DOCKETED	
Docket Number:	79-AFC-04C
Project Title:	Compliance - Application for Certification of DWR Bottlerock Geothermal Project
TN #:	272582
Document Title:	BRP_CEC Response to DR 7__ 9112026_with Geotech
Description:	BRP_CEC Response to DR 7__ 9.11.2026_with Geotech
Filer:	John C Casteel
Organization:	Mayacma Geothermal LLC
Submitter Role:	Applicant
Submission Date:	9/11/2026 3:39:08 PM
Docketed Date:	9/11/2026

September 2, 2026

Anwar Ali, PhD
Senior Environmental Planner
Compliance Project Manager
Compliance, Monitoring and Enforcement Unit
California Energy Commission

RE: Response to Data Requests Set No. 7 – Bottle Rock Geothermal Power Plant (79-AFC-04C)

Anwar,

On behalf of Bottle Rock Power, LLC and Open Mountain Energy, please find the following response to Data Request Set. No. 7 (Paleontological, Geological, and Mineral Resources) for the Bottle Rock Geothermal Power Plant (79-AFC-04C). These responses provide clarification and additional details as requested in Data Request Set No. 9. Please let us know if you wish to discuss these responses.

Regards,

Brady Olson

Manager, Mayacma Geothermal LLC

Cc:

Enclosure Following: Responses to Data Request Set No. 9 (79-AFC-04C)

Data Request 1. Site-specific Preliminary Geotechnical Investigation

1. Please provide a timeline for when a site-specific preliminary geotechnical investigation will be completed and submitted to the CEC for review.

Response 1

The preliminary geotechnical investigation was completed in August 2026, and is attached herewith.

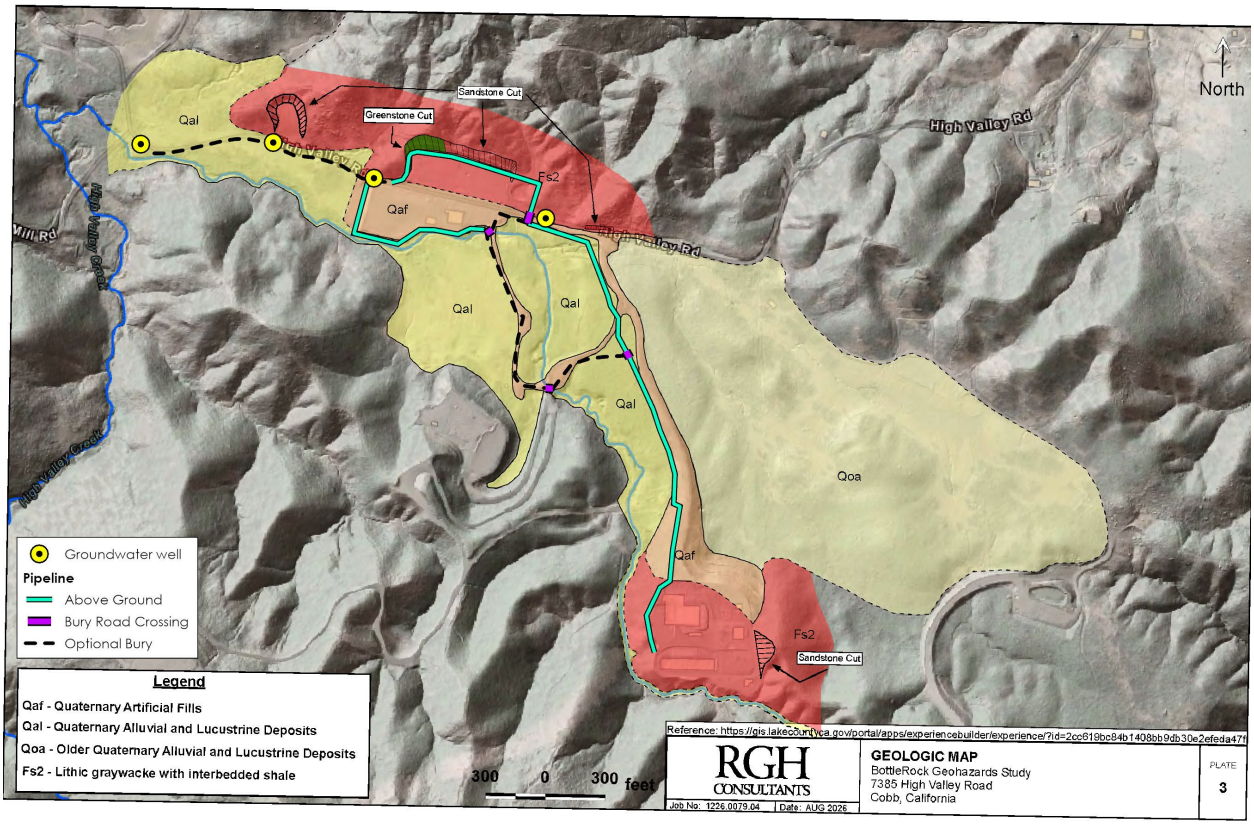
Data Request 2. Clarification of spatial extent of ground disturbance.

2. In the site-specific preliminary geotechnical investigation requested above, please clarify the spatial extent and depth of ground disturbing activities within undisturbed rock formations and Quaternary sedimentary deposits.

Response 2

The proposed pipeline would be located within areas containing Quaternary sedimentary deposits as shown on the figure that follows. The majority of the pipeline would be aboveground in these areas; however, some areas of buried pipeline are in areas containing Quaternary sedimentary deposits. Ground disturbance would be up to 3 feet deep in areas of buried pipeline.

Figure 1. Project Disturbance in Geologic Units



Data Request 3. Provide past paleontological studies.

3. Provide all past paleontological studies that were performed for the BRPP, including, but not limited to: "Archaeological Services, Inc. 2010., for "Bottle Rock Power Stream Project Cultural Resources Investigation Near Glenbrook, Lake County, California."

Response 3

The Cultural Resources Investigation report prepared in 2010 is a confidential document and can be made accessible to the CEC via direct coordination with California Historical Resources Information Systems. Mayacma does not have a complete copy of the report and with added concerns in handling of confidential information not generated by Mayacma, we are unable to provide the report directly in this response to the Data Request.

Statement of Report Confidentiality:

The contents of this report, including text, maps, graphics, and appendices are not subject to the disclosure requirements of the California Public Records Act. All current and future users shall treat the report and all of its content as confidential information. The information herein presented shall not be reviewed by or released to the public nor included, all or part, within any document that shall be accessible to the public. This prohibition excludes even casual review by (1) anyone not legally or officially involved in Bottle Rock Power Steam Project related planning or (2) other professional archaeologists recognized as such by the California Historical Resources Information System.

