Southern California Edison

Preliminary Geotechnical Investigation Report

SCE TLRR Program

Gorman-Kern River Project

Revision 0

March 2022

Preliminary Geotechnical Investigation Report

TLRR Program,

Gorman-Kern River Project

March 2022

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Acronyms and Abbreviations

Arcadis	Arcadis U.S., Inc.
ASTM	American Society for Testing and Materials
bgs	below ground surface
bpf	blows per foot
CalTrans	California Department of Transportation
CDWR	California Department of Water Resources
CPUC	California Public Utilities Commission
g	Earth’s gravity
GIR	Geotechnical Investigation Report
GKR	Gorman-Kern River
HSA	hollow-stem auger
ICC	International Code Council
ID	inside diameter
kV	kilovolt
LST	lattice steel tower
LWS	lightweight steel
Mod Cal	modified California
msl	mean sea level
NRCS	National Resource Conservation Service
OD	outside diameter
OSHA	Occupational Safety and Health Administration
psf	pounds per square foot
SCE	Southern California Edison
SPT	standard penetration testing
TLRR	Transmission Line Rating and Remediation
TSP	tubular steel pole
USGS	United States Geological Survey
USDOC	United States Department of Commerce

1 Introduction

Arcadis U.S., Inc. (Arcadis), prepared this Preliminary Geotechnical Investigation Report (GIR) for Southern California Edison (SCE) for the Gorman-Kern River (GKR) Project of the Transmission Line Rating and Remediation (TLRR) Program. The TLRR Program involves the repair of ground discrepancies related to the overhead electrical conductors. The GKR Project subtransmission line is located in Kern and Los Angeles Counties, California (Figure 1). The GKR Project alignment is approximately 65 miles long.

The subtransmission lines included in the GKR Project are 66 kilovolt (kV) subtransmission circuits supported on lattice steel towers (LSTs), lattice steel H-frames, wood poles, and wood H-frames. In some areas of the GKR Project, the horizontal and vertical clearances between the conductors and the ground, buildings, or other objects are not compliant with the clearances required by the California Public Utilities Commission (CPUC). The compliance issues reflect a combination of line and facility rating changes since installation, installation of new infrastructure beneath the lines, and inaccuracies in previous surveying, engineering, and construction.

The TLRR Program is intended to remediate clearance discrepancies. Following approval by the CPUC and federal agencies, Arcadis anticipates that the GKR Project will include removal of existing LSTs, wood poles, and H-frames, and installation of new poles as replacements. New conductor and new optical ground wire will be installed on the new structures.

The GKR Project also includes upgrades at existing substations along the alignment including installation of new buried and overhead lines.

1.1 Project Location

The GKR Project alignment is located in Kern County and Los Angeles County within the State of California at the locations shown on Figure 1. Detailed descriptions of the areas crossed by the GKR Project alignment are provided in the Desktop Geologic Hazards Study (Arcadis 2021b) and the Proponent's Environmental Assessment (Arcadis 2022).

The GKR Project includes work along the following existing assets: the Banducci-Kern River 1 66 kV Subtransmission Line, the Frazier Park-Gorman 66 kV Subtransmission Line, the Gorman-Kern River 1 66 kV Subtransmission Line, and the substations associated with those lines. These subtransmission lines are divided into five segments.

- Segment 1 extends from the Kern River Substation south 20.4 miles.
- Segment 2 extends from the southern terminus of Segment 1 approximately 26.5 miles south to Lebec, California.
- Segment 3 extends from Lebec, California south approximately 4.1 miles to the Gorman Substation.
- Segments 4 and 5 extend from the southern terminus of Segment 1 approximately 14 miles east to the Banducci Substation near Stallion Springs, California.

Segments 1, 2, and 3 extend generally north-south for approximately 51 miles from the Kern River Substation to the Gorman Substation and fourteen miles of Subtransmission Line (segments 4 & 5) extend over to the Banducci Substation in approximately the middle of the alignment (see Figure 1). Most of the GKR Project alignment is in Kern County, California, but the southernmost part is in Los Angeles County, California.

1.2 Project Description

The purpose of the GKR Project is to comply with CPUC General Order 95 by remediating discrepancies identified through SCE's TLRR Program. The GKR Project is intended to remediate documented ground discrepancies by rebuilding approximately 65 miles of the existing 66 kV subtransmission lines listed in Section 1.1. For each of the subtransmission lines to be rebuilt, existing LSTs, lattice steel H-frames, wood poles, and wood H-frames will be replaced with new lightweight steel (LWS) poles (or functional equivalent) and tubular steel poles (TSPs), generally at or near the existing alignment. New conductor and new optical ground wires will be installed on the new structures, and the existing structures and conductors will be removed. As part of the GKR Project, staging and work areas will be established to support the reconstruction of the subtransmission lines.

The TSPs will be approximately 2 to 5 feet in diameter at the base and extend approximately 50 to 120 feet above ground. TSPs will be either direct buried, attached to concrete foundations, or installed on a concrete cap supported on micropiles. Concrete foundations will be approximately 4 to 8 feet in diameter and will extend underground approximately 10 to 30 feet with approximately 1 to 2 feet of concrete visible above ground. If used, each concrete-encased micropile would be 7 to 10 inches in diameter and will extend underground to similar depths as the proposed concrete foundations, with the micropiles embedded at the surface in a reinforced concrete pile cap approximately 4 to 8 feet in diameter on which the TSP will be installed.

LWS poles will generally be direct buried to a depth of approximately 7 to 14 feet below the ground surface and extend approximately 50 to 106 feet above the ground. The diameter of the LWS poles will be approximately 1.5 to 3 feet at ground level and will taper to the top of the pole. Depending on field conditions at the time of construction, hybrid LWS poles may be installed at some locations. Hybrid LWS poles have a concrete base (either poured in-place or pre-cast) with the steel portion of the pole installed on the concrete base. In some locations, caissons (corrugated steel tubes) may be installed first, and then the LWS pole will be installed within the caisson.

Guys are typically used to provide support to LWS poles when they are located on angles or corners. Guys may also be used on tangent/suspension poles as field conditions dictate. Guying consists of a guy wire (down guy) that is fastened to a LWS pole and attached to an anchor; when there is not adequate space for the required down guy, a shorter guy pole (stub pole) is typically placed with a down guy and anchor in a location that has sufficient room for these facilities. The need for and location of guy wires and anchors for poles will be determined during final engineering and construction on a case-by-case basis.

The foregoing descriptions are based on planning level assumptions. Actual work scope will be determined following completion of final engineering and will be based on identification of field conditions; availability of labor, material, and equipment; and compliance with applicable environmental and permitting requirements following GKR Project licensing.

1.3 Purpose and Scope of Work

The purpose of this GIR is to support the licensing and permitting of the GKR Project including an analysis of potential impacts to construction and operation. The analysis includes an evaluation of geohazards along the GKR Project alignment. This GIR is intended to supplement and validate mapped information provided in the Desktop Geologic Hazards Study (Arcadis 2021b) with information collected in the field. This GIR includes preliminary confirmation of subsurface soil and groundwater conditions, a geologic hazard analysis that included flooding and erosion, subsidence, liquefaction, seismically induced settlement, fault crossings, settlement, expansive soils, corrosive soils, and landslides and rockfall for the proposed GKR Project alignment.

This GIR discusses potential impacts to construction and operation. Additional field investigation and testing will be required to develop recommendations for final design of foundations, for further evaluation of geohazards, and for other geotechnical considerations.

The scope of work presented in this GIR includes installation of soil borings; field and laboratory testing of soil samples; field observations of soil, rock, and water conditions; and an evaluation and discussion of preliminary geotechnical considerations and geohazards.

2 Regional Geologic Setting

2.1 Topography

The GKR Project alignment extends from the Kern River Substation located near Bakersfield, California at an elevation of approximately 1,000 feet above mean sea level (msl) south to the Gorman Substation at an elevation of approximately 3,600 feet msl and east to the Banducci Substation located near Stallion Springs, California at an elevation of approximately 3,800 feet msl. The surface elevations of the alignment are relatively flat and generally less than approximately 1,000 feet msl where the alignment crosses the southeast end of the San Joaquin Valley. The elevation increases where the alignment climbs into the mountains toward the Gorman and Banducci Substations.

Relief maps that show the mountain and valley areas and the proposed alignment are provided on Figure 1 and Figure 2, and a description of significant topographic features along the alignment are provided in the sections below. A more detailed description of the topography is provided in the Desktop Geologic Hazards Study (Arcadis 2021b).

Segment 1

Segment 1 is approximately 20.4 miles in length and includes portions of the Gorman-Kern River 1 and Banducci-Kern River 1 66kV subtransmission lines. All of Segment 1 is located within unincorporated Kern County, California.

The northern terminus of Segment 1, which also represents the northernmost point of the project, is at the Kern River 1 Substation. The Kern River 1 Substation is located at the base of the Kern River Canyon within the southern Sierra Nevada adjacent to the Kern River and to California Highway 178. The substation is located at an elevation of approximately 950 feet msl.

The GKR Project alignment extends through Kern River Canyon for approximately 1.5 miles to the southwest. This represents the general downhill direction; however, the project ascends the steep slopes on the southeastern side of the canyon reaching a maximum elevation of approximately 1,600 feet msl. Near the mouth of the canyon, the project alignment descends steeply to foothills between the Sierra Nevada and the San Joaquin Valley at an elevation of approximately 800 feet msl.

Segment 1 then turns towards the south away from the Kern River and California Highway 178. It extends generally southward through the foothills for approximately 6.5 miles, crossing Cottonwood Creek. The maximum project elevation in the foothills is approximately 1,300 feet msl. The alignment then descends from the foothills to the floor of the San Joaquin Valley at an elevation of approximately 850 feet msl.

The GKR Project alignment extends south across the floor of the San Joaquin Valley for approximately 12 miles, gradually descending in elevation, and generally paralleling Tower Line Road. It successively crosses the Union Pacific Railroad right-of-way, California Highway 58, Caliente Creek, the Arvin-Edison Water Storage District Canal, and California Highway 223. This area represents the southeastern end of the San Joaquin Valley.

Segment 1 terminates at structure M20-T3, located at a T intersection with Segments 2 and 4. This T-intersection is located approximately 2 miles southeast of Arvin and approximately one mile northwest of the Tejon Hills. The elevation at the T intersection is approximately 400 feet msl, which represents the lowest point along the project route.

Segment 2

Segment 2 is approximately 26.5 miles in length, and it includes portions of the Gorman-Kern River No. 1 66 kV Subtransmission line. All of Segment 2 is located within unincorporated Kern County, California.

The northern terminus of Segment 2 is located at the T-intersection with Segments 1 and 4. It continues south along Tower Line Road for approximately 0.5 mile, then turns to the southwest as it approaches the Tejon Hills. Segment 2 continues southwest for approximately 3.5 miles; it crosses the Arvin-Edison Water Storage District Canal, extends along the base of the Tejon Hills at Comanche Point, and then crosses Tejon Creek at an elevation of approximately 575 feet msl.

After passing the Tejon Hills, Segment 2 continues in a generally southward direction across the floor of the San Joaquin Valley, gradually gaining in elevation. From Tejon Creek, it extends roughly southward for approximately 7.5 miles, crossing El Paso Creek. It then turns towards the southwest for approximately 5.5 miles, crossing the Wheeler Ridge-Maricopa Water Storage District 850 Canal and the California Aqueduct. Segment 2 then extends to the south-southwest for approximately 1.5 miles, where it reaches the mouth of Grapevine Canyon, located at the southern end of the San Joaquin Valley at an elevation of approximately 1,600 feet msl.

Grapevine Canyon is a roughly north-south trending canyon that separates the San Emigdio Mountains (to the west) and the Tehachapi Mountains (to the east). In general, the floor of the canyon is occupied by Interstate 5, while the GKR Project structures are located on the ridges and slopes above the canyon to the east and west.

Segment 2 initially extends along the ridges and slopes on the eastern side of the canyon, reaching a maximum elevation of approximately 2,850 feet msl. After approximately 3 miles, it makes an initial crossing of Interstate 5 to the western side of the canyon. Grapevine Canyon then turns to the southeast. The GKR Project alignment extends along the ridges and slopes on the southwestern side of the canyon for approximately 2 miles, reaching a maximum elevation of approximately 3,550 feet msl.

The southeastern end of Grapevine Canyon opens into the broader Castac Valley. The GKR Project alignment drops to the floor of Castac Valley near Fort Tejon State Historic Park, at an elevation of approximately 3,200 feet msl. Castac Valley is a small valley in Kern County, located to the east of Lebec, and drained by Grapevine Creek. It should not be confused with Castaic Valley in Los Angeles County, which is located to the north of Santa Clarita and is drained by Castaic Creek; the Castaic Valley is located approximately 25 miles to the south, outside of the GKR Project area.

The remainder of Segment 2 continues to the southeast in Castac Valley, gradually gaining in elevation, while extending generally parallel to Interstate 5 and Grapevine Creek. Segment 2 makes a second crossing of

Interstate 5 at Fort Tejon State Historic Park. It extends along the northeastern side of Interstate 5 for approximately 0.4 mile, passing El Tejon Middle School. It then makes a third crossing of Interstate 5 and continues near the southwestern side of Interstate 5 for approximately 1.3 miles, reaching a maximum elevation of approximately 3,400 feet msl.

Segment 2 then makes a fourth and final crossing of Interstate 5, closely approaching the base of the Tehachapi Mountains. It then continues southeast across Castac Valley for approximately 1.3 miles, generally parallel to the northeastern side of Interstate 5. The southern terminus of Segment 2 is at the intersection of the GKR Project alignment with Beartrap Road. This point is approximately 900 feet northeast of Interstate 5, near the community of Lebec, at an elevation of approximately 3,500 feet msl.

Segment 3

Segment 3 is approximately 4.1 miles in length. It includes portions of the Gorman-Kern River No.1 and Gorman-Frazier Park 66 kV Subtransmission lines. The northern part of Segment 3 is located in unincorporated Kern County, while the southern part is located in unincorporated Los Angeles County.

The northern terminus of Segment 3 corresponds with the southern terminus of Segment 2 at Beartrap Road near Lebec. Segment 3 then extends for approximately 1.5 miles southeast across the floor of Castac Valley, skirting the southwest edge of Castac Lake, a small saline lake. This lake formed as a sag pond associated with the Garlock fault zone (California Department of Water Resources [CDWR] 2004; Section 4.1). Castac Lake, located in Kern County, should not be confused with Castaic Lake in Los Angeles County; the latter is a much larger reservoir located approximately 25 miles to the south, outside of the GKR Project area. Segment 3 then enters the Tehachapi Mountains at Crane Canyon at an elevation of approximately 3,500 feet msl.

Segment 3 ascends the southwestern slopes of Crane Canyon and crosses the Kern-Los Angeles County line. It gains elevation for approximately 2 miles reaching a maximum elevation of approximately 4,550 feet msl at the top of the ridge above Crane Canyon. This represents the highest point along the project route.

Segment 3 then drops steeply down a south-facing slope for approximately 0.5 mile. Its southern terminus is at the Gorman Substation, which is located at the base of the Tehachapi Mountains, at the edge of Peace Valley, at an elevation of approximately 3,600 feet msl. The substation is located on Gorman Post Road approximately 1.5 miles east of the community of Gorman and approximately 900 feet northeast of Interstate 5.

Segment 4

Segment 4 is approximately 11.3 miles in length. It includes portions of the Correction-Cummings-Kern River No.1 66 kV Subtransmission Line. All of Segment 4 is located within unincorporated Kern County.

The western terminus of Segment 4 is located within the San Joaquin Valley at the T-intersection with Segments 1 and 2. It extends eastward from the T-intersection for approximately 2.0 miles, crossing the Arvin-Edison Canal and entering the Tejon Hills, which border the southeastern edge of the valley.

Segment 4 then turns to the southeast and continues through the Tejon Hills for approximately 9.4 miles. The GKR Project alignment crosses a series of ridges and valleys in this area including Little Sycamore Canyon, Horsethief Flat, and Comanche Creek, while generally gaining in elevation.

Segment 4 terminates in the community of Stallion Springs, located on the eastern side of the Tejon Hills. It reaches a maximum elevation of approximately 4,100 feet msl in Stallion Springs. The eastern termination point is located near the intersection of Comanche Point Road, Longhorn Lane, and Banducci Road at an elevation of approximately 3,850 feet msl.

Segment 5

Segment 5 is approximately 3 miles in length. It includes portions of the Correction-Cummings-Kern River No.1 66 kV Subtransmission Line. All of Segment 5 is located within unincorporated Kern County, California.

The western terminus of Segment 5 is located at the junction with Segment 4 in Stallion Springs. The GKR Project alignment extends eastward from this location generally following Banducci Road. Segment 5 descends for approximately 0.6 mile to the foot of the Tejon Hills. It then crosses Chanac Creek and enters Cummings Valley at an elevation of approximately 3,750 feet msl.

The GKR Project alignment follows Banducci Road eastward across Cummings Valley for approximately 1.9 miles. It turns northward at the intersection with Pellisier Road and continues for approximately 0.5 mile to the Banducci Substation, located near the intersection of Pellisier and Dale Roads at an elevation of approximately 3,850 feet msl.

2.2 Regional Geology and Soils

The following general descriptions of the regional geology along the GKR Project alignment was taken from the Desktop Geologic Hazard Study (Arcadis 2021b) and is based on United States Geological Survey (USGS 2019) generalized maps for California.

Two general geologic units are particularly widespread in the project area. The mountainous areas crossed by the GKR Project alignment have been mapped predominantly as granitic rocks including granodiorite and quartz monzonite, typically of Mesozoic age ("Mesozoic granitic rocks"). The valley areas crossed by the GKR Project alignment have been mapped predominantly as alluvial and terrace deposits of Pliocene to Holocene age ("alluvial deposits").

- **Segment 1.** The northern end of Segment 1 is mostly underlain by consolidated bedrock. The Kern River Canyon is associated with Mesozoic granitic rocks of the Sierra Nevada. The adjacent foothills to the south are underlain by sandstones, conglomerates, and mudstones of Oligocene to Pleistocene age.

  There are two areas where the northern end of Segment 1 extends close to the Kern River: at the Kern River 1 Substation and near the mouth of Kern Canyon. Structures in these two areas may be underlain by alluvial deposits, although Wilkerson (2017) indicated that the substation was constructed on granitic bedrock.

  The remainder of Segment 1, located further to the south, extends across the floor of the San Joaquin Valley. This area is underlain entirely by unconsolidated alluvial deposits.

- **Segment 2.** The northern part of Segment 2 extends across unconsolidated alluvial deposits on the floor of the San Joaquin Valley. In the Comanche Point area, Segment 2 approaches the base of the Tejon Hills, which border the San Joaquin Valley. The Tejon Hills have been mapped as sandstones and conglomerates of Miocene to Pleistocene age.

  The southern part of Segment 2 leaves the San Joaquin Valley and climbs into the mountains along the slopes and ridges on the sides of Grapevine Canyon. The bedrock at the mouth of Grapevine Canyon has been mapped as mudstone and sandstone of Paleocene to Oligocene age. However, most of Grapevine

Canyon is associated with the Mesozoic granitic rocks of the San Emigdio Mountains (on the west side of the canyon) and the Tehachapi Mountains (on the east side).

The southern end of Grapevine Canyon opens into the broader Castac Valley. Segment 2 extends across unconsolidated alluvial deposits in this area.

- **Segment 3.** The northern part of Segment 3 is located on alluvial deposits in Castac Valley. The southern part of Segment 3 crosses the Tehachapi Mountains, which consist of Mesozoic granitic rock**.**

- **Segment 4.** The western end of Segment 4 is located on alluvial deposits of the San Joaquin Valley. The remainder of Segment 4 is in located in the Tejon Hills, which are associated with Mesozoic granitic rocks.

- **Segment 5.** The westernmost end of Segment 5 is in located in the Tejon Hills, which are underlain by Mesozoic granitic rocks. The remainder of Segment 5 is located in unconsolidated alluvial deposits of Cummings Valley.

Mapped soil information for the project alignment from the National Resource Conservation Service (NRCS) web soil survey (NRCS 2018) is provided in the Desktop Geologic Hazards Study (Arcadis 2021b).

2.3 Hydrology and Hydrogeology

The peak rainfall within a 24-hour period for a recurrence interval of 100 years ranges from approximately 3.5 to 6.5 inches over the Project alignment (United States Department of Commerce [USDOC] 2011). Lower rainfall quantities are generally observed in the southern San Joaquin Valley and higher rainfall quantities are generally observed in the higher elevation mountainous portions of the Project alignment. Average annual rainfall in the San Joaquin Valley near the project alignment is 9 to 13 inches. Natural groundwater recharge occurs from stream and river seepage where mountain streams and rivers flow into the San Joaquin Valley, however, irrigation water recharge is the largest contributor to groundwater recharge in this area (CDWR 1995). Younger alluvium in the southern San Joaquin Valley in the project area consists of up to 150 feet of interstratified and discontinuous beds of clay, silt, sand, and gravel (CDWR 2006).

The Castac Lake Subbasin receives an average annual precipitation of 12 to 14 inches per year. The basin is internally drained, but Castac Lake can overflow into Grapevine Creek during periods of high inflow. The basin recharges from direct precipitation and from spring-fed perennial streams and from Cuddy Creek. Limited hydrogeologic data is available for this basin, but available data indicate shallow water well yields as low as 3 gpm (CDWR 2004) which may be related to the finer-grained unconsolidated materials found within the Castac Valley which generally consist of interbedded silt, clay, and sandy clay.

The Cummings Valley basin receives an average annual precipitation of 10 to 14 inches per year. The basin is drained by Chanac Creek, which exits in the southwest part of the valley. The valley is filled with alluvium that is 50 feet thick in the southern valley and up to 450 feet thick in the northeastern part of the valley. Groundwater recharge occurs primarily at the margins of the valley where the alluvial sediments consist of coarser grained sand and gravel. Water from the State Water Project has been imported to recharge groundwater since 1973. Water levels are near their 1950’s level (CDWR 2006a).

2.4 Seismicity

The GKR Project alignment is in a seismically active area with numerous historically active and potentially active faults having the potential for peak ground accelerations of 0.4 to 1.4 of Earth's gravity for the risk targeted maximum considered earthquake. More detailed information about faulting and ground motions is provided in the Desktop Geologic Hazards Study (Arcadis 2021b).

3 Field Investigation

The field investigation included soil borings and associated field and laboratory testing. Arcadis installed five soil borings in 2017 and 17 soil borings in 2021. Gregg Drilling, Inc. of Signal Hill, California, advanced the soil borings in July and August of 2017 and in November and December of 2021. The five borings installed in 2017 and eight of the 17 borings installed in 2021 were advanced using hollow-stem auger (HSA) drilling methods. Nine of 17 borings installed in 2021 were advanced using rotary wash methods because these locations were identified in advance as having higher potential for shallow bedrock where rock coring may be performed. Boring locations are shown on Figure 2. Soil borings were advanced to a depth of 50 feet below ground surface (bgs), to HSA refusal, or a depth where standard penetration testing (SPT) resulted in 50 blows per foot (bpf) for 1 inch of less of penetration, whichever occurred first. Rock coring was performed at two boring locations where drilling ceased at a depth of 25 feet or shallower as detailed in the GKR Geotechnical Investigation Plan Memorandum (Arcadis 2021a). Table 1 summarizes the installed depth of each boring, the drilling method used, and the amount of rock coring performed.

Boring 5-004 was not installed due to road closures caused by snow during the field work. Subsurface conditions encountered at adjacent borings 5-002 and 5-005 were similar and mapped geologic and soil information indicate similar conditions; therefore, boring 5-004 was omitted from the drilling program. The location of the omitted boring is shown on Figure 2. The boring omission was approved by SCE by email on December 22, 2021.

Arcadis acquired boring permits as required by Los Angeles County. Kern County did not require boring permits. The following steps were performed prior to drilling:

- Arcadis provided property owners with 10-day advance notification of the field activities,
- Arcadis performed biological clearances, and
- Arcadis worked with SCE to gain access to areas behind locked gates.

Arcadis notified One-Call and attempted to hand-clear the upper 5 feet of each boring location. If hand clearance could not be completed to a depth of 5 feet using a hand auger due to gravel, cobbles, or boulders, the boring was advanced using drill tooling or rock coring after documenting three reliable lines of evidence that buried utilities would not be disturbed. Boring names post-ceded with an "A" indicate that the boring location was moved due to access, clearance, biological, or cultural issues.

The soil borings in Kern County were backfilled with drill cuttings, and the soil borings in Los Angeles County were backfilled with bentonite cement grout.

3.1 Field Observations

Arcadis field geologists made visual observations about surface geology, topography, vegetation, and access at the boring locations identified as potentially having shallow bedrock prior to the field drilling event. The field observations are summarized in a trip report provided in Appendix A. A photograph log of areas surrounding each soil boring is provided in Appendix B. A summary of surficial geology and topography is provided in Table 1.

3.2 Field Sampling and Testing

SPT or Modified California (Mod Cal) drive sampling was performed at regular intervals in each boring in general accordance with ASTM D1586 or ASTM D3550, respectively. Arcadis submitted selected samples to the geotechnical laboratory for analysis.

During drilling and sampling, an Arcadis field geologist logged samples in general accordance with ASTM D2488 (visual-manual procedures). The field log descriptions were used along with the geotechnical laboratory results to complete the boring logs provided in Appendix C.

SPT was performed in the 17 borings installed in 2021 using an 18-inch-long, 2-inch outside diameter (OD), 1.375 inside diameter (ID) split-spoon sampler driven into the soil with a 140-pound auto-hammer dropped from a height of 30 inches in general accordance with ASTM D1586. The number of blows for each 6 inches of sampler advancement was recorded, and the number of blows required to advance the sampler from 6 to 18 inches is shown as the SPT “N” value on the boring logs provided in Appendix C.

Soil samples were collected using a Mod Cal drive sampler in the borings installed in 2017 with a 3.0-inch OD and 2.5-inch ID at selected locations. The SPT hammer weight, fall height, and methodology was used for the Mod Cal sampling. The Mod Cal blow counts shown on the boring logs were not corrected or adjusted.

Special care was exercised when SPT was performed in borings installed using HSA methods in sandy soil below the groundwater table to prevent sand from heaving into the augers. Water or polymer was added to the auger stem to keep the water level in the tooling above the level of the surrounding groundwater

Hammer Energy Measurement Reports for the PH-1 Marl hollow stem auger rig and the D43 Fraste Multidrill rotary drill rig used during the field program were provided by Gregg Drilling, Inc. Copies of the reports are included in Appendix D.

4 Laboratory Testing

AP Engineering and Testing, Inc. of Pomona, California, performed the following geotechnical laboratory tests on selected soil samples to confirm the field soil descriptions:

- Grain size distribution by ASTM D6913,
- Fines content by ASTM D1140,
- Moisture content by ASTM D2216,
- Atterberg limits by ASTM D4318,
- Corrosion suite (resistivity, pH, chloride, and sulfate),

- Visual-manual soil classification by ASTM D2488, and
- Laboratory soil classification by ASTM D2487.

The laboratory reports are provided in Appendix E, and the laboratory results are summarized in Table 2 and on the boring logs provided in Appendix C.

5 Subsurface Conditions

Subsurface conditions were determined based on information gathered during the field investigation(s) and are discussed in the subsections that follow. A photograph log of the soil and bedrock samples are provided in Appendix B.

Seven of the 22 borings were not completed to the target depth due to the presence of bedrock or gravel, cobbles, or boulders that may overlie bedrock. One boring installed in 2017 (KERN-006) was not completed to target depth due to difficult hand augering. The total depth of each boring and the reason for boring termination are summarized in Table 1. Of the eight borings that were not completed to the target depth, four were advanced to a depth of 25 feet bgs or less not including rock coring (KERN-009, KERN-NEW03, KERN-005, and KERN-006).

Lithology and rock encountered during the field investigation were generally consistent with the regional geological and soils mapping for the area.

5.1 Artificial Fill

Apparent imported road base, gravel, or debris mixed in with shallow soil observed within the limits of gravel roadways or access roads were interpreted as artificial fill material. Interpreted artificial fill material was encountered in borings 1-005, 1-006A, KERN-008A, KERN-011, KERN-012, and KERN-013 as shown on the boring logs (Appendix C).

5.2 Alluvium

Portions of the GKR Project alignment lies within relatively flat valley areas except where the alignment extends up into the Tejon Hills to the east or into the Grapevine Canyon and Tehachapi Mountains to the south, as discussed in Section 2.1. Material encountered in valley areas in the soil borings was primarily alluvium.

The alluvium generally consists of non-plastic, silty sand, and sand. Some sandy lean clay and clayey sand is present in borings 1-002, 1-004, 1-005, 1-006A, 1-008, 3-002, 3-004, 3-005, KERN-003, KERN-008A, KERN-009, KERN-011, KERN-012, KERN-NEW01, KERN-NEW02, and KERN-NEW03.

SPT N-values of 10 bpf or less indicate loose or very loose soil density. N-values of 10 bpf or less were encountered in alluvial soils at depths of 15 feet or shallower in four of the 17 borings where SPT was performed (1-006A, 1-008, KERN-011, and KERN-NEW02). Blow counts in the remaining borings and at depths of greater than 15 feet generally increased with depth or had N-values of greater than 10 bpf, except for boring KERN-011 at a depth of 25 feet bgs where the N-value was only 7 bpf.

5.3 Bedrock

Borings located in mountainous areas encountered bedrock and weathered bedrock. Rock coring was performed at two borings (KERN-009 and KERN-NEW03) where drilling was stopped at a depth of 25 feet or less due to difficult drilling conditions. Bedrock in these borings was identified as highly to intensely fractured granodiorite. Rock quality designation (RQD) was measured in each rock core in the field. The upper 8 feet of rock in boring KERN-NEW03 was very poor quality. The rock core was extended to a depth of 11 feet bgs where the RQD indicated fair quality rock. Rock coring was initiated at a depth of 24 feet bgs in boring KERN-009. Very poor quality rock was encountered to a depth of 33 feet bgs. Interbedded sand and rock were encountered from a depth of 33 feet bgs to the total depth of coring at 36 feet bgs.

Three borings (3-004, 5-002, and 5-005) encountered granodiorite bedrock or weathered granodiorite bedrock where SPT testing indicated 2 inches or less of advancement for 50 bpf and recoveries were generally poor. SPT advancement of 6 inches or less for 50 bpf were observed in the deeper sampling intervals of several other borings (1-004, 3-002, 3-005, KERN-011, KERN-NEW01, and KERN-NEW02), which may indicate the borings were in or were approaching weathered bedrock, typically at depths of 20 to 30 feet bgs.

Four of the five borings installed in 2017 (KERN-002, KERN-005, KERN-006, and KERN-013) were terminated due to difficult drilling on suspected bedrock, which is generally consistent with the boring locations in mountainous areas of the GKR Project alignment and generally consistent with nearby borings installed in 2021. Generalized geologic maps of the region show sandstone, mudstone, and conglomerate at KERN-002, granodiorite at KERN-005 and KERN-013, and alluvium and terrace deposits at KERN-006. Hand auger refusal at KERN-006 may have been due to gravel or dense alluvial/terrace deposits.

5.4 Groundwater

Groundwater was observed and measured in four of the 22 soil borings at depths of 13 to 33 feet bgs during boring installation. Depths to groundwater measured during boring installation are summarized in Table 1, and the boring locations where groundwater was observed are shown on Figure 3.

The four borings with observed groundwater were located near surface water features in valleys in the southern parts of the project. Three of the borings were located in the Castac Valley at the southern end of Segment 2; two of these borings were near Grapevine Creek (KERN-011 and KERN-02) and the third was near Castac Lake (3-002). The fourth boring (3-005) was located at the Gorman Substation at the southern end of Segment 3; this location is in Peace Valley near Gorman Creek.

Groundwater likely fluctuates seasonally along the GKR Project alignment and seasonal fluctuations may be significant in some areas. Groundwater levels likely rise during the wet season and fall during the dry season but may also be influenced by groundwater pumping or other local conditions.

6 Geologic Hazards

This section discusses geotechnical and geologic hazards that have the potential to affect the GKR Project. When appropriate, the mapped information presented in the Geologic Hazards Desktop Study (Arcadis 2021b) was updated with information acquired during the soil investigation. Recommendations for addressing geologic hazards are discussed in the subsections that follow.

6.1 Flooding and Erosion

Channelized surface water that contacts structure foundations may have the potential for causing scour, which could undermine the foundation. A list of proposed structures that are in the 100-year and 500-year mapped Federal Emergency Management Agency floodplains is included in the Desktop Geologic Hazard Study (Arcadis 2021b). The locations of soil borings relative to the 100- and 500-year floodplains are shown on Figure 4. Borings that exhibited shallow groundwater levels may have a greater potential for channelized surface water. Groundwater levels measured at the time of drilling are summarized on Table 1.

Non-plastic silt and sand are generally the most erodible soil types, while plastic clay is usually the most erosion-resistant (United States Bureau of Reclamation 2015). Portions of the proposed alignment located in the southern San Joaquin Valley and adjacent to Castac Lake are in or adjacent to the floodplain. Eight of the 22 soil borings (1-006A, 1-008, 3-002, KERN-003, KERN-006, KERN-011, KERN-NEW01, and KERN-NEW02) are located within the footprint of a mapped floodplain or immediately adjacent to a mapped floodplain as shown on Figure 4. Shallow soil at six of these eight borings consists of non-plastic silt and sand, while the shallow soil at borings KERN-003 and KERN-011 contain clayey sand and sandy lean clay, which may still be susceptible to erosion and undermining.

A detailed scour analysis should be performed during design for each structure to be placed in a location with a potential for contact with surface water – inside or outside of the floodplain. The ground surface should be sloped away from each proposed structure to the extent practical. Structure foundations that will be exposed to channelized surface water may need:

- To be supported on a deep foundation that extends beyond the depth of potential scour; or
- Armoring or other soil reinforcement at the ground surface to lower the potential for foundation undermining.

There are dam inundation zones along the GKR Project alignment, which are discussed in more detail in the Desktop Geologic Hazards Study (Arcadis 2021b).

Poles located within flood plains and/or dam inundation zones that require scour analysis are indicated on Table 4.

6.2 Subsidence

As described in the Desktop Geologic Hazards Study (Arcadis 2021b). CDWR (2014) rated the “overall estimated potential for future subsidence” in southern San Joaquin Valley Groundwater Subbasin and the Cummings Valley as “high” and “low,” respectively. CDWR (2014) indicated that the Castac Lake Valley had insufficient data for evaluation.

Subsidence has been recognized as a significant issue in the San Joaquin Valley Groundwater Basin, which is the largest groundwater basin crossed by the project alignment. The principal cause of subsidence is excessive groundwater extraction:

“Subsidence [in the San Joaquin Valley is] caused by withdrawal of groundwater in quantities much larger than replacement can occur, causing a decline of the water level. This type of subsidence is of major concern. This practice has lowered the ground level over a large area south of Bakersfield…” (Kern County 2004, p. 4-1-11).

The southern part of Segment 1, the northern part of Segment 2, and the western end of Segment 4 are located near the southeastern end of the San Joaquin Valley in the Kern County Subbasin, to the south of Bakersfield. While subsidence has historically occurred in this area, it is less significant than in other parts of the San Joaquin Valley. In the most affected part of the GKR Project alignment, near the southern end of Section 1, subsidence was estimated at 1 to 2 feet between 1926 and 1970 (USGS 1975).

Subsidence generally occurs over large areas and changes in subsidence magnitude generally occurs gradually. So, the distance from the ground to the conductors, or the elevation differences between structures, are unlikely to change significantly due to subsidence. There may be impacts to other features along the proposed alignment, such as aqueducts, that may have secondary effects on the project. The potential for subsidence related impacts to the proposed project is considered low.

6.3 Seismic Hazards

Seismic hazards include soil liquefaction (and associated hazards such as lateral spreading), seismically induced settlement, seismically induced landslides, off-set of the alignment due to fault movement, and inundation due to seismically induced failure of water-retention facilities.

Significant portions of the GKR Project alignment are in areas with the potential for strong ground motions, and the alignment crosses numerous active faults. The potential for strong ground motions generally increases from the north near the Kern River Canyon where the 475-year return period peak ground acceleration is less than 0.25 of Earth's gravity (g) to the south at the Gorman Substation where the 475-year return period peak ground acceleration is greater than 0.6 g. A list of structures that are in areas with intermediate period seismic accelerations greater than 0.75 g and a discussion of mapped active faults are included in the Desktop Geologic Hazards Study (Arcadis 2021b).

6.3.1 Liquefaction

Soil liquefaction is a soil behavior phenomenon where loose- to medium-dense non-cohesive soil compacts during strong earthquake shaking, inducing excess pore water pressure in the saturated soil causing a reduction in soil strength. Loose, saturated natural soil and uncompacted or poorly compacted fills are susceptible to liquefaction.

Arcadis performed an SPT-based liquefaction triggering evaluation for each of the four soil borings where groundwater was encountered during the field investigation. Liquefaction triggering was evaluated for seismic event return periods of 475 years and 4,975 years. A summary of the liquefaction evaluation results is presented in Table 3. The location of borings where groundwater was encountered, and those borings that had at least one SPT result with a liquefaction factor of safety of less than one for each of the return periods evaluated are shown on Figure 3. Details of calculations for triggering liquefaction are presented in Appendix F.

Two borings with at least one SPT result with a liquefaction factor of safety of less than one were identified for the 475 year and the 4,975 year return period seismic events. The affected borings (KERN-011 and KERN-012) are located adjacent to each other on the floor of the Grapevine Canyon near the mouth of Castac Valley and in the Castac Valley, respectively. Both borings are located close to Grapevine Creek.

6.3.2 Seismically Induced Settlement

Strong earthquake ground shaking can cause densification of loose soil resulting in settlement. Seismic densification of loose soil above the groundwater table occurs suddenly during ground shaking. Seismic densification of loose soil below the groundwater table may occur following liquefaction as excess pore water pressures in the soil dissipate after ground shaking ceases. If densification does not occur uniformly over an area, the resulting differential settlement can be damaging to structures supported on the loose soil.

Loose to very loose sandy and silty soil was encountered in four of the 17 soil borings where SPT was performed, as described in Section 5.2. These materials have low strength under the small confining pressures present at shallow depths. These loose shallow soils have the potential to settle during seismic ground shaking.

Seismically induced settlement should be evaluated during final design for shallow-founded structures that are supported by shallow, potentially loose soil. Structures on deep foundations or direct-burial poles are less susceptible to seismically induced settlement as they generally get support from deeper, denser soil; however, down drag and associated settlement should be considered during final design.

Methods available to mitigate seismically induced settlement include ground improvement (e.g., excavation and replacement as compacted fill) beneath a proposed shallow foundation or supporting the structure on a deep foundation.

6.3.3 Fault Crossings

Mapped Holocene faults with the potential for surface rupture and the associated Alquist-Priolo Special Studies Zones are presented in the Desktop Geologic Hazards Study (Arcadis 2021b). Alquist-Priolo Special Studies Zones encompass areas within approximately 50 feet of Holocene faults with the potential for surface rupture. New construction for human occupancy within these zones is prohibited unless a comprehensive geologic study shows that the fault does not pose a hazard to the proposed structure. Power transmission support structures are not intended for human occupancy; therefore, they do not fall within the Alquist-Priolo Special Studies Zones requirements. However, these zones represent the best-available information for the potential for fault surface ruptures along the GKR Project alignment. Additional unmapped faults or older faults thought to be inactive may be present along the GKR Project alignment. Structures located directly on or adjacent to a fault may be at a higher risk for damage during a seismic event due to surface rupture of the fault. Structures located within Alquist-Priolo Special Studies Zones are listed in Table 4, and portions of the GKR project alignment that cross mapped Alquist-Priolo Special Studies Zones are shown on Figures 5a through 5d. A detailed description of each fault zone crossed by the project alignment is provided in the Desktop Geologic Hazards Study (Arcadis 2021b).

The following measures should be considered to reduce the potential for damage due to fault rupture for structures located within the Alquist-Priolo zones or structures that will span Alquist-Priolo zones:

- Move the alignment so that structures are not located in Alquist-Priolo zones or away from active fault traces if structures must be placed in an Alquist-Priolo zone,
- The alignment could be modified so that fault crossings are perpendicular to the fault to reduce the potential change in loading on the structure(s) and lines,
- Structures capable of spanning across faults and/or fault zones could be used to reduce the potential for foundation damage or failure, or

- More robust structures and/or structure foundations (including ground improvement) near faults to reduce the potential for damage due to changes in structure loading from fault movement.

If specific structures must be located within Alquist-Priolo zones, additional fault studies may be needed to confirm structure foundations do not span an active surface fault.

The project alignment near the north end of Segment 2 runs parallel to the White Wolf Fault Zone for approximately 1.5 miles. Numerous structures may be located on or near the fault trace or may cross the fault trace at a low angle. A fault study and/or changes to the project alignment may be warranted in this area.

6.4 Settlement

Settlement in granular, non-cohesive soils such as those generally encountered along the GKR Project alignment will occur essentially instantaneously during construction. Loose or very loose non-cohesive soil can densify and cause settlement. Some longer-term consolidation settlement may be possible in the sandy cohesive soils described in Section 5.2 but will likely be limited due to the low plasticity and high sand content of these soils. Static settlement is unlikely to be a significant issue for power poles and related structures because vertical loads are relatively light, and these structures will be constructed with foundations that extend at least 10 feet below ground surface.Detailed settlement analysis should be performed for any heavily loaded structures or equipment and/or for any structures or equipment supported on shallow spread or mat footings located in the vicinity of borings that indicated the presence of loose/very loose granular soil or cohesive soil. Soil with N-values of less than 10 bpf is described in Section 5.2. Loose or very loose soil may need to be improved, or a deep foundation may be required where heavily loaded, shallow founded, settlement sensitive structures will be constructed.

6.5 Expansive Soils

Some clayey soils have the potential to expand or shrink with changes in moisture content. Shallow soil has the greatest potential for large seasonal changes in moisture content. The International Building Code (International Code Council 2018) and the U.S. Army Waterways Experiment Station (Snethen et al. 1977) define soil property criteria that may be indicative of soil with the potential to swell during wetting cycles. Shallow soils that meet the International Building Code and US Army Waterways Experiment Station criteria were generally not encountered during the soil investigation.

The Atterberg limit tests performed on clayey soils encountered during the investigation indicate they have low swell potential because the plasticity indices are less than 25 and the liquid limits are less than 50 percent. As such, the potential for foundation problems due to expansive soils is considered low. If highly plastic clay soil is unexpectedly encountered at shallow depths during subsequent soil investigations or during construction, the potential for soil expansion should be evaluated and accounted-for in design and construction.

6.6 Corrosion

Arcadis collected soil samples from 2 to 3 feet bgs at five boring locations (1-005, 3-005, 5-005, KERN-008A, and KERN-NEW01) and had them analyzed for a standard suite of corrosive soil indicators, including pH, resistivity, chloride concentration, and sulfate concentration. The soil samples analyzed are considered to be representative of soil that will be in contact with shallow concrete and/or steel structures.

Mapped soil corrosive potential for concrete and steel was provided in the Desktop Geologic Hazards Study (Arcadis 2021b) based on data from the NRCS. The laboratory corrosivity results, the soil Unified Soil Classification System group symbol, and the predicted corrosivity based on the mapped NRCS data are summarized in Table 5. Table 5 also includes a summary of the NRCS and California Department of Transportation (CalTrans) ranges for characterizing the corrosive potential of soil samples and the resulting CalTrans corrosivity classification. The soil corrosion laboratory reports are provided in Appendix E.

The laboratory results generally indicate a low corrosive potential in the samples analyzed. These results generally compare well with the mapped NRCS soil corrosion information. Figure 6 and Figure 7 present the mapped NRCS corrosivity potential to steel and concrete, respectively, and a comparison with the laboratory data collected as part of the field investigation.

Measures to mitigate or further investigate soil corrosion should be evaluated by the structural designer and/or a corrosion engineer during final design and should follow the latest recommendations from the American Concrete Institute.

6.7 Landslides and Rockfall

Landslide and rockfall risks depend on slope geometry, local soil and groundwater conditions, and on earthquake potential. As discussed in the Desktop Geologic Hazard Study (Arcadis 2021b), much of the GKR Project alignment is in relatively flat valley areas with low potential for landslides. Maps from the California Geological Survey that show potential landslide susceptibility for the project alignment are provided on Figure 8a through 8c. Local areas where the GKR Project alignment runs on or near steeper slopes that may be susceptible to landslide or rockfall are indicated on Figure 8a through 8c. Areas that may be susceptible to landslide or rockfall are based on the California Geological Survey landslide susceptibility maps, on observations collected during the field work, and on historical records of landslides or rockfall events presented in the Desktop Geologic Hazard Study (Arcadis 2021b). Structures that are located within areas with relatively high landslide susceptibility ratings (Class 6 or above on the CGS maps) are shown on Figures 9a through 9j.

We also reviewed available detailed geologic maps for the areas that may present a higher hazard including Kern River Canyon, Tejon Hills, Grapevine Canyon, and the area near the Gorman Substation. Mapped landslides are not included on maps of the Kern River Canyon area, and the project alignment does not cross any mapped landslide deposits in the Tejon Hills or near the Gorman Substation. Twelve structures are located on mapped Quaternary landslide deposits in Grapevine Canyon, as shown on Figure 10.

Three soil borings, KERN-008A, KERN-009, and KERN-NEW03, were installed on the side slopes and hills in Grapevine Canyon during the soil investigation. Boring KERN-008A was installed at an elevation of approximately 200 feet above the floor of Grapevine Canyon in an area mapped as Quaternary landslide deposits. Soils encountered in this boring consisted of medium dense to very dense sand and silty sand to the total depth explored (50 feet bgs). Based on the topographic and geologic settings and the thickness of unconsolidated material, the unconsolidated material encountered in this boring are interpreted as landslide deposits, however we did not identify a landslide failure surface in the boring. The large area of mapped landslide deposits indicates that these deposits were likely formed as the result of an ancient deep-seated landslide. SCE has operated power structures in this area since this line was installed in the early 20th century which indicates the landslide is not actively moving. Given the apparent age and inactivity of these landslide deposits, no further mitigation appears necessary.

Borings KERN-009 and KERN-NEW03 were installed in areas mapped as consolidated rock. Bedrock was encountered in these borings at depths of 25 feet bgs and 2 feet bgs, respectively. Boring KERN-009 was installed at an elevation approximately 200 feet above the floor of Grapevine Canyon. Unconsolidated materials overlying rock in boring KERN-009 consisted of dense silty sand that are interpreted as colluvium, potentially including minor landslide deposits. SCE has operated power structures in this area since this line was installed in the early 20th century which indicates any landslides in this area are not actively moving.

More detailed studies to quantify the potential for landslides and rockfall in areas with high landslide susceptibility shown on Figures 9a through 9j should be considered during a subsequent stage of design. The analysis should consider the effect of earthquake-related ground motions. The studies should recommend measures to mitigate or eliminate the hazard, which may include:

1. Moving the GKR Project alignment or structure locations,
2. Use of longer spans and/or different structures to avoid placing structures in higher hazard areas,
3. Founding structures on deep foundations adequate to withstand the hazard,
4. Mitigating the potential for landslide on the slope, or
5. Fences, screens, or other barriers to protect structures from rockfall or landslide.

7 Design and Construction Considerations and Recommendations

This section discusses foundation and constructability considerations and provides earthwork recommendations that should be considered during final design. Recommendations for potential future investigation are also provided.

7.1 Foundations

TSPs and LWS poles will likely either be direct-buried or will be installed on deep foundations. Typical foundation types and dimensions are described in Section 1.2. Shallow foundations may be used for small, lightly loaded structures or supports at substations. Deep foundations may be required in certain locations to mitigate the effects of the geologic hazards discussed in Section 6. Micropiles or other types of rock anchors may be more economical than deep foundations where shallow bedrock is present.

Detailed foundation analysis should be performed during final design. Shallow foundation designs should include analysis for allowable bearing pressure, settlement, and lateral support. Deep foundation designs should include a recommendation for the type of deep foundation system and an analysis for axial and lateral load capacity, group efficiency, negative skin friction, settlement, and any load testing requirements. Deep foundations or direct-buried poles located in areas of loose shallow soil may require ground improvement or deeper/more robust designs to compensate for potentially low lateral support of the loose shallow soil. P-Y analysis is commonly used to perform lateral soil support analysis for deep foundation elements. Preliminary soil properties that may be used for P-Y lateral support analysis for the sandy soil that predominates the project alignment are summarized in the table below. We recommend neglecting lateral support from the upper 4 feet of the soil profile to account for the presence of loose soil and/or scour.

Soil Type	Angle of Internal Friction (°)	Unit Weight (pcf)	P-Y Constitutive Model
Shallow Loose to Medium Dense Sandy Soil	30	95	Reese Sand
Deeper Very Dense Sandy Soil	36	110	Reese Sand

The power pole structures will be designed in accordance with ASCE 48, which incorporates ASCE 7 by reference. Seismic design should be in accordance with ASCE 7. Based on the N-values obtained during the soil investigation and the provisions of ASCE 7-16, site class D may be used for preliminary design.

7.2 Constructability

Constructability considerations specific to local soil and rock conditions should be further evaluated during final design. Preliminary constructability considerations based on the field investigation are discussed in the following paragraphs. Other constructability and access considerations not related to local soil and rock conditions such as permitting, right-of-way, cultural/biological resources, and other project impacts and mitigation measures should be evaluated and are discussed in the Proponent's Environmental Assessment (Arcadis 2022).

Much of the GKR Project alignment is on rural, undeveloped land, and large portions of the GKR Project alignment are located in mountainous terrain. Loose sandy soil conditions are present in portions of the GKR Project alignment, which can make access difficult for rubber-tire highway vehicles, particularly during and after rainstorms. Steep slopes and limited work areas can also make access difficult. Specialized vehicles with off-road capability and/or construction of temporary construction access roads and working platforms will likely be required for portions of the GKR Project alignment.

Local soil and rock conditions should be considered when structure and foundation types are determined during final design. Foundation construction practices that require unsupported vertical cuts or open boreholes should be avoided.

Hard gravel, stones, cobbles, boulders, or weathered bedrock will likely make excavation and foundation construction difficult. Soil borings could only be advanced to shallow depths during the soil investigation at borings KERN-NEW03, KERN-005, and KERN-006 due to suspected cobbles, boulders, or bedrock. Mapped NRCS soil survey information describes shallow bedrock at boring location KERN-NEW03 and increasing gravel content at boring location KERN-006. Boring KERN-005 encountered refusal at a depth of 15 feet bgs, which is deeper than then NRCS soil survey information extends. The field data and observations in areas mapped by the NRCS confirm the NRCS soil information at these locations and indicate the NRCS soil survey data are useful for identifying ground conditions that may be difficult for excavation and foundation construction. Special equipment may be required to drill or excavate through large cobbles, boulders, or bedrock for foundation or embedded pole installation.

Arcadis encountered shallow granitic bedrock at boring location KERN-NEW03. Granodiorite is generally strong, high-quality material for foundations and rock anchors, but is generally not very rippable and will likely require coring and/or drilling for foundation construction.

Special care and control of water will be required for construction of foundations below the groundwater table. Shallow non-plastic soils present over large portions of the GKR Project alignment are discussed in Section 5.2. Foundation construction may be difficult because excavations and holes will likely collapse without some type of shoring, casing, drilling fluid, or other support.

7.3 Earthwork

General earthwork requirements are presented in the sections below. Anticipated earthwork includes site preparation, excavation, fill materials, and soil compaction.

7.3.1 Site Preparation

Work areas should be prepared where structures will be placed as well as at staging and access roads. The ground surface should be cleared and grubbed including removal of objectionable material such as trash, debris, green waste, roots, and other deleterious materials. Stripping of the surface soil should extend to the bottom of the root systems of existing grassy vegetation, and grubbing should extend to the bottom of the root systems of trees or shrubs, or to a depth adequate to remove debris or other deleterious material. The depth of grubbing should be increased in areas where large roots, debris, or other deleterious material are encountered during clearing activities. After this material is stripped, any loose or water-softened soils should be removed. Rough grading should be performed to eliminate holes and sharp breaks in grade and to provide surface drainage. Excavations that extend beneath final grades should be backfilled with compacted select fill.

7.3.2 Excavation Conditions and Lateral Earth Pressures

In accordance with the Occupational Safety and Health Administration (OSHA) excavation soil classification system, shallow soil along the GKR Project alignment is generally classified as Type C. OSHA requires that temporary excavations in Type C soil be constructed at slopes or stepped benches with a maximum slope of 1.5H:1V (horizontal:vertical). The OSHA soil type and surrounding conditions should be observed in the field by a competent person in accordance with OSHA requirements. Shoring and/or shielding systems should be designed by an experienced, licensed engineer where cuts will be steeper or deeper than those allowed by OSHA.

Groundwater was encountered at depths as shallow as 13 feet bgs during the investigation. Shallow soil along the GKR Project alignment generally consists of silty and sandy soil that likely has high permeability. Due to the generally non-plastic nature of the native shallow soil, groundwater should be maintained at least 2 feet beneath the floor of any excavations. Groundwater may be controlled using sumps and collection trenches in excavations that will extend a small distance beneath the groundwater table and will likely need to be managed with well extraction points for any deeper excavations. Excavations extending beneath the groundwater table should be closed as quickly as practicable and should be frequently inspected by a competent person.

Deep excavations, excavations extending near or below the groundwater table, and excavations adjacent to existing infrastructure should be evaluated and designed by an experienced, licensed engineer on a case-by-case basis.

Shallow sumps, trenches, and other excavations that are less than 4 feet deep may be designed using the following lateral earth pressures for unsaturated soil:

- Active pressure: 45 pounds per square foot (psf)/foot of depth,
- At-rest pressure: 100 psf/foot of depth.

These pressures should be adjusted to account for local soil conditions and for additional hydrostatic forces for any submerged or saturated soils.

7.3.3 Fill Materials

The following fill material categories are anticipated for this work:

1. Aggregate Base,
2. Select Fill, and
3. Random Fill.

Fill materials should be tested by a California-licensed geotechnical laboratory to confirm they meet the GKR Project requirements and specifications.

Aggregate Base

Imported aggregate base material may be used for roadways, retaining wall backfill, or beneath foundations and/or slabs. Aggregate base material should meet the latest CalTrans specifications. When placed beneath footings, slabs, or for roadways, the aggregate base material should be compacted to at least 95 percent of the Modified Proctor maximum dry density as determined by ASTM D1557. The material should be compacted near the optimum moisture content in 8-inch loose lifts. The upper 6 inches of subgrade soil that will receive aggregate base fill material should be scarified and compacted to 95 percent of the Modified Proctor maximum dry density.

Select Fill

Select fill material may be placed beneath or around structures or in utility trenches. When placed beneath footings, slabs, or for roadways, select fill should be compacted to at least 95 percent of the Modified Proctor maximum dry density as determined by ASTM D1557, unless otherwise specified. The upper 6 inches of subgrade soil that will receive select fill material beneath footings, slabs, or for roadways should be scarified and compacted to 95 percent of the Modified Proctor maximum dry density. When select fill is placed to backfill excavations that will not receive roadways or other surcharge loads or around footings it should be compacted to 90 percent of the Modified Proctor maximum dry density. Select fill may be onsite material or imported and should meet the following requirements:

- Coefficient of uniformity greater than 6 and a coefficient of gradation between 1 and 3,
- Maximum particle size of 3 inches,
- At least 80 percent passing the ¾-inch sieve,
- Plasticity index less than 15, and
- Free of debris, organic material, contaminated soil, or other deleterious material.

Random Fill

Random fill is soil obtained from onsite excavations and grading work that is free from deleterious materials and is capable of being compacted to a dense and non-yielding state but that does not meet the requirements for select fill. Random fill should not be placed beneath slabs, footings, pavement, or behind retaining walls. Random fill may be used for general site grading and should be compacted to at least 90 percent of the Modified Proctor maximum dry density as determined by ASTM D1557.

7.4 Recommendations for Future Geotechnical Investigation

Additional geotechnical investigation is advised to develop site-specific recommendations for structure foundations during final design. The following items may require additional investigation to support final design:

- Delineation of shallow groundwater and the extent of liquefiable soils, particularly in the small alluvial valleys (Castac Valley and Peace Valley) at the southern end of the project, where the alignment runs near surface water features. Cone penetrometer testing may be useful to gather data in fine-grained soils.
- Boring 5-004 could not be installed due to weather related road access constraints. This boring should be installed to provide adequate soil boring coverage and to confirm subsurface conditions in this area.
- Undisturbed sampling of clayey soil to enable settlement analysis for heavily loaded structures on shallow foundations.
- Delineation of bedrock and/or hard soil layers present at greater depth where deep foundation elements may extend into these layers.
- Detailed information about the presence, strength, and quality of shallow bedrock and/or the presence, consistency, and composition of subsurface cobbles or boulders where foundations or embedded poles may extend into these materials. In particular areas near borings KERN-005, KERN-006, and KERN-NEW03 should be further investigated and delineated.

8 Limitations

This GIR has been prepared with a standard of care generally accepted in the geotechnical engineering community of practice. No other warranty, expressed or implied, is made. The analyses and recommendations contained in this GIR are based on our understanding of the GKR Project scope at the time of writing and the data obtained from desktop research, soil borings, laboratory testing, and field observations. Investigation data depict subsurface conditions only at the specific locations and times indicated. Water levels may differ at other locations or at other times of year from conditions occurring at the indicated locations during the field work. The boring logs indicate subsurface conditions only at specific locations and times, and only to the depths penetrated. They do not necessarily reflect strata or water level variations that may exist between such locations. If variations in subsurface conditions from those described are noted during final design and/or construction, the recommendations in this GIR must be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this GIR modified or verified in writing by Arcadis. Arcadis is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analyses without the express written authorization of Arcadis.

9 References

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Tables

Table 1
Boring Summary
Southern California Edison
TLRR Program, Gorman-Kern River Project

Boring ID	Installation Date	Drilling Method	County	Landowner	Total Depth (feet bgs)	Rock Coring (feet)	DTW (feet)	Reason for Boring Termination	Ground Surface Geology	Topography / Vegetation Cover	Nearby Structure and Foundation Type
1-002	12/8/2021	Rotary Wash	Kern	Private	50	0	NE	Target depth	Sand / gravel / cobbles at ground surface, boulders in the vicinity	Top of hill, sparce grass vegetation	LST; four legs on concrete footings
1-004	12/15/2021	HSA	Kern	Private	50	0	NE	Target depth	Alluvium - Silty sand	Base of gently sloping hill	Twin wooden poles with cross-bar; direct burial
1-005	12/15/2021	HSA	Kern	Private	50	0	NE	Target depth	Alluvium - Silty sand	Flat valley area	LST; four legs on concrete footings
1-006A	12/16/2021	HSA	Kern	Private	50	0	NE	Target depth	Alluvium - Silty sand	Flat agricultrual area	Twin wooden poles with cross-bar; direct burial
1-008	12/16/2021	HSA	Kern	Private	50	0	NE	Target depth	Alluvium - Silty sand	Flat agricultrual area	LST; four legs on concrete footings
3-002	12/20/2021	HSA	Kern	Private	50	0	33	Target depth	Alluvium - Silty sand	Flat valley area adjacent to Castac Lake	LST; four legs on concrete footings
3-004	12/2/2021	Rotary Wash	LA	Private	50	0	NE	Target depth	Sand / gravel / cobbles at ground surface, large boulders in area	Top of hill, grassy vegetation	LST; four legs on concrete footings
3-005	12/13/2021	Rotary Wash	LA	Private	50	0	33	Target depth	Sand / gravel at ground surface	Rolling hillside with grassy vegetation	Substation
5-002	12/10/2021	Rotary Wash	Kern	Private	45	0	NE	Bedrock	Sand / gravel / cobbles at ground surface, numerous large boulders in the vicinity	Crest of hill, sparse brush vegetation	3-pole dead end
5-005	12/7/2021	Rotary Wash	Kern	Private	35	0	NE	Bedrock	Sand / gravel / cobbles at ground surface, numerous large boulders in the vicinity	Crest of hill, sparse grass vegetation	LST; four legs on concrete footings
KERN-008A	12/6/2021	Rotary Wash	Kern	Private/TEP	50	0	NE	Target depth	gravel / boulders / rock outcrops	Steep hillside	LST; four legs on concrete footings
KERN-009	12/1/2021	Rotary Wash	Kern	Private	36	12	NE	Bedrock	Sand / gravel / cobbles at ground surface, large boulders in area	Mountainous terrain, grass vegetation	LST; four legs on concrete footings
KERN-011	12/21/2021	HSA	Kern	Private	50	0	13	Target depth	Sand / gravel at ground surface	Flat, grassland	LST; four legs on concrete footings
KERN-012	12/20/2021	HSA	Kern	Private/TEP	50	0	23	Target depth	Sand / gravel at ground surface	Flat, grassland	LST; four legs on concrete footings
KERN-NEW01	12/9/2021	Rotary Wash	Kern	Private	50	0	NE	Target depth	Sand / gravel / cobbles at ground surface, boulders in the vicinity	Flat grassy plains with nearby hills	LST; four legs on concrete footings
KERN-NEW02	12/17/2021	HSA	Kern	Private	50	0	NE	Target depth	Alluvium - Silty sand	Flat agricultrual area	LST; four legs on concrete footings
KERN-NEW03	11/30/2021	Rotary Wash	Kern	Private	11	9	NE	Bedrock	Rock outcrops nearby, sand/gravel ground cover	Top of hill, sparce brush vegetation	LST; four legs on concrete footings
KERN-002	8/3/2017	HSA	Kern	Private	30	0	NE	Bedrock	--	--	--
KERN-003	8/2/2017	HSA	Kern	Private	40	0	NE	Target depth	--	--	--
KERN-005	8/4/2017	HSA	Kern	Private	15	0	NE	Bedrock	--	--	--
KERN-006	8/1/2017	Hand Auger	Kern	Private	5	0	NE	Hard Augering	--	--	--
KERN-013	7/31/2017	HSA	LA	SCE	35	0	NE	Bedrock	--	--	--

Notes:
bgs - below ground surface
DTW - depth to water
HSA - hollow stem auger
LA - Los Angeles
LADWP - Los Angeles Department of Water and Power
LST - lattice steel tower
NE - not encountered

Table 2
Laboratory Results Summary
Southern California Edison
TLRR Program, Gorman-Kern River Project

Boring Number and Sample Number	Depth (feet)	Atterberg Limits*			Moisture Content (%)	Percent Gravel (%)	Percent Sand (%)	Percent Fines (%)
		LL	PL	PI				
1-002_7.0-7.65	7.0-7.65	68	24	44	-	0	10	90
1-002_20.0-20.75	20.0-20.75	-	-	-	-	-	-	83
1-004_7.0-8.15	7.0-8.15	36	14	22	-	7	62	31
1-004_10.0-11.15	10.0-11.15	-	-	-	-	-	-	42
1-005_4.5-5.0	4.5-5.0	-	-	-	-	1	77	22
1-005_10.0-11.25	10.0-11.25	-	-	-	-	2	94	4
1-006a_7.0-8.0	7.0-8.0	-	-	-	-	2	95	3
1-006a_25.0-26.5	25.0-26.5	0	0	0	-	-	-	7
1-008_4.5-5.0	4.5-5.0	-	-	-	-	0	79	21
1-008_10.0-11.5	10.0-11.5	-	-	-	-	0	60	40
3-002_7.0-8.3	7.0-8.3	34	17	17	-	4	45	51
3-002_20.0-21.5	20.0-21.5	-	-	-	-	19	63	18
3-004_7.0-7.9	7.0-7.9	-	-	-	-	8	78	14
3-004_10.0-10.75	10.0-10.75	-	-	-	-	10	76	14
3-005_4.5-5.0	4.5-5.0	-	-	-	-	3	73	24
3-005_20.0-20.6	20.0-20.6	-	-	-	-	-	-	19
5-002_4.5-5.0	4.5-5.0	-	-	-	-	5	70	25
5-005_4.5-5.0	4.5-5.0	-	-	-	-	-	-	17
5-005_10.0-10.65	10.0-10.65	-	-	-	-	0	69	31
KERN-NEW01_10.0-10.75	20.0-20.75	-	-	-	-	1	79	20
KERN-NEW02_7.0-8.5	7.0-8.5	-	-	-	-	2	66	32
GT KERN-008a_10.0-10.85	10.0-10.85	-	-	-	-	3	79	18
GT KERN-009_7.5-8.5	7.5-8.5	-	-	-	-	11	53	36
GT KERN-009_20.0-20.7	20.0-20.7	-	-	-	-	25	37	38
GT KERN-011_15.0-16.5	15.0-16.5	24	17	7	-	5	67	28
GT KERN-011_25.0-26.1	25.0-26.1	-	-	-	-	28	66	6
GT KERN-011_26.1-26.5	26.1-26.5	30	18	12	-	-	-	52
GT KERN-011_30.0-31.5	30.0-31.5	-	-	-	-	-	-	18
GT KERN-012_10.0-11.3	10.0-11.3	-	-	-	-	7	73	20
GT KERN-012_20.0-21.5	20.0-21.5	31	19	12	-	1	74	25
GT KERN-012_30.0-31.5	30.0-31.5	-	-	-	-	2	76	22
GT KERN-012_35.0-36.5	35.0-36.5	31	16	15	-	-	-	68
GT KERN-012_48.5-50.0	48.5-50.0	-	-	-	-	6	72	22
GT-KERN-002	5-6.5	-	-	-	-	11	55	34
GT-KERN-002	5.5-6	-	-	-	1.4	-	-	-
GT-KERN-002	18.5-20	-	-	-	-	16	42	42
GT-KERN-002	19-19.5	0	0	0	2.4	-	-	-
GT-KERN-003	5-6.5	-	-	-	-	0	38	62
GT-KERN-003	5.5-6	51	13	38	15.5	-	-	-
GT-KERN-003	8.5-10	-	-	-	-	0	34	66
GT-KERN-003	9-9.5	-	-	-	19.0	-	-	-
GT-KERN-003	33.5-35	-	-	-	-	0	80	20
GT-KERN-003	34-34.5	-	-	-	3.3	-	-	-
GT-KERN-005	5-6.5	-	-	-	-	9	58	33
GT-KERN-005	5.5-6	-	-	-	6.6	-	-	-
GT-KERN-013	8.5-10	-	-	-	-	15	61	24
GT-KERN-013	9-9.5	-	-	-	11.8	-	-	-
GT-KERN-013	18.5-20	-	-	-	-	1	62	37

Table 2
Laboratory Results Summary
Southern California Edison
TLRR Program, Gorman-Kern River Project

Boring Number and Sample Number	Depth (feet)	Atterberg Limits*			Moisture Content (%)	Percent Gravel (%)	Percent Sand (%)	Percent Fines (%)
		LL	PL	PI				
GT-KERN-013	19-19.5	-	-	-	9.8	-	-	-

Notes:
% - percent
- not tested
LL - liquid limit
PI - plasticity index
PL - plastic limit
* - Material determined to be non-plastic in the laboratory is shown with a plastic limit, liquid limit, and plasticity index of 0 .

