Fault Rupture Hazard Evaluation

Proposed Subdivision of APN 510-371-010
2424 Bolier Avenue
McKinleyville, California

Prepared for:

Celine Pele

December 2025

025090

Phone: (707) 441-8855 **Email:** info@shn-engr.com
Web: shn-engr.com • 812 W. Wabash Avenue, Eureka, CA 95501-2138

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Prepared for:

Celine Pele

12/17/25

Alyssa R. Troia, PG 10424
Project Geologist

12/17/25

Gary D. Simpson, CEG 2107
Principal Engineering Geologist

Prepared by:

812 W. Wabash Ave.
Eureka, CA 95501-2138
(707) 441-8855

December 2025

Reference: 025090

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Abbreviations and Acronyms

Term	Definition
AAPG	American Association of Petroleum Geologists
ADU	accessory dwelling unit
A-P Act	Alquist-Priolo Earthquake Fault Zoning Act
APN	Assessor's parcel number
BGC	Busch Geotechnical Consultants
BGS	below ground surface
CBC	California Building Code
CDMG	California Department of Conservation, Division of Mines and Geology
CGS	California Geological Survey
DEM	digital elevation model
LiDAR	light detection and ranging
MRfz	Mad River fault zone
NR	no reference
USGS	United States Geological Survey

Introduction

Description of Proposed Development

This report presents the results of a fault rupture hazard evaluation for a proposed minor subdivision of Assessor's parcel number (APN) 510-371-010, at 2424 Bolier Avenue in McKinleyville, California (Figure 1, Appendix 1). Our understanding of the proposed project is based on the preliminary site survey showing the proposed parcels and proposed buildings, (Figure 2; Points West Surveying Co, November 2025;).

The subdivision of the 1.64-acre parcel will result in three individual parcels (Parcels 1, 2, and 3). Parcel 1 will contain the existing single-family residence, existing detached garage, and existing detached art studio; Parcel 2 will contain a proposed primary residence and proposed accessory dwelling unit (ADU); and Parcel 3 will contain the existing single-family residence, and a proposed ADU.

Purpose and Scope of Investigation

The eastern two thirds of the property is located within a state-designated Earthquake Fault Hazard Zone (CDMG, 1982) associated with the Mad River fault (Figure 3). The active trace of the Mad River fault is mapped approximately 200 feet east of the property (CDMG, 1982). The southwestern boundary of the State of California Earthquake Fault Zone as delineated under the Alquist-Priolo Earthquake Fault Zoning Act (A-P Act, Public Resources Code, Chapter 7.5, Division 2) encompassing the Mad River Fault, passes through the subject parcel. The intent of the A-P Act is to mitigate the hazard of surface fault rupture while mandating specific, detailed geologic studies to demonstrate the absence of active faulting before certain types of development are permitted. Because subdivision of land within an Earthquake Fault Zone is subject to the provisions of the A-P Act, the purpose of this investigation was to evaluate the presence or absence of evidence for past surface rupture events at the site.

SHN was retained to conduct a site-specific fault investigation to determine whether the existing structures and proposed new building sites on the new parcels are underlain by active faults.
The focus of our trench study spanned the portion of the property between the western edge of the mapped fault-hazard zone to just beyond the eastern fence line. The field investigation and trench layout were designed to address the potential for development on all three proposed parcels.

SHN's investigation included excavation of two exploratory earthquake-fault trenches. The trenches positioned to ensure that any faults trending near parallel to the mapped fault trace or fault-zone boundary would be exposed in the trench walls.

The scope of our investigation included review of pertinent published and unpublished maps and reports; reconnaissance and evaluation of surficial geomorphic and geologic conditions at the site and in the site vicinity to evaluate evidence for the location of active fault traces; review of historic aerial imagery and light detecting and ranging (LiDAR) data to for lineations or geomorphic indicators related to active faulting; coordination and oversight of the excavation of two exploratory fault trenches across the property, and interpretation and logging of the subsurface materials exposed in the trenches; coordination of third-party review of the fault study, per the requirements of the A-P Act; and compilation of field data and development of this report.

Geologic Setting

Regional Geology

Basement rock underlying the property is composed of late Jurassic- to late Cretaceous-age mélange of the Franciscan Complex (McLaughlin and others, 2000; Clarke, 1992). The Franciscan basement rock is overlain by a variety of late Cenozoic age sedimentary rocks, which in coastal central Humboldt County includes the Falor formation (see Figure 3 and Figure 3a) and a series of late Pleistocene-age marine terraces (Carver and others, 1984). McKinleyville is located on a particularly well-developed flight of marine terraces that extends from the modern coastline to the hills along the eastern side of town. These terraces typically consist of an abrasion platform cut across bedrock, covered by sediments typically consisting of near-shore marine deposits and terrestrial alluvial, colluvial, and eolian deposits. The terrace at the subject property correlates to the 83,000-year-old Stage 5a sea level high stand, according to Carver and Burke (1992); this surface is referred to as the "Savage Creek terrace."

Tectonic Setting

Northwestern California is located in a complex tectonic region dominated by northeast-southwest compression associated with collision of the Gorda and North American tectonic plates. The Gorda plate is being actively subducted beneath North America north of Cape Mendocino, along the southern part of what is commonly referred to as the Cascadia Subduction Zone. This plate convergence has resulted in a broad fold and thrust belt along the western edge of the accretionary margin of the North American plate. In the Humboldt Bay region, this fold and thrust belt is manifested as a series of northwest-trending, northeast-dipping thrust faults, including the Little Salmon fault and faults that comprise the Mad River fault zone (MRfz). These faults are active and can generate large-magnitude earthquakes. Figure 4 depicts the tectonic setting within the project vicinity.

The project site is located within the MRfz. This zone consists of several major northwest-trending thrust faults and numerous minor, secondary synthetic and antithetic faults. Major faults within the MRfz include (from north to south): the Trinidad, McKinleyville, Mad River, and Fickle Hill faults. The project site is located within the Earthquake Fault Zone associated with the Mad River fault (Figures 3 and 5). Individual faults within the MRfz exhibit variable strikes, which is common along thrust faults, and shallow to moderate dips ranging from as little as 10 degrees to as much as 55 degrees. At least 5 kilometers (3 miles) of middle and late Pleistocene displacement has occurred across the MRfz since deposition of the Falor formation (Carver, 1987). In the McKinleyville area, the MRfz cuts across and displaces the flight of marine terraces described above. The faults are typically well expressed at the surface as west- and southwest-facing scarps separating the displaced, relatively planar terrace surfaces. Antithetic faults within the MRfz are typically associated with lesser amounts of cumulative displacement and form subtle northeast-facing scarps. Only one moderate historic earthquake may have been generated within the MRfz, but all the faults within the zone are considered active, based on deformation of Holocene-age soils overlying the faults. Limited paleoseismic data is available to constrain the timing of past earthquakes on faults within the MRfz, but available data suggest recurrence intervals on the order of thousands of years. The principal faults within the MRfz are considered active by the state and are included within Alquist-Priolo Earthquake Fault Zones. This investigation focuses on the Mad River fault, which has been investigated on other properties to the southeast of the project site (see below).

Mad River Fault

Although up to four traces of the Mad River fault have been mapped in the McKinleyville region (Carver and others, 1984), only the easternmost two traces are included by the state within the Alquist-Priolo Earthquake Fault Zone (CDMG, 1982). These faults form a southwest-stepping fault pair. The easternmost trace is mapped as extending from the coastal bluff north of the project site near the west end of Murray Road, to the southeast beneath U.S. Highway 101 and across School Road. Near the project site, the eastern trace strikes about N15W, on the west side of U.S. Highway 101, and progressively bends to the southeast toward its terminus south of School Road. Trenching investigations south of School Road indicate the eastern trace of the Mad River fault dies out to the south and east of Bugenig Avenue.

In the vicinity of School Road, the fault appears to strike about N70W, based on the trend of the geomorphic escarpment. The eastern fault trace is associated with a prominent topographic scarp north of School Road (referred to herein as the "School Road scarp"), which becomes increasingly subdued as it extends southeastward across School Road. The western A-P zoned trace of the Mad River fault overlaps the eastern trace between School Road and U.S. Highway 101 and extends toward the southeast to the northern valley wall of the Mad River (Figure 3). This scarp becomes very high (60+ feet) directly south of School Road; however, scarp height may have been enhanced in the past by incision by the Mad River.

To the north and west of School Road and U.S. Highway 101, in the vicinity of the project site, the Mad River fault is expressed as a roughly 10-foot-high, approximately 100- to 150-foot-wide scarp. Topography suggests the scarp is present east of the project site, east of Bolier Avenue. The scarp appears to cross Bolier Avenue at Eucalyptus Road, northeast of the project site.

Previous Fault Investigations

Numerous trenching studies have been conducted within the Earthquake Fault Zone along the Mad River fault in the site vicinity. The