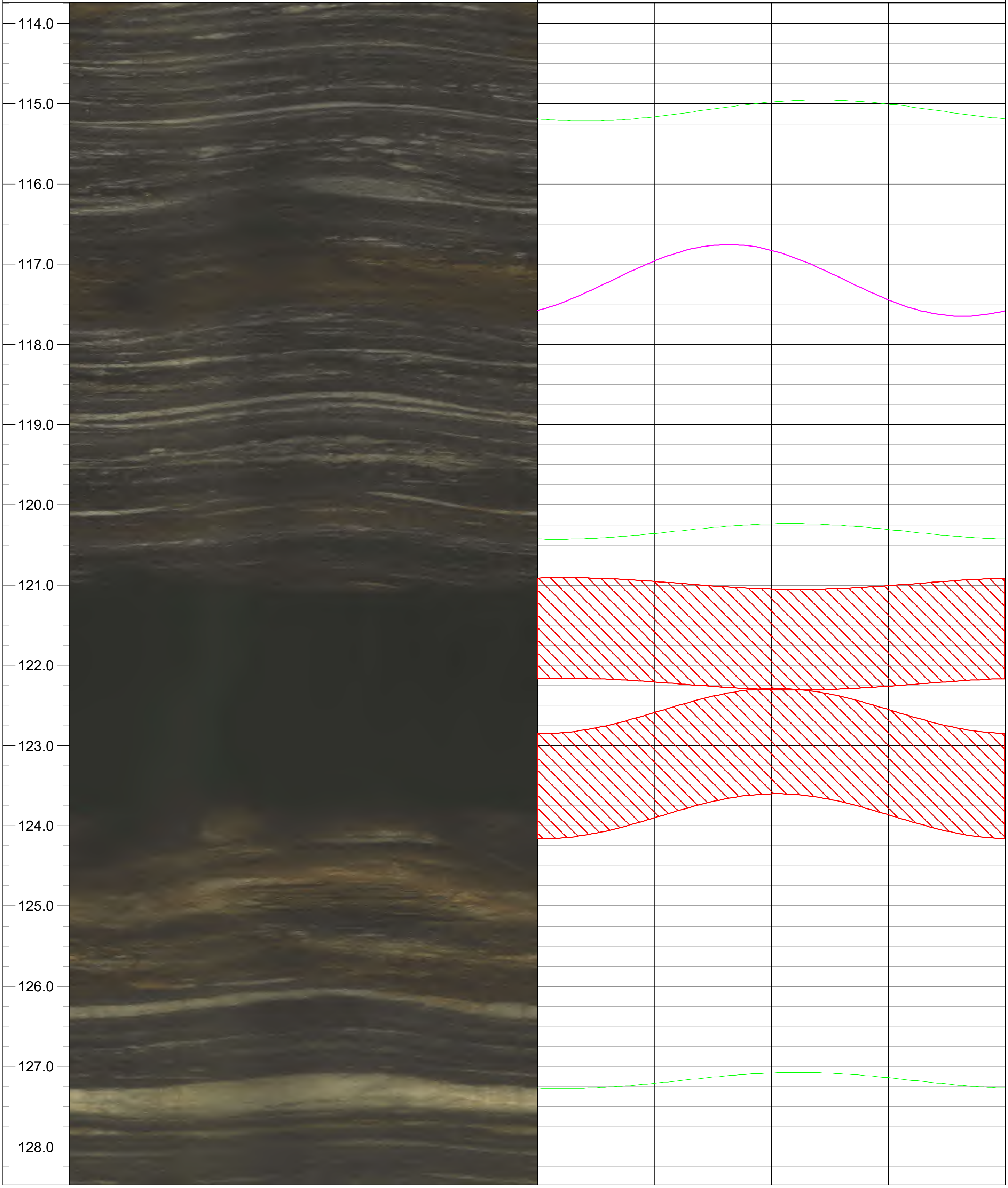
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

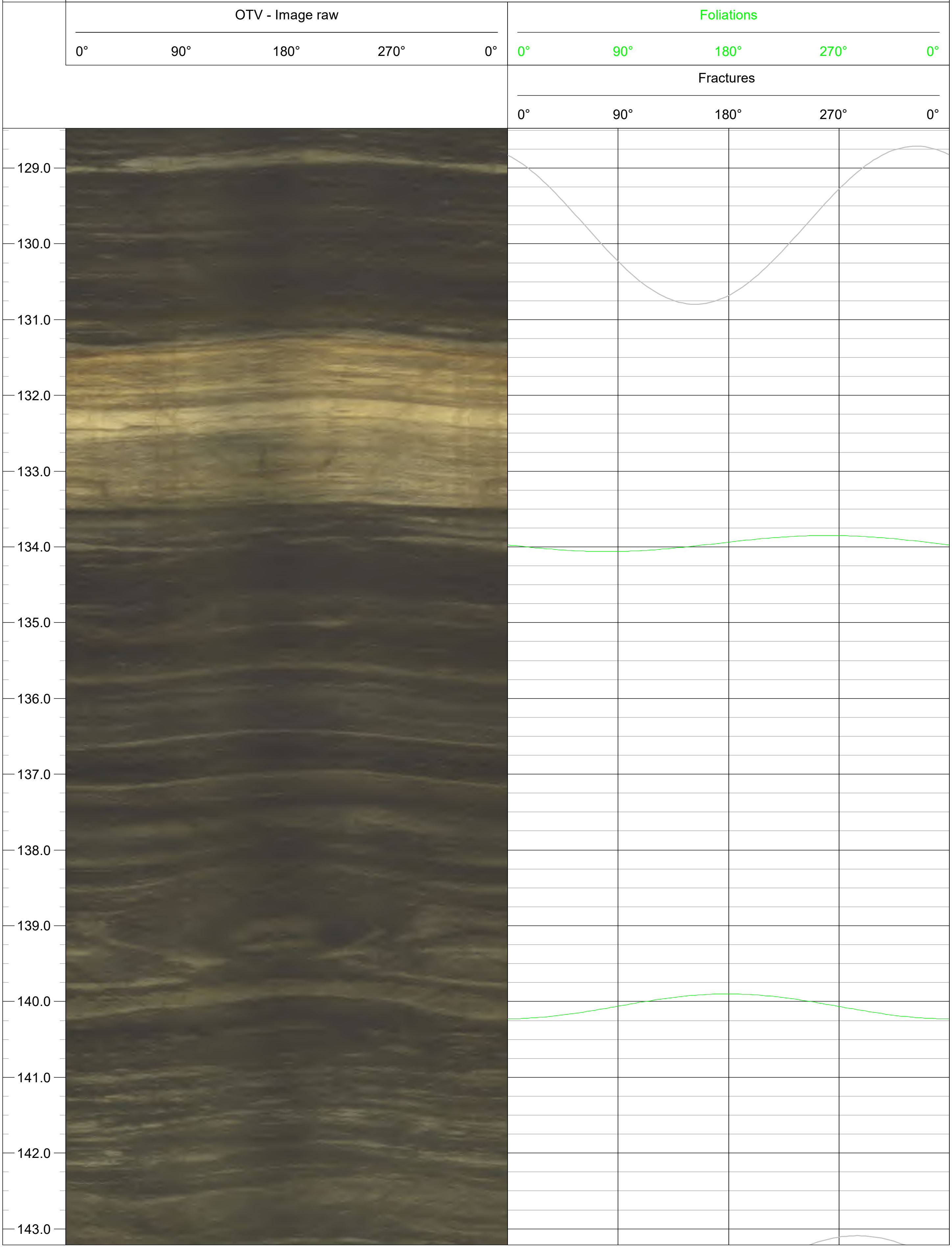
0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

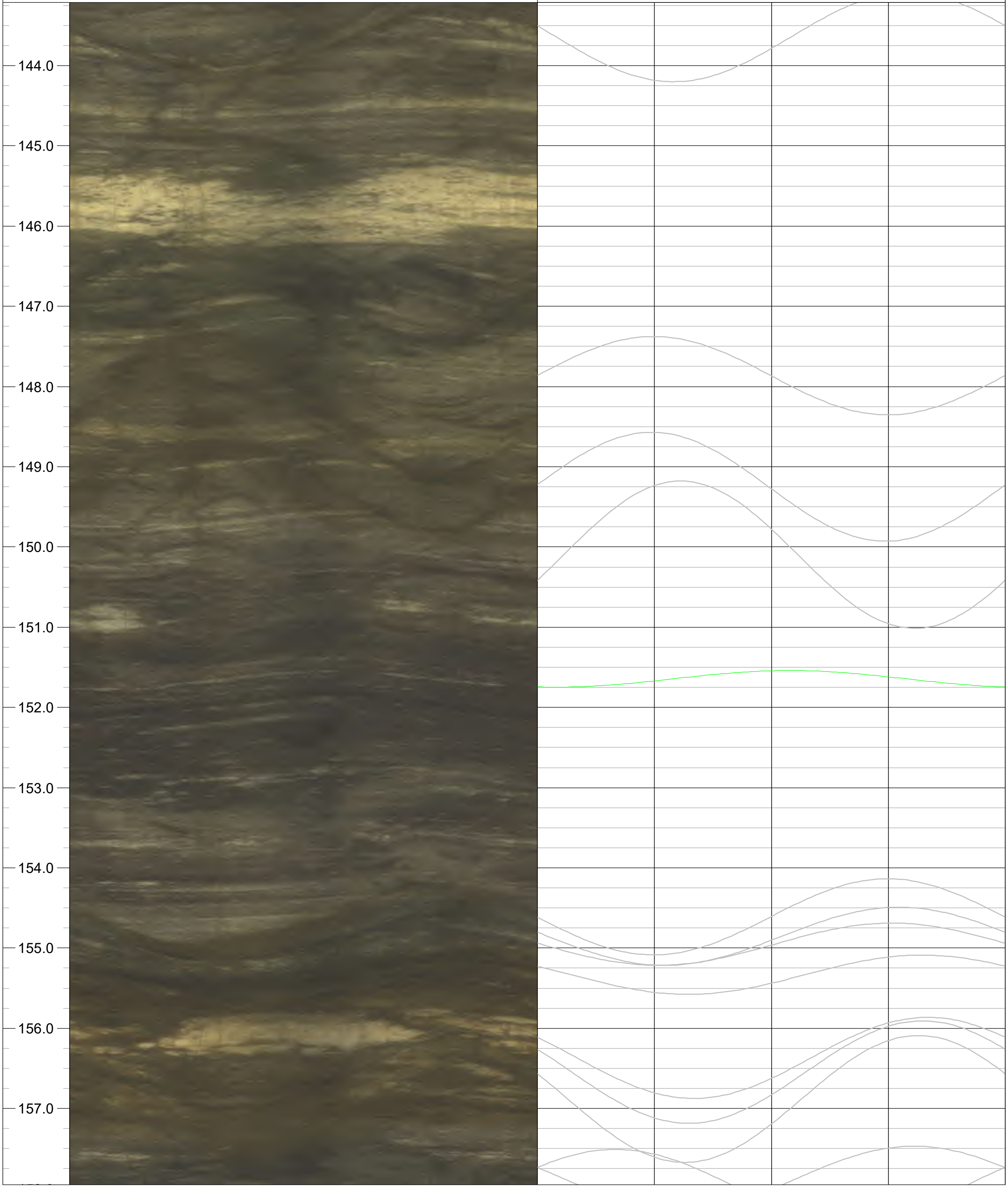


Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw	Foliations
0° 90° 180° 270° 0°	0° 90° 180° 270° 0°
	Fractures
	0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

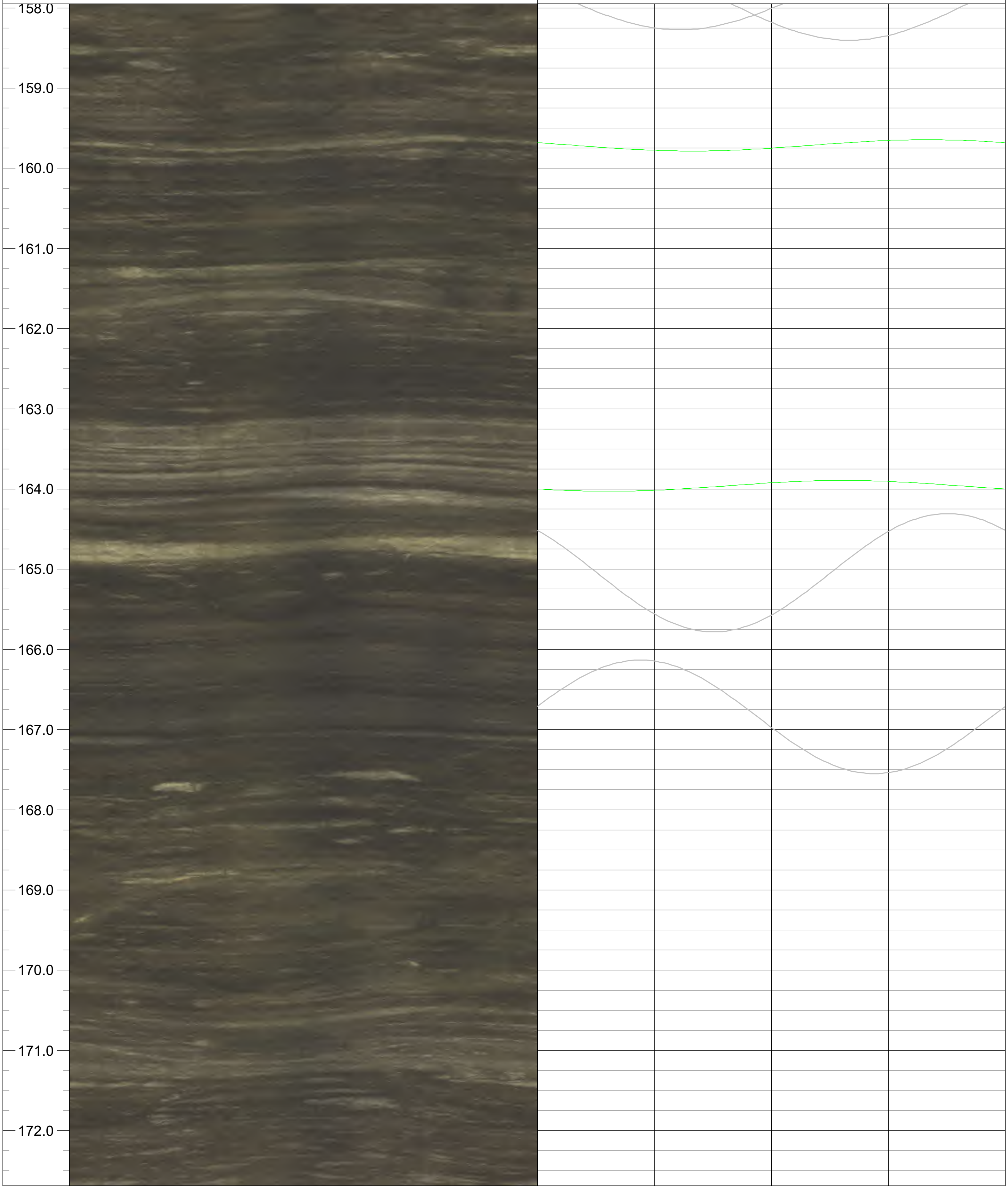
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

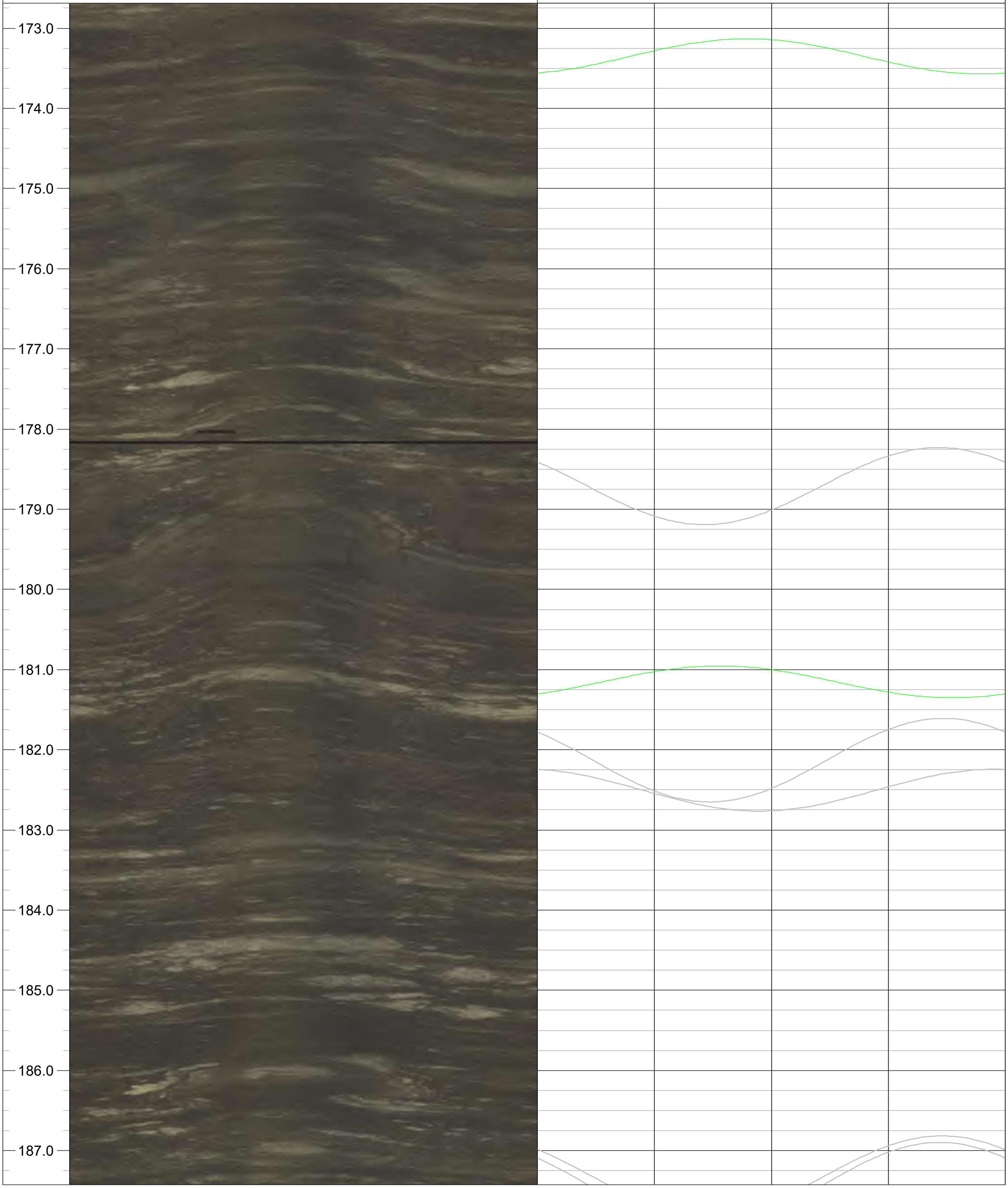
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

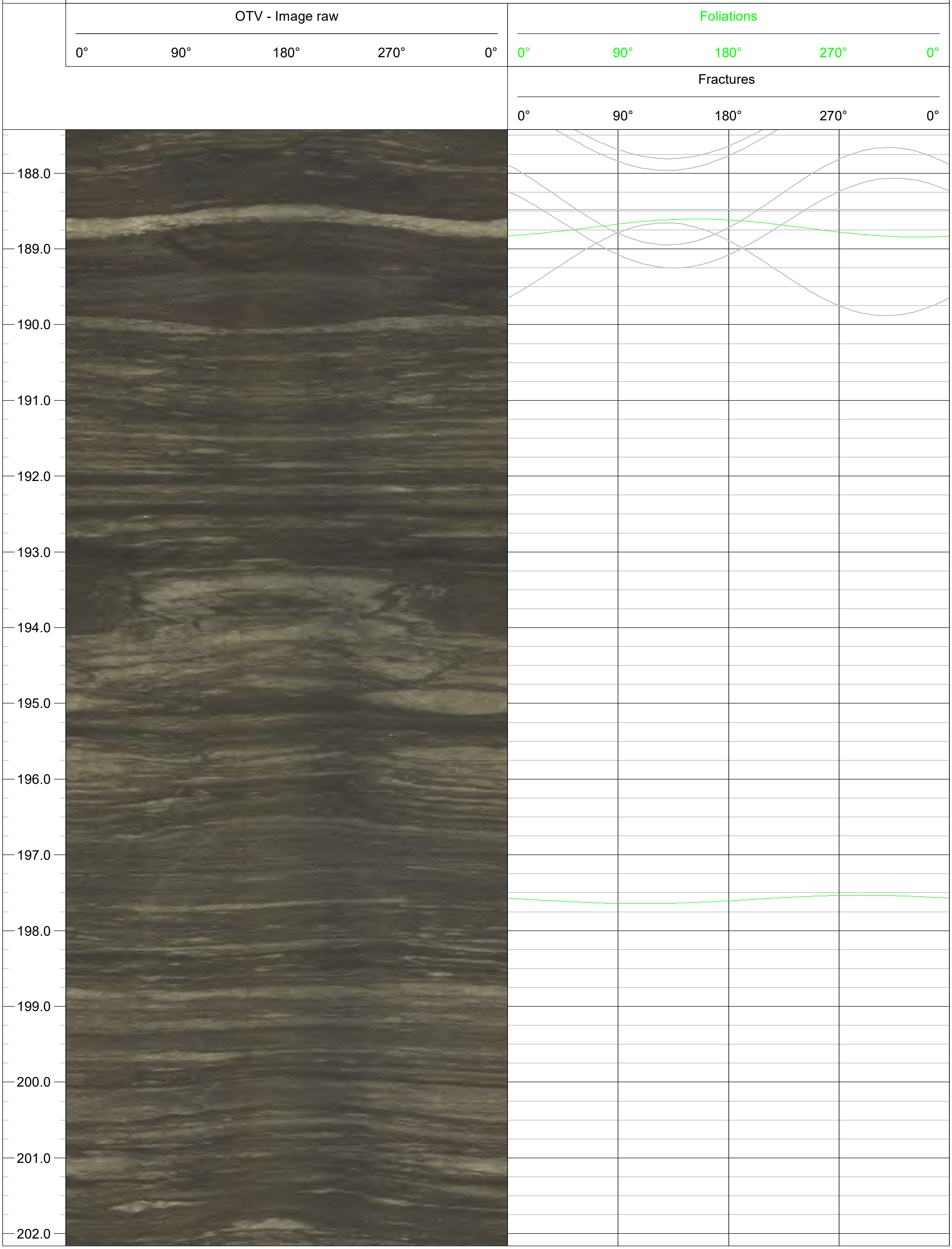
0° 90° 180° 270° 0°



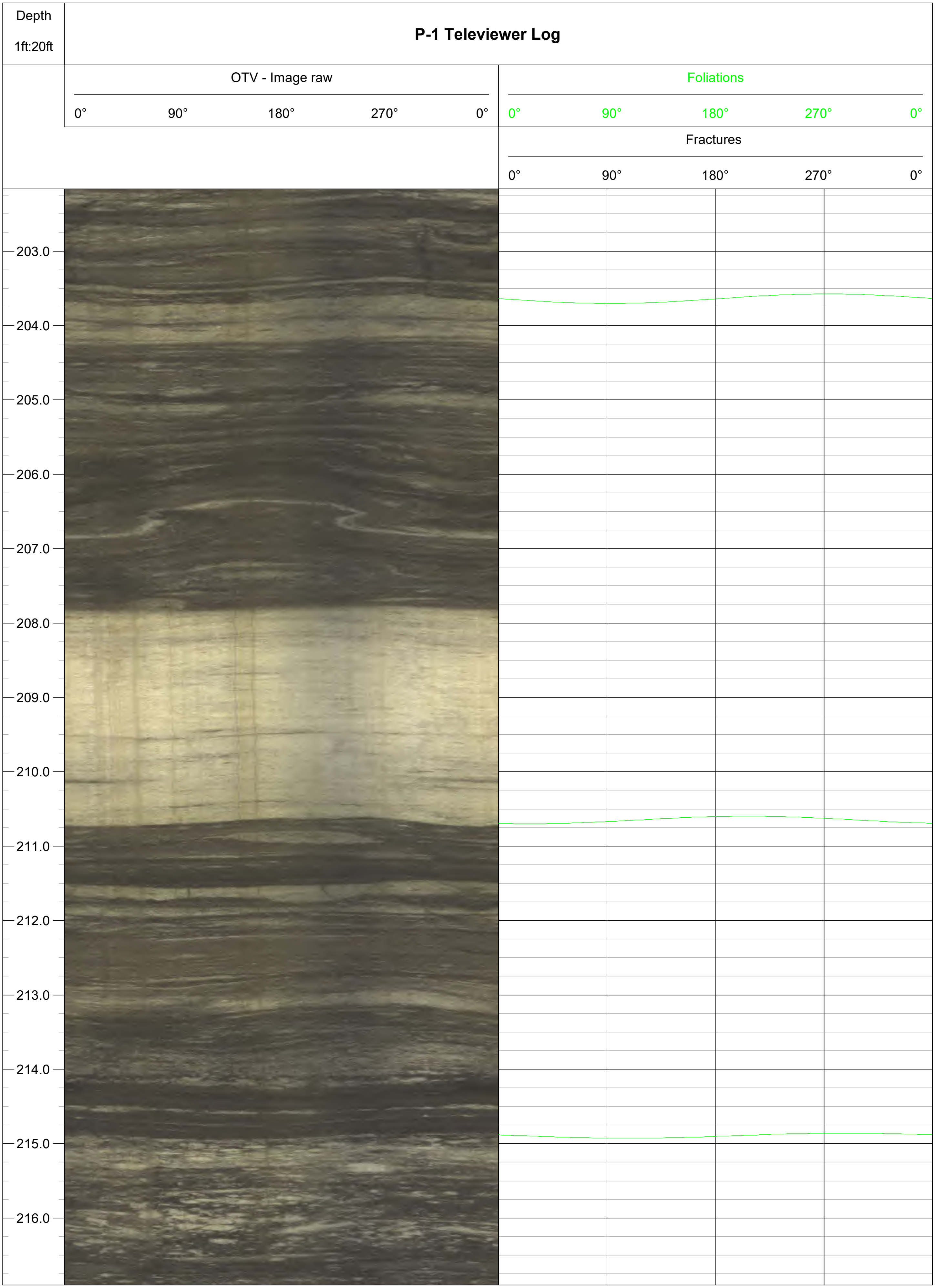
Depth

1ft:20ft

P-1 Televiewer Log



P-1 Televiewer Log



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

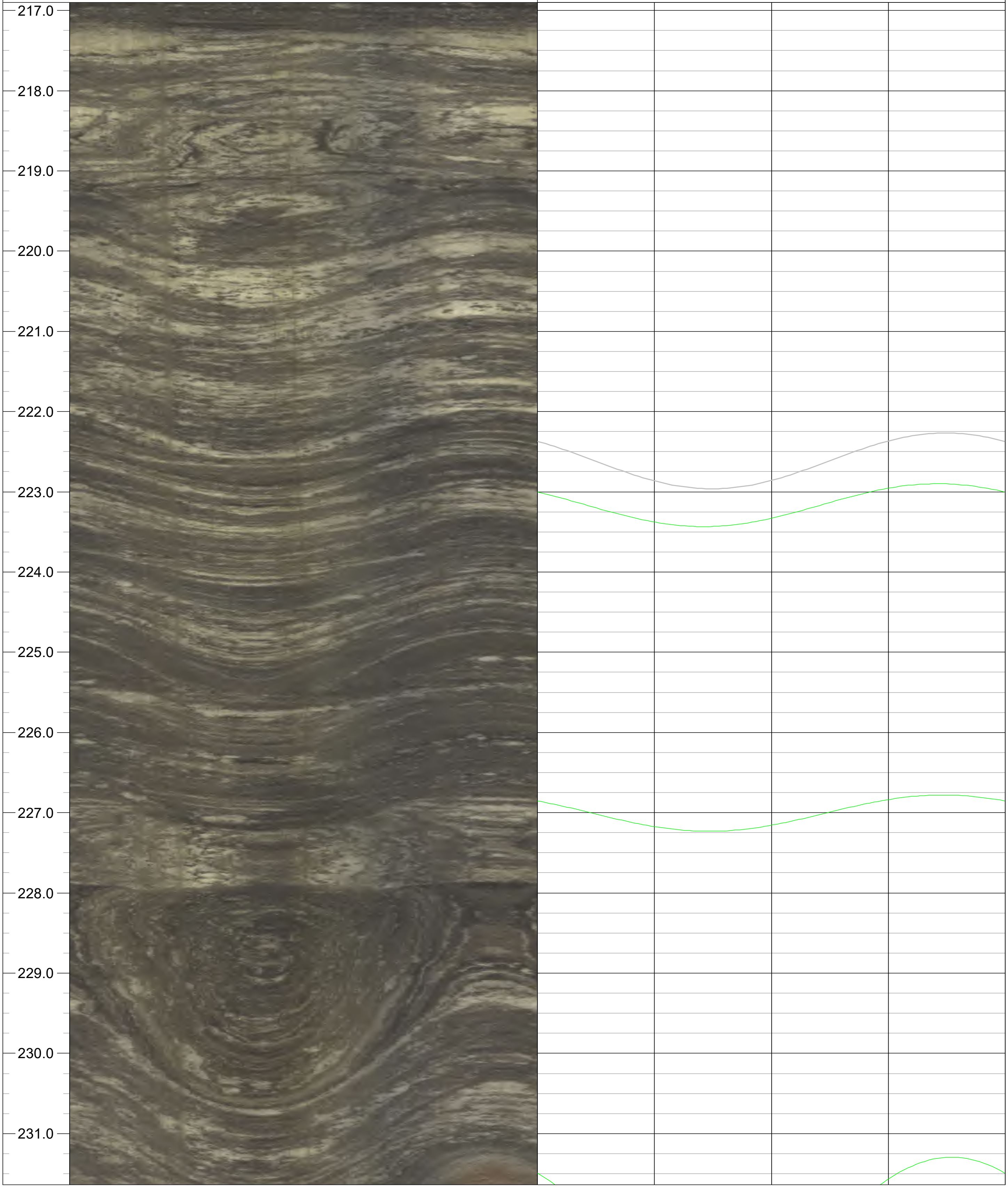
0° 90° 180° 270° 0°

Foliations

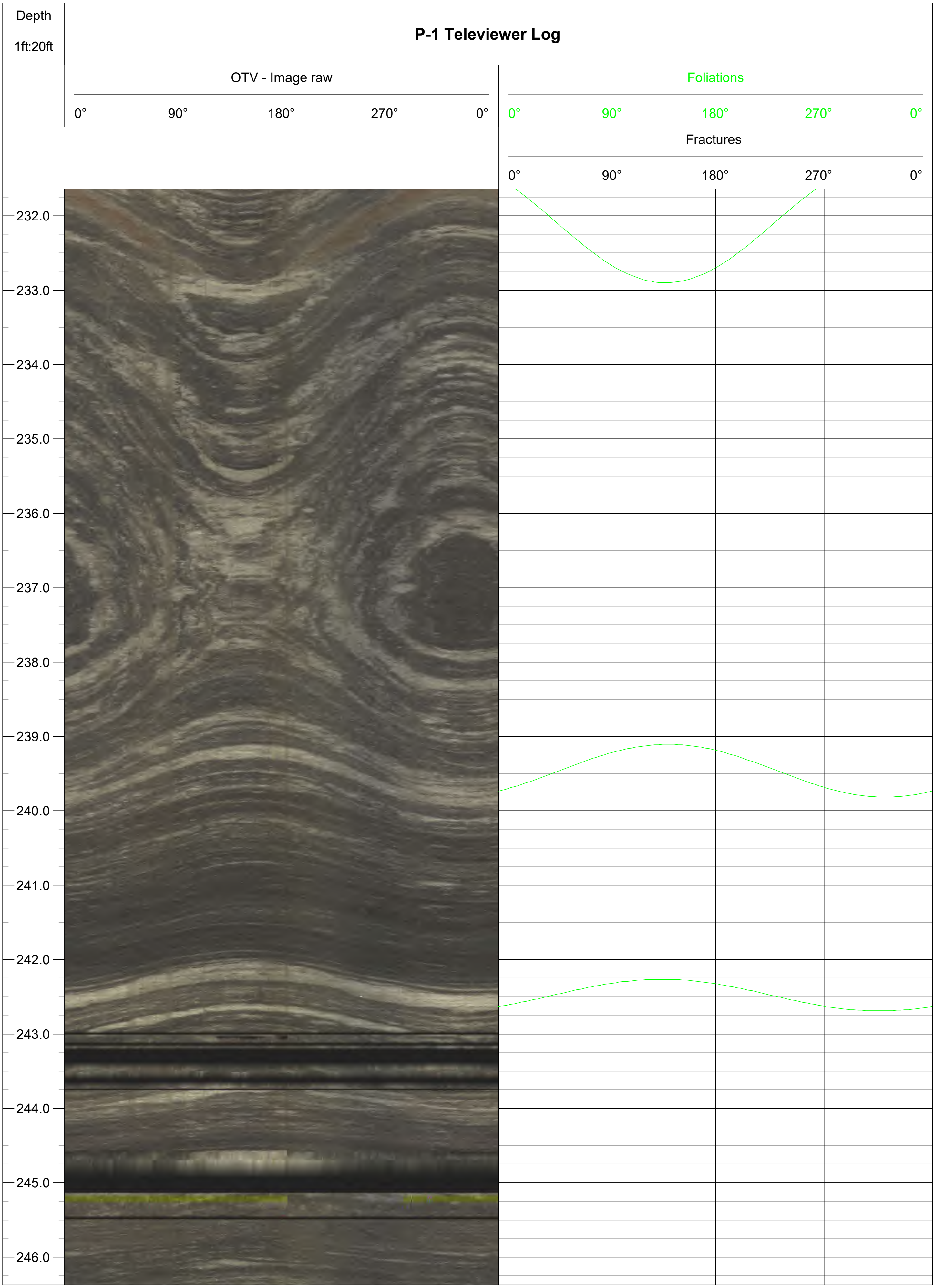
0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