Table 3
Soil Liquefaction Summary
Southern California Edison
TLRR Program, Gorman-Kern River Project

Boring ID	Total Depth (feet bgs)	DTW	Total # of SPTs	475 year return period		2,475 year return period	
				# of SPT results with FS<1	Minimum Liquefaction FS	# of SPT results with FS<1	Minimum Liquefaction FS
KERN-011	50	13	10	2	0.2	3	0.1
KERN-012	50	23	10	2	0.6	5	0.3
3-002	50	33	10	0	NA	0	NA
3-005	50	33	10	0	NA	0	NA

Notes:
bgs - below ground surface
DTW - depth to water
FS - factor of safety
NA - not applicable
NE - not encountered
SCE - Southern California Edison
SPT - standard penetration test

Table 4. Structure Summary
Gorman-Kern River 66 kV Project, Transmission Line Rating Remediation Project

SEG	STATUS	STR_ID	STR_TYPE	MATL	HARDWARE	STR_HT	KV	CL_HUB_ELEV	LINE_ANGLE	AHEAD_SPAN	CIRCUIT_TYPE	CIRCUIT_1	CIRCUIT_2	CONST_NO	LATITUDE	LONGITUDE	PROJECT_NAME	UNIT_AGE	ROCKTYPE1	ROCKTYPE2	Ground Motion	Landslide	AP_Zone	Liquefaction	Floodzone	Inundation	Inundation Dam	Erosion	MUSYM	MUKEY	muname	WEI	WEG	HydroGRP	CorrConcre	CorrSteel
1	New	2080934E 2080935E	Monopole	LWS	Pin/Post	65.5	66	1163.142	0.3306	539.565	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1039	35.379945	-118.808085	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	8	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2080942E 2080943E	Monopole	LWS	Pin/Post	65.5	66	1069.524	0.1732	519.062	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1046	35.367821	-118.808048	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2080944E 2080945E	Monopole	TSP	Dead End	60	66	1152.175	-0.0923	976.141	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1048	35.364414	-118.808032	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088880E 2088879E	Monopole	LWS	Pin/Post	56.5	66	1055.061	0.1683	352.81	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1050	35.36106	-118.808006	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	8	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088882E 2088881E	Monopole	LWS	Pin/Post	56.5	66	1181.621	-0.5169	278.308	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1044	35.370463	-118.808073	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	9	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088884E 2088883E	Monopole	LWS	Pin/Post	65.5	66	889.248	-0.2022	354.525	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1033	35.390571	-118.808117	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.55	8	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088886E 2088885E	Monopole	LWS	Pin/Post	65.5	66	832.558	-0.1583	576.549	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1030	35.395388	-118.808139	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.55	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088888E 2088887E	Monopole	LWS	Pin/Post	65.5	66	836.37	0.0819	446.601	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1029	35.396615	-118.808141	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	7	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088890E 2088889E	Monopole	LWS	Pin/Post	61	66	869.29	-0.019	419.176	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1027	35.399333	-118.808153	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	10	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088892E 2088891E	Monopole	LWS	Pin/Post	56.5	66	982.608	0.0557	736.219	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1026	35.401356	-118.80816	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	7	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2088894E 2088893E	Monopole	TSP	Dead End	60	66	1051.434	-0.0758	395.978	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1025	35.402444	-118.808166	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	7	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2089090E 2089091E	Monopole	LWS	Suspension	65.5	66	1285.112	-0.0724	980.651	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1042	35.37433	-118.808094	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	8	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2145332E 2145333E	Monopole	LWS	Pin/Post	61	66	569.363	0.0334	689.011	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1114	35.263232	-118.807219	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	2145334E 2145335E	Monopole	LWS	Pin/Post	56.5	66	574.145	0.0345	701.497	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1113	35.265159	-118.807246	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	213ne	2218090	Calicreek loamy coarse sand, 0 to 2 percent slopes, occasionally flooded	134	2	A	Moderate	High
1	New	2145336E 2145337E	Monopole	LWS	Pin/Post	65.5	66	578.877	-0.0786	725.497	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1112	35.267152	-118.807274	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	213ne	2218090	Calicreek loamy coarse sand, 0 to 2 percent slopes, occasionally flooded	134	2	A	Moderate	High
1	New	2145338E 2145339E	Monopole	LWS	Pin/Post	56.5	66	584.277	0.0021	699.451	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1111	35.269074	-118.807299	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	209	467326	Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	2145340E 2145341E	Monopole	LWS	Pin/Post	61	66	589.14	0.1398	700.166	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1110	35.270997	-118.807324	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	209	467326	Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	2145342E 2145343E	Monopole	LWS	Pin/Post	61	66	594.575	-0.1563	700.453	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1109	35.272921	-118.807355	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	209	467326	Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	2145344E 2145345E	Monopole	LWS	Pin/Post	61	66	598.568	0.0669	702.301	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1108	35.274851	-118.807379	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	209	467326	Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	2145346E 2145347E	Monopole	LWS	Pin/Post	56.5	66	603.13	-0.0253	664.319	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1107	35.276676	-118.807404	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	209	467326	Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	2175091E 2175090E	Monopole	LWS	Pin/Post	74.5	66	618.049	-0.1779	718.627	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1104	35.282562	-118.807488	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	217	467333	Whitewolf-Riverwash complex, 0 to 5 percent slopes, frequently flooded	n/a	n/a	n/a	n/a	n/a
1	New	2241805E 2241806E	Monopole	LWS	Pin/Post	65.5	66	1028.369	-0.2157	298.934	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1052	35.358416	-118.80799	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	9	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241807E 2241808E	Monopole	LWS	Pin/Post	56.5	66	1066.426	0.1758	304.508	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1053	35.357595	-118.807982	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241809E 2241810E	Monopole	LWS	Pin/Post	56.5	66	1048.649	-0.2084	434.946	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1054	35.356759	-118.807977	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	8	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241811E 2241812E	Monopole	LWS	Pin/Post	65.5	66	983.925	-0.201	342.873	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1056	35.354589	-118.807959	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241813E 2241814E	Monopole	LWS	Pin/Post	52	66	894.319	-0.443	348.52	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1060	35.349665	-118.807923	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	193	467315	Chanac-Pleito complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241815E 2241816E	Monopole	LWS	Pin/Post	52	66	865.745	-0.336	346.053	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1062	35.347735	-118.807908	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	193	467315	Chanac-Pleito complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241817E 2241818E	Monopole	LWS	Pin/Post	52	66	844.753	-0.4342	332.406	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1064	35.345776	-118.807893	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	Yes	No	No	No	n/a	No	193	467315	Chanac-Pleito complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241819E 2241821E	Monopole	LWS	Pin/Post	52	66	829.202	-0.0843	302.75	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1066	35.343771	-118.807874	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241821E 2241822E	Monopole	LWS	Pin/Post	56.5	66	823.651	-0.0541	397.11	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1070	35.340185	-118.807852	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241821E 2241822E	Monopole	LWS	Pin/Post	52	66	825.317	-0.0502	355.815	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1068	35.341995	-118.807862	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241825E 2241826E	Monopole	LWS	Pin/Post	56.5	66	810.724	0.0611	334.976	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1072	35.338095	-118.807839	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	2241827E 2241828E	Monopole	LWS	Pin/Post	52	66	803.607	-0.6162	332.91	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1074	35.336164	-118.807834	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	Existing	Kern River Substation	Horizontal Configuration	Lattice Steel	Dead End	33.68	66	962.993	-99	-99	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1000	35.460117	-118.779649	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.55	10	No	No	No	Yes	Lake Isabella	Yes	139ne	2371566	Riverwash	n/a	n/a	n/a	n/a	n/a
1	Existing	M0-T1	Vertical Configuration	Lattice Steel	Dead End	100.63	66	937.565	-5.4945	1791.329	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1001	35.459517	-118.77984	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.55	10	No	No	No	Yes	Lake Isabella	Yes	139ne	2371566	Riverwash	n/a	n/a	n/a	n/a	n/a
1	Existing	M0-T2	Vertical Configuration	Lattice Steel	Dead End	115.61	66	1185.776	15.1052	3281.731	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1002	35.454657	-118.780791	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.25	10	No	No	No	Yes	Lake Isabella	Yes	267	467359	Cieneba-Vista-Rock outcrop complex, 30 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M10-T1	Monopole	LWS	Pin/Post	56.5	66	779.184	0.0082	701.232	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1083	35.320988	-118.807727	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	207	467325	Whitewolf loamy sand, 0 to 2 percent slopes, rarely flooded	n/a	n/a	n/a	n/a	n/a
1	New	M10-T2	Monopole	LWS	Pin/Post	61	66	775.003	-0.0034	701.962	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1084	35.319061	-118.807714	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	207	467325	Whitewolf loamy sand, 0 to 2 percent slopes, rarely flooded	n/a	n/a	n/a	n/a	n/a
1	New	M10-T3	Monopole	LWS	Pin/Post	61	66	768.631	-0.0071	700.702	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1085	35.317133	-118.807702	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	207	467325	Whitewolf loamy sand, 0 to 2 percent slopes, rarely flooded	n/a	n/a	n/a	n/a	n/a
1	New	M10-T4	Monopole	LWS	Pin/Post	56.5	66	761.545	-0.0123	700.882	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1086	35.315208	-118.807689	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M10-T5	Monopole	LWS	Pin/Post	61	66	757.151	0.0497	701.503	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1087	35.313282	-118.807675	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M10-T6	Monopole	LWS	Pin/Post	61	66	752.308	-0.0874	701.901	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1088	35.311355	-118.807664	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M10-T7	Monopole	LWS	Pin/Post	61	66	744.722	0.0018	700.691	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1089	35.309427	-118.807648	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T1	Monopole	LWS	Pin/Post	56.5	66	742.618	-0.0761	701.21	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1090	35.307502	-118.807633	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T2	Monopole	LWS	Pin/Post	61	66	740.209	0.041	700.02	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1091	35.305575	-118.807615	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T3	Monopole	LWS	Pin/Post	61	66	731.499	-0.0548	701.47	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1092	35.303652	-118.807599	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T4	Monopole	LWS	Pin/Post	56.5	66	724.399	-0.0131	701.87	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1093	35.301725	-118.80758	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T5	Monopole	LWS	Pin/Post	56.5	66	714.857	0.0359	701.12	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1094	35.299797	-118.807561	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T6	Monopole	LWS	Pin/Post	56.5	66	706.284	-0.0098	701.14	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1095	35.297871	-118.807543	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T7	Monopole	LWS	Pin/Post	65.5	66	696.068	-0.0066	702.02	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1096	35.295944	-118.807525	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M11-T8	Monopole	LWS	Pin/Post	56.5	66	685.835	0.0213	699.67	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1097	35.294016	-118.807506	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M12-T1	Monopole	LWS	Pin/Post	56.5	66	675.347	-0.0426	695.37	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1098	35.292094	-118.807489	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M12-T2	Monopole	LWS	Pin/Post	56.5	66	665.776	0.1393	610.402	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1099	35.290183	-118.80747	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M12-T3	Monopole	LWS	Pin/Post	65.5	66	657.808	-0.0816	499.51	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1100	35.288506	-118.807458	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	207	467325	Whitewolf loamy sand, 0 to 2 percent slopes, rarely flooded	n/a	n/a	n/a	n/a	n/a
1	New	M12-T4	Monopole	LWS	Pin/Post	56.5	66	677.208	0.018	546.46	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1101	35.287134	-118.807446	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	7	No	No	No	No	n/a	No	240	467340	Dune land	n/a	n/a	n/a	n/a	n/a
1	New	M12-T5	Monopole	TSP	Dead End	50	66	712.598	5.4233	280.837	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1102	35.285633	-118.807433	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	7	No	No	No	No	n/a	No	240	467340	Dune land	n/a	n/a	n/a	n/a	n/a
1	New	M12-T6	Monopole	TSP	Dead End	60	66	687.039	-5.5895	838.033	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1103	35.284864	-118.807516	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	10	No	No	100-year	No	n/a	Yes	240	467340	Dune land	n/a	n/a	n/a	n/a	n/a
1	New	M12-T8	Monopole	LWS	Pin/Post	56.5	66	615.835	0.0998	699.913	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1105	35.280587	-118.807457	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	209	467326	Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	M13-T1	Monopole	LWS	Pin/Post	61	66	609.466	0.0082	723.919	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1106	35.278665	-118.807431	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	209	467326	Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	M14-T2	Monopole	LWS	Pin/Post	56.5	66	564.91	0.0057	701.032	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1115	35.261339	-118.807194	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M14-T3	Monopole	LWS	Pin/Post	61	66	560.625	-0.0205	700.643	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1116	35.259413	-118.807169	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M14-T4	Monopole	LWS	Pin/Post	56.5	66	555.736	0.036	700.942	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1117	35.257488	-118.807143	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M14-T5	Monopole	LWS	Pin/Post	61	66	551.562	-0.0296	700.173	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1118	35.255563	-118.807119	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M14-T6	Monopole	LWS	Pin/Post	56.5	66	548.964	-0.0134	702.233	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1119	35.253639	-118.807094	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M14-T7	Monopole	LWS	Pin/Post	61	66	542.603	0.0021	700.813	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1120	35.25171	-118.807068	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M14-T8	Monopole	LWS	Pin/Post	56.5	66	538.785	-0.018	700.764	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1121	35.249784	-118.807042	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M15-T1	Monopole	LWS	Pin/Post	56.5	66	534.065	-0.0055	701.684	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1122	35.247859	-118.807015	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M15-T2	Monopole	LWS	Pin/Post	56.5	66	530.149	-0.0288	701.045	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1123	35.245932	-118.806988	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M15-T3	Monopole	LWS	Pin/Post	56.5	66	524.862	-0.0649	700.319	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1124	35.244006	-118.80696	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M15-T4	Monopole	LWS	Pin/Post	56.5	66	519.983	0.1727	700.891	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1125	35.242082	-118.806929	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M15-T5	Monopole	LWS	Pin/Post	56.5	66	514.74	-0.003	702.632	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1126	35.240156	-118.806905	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M15-T6	Monopole	LWS	Pin/Post	65.5	66	511.107	0.0624	727.45	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1127	35.238226	-118.806881	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M15-T7	Monopole	LWS	Pin/Post	61	66	506.865	-0.0441	699.771	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1128	35.236227	-118.806859	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T1	Monopole	LWS	Pin/Post	61	66	502.73	-0.03	701.342	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1129	35.234305	-118.806836	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T2	Monopole	LWS	Pin/Post	61	66	497.518	0.0037	699.212	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1130	35.232378	-118.806812	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T3	H-Frame	TSP	Dead End	70	66	493.38	0.0265	701.031	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1131	35.230457	-118.806788	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T4	H-Frame	TSP	Dead End	55	66	489.783	-99	700.981	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1132	35.228531	-118.806765	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T5	Monopole	LWS	Pin/Post	83.5	66	485.299	-0.0363	699.212	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1133	35.226605	-118.806742	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T6	Monopole	LWS	Pin/Post	97	66	480.658	0.0021	701.482	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1134	35.224684	-118.806717	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T7	Monopole	LWS	Pin/Post	97	66	476.963	0.0169	700.082	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1135	35.222757	-118.806693	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M16-T8	Monopole	LWS	Pin/Post	65.5	66	473.362	0.0148	700.611	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1136	35.220834	-118.806669	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M17-T1	Monopole	LWS	Pin/Post	61	66	469.158	-0.0278	700.382	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1137	35.218909	-118.806646	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M17-T2	Monopole	LWS	Pin/Post	74.5	66	465.814	-0.0501	699.724	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1138	35.216985	-118.806622	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M17-T3	Monopole	TSP	Dead End	60	66	462.153	0.0741	702.221	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1139	35.215063	-118.806595	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M17-T4	Monopole	LWS	Pin/Post	61	66	457.812	-0.023	701.262	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1140	35.213133	-118.806572	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M17-T5	Monopole	LWS	Pin/Post	56.5	66	453.682	-0.0072	702.142	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1141	35.211207	-118.806548	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M17-T6	Monopole	LWS	Pin/Post	61	66	450.723	-0.0193	699.833	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1142	35.209278	-118.806523	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M17-T7	Monopole	LWS	Pin/Post	56.5	66	446.712	0.0271	704.572	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1143	35.207355	-118.806498	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T1	Monopole	LWS	Pin/Post	56.5	66	441.491	-0.0398	701.243	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1144	35.205419	-118.806474	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T2	Monopole	LWS	Pin/Post	56.5	66	438.215	0.0053	702.853	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1145	35.203493	-118.806448	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T3	Monopole	LWS	Pin/Post	65.5	66	435.197	-0.0126	701.393	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1146	35.201562	-118.806422	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T4	Monopole	LWS	Pin/Post	52	66	431.493	0.0113	700.753	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1147	35.199635	-118.806396	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T5	Monopole	LWS	Pin/Post	61	66	429.684	-0.024	699.754	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1148	35.19771	-118.80637	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T6	Monopole	LWS	Pin/Post	52	66	426.399	-0.0023	700.194	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1149	35.195788	-118.806344	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T7	Monopole	LWS	Pin/Post	65.5	66	423.586	0.009	700.234	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1150	35.193864	-118.806317	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M18-T8	Monopole	LWS	Pin/Post	56.5	66	421.764	0.0007	699.704	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1151	35.19194	-118.80629	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M19-T1	Monopole	LWS	Pin/Post	56.5	66	419.316	0.0024	699.484	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1152	35.190018	-118.806264	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M19-T2	Monopole	LWS	Pin/Post	61	66	416.36	0.0028	700.853	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1153	35.188096	-118.806238	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M19-T3	Monopole	LWS	Pin/Post	56.5	66	413.552	-0.0295	700.495	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1154	35.186171	-118.806212	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.65	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M19-T4	Monopole	LWS	Pin/Post	56.5	66	411.415	0.0368	700.333	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1155	35.184246	-118.806184	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M19-T5	Monopole	LWS	Pin/Post	56.5	66	409.559	-0.9578	701.546	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1156	35.182322	-118.806159	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M19-T6	Monopole	TSP	Dead End	60	66	407.969	-4.9206	700.19	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1157	35.180395	-118.806094	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
1	New	M19-T7	Monopole	LWS	Pin/Post	56.5	66	406.756	-0.0611	700.642	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1158	35.178484	-118.805828	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
1	Existing	M1-T1	Vertical Configuration	Lattice Steel	Dead End	101.9	66	1355.712	11.6991	1418.522	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1003	35.446434	-118.785307	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.25	8	No	No	No	Yes	Lake Isabella	Yes	267	467359	Cieneba-Vista-Rock outcrop complex, 30 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	Existing	M1-T2	Vertical Configuration	Lattice Steel	Suspension	115.98	66	1601.582	-0.0795	590.189	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1004	35.443277	-118.788099	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.25	8	No	No	No	Yes	Lake Isabella	Yes	267	467359	Cieneba-Vista-Rock outcrop complex, 30 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	Existing	M1-T3	Vertical Configuration	Lattice Steel	Dead End	124.91	66	1574.503	21.2238	2757.198	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1005	35.441962	-118.789259	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.25	8	No	No	No	No	n/a	No	267	467359	Cieneba-Vista-Rock outcrop complex, 30 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	Existing	M1-T4	Vertical Configuration	Lattice Steel	Dead End	103.03	66	800.264	-17.0065	694.662	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1006	35.437841	-118.797024	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	5	No	Yes	No	Yes	Lake Isabella	Yes	201	467323	Pleito-Chanac-Raggulch complex, 5 to 30 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M20-T1	Monopole	TSP	DEAD END	60	66	405.003	3.8044	696.364	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1159	35.176572	-118.80556	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
1	New	M20-T2	Monopole	LWS	Pin/Post	61	66	404.186	0.0636	557.437	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1160	35.174661	-118.805447	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	100-year	No	n/a	Yes	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
1	Remove	M2-T2	H-Frame	Wood	Dead End	60.988	66	790.735	-4.3819	-99	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1008	35.436325	-118.798576	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	5	No	Yes	No	No	n/a	No	201	467323	Pleito-Chanac-Raggulch complex, 5 to 30 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M2-T3	Monopole	TSP	Dead End	65	66	772.786	-3.9062	734.433	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1009	35.435215	-118.799483	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	7	No	Yes	No	No	n/a	No	201	467323	Pleito-Chanac-Raggulch complex, 5 to 30 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M2-T4	Monopole	TSP	Dead End	65	66	929.666	-0.0522	483.427	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1010	35.433465	-118.80071	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	7	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M2-T5	Monopole	TSP	Dead End	55	66	921.609	0.037	1020.826	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1011	35.432312	-118.801516	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	7	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M2-T6	Monopole	TSP	Dead End	60	66	845.929	-0.0213	801.603	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1012	35.429879	-118.80322	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	7	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M2-T7	Monopole	TSP	Dead End	55	66	928.255	-4.8532	588.46	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1013	35.427968	-118.804558	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	5	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M2-T8	Monopole	TSP	Dead End	60	66	888.087	-5.1589	646.771	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1014	35.426503	-118.805391	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	8	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M2-T9	Monopole	TSP	Dead End	55	66	956.499	-5.0002	426.008	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1015	35.424831	-118.806126	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	8	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M3-T1	Monopole	TSP	Dead End	60	66	998.429	0.0424	877.308	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1016	35.423699	-118.806491	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	8	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M3-T2	Monopole	TSP	Dead End	60	66	807.004	-0.1674	735.667	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1017	35.42137	-118.807245	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	9	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M3-T3	Monopole	TSP	Dead End	65	66	909.352	-7.7013	875.385	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1018	35.419414	-118.807871	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	5	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M3-T4	Monopole	TSP	Dead End	60	66	856.804	-7.1843	954.769	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1019	35.417027	-118.808227	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	5	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M3-T5	Monopole	TSP	Dead End	60	66	935.025	0.0242	1408.605	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1020	35.414404	-118.808215	Gorman-Kern River	Oligocene to Pliocene	sandstone	mudstone	0.45	5	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M3-T6	Monopole	TSP	Dead End	55	66	1041.347	0.0282	779.52	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1021	35.410534	-118.808199	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	8	No	No	No	No	n/a	No	205	467324	Pleito-Trigo-Chanac complex, 15 to 50 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M4-T1	Monopole	LWS	Pin/Post	56.5	66	1050.097	-0.0287	882.65	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1022	35.408393	-118.808191	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M4-T2	Monopole	TSP	Dead End	55	66	1058.738	-0.0345	789.396	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1023	35.405968	-118.808181	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	8	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M4-T3	Monopole	TSP	Dead End	55	66	973.601	0.0672	493.4	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1024	35.403799	-118.808171	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	8	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M4-T7	Monopole	TSP	Dead End	50	66	833.068	0.01	570.477	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1028	35.398182	-118.808148	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	7	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M5-T1	Monopole	LWS	Pin/Post	61	66	847.231	0.057	808.218	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1031	35.393804	-118.80813	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.55	0	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M5-T2	Monopole	TSP	Dead End	55	66	848.962	0.0844	368.332	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1032	35.391583	-118.80812	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.55	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M5-T3	Monopole	TSP	Dead End	55	66	918.89	0.1037	708.746	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1034	35.389597	-118.80811	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.55	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M5-T4	Monopole	LWS	Pin/Post	83.5	66	1071.579	0.0376	651.609	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1035	35.38765	-118.808101	Gorman-Kern River	Oligocene to Pleistocene	sandstone	conglomerate	0.45	9	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M5-T7	Monopole	LWS	Pin/Post	92.5	66	1170.71	0.1639	582.624	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1038	35.381545	-118.808082	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M6-T11	Monopole	TSP	Dead End	55	66	1039.282	-0.0599	720.966	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1047	35.366395	-118.808043	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.55	0	Yes	No	100-year	No	n/a	Yes	217	467333	Whitewolf-Riverwash complex, 0 to 5 percent slopes, frequently flooded	n/a	n/a	n/a	n/a	n/a
1	New	M6-T2	Monopole	TSP	Dead End	55	66	1158.523	-0.1602	624.782	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1040	35.378462	-118.808098	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	8	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M6-T7	Monopole	TSP	Dead End	110	66	1152.982	0.2181	426.931	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1043	35.371636	-118.808076	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	8	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M6-T9	Monopole	LWS	Suspension	83.5	66	1134.083	0.2603	683.425	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1045	35.369698	-118.808063	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M7-T10	Monopole	LWS	Pin/Post	56.5	66	919.297	0.0616	350.051	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1058	35.351587	-118.807932	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	7	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M7-T2	Monopole	TSP	Dead End	55	66	1084.179	-0.1572	244.591	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1049	35.361732	-118.808013	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M7-T4	Monopole	TSP	Dead End	50	66	992.194	0.0883	609.599	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1051	35.360091	-118.807999	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	9	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M7-T8	Monopole	LWS	Pin/Post	52	66	1020.282	0.1857	354.948	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1055	35.355564	-118.807965	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M7-T9	Monopole	LWS	Suspension	88	66	948.777	0.1157	749.741	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1057	35.353647	-118.807949	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T1	Monopole	LWS	Pin/Post	52	66	908.236	0.2215	349.667	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1059	35.350625	-118.807925	Gorman-Kern River	Miocene to Pleistocene	sandstone	conglomerate	0.55	0	No	No	No	No	n/a	No	193	467315	Chanac-Pleito complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T2	Monopole	LWS	Pin/Post	52	66	880.114	0.3516	353.971	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1061	35.348707	-118.807912	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	193	467315	Chanac-Pleito complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T3	Monopole	LWS	Pin/Post	52	66	855.198	0.3559	366.92	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1063	35.346784	-118.807897	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	193	467315	Chanac-Pleito complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T4	Monopole	LWS	Pin/Post	52	66	835.252	0.3001	397.521	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1065	35.344863	-118.807881	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	Yes	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T5	Monopole	LWS	Pin/Post	52	66	828.089	0.1399	343.698	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1067	35.342939	-118.807867	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T6	Monopole	LWS	Pin/Post	52	66	823.199	0.1003	302.805	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1069	35.341017	-118.807855	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T7	Monopole	LWS	Pin/Post	52	66	817.163	-0.0727	363.857	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1071	35.339094	-118.807846	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M8-T8	Monopole	LWS	Pin/Post	52	66	808.524	0.2884	367.624	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1073	35.337174	-118.807833	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M9-T1	Monopole	LWS	Pin/Post	56.5	66	802.805	0.3123	698.883	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1075	35.33525	-118.807822	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M9-T2	Monopole	TSP	Dead End	65	66	799.924	-0.0066	371.612	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1076	35.33333	-118.80781	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	144	467286	Calicreek sandy loam, 0 to 2 percent slopes, occasionally flooded	n/a	n/a	n/a	n/a	n/a
1	New	M9-T3	Monopole	TSP	Dead End	65	66	800.656	-0.0358	424.691	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1077	35.332309	-118.807804	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	152	467291	Pleito gravelly sandy clay loam, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
1	New	M9-T4	Monopole	TSP	Dead End	85	66	796.747	-0.0042	1007.083	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1078	35.331142	-118.807796	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a

Table 4. Structure Summary

Gorman-Kern River 66 kV Project, Transmission Line Rating Remediation Project

SEG	STATUS	STR_ID	STR_TYPE	MATL	HARDWARE	STR_HT	KV	CL_HUB_ELEV	LINE_ANGLE	AHEAD_SPAN	CIRCUIT_TYPE	CIRCUIT_1	CIRCUIT_2	CONST_NO	LATITUDE	LONGITUDE	PROJECT_NAME	UNIT_AGE
1	New	M9-T5	Monopole	TSP	Dead End	85	66	792.85	0.0049	586.222	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1079	35.328375	-118.807776	Gorman-Kern River	Pliocene to Holocene
1	New	M9-T6	Monopole	LWS	Pin/Post	65.5	66	791.113	0.0012	700.332	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1080	35.326765	-118.807765	Gorman-Kern River	Pliocene to Holocene
1	New	M9-T7	Monopole	LWS	Pin/Post	74.5	66	787.255	0.04	700.833	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1081	35.324841	-118.807752	Gorman-Kern River	Pliocene to Holocene
1	New	M9-T8	Monopole	LWS	Pin/Post	56.5	66	784.531	-0.0296	701.522	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1082	35.322915	-118.80774	Gorman-Kern River	Pliocene to Holocene
1	New	W2080930E E2080931E	Monopole	TSP	Dead End	65	66	1294.171	0.0238	908.06	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1036	35.38586	-118.808094	Gorman-Kern River	Oligocene to Pleistocene
1	New	W2344579E E2344580E	Monopole	TSP	Dead End	65	66	1298.431	-0.5014	879.404	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1041	35.376746	-118.808107	Gorman-Kern River	Miocene to Pleistocene
1	New	W4683791E E4683792E	Monopole	TSP	Dead End	60	66	790.431	-1.8906	511.071	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1007	35.436379	-118.798524	Gorman-Kern River	Oligocene to Pliocene
1	New	W4686212E E4686213E	Monopole	LWS	Suspension	61	66	1274.884	0.08	662.524	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	GORMAN-KERN RIVER	1037	35.383365	-118.808085	Gorman-Kern River	Miocene to Pleistocene
2	New	2175040E	Monopole	TSP	Dead End	75	66	1853.274	-10.3083	1443.944	Single Circuit	GORMAN-KERN RIVER	TBD	2146	34.929966	-118.921978	Gorman-Kern River	Pliocene to Holocene
2	New	2175041E	Monopole	TSP	Dead End	60	66	2112.572	34.2197	640.586	Single Circuit	GORMAN-KERN RIVER	TBD	2147	34.926496	-118.919642	Gorman-Kern River	Pliocene to Holocene
2	New	2299363E 2299364E	H-Frame	LWS	Suspension	52	66	840.176	-0.2158	763.601	Single Circuit	GORMAN-KERN RIVER	TBD	2098	35.001336	-118.861288	Gorman-Kern River	Pliocene to Holocene
2	New	2344595E 2344594E	Monopole	LWS	Pin/Post	56.5	66	452.981	-0.1128	716.521	Single Circuit	GORMAN-KERN RIVER	TBD	2010	35.15619	-118.80999	Gorman-Kern River	Pliocene to Holocene
2	New	4012794E 4012795E	Monopole	LWS	Pin/Post	65.5	66	482.605	-0.2988	341.151	Single Circuit	GORMAN-KERN RIVER	TBD	2014	35.150422	-118.814947	Gorman-Kern River	Pliocene to Holocene
2	New	M20-T3	Monopole	LWS	Dead End	65	66	404.454	2.9428	841.617	Single Circuit	GORMAN-KERN RIVER	TBD	2001	35.173131	-118.805359	Gorman-Kern River	Pliocene to Holocene
2	New	M20-T4	Monopole	LWS	Pin/Post	65.5	66	405.64	0.597	699.15	Single Circuit	GORMAN-KERN RIVER	TBD	2002	35.170819	-118.805371	Gorman-Kern River	Pliocene to Holocene
2	New	M20-T5	Monopole	LWS	Pin/Post	56.5	66	407.423	5.0132	699.87	Single Circuit	GORMAN-KERN RIVER	TBD	2003	35.168898	-118.805405	Gorman-Kern River	Pliocene to Holocene
2	New	M20-T6	Monopole	LWS	Pin/Post	56.5	66	410.399	-0.0258	699.065	Single Circuit	GORMAN-KERN RIVER	TBD	2004	35.166985	-118.805644	Gorman-Kern River	Pliocene to Holocene
2	New	M20-T7	Monopole	LWS	Pin/Post	65.5	66	413.367	5.071	697.815	Single Circuit	GORMAN-KERN RIVER	TBD	2005	35.165074	-118.805881	Gorman-Kern River	Pliocene to Holocene
2	New	M20-T8	Monopole	LWS	Pin/Post	56.5	66	420.223	5.049	699.462	Single Circuit	GORMAN-KERN RIVER	TBD	2006	35.163192	-118.806323	Gorman-Kern River	Pliocene to Holocene
2	New	M21-T1	Monopole	LWS	Pin/Post	65.5	66	429.094	4.73	699.228	Single Circuit	GORMAN-KERN RIVER	TBD	2007	35.161344	-118.806965	Gorman-Kern River	Pliocene to Holocene
2	New	M21-T2	Monopole	LWS	Pin/Post	56.5	66	441.946	5.1441	699.03	Single Circuit	GORMAN-KERN RIVER	TBD	2008	35.159546	-118.807791	Gorman-Kern River	Pliocene to Holocene
2	New	M21-T3	Monopole	LWS	Pin/Post	56.5	66	446.329	4.9571	689.26	Single Circuit	GORMAN-KERN RIVER	TBD	2009	35.157817	-118.80881	Gorman-Kern River	Pliocene to Holocene
2	New	M21-T5	Monopole	LWS	Pin/Post	56.5	66	459.234	5.035	700.952	Single Circuit	GORMAN-KERN RIVER	TBD	2011	35.154497	-118.811212	Gorman-Kern River	Pliocene to Holocene
2	New	M21-T6	Monopole	LWS	Pin/Post	56.5	66	465.059	-0.0066	698.96	Single Circuit	GORMAN-KERN RIVER	TBD	2012	35.152933	-118.81258	Gorman-Kern River	Pliocene to Holocene
2	New	M21-T7	Monopole	TSP	Dead End	75	66	472.57	5.1951	457.845	Single Circuit	GORMAN-KERN RIVER	TBD	2013	35.151373	-118.813944	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T1	Monopole	TSP	Dead End	70	66	481.675	4.159	797.281	Single Circuit	GORMAN-KERN RIVER	TBD	2015	35.14971	-118.815689	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T2	Monopole	LWS	Pin/Post	61	66	488.908	1.9787	801.984	Single Circuit	GORMAN-KERN RIVER	TBD	2016	35.148154	-118.817566	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T3	Monopole	LWS	Pin/Post	56.5	66	493.219	0.0113	800.912	Single Circuit	GORMAN-KERN RIVER	TBD	2017	35.146644	-118.819519	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T4	Monopole	LWS	Pin/Post	61	66	494.697	-0.0139	801.759	Single Circuit	GORMAN-KERN RIVER	TBD	2018	35.145135	-118.82147	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T5	Monopole	LWS	Pin/Post	65.5	66	493.383	0.0362	801.39	Single Circuit	GORMAN-KERN RIVER	TBD	2019	35.143625	-118.823422	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T6	Monopole	TSP	Pin/Post	61	66	487.135	0.0294	801.598	Single Circuit	GORMAN-KERN RIVER	TBD	2020	35.142116	-118.825375	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T7	Monopole	LWS	Pin/Post	61	66	482.676	-0.0362	801.243	Single Circuit	GORMAN-KERN RIVER	TBD	2021	35.140608	-118.827328	Gorman-Kern River	Pliocene to Holocene
2	New	M22-T8	Monopole	LWS	Pin/Post	61	66	493.473	-0.1126	600.1	Single Circuit	GORMAN-KERN RIVER	TBD	2022	35.139099	-118.82928	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T1	Monopole	LWS	Pin/Post	56.5	66	515.044	0.099	800.811	Single Circuit	GORMAN-KERN RIVER	TBD	2023	35.137967	-118.830739	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T2	Monopole	LWS	Pin/Post	56.5	66	514.18	-0.0443	803.194	Single Circuit	GORMAN-KERN RIVER	TBD	2024	35.136459	-118.832689	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T3	Monopole	LWS	Pin/Post	65.5	66	527.162	-6.039	704.853	Single Circuit	GORMAN-KERN RIVER	TBD	2025	35.134944	-118.834643	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T4	Monopole	LWS	Pin/Post	56.5	66	548.115	-3.941	702.043	Single Circuit	GORMAN-KERN RIVER	TBD	2026	35.133475	-118.836179	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T5	Monopole	TSP	Dead End	75	66	545.539	-5.0299	398.234	Single Circuit	GORMAN-KERN RIVER	TBD	2027	35.131928	-118.837582	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T6	Monopole	TSP	Dead End	65	66	580.185	-4.0579	708.096	Single Circuit	GORMAN-KERN RIVER	TBD	2028	35.130997	-118.838281	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T7	Monopole	LWS	Pin/Post	61	66	563.967	-4.9828	703.11	Single Circuit	GORMAN-KERN RIVER	TBD	2029	35.129273	-118.839379	Gorman-Kern River	Pliocene to Holocene
2	New	M23-T8	Monopole	LWS	Pin/Post	56.5	66	570.562	-4.9337	603.247	Single Circuit	GORMAN-KERN RIVER	TBD	2030	35.12749	-118.840283	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T1	Monopole	TSP	Dead End	65	66	572.872	-12.0278	601.143	Single Circuit	GORMAN-KERN RIVER	TBD	2031	35.125911	-118.840896	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T2	Monopole	LWS	Pin/Post	56.5	66	579.004	-5.5881	703.51	Single Circuit	GORMAN-KERN RIVER	TBD	2032	35.124267	-118.841094	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T3	Monopole	LWS	Pin/Post	61	66	586.958	-0.0537	599.816	Single Circuit	GORMAN-KERN RIVER	TBD	2033	35.122334	-118.841097	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T4	Monopole	LWS	Pin/Post	56.5	66	593.913	0.0157	702.108	Single Circuit	GORMAN-KERN RIVER	TBD	2034	35.120686	-118.841098	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T5	Monopole	LWS	Pin/Post	56.5	66	601.737	0.0069	701.121	Single Circuit	GORMAN-KERN RIVER	TBD	2035	35.118757	-118.8411	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T6	Monopole	LWS	Pin/Post	65.5	66	605.312	-0.0132	600.224	Single Circuit	GORMAN-KERN RIVER	TBD	2036	35.116831	-118.841101	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T7	Monopole	LWS	Pin/Post	61	66	614.27	0.1077	700.595	Single Circuit	GORMAN-KERN RIVER	TBD	2037	35.115182	-118.841102	Gorman-Kern River	Pliocene to Holocene
2	New	M24-T8	Monopole	LWS	Pin/Post	56.5	66	602.804	0.0103	700.09	Single Circuit	GORMAN-KERN RIVER	TBD	2038	35.113257	-118.841108	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T1	Monopole	LWS	Pin/Post	56.5	66	594.879	0.0226	700.651	Single Circuit	GORMAN-KERN RIVER	TBD	2039	35.111333	-118.841114	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T2	Monopole	LWS	Pin/Post	56.5	66	601.595	-0.0391	700.71	Single Circuit	GORMAN-KERN RIVER	TBD	2040	35.109408	-118.841121	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T3	Monopole	LWS	Pin/Post	56.5	66	605.762	-0.0043	700.726	Single Circuit	GORMAN-KERN RIVER	TBD	2041	35.107483	-118.841126	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T4	Monopole	LWS	Pin/Post	56.5	66	602.106	0.021	700.208	Single Circuit	GORMAN-KERN RIVER	TBD	2042	35.105558	-118.841132	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T5	Monopole	LWS	Pin/Post	56.5	66	601.982	0.0024	701.203	Single Circuit	GORMAN-KERN RIVER	TBD	2043	35.103634	-118.841138	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T6	Monopole	LWS	Pin/Post	56.5	66	604.23	0.0175	701.459	Single Circuit	GORMAN-KERN RIVER	TBD	2044	35.101707	-118.841144	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T7	Monopole	LWS	Pin/Post	61	66	608.272	0.0016	701.418	Single Circuit	GORMAN-KERN RIVER	TBD	2045	35.09978	-118.841151	Gorman-Kern River	Pliocene to Holocene
2	New	M25-T8	Monopole	LWS	Pin/Post	61	66	610.308	0.0108	700.935	Single Circuit	GORMAN-KERN RIVER	TBD	2046	35.097853	-118.841158	Gorman-Kern River	Pliocene to Holocene
2	New	M26-T1	Monopole	LWS	Pin/Post	56.5	66	611.917	0.0525	700.509	Single Circuit	GORMAN-KERN RIVER	TBD	2047	35.095927	-118.841165	Gorman-Kern River	Pliocene to Holocene
2	New	M26-T2	Monopole	LWS	Pin/Post	56.5	66	614.427	-0.0386	701.388	Single Circuit	GORMAN-KERN RIVER	TBD	2048	35.094003	-118.841175	Gorman-Kern River	Pliocene to Holocene
2	New	M26-T3	Monopole	LWS	Pin/Post	70	66	618.381	0.0088	699.998	Single Circuit	GORMAN-KERN RIVER	TBD	2049	35.092075	-118.841182	Gorman-Kern River	Pliocene to Holocene
2	New	M26-T4	Monopole	TSP	Dead End	65	66	618.919	-99	-99	Single Circuit	GORMAN-KERN RIVER	TBD	2050	35.090152	-118.841191	Gorman-Kern River	Pliocene to Holocene
2	New	M26-T5	Monopole	LWS	Pin/Post	52	66	615.635	-0.0087	700.669	Single Circuit	GORMAN-KERN RIVER	TBD	2050	35.088232	-118.841351	Gorman-Kern River	Pliocene to Holocene
2	New	M26-T6	Monopole	LWS	Pin/Post	56.5	66	617.468	0.0209	701.658	Single Circuit	GORMAN-KERN RIVER	TBD	2051	35.086311	-118.841512	Gorman-Kern River	Pliocene to Holocene
2	New	M26-T7	Monopole	LWS	Pin/Post	56.5	66	616.676	-0.0303	700.736	Single Circuit	GORMAN-KERN RIVER	TBD	2052	35.084388	-118.841673	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T1	Monopole	LWS	Pin/Post	56.5	66	610.48	0.0634	700.902	Single Circuit	GORMAN-KERN RIVER	TBD	2053	35.082467	-118.841833	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T2	Monopole	LWS	Pin/Post	52	66	606.093	0.0282	701.629	Single Circuit	GORMAN-KERN RIVER	TBD	2054	35.080546	-118.841996	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T3	Monopole	LWS	Pin/Post	56.5	66	609.32	-0.0574	700.749	Single Circuit	GORMAN-KERN RIVER	TBD	2055	35.078623	-118.84216	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T4	Monopole	LWS	Pin/Post	52	66	612.319	0.0451	700.318	Single Circuit	GORMAN-KERN RIVER	TBD	2056	35.076702	-118.842321	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T5	Monopole	LWS	Pin/Post	56.5	66	614.742	-0.0079	699.725	Single Circuit	GORMAN-KERN RIVER	TBD	2057	35.074783	-118.842484	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T6	Monopole	LWS	Pin/Post	52	66	618.517	-0.0437	700.956	Single Circuit	GORMAN-KERN RIVER	TBD	2058	35.072865	-118.842647	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T7	Monopole	LWS	Pin/Post	56.5	66	623.322	-1.6622	700.583	Single Circuit	GORMAN-KERN RIVER	TBD	2059	35.070944	-118.842808	Gorman-Kern River	Pliocene to Holocene
2	New	M27-T8	Monopole	LWS	Pin/Post	52	66	627.307	0.2572	701.719	Single Circuit	GORMAN-KERN RIVER	TBD	2060	35.06902	-118.842901	Gorman-Kern River	Pliocene to Holocene
2	New	M28-T1	Monopole	LWS	Pin/Post	56.5	66	632.699	0.4842	700.288	Single Circuit	GORMAN-KERN RIVER	TBD	2061	35.067094	-118.843005	Gorman-Kern River	Pliocene to Holocene
2	New	M28-T2	Monopole	LWS	Pin/Post	52	66	637.764	-0.1042	700.218	Single Circuit	GORMAN-KERN RIVER	TBD	2062	35.065173	-118.843128	Gorman-Kern River	Pliocene to Holocene
2	New	M28-T3	Monopole	LWS	Pin/Post	56.5	66	641.37	-0.1431	700.908	Single Circuit	GORMAN-KERN RIVER	TBD	2063	35.063251	-118.843248	Gorman-Kern River	Pliocene to Holocene
2	New	M28-T4	Monopole	LWS	Pin/Post	61	66	647.554	-0.0991	700.852	Single Circuit	GORMAN-KERN RIVER	TBD	2064	35.061328	-118.843361	Gorman-Kern River	Pliocene to Holocene
2	New	M28-T5	Monopole	LWS	Pin/Post	70	66	652.909	0.0481	700.519	Single Circuit	GORMAN-KERN RIVER	TBD	2065	35.059404	-118.84347	Gorman-Kern River	Pliocene to Holocene
2	New	M28-T6	Monopole	LWS	Pin/Post	56.5	66	657.962	-0.0056	700.312	Single Circuit	GORMAN-KERN RIVER	TBD	2066	35.057482	-118.843582	Gorman-Kern River	Pliocene to Holocene
2	New	M28-T7	Monopole	LWS	Pin/Post	56.5	66	662.629	0.0291	701.114	Single Circuit	GORMAN-KERN RIVER	TBD	2067	35.05556	-118.843693	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T1	Monopole	LWS	Pin/Post	56.5	66	667.62	-0.0453	699.449	Single Circuit	GORMAN-KERN RIVER	TBD	2068	35.053635	-118.843805	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T2	Monopole	TSP	Dead End	60	66	672.122	-0.0199	701.007	Single Circuit	GORMAN-KERN RIVER	TBD	2069	35.051716	-118.843915	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T3	Monopole	LWS	Pin/Post	52	66	677.558	0.0029	700.489	Single Circuit	GORMAN-KERN RIVER	TBD	2070	35.049792	-118.844025	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T4	Monopole	LWS	Pin/Post	56.5	66	683.488	0.0012	700.611	Single Circuit	GORMAN-KERN RIVER	TBD	2071	35.047869	-118.844134	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T5	Monopole	LWS	Pin/Post	61	66	688.682	-0.0034	700.363	Single Circuit	GORMAN-KERN RIVER	TBD	2072	35.045946	-118.844244	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T6	Monopole	LWS	Pin/Post	56.5	66	693.06	0.0252	701.027	Single Circuit	GORMAN-KERN RIVER	TBD	2073	35.044024	-118.844354	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T7	Monopole	LWS	Pin/Post	52	66	696.637	-0.0454	700.418	Single Circuit	GORMAN-KERN RIVER	TBD	2074	35.0421	-118.844464	Gorman-Kern River	Pliocene to Holocene
2	New	M29-T8	Monopole	LWS	Pin/Post	56.5	66	698.736	0.0118	700.373	Single Circuit	GORMAN-KERN RIVER	TBD	2075	35.040178	-118.844573	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T1	Monopole	LWS	Pin/Post	65.5	66	703.466	0.0318	700.178	Single Circuit	GORMAN-KERN RIVER	TBD	2076	35.038256	-118.844682	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T2	Monopole	LWS	Pin/Post	56.5	66	707.097	-0.044	701.522	Single Circuit	GORMAN-KERN RIVER	TBD	2077	35.036334	-118.844792	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T3	Monopole	LWS	Pin/Post	56.5	66	708.262	0.0301	700.536	Single Circuit	GORMAN-KERN RIVER	TBD	2078	35.034409	-118.844901	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T4	Monopole	LWS	Pin/Post	52	66	711.746	0.029	700.831	Single Circuit	GORMAN-KERN RIVER	TBD	2079	35.032486	-118.845011	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T5	Monopole	LWS	Pin/Post	65.5	66	715.754	-0.016	700.667	Single Circuit	GORMAN-KERN RIVER	TBD	2080	35.030563	-118.845122	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T6	Monopole	LWS	Pin/Post	52	66	720.622	-0.0071	701.393	Single Circuit	GORMAN-KERN RIVER	TBD	2081	35.02864	-118.845233	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T7	Monopole	LWS	Pin/Post	56.5	66	725.585	-0.013	701.07	Single Circuit	GORMAN-KERN RIVER	TBD	2082	35.026715	-118.845343	Gorman-Kern River	Pliocene to Holocene
2	New	M30-T8	Monopole	LWS	Pin/Post	52	66	731.538	0.0221	700.433	Single Circuit	GORMAN-KERN RIVER	TBD	2083	35.02479	-118.845453	Gorman-Kern River	Pliocene to Holocene
2	New	M31-T1	Monopole	LWS	Pin/Post	70	66	737.683	0.0066	700.667	Single Circuit	GORMAN-KERN RIVER	TBD	2084	35.022868	-118.845563	Gorman-Kern River	Pliocene to Holocene
2	New	M31-T2	Monopole	LWS	Pin/Post	56.5	66	744.467	-0.0217	699.997	Single Circuit	GORMAN-KERN RIVER	TBD	2085	35.020945	-118.845674	Gorman-Kern River	Pliocene to Holocene
2	New	M31-T3	Monopole	LWS	Pin/Post	56.5	66	751.556	5.0732	697.443	Single Circuit	GORMAN-KERN RIVER	TBD	2086	35.019024	-118.845784	Gorman-Kern River	Pliocene to Holocene
2	New	M31-T4	Monopole	TSP	Dead End	70	66	759.369	9.8811	597.79	Single Circuit	GORMAN-KERN RIVER	TBD	2087	35.017125	-118.846099	Gorman-Kern River	Pliocene to Holocene
2	New	M31-T5	Monopole	LWS	Pin/Post	61	66	765.978	5.0825	598.011	Single Circuit	GORMAN-KERN RIVER	TBD	2088	35.01556	-118.846704	Gorman-Kern River	Pliocene to Holocene
2	New	M31-T6	Monopole	LWS	Pin/Post	52	66	772.683	4.9641	698.717	Single Circuit	GORMAN-KERN RIVER	TBD	2089	35.014044	-118.847475	Gorman-Kern River	Pliocene to Holocene
2	New	M31-T7	Monopole	LWS	Pin/Post	56.5	66	781.007	5.0415	698.56	Single Circuit	GORMAN-KERN RIVER	TBD	2090	35.012344	-118.84856	Gorman-Kern River	Pliocene to Holocene
2	New	M32-T1	Monopole	TSP	Dead End	60	66	787.904	9.3548	677.308	Single Circuit	GORMAN-KERN RIVER	TBD	2091	35.01073	-118.849821	Gorman-Kern River	Pliocene to Holocene
2	New	M32-T2	Monopole	LWS	Pin/Post	65.5	66	794.856	3.5292	730.966	Single Circuit	GORMAN-KERN RIVER	TBD	2092	35.009349	-118.851337	Gorman-Kern River	Pliocene to Holocene
2	New	M32-T3	Monopole	LWS	Pin/Post	52	66	801.893	0.0226	700.109	Single Circuit	GORMAN-KERN RIVER	TBD	2093	35.007944	-118.853082	Gorman-Kern River	Pliocene to Holocene
2	New	M32-T4	Monopole	LWS	Pin/Post	56.5	66	808.437	-0.0127	700.13	Single Circuit	GORMAN-KERN RIVER	TBD	2094	35.006599	-118.854753	Gorman-Kern River	Pliocene to Holocene
2	New	M32-T5	Monopole	LWS	Pin/Post	56.5	66	813.123	-0.0132	700.622	Single Circuit	GORMAN-KERN RIVER	TBD	2095	35.005253	-118.856424	Gorman-Kern River	Pliocene to Holocene
2	New	M32-T6	Monopole	LWS	Pin/Post	52	66	819.748	-0.0231	700.803	Single Circuit	GORMAN-KERN RIVER	TBD	2096	35.003907	-118.858096	Gorman-Kern River	Pliocene to Holocene
2	New	M32-T7	Monopole	LWS	Pin/Post	74.5	66	830.063	0.0792	636.87	Single Circuit	GORMAN-KERN RIVER	TBD	2097	35.002559	-118.859767	Gorman-Kern River	Pliocene to Holocene
2	New	M33-T1	H-Frame	LWS	Suspension	56.5	66	853.946	0.1664	700.854	Single Circuit	GORMAN-KERN RIVER	TBD	2099	34.999864	-118.863105	Gorman-Kern River	Pliocene to Holocene
2	New	M33-T2	Monopole	LWS	Pin/Post	52	66	864.341	-0.0335	701.25	Single Circuit	GORMAN-KERN RIVER	TBD	2100	34.998517	-118.864778	Gorman-Kern River	Pliocene to Holocene
2	New	M33-T3	Monopole	LWS	Pin/Post	56.5	66	875.177	0.0067	700.292	Single Circuit	GORMAN-KERN RIVER	TBD	2101	34.997169	-118.86645	Gorman-Kern River	Pliocene to Holocene
2	New	M33-T4	Monopole	LWS	Pin/Post	56.5	66	885.828	0.0103	701.097	Single Circuit	GORMAN-KERN RIVER	TBD	2102	34.995822	-118.86812	Gorman-Kern River	Pliocene to Holocene
2	New	M33-T5	Monopole	TSP	Dead End	65	66	896.029	0.027	700.045	Single Circuit	GORMAN-KERN RIVER	TBD	2103	34.994474	-118.869792	Gorman-Kern River	Pliocene to Holocene
2	New	M33-T6	Monopole	LWS	Pin/Post	61	66	909.643	-0.0192	700.439	Single Circuit	GORMAN-KERN RIVER	TBD	2104	34.993128	-118.871463	Gorman-Kern River	Pliocene to Holocene
2	New	M33-T7	Monopole	LWS	Pin/Post	61	66	923.883	-0.0054	700.784	Single Circuit	GORMAN-KERN RIVER	TBD	2105	34.991782	-118.873134	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T1	Monopole	LWS	Pin/Post	56.5	66	935.231	-0.0168	700.458	Single Circuit	GORMAN-KERN RIVER	TBD	2106	34.990434	-118.874805	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T2	Monopole	LWS	Pin/Post	56.5	66	948.845	0.0232	700.348	Single Circuit	GORMAN-KERN RIVER	TBD	2107	34.989087	-118.876475	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T3	Monopole	LWS	Pin/Post	56.5	66	962.501	0.0163	700.583	Single Circuit	GORMAN-KERN RIVER	TBD	2108	34.987741	-118.878146	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T4	Monopole	LWS	Pin/Post	52	66	974.324	-0.0354	700.26	Single Circuit	GORMAN-KERN RIVER	TBD	2109	34.986394	-118.879817	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T5	Monopole	LWS	Pin/Post	61	66	985.208	-0.0148	701.457	Single Circuit	GORMAN-KERN RIVER	TBD	2110	34.985047	-118.881487	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T6	Monopole	LWS	Pin/Post	56.5	66	998.542	0.1032	700.283	Single Circuit	GORMAN-KERN RIVER	TBD	2111	34.983698	-118.883159	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T7	Monopole	LWS	Pin/Post	52	66	1013.017	0.0019	701.564	Single Circuit	GORMAN-KERN RIVER	TBD	2112	34.982353	-118.884831	Gorman-Kern River	Pliocene to Holocene
2	New	M34-T8	Monopole	LWS	Pin/Post	61	66	1025.79	-0.0941	700.615	Single Circuit	GORMAN-KERN RIVER	TBD	2113	34.981006	-118.886506	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T1	Monopole	LWS	Pin/Post	52	66	1038.879	0.096	700.444	Single Circuit	GORMAN-KERN RIVER	TBD	2114	34.979658	-118.888176	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T2	Monopole	LWS	Pin/Post	56.5	66	1052.936	-0.0162	700.819	Single Circuit	GORMAN-KERN RIVER	TBD	2115	34.978313	-118.889848	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T3	Monopole	TSP	Dead End	65	66	1067.062	-0.0423	700.577	Single Circuit	GORMAN-KERN RIVER	TBD	2116	34.976967	-118.891521	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T4	Monopole	LWS	Pin/Post	52	66	1082.348	0.0626	701.86	Single Circuit	GORMAN-KERN RIVER	TBD	2117	34.97562	-118.893192	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T5	Monopole	LWS	Pin/Post	56.5	66	1098.389	-0.0411	699.867	Single Circuit	GORMAN-KERN RIVER	TBD	2118	34.974273	-118.894868	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T6	Monopole	LWS	Pin/Post	52	66	1115.478	-0.0134	700.65	Single Circuit	GORMAN-KERN RIVER	TBD	2119	34.972928	-118.896537	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T7	Monopole	LWS	Pin/Post	56.5	66	1131.345	0.0345	700.439	Single Circuit	GORMAN-KERN RIVER	TBD	2120	34.971581	-118.898209	Gorman-Kern River	Pliocene to Holocene
2	New	M35-T8	Monopole	LWS	Pin/Post	52	66	1146.31	-0.002	699.562	Single Circuit	GORMAN-KERN RIVER	TBD	2121	34.970235	-118.89988	Gorman-Kern River	Pliocene to Holocene
2	New	M36-T1	Monopole	LWS	Pin/Post	56.5	66	1162.632	-0.0021	700.459	Single Circuit	GORMAN-KERN RIVER	TBD	2122	34.968891	-118.90155	Gorman-Kern River	Pliocene to Holocene
2	New	M36-T2	Monopole	LWS	Pin/Post	52	66	1178.484	-0.0686	701.433	Single Circuit	GORMAN-KERN RIVER	TBD	2123	34.967546	-118.903221	Gorman-Kern River	Pliocene to Holocene
2	New	M36-T3	Monopole	LWS	Pin/Post	56.5	66	1195.337	0.0212	700.087	Single Circuit	GORMAN-KERN RIVER	TBD	2124	34.966196	-118.904893	Gorman-Kern River	Pliocene to Holocene
2	New	M36-T4	Monopole	LWS	Pin/Post	56.5	66	1209.128	0.0874	700.434	Single Circuit	GORMAN-KERN RIVER	TBD	2125	34.96485	-118.906562	Gorman-Kern River	Pliocene to Holocene
2	New	M36-T5	Monopole	LWS	Pin/Post	56.5	66	1227.763	-0.091	700.185	Single Circuit	GORMAN-KERN RIVER	TBD	2126	34.963505	-118.908234	Gorman-Kern River	Pliocene to Holocene
2	New	M36-T6	Monopole	LWS	Pin/Post	70	66	1245.52	0.0568	700.489	Single Circuit	GORMAN-KERN RIVER	TBD	2127	34.962159	-118.909903	Gorman-Kern River	Pliocene to Holocene
2	New	M36-T7	Monopole	LWS	Pin/Post	52	66	1261.394	-0.0314	700.22	Single Circuit	GORMAN-KERN RIVER	TBD	2128	34.960813	-118.911575	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T1	Monopole	LWS	Pin/Post	56.5	66	1277.125	-0.0239	700.723	Single Circuit	GORMAN-KERN RIVER	TBD	2129	34.959467	-118.913245	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T2	Monopole	LWS	Pin/Post	52	66	1295.188	-4.8905	701.833	Single Circuit	GORMAN-KERN RIVER	TBD	2130	34.958119	-118.914915	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T3	Monopole	LWS	Pin/Post	56.5	66	1315.89	-4.9546	702.391	Single Circuit	GORMAN-KERN RIVER	TBD	2131	34.956657	-118.916442	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T4	Monopole	LWS	Pin/Post	56.5	66	1334.372	-5.116	702.106	Single Circuit	GORMAN-KERN RIVER	TBD	2132	34.95509	-118.917811	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T5	Monopole	TSP	Dead End	60	66	1353.138	-12.9957	556.012	Single Circuit	GORMAN-KERN RIVER	TBD	2133	34.95343	-118.919004	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T6	Monopole	TSP	Dead End	65	66	1369.001	-4.7884	244.408	Single Circuit	GORMAN-KERN RIVER	TBD	2134	34.951974	-118.919566	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T7	Monopole	TSP	Dead End	65	66	1377.181	0.1669	661.894	Single Circuit	GORMAN-KERN RIVER	TBD	2135	34.951319	-118.919747	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T8	Monopole	LWS	Pin/Post	52	66	1397.675	-0.035	660.491	Single Circuit	GORMAN-KERN RIVER	TBD	2136	34.949547	-118.920243	Gorman-Kern River	Pliocene to Holocene
2	New	M37-T9	Monopole	LWS	Pin/Post	56.5	66	1419.383	0.0007	661.059	Single Circuit	GORMAN-KERN RIVER	TBD	2137	34.947779	-118.920738	Gorman-Kern River	Pliocene to Holocene
2	New	M38-T1	Monopole	LWS	Pin/Post	56.5	66	1441.249	0.0329	660.636	Single Circuit	GORMAN-KERN RIVER	TBD	2138	34.946009	-118.921233	Gorman-Kern River	Pliocene to Holocene
2	New	M38-T2	Monopole	LWS	Pin/Post	56.5	66	1465.198	-0.0076	661.643	Single Circuit	GORMAN-KERN RIVER	TBD	2139	34.94424	-118.921728	Gorman-Kern River	Pliocene to Holocene
2	New	M38-T3	Monopole	LWS	Pin/Post	52	66	1487.543	-0.042	658.432	Single Circuit	GORMAN-KERN RIVER	TBD	2140	34.942468	-118.922224	Gorman-Kern River	Pliocene to Holocene
2	New	M38-T4	Monopole	LWS	Pin/Post	56.5	66	1512.188	0.0515	662.173	Single Circuit	GORMAN-KERN RIVER	TBD	2141	34.940705	-118.922717	Gorman-Kern River	Pliocene to Holocene
2	New	M38-T5	Monopole	LWS	Pin/Post	52	66	1537.017	0.0171	660.585	Single Circuit	GORMAN-KERN RIVER	TBD	2142	34.938933	-118.923213	Gorman-Kern River	Pliocene to Holocene

STR_ID	ROCKTYPE1	ROCKTYPE2	Ground Motion	Landslide	AP_Zone	Liquefaction	Floodzone	Inundation	Inundation Dam	Erosion	MUSYM	MUKEY	muname	WEI	WEG	HydroGRP	CorrConcre	CorrSteel
M9-T5	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M9-T6	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	145	467287	Delano loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M9-T7	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	207	467325	Whitewolf loamy sand, 0 to 2 percent slopes, rarely flooded	n/a	n/a	n/a	n/a	n/a
M9-T8	alluvium	terrace	0.55	0	No	No	No	No	n/a	No	207	467325	Whitewolf loamy sand, 0 to 2 percent slopes, rarely flooded	n/a	n/a	n/a	n/a	n/a
W2080930E E2080931E	sandstone	conglomerate	0.45	5	Yes	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
W2344579E E2344580E	sandstone	conglomerate	0.45	0	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
W4683791E E4683792E	sandstone	mudstone	0.45	5	No	Yes	No	No	n/a	No	201	467323	Pleito-Chanac-Raggulch complex, 5 to 30 percent slopes	n/a	n/a	n/a	n/a	n/a
W4686212E E4686213E	sandstone	conglomerate	0.45	5	No	No	No	No	n/a	No	185	467308	Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes	n/a	n/a	n/a	n/a	n/a
2175040E	alluvium	terrace	1.15	0	No	No	No	No	n/a	No	461	466557	Geghus-Tecuya association, 30 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2175041E	alluvium	terrace	1.15	9	No	No	No	No	n/a	No	461	466557	Geghus-Tecuya association, 30 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2299363E 2299364E	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	370	466489	Whitewolf loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
2344595E 2344594E	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
4012794E 4012795E	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M20-T3	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
M20-T4	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
M20-T5	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
M20-T6	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
M20-T7	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
M20-T8	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
M21-T1	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
M21-T2	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
M21-T3	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
M21-T5	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
M21-T6	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M21-T7	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T1	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T2	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T3	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T4	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T5	alluvium	terrace	0.85	0	Yes	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T6	alluvium	terrace	0.85	0	Yes	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T7	alluvium	terrace	0.75	0	Yes	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M22-T8	alluvium	terrace	0.75	0	Yes	No	No	No	n/a	No	173	463877	Rosamond variant sandy loam, 5 to 15 percent slopes	86	3	C	Low	Moderate
M23-T1	alluvium	terrace	0.75	0	Yes	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M23-T2	alluvium	terrace	0.75	0	Yes	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M23-T3	alluvium	terrace	0.75	5	Yes	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M23-T4	alluvium	terrace	0.75	5	Yes	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M23-T5	alluvium	terrace	0.65	0	Yes	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M23-T6	alluvium	terrace	0.65	0	Yes	No	No	No	n/a	No	139	463843	Haploxerolls, hilly	n/a	n/a	n/a	n/a	n/a
M23-T7	alluvium	terrace	0.75	7	Yes	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M23-T8	alluvium	terrace	0.75	0	Yes	No	100-year	No	n/a	Yes	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M24-T1	alluvium	terrace	0.75	0	Yes	No	100-year	Yes	Brite Lake	Yes	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M24-T2	alluvium	terrace	0.85	0	No	No	100-year	Yes	Brite Lake	Yes	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M24-T3	alluvium	terrace	0.85	0	No	No	100-year	Yes	Brite Lake	Yes	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M24-T4	alluvium	terrace	0.85	0	No	No	100-year	Yes	Brite Lake	Yes	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M24-T5	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M24-T6	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M24-T7	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	201	463905	Wasioja sandy loam, 2 to 9 percent slopes	86	3	C	Low	Moderate
M24-T8	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T1	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T2	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T3	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T4	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T5	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T6	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T7	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M25-T8	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	201	463905	Wasioja sandy loam, 2 to 9 percent slopes	86	3	C	Low	Moderate
M26-T1	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	201	463905	Wasioja sandy loam, 2 to 9 percent slopes	86	3	C	Low	Moderate
M26-T2	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	201	463905	Wasioja sandy loam, 2 to 9 percent slopes	86	3	C	Low	Moderate
M26-T3	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	201	463905	Wasioja sandy loam, 2 to 9 percent slopes	86	3	C	Low	Moderate
M26-T4	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	201	463905	Wasioja sandy loam, 2 to 9 percent slopes	86	3	C	Low	Moderate
M26-T5	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M26-T6	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M26-T7	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	201	463905	Wasioja sandy loam, 2 to 9 percent slopes	86	3	C	Low	Moderate
M27-T1	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M27-T2	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M27-T3	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M27-T4	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	127	463831	DiGiorgio sandy clay loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
M27-T5	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M27-T6	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M27-T7	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M27-T8	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M28-T1	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M28-T2	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M28-T3	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M28-T4	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M28-T5	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M28-T6	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M28-T7	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M29-T1	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M29-T2	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M29-T3	alluvium	terrace	0.85	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M29-T4	alluvium	terrace	0.85	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M29-T5	alluvium	terrace	0.85	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M29-T6	alluvium	terrace	0.85	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M29-T7	alluvium	terrace	0.85	0	No	No	100-year	No	n/a	Yes	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M29-T8	alluvium	terrace	0.85	0	No	No	100-year	No	n/a	Yes	165	463869	Psamments-Xerolls complex, nearly level	134	2	A	Low	High
M30-T1	alluvium	terrace	0.85	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M30-T2	alluvium	terrace	0.85	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M30-T3	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M30-T4	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M30-T5	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M30-T6	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M30-T7	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M30-T8	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M31-T1	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M31-T2	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M31-T3	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M31-T4	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	144	463848	Hesperia sandy loam, 0 to 2 percent slopes	86	3	A	Low	Moderate
M31-T5	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	201	466463	Hesperia sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M31-T6	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	201	466463	Hesperia sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M31-T7	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	201	466463	Hesperia sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M32-T1	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	370	466489	Whitewolf loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M32-T2	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	201	466463	Hesperia sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M32-T3	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	370	466489	Whitewolf loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M32-T4	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	370	466489	Whitewolf loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M32-T5	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	370	466489	Whitewolf loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M32-T6	alluvium	terrace	0.95	0	No	No	100-year	No	n/a	Yes	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M32-T7	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M33-T1	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	370	466489	Whitewolf loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M33-T2	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M33-T3	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M33-T4	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M33-T5	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M33-T6	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M33-T7	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T1	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T2	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T3	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T4	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T5	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T6	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	280	466479	Premier sandy loam, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T7	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M34-T8	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T1	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T2	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T3	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T4	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T5	alluvium	terrace	0.95	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T6	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T7	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M35-T8	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M36-T1	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M36-T2	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M36-T3	alluvium	terrace	1.05	0	No	No	No	No	n/a	No	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M36-T4	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M36-T5	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M36-T6	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M36-T7	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T1	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	360	466487	Wheelridge gravelly loamy sand, 0 to 2 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T2	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	192	466543	Guijarral-Klipstein complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T3	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T4	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T5	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T6	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T7	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T8	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M37-T9	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M38-T1	alluvium	terrace	1.05	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M38-T2	alluvium	terrace	1.15	0	No	No	100-year	No	n/a	Yes	191	466461	Guijarral sandy loam, 2 to 9 percent slopes	n/a	n/a	n/a	n/a	n/a
M38-T3	alluvium	terrace	1.15	0	No	No	100-year	No	n/a	Yes	192	466543	Guijarral-Klipstein complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
M38-T4	alluvium	terrace	1.15	0	No	No	100-year	No	n/a	Yes	192	466543	Guijarral-Klipstein complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
M38-T5	alluvium	terrace	1.15	0	No	No	100-year	No	n/a	Yes	192	466543	Guijarral-Klipstein complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a

Table 4. Structure Summary
Gorman-Kern River 66 kV Project, Transmission Line Rating Remediation Project

SEG	STATUS	STR_ID	STR_TYPE	MATL	HARDWARE	STR_HT	KV	CL_HUB_ELEV	LINE_ANGLE	AHEAD_SPAN	CIRCUIT_TYPE	CIRCUIT_1	CIRCUIT_2	CONST_NO	LATITUDE	LONGITUDE	PROJECT_NAME	UNIT_AGE	ROCKTYPE1	ROCKTYPE2	Ground Motion	Landslide	AP_Zone	Liquefaction	Floodzone	Inundation	Inundation Dam	Erosion	MUSYM	MUKEY	muname	WEI	WEG	HydroGRP	CorrConcre	CorrSteel
2	New	M38-T6	Monopole	LWS	Pin/Post	56.5	66	1563.933	-0.0412	639.728	Single Circuit	GORMAN-KERN RIVER	TBD	2143	34.937164	-118.92371	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.15	0	No	No	100-year	No	n/a	Yes	192	466543	Guijarral-Klipstein complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M38-T7	Monopole	TSP	Dead End	75	66	1591.006	-31.1666	1392.861	Single Circuit	GORMAN-KERN RIVER	TBD	2144	34.935451	-118.924189	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.15	7	Yes	No	No	No	n/a	No	192	466543	Guijarral-Klipstein complex, 2 to 5 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M40-T4	Monopole	TSP	Dead End	70	66	2611.284	0.0691	235.048	Single Circuit	GORMAN-KERN RIVER	TBD	2153	34.909439	-118.921747	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M40-T5	Monopole	TSP	Dead End	60	66	2658.268	1.5636	524.401	Single Circuit	GORMAN-KERN RIVER	TBD	2154	34.908801	-118.921628	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M43-T6	Monopole	TSP	Dead End	85	66	3152.877	20.1839	749.253	Single Circuit	GORMAN-KERN RIVER	TBD	2168	34.875773	-118.893831	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.45	7	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M43-T7	Monopole	TSP	Dead End	85	66	3176.03	-24.293	708.207	Single Circuit	GORMAN-KERN RIVER	TBD	2169	34.874151	-118.892292	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M43-T8	Monopole	TSP	Dead End	85	66	3187.332	19.6354	479.997	Single Circuit	GORMAN-KERN RIVER	TBD	2170	34.873247	-118.890201	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M44-T1	Monopole	LWS	Pin/Post	74.5	66	3196.309	-2.012	495.075	Single Circuit	GORMAN-KERN RIVER	TBD	2171	34.872278	-118.889117	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M44-T2	Monopole	LWS	Pin/Post	74.5	66	3203.816	5.1236	515.983	Single Circuit	GORMAN-KERN RIVER	TBD	2172	34.871311	-118.887956	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M44-T3	Monopole	TSP	Dead End	85	66	3212.069	27.0836	647.839	Single Circuit	GORMAN-KERN RIVER	TBD	2173	34.870218	-118.88686	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M44-T3A	Monopole	TSP	Dead End	80	66	3233.828	-27.4284	439.412	Single Circuit	GORMAN-KERN RIVER	TBD	2174	34.86848	-118.886393	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	No	No	n/a	No	860	466585	Hawk gravelly sandy loam, 9 to 15 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M44-T4	Monopole	LWS	Suspension	83.5	66	3238.035	-0.3584	563.96	Single Circuit	GORMAN-KERN RIVER	TBD	2175	34.867553	-118.885454	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	100-year	No	n/a	Yes	860	466585	Hawk gravelly sandy loam, 9 to 15 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M44-T5	Monopole	TSP	Dead End	65	66	3252.206	12.6444	380.655	Single Circuit	GORMAN-KERN RIVER	TBD	2176	34.866371	-118.884238	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	100-year	No	n/a	Yes	860	466585	Hawk gravelly sandy loam, 9 to 15 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M44-T6	Monopole	TSP	Dead End	85	66	3268.807	-2.0383	700.426	Single Circuit	GORMAN-KERN RIVER	TBD	2177	34.865444	-118.88365	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	100-year	No	n/a	Yes	860	466585	Hawk gravelly sandy loam, 9 to 15 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M44-T7	Monopole	LWS	Pin/Post	70	66	3310.199	-3.748	593.76	Single Circuit	GORMAN-KERN RIVER	TBD	2178	34.863772	-118.882495	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	100-year	No	n/a	Yes	860	466585	Hawk gravelly sandy loam, 9 to 15 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M44-T8	Monopole	TSP	Dead End	80	66	3345.271	-5.4082	593.326	Single Circuit	GORMAN-KERN RIVER	TBD	2179	34.86241	-118.881405	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	7	No	No	100-year	No	n/a	Yes	860	466585	Hawk gravelly sandy loam, 9 to 15 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M44-T9	Monopole	LWS	Suspension	74.5	66	3357.751	0.0395	572.049	Single Circuit	GORMAN-KERN RIVER	TBD	2180	34.86114	-118.880165	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	No	No	n/a	No	860	466585	Hawk gravelly sandy loam, 9 to 15 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M45-T1	Monopole	LWS	Pin/Post	65.5	66	3356.829	0.0057	574.947	Single Circuit	GORMAN-KERN RIVER	TBD	2181	34.859914	-118.878971	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.55	0	No	No	No	No	n/a	No	880	466583	Chuchupate gravelly sandy loam, 50 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	M45-T2	Monopole	LWS	Pin/Post	65.5	66	3342.201	0.0014	590.805	Single Circuit	GORMAN-KERN RIVER	TBD	2182	34.858683	-118.877771	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.65	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M45-T3	Monopole	LWS	Pin/Post	65.5	66	3346.066	7.0685	688.633	Single Circuit	GORMAN-KERN RIVER	TBD	2183	34.857417	-118.876538	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.65	0	No	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M45-T4	Monopole	LWS	Suspension	79	66	3359.954	1.332	615.613	Single Circuit	GORMAN-KERN RIVER	TBD	2184	34.855807	-118.875332	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M45-T4A	Monopole	TSP	Dead End	70	66	3373.295	-25.9537	592.084	Single Circuit	GORMAN-KERN RIVER	TBD	2185	34.854347	-118.874294	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M45-T5	Monopole	TSP	Dead End	70	66	3382.224	17.9485	503.913	Single Circuit	GORMAN-KERN RIVER	TBD	2186	34.853445	-118.872652	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	7	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M45-T6	Monopole	LWS	Suspension	74.5	66	3389.303	-0.3981	699.997	Single Circuit	GORMAN-KERN RIVER	TBD	2187	34.85236	-118.87161	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M45-T7	Monopole	LWS	Suspension	79	66	3403.287	-0.0215	699.325	Single Circuit	GORMAN-KERN RIVER	TBD	2188	34.85086	-118.870149	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M45-T8	Monopole	LWS	Suspension	79	66	3419.779	-0.0026	699.236	Single Circuit	GORMAN-KERN RIVER	TBD	2189	34.849362	-118.868689	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M46-T1	Monopole	LWS	Suspension	79	66	3434.779	0.0077	699.645	Single Circuit	GORMAN-KERN RIVER	TBD	2190	34.847864	-118.867229	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M46-T2	Monopole	LWS	Pin/Post	65.5	66	3448.454	0.0163	698.686	Single Circuit	GORMAN-KERN RIVER	TBD	2191	34.846366	-118.865768	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M46-T3	Monopole	LWS	Suspension	74.5	66	3464.965	-0.0238	698.979	Single Circuit	GORMAN-KERN RIVER	TBD	2192	34.844869	-118.86431	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.65	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M46-T4	Monopole	LWS	Pin/Post	65.5	66	3481.262	-0.0001	698.993	Single Circuit	GORMAN-KERN RIVER	TBD	2193	34.843372	-118.862851	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M46-T5	Monopole	LWS	Suspension	79	66	3497.158	0.0346	698.851	Single Circuit	GORMAN-KERN RIVER	TBD	2194	34.841874	-118.861392	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	M46-T6	Monopole	TSP	Dead End	80	66	3505.713	-0.1576	348.928	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2195	34.840377	-118.859934	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 11	Monopole	LWS	Pin/Post	56.5	66	2680.757	0.0562	473.474	Single Circuit	GORMAN-KERN RIVER	TBD	2155	34.907371	-118.921409	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 12	Monopole	TSP	Dead End	65	66	2687.68	0.0007	920.188	Single Circuit	GORMAN-KERN RIVER	TBD	2156	34.90608	-118.921213	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	8	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 13	Monopole	LWS	Pin/Post	56.5	66	2699.706	0.0001	854.22	Single Circuit	GORMAN-KERN RIVER	TBD	2157	34.903571	-118.920832	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 14	Monopole	TSP	Dead End	70	66	2680.536	-0.0035	961.6	Single Circuit	GORMAN-KERN RIVER	TBD	2158	34.901242	-118.920478	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	3	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 15	Monopole	TSP	Dead End	75	66	2810.265	-0.0005	1676.492	Single Circuit	GORMAN-KERN RIVER	TBD	2159	34.898621	-118.92008	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.85	8	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 16	Monopole	TSP	Dead End	75	66	2670.844	-29.4528	1521.845	Single Circuit	GORMAN-KERN RIVER	TBD	2160	34.89405	-118.919386	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.85	8	No	No	No	No	n/a	No	870	466584	Frazier very gravelly sandy loam, 50 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 17	Monopole	TSP	Dead End	85	66	2883.162	-20.2339	1483.193	Single Circuit	GORMAN-KERN RIVER	TBD	2161	34.890692	-118.916361	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.85	0	No	No	No	No	n/a	No	870	466584	Frazier very gravelly sandy loam, 50 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 18	Monopole	TSP	Dead End	80	66	2983.702	18.7202	1789.658	Single Circuit	GORMAN-KERN RIVER	TBD	2162	34.888462	-118.912221	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.85	3	No	No	No	No	n/a	No	870	466584	Frazier very gravelly sandy loam, 50 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 19	Monopole	TSP	Dead End	75	66	3230.599	0.0262	867.491	Single Circuit	GORMAN-KERN RIVER	TBD	2163	34.884592	-118.90854	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.85	8	No	No	No	No	n/a	No	870	466584	Frazier very gravelly sandy loam, 50 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 2	Monopole	TSP	Dead End	105	66	1719.659	-0.4957	710.555	Single Circuit	GORMAN-KERN RIVER	TBD	2145	34.931815	-118.922738	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.15	10	Yes	No	No	No	n/a	No	461	466557	Geghus-Tecuya association, 30 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 20	Monopole	TSP	Dead End	70	66	3400.045	-2.8252	765.255	Single Circuit	GORMAN-KERN RIVER	TBD	2164	34.882715	-118.906756	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.95	7	No	No	No	No	n/a	No	18	465283	Lodo-Modjeska-Botella families association, 10 to 70 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 21	Monopole	TSP	Dead End	85	66	3532.888	0.0003	2100.067	Single Circuit	GORMAN-KERN RIVER	TBD	2165	34.881126	-118.905086	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.95	6	No	No	No	No	n/a	No	870	466584	Frazier very gravelly sandy loam, 50 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 23	Monopole	TSP	Dead End	70	66	3329.77	-40.4593	1903.133	Single Circuit	GORMAN-KERN RIVER	TBD	2166	34.876763	-118.900502	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.95	0	No	No	No	No	n/a	No	870	466584	Frazier very gravelly sandy loam, 50 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 24	Monopole	TSP	Dead End	100	66	3145.67	23.1369	140.494	Single Circuit	GORMAN-KERN RIVER	TBD	2167	34.875977	-118.894229	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.45	0	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 5	Monopole	TSP	Dead End	85	66	2180.415	12.3182	573.004	Single Circuit	GORMAN-KERN RIVER	TBD	2148	34.924743	-118.919837	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.05	8	No	No	No	No	n/a	No	461	466557	Geghus-Tecuya association, 30 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 6	Monopole	LWS	Suspension	56.5	66	2198.035	-0.0512	1095.768	Single Circuit	GORMAN-KERN RIVER	TBD	2149	34.923242	-118.920413	Gorman-Kern River	Paleocene to Oligocene	mudstone	sandstone	1.05	5	No	No	No	No	n/a	No	461	466557	Geghus-Tecuya association, 30 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	New	NO 7	Monopole	TSP	Dead End	75	66	2179.621	0.0147	1532.502	Single Circuit	GORMAN-KERN RIVER	TBD	2150	34.92037	-118.921512	Gorman-Kern River	Paleocene to Oligocene	mudstone	sandstone	1.15	8	No	No	No	No	n/a	No	461	466557	Geghus-Tecuya association, 30 to 75 percent slopes	n/a	n/a	n/a	n/a	n/a
2	Remove	NO 8	Horizontal Configuration	Lattice Steel	Suspension	56.397	66	2203.941	0.015	-99	Single Circuit	GORMAN-KERN RIVER	TBD	2151	34.918503	-118.922226	Gorman-Kern River	Paleocene to Oligocene	mudstone	sandstone	1.15	9	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
2	New	NO 9	Monopole	TSP	Dead End	75	66	2265.754	-26.3378	2547.036	Single Circuit	GORMAN-KERN RIVER	TBD	2152	34.916355	-118.92305	Gorman-Kern River	Paleocene to Oligocene	mudstone	sandstone	1.25	9	No	No	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	Remove	1433688e 1433687e	H-Frame	Wood	Suspension	8	66	3865.475	0.303	-99	Single Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2228	34.810321	-118.833109	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	3	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	Remove	1433690E 1433689E	H-Frame	Wood	Suspension	8	66	3837.314	0.1339	-99	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2226	34.81221	-118.833725	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	Remove	1433693E 1433694E	H-Frame	Wood	Suspension	8	66	3647.767	0.3927	-99	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2217	34.821288	-118.838654	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.85	0	No	No	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	1483082e 1483083e	Monopole	LWS	Pin/Post	65.5	66	3515.77	0.1484	351.753	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2207	34.832144	-118.851908	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	1501396e 1501397e	Monopole	LWS	Pin/Post	65.5	66	3511.33	0.0181	349.44	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2203	34.835135	-118.854824	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	1501398e 1501399e	Monopole	LWS	Pin/Post	65.5	66	3512.122	-0.1182	351.515	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2205	34.833641	-118.85337	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	4410454E 4410455E	Monopole	TSP	Dead End	90	66	3547.043	-5.2685	1261.13	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2210	34.82935	-118.848988	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.15	10	Yes	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	4410456E 4410457E	Monopole	TSP	Dead End	80	66	3515.592	-1.3402	650.197	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2211	34.827164	-118.845727	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.15	0	Yes	Yes	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
3	Existing	Gorman Sub	Horizontal Configuration	Lattice Steel	Dead End	38.47	66	3618.28	-99	-99	Single Circuit	GORMAN-KERN RIVER	TBD	2250	34.790594	-118.827074	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	0	Yes	No	No	No	n/a	No	ObC	457871	Oak Glen sandy loam, 2 to 9 percent slopes	86	3	A	Moderate	Low
3	New	M46-T6	Monopole	TSP	Dead End	80	66	3505.713	-0.1576	348.928	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2196	34.840377	-118.859934	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	No	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M46-T7	Monopole	LWS	Pin/Post	65.5	66	3510.039	-0.0898	350.211	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2198	34.83888	-118.858474	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	No	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M47-T1	Monopole	LWS	Pin/Post	65.5	66	3513.435	0.0375	343.547	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2200	34.837383	-118.857015	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M47-T2	Monopole	LWS	Pin/Post	65.5	66	3513.389	-0.0089	349.594	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2202	34.835884	-118.855554	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M47-T3	Monopole	LWS	Pin/Post	65.5	66	3511.505	0.0439	347.646	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2204	34.834386	-118.854095	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M47-T4	Monopole	LWS	Pin/Post	65.5	66	3515.647	-0.0197	348.172	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2206	34.832889	-118.852636	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M47-T5	Monopole	TSP	Dead End	75	66	3517.84	-0.0771	600.714	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2208	34.83139	-118.851175	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M47-T6	Monopole	TSP	Dead End	75	66	3552.876	-6.8367	391.86	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2209	34.830103	-118.849921	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.15	9	Yes	Yes	No	No	n/a	No	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	M48-T10	Monopole	TSP	Dead End	75	66	3759.282	6.0036	478.51	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2222	34.816607	-118.835556	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.15	6	No	No	No	No	n/a	No	ShF2	457913	Sheridan sandy loam, 30 to 50 percent slopes, eroded	86	3	B	Moderate	Low
3	New	M48-T2	Monopole	LWS	Suspension	88	66	3502.533	0.6121	499.477	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2212	34.82607	-118.844014	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.85	0	Yes	Yes	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	M48-T3	Monopole	LWS	Pin/Post	83.5	66	3514.751	-0.0201	469.098	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2213	34.825218	-118.84271	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.85	0	No	Yes	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	M48-T4	Monopole	TSP	Dead End	75	66	3535.749	6.0731	582.353	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2214	34.824418	-118.841484	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.85	0	No	Yes	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	M48-T5	Monopole	TSP	Dead End	80	66	3578.062	14.9409	515.909	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2215	34.823298	-118.840099	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.15	0	No	No	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	M48-T6	Monopole	LWS	Pin/Post	74.5	66	3620.939	-0.098	424.573	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2216	34.822078	-118.839223	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.15	3	No	No	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	M48-T7	Monopole	TSP	Dead End	85	66	3644.953	-0.2486	649.639	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2218	34.821074	-118.838502	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.85	0	No	No	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	M48-T8	Monopole	TSP	Dead End	70	66	3653.76	-0.0562	497.157	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2219	34.819537	-118.837401	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.85	0	No	No	No	No	n/a	No	176	463880	Steuber sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
3	New	M48-T9	Monopole	TSP	Dead End	75	66	3761.755	5.4409	424.028	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2220	34.818362	-118.836557	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.15	3	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
3	New	M48-T9A	Monopole	LWS	Suspension	79	66	3757.261	-0.0297	281.731	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2221	34.817307	-118.835956	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.15	7	No	No	No	No	n/a	No	ShF2	457913	Sheridan sandy loam, 30 to 50 percent slopes, eroded	86	3	B	Moderate	Low
3	New	M49-T1	Monopole	LWS	Pin/Post	74.5	66	3752.809	0.0334	560.944	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2223	34.815365	-118.835031	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	0	No	No	No	No	n/a	No	OcC	457872	Oak Glen gravelly sandy loam, 2 to 9 percent slopes	56	5	A	Moderate	Low
3	New	M49-T2	Monopole	LWS	Pin/Post	92.5	66	3754.027	-0.0489	549.827	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2224	34.81391	-118.834417	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.85	0	No	No	No	No	n/a	No	OcC	457872	Oak Glen gravelly sandy loam, 2 to 9 percent slopes	56	5	A	Moderate	Low
3	New	M49-T3	Monopole	TSP	Dead End	75	66	3837.106	4.1155	646.068	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2225	34.812483	-118.833814	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	3	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M49-T4	Monopole	LWS	Pin/Post	83.5	66	3842.046	-0.2699	550.941	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2227	34.810768	-118.833257	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	3	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M49-T5	Monopole	LWS	Pin/Post	70	66	3897.582	-0.1175	598.948	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2229	34.809306	-118.832781	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M49-T6	Monopole	LWS	Pin/Post	74.5	66	3969.927	-0.064	680.757	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2230	34.807717	-118.832262	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M49-T7	Monopole	LWS	Suspension	106	66	4047.702	0.1376	518.486	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2231	34.805911	-118.831671	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	0	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M49-T8	Monopole	LWS	Pin/Post	65.5	66	4193.307	-0.0554	484.437	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2232	34.804535	-118.831224	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	ShF2	457913	Sheridan sandy loam, 30 to 50 percent slopes, eroded	86	3	B	Moderate	Low
3	New	M49-T9	Monopole	LWS	Pin/Post	97	66	4255.008	0.0014	461.662	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2233	34.80325	-118.830805	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	8	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T1	Monopole	LWS	Suspension	106	66	4346.848	0.0007	297.638	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2234	34.802025	-118.830406	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T10	Monopole	TSP	Dead End	85	66	3804.428	-0.5223	384.754	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2247	34.791828	-118.827229	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T2	Monopole	LWS	Pin/Post	74.5	66	4432.723	0.0967	374.936	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2235	34.801235	-118.830149	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	Remove	M50-T3	Horizontal Configuration	Lattice Steel	Suspension	8	66	4516.963	0.1153	-99	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2236	34.800442	-118.829892	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	3	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T4	Monopole	TSP	Dead End	80	66	4531.388	0.4995	414.532	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2237	34.800239	-118.829827	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	0	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T5	Monopole	LWS	Pin/Post	74.5	66	4394.695	-0.8248	368.987	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2238	34.799136	-118.829485	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	8	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T6	Monopole	TSP	Dead End	85	66	4194.066	-1.0549	392.665	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2240	34.7965	-118.828671	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T7	Monopole	LWS	Pin/Post	70	66	4071.991	-0.3431	354.306	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2242	34.795454	-118.82835	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	M50-T8	Monopole	TSP	Dead End	70	66	3992.15	-0.0394	435.216	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2243	34.794511	-118.828056	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	Remove	M50-T9	Horizontal Configuration	Lattice Steel	Suspension	8	66	3910.281	-1.0915	-99	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2245	34.792939	-118.827572	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	N1445349E S1445350E	Monopole	LWS	Pin/Post	65.5	66	3508.45	0.2262	350.224	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2197	34.839631	-118.859204	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	No	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	n1501394e s1501395e	Monopole	LWS	Pin/Post	65.5	66	3512.181	0.0106	356.163	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2201	34.836647	-118.856297	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	New	n1505049e s1505050e	Monopole	LWS	Pin/Post	65.5	66	3511.005	-0.0579	348.818	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2199	34.838129	-118.857743	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	1.75	0	Yes	Yes	100-year	No	n/a	Yes	980	2394575	Area not surveyed, access denied	n/a	n/a	n/a	n/a	n/a
3	Existing	NO #	Monopole	Wood	Dead End	33.66	66	3620.387	-99	-99	Single Circuit	GORMAN-KERN RIVER	TBD	2249	34.790778	-118.827187	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	0	Yes	No	No	No	n/a	No	ObC	457871	Oak Glen sandy loam, 2 to 9 percent slopes	86	3	A	Moderate	Low
3	Existing	NO #	Vertical Configuration	Lattice Steel	Dead End	45.73	66	3636.62	47.6646	-99	Single Circuit	GORMAN-KERN RIVER	TBD	2248	34.790804	-118.826908	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.95	0	Yes	No	No	No	n/a	No	ObC	457871	Oak Glen sandy loam, 2 to 9 percent slopes	86	3	A	Moderate	Low
3	New	W1421648E E1421647E	Monopole	LWS	Suspension	79	66	3936.007	0.764	316.217	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2244	34.793353	-118.827694	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	3	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	W1960783E E1960784E	Monopole	TSP	Dead End	85	66	4241.195	1.3627	621.05	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2239	34.798157	-118.829164	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	New	W4479523E E4479522E	Monopole	LWS	Suspension	79	66	3875.192	0.7775	256.244	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2246	34.792511	-118.827435	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	6	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
3	Remove	W4479525E E4479524E	H-Frame	Wood	PinPost	8	66	4174.263	0.7814	-99	Double Circuit	GORMAN-KERN RIVER	FRAZIER PARK-GORMAN	2241	34.796286	-118.828602	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	1.25	7	No	No	No	No	n/a	No	GoF2	457833	Gorman sandy loam, 30 to 50 percent slopes, eroded	n/a	n/a	n/a	n/a	n/a
4	New	2115338E 2115339E	Monopole	LWS	Pin/Post	70	66	642.617	-0.0947	626.832	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1171	35.173268	-118.77704	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	7	No	No	No	No	n/a	No	187	463891	Tunis sandy loam, 5 to 30 percent slopes	86	3	D	Low	Moderate
4	New	2145301E 2145302E	Monopole	TSP	Dead End	65	66	2085.723	-0.0717	1262.301	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1179	35.158355	-118.759045	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	2145303E 2145304E	Monopole	TSP	Dead End	60	66	1838.377	0.018	1324.896	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1178	35.161532	-118.761209	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	2145305E 2145306E 2145307E	Monopole	TSP	Dead End	60	66	1872.664	1.3732	1712.157	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1177	35.165637	-118.764007	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	2145308E 2145309E 2145310E	Monopole	TSP	Dead End	60	66	1871.581	-1.4644	121.174	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1176	35.165923	-118.764214	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	2145311E 2145312E	H-Frame	LWS	Suspension	52	66	1488.227	-0.0368	1729.76	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1175	35.170074	-118.767033	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	211	463915	Xerorthents-Rock outcrop complex, very steep	48	6	D	Low	Moderate
4	New	2145313E 2145314E 2145315E	Monopole	TSP	Dead End	65	66	1274.798	44.4415	1155.499	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1174	35.172847	-118.768914	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	211	463915	Xerorthents-Rock outcrop complex, very steep	48	6	D	Low	Moderate
4	New	2145316E 2145317E	Monopole	LWS	Pin/Post	74.5	66	596.326	0.128	561.182	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1170	35.173259	-118.778918	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	7	No	No	No	No	n/a	No	187	463891	Tunis sandy loam, 5 to 30 percent slopes	86	3	D	Low	Moderate
4	New	2145318E 2145319E	Monopole	LWS	Pin/Post	70	66	575.184	0.0071	887.426	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1169	35.173239	-118.781887	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	7	No	No	No	No	n/a	No	110	463814	Arvin sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
4	New	2145320E 2145321E	Monopole	LWS	Pin/Post	70	66	518.962	-0.0958	828.231	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1168	35.173219	-118.784659	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	7	Yes	No	No	No	n/a	No	110	463814	Arvin sandy loam, 5 to 9 percent slopes	56	5	A	Low	Moderate
4	New	2145322E 2145323E	Monopole	LWS	Pin/Post	61	66	448.307	0.0801	1063.845	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1167	35.173199	-118.788218	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	Yes	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
4	New	2145324E 2145325E	Monopole	LWS	Pin/Post	65.5	66	444.665	-0.0783	993.19	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1166	35.173176	-118.791541	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
4	New	2145326E 2145327E	Monopole	LWS	Pin/Post	65.5	66	435.482	0.054	992.807	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1165	35.173157	-118.794863	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
4	New	M10-T1	Monopole	LWS	Suspension	70	66	4072.606	-0.0572	325.865	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1223	35.09866	-118.667693	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M10-T2	Monopole	LWS	Suspension	83.5	66	4104.15	0.0427	999.786	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1224	35.098157	-118.666791	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M10-T3	Monopole	LWS	Suspension	74.5	66	4095.418	-0.0031	470.415	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1225	35.096614	-118.664026	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M10-T4	Monopole	LWS	Pin/Post	70	66	4080.981	-0.0126	601.471	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1226	35.095887	-118.662725	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M10-T5	Monopole	TSP	Dead End	70	66	4042.44	-32.9839	728.102	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1227	35.094959	-118.661062	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M10-T6	Monopole	LWS	Pin/Post	70	66	4032.389	0.0334	630.136	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1228	35.094918	-118.658628	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M10-T7	Monopole	LWS	Pin/Post	74.5	66	4051.299	-0.0796	716.672	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1229	35.094881	-118.656522	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M10-T8	Monopole	LWS	Suspension	83.5	66	4088.895	0.104	362.736	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1230	35.094841	-118.654127	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
4	New	M10-T9	Monopole	LWS	Pin/Post	74.5	66	4093.089	-0.0807	364.252	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1231	35.094819	-118.652914	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
4	New	M11-T1	Monopole	LWS	Suspension	74.5	66	4062.613	0.0308	675.645	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1232	35.094799	-118.651697	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
4	New	M11-T2	Monopole	LWS	Pin/Post	70	66	3940.556	0.0085	634.002	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1233	35.09476	-118.649439	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M11-T3	Monopole	TSP	Dead End	65	66	3845.246	5.7616	344.7	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1234	35.094723	-118.64732	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M1-T4	Monopole	TSP	Dead End	65	66	719.656	-0.0006	1233.24	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1172	35.173282	-118.774943	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	9	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M1-T5	Monopole	TSP	Dead End	70	66	1066.909	16.8806	592.599	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1173	35.173308	-118.770816	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M3-T2	Monopole	LWS	Suspension	74.5	66	2198.873	0.0703	520.042	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1180	35.155331	-118.756978	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M3-T3	H-Frame	TSP	Dead End	50	66	2196.836	-0.051	1980.642	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1181	35.154084	-118.756129	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M3-T4	Monopole	LWS	Suspension	106	66	2547.261	0.0753	500.059	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1182	35.149337	-118.752889	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M4-T1	Monopole	LWS	Suspension	88	66	2656.115	-0.0298	1185.005	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1183	35.148138	-118.752073	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M4-T2	H-Frame	LWS	Suspension	70	66	2858.548	-1.7617	975.529	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1184	35.145296	-118.750138	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	197	463901	Walong-Arujo sandy loams, 50 to 75 percent slopes	86	3	B	Low	Moderate
4	New	M4-T3	H-Frame	LWS	Suspension	70	66	2880.914	-0.2499	1820.366	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1185	35.142999	-118.748458	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M4-T4	H-Frame	LWS	Suspension	65.5	66	3107.894	-0.0023	1189.71	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1186	35.138722	-118.7453	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	131	463835	Edmundston gravelly sandy loam, 50 to 75 percent slopes	56	5	A	Moderate	Moderate
4	New	M4-T5	H-Frame	LWS	Suspension	74.5	66	3146.611	0.0304	539.92	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1187	35.135927	-118.743237	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	205	463909	Xererts-Xerolls complex, steep	86	4	D	Low	High
4	New	M5-T1	H-Frame	LWS	Suspension	83.5	66	3113.401	-0.0309	1180.204	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1188	35.134658	-118.742301	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	205	463909	Xererts-Xerolls complex, steep	86	4	D	Low	High
4	New	M5-T2	H-Frame	TSP	Dead End	65	66	3092.467	-38.8073	568.092	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1189	35.131886	-118.740255	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	188	463892	Tunis-Walong complex, 50 to 75 percent slopes	56	5	D	Low	Moderate
4	New	M5-T3	H-Frame	LWS	Suspension	65.5	66	3118.744	-0.6184	596.778	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1190	35.131353	-118.738469	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M5-T4	Monopole	LWS	Suspension	83.5	66	3158.133	-0.0118	712.62	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1191	35.13081	-118.736586	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M5-T5	Monopole	LWS	Suspension	74.5	66	3192.414	0.009	677.405	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1192	35.130162	-118.734337	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M5-T6	Monopole	LWS	Suspension	88	66	3160.003	-0.017	949.851	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1193	35.129545	-118.732199	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M5-T7	Monopole	LWS	Suspension	61	66	3134.294	0.0064	362.894	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1194	35.128682	-118.729201	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M6-T1	Monopole	TSP	Dead End	120	66	3047.556	0.0318	1503.736	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1195	35.128352	-118.728056	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
4	New	M6-T2	H-Frame	LWS	Suspension	79	66	3139.199	-0.0403	945.981	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1196	35.126981	-118.723312	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
4	New	M6-T3	Monopole	TSP	Dead End	65	66	3033.482	-0.0078	739.78	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1197	35.126121	-118.720327	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.75	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M6-T4	Monopole	LWS	Pin/Post	88	66	3065.662	0.0121	650.068	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1198	35.125449	-118.717992	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.75	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M6-T5	Monopole	LWS	Pin/Post	79	66	3166.833	0.0098	824.884	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1199	35.124857	-118.715941	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate

Table 4. Structure Summary
Gorman-Kern River 66 kV Project, Transmission Line Rating Remediation Project

SEG	STATUS	STR_ID	STR_TYPE	MATL	HARDWARE	STR_HT	KV	CL_HUB_ELEV	LINE_ANGLE	AHEAD_SPAN	CIRCUIT_TYPE	CIRCUIT_1	CIRCUIT_2	CONST_NO	LATITUDE	LONGITUDE	PROJECT_NAME	UNIT_AGE	ROCKTYPE1	ROCKTYPE2	Ground Motion	Landslide	AP_Zone	Liquefaction	Floodzone	Inundation	Inundation Dam	Erosion	MUSYM	MUKEY	muname	WEI	WEG	HydroGRP	CorrConcre	CorrSteel
4	New	M6-T6	Monopole	TSP	Dead End	70	66	3352.317	14.4088	597.008	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1200	35.124106	-118.713338	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
4	New	M7-T1	Monopole	LWS	Pin/Post	97	66	3266.625	0.3944	847.482	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1201	35.123195	-118.711678	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	194	463898	Walong sandy loam, 30 to 50 percent slopes	86	3	B	Low	Moderate
4	New	M7-T2	Monopole	LWS	Pin/Post	106	66	3227.121	0.0056	659.987	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1202	35.121888	-118.709333	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M7-T3	Monopole	TSP	Dead End	85	66	3304.635	0.0248	894.85	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1203	35.12087	-118.707506	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M7-T4	Monopole	LWS	Suspension	97	66	3168.7	-0.0274	834.654	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1204	35.119488	-118.705031	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.75	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M7-T5	Monopole	LWS	Pin/Post	70	66	3105.903	-0.0044	834.889	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1205	35.118201	-118.702722	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M7-T6	H-Frame	LWS	Suspension	70	66	3073.133	-0.0147	754.883	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1206	35.116913	-118.700411	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M7-T7	Monopole	LWS	Pin/Post	74.5	66	3050.518	0.0221	824.932	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1207	35.115749	-118.698322	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M8-T1	Monopole	LWS	Suspension	83.5	66	3085.421	-0.0066	474.997	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1208	35.114476	-118.69604	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M8-T2	Monopole	LWS	Pin/Post	97	66	3102.255	-0.0059	775.611	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1209	35.113743	-118.694726	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M8-T3	Monopole	LWS	Suspension	106	66	3213.995	0.0293	624.268	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1210	35.112546	-118.69258	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M8-T4	Monopole	LWS	Suspension	79	66	3425.516	-0.0263	624.86	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1211	35.111583	-118.690853	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M8-T5	Monopole	LWS	Suspension	79	66	3443.384	0.0246	505.096	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1212	35.110619	-118.689124	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M8-T6	Monopole	LWS	Suspension	88	66	3421.377	-0.0428	1047.923	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1213	35.109839	-118.687727	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M8-T7	Monopole	LWS	Pin/Post	70	66	3397.303	0.0651	916.164	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1214	35.108223	-118.684827	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M9-T1	Monopole	LWS	Suspension	65.5	66	3522.49	-0.0422	678.044	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1215	35.106808	-118.682294	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	198	463902	Walong-Rock outcrop complex, 30 to 75 percent slopes	86	3	B	Low	Moderate
4	New	M9-T2	Monopole	LWS	Suspension	88	66	3474.448	0.006	992.693	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1216	35.105761	-118.680419	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	198	463902	Walong-Rock outcrop complex, 30 to 75 percent slopes	86	3	B	Low	Moderate
4	New	M9-T3	Monopole	TSP	Dead End	70	66	3413.121	-0.0126	908.413	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1217	35.104229	-118.677673	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	198	463902	Walong-Rock outcrop complex, 30 to 75 percent slopes	86	3	B	Low	Moderate
4	New	M9-T4	Monopole	LWS	Suspension	79	66	3616.862	0.0358	374.937	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1218	35.102827	-118.67516	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	198	463902	Walong-Rock outcrop complex, 30 to 75 percent slopes	86	3	B	Low	Moderate
4	New	M9-T5	Monopole	LWS	Suspension	70	66	3753.28	0.0121	303.412	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1219	35.102248	-118.674123	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	198	463902	Walong-Rock outcrop complex, 30 to 75 percent slopes	86	3	B	Low	Moderate
4	New	M9-T6	Monopole	LWS	Suspension	65.5	66	3845.235	-0.1007	512.064	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1220	35.101779	-118.673284	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M9-T7	Monopole	LWS	Suspension	106	66	3840.656	0.0704	834.975	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1221	35.10099	-118.671867	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	3	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
4	New	M9-T8	Monopole	LWS	Pin/Post	70	66	3932.208	0.0107	674.625	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1222	35.099701	-118.669558	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	6	No	No	No	No	n/a	No	198	463902	Walong-Rock outcrop complex, 30 to 75 percent slopes	86	3	B	Low	Moderate
4	New	N2145329E S2145328E	Monopole	LWS	Pin/Post	65.5	66	425.8	-0.0881	1004.859	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1164	35.173135	-118.798226	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
4	New	N2145331E S4410541E	Monopole	TSP	Dead End	65	66	410.462	-99	1001.009	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1163	35.173117	-118.801575	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	No	No	No	n/a	No	109	463813	Arvin sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	2174714E	TBD	LWS	TBD	60	66	3833.1	0.2164	222.494	Single Circuit	TBD	TBD	TBD	35.09448	-118.608907	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	2174716E	TBD	LWS	TBD	60	66	3805.82	-0.5734	199.583	Single Circuit	TBD	TBD	TBD	35.094433	-118.621215	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2174717E	TBD	LWS	TBD	56	66	3774.89	0.1712	183.551	Single Circuit	TBD	TBD	TBD	35.094415	-118.631237	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2175511E	TBD	LWS	TBD	60	66	3822	-0.1311	236.9	Single Circuit	TBD	TBD	TBD	35.09446	-118.615096	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2241803E	TBD	TSP	TBD	56	66	3852.17	89.241	226.626	Single Circuit	TBD	TBD	TBD	35.094484	-118.602197	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2241835E	TBD	LWS	TBD	56	66	3841.08	-0.3644	229.42	Single Circuit	TBD	TBD	TBD	35.097554	-118.602133	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	2287523E	TBD	LWS	TBD	56	66	3779.39	-0.3289	184.02	Single Circuit	TBD	TBD	TBD	35.094426	-118.629232	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2287525E	TBD	LWS	TBD	56	66	3784.71	-0.0747	188.95	Single Circuit	TBD	TBD	TBD	35.09443	-118.627892	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2287590E	TBD	LWS	TBD	56	66	3773.4	-0.1034	199.39	Single Circuit	TBD	TBD	TBD	35.094413	-118.63185	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2287648E	TBD	TSP	TBD	56	66	3797.6	2.4086	197.659	Single Circuit	TBD	TBD	TBD	35.094417	-118.623891	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	2299510E	TBD	LWS	TBD	60	66	3813.67	-0.0641	203.998	Single Circuit	TBD	TBD	TBD	35.09457	-118.644777	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
5	Existing	314174E	TBD	LWS	TBD	56	66	3792.05	-0.2115	193.871	Single Circuit	TBD	TBD	TBD	35.094439	-118.625845	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	314180E	TBD	LWS	TBD	56	66	3778.02	0.0284	207.92	Single Circuit	TBD	TBD	TBD	35.094423	-118.629847	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	314184E	TBD	LWS	TBD	56	66	3770.98	0.7308	196.918	Single Circuit	TBD	TBD	TBD	35.09441	-118.632517	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	314185E	TBD	LWS	TBD	56	66	3768.75	-0.3176	211.017	Single Circuit	TBD	TBD	TBD	35.094414	-118.633175	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	314186E	TBD	LWS	TBD	56	66	3766.24	-0.066	192.244	Single Circuit	TBD	TBD	TBD	35.094415	-118.633881	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	314187E	TBD	LWS	TBD	56	66	3763.33	0.0352	197.925	Single Circuit	TBD	TBD	TBD	35.094415	-118.634523	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	100-year	No	n/a	Yes	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	314188E	TBD	LWS	TBD	56	66	3759.55	-2.662	180.938	Single Circuit	TBD	TBD	TBD	35.094416	-118.635185	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	100-year	No	n/a	Yes	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4012826E	TBD	LWS	TBD	56	66	3840.84	0.1626	221.89	Single Circuit	TBD	TBD	TBD	35.098163	-118.602119	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	4012827E	TBD	LWS	TBD	56	66	3840.17	-1.0018	217.364	Single Circuit	TBD	TBD	TBD	35.09876	-118.602107	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	4012828E	TBD	LWS	TBD	56	66	3838.89	1.616	221.174	Single Circuit	TBD	TBD	TBD	35.099368	-118.602082	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	4012829E	TBD	LWS	TBD	56	66	3795.34	-1.7688	189.749	Single Circuit	TBD	TBD	TBD	35.094438	-118.624551	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4012898E	TBD	LWS	TBD	60	66	3849.25	-0.2467	220.603	Single Circuit	TBD	TBD	TBD	35.094486	-118.603677	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4141083E	TBD	LWS	TBD	56	66	3841.04	0.4627	210.285	Single Circuit	TBD	TBD	TBD	35.096923	-118.602143	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	4141089E	TBD	TSP	TBD	56	66	3840.62	-76.9409	179.525	Single Circuit	TBD	TBD	TBD	35.100406	-118.601939	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	4141254E	TBD	LWS	TBD	56	66	3756.59	3.8942	142.319	Single Circuit	TBD	TBD	TBD	35.094393	-118.635789	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	100-year	Yes	Brite Lake	Yes	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4141255E	TBD	LWS	TBD	56	66	3776.49	-0.0248	207.88	Single Circuit	TBD	TBD	TBD	35.094419	-118.630542	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236655E	TBD	LWS	TBD	60	66	3851.21	0.1124	216.229	Single Circuit	TBD	TBD	TBD	35.094484	-118.602954	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236656E	TBD	LWS	TBD	60	66	3847.95	0.0207	220.663	Single Circuit	TBD	TBD	TBD	35.094485	-118.604414	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236657E	TBD	LWS	TBD	60	66	3844.83	-0.0905	223.011	Single Circuit	TBD	TBD	TBD	35.094485	-118.605152	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236658E	TBD	LWS	TBD	60	66	3842.01	0.1644	221.455	Single Circuit	TBD	TBD	TBD	35.094483	-118.605898	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236659E	TBD	LWS	TBD	60	66	3839.24	-0.406	222.53	Single Circuit	TBD	TBD	TBD	35.094484	-118.606638	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236660E	TBD	LWS	TBD	60	66	3839.56	0.6368	225.102	Single Circuit	TBD	TBD	TBD	35.09448	-118.607382	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236661E	TBD	LWS	TBD	60	66	3835.15	-0.4643	231.091	Single Circuit	TBD	TBD	TBD	35.094482	-118.608134	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236662E	TBD	LWS	TBD	60	66	3830.72	-0.0851	237.543	Single Circuit	TBD	TBD	TBD	35.09448	-118.609651	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236663E	TBD	LWS	TBD	60	66	3828.53	-0.1227	233.131	Single Circuit	TBD	TBD	TBD	35.094479	-118.610445	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236664E	TBD	LWS	TBD	60	66	3823.81	-0.0044	236.301	Single Circuit	TBD	TBD	TBD	35.094477	-118.611224	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4236665E	TBD	LWS	TBD	60	66	3822.29	-0.1879	230.53	Single Circuit	TBD	TBD	TBD	35.094474	-118.612014	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	179	463883	Tehachapi sandy loam, 2 to 15 percent slopes	86	3	C	Low	High
5	Existing	4236666E	TBD	LWS	TBD	60	66	3828.22	0.1041	231.81	Single Circuit	TBD	TBD	TBD	35.09447	-118.612785	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	179	463883	Tehachapi sandy loam, 2 to 15 percent slopes	86	3	C	Low	High
5	Existing	4236667E	TBD	LWS	TBD	60	66	3820.29	0.2853	233.261	Single Circuit	TBD	TBD	TBD	35.094462	-118.614316	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236668E	TBD	LWS	TBD	60	66	3811.63	0.3178	220.623	Single Circuit	TBD	TBD	TBD	35.094441	-118.618952	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236669E	TBD	LWS	TBD	60	66	3809.05	-0.6098	226.324	Single Circuit	TBD	TBD	TBD	35.094441	-118.619689	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236670E	TBD	LWS	TBD	60	66	3807.32	0.5852	230.252	Single Circuit	TBD	TBD	TBD	35.094434	-118.620446	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236672E	TBD	LWS	TBD	60	66	3804.07	0.3245	198.55	Single Circuit	TBD	TBD	TBD	35.094426	-118.621883	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236673E	TBD	LWS	TBD	60	66	3801.77	-0.121	198.88	Single Circuit	TBD	TBD	TBD	35.094423	-118.622546	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4236674E	TBD	LWS	TBD	60	66	3800.14	0.2672	203.301	Single Circuit	TBD	TBD	TBD	35.094419	-118.623211	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4277847E	TBD	LWS	TBD	60	66	3814.3	0.0579	234.02	Single Circuit	TBD	TBD	TBD	35.094446	-118.618169	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4277848E	TBD	LWS	TBD	60	66	3816.76	-0.2138	229.54	Single Circuit	TBD	TBD	TBD	35.094451	-118.617402	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4277849E	TBD	LWS	TBD	60	66	3819.76	0.1463	222.161	Single Circuit	TBD	TBD	TBD	35.094453	-118.616659	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4277850E	TBD	LWS	TBD	60	66	3821.58	-0.0778	230.84	Single Circuit	TBD	TBD	TBD	35.094457	-118.615888	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	New-R-EX	4332484E	TBD	LWS	Pin/Post	54.56	66	3781.67	0.3099	211.663	Single Circuit	TBD	TBD	TBD	35.094427	-118.628524	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4410594E	TBD	LWS	TBD	56	66	3789.25	0.3782	198.822	Single Circuit	TBD	TBD	TBD	35.094434	-118.626493	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	New-R-EX	4410595E	TBD	LWS	Pin/Post	60.43	66	3786.76	-0.1737	219.79	Single Circuit	TBD	TBD	TBD	35.094433	-118.627158	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4410597E	TBD	LWS	TBD	56	66	3842.11	-0.0848	225.352	Single Circuit	TBD	TBD	TBD	35.096346	-118.602157	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	4568120E	TBD	LWS	TBD	60	66	3821.07	-0.1505	226.33	Single Circuit	TBD	TBD	TBD	35.094467	-118.613559	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4568121E	TBD	LWS	TBD	56	66	3794.39	-0.7335	197.34	Single Circuit	TBD	TBD	TBD	35.094442	-118.625185	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	4568289E	TBD	LWS	TBD	56	66	3843.86	-0.0629	213.673	Single Circuit	TBD	TBD	TBD	35.095727	-118.602172	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	4568390E	TBD	LWS	TBD	56	66	3846.82	-0.2179	238.8	Single Circuit	TBD	TBD	TBD	35.09514	-118.602185	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	816950E	TBD	LWS	TBD	56	66	3838.96	-13.0908	203.433	Single Circuit	TBD	TBD	TBD	35.099927	-118.602078	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	SUB	TBD	TSP	TBD	56	66	3841.86	-99	184.153	Single Circuit	TBD	TBD	TBD	35.100403	-118.601324	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.75	0	No	Yes	No	No	n/a	No	174	463878	Steuber sandy loam, 0 to 2 percent slopes	56	5	A	Low	Moderate
5	Existing	X7653E	TBD	LWS	TBD	60	66	3757.13	-0.2308	158.939	Single Circuit	TBD	TBD	TBD	35.094402	-118.636265	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	0	No	Yes	100-year	Yes	Brite Lake	Yes	140	463844	Havala sandy loam, 0 to 2 percent slopes	56	5	C	Low	Moderate
5	Existing	X7654E	TBD	LWS	TBD	60	66	3760.63	1.4424	154.173	Single Circuit	TBD	TBD	TBD	35.09441	-118.636796	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	0	No	Yes	100-year	No	n/a	Yes	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
5	Existing	X7655E	TBD	LWS	TBD	60	66	3762.85	-8.2545	226.41	Single Circuit	TBD	TBD	TBD	35.094429	-118.637311	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	0	No	Yes	100-year	No	n/a	Yes	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
5	Existing	X7656E	TBD	LWS	TBD	60	66	3765.87	8.1655	258.994	Single Circuit	TBD	TBD	TBD	35.094366	-118.638064	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	X7657E	TBD	LWS	TBD	60	66	3771.23	0.2272	256.593	Single Circuit	TBD	TBD	TBD	35.094396	-118.638929	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	0	No	Yes	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	X7658E	TBD	LWS	TBD	60	66	3776.2	0.142	231.179	Single Circuit	TBD	TBD	TBD	35.094429	-118.639786	Gorman-Kern River	Pliocene to Holocene	alluvium	terrace	0.45	0	No	No	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	X7659E	TBD	LWS	TBD	60	66	3799.44	-0.1728	179.642	Single Circuit	TBD	TBD	TBD	35.09446	-118.640558	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	X7660E	TBD	LWS	TBD	60	66	3798.79	-1.1714	283.58	Single Circuit	TBD	TBD	TBD	35.094482	-118.641158	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	7	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
5	Existing	X7661E	TBD	LWS	TBD	60	66	3796.72	0.3853	315.12	Single Circuit	TBD	TBD	TBD	35.094502	-118.642105	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
5	Existing	X7662E	TBD	LWS	TBD	60	66	3805.48	-0.1271	251.953	Single Circuit	TBD	TBD	TBD	35.094529	-118.643158	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
5	Existing	X7663E	TBD	LWS	TBD	60	66	3808.35	0.1132	232.517	Single Circuit	TBD	TBD	TBD	35.09455	-118.644	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	193	463897	Walong sandy loam, 15 to 30 percent slopes	86	3	B	Low	Moderate
5	Existing	X7665E	TBD	LWS	TBD	60	66	3815.97	0.0367	214.4	Single Circuit	TBD	TBD	TBD	35.094587	-118.645459	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	Existing	X7666E	TBD	LWS	TBD	60	66	3817.11	5.3784	345.384	Single Circuit	TBD	TBD	TBD	35.094605	-118.646175	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate
5	New	X7666E	Monopole	LWS	Pin/Post	79	66	3817.095	-5.2206	418.356	Single Circuit	CORRECTIONS-CUMMINGS-KERN RIVER	TBD	1235	35.094608	-118.646176	Gorman-Kern River	Permian to Tertiary; most Mesozoic	granodiorite	quartz monzonite	0.45	0	No	No	No	No	n/a	No	175	463879	Steuber sandy loam, 2 to 5 percent slopes	56	5	A	Low	Moderate

Table 5
Soil Corrosivity Summary
Southern California Edison
TLRR Program, Gorman-Kern River Project

ARCADIS

Boring Number	Depth (feet)	Soil Type	Minimum Resistivity (ohm-cm)	pH	Sulfate (ppm)	Chloride (ppm)	Mapped USDA Concrete Corrosivity at the Boring Location	Mapped USDA Steel Corrosivity at the Boring Location	CalTrans Corrosivity for Structural Elements	CalTrans Corrosivity for MSE Wall Backfill
1-005	2.0-3.0	SC	3,219	7.9	79	26	moderate	moderate	not corrosive	compliant
3-005	2.0-3.0	SM	11,459	7.3	28	21	moderate	low	not corrosive	compliant
KERN-NEW01	2.0-3.0	SM	2,698	8.2	68	40	low	moderate	not corrosive	compliant
5-005	2.0-2.5	SW	9,214	8.2	32	22	low	moderate	not corrosive	compliant
KERN-008A	2.0-3.0	SM	7,379	7.7	28	20	low	low	not corrosive	compliant

USDA Soil Corrosion Ranges						
High			*<2,000*	*<5.5*	*>7,000*	*>1,500*
Moderate			*2,000-5,000*	*5.5-6.5*	*1,000-7,000*	*300-1,500*
Low			*>5,000*	*>6.5*	*<1,000*	*<300*

CalTrans Soil Corrosion Ranges for Structural Elements						
Corrosive			*<1,500**	*<5.5*	*>1,500*	*>500*
Not Corrosive			*>1,500**	*>5.5*	*<1,500*	*<500*

CalTrans Soil Corrosion Ranges for MSE Wall Backfill					
Not Compliant (Corrosive)		*<2,000*	*<5.5 or >10*	*>500*	*>250*
Compliant (Not Corrosive)		*>2,000*	*5.5-10*	*<500*	*<250*

Notes:

* Resistivity serves as an indicator for the possible presence of soluble salts. It is not used to define a corrosive soil for structures.

MSE - mechanically-stabilized earth

ohm-cm - ohms centimeter

ppm - parts per million

SC - clayey sand

SM - silty sand

SW - well graded sand

USDA - United States Department of Agriculture

References:

USDA corrosive potential typical ranges taken from the SSURGO database. Title 430 - National Soil Survey Handbook. Part 618 - Soil Properties and Qualities. Subpart B. 618.80 and 618.81.

CalTrans corrosive potential ranges taken from the CalTrans Corrosion Guildelines, May 2021, Version 3.2. Section 6.1 and Section 8.1.

Figures

Legend

- Substation
- Counties
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5

N

0 6 12
Miles

GORMAN-KERN RIVER 66 kV PROJECT

SITE VICINITY MAP

ARCADIS SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL® Company

FIGURE 1

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig1_Site Vicinity.mxd 1/24/2022 1:43:30 PM

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig2_Proposed Alignment and Boring Locations.mxd 1/28/2022 4:34:27 PM

Legend

- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Completed Boring Location
- Omitted Boring Location
- Counties

N

0 6 12

Miles

GORMAN-KERN RIVER 66 kV PROJECT

PROPOSED ALIGNMENT AND BORING LOCATIONS

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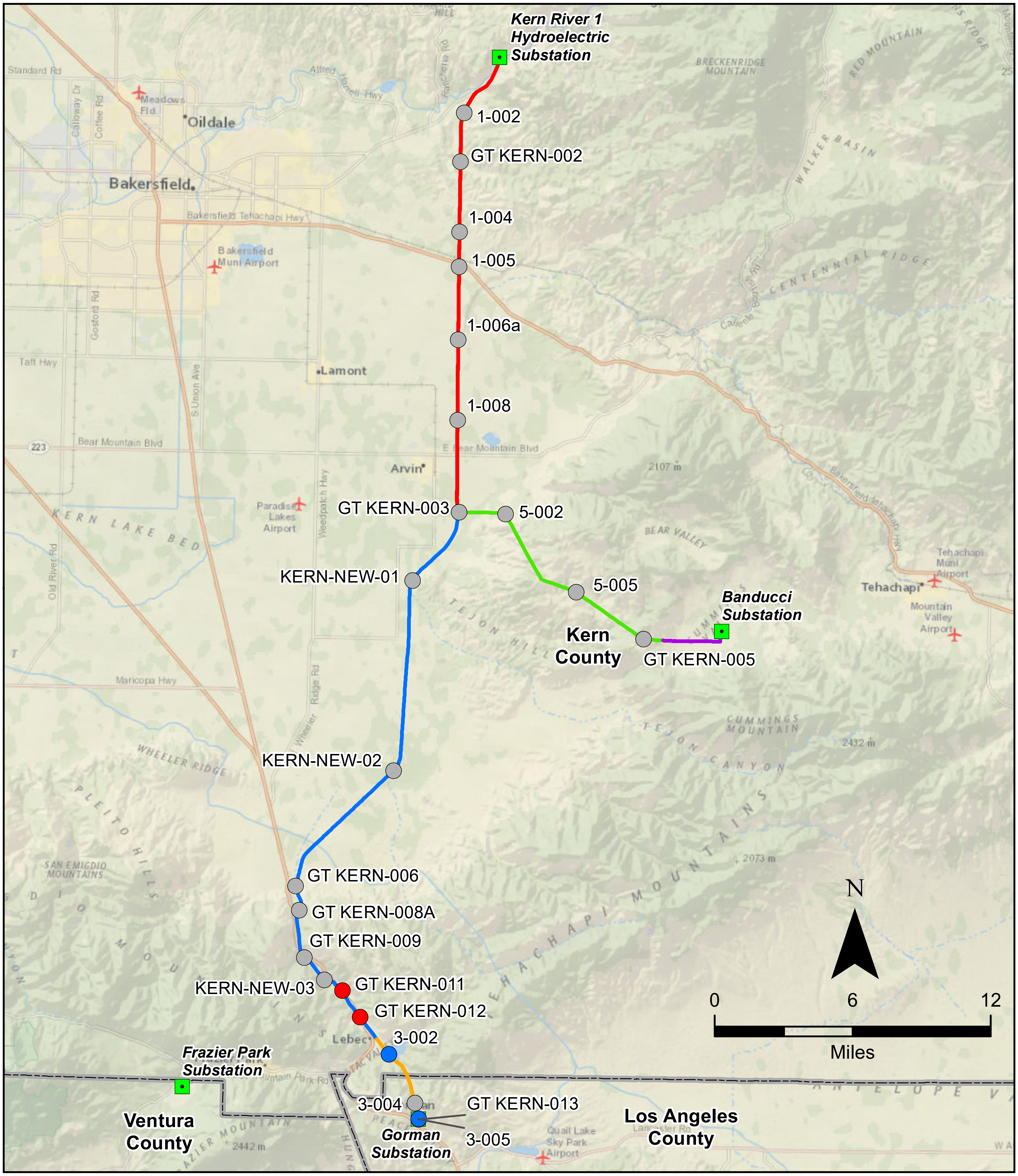
FIGURE 2



Legend

	Substation		Boring Location		Counties
	Segment 1		Groundwater Not Encountered During Boring Installation		
	Segment 2		Liquefaction Factor of Safety Less Than One		
	Segment 3		Liquefaction Factor of Safety Greater Than One		
	Segment 4				
	Segment 5				

GORMAN-KERN RIVER 66 kV PROJECT

SOIL LIQUEFACTION SUMMARY

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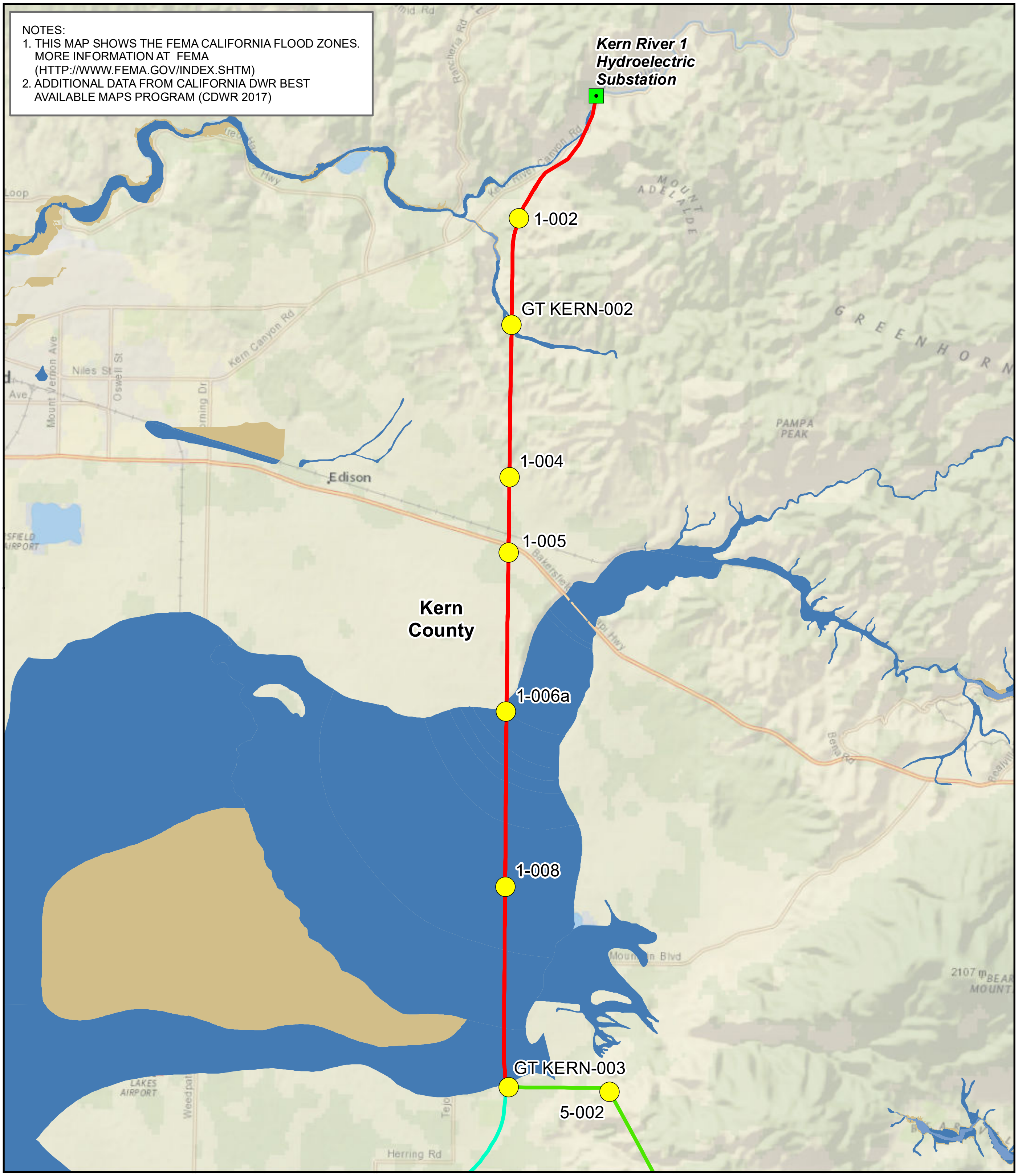
FIGURE 3

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig3_Soil Liquefaction Summary.mxd 1/28/2022 4:38:42 PM



Legend

- Substation
- Boring Location
- Segment 1
- Counties
- Segment 2
- Approximate Limits of 100-Year Floodplain
- Segment 3
- Approximate Limits of 500-Year Floodplain
- Segment 4
- Segment 5

N

0 2.5 5

Miles

GORMAN-KERN RIVER 66 kV PROJECT

FLOODPLAIN AND BORING LOCATION MAP

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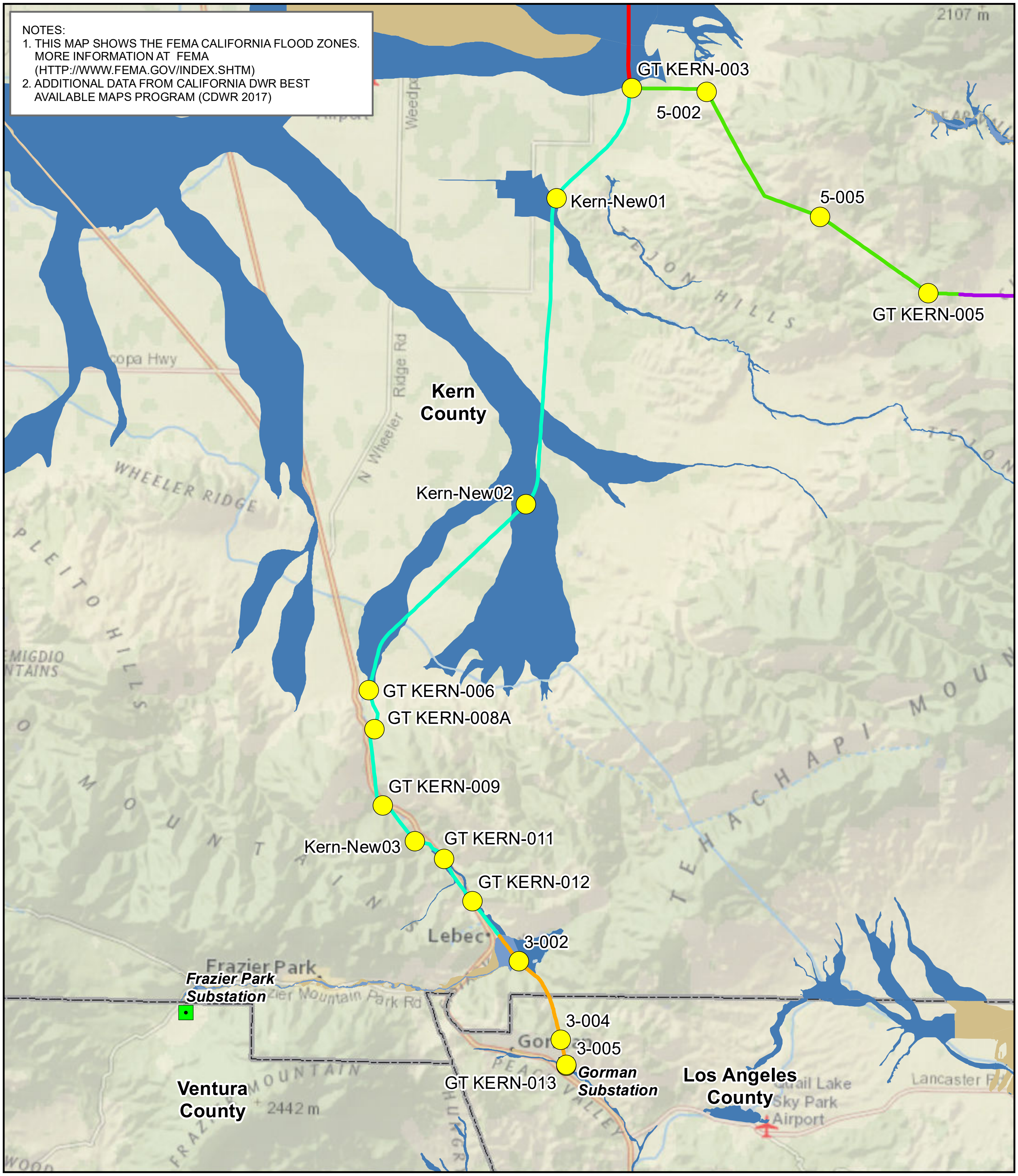
FIGURE 4a

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig4_Flood Plain.mxd 2/21/2022 6:38:23 PM



Legend

- Substation
- Boring Location
- Segment 1
- Counties
- Segment 2
- Approximate Limits of 100-Year Floodplain
- Segment 3
- Approximate Limits of 500-Year Floodplain
- Segment 4
- Segment 5

N

0 3.5 7
Miles

GORMAN-KERN RIVER 66 kV PROJECT

FLOODPLAIN AND BORING LOCATION MAP

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FIGURE **4b**

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig4_Flood Plain.mxd 2/21/2022 6:38:23 PM

Legend

- Substation
- Boring Location
- Segment 1
- Counties
- Segment 2
- Approximate Limits of 100-Year Floodplain
- Segment 3
- Approximate Limits of 500-Year Floodplain
- Segment 4
- Segment 5

N

0 1.5 3
Miles

GORMAN-KERN RIVER 66 kV PROJECT

FLOODPLAIN AND BORING LOCATION MAP

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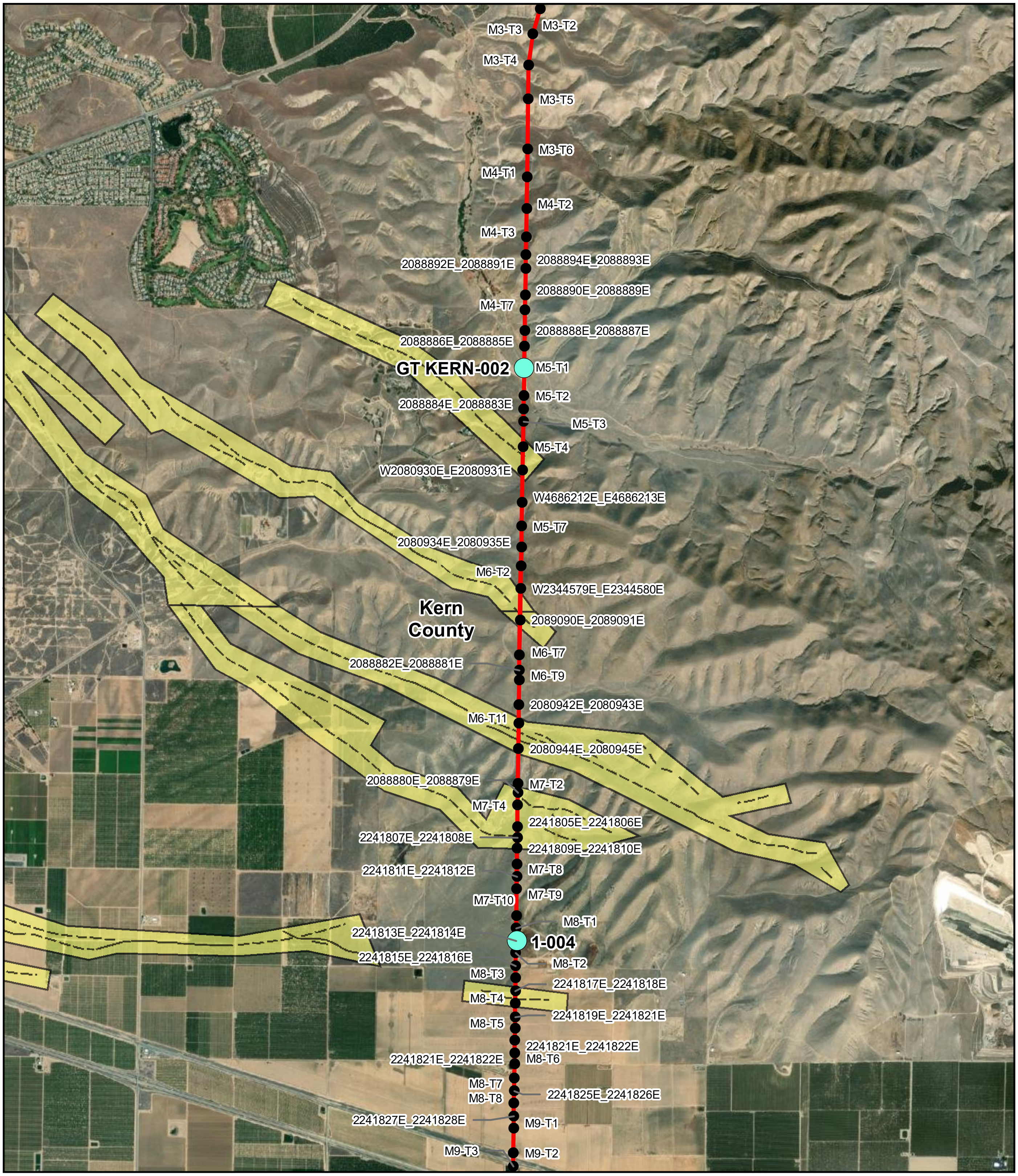
FIGURE **4c**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig4_Flood Plain.mxd 2/21/2022 6:38:23 PM



Legend

Boring Location	Structure Location
Substation	Alquist Priolo Fault Traces
Segment 1	Alquist Priolo Fault Zones
Segment 2	Counties
Segment 3	
Segment 4	
Segment 5	

Source: CGS (2018a, 2018b)

0 0.7 1.4
Miles

N

GORMAN-KERN RIVER
66 kV PROJECT

ALQUIST-PRIOLO SPECIAL STUDIES ZONES MAP

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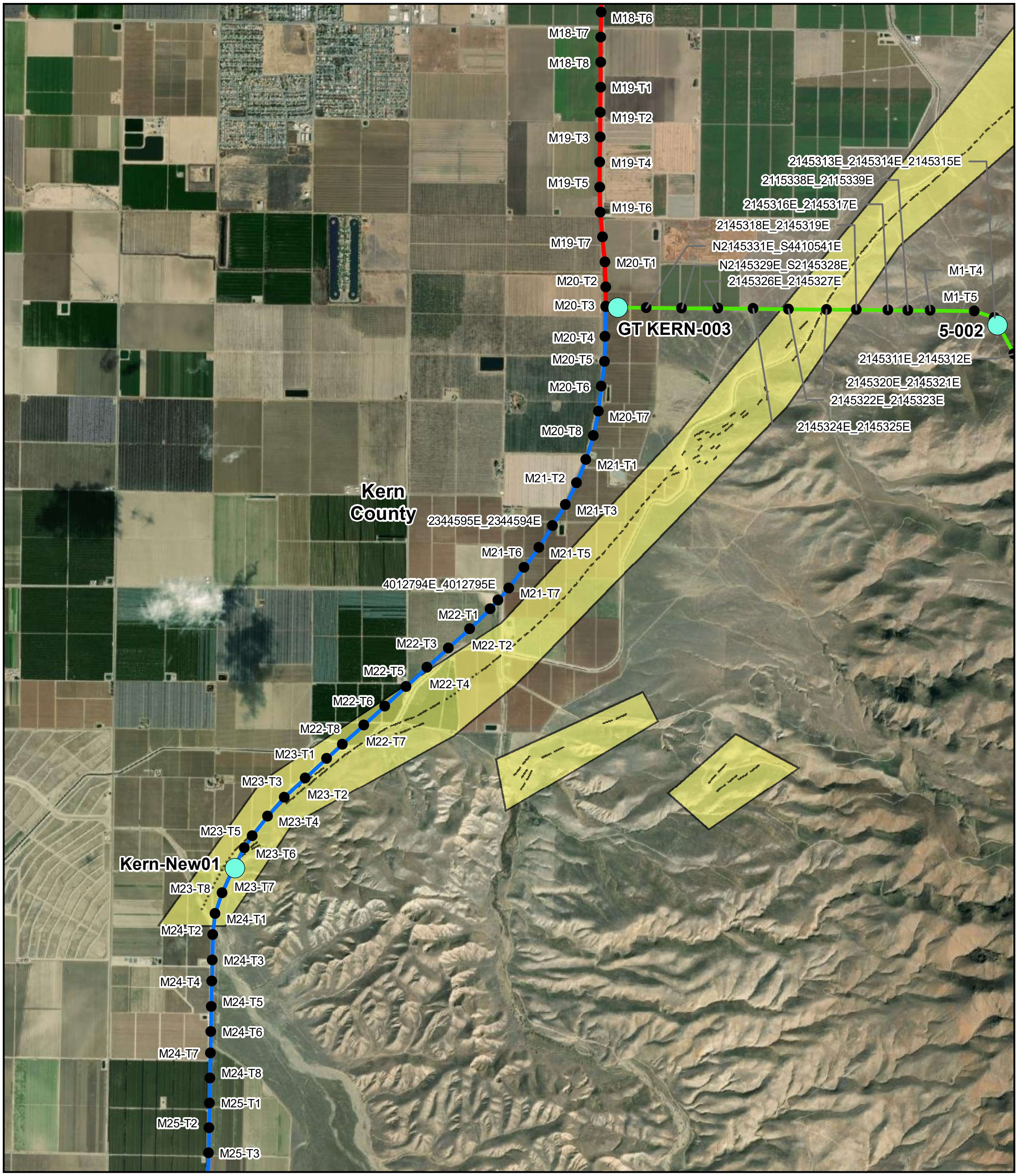
FIGURE
5a

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig5_Alquist-Priolo Zone.mxd 2/17/2022 2:12:24 PM



Legend

Boring Location	Structure Location
Substation	Alquist Priolo Fault Traces
Segment 1	Alquist Priolo Fault Zones
Segment 2	Counties
Segment 3	
Segment 4	
Segment 5	

Source: CGS (2018a, 2018b)

0 0.7 1.4
Miles

N

GORMAN-KERN RIVER
66 kV PROJECT

ALQUIST-PRIOLO SPECIAL
STUDIES ZONES MAP

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FIGURE
5b

T:_ENVS\CE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig5_Alquist-Priolo Zone.mxd 2/17/2022 2:12:24 PM

Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Alquist Priolo Fault Traces
- Alquist Priolo Fault Zones
- Counties

Source: CGS (2018a, 2018b)

0 0.7 1.4
Miles

N

GORMAN-KERN RIVER
66 kV PROJECT

ALQUIST-PRIOLO SPECIAL STUDIES ZONES MAP

ARCADIS
SOUTHERN CALIFORNIA EDISON
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FIGURE
5c

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig5_Alquist-Priolo Zone.mxd 2/17/2022 2:12:24 PM

Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Alquist Priolo Fault Traces
- Alquist Priolo Fault Zones
- Counties

Source: CGS (2018a, 2018b)

0 0.7 1.4

Miles

N

GORMAN-KERN RIVER 66 kV PROJECT

ALQUIST-PRIOLO SPECIAL STUDIES ZONES MAP

ARCADIS

SOUTHERN CALIFORNIA EDISON

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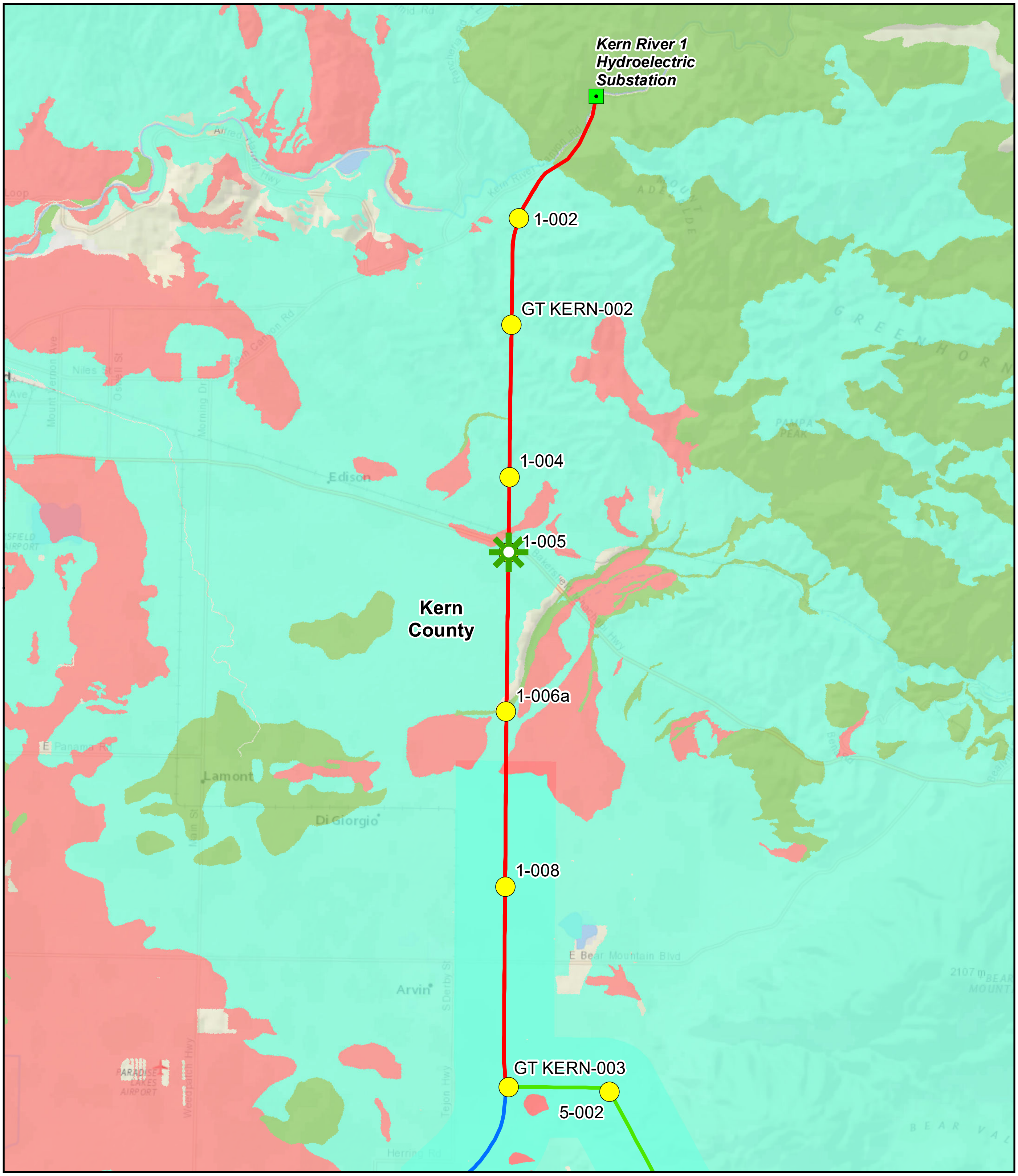
FIGURE 5d

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig5_Alquist-Priolo Zone.mxd 2/17/2022 2:12:24 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties

Areas With Potential Corrosion To Steel Mapped

- High
- Moderate
- Low

Chloride Concentration in Subgrade Soil from Laboratory Data

- Low (<300 ppm)

0 2.5 5
Miles

N

NOTE:
1. Mapped corrosion information taken from the NRCS web soil survey.

GORMAN-KERN RIVER 66 kV PROJECT

SOIL CORROSION TO STEEL

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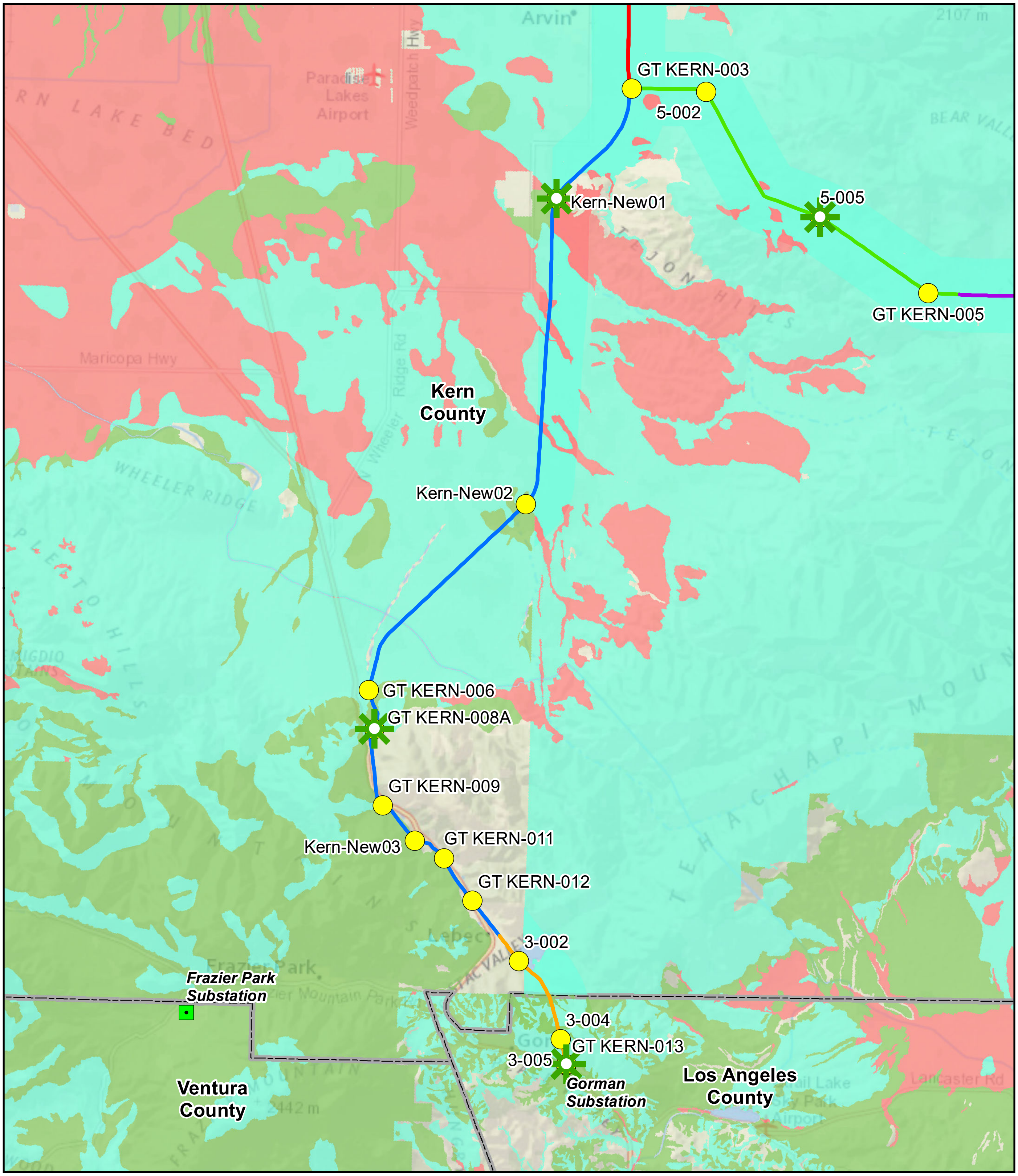
FIGURE
6a

T:_ENVS\CE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig6_Soil Corrosion to Steel.mxd 2/16/2022 1:49:05 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties

Areas With Potential Corrosion To Steel Mapped

- High
- Moderate
- Low

Chloride Concentration in Subgrade Soil from Laboratory Data

- Low (<300 ppm)

0 3.5 7
Miles

N

NOTE:
1. Mapped corrosion information taken from the NRCS web soil survey.

GORMAN-KERN RIVER 66 kV PROJECT

SOIL CORROSION TO STEEL

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FIGURE **6b**

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig6_Soil Corrosion to Steel.mxd 2/16/2022 1:49:05 PM

Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties

Areas With Potential Corrosion To Steel Mapped

- High
- Moderate
- Low

Chloride Concentration in Subgrade Soil from Laboratory Data

- Low (<300 ppm)

0 1.5 3
Miles

N

NOTE:
1. Mapped corrosion information taken from the NRCS web soil survey.

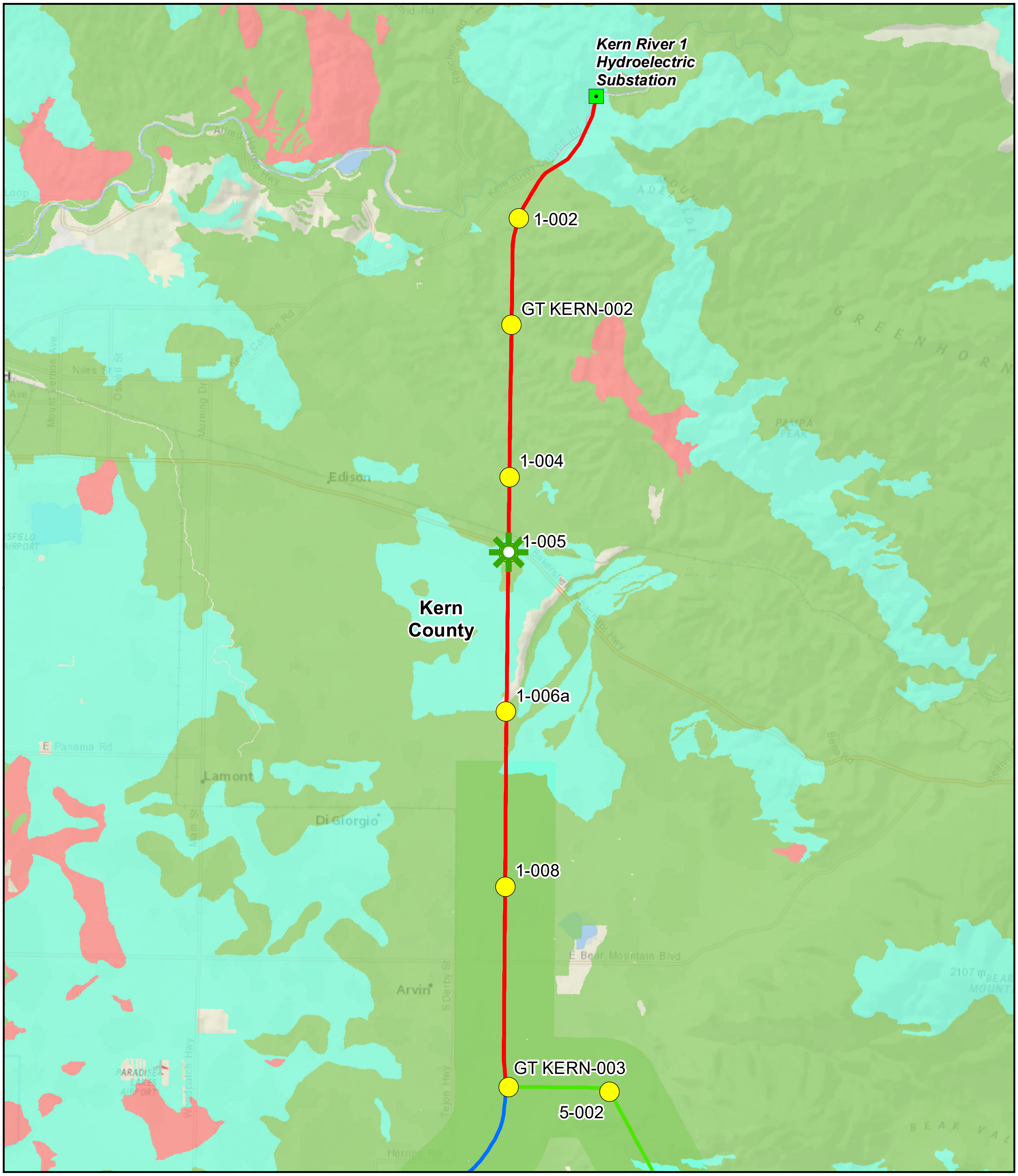
GORMAN-KERN RIVER 66 kV PROJECT

SOIL CORROSION TO STEEL

ARCADIS | SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company

FIGURE **6c**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig6_Soil Corrosion to Steel.mxd 2/16/2022 1:49:05 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties

Areas With Potential Corrosion To Concrete Mapped

- High
- Moderate
- Low

Sulfate Concentration in Subgrade Soil from Laboratory Data

- Low (<1,000 ppm)

0 2.5 5
Miles

N

NOTE:
1. Mapped corrosion information taken from the NRCS web soil survey.

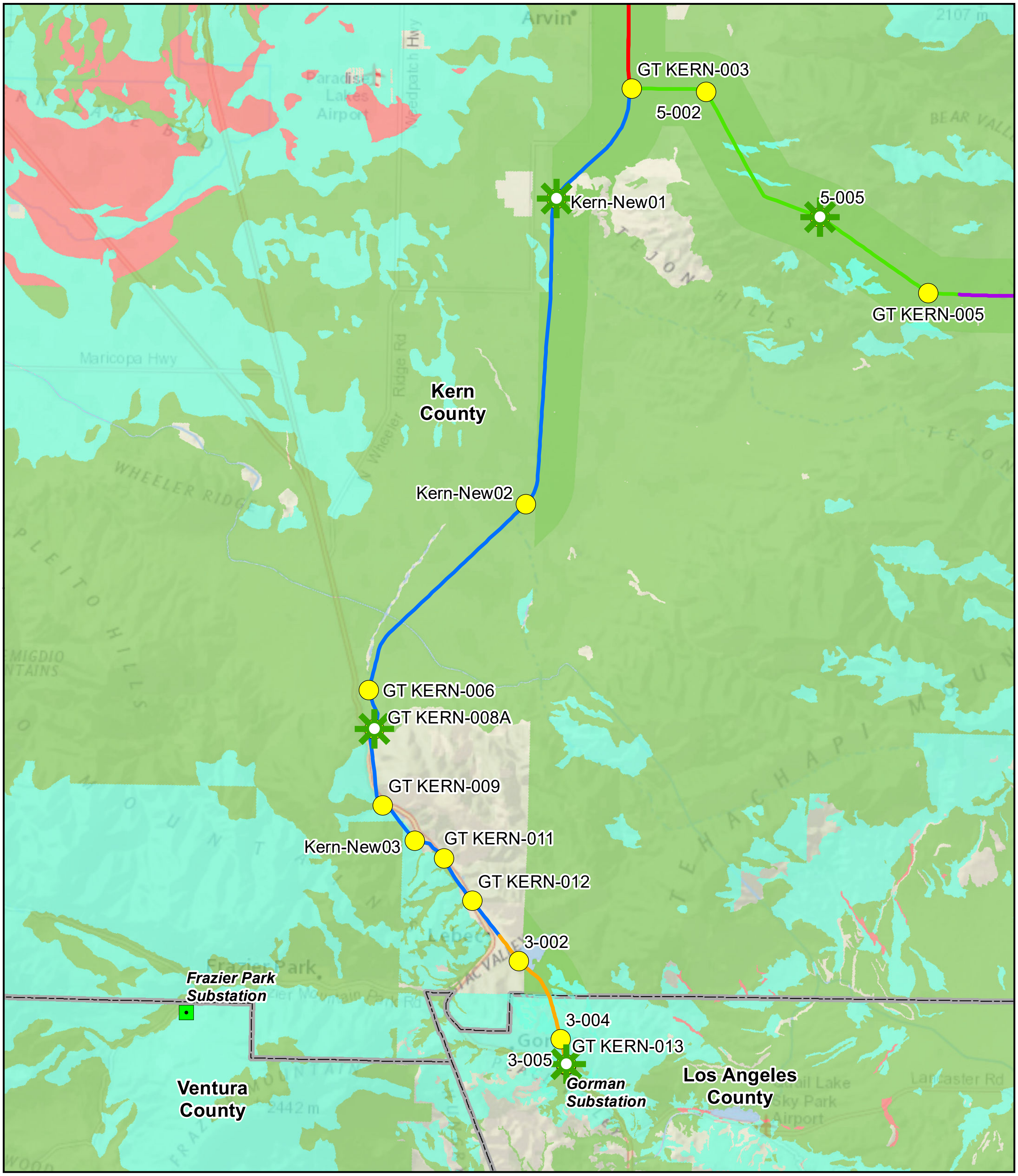
GORMAN-KERN RIVER 66 kV PROJECT

SOIL CORROSION TO CONCRETE

ARCADIS
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

FIGURE
7a

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig7_Soil Corrosion to Concrete.mxd 2/23/2022 11:46:31 AM



Legend

Boring Location

Substation

Segment 1

Segment 2

Segment 3

Segment 4

Segment 5

Counties

Areas With Potential Corrosion To Concrete Mapped

High

Moderate

Low

Sulfate Concentration in Subgrade Soil from Laboratory Data

Low (<1,000 ppm)

0 3.5 7

Miles

N

NOTE:
1. Mapped corrosion information taken from the NRCS web soil survey.

GORMAN-KERN RIVER 66 kV PROJECT

SOIL CORROSION TO CONCRETE

ARCADIS

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL® Company

FIGURE
7b

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig7_Soil Corrosion to Concrete.mxd 2/23/2022 11:46:31 AM

Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties

Areas With Potential Corrosion To Concrete Mapped

- High
- Moderate
- Low

Sulfate Concentration in Subgrade Soil from Laboratory Data

- Low (<1,000 ppm)

0 1.5 3
Miles

N

NOTE:
1. Mapped corrosion information taken from the NRCS web soil survey.