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PRELIMINARY GEOTECHNICAL STUDY REPORT

BOTTLEROCK GEOHAZARDS STUDY
7385 HIGH VALLEY ROAD
COBB, CALIFORNIA 95426

Project Number:

1226.0079.04

Prepared For:
Open Mountain Energy
Attn: Tiara Bechtold

Prepared By:

RGH Consultants

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REGISTERED PROFESSIONAL ENGINEER
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August 11, 2026

CERTIFIED ENGINEERING GEOLOGIST
JARED JACKSON PRATT
No. 2453
STATE OF CALIFORNIA

TABLE OF CONTENTS

INTRODUCTION

This report presents the results of our preliminary geotechnical study for two power generation units, water wells, and water transfer pipeline to be constructed at 7385 High Valley Road in Cobb, California. The BottleRock Power Plant (BRPP) property extends over moderately sloping terrain northeast of Cobb Mountain. The site location is shown on Plate 1.

We understand that it is planned to return BRPP to working conditions. This includes the construction of two 4.8-megawatt Binary Geothermal Power Generation Units, water wells, and water pipelines within the BRPP property.

The purpose of our study as outlined in our Professional Services Agreement dated April 2, 2026, revised June 8, 2026, was to evaluate the geologic hazards within the property and comment on the geotechnical feasibility of the project. In addition, we were to recommend the geotechnical services needed for actual development, design and construction of the project.

SCOPE

Our scope of work included the review of selected published geologic data, LIDAR imagery and our previous work in the vicinity of the site. Our Engineering Geologist was onsite to conduct a surficial reconnaissance of the power plant pad and water pipeline corridor, observing exposed topographic features, surface soils, rock outcrops, and cut banks. Subsurface conditions were evaluated through the excavation and logging of exploratory test pits within the proposed power generation unit footprints and along the proposed water pipeline alignment.

SERVICES PROVIDED

We reviewed aerial photographs of the site and select published geologic information pertinent to the site. A list of the geologic references reviewed is presented at the end of this report. On July 1, 2026, our geologist conducted a surficial site reconnaissance and marked our test pit locations. Our Engineering Geologist returned to the site on July 16, 2026, and conducted a surficial reconnaissance of the property to map exposed topographic features, surface soils, rock outcroppings, cut banks, and log the test pit excavations. A map of the property showing the location/alignment of proposed improvements along with the test pit locations is presented on Plate 2.

Based on the geologic literature review and site reconnaissance, we were to develop the following information:

1. A brief description of geologic, surface soil, and spring or other conditions observed during our reconnaissance;

2. Distance to nearby active faults and a discussion of geologic hazards that may affect the proposed project;

3. A brief description of surface soil, geologic exposures and spring or seepage conditions observed during our reconnaissance;

4. Our opinions regarding the geotechnical feasibility of the project; and

5. Preliminary conclusions and recommendations concerning;

    a. Primary geotechnical engineering concerns and possible mitigation measures, as applicable;

    b. Suitable foundation systems for new structures;

    c. Stability and feasibility of stable building envelopes and access routes;

    d. Slope stability within and adjacent to the project area;

    e. Paleontological conditions of the bedrock units anticipated to be disturbed during construction.

SITE CONDITIONS

General

Lake County is located within the California Coast Range geomorphic province. This province is a geologically complex and seismically active region characterized by sub-parallel northwest-trending faults, mountain ranges and valleys. The oldest bedrock units are the Jurassic-Cretaceous Franciscan Complex and Great Valley sequence sediments originally deposited in a marine environment. Subsequently, younger rocks such as the Tertiary-age Sonoma Volcanics group, the Plio-Pleistocene-age Clear Lake Volcanics and sedimentary rocks such as the Guinda, Domengine, Petaluma, Wilson Grove, Cache, Huichica and Glen Ellen formations were deposited throughout the province. Extensive folding and thrust faulting during late Cretaceous through early Tertiary geologic time created complex geologic conditions that underlie the highly varied topography of today. In valleys, the bedrock is covered by thick alluvial soils. The site is located on the eastern edge of the BottleRock steam field and northeast of Cobb Mountain.

Geology

Published geologic maps (McLaughlin, 1978) indicate that the project site is underlain by Franciscan Mélange and Quaternary alluvial and lacustrine deposits. The Quaternary deposits include older alluvial and lacustrine deposits (Qoa) and younger alluvial and lacustrine deposits (Qal). The Qoa unit consists of unconsolidated to semi consolidated, dissected alluvial fan, fluvial, and lacustrine deposits of Late Pleistocene age. These younger deposits are locally hydrothermally altered and cemented. The bedrock underlying these surficial deposits is mapped as Franciscan Mélange (fsr_2), a sheared tectonic assemblage composed of lithic graywacke, ranging from thinly bedded to massive, with minor interbeds of black shale, greenstone, and chert.

Landslides

Landslide maps (https://maps.conservation.ca.gov/cgs/lsi/app/) do not indicate large-scale slope instability at the site, and we did not observe active landslides at the site during our study.

Faulting

The site is not within a current Alquist-Priolo Earthquake Fault Zone for active faults as defined by CGS. CGS defines active faults as those exhibiting evidence of surface displacement during Holocene time (last 11,000 years). Maps prepared by CGS indicate that a trace of the Red Road Fault, part of the Konocti Bay Fault Zone, is located about 4½ miles North of the project site. In addition, several northwest-trending Earthquake Fault Zones exist in close proximity to, and within several miles of, the site. The shortest distances from the site to the mapped surface expression of these faults are presented in the table below.

ACTIVE FAULT PROXIMITY		
Fault	**Direction**	**Distance-Miles**
Healdsburg-Rodgers Creek	South	17 ¼
Maacama	Southeast	8
Konocti	North	4 ½
Hunting Creek	East	19 ¾

Surface

The property extends primarily over moderately sloping to level terrain. The power production facility is located on flat cut building pad on the south end of the property with sloping conditions headed north to the stream valley. The vegetation consists of mature trees, seasonal grasses and shrubbery. The proposed building site is located on the southeast corner of the main power production facility. The wells and water line to be constructed run north to northwest along the roadways.

In general, the ground surface on the cut pad for the production facility is moderately hard and surface fills overly bedrock. North of the production facility soft fluvial deposits span the valley floor. These deposits are associated with weak and porous surface soils. Moderately hard fills are present along roadways and the administration building pad.

Natural drainage consists of overland flow over the ground surface that concentrates on a natural drainage element such as swales and ravines. The drainage trends northwest towards High Valley creek.

Subsurface

Test pits excavated across the site encountered bedrock consisting of Franciscan Complex graywacke sandstone, and shale locally overlain in places by Quaternary alluvial deposits. The alluvium consisted predominantly of sandy gravel containing rounded to subrounded cobbles and boulders, consistent with deposition in a fluvial (stream) environment.

Paleontological Observations

Excavated materials were examined during field logging for evidence of paleontological resources through macroscopic visual inspection, supplemented by a 10× hand lens where appropriate. No fossil remains, fossiliferous bedding, shell fragments, plant material, trace fossils, or other paleontological resources were identified within the graywacke sandstone, shale, or the overlying Quaternary alluvial deposits. The absence of observed fossils is consistent with the lithologies encountered, as Franciscan graywacke and is generally considered to have low paleontological sensitivity, and Quaternary stream alluvium is typically not a significant source of in situ paleontological resources due to the reworked nature of the deposits.

DISCUSSION AND CONCLUSIONS

Geologic Hazards

Landslides

Landslide maps (https://maps.conservation.ca.gov/cgs/lsi/app/) and our observations do not indicate large scale slope instability at the site.