P-1 Televiewer Log



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

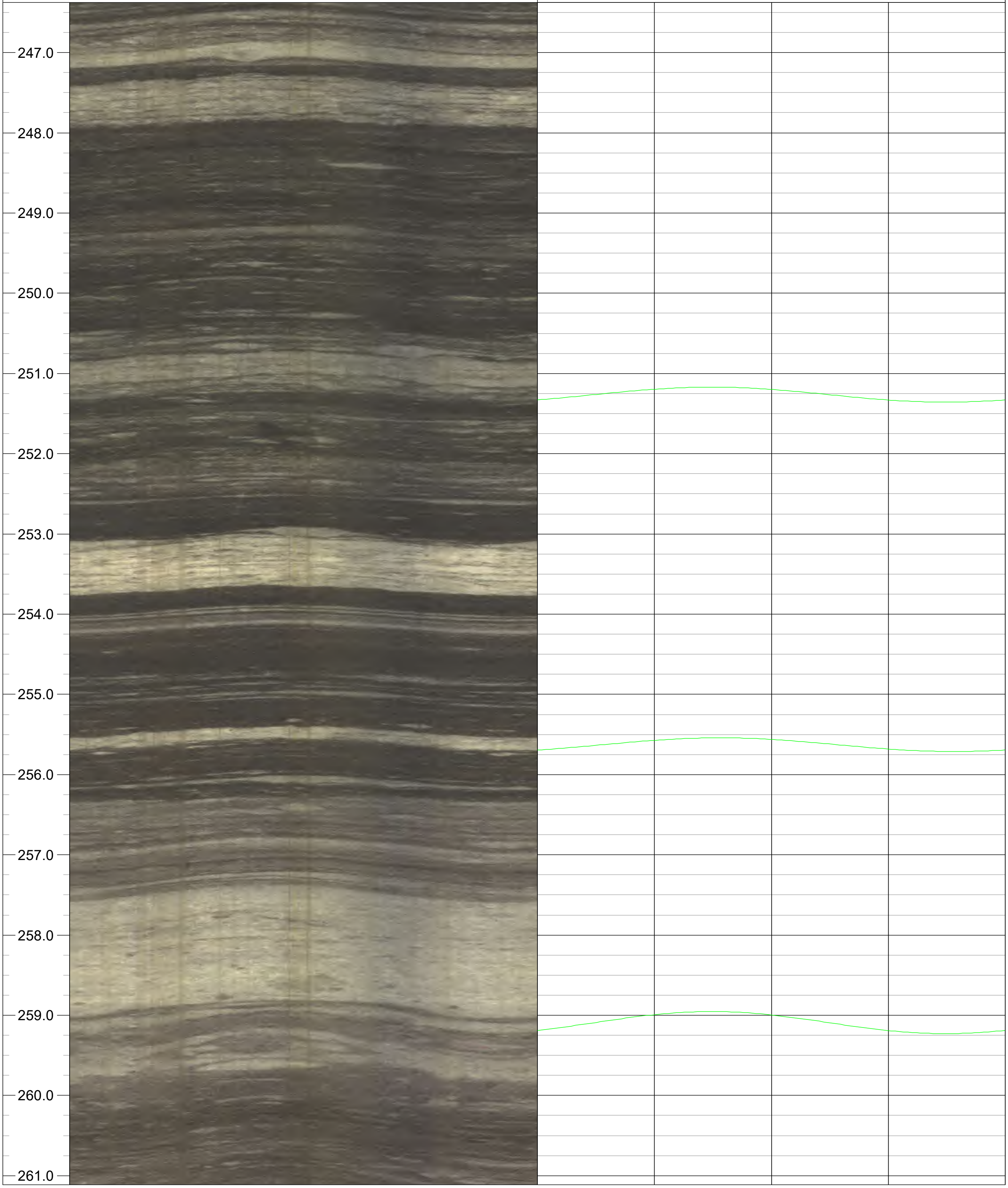
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

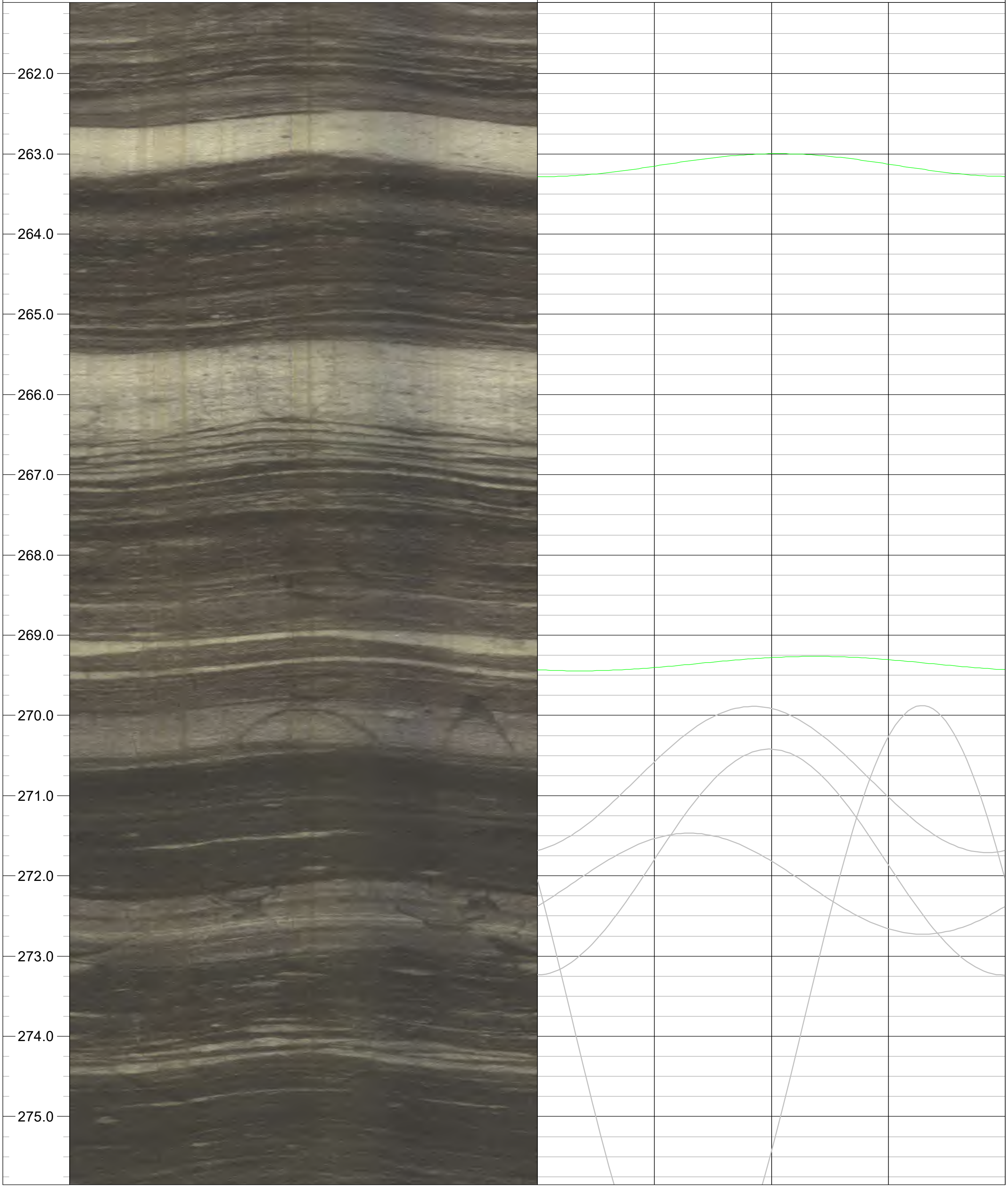
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

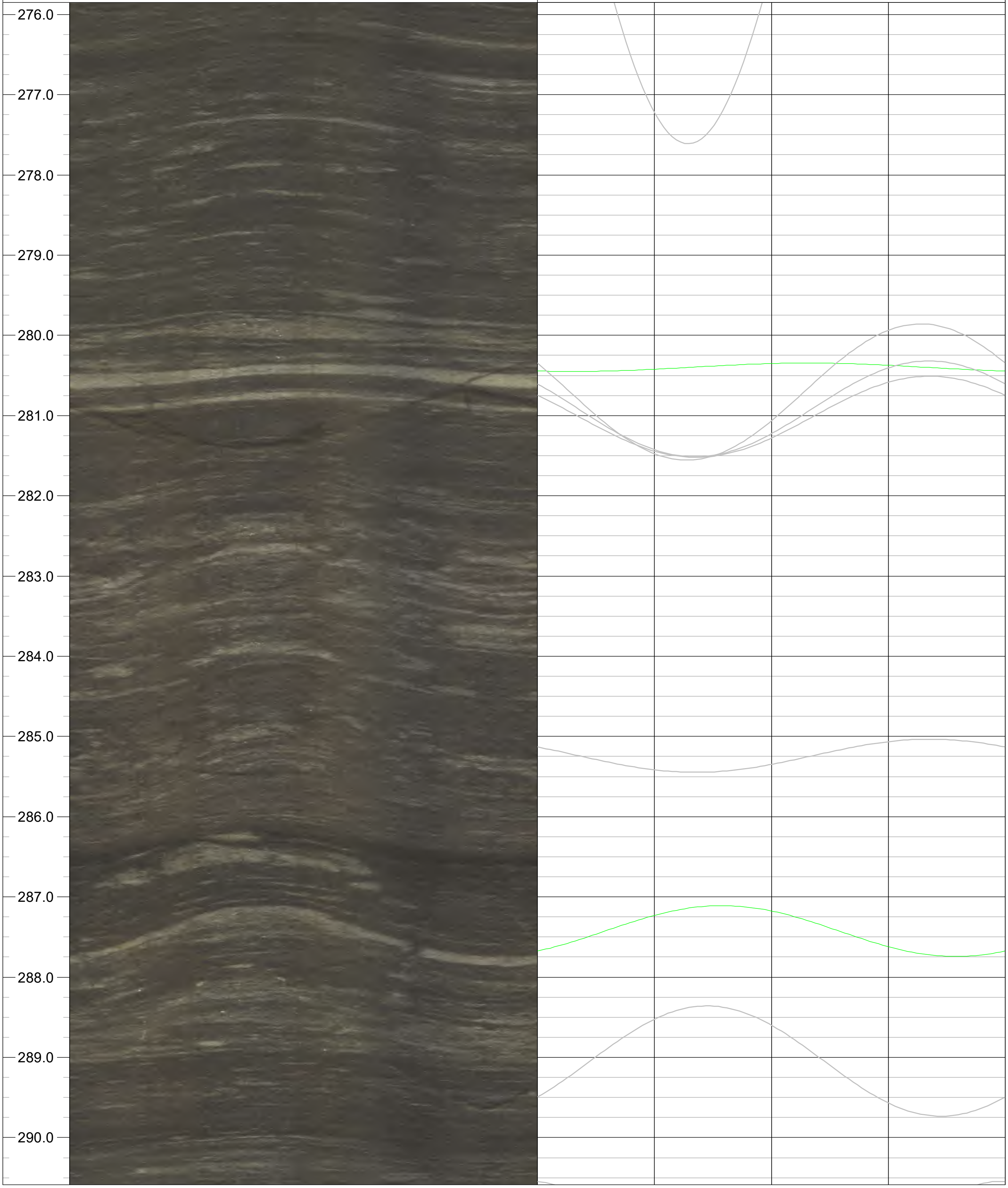
0° 90° 180° 270° 0°

Foliations

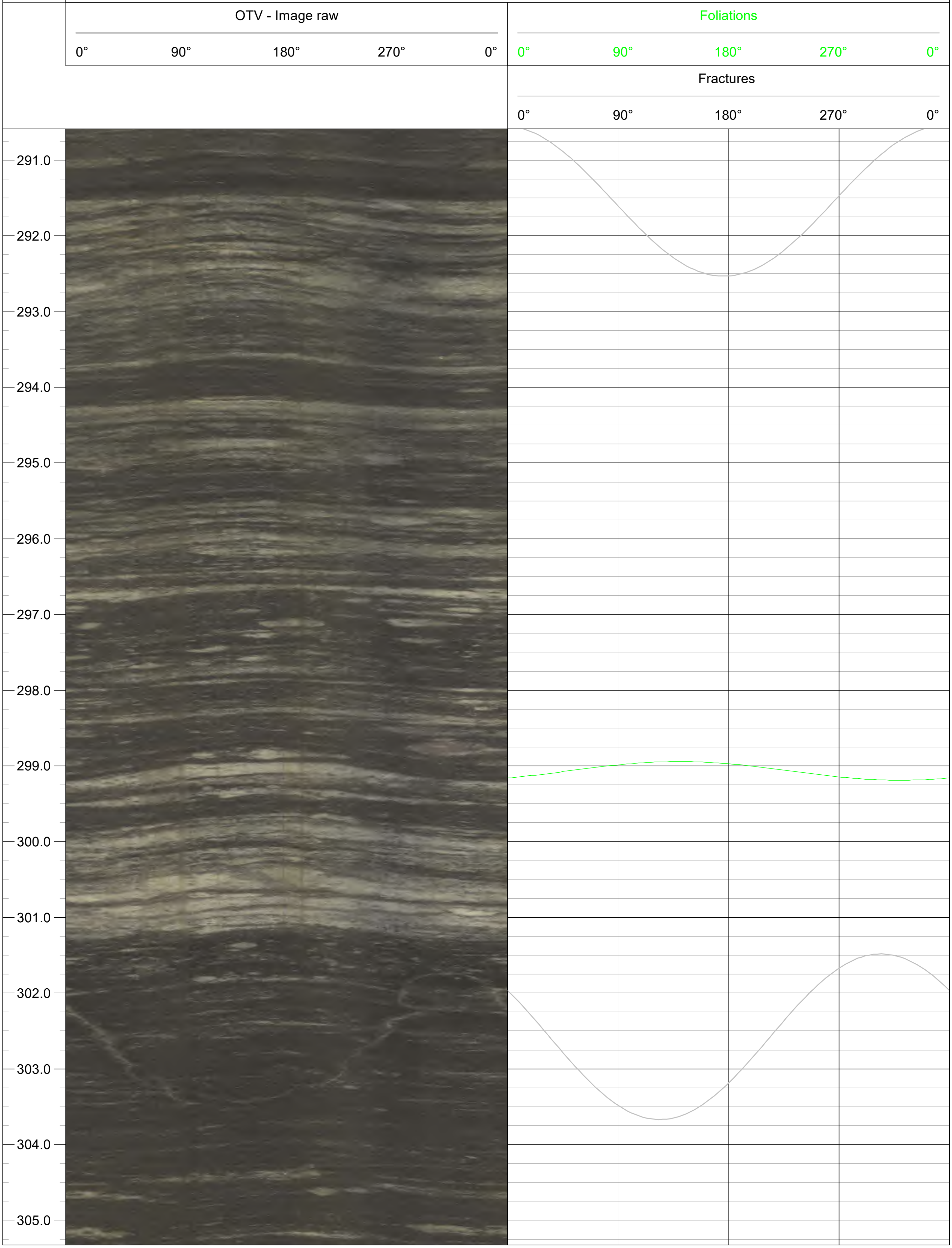
0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



Depth 1ft:20ft	P-1 Televiewer Log



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

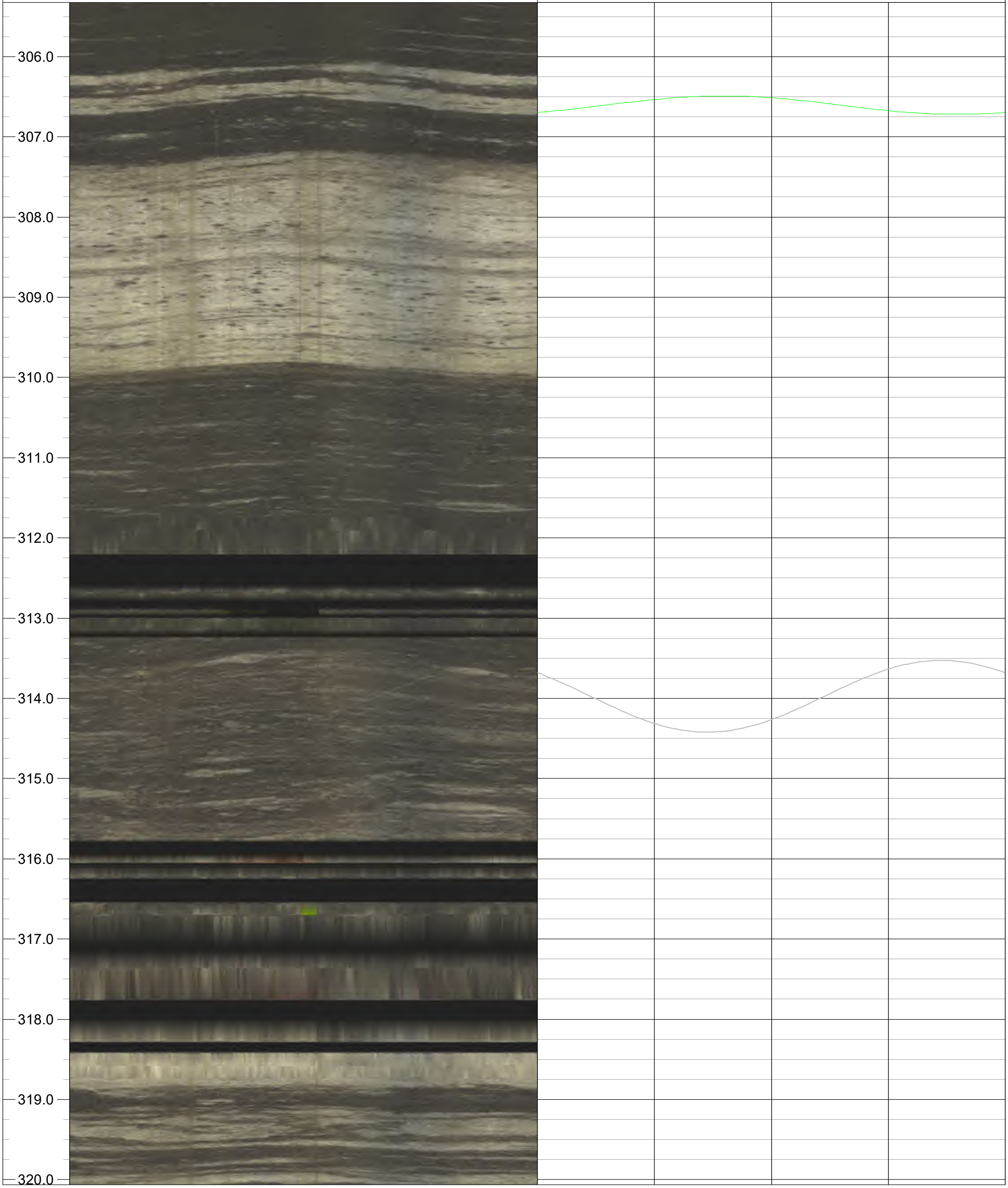
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

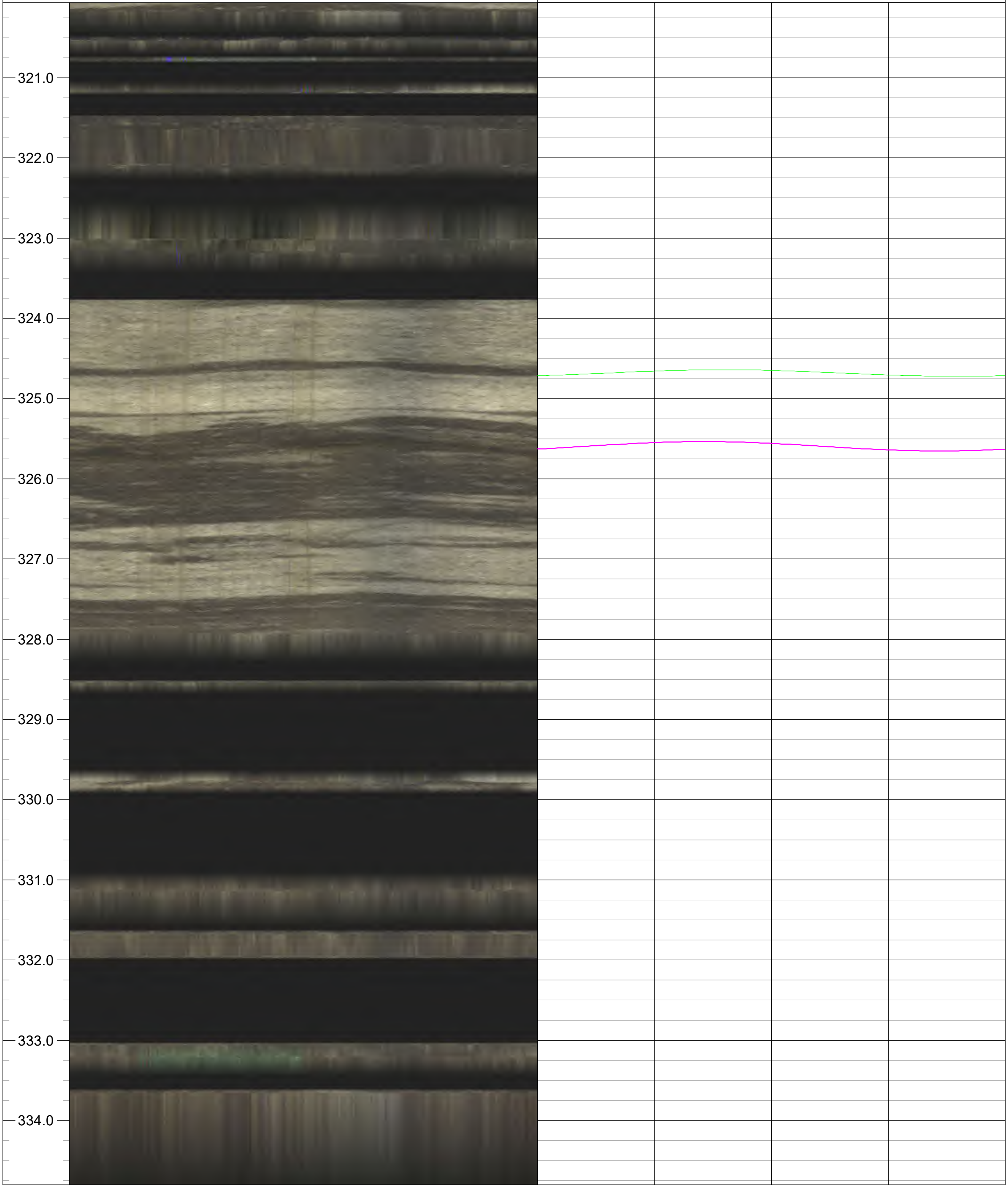
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

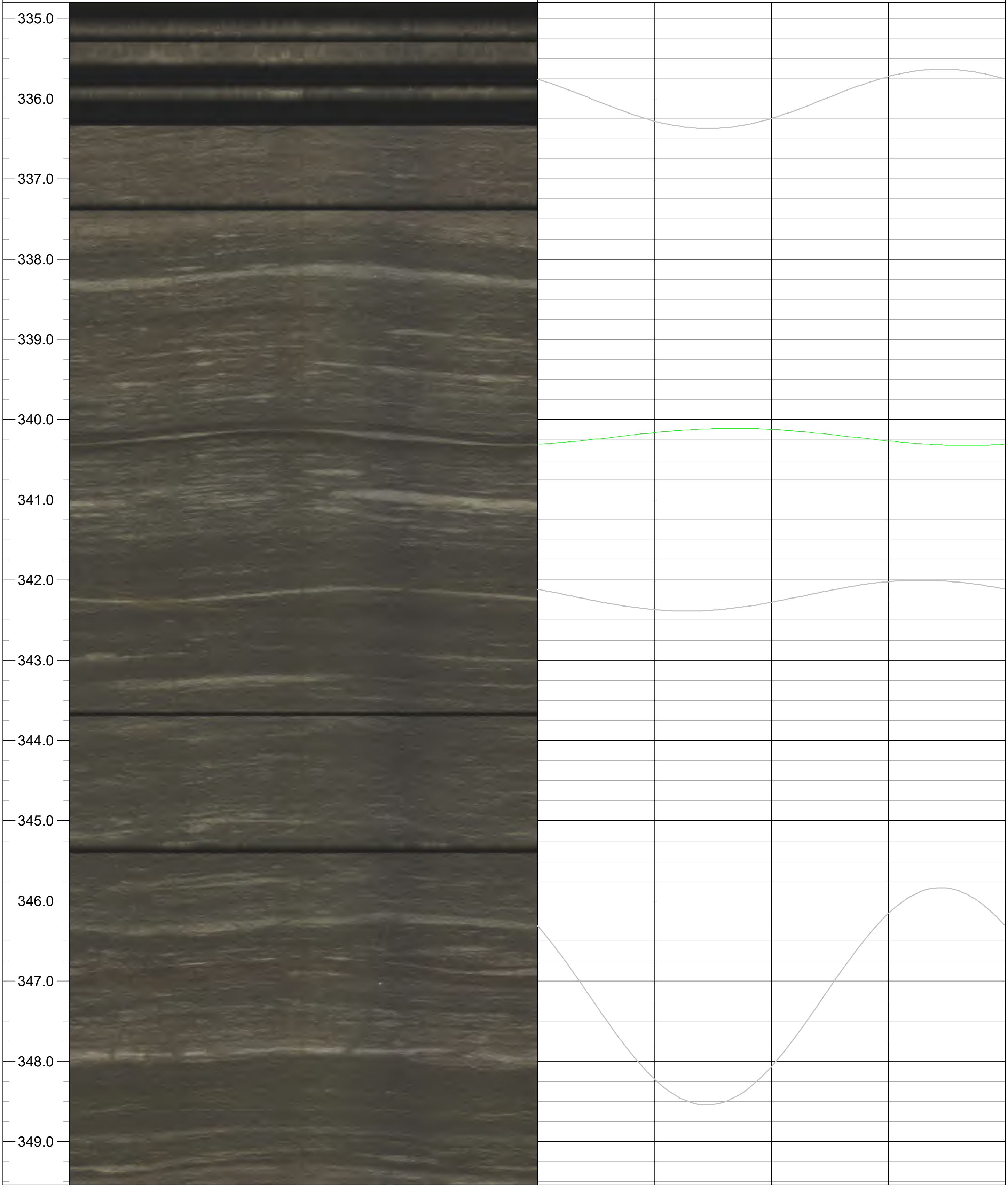
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