GORMAN-KERN RIVER 66 kV PROJECT

SOIL CORROSION TO CONCRETE

ARCADIS
SOUTHERN CALIFORNIA EDISON
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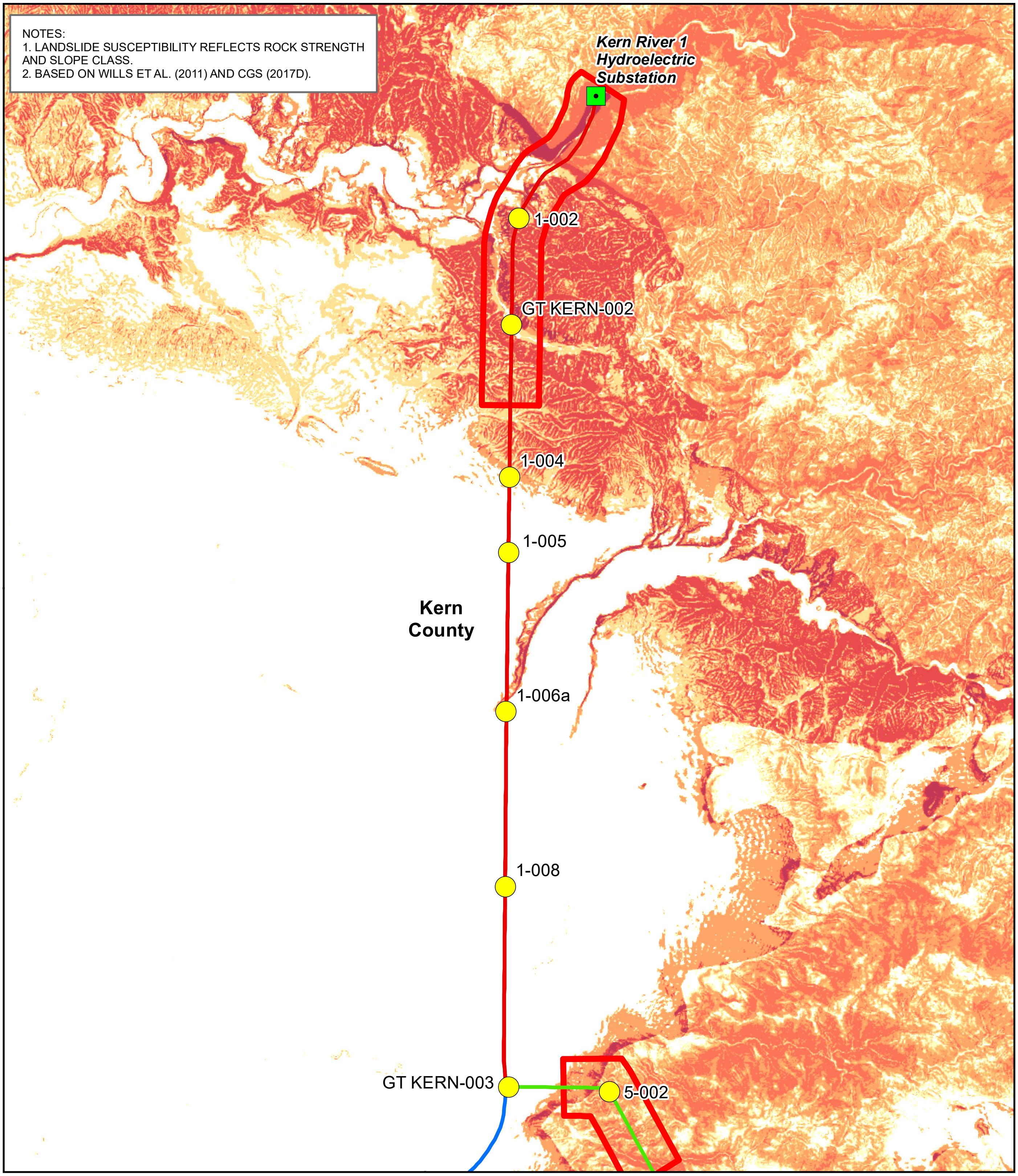
FIGURE
7c

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig7_Soil Corrosion to Concrete.mxd 2/23/2022 11:46:31 AM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties
- Areas of Project Alignment with Higher Susceptibility of Landslide and/or Rockfall
- Greater Landslide Susceptibility
- Lower Landslide Susceptibility

0 2.5 5
Miles

N

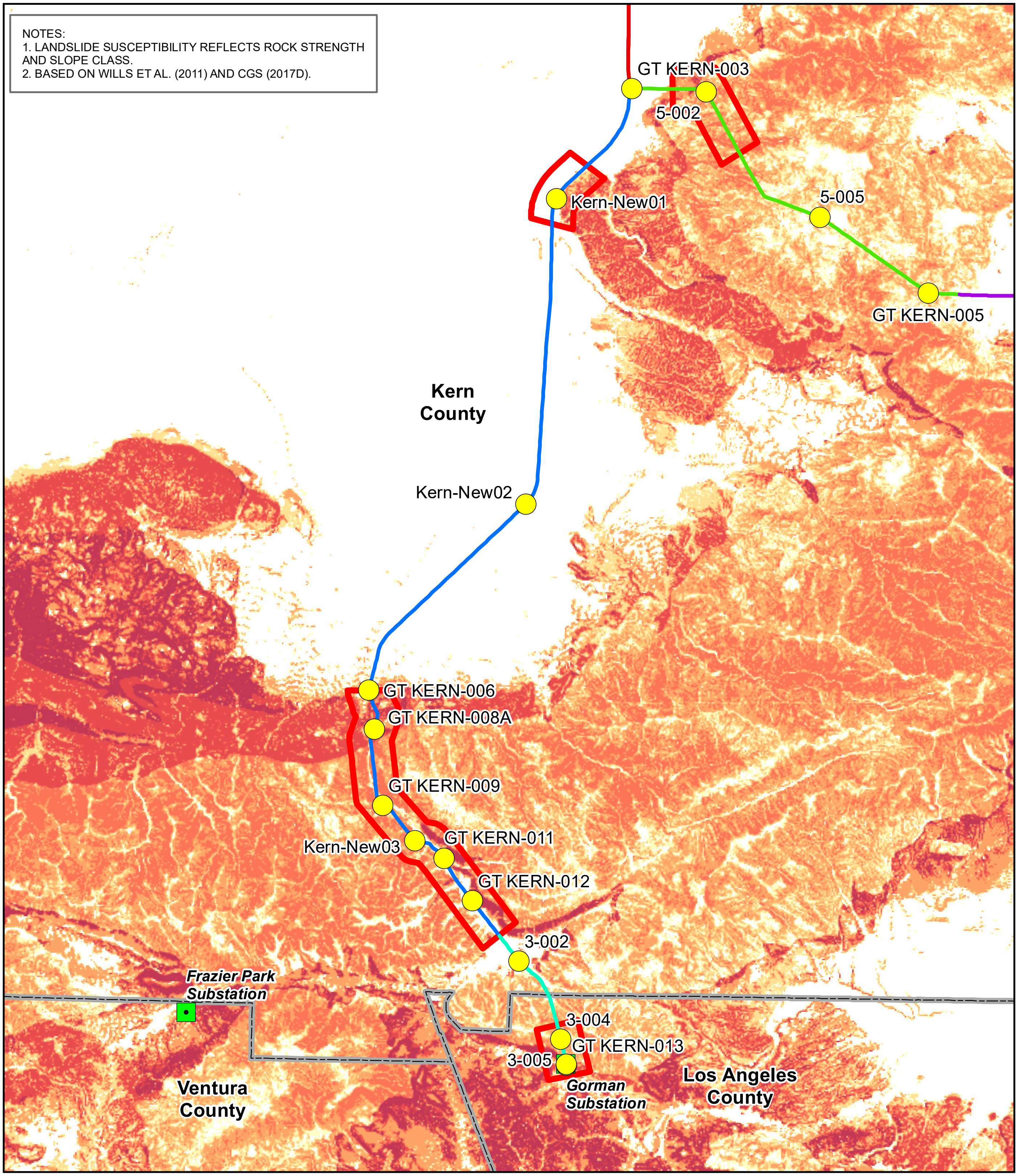
GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY

ARCADIS SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL® Company

FIGURE **8a**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig8_Potential Landslide Susceptibility.mxd 2/16/2022 1:49:26 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties
- Areas of Project Alignment with Higher Susceptibility of Landslide and/or Rockfall
- Greater Landslide Susceptibility
- Lower Landslide Susceptibility

0 3 6
Miles

N

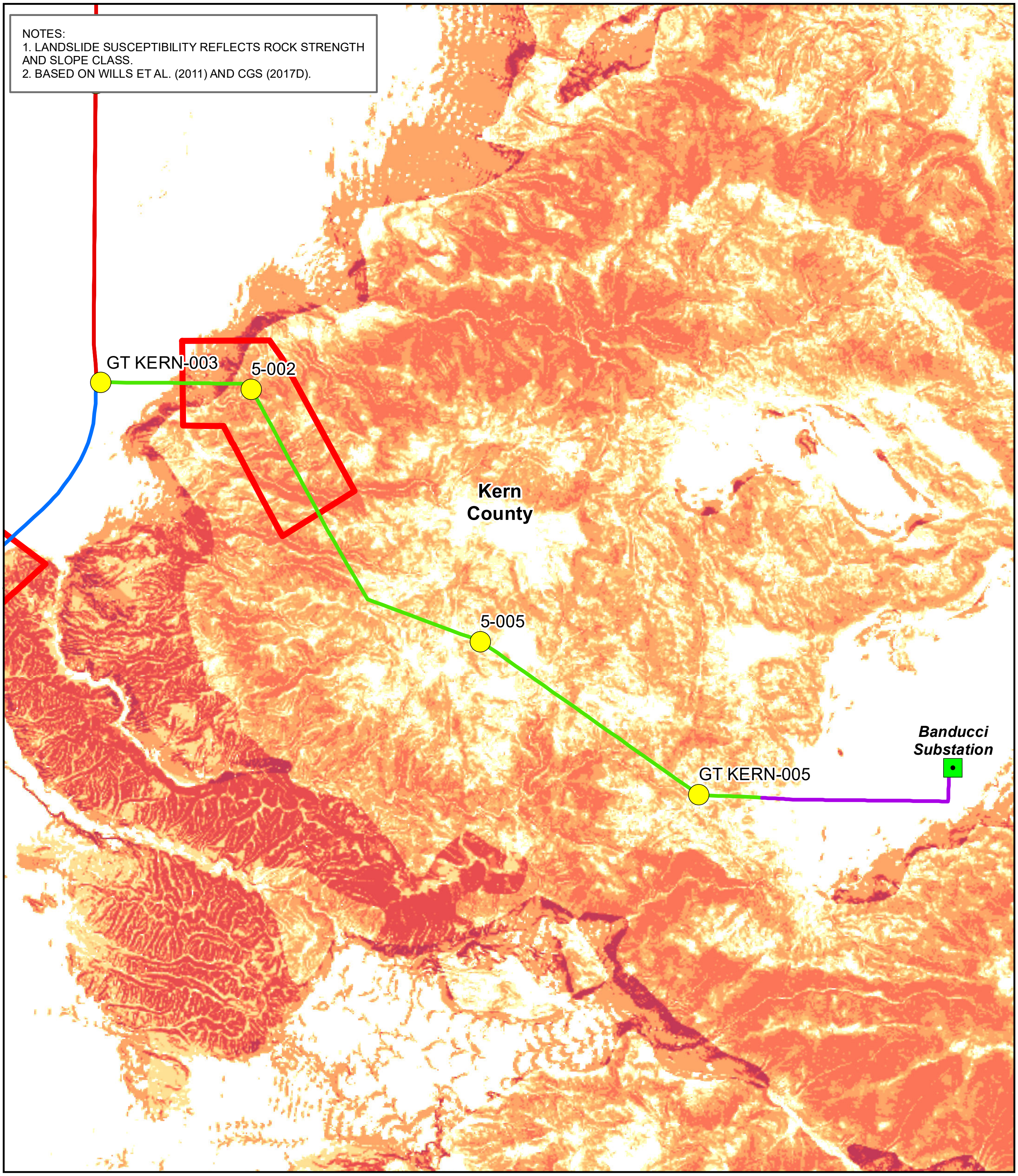
GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY

ARCADIS | SOUTHERN CALIFORNIA EDISON — An EDISON INTERNATIONAL® Company

FIGURE **8b**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig8_Potential Landslide Susceptibility.mxd 2/16/2022 1:49:26 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Counties
- Areas of Project Alignment with Higher Susceptibility of Landslide and/or Rockfall
- Greater Landslide Susceptibility
- Lower Landslide Susceptibility

0 1.5 3
Miles

N

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY

ARCADIS

SOUTHERN CALIFORNIA EDISON
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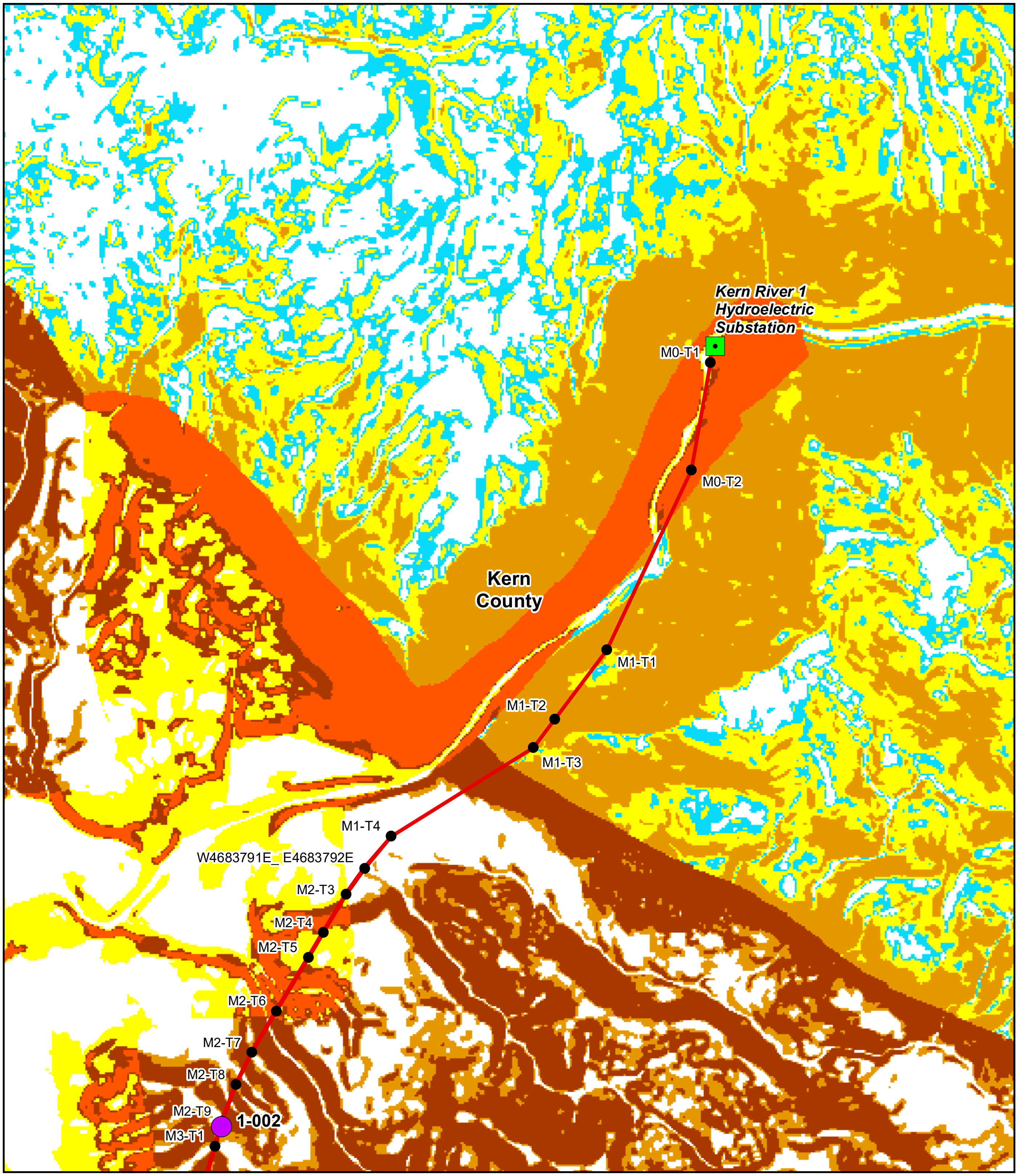
FIGURE
8c

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig8_Potential Landslide Susceptibility.mxd 2/16/2022 1:49:26 PM



T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM

Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.35 0.7
Miles

N

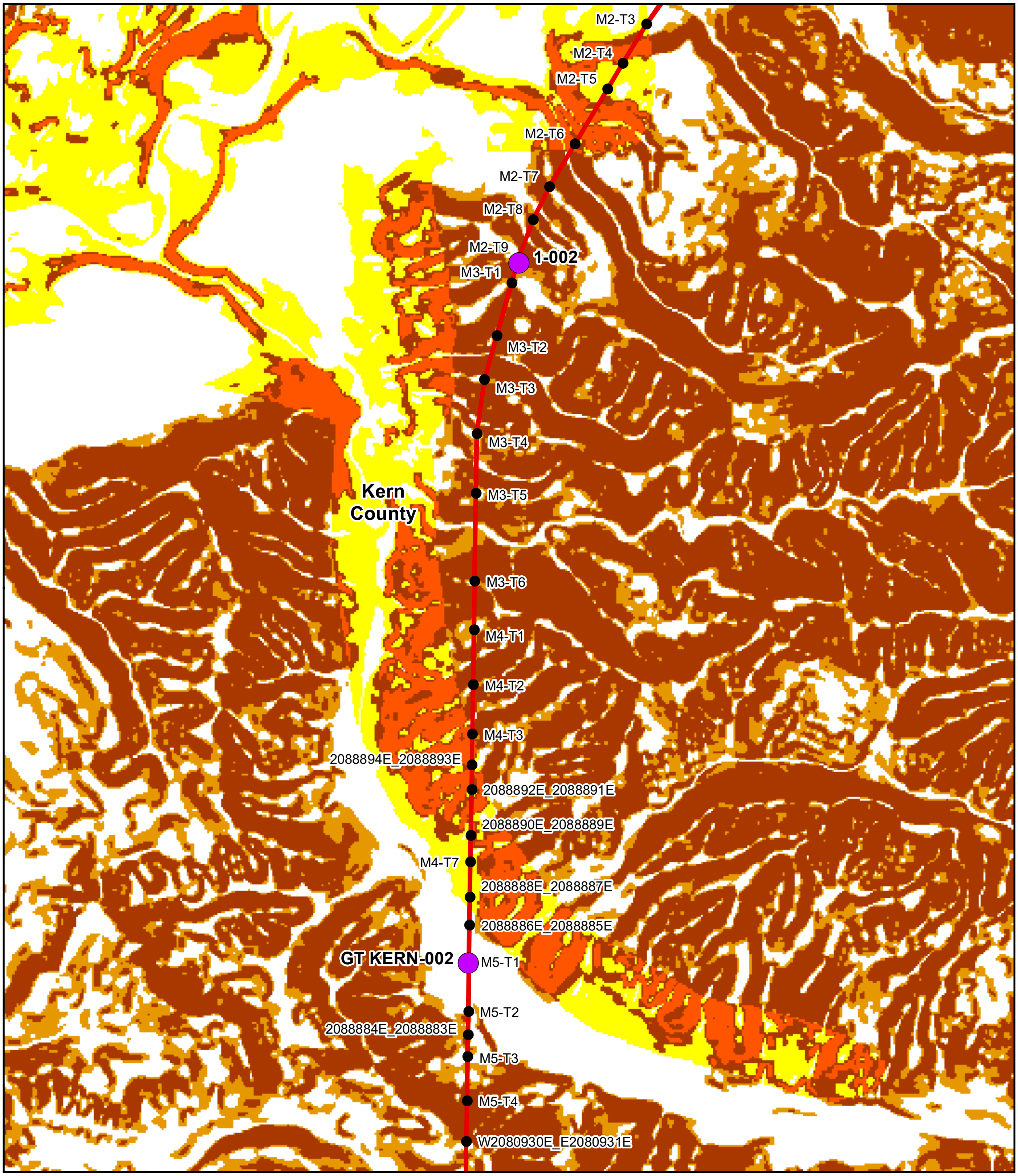
NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL® Company

FIGURE **9a**



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.35 0.7
Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

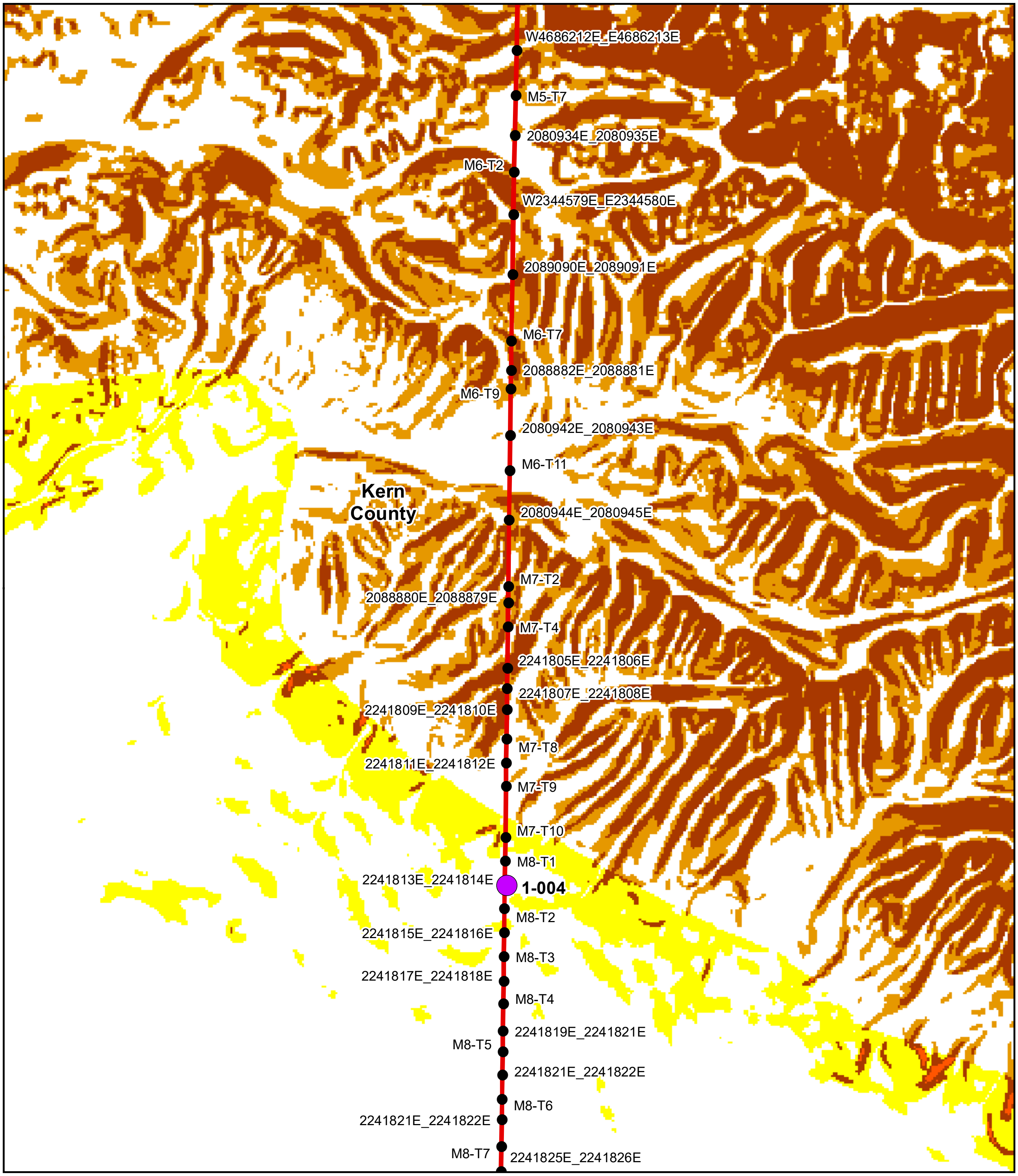
GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company

FIGURE **9b**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

Boring Location
Substation
Segment 1
Segment 2
Segment 3
Segment 4
Segment 5
Structure Location
Counties

Landslide Susceptibility

6
7
8
9
10

0 0.3 0.6
Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

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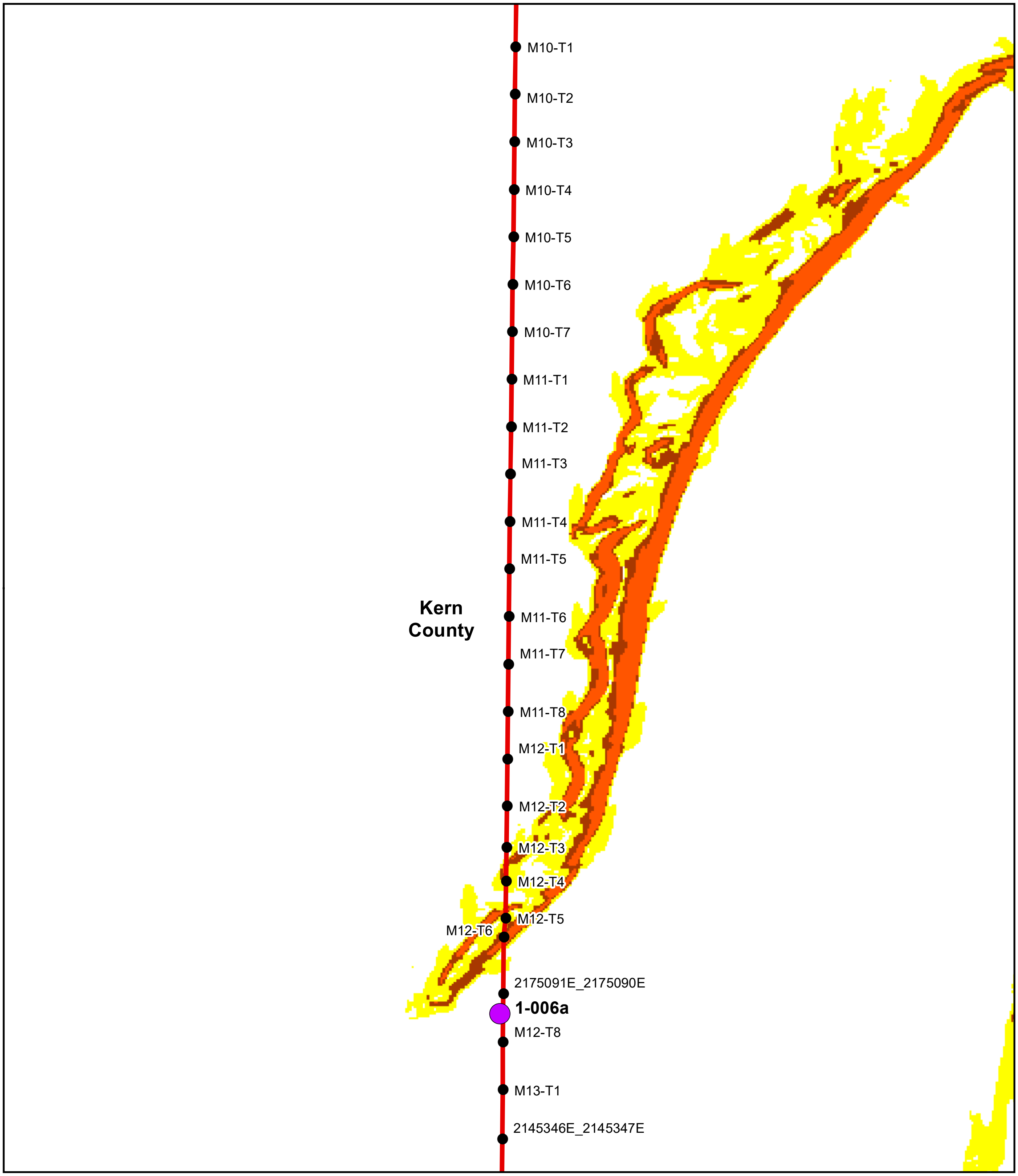
FIGURE
9c

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.3 0.6

Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS

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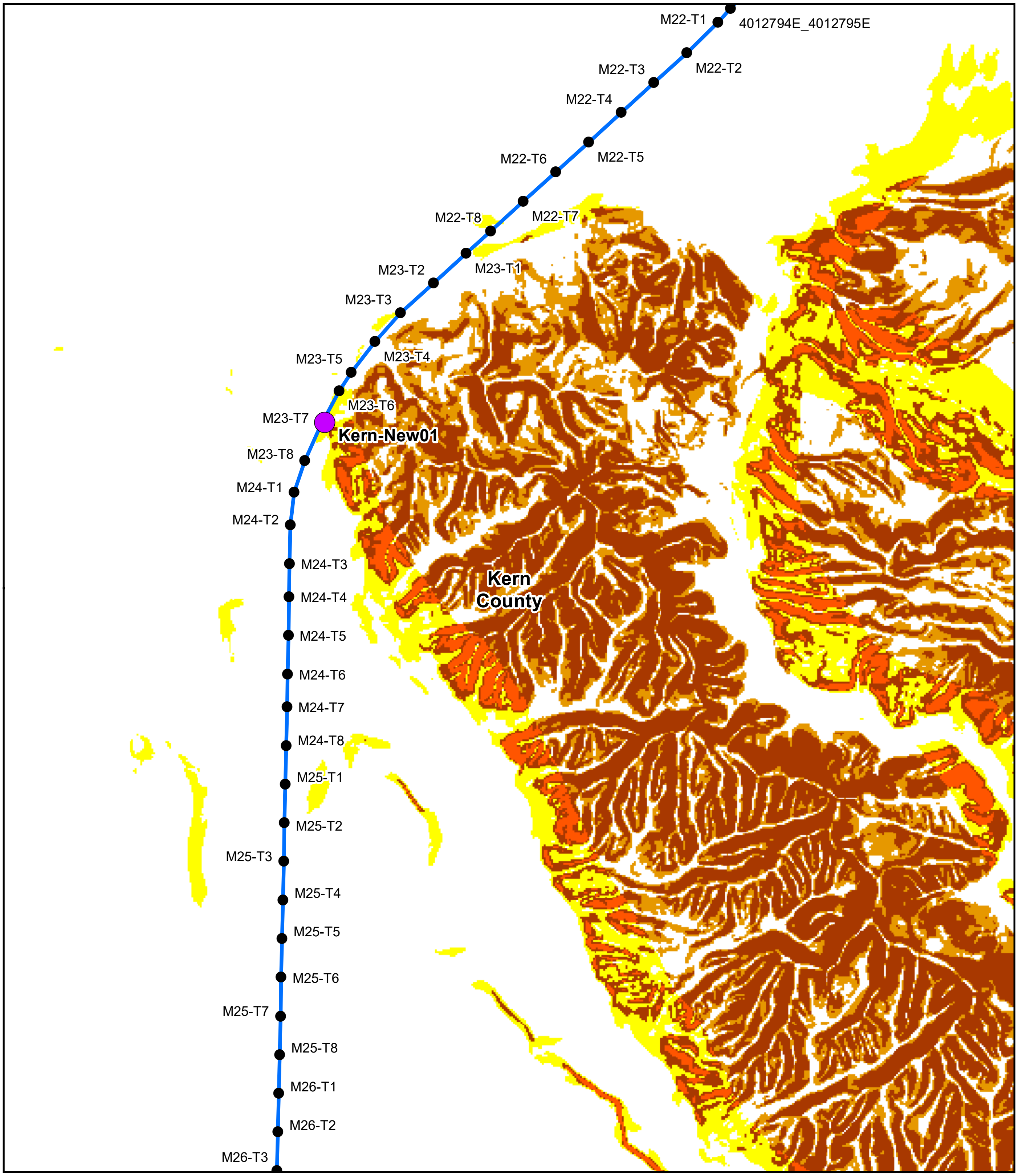
FIGURE
9d

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.4 0.8

Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS

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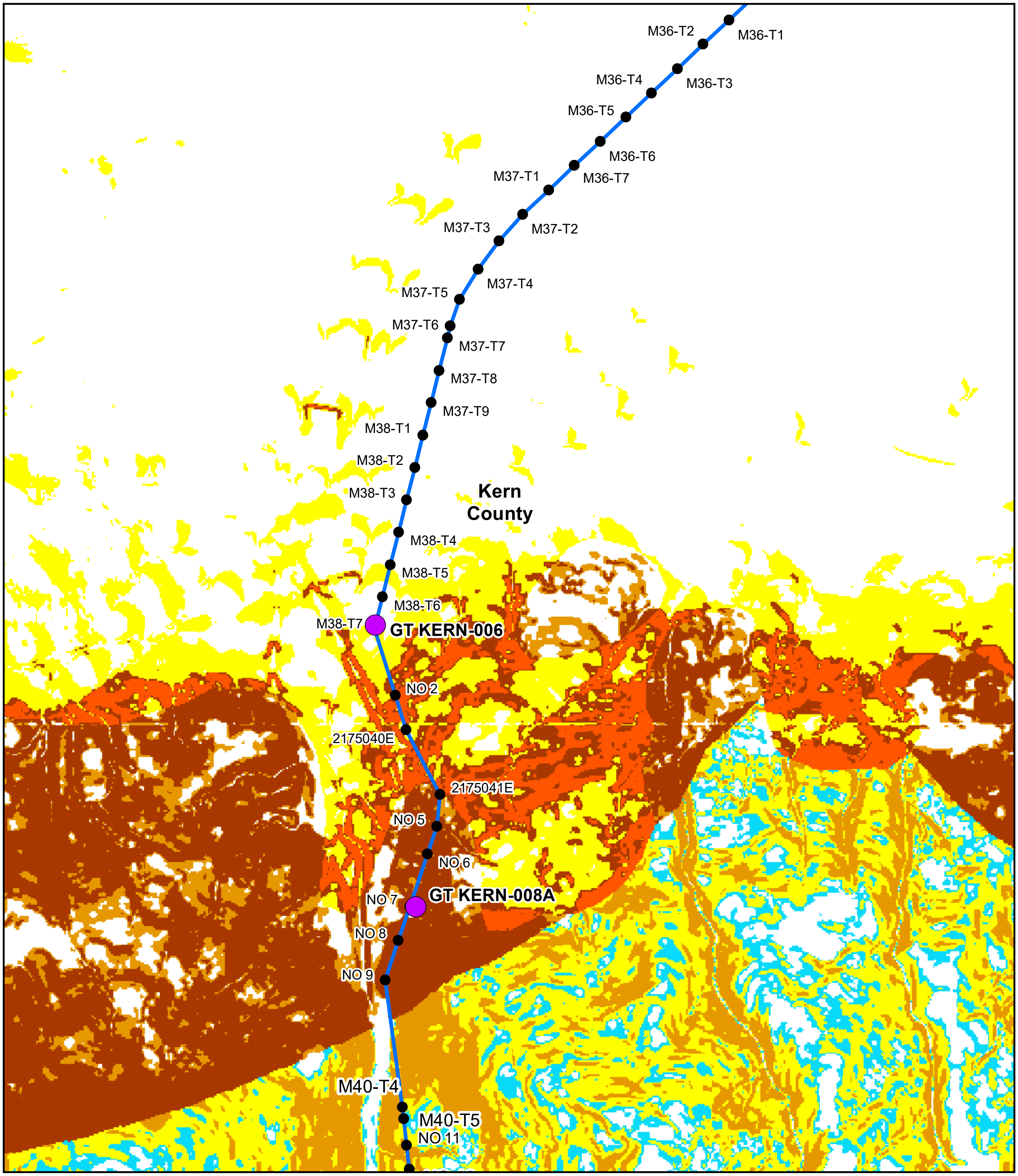
FIGURE **9e**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.4 0.8
Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS

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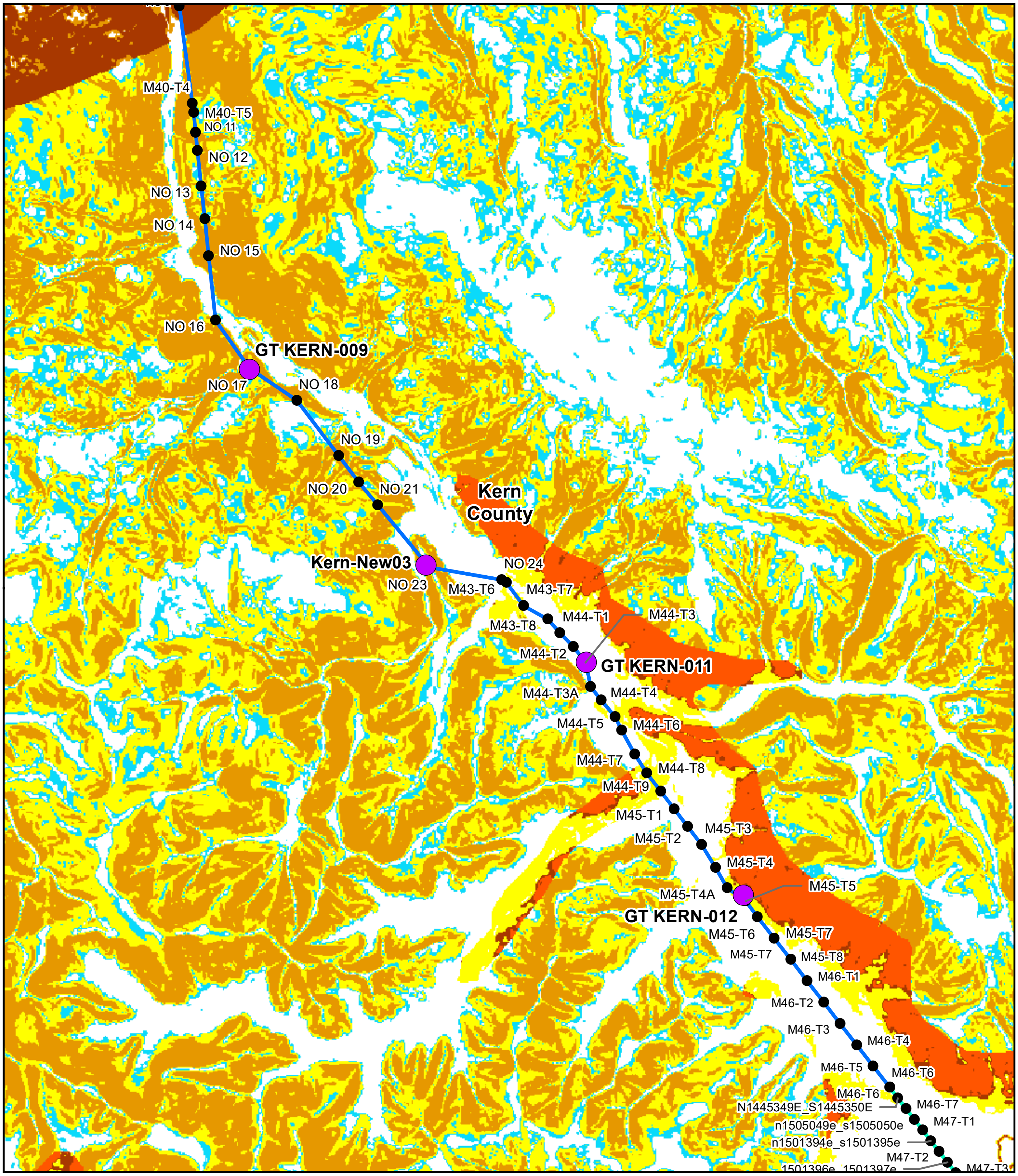
FIGURE 9f

T:_ENVSCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.55 1.1

Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS

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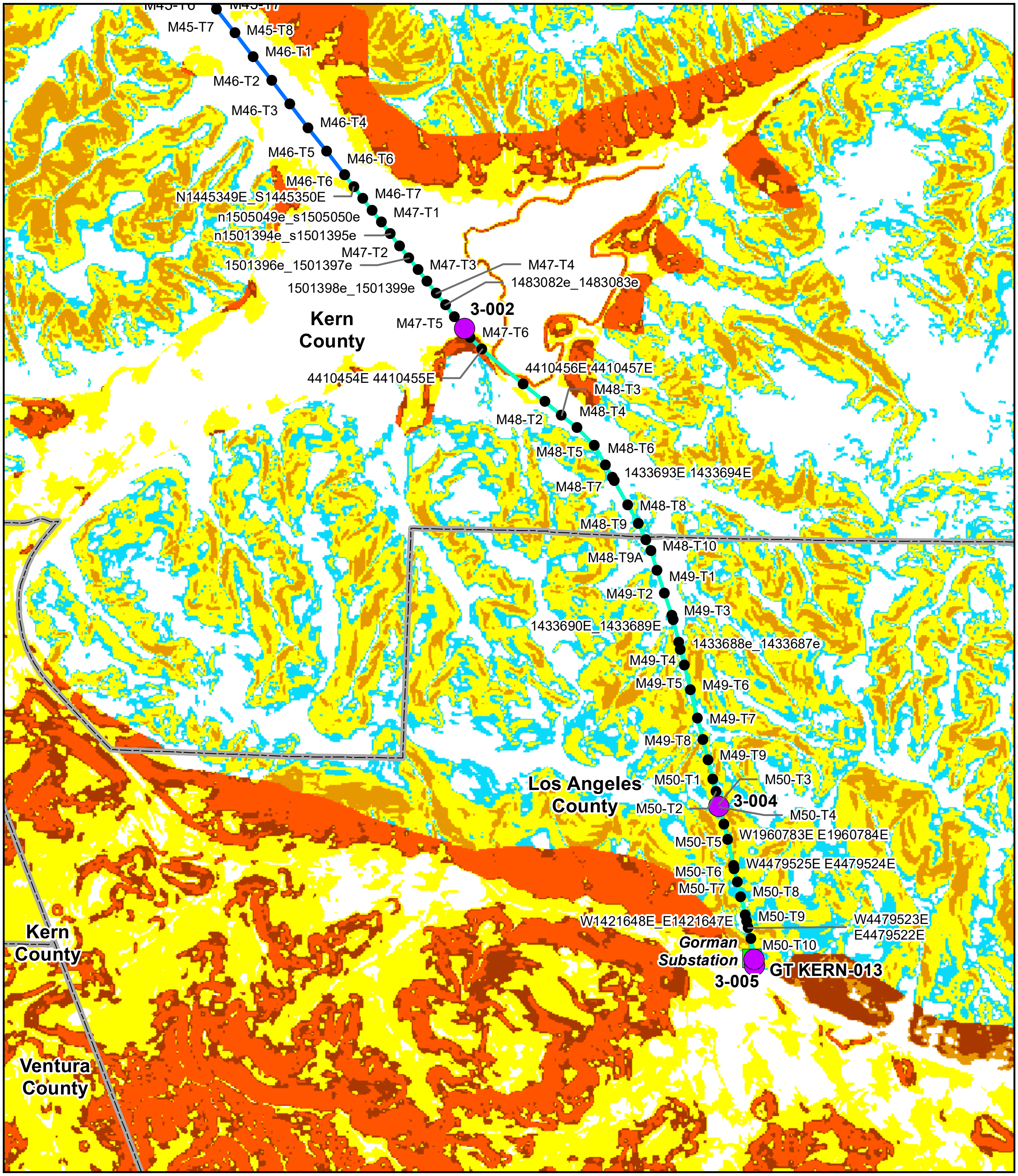
An EDISON INTERNATIONAL® Company

FIGURE 9g

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.5 1
Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS

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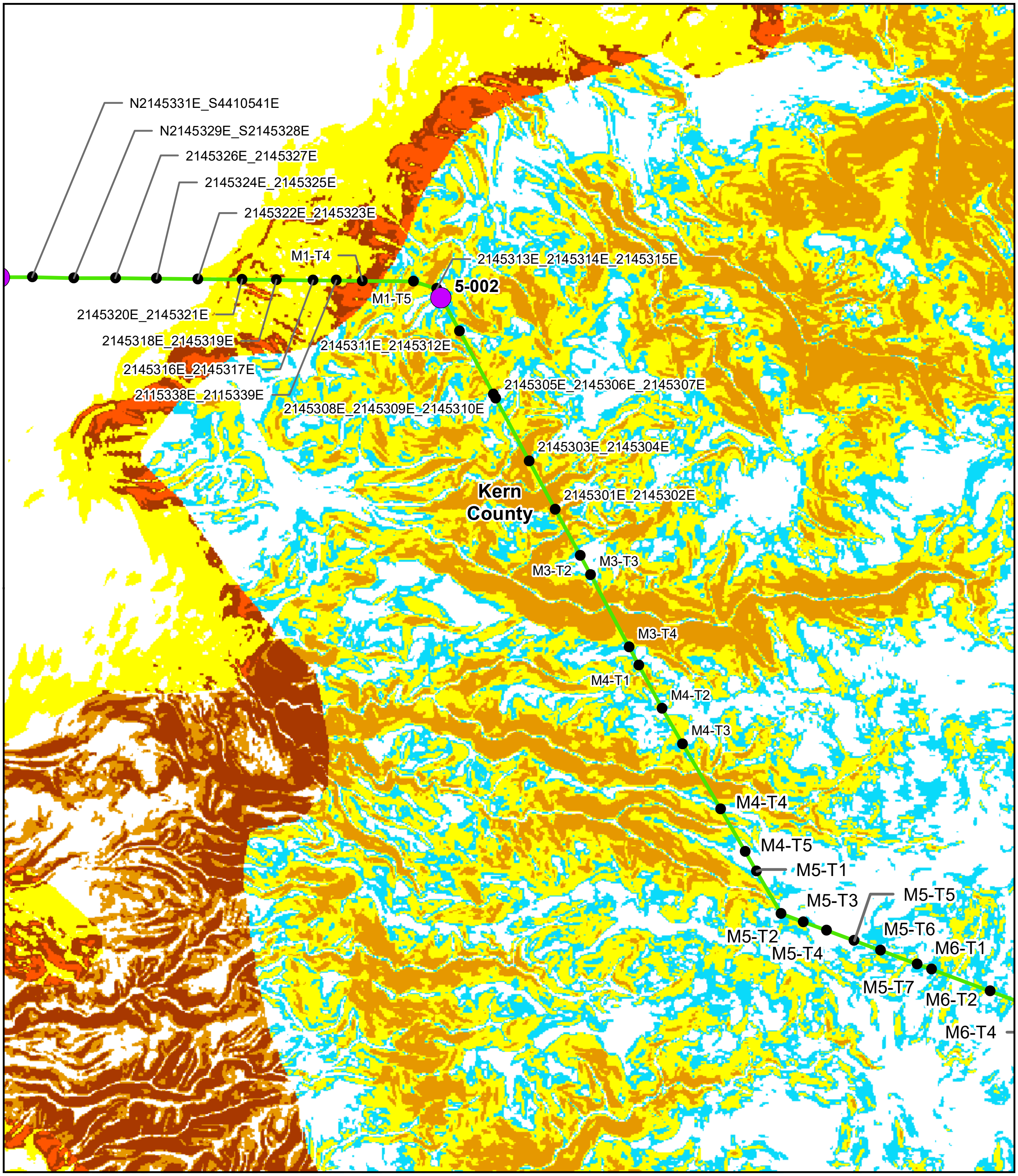
FIGURE
9h

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

0 0.55 1.1

Miles

N

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS

SOUTHERN CALIFORNIA EDISON
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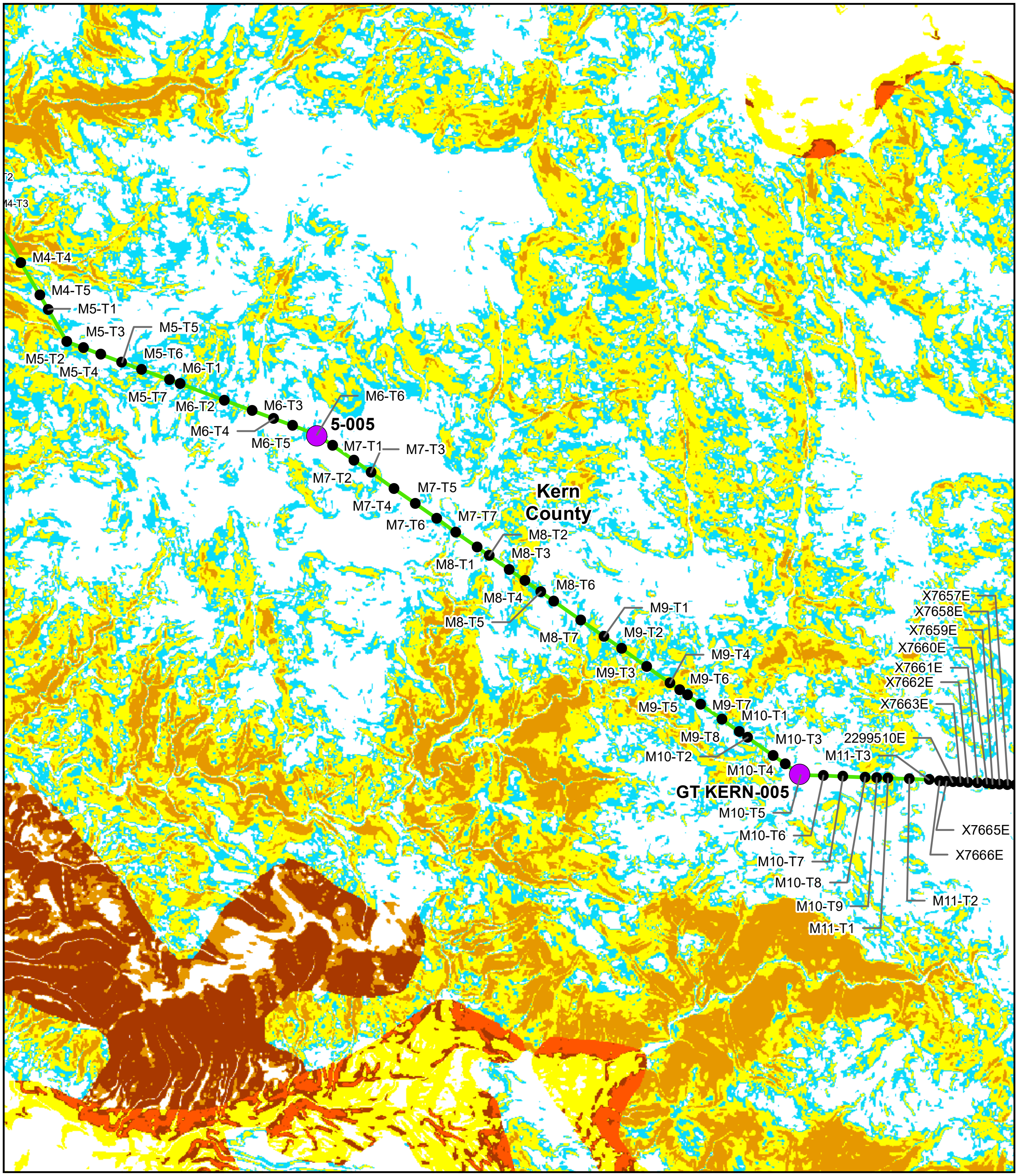
FIGURE **9i**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

- Boring Location
- Substation
- Segment 1
- Segment 2
- Segment 3
- Segment 4
- Segment 5
- Structure Location
- Counties

Landslide Susceptibility

- 6
- 7
- 8
- 9
- 10

NOTES:
1. LANDSLIDE SUSCEPTIBILITY REFLECTS ROCK STRENGTH AND SLOPE CLASS.
2. BASED ON WILLS ET AL. (2011) AND CGS (2017D).

GORMAN-KERN RIVER 66 kV PROJECT

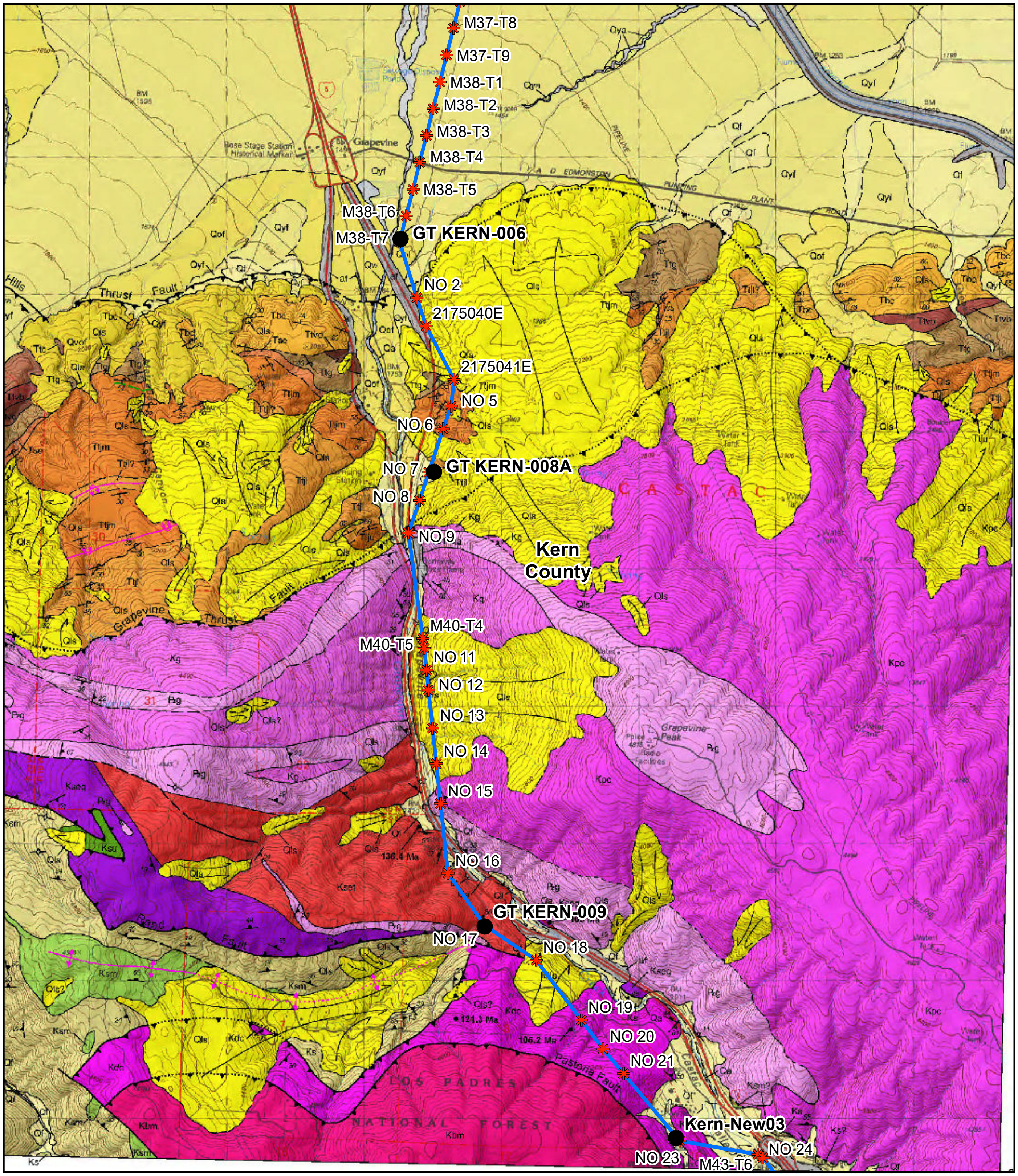
POTENTIAL LANDSLIDE SUSCEPTIBILITY AREAS

ARCADIS

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL® Company

FIGURE **9j**

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig9_Potential Landslide Susceptibility Areas Zoomed-in.mxd 2/17/2022 4:39:16 PM



Legend

	Substation		Boring Location
	Segment 1		Structure Location
	Segment 2		Counties
	Segment 3	Qls	Quaternary landslide deposits, showing direction of downslope movement
	Segment 4		
	Segment 5		

Source: Olson (2014)

0 0.5 1
Miles

N

GORMAN-KERN RIVER 66 kV PROJECT

MAPPED LANDSLIDE DEPOSITS

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FIGURE 10

T:_ENV\SCE\SCE_TLLR\ArcGIS_Desktop\KERN\Geotech Report Figures-2022\Fig10_Mapped Landslide Deposits.mxd 2/17/2022 12:07:33 PM

Appendix A

Reconnaissance Report

Kevin Garrity
Scott Richtmyer
Southern California Edison
Transmission and Distribution

Arcadis U.S., Inc.
320 Commerce, Suite 200
Irvine, California 92602
Phone: 714-508-2671
www.arcadis.com

Date: October 29, 2021

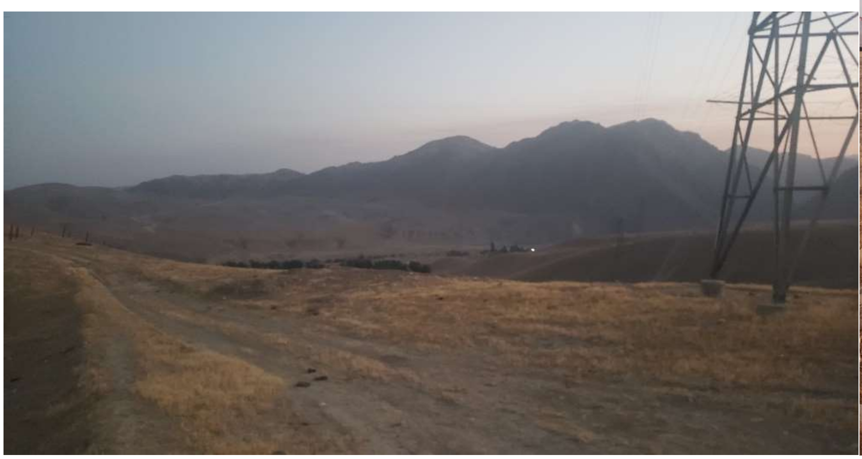
Subject: Gorman-Kern River 66kV Geotechnical Investigation Locations

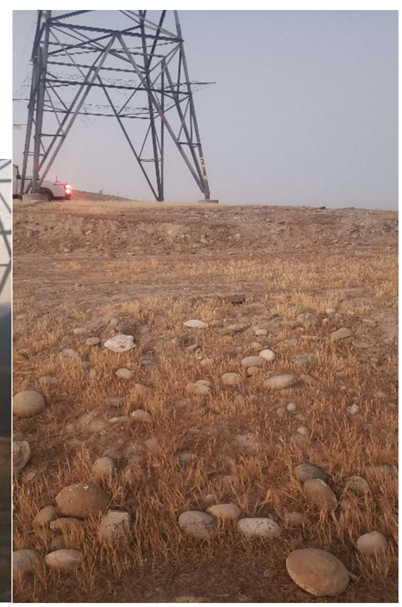
Dear Mr. Garrity and Mr. Richtmyer,

This memorandum presents a geotechnical investigation reconnaissance plan for the remaining portions of the Gorman-Kern River 66 kV Project (Segments 1 through 5). This work includes the installation of borings and cores at select areas along the Gorman-Kern River alignment. Arcadis anticipated that 9 locations (1-002, KERN-NEW1, KERN-NEW3, KERN-8, KERN-9, 3-004, 3-005, 5-002, and 5-005) designated as “Rock Coring” will be installed using a drilling method that will not allow for logging or sampling of unconsolidated materials. The objective of the reconnaissance was two-fold. The first was to determine drill rig and support truck accessibility to the proposed boring locations from existing access or Forest Service roads. The second objective was to determine how many, if any, of the proposed boring locations would need to be rock cored based on the geology observed in the field.

The field observations were performed by one Arcadis geologist with the assistance of one representative from Southern California Edison. The work was noninvasive, and no samples of rock or soil were collected. Field observations were made from existing access or Forest Service roads; field staff did not climb slopes or otherwise placing themselves in unsafe situations to collect data. Below are the findings of the field reconnaissance.

1-002





Drill Rig Accessibility

The access road leading to 1-002 is well maintained, and there should be no issues with mobilizing the drill rig/support trucks to the location. There are however several gates leading to the proposed boring location, therefore the field teams will require access through the gates during the field mobilization. There is ample space for the drill rig and support trucks to work safely in the area.

Drilling Method

The proposed boring location is located at the top of a hill. There is a considerable number of large boulders in the area and nearby rock outcrops were not observed in the area. It's likely that some amount of drilling can likely be done using a hollow-stem auger (HSA) rig, however it also seems very likely that rock coring will need to be utilized to get to the proposed depths given the number of large boulders in the immediate area.

5-002



Drill Rig Accessibility

The access road leading to 5-002 is very rough terrain and there are some areas where the drill rig and support trucks will not be able to manage passing through. There is alternate public access road that will also leads to the proposed boring location that is much safer. There are however several gates leading to the proposed boring location, therefore the field teams will require access through the gates during the field mobilization. The drill rig will be unable to set up right next to the existing tower due to inclined topography. The proposed boring will be located approximately 50 feet east of the existing tower. There is ample space for the drill rig and support trucks to work safely in the area.

Drilling Method

The proposed boring location is located at the crest of a hill with some nearby rock outcrops that are close to the same elevation as the proposed boring. There is a considerable number of large boulders in the area. It’s likely that some amount of drilling can likely be done using a HSA rig, however it also seems very likely that rock coring will need to be utilized to get to the proposed depths.

5-005



Drill Rig Accessibility

The access road leading to 5-005 is very rough terrain and there are some areas where the drill rig and support trucks will not be able to manage passing through. There is alternate public access road that will also leads to the proposed boring location that is much safer. There are however several gates leading to the proposed boring location, therefore the field teams will require access through the gates during the field mobilization. The work area is large enough that the drill/support trucks are able to turn around safely, if needed.

Drilling Method

The proposed boring location is located at the crest of a hill with some rock outcrops that are approximately 150 feet away at approximately the same elevation as the proposed boring. There is a considerable number of large boulders in the area. It’s likely that some amount of drilling can likely be done using a HSA rig, however it also seems very likely that rock coring will need to be utilized to get to the proposed depths.

Kevin Garrity/ Scott Richtmyer
Southern California Edison
October 29, 2021

KERN-NEW1

Drill Rig Accessibility

The access road leading to KERN-NEW1 is well maintained, and there should be no issues with mobilizing the drill rig/support trucks to the location. There are however several gates leading to the proposed boring location, therefore the field teams will require access through the gates during the field mobilization. There is ample space for the drill rig and support trucks to work safely in the area.

Drilling Method

The proposed boring location is located in a relatively flat plains area with some small hills nearby. There is a considerable number of large boulders in the area. It's likely that some amount of drilling can likely be done using a HSA rig, however it also seems likely that rock coring will need to be utilized to get to the proposed depths.

KERN-8



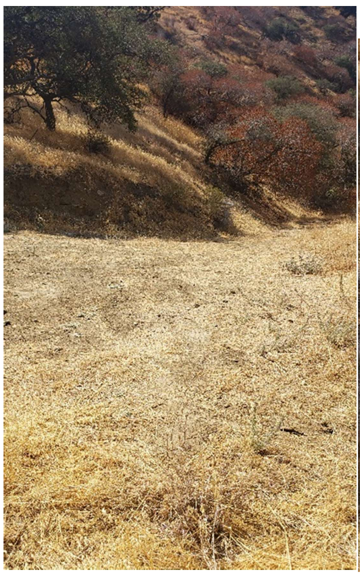
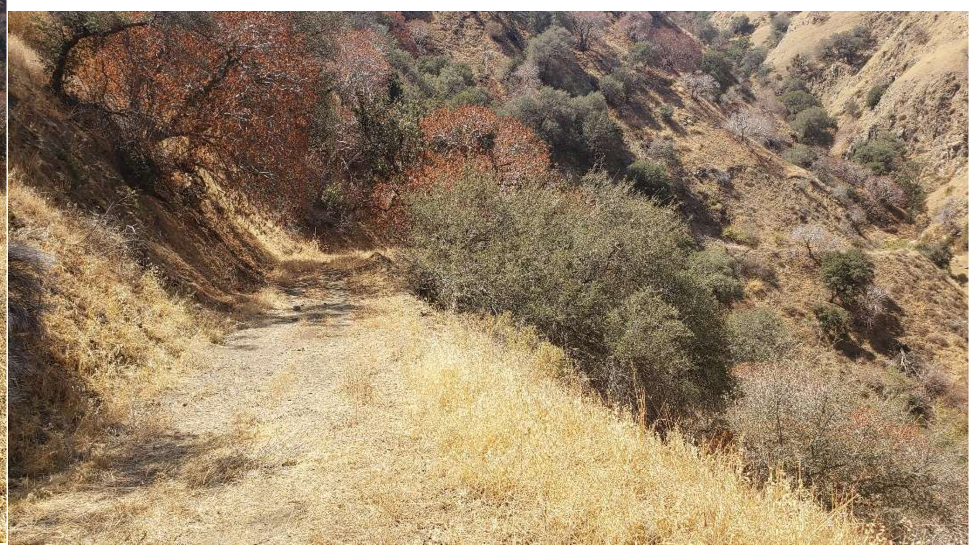
Drill Rig Accessibility

The access road leading to KERN-8 contains some inclined areas and fairly rough terrain however the drill rig and support trucks should be able to mobilize to the location without any issues. There are however several gates leading to the proposed boring location, therefore the field teams will require access through the gates during the field mobilization. Will need approval from security officer from Tejon Ranch prior to mobilizing onto site. There will be limited spacing in the work area so consolidating the number of trucks mobilizing up to the location should be considered beforehand.

Drilling Method

The proposed boring location is located in an area with some nearby rock outcrops that are close to the same elevation as the proposed boring. There is a considerable number of large boulders in the area. It's likely that some amount of drilling can likely be done using a HSA rig, however it also seems very likely that rock coring will need to be utilized to get to the proposed depths.

<u>KERN-9</u>

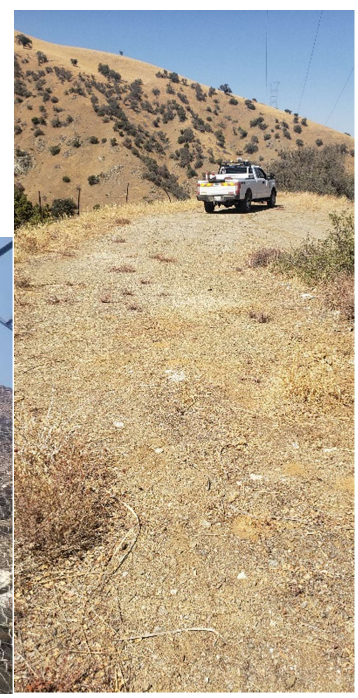
Drill Rig Accessibility

The access road leading to KERN-9 contains some inclined roads however the drill rig and support trucks should be able to mobilize to the location without any issues. There will be very limited spacing in the work area so consolidating the number of trucks mobilizing up to the location should be considered beforehand.

Drilling Method

The proposed boring location is located in an area with some nearby rock outcrops that are close to the same elevation as the proposed boring. There is a considerable number of large boulders in the area. It's likely that some amount of drilling can likely be done using a HSA rig, however it also seems very likely that rock coring will need to be utilized to get to the proposed depths.

KERN-NEW3



Drill Rig Accessibility

The access road leading to KERN-NEW3 contains some inclined roads however the drill rig and support trucks should be able to mobilize to the location without any issues. There is one gate leading to the proposed boring location, therefore the field teams will require access through the gate during the field mobilization. There will be extremely limited spacing in the work area so consolidating the number of trucks mobilizing up to the location should be considered beforehand.

Drilling Method

The proposed boring location is located at the top of a hill. The existing tower sits on top of a rock outcrop. There area has a retaining mesh wall adjacent to the existing tower which houses a considerable number of large boulders. It's unlikely that some amount of drilling can likely be done using an HSA rig. It seems very likely that rock coring will need to be utilized to get to the proposed depths.

<u>3-004</u>


Drill Rig Accessibility

The access road leading to 3-004 contains a steep inclined road, however there should be no issues mobilizing the drill rig/support trucks onto site. There is one gate leading to the proposed boring location, therefore the field teams will require access through the gate during the field mobilization. There is ample space for the drill rig and support trucks to work safely in the area.

Drilling Method

The proposed boring location is located at the top of a hill. There is a considerable number of large boulders in the area and a few nearby rock outcrops at slightly lower elevations than the proposed location. It's likely that some amount of drilling can likely be done using a HSA rig, however it also seems very likely that rock coring will need to be utilized to get to the proposed depths given the number of large boulders in the immediate area

3-005



Drill Rig Accessibility

The proposed boring location is located near an existing SCE substation. Driving to the site is accessed from an established public road. There is no way for a drill rig or support trucks to gain access near the existing tower/proposed boring. The tower is only accessible by foot so drilling using any sort of drill rig will not be possible. An alternate location could be placed approximately 150 feet south of the existing tower location near the entrance to the substation.

Drilling Method

The proposed boring location is located in a valley with no observable rock outcrops in the immediate vicinity. No observable rock outcrops or large boulders were observed near the alternate drilling location so it's very likely that drilling can likely be done using an HSA rig. Drilling with rock coring may not be necessary for this location if drilled at the alternate location.

If you have any questions, please contact Geetha Shanmugasundaram at 213.262.3716 or at Geetha.Shanmugasundaram@arcadis.com.

Sincerely,
Arcadis U.S., Inc.

Geetha Shanmugasundaram
Project Manager

Appendix B

Photograph Log

Photograph Log

Southern California Edison – GKR Geotechnical Borings

Photograph 1: IMG_6044

Photograph 2: IMG_6045

Photograph 3: IMG_6050

Photograph 4: IMG_6051

Photograph 5: IMG_6054

Photograph 6: IMG_6055

Photograph Log

Southern California Edison – GKR Geotechnical Borings

Photograph 7: IMG_6056

Photograph 8: IMG_6057

Photograph 9: IMG_6058

Photograph 10: IMG_6059

Photograph 11: IMG_6064

Photograph 12: IMG_6065

Photograph 13: IMG_6066

Photograph 14: IMG_6068

Photograph 15: IMG_6069

Photograph 16: IMG_6070

Photograph 17: IMG_6072

Photograph 18: IMG_6073

Photograph 19: IMG_6074

Photograph 20: IMG_6077

Photograph 21: IMG_6078

Photograph 22: IMG_6086

Photograph 23: IMG_6087

Photograph 24: IMG_6088

Photograph 25: IMG_6090

Photograph 26: IMG_6093

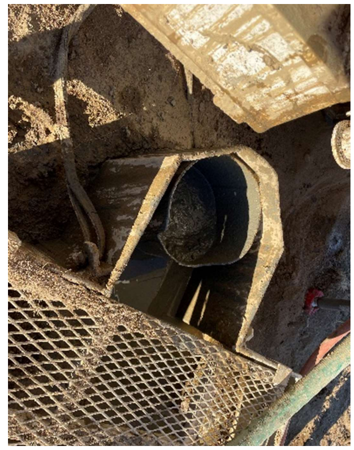
Photograph 27: IMG_6094

Photograph 28: IMG_6095

Photograph 29: IMG_6096

Photograph 30: IMG_6097

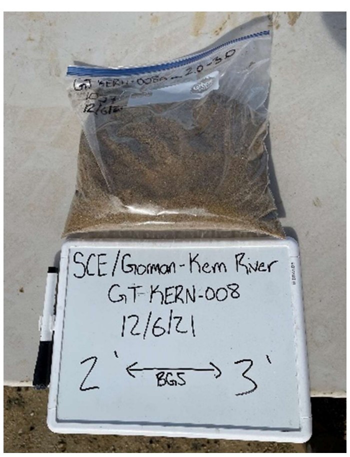
Photograph 31: IMG_6104



Photograph 32: IMG_6105

Photograph 33: IMG_6106

Photograph 34: IMG_6145



Photograph 35: IMG_6147

Photograph 36: IMG_6148

Photograph 37: IMG_6149

Photograph 38: IMG_6150

Photograph 39: IMG_6151

Photograph 40: IMG_6152

Photograph 41: IMG_6153

Photograph 42: IMG_6154

Photograph Log

Southern California Edison – GKR Geotechnical Borings

Photograph 43: IMG_6156

Photograph 44: IMG_6157

Photograph 45: IMG_6158

Photograph 46: IMG_6159

Photograph 47: IMG_6165

Photograph 48: IMG_6166

Photograph 49: IMG_6167

Photograph 50: IMG_6168

Photograph 51: IMG_6169

Photograph 52: IMG_6170

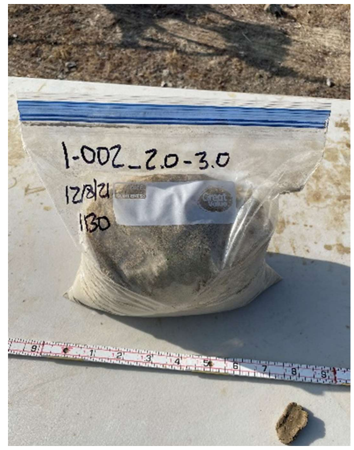
Photograph 53: IMG_6171

Photograph 54: IMG_6177

Photograph Log

Southern California Edison – GKR Geotechnical Borings

Photograph 55: IMG_6178



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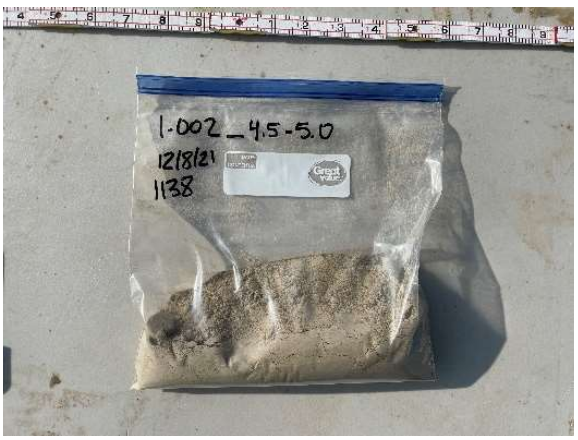


Photograph 57: IMG_6185

Photograph 58: IMG_6186

Photograph 59: IMG_6187

Photograph 60: IMG_6188

Photograph 61: IMG_6189

Photograph 62: IMG_6190

Photograph 63: IMG_6191

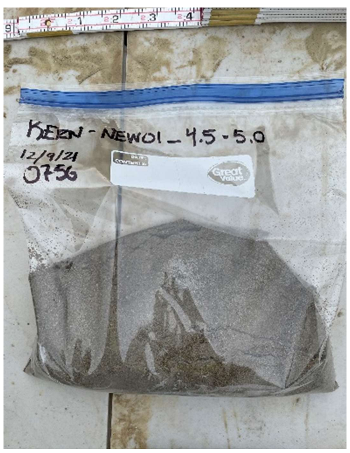
Photograph 64: IMG_6193

Photograph 65: IMG_6194

Photograph 66: IMG_6195

Photograph 67: IMG_6196

Photograph 68: IMG_6197



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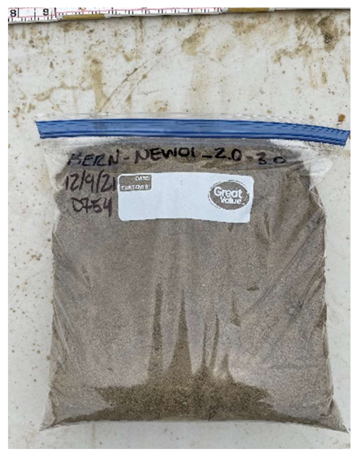


Photograph 70: IMG_6204

Photograph 71: IMG_6205

Photograph 72: IMG_6206

Photograph 73: IMG_6207

Photograph 74: IMG_6208

Photograph 75: IMG_6209

Photograph 76: IMG_6210

Photograph 77: IMG_6213

Photograph 78: IMG_6214

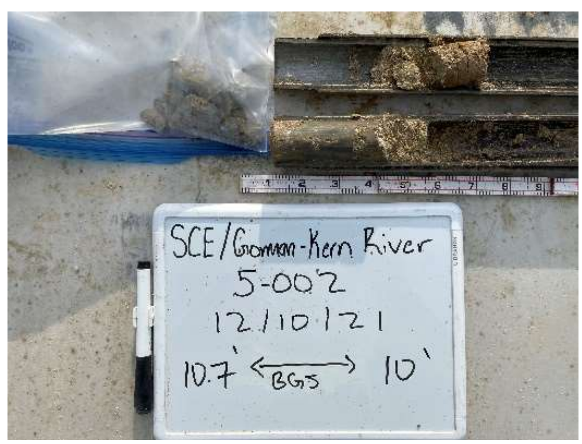
Photograph 79: IMG_6215

Photograph 80: IMG_6216

Photograph 81: IMG_6217

Photograph 82: IMG_6221

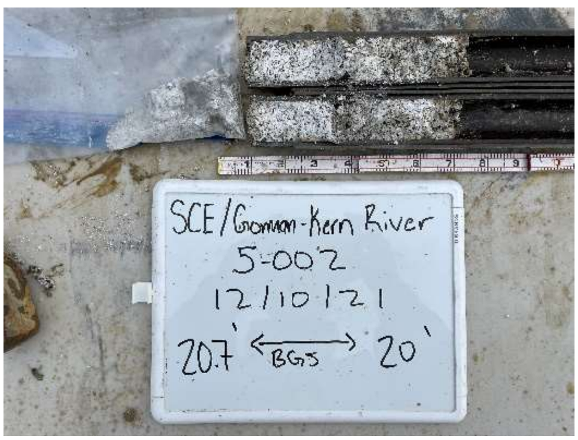
Photograph 83: IMG_6226



Photograph 84: IMG_6227

Photograph 85: IMG_6228

Photograph 86: IMG_6230



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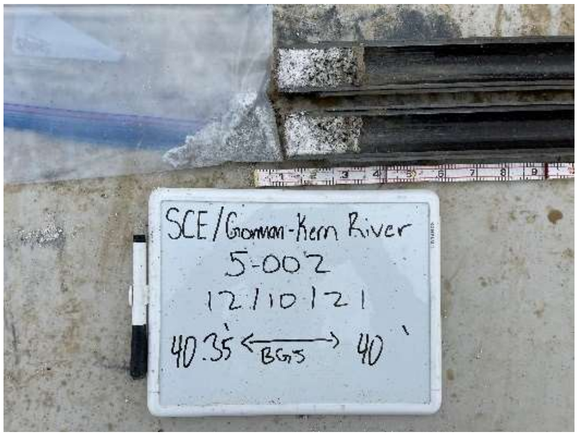
Photograph 88: IMG_6233

Photograph 89: IMG_6234

Photograph 90: IMG_6235



Photograph 91: IMG_6236

Photograph 92: IMG_6240

Photograph 93: IMG_6266

Photograph 94: IMG_6267

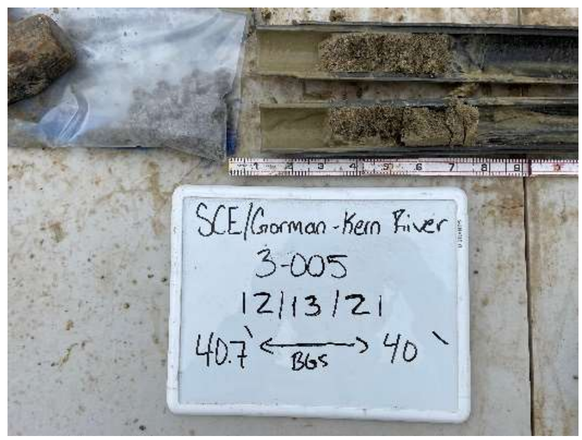
Photograph 95: IMG_6268

Photograph 96: IMG_6269

Photograph 97: IMG_6270

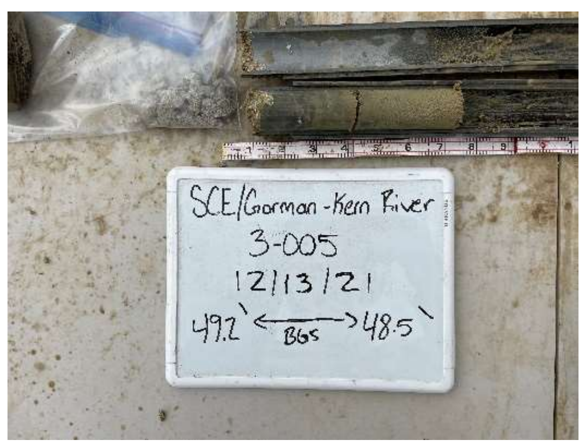
Photograph 98: IMG_6271

Photograph 99: IMG_6272



Photograph 100: IMG_6273

Photograph 101: IMG_6274



Photograph 102: IMG_6275

Photograph 103: IMG_6276

Photograph 104: IMG_6278

Photograph 105: IMG_6279

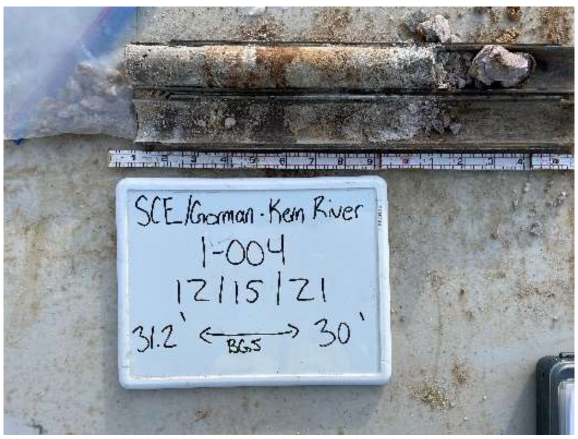
Photograph 106: IMG_6280

Photograph 107: IMG_6281

Photograph 108: IMG_6282

Photograph 109: IMG_6303

Photograph 110: IMG_6304



Photograph 111: IMG_6305

Photograph 112: IMG_6306

Photograph 113: IMG_6307

Photograph 114: IMG_6308

Photograph 115: IMG_6309

Photograph 116: IMG_6310

Photograph 117: IMG_6311

Photograph 118: IMG_6312

Photograph 119: IMG_6313

Photograph 120: IMG_6314

Photograph 121: IMG_6315

Photograph 122: IMG_6316

Photograph 123: IMG_6317

Photograph 124: IMG_6318

Photograph 125: IMG_6319

Photograph 126: IMG_6320

Photograph 127: IMG_6321

Photograph 128: IMG_6326

Photograph 129: IMG_6327

Photograph 130: IMG_6328

Photograph 131: IMG_6329

Photograph 132: IMG_6333

Photograph 133: IMG_6334

Photograph 134: IMG_6335

Photograph 135: IMG_6336

Photograph 136: IMG_6338

Photograph 137: IMG_6339

Photograph 138: IMG_6340

Photograph 139: IMG_6341

Photograph 140: IMG_6342

Photograph 141: IMG_6343

Photograph 142: IMG_6344

Photograph 143: IMG_6345

Photograph 144: IMG_6346

Photograph 145: IMG_6347

Photograph 146: IMG_6351

Photograph 147: IMG_6352

Photograph 148: IMG_6353

Photograph 149: IMG_6354

Photograph 150: IMG_6355

Photograph 151: IMG_6356

Photograph 152: IMG_6357

Photograph 153: IMG_6358

Photograph 154: IMG_6359

Photograph 155: IMG_6360

Photograph 156: IMG_6361

Photograph 157: IMG_6417

Photograph 158: IMG_6418

Photograph 159: IMG_6419

Photograph 160: IMG_6420

Photograph 161: IMG_6421

Photograph 162: IMG_6422

Photograph 163: IMG_6423

Photograph 164: IMG_6425

Photograph 165: IMG_6426

Photograph 166: IMG_6427

Photograph 167: IMG_6428

Photograph 168: IMG_6429

Photograph Log

Southern California Edison – GKR Geotechnical Borings

Photograph 169: IMG_6431

Photograph 170: IMG_6432

Photograph 171: IMG_6434

Photograph 172: IMG_6435

Photograph 173: IMG_6436

Photograph 174: IMG_6437

Photograph 175: IMG_6438

Photograph 176: IMG_6439

Photograph 177: IMG_6440

Photograph 178: IMG_6441

Photograph 179: IMG_6442

Photograph 180: IMG_6443

Photograph 181: IMG_6444

Photograph 182: IMG_6445

Photograph 183: IMG_6446

Photograph 184: IMG_6447

Photograph 185: IMG_6448

Photograph 186: IMG_6449

Photograph 187: IMG_6450

Photograph 188: IMG_6451

Photograph 189: IMG_6454

Photograph 190: IMG_6455

Appendix C

Boring Logs

2021

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/8/21 **COMPLETED** 12/8/21
GROUND ELEVATION **HOLE SIZE** 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80
	0		(ALLUVIUM/ COLLUVIUM) (CH) FAT CLAY, VF-med subangular to subrounded sand, trace C-VC subangular to subrounded sand, trace angular to subrounded gravel (2mm - 6mm), well graded, dry, 10 YR 5/3 brown, trace mica.	HA 1	100					
	5		loose, oxide staining. No recovery from 7.65-8.5' bgs	SS 2	44	3-6-8 (14)	44	90.0		
	10		(ALLUVIUM/ COLLUVIUM) (CH) FAT CLAY, VF-F sand, poorly graded. No recovery from 10.5' - 11.5' bgs	SS 3	33	8-9-9 (18)				
	15		(ALLUVIUM/ COLLUVIUM) (CH) FAT CLAY with SAND, VF-F subangular to subrounded sand, dry, med dense, 10 YR, 6/2 light brownish grey, trace mica, trace canche. No recovery from 15.55' - 16.5' bgs	SS 4	36	14-22-27 (49)				
	20		loose, dry, 10 YR 6/2 light brownish gray mottled w/ 7.5 YR 6/8 reddish yellow, trace coliche, trace mica. No recovery from 20.75' - 21.5' bgs.	SS 5	50	4-7-10 (17)		82.7		
	25		No recovery from 25.55' - 26.5' bgs	SS 6	36	5-7-8 (15)				
	30		No recovery from 30.55' - 31.5' bgs	SS 7	36	8-10-15 (25)				
	35									

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CLIENT Southern California Edison (SCE)

PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C

PROJECT LOCATION California

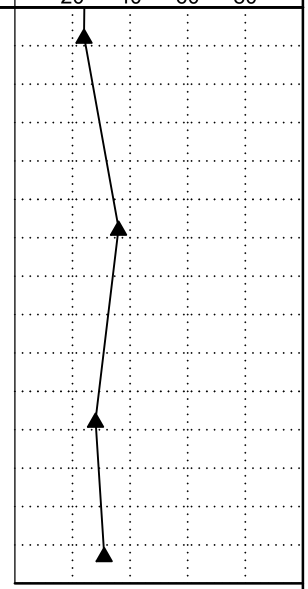
ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM/ COLLUVIUM) (CH) FAT CLAY with SAND, VF-F subangular to subrounded sand, dry, med dense, 10 YR, 6/2 light brownish grey, trace mica, trace canche. *(continued)* No recovery from 35.5' - 36.5' bgs	SS 8	33	10-11-13 (24)			
	40		Color change: 10 YR 5/4 yellowish brown mottled with 5Y 5/1 gray No recovery from 40.6' - 41.5' bgs	SS 9	39	14-17-19 (36)			
	45		No recovery from 45.75' - 46.5' bgs	SS 10	50	11-13-15 (28)			
	50		(ALLUVIUM/ COLLUVIUM) (CH) FAT CLAY wth SAND, same as at 15' bgs, med dense, 7.5 YR 5-6 strong brown mottled with 5Y 6/1 gray. No recovery from 49.2' - 50' bgs	SS 11	47	12-15-16 (31)			

Borehole terminated at 50.0 feet depth.