Fault Rupture

We did not observe landforms within the area that would indicate the presence of active faults and the site is not within a current Alquist-Priolo Earthquake Fault Zone. Therefore, we believe the risk of fault rupture at the site is low.

Strong Ground Shaking

Data presented by the Working Group on California Earthquake Probabilities (2002) estimates the chance of one or more large earthquakes (Magnitude 6.7 or greater) in the San Francisco Bay region within the next 30 years to be approximately 62 percent. The CGS Interactive Probabilistic Hazard Assessment Map for California (2002) indicates that peak ground acceleration at the site for an earthquake with a 10 percent chance of exceedance in the next 50 years is 0.721g for the site. Therefore, future seismic shaking should be anticipated at the site. It will be necessary to design and construct the proposed improvements in strict adherence with current standards for earthquake-resistant construction.

Lurching

Seismic slope failure or lurching is a phenomenon that occurs during earthquakes when slopes or man-made embankments yield and displace in the unsupported direction. Provided the improvements are located outside areas of identified slope instability and the foundations are installed as recommended herein, we judge the potential for impact to the proposed improvements from the occurrence of these phenomena at the site is low. However, some of these secondary earthquake effects are unpredictable as to location and extent, as evidenced by the 1989 Loma Prieta Earthquake.

Volcanism

The Clear Lake volcanic field has experienced a complex and cyclic eruptive history. The youngest eruptive sequence is dated at 10,000 years old (Miller, 1989; Sims and Rymer, 1975), and fumaroles (gas vents) are active throughout the Clear Lake Basin. These conditions suggest that the Clear Lake Volcanic System is not extinct and future eruptions could occur. Volcanic hazards that may be pertinent to the site area include phreatic and tephra eruptions and surges (Miller, 1989). Volcanic impact could range from inundation by several inches of ash to major ash flow eruptions. Due to the complex nature of the past episodic volcanic activity, no prediction regarding the extent or time of future volcanic activity is available. The risk of impact from volcanism at the site can be further influenced by wind and other climatologic conditions, is consistent with that of other properties in the Clear Lake area and is not considered to be sufficiently defined to preclude site development.

Geotechnical Issues

Based upon the results of our geologic data review and reconnaissance, we judge that it is geotechnically feasible to construct the Binary Power Generating Units, water well, and water pipeline. The primary geotechnical considerations and potential mitigating measures recommended for building site development are discussed in the following sections of the report. These conclusions are preliminary and will need to be verified or modified during final design following detailed site-specific subsurface exploration, laboratory testing and geotechnical engineering evaluations, as recommended herein.

Weak, Porous Surface Soils

Weak, porous surface soils, such as those found along the well and pipeline locations (TP-6, TP-12, TP-13), appear hard and strong when dry but will lose strength rapidly and settle under the load of fills, foundations, and slabs as their moisture content increases and approaches saturation. The moisture content of these soils can increase as the result of rainfall, periodic irrigation or when the natural upward migration of water vapor through the soils is impeded by, and condenses under fills, foundations, and slabs. The detrimental effects of such movements can be remediated by strengthening the soils during grading. This is typically achieved by excavating the weak soils and replacing them as properly compacted (engineered) fill. Alternatively, foundation support can be obtained by a foundation system that gains support below the weak surface soils.

Foundation Support

Satisfactory foundation support for the power generation units, pipeline and well pads can be obtained from spread footings or mat slabs that bottom at minimum depth on firm undisturbed bedrock or firm native soils. Criteria for the design of these foundation systems should be developed by a site-specific geotechnical study as recommended in the supplemental services section of this report.

Floor Systems

Slab-on-grade floors can be used provided that the planned grading either removes heterogeneous fills and/or the weak surface soils or increases their supporting capacity by mechanical compaction; and the slabs are reinforced to reduce cracks and span areas of uneven support.

Erosion and Site Drainage

The long-term satisfactory performance of the improvements results primarily from strict control of surface runoff and subsurface seepage. The site's surface soils have a low erosion potential. Uncontrolled erosion could induce sloughing or landsliding. Any downspouts from the future improvements should discharge into closed glued pipes that empty away from unstable areas and into nearby roadway or natural drainages. Discharge for roadway culverts, ditches, and downspout points need to be protected against erosion and sloughing by energy dissipators such as rip-rap and gabions, or equivalent protective and energy dissipation measures, as appropriate.

Groundwater

Free groundwater seeps or springs were not observed during our reconnaissance. On hillsides, rainwater typically percolates through the porous topsoil and migrates downslope in the form of seepage at the interface of the topsoil and bedrock, and through cracks in the bedrock. Fluctuations in the seepage rates typically occur due to variations in rainfall and other factors such as periodic irrigation.

Flooding

If the building sites are located as shown on Plate 2, we judge the risk of flooding will be low. However, evaluation of flooding potential is typically the responsibility of the project civil engineer.

Supplemental Services

We should perform a design level geotechnical study prior to the construction of the improvements. The study should include test borings or backhoe pits, laboratory testing and engineering analyses. Based on the currently planned improvements, we judge that the test pits that were excavated for this study will be sufficient to complete the design level study. The geotechnical study should address specific design and locating aspects of each planned residential location and the access road, and the data generated should be incorporated into project plans. The plans should then be reviewed by the geotechnical engineer and/or engineering geologist prior to receiving bids for planned work.

LIMITATIONS

This report has been prepared by RGH for the exclusive use of Open Mountain Energy LLC. and their consultants to evaluate the geotechnical feasibility of residential development within the proposed subdivision.

Our services consist of professional opinions and conclusions developed in accordance with generally accepted geotechnical engineering principles and practices. We provide no warranty, either expressed or implied. Our conclusions and recommendations are based on the information provided to us regarding the proposed parcel split: the results of our field reconnaissance, data review: and professional judgment. As such, our conclusions and recommendations should be considered preliminary and for feasibility and planning purposes only. A subsurface study, such as recommended herein, may reveal conditions different from those inferred by surface observation and data review only. Such subsurface study may warrant a revision to our preliminary conclusions.

Site conditions and cultural features described in the text of this report are those existing at the time of our field exploration on July 16, 2026, and may not necessarily be the same or comparable at other times.