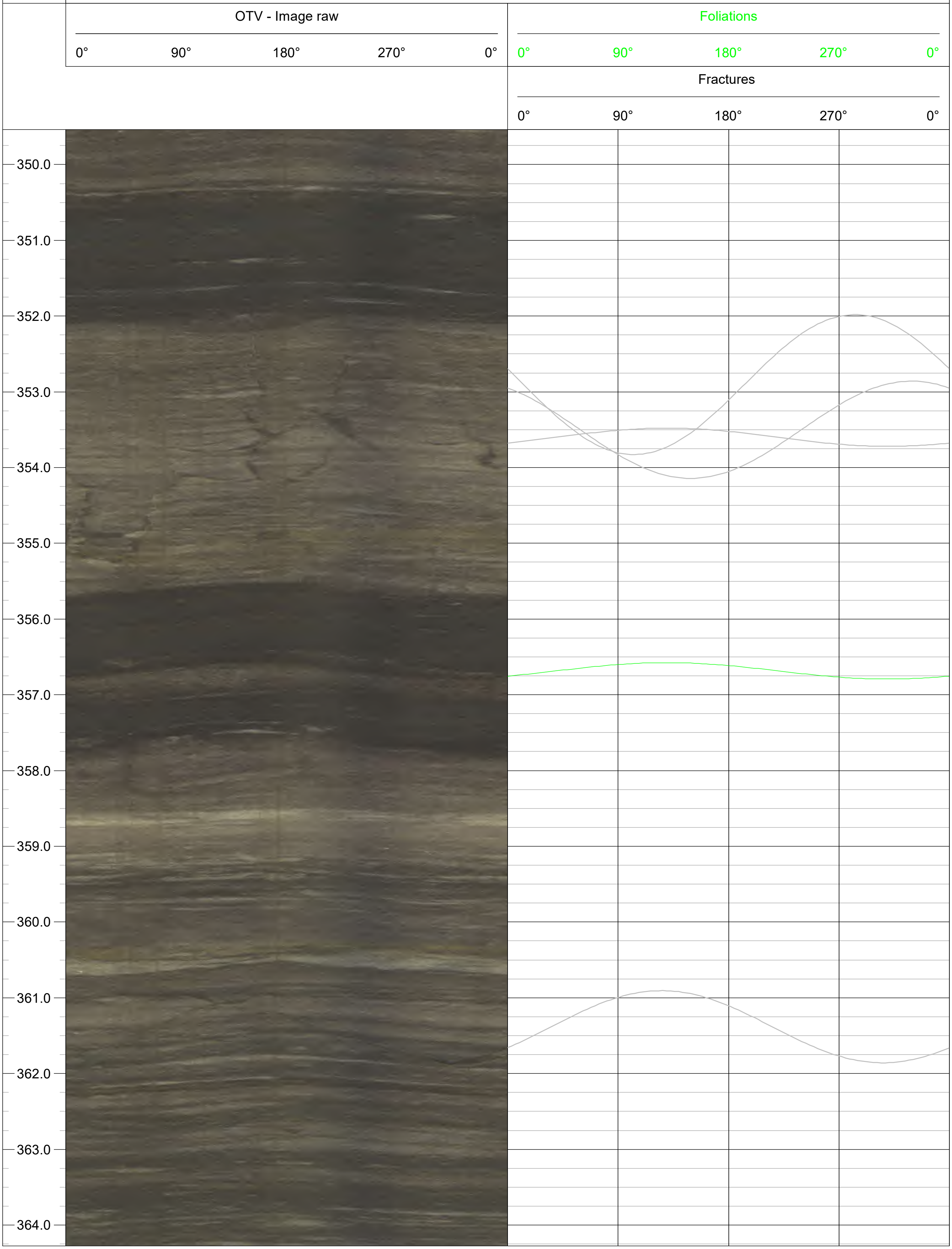
0° 90° 180° 270° 0°



Depth

1ft:20ft

P-1 Televiewer Log



Depth

1ft:20ft

P-1 Televiewer Log

OTV - Image raw

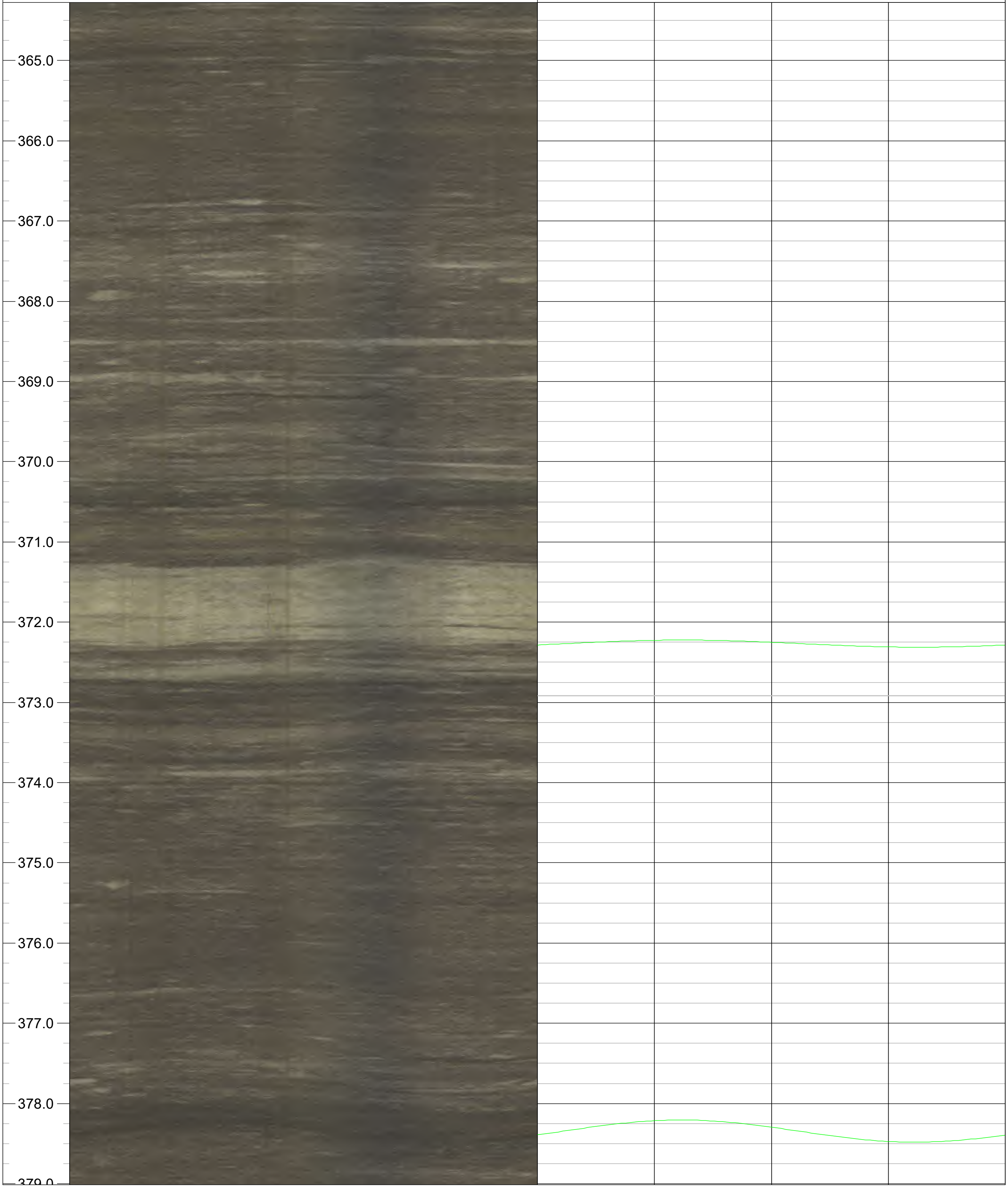
0° 90° 180° 270° 0°

Foliations

0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



P-1 Televiewer Log

Depth

1ft:20ft

OTV - Image raw

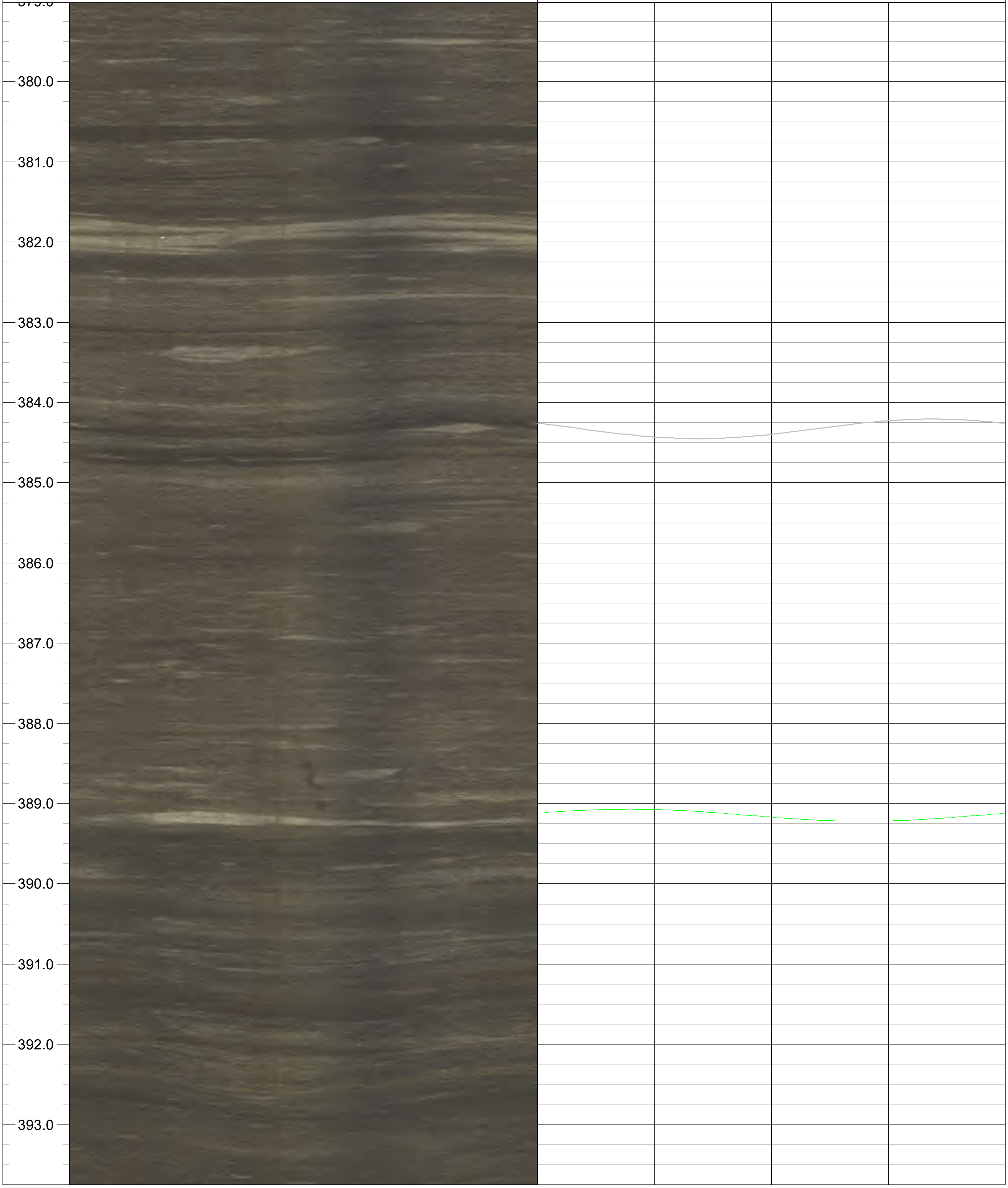
0° 90° 180° 270° 0°

Foliations

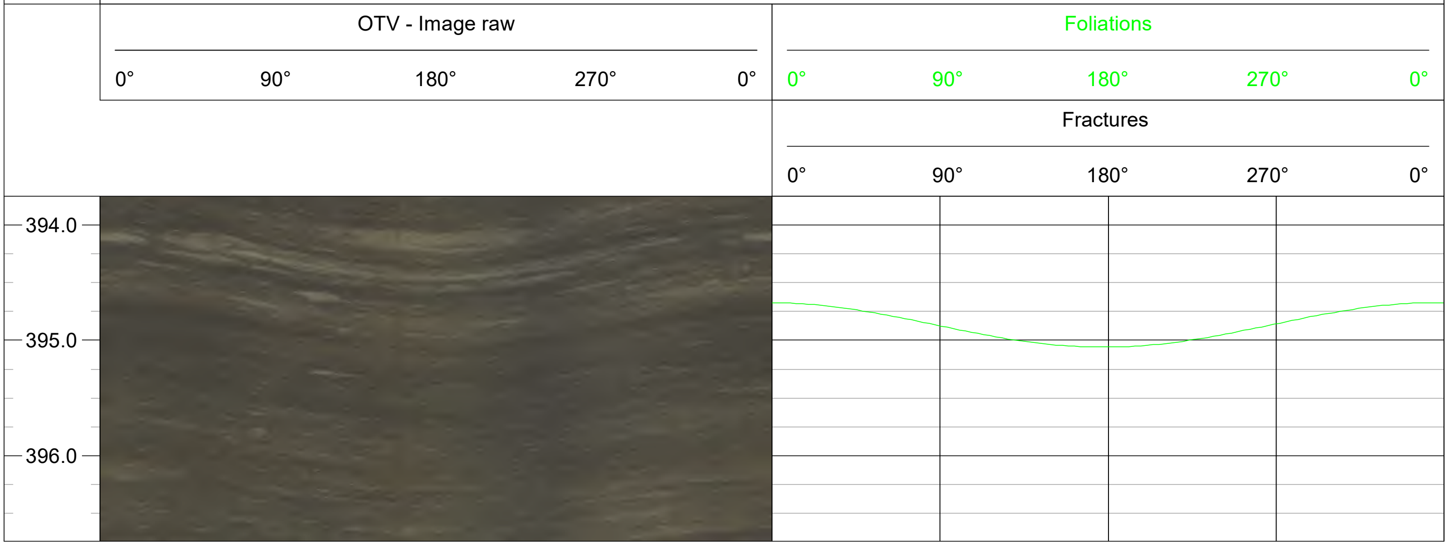
0° 90° 180° 270° 0°

Fractures

0° 90° 180° 270° 0°



Depth 1ft:20ft	**P-1 Televiewer Log**



APPENDIX C
Well Permit and Well Records

BLE | BUNNELL
LAMMONS
ENGINEERING

November 8, 2024

SCDES
2600 Bull Street
Columbia, SC 29201

Attention: Mr. Jeremy Eddy, Mining Section Manager

Subject: **SCDES 3736 Monitoring Well Application**
Proposed Macedonia Development
Greenfield Timber, LLC
Cherokee County, South Carolina
BLE Job Number 24-24056

Dear Mr. Eddy:

Bunnell-Lammons Engineering, Inc. (BLE) is pleased to submit this Monitoring Well Application to the South Carolina Department of Environmental Services (SCDES) on behalf of Greenfield Timber, LLC. This application addresses the installation of six (6) wells to be installed for the purpose of aquifer testing at the proposed Macedonia Development (**Figure 1**).

The proposed wells are anticipated to be installed to a depth of 400 feet below ground surface. The actual installation depths will vary based on the subsurface conditions encountered. Please see the attached **Figure 2** for a typical observation well schematic. In general, each well will be constructed with 6-inch diameter Schedule 40 PVC from ground surface to the top of bedrock at which point the well will be completed "open-hole". The wells will be secured with a locking expandable well cap.

We ask that SCDES please review this application and respond to BLE and Greenfield Timber, LLC prior to the tentative drilling start date of November 18, 2024.

If you have any questions, please contact us at (864) 288-1265.

Sincerely,

BUNNELL LAMMONS ENGINEERING INC.

T.J. Daniel

T.J. Daniel, P.G.
Project Geologist
Registered, South Carolina #2844

David R. Loftis, P.E.
Senior Engineer
Registered, South Carolina #27867

Attachments: Figures
SCDES 3637 Monitoring Well Application

ATTACHMENT

Figures

PROPOSED LOCATION OF PUMPING AND OBSERVATION WELLS (500-FT X 500-FT AREA)

Service Layer Credits: Hybrid Reference Layer: Esri Community Maps Contributors, State of North Carolina DOT, Esri, TomTom, Garmin,

DRAWN BY:	TAO	DATE:	11-7-24	
CHECKED BY:	TJD	FILE NAME:	24056-MWAPP	
APPROVED BY:	DRL	JOB NO:	24-24056	

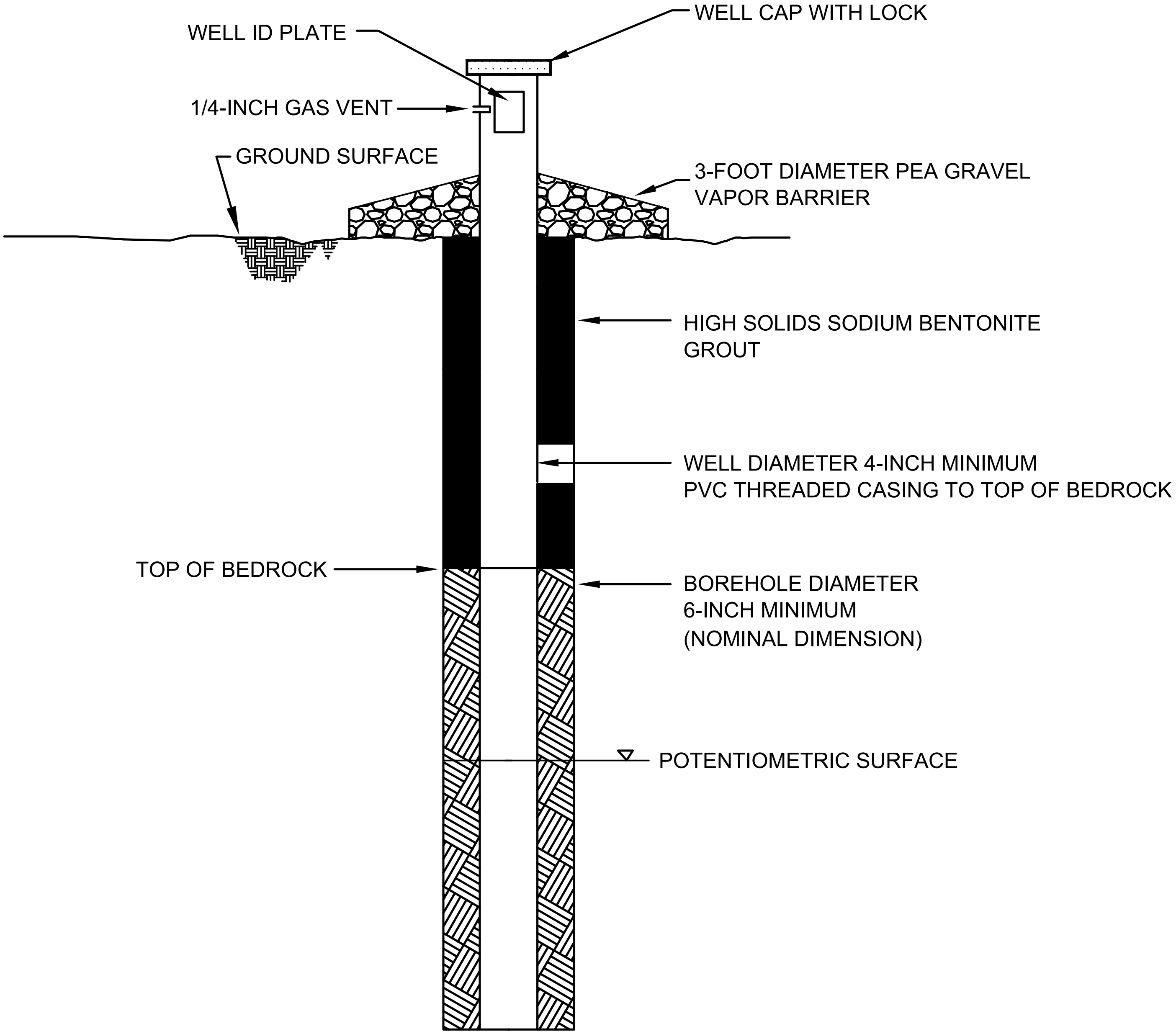
REVISIONS

No.	DESCRIPTION	BY

BLE BUNNELL LAMMONS ENGINEERING

PROPOSED LOCATION OF PUMPING AND OBSERVATION WELLS
PROPOSED MACEDONIA DEVELOPMENT
GREENFIELD TIMBER, LLC
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
1



NOTE: WELL CONSTRUCTION DETAILS MAY VARY SLIGHTLY BASED ON SITE SPECIFIC CONDITIONS ENCOUNTERED.

OBSERVATION WELL (TYP.)

JOB NO.: J24-24056-01
DATE: 10-17-24
SCALE: NOT TO SCALE

BLE BUNNELL LAMMONS ENGINEERING
6004 Ponders Court, Greenville, SC 29615
Phone: (864) 288-1265 **Fax:** (864) 288-4430

OBSERVATION WELL DETAIL
PROPOSED MACEDONIA DEVELOPMENT
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
2

ATTACHMENT
SCDES 3736 Monitoring Well Application

Monitoring Well Application

1. Proposed Location of Monitoring Well(s):

Street Address: **Tax ID # 027-00-00-035.000**
459 SHADY GROVE RD

City (including Zip): **Gaffney (Zip 29341)**

County: **Cherokee**

Please attach Scaled Map or Plat

2. Well Owner's Information:

Name (Last then First): **Smith, Bruce**

Company: **GREENFIELD TIMBER LLC**

Complete Address: **1001 Haxall Point**
Richmond, Va. 23219

Telephone Number: **(804) 641-9458**

3. Property Owner's Information:

☐ Check if same as Well Owner

Name (Last then First): **Beeson, John**

Company:

Address: **PO BOX 170248**
SPARTANBURG SC
29301

Telephone Number:

4. Proposed Drilling Date: **11/18/2024**

5. Intended Purpose of Well(s):

Pre-Purchase ☑

Investigation ☐

NOTE: If this request is for an existing DHEC project, please enter the Program area and ID number below.

Program Area:
Project or Site ID #:

6. Proposed number of monitoring wells: **6**

7. Proposed parameters to be analyzed (check all that apply), please specify analytical method beside check box:

VOCs ☐
BTEX ☐
MtBE ☐
Naphthalene ☐
PAHs ☐
Metals ☐
Nitrates ☐
Base, Neutral & Acid Ex. ☐
Pesticides/Herbicides ☐
Phenols ☐
Radionuclides ☐
PCBs ☐
Other (<u>specify below</u>) ☐

No laboratory analysis is anticipated.

8. Proposed construction details (complete and attach proposed monitoring well schematics):

See Figure 2.

SC DEPARTMENT *of* ENVIRONMENTAL SERVICES

Robert Cole
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

Temporary Monitoring Well Approval

Approval is	TJ Daniel/BLE
on behalf of:	Greenfield Timber LLC
Facility:	Greenfield Timber LLC
Site Identification:	SARR-00489
County:	Cherokee

This approval is for the installation of 6 temporary groundwater-monitoring wells. The temporary wells are to be installed in the locations as illustrated on the submitted map and per the proposed construction details provided by your correspondence dated 11/08/24. The temporary wells are to be installed following all of the applicable requirements of R.61-71.

Please note that R.61-71 requires the following:

1. All wells shall be drilled, constructed, and abandoned by a South Carolina certified well driller per R.61-71.D.1.
2. A Water Well Record Form or other form provided or approved by the Department shall be completed and submitted to the Department within 30 days after well completion or abandonment unless the Department has approved another schedule. The form should contain the "as-built" construction details and all other information required by R.61-71.H.1.f.
3. All analytical data and water levels obtained from each monitoring well shall be submitted to the Department within 30 days of receipt of laboratory results unless another schedule has
4. All temporary monitoring wells shall be abandoned within 5 days of borehole completion using appropriate methods as required by R.61-71.H.4.c.
5. If any of the information provided to the Department changes, Karen Morrison (803-898-0792, morrisks@dhec.sc.gov) shall be notified a minimum of twenty-four hours prior to well construction as required by R.61-71.H.1.a.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and R.61-71 of the South Carolina Well Standards and Regulations, dated April 26, 2002.

Date of Issuance: 11/18/24 **Approval #:** SARRMW-00489

Robert Cole, Manager

Division of Site Assessment Remediation & Revitalization Division (SARR)

Federal & State Site Assessment Section

Bureau of Land & Waste Management

SC DEPARTMENT *of*
ENVIRONMENTAL SERVICES

Robert Cole
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

November 18, 2024

John Beeson
PO Box 17028
Spartanburg, SC 29301

Re: Temporary Monitoring Well Approval Request received 11/8/24
Greenfield Timber, LLC
Cherokee County Well ID: SARRMW-00489

Dear Mr Beeson:

The South Carolina Department of Environmental Services (SCDES) has reviewed and approved the referenced temporary monitoring well approval request submitted 11/8/24. The original temporary monitoring well approval has been sent to TJ Daniel/BLE, and a copy is enclosed for your records. The analytical results from the groundwater samples should be submitted to my attention on or before 1/18/25. Please note the following:

- Well construction and sampling derived waste including but not limited to drill cuttings, drilling fluids, and development/purge water should be managed properly and in compliance with applicable requirements. If containerized, each vessel should be clearly labeled with regards to contents, source, and date of activity.
- Monitoring wells are to yield groundwater samples representative of the zone monitored per R.61-71 H.1.c of the South Carolina Well Standards and Regulations (e.g. low flow sampling techniques are recommended for samples to be analyzed for metals to reduce induced turbidity).
- If this investigation is conducted as part of a potential real estate transaction, the potential purchaser may want to contact SCDES's Brownfields Program before this work is performed. The Brownfields Program offers a mechanism to avoid liability for contamination that may be found during this investigation. The investigation proposed may satisfy part or all of the required assessment if pre-approved by the Brownfields Program. The Brownfields Program may be reached at 1-866-576-3432.

If you have any questions, please contact me at (803) 898-0802.

Sincerely,

Robert Cole, Manager
Federal & State Site Assessment Section
Division of Site Assessment Remediation & Revitalization Division (SARR)
Bureau of Land & Waste Management

enc: Monitor well approval cc: SCDES Regional Office

DHEC
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: HOMILLER, WILL
(last) (first)
Address: 1001 HAXALL POINT
City: RICHMOND State: VA Zip: 23219
Telephone: Work: 804-641-9458 Home:

2. LOCATION OF WELL: **COUNTY:** Cherokee
Name: Type III Open Hole Wells
Street Address: 72 Shady Grove Rd
City: Gaffney, SC Zip: 29341
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: **PUBLIC SYSTEM NUMBER:** P-1

4. ABANDONMENT: ☐ Yes ☒ No
Give Details Below
Grouted Depth: from ____ ft. to ____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Bedrock	295	400

*Indicate Water Bearing Zones

(Use a 2nd sheet if needed)

5. REMARKS:
Open Hole Type III well; open hole from bottom
of casing to 400' bgs

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored
☐ Dug ☒ Air Rotary ☐ Driven
☐ Cable tool ☐ Other

7. PERMIT NUMBER: SARRMW-00489

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☒ Test Well ☐ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 11-26-24
400 ft. Date Completed: 12-6-24

10. CASING: ☒ Threaded ☐ Welded
Diam.: 6in
Type: ☒ PVC ☐ Galvanized
☐ Steel ☐ Other
0 in. to 105 ft. depth
____ in. to ____ ft. depth
Height: Above/[✓ Below]
Surface ____ ft.
Weight ____ lb./ft.
Drive Shoe? ☐ Yes ☒ No

11. SCREEN:
Type: ____ Diam.: ____
Slot/Gauge: ____ Length: ____
Set Between: ____ ft. and ____ ft. **NOTE: MULTIPLE SCREENS**
____ ft. and ____ ft. **USE SECOND SHEET**
Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL 53.7 ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
____ ft. after ____ hrs. Pumping ____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☒ No
Yield: ____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☐ Yes ☒ No
Installed from ____ ft. to ____ ft.
Effective size ____ Uniformity Coefficient ____

16. WELL GROUTED? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other ____
Depth: From 0 ft. to 105 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type ____
Well Disinfected ☐ Yes ☒ No Type: ____ Amount: ____

18. PUMP: Date installed: ____ Not installed ☒
Mfr. Name: ____ Model No.: ____
H.P. ____ Volts ____ Length of drop pipe ____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine
☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: John Eisenman **CERT. NO.:** 2195
Address: (Print) Level: A B [✓ C] D (circle one)
SAEDACCO
9088 Northfield Drive
Fort Mill, SC 29707
Telephone No.: (803)548-2180 Fax No.: (803)548-2181

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: ____ Date: 12/24/2024
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004) **COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER**

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water

2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:

Name: HOMILLER, WILL
(last) (first)

Address: 1001 HAXALL POINT

City: RICHMOND State: VA Zip: 23219

Telephone: Work: 804-641-9458 Home:

2. LOCATION OF WELL: **COUNTY:** Cherokee

Name: Type III Open Hole Wells

Street Address: 72 Shady Grove Rd

City: Gaffney, SC Zip: 29341

Latitude: Longitude:

3. PUBLIC SYSTEM NAME: **PUBLIC SYSTEM NUMBER:** O-1

4. ABANDONMENT: ☐ Yes ☒ No

Give Details Below

Grouted Depth: from ____________ ft. to ______________ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Bedrock	313	400

*Indicate Water Bearing Zones

(Use a 2nd sheet if needed)

5. REMARKS:

Open Hole Type III well; open hole from bottom of casing to 400'

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored ☐ Dug ☒ Air Rotary ☐ Driven ☐ Cable tool ☐ Other

7. PERMIT NUMBER: SARRMW-00489

8. USE:

☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☒ Test Well ☐ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) 400 ft.

Date Started: 12-16-24

Date Completed: 12-20-24

10. CASING: ☒ Threaded ☐ Welded

Diam.: 6in

Type: ☒ PVC ☐ Galvanized ☐ Steel ☐ Other

0 in. to 87 ft. depth

______ in. to ______ ft. depth

Height: Above/[✓ Below]

Surface ______________ ft.

Weight ______________ lb./ft.

Drive Shoe? ☐ Yes ☒ No

11. SCREEN:

Type: ______________ Diam.: ______________

Slot/Gauge: ______________ Length: ______________

Set Between: ________ ft. and ________ ft.

________ ft. and ________ ft.

NOTE: MULTIPLE SCREENS USE SECOND SHEET

Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL 57.7 ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.

________ ft. after ________ hrs. Pumping ________ G.P.M.

Pumping Test: ☐ Yes (please enclose) ☒ No

Yield: ______________

14. WATER QUALITY

Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No

Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☐ Yes ☒ No

Installed from ______________ ft. to ______________ ft.

Effective size ______________ Uniformity Coefficient ______________

16. WELL GROUTED? ☒ Yes ☐ No

☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other ______________

Depth: From 0 ft. to 87 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: _____ ft. _____ direction

Type ______________

Well Disinfected ☒ Yes ☐ No Type: ______________ Amount: ______________

18. PUMP: Date installed: ______________ Not installed ☒

Mfr. Name: ______________ Model No.: ______________

H.P. ________ Volts ________ Length of drop pipe ________ ft. Capacity ____ gpm

TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: John Eisenman **CERT. NO.:** 2195

Level: A B [✓ C] D (circle one)

Address: (Print)

SAEDACCO
9088 Northfield Drive
Fort Mill, SC 29707

Telephone No.: (803)548-2180 Fax No.: (803)548-2181

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: ______________ Date: 12/24/2024
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004)

COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER

DHEC
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: HOMILLER, WILL
(last) (first)
Address: 1001 HAXALL POINT
City: RICHMOND State: VA Zip: 23219
Telephone: Work: 804-641-9458 Home:

2. LOCATION OF WELL: **COUNTY:** Cherokee
Name: Type III Open Hole Wells
Street Address: 72 Shady Grove Rd
City: Gaffney, SC Zip: 29341
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: **PUBLIC SYSTEM NUMBER:** O-2

4. ABANDONMENT: ☐ Yes ☒ No
Give Details Below
Grouted Depth: from ____ ft. to ____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Bedrock	260	400

*Indicate Water Bearing Zones

(Use a 2nd sheet if needed)

5. REMARKS:
Open Hole Type III well; open hole from bottom of casing to 400'

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored
☐ Dug ☒ Air Rotary ☐ Driven
☐ Cable tool ☐ Other

7. PERMIT NUMBER: SARRMW-00489

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☒ Test Well ☐ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 12-9-24
400 ft. Date Completed: 12-13-24

10. CASING: ☒ Threaded ☐ Welded
Diam.: 6in
Type: ☒ PVC ☐ Galvanized
☐ Steel ☐ Other
0 in. to 140 ft. depth
____ in. to ____ ft. depth
Height: Above/[✓ Below]
Surface ____ ft.
Weight ____ lb./ft.
Drive Shoe? ☐ Yes ☒ No

11. SCREEN:
Type: ____ Diam.: ____
Slot/Gauge: ____ Length: ____
Set Between: ____ ft. and ____ ft. **NOTE: MULTIPLE SCREENS**
____ ft. and ____ ft. **USE SECOND SHEET**
Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL 49.8 ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
____ ft. after ____ hrs. Pumping ____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☒ No
Yield: ____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☐ Yes ☒ No
Installed from ____ ft. to ____ ft.
Effective size ____ Uniformity Coefficient ____

16. WELL GROUTED? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other ____
Depth: From 0 ft. to 140 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type ____
Well Disinfected ☒ Yes ☐ No Type: ____ Amount: ____

18. PUMP: Date installed: ____ Not installed ☒
Mfr. Name: ____ Model No.: ____
H.P. ____ Volts ____ Length of drop pipe ____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine
☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: John Eisenman **CERT. NO.:** 2195
Address: (Print) Level: A B [✓ C] D (circle one)
SAEDACCO
9088 Northfield Drive
Fort Mill, SC 29707
Telephone No.: (803)548-2180 Fax No.: (803)548-2181

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: ____ Date: 12/24/2024
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004)

COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: HOMILLER, WILL
(last) (first)
Address: 1001 HAXALL POINT
City: RICHMOND State: VA Zip: 23219
Telephone: Work: 804-641-9458 Home:

2. LOCATION OF WELL: **COUNTY:** Cherokee
Name: Type III Open Hole Wells
Street Address: 72 Shady Grove Rd
City: Gaffney, SC Zip: 29341
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: **PUBLIC SYSTEM NUMBER:** O-3

4. ABANDONMENT: ☐ Yes ☒ No
Give Details Below
Grouted Depth: from ____ ft. to ____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Bedrock	300	400

*Indicate Water Bearing Zones

(Use a 2nd sheet if needed)

5. REMARKS:
Open Hole Type III well; open hole from bottom of casing to 400'

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored
☐ Dug ☒ Air Rotary ☐ Driven
☐ Cable tool ☐ Other

7. PERMIT NUMBER: SARRMW-00489

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☒ Test Well ☐ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 12-23-24
400 ft. Date Completed: 12-31-24

10. CASING: ☒ Threaded ☐ Welded
Diam.: 6in
Type: ☒ PVC ☐ Galvanized
☐ Steel ☐ Other
0 in. to 100 ft. depth
____ in. to ____ ft. depth
Height: Above/[✓ Below]
Surface ____ ft.
Weight ____ lb./ft.
Drive Shoe? ☐ Yes ☒ No

11. SCREEN:
Type: ____ Diam.: ____
Slot/Gauge: ____ Length: ____
Set Between: ____ ft. and ____ ft.
____ ft. and ____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL ____ ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
____ ft. after ____ hrs. Pumping ____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☒ No
Yield: ____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☐ Yes ☒ No
Installed from ____ ft. to ____ ft.
Effective size ____ Uniformity Coefficient ____

16. WELL GROUTED? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other ____
Depth: From 0 ft. to 100 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type ____
Well Disinfected ☒ Yes ☐ No Type: ____ Amount: ____

18. PUMP: Date installed: ____ Not installed ☒
Mfr. Name: ____ Model No.: ____
H.P. ____ Volts ____ Length of drop pipe ____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine
☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: John Eisenman **CERT. NO.:** 2195
Address: (Print) Level: A B [✓ C] D (circle one)
SAEDACCO
9088 Northfield Drive
Fort Mill, SC 29707
Telephone No.: (803)548-2180 Fax No.: (803)548-2181

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: John Eisenman Date: 12/24/2024
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004) **COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER**

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: HOMILLER, WILL
(last) (first)
Address: 1001 HAXALL POINT
City: RICHMOND State: VA Zip: 23219
Telephone: Work: 804-641-9458 Home:

2. LOCATION OF WELL: **COUNTY:** Cherokee
Name: Type III Open Hole Wells
Street Address: 72 Shady Grove Rd
City: Gaffney, SC Zip: 29341
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: **PUBLIC SYSTEM NUMBER:** O-4

4. ABANDONMENT: ☐ Yes ☒ No
Give Details Below
Grouted Depth: from ____ ft. to ____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Bedrock	307	400

*Indicate Water Bearing Zones

(Use a 2nd sheet if needed)

5. REMARKS:
Open Hole Type III well; open hole from bottom of casing to 400'

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored ☐ Dug ☒ Air Rotary ☐ Driven ☐ Cable tool ☐ Other

7. PERMIT NUMBER: SARRMW-00489

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☒ Test Well ☐ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 12-16-25
400 ft. Date Completed: 1-6-25

10. CASING: ☒ Threaded ☐ Welded
Diam.: 6in
Type: ☒ PVC ☐ Galvanized
☐ Steel ☐ Other
0 in. to 93 ft. depth
____ in. to ____ ft. depth

Height: Above/[✓ Below]
Surface ____ ft.
Weight ____ lb./ft.
Drive Shoe? ☐ Yes ☒ No

11. SCREEN:
Type: ____ Diam.: ____
Slot/Gauge: ____ Length: ____
Set Between: ____ ft. and ____ ft.
____ ft. and ____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL 54.4 ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
____ ft. after ____ hrs. Pumping ____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☒ No
Yield: ____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☐ Yes ☒ No
Installed from ____ ft. to ____ ft.
Effective size ____ Uniformity Coefficient ____

16. WELL GROUTED? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other ____
Depth: From 0 ft. to 93 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type ____
Well Disinfected ☒ Yes ☐ No Type: ____ Amount: ____

18. PUMP: Date installed: ____ Not installed ☒
Mfr. Name: ____ Model No.: ____
H.P. ____ Volts ____ Length of drop pipe ____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine
☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: John Eisenman **CERT. NO.:** 2195
Address: (Print) Level: A B [✓ C] D (circle one)
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9088 Northfield Drive
Fort Mill, SC 29707
Telephone No.: (803)548-2180 Fax No.: (803)548-2181

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Signed: ____ Date: 12/24/2024
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004)

COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water

2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: HOMILLER, WILL
(last) (first)
Address: 1001 HAXALL POINT
City: RICHMOND State: VA Zip: 23219
Telephone: Work: 804-641-9458 Home:

2. LOCATION OF WELL: **COUNTY:** Cherokee
Name: Type III Open Hole Wells
Street Address: 72 Shady Grove Rd
City: Gaffney, SC Zip: 29341
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: **PUBLIC SYSTEM NUMBER:** O-5

4. ABANDONMENT: ☐ Yes ☒ No
Give Details Below
Grouted Depth: from ____ ft. to ____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Bedrock	344	400

*Indicate Water Bearing Zones

(Use a 2nd sheet if needed)

5. REMARKS:
Open Hole Type III well; open hole from bottom of casing to 400'

6. TYPE: ☐ Mud Rotary ☐ Jetted ☒ Bored
☐ Dug ☒ Air Rotary ☐ Driven
☐ Cable tool ☐ Other

7. PERMIT NUMBER: SARRMW-00489

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☒ Test Well ☐ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 12-18-25
400 ft. Date Completed: 1-8-25

10. CASING: ☒ Threaded ☐ Welded
Diam.: 6in
Type: ☒ PVC ☐ Galvanized
☐ Steel ☐ Other
0 in. to 56 ft. depth
____ in. to ____ ft. depth
Height: Above/[✓ Below]
Surface ____ ft.
Weight ____ lb./ft.
Drive Shoe? ☐ Yes ☒ No

11. SCREEN:
Type: ____ Diam.: ____
Slot/Gauge: ____ Length: ____
Set Between: ____ ft. and ____ ft.
____ ft. and ____ ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☒ No

12. STATIC WATER LEVEL 52.5 ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
____ ft. after ____ hrs. Pumping ____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☒ No
Yield: ____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☒ No Bacterial Analysis ☐ Yes ☒ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☐ Yes ☒ No
Installed from ____ ft. to ____ ft.
Effective size ____ Uniformity Coefficient ____

16. WELL GROUTED? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ Bentonite/Cement ☐ Other ____
Depth: From 0 ft. to 48 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type ____
Well Disinfected ☒ Yes ☐ No Type: ____ Amount: ____

18. PUMP: Date installed: ____ Not installed ☒
Mfr. Name: ____ Model No.: ____
H.P. ____ Volts ____ Length of drop pipe ____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine
☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: John Eisenman **CERT. NO.:** 2195
Address: (Print) Level: A B [✓ C] D (circle one)
SAEDACCO
9088 Northfield Drive
Fort Mill, SC 29707
Telephone No.: (803)548-2180 Fax No.: (803)548-2181

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: John Eisenman Date: 12/24/2024
Well Driller

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004)

COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER

KEY TO SOIL CLASSIFICATIONS AND CONSISTENCY DESCRIPTIONS

BUNNELL-LAMMONS ENGINEERING, INC.