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

☐ FINES CONTENT (%) ☐ 20 40 60 80



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ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER 1-004

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/14/21 **COMPLETED** 12/15/21
GROUND ELEVATION **HOLE SIZE** 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	0		(ALLUVIUM) (SC) CLAYEY SAND, VF-VC subangular to subrounded sand, trace angular - subrounded gravel (2mm - 16mm), dry, 10 YR 4/4 dark yellowish brown VF-VC subangular to subrounded gravel (2mm - 47mm)	HA 1	100					
	5			SS 2	90	30-50/4"				>>
			Color change 10YR, 5/6 yellowish brown, dense. No recovery from 8.15' - 8.5' bgs.	SS 3	78	15-32-36 (68)	22	31.0		
	10		(ALLUVIUM) VF-VC angular to subrounded sand, little angular to subangular gravel (2mm - 17mm), dry, very dense, 7.5 YR 5/6 strong brown, trace mica. No recovery from 11.15' - 11.5' bgs.	SS 4	88	13-28-50/4"		41.7		>>
	15		Color change: 7.5 YR 5/6 strong brown, very dense.	SS 5	73	21-50/5"				>>
	20			SS 6	81	36-45-50/4"				>>
			Drill rig chattered from 21' - 23' bgs, rocks in cuttings. No recovery from 21.1' - 21.5 bgs.							
	25			SS 7	100	21-22-50/3"				>>
	30		No recovery from 31.2' - 31.5' bgs	SS 8	81	32-47-48 (95)				
	35									

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ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)

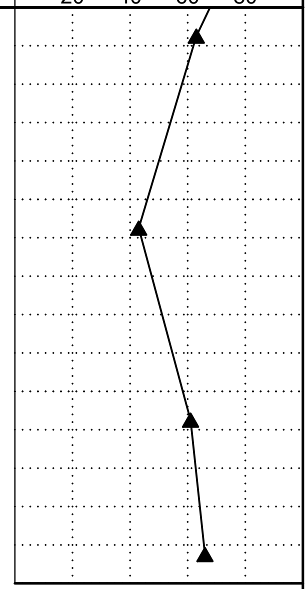
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C

PROJECT LOCATION California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM) (SC) CLAYEY SAND, VF-VC subangular to subrounded sand, trace angular - subrounded gravel (2mm - 16mm), dry, 10 YR 4/4 dark yellowish brown *(continued)*	SS 9	100	37-35-28 (63)			
	40			SS 10	100	15-21-22 (43)			
	45			SS 11	100	11-25-36 (61)			
	50			SS 12	99	21-32-34 (66)			

▲ SPT N VALUE ▲ (20 40 60 80)
PL MC LL (20 40 60 80)
☐ FINES CONTENT (%) ☐ (20 40 60 80)



No recovery from 49.9' - 50' bgs.
Borehole terminated at 50.0 feet depth.

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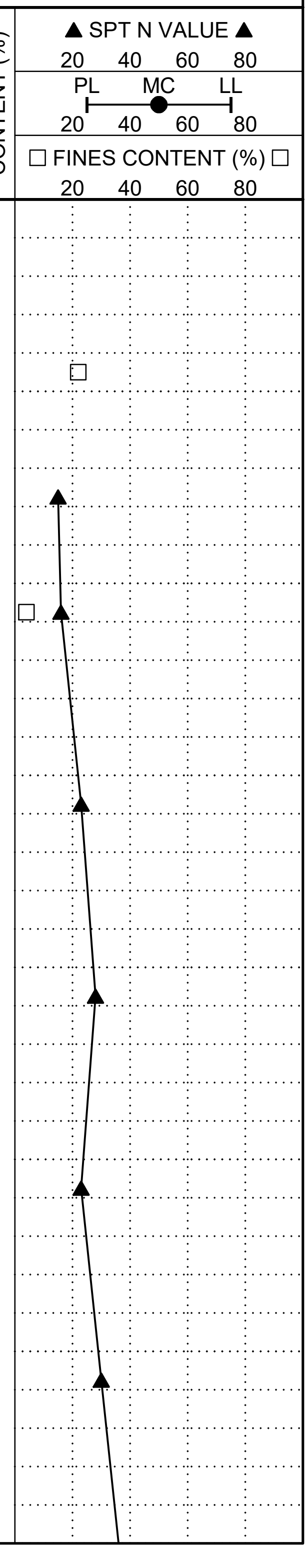
BORING NUMBER 1-005

ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/15/21 **COMPLETED** 12/15/21
GROUND ELEVATION
HOLE SIZE 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft
EASTING ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING ---
AFTER DRILLING ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(FILL) (SC) CLAYEY SAND, VF-VC subangular to subrounded sand, trace angular to subangular gravel (2mm - 7mm), dry, 10 YR 4/3 brown, mill material, micaceous.	HA 1	100				
	5							22.0	
			(ALLUVIUM) (SW) WELL GRADED SAND, VF-VC angular to subrounded sand, some angular to subangular gravel (2mm - 16mm), trace fines, dry-moist, 10 YR 5/4 yellowish brown, trace mica, loose.	SS 2	86	6-7-8 (15)			
	10		No recovery from 8.3' - 8.5' bgs.						
			No recovery from 11.25' - 11.5' bgs	SS 3	88	5-6-10 (16)		4.0	
	15		VF-VC subangular to subrounded sand, trace fines, dry-moist, loose, 10 YR 4/3 brown, micaceous (ALLUVIUM) (SW) WELL GRADED SAND with GRAVEL, med dense. No recovery from 16.4' - 16.5' bgs	SS 4	94	9-7-16 (23)			
	20		(ALLUVIUM) (SM) SILTY SAND, F-C subangular sand, non-plastic fines, med dense, angular to subrounded gravel (12mm - 9mm). No recovery 21.15' - 21.5' bgs.	SS 5	75	11-13-15 (28)			
	25			SS 6	100	9-11-12 (23)			
	30		No recovery from 31.2' - 31.5' bgs.	SS 7	81	9-13-17 (30)			
	35								



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CLIENT Southern California Edison (SCE)

PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C

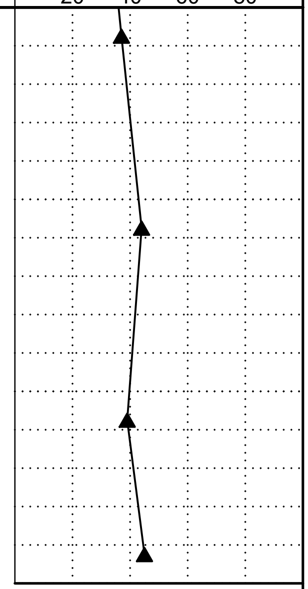
PROJECT LOCATION California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM) (SM) SILTY SAND, F-C subangular sand, non-plastic fines, med dense, angular to subrounded gravel (12mm - 9mm). *(continued)*	SS 8	100	8-16-21 (37)			
	40		(ALLUVIUM) (SW) WELL GRADED SAND with GRAVEL, color change: 7.5 YR 5/6 strong brown.	SS 9	100	13-20-24 (44)			
	45			SS 10	100	16-17-22 (39)			
	50			SS 11	100	13-18-27 (45)			

▲ SPT N VALUE ▲ (20 40 60 80)

PL MC LL (20 40 60 80)

☐ FINES CONTENT (%) ☐ (20 40 60 80)



Borehole terminated at 50.0 feet depth.

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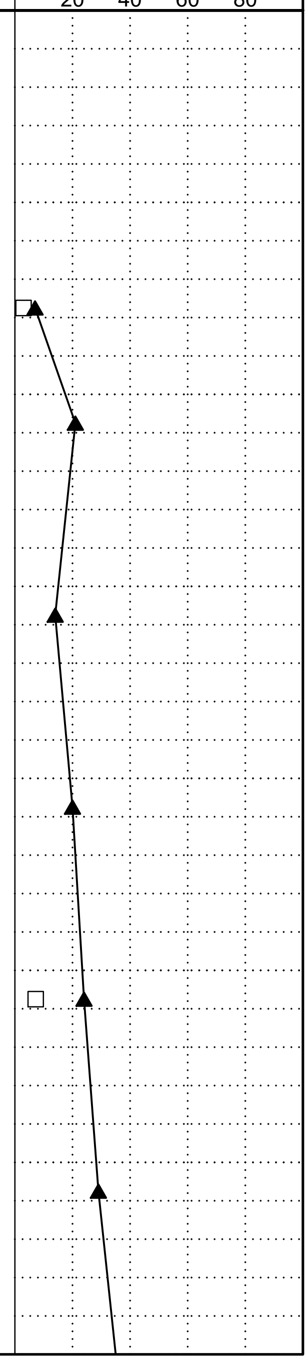
ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER 1-006A

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/15/21 **COMPLETED** 12/16/21
GROUND ELEVATION
HOLE SIZE 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft
EASTING ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING ---
AFTER DRILLING ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0–15	(FILL) (SW) WELL GRADED SAND, VF-VC subangular to subrounded sand, little angular to subrounded gravel (2mm - 22mm), trace fines, moist-wet, 10 YR 4/3 brown, micaceous, trace asphalt chunks. (ALLUVIUM) At 2' bgs gravel to trace, no asphalt, dry.	HA 1	100				
		No recovery from 8' - 8.5' bgs.	SS 2	67	3-3-4 (7)		3.0	
			SS 3	100	4-10-11 (21)			
	15–25	(ALLUVIUM) (SW) WELL GRADED SAND with GRAVEL, VF-VC angular to subrounded sand, little angular to subangular gravel (2mm - 12mm) dry, loose, 10 YR 5/4 yellowish brown, micaceous. No recovery from 16.4' - 16.5' bgs.	SS 4	92	9-8-6 (14)			
		No recovery from 21.15' - 21.5' bgs.	SS 5	78	6-7-13 (20)			
	25–35	(ALLUVIUM) (SM) SILTY SAND, VF-VC subangular to subrounded sand, some non-plastic fines, little angular to subangular gravel (2mm - 14mm), dry, med dense, 7.5 YR 5/6 strong brown, trace mica.	SS 6	100	10-10-14 (24)		7.2	
		No recovery from 31.4 - 31.5' bgs.	SS 7	92	13-13-16 (29)			

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
☐ FINES CONTENT (%) ☐ 20 40 60 80



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CLIENT Southern California Edison (SCE)

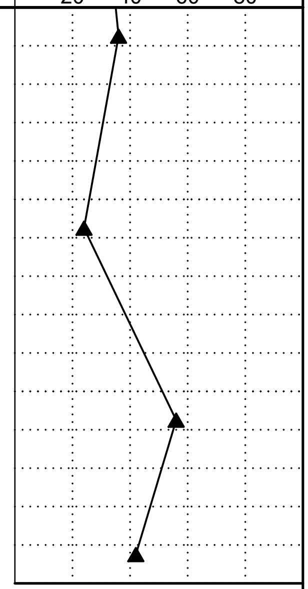
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C

PROJECT LOCATION California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM) (SM) SILTY SAND, VF-VC subangular to subrounded sand, some non-plastic fines, little angular to subangular gravel (2mm - 14mm), dry, med dense, 7.5 YR 5/6 strong brown, trace mica. *(continued)* At 35.5' bgs, pulverized rock fragments. No recovery from 36.2' - 36.5' bgs.	SS 8	75	12-17-19 (36)			
	40			SS 9	100	9-11-13 (24)			
	45		At 45' bgs grades to gravel, trace angular to subangular gravel (2mm - 9mm), med dense to dense.	SS 10	100	11-22-34 (56)			
	50			SS 11	100	19-20-22 (42)			

▲ SPT N VALUE ▲ (20 40 60 80)
PL MC LL (20 40 60 80)
☐ FINES CONTENT (%) ☐ (20 40 60 80)



Borehole terminated at 50.0 feet depth.

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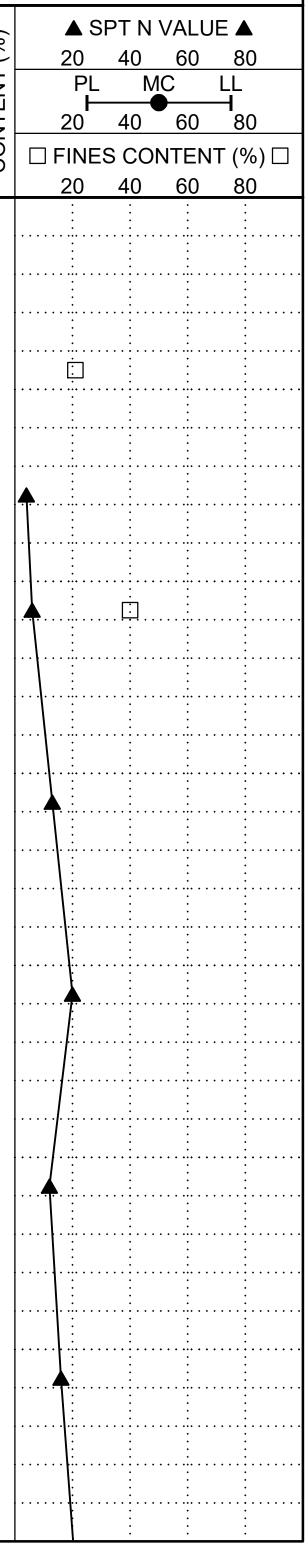
BORING NUMBER 1-008

Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/16/21 **COMPLETED** 12/16/21
GROUND ELEVATION
HOLE SIZE 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft
EASTING ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING ---
AFTER DRILLING ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(ALLUVIUM) (SM) SILTY SAND, VF-VC subangular to subrounded sand, little subangular gravel (2mm - 16mm), moist, 10YR 3/4 dark yellowish brown, micaceous. 1.3' bgs sand grain size (VF- med), no gravel 3.5' bgs trace C-VC sand	HA 1	100				
	5							21.0	
			(ALLUVIUM) Interbedded WELL GRADED SAND (SW) and WELL GRADED SAND with SILT (SW-SM), VF-VC subangular to subrounded sand, trace angular to subangular gravel (2mm- 6mm), trace to little fines, moist to dry, very loose 10 YR 3/4 dark yellowish brown, micaceous.	SS 2	100	2-2-2 (4)			
	10		(ALLUVIUM) (SC) CLAYEY SAND, VF-C angular to subrounded sand, trace VC angular to subrounded sand, moist, very loose, 10YR 3/4 dark yellowish brown, micaceous.	SS 3	100	2-3-3 (6)		40.0	
	15		(ALLUVIUM) (SC) CLAYEY SAND with GRAVEL, VF-VC subangular to subrounded sand, little angular to subrounded gravel (2mm - 12mm), dry, loose, 10 YR 5/4 yellowish brown, trace mica.	SS 4	100	4-6-7 (13)			
	20		At 20' bgs increase in gravel, some angular to subrounded gravel (2mm - 17mm). No recovery from 21.25' - 21.5' bgs.	SS 5	83	5-8-12 (20)			
	25		(ALLUVIUM) (ML) SILT, low plasticity, few VF-med subangular to subrounded sand, trace C-VC subangular to subrounded sand, moist, loose, 10YR 5/3 brown, micaceous.	SS 6	100	5-5-7 (12)			
	30		At 30' bgs grades to little angular to subrounded gravel (2mm - 7mm), dry to moist, loose, 10 YR 5/3 brown. No recovery from 31.3' 31.5' bgs.	SS 7	89	4-5-11 (16)			
	35								



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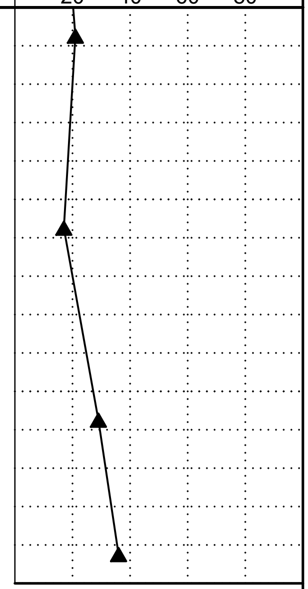
ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER 1-008

CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM) (SP) WELL GRADED SAND interbedded w/ POORLY GRADED SAND (SW)/ (SP), VF-F/ VF-VC subangular to subrounded sand, moist, loose, 10 YR 5/3 brown, micaceous.	SS 8	100	5-9-12 (21)			
	40		(ALLUVIUM) (SW) WELL GRADED SAND, VF-med subangular to subrounded sand, trace C sand, trace fines, moist, loose 10 YR 6/3 brown micaceous.	SS 9	100	4-7-10 (17)			
			(ALLUVIUM) (SM) SILTY SAND, poorly graded, VF-F subangular to subrounded sand, some fines, moist, loose, 10 YR 5/4 yellowish brown, micaceous.						
	45		(ALLUVIUM) (SW-SM) WELL GRADED SAND with SILT and GRAVEL, VF-VC angular to subrounded sand, some angular subrounded gravel (2mm - 30mm), dry, med dense, 10YR 6/3 pale brown.	SS 10	100	12-13-16 (29)			
	50			SS 11	100	13-17-19 (36)			

▲ SPT N VALUE ▲ (20 40 60 80); PL MC LL (20 40 60 80); ☐ FINES CONTENT (%) ☐ (20 40 60 80)



Borehole terminated at 50.0 feet depth.

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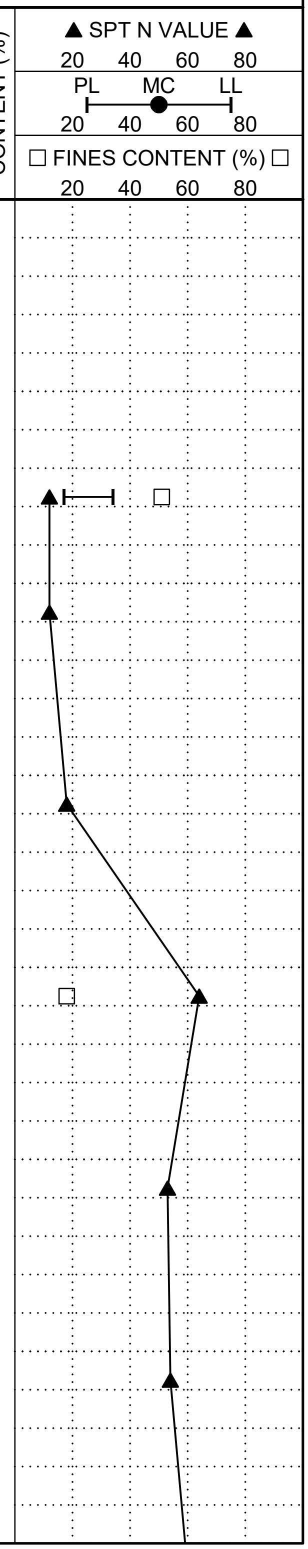
BORING NUMBER 3-002

ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/20/21 **COMPLETED** 12/20/21
GROUND ELEVATION **HOLE SIZE** 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING 33.00 ft **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater at 33 ft

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(ALLUVIUM) (CL) SANDY LEAN CLAY, VF-VC subangular to subrounded sand, little silt, trace angular to subrounded gravel (2mm - 27mm), moist, 10 YR 3/3 dark brown, micaceous.	HA 1	100				
	5								
			VF-VC subangular to subrounded sand, little angular to subangular gravel (2mm - 28mm), well graded, moist to dry, loose, 10 YR 3/3 dark brown. No recovery from 8.3' - 8.5' bgs	SS 2	86	8-5-7 (12)	17	51.0	
	10			SS 3	100	4-5-7 (12)			
	15		(ALLUVIUM) (SW-SM) WELL GRADED SAND with SILT and GRAVEL, VF-VC subangular to subrounded sand, little angular to subangular gravel (2mm - 15mm), trace fines, dry, loost, 7.5 YR 5/6 strong brown, trace mica.	SS 4	100	9-9-9 (18)			
	20		(ALLUVIUM) (SW) SILTY SAND with GRAVEL, VF-VC subangular to subrounded sand, little angular to subangular gravel (2mm-15mm), trace fines, moist, med dense, 7.5 YR 5/6 strong brown, trace mica.	SS 5	100	17-31-33 (64)		18.0	
	25			SS 6	100	17-29-24 (53)			
	30		increased gravel, color change: 7.5 YR 6/3 reddish yellow.	SS 7	100	20-21-33 (54)			
	35	∇							



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CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80; PL MC LL 20 40 60 80; ☐ FINES CONTENT (%) ☐ 20 40 60 80
	35		(ALLUVIUM) (SW) SILTY SAND with GRAVEL, VF-VC subangular to subrounded sand, little angular to subangular gravel (2mm-15mm), trace fines, moist, med dense, 7.5 YR 5/6 strong brown, trace mica. *(continued)*	SS 8	100	19-25-35 (60)				
			(ALLUVIUM) increased gravel, some angular to subangular gravel (2mm - 14mm), wet.							
	40		increased gravel, decrease sand, color change: 5 YR 5/8 yellowish red, very dense.	SS 9	100	25-38-50/5"				>>
	45		increased gravel (angular to subangular gravel (2mm - 15mm)), decreased sand	SS 10	100	27-48-50/5"				>>
	50		color change: 7.5 YR 6/8 reddish yellow mottled w/ 7.5 YR 3/2 dark brown.	SS 11	100	23-41-50/4"				>>

Refusal of SPT at 49.9' bgs.
Refusal at 49.9 feet.
Borehole terminated at 50.0 feet depth.

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ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER 3-004

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/2/21 **COMPLETED** 12/2/21
GROUND ELEVATION
HOLE SIZE 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(WEATHERED GRANODIORITE) (SM) SILTY SAND, (5, 90, 5), VF-VC, subangular to subrounded sand, trace angular to subangular grave (2mm - 11mm) trace fines, dry, 10 YR 5/3 brown, trace mica.	HA 1	100				
	5		at 4' bgs, increased gravel (10%), increased gravel size (2mm - 19mm)						
			grades to angular to subangular gravel (2mm - 12mm), dry, 10YR 5/3 brown, medium dense. No recovery from 7.9' 8.5' bgs. No recovery from 7.9' 8.5' bgs.	SS 2	61	12-21-26 (47)		14.0	
	10		trace caliche, dense, weak cementation. no recovery from 10.75' - 11.5' bgs	SS 3	50	15-29-43 (72)		14.0	
	15		oxidized staining and moderate cementation. no recovery from 15.6' 16.5' bgs.	SS 4	63	25-50			
	20		(WEATHERED GRANODIORITE) (SM) SILTY SAND, VF-VC angular to subangular sand, little angular to subangular gravel (2mm - 6mm), moist, very dense, trace caliche, oxidize staining, 7.5 YR 3/3 dark brown mottled w/ 10R 5/6 red, weak cementation. no recovery from 20.7' - 21.5' bgs.	SS 5	56	29-44-50/4"			
	25		increased gravel grain size (2mm - 15mm). no recovery from 25.8' - 26.5' bgs.	SS 6	56	30-42-50/5"			
	30		wet, very dense, 7.5 YR 3/3 dark brown mottled w/ 10 R 5/6 red. no recovery from 30.6' - 31.5' bgs.	SS 7	78	37-50/3"			
	35								

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CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80; PL MC LL 20 40 60 80; ☐ FINES CONTENT (%) ☐ 20 40 60 80
	35		(WEATHERED GRANODIORITE) (SM) SILTY SAND, VF-VC angular to subangular sand, little angular to subangular gravel (2mm - 6mm), moist, very dense, trace caliche, oxidize staining, 7.5 YR 3/3 dark brown mottled w/ 10R 5/6 red, weak cementation. *(continued)*	SS 8	66	20-45-50/4"				>>
			10 YR 5/2 grayish brown, weak cementation.							
			no recovery from 35.9' - 36.5' bgs							
	40			SS 9	70	38-42-50/3"				>>
			no recovery from 40.9' 0 41.5' bgs							
	45		no recovery from 45' - 46.5' bgs	SS 10	0	50/3"				>>
	50		no recovery from 49' - 50' bgs	SS 11	0	50/2"				>>

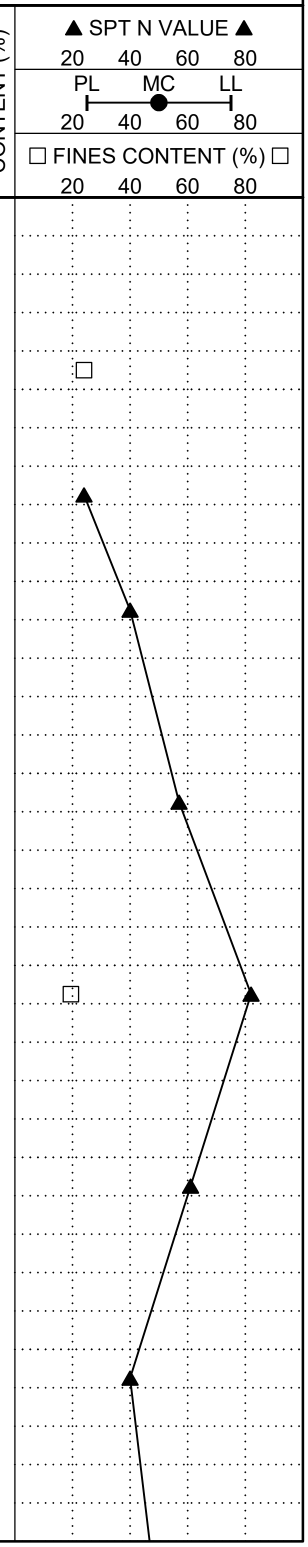
Borehole terminated at 50.0 feet depth.

ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER 3-005

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/16/21 **COMPLETED** 12/13/21
GROUND ELEVATION **HOLE SIZE** 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING 33.00 ft **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater encountered at 33 feet

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(ALLUVIUM/ COLLUVIUM) (SM) SILTY SAND, VF-VC subangular to subrounded sand, trace subangular to angular gravel (2mm - 8mm), little non-plastic fines, dry, 10YR, 4/2 dark grayish brown.	HA 1	100				
	5							24.0	
			color change: 10 YR 5/6 yellowish brown, med dense. no recovery from 7.9' - 8.5' bgs.	SS 2	61	7-10-14 (24)			
	10		little angular to subangular gravel (2mm- 6mm), dry, med dense, 10 YR 5/4 yellowish brown, trace mica. no recovery from 10.75' - 11.5' bgs.	SS 3	50	10-18-22 (40)			
	15		no recovery from 15.8' - 16.5' bgs	SS 4	53	17-24-33 (57)			
	20		no recovery from 20.6' - 21.5' bgs	SS 5	39	36-39-43 (82)		19.4	
	25		no recovery from 25.5' - 26.5' bgs	SS 6	33	20-30-31 (61)			
	30		no recovery from 30.65' - 31.5' bgs	SS 7	39	16-13-27 (40)			
	35								



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ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

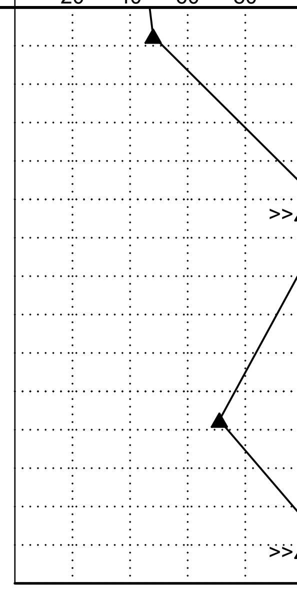
ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM/ COLLUVIUM) (SM) SILTY SAND, VF-VC subangular to subrounded sand, trace subangular to angular gravel (2mm - 8mm), little non-plastic fines, dry, 10YR, 4/2 dark grayish brown. *(continued)* increased gravel size (2mm - 27mm), wet (groundwater observed) no recovery from 35.85' - 36.5' bgs	SS 8	56	19-22-26 (48)			
	40			SS 9	94	34-50/3"			
	45		no recovery from 45.9 - 46.5' bgs	SS 10	61	23-33-38 (71)			
	50		(SM) SILTY SAND, VF-VC angular to subrounded sand, little fines, little angular to subangular gravel (2mm - 14mm), wet, very dense, 2.5 Y 5/4 light olive brown, oxidized staining, trace mica. No recovery from 49.2' - 50' bgs	SS 11	50	22-24-50/4"			

Borehole terminated at 50.0 feet depth.

▲ SPT N VALUE ▲ 20 40 60 80

PL MC LL 20 40 60 80

☐ FINES CONTENT (%) ☐ 20 40 60 80



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ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER 5-002

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/10/21 **COMPLETED** 12/10/21
GROUND ELEVATION **HOLE SIZE** 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	0		(WEATHERED GRANODIORITE) (SM) SILTY SAND, VF-VC subangular to subrounded sand, little angular gravel (2mm - 27mm), trace fines, moist, 10 YR 3/2 very dark grayish brown, organic staining, roots present. grades to trace subangular to subrounded gravel (2mm - 17mm), dry, 10 YR 4/3 brown	HA 1	100					
	5							25.0		
			No recovery from 7.7' - 8.5' bgs.	SS 2	47	11-15-17 (32)				
	10		color change: 2.5 YR 6/3 yellowish brown. No recovery from 10.7' - 11.5' bgs.	SS 3	47	11-16-20 (36)				
	15		15' - 15.2' bgs, granodiorite (pulverized).	SS 4	100	50/2"				>>
			(WEATHERED GRANODIORITE) (SW-SM) WELL GRADED SAND with SILT, VF-VC subangular to subrounded sand, little subangular to subrounded gravel (2mm - 6mm), little fines, dry to moist, 2.5 Y 6/3 light yellowish brown.							
	20		(WEATHERED GRANODIORITE) (SM) SILTY SAND, residual soil from granodiorite, VF-VC, angular sand, little angular gravel (2mm - 7mm), little fines, very dense, white n/9 white w/ specks of 2.5 Y3/1 very dark gray, oxidized staining. No recovery from 20.7' - 21.5' bgs.	SS 5	50	38-49-50/5"				>>
	25		No recovery from 25.6' - 25.8' bgs	SS 6	70	49-50/4"				>>
	30			SS 7	88	50/4"				>>
			Drilling Rig chatted from 31.5' - 35' bgs.							
	35									

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CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

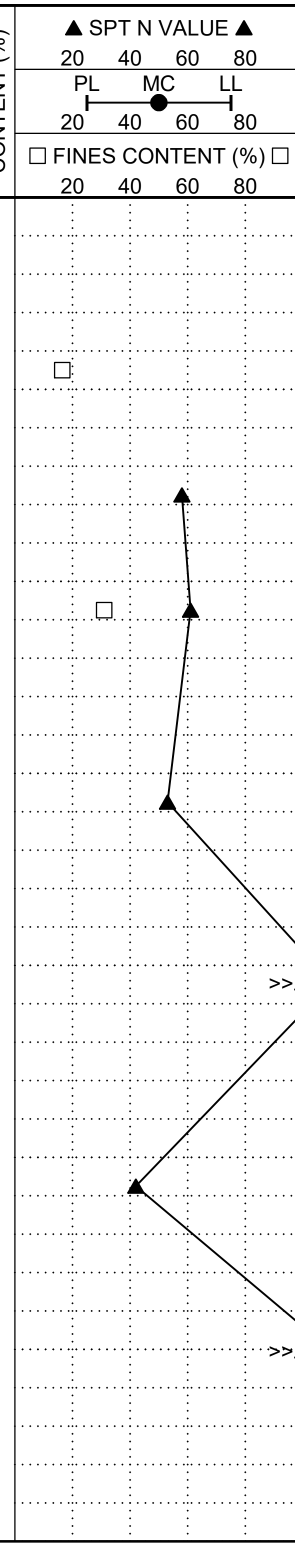
ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	35		(WEATHERED GRANODIORITE) (SM) SILTY SAND, residual soil from granodiorite, VF-VC, angular sand, little angular gravel (2mm - 7mm), little fines, very dense, white n/9 white w/ specks of 2.5 Y3/1 very dark gray, oxidized staining. *(continued)* no recovery from 35.6' 35.8' bgs.	SS 8	78	43-50/3"				>>▲
	40			SS 9	100	50/4"				>>▲
	45		No recovery from 45' - 45.1' bgs (Possible Bedrock encountered)	SS 10	0	50/1"				>>▲
			Borehole terminated at 45.1 feet depth.							

BORING NUMBER 5-005

ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/7/21 **COMPLETED** 12/7/21
GROUND ELEVATION
HOLE SIZE 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft
EASTING ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING ---
AFTER DRILLING ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(SW) WELL GRADED SAND, VF-VC subangular to subrounded sand, trace subangular gravel (2mm - 8mm), trace fines, dry, 10YR 3/2 very dark grayish brown, micaceous.	HA 1	100				
			(WEATHERED GRANODIORITE) (SW) WELL GRADED SAND with GRAVEL, VF-VC angular to subrounded sand, little angular to subangular gravel (2mm - 15mm), trace fines, dry, 10 YR 6/3 pale brown, micaceous.					16.5	
	5		(WEATHERED GRANODIORITE) (SM) SILTY SAND, VF-VC subangular to subrounded sand, little angular to subangular gravel (2mm - 15mm), little fines, dry, 10 YR 5/4 yellowish brown, trace mica.	SS 2	44	13-28-30 (58)			
			(WEATHERED GRANODIORITE) (SW) WELL GRADED SAND with GRAVEL, same as @ 1.8' bgs. color change: 10 YR 5/3 brown, pulverized rock @ bottom of shoe (granodiorite), dense. no recovery from 7.7' - 8.5' bgs.						
	10		(WEATHERED GRANODIORITE) (SM) SILTY SAND, VF-VC subangular to subrounded sand, trace strace subangular gravel (2mm - 6mm), SOME fines, moist, dense, 10 YR 4/2 dark grayish brown mottled w/ white N/9.5 white, weathered gravel embedded, micaceous, possible residual soil. no recovery from 10.65' - 11.5'	SS 3	42	14-30-31 (61)		31.0	
	15		no recovery from 15.6' - 16.5' bgs.	SS 4	39	18-21-32 (53)			
	20		no recovery from 20.5' - 21' bgs	SS 5	55	21-50/5"			
	25		no recovery from 25.6' - 26.5' bgs.	SS 6	39	13-18-24 (42)			
	30		No recovery from 30' - 30.1' bgs. At 30' bgs, rig chattering. Based on driller, bedrock encountered at 30' bgs	SS 7	0	50/1"			
	35								



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CLIENT Southern California Edison (SCE)

PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C

PROJECT LOCATION California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	35		No recovery from 35' - 35.1' bgs	SS 8	0	50/2"				>> ▲
			Borehole terminated at 35.1 feet depth.							

ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER KERN-008a

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/6/21 **COMPLETED** 12/6/21
GROUND ELEVATION **HOLE SIZE** 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80
	0		(FILL) (SM) SILTY SAND with GRAVEL, VF-VC angular to subrounded sand, little angular gravel (2mm - 200mm), little fines, dry, 10 YR 4/3 brown, micaceous. (FILL)							
			(LAND DEPOSITS) (SM) SILTY SAND, VF-VC angular to subrounded sand, trace angular to subangular gravel (2mm - 6mm), little fines, dry, 10 YR 4/3 brown, some mica.	HA 1	100					
	5									
			No recovery from 7.6' - 8.5' bgs.	SS 2	42	8-10-9 (19)				
	10									
			color change 10YR 5/3 brown, oxidized staining. No recovery from 10.85' - 11.5' bgs.	SS 3	56	6-9-15 (24)		18.0		
	15									
			some laminations of weather gravel, trace oxidized staining. no recovery from 15.9' - 16.5' bgs.	SS 4	61	5-14-20 (34)				
	20									
			grades to little angular gravel (2mm - 29mm), trace fines, dry to moist, med dense, 10 YR 5/2 grayish brown, some pulverized gravel, alluvium, mica. No recovery from 20.7' - 21.5' bgs.	SS 5	47	13-15-11 (26)				
	25									
			color change 10 YR 5/3 brown, oxidized staining. No recovery from 25.8' - 26.5' bgs.	SS 6	53	17-21-24 (45)				
	30									
			grades to trace subangular gravel (2mm - 16mm), moist, med dense, 10 YR 4/4 dark yellowish brown, micaceous, alluvium. no recovery from 30.7' - 31.5' bgs	SS 7	47	8-14-15 (29)				
	35									

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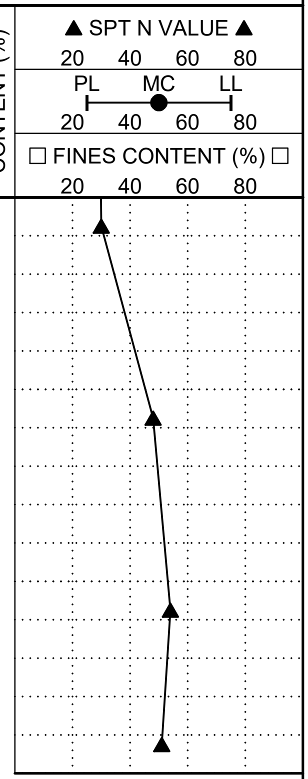
ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(LAND DEPOSITS) (SM) SILTY SAND, VF-VC angular to subrounded sand, trace angular to subangular gravel (2mm - 6mm), little fines, dry, 10 YR 4/3 brown, some mica. *(continued)* No recovery from 35.75' - 36.5' bgs.	SS 8	50	8-12-18 (30)			
	40		pulverized gravel fragments No recovery from 40.8' - 41.5' bgs.	SS 9	53	9-16-32 (48)			
	45		(ALLUVIUM) (SW) WELL GRADED SAND, VF- med subrounded subangular sand, trace subangular gravel (2mm - 14mm), trace fines, trace C-VC subangular to subrounded sand, moist, dense, GLEY 2 5/5B blueish gray mottles w/ 7.5 YR 6/8 reddish yellow. No recovery from 45.7' - 46.5' bgs.	SS 10	47	16-22-32 (54)			
	50		no recovery from 49.2' - 50' bgs.	SS 11	47	19-27-24 (51)			



Borehole terminated at 50.0 feet depth.

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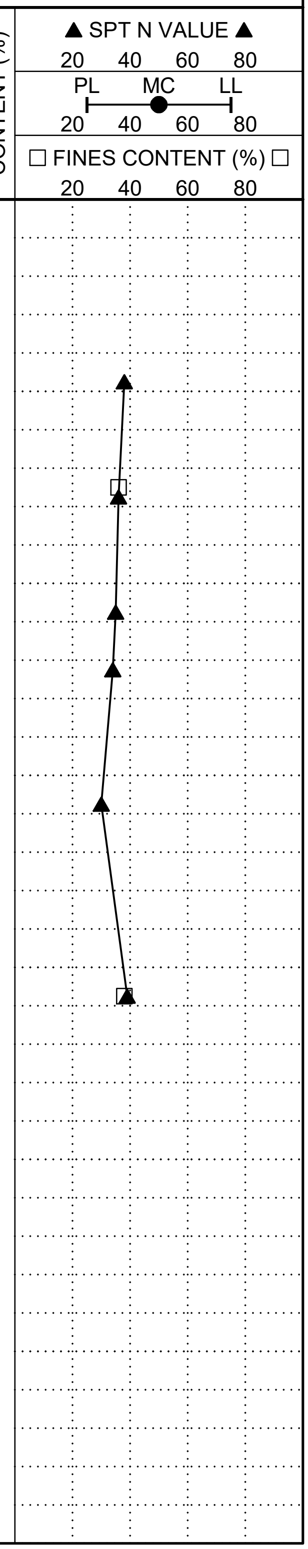
BORING NUMBER KERN-009

ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/1/21 **COMPLETED** 12/1/21
GROUND ELEVATION **HOLE SIZE** 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(COLLUVIUM) (SM) SILTY SAND, VF-VC, angular to subrounded sand, few angular gravel (2mm - 112mm), dry, 10 YR 3/3 dark brown, trace mica.	HA 1	100				
			@1.4' bgs, iron oxide staining, increase in fines (10%), w/ silt. no recovery from 2.3' - 4' bgs	RC 2					
	5		weak cementation, some mica, medium dense	SS 3	100	9-16-22 (38)			
				SS 4	100	13-15-21 (36)		36.0	
	10		no recovery from 10' - 11.5' bgs	SS 5	0	17-17-18 (35)			
			no recovery from 12.1' 13' bgs	SS 6	39	9-16-18 (34)			
	15		no recovery from 16' - 16.5' bgs	SS 7	67	9-15-15 (30)			
	20		grades to some gravel no recovery from 20.7' 21.5' bgs.	SS 8	47	10-14-25 (39)		38.0	
	25		(GW) WELL GRADED GRAVEL with SAND, 23.9' - 24.5' bgs, gravel clast (6 inches), fractured granodiorite, lens, gravel angular to subangular (2mm - 28mm), some med-VC subangular to subrounded sand, wet (drilling thick), 10YR 5/3 brown mottles w/ iron oxide, colluvial deposites.	RC 9					
			IGNEOUS GRANODIORITE BEDROCK, course grained crystals, GLEY 2 3/10 B (lught bluish gray) mottles w/ GLEY 2 3/10BG (v dark greenish gray), slightly weathered, very hard, intensely gractured, CRD = 100%, RQD - 0%, poor quality	RC 10					
	30		at 35.6' bgs CRD = 93%, RQD = 0%	RC 11					
			at 27.6' bgs CRD = 100%, RQD = 0%	RC 12					
			at 29' bgs CRD = 47%, RQD = 0%, very intensely fractured	RC 13					
			at 30.7' bgs CRD - 100%, RQD = 23%, intensely fractured	RC 14					
	35		(SW) WELL GRADED SAND, VF-VC, anular to	RC					



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CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80; PL MC LL 20 40 60 80; ☐ FINES CONTENT (%) ☐ 20 40 60 80
	35		subrounded sand, little gravel (2mm - 31mm), subangular, trace silt nodules, 10 YR 5/2 grayish brown, possible lens in traces of bedrock	15						
			IGNEOUS GRANODIORITE BEDROCK, CRD = 100%, RQD = 0%							
			no recovery from 34.9' - 36' bgs (SW) WELL GRADED SAND with GRAVEL, VF-VC angular to subangular sand, little gravel (2mm - 7mm), angular trace fines, 10 YR 6/4 light yellowish brown, oxidized staining. *(continued)*							
			Borehole terminated at 36.0 feet depth.							

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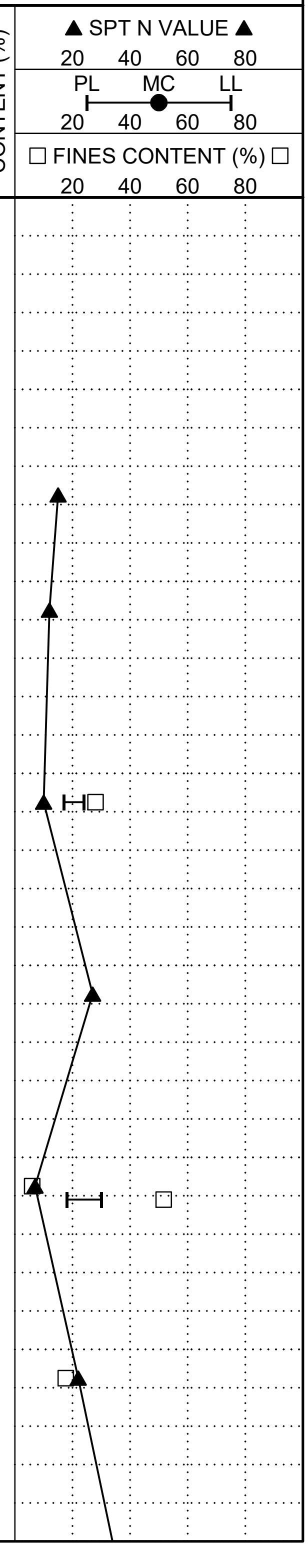
BORING NUMBER KERN-011

ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/21/21 **COMPLETED** 12/21/21
GROUND ELEVATION **HOLE SIZE** 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING 13.00 ft **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater at 13 feet

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(FILL, TOPSOIL) (SM) SILTY SAND, well graded VF-VC subangular - subrounded sand, little fines, trace subangular gravel (2mm - 12mm), mott, 10YR 3/3 dark brown, organic material.						
			(ALLUVIUM) (SC-SM) SILTY, CLAYEY SAND, VF-VC angular to subrounded sand, trace angular to subangular gravel (2mm - 17mm), dry, 10 YR 4/3 brown, trace mica.	HA 1	100				
	5								
			increased grain size gravel (2mm - 28mm), loose.	SS 2	81	4-7-8 (15)			
			No recovery 8.2' - 8.5' bgs						
	10		color change 10 YR 5/4 yellowish brown.	SS 3	94	5-5-7 (12)			
			No recovery 11.4' - 11.5' bgs						
	15			SS 4	100	4-5-5 (10)	7	28.0	
	20		color change: 7.5 YR 5/6 strong brown mottled w/ 5Y 5/3 olive oxidized staining. No recovery 21.15' - 21.5' bgs	SS 5	78	7-12-15 (27)			
	25		(ALLUVIUM) (SW-SM) WELL GRADED SAND with SILT and GRAVEL, VF-VC angular to subrounded sand, some angular to subangular gravel (2mm - 28mm), wet loose, 10 YR 5/3 brown.	SS 6	100	11-4-3 (7)	12	6.0 51.7	
			(ALLUVIUM) (CL) SANDY LEAN CLAY, VF-F subangular to subrounded sand, trace M-VC subangular to subrounded sand, little fines, wet, v loose, 7.5 YR 5/6 strong brown.						
	30		(ALLUVIUM) (SM) SILTY SAND, VF-VC subangular to subrounded sand, little angular to subangular (2mm - 19mm), trace fines, wet, med dense, 7.5 YR 5/6 strong brown.	SS 7	100	5-10-12 (22)		17.7	
	35								



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CLIENT Southern California Edison (SCE)

PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C

PROJECT LOCATION California

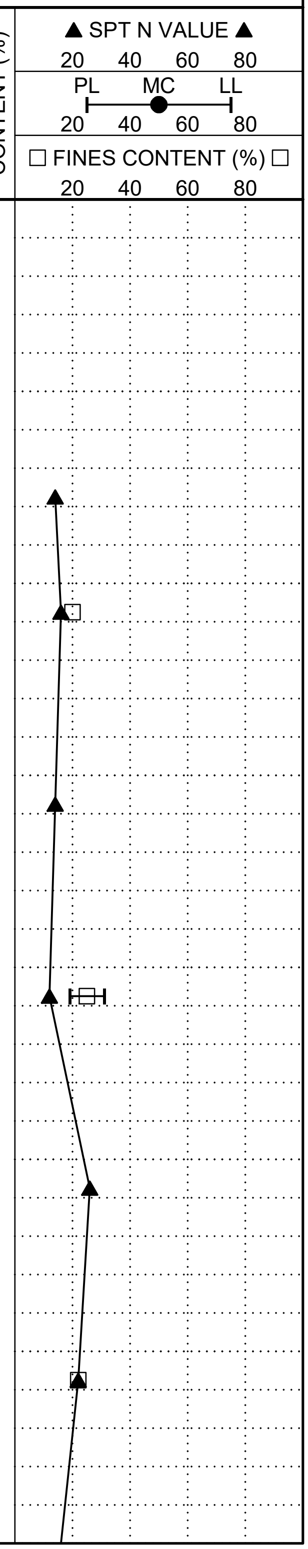
ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	35		(ALLUVIUM) (SM) SILTY SAND with GRAVEL, same as @ 25' bgs, color change: 7.5 YR 5/6 strong brown, med dense.	SS 8	100	7-15-21 (36)				
	40		increased gravel (some angular to subangular gravel) *heaving sands*	SS 9	100	10-14-50/4"				>>
	45		increase in gravel, med dense to very dense. *heaving sands*	SS 10	100	31-50/4"				>>
			decrease in gravel (little angular to subrounded gravel), dense to v dense. *heaving sands*	SS 11	97	45-38-50/4"				>>

Borehole terminated at 49.9 feet depth.

ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/20/21 **COMPLETED** 12/20/21
GROUND ELEVATION ______ **HOLE SIZE** 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING 23.00 ft **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater at 23 feet

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(FILL/ TOPSOIL) (SW-SM) WELL GRADED SAND with SILT, VF-VC angular to subangular sand, little angular to subangular gravel (2mm - 9mm), little fines, moist, 10YR 2/2 dark brown, trace mica, trace organics.	HA 1	100				
			(ALLUVIUM) (SC) CLAYEY SAND, VF-VC subangular to subrounded sand, trace angular to subangular gravel (2mm - 22mm), trace fines, dry to moist, 10 YR 3/3 dark brown, micaceous.						
	5		At 3.5' bgs, increased gravel (10%), little angular to subangular gravel (2mm - 22mm), color change: 10 YR 5/4 yellowish brown						
			No recovery from 8.3' - 8.5' bgs.	SS 2	92	4-7-7 (14)			
	10		color change 10 YR 5/3 brown mottled w/ 7.5 YR 6/8 reddish brown, trace mica.	SS 3	92	5-7-9 (16)		20.0	
	15			SS 4	100	7-7-7 (14)			
	20		color change 2.5 Y 4/1 dark gray mottled w/ 7.5 YR 6/8 reddish yellow, trace mica.	SS 5	100	3-5-7 (12)	12	25.0	
	▽ (23)								
	25		color change: 5 Y 4/3 olive mottles w/ 7.5 6/8 reddish yellow, oxidized staining, trace mica.	SS 6	100	7-11-15 (26)			
	30			SS 7	100	8-10-12 (22)		22.0	
	35								



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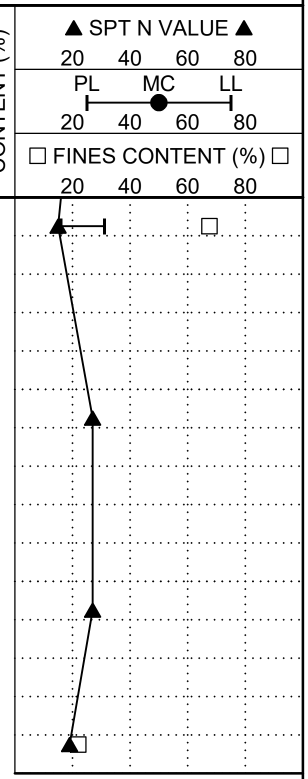
ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM) (CL) SANDY LEAN CLAY, trace subangular gravel (2mm - 5mm), wet, loose, 5 Y 3/2 dark olive gray, trace mica.	SS 8	100	5-5-10 (15)	15	67.6	
	40		(ALLUVIUM) (SC) CLAYEY SAND with GRAVEL, color change: 5 Y 3/2 dark olive gray mottles w/ 7.5 YR 6/8 reddish yellow.	SS 9	100	8-10-17 (27)			
	45			SS 10	100	7-11-16 (27)			
	50			SS 11	100	5-7-12 (19)		22.0	



Refusal at 49.9 feet.
Borehole terminated at 50.0 feet depth.

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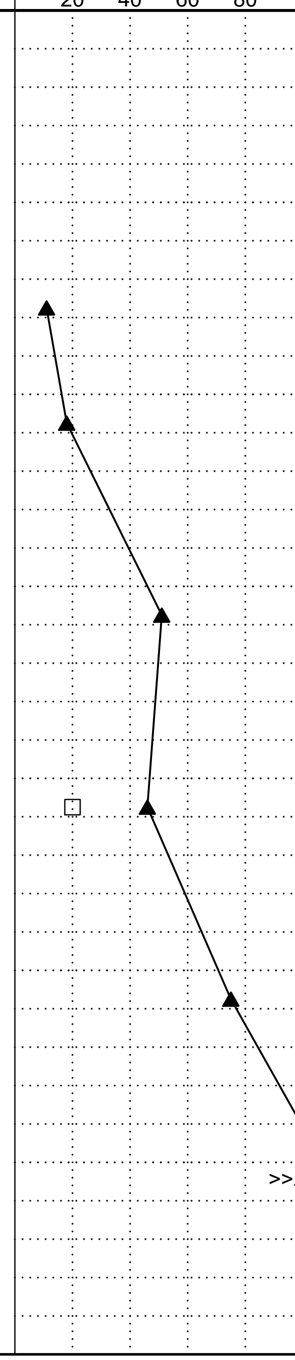
BORING NUMBER KERN-NEW01

ARCADIS Design & Consultancy for natural and built assets

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/19/21 **COMPLETED** 12/19/21
GROUND ELEVATION **HOLE SIZE** 3.5 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Mud Rotary
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	0		(ALLUVIUM/ COLLUVIUM) (SM) SILTY SAND, VF-C subangular to subrounded sand, trace VC sand, trace subangular to subrounded gravel (2mm - 6mm), dry, trace mica, 10YR 4/2 dark grayish brown.	HA 1	100				
	5		grades to little subangular to rounded gravel (2mm - 19mm), micaceous. No recovery from 7.65' - 8.5' gs	SS 2	44	3-5-6 (11)			
	10		(ALLUVIUM/ COLLUVIUM) (SM) SILTY SAND, VF - med subangular to subrounded sand, trace subangular gravel (2mm - 4mm), dry, med dense, 11YR 6/3 pale brown, oxidized staining. No recovery from 10.75' - 11.5' bgs	SS 3	50	5-8-10 (18)			
	15		grades to little subangular to rounded gravel (2mm - 24mm) trace dines, dry, med dense, 5 Y 7/2 light gray, oxidize staining No recovery 16.2' - 16.5' bgs	SS 4	72	19-23-28 (51)			
	20		No recovery 21' - 21.5' bgs	SS 5	67	16-17-29 (46)		20.0	
	25		No recovery 26.2' - 26.5' bgs (POSSIBLE WEATHERED BEDROCK) Drill rig chattered @ 27' - 30' bgs	SS 6	81	20-32-43 (75)			
	30		no oxidation, very dense, moist No recovery from 30.6' - 30.8' bgs	SS 7	70	44-50/4"			
	35								

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
☐ FINES CONTENT (%) ☐ 20 40 60 80



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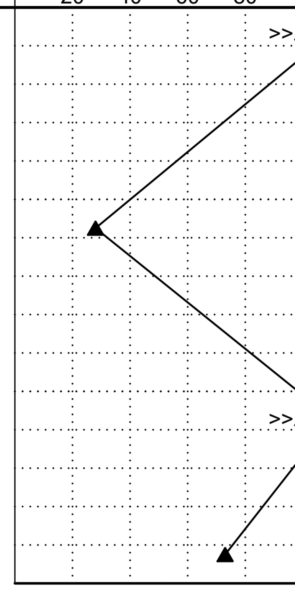
CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	35		(ALLUVIUM/ COLLUVIUM) (SM) SILTY SAND, VF - med subangular to subrounded sand, trace subangular gravel (2mm - 4mm), dry, med dense, 11YR 6/3 pale brown, oxidized staining. *(continued)* oxidize staining. No recovery 35.8' - 36.5' bgs	SS 8	59	29-43-50/4"				>>
	40		color change: 5Y 7/3 pale yellow mottled w/ 10 YR 6/8 brown yellow. No recovery from 45.6' - 46.5' bgs	SS 9	39	15-15-13 (28)				
	45		trace subangular to subrounded gravel (2mm- 4mm), very dense No recovery 45.6' - 46.5' bgs	SS 10	41	31-48-50/5"				>>
	50			SS 11	39	21-34-39 (73)				



Borehole terminated at 50.0 feet depth.

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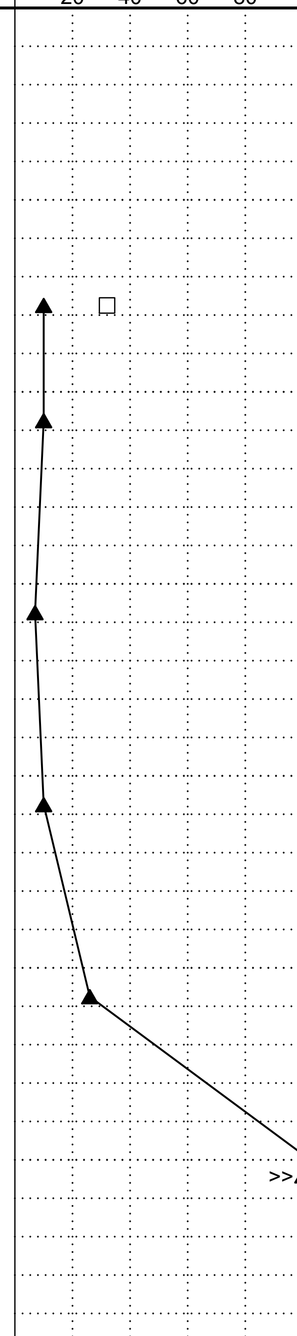
ARCADIS Design & Consultancy for natural and built assets

BORING NUMBER KERN-NEW02

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California
DATE STARTED 12/17/21 **COMPLETED** 12/17/21
GROUND ELEVATION **HOLE SIZE** 7 inches
DRILLING CONTRACTOR Gregg Drilling
NORTHING ft **EASTING** ft
DRILLING METHOD Hollow Stem Auger
GROUND WATER LEVELS:
LOGGED BY G. Jeffers **CHECKED BY** N. Trimble
AT TIME OF DRILLING --- **AFTER DRILLING** ---
NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	0		(ALLUVIUM) (SM) SILTY SAND, VF-C subangular to subrounded sand, trace VC sand, trace subanglar to subrounded gravel (2mm - 6mm), trace fines, dry, trace mica, 10 YR 4/2 drak grayish brown.	HA 1	100					
	5		color change: 10 YR 4/4 dark yellowish brown, loose	SS 2	100	4-4-6 (10)		32.0		
	10			SS 3	100	4-5-5 (10)				
	15		grades to no gravel, very loose	SS 4	100	3-3-4 (7)				
	20			SS 5	100	4-4-6 (10)				
			No recovery from 21' - 21.5' bgs							
	25		color change 10YR 5/3 brown	SS 6	100	9-12-14 (26)				
	30		grades to little angular to subangular gravel (2mm - 22mm) dry, med dense, 10 YR 6/3 pale brown	SS 7	180	13-17-24/0"				>>
	35									



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ARCADIS Design & Consultancy for natural and built assets

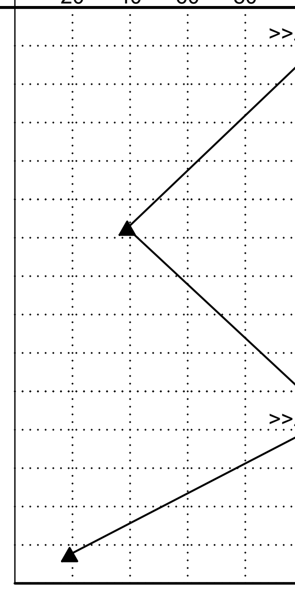
BORING NUMBER KERN-NEW02

CLIENT Southern California Edison (SCE)
PROJECT NAME TLRR Gorman-Kern River 66kV Geotech Investigation
PROJECT NUMBER 30104283-01325.C
PROJECT LOCATION California

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)
	35		(ALLUVIUM) (SM) SILTY SAND, VF-C subangular to subrounded sand, trace VC sand, trace subanglar to subrounded gravel (2mm - 6mm), trace fines, dry, trace mica, 10 YR 4/2 drak grayish brown. *(continued)* at 35.5' bgs pulverized gravel fragments No recovery from 36.3' - 36.5' bgs	SS 8	97	44-32-27/4"			
	40		color change: 10 YR 5/4 yellowish brown	SS 9	100	14-17-22 (39)			
	45			SS 10	106	13-31-37/5"			
	50		at 49' bgs pulverized gravel fragments	SS 11	44	10-14-5 (19)			

Borehole terminated at 50.0 feet depth.

▲ SPT N VALUE ▲ (20 40 60 80)
PL MC LL (20 40 60 80)
☐ FINES CONTENT (%) ☐ (20 40 60 80)



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BORING NUMBER KERN-NEW03

CLIENT Southern California Edison (SCE) **PROJECT NAME** TLRR Gorman-Kern River 66kV Geotech Investigation

PROJECT NUMBER 30104283-01325.C **PROJECT LOCATION** California

DATE STARTED 11/30/21 **COMPLETED** 11/30/21 **GROUND ELEVATION** **HOLE SIZE** 3.5 inches

DRILLING CONTRACTOR Gregg Drilling **NORTHING** ft **EASTING** ft

DRILLING METHOD Mud Rotary **GROUND WATER LEVELS:**

LOGGED BY G. Jeffers **CHECKED BY** N. Trimble **AT TIME OF DRILLING** --- **AFTER DRILLING** ---

NOTES Hammer = 140lbs, 30-inch drop, Auto Hammer, Groundwater not encountered

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD%)	BLOW COUNTS (N VALUE)	PLASTICITY INDEX (%)	PERCENTAGE FINES (%)	ORGANIC CONTENT (%)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
	0		(SW) WELL GRADED SAND with GRAVEL, VF-VC angular to subrounded sand, some angular to subangular gravel (2mm - 91mm), trace fines, dry, 10 YR 4/3 brown, alluvium deposits.	HA 1	100					
			GRAVEL, colluvium bed of granodiorite, highly fractured, slightly weatherd gravel , coarse grained crystals	RC 2	100					
	5		GRANODIORITE IGNEOUS ROCK, slightly weathered, very hard, intensely fractured, GLEY 2 8/10 B light bluish gray, mottled w/ GLEY 2 3/10BG very dark greenish gray, CRD = 100%, RQD = 0% at 3.9' bgs, very poor quality.	RC 3	100					
			CRD = 100%, RQD = 0% at 5' bgs, very poor quality	RC 4	100					
			CRD = 100%, RQD = 0% at 6.3' bgs, very poor quality	RC 5	93					
	10		8' - 8.7' bgs, bedrock crumbled due to too much pressure on drill bit from driller moderately fractured, CRD = 100%, RQD = 68% at 8.7' bgs, fair quality.	RC 6	100					

Borehole terminated at 11.0 feet depth.

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2017

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: GT-KERN-002

Sheet: 1 of 1

Project Name: Southern California Edison (SCE), TLRR
Project Number: 05032060.0000
Project Location: Kern County, CA

Date Started: 08/03/2017
Date Completed: 08/03/2017

Field Geologist: Valerie Naskrent
Editor:
Reviewed by: Steve Beadle, CEG

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0-5		NA	HA		5.2		(0.0-5.0') Sandy SILT (ML) with little gravel, loose, brown (7.5YR 5/4), dry, (20,30,50,0) very fine to very coarse grained sand, granule to small cobbles (2-100 mm), subangular to subrounded, nonplastic, medium dry strength.	Backfilled with native material	
5-6.5		10, 42, 47	15/18	GT KERN-002 (5.5-6.0)	25.9		(5.0-6.5') Silty SAND (SM) with little gravel, very dense, little brown (7.5YR 6/3), dry, (20,50,30,0) fine to very coarse grained sand, granule to very large pebbles (2-60 mm), subangular to subrounded, nonplastic, medium dry strength.		
8.5-10		50/3"	9/18		104		(8.5-10.0') Decreasing gravel size, granule to very large pebble (2-40 mm), low dry strength.		
13.5-15		20, 27, 23	12/18	GT KERN-002 (13.5-15.0)	225		(13.5-15.5') Poorly graded SAND (SM) with little silt and gravel, very dense, very pale brown (10YR 7/4), dry, (20,70,10,0), fine to very coarse grained sand, granule to very large pebble (2-60 mm), subangular to subrounded, nonplastic.		
18.5-20		17, 17, 20	16/18	GT KERN-002 (19.0-19.5)	27.8		(18.5-19.0') Poorly graded SAND (SM) with little silt and gravel, very dense, very pale brown (10YR 7/4), dry, (20,70,10,0), fine to very coarse grained sand, granule to very large pebble (2-60 mm), subangular to subrounded, nonplastic.		
							(19.0-20.0') SILT (ML) with little sand, dense, yellowish brown (10YR 6/6), dry, (2,88,10,0), very fine to medium grained sand, granules (2 mm), subangular, low plasticity, low dry strength, low toughness.		
23.5-25		21, 50/2"	NA				(23.5-25.0') No recovery, auger refusal.		
28.5-30		50/2"	NA				(28.5-30.0') No recovery, auger refusal.		
30							End of boring at 30.0' bgs.		

Drilling Co.: Gregg Drilling LLC
Driller/Helper: Daniel Del Castillo / Jose Castillo
Drilling Method: Hand Auger / Hollow Stem Auger
Drilling Fluid: NA
Drilling Rig: CME 95 140-lb pneumatic hammer (30-in drop)
Remarks: '/ft = feet; "/in = inch; mm= millimeter; bgs= below ground surface; ppm= parts per million; NE = not encountered; NA = not applicable / available; Hand Auger to 5' bgs.

Sampling Method: CA MOD.Split Spoon 18"/3"/2.5"
Sampling Interval: 2-ft (sample #'s 1-2) to 5-feet
Water Level Start (ft. bgs.): NE
Water Level Finish (ft. btoc.): NE
Converted to Well: ☐ Yes ☒ No
Surface Elev: NA
North Coor: 35°23'38.3680"
East Coor: 118°48'30.2356"

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ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: GT-KERN-003

Project Name: Southern California Edison (SCE), TLRR
Date Started: 08/02/2017
Field Geologist: Hannah Hagemann
Project Number: 05032060.0000
Date Completed: 08/02/2017
Editor:
Project Location: Kern County, CA
Reviewed by: Steve Beadle, CEG

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0.0-4.0					1.1	CL	(0.0-4.0') Sandy CLAY (CL), medium stiff, dark olive brown (2.5Y 3/3), moist, (0,40,10,50) very fine to fine sand (0.0625-0.25 mm), medium plasticity, no dilatancy, medium toughness.	Backfilled with native material	
4.0-5.5						SM	(4.0-5.5') Silty SAND (SM), little clay, trace gravel, loose, dark yellowish brown, (10YR 4/4), dry, (5,50,30,10) very fine to coarse grained sand (0.0625-1.0 mm), subangular to subrounded, nonplastic, medium dry strength.		
5.5-6.5	5.0-6.5	3, 7, 12	16/18	GT-KERN-003 (5.5-6.0)	1.4	CH	(5.5-6.5') Sandy CLAY (CH), very stiff, dark olive brown (2.5Y 3/3), moist, (0,40,10,50) very fine to fine sand (0.0625-0.25 mm), low plasticity, no dilatancy, medium toughness. At 6.0-6.5' bgs, low plasticity.		
8.5-10.0	8.5-10.0	14, 10, 14	18/18	GT-KERN-003 (9.0-9.5)	4.3	SM	(8.5-10.0') Silty SAND (SM) little clay, trace gravel, medium dense, dark yellowish brown, (10YR 4/4), dry, (5,50,30,10) very fine to coarse grained sand (0.0625-1.0 mm), subangular to subrounded, nonplastic, medium dry strength.		
13.5-14.0	13.5-15.0	4, 5, 9	18/18		1.6	SM	(13.5-14.0') SAND with SILT (SM), medium dense, light olive brown (2.5Y 5/4), dry, (0,70,25,5), very fine to fine grained sand (0.0625-1.0 mm), subangular to subrounded, low plasticity, no dilatancy, medium dry strength.		
14.0-15.0						CH	(14.0-15.0') Silty CLAY(CH) with Sand, stiff, moist, (0,20,30,50), olive brown (2.5Y 4/3), very fine to fine (0.0625-0.25 mm), subangular to subrounded sand, low plasticity, no dilatancy, medium dry strength.		
15.0-18.7						CH	(15.0-18.7') Silty CLAY (CH) with Sand, stiff, moist, (0,15,40,45), olive brown (2.5Y 4/3), very fine to fine (0.0625-0.25 mm), subangular to subrounded sand, low plasticity, no dilatancy, medium dry strength.		
18.7-19.6	18.5-20.0	9, 13, 20	18/18		1.7	SM	(18.7-19.6') SAND with SILT (SM), very stiff, light olive brown (2.5Y 5/4), dry, (0,70,25,5), very fine to fine grained sand (0.0625-1.0 mm), subangular to subrounded, low plasticity, no dilatancy, medium dry strength.		

Drilling Co.: Gregg Drilling LLC
Driller/Helper: Daniel Del Castillo / Jose Castillo
Drilling Method: Hand Auger / Hollow Stem Auger
Drilling Fluid: NA
Drilling Rig: CME 95 140-lb pneumatic hammer (30-in drop)
Remarks: '/ft = feet; "/in = inch; mm= millimeter; bgs= below ground surface; ppm= parts per million; NE = not encountered; NA = not applicable / available.

Sampling Method: CA MOD.Split Spoon 18"/3"/2.5"
Sampling Interval: 2-ft (sample #'s 1-2) to 5-feet
Water Level Start (ft. bgs.): NE
Water Level Finish (ft. btoc.): NE
Converted to Well: ☐ Yes ☒ No
Surface Elev: NA
North Coor: 35.173092°
East Coor: -118.805551°

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ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: GT-KERN-003

Project Name: Southern California Edison (SCE), TLRR   Date Started: 08/02/2017   Field Geologist: Hannah Hagemann

Project Number: 05032060.0000   Date Completed: 08/02/2017   Editor:

Project Location: Kern County, CA   Reviewed by: Steve Beadle, CEG

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
20-24							(19.6-20.0') Silty SAND (SM), little clay, medium dense, olive brown (2.5Y 4/3), dry, (5,50,30,15), very fine to coarse grained sand with large pebbles (0.0625-30 mm) subangular to subrounded, nonplastic, low dry strength. Flecks of ferrous (Fe+) minerals, mica, muscovite and granodiorite pebbles present.		
24-25	X	6, 20, 22	16/18		1.4		(23.9-29.0') Poorly graded SAND (SM), little gravel, little silt, loose, light olive brown (2.5Y 5/3), dry, (5,85,10,0), very fine to very coarse grained (0.0625-4.0 mm) subangular to subrounded, low dry strength.		
29-30	X	5, 10, 21	18/18		0.7		(29.0-30.0') Silty SAND (SM), little clay, medium dense, olive brown (2.5Y 4/3), dry, (5,50,30,15), very fine to coarse grained sand with large pebbles (0.0625-30 mm) subangular to subrounded, nonplastic, low dry strength. Flecks of ferrous (Fe+) minerals, mica, muscovite and granodiorite pebbles present.	Backfilled with native material	
30-35							(30.0-35.0') Poorly graded SAND (SM), little gravel, little silt, loose, light olive brown (2.5Y 5/3), dry, (5,85,10,0), very fine to very coarse grained (0.0625-4.0 mm) subangular to subrounded, low dry strength.		
34-35	X	9, 19, 23	16/18		1.6				
36.5-39							(36.5-39.0') Silty SAND (SM), little clay, medium dense, olive brown (2.5Y 4/3), dry, (5,50,30,15), very fine to coarse grained sand with large pebbles (0.0625-30 mm) subangular to subrounded, nonplastic, low dry strength. Flecks of ferrous (Fe+) minerals, mica, muscovite and granodiorite pebbles present.		
39-40	X	7, 14, 20	18/18		1.1		(39.0-40.0') Poorly graded SAND (SM), little gravel, little silt, loose, light olive brown (2.5Y 5/3), dry, (5,85,10,0), very fine to very coarse grained (0.0625-4.0 mm) subangular to subrounded, low dry strength.		
40							End of boring at 40.0 ft bgs.		

Remarks: '/ft = feet; "/in = inch; mm= millimeter; bgs= below ground surface; ppm= parts per million; NE = not encountered; NA = not applicable / available.

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: GT-KERN-005

Sheet: 1 of 1

Project Name: Southern California Edison (SCE), TLRR
Date Started: 08/04/2017
Field Geologist: Valerie Naskrent
Project Number: 05032060.0000
Date Completed: 08/04/2017
Editor:
Project Location: Kern County, CA
Reviewed by: Steve Beadle, CEG

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0.0-3.0	Hand auger	NA	HA		37.4	ML	(0.0-3.0') Sandy SILT (ML) with little clay, loose, very dark brown (7.5YR 2.5/2), damp, (0,30,10,10), very fine to medium grained sand, subangular to subrounded, medium plasticity, low dry strength, low toughness.	Backfilled with native material	
3.0-5.0	Hand auger				36.2	SM	(3.0-5.0') Poorly graded SAND (SM) with little gravel and silt, very dense, dark brown (7.5YR 3/2), damp, (20.70,10,0), fine to very coarse grained sand, granule to medium pebble (2-13 mm), subangular to subrounded.		
5.0-6.0	Split spoon	7, 8, 50	18/18	GT-KERN-005 (5.5-6.0)	24.8	SC	(5.0-6.0') Clayey SAND (SC) with little clay, loose, very dark brown (7.5YR 2.5/2), damp, (0,30,10,10), very fine to medium grained sand, subangular to subrounded, medium plasticity, low dry strength, low toughness. At 5.5' color transition to brown (7.5YR 4/2).		
6.0-6.5						Bedrock	(6.0-6.5') Weathered bedrock, granodiorite with mica (muscovite, biotite) with iron staining.		
8.5-10.0	Split spoon	50/3"	4/18		10.5	Bedrock	(8.5-10.0') Auger refusal on bedrock, low recovery, weathered bedrock, granodiorite with mica (muscovite, biotite) with iron staining.		
13.5-15.0	Split spoon	50/2"	5/18		41.6	Bedrock	(13.5-15') Auger refusal on weathered bedrock, powered bedrock from grinding of rock bit.		
15.0							End of boring at 15.0 ft bgs.		

Drilling Co.: Gregg Drilling LLC
Sampling Method: CA MOD.Split Spoon 18"/3"/2.5"
Driller/Helper: Daniel Del Castillo / Jose Castillo
Sampling Interval: 2-ft (sample #'s 1-2) to 5-feet
Drilling Method: Hand Auger / Hollow Stem Auger
Water Level Start (ft. bgs.): NE
Drilling Fluid: NA
Water Level Finish (ft. btoc.): NE
Drilling Rig: CME 95 140-lb pneumatic hammer (30-in drop)
Converted to Well: ☐ Yes ☒ No
Remarks: '/ft = feet; "/in = inch; mm= millimeter; bgs= below ground surface; ppm= parts per million; NE = not encountered; NA = not applicable / available; Hand Auger to 5' bgs.
Surface Elev: NA
North Coor: 35°5'41.5442
East Coor: 118°39'40.1902"

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: GT-KERN-006

Sheet: 1 of 1

Project Name: Southern California Edison (SCE), TLRR
Date Started: 08/01/2017
Field Geologist: Valerie Naskrent

Project Number: 05032060.0000
Date Completed: 08/01/2017
Editor:

Project Location: Kern County, CA
Reviewed by: Steve Beadle, CEG

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0–5		NA	HA		2.2	SM	(0.0-5.0') Silty SAND (SM) with little gravel, loose, dark brown (7.5YR 3/3), moist, (10,70,20,0), fine to very coarse grained, subangular to subrounded, nonplastic. Refusal. Boring terminated.	Backfilled with native material	
5							End of boring at 5.0 ft bgs.		

Drilling Co.: Gregg Drilling LLC

Driller/Helper: Daniel Del Castillo / Jose Castillo

Drilling Method: Hand Auger / Hollow Stem Auger

Drilling Fluid: NA

Drilling Rig: CME 95 140-lb pneumatic hammer (30-in drop)

Remarks: '/ft = feet; "/in = inch; mm= millimeter; bgs= below ground surface; ppm= parts per million; NE = not encountered; NA = not applicable / available; Hand Auger to 5' bgs.

Sampling Method: CA MOD.Split Spoon 18"/3"/2.5"

Sampling Interval: 5-feet

Water Level Start (ft. bgs.): NE

Water Level Finish (ft. btoc.): NE

Converted to Well: ☐ Yes ☒ No

Surface Elev: NA

North Coor: 34.935704°

East Coor: -118.923927°

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: GT-KERN-013

Project Name: Southern California Edison (SCE), TLRR
Date Started: 07/31/2017
Field Geologist: Valerie Naskrent
Project Number: 05032060.0000
Date Completed: 07/31/2017
Editor:
Project Location: Kern County, CA
Reviewed by: Steve Beadle, CEG

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
0–0.33							Asphalt 4"		
0–5	Hand auger	NA	HA						
5–6.5	Sample	1, 2, 4	11/18		0.5	SM	(5.0-5.5)' Silty SAND (SM) with trace granule and clay, loose, very dark gray (7.5YR 3/1), damp, (5,70,20,5), very fine to medium grained, subangular to subrounded.		
							(6.0-6.5) Increasing Clay (5,65,15,15), brown (10YR 2/2).		
8.5–10	Sample	7, 10, 13	16/18	GT-KERN-013 (9.0-9.5)	1.2	SM	(8.5-9.5') Silty SAND (SM) with little gravel, trace clay, medium dense, very dark gray (7.5YR 3/1) moist, (10,70,15,5), very fine to coarse grained, subangular to subrounded, no plasticity	Backfilled with native material	
							(9.5-10') Decreasing Gravel and Clay (5,75,20,0), brown (7.5YR 4/4).		
13.5–15	Sample	8, 14, 15	14/18		2.8	SM	(13.5-14.5') Silty SAND (SM) with little gravel, trace clay, (5,60,25,10), dark greenish gray (GLEY 4/1).		
							At 14.5' Silty SAND (SM) (5,70,15,10), greenish gray (GLEY 4/1)		
18.5–20	Sample	4, 18, 20	16/18	GT-KERN-013 (19.0-19.5)	3.4	SM	(18.5-19.5') Poorly graded SAND (SM) with little silt and trace clay, dense, dark yellowish brown (10YR 4/6), moist, (2,70,18,10), very fine to medium grained, subangular to subrounded, low plasticity.		

Drilling Co.: Gregg Drilling LLC
Driller/Helper: Daniel Del Castillo / Jose Castillo
Drilling Method: Hand Auger / Hollow Stem Auger
Drilling Fluid: NA
Drilling Rig: Marl M12 140-lb pneumatic hammer (30-in drop)
Remarks: '/ft = feet; "/in = inch; mm= millimeter; bgs= below ground surface; ppm= parts per million; NE = not encountered; NA = not applicable / available; Hand Auger to 5' bgs.

Sampling Method: Rings 18"/2.5"
Sampling Interval: 2-ft (sample #'s 1-2) to 5-feet
Water Level Start (ft. bgs.): NE
Water Level Finish (ft. btoc.): NE
Converted to Well: ☐ Yes ☒ No
Surface Elev: NA
North Coor: 34.7908055°
East Coor: -118.82692529°

SCE TLRR D:\BORING LOGS\SCE TLRR BORING LOGS\SCE TLRR PROJECT.GPJ ARCADIS.GDT 1/29/19

Soil Boring Log

Boring No.: GT-KERN-013

Project Name: Southern California Edison (SCE), TLRR
Date Started: 07/31/2017
Field Geologist: Valerie Naskrent
Project Number: 05032060.0000
Date Completed: 07/31/2017
Editor:
Project Location: Kern County, CA
Reviewed by: Steve Beadle, CEG

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
20-21							19.5' Decreasing Sand, increasing Clay (2,65,18,15)		
23.5-24.5	X	13, 31, 39	18/18			SP	(23.5-24.5') SAND (SP) with little silt and trace clay, dense, dark yellowish brown (10YR 4/6), moist, (2,70,18,10), fine to very coarse grained, subangular to subrounded, low plasticity.		
24.5-25					1.4	SM	(24.5-25.0') Poorly graded SAND (SM), very dense, light olive brown (2.5Y 5/3), wet, (2,88,10,0), fine to very coarse grained, subangular to subrounded, nonplastic. At 24.5' Water flowing on top of bedrock, localized spring uphill.		
28.5-29.6	X	50/4	4/18		0.3		(28.5-29.6') No recovery, wet, flowing. At 28.5' Refusal upon weathered bedrock	Backfilled with native material	
29.6-30						SM	(29.6-30') Poorly graded SAND (SM), very dense, light olive brown (2.5Y 5/3), wet, (2,88,10,0), fine to very coarse grained, subangular to subrounded, nonplastic.		
33.5-34.5	X	50/4.5	6/18		2.0		(33.5-34.5') No recovery, wet, refusal upon bedrock (weathered).		
34.5-35						SM	(34.5-35') Poorly graded SAND (SM), very dense, light olive brown (2.5Y 5/3), wet, (2,88,10,0), fine to very coarse grained, subangular to subrounded, nonplastic.		
35							End of boring at 35.0 ft bgs.		

Remarks: '/ft = feet; "/in = inch; mm= millimeter; bgs= below ground surface; ppm= parts per million; NE = not encountered; NA = not applicable / available; Hand Auger to 5' bgs.

Appendix D

SPT Hammer Energy Reports

November 16, 2020

Gregg In-house Test
Attn: Brian Savela

Re: Standard Penetration Energy Measurements
Portable Hammer, PH-1 on D-20
Signal Hill Yard, Signal Hill, CA

Dear Mr. Savela,

This report offers results of energy measurements and related calculations made on November 13, 2020 during Standard Penetration Testing (SPT) and Modified California sampling on Gregg Drilling's portable automatic hammer on drill rig D20. Dynamic tests were performed on an instrumented section of NWJ drill rod attached to the sampler rod string. All dynamic measurements were obtained and recorded using a SPT Analyzer®.

Average Energy: 78% Modified California samples, 81% SPT samples
Sample Depths tested (in feet): 1, 2, 3.16, 5ft (MC samples) and 1, 2.5, 4, 5ft (SPT samples)

***Note:** If the SPT Analyzer did not measure all blows for a sample depth, the reported blow count and therefore calculated N60 value in the following tables will be incorrect. Often blows are excluded from calculations if the sensors are loose or have drifted from the baseline. Field records of actual blow count values should be used in place of the blow counts shown in the following tables.

Equipment:

SPT energy measurements were made on SPT samplers driven by the hammer/anvil system on the Gregg Drilling drill rig on November 13, 2020. The rig was tested in the Gregg Drilling Signal Hill yard. In total, 4 energy measurements were collected corresponding to 4 different samples at increasing depth using both SPT and Modified California samplers.

Gregg used a SPT Analyzer (SPTA) to acquire and process measurements of force and velocity with every impact of the automatic hammer on the sample rods. Gregg follows the procedure outlined in ASTM D4633. Two strain gauges mounted on a two foot section of NWJ rod measured force, while two piezoresistive accelerometers bolted on the same rod measured acceleration. The gauges were mounted approximately 6" from the top of the rod.
Analog signals from the gauges and accelerometers were collected, digitized, displayed in real-time, and stored by the SPTA. Selected output from the SPTA for each recorded impact of the hammer included:

- Maximum force in the rod (FMX)
- Maximum velocity in the rod (VMX)
- Maximum calculated transferred energy (EFV)
- Blows per minute (BPM)
- Energy transferred to the rods (ETR)

Data and Calculations:

The purpose of testing was to measure the energy transferred from the hammer to the drill rod and to calculate the energy efficiency of the hammer. The SPTA measurements of force and velocity were reviewed after field testing and analyzed to calculate the transferred energy (EFV).

The maximum energy transferred past the gauge location, EFV, is computed by the SPTA using force (F) and velocity (V) records as follows:

$$EMX = \int_a^b F(t)\, V(t)\, dt$$

The time "a" corresponds to the start of the record when the energy transfer begins and "b" is the time at which energy transferred to the rod reaches a maximum value. The energy transferred is defined as ETR, and is usually used to define the efficiency of the hammer/anvil system.

Results:

Tables for each sample depth summarize the average calculated energies for each sample tested as well as the details for each sample. It is shown that the overall average (ETR) energy for this system is 78% using Modified California samplers and 81% using SPT samplers . The Summary of SPT Test Results table at the end provides a summary of all the samples tested at each sampling depth. The plots and tables present selected measured and calculated results as a function of blow number. The results include:

- the blow number
- BC (blow count in feet) *NOTE: This is calculated by dividing the number of blows for each 6" of penetration by the 6" depth interval and is therefore only approximate. If some blows were deleted due to erroneous or poor data, the penetration depths are not correct.
- FMX (maximum rod force)
- VMX (maximum rod velocity)
- BPM (blows per minute)
- EFV (energy using the Force Velocity method in ft-lbs)
- ETR (energy transferred as a percentage of maximum)

At the end of each table is a statistical evaluation of the results for each variable including the average, standard deviation, maximum, minimum and what blow number these maximums and minimums occurred.

If you have any questions or comments on this report, please do not hesitate to call or e-mail me: kcabal@greggdrilling.com.

Sincerely,

Kelly Cabal

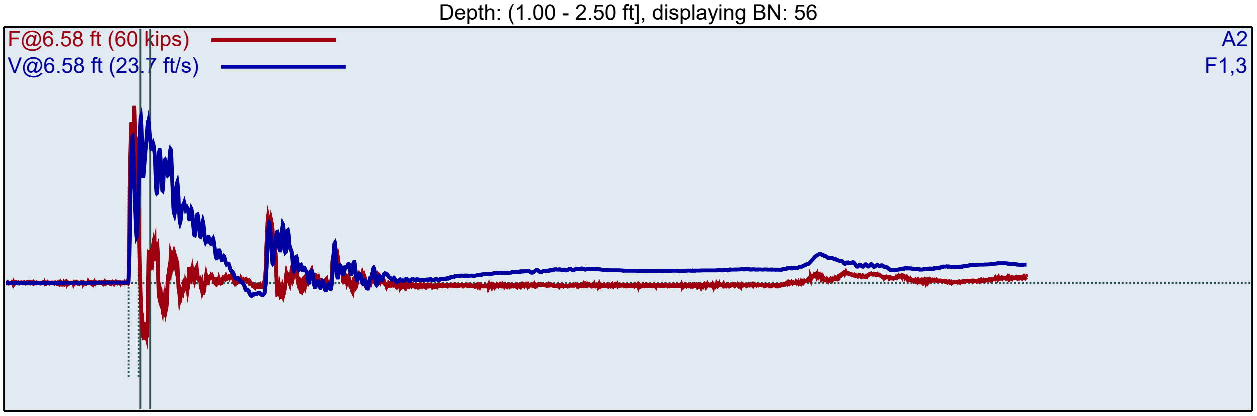
Kelly Cabal
Data Management & Communications
Gregg Drilling, LLC

Appendix A

PH-1 1
Wessam Zanaty Test date: 11/13/2020
Signal Hill yard BH

AR: 1.42 in^2 SP: 0.492 k/ft3
LE: 6.58 ft EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (1.00 - 2.50 ft], displaying BN: 56



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
5	13	36	15.0	42.8	270	77.1
6	13	37	15.4	43.7	269	76.9
7	13	36	15.9	45.0	282	80.7
8	13	36	15.2	45.0	260	74.3
9	13	37	15.6	40.3	280	80.1
10	13	37	16.3	45.0	295	84.2
11	13	39	14.8	46.0	266	76.1
12	13	38	15.9	46.3	280	80.0
13	13	39	16.9	47.6	320	91.3
14	13	40	17.1	53.2	312	89.2
15	13	40	16.9	52.3	297	84.8
16	13	39	17.2	54.2	303	86.5
17	13	38	15.3	54.0	271	77.6
18	15	36	15.3	39.8	253	72.2
19	15	39	16.4	46.0	304	87.0
20	15	38	16.6	48.7	294	83.9
21	15	39	14.6	48.9	276	78.7
22	15	37	14.7	41.2	262	74.8
23	15	38	15.2	41.3	272	77.8
24	15	38	16.3	47.7	294	84.0
25	15	36	15.1	45.8	245	70.1
26	15	39	14.9	39.8	273	77.9
27	15	40	14.7	48.8	278	79.5
28	15	38	16.0	47.7	275	78.6
29	15	38	16.2	46.1	277	79.2
30	15	37	16.1	46.6	275	78.5
31	15	39	14.2	45.4	262	74.7
32	15	36	15.2	45.4	262	74.8

33	23	37	14.1	45.2	282	80.6
34	23	37	13.2	44.7	261	74.6
35	23	37	13.3	44.9	263	75.1
36	23	40	14.3	44.9	276	79.0
37	23	39	13.6	44.3	263	75.1
38	23	38	13.7	44.8	264	75.5
39	23	40	15.1	44.3	276	78.7
40	23	38	13.2	44.5	270	77.1
41	23	38	13.4	44.4	269	76.8
42	23	38	12.9	44.3	271	77.5
43	23	39	13.0	44.5	267	76.2
44	23	38	12.8	44.2	263	75.1
45	23	39	12.9	44.3	262	74.8
46	0	39	13.2	44.0	263	75.1
47	0	37	12.7	43.9	267	76.4
48	0	37	12.4	40.2	264	75.5
49	0	39	12.8	39.0	260	74.4
50	0	39	12.8	42.1	267	76.2
51	0	38	13.4	42.9	267	76.2
52	0	39	12.6	43.1	270	77.2
53	13	39	16.9	1.9	242	69.2
54	13	41	16.9	22.8	259	74.0
55	15	37	16.6	67.3	255	72.8
56	23	41	15.4	63.5	288	82.2
57	23	40	15.4	67.1	265	75.8
	Average	38	14.3	46.1	270	77.1
	Std Dev	1	1.3	6.3	11	3.3
	Maximum	41	16.6	67.3	304	87.0
	Minimum	36	12.4	39.0	245	70.1

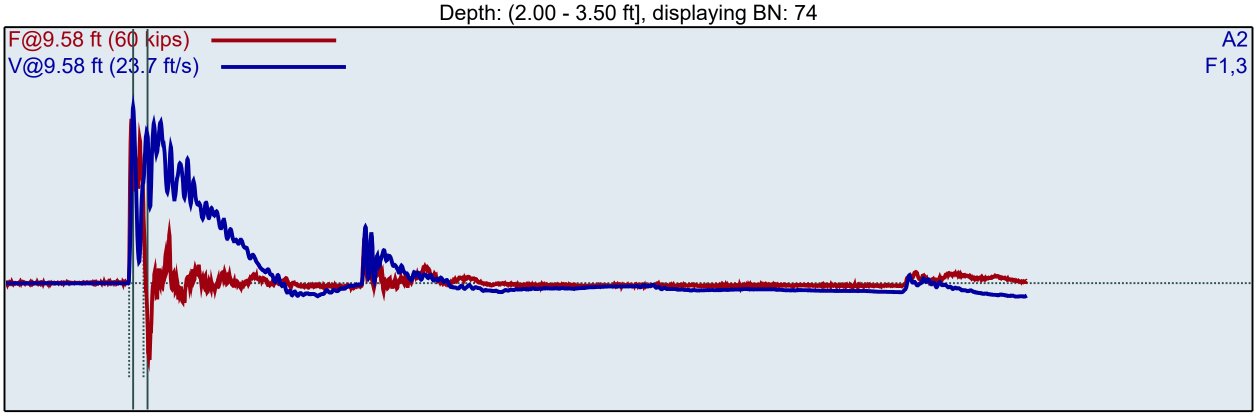
N-value: 38

Sample Interval Time: 734.76 seconds.

PH-1 1
Wessam Zanaty Test date: 11/13/2020
Signal Hill yard BH

AR: 1.42 in^2 SP: 0.492 k/ft3
LE: 6.58 ft EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (2.00 - 3.50 ft], displaying BN: 74



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
33	23	37	14.1	45.2	282	80.6
34	23	37	13.2	44.7	261	74.6
35	23	37	13.3	44.9	263	75.1
36	23	40	14.3	44.9	276	79.0
37	23	39	13.6	44.3	263	75.1
38	23	38	13.7	44.8	264	75.5
39	23	40	15.1	44.3	276	78.7
40	23	38	13.2	44.5	270	77.1
41	23	38	13.4	44.4	269	76.8
42	23	38	12.9	44.3	271	77.5
43	23	39	13.0	44.5	267	76.2
44	23	38	12.8	44.2	263	75.1
45	23	39	12.9	44.3	262	74.8
46	23	39	13.2	44.0	263	75.1
47	23	37	12.7	43.9	267	76.4
48	23	37	12.4	40.2	264	75.5
49	23	39	12.8	39.0	260	74.4
50	23	39	12.8	42.1	267	76.2
51	23	38	13.4	42.9	267	76.2
52	23	39	12.6	43.1	270	77.2
53	23	39	16.9	1.9	242	69.2
54	23	41	16.9	22.8	259	74.0
55	23	37	16.6	67.3	255	72.8
56	23	41	15.4	63.5	288	82.2
57	23	40	15.4	67.1	265	75.8
58	23	41	15.2	41.8	270	77.0
59	5	40	17.1	45.8	264	75.4
60	5	31	11.6	47.8	160	45.6
61	5	39	15.5	73.6	249	71.2
62	5	40	16.1	55.4	263	75.3
63	5	37	17.2	63.8	273	78.1

64	5	41	16.8	62.6	267	76.2
65	5	43	16.4	62.9	255	72.7
66	5	40	15.6	63.0	257	73.3
67	0	40	17.3	65.9	264	75.5
68	0	43	16.5	60.4	265	75.8
69	5	39	16.7	1.9	278	79.3
71	5	40	15.1	69.2	244	69.7
72	5	36	15.5	58.4	244	69.7
73	5	39	16.4	48.7	280	80.0
	Average	39	16.0	55.7	254	72.7
	Std Dev	3	1.4	16.8	28	8.1
	Maximum	43	17.3	73.6	280	80.0
	Minimum	31	11.6	1.9	160	45.6

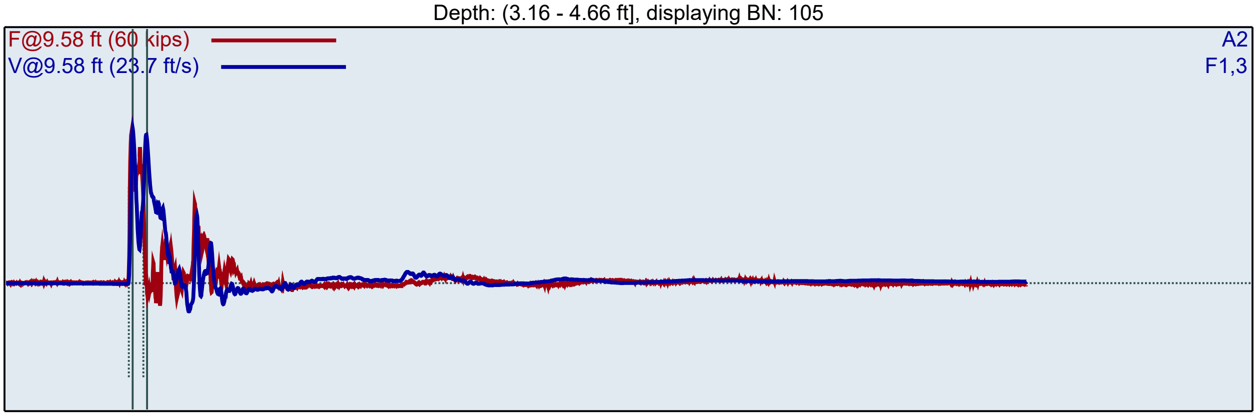
N-value: 14

Sample Interval Time: 967.20 seconds.

PH-1 1
Wessam Zanaty Test date: 11/13/2020
Signal Hill yard BH

AR: 1.42 in^2 SP: 0.492 k/ft3
LE: 6.58 ft EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (3.16 - 4.66 ft], displaying BN: 105



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1
A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
65	13	43	16.4	62.9	255	72.7
66	13	40	15.6	63.0	257	73.3
67	13	40	17.3	65.9	264	75.5
68	13	43	16.5	60.4	265	75.8
69	13	39	16.7	1.9	278	79.3
71	13	40	15.1	69.2	244	69.7
72	13	36	15.5	58.4	244	69.7
73	13	39	16.4	48.7	280	80.0
74	13	39	16.3	58.4	286	81.6
75	13	36	15.5	55.8	267	76.3
76	13	35	15.2	55.0	275	78.5
77	13	39	16.1	54.3	305	87.0
78	13	36	16.1	53.8	299	85.3
79	13	35	15.2	53.6	290	82.9
80	13	36	15.8	52.7	293	83.8
81	13	35	15.4	53.0	307	87.8
82	13	35	15.0	53.1	287	82.0
83	13	36	15.6	52.6	291	83.1
84	13	34	15.0	52.6	288	82.2
85	13	36	15.4	52.4	281	80.3
86	13	34	15.0	52.3	297	84.9
87	13	37	15.4	56.4	287	82.1
88	13	33	14.8	56.0	281	80.4
89	13	37	15.3	54.9	269	77.0
90	13	35	14.8	52.7	286	81.7
91	13	39	15.6	51.6	299	85.3
92	13	35	14.7	52.2	303	86.5
93	13	38	15.2	52.5	284	81.1
94	13	37	15.6	52.8	295	84.3
95	13	41	15.6	21.8	317	90.7
96	13	38	15.4	49.7	306	87.3

97	13	33	14.4	53.1	293	83.7
98	13	37	15.4	51.7	289	82.5
99	13	33	13.8	54.5	274	78.4
100	13	35	14.5	51.6	253	72.2
101	13	35	14.6	47.8	298	85.2
102	13	36	14.7	55.8	288	82.3
103	13	37	14.9	54.3	286	81.6
104	13	34	13.7	53.8	267	76.2
105	13	35	14.3	45.5	296	84.7
106	13	35	15.1	52.3	297	84.7
107	13	34	14.1	55.4	290	82.9
	Average	36	14.9	51.5	289	82.4
	Std Dev	2	0.5	6.4	13	3.7
	Maximum	41	15.6	56.4	317	90.7
	Minimum	33	13.7	21.8	253	72.2

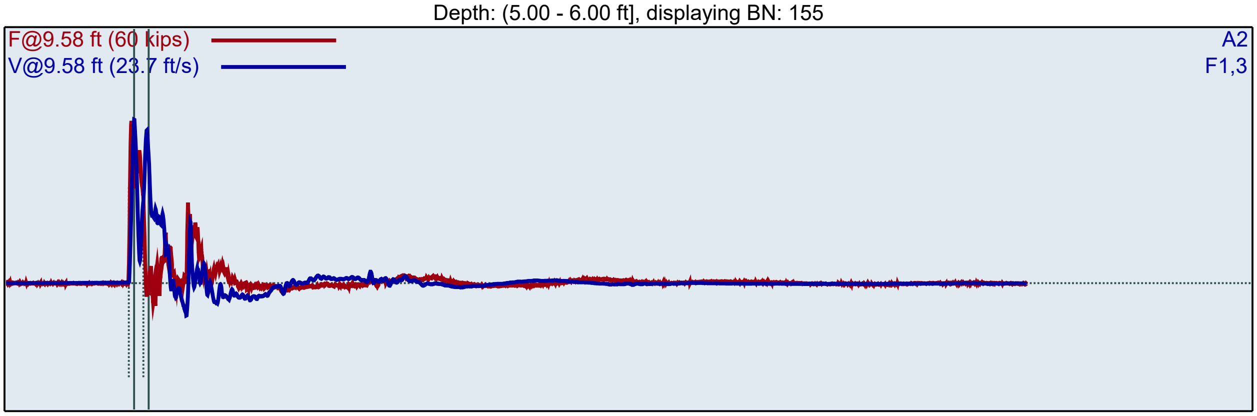
N-value: 26

Sample Interval Time: 300.30 seconds.

PH-1 1
Wessam Zanaty Test date: 11/13/2020
Signal Hill yard BH

AR: 1.42 in^2 SP: 0.492 k/ft3
LE: 9.58 ft EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (5.00 - 6.00 ft], displaying BN: 155



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1
A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
108	23	36	15.0	1.9	246	70.4
109	23	36	14.5	24.1	241	68.8
110	23	36	15.4	46.8	274	78.2
111	23	40	15.5	52.3	270	77.1
112	23	39	15.4	49.3	261	74.6
113	23	36	15.0	59.6	265	75.6
114	23	40	15.4	57.0	263	75.1
115	23	39	15.2	55.2	272	77.6
116	23	36	15.6	55.0	275	78.6
117	23	38	15.4	56.1	267	76.2
118	23	37	15.5	54.8	273	78.1
119	23	39	15.3	55.1	278	79.5
120	23	41	15.9	54.7	275	78.6
121	23	38	15.0	54.6	277	79.2
122	23	39	15.4	55.1	265	75.7
123	23	39	15.7	54.4	285	81.5
124	23	40	15.6	54.6	279	79.7
125	23	39	15.7	54.4	262	75.0
126	23	41	15.2	54.6	284	81.2
127	23	39	15.6	54.2	286	81.8
128	23	37	15.4	54.4	273	78.0
129	23	37	15.4	54.3	273	77.9
130	23	37	15.7	54.2	265	75.7
131	27	42	16.0	60.5	275	78.6
132	27	36	15.3	53.6	250	71.5
133	27	37	14.4	47.4	246	70.4
134	27	39	14.9	46.6	249	71.2
135	27	37	14.5	46.3	266	76.0
136	27	40	14.9	47.4	253	72.2
137	27	40	15.4	47.2	274	78.3
138	27	41	15.7	53.0	273	78.1

139	27	39	15.3	52.6	279	79.8
140	27	38	15.9	52.0	263	75.1
141	27	41	15.9	51.9	274	78.4
142	27	41	15.5	52.9	277	79.1
143	27	39	15.8	52.3	277	79.2
144	27	38	15.4	51.9	267	76.3
145	27	41	15.5	52.2	271	77.4
146	27	39	15.2	51.5	279	79.7
147	27	39	15.5	51.2	280	79.9
148	27	38	15.4	51.8	264	75.4
149	27	41	15.4	51.3	280	79.9
150	27	42	15.5	51.7	276	78.9
151	27	41	15.3	51.2	282	80.7
152	27	39	15.4	51.4	277	79.0
153	27	40	15.3	51.2	286	81.8
154	27	41	15.5	51.4	280	79.9
155	27	38	15.1	51.3	277	79.1
156	27	39	15.4	50.7	281	80.3
157	27	39	15.4	50.8	281	80.3
	Average	39	15.4	51.0	271	77.4
	Std Dev	2	0.3	8.6	11	3.1
	Maximum	42	16.0	60.5	286	81.8
	Minimum	36	14.4	1.9	241	68.8

N-value: 50

Sample Interval Time: 57.42 seconds.

Summary of SPT Test Results

Project: PH-1, Test Date: 11/13/2020

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. Length ft	Blows Applied /6"	**N Value**	**N60 Value**	Average FMX kips	Average VMX ft/s	Average BPM bpm	Average EFV ft-lb	Average ETR %
6.58	**13-15-23**	**38**	**49**	38	14.3	46.1	270	77.1
6.58	**23-5-5**	**10**	**12**	39	16.0	55.7	254	72.7
6.58	**13-13-13**	**26**	**33**	36	14.9	51.5	289	82.4
9.58	**23-27**	**27**	**35**	39	15.4	51.0	271	77.4
			Overall Average Values:	38	15.0	50.2	272	77.8
			Standard Deviation:	2	1.4	12.9	19	5.3
			Overall Maximum Value:	43	17.3	73.6	317	90.7
			Overall Minimum Value:	31	11.6	1.9	160	45.6

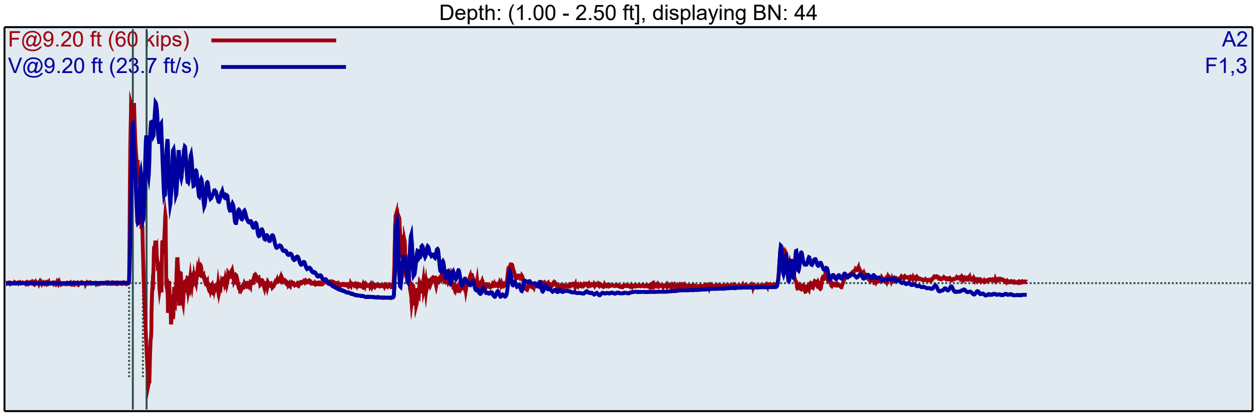
PH-1
Wessam Zanaty
Signal Hill yard BH

1-a
Test date: 11/13/2020

AR: 1.42 in^2
LE: 7.20 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (1.00 - 2.50 ft], displaying BN: 44



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
21	10	41	14.1	45.6	259	73.9
22	10	42	15.2	46.3	300	85.7
23	10	40	14.5	49.7	278	79.5
24	10	43	14.9	49.9	291	83.1
25	10	40	14.8	48.8	272	77.7
26	10	39	14.6	48.5	268	76.6
27	10	40	15.9	49.1	286	81.7
28	10	40	15.6	49.0	274	78.1
29	10	39	14.4	49.1	276	78.9
30	10	41	14.9	48.5	255	72.9
31	10	41	15.2	48.4	276	78.9
32	10	40	15.6	48.2	275	78.5
33	10	41	14.5	48.6	267	76.2
34	10	39	14.1	48.5	250	71.5
35	10	37	14.6	44.5	239	68.3
36	10	39	14.8	43.0	256	73.0
37	10	42	15.2	43.3	273	77.9
38	10	40	14.9	53.5	294	84.1
39	10	38	14.4	53.5	296	84.5
40	10	40	15.2	52.0	322	92.0
41	6	37	16.0	1.9	234	66.8
42	6	32	12.5	68.0	169	48.3
43	6	38	15.6	24.0	247	70.7
44	6	42	16.7	43.4	294	84.1
45	6	40	15.4	61.3	262	75.0
46	6	41	15.9	56.2	269	76.9

Average	39	15.0	46.2	264	75.4
Std Dev	2	0.9	14.7	33	9.5
Maximum	42	16.7	68.0	322	92.0
Minimum	32	12.5	1.9	169	48.3

N-value: 16

Sample Interval Time: 394.95 seconds.

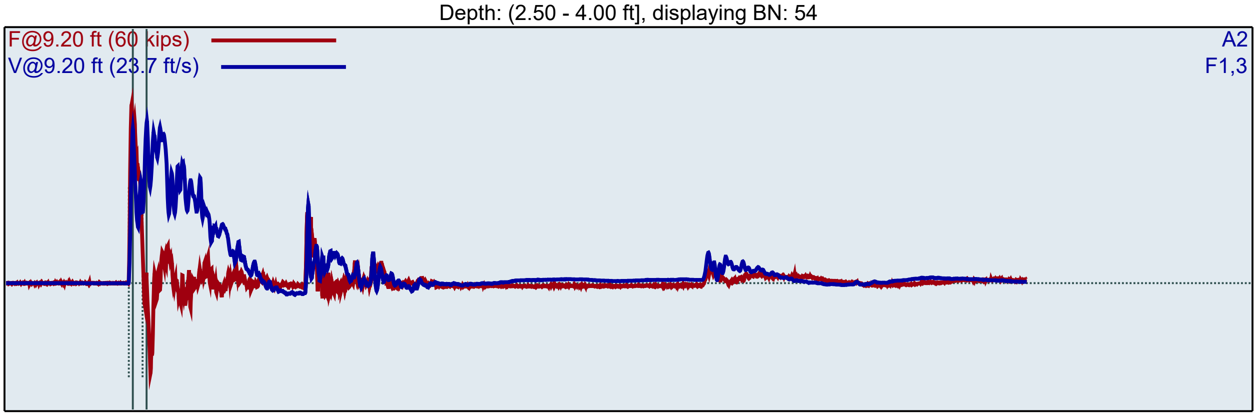
PH-1
Wessam Zanaty
Signal Hill yard BH

1-a
Test date: 11/13/2020

AR: 1.42 in^2
LE: 9.20 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (2.50 - 4.00 ft], displaying BN: 54



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
47	5	40	16.0	56.7	276	78.8
48	5	41	16.2	57.5	264	75.5
49	5	37	14.8	59.0	220	62.9
50	5	39	15.8	63.2	250	71.5
51	5	41	17.4	64.7	254	72.6
52	5	42	17.4	61.9	273	77.9
53	5	42	17.1	61.1	279	79.8
54	5	42	15.0	59.3	292	83.5
55	5	40	15.9	59.1	310	88.5
56	5	40	14.7	59.6	273	78.0
	Average	41	16.0	60.2	285	81.5
	Std Dev	1	1.1	1.1	14	4.0
	Maximum	42	17.4	61.9	310	88.5
	Minimum	40	14.7	59.1	273	77.9

N-value: 5

Sample Interval Time: 8.92 seconds.

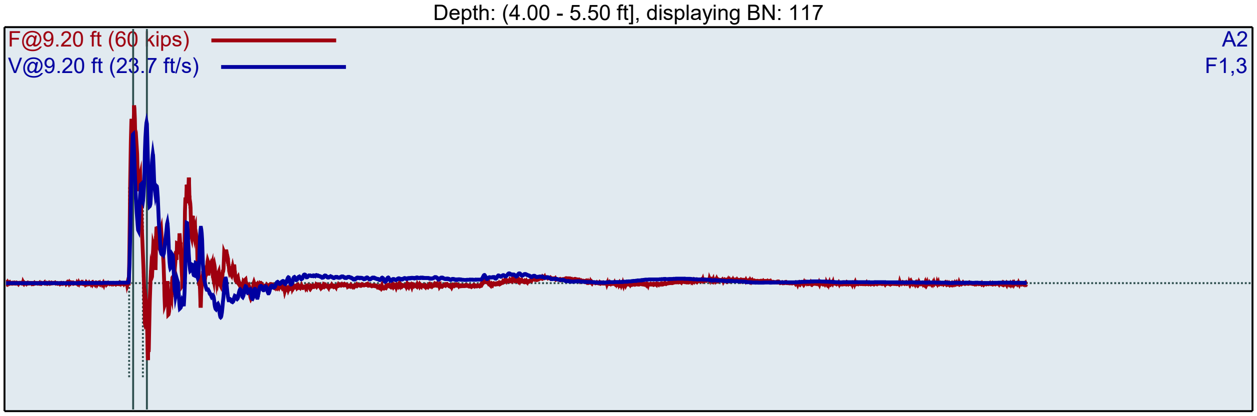
PH-1
Wessam Zanaty
Signal Hill yard BH

1-a
Test date: 11/13/2020

AR: 1.42 in^2
LE: 9.20 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (4.00 - 5.50 ft], displaying BN: 117



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
57	11	38	15.9	1.9	264	75.6
59	11	35	14.9	25.2	235	67.1
60	11	39	15.6	50.3	293	83.7
61	11	38	14.3	57.4	275	78.4
62	11	39	15.0	58.1	285	81.5
63	11	37	14.6	57.9	274	78.3
64	11	37	14.9	58.5	279	79.8
65	11	39	14.7	51.6	286	81.7
66	11	38	15.4	52.6	299	85.4
67	11	39	14.9	53.3	287	81.9
68	16	39	15.7	53.9	301	86.1
69	16	39	15.3	53.8	301	86.1
70	16	38	15.1	53.9	294	83.9
71	16	39	15.4	54.1	285	81.5
72	16	39	15.8	54.0	295	84.3
73	16	39	15.7	54.2	304	86.8
74	16	38	15.1	54.0	291	83.0
75	16	38	14.1	60.9	265	75.8
76	16	39	15.9	55.9	294	84.1
77	16	37	14.7	56.6	283	80.9
78	16	38	15.1	56.8	292	83.4
79	16	38	15.6	55.8	287	82.0
80	16	39	14.7	56.0	291	83.2
81	16	39	15.3	56.1	304	86.8
82	16	33	12.0	57.3	205	58.6
83	16	36	14.5	68.4	273	77.9
84	36	37	13.3	60.5	254	72.5
85	36	36	13.4	63.1	246	70.3
86	36	33	12.0	59.6	189	54.1
87	36	36	14.6	69.5	266	75.9
88	36	38	13.9	53.7	284	81.1

89	36	39	14.7	52.2	317	90.6
90	36	36	14.1	60.2	265	75.7
91	36	38	14.0	54.8	284	81.1
92	36	37	13.7	54.7	286	81.8
93	36	38	14.1	53.1	289	82.7
94	36	38	14.5	51.7	319	91.0
95	36	38	13.5	52.6	277	79.2
96	36	38	14.6	53.1	309	88.4
97	36	40	15.0	52.7	307	87.7
98	36	37	13.6	53.3	300	85.6
99	36	38	14.1	53.3	285	81.4
100	36	39	14.3	53.1	294	84.1
101	36	40	14.4	52.7	307	87.8
102	36	38	13.1	53.5	297	84.9
103	36	39	14.5	53.1	311	88.7
104	36	38	13.5	53.4	300	85.6
105	36	38	13.7	53.5	289	82.4
106	36	38	13.2	53.1	292	83.5
107	36	38	15.9	1.9	253	72.3
108	36	42	17.3	18.6	290	82.8
109	36	41	15.2	55.9	281	80.3
110	36	39	14.4	57.7	267	76.3
111	36	39	14.1	60.4	298	85.2
112	36	40	15.0	55.7	306	87.5
113	36	39	14.8	55.5	299	85.4
114	36	40	15.0	55.4	303	86.6
115	36	40	14.2	55.4	301	86.1
116	36	40	14.3	55.6	298	85.2
117	36	42	14.9	55.5	299	85.4
118	36	40	13.7	54.9	294	84.0
119	36	39	15.2	54.9	309	88.3
	Average	38	14.5	54.0	287	82.0
	Std Dev	2	1.0	9.6	24	6.8
	Maximum	42	17.3	69.5	319	91.0
	Minimum	33	12.0	1.9	189	54.1

N-value: 52

Sample Interval Time: 322.50 seconds.

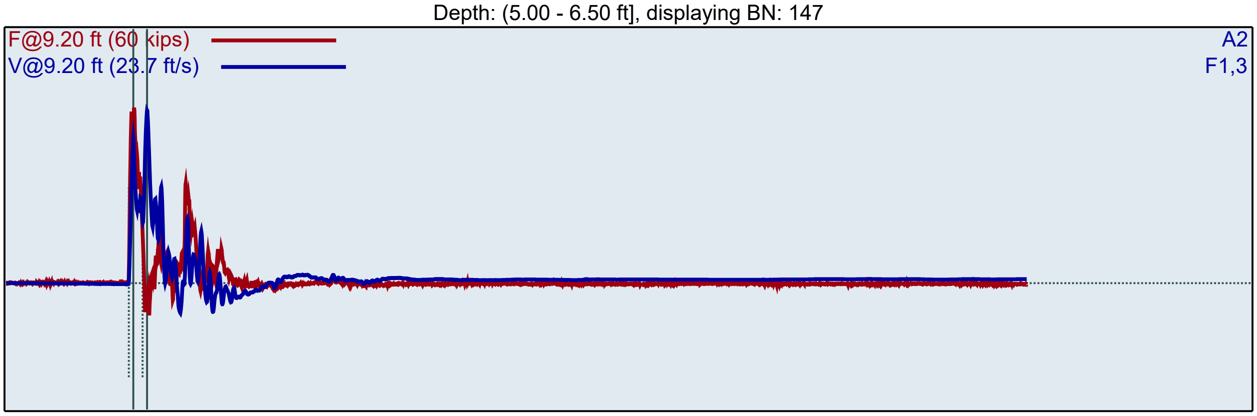
PH-1
Wessam Zanaty
Signal Hill yard BH

1-a
Test date: 11/13/2020

AR: 1.42 in^2
LE: 9.20 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (5.00 - 6.50 ft], displaying BN: 147



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
84	36	37	13.3	60.5	254	72.5
85	36	36	13.4	63.1	246	70.3
86	36	33	12.0	59.6	189	54.1
87	36	36	14.6	69.5	266	75.9
88	36	38	13.9	53.7	284	81.1
89	36	39	14.7	52.2	317	90.6
90	36	36	14.1	60.2	265	75.7
91	36	38	14.0	54.8	284	81.1
92	36	37	13.7	54.7	286	81.8
93	36	38	14.1	53.1	289	82.7
94	36	38	14.5	51.7	319	91.0
95	36	38	13.5	52.6	277	79.2
96	36	38	14.6	53.1	309	88.4
97	36	40	15.0	52.7	307	87.7
98	36	37	13.6	53.3	300	85.6
99	36	38	14.1	53.3	285	81.4
100	36	39	14.3	53.1	294	84.1
101	36	40	14.4	52.7	307	87.8
102	36	38	13.1	53.5	297	84.9
103	36	39	14.5	53.1	311	88.7
104	36	38	13.5	53.4	300	85.6
105	36	38	13.7	53.5	289	82.4
106	36	38	13.2	53.1	292	83.5
107	36	38	15.9	1.9	253	72.3
108	36	42	17.3	18.6	290	82.8
109	36	41	15.2	55.9	281	80.3
110	36	39	14.4	57.7	267	76.3
111	36	39	14.1	60.4	298	85.2
112	36	40	15.0	55.7	306	87.5
113	36	39	14.8	55.5	299	85.4
114	36	40	15.0	55.4	303	86.6

115	36	40	14.2	55.4	301	86.1
116	36	40	14.3	55.6	298	85.2
117	36	42	14.9	55.5	299	85.4
118	36	40	13.7	54.9	294	84.0
119	36	39	15.2	54.9	309	88.3
120	20	40	15.5	55.2	288	82.2
121	20	40	13.9	55.0	276	78.9
122	20	41	15.3	54.9	306	87.6
123	20	40	14.0	54.9	271	77.5
124	20	42	15.4	53.2	292	83.5
125	20	40	14.8	54.1	281	80.2
126	20	40	15.0	55.6	294	84.0
127	20	40	14.3	54.8	283	80.9
128	20	40	15.2	55.8	291	83.2
129	20	39	14.5	53.2	290	82.8
130	20	42	15.9	52.9	292	83.5
131	20	40	15.3	52.9	290	82.8
132	20	39	16.0	52.2	289	82.4
133	20	40	16.1	50.9	293	83.7
134	20	40	16.9	50.7	277	79.1
135	20	40	17.2	61.0	266	76.1
136	20	38	17.0	60.7	294	84.0
137	20	39	15.5	59.0	291	83.0
138	20	40	16.7	52.5	295	84.3
139	20	42	15.9	52.7	290	82.8
140	10	41	16.6	52.0	309	88.1
141	10	39	15.4	51.7	301	86.1
142	10	39	17.1	51.3	299	85.4
143	10	41	16.7	52.0	317	90.5
144	10	41	16.9	51.4	311	88.8
145	10	40	16.3	51.2	303	86.6
146	10	40	15.7	52.3	298	85.0
147	10	41	16.0	50.5	311	89.0
148	10	40	16.3	51.1	321	91.8
149	10	41	16.4	51.6	339	96.9
	Average	40	15.8	53.6	295	84.4
	Std Dev	1	0.9	2.7	15	4.3
	Maximum	42	17.2	61.0	339	96.9
	Minimum	38	13.9	50.5	266	76.1

N-value: 30

Sample Interval Time: 326.20 seconds.

Summary of SPT Test Results

Project: PH-1, Test Date: 11/13/2020

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. Length ft	Blows Applied /6"	**N Value**	**N60 Value**	Average FMX kips	Average VMX ft/s	Average BPM bpm	Average EFV ft-lb	Average ETR %
7.20	**10-10-6**	**16**	**21**	39	15.0	46.2	264	75.4
9.20	**5-5-0**	**5**	**6**	41	16.0	60.2	285	81.5
9.20	**11-16-36**	**52**	**70**	38	14.5	54.0	287	82.0
9.20	**36-20-10**	**30**	**40**	40	15.8	53.6	295	84.4
			Overall Average Values:	39	15.0	53.0	286	81.7
			Standard Deviation:	2	1.3	11.7	29	8.3
			Overall Maximum Value:	42	17.4	69.5	339	96.9
			Overall Minimum Value:	32	12.0	1.9	169	48.3

November 17, 2020

Gregg Drilling In-house
Attn: Brian Savela

Re: Standard Penetration Energy Measurements
Automatic Hammer on Mud Rotary Drill Rig, D-43
Gregg Drilling yard, Signal Hill, CA

Dear Mr. Savela,

This report offers results of energy measurements and related calculations made on November 12, 2020 during Standard Penetration Testing (SPT) and Modified California sampling on Gregg Drilling's mud rotary drill rig. Dynamic tests were performed on an instrumented section of NWJ drill rod attached to the sampler rod string. All dynamic measurements were obtained and recorded using a SPT Analyzer®.

Average Energy: 81%
Sample Depths tested (in feet): 0, 1.5, 3, 4.5, 6, 7.5, 9, 10.5

***Note:** If the SPT Analyzer did not measure all blows for a sample depth, the reported blow count and therefore calculated N60 value in the following tables will be incorrect. Often blows are excluded from calculations if the sensors are loose or have drifted from the baseline. Field records of actual blow count values should be used in place of the blow counts shown in the following tables.

Equipment:

SPT energy measurements were made on SPT samplers driven by the hammer/anvil system on the Gregg Drilling drill rig on November 12, 2020. The rig was tested Gregg Drilling yard in Signal Hill, CA. In total, 8 energy measurements were collected corresponding to 8 different samples at increasing depth.

Gregg used a SPT Analyzer (SPTA) to acquire and process measurements of force and velocity with every impact of the automatic hammer on the sample rods. Gregg follows the procedure outlined in ASTM D4633. Two strain gauges mounted on a two foot section of NWJ rod measured force, while two piezoresistive accelerometers bolted on the same rod measured acceleration. The gauges were mounted approximately 6" from the top of the rod.
Analog signals from the gauges and accelerometers were collected, digitized, displayed in real-time, and stored by the SPTA. Selected output from the SPTA for each recorded impact of the hammer included:

- Maximum force in the rod (FMX)
- Maximum velocity in the rod (VMX)
- Maximum calculated transferred energy (EFV)
- Blows per minute (BPM)
- Energy transferred to the rods (ETR)

Data and Calculations:

The purpose of testing was to measure the energy transferred from the hammer to the drill rod and to calculate the energy efficiency of the hammer. The SPTA measurements of force and velocity were reviewed after field testing and analyzed to calculate the transferred energy (EFV).

The maximum energy transferred past the gauge location, EFV, is computed by the SPTA using force (F) and velocity (V) records as follows:

$$EMX = \int_a^b F(t)\, V(t)\, dt$$

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www.greggdrilling.com

The time “a” corresponds to the start of the record when the energy transfer begins and “b” is the time at which energy transferred to the rod reaches a maximum value. The energy transferred is defined as ETR, and is usually used to define the efficiency of the hammer/anvil system.

Results:

Tables for each sample depth summarize the average calculated energies for each sample tested as well as the details for each sample. It is shown that the overall average (ETR) energy for this system is 81%. The Summary of SPT Test Results table at the end provides a summary of all the samples tested at each sampling depth. The plots and tables present selected measured and calculated results as a function of blow number. The results include:

- the blow number
- BC (blow count in feet) *NOTE: This is calculated by dividing the number of blows for each 6” of penetration by the 6” depth interval and is therefore only approximate. If some blows were deleted due to erroneous or poor data, the penetration depths are not correct.
- FMX (maximum rod force)
- VMX (maximum rod velocity)
- BPM (blows per minute)
- EFV (energy using the Force Velocity method in ft-lbs)
- ETR (energy transferred as a percentage of maximum)

At the end of each table is a statistical evaluation of the results for each variable including the average, standard deviation, maximum, minimum and what blow number these maximums and minimums occurred.

If you have any questions or comments on this report, please do not hesitate to call or e-mail me: kcabal@greggdrilling.com.

Sincerely,

Kelly Cabal

Kelly Cabal
Data Management & Communications
Gregg Drilling, LLC

Appendix A

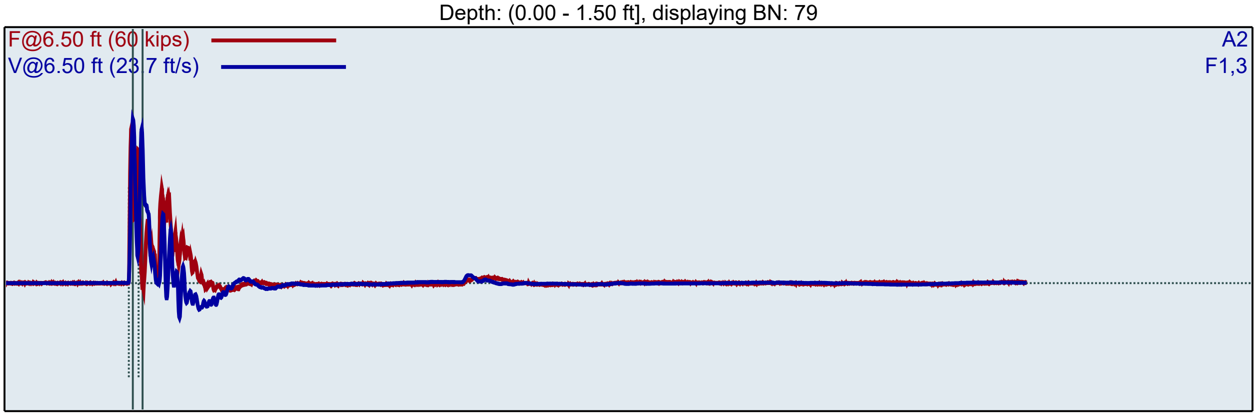
D-43
Wessam Zanaty
Signal Hill yard BH

0
Test date: 11/12/2020

AR: 1.42 in^2
LE: 6.50 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (0.00 - 1.50 ft], displaying BN: 79



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
2	14	37	14.9	16.2	260	74.3
3	14	35	15.2	34.2	269	76.7
4	14	29	14.5	34.0	200	57.0
5	14	35	14.6	34.3	261	74.6
6	14	34	14.5	34.0	256	73.0
7	14	36	14.7	36.4	263	75.0
8	14	36	14.8	38.2	262	74.9
9	14	37	14.9	38.7	269	76.7
10	14	37	14.7	38.4	271	77.5
11	14	37	14.5	20.2	267	76.3
12	14	37	14.7	38.8	266	76.1
13	14	37	14.8	38.6	271	77.6
14	14	37	14.4	38.5	277	79.1
15	24	37	14.5	38.7	267	76.4
16	24	37	14.5	38.5	269	76.8
17	24	36	14.5	38.5	269	76.8
18	24	37	14.8	38.5	273	78.0
19	24	37	14.6	38.8	291	83.2
20	24	36	14.5	38.7	276	79.0
21	24	39	15.2	38.2	288	82.2
22	24	36	14.7	38.4	283	81.0
23	24	36	14.5	38.9	274	78.3
24	24	35	14.7	38.4	272	77.7
25	24	37	14.8	38.6	274	78.4
26	24	36	14.5	38.6	267	76.2
27	24	37	14.6	38.6	274	78.4
28	24	37	14.8	38.4	273	78.0
29	24	37	15.3	38.7	274	78.3

30	24	36	14.6	38.5	261	74.7
31	24	37	14.6	38.4	285	81.3
32	24	36	14.8	38.8	285	81.5
33	24	37	14.9	38.3	290	82.8
34	24	37	14.8	41.3	292	83.5
35	24	37	14.9	41.4	285	81.5
36	24	36	14.7	41.2	291	83.2
37	24	37	14.9	41.1	290	83.0
38	24	37	14.8	40.9	295	84.2
39	43	36	14.8	41.4	283	80.7
40	43	37	14.9	41.2	284	81.2
41	43	36	14.9	40.9	291	83.0
42	43	37	14.8	41.5	286	81.7
43	43	37	14.8	41.3	282	80.7
44	43	37	14.9	40.6	286	81.8
45	43	36	14.6	41.7	281	80.4
46	43	37	14.8	40.8	288	82.3
47	43	36	14.8	41.5	285	81.4
48	43	37	15.0	40.6	288	82.2
49	43	37	14.8	41.7	282	80.5
50	43	37	14.7	41.0	284	81.0
51	43	36	14.7	41.4	284	81.0
52	43	37	14.8	41.0	284	81.1
53	43	36	14.6	41.2	285	81.5
54	43	37	14.7	40.9	283	80.9
55	43	36	14.7	41.5	285	81.4
56	43	37	14.7	41.0	283	80.8
57	43	36	14.8	41.2	286	81.7
58	43	37	15.1	40.7	287	81.9
59	43	37	14.7	41.5	282	80.6
60	43	36	14.8	40.8	283	80.9
61	43	37	14.7	41.2	283	80.7
62	43	37	14.8	40.9	284	81.3
63	43	36	14.9	41.4	283	80.9
64	43	37	14.9	40.8	282	80.6
65	43	37	14.8	41.3	284	81.1
66	43	37	14.7	41.1	283	80.7
67	43	37	14.8	41.1	281	80.4
68	43	36	15.0	41.2	280	80.1
69	43	36	14.7	41.0	280	80.0
70	43	36	14.9	41.2	283	80.7
71	43	36	14.6	41.2	279	79.8
72	43	36	15.0	40.9	286	81.7
73	43	36	14.6	41.3	281	80.4
74	43	37	14.9	40.4	286	81.8
75	43	35	15.0	41.5	283	80.8
76	43	37	15.1	40.8	285	81.5
77	43	36	14.8	41.3	288	82.1
78	43	36	14.9	40.9	288	82.4
79	43	36	15.2	41.2	290	82.7
80	43	37	14.9	41.1	291	83.1
81	43	39	15.4	42.6	309	88.2
	Average	37	14.8	40.4	283	80.8
	Std Dev	1	0.2	1.2	7	2.1
	Maximum	39	15.4	42.6	309	88.2
	Minimum	35	14.5	38.2	261	74.7

N-value: 67

Sample Interval Time: 120.54 seconds.

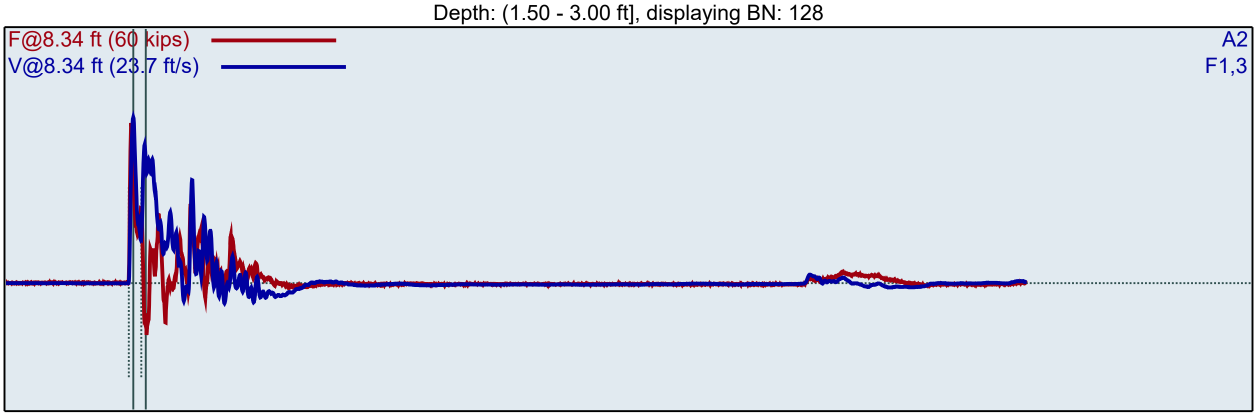
D-43
Wessam Zanaty
Signal Hill yard BH

0
Test date: 11/12/2020

AR: 1.42 in^2
LE: 8.34 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (1.50 - 3.00 ft], displaying BN: 128



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
82	13	37	15.7	1.9	268	76.7
83	13	36	15.0	19.7	271	77.4
84	13	37	16.1	35.5	282	80.5
85	13	40	16.0	39.3	286	81.8
86	13	39	15.7	40.4	284	81.1
87	13	39	16.4	40.0	289	82.6
89	13	39	16.9	37.8	302	86.4
90	13	36	15.4	40.8	278	79.5
91	13	38	17.0	40.6	273	78.0
92	13	37	15.3	40.3	289	82.6
93	13	39	15.9	40.6	286	81.6
94	13	37	15.3	40.4	281	80.2
95	18	38	15.6	40.1	280	80.0
96	18	39	15.6	40.8	279	79.6
97	18	38	15.7	40.5	287	82.0
98	18	39	15.7	40.5	290	82.7
99	18	37	15.2	40.5	286	81.7
100	18	39	15.8	40.2	291	83.1
101	18	39	15.9	40.6	292	83.4
102	18	38	15.3	40.5	289	82.6
103	18	37	15.4	40.5	286	81.7
104	18	38	16.3	40.5	296	84.6
105	18	38	15.2	40.5	283	80.9
106	18	37	15.4	40.3	288	82.2
107	18	38	15.8	40.5	285	81.4
108	18	37	15.2	40.4	289	82.4
109	18	38	15.1	40.0	291	83.2
110	18	37	15.3	40.7	289	82.6
111	18	40	16.0	40.1	303	86.5
112	18	38	15.5	43.7	293	83.7
113	18	40	16.3	43.7	302	86.3

114	18	39	16.0	43.8	302	86.1
115	18	39	15.7	43.6	280	80.1
116	18	39	15.7	43.9	288	82.3
117	18	40	16.5	43.6	298	85.0
118	18	38	15.4	44.0	289	82.6
119	18	40	16.3	43.1	297	84.9
120	18	38	15.7	44.2	293	83.6
121	18	39	16.7	43.5	293	83.7
122	18	39	15.8	43.8	299	85.4
123	18	38	15.5	43.6	299	85.3
124	18	38	15.6	43.9	291	83.1
125	18	38	15.6	43.4	288	82.3
126	18	39	15.7	43.7	289	82.5
127	18	39	16.4	43.9	291	83.3
128	18	38	15.3	43.3	287	82.1
129	18	40	16.1	44.0	289	82.5
130	18	38	15.3	43.9	274	78.3
	Average	38	15.7	42.2	290	82.9
	Std Dev	1	0.4	1.7	6	1.8
	Maximum	40	16.7	44.2	303	86.5
	Minimum	37	15.1	40.0	274	78.3

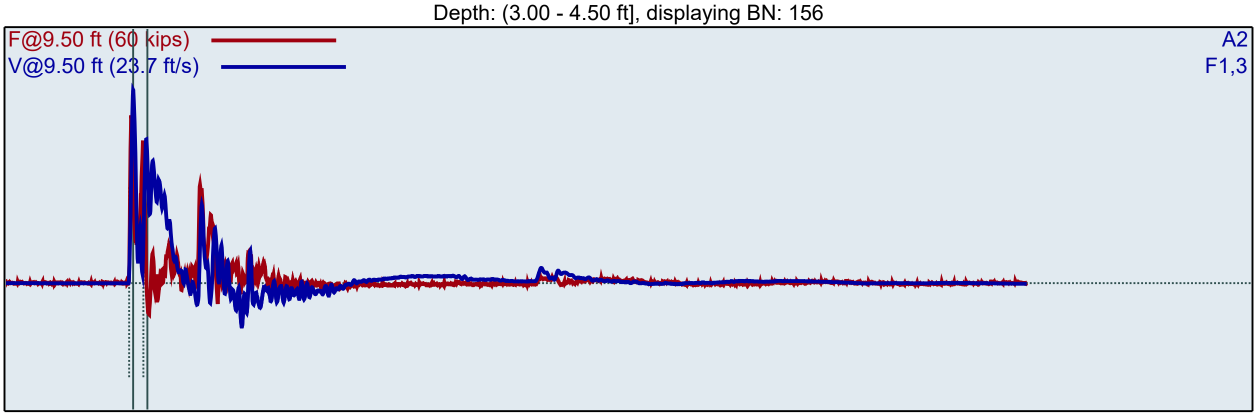
N-value: 36

Sample Interval Time: 70.57 seconds.

D-43 0
Wessam Zanaty Test date: 11/12/2020
Signal Hill yard BH

AR: 1.42 in^2 SP: 0.492 k/ft3
LE: 9.50 ft EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (3.00 - 4.50 ft], displaying BN: 156



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
131	6	34	17.0	1.9	244	69.7
132	6	37	16.3	19.6	262	75.0
133	6	38	16.2	35.1	243	69.3
134	6	39	16.4	37.5	250	71.4
135	6	37	17.5	38.0	249	71.0
136	6	39	16.0	39.0	257	73.6
137	7	39	17.3	39.6	252	71.9
138	7	37	16.9	39.9	233	66.7
139	7	37	17.3	39.2	246	70.2
140	7	38	17.3	39.0	254	72.5
141	7	38	17.3	40.1	246	70.1
142	7	39	17.5	39.0	249	71.0
143	7	37	17.6	39.4	253	72.4
144	15	37	17.8	39.9	239	68.4
145	15	39	18.0	39.3	256	73.2
146	15	39	18.1	39.1	264	75.4
147	15	39	17.4	39.9	263	75.2
148	15	35	16.6	39.2	256	73.2
149	15	36	18.3	39.3	262	75.0
150	15	37	17.8	39.7	253	72.4
151	15	38	17.8	39.8	264	75.4
152	15	40	18.1	39.5	274	78.4
153	15	38	17.5	39.0	285	81.3
154	15	40	17.8	40.1	270	77.2
155	15	39	17.8	39.6	268	76.6
156	15	39	17.9	39.6	279	79.7
157	15	38	18.0	39.3	275	78.5
158	15	39	18.2	39.1	275	78.5

Average	38	17.7	39.5	260	74.2
Std Dev	1	0.4	0.3	13	3.7
Maximum	40	18.3	40.1	285	81.3
Minimum	35	16.6	39.0	233	66.7

N-value: 22

Sample Interval Time: 42.92 seconds.

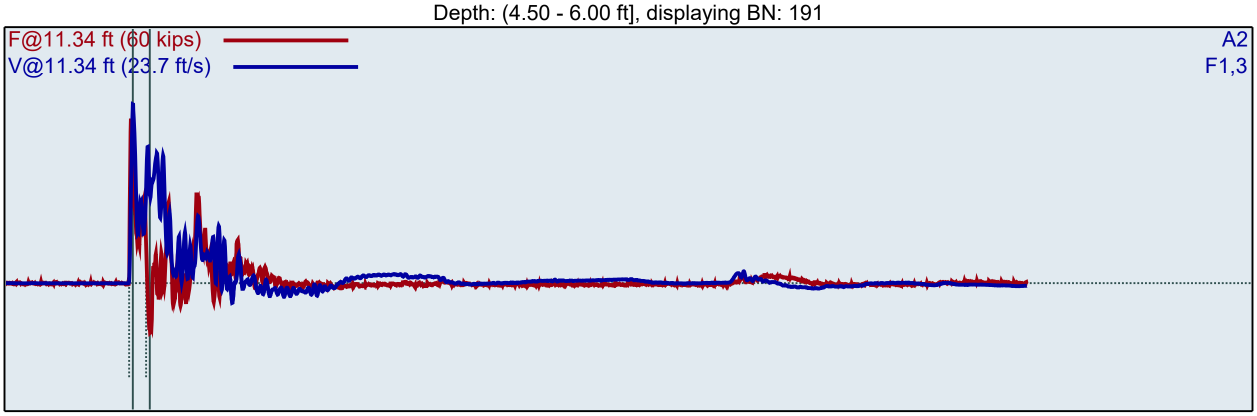
D-43
Wessam Zanaty
Signal Hill yard BH

0
Test date: 11/12/2020

AR: 1.42 in^2
LE: 11.34 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (4.50 - 6.00 ft], displaying BN: 191



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
159	10	42	20.6	1.9	269	76.9
160	10	33	16.1	21.4	240	68.6
161	10	33	15.9	41.5	252	72.0
162	10	34	15.4	42.1	262	74.7
163	10	35	15.2	43.7	268	76.6
164	10	34	15.3	45.4	262	74.9
165	10	36	16.3	45.1	281	80.4
166	10	37	16.0	46.3	290	82.9
167	10	39	16.7	45.4	299	85.4
168	10	34	15.2	45.5	296	84.6
169	11	34	15.3	46.0	285	81.5
170	11	36	15.6	45.8	278	79.4
171	11	41	16.5	45.8	296	84.5
172	11	39	16.2	45.9	293	83.6
173	11	38	16.1	45.4	296	84.5
174	11	38	16.2	45.6	287	82.0
175	11	35	16.1	46.1	280	80.0
176	11	41	16.6	45.8	313	89.6
177	11	36	16.1	45.3	291	83.0
178	11	39	16.7	46.1	303	86.6
179	11	38	16.6	45.4	300	85.8
180	14	38	15.4	46.0	290	82.8
181	14	36	16.0	45.6	288	82.2
182	14	40	16.4	45.6	300	85.8
183	14	36	15.9	45.9	295	84.2
184	14	39	16.6	45.1	297	84.9
185	14	36	16.5	46.0	293	83.7
186	14	38	16.4	45.3	303	86.7
187	14	39	17.5	46.2	307	87.8
188	14	36	16.4	45.9	285	81.5
189	14	37	17.0	45.6	302	86.2

190	14	38	16.1	45.9	293	83.8
191	14	39	16.6	45.8	299	85.5
192	14	37	16.3	45.6	304	86.8
193	14	37	16.2	46.1	289	82.7
	Average	38	16.3	45.8	295	84.2
	Std Dev	2	0.5	0.3	8	2.4
	Maximum	41	17.5	46.2	313	89.6
	Minimum	34	15.3	45.1	278	79.4

N-value: 25

Sample Interval Time: 46.44 seconds.

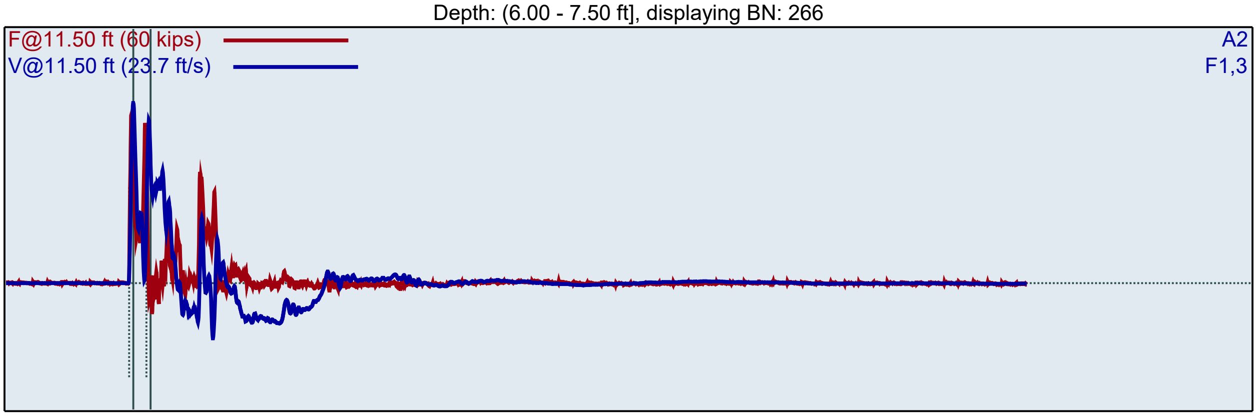
D-43
Wessam Zanaty
Signal Hill yard BH

0
Test date: 11/12/2020

AR: 1.42 in^2
LE: 11.50 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (6.00 - 7.50 ft], displaying BN: 266



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
194	6	37	17.8	1.9	281	80.4
195	6	35	16.7	25.2	273	78.1
196	6	36	17.4	48.1	278	79.5
197	6	38	17.7	48.4	273	78.0
198	6	37	17.4	48.7	261	74.6
199	6	37	16.9	48.4	271	77.4
200	22	38	16.4	48.3	286	81.8
201	22	38	15.9	48.4	288	82.2
202	22	39	16.2	48.6	285	81.3
203	22	38	15.6	48.5	286	81.7
204	22	41	16.3	47.9	291	83.3
205	22	39	15.8	48.2	306	87.3
206	22	39	15.6	48.8	287	82.1
207	22	38	15.9	48.4	295	84.2
208	22	38	15.7	48.5	299	85.6
209	22	40	15.6	48.2	298	85.2
210	22	38	15.5	48.6	301	86.0
211	22	40	16.0	48.2	306	87.5
212	22	38	15.9	47.9	304	86.8
213	22	39	15.8	48.2	309	88.2
214	22	38	15.7	48.8	305	87.2
215	22	41	16.2	48.1	312	89.1
216	22	38	15.9	49.1	297	84.9
217	22	41	16.5	47.8	309	88.4
218	22	40	15.9	48.8	298	85.1
219	22	38	15.8	48.7	304	86.9
220	22	40	15.7	48.9	304	86.8
221	22	39	16.0	48.5	306	87.6
222	46	41	16.4	48.3	299	85.4
223	46	38	16.1	48.1	301	85.9
224	46	40	16.0	48.8	297	84.9

225	46	37	16.0	48.4	297	84.7
226	46	40	16.1	48.9	292	83.4
227	46	37	16.0	48.5	301	86.0
228	46	38	16.0	50.1	299	85.6
229	46	37	15.9	52.0	301	86.0
230	46	39	16.5	51.1	303	86.6
231	46	38	16.1	52.6	296	84.5
232	46	38	16.3	50.9	306	87.5
233	46	39	16.3	51.8	299	85.4
234	46	38	16.3	51.7	303	86.7
235	46	38	16.1	51.4	302	86.4
236	46	39	16.4	51.7	297	84.7
237	46	38	16.1	51.7	300	85.7
238	46	39	16.4	51.7	296	84.5
239	46	38	16.7	51.3	297	84.8
240	46	38	16.6	51.5	291	83.1
241	46	39	16.6	51.7	294	84.1
242	46	41	16.8	51.2	299	85.5
243	46	40	16.8	52.0	294	83.9
244	46	38	16.6	51.2	289	82.7
245	46	42	16.9	51.9	298	85.3
246	46	41	16.8	51.7	296	84.6
247	46	40	16.8	51.2	296	84.6
248	46	41	16.6	51.5	296	84.5
249	46	40	17.0	51.9	294	84.1
250	46	42	17.1	51.3	294	83.9
251	46	40	16.7	51.7	295	84.2
252	46	40	17.1	51.3	302	86.3
253	46	41	16.9	51.7	299	85.6
254	46	40	16.2	51.5	298	85.2
255	46	40	16.6	51.6	296	84.6
256	46	40	16.4	51.4	298	85.1
257	46	41	16.5	51.3	305	87.0
258	46	41	16.5	51.7	298	85.1
259	46	40	16.6	51.3	297	84.8
260	46	41	16.5	51.3	303	86.5
261	46	40	16.5	51.9	297	85.0
262	46	41	16.8	51.6	305	87.2
263	46	39	16.1	51.5	284	81.2
264	46	42	16.9	51.0	297	84.8
265	46	41	16.5	51.5	301	86.0
266	46	40	16.7	51.4	295	84.4
267	46	41	16.4	51.9	293	83.7
268	46	36	19.4	1.9	250	71.5
	Average	39	16.3	49.6	297	85.0
	Std Dev	1	0.5	6.0	8	2.3
	Maximum	42	19.4	52.6	312	89.1
	Minimum	36	15.5	1.9	250	71.5

N-value: 69

Sample Interval Time: 323.29 seconds.

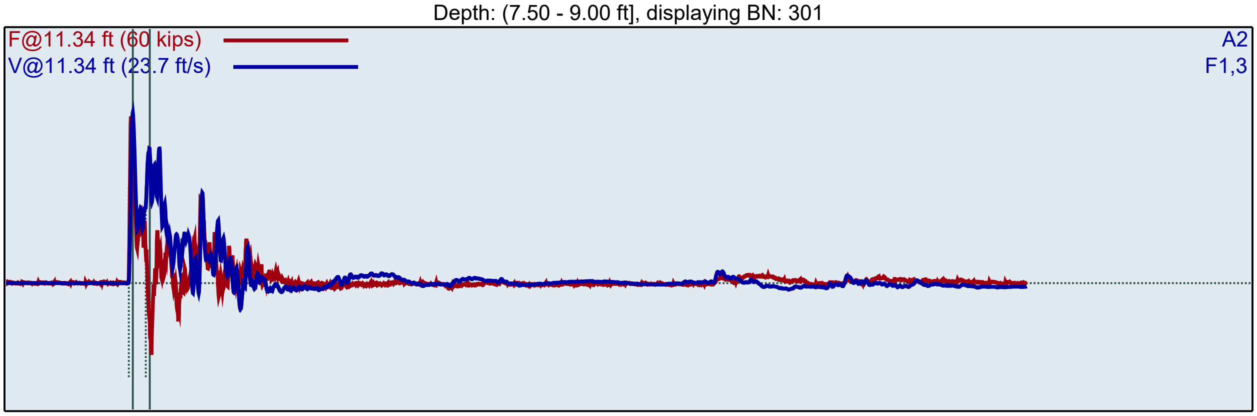
D-43
Wessam Zanaty
Signal Hill yard BH

0
Test date: 11/12/2020

AR: 1.42 in^2
LE: 11.34 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (7.50 - 9.00 ft], displaying BN: 301



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
269	9	36	16.9	19.8	249	71.2
270	9	39	16.7	37.7	259	74.1
271	9	36	17.1	38.4	278	79.4
272	9	40	17.1	41.5	277	79.0
273	9	36	16.4	41.7	272	77.8
274	9	40	16.6	41.8	274	78.2
275	9	40	16.6	41.6	287	81.9
276	9	37	15.8	42.0	269	77.0
277	9	39	15.9	41.9	273	78.1
278	11	39	16.7	41.6	287	82.1
279	11	39	15.9	41.3	276	79.0
280	11	39	16.5	41.9	288	82.3
281	11	38	15.7	15.9	286	81.6
282	11	36	16.7	42.9	280	80.0
283	11	39	15.6	40.6	283	80.8
284	11	38	16.3	42.1	284	81.1
285	11	40	15.8	41.9	280	79.9
286	11	36	15.1	41.9	275	78.7
287	11	40	16.2	41.5	287	82.0
288	11	39	15.3	41.5	280	79.9
289	14	38	15.0	42.1	274	78.3
290	14	37	14.5	41.8	266	76.0
291	14	34	14.0	41.9	258	73.9
292	14	37	14.9	41.2	282	80.5
293	14	37	14.5	41.6	267	76.3
294	14	38	14.7	41.7	282	80.7
295	14	40	15.1	41.8	286	81.9
296	14	37	14.5	42.0	280	80.1
297	14	38	14.9	41.6	283	80.9
298	14	38	15.1	41.6	288	82.4
299	14	39	15.3	41.7	291	83.3

300	14	38	15.5	41.7	295	84.3
301	14	39	15.8	41.9	298	85.0
302	14	39	16.5	41.3	281	80.2
303	14	39	16.7	1.9	241	68.9
	Average	38	15.5	39.2	280	80.0
	Std Dev	1	0.8	9.0	11	3.3
	Maximum	40	16.7	42.9	298	85.0
	Minimum	34	14.0	1.9	241	68.9

N-value: 26

Sample Interval Time: 536.39 seconds.

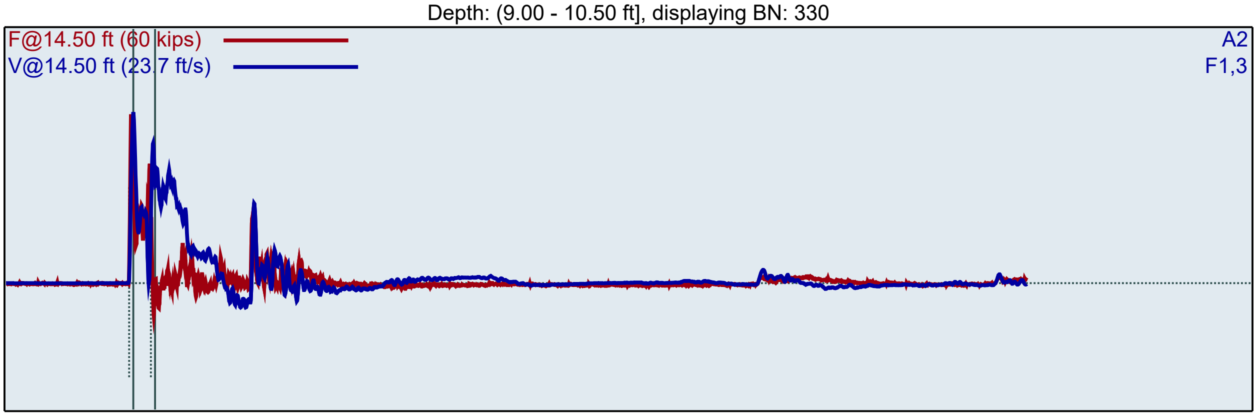
D-43
Wessam Zanaty
Signal Hill yard BH

0
Test date: 11/12/2020

AR: 1.42 in^2
LE: 14.50 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (9.00 - 10.50 ft], displaying BN: 330



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
305	6	38	16.9	17.4	243	69.5
306	6	35	15.5	41.4	263	75.1
307	6	35	16.0	42.4	285	81.3
308	6	38	16.8	41.8	283	80.9
309	6	35	15.6	42.6	272	77.6
310	9	39	16.9	42.0	277	79.2
311	9	40	16.9	41.5	278	79.5
312	9	40	15.7	42.0	270	77.3
313	9	41	16.5	42.2	272	77.6
314	9	38	16.1	42.0	269	76.9
315	9	38	15.6	42.2	275	78.5
316	9	38	15.2	41.8	268	76.6
317	9	39	15.6	42.2	270	77.2
318	9	38	15.7	41.8	266	75.9
319	13	38	16.0	42.2	251	71.7
320	13	38	15.2	42.2	266	75.9
321	13	40	15.1	41.9	271	77.4
322	13	44	16.8	41.7	280	80.1
323	13	36	15.0	42.6	268	76.5
324	13	38	15.3	42.3	265	75.7
325	13	40	15.2	41.5	270	77.1
326	13	39	16.0	41.7	267	76.3
327	13	39	16.5	42.4	260	74.4
328	13	39	15.2	41.8	278	79.3
329	13	41	14.8	42.0	268	76.6
330	13	40	15.8	41.7	266	76.1
331	13	38	15.3	42.6	257	73.5
332	13	41	17.3	1.9	236	67.4

Average	39	15.8	40.3	267	76.4
Std Dev	1	0.7	8.2	9	2.7
Maximum	44	17.3	42.6	280	80.1
Minimum	36	14.8	1.9	236	67.4

N-value: 23

Sample Interval Time: 282.25 seconds.

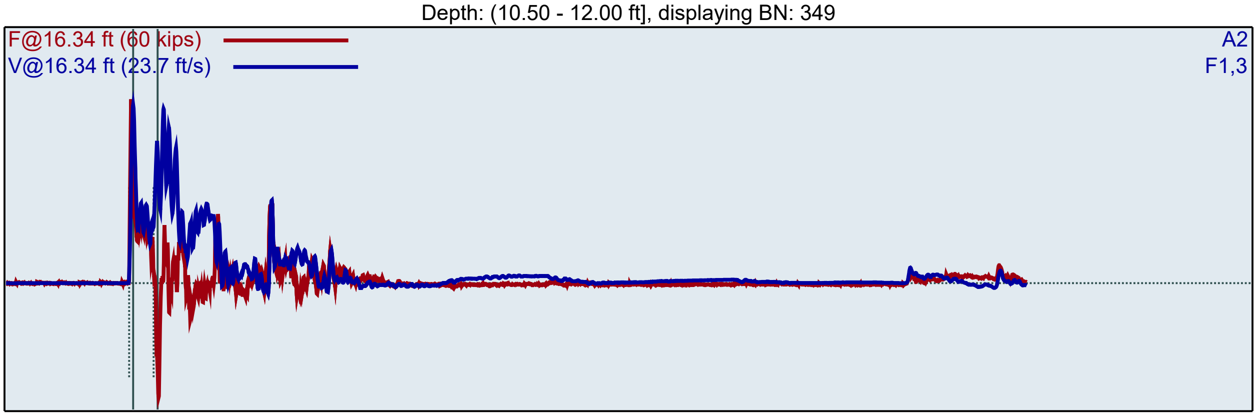
D-43
Wessam Zanaty
Signal Hill yard BH

0
Test date: 11/12/2020

AR: 1.42 in^2
LE: 16.34 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (10.50 - 12.00 ft], displaying BN: 349



F1 : [150NWJ1] 210.83 PDICAL (1) FF1
F3 : [150NWJ2] 212.78 PDICAL (1) FF1

A2 (PR): [K3719] 368 mv/6.4v/5000g (1) VF1

BL#	BC	FMX	VMX	BPM	EFV	ETR
	/6"	kips	ft/s	bpm	ft-lb	%
333	5	41	19.3	23.5	246	70.4
334	5	40	17.7	40.5	246	70.4
335	5	40	17.0	41.1	269	76.7
336	5	35	15.8	40.8	240	68.5
337	5	38	16.8	41.4	286	81.8
338	7	34	15.6	41.2	238	67.9
339	7	36	16.6	40.9	262	74.8
340	7	36	15.8	40.7	258	73.8
341	7	35	15.8	41.2	260	74.2
342	7	38	16.5	41.3	265	75.6
343	7	38	17.1	40.5	274	78.4
344	7	35	15.5	41.4	273	78.0
345	7	35	15.8	40.4	276	78.7
346	7	36	16.0	41.3	284	81.0
347	7	32	14.6	40.6	287	82.1
348	7	34	14.9	40.9	263	75.3
349	7	43	16.5	40.9	292	83.3
350	7	35	15.3	41.2	270	77.3
351	7	39	15.6	41.2	283	81.0
	Average	36	15.8	41.0	270	77.3
	Std Dev	3	0.7	0.3	14	3.9
	Maximum	43	17.1	41.4	292	83.3
	Minimum	32	14.6	40.4	238	67.9

N-value: 14

Sample Interval Time: 26.36 seconds.

Summary of SPT Test Results

Project: D-43, Test Date: 11/12/2020

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. Length ft	Blows Applied /6"	**N Value**	**N60 Value**	Average FMX kips	Average VMX ft/s	Average BPM bpm	Average EFV ft-lb	Average ETR %
6.50	**14-24-43**	**67**	**90**	37	14.8	40.4	283	80.8
8.34	**13-18-18**	**36**	**48**	38	15.7	42.2	290	82.9
9.50	**6-7-15**	**22**	**29**	38	17.7	39.5	260	74.2
11.34	**10-11-14**	**25**	**33**	38	16.3	45.8	295	84.2
11.50	**6-22-46**	**68**	**92**	39	16.3	49.6	297	85.0
11.34	**9-11-14**	**25**	**33**	38	15.5	39.2	280	80.0
14.50	**6-9-13**	**22**	**29**	39	15.8	40.3	267	76.4
16.34	**5-7-7**	**14**	**18**	36	15.8	41.0	270	77.3
			Overall Average Values:	38	15.8	43.2	284	81.3
			Standard Deviation:	2	0.9	6.2	15	4.2
			Overall Maximum Value:	44	19.4	52.6	313	89.6
			Overall Minimum Value:	32	14.0	1.9	233	66.7

Appendix E

Geotechnical Laboratory Reports

2021

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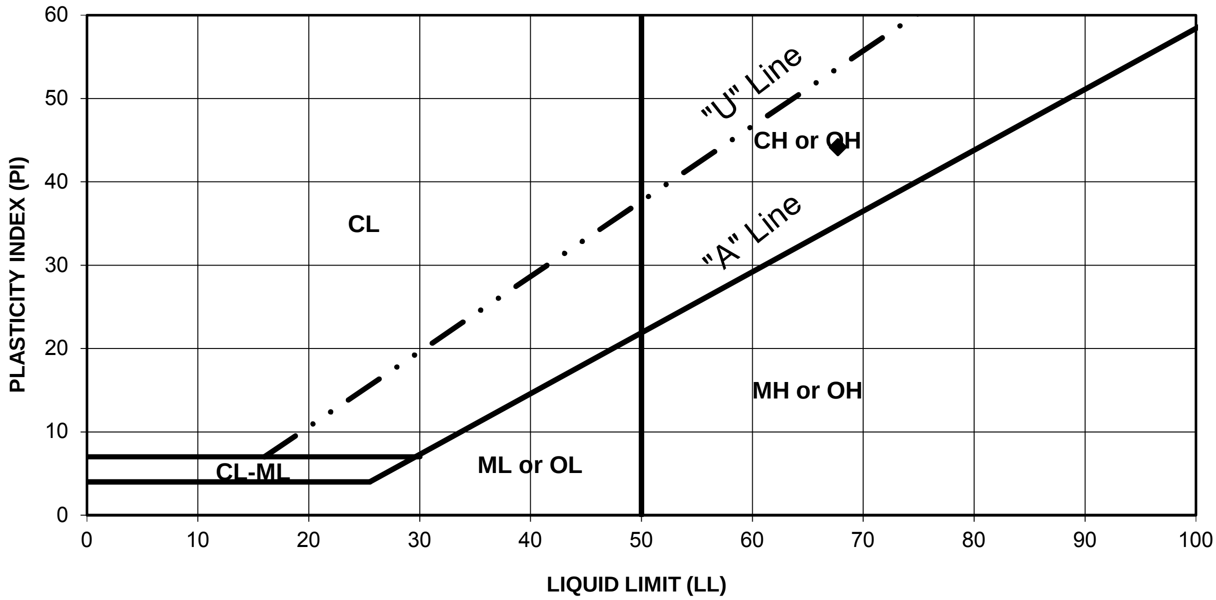
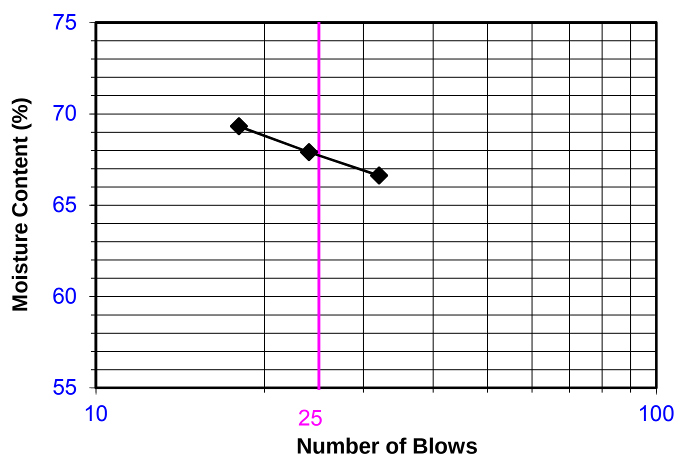
ATTERBERG LIMITS
ASTM D 4318

Client Name:	Arcadis	Tested By:	LS	Date:	01/26/22
Project Name:	SCE - TLRR	Computed By:	NR	Date:	01/31/22
Project No.:	30002905-01325.C	Checked By:	AP	Date:	01/31/22



PROCEDURE USED

- [ ] Wet Preparation
- [X] Dry Preparation
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
♦	1-002_7.0-7.65	-	7.0-7.65	68	24	44	CH

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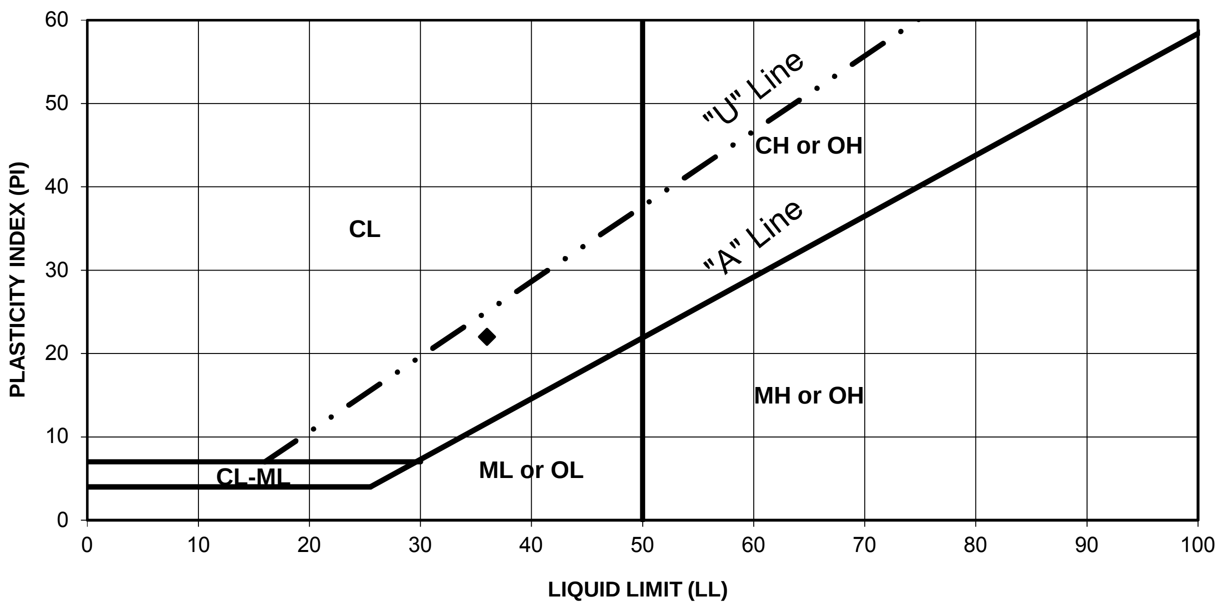
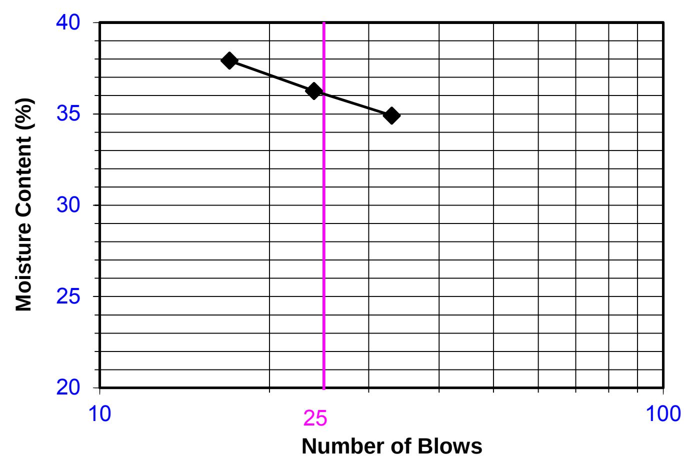
ATTERBERG LIMITS
ASTM D 4318

Client Name: Arcadis — Tested By: LS — Date: 01/26/22
Project Name: SCE - TLRR — Computed By: NR — Date: 01/31/22
Project No.: 30002905-01325.C — Checked By: AP — Date: 01/31/22



PROCEDURE USED

- [ ] Wet Preparation
- [x] Dry Preparation
- [x] Procedure A Multipoint Test
- [ ] Procedure B One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
♦	1-004_7.0-8.15	-	7.0-8.15	36	14	22	CL

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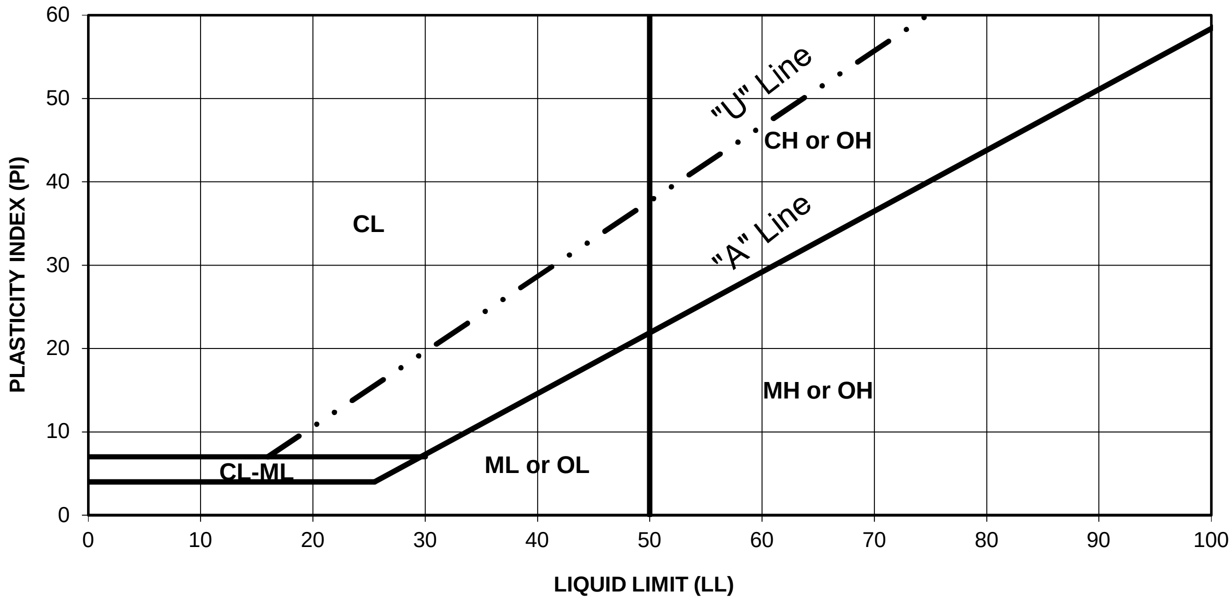
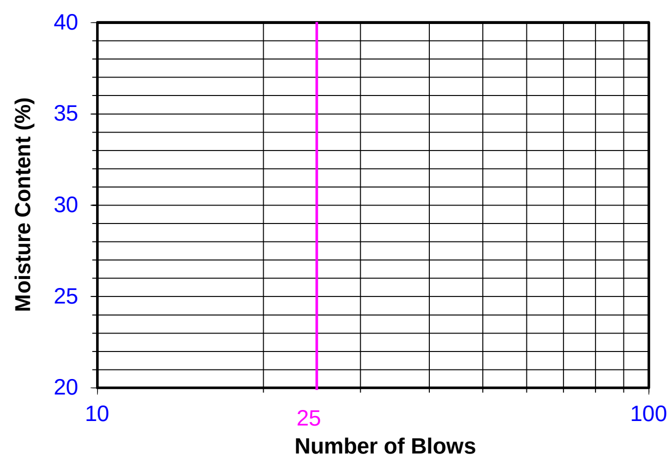
ATTERBERG LIMITS
ASTM D 4318

Client Name: Arcadis — Tested By: LS — Date: 01/26/22
Project Name: SCE - TLRR — Computed By: NR — Date: 01/31/22
Project No.: 30002905-01325.C — Checked By: AP — Date: 01/31/22



PROCEDURE USED

- [ ] Wet Preparation
- [X] Dry Preparation
- [X] Procedure A Multipoint Test
- [ ] Procedure B One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
	1-006a_25.0-26.5	-	25.0-26.5	NP	NP	NP	

* NP denotes "non-plastic"

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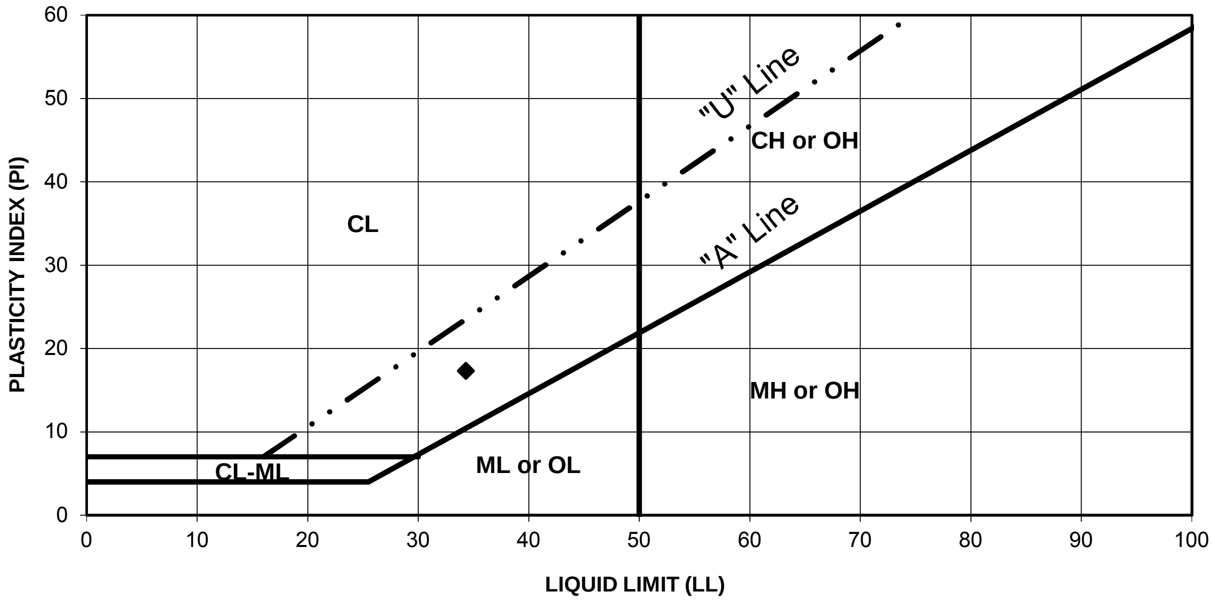
ATTERBERG LIMITS
ASTM D 4318

Client Name: Arcadis — Tested By: LS — Date: 01/26/22
Project Name: SCE - TLRR — Computed By: NR — Date: 01/31/22
Project No.: 30002905-01325.C — Checked By: AP — Date: 01/31/22



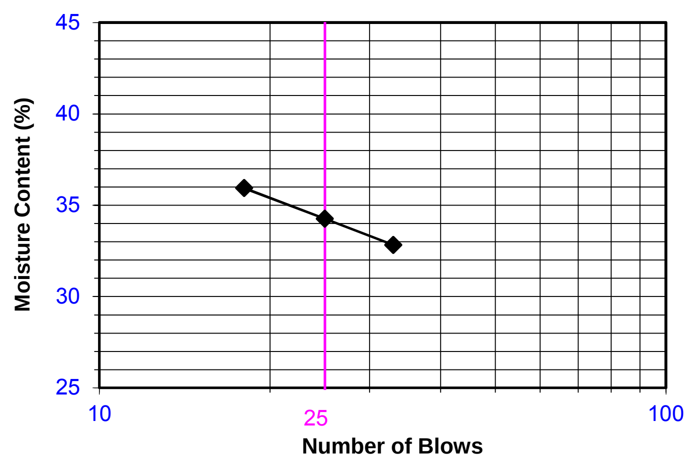
PROCEDURE USED

☐ Wet Preparation

☒ Dry Preparation

☒ Procedure A
Multipoint Test

☐ Procedure B
One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
♦	3-002_7.0-8.3	-	7.0-8.3	34	17	17	CL

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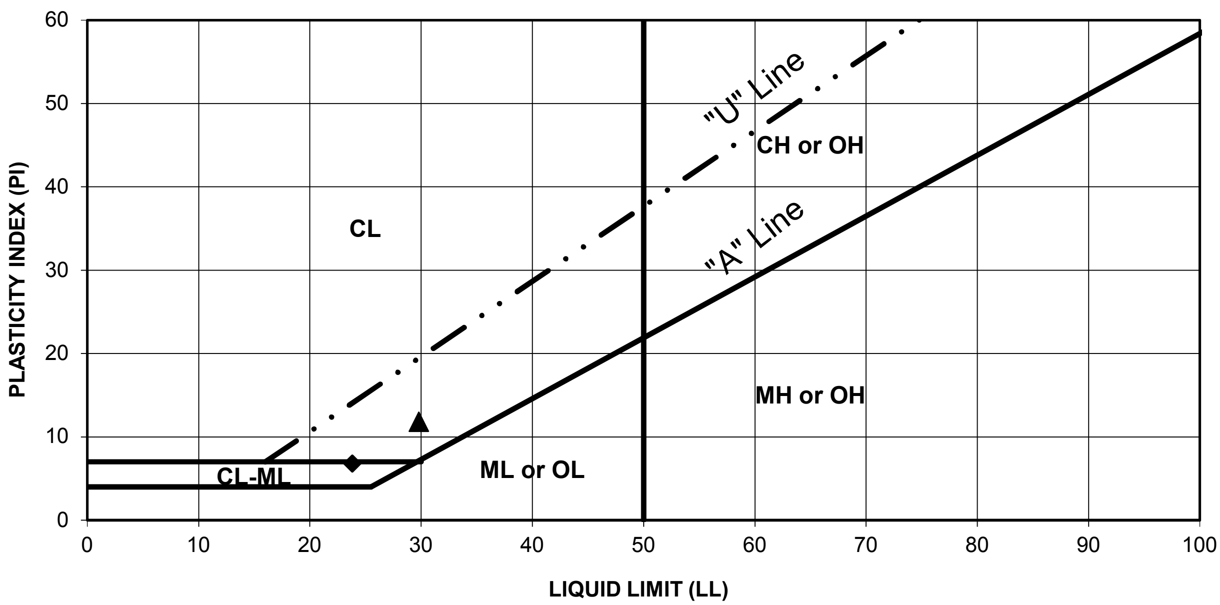
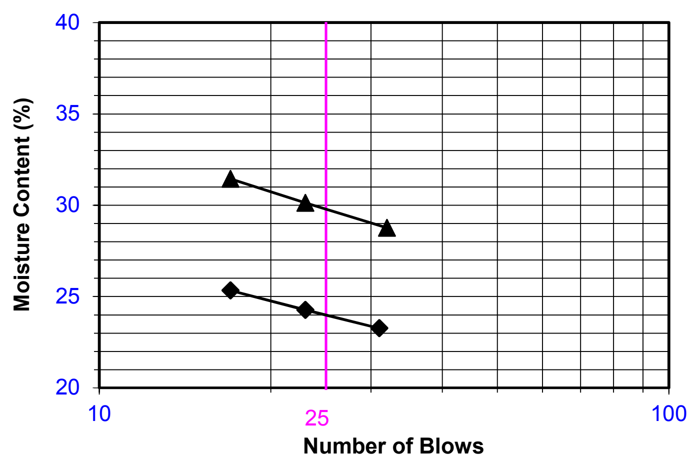
ATTERBERG LIMITS
ASTM D 4318

Client Name: Arcadis Tested By: LS Date: 01/26/22
Project Name: SCE - TLRR Computed By: NR Date: 01/31/22
Project No.: 30002905-01325.C Checked By: AP Date: 01/31/22



PROCEDURE USED

- [ ] Wet Preparation
- [x] Dry Preparation
- [x] Procedure A Multipoint Test
- [ ] Procedure B One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
♦	GT KERN-011_15.0-16.5	-	15.0-16.5	24	17	7	CL-ML
▲	GT KERN-011_26.1-26.5	-	26.1-26.5	30	18	12	CL

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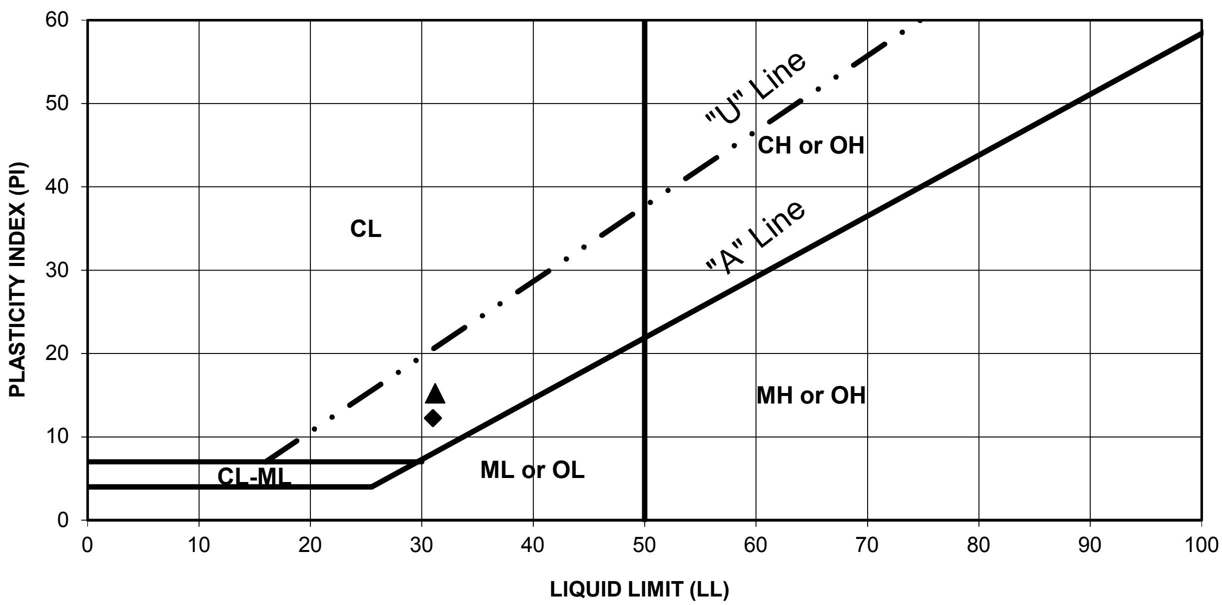
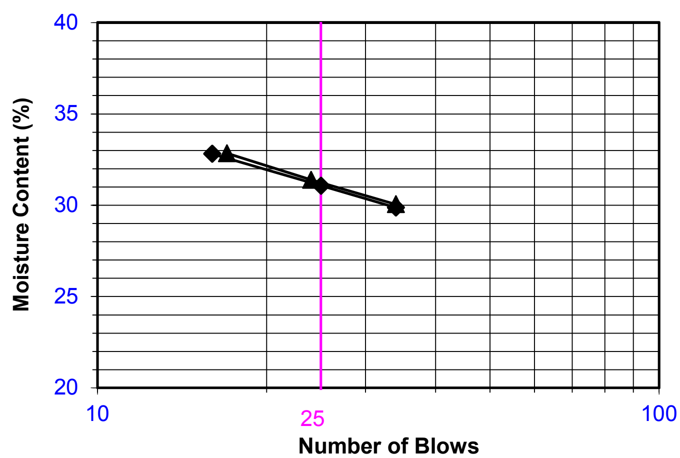
ATTERBERG LIMITS
ASTM D 4318

Client Name: Arcadis — Tested By: LS — Date: 01/07/22
Project Name: SCE - TLRR — Computed By: NR — Date: 01/10/22
Project No.: 30002905-01325.C — Checked By: AP — Date: 01/31/22



PROCEDURE USED

- [ ] Wet Preparation
- [X] Dry Preparation
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
♦	GT KERN-012_20.0-21.5	-	20.0-21.5	31	19	12	CL
▲	GT KERN-012_35.0-36.5	-	35.0-36.5	31	16	15	CL

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PERCENT PASSING NO. 200 SIEVE

ASTM D1140

Client: Arcadis

AP Lab No.: 21-1215

Project Name: SCE - TLRR

Test Date: 01/03/22

Project Number: 30002905-01325.C

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
1-002_20.0-20.75	-	20.0-20.75	82.7

PERCENT PASSING NO. 200 SIEVE

ASTM D1140

Client: Arcadis
AP Lab No.: 21-1215
Project Name: SCE - TLRR
Test Date: 01/03/22
Project Number: 30002905-01325.C

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
1-004_10.0-11.15	-	10.0-11.15	41.7

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PERCENT PASSING NO. 200 SIEVE

ASTM D1140

Client:	Arcadis	AP Lab No.:	21-1215
Project Name:	SCE - TLRR	Test Date:	01/25/22
Project Number:	30002905-01325.C		

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
1-006a_25.0-26.5	-	25.0-26.5	7.2

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PERCENT PASSING NO. 200 SIEVE

ASTM D1140

Client: Arcadis
AP Lab No.: 21-1215
Project Name: SCE - TLRR
Test Date: 01/03/22
Project Number: 30002905-01325.C

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
3-005_20.0-20.6	-	20.0-20.6	19.4

PERCENT PASSING NO. 200 SIEVE

ASTM D1140

Client: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Test Date: 12/10/21

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
5-005_4.5-5.0	-	4.5-5.0	16.5

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PERCENT PASSING NO. 200 SIEVE
ASTM D1140

Client:	Arcadis	AP Lab No.:	21-1215
Project Name:	SCE - TLRR	Test Date:	01/03/22
Project Number:	30002905-01325.C		

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
GT KERN-011_26.1-26.5	-	26.1-26.5	51.7
GT KERN-011_30.0-31.5	-	30.0-31.5	17.7

PERCENT PASSING NO. 200 SIEVE

ASTM D1140

Client: Arcadis
AP Lab No.: 21-1215
Project Name: SCE - TLRR
Test Date: 01/03/22
Project Number: 30002905-01325.C

Boring No.	Sample No.	Depth (ft)	Percent Fines (%)
GT KERN-012_35.0-36.5	-	35.0-36.5	67.6

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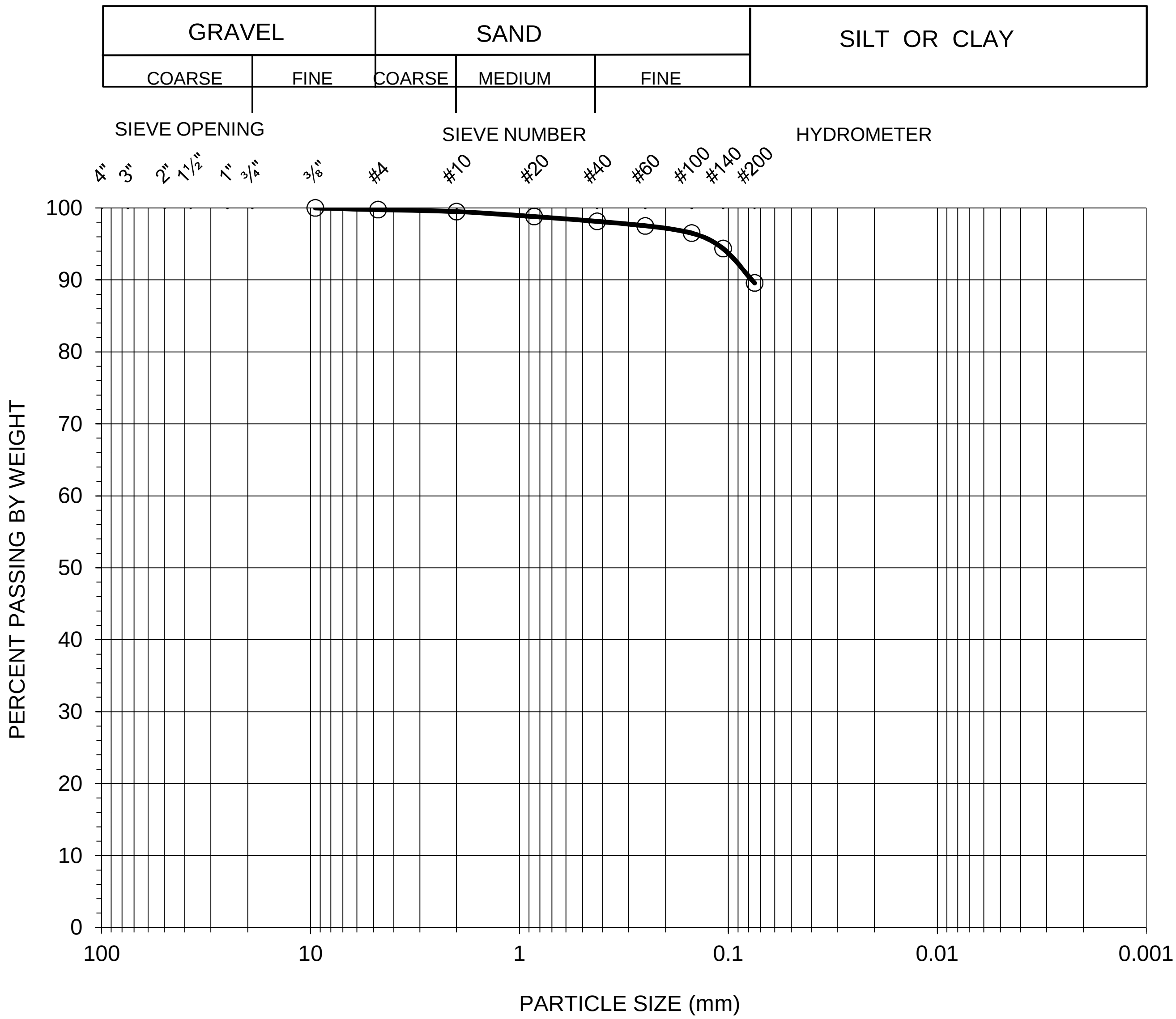
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/31/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	1-002_7.0-7.65	-	7.0-7.65	0	10	90	68:24:44	CH

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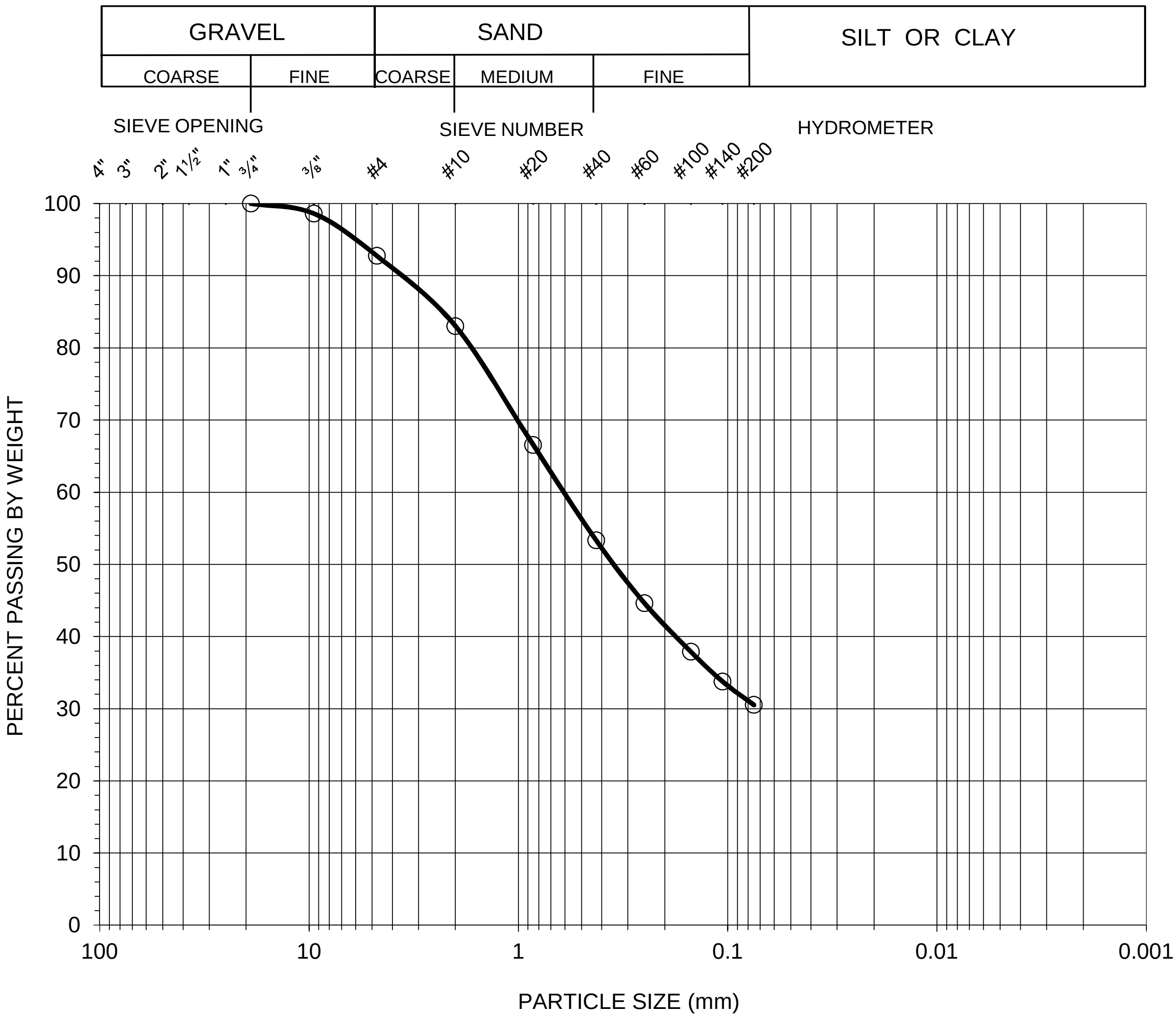
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/31/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	1-004_7.0-8.15	-	7.0-8.15	7	62	31	36:14:22	SC

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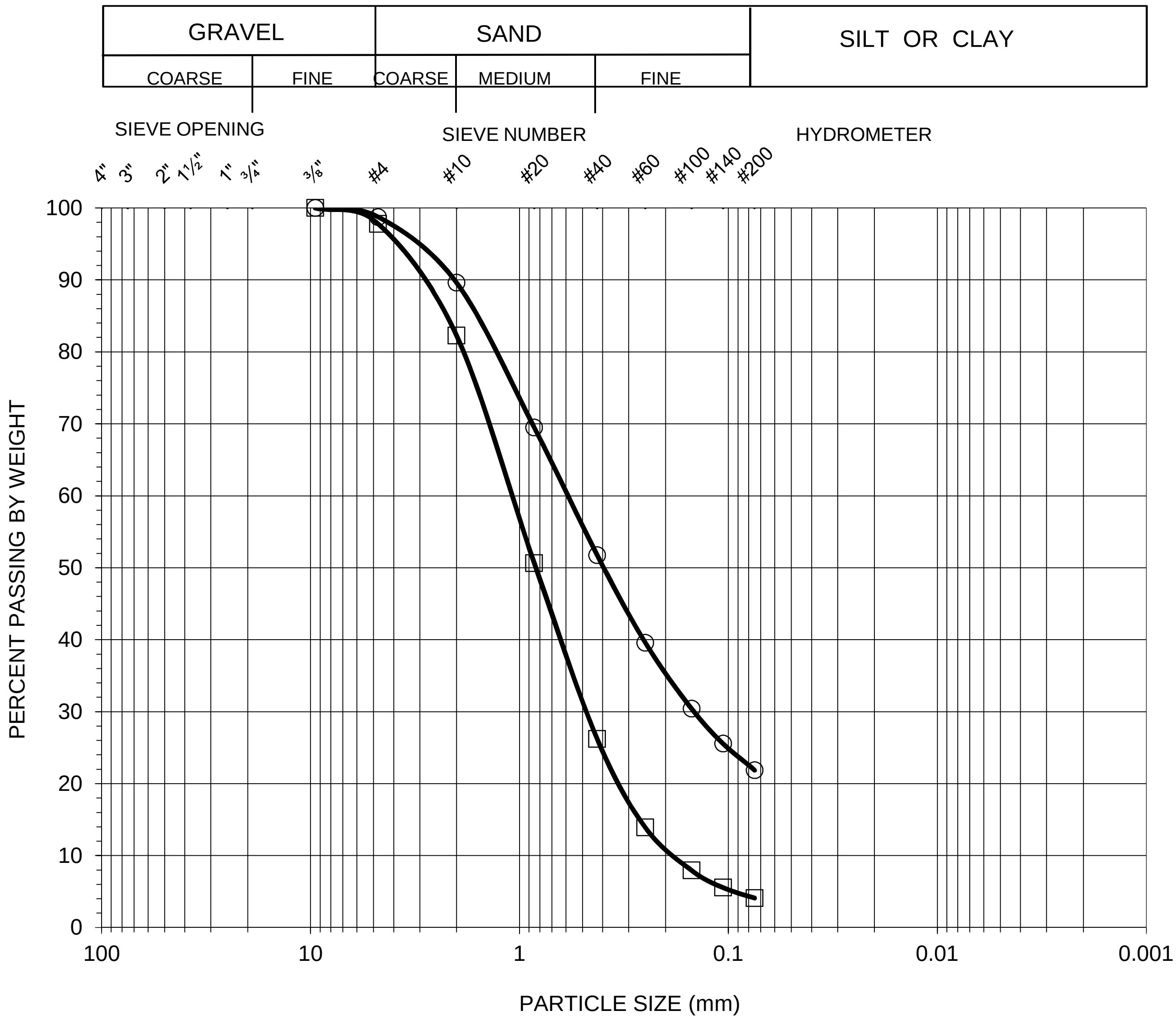
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	1-005_4.5-5.0	-	4.5-5.0	1	77	22	N/A	SC*
□	1-005_10.0-11.25	-	10.0-11.25	2	94	4	N/A	SW

**Note: Based on visual classification of sample*

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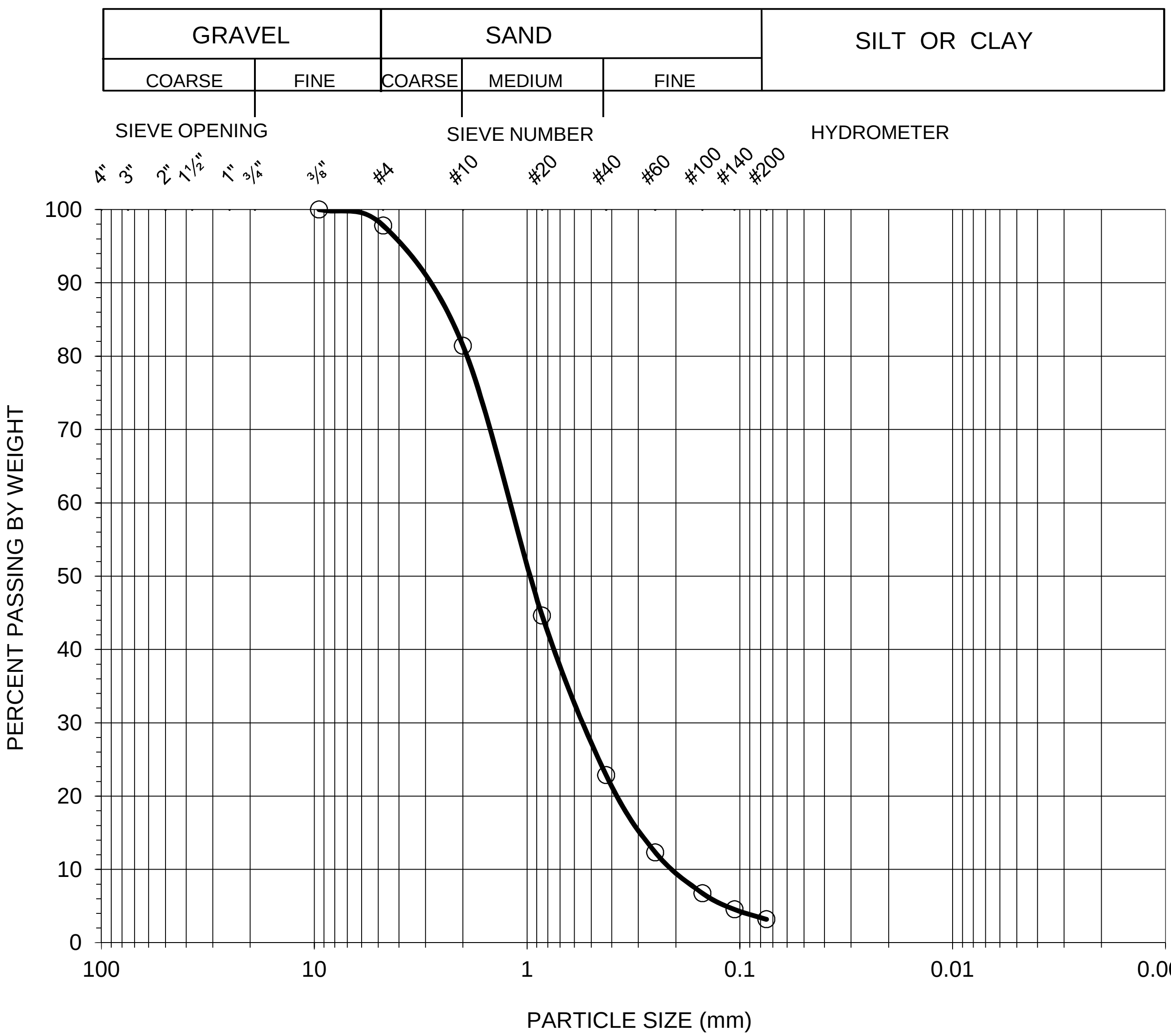
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by: DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by: NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by: AP	Date:	01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	1-006a_7.0-8.0	-	7.0-8.0	2	95	3	N/A	SW

**Note: Based on visual classification of sample*

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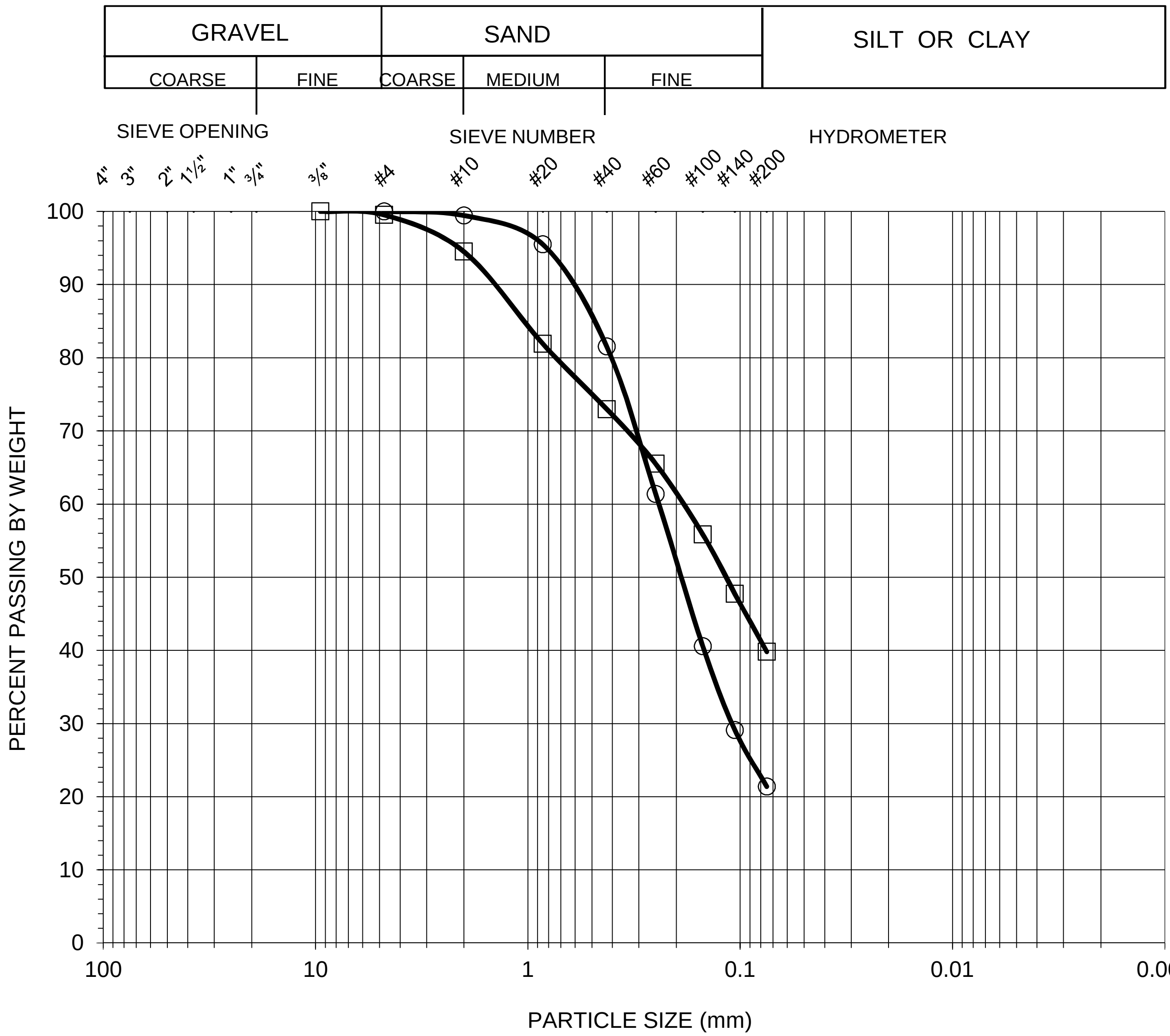
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	1-008_4.5-5.0	-	4.5-5.0	0	79	21	N/A	SM
□	1-008_10.0-11.5	-	10.0-11.5	0	60	40	N/A	SC*

**Note: Based on visual classification of sample*

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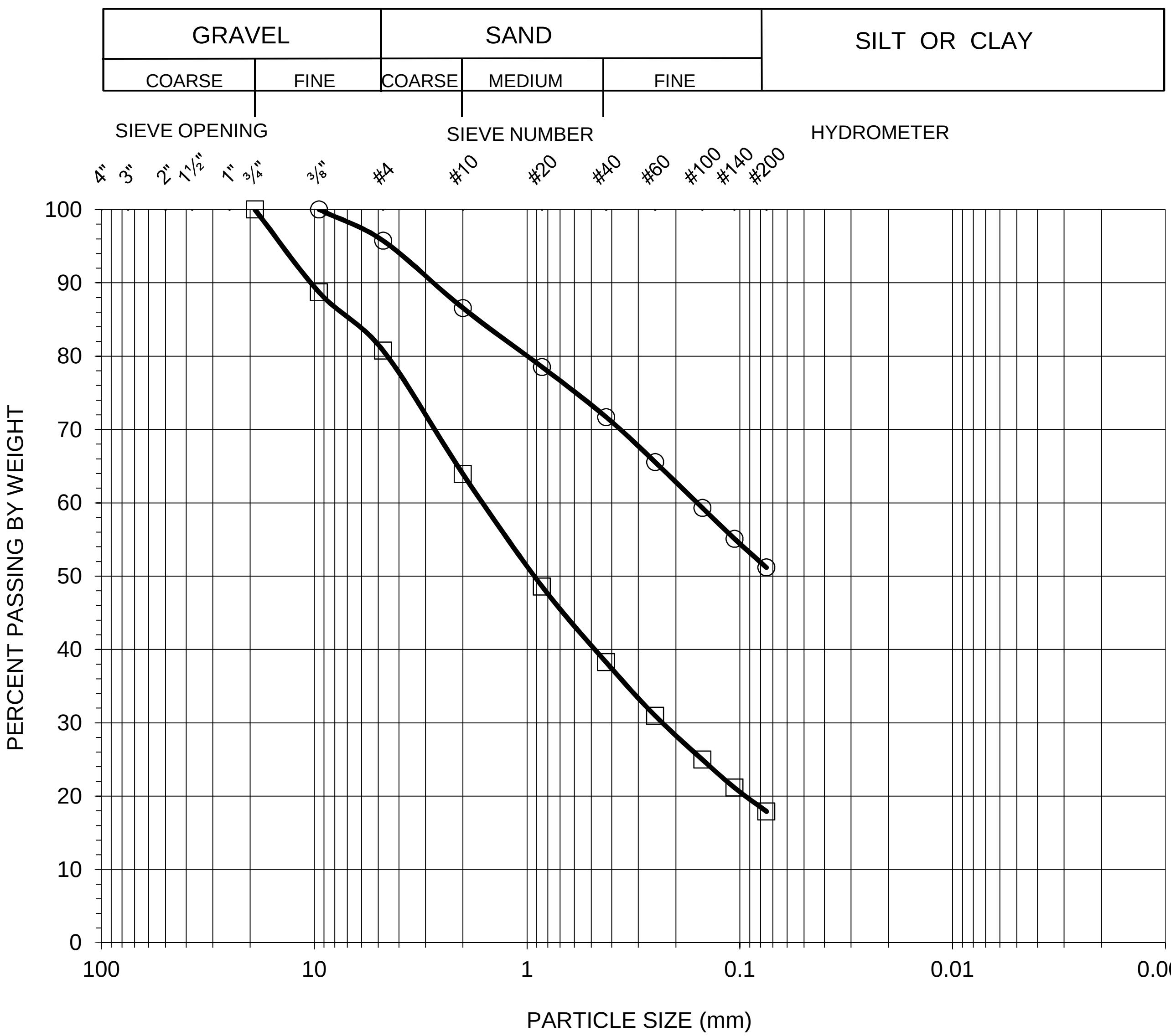
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/31/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	3-002_7.0-8.3	-	7.0-8.3	4	45	51	34:17:17	CL
□	3-002_20.0-21.5	-	20.0-21.5	19	63	18	N/A	SM

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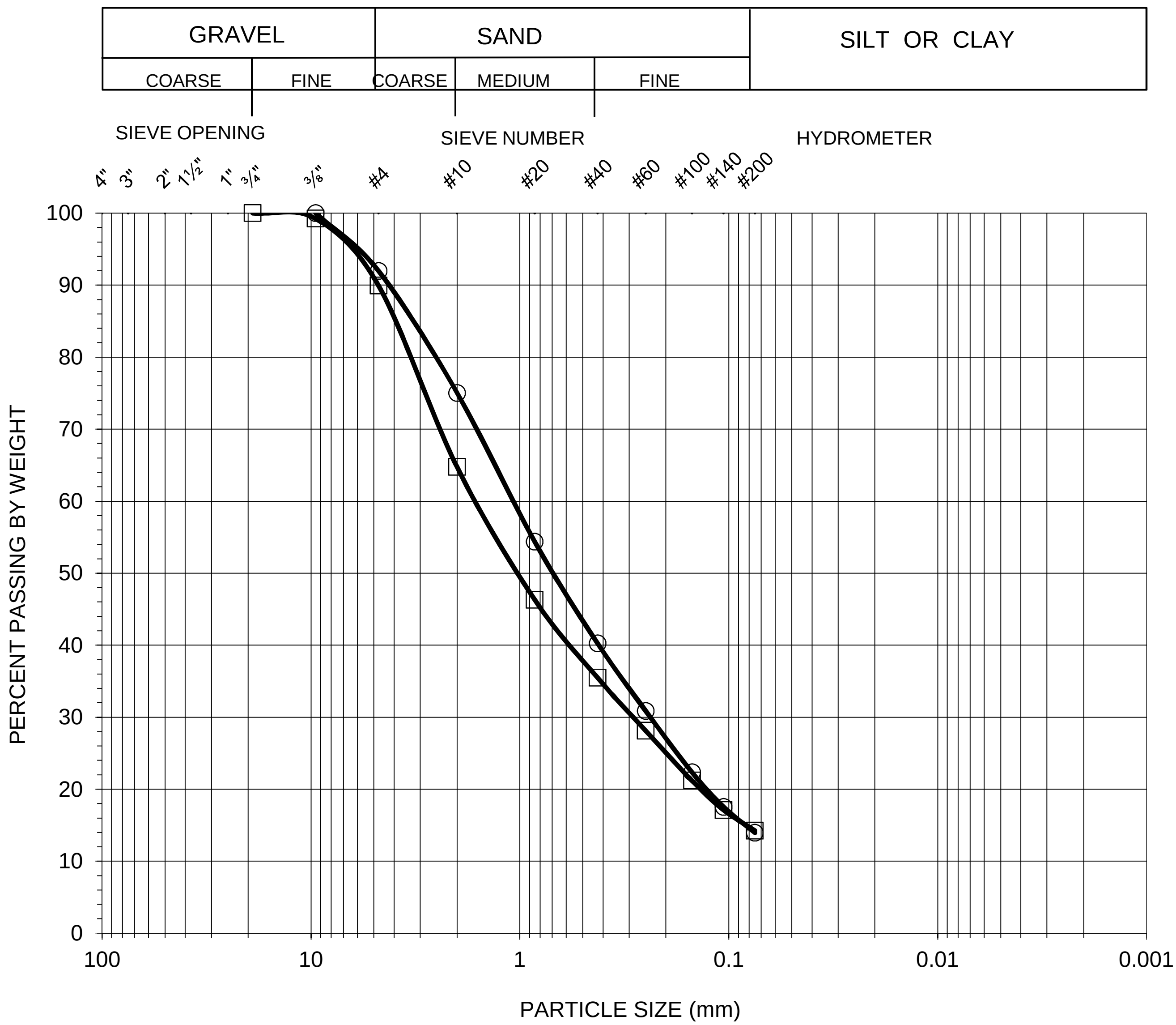
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	JT	Date:	12/14/21
Project Name:	SCE - TLRR	Computed by:	JP	Date:	12/16/21
Project No.:	30002905-01325.C	Checked by:	AP	Date:	12/16/21



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	3-004_7.0-7.9	-	7.0-7.9	8	78	14	N/A	SM
□	3-004_10.0-10.75	-	10.0-10.75	10	76	14	N/A	SM

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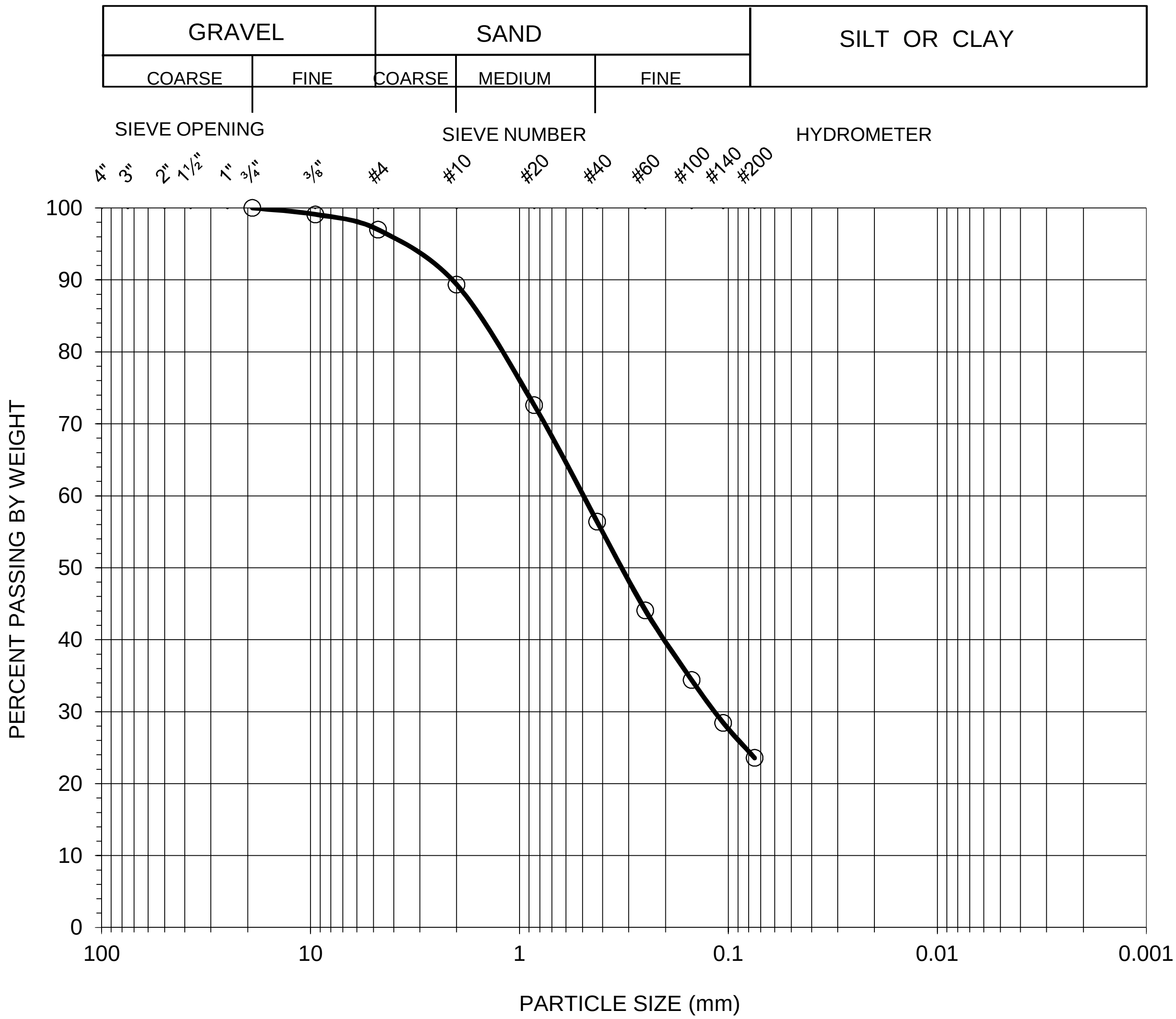
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	3-005_4.5-5.0	-	4.5-5.0	3	73	24	N/A	SM

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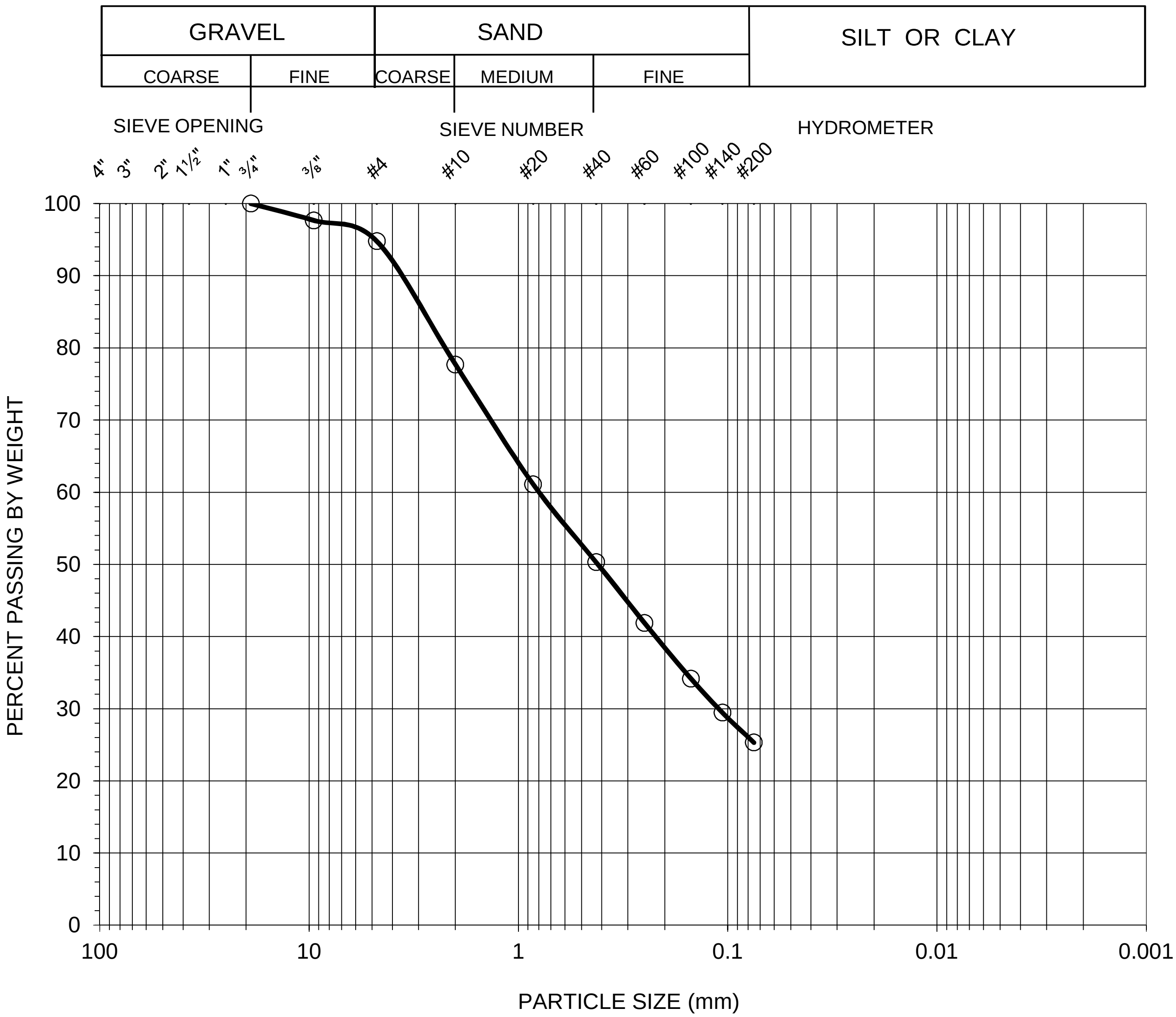
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	5-002_4.5-5.0	-	4.5-5.0	5	70	25	N/A	SC*

Note: Based on visual classification of sample

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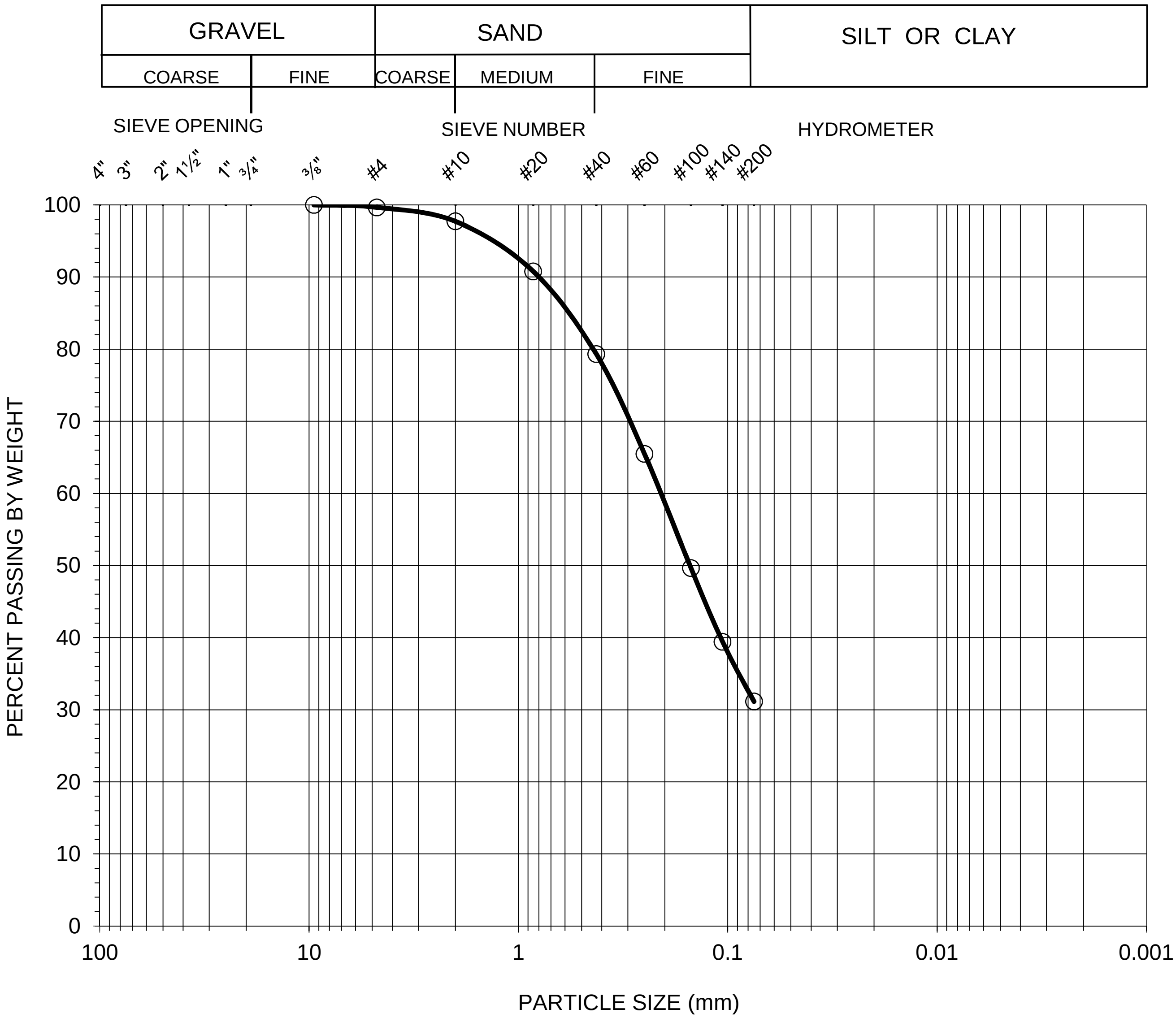
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	JT	Date:	12/14/21
Project Name:	SCE - TLRR	Computed by:	JP	Date:	12/16/21
Project No.:	30002905-01325.C	Checked by:	AP	Date:	12/16/21

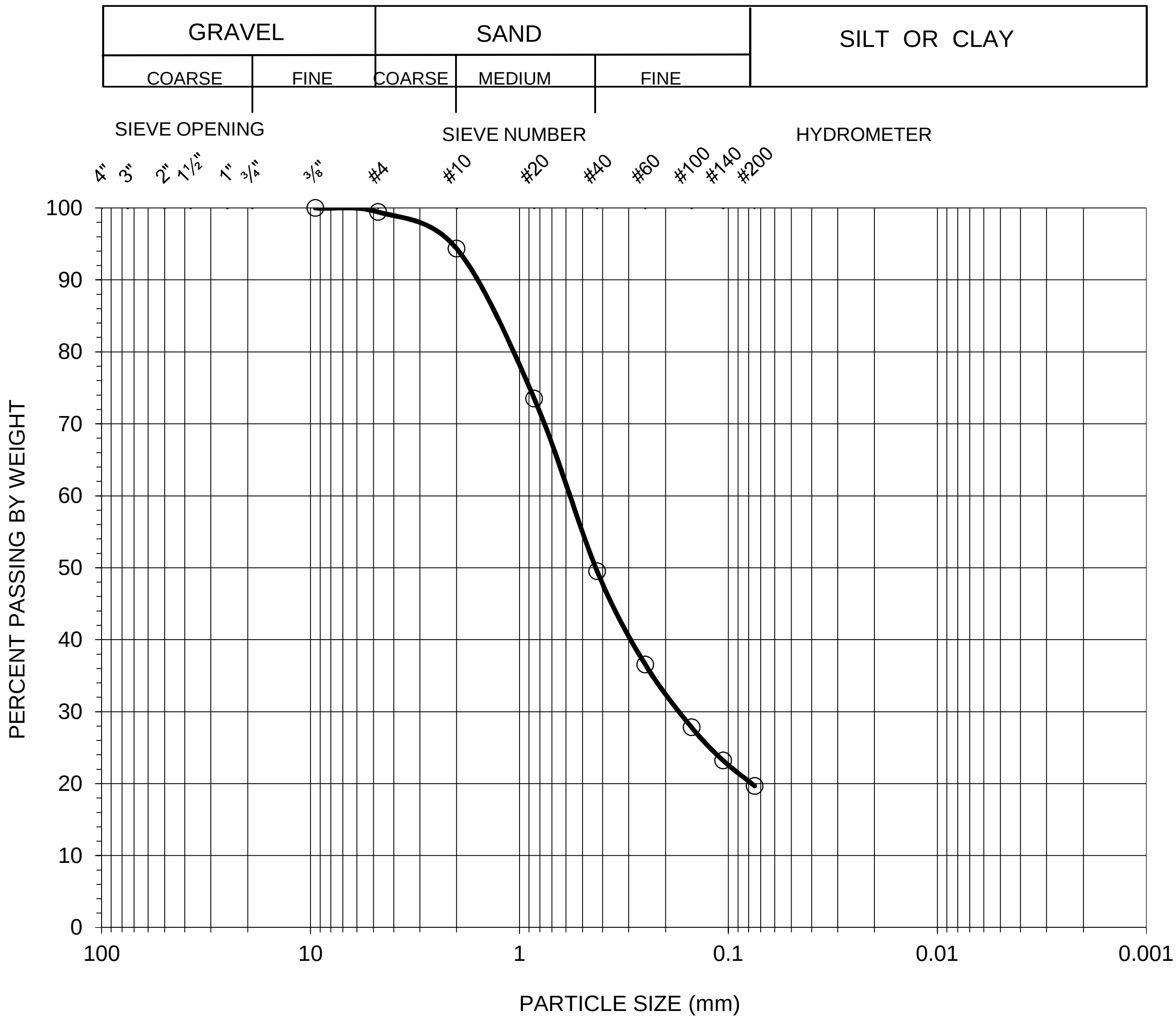


Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	5-005_10.0-10.65	-	10.0-10.65	0	69	31	N/A	SM

GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name: Arcadis
Project Name: SCE - TLRR
Project No.: 30002905-01325.C

Tested by: DK Date: 01/10/22
Computed by: NR Date: 01/10/22
Checked by: AP Date: 01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	KERN-NEW01 _10.0-10.75	-	10.0-10.75	1	79	20	N/A	SC*

Note: Based on visual classification of sample

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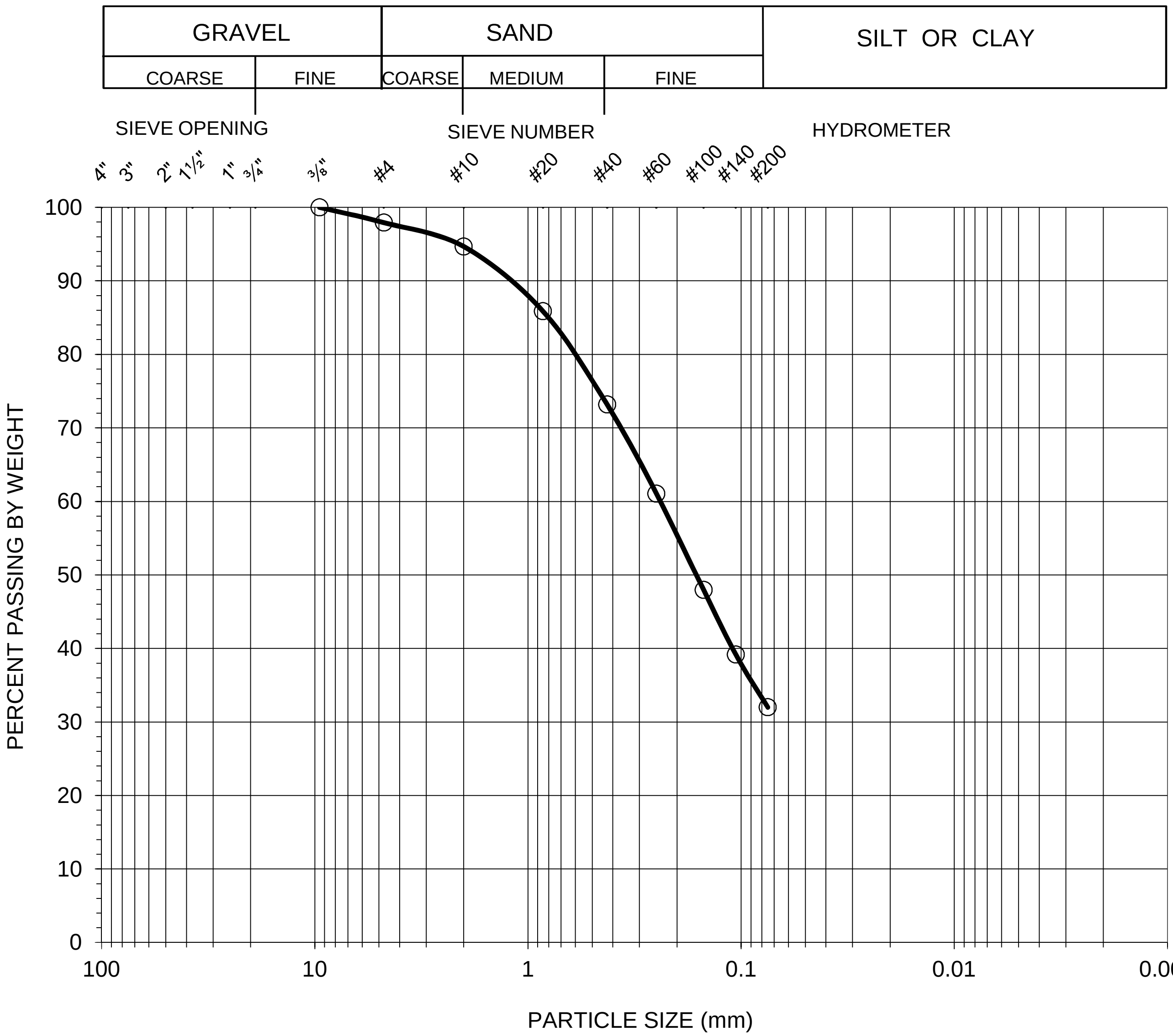
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	KERN-NEW02 _7.0-8.5	-	7.0-8.5	2	66	32	N/A	SC*

**Note: Based on visual classification of sample*

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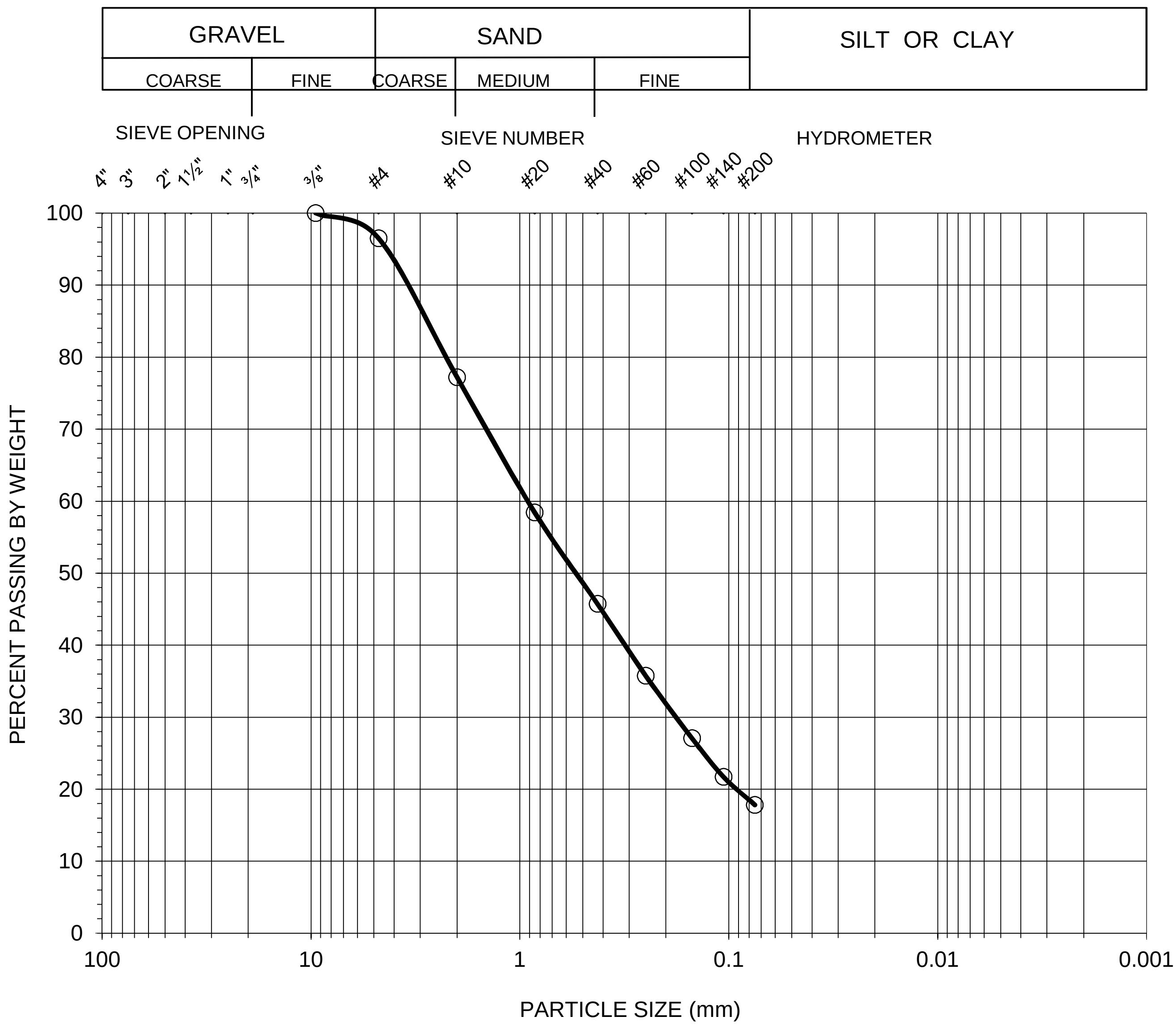
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	JT	Date:	12/14/21
Project Name:	SCE - TLRR	Computed by:	JP	Date:	12/16/21
Project No.:	30002905-01325.C	Checked by:	AP	Date:	12/16/21



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT KERN-008a_10.0-10.85	-	10.0-10.85	3	79	18	N/A	SM

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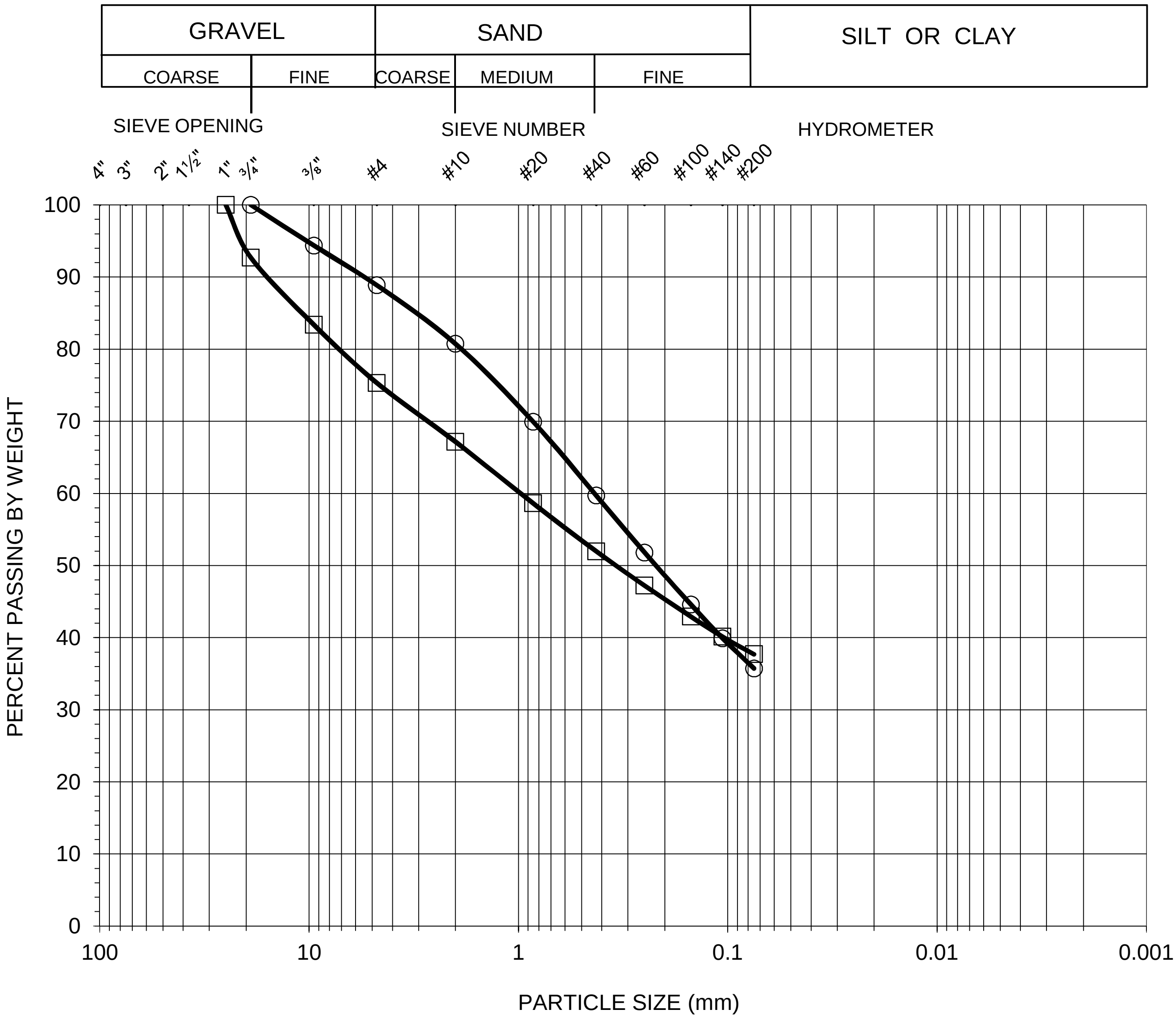
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name: Arcadis
Project Name: SCE - TLRR
Project No.: 30002905-01325.C

Tested by: JT Date: 12/14/21
Computed by: JP Date: 12/16/21
Checked by: AP Date: 12/16/21



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT KERN-009_7.5-8.5	-	7.5-8.5	11	53	36	N/A	SM
□	GT KERN-009_20.0-20.7	-	20.0-20.7	25	37	38	N/A	SM

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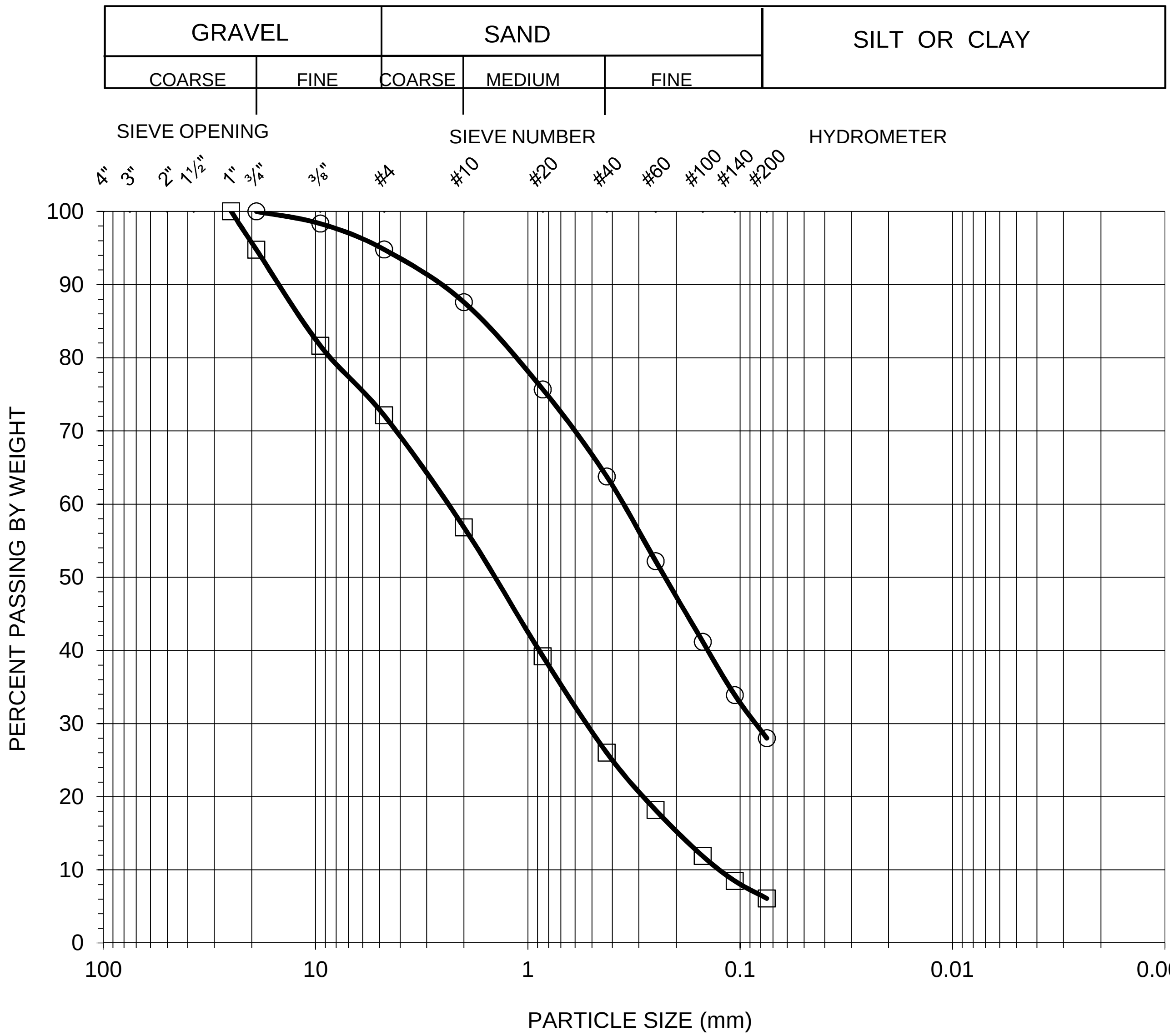
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/31/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT KERN-011_15.0-16.5	-	15.0-16.5	5	67	28	24:17:7	SC-SM
□	GT KERN-011_25.0-26.1	-	25.0-26.1	28	66	6	N/A	SW-SM

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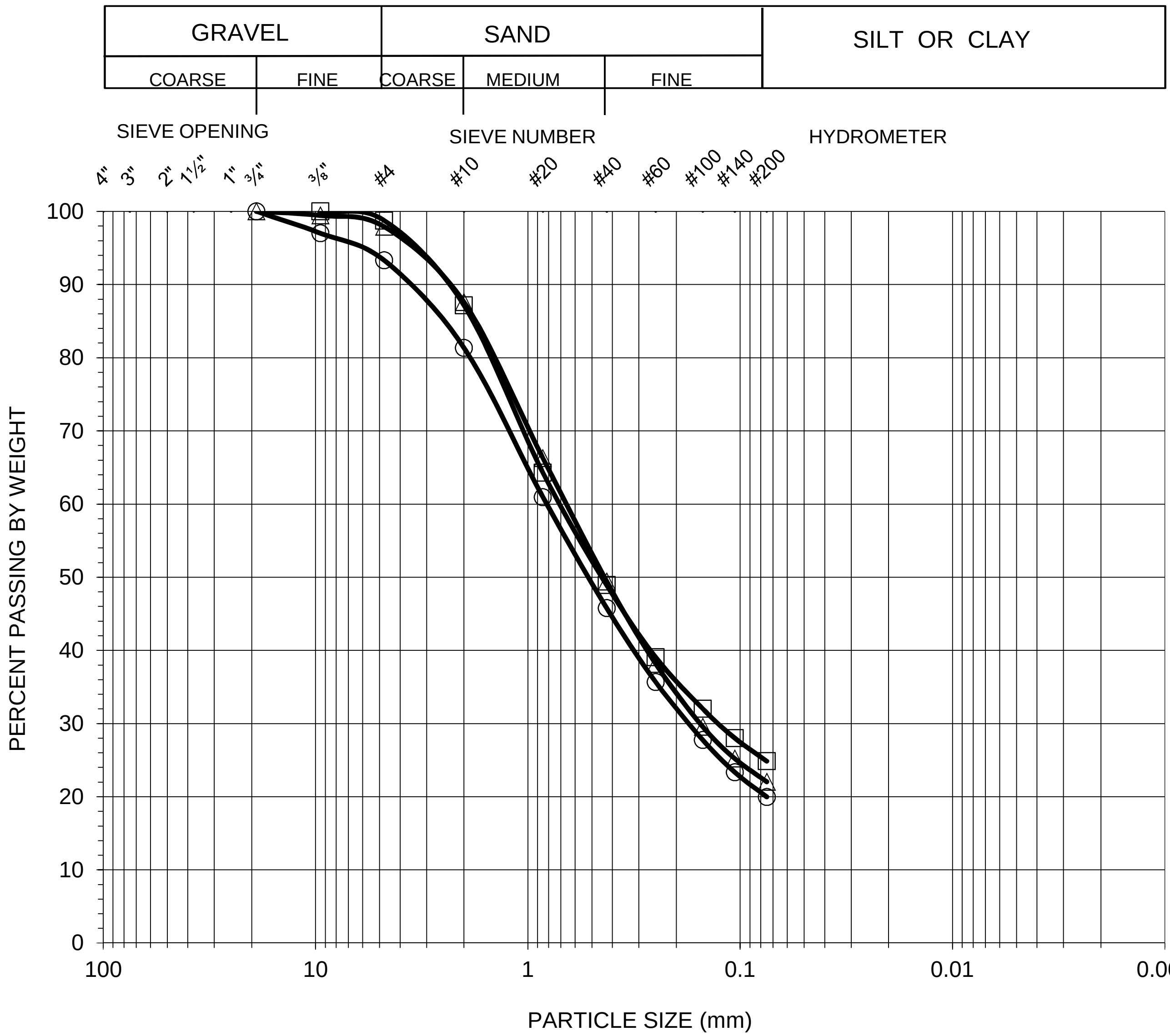
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/31/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT KERN-012_10.0-11.3	-	10.0-11.3	7	73	20	N/A	SC*
□	GT KERN-012_20.0-21.5	-	20.0-21.5	1	74	25	31:19:12	SC
△	GT KERN-012_30.0-31.5	-	30.0-31.5	2	76	22	N/A	SC*

**Note: Based on visual classification of sample*

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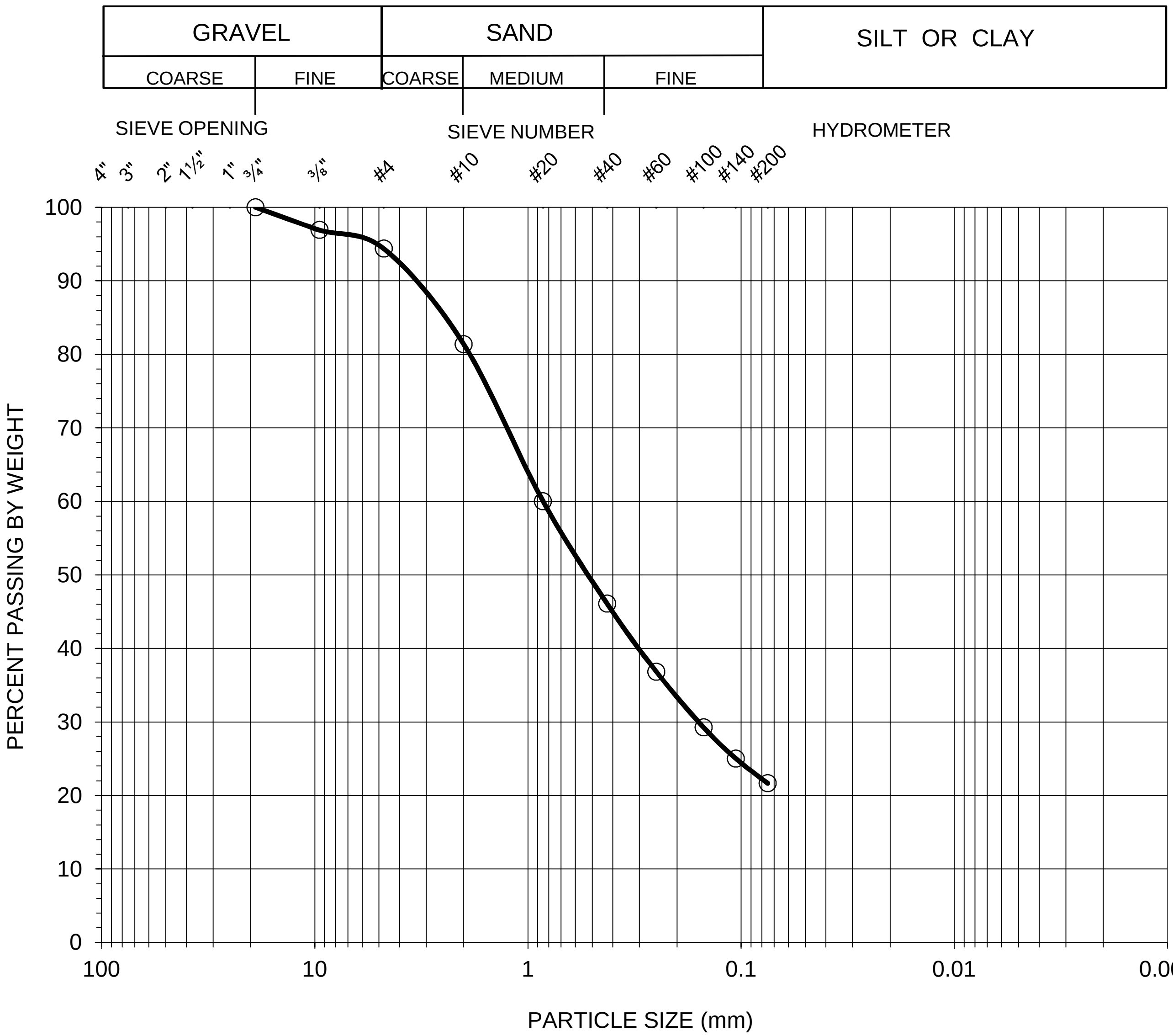
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/31/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT KERN-012_48.5-50.0	-	48.5-50.0	6	72	22	N/A	SC*

Note: Based on visual classification of sample

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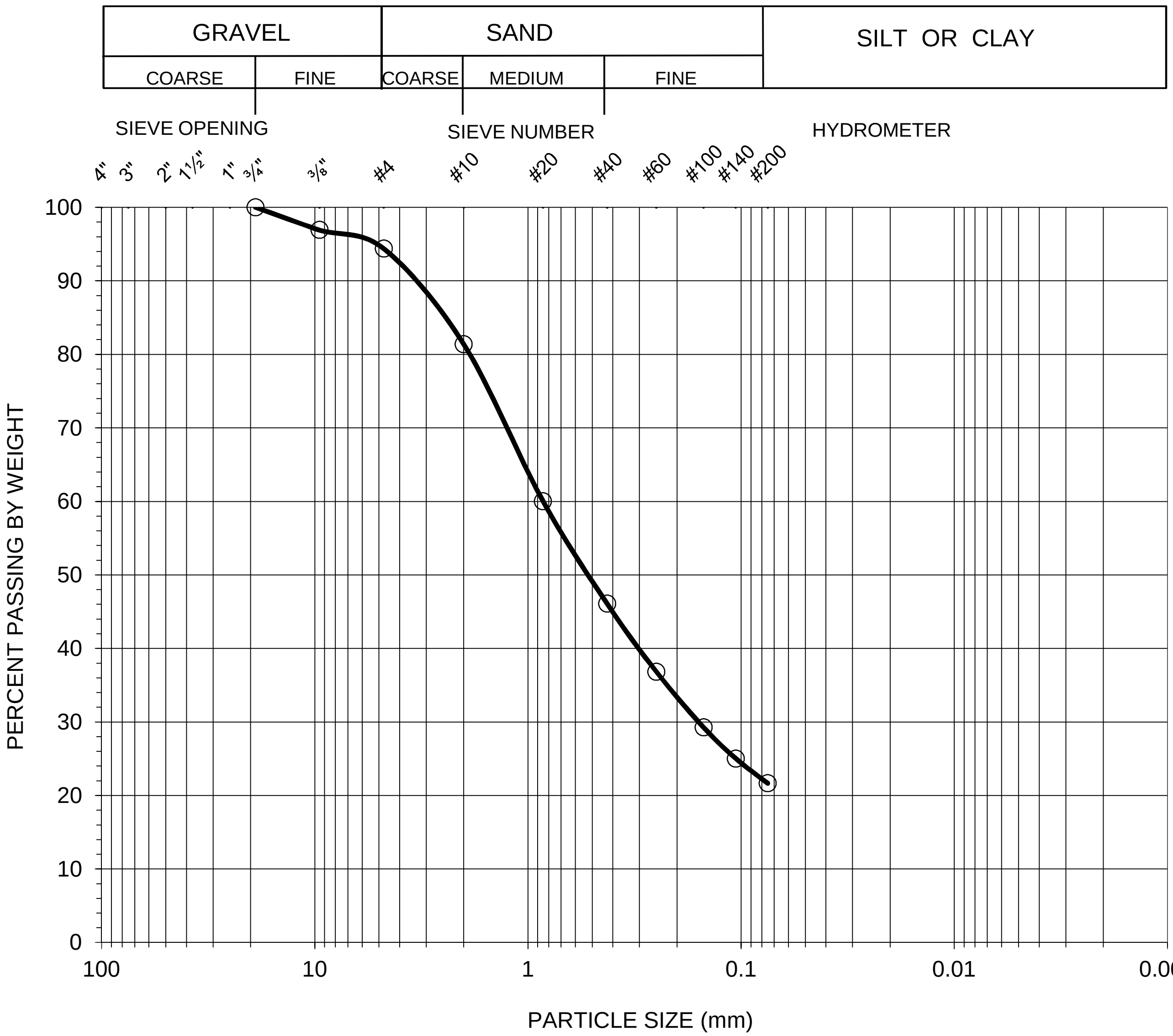
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	DK	Date:	01/10/22
Project Name:	SCE - TLRR	Computed by:	NR	Date:	01/10/22
Project No.:	30002905-01325.C	Checked by:	AP	Date:	01/10/22



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT KERN-012_48.5-50.0	-	48.5-50.0	6	72	22	N/A	SC*

Note: Based on visual classification of sample

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CORROSION TEST RESULTS

Client Name: Arcadis
Project Name: SCE - TLRR
Project No.: 30002905-01325.C

AP Job No.: 21-1215
Date: 01/06/22

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
1-005_2.0-3.0	-	2.0-3.0	Silty Sand w/gravel	3,219	7.9	79	26

NOTES:
Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

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CORROSION TEST RESULTS

Client Name: Arcadis
Project Name: SCE - TLRR
Project No.: 30002905-01325.C

AP Job No.: 21-1215
Date: 01/06/22

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
3-005_2.0-3.0	-	2.0-3.0	Silty Sand w/gravel	11,459	7.3	28	21

NOTES:
Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

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CORROSION TEST RESULTS

Client Name: Arcadis
Project Name: SCE - TLRR
Project No.: 30002905-01325.C

AP Job No.: 21-1215
Date: 01/06/22

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
5-005_2.0-2.5	-	2.0-2.5	Silty Sand w/gravel	9,214	8.2	32	22

NOTES:
Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

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CORROSION TEST RESULTS

Client Name: Arcadis
Project Name: SCE - TLRR
Project No.: 30002905-01325.C

AP Job No.: 21-1215
Date: 01/06/22

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
KERN-NEW01 _2.0-3.0	-	2.0-3.0	Silty Sand w/gravel	2,698	8.2	68	40

NOTES:
Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

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CORROSION TEST RESULTS

Client Name: Arcadis
Project Name: SCE - TLRR
Project No.: 30002905-01325.C

AP Job No.: 21-1215
Date: 12/14/21

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
GT KERN-008a_2.0-3.0	-	2.0-3.0	Silty Sand	7,379	7.7	28	20

NOTES:
Resistivity Test and pH: California Test Method 643
Sulfate Content : California Test Method 417
Chloride Content : California Test Method 422
ND = Not Detectable
NA = Not Sufficient Sample
NR = Not Requested

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
1-002_30.0-30.55	-	30.0-30.55	Lean Clay w/sand (CL), about 20% fine to medium grained, subangular sand; 80% fines with medium plasticity, high dry strength, slow dilatency, medium toughness; no gravel, olive, no odor, moist

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VISUAL SOIL CLASSIFICATION
ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
1-004_35.0-36.5	-	35.0-36.5	Clayey Sand (SC), about 70% fine to coarse grained, subangular sand; 30% fines with medium plasticity, high dry strength, slow dilatency, medium toughness; no gravel, brown, no odor, moist

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
1-005_20.0-21.15	-	20.0-21.15	Silty Sand (SM), about 65% fine to coarse grained, subangular sand; 30% fines with no plasticity; 5% subangular gravel with max size~1/4", olive, no odor, moist

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
1-006a_40.0-41.5	-	40.0-41.5	Silty Sand (SM), about 60% fine to coarse grained, subangular sand; 30% fines with no plasticity; 10% subangular gravel with max size~1/2", olive, no odor, moist

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
1-008_25.0-26.5	-	25.0-26.5	Silt (ML), about 10% fine to medium grained, subangular sand; 90% fines with very low plasticity, low dry strength, rapid dilatancy, low toughness; no gravel, olive brown, no odor, moist
1-008_48.5-50.0	-	48.5-50.0	Well-Graded Sand w/silt (SW-SM), about 85% fine to coarse grained, subangular sand; 5% fines with no plasticity; 10% subangular gravel with max size~3/8", light brown, no odor, dry

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
3-002_4.5-5.0	-	4.5-5.0	Silty Sand (SM), about 65% fine to coarse grained, subangular sand; 30% fines with no plasticity; 5% subrounded gravel with max size~3/8", brown, no odor, dry
3-002_35.0-36.5	-	35.0-36.5	Clayey Sand (SC), about 70% fine to coarse grained, subangular sand; 20% fines with low plasticity, high dry strength, slow dilatency, low toughness; 10% angular gravel with max size~1/2", strong brown, no odor, moist
3-002_45.0-46.4	-	45.0-46.4	Sandy Lean Clay (CL), about 45% fine to coarse grained, subangular sand; 50% fines with medium plasticity, high dry strength, slow dilatency, low toughness; 5% subrounded gravel with max size~3/4", yellowish brown, no odor, moist

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VISUAL SOIL CLASSIFICATION
ASTM D 2488

Client Name: Arcadis — AP Lab No.: 21-1215
Project Name: SCE - TLRR — Date: 12/13/21
Project Number: 30002905-01325.C

Boring No.	Sample No.	Depth (feet)	Description
3-004_4.5-5.0	-	4.5-5.0	Silty Sand (SM), about 75% fine to coarse grained, subangular sand; 20% fines with no plasticity; 5% fine gravel with max size~3/8", brown, no odor, dry
3-004_40.0-40.9	-	40.0-40.9	Silty Sand w/gravel (SM), about 50% fine to coarse grained, subangular sand; 30% fines with no plasticity; 20% fine gravel with max size~3/8", brown, no odor, moist

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VISUAL SOIL CLASSIFICATION
ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
3-005_35.0-35.85	-	35.0-35.85	Silty Sand (SM), about 50% fine to coarse grained, subangular sand; 40% fines with no plasticity; 10% subangular gravel with max size~3/8", olive, no odor, moist

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
5-002_25.0-25.6	-	25.0-25.6	Silty Sand (SM), about 80% fine to coarse grained, subangular sand; 20% fines with no plasticity; no gravel, white, no odor, moist

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 12/13/21

Boring No.	Sample No.	Depth (feet)	Description
5-005_4.5-5.0	-	4.5-5.0	Silty Sand (SM), about 73% fine to coarse grained, subangular sand; 17% fines with no plasticity; 10% fine gravel with max size~3/8", brown, no odor, moist
5-005_25.0-25.6	-	25.0-25.6	Silty Sand (SM), about 70% fine to coarse grained, subrounded sand; 20% fines with no plasticity; 10% fine gravel with max size~3/8", grey, no odor, moist

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
KERN-NEW01_30.0-30.6	-	30.0-30.6	Silty Sand (SM), about 60% fine to coarse grained, subangular sand; 40% fines with no plasticity; no gravel, white, no odor, moist

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VISUAL SOIL CLASSIFICATION

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AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
KERN-NEW02_25.0-26.5	-	25.0-26.5	Silty Sand (SM), about 65% fine to coarse grained, subangular sand; 30% fines with very low plasticity; 5% subrounded gravel with max size~3/8", brown, no odor, dry
KERN-NEW02_45.0-46.5	-	45.0-46.5	Silty Sand (SM), about 80% fine to coarse grained, subangular sand; 15% fines with no plasticity; 5% subangular gravel with max size~3/8", light brown, no odor, dry

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name:	Arcadis	AP Lab No.:	21-1215
Project Name:	SCE - TLRR	Date:	12/13/21
Project Number:	30002905-01325.C		

Boring No.	Sample No.	Depth (feet)	Description
GT KERN-008a_2.0-3.0	-	2.0-3.0	Silty Sand (SM), about 80% fine to coarse grained, subangular sand; 20% fines with very low plasticity; no gravel with max size~1/4", brown, no odor, moist
GT KERN-008a_15.0-15.9	-	15.0-15.9	Silty Sand (SM), about 80% fine to coarse grained, subrounded sand; 15% fines with no plasticity; 5% fine gravel with max size~3/8", greyish brown, no odor, moist

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VISUAL SOIL CLASSIFICATION
ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 12/13/21

Boring No.	Sample No.	Depth (feet)	Description
GT KERN-009_1.3-2.3	-	1.3-2.3	Silty Sand (SM), about 80% fine to coarse grained, angular sand; 15% fines with very low plasticity; 5% fine gravel with max size~3/4", brown, no odor, moist

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 30002905-01325.C

AP Lab No.: 21-1215
Date: 01/05/22

Boring No.	Sample No.	Depth (feet)	Description
GT KERN-011_4.5-5.0	-	4.5-5.0	Sandy Lean Clay (CL), about 45% fine to coarse grained, subangular sand; 50% fines with medium plasticity, medium dry strength, slow dilatency, medium toughness; 5% subangular gravel with max size~1/4", brown, no odor, dry
GT KERN-011_35.0-36.5	-	35.0-36.5	Silty Sand (SM), about 50% fine to coarse grained, subangular sand; 40% fines with no plasticity; 10% subangular gravel with max size~3/4", brown, no odor, wet
GT KERN-011_45.0-46.5		45.0-46.5	Silty Sand w/gravel (SM), about 45% fine to coarse grained, subangular sand; 40% fines with no plasticity; 15% subangular gravel with max size~1/2", brown, no odor, moist

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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORE SPECIMEN
(ASTM D7012 Method C)

Project Name:	SCE - TLRR	Prepared by	ST	Date	12/15/21
Project No.	30002905-01325.C	Tested by	ST	Date	12/15/21
Boring No	KERN-NEW03_6.3-11.0	Calculated by	JP	Date	12/15/21
Sample No	-	Checked by	AP	Date	12/16/21
Depth:	6.3-11.0				

Lithologic Description of the Rock: Granodiorite

INITIAL CONDITION OF SPECIMEN

Diameter	2.405	in
Height	5.185	in
Weight Before	1108.29	g
Area	4.54	in^2
Volume	23.6	in^3
Total Unit Weight	179.2	pcf
h/d Ratio	2.2	

Moisture After Test

Container No.	
Wt. Wet Soil+Container (g)	329.28
Wt. Dry Soil+Container (g)	329.09
Wt. Container (g)	50.48
Moisture, (%)	0.07

SHEARING DATA

Axial Load (lbs)	Compressive Strength (psi)
45020	9910

Specimen Pictures After Test

*Failure Types:

	1	Cone
X	2	Cone and Split
	3	Columnar Vertical Cracking
	4	Shear
	5	Side Fracture (Top or Bottom)
	6	Side Fracture (Pointed)
	7	Other

Remarks:

2017

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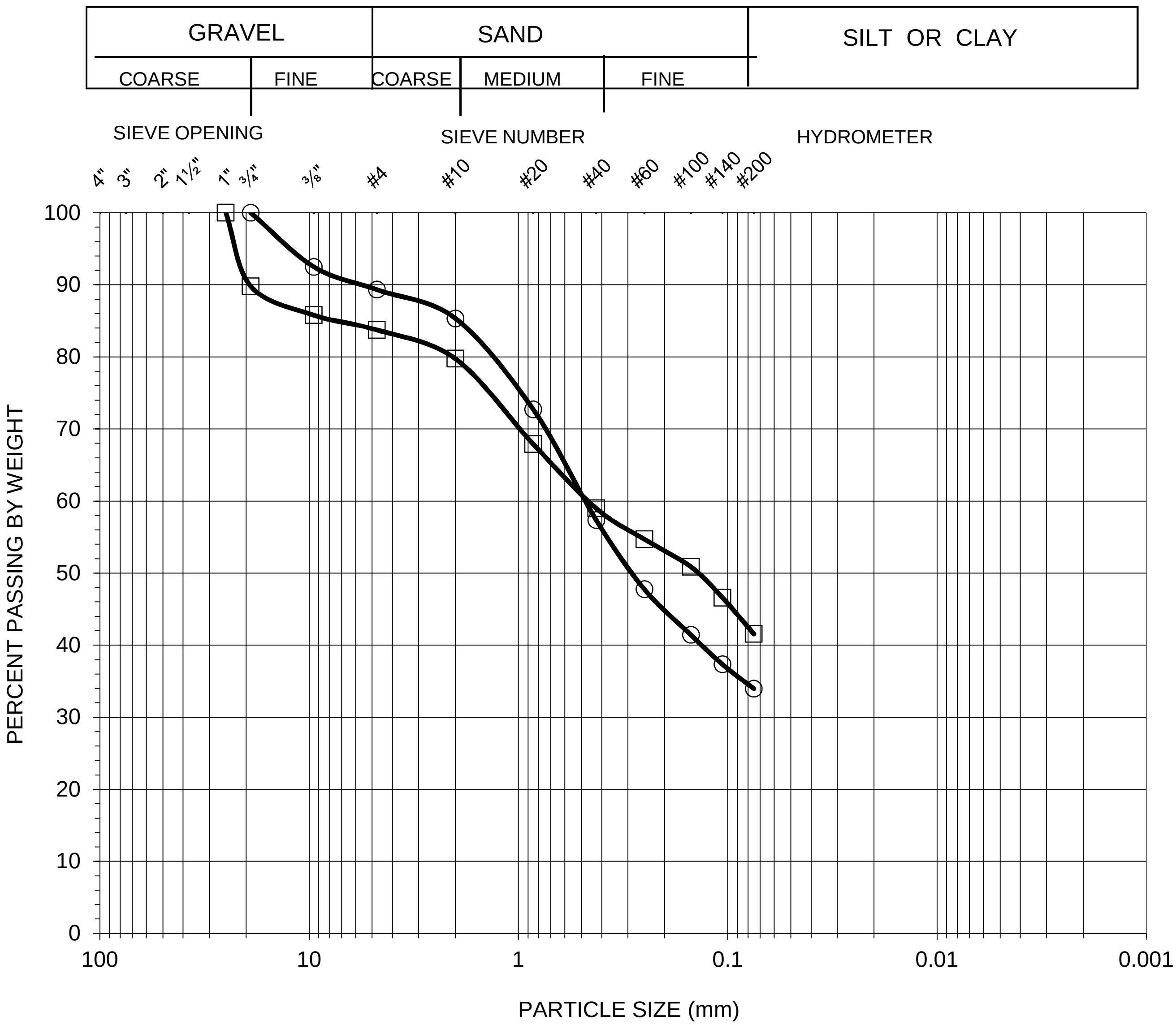
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	NG	Date:	08/09/17
Project Name:	SCE - TLRR	Computed by:	JP	Date:	08/11/17
Project Number:	05032060.01325	Checked by:	AP	Date:	08/11/17



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT-KERN-002	-	5-6.5	11	55	34	N/A	SM
□	GT-KERN-002	-	18.5-20	16	42	42	N/A	SM

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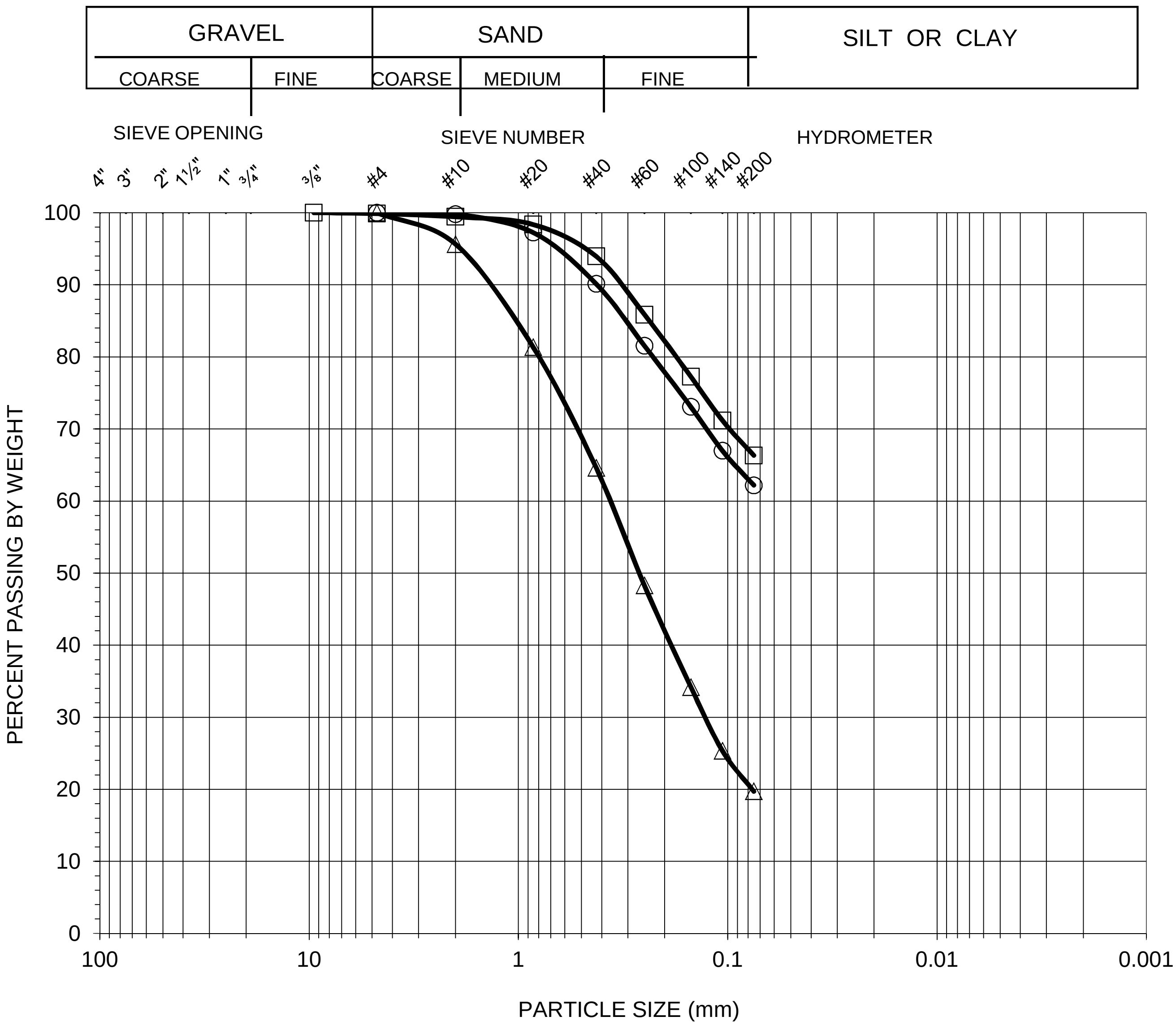
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	NG	Date:	08/09/17
Project Name:	SCE - TLRR	Computed by:	JP	Date:	08/11/17
Project Number:	05032060.01325	Checked by:	AP	Date:	08/11/17



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT-KERN-003	-	5-6.5	0	38	62	N/A	CH*
□	GT-KERN-003	-	8.5-10	0	34	66	N/A	CH*
△	GT-KERN-003	-	33.5-35	0	80	20	N/A	SM

**Note: Based on visual classification of sample*

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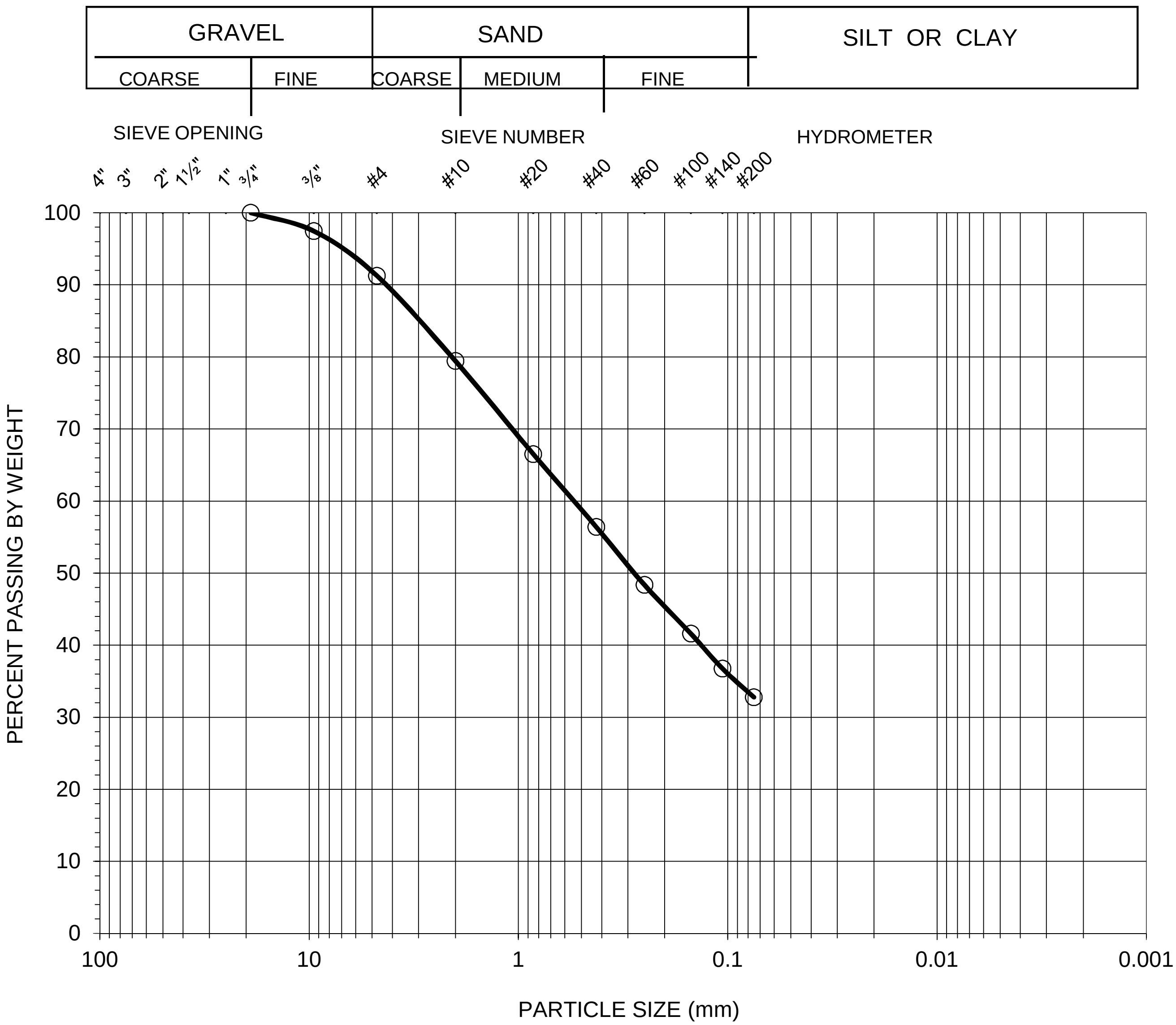
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

Client Name:	Arcadis	Tested by:	NG	Date:	08/09/17
Project Name:	SCE - TLRR	Computed by:	JP	Date:	08/11/17
Project Number:	05032060.01325	Checked by:	AP	Date:	08/11/17



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT-KERN-005	-	5-6.5	9	58	33	N/A	SC*

**Note: Based on visual classification of sample*

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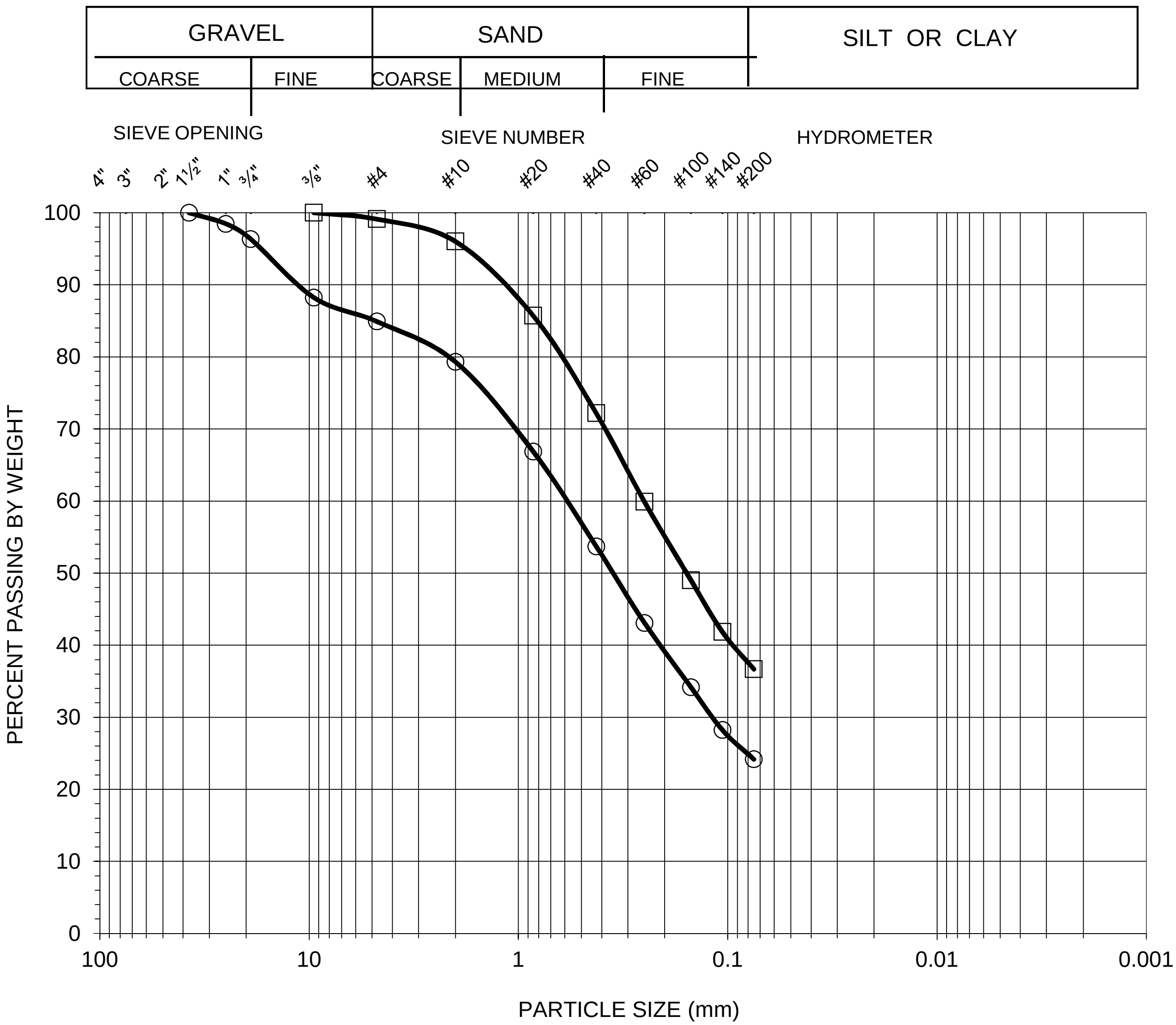
GRAIN SIZE DISTRIBUTION CURVE
ASTM D 6913

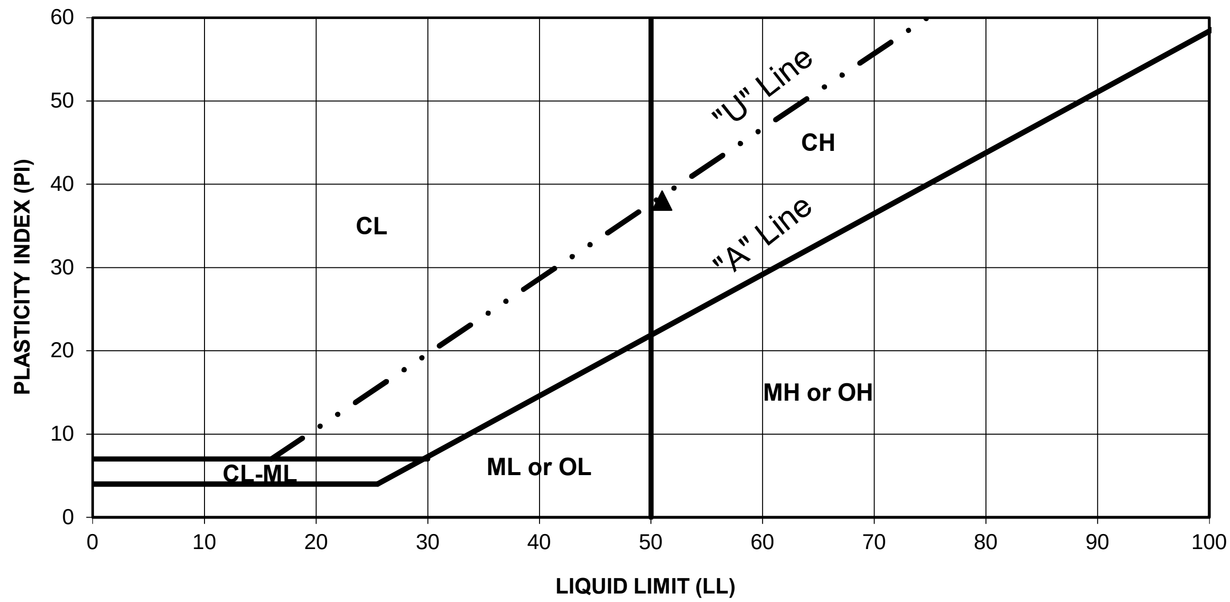
Client Name:	Arcadis	Tested by:	NG	Date:	08/09/17
Project Name:	SCE - TLRR	Computed by:	JP	Date:	08/11/17
Project Number:	05032060.01325	Checked by:	AP	Date:	08/11/17



Symbol	Boring No.	Sample No.	Sample Depth (feet)	Percent			Atterberg Limits LL:PL:PI	Soil Type U.S.C.S
				Gravel	Sand	Silt & Clay		
○	GT-KERN-013	-	8.5-10	15	61	24	N/A	SM
□	GT-KERN-013	-	18.5-20	1	62	37	N/A	SM

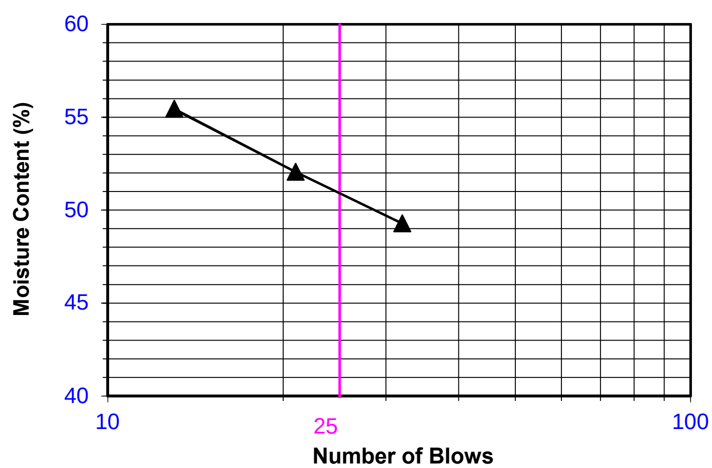
ATTERBERG LIMITS
ASTM D 4318

Project Name: SCE - TLRR **Tested By:** DK Date: 08/08/17
Project No.: 05032060.01325 **Checked By:** AP Date: 08/11/17



PROCEDURE USED

- [ ] Wet Preparation
- [X] Dry Preparation
- [X] Procedure A Multipoint Test
- [ ] Procedure B One-point Test



Symbol	Boring Number	Sample Number	Depth (feet)	LL	PL	PI	Plasticity Chart Symbol
	GT-KERN-002	-	19-19.5	NP	NP	NP	
▲	GT-KERN-003	-	5.5-6	51	13	38	CH

* NP denotes "non-plastic"

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MOISTURE AND DENSITY TEST RESULTS

Client: Arcadis
Project Name: SCE - TLRR
Project No.: 05032060.01325

AP Lab No.: 17-0812
Date: 08/08/17

Boring No.	Sample No.	Sample Depth (ft.)	Moisture Content (%)	Dry Density (pcf)
GT-KERN-002	-	5.5-6	1.4	103.2
GT-KERN-002	-	19-19.5	2.4	113.1
GT-KERN-003	-	5.5-6	15.5	101.3
GT-KERN-003	-	9-9.5	19.0	96.3
GT-KERN-003	-	34-34.5	3.3	105.8
GT-KERN-005	-	5.5-6	6.6	105.1
GT-KERN-013	-	9-9.5	11.8	123.2
GT-KERN-013	-	19-19.5	9.8	124.2

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VISUAL SOIL CLASSIFICATION

ASTM D 2488

Client Name: Arcadis
Project Name: SCE - TLRR
Project Number: 05032060.01325

AP Lab No.: 17-0812
Date: 08/09/17

Boring No.	Sample No.	Depth (feet)	Description
GT-KERN-002	-	5.5-6	Silty Sand (SM), about 50% sand, 40% fines, 10% gravel, fine-grained sand, yellowish brown, non plastic, subangular, no odor, moist
GT-KERN-002	-	19-19.5	Silty Sand (SM), about 65% sand, 20% fines, 15% gravel, light yellowish brown, medium to coarse grained sand, max. size~3/8", subangular, no odor, moist
GT-KERN-003	-	5.5-6	Fat Clay (CH), dark brown, about 5% sand, 95% fines, no gravel, fine-grained sand, high plasticity, slow dilatancy, no odor, high toughness, moist, hard consistency
GT-KERN-003	-	9-9.5	Fat Clay (CH), dark brown, about 10% sand, 90% fines, no gravel, fine-grained sand, high plasticity, slow dilatancy, no odor, high toughness, moist, hard consistency
GT-KERN-003	-	34-34.5	Silty Sand (SM), olive gray, about 85% sand, 15% fines, no gravel, medium to coarse grained sand, max. size~1/4", non plastic, subangular, no odor, moist
GT-KERN-005	-	5.5-6	Clayey Sand (SC), brown, about 60% sand, 40% fines, no gravel, fine to medium grained sand, medium plasticity, subrounded, no odor, low toughness, moist
GT-KERN-013	-	9-9.5	Silty Sand (SM), dark greenish gray, about 80% sand, 15% fines, 5% gravel, fine to coarse grained sand, subangular, no odor, moist
GT-KERN-013	-	19-19.5	Silty Sand (SM), olive yellow, about 80% sand, 20% fines, no gravel, fine to medium grained sand, non plastic, subrounded, no odor,moist

Appendix F

Liquefaction Triggering Calculation Summary

MEMO

Subject:

Liquefaction Triggering Calculation Summary
Preliminary Geotechnical Investigation Report
Southern California Edison
TLRR Program
Gorman-Kern River Project

Date:

January 2022

Arcadis U.S., Inc.
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Los Angeles
California 90071
Tel 213 486 9884
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Arcadis U.S., Inc. performed a detailed liquefaction triggering evaluation using standard penetration testing (SPT) data collected during the field exploration. Liquefaction triggering was evaluated for soils below the groundwater table in the four soil borings where groundwater was observed during drilling. Liquefaction triggering was evaluated using the SPT-based methods developed by Boulanger and Idriss (2014). This memorandum briefly summarizes the methods, assumptions, and values used in the evaluation.

The Boulanger and Idriss (2014) approach for evaluating liquefaction triggering is an updated version of the simplified procedure originally developed by Seed and Idriss (1967), which calculates and compares the in-situ soil liquefaction resistance to the soil stresses that may develop during an earthquake. The result of the calculations is a factor of safety, where a value of less than one indicates the soil is potentially susceptible to liquefaction.

Susceptibility Screening

It is generally accepted that high plasticity soils are not susceptible to liquefaction and non-plastic soils are susceptible to liquefaction. Liquefaction susceptibility of low to medium plasticity soils is an area of ongoing research and requires detailed analysis. Due to the prevalence of non-plastic material along the project alignment, the low plasticity of the few clayey soils encountered, and the preliminary screening-level of this analysis, low plasticity clayey soils were conservatively included in the liquefaction triggering evaluation.

Soil liquefaction is more common in recently deposited geologic formations (Holocene age) than in older deposits (Pleistocene age and older). Age effects are not completely understood and are difficult to account for (National Academies of Sciences, Engineering, and Medicine 2016). Shallow soil in the project alignment is Holocene to Pleistocene in age. Due to the prevalence of younger soil deposits and shallow depth of soil borings along the project alignment, and the preliminary screening-level of this analysis, all SPT results were included in the liquefaction evaluation.

Soil Resistance

Soil resistance to liquefaction, termed the cyclic resistance ratio (CRR), is derived from the SPT N-value, sample depth, and fines content. The SPT N-values were corrected for overburden, hammer efficiency, and clean sand to $(N_1)_{60,cs}$ values. The CRR is then standardized to an M_w of 7.5 and an effective vertical stress of 1. The SPT N-value correction calculations and the standardized CRR calculations are summarized in the attached summary tables.

Ground Motions

The site modified peak ground acceleration (PGA_M) and earthquake moment magnitude (M_w) are the earthquake ground motion parameters used in the Boulanger and Idriss (2014) simplified procedure. The PGA_M is used as the ground acceleration and M_w is used as a proxy for the duration of shaking. The PGA_M was determined using the United States Geological Survey (USGS) Unified Hazard Tool for site class D. We determined ground motions for a seismic event with a 2 percent chance of exceedance in 50 years, which equates to a return period of 2,475 years and for a seismic event with a 10 percent chance of exceedance in 50 years, which equates to a return period of 475 years. The M_w used in the liquefaction calculations is the mean M_w for deaggregated earthquake data for a given return period. The M_w was determined with the USGS Unified Hazard Tool using the dynamic conterminous U.S. 2014 updated edition (USGS 2019).

The PGA_M and M_w were determined at two locations along the project alignment, as summarized in the table below. Ground motions were relatively strong at each of the locations evaluated. Borings KERN-011 and KERN-012 were evaluated using the ground motions determined for the Grapevine Canyon, and borings 3-002 and 3-005 were evaluated using ground motions determined at the Gorman Substation. The Gorman Substation is located adjacent to the San Andreas fault. A more detailed structure-by-structure or segment-based analysis could be performed during final design in critical areas.

Location	475 year Return Period PGA_M (g)	475 year Return Period M_w	2,475 year Retun Period PGA_M (g)	2,475 year Return Period M_w
Grapevine Canyon	0.54	7.5	0.99	7.9
Gorman Substation	0.64	7.7	1.19	7.7

PGA_M - site modified peak ground acceleration
M_w - moment magnitude

Liquefaction Triggering

The driving force behind liquefaction triggering, termed the cyclic stress ratio (CSR), is derived from the PGA_M and the calculated in-situ soil stresses. The CSR is then standardized to an M_w of 7.5 a vertical effective stress of one.

The CSR is then divided by the CRR to produce a result. A value of less than one indicates a potentially liquefiable soil.

References

Boulanger, R.W. and I.M. Idriss. 2014. CPT and SPT Based Liquefaction Triggering Procedures. Center for Geotechnical Modeling. University of California – Davis. Report No. UCD/CGM-14/01. April.

National Academies of Sciences, Engineering, and Medicine (NASEM). 2016. State of the Art and Practice in the Assessment of Earthquake-Induced Soil Liquefaction and Its Consequences. Washington, DC: the National Academies Press.

Seed, H.B., and I.M. Idriss. 1967. Analysis of liquefaction: Niigata earthquake. Proc., ASCE, 93(SM3), 83-108.

USGS. 2019. Unified Hazard Tool. Accessed in 2022. https://earthquake.usgs.gov/hazards/interactive/

Proj	Southern California Edison TLRR Program - Gorman-Kern River Project	Job No.	30002904 01325.C	Sheet No.	1 of 1
Calc	SPT "Simplified Procedure" Liquifaction Triggering Calculation	By	N. Trimble	Checked by	T. Newton
		Date	1/26/2022, rev 2/3/2022	Date	2/10/2022

ARCADIS

Borehole ID: KERN-011

Earthquake Values

Site Class	D	
PGA_M	0.99	2,475 year return period
M_W	7.7	2,475 year return period
PGA_M	0.54	475 year return period
M_W	7.5	475 year return period

Global Values

Borehole ID	KERN-011	Depth to Water	13.0 ft bgs	Hammer Energy	81.0 %	MSF	2,475 year return period	0.94	Pa 1,888 psf
Boring Elevation	3,215 ft	Borehole Dia	7.0 in	Liners in sampler?	n (y/n)	MSF	475 year return period	0.99	

No	Samp ID	Sample Depth (ft)	Sample Mid-Depth (ft)	USCS	N	γ (pcf)	C_R	C_S	C_E	C_B	N_{60}	σ_v (psf)	u (psf)	σ'_v (psf)	C_N	N_1	$(N_1)_{60}$	Fines	$\Delta(N_1)_{60}$	$(N_1)_{60,cs}$	CRR M=7.5 σ'v=1	Consider Lique-faction? *	K_σ	475 year return period r_d	475 $CSR_{M,\sigma'v}$	475 CSR M=7.5 σ'v=1	475 Liq FOS	2,475 year return period r_d	2,475 $CSR_{M,\sigma'v}$	2,475 CSR M=7.5 σ'v=1	2,475 Liq FOS
1	7	7	8	SC-SM	15	113	1	1	1.35	1.05	21	904	0	904	1.30	20	28	15	3.3	31	0.55	no	1.10	0.99	0.35	0.32	NA	0.99	0.64	0.61	NA
2	10	10	11	SC-SM	12	111	1	1	1.35	1.05	17	1,237	0	1,237	1.19	14	20	15	3.3	23	0.26	no	1.06	0.98	0.35	0.33	NA	0.98	0.63	0.63	NA
3	15	15	16	SC-SM	10	115	1	1	1.35	1.05	14	1,812	187	1,625	1.07	11	15	28	5.3	20	0.21	yes	1.02	0.96	0.38	0.37	0.56	0.97	0.69	0.72	0.29
4	20	20	21	SC-SM	27	119	1	1	1.35	1.05	38	2,407	499	1,908	1.00	27	38	15	3.3	41	6.83	yes	1.00	0.95	0.42	0.43	16.04	0.95	0.77	0.82	8.31
5	25	25	26	CL	7	115	1	1	1.35	1.05	10	2,982	811	2,171	0.93	7	9	52	5.6	15	0.15	yes	0.98	0.93	0.45	0.46	0.34	0.94	0.83	0.89	0.17
6	30	30	31	SM	22	116	1	1	1.35	1.05	31	3,562	1,123	2,439	0.92	20	29	18	4.1	33	0.72	yes	0.94	0.91	0.47	0.50	1.43	0.92	0.86	0.97	0.74
7	35	35	36	SM	36	123	1	1	1.35	1.05	51	4,177	1,435	2,742	0.91	33	46	15	3.3	49	>10	yes	0.89	0.88	0.48	0.54	>>2	0.90	0.88	1.05	>>2
8	40	40	41	SM	100	130	1	1	1.35	1.05	142	4,827	1,747	3,080	0.88	88	125	15	3.3	128	>10	yes	0.86	0.86	0.48	0.56	>>2	0.88	0.89	1.10	>>2
9	45	45	46	SM	100	130	1	1	1.35	1.05	142	5,477	2,059	3,418	0.86	86	121	15	3.3	125	>10	yes	0.82	0.84	0.48	0.58	>>2	0.86	0.88	1.14	>>2
10	48.5	48.5	49.5	SM	100	130	1	1	1.35	1.05	142	5,932	2,278	3,654	0.84	84	119	15	3.3	122	>10	yes	0.81	0.82	0.47	0.59	>>2	0.84	0.88	1.16	>>2

Notes

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Earthquake PGA and Mw taken from the USGS Unified Hazard Tool mapped values.

The SPT "Simplified Procedure" is based on the Boulanger and Idriss (2014) Recommendations

Proj	Southern California Edison TLRR Program - Gorman-Kern River Project	Job No.	30002904 01325.C	Sheet No.	1 of 1
Calc	SPT "Simplified Procedure" Liquifaction Triggering Calculation	By	N. Trimble	Checked by	T. Newton
		Date	1/26/2022, rev 2/3/2022	Date	2/10/2022

ARCADIS

Borehole ID: KERN-012

Earthquake Values

Site Class	D	
PGA_M	0.99	2,475 year return period
M_W	7.7	2,475 year return period
PGA_M	0.54	475 year return period
M_W	7.5	475 year return period

Global Values

Borehole ID	KERN-012	Depth to Water	23.0 ft bgs	Hammer Energy	81.0 %	MSF 2,475 year return period	0.94
Boring Elevation	3,427 ft	Borehole Dia	7.0 in	Liners in sampler?	n (y/n)	MSF 475 year return period	0.99

Pa 1,872 psf

																								475 year return period				2,475 year return period			
No	Samp ID	Sample Depth (ft)	Sample Mid-Depth (ft)	USCS	N	γ (pcf)	C_R	C_S	C_E	C_B	N_{60}	σ_v (psf)	u (psf)	σ'_v (psf)	C_N	N_1	$(N_1)_{60}$	Fines	$\Delta(N_1)_{60}$	$(N_1)_{60,cs}$	CRR M=7.5 σ'v=1	Consider Lique-faction? *	K_σ	r_d	$CSR_{M,\sigma'v}$	CSR M=7.5 σ'v=1	Liq FOS	r_d	$CSR_{M,\sigma'v}$	CSR M=7.5 σ'v=1	Liq FOS
1	7	7	8	SC	14	112	1	1	1.35	1.05	20	896	0	896	1.31	18	26	15	3.3	29	0.44	no	1.10	0.99	0.35	0.32	NA	0.99	0.64	0.61	NA
2	10	10	11	SC	16	113	1	1	1.35	1.05	23	1,235	0	1,235	1.16	19	26	20	4.5	31	0.54	no	1.09	0.98	0.35	0.32	NA	0.98	0.63	0.62	NA
3	15	15	16	SC	14	112	1	1	1.35	1.05	20	1,795	0	1,795	1.02	14	20	15	3.3	23	0.26	no	1.01	0.96	0.34	0.34	NA	0.97	0.62	0.66	NA
4	20	20	21	SC	12	111	1	1	1.35	1.05	17	2,350	0	2,350	0.91	11	15	25	5.1	20	0.21	no	0.97	0.95	0.33	0.35	NA	0.95	0.61	0.67	NA
5	25	25	26	SC	26	118	1	1	1.35	1.05	37	2,940	187	2,753	0.88	23	33	15	3.3	36	1.32	yes	0.89	0.93	0.35	0.39	3.36	0.94	0.64	0.76	1.74
6	30	30	31	SC	22	116	1	1	1.35	1.05	31	3,520	499	3,021	0.84	19	26	22	4.8	31	0.56	yes	0.90	0.91	0.37	0.42	1.34	0.92	0.69	0.81	0.69
7	35	35	36	CL	15	130	1	1	1.35	1.05	21	4,170	811	3,359	0.78	12	17	68	5.6	22	0.24	yes	0.92	0.88	0.39	0.43	0.55	0.90	0.72	0.83	0.28
8	40	40	41	SC	27	119	1	1	1.35	1.05	38	4,765	1,123	3,642	0.80	22	31	15	3.3	34	0.89	yes	0.84	0.86	0.40	0.48	1.85	0.88	0.74	0.94	0.95
9	45	45	46	SC	27	119	1	1	1.35	1.05	38	5,360	1,435	3,925	0.78	21	30	15	3.3	33	0.76	yes	0.83	0.84	0.40	0.49	1.53	0.86	0.75	0.97	0.78
10	48.5	48.5	49.5	SC	19	115	1	1	1.35	1.05	27	5,763	1,654	4,109	0.73	14	20	22	4.8	24	0.27	yes	0.88	0.82	0.41	0.47	0.59	0.84	0.76	0.92	0.30

Notes

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Earthquake PGA and Mw taken from the USGS Unified Hazard Tool mapped values.

The SPT "Simplified Procedure" is based on the Boulanger and Idriss (2014) Recommendations

Proj	Southern California Edison TLRR Program - Gorman-Kern River Project	Job No.	30002904 01325.C	Sheet No.	1 of 1
Calc	SPT "Simplified Procedure" Liquifaction Triggering Calculation	By	N. Trimble	Checked by	T. Newton
		Date	1/26/2022, rev 2/3/2022	Date	2/10/2022

ARCADIS

Borehole ID: 3-002

Earthquake Values

Site Class	D	
PGA_M	1.19	2,475 year return period
M_W	7.9	2,475 year return period
PGA_M	0.64	475 year return period
M_W	7.7	475 year return period

Global Values

Borehole ID	3-002	Depth to Water	33.0 ft bgs	Hammer Energy	81.0 %	MSF	2,475 year return period	0.90
Boring Elevation	3,570 ft	Borehole Dia	7.0 in	Liners in sampler?	n (y/n)	MSF	475 year return period	0.95

Pa 1,861 psf

																								475 year return period				2,475 year return period			
No	Samp ID	Sample Depth (ft)	Sample Mid-Depth (ft)	USCS	N	γ (pcf)	C_R	C_S	C_E	C_B	N_{60}	σ_v (psf)	u (psf)	σ'_v (psf)	C_N	N_1	$(N_1)_{60}$	Fines	$\Delta(N_1)_{60}$	$(N_1)_{60,cs}$	CRR M=7.5 σ'v=1	Consider Lique-faction? *	K_σ	r_d	$CSR_{M,\sigma'v}$	CSR M=7.5 σ'v=1	Liq FOS	r_d	$CSR_{M,\sigma'v}$	CSR M=7.5 σ'v=1	Liq FOS
1	7	7	8	CL	12	130	1	1	1.35	1.05	17	1,040	0	1,040	1.25	15	21	51	5.6	27	0.34	no	1.10	0.99	0.41	0.39	NA	0.99	0.77	0.78	NA
2	10	10	11	CL	12	130	1	1	1.35	1.05	17	1,430	0	1,430	1.11	13	19	50	5.6	25	0.28	no	1.04	0.98	0.41	0.41	NA	0.99	0.76	0.81	NA
3	15	15	16	SW-SM	18	134	1	1	1.35	1.05	26	2,100	0	2,100	0.95	17	24	9	0.5	25	0.29	no	0.98	0.97	0.40	0.43	NA	0.97	0.75	0.85	NA
4	20	20	21	SW	64	130	1	1	1.35	1.05	91	2,750	0	2,750	0.90	58	82	18	4.1	86	>10	no	0.88	0.95	0.40	0.47	NA	0.96	0.74	0.93	NA
5	25	25	26	SW	53	130	1	1	1.35	1.05	75	3,400	0	3,400	0.85	45	64	3	0.0	64	>10	no	0.82	0.94	0.39	0.50	NA	0.95	0.73	0.99	NA
6	30	30	31	SW	54	130	1	1	1.35	1.05	77	4,050	0	4,050	0.81	44	62	3	0.0	62	>10	no	0.77	0.92	0.38	0.52	NA	0.93	0.72	1.04	NA
7	35	35	36	SW	60	130	1	1	1.35	1.05	85	4,700	187	4,513	0.79	48	67	3	0.0	67	>10	yes	0.74	0.90	0.39	0.55	>>2	0.91	0.74	1.11	>>2
8	40	40	41	SW	100	130	1	1	1.35	1.05	142	5,350	499	4,851	0.78	78	110	3	0.0	110	>10	yes	0.72	0.88	0.40	0.59	>>2	0.90	0.76	1.18	>>2
9	45	45	46	SW	100	130	1	1	1.35	1.05	142	6,000	811	5,189	0.76	76	108	3	0.0	108	>10	yes	0.70	0.86	0.41	0.62	>>2	0.88	0.78	1.25	>>2
10	48.5	48.5	49.5	SW	100	130	1	1	1.35	1.05	142	6,455	1,030	5,425	0.75	75	107	3	0.0	107	>10	yes	0.68	0.84	0.42	0.64	>>2	0.86	0.80	1.29	>>2

Notes

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Earthquake PGA and Mw taken from the USGS Unified Hazard Tool mapped values.

The SPT "Simplified Procedure" is based on the Boulanger and Idriss (2014) Recommendations

Proj	Southern California Edison TLRR Program - Gorman-Kern River Project	Job No.	30002904 01325.C	Sheet No.	1 of 1
Calc	SPT "Simplified Procedure" Liquifaction Triggering Calculation	By	N. Trimble	Checked by	T. Newton
		Date	1/26/2022, rev 2/3/2022	Date	2/10/2022

Borehole ID: 3-005

Earthquake Values

Site Class	D	
PGA_M	1.19	2,475 year return period
M_W	7.9	2,475 year return period
PGA_M	0.64	475 year return period
M_W	7.7	475 year return period

Global Values

Borehole ID	3-005		Depth to Water	33.0	ft bgs	Hammer Energy	81.0	%	MSF	2,475 year return period	0.90	Pa	1,857	psf
Boring Elevation	3,627	ft	Borehole Dia	3.5	in	Liners in sampler?	n	(y/n)	MSF	475 year return period	0.95			

																								475 year return period				2,475 year return period			
No	Samp ID	Sample Depth (ft)	Sample Mid-Depth (ft)	USCS	N	γ (pcf)	C_R	C_S	C_E	C_B	N_{60}	σ_v (psf)	u (psf)	σ'_v (psf)	C_N	N_1	$(N_1)_{60}$	Fines	$\Delta(N_1)_{60}$	$(N_1)_{60,cs}$	CRR $_{M=7.5\ \sigma'v=1}$	Consider Lique-faction? *	K_σ	r_d	$CSR_{M,\sigma'v}$	CSR $_{M=7.5\ \sigma'v=1}$	Liq FOS	r_d	$CSR_{M,\sigma'v}$	CSR $_{M=7.5\ \sigma'v=1}$	Liq FOS
1	7	7	8	SM	24	117	1	1	1.35	1	32	936	0	936	1.21	29	39	15	3.3	43	>10	no	1.10	0.99	0.41	0.39	NA	0.99	0.77	0.78	NA
2	10	10	11	SM	40	125	1	1	1.35	1	54	1,311	0	1,311	1.10	44	59	15	3.3	62	>10	no	1.10	0.98	0.41	0.39	NA	0.99	0.76	0.77	NA
3	15	15	16	SM	57	130	1	1	1.35	1	77	1,961	0	1,961	0.99	56	76	15	3.3	79	>10	no	0.98	0.97	0.40	0.43	NA	0.97	0.75	0.85	NA
4	20	20	21	SM	82	130	1	1	1.35	1	111	2,611	0	2,611	0.91	75	101	19	4.3	106	>10	no	0.90	0.95	0.40	0.46	NA	0.96	0.74	0.92	NA
5	25	25	26	SM	61	130	1	1	1.35	1	82	3,261	0	3,261	0.86	53	71	15	3.3	74	>10	no	0.83	0.94	0.39	0.49	NA	0.95	0.73	0.98	NA
6	30	30	31	SM	40	125	1	1	1.35	1	54	3,886	0	3,886	0.82	33	44	15	3.3	48	>10	no	0.78	0.92	0.38	0.51	NA	0.93	0.72	1.02	NA
7	35	35	36	SM	48	129	1	1	1.35	1	65	4,531	187	4,344	0.80	38	52	15	3.3	55	>10	yes	0.75	0.90	0.39	0.55	>>2	0.91	0.74	1.09	>>2
8	40	40	41	SM	100	130	1	1	1.35	1	135	5,181	499	4,682	0.78	78	106	15	3.3	109	>10	yes	0.73	0.88	0.40	0.59	>>2	0.90	0.77	1.17	>>2
9	45	45	46	SM	71	130	1	1	1.35	1	96	5,831	811	5,020	0.77	55	74	15	3.3	77	>10	yes	0.71	0.86	0.41	0.62	>>2	0.88	0.79	1.24	>>2
10	48.5	48.5	49.5	SM	100	130	1	1	1.35	1	135	6,286	1,030	5,256	0.76	76	103	15	3.3	106	>10	yes	0.69	0.84	0.42	0.64	>>2	0.86	0.80	1.28	>>2

Notes

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Earthquake PGA and Mw taken from the USGS Unified Hazard Tool mapped values.

The SPT "Simplified Procedure" is based on the Boulanger and Idriss (2014) Recommendations

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