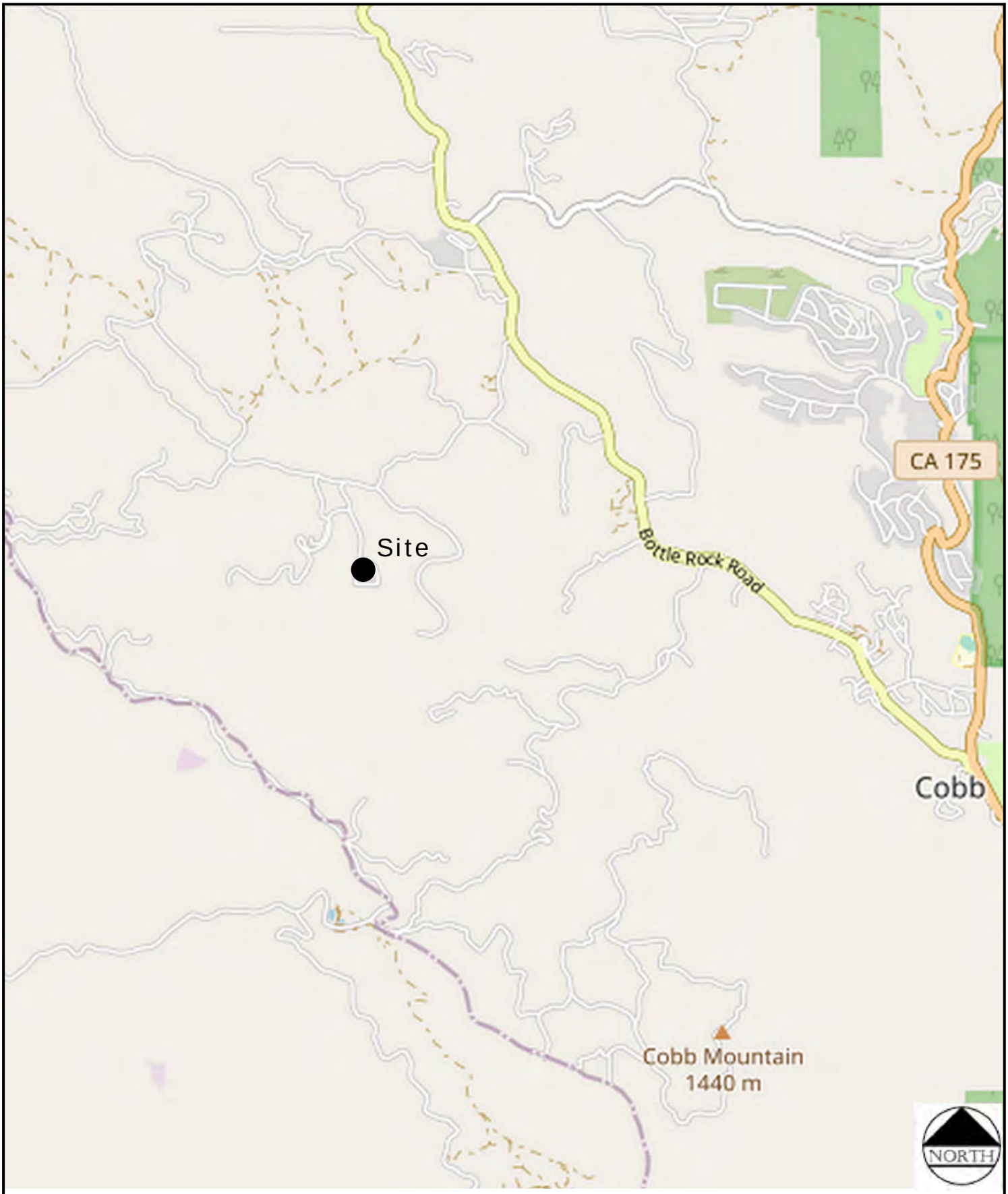
It should be understood that slope failures including landslides, debris flows and erosion are on-going natural processes which gradually wear away the landscape. Residual soils and weathered bedrock can be susceptible to downslope movement, even on apparently stable sites. Such inherent hillside and slope risks are generally more prevalent during periods of intense and prolonged rainfall, which occasionally occur in northern California and/or during earthquakes. Therefore, it must be accepted that occasional slope failure and erosion and deposition of the residual soils and weathered bedrock materials are irreducible risks and hazards of building upon or near the base of any hillside or steep slope throughout northern California. By accepting this report, the client and other recipients acknowledge their understanding and acceptance of these risks and hazards.

The scope of our services did not include an environmental assessment or a study of the presence or absence of hazardous, toxic or corrosive materials in the soil, surface water, groundwater or air on, below, or around this site, nor did it include an evaluation or study for the presence or absence of wetlands.

APPENDIX A - PLATES

LIST OF PLATES

Plate 1	Site Location Map
Plate 2a and 2b	Exploration Plan
Plate 3	Geologic Map
Plate 4 through 9	Test Pit Logs
Plate 10	Soil Classification and Key to Test Data
Plate 11	Engineering Geology Rock Terms



Reference: Mapline

Scale: 1" = 3000'

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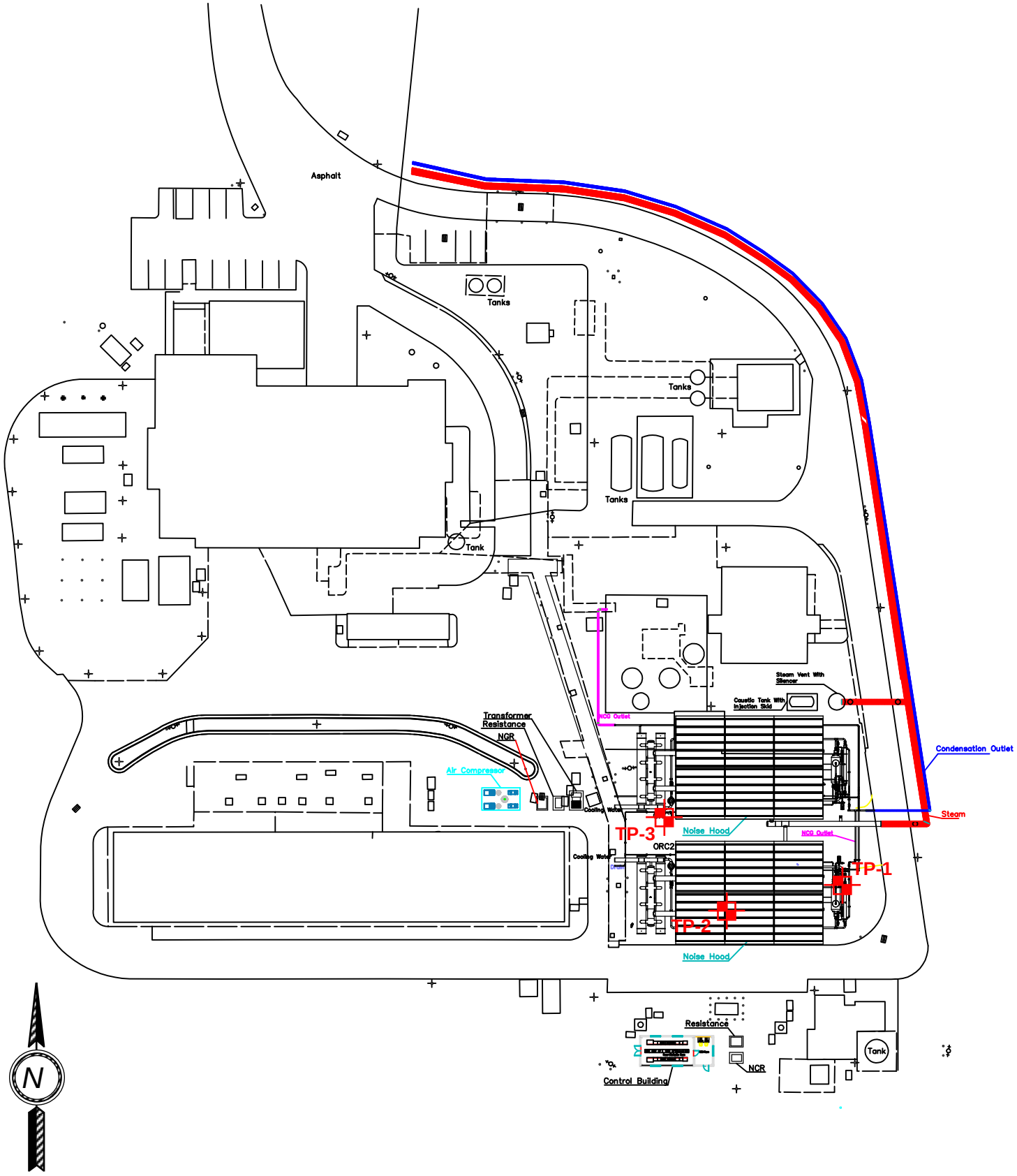
Job No: 1226.0079.04 | Date: AUG 2026

SITE LOCATION MAP
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
1



Reference: "Bottle Rock Plant" by Kaishan Engineering the Future, Undated, Sheet 01 of 01 Scale: 1" = 40'

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EXPLORATION PLAN
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
2a

EXPLANATION

TP-5 Test Pit Location and Number

30 0 30 feet

Reference: Google Earth, Imagery Date 5/29/2024 Scale: 1" = 30'

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EXPLORATION PLAN
BottleRock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
2b

North

Sandstone Cut

Greenstone Cut

Qal

Fs2

Qaf

High Valley Rd

Mill Rd

High Valley Creek

Qal

Qal

Qal

Qoa

Qaf

Fs2

Sandstone Cut

Legend

Qaf - Quaternary Artificial Fills

Qal - Quaternary Alluvial and Lucustrine Deposits

Qoa - Older Quaternary Alluvial and Lucustrine Deposits

Fs2 - Lithic graywacke with interbedded shale

300 0 300 feet

Reference: https://gis.lakecountyca.gov/portal/apps/experiencebuilder/experience/?id=2cc619bc84b1408bb9db30e2efeda47f

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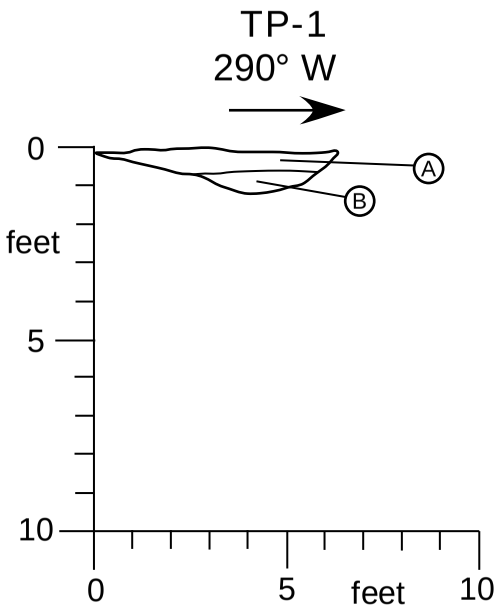
Job No: 1226.0079.04 Date: AUG 2026

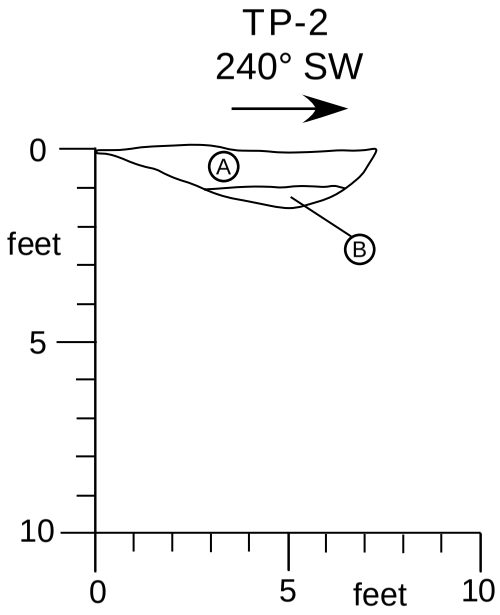
GEOLOGIC MAP
BottleRock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
3



(A) GRAY BROWN CLAYEY GRAVEL WITH SAND (GC), very dense, dry (Fill)

(B) GRAY GRAYWACKE SANDSTONE, closely laminated to thinly bedded, closely spaced fractures, hard to very hard, very strong, fresh to slightly weathered



(A) GRAY BROWN CLAYEY GRAVEL WITH SAND (GC), very dense, dry (Fill)

(B) GRAY GRAYWACKE SANDSTONE, closely laminated to thinly bedded, closely spaced fractures, hard to very hard, very strong, fresh to slightly weathered

Date of Exploration: 7/16/2026
Logged by: PLB
Contractor: Pearson

Scale: 1" = 5'

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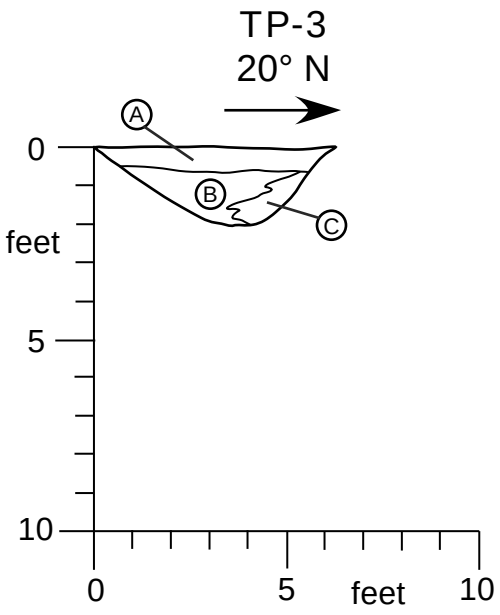
LOGS OF TEST PITS TP-1 AND TP-2
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

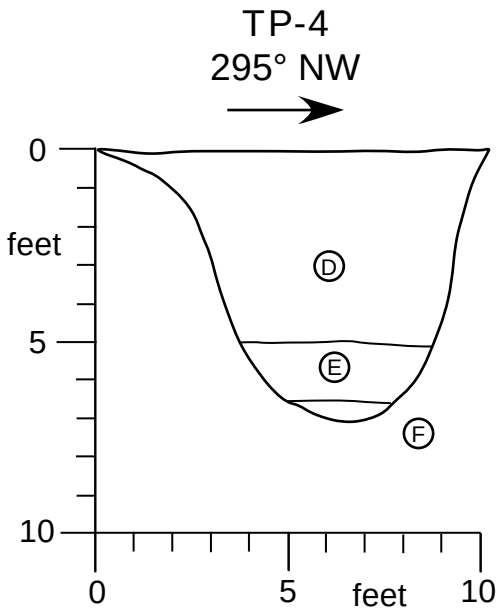
PLATE
3



(A) GRAY BROWN CLAYEY GRAVEL WITH SAND (GC), very dense, dry (Fill)

(B) GRAY GRAYWACKE SANDSTONE, thinly bedded, closely spaced fractures, hard to very hard, very strong, fresh to slightly weathered

(C) GRAY BROWN AND RED BROWN INTERBEDDED GRAYWACKE SANDSTONE AND SHALE, thinly bedded to closely laminated, very closely to closely spaced fractures, moderately hard to moderately strong, slightly to moderately weathered



(D) RED BROWN CLAYEY SAND WITH GRAVEL (SC), dense to very dense, dry, fine to coarse grained sand to 6 inches, rebar at 3 feet (Fill)

(E) RED BROWN CLAYEY SAND (SC), dense, dry, fine to coarse grained rounded sand, porous (Buried Surface Soil)

(F) LIGHT BROWN SHALE, firm, friable, highly weathered

Date of Exploration: 7/16/2026
Logged by: PLB
Contractor: Pearson

Scale: 1" = 5'

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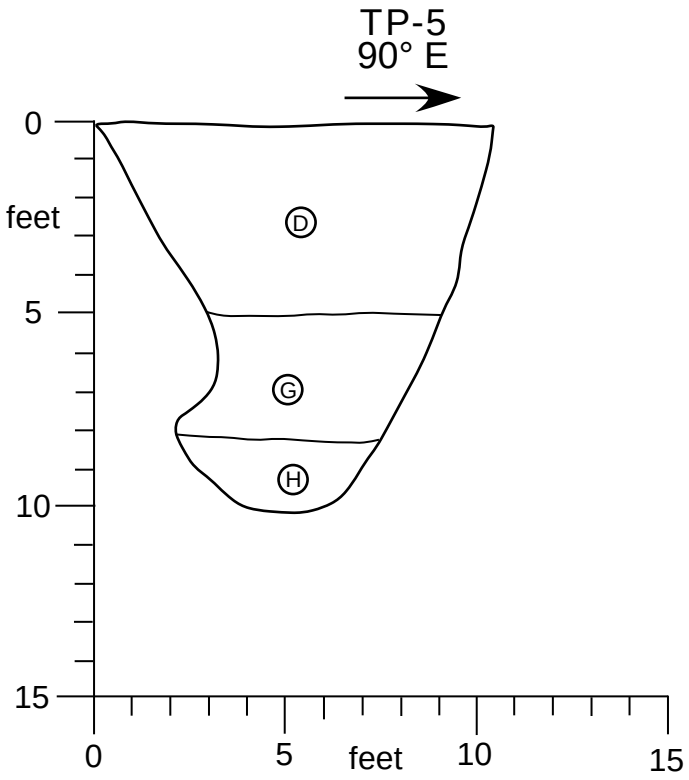
Job No: 1226.0079.04 | Date: AUG 2026

LOGS OF TEST PITS TP-3 AND TP-4
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

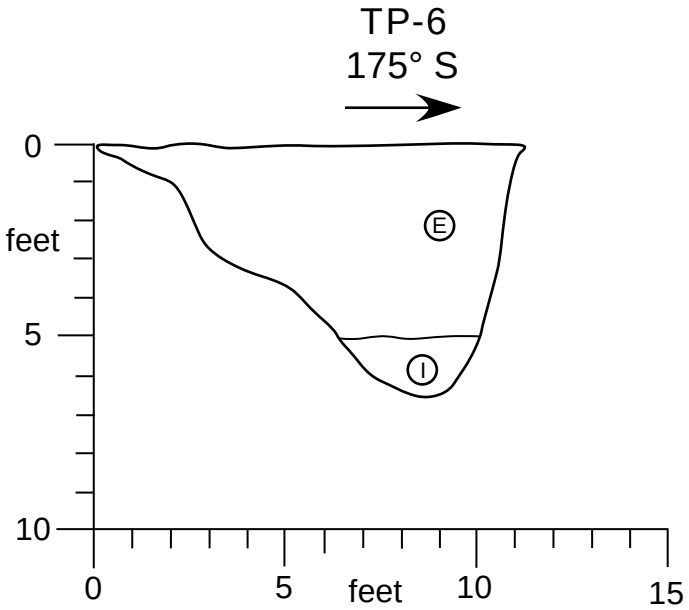
PLATE
4



Ⓓ RED BROWN CLAYEY SAND WITH GRAVEL (SC), very dense, dry, fine to coarse grained sand, fine to coarse angular gravel up to 1 inch in diameter (Fill)

Ⓖ DARK BROWN CLAYEY SAND (SC), dense, moist, fine grained sand, few rootlets (Buried Surface Soil)

Ⓗ BROWN SAND WITH CLAY AND GRAVEL (SP-SC), medium dense to dense, moist, fine to coarse grained sand, subrounded gravel up to 1/2" in diameter (Qal)



Ⓔ RED BROWN CLAYEY SAND (SC), very dense, dry, compacted to 6 inches on one side, and porous to 12 inches on the other, fine to coarse grained sand, fine subrounded gravel up to 1/2 inch in diameter

Ⓘ RED BROWN SANDSTONE, very closely spaced fractures, firm, friable to moderately strong, moderately to highly weathered

Date of Exploration: 7/16/2026
Logged by: PLB
Contractor: Pearson

Scale: 1" = 5'

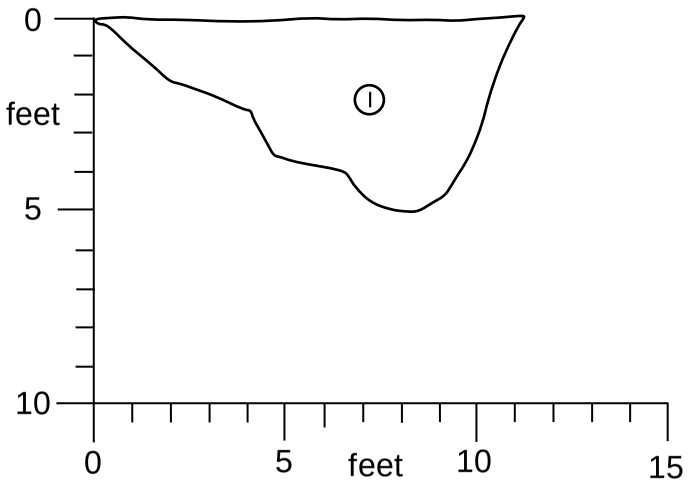
RGH CONSULTANTS

Job No: 1226.0079.04 | Date: AUG 2026

LOGS OF TEST PITS TP-5 AND TP-6
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

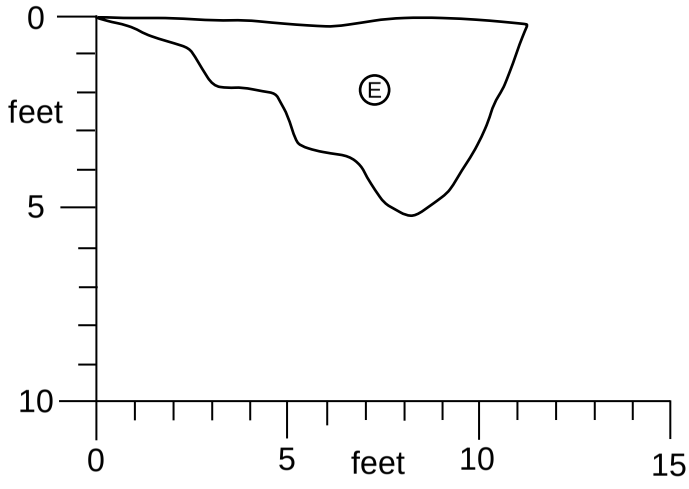
PLATE **5**

TP-7
205° SW



(I) RED BROWN AND GRAY BROWN GRAYWACKE SANDSTONE COBBLES WITHIN A RED BROWN CLAYEY SAND WITH GRAVEL MATRIX (SC), very dense, dry

TP-8
345° NW



(E) RED BROWN CLAYEY SAND WITH GRAVEL AND GRAYWACKE SANDSTONE COBBLES (SC), dense, dry, fine to coarse grained rounded sand, porous, cobbles are hard, very strong, slightly to moderately weathered

Date of Exploration: 7/16/2026
Logged by: PLB
Contractor: Pearson

Scale: 1" = 5'

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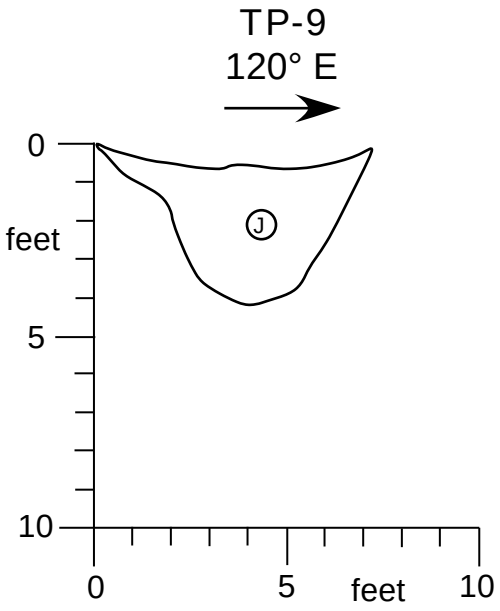
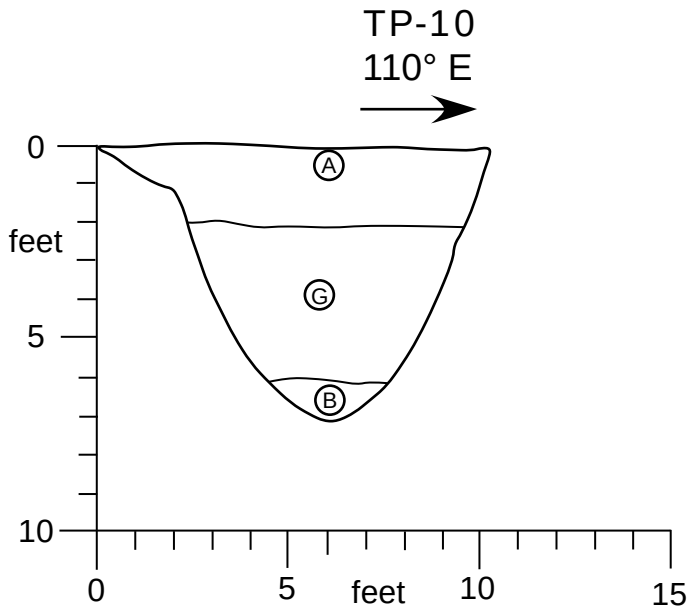
LOGS OF TEST PITS TP-7 AND TP-8
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
6



(J) RED BROWN SHALE, firm, friable to weak, locally moderately strong, moderately to highly weathered, porous and completely weathered to 6 inches



(A) GRAY BROWN CLAYEY SAND WITH GRAVEL (SC), very dense, dry (Fill)

(G) DARK BROWN CLAYEY SAND (SC), very dense, dry

(B) GRAY BROWN GRAYWACKE SANDSTONE, thinly bedded, closely spaced fractures, hard, strong, slightly to moderately weathered

Date of Exploration: 7/16/2026
Logged by: PLB
Contractor: Pearson

Scale: 1" = 5'

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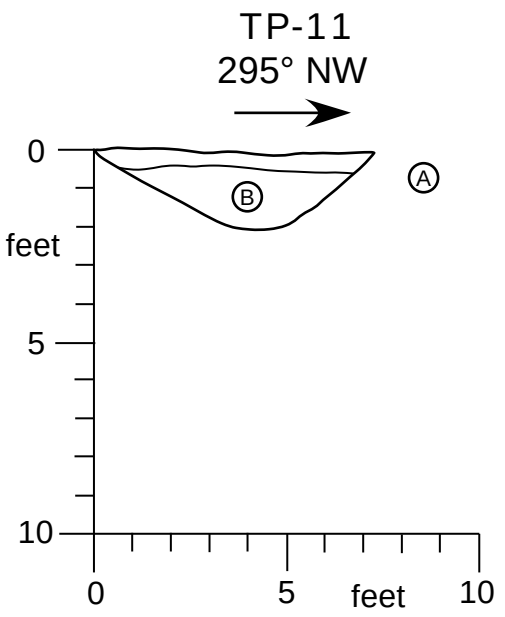
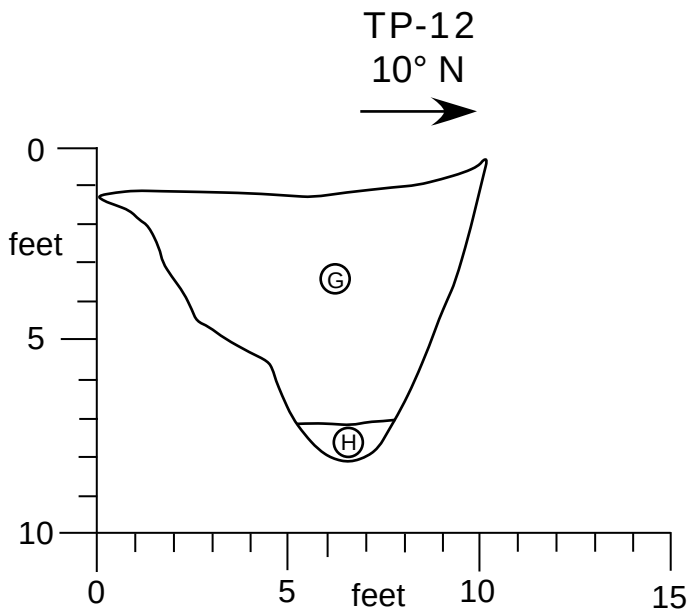
LOGS OF TEST PITS TP-9 AND TP-10
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
7



(A) GRAY BROWN GRAVEL WITH CLAY AND SAND (GP-GC), very dense, dry (Fill)

(B) GRAY GRAYWACKE SANDSTONE, thinly bedded, closely spaced fractures, hard, strong to very strong, slightly weathered



(G) BROWN CLAYEY SAND (SC), very dense, dry, fine to coarse grained sand, subrounded gravel up to 1/2 inch in diameter, porous to 12 inches

(H) BROWN SAND WITH CLAY AND GRAVEL (SP-SC), medium dense to dense, dry, fine to coarse grained sand, rounded gravel up to 1/2" in diameter

Date of Exploration: 7/16/2026
Logged by: PLB
Contractor: Pearson

Scale: 1" = 5'

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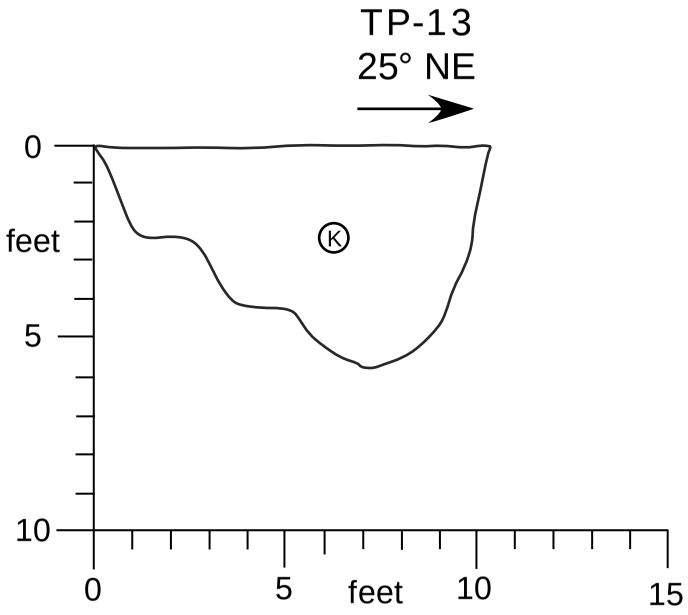
LOGS OF TEST PITS TP-11 AND TP-12
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
8



Ⓚ DARK BROWN SANDY CLAY WITH GRAVEL (CL), very stiff to hard, moist, fine to coarse grained sand, rounded gravel up to 1 inch in diameter, porous to 6 inches

Date of Exploration: 7/16/2026
Logged by: PLB
Contractor: Pearson

Scale: 1" = 5'

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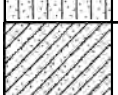
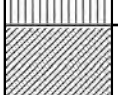
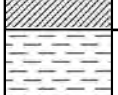
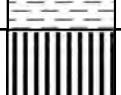
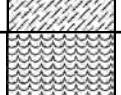
Job No: 1226.0079.04 | Date: AUG 2026

LOG OF TEST PIT TP-13
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE
9

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR FINES)		GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVEL, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVEL WITH FINES (OVER 12% OF FINES)		GM	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GC	CLAYEY GRAVEL, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SAND, GRAVELLY SAND, LITTLE OR NO FINES
				SP	POORLY-GRADED SAND, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (OVER 12% OF FINES)		SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
				SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50			ML	INORGANICS SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50			MH	ORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS AND OTHER SOILS WITH HIGH ORGANIC-CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

KEY TO TEST DATA

Consol - Consolidation
Gs - Specific Gravity
SA - Sieve Analysis
■ - "Undisturbed" Sample
⊠ - Bulk or Disturbed Sample
◪ - Standard Penetration Test
⊘ - Sample Attempt With No Recovery
▯ - Sample Recovered But Not Retained

Shear Strength, psf ↓		Confining Pressure, psf →	
Tx	320	(2600)	- Unconsolidated Undrained Traixial
TxCU	320	(2600)	- Consolidated Undrained Triaxial
DS	2750	(2600)	- Consolidated Drained Direct Shear
UC	2000		- Unconfined Compression
FVS	470		- Field Vane Shear
LVS	700		- Laboratory Vane Shear
SS			- Shrink Swell
EXP			- Expansion
P			- Permeability

Note: All strength tests on 2.8-in. or 2.4-in. diameter sample, unless otherwise indicated.

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Job No: 1226.0079.04 | Date: AUG 2026

SOIL CLASSIFICATION AND KEY TO TEST DATA
Bottle Rock Geohazards Study
7385 High Valley Road
Cobb, California

PLATE **10**

LAYERING

MASSIVE	Greater than 6 feet
THICKLY BEDDED	2 to 6 feet
MEDIUM BEDDED	8 to 24 inches
THINLY BEDDED	2½ to 8 inches
VERY THINLY BEDDED	¾ to 2½ inches
CLOSELY LAMINATED	¼ to ¾ inches
VERY CLOSELY LAMINATED	Less than ¼ inch

JOINT, FRACTURE, OR SHEAR SPACING

VERY WIDELY SPACED	Greater than 6 feet
WIDELY SPACED	2 to 6 feet
MODERATELY SPACED	8 to 24 inches
CLOSELY SPACED	2½ to 8 inches
VERY CLOSELY SPACED	¾ to 2½ inches
EXTREMELY CLOSELY SPACED	Less than ¼ inch

HARDNESS

Soft - pliable; can be dug by hand

Firm - can be gouged deeply or carved with a pocket knife

Moderately Hard - can be readily scratched by a knife blade; scratch leaves heavy trace of dust and is readily visible after the powder has been blown away

Hard - can be scratched with difficulty; scratch produces little powder and is often faintly visible

Very Hard - cannot be scratched with pocket knife, leaves a metallic streak

STRENGTH

Plastic - capable of being molded by hand

Friable - crumbles by rubbing with fingers

Weak - an unfractured specimen of such material will crumble under light hammer blows

Moderately Strong - specimen will withstand a few heavy hammer blows before breaking

Strong - specimen will withstand a few heavy ringing hammer blows and usually yields large fragments

Very Strong - rock will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments

DEGREE OF WEATHERING

Highly Weathered - abundant fractures coated with oxides, carbonates, sulphates, mud, etc., thorough discoloration, rock disintegration, mineral decomposition

Moderately Weathered - some fracture coating, moderate or localized discoloration, little to no effect on cementation, slight mineral decomposition

Slightly Weathered - a few stained fractures, slight discoloration, little or no effect on cementation, no mineral composition

Fresh - unaffected by weathering agents; no appreciable change with depth

APPENDIX B - REFERENCES

Bryant, W.A., 1992, Alexander-Redwood Hill fault, Sonoma County, California: California Division of Mines and Geology Fault Evaluation Report FER-233, 12 p., 4 photos, 4 plates, Scale 1:24,000.

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California Geological Survey. (n.d.). *Ground motion hazard maps*. Ground Motion Hazard Maps. https://maps.conservation.ca.gov/cgs/ms48/groundmotion/

McLaughlin, R.J., 1978, Preliminary geologic map and structural sections of the central Mayacamas Mountains and the Geysers steam field, Sonoma, Lake, and Mendocino Counties, California [GIS data], U.S. Geological Survey, Open-File Report OF-78-389, 1:24,000.

Miller, C.D., 1989, Potential hazards from future volcanic eruptions in California [Clear Lake area], U.S. Geological Survey, Bulletin 1847, 1:500,000.

Sims, J. D., & Rymer, M. J. (1975). Preliminary description and interpretation of cores and radiographs from Clear Lake, Lake County, California: Core 6. *Open-File Report*. https://doi.org/10.3133/ofr75569

APPENDIX C - DISTRIBUTION

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Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from alight industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ-sometimes significantly from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the express purpose of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer For Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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