Penetration Resistance* Blows per Foot	Relative Density
SANDS	
0 to 4	Very Loose
5 to 10	Loose
11 to 30	Medium-Dense
31 to 50	Dense
over 50	Very Dense

Particle Size Identification

Boulder:	Greater than 300 mm
Cobble:	75 to 300 mm
Gravel:	Coarse - 19 to 75 mm
	Fine - 4.75 to 19 mm
Sand:	Coarse - 2 to 4.75 mm
	Medium - 0.425 to 2 mm
	Fine - 0.075 to 0.425 mm
Silt & Clay:	Less than 0.075 mm

Penetration Resistance* Blows per Foot	Consistency
SILTS AND CLAYS	
0 to 2	Very Soft
3 to 4	Soft
5 to 8	Firm
9 to 15	Stiff
16 to 30	Very Stiff
31 to 50	Hard
over 50	Very Hard

*ASTM D 1586

KEY TO DRILLING SYMBOLS

✋	Bulk Sample	▽	Groundwater Table at Time of Drilling
☒	Split Spoon Sample	▼	Groundwater Table 24 Hours After Completion of Drilling
■	Undisturbed Sample	▩	Cave-in Depth

KEY TO SOIL CLASSIFICATION

▒	Well-graded Gravel GW	▨	Fat Clay CH	▥	Elastic Silt MH	░	Well Graded Sand SW
▒	Poorly-graded Gravel GP	▤	Lean Clay CL	▥	Silt ML	░	Poorly Graded Sand SP
▒	Partially Weathered Rock PWR	▤	Sandy Clay CL	▥	Sandy Silt ML	▨	Clayey Sand SC
▓	Fill FILL	▤	Silty Clay CL-ML	▒	Topsoil TOPSOIL	▥	Silty Sand SM

GROUNDWATER MONITORING WELL NO. O-1

BUNNELL-LAMMONS ENGINEERING, INC.

Geotechncal And Environmental Consultants

PROJECT: Luck Cherokee

PROJECT NO.: 24-24056

CLIENT: Luck Companies

START: 12/16/2024

END: 12/20/2024

LOCATION: Gaffney, SC, USA

GS ELEVATION: 766.44

NORTHING/EASTING: 1183990.65 N, 1777136.16 E

TOC Elevation: 769.71

DRILLER: SAEDACCO, J. Eisenman

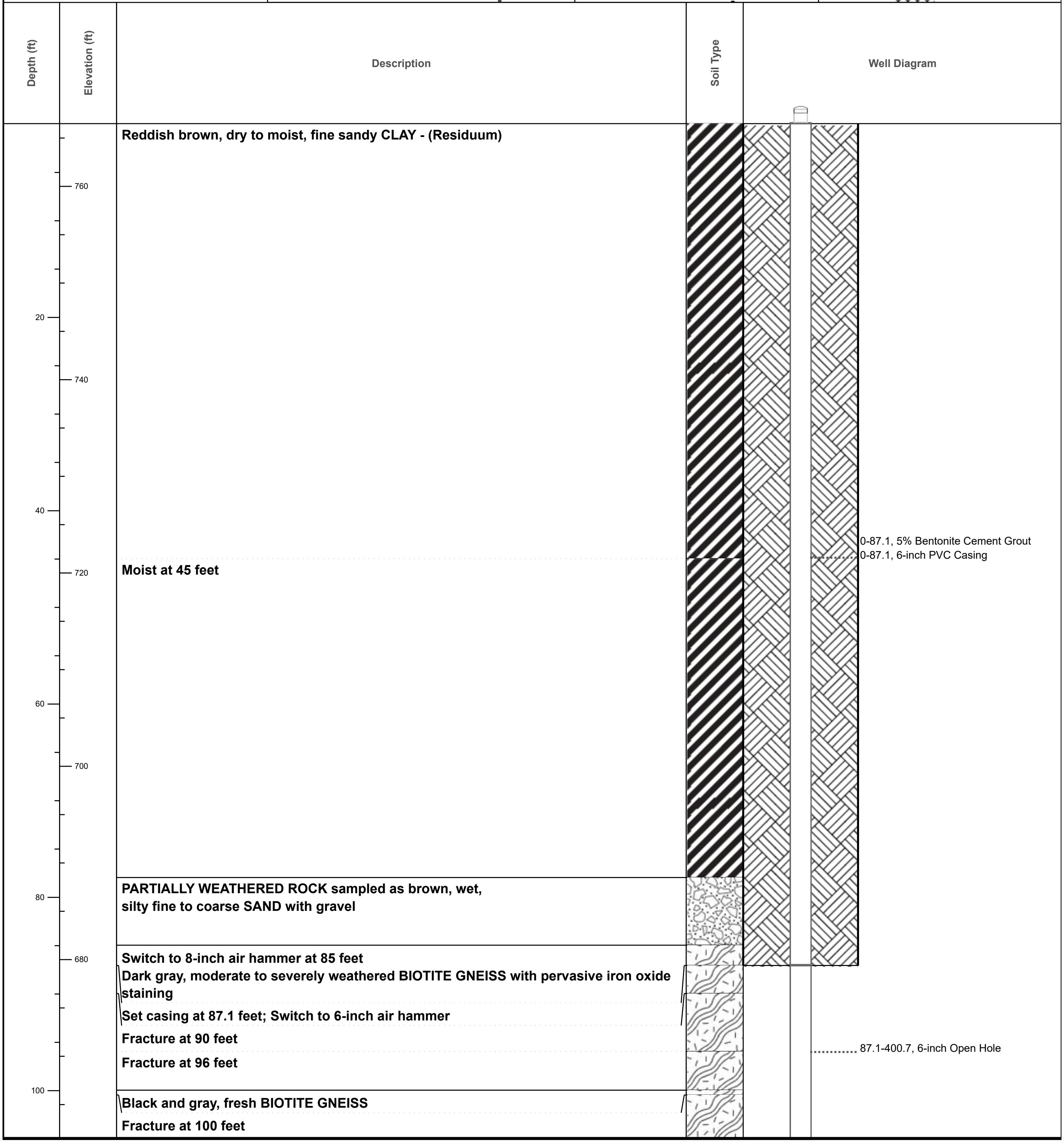
LOGGED BY: TAO

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ 60

AFTER 24 HOURS: ▼ 57.7

CAVING: ▨ N/A



Reddish brown, dry to moist, fine sandy CLAY - (Residuum)

Moist at 45 feet

PARTIALLY WEATHERED ROCK sampled as brown, wet, silty fine to coarse SAND with gravel

Switch to 8-inch air hammer at 85 feet

Dark gray, moderate to severely weathered BIOTITE GNEISS with pervasive iron oxide staining

Set casing at 87.1 feet; Switch to 6-inch air hammer

Fracture at 90 feet

Fracture at 96 feet

Black and gray, fresh BIOTITE GNEISS

Fracture at 100 feet

BUNNELL-LAMMONS ENGINEERING, INC.

Geotechncal And Environmental Consultants

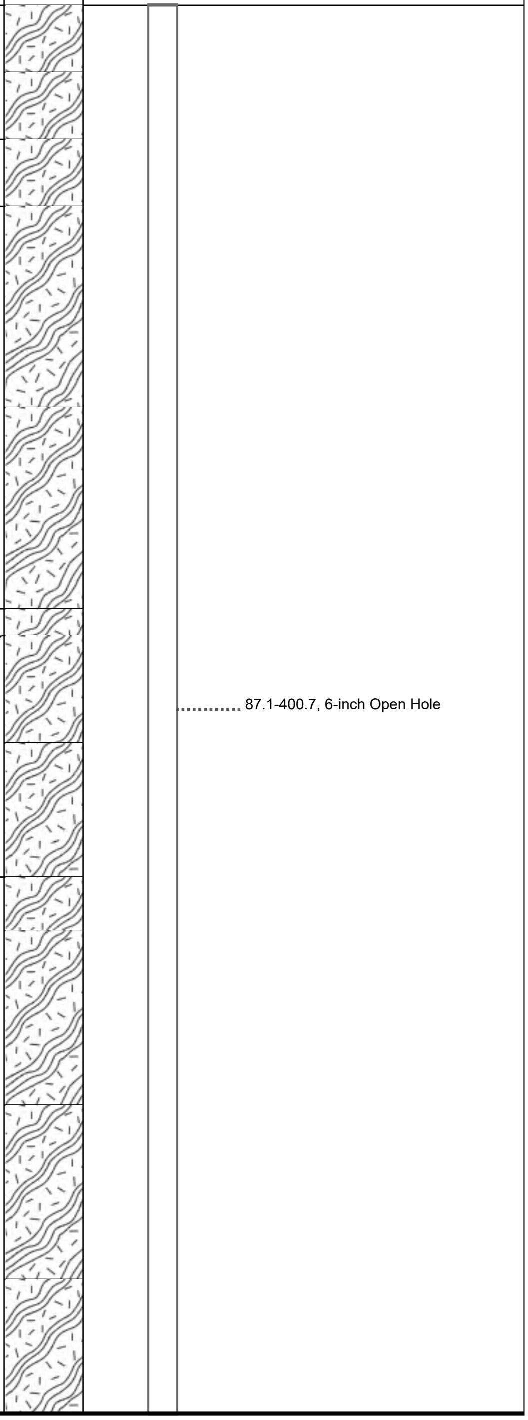
GROUNDWATER MONITORING WELL NO. O-1

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 12/16/2024 END: 12/20/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 766.44
NORTHING/EASTING: 1183990.65 N, 1777136.16 E	TOC Elevation: 769.71
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer	

DEPTH TO - WATER> INITIAL: ▽ 60 | AFTER 24 HOURS: ▼ 57.7 | CAVING: ▩ N/A

Depth (ft)	Elevation (ft)	Description
	660	**Fracture at 100 feet**
		Fractured interval from 110 to 112 feet
		Fractured interval with advanced weathering from 115 to 120 feet
120		**Black and gray, fresh BIOTITE GNEISS**
	640	
		Water-bearing fractured interval from 135 to 139 feet
140		
	620	
		Increased quartz content, minor garnet from 150 to 170 feet
		Water-bearing fractured interval from 150 to 153 feet
160		**Water-bearing fracture at 160 feet**
	600	
		Black and gray, fresh BIOTITE GNEISS
		Fractured interval from 174 to 179 feet
180		
	580	
		Fracture at 187 feet
200		**Fracture at 200 feet**
	560	

Soil Type | Well Diagram



BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-1

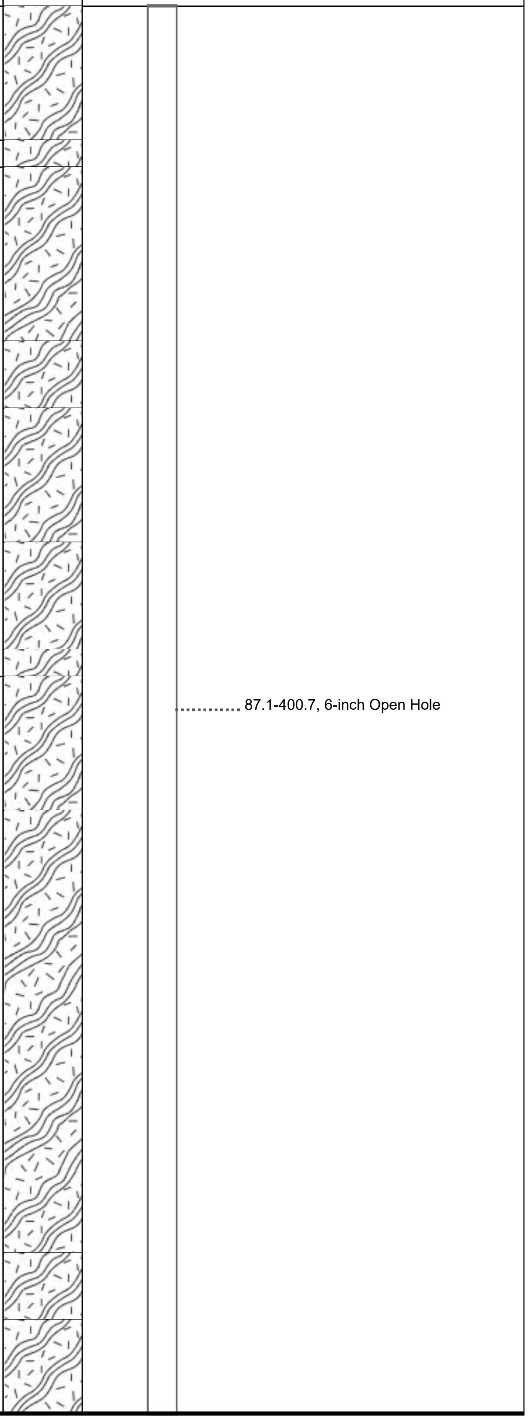
PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 12/16/2024 END: 12/20/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 766.44
NORTHING/EASTING: 1183990.65 N, 1777136.16 E	TOC Elevation: 769.71
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ∇ 60 AFTER 24 HOURS: ▼ 57.7 CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description
		Fracture at 210 feet
220		
		Black and white, fresh BIOTITE GNIESS with garnet
		Fracture at 222 feet
	540	
		Fracture at 235 feet
240		
		Fracture at 240 feet
	520	
		Fracture at 250 feet
		Fractured interval from 258 to 260 feet
260		
		Black and white, fresh to moderately weathered BIOTITE GNEISS with garnet and trace sulfides
	500	
		Fracture at 270 feet
280		
	480	
300		
		Fracture at 303 feet
	460	
		Fracture at 308 feet

Soil Type / Well Diagram

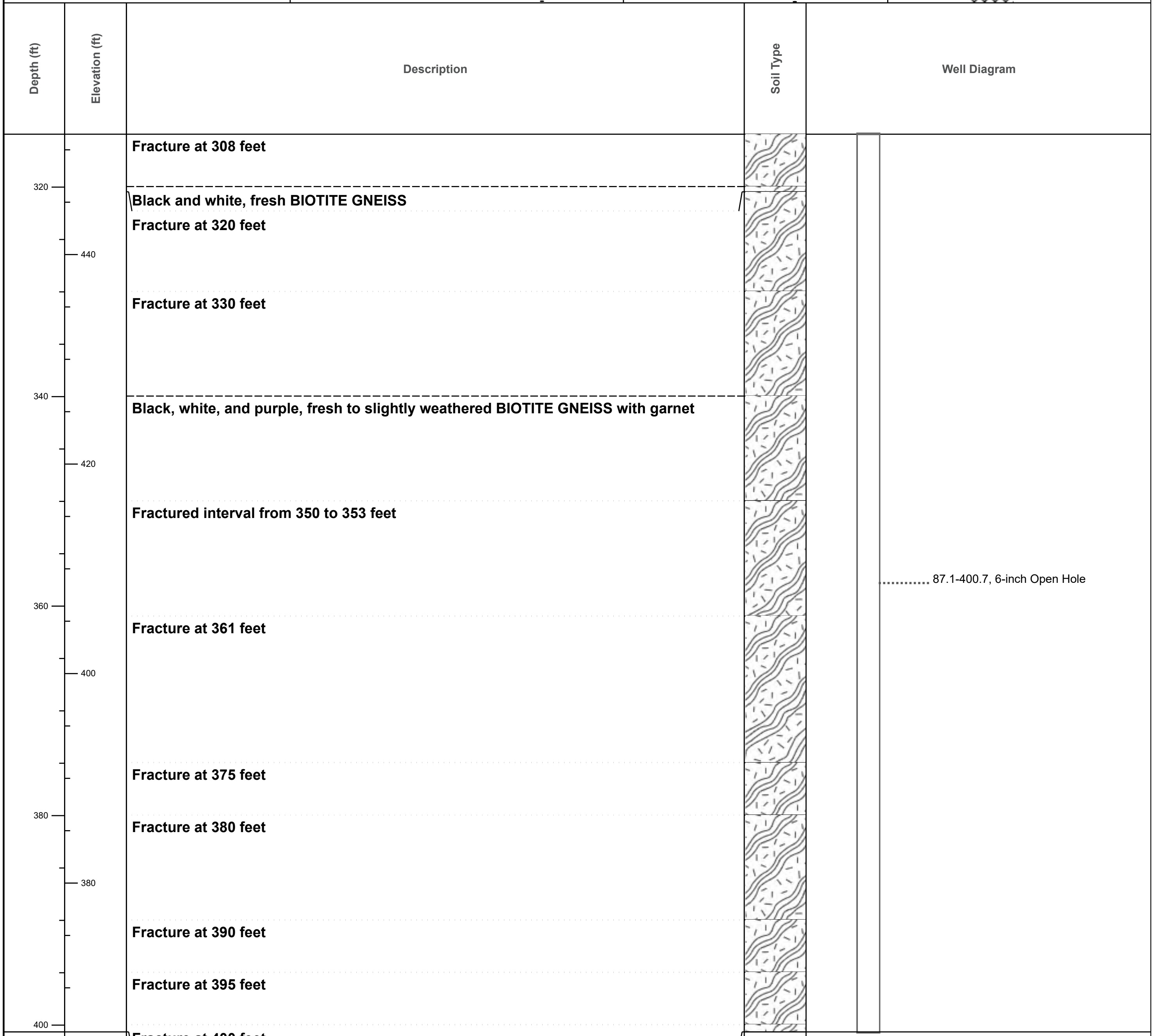


GROUNDWATER MONITORING WELL NO. O-1

BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

PROJECT: Luck Cherokee	**PROJECT NO.: 24-24056**	
CLIENT: Luck Companies	**START: 12/16/2024**	**END: 12/20/2024**
LOCATION: Gaffney, SC, USA	**GS ELEVATION: 766.44**	
NORTHING/EASTING: 1183990.65 N, 1777136.16 E	**TOC Elevation: 769.71**	
DRILLER: SAEDACCO, J. Eisenman	**LOGGED BY: TAO**	
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer		
DEPTH TO - WATER> INITIAL: ∇ 60	**AFTER 24 HOURS: ▼ 57.7**	**CAVING: ▨ N/A**



Fracture at 308 feet

Black and white, fresh BIOTITE GNEISS

Fracture at 320 feet

Fracture at 330 feet

Black, white, and purple, fresh to slightly weathered BIOTITE GNEISS with garnet

Fractured interval from 350 to 353 feet

Fracture at 361 feet

Fracture at 375 feet

Fracture at 380 feet

Fracture at 390 feet

Fracture at 395 feet

Fracture at 400 feet

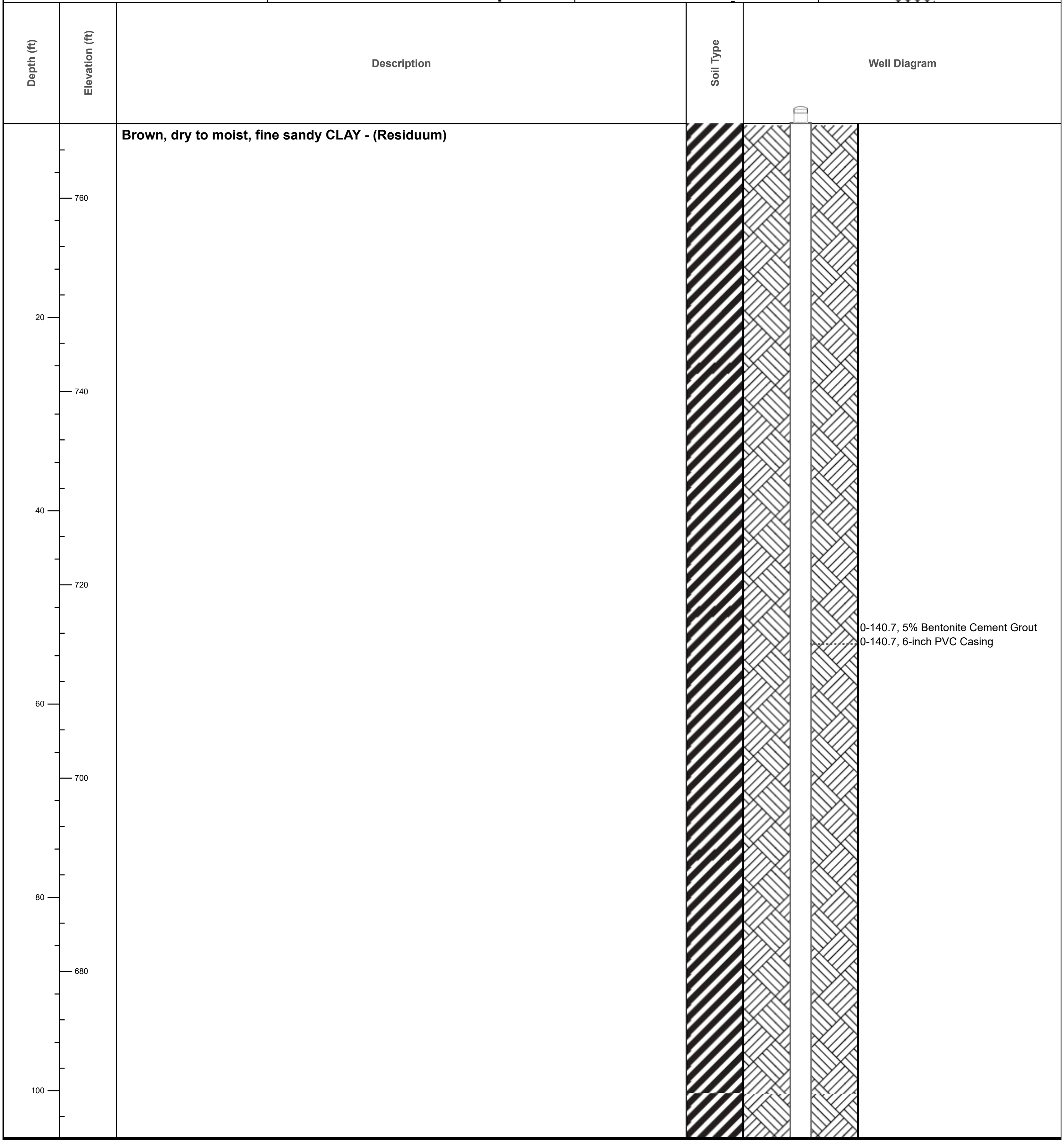
O-1 Terminated at 400.7ft (Groundwater encountered at 60 feet below ground surface at time of drilling and 57.7 feet after 24 hours.)

BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-2

PROJECT: Luck Cherokee
PROJECT NO.: 24-24056
CLIENT: Luck Companies
START: 12/09/2024
END: 12/13/2024
LOCATION: Gaffney, SC, USA
GS ELEVATION: 767.67
NORTHING/EASTING: 1183995.61 N, 1777188.07 E
TOC Elevation: 770.98
DRILLER: SAEDACCO, J. Eisenman
LOGGED BY: TAO/ZAW
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer
DEPTH TO - WATER> INITIAL: ▽ N/A
AFTER 24 HOURS: ▼ 49.8
CAVING: ▨ N/A



Brown, dry to moist, fine sandy CLAY - (Residuum)

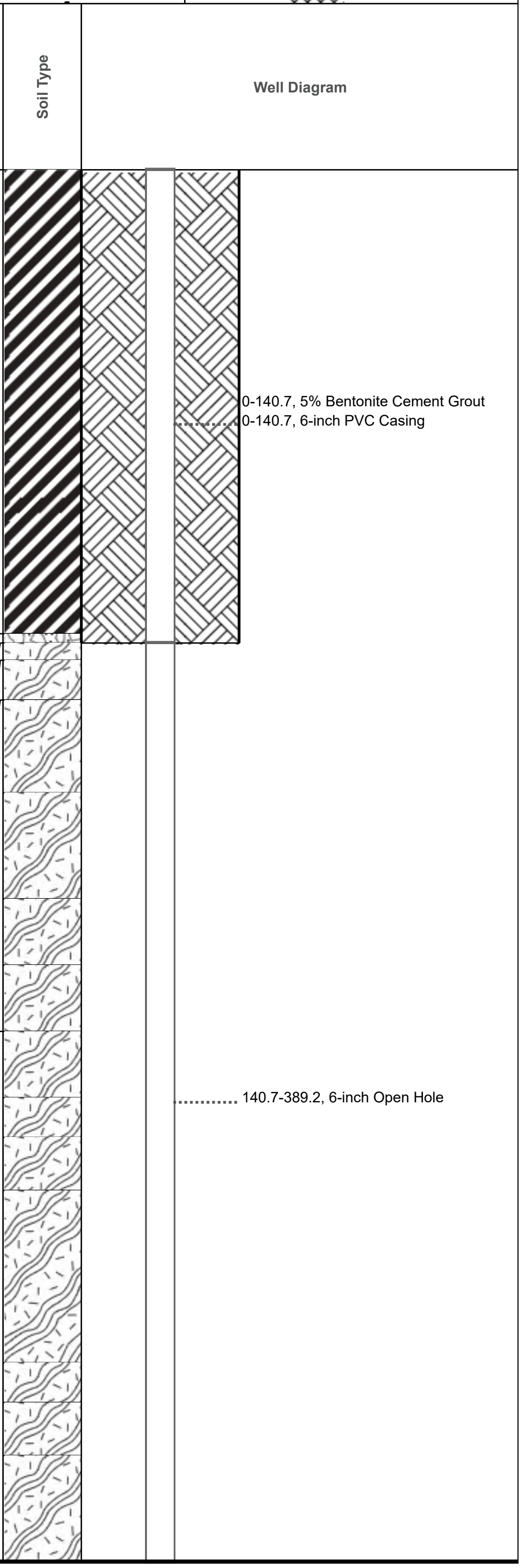
BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-2

PROJECT: Luck Cherokee
PROJECT NO.: 24-24056
CLIENT: Luck Companies
START: 12/09/2024
END: 12/13/2024
LOCATION: Gaffney, SC, USA
GS ELEVATION: 767.67
NORTHING/EASTING: 1183995.61 N, 1777188.07 E
TOC Elevation: 770.98
DRILLER: SAEDACCO, J. Eisenman
LOGGED BY: TAO/ZAW
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer
DEPTH TO - WATER> INITIAL: ∇ N/A
AFTER 24 HOURS: ▼ 49.8
CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description
	660	Brown, dry to moist, fine sandy CLAY - (Residuum)
120		
	640	
140		Switch to 8-inch air hammer at 140 feet
		Set casing at 140.7 feet; switch to 6-inch air hammer
		Black and gray, fresh BIOTITE GNEISS
	620	Fractured interval from 145 to 160 feet
		Water-bearing fractured interval from 150 to 153 feet
160		Fracture at 160 feet
		Fracture at 165 feet
	600	
		Black and gray, fresh BIOTITE GNEISS with garnet
		Fracture at 175 feet
		Water-bearing fracture at 178 feet
180		Fractured interval from 182 to 190 feet
	580	
		Fracture at 195 feet
		Fracture at 198 feet
200		Fracture at 202 feet
	560	



BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-2

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 12/09/2024 END: 12/13/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 767.67
NORTHING/EASTING: 1183995.61 N, 1777188.07 E	TOC Elevation: 770.98
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW

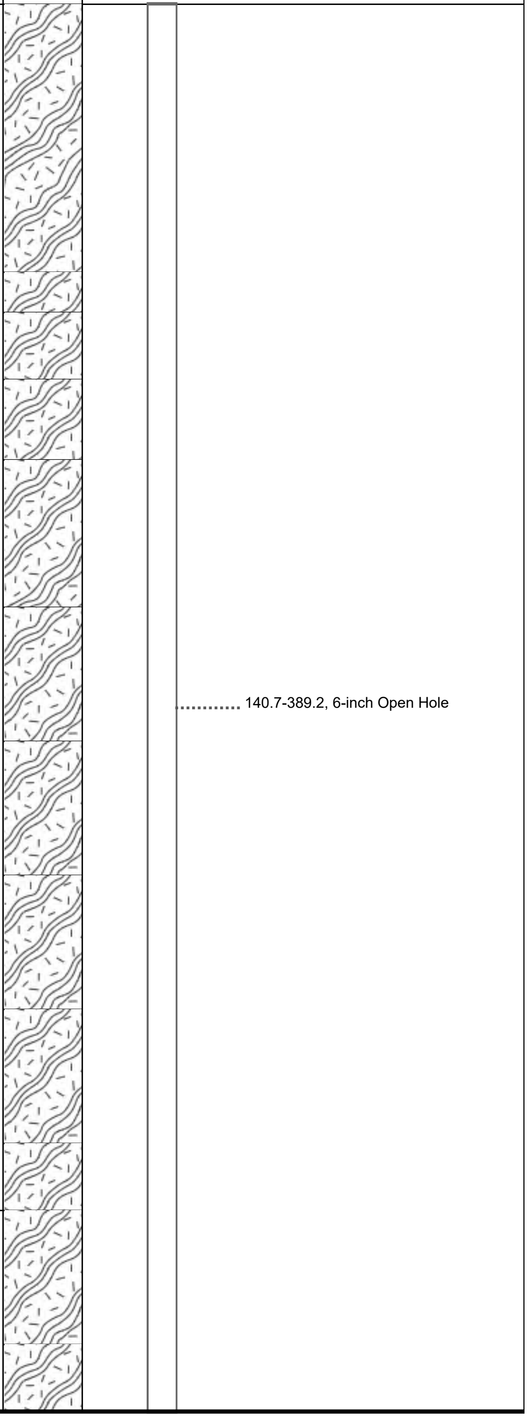
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ∇ N/A | AFTER 24 HOURS: ▼ 49.8 | CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description
		Fracture at 202 feet
220		
	540	
		Fracture at 230 feet
		Fracture at 233 feet
		Water-bearing fracture at 238 feet
240		
		Fractured interval from 244 to 250 feet
	520	
		Fractured interval from 255 to 260 feet
260		
		Fracture at 265 feet
	500	
		Fracture at 275 feet
280		
		Fracture at 285 feet
	480	
		Fracture at 295 feet
300		**Fractured interval with zones of advanced weathering from 300 to 320 feet.**
	460	
		Increased quartz content from 300 to 310 feet

Soil Type

Well Diagram



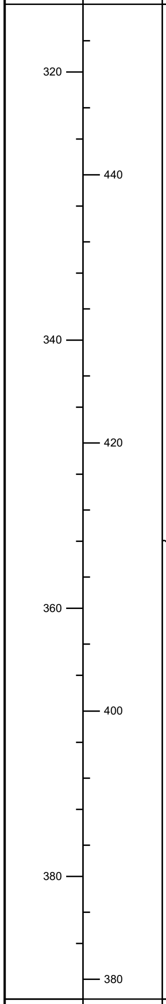
BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-2

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056	
CLIENT: Luck Companies	START: 12/09/2024	END: 12/13/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 767.67	
NORTHING/EASTING: 1183995.61 N, 1777188.07 E	TOC Elevation: 770.98	
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW	
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer		
DEPTH TO - WATER> INITIAL: ▽ N/A	AFTER 24 HOURS: ▼ 49.8	CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description	Soil Type	Well Diagram



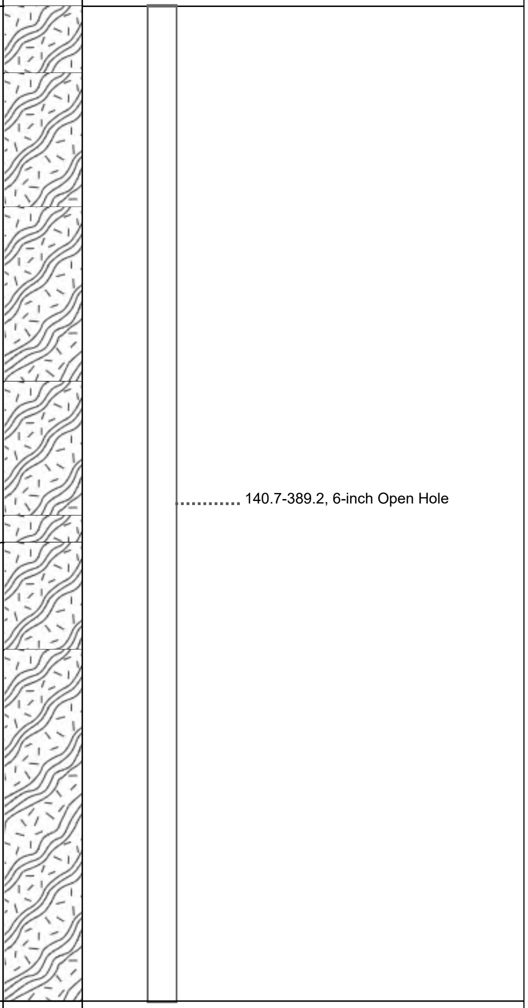
Water-bearing fracture at 330 feet

Fractured interval from 343 to 347 feet

Fracture at 353 feet

Fracture at 355 feet

Water-bearing fracture at 363 feet



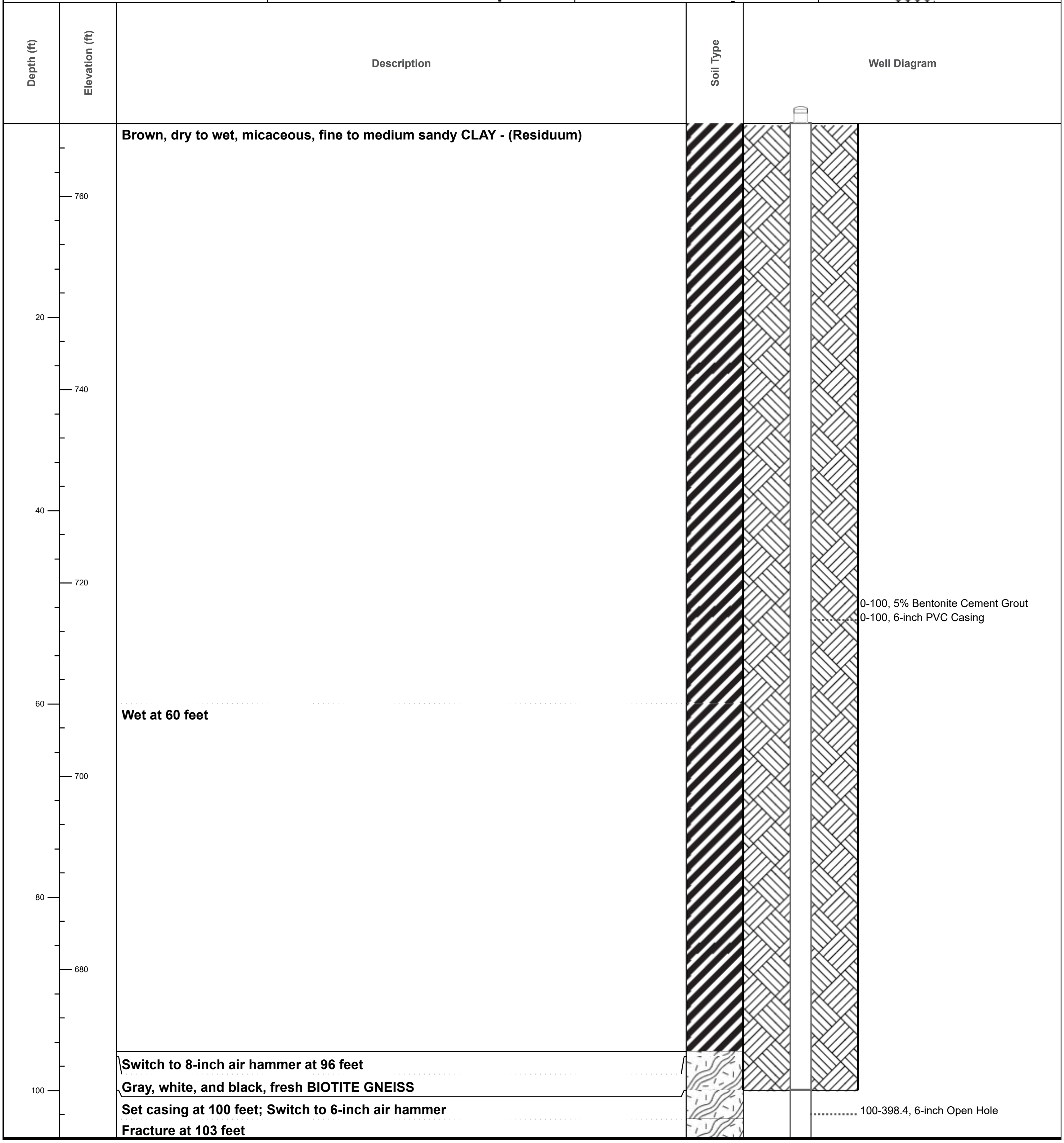
O-2 Terminated at 389.2ft (Groundwater encountered at 49.8 feet below ground surface 24 hours after drilling.)

BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-3

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056	
CLIENT: Luck Companies	START: 12/23/2024	END: 12/31/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 767.47	
NORTHING/EASTING: 1183936.95 N, 1777242.88 E	TOC Elevation: 770.68	
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ACJ	
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer		
DEPTH TO - WATER> INITIAL: ▽ N/A	AFTER 24 HOURS: ▼ 59.8	CAVING: ▨ N/A



Brown, dry to wet, micaceous, fine to medium sandy CLAY - (Residuum)

Wet at 60 feet

Switch to 8-inch air hammer at 96 feet

Gray, white, and black, fresh BIOTITE GNEISS

Set casing at 100 feet; Switch to 6-inch air hammer

Fracture at 103 feet

GROUNDWATER MONITORING WELL NO. O-3

BUNNELL-LAMMONS ENGINEERING, INC.

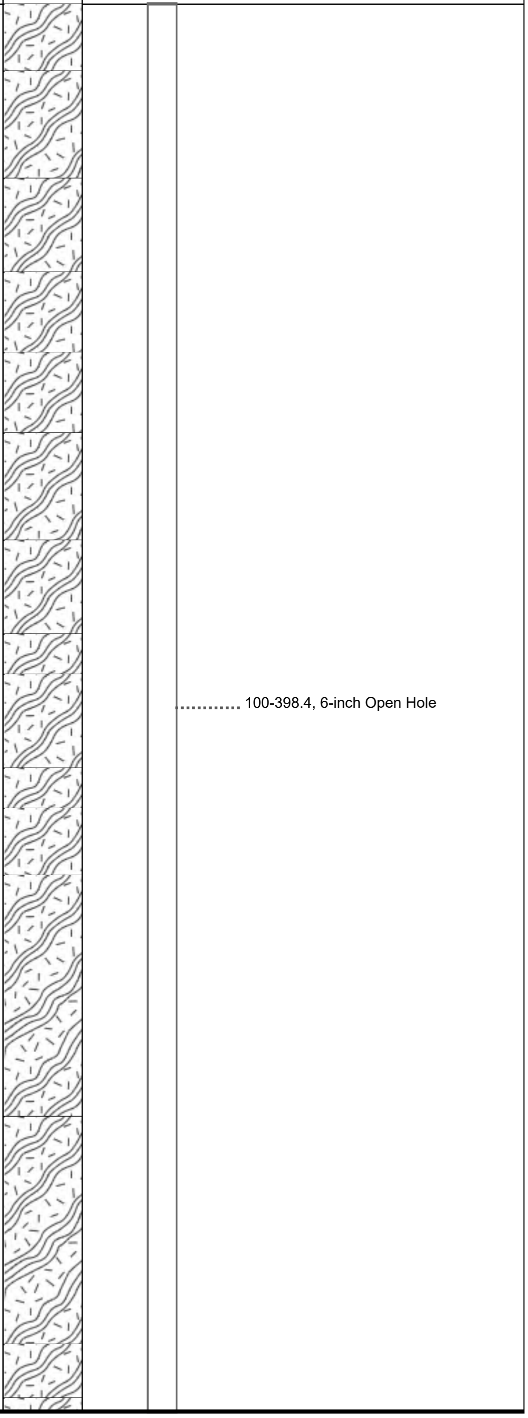
GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056	
CLIENT: Luck Companies	START: 12/23/2024	END: 12/31/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 767.47	
NORTHING/EASTING: 1183936.95 N, 1777242.88 E	TOC Elevation: 770.68	
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ACJ	
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer		
DEPTH TO - WATER> INITIAL: ▽ N/A	AFTER 24 HOURS: ▼ 59.8	CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description
	660	Fracture at 103 feet
		Fracture at 110 feet
120		Fracture at 118 feet
	640	Fracture at 125 feet
		Fracture at 131 feet
140		Fracture at 137 feet
	620	Fracture at 145 feet
		Fracture at 152 feet
		Fracture at 155 feet
160		Fracture at 162 feet
	600	Fracture at 165 feet
180		Fractured interval with trace sulfides from 170 to 180 feet
	580	Fractured interval from 188 to 190 feet
200	560	Fractured interval from 205 to 210 feet

Soil Type

Well Diagram



BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-3

PROJECT: Luck Cherokee	**PROJECT NO.: 24-24056**
CLIENT: Luck Companies	**START: 12/23/2024** **END: 12/31/2024**
LOCATION: Gaffney, SC, USA	**GS ELEVATION: 767.47**
NORTHING/EASTING: 1183936.95 N, 1777242.88 E	**TOC Elevation: 770.68**
DRILLER: SAEDACCO, J. Eisenman	**LOGGED BY: TAO/ACJ**

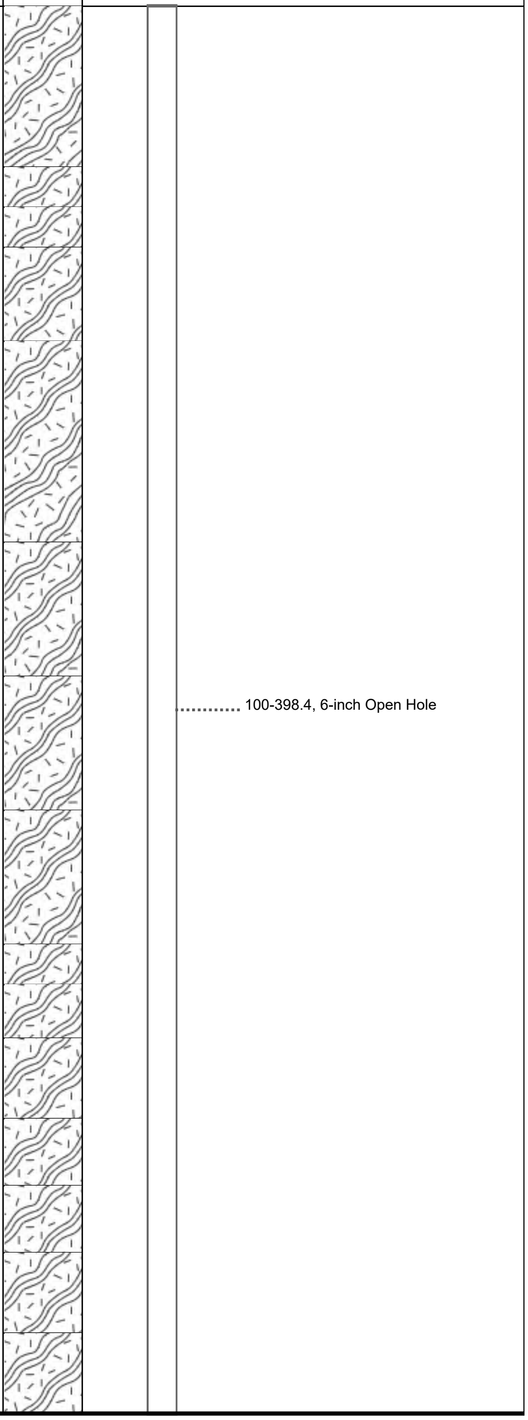
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ N/A **AFTER 24 HOURS: ▼ 59.8** **CAVING: ▨ N/A**

Depth (ft)	Elevation (ft)	Description
220		
		Fracture at 222 feet
		Fracture at 225 feet
	540	
		Fracture at 228 feet
		Fractured interval from 235 to 240 feet
240		
	520	
		Fracture at 250 feet
260		
		Fracture at 260 feet
	500	
		Fracture at 270 feet
280		
		Fracture at 280 feet
		Fracture at 283 feet
	480	
		Fracture at 287 feet
		Fracture at 293 feet
		Fracture at 298 feet
300		
		Fractured interval with advanced weathering from 303 to 305 feet (sampled as micaceous silt)
	460	

Soil Type

Well Diagram



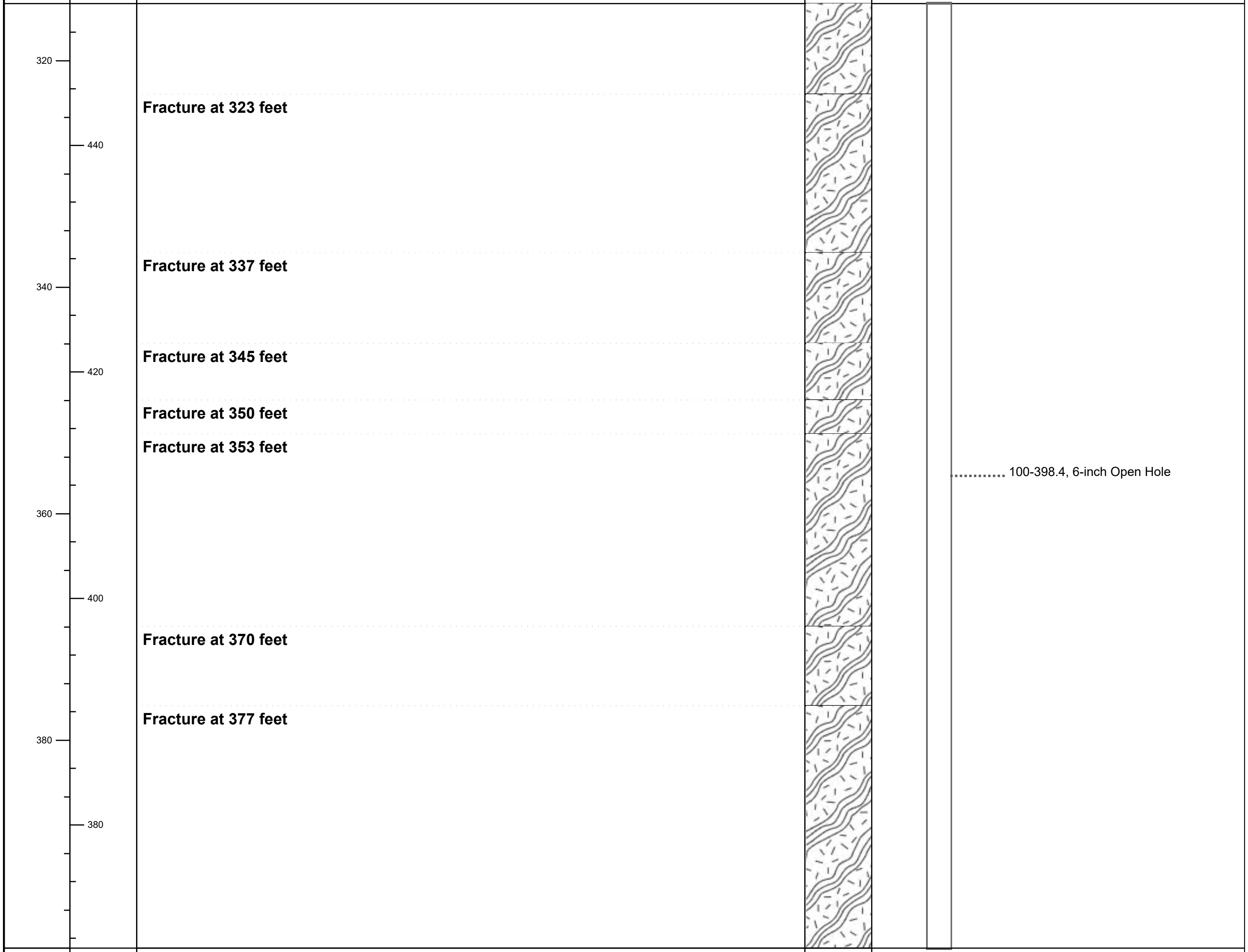
BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-3

PROJECT: Luck Cherokee
PROJECT NO.: 24-24056
CLIENT: Luck Companies
START: 12/23/2024
END: 12/31/2024
LOCATION: Gaffney, SC, USA
GS ELEVATION: 767.47
NORTHING/EASTING: 1183936.95 N, 1777242.88 E
TOC Elevation: 770.68
DRILLER: SAEDACCO, J. Eisenman
LOGGED BY: TAO/ACJ
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer
DEPTH TO - WATER> INITIAL: ▽ N/A
AFTER 24 HOURS: ▼ 59.8
CAVING: ▨ N/A

Depth (ft) | Elevation (ft) | Description | Soil Type | Well Diagram



Fracture at 323 feet

Fracture at 337 feet

Fracture at 345 feet

Fracture at 350 feet

Fracture at 353 feet

Fracture at 370 feet

Fracture at 377 feet

O-3 Terminated at 398.4ft (Groundwater encountered at 59.8 feet below ground surface 24 hours after drilling.)

BUNNELL-LAMMONS ENGINEERING, INC.

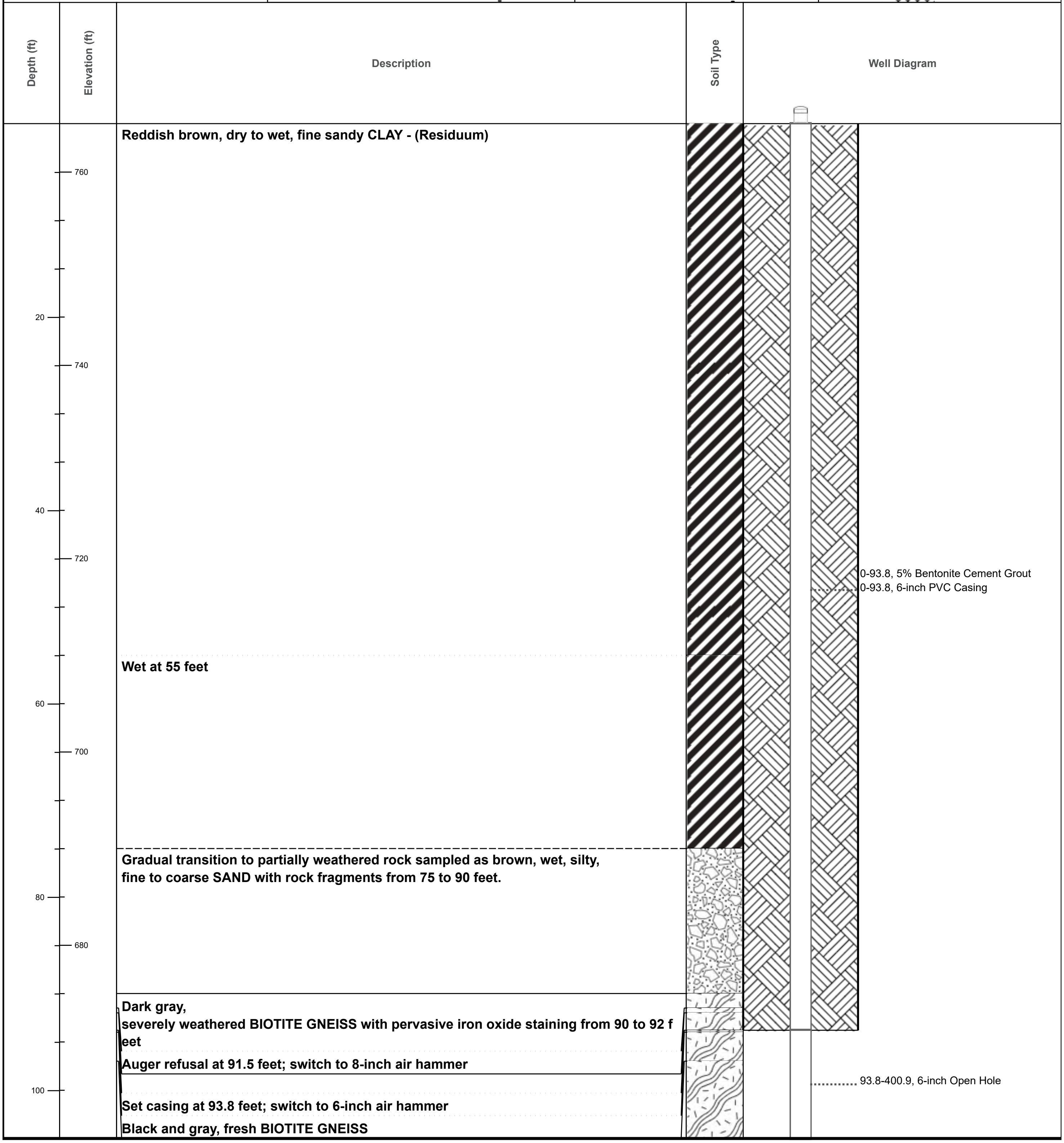
GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-4

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 12/16/2024 END: 01/06/2025
LOCATION: Gaffney, SC, USA	GS ELEVATION: 764.96
NORTHING/EASTING: 1183887.21 N, 1777243.87 E	TOC Elevation: 768.42
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ N/A | AFTER 24 HOURS: ▼ 54.4 | CAVING: ▨ N/A



Reddish brown, dry to wet, fine sandy CLAY - (Residuum)

Wet at 55 feet

Gradual transition to partially weathered rock sampled as brown, wet, silty, fine to coarse SAND with rock fragments from 75 to 90 feet.

Dark gray, severely weathered BIOTITE GNEISS with pervasive iron oxide staining from 90 to 92 feet

Auger refusal at 91.5 feet; switch to 8-inch air hammer

Set casing at 93.8 feet; switch to 6-inch air hammer

Black and gray, fresh BIOTITE GNEISS

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GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-4

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056	
CLIENT: Luck Companies	START: 12/16/2024	END: 01/06/2025
LOCATION: Gaffney, SC, USA	GS ELEVATION: 764.96	
NORTHING/EASTING: 1183887.21 N, 1777243.87 E	TOC Elevation: 768.42	
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW	
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer		
DEPTH TO - WATER> INITIAL: ∇ N/A	AFTER 24 HOURS: ▼ 54.4	CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description	Soil Type	Well Diagram

Fracture at 108 feet

Fracture at 115 feet

Fractured interval from 130 to 140 feet

Fracture at 142 feet

Fracture at 148 feet

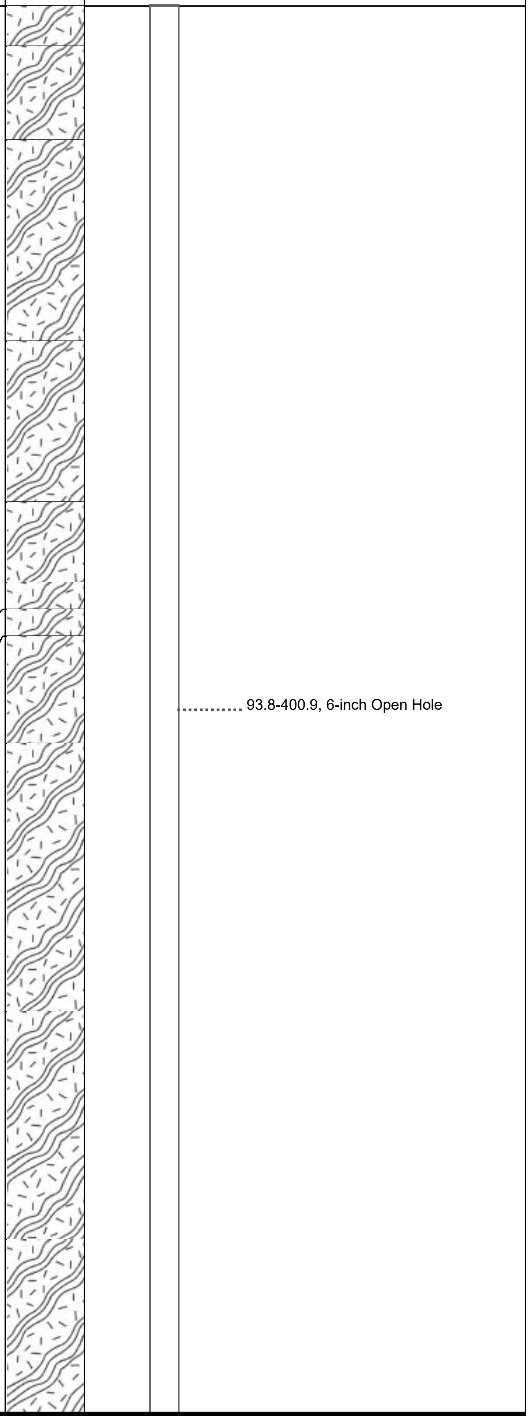
Fracture at 150 feet

Fractured interval from 152 to 160 feet

Water-bearing fractured interval from 160 to 170 feet

Water-bearing fractured interval from 180 to 190 feet

Fracture at 197 feet



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GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

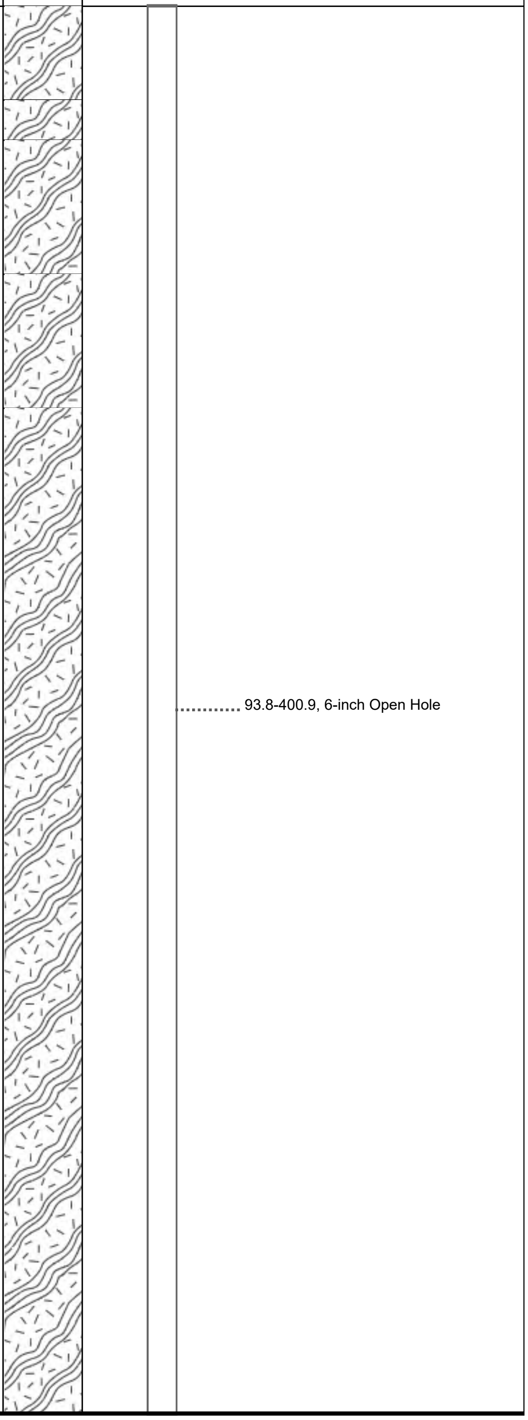
GROUNDWATER MONITORING WELL NO. O-4

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 12/16/2024 END: 01/06/2025
LOCATION: Gaffney, SC, USA	GS ELEVATION: 764.96
NORTHING/EASTING: 1183887.21 N, 1777243.87 E	TOC Elevation: 768.42
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ N/A | AFTER 24 HOURS: ▼ 54.4 | CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description
		Fracture at 210 feet
		Fracture at 217 feet
220		**Fractured interval from 220 to 225 feet**
	540	
		Fracture at 230 feet
240		
	520	
260		
	500	
280		
	480	
300		
	460	

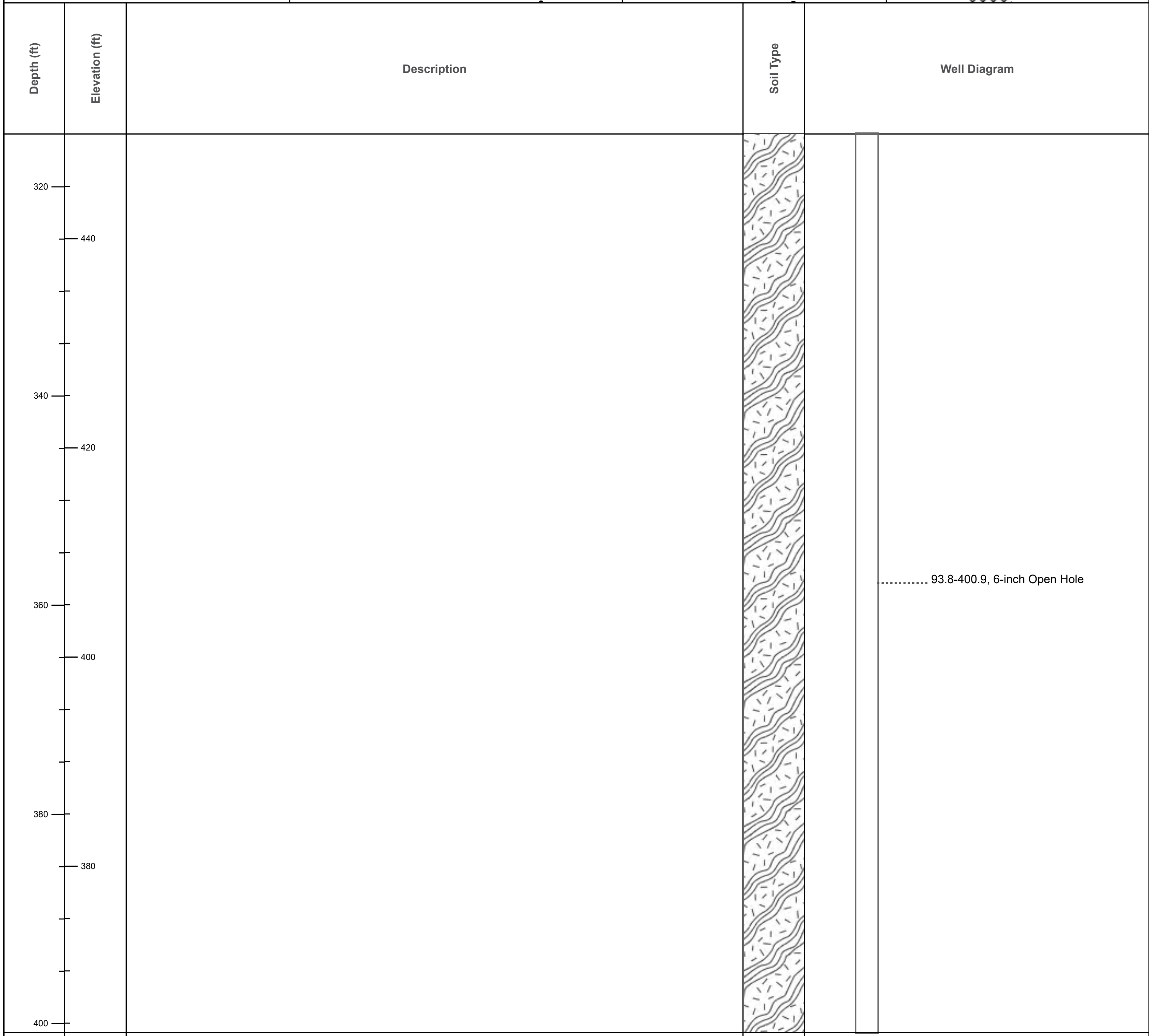


BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-4

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056	
CLIENT: Luck Companies	START: 12/16/2024	END: 01/06/2025
LOCATION: Gaffney, SC, USA	GS ELEVATION: 764.96	
NORTHING/EASTING: 1183887.21 N, 1777243.87 E	TOC Elevation: 768.42	
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW	
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer		
DEPTH TO - WATER> INITIAL: ▽ N/A	AFTER 24 HOURS: ▼ 54.4	CAVING: ▨ N/A



O-4 Terminated at 400.9ft (Groundwater encountered at 54.4 feet below ground surface 24 hours after drilling.)

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GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-5

PROJECT: Luck Cherokee

PROJECT NO.: 24-24056

CLIENT: Luck Companies

START: 12/18/2024

END: 01/08/2025

LOCATION: Gaffney, SC, USA

GS ELEVATION: 761.82

NORTHING/EASTING: 1183739.15 N, 1777230.28 E

TOC Elevation: 765.19

DRILLER: SAEDACCO, J. Eisenman

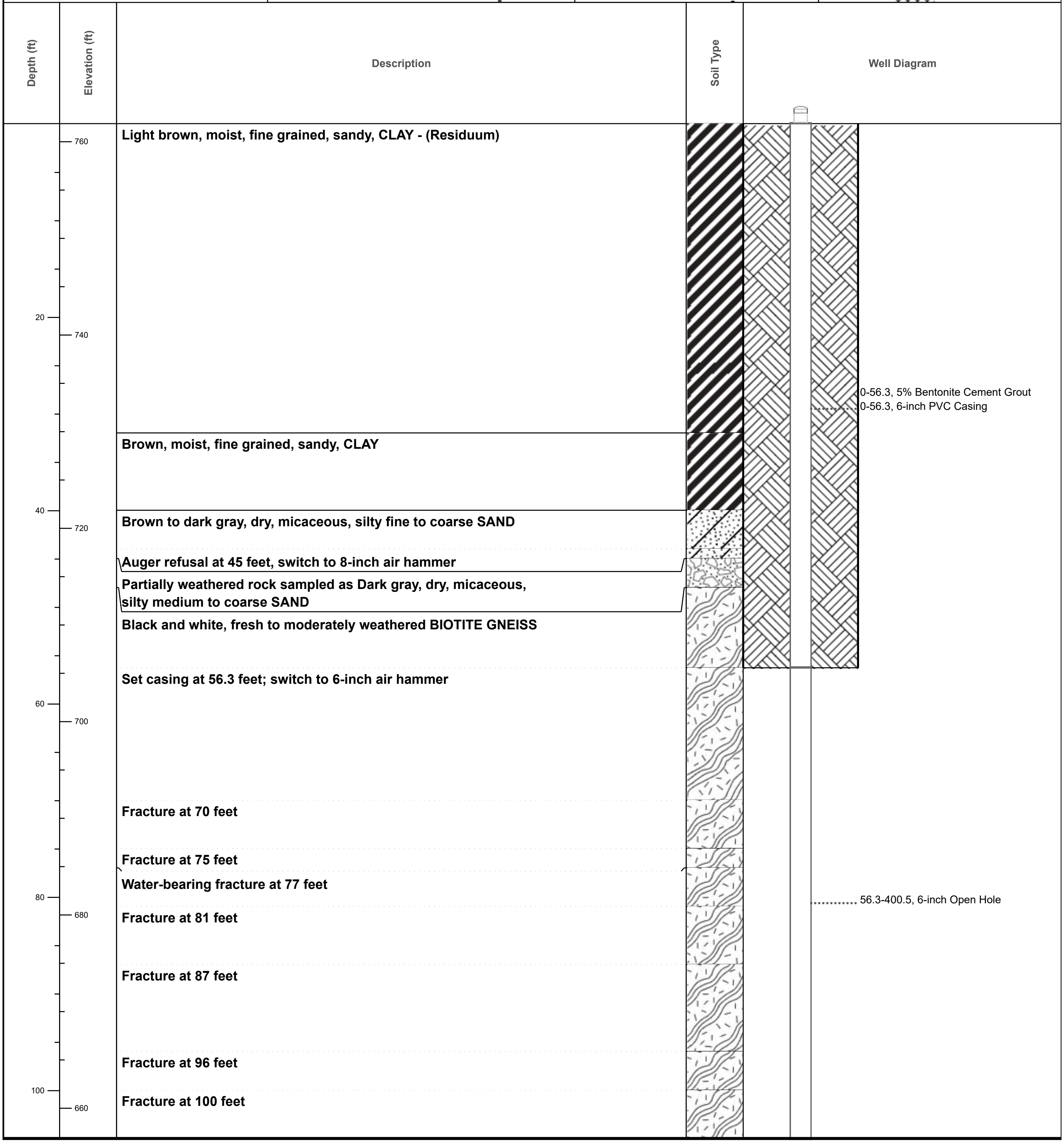
LOGGED BY: TAO/ZAW

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ N/A

AFTER 24 HOURS: ▼ 52.5

CAVING: ▨ N/A



Light brown, moist, fine grained, sandy, CLAY - (Residuum)

Brown, moist, fine grained, sandy, CLAY

Brown to dark gray, dry, micaceous, silty fine to coarse SAND

Auger refusal at 45 feet, switch to 8-inch air hammer

Partially weathered rock sampled as Dark gray, dry, micaceous, silty medium to coarse SAND

Black and white, fresh to moderately weathered BIOTITE GNEISS

Set casing at 56.3 feet; switch to 6-inch air hammer

Fracture at 70 feet

Fracture at 75 feet

Water-bearing fracture at 77 feet

Fracture at 81 feet

Fracture at 87 feet

Fracture at 96 feet

Fracture at 100 feet

GROUNDWATER MONITORING WELL NO. O-5

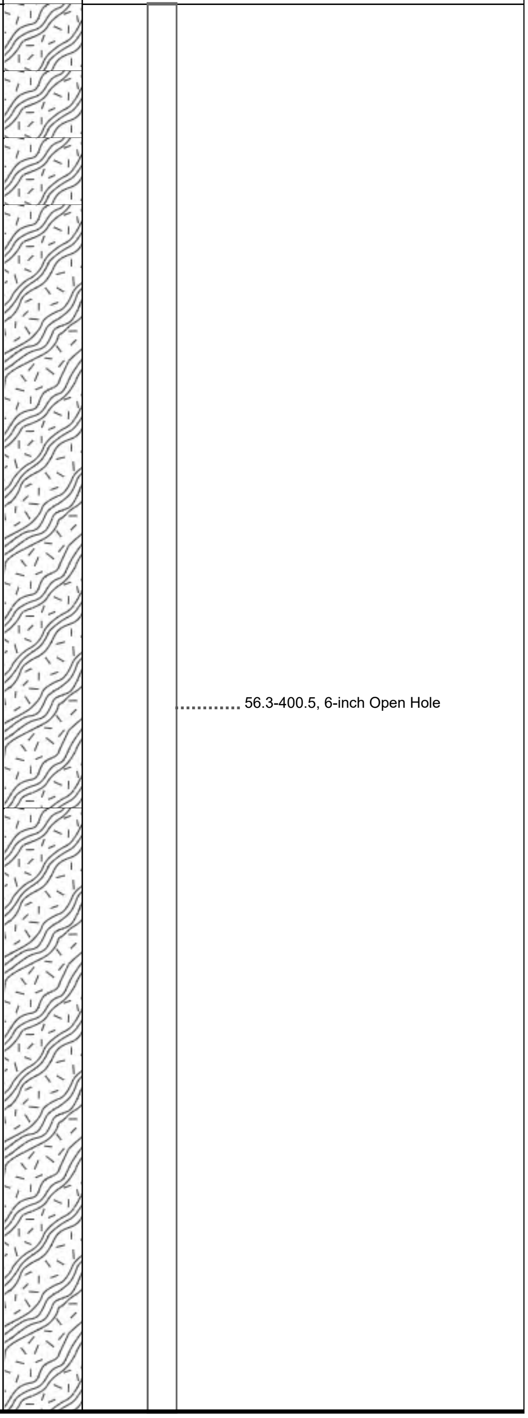
PROJECT: Luck Cherokee	**PROJECT NO.: 24-24056**
CLIENT: Luck Companies	**START: 12/18/2024** **END: 01/08/2025**
LOCATION: Gaffney, SC, USA	**GS ELEVATION: 761.82**
NORTHING/EASTING: 1183739.15 N, 1777230.28 E	**TOC Elevation: 765.19**
DRILLER: SAEDACCO, J. Eisenman	**LOGGED BY: TAO/ZAW**
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer	

DEPTH TO - WATER> INITIAL: ▽ N/A **AFTER 24 HOURS: ▼ 52.5** **CAVING: ▨ N/A**

Depth (ft)	Elevation (ft)	Description
		Fracture at 100 feet
		Fracture at 110 feet
		Water-bearing fractured interval from 115 to 120 feet
120	640	**Fractured interval from 120 to 140 feet**
140	620	
160	600	**Fractured interval from 165 to 175 feet**
180	580	
200	560	

Soil Type

Well Diagram



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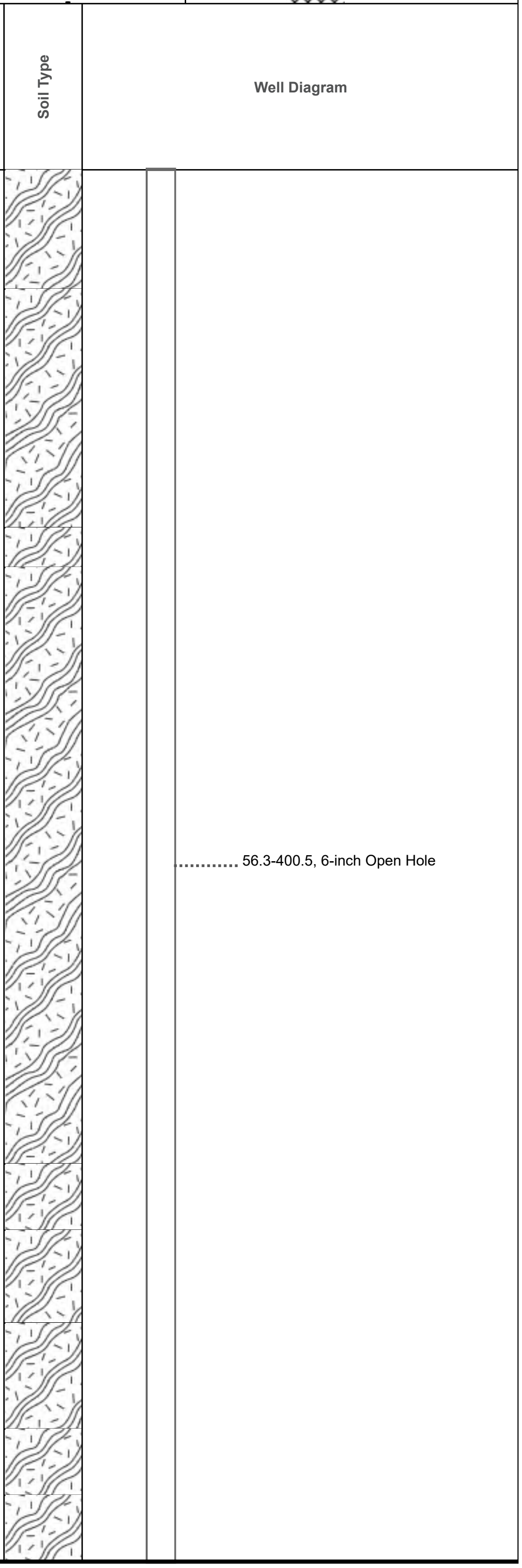
GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-5

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 12/18/2024 END: 01/08/2025
LOCATION: Gaffney, SC, USA	GS ELEVATION: 761.82
NORTHING/EASTING: 1183739.15 N, 1777230.28 E	TOC Elevation: 765.19
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer	

DEPTH TO - WATER> INITIAL: ▽ N/A | AFTER 24 HOURS: ▼ 52.5 | CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description
		Fractured interval from 165 to 175 feet
220	540	Fracture at 219 feet
		Fracture at 237 feet
240	520	Fracture at 240 feet
260	500	
280	480	
		Fracture at 285 feet
		Fracture at 290 feet
		Fracture at 297 feet
300	460	
		Fracture at 305 feet
		Fracture at 310 feet



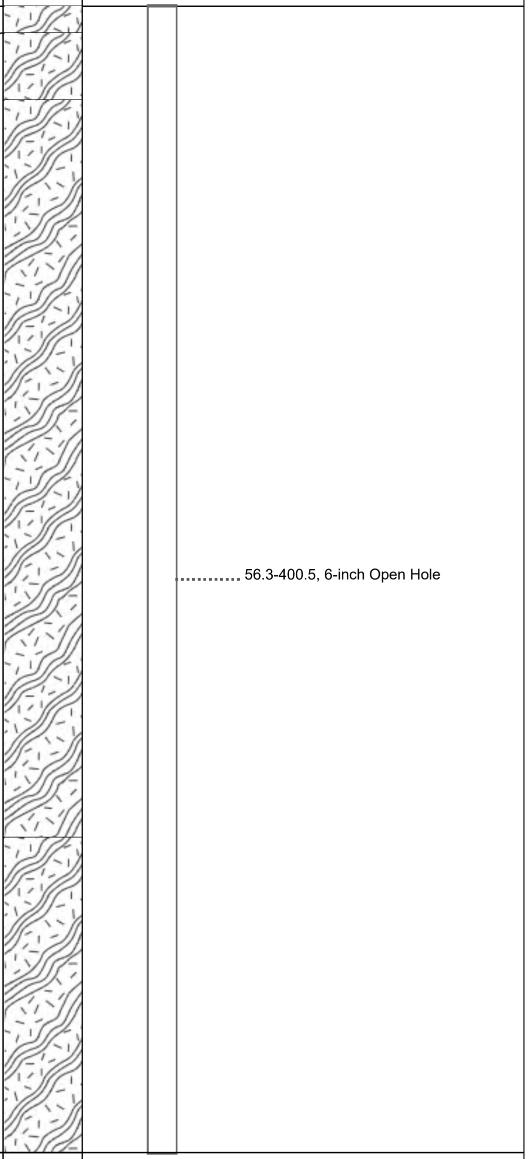
BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. O-5

PROJECT: Luck Cherokee
PROJECT NO.: 24-24056
CLIENT: Luck Companies
START: 12/18/2024
END: 01/08/2025
LOCATION: Gaffney, SC, USA
GS ELEVATION: 761.82
NORTHING/EASTING: 1183739.15 N, 1777230.28 E
TOC Elevation: 765.19
DRILLER: SAEDACCO, J. Eisenman
LOGGED BY: TAO/ZAW
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer
DEPTH TO - WATER> INITIAL: ▽ N/A
AFTER 24 HOURS: ▼ 52.5
CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description
		Fracture at 310 feet
		Fracture at 317 feet
320	440	
		Fracture at 322 feet
340	420	
360	400	
		Fractured interval from 377 to 387 feet
380	380	
400		
		O-5 Terminated at 400.5ft (Groundwater encountered at 52.5 feet below ground surface 24 hours after drilling.)



BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. P-1

PROJECT: Luck Cherokee

PROJECT NO.: 24-24056

CLIENT: Luck Companies

START: 11/26/2024

END: 12/06/2024

LOCATION: Gaffney, SC, USA

GS ELEVATION: 768.81

NORTHING/EASTING: 1183987.69 N, 1777236.22 E

TOC Elevation: 772.31

DRILLER: SAEDACCO, J. Eisenman

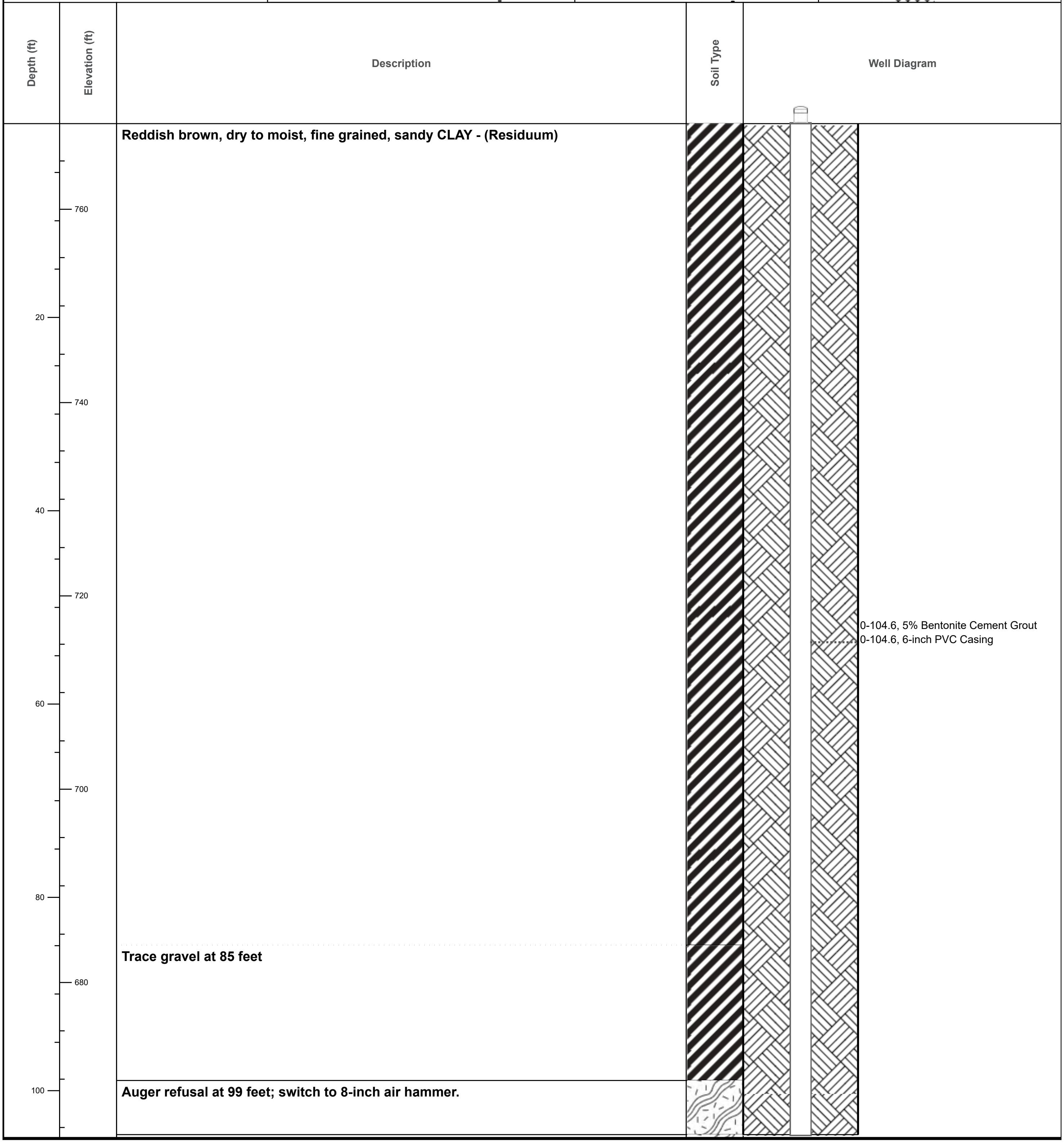
LOGGED BY: TAO/ZAW

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ 60

AFTER 24 HOURS: ▼ 53.7

CAVING: ▨ N/A



Reddish brown, dry to moist, fine grained, sandy CLAY - (Residuum)

Trace gravel at 85 feet

Auger refusal at 99 feet; switch to 8-inch air hammer.

BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. P-1

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 11/26/2024 END: 12/06/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 768.81
NORTHING/EASTING: 1183987.69 N, 1777236.22 E	TOC Elevation: 772.31
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ 60 | AFTER 24 HOURS: ▼ 53.7 | CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description	Soil Type	Well Diagram
		Black and white, fresh to moderately weathered BIOTITE GNEISS with some iron oxide staining.		
	660			
		Fractured intervals with advanced weathering from 112 to 115 feet (sampled as micaceous silt).		
120				
		Water-bearing fracture at 120 feet		
	640			
		Fractured intervals with advanced weathering from 130 to 138 feet (sampled as micaceous silt).		
140				
		Fracture at 145 feet		
	620			
		Fracture at 155 feet		
160				
		Fracture at 160 feet		
	600			
		Fracture at 170 feet		
180				
		Fractured interval from 180 to 190 feet		
		Black and purple, fresh BIOTITE GNEISS with garnet		
	580			
200				
		Fracture at 205 feet		
	560			

BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. P-1

PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 11/26/2024 END: 12/06/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 768.81
NORTHING/EASTING: 1183987.69 N, 1777236.22 E	TOC Elevation: 772.31
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW

DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer

DEPTH TO - WATER> INITIAL: ▽ 60 AFTER 24 HOURS: ▼ 53.7 CAVING: ▨ N/A

Depth (ft)	Elevation (ft)	Description	Soil Type	Well Diagram
		Fractured interval from 210 to 215 feet		
220		Water-bearing fracture at 220 feet		
	540	Water-bearing fractured interval from 230 to 240 feet		
240		Black, gray, and white, fresh to slightly weathered BIOTITE GNEISS		
	520	Fracture at 250 feet		
		Fracture at 255 feet		
		Fracture at 258 feet		
260		Purple, black, and white, fresh to slightly weathered BIOTITE GNEISS with garnet		
		Fractured interval from 260 to 268 feet		
	500	Water-bearing fracture at 270 feet		
280				
		Fracture at 285 feet		
	480	Fracture at 290 feet		
		Fractured interval from 298 to 300 feet		
300		Black, white, and gray, moderate to severely weathered BIOTITE GNEISS with some iron oxide staining; quartz veining with minor garnet and sulfides.		
		Water bearing fractured interval from 305 to 310 feet		
	460	Fractured interval from 310 to 315 feet		

BUNNELL-LAMMONS ENGINEERING, INC.

GEOTECHNCAL AND ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING WELL NO. P-1

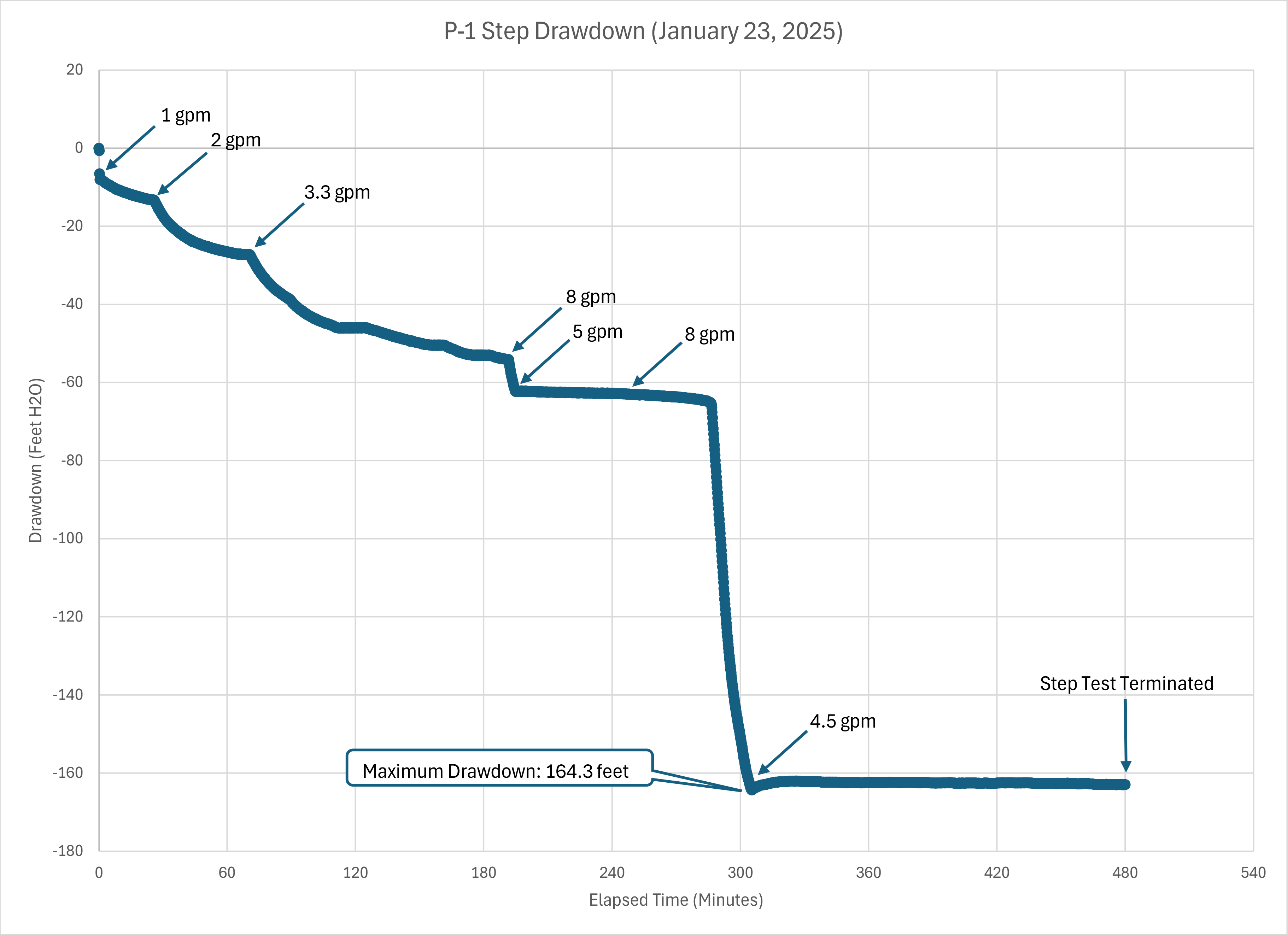
PROJECT: Luck Cherokee	PROJECT NO.: 24-24056
CLIENT: Luck Companies	START: 11/26/2024 END: 12/06/2024
LOCATION: Gaffney, SC, USA	GS ELEVATION: 768.81
NORTHING/EASTING: 1183987.69 N, 1777236.22 E	TOC Elevation: 772.31
DRILLER: SAEDACCO, J. Eisenman	LOGGED BY: TAO/ZAW
DRILLING METHOD: Gus Pech Brute 1100D with 12-inch O.D. HSA and Air Hammer	

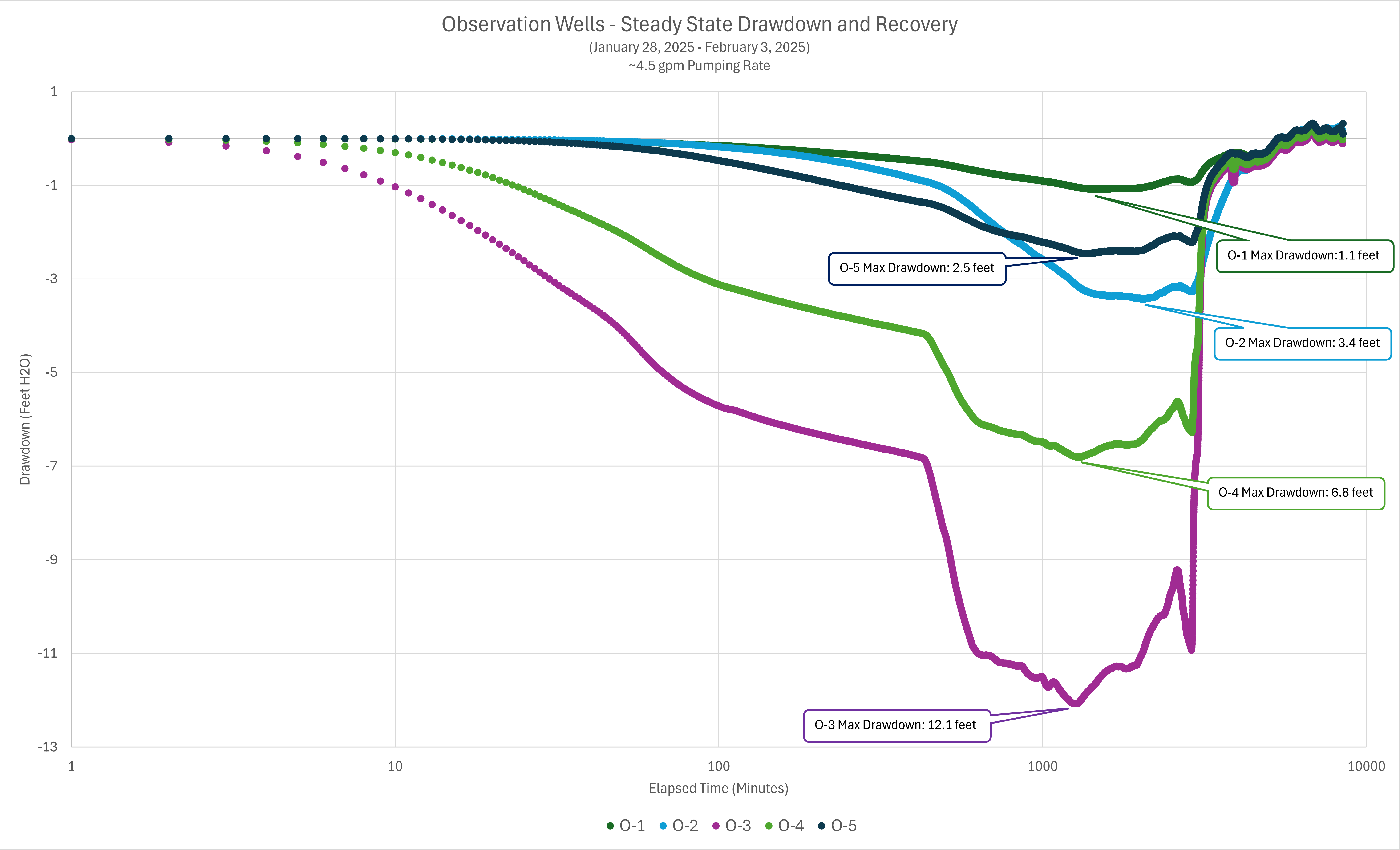
DEPTH TO - WATER> INITIAL: ▽ 60 AFTER 24 HOURS: ▼ 53.7 CAVING: ▨ N/A

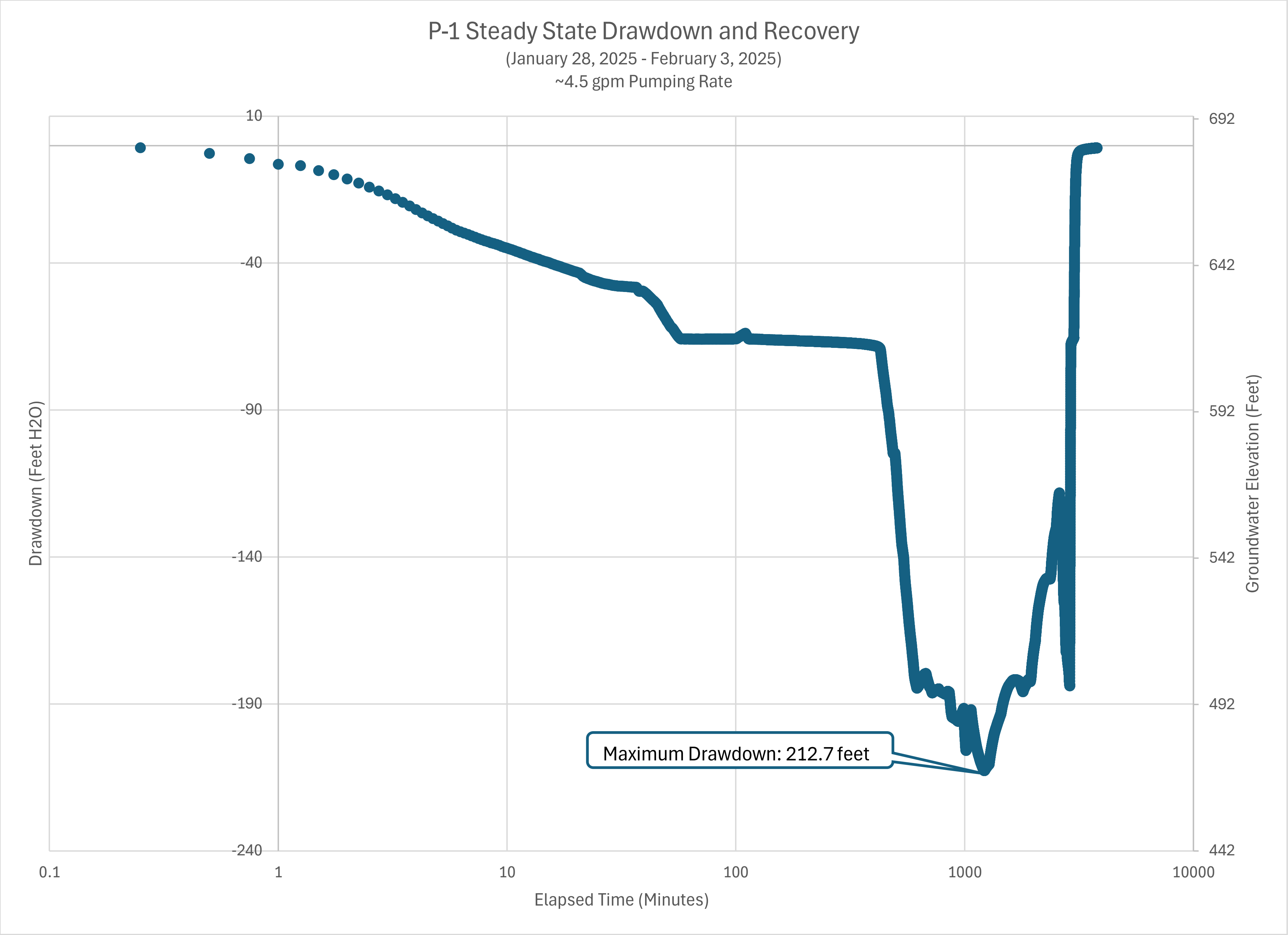
Depth (ft)	Elevation (ft)	Description	Soil Type	Well Diagram
320		Fracture at 318		
	440	Water-bearing fractured interval from 325 to 330 feet		
		Water-bearing fracture at 333 feet		
340		Fractured interval from 337 to 345 feet		
	420	Black, gray, white, and purple, fresh to slightly weathered BIOTITE GNEISS with garnet and sulfides, some iron oxide staining		
		Fractured interval from 347 to 380 feet		
360				
	400			
		Water-bearing fracture at 375 feet		
380				
		Fractured interval from 385 to 390 feet		
	380			
		Fracture at 398 feet		

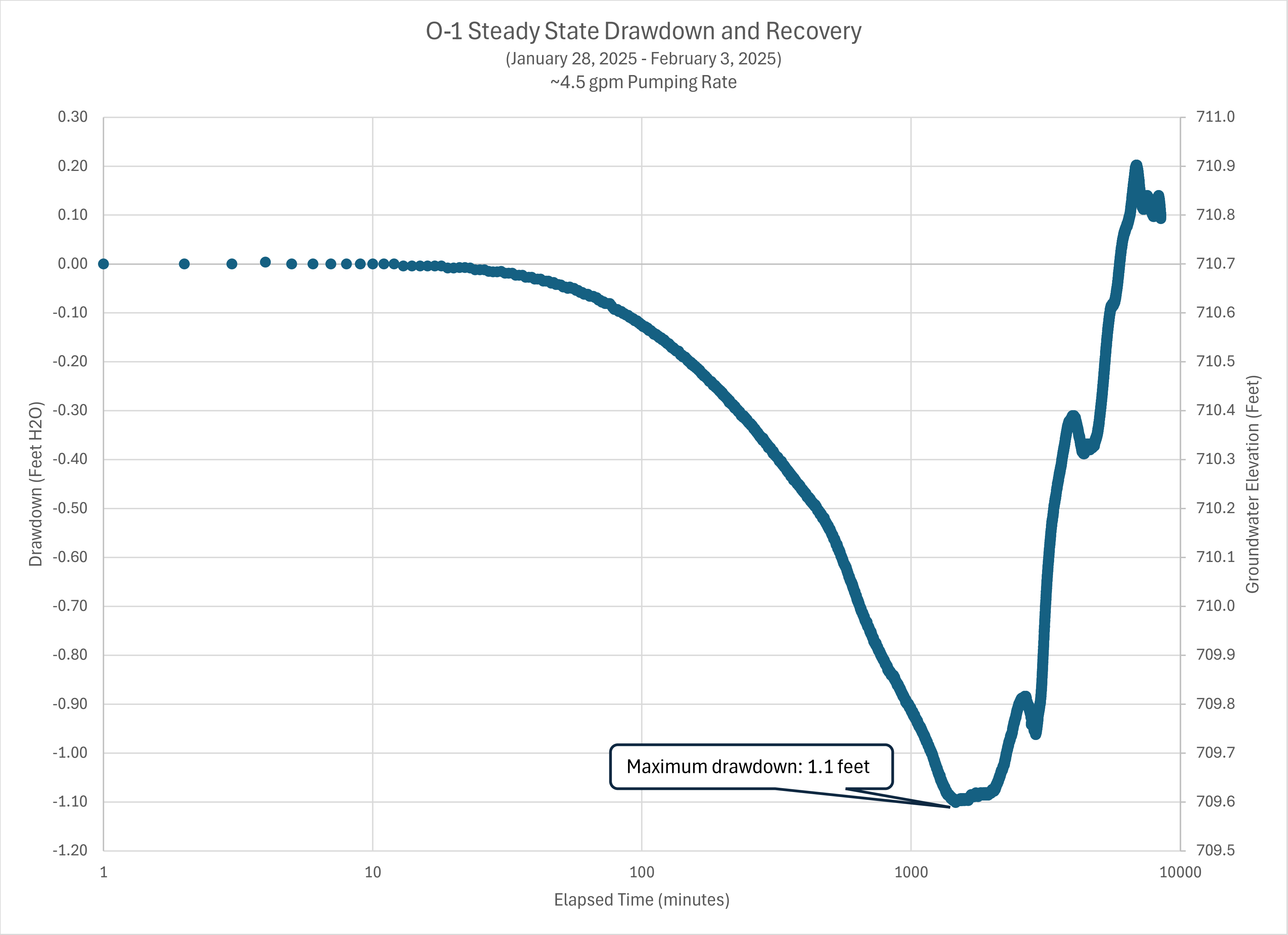
P-1 Terminated at 398.2ft (Groundwater encountered at 60 feet below ground surface at time of drilling and 53.7 feet after 24 hours.)

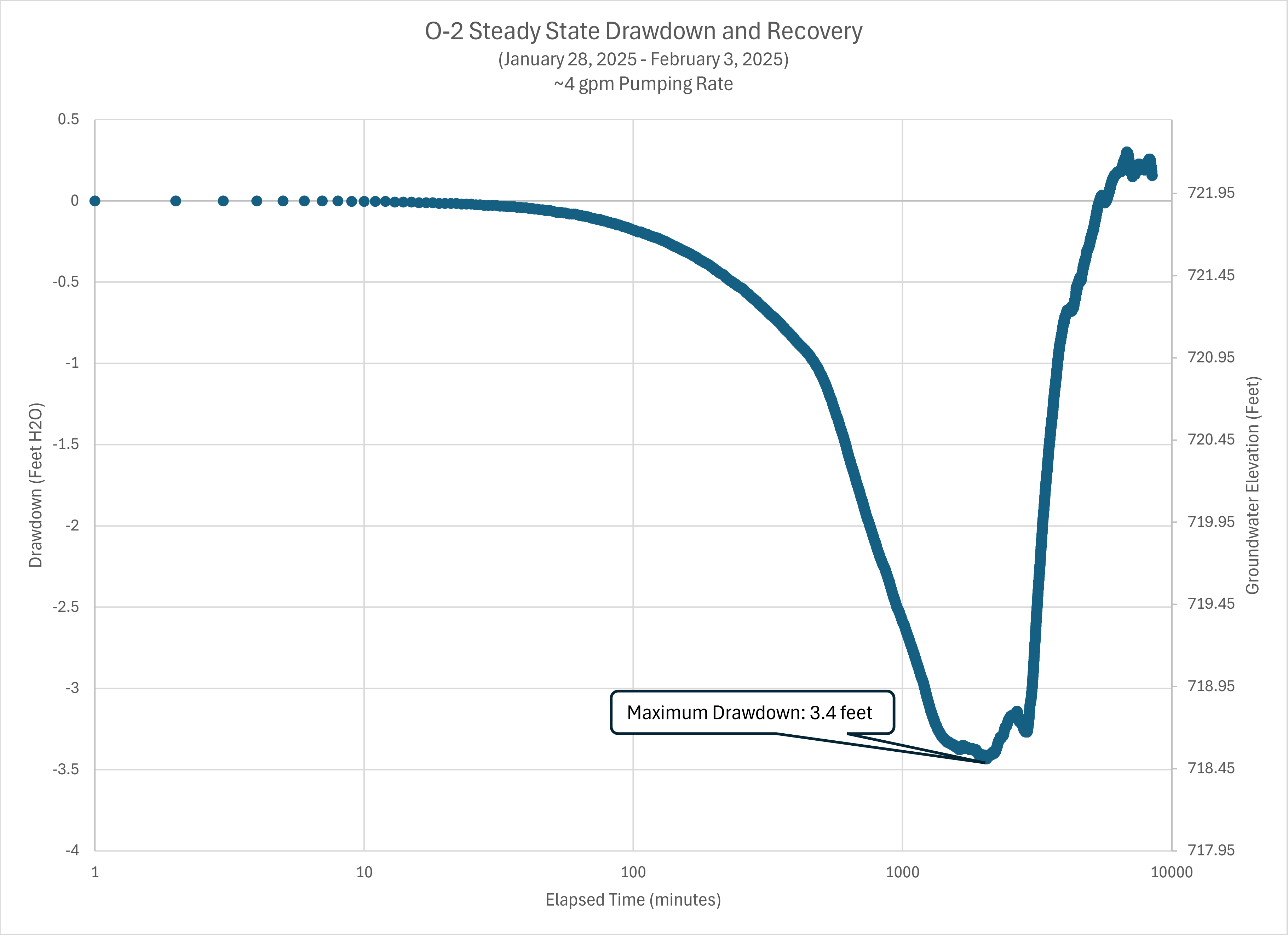
APPENDIX D
Aquifer Pumping Test Charts

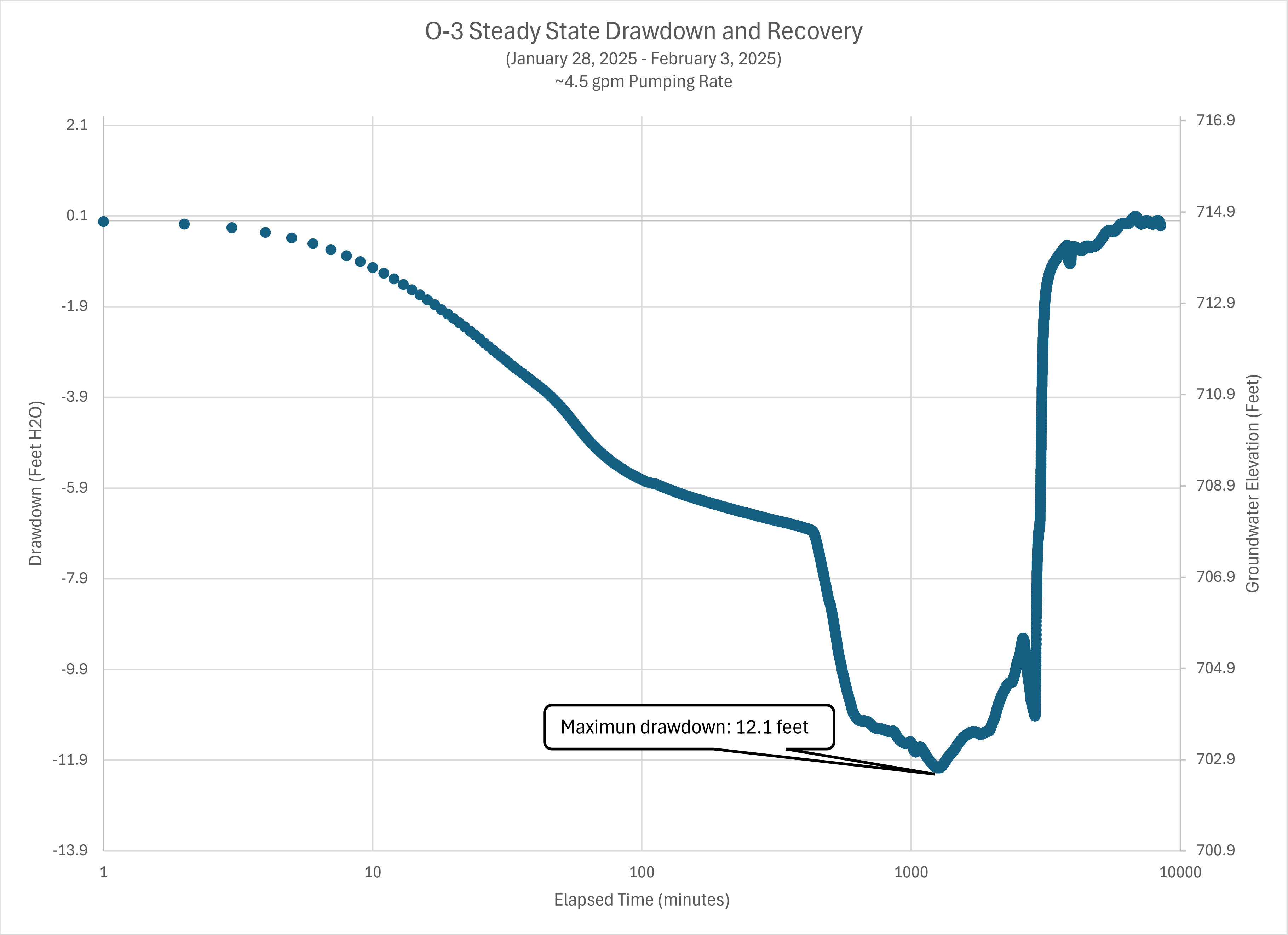

P-1 Step Drawdown (January 23, 2025)
Drawdown (Feet H2O)
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
Elapsed Time (Minutes)
0
60
120
180
240
300
360
420
480
540
1 gpm
2 gpm
3.3 gpm
8 gpm
5 gpm
8 gpm
4.5 gpm
Step Test Terminated
Maximum Drawdown: 164.3 feet

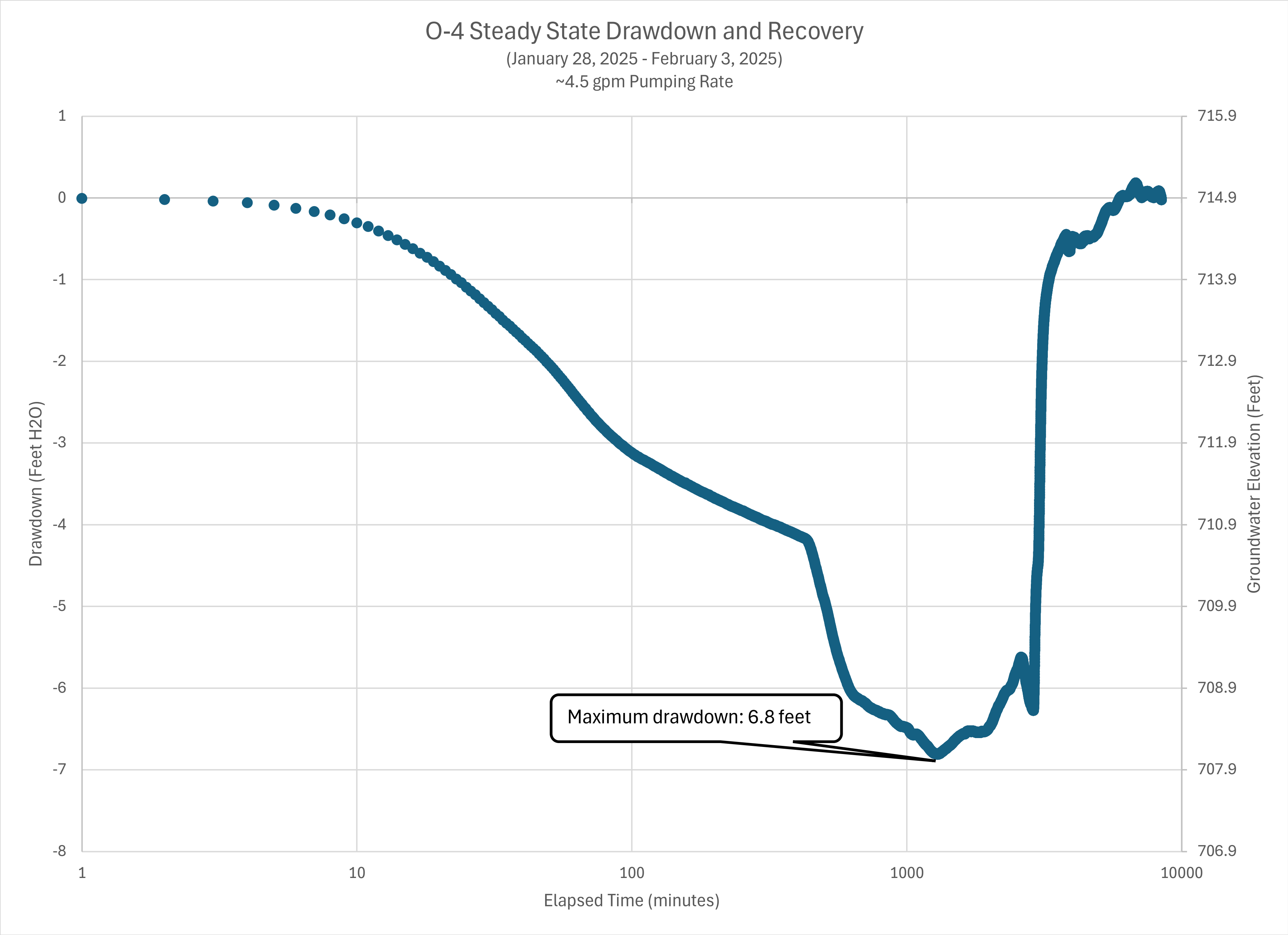

Observation Wells - Steady State Drawdown and Recovery
(January 28, 2025 - February 3, 2025)
~4.5 gpm Pumping Rate
1
-1
-3
-5
-7
-9
-11
-13
Drawdown (Feet H2O)
1
10
100
1000
10000
Elapsed Time (Minutes)
O-1 Max Drawdown:1.1 feet
O-5 Max Drawdown: 2.5 feet
O-2 Max Drawdown: 3.4 feet
O-4 Max Drawdown: 6.8 feet
O-3 Max Drawdown: 12.1 feet
● O-1 ● O-2 ● O-3 ● O-4 ● O-5

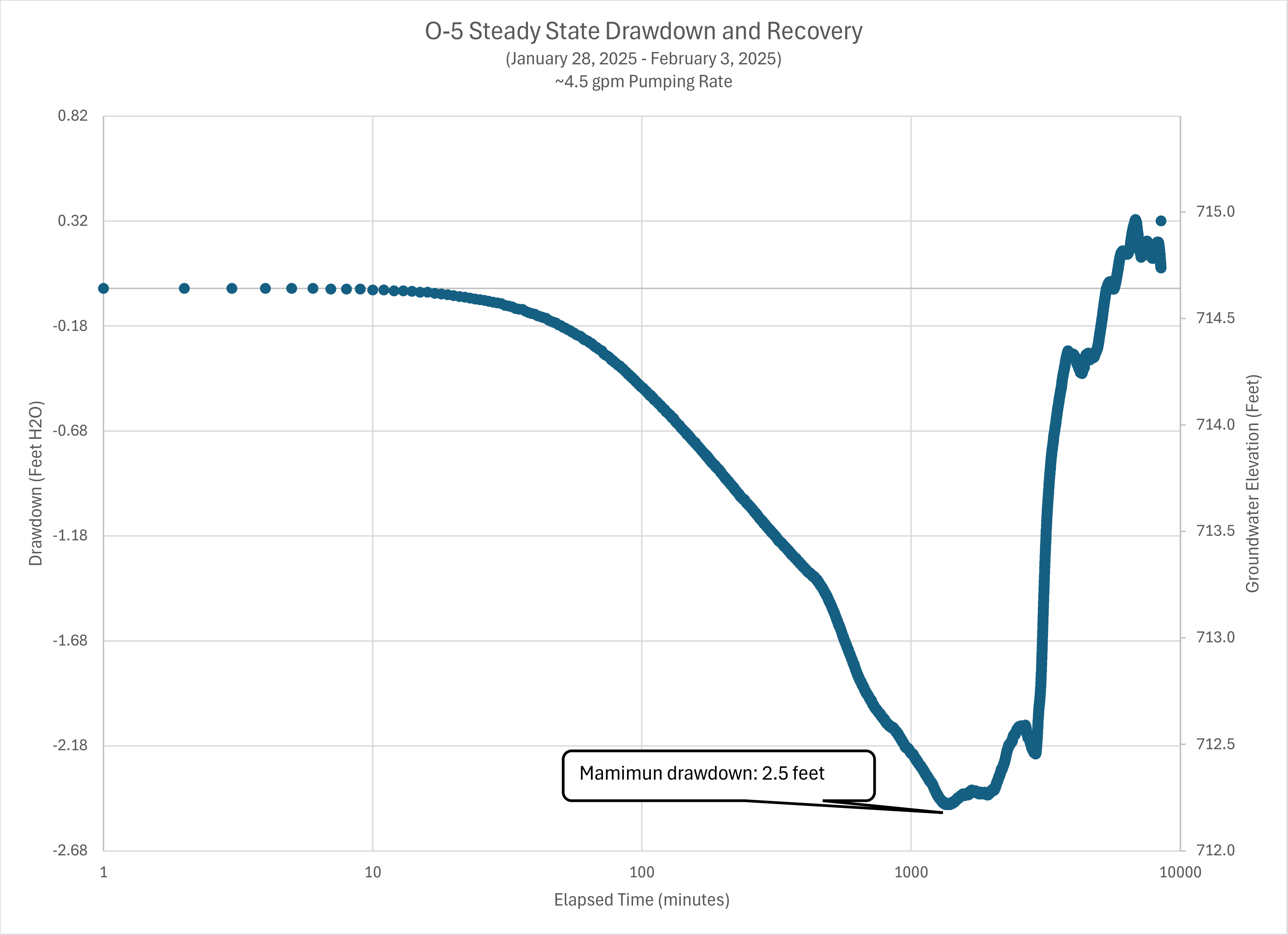

P-1 Steady State Drawdown and Recovery
(January 28, 2025 - February 3, 2025)
~4.5 gpm Pumping Rate
Drawdown (Feet H2O)
Groundwater Elevation (Feet)
Elapsed Time (Minutes)
10
-40
-90
-140
-190
-240
692
642
592
542
492
442
0.1
1
10
100
1000
10000
Maximum Drawdown: 212.7 feet


O-1 Steady State Drawdown and Recovery
(January 28, 2025 - February 3, 2025)
~4.5 gpm Pumping Rate
Drawdown (Feet H2O)
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
-0.40
-0.50
-0.60
-0.70
-0.80
-0.90
-1.00
-1.10
-1.20
Groundwater Elevation (Feet)
711.0
710.9
710.8
710.7
710.6
710.5
710.4
710.3
710.2
710.1
710.0
709.9
709.8
709.7
709.6
709.5
1
10
100
1000
10000
Elapsed Time (minutes)
Maximum drawdown: 1.1 feet


O-2 Steady State Drawdown and Recovery
(January 28, 2025 - February 3, 2025)
~4 gpm Pumping Rate
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
Drawdown (Feet H2O)
721.95
721.45
720.95
720.45
719.95
719.45
718.95
718.45
717.95
Groundwater Elevation (Feet)
1
10
100
1000
10000
Elapsed Time (minutes)
Maximum Drawdown: 3.4 feet


O-3 Steady State Drawdown and Recovery
(January 28, 2025 - February 3, 2025)
~4.5 gpm Pumping Rate
Drawdown (Feet H2O)
2.1
0.1
-1.9
-3.9
-5.9
-7.9
-9.9
-11.9
-13.9
Groundwater Elevation (Feet)
716.9
714.9
712.9
710.9
708.9
706.9
704.9
702.9
700.9
1
10
100
1000
10000
Elapsed Time (minutes)
Maximun drawdown: 12.1 feet


O-4 Steady State Drawdown and Recovery
(January 28, 2025 - February 3, 2025)
~4.5 gpm Pumping Rate
Drawdown (Feet H2O)
Groundwater Elevation (Feet)
Elapsed Time (minutes)
1
0
-1
-2
-3
-4
-5
-6
-7
-8
715.9
714.9
713.9
712.9
711.9
710.9
709.9
708.9
707.9
706.9
1
10
100
1000
10000
Maximum drawdown: 6.8 feet


O-5 Steady State Drawdown and Recovery
(January 28, 2025 - February 3, 2025)
~4.5 gpm Pumping Rate
0.82
0.32
-0.18
-0.68
-1.18
-1.68
-2.18
-2.68
Drawdown (Feet H2O)
715.0
714.5
714.0
713.5
713.0
712.5
712.0
Groundwater Elevation (Feet)
1
10
100
1000
10000
Elapsed Time (minutes)
Mamimun drawdown: 2.5 feet

APPENDIX E
Groundwater Modeling Calibration Plots

Figure 1. Pumping test approximation via model simulation (with pumped well).

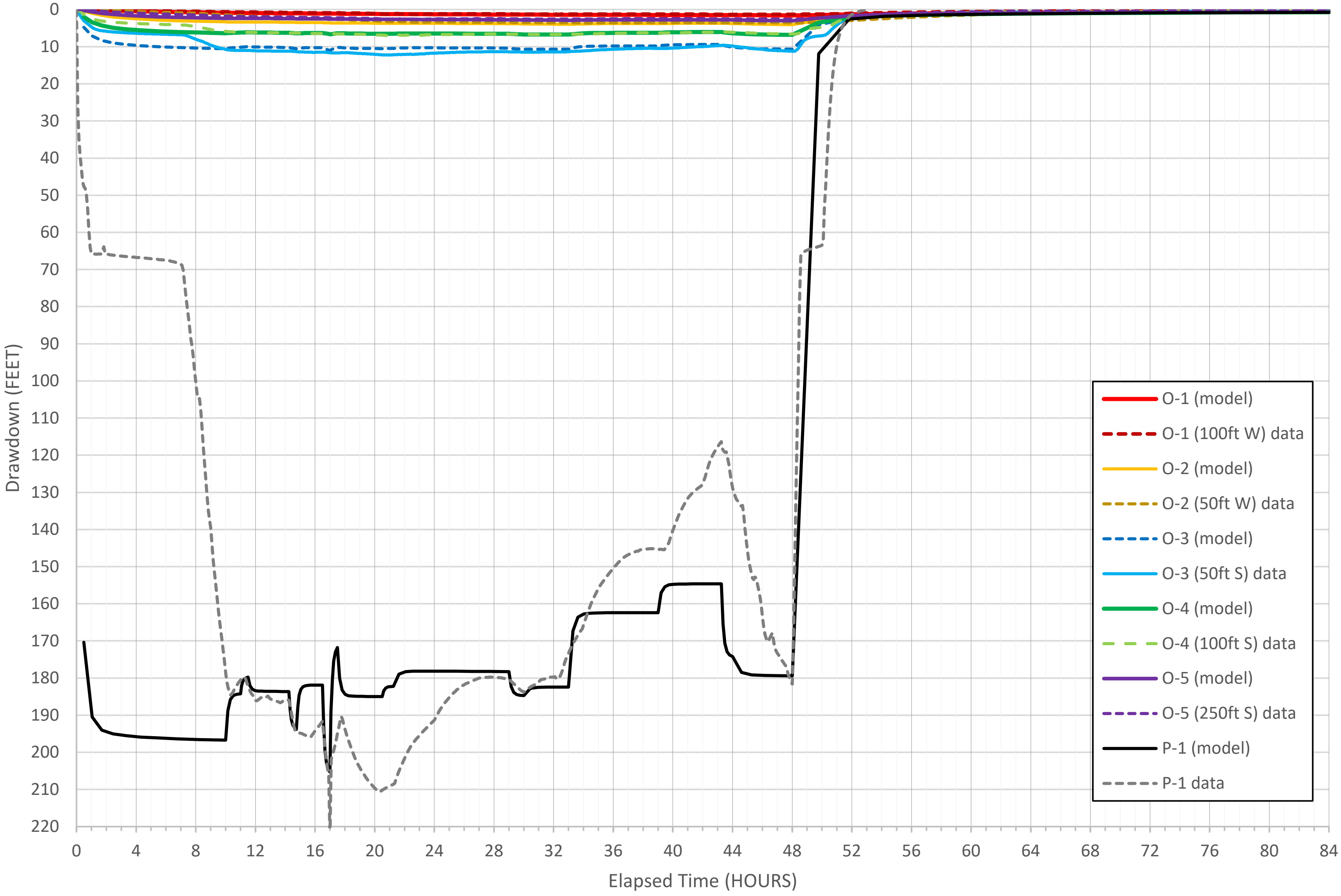


Figure 2. Pumping test approximation via model simulation.

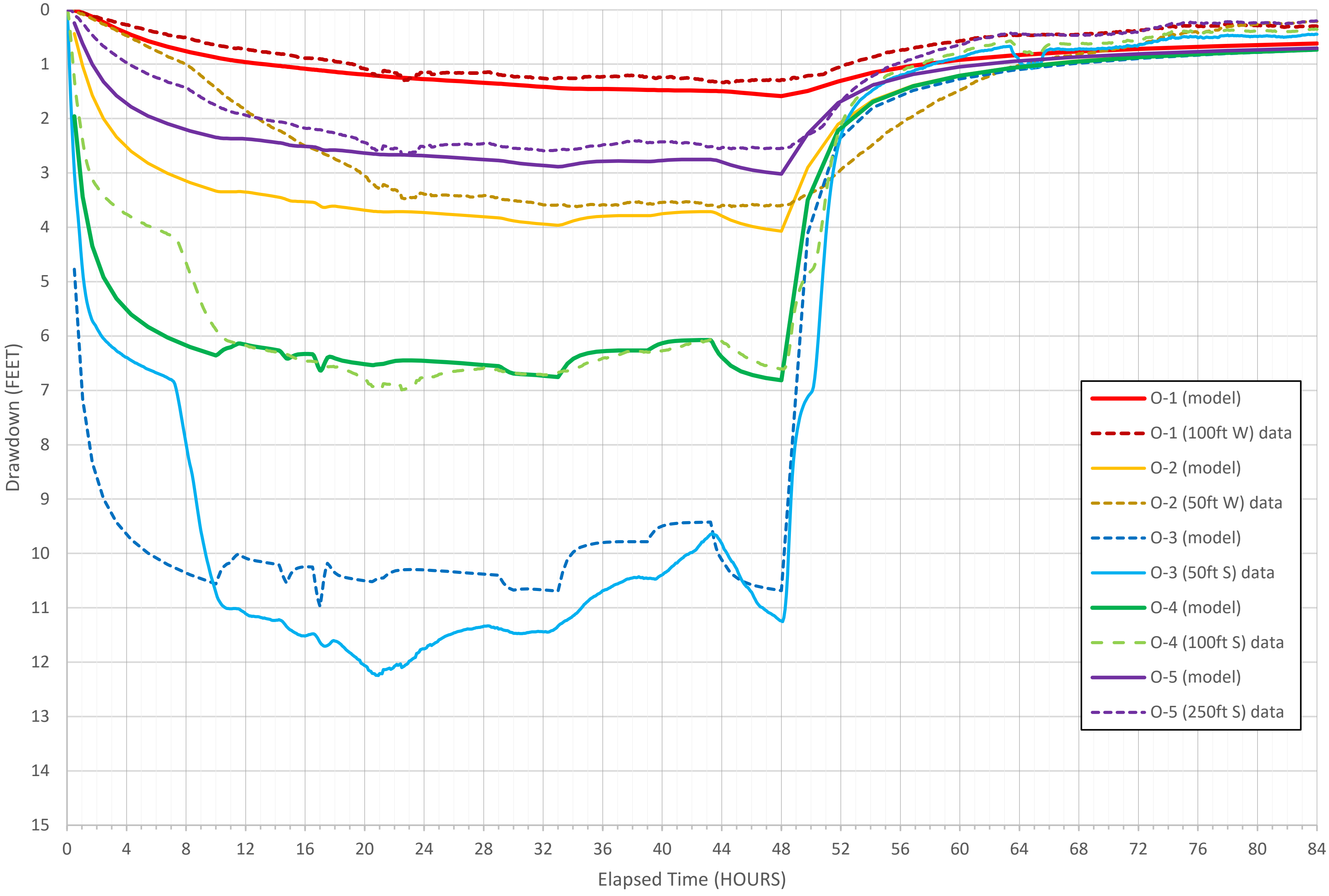


Figure 3. Semi-log pumping test approximation via model simulation.

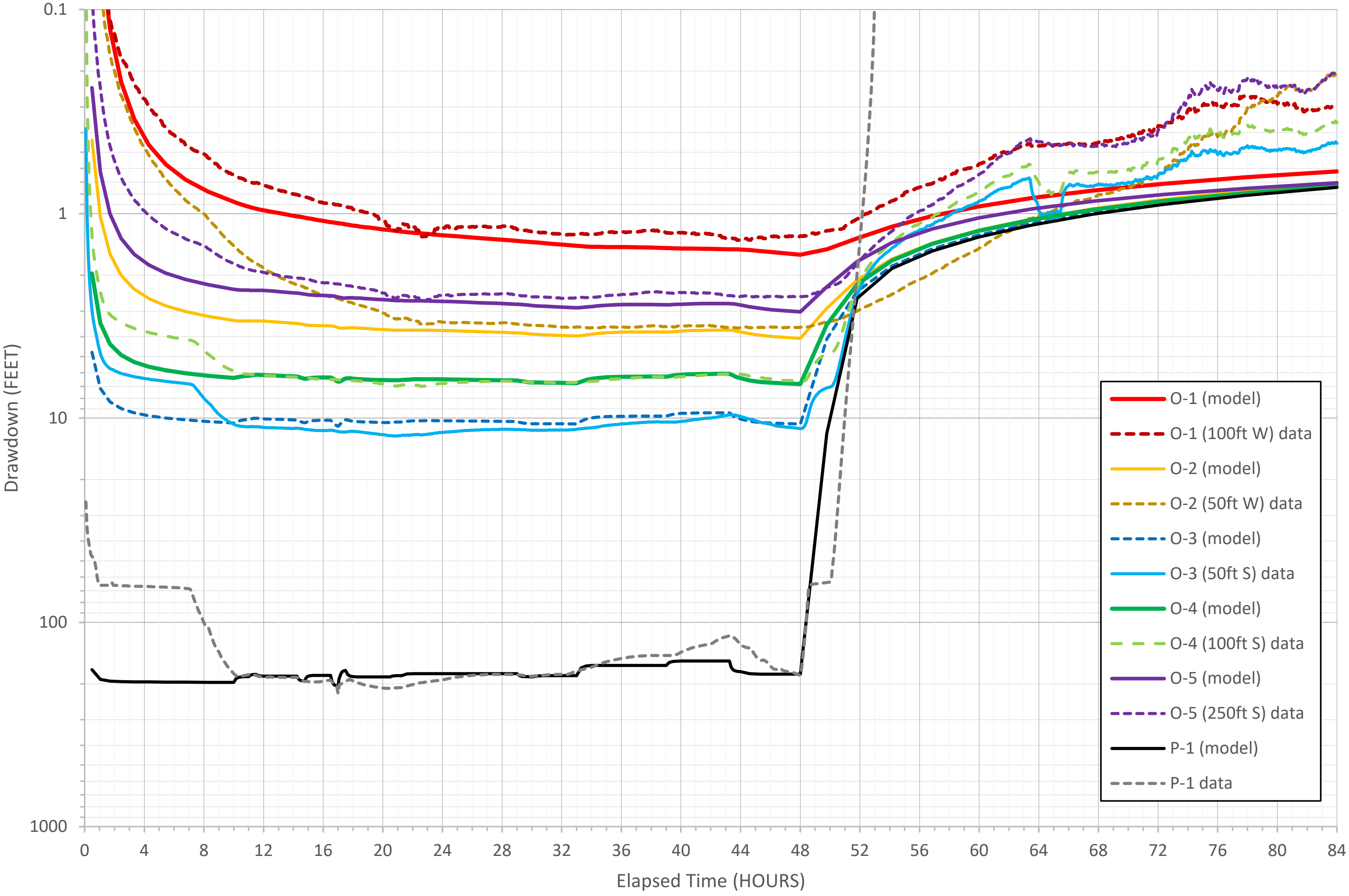


Table 1. Summary of calibrated aquifer parameters (EPM approach).

Model ID	Kx	Ky	Kz	S_y	PW-Keff
Mac-PT3	0.03	0.5	0.25	0.0005	0.0025

Kx	Ky	
0.03	0.5	ft/day
1.1E-05	1.8E-04	cm/sec

Ky/Kx	16.7

sqrt(Ky/Kx) 4.08 (i.e., 4:1 ratio of distance to same drawdown)

Figure A. Groundwater Model of Macedonia Mine: Elevations and Dewatering Rate.

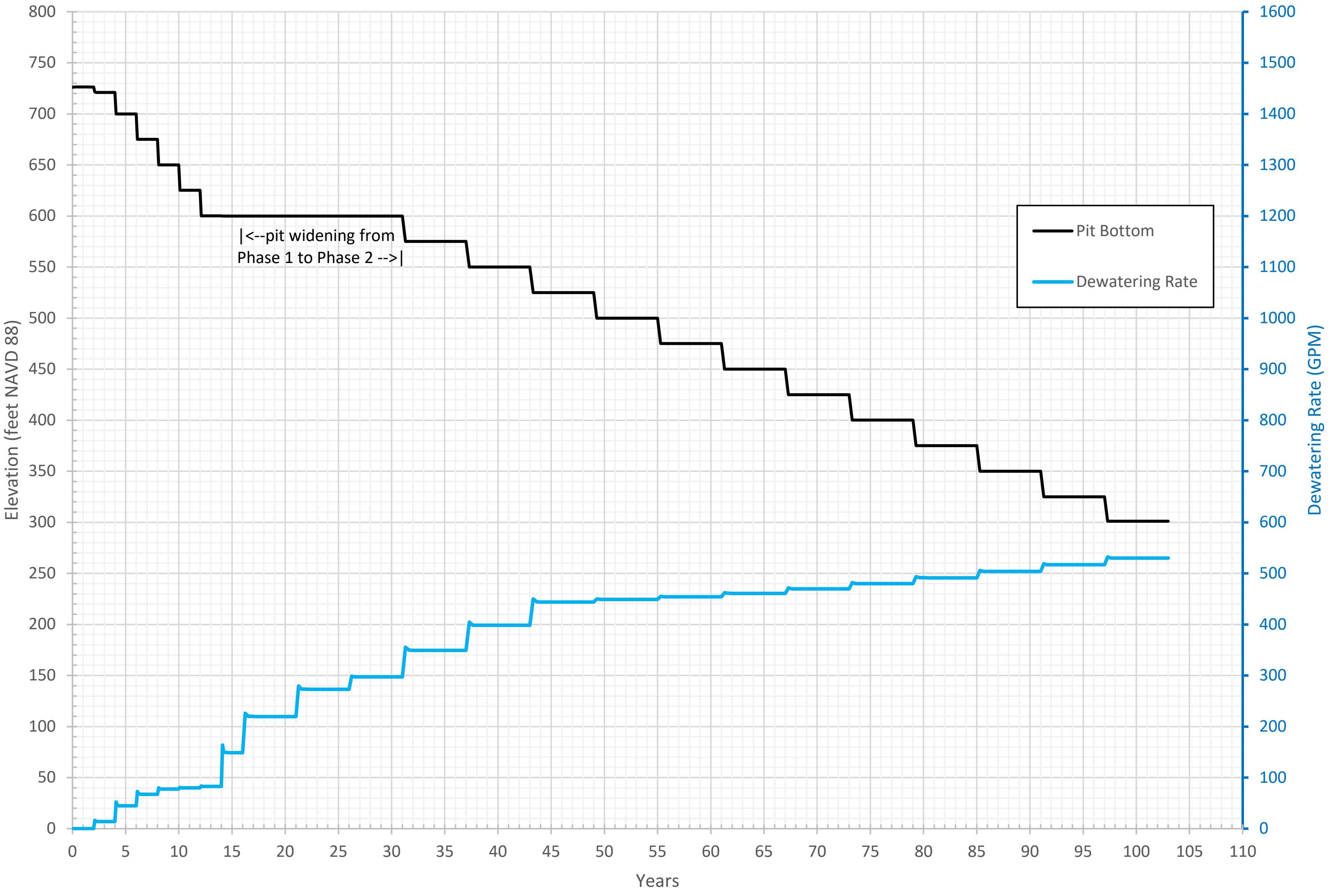
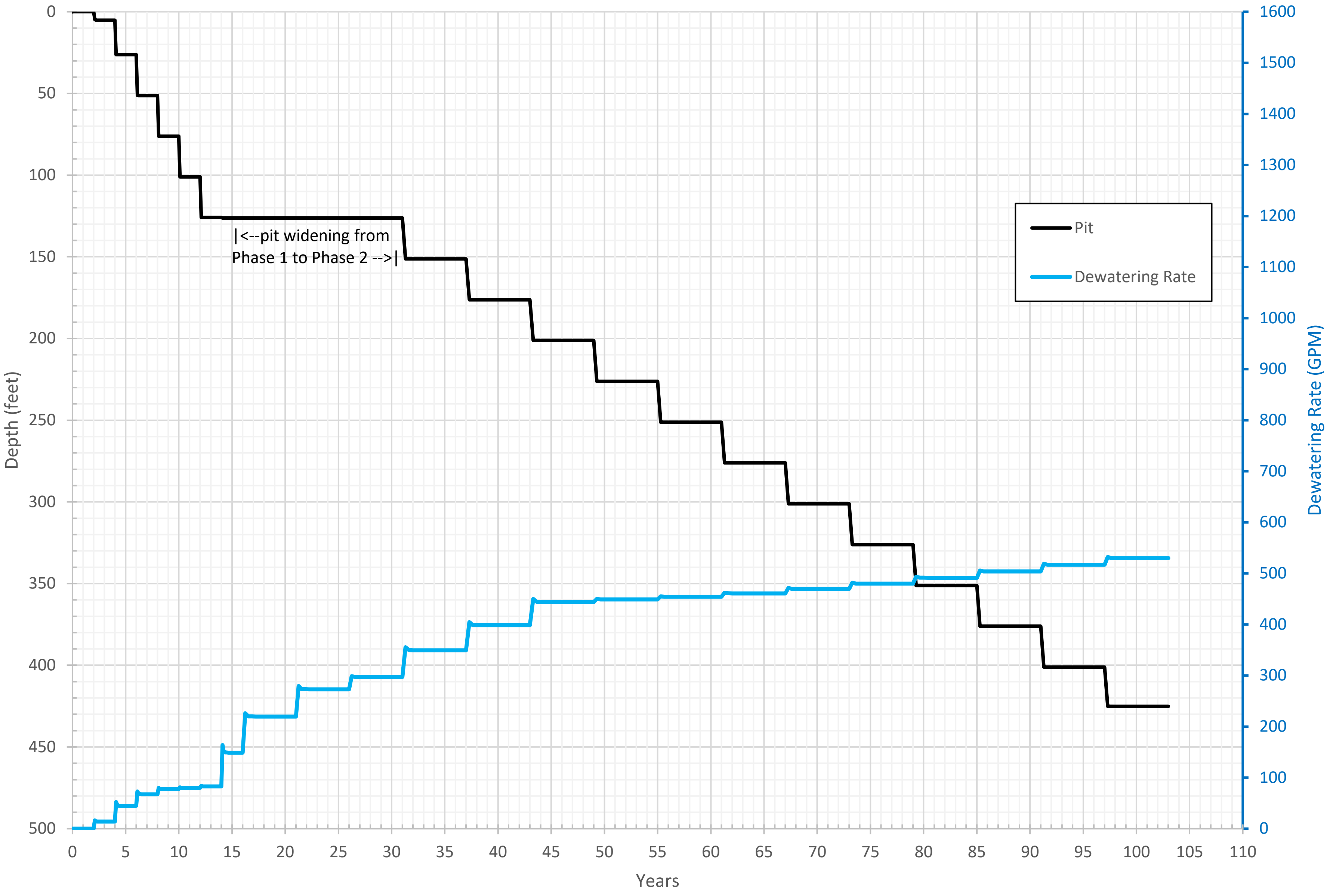


Figure B. Groundwater Model of Macedonia Mine: Pit Depth and Dewatering Rate.



|<--pit widening from
Phase 1 to Phase 2 -->|

APPENDIX F
Groundwater Monitoring Plan – Luck Cherokee

GROUNDWATER MONITORING PLAN: LUCK CHEROKEE

OLD POST ROAD
CHEROKEE COUNTY, SOUTH CAROLINA

LUCK COMPANIES

Prepared For:
Luck Stone Corporation
P.O. Box 29682
Richmond, Virginia 23242

BUNNELL-LAMMONS ENGINEERING, INC.
No. C01452

BLE Project Number 24-24056

May 12, 2025

No. 2844
TIMOTHY JOHN DANIEL
5/12/25

No. 27867
5/12/2025
DAVID R. LOFTIS

BLE
BUNNELL LAMMONS ENGINEERING

6004 Ponders Court I Greenville, SC 29615
864.288.1265 864.288.4330 info@blecorp.com
BLECORP.COM

BLE | BUNNELL
LAMMONS
ENGINEERING

May 12, 2025

Luck Companies
P.O. Box 29682
Richmond, Virginia 23242

Attention: Mr. Bruce Smith
Greenfield Development Manager

Subject: **Groundwater Monitoring Plan: Luck Cherokee**
Luck Companies
Cherokee County, South Carolina
BLE Project Number 24-24056

Dear Mr. Smith:

As authorized, Bunnell Lammons Engineering, Inc. (BLE) has prepared the Groundwater Monitoring Plan (GWMP) herein in association with the proposed Luck Companies aggregate quarry in Cherokee County, South Carolina (herein referred to as the "Site"). The plan herein provides details regarding the monitoring of groundwater elevation prior to and during operation of the proposed aggregate quarry in accordance with South Carolina Department of Environmental Services (SCDES) Form MR-400. A hydrogeologic assessment report including estimated drawdown of the water table surrounding the facility was submitted by BLE under a separate cover on May 1, 2025.

If you have any questions concerning this report, please contact Timothy J. Daniel at (864) 288-1265.

Sincerely,
BUNNELL LAMMONS ENGINEERING INC.

Timothy J. Daniel, P.G.
Project Geologist
Registered, South Carolina #2385

No. 2844
5/12/25
TIMOTHY JOHN DANIEL

David R. Loftis, P.E.
Senior Engineer
Registered, South Carolina #27867

No. 27867
5/12/2025
DAVID R. LOFTIS

cc: Jeremy Eddy – South Carolina SCDES, Mining Reclamation
Mark Williams – Luck Companies
Clint Courson, CHMM – Hodges, Harbin, Newberry & Tribble
Brant Lane, P.E. – Hodges, Harbin, Newberry & Tribble

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FIGURES

1.0 INTRODUCTION

1.1 Background Information and Objective

BLE has prepared this GWMP on behalf of Luck Companies in association with the proposed Luck Cherokee aggregate quarry. The Site is located north of Old Post Road and interstate I-85, approximately five miles west of Gaffney, Cherokee County, South Carolina (see **Figure 1**).

This GWMP was prepared for submittal to the Mining Reclamation Section of the South Carolina Department Environmental Services (SCDES) as required by SCDES Form MR-400 (Application for a Mine Operating Permit). The GWMP provides details regarding the collection of baseline groundwater elevations prior to site development and to document changes in water table elevations during mining activities.

2.0 GROUNDWATER MONITORING

2.1 Groundwater Monitoring Well Locations

The proposed groundwater monitoring network for the Luck Cherokee facility consists of five (5) groundwater monitoring wells (see **Figure 2**). Four (4) wells (MW-1D, MW-2, MW-3, MW-4) will be installed to intersect water bearing fractures within the bedrock aquifer across the Site. One (1) well (MW-1S) will be installed to monitor groundwater in the shallow residuum in the general vicinity of private wells near the southern property boundary.

2.2 SCDES Well Permit Application

A monitoring well installation permit application will be submitted to SCDES for approval prior to performing well installation activities. The application package will include the following:

- SCDES Form D-3736;
- Drilling procedures;
- Monitoring well construction procedures;
- A typical monitoring well construction diagram;
- A site location map; and
- A site plan showing the proposed well locations.

Once a SCDES Permit has been issued, the monitoring wells will be scheduled for installation.

2.3 Groundwater Monitoring Well Construction

A South Carolina licensed well driller will perform the well installations, under the supervision of qualified field personnel at the direction of a South Carolina licensed Geologist or Engineer. The monitoring wells will be constructed in accordance with South Carolina Well Construction Standards – *SCDES Regulation No. 61-71.H.*

Groundwater monitoring wells set to intersect water bearing fractures within the bedrock aquifer will be constructed of 6-inch nominal diameter Schedule 40 PVC pipe (or similar) from the ground surface to the top of competent bedrock. The remainder of each well will be completed “open hole”, from the top of competent bedrock to the total depth. No well screen will be used unless site-specific conditions require it.

Groundwater monitoring wells installed in shallow residuum above the bedrock will be constructed of 2-inch nominal diameter Schedule 40 PVC casing inserted into a 6-inch (or larger) diameter borehole. The bottom 10-foot section will be a manufactured well screen with 0.010-inch-wide slots. Silica filter sand will be placed in the borehole annulus around the well screen. A hydrated bentonite seal will be placed on top of the filter sand backfill to seal the monitoring well at the desired level. The remaining well annulus will be grouted with a 5% bentonite-cement mixture to within one-foot of the ground surface.

The surface completion of each well will consist of a locking protective steel cover, with a 3-foot by 3-foot concrete pad. A vent hole will be drilled in the PVC casing near the top of the well and a weep hole will be drilled near the base of the steel cover. Each well will have an identification tag secured to the locking steel cover with its corresponding well number and construction details.

A licensed land surveyor registered in South Carolina will perform the as-built surveying for each well.

2.4 Monitoring Intervals, Data Collection, and Reporting

The proposed monitoring well locations were selected to monitor changes in water table elevation across the Site. Proposed monitoring wells MW-1S, MW-1D, MW-2, and MW-3 are located in the vicinity of private drinking water wells south, west, and north of the proposed extraction area (see **Figure 2**). Proposed monitoring well MW-4 is located between the proposed facility and Thicketty Creek Watershed Reservoir No. 19.

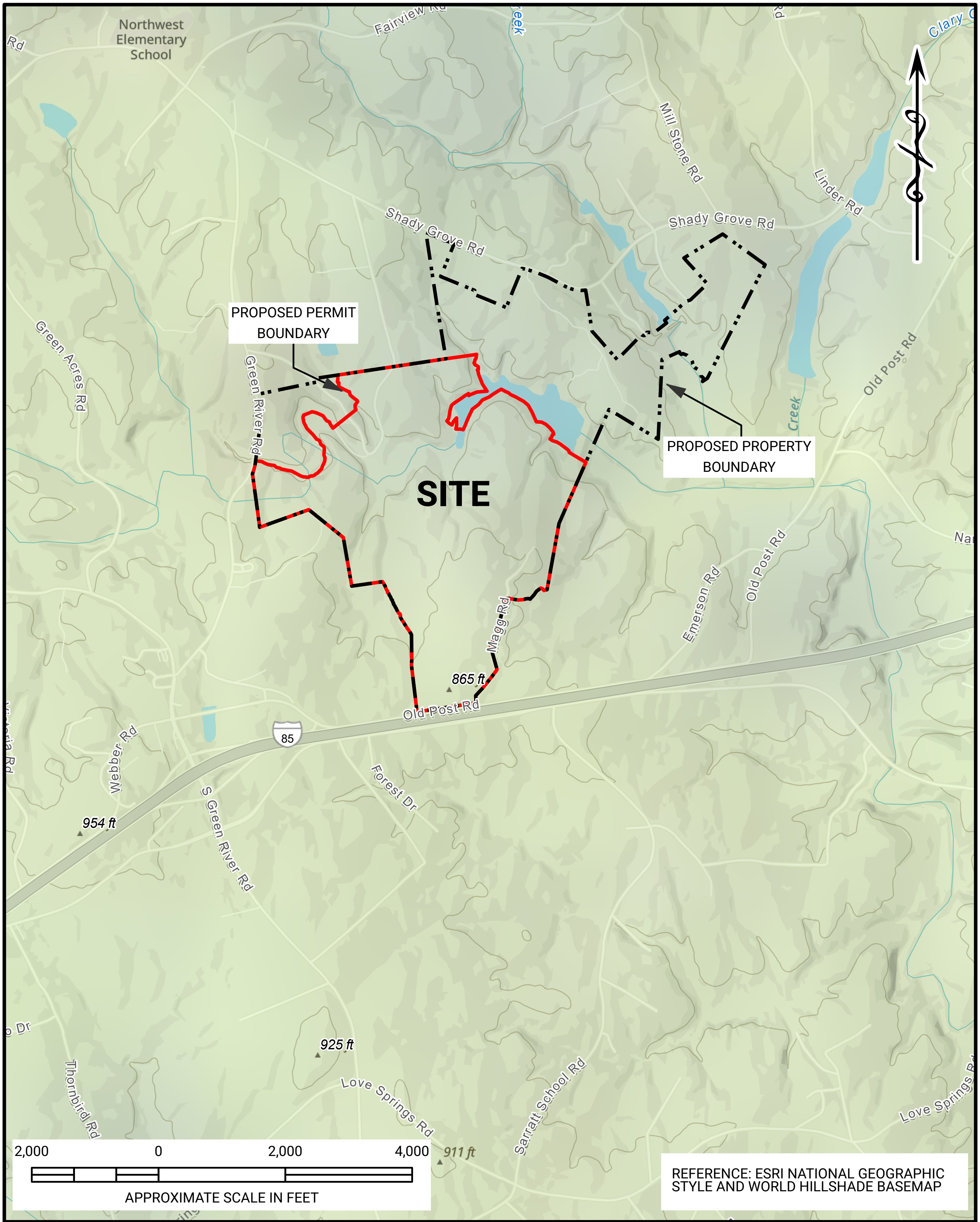
Monthly monitoring will consist of depth to groundwater measurements collected from each groundwater monitoring well at the facility and daily precipitation measurements from a tipping bucket rain gauge with integrated datalogger. Groundwater elevations will be normalized to the North American Vertical Datum of 1988 (NAVD88) and plotted over time for each monitoring well.

Quarterly data reports will be submitted to the Division of Mining and Solid Waste Management (DMSWM) by the 28th day of the month following the end of the quarter. Each quarterly report will include a description of the field procedures and observations, groundwater elevation data plotted over time, and a record of daily precipitation measurements with monthly rainfall totals presented in graphical form.

Should the DSMWM identify groundwater elevation trends that could cause significant adverse impacts to nearby wells, a South Carolina-licensed professional geologist or engineer will be retained to conduct a further investigation of the potential impacts.

No groundwater sampling activities for laboratory analysis are planned.

FIGURES



REFERENCE: ESRI NATIONAL GEOGRAPHIC STYLE AND WORLD HILLSHADE BASEMAP

DRAWN:	TAO	DATE:	4-30-25
CHECKED:	TJD	FILE:	24-24056 SLM
APPROVED:	DRL	JOB NO:	24-24056

BLE
BUNNELL
LAMMONS
ENGINEERING

SITE LOCATION MAP
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
1

LEGEND

⌖ PROPOSED GROUNDWATER MONITORING WELL

▭ PROPOSED PROPERTY BOUNDARY

— PROPOSED PERMIT BOUNDARY

🟧 PHASE 1 EXTRACTION AREA

▨ PHASE 1 EXTRACTION AREA AND TEMPORARY PLANT FACILITIES

🟥 PHASE 2 EXTRACTION AREA

○ 0.5 MILE RADIUS AROUND PROPOSED EXTRACTION AREA

◐ CONFIRMED PRIVATE DRINKING WATER WELL

◐ SUSPECTED PRIVATE DRINKING WATER WELL

💧 PUBLIC WATER SUPPLY WELL PWSW

○ EXISTING LOW VOLUME BUFFER 500 FEET

⬭ JURISDICTIONAL SURFACE WATER

~ JURISDICTIONAL INTERMITTENT STREAM

~ JURISDICTIONAL PERENNIAL STREAM

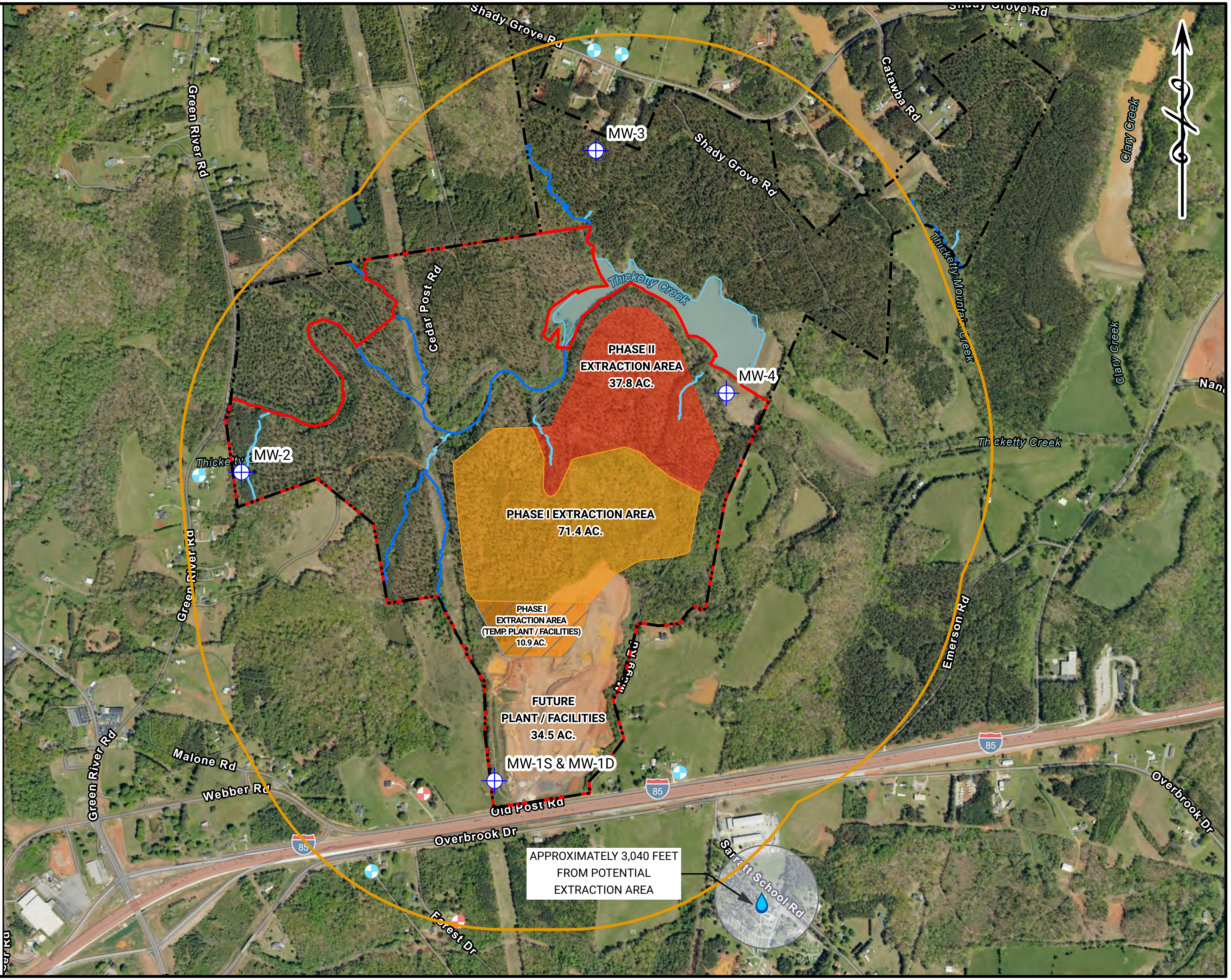
▨ JURISDICTIONAL WETLANDS

NOTES:
1. PROPOSED GROUNDWATER MONITORING WELL LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON SITE CONDITIONS ENCOUNTERED AT TIME OF DRILLING.
2. PRIVATE DRINKING WATER WELL LOCATIONS ARE APPROXIMATE.
3. VEHICULAR AREA RECONNAISSANCE PERFORMED BY BLE IN SEPTEMBER 2024.

REFERENCES:
PROPOSED BOUNDARIES PROVIDED BY HODGES, HARBIN, NEWBERRY TRIBBLE; PUBLIC WATER SUPPLY WELL AND PROTECTION ZONES SOUTH CAROLINA DEPT. OF ENVIRONMENTAL SERVICES FORMERLY SC DHEC GIS CLEARINGHOUSE; ROADS US CENSUS, TIGER 2023 ; BASEMAP US NAIP NATURAL COLOR IMAGERY DATED 4 26 2021

1,000 0 1,000 2,000

APPROXIMATE SCALE IN FEET



APPROXIMATELY 3,040 FEET
FROM POTENTIAL
EXTRACTION AREA

DRAWN BY:	TAO	DATE:	5-1-25	REVISIONS			
				No.	DESCRIPTION	BY	
CHECKED BY:	TJD	FILE NAME:	24056 GWMN				
APPROVED BY:	DRL	JOB NO:	24-24056				

BLE BUNNELL LAMMONS ENGINEERING

PROPOSED GROUNDWATER MONITORING NETWORK
PROPOSED LUCK CHEROKEE
CHEROKEE COUNTY, SOUTH CAROLINA

FIGURE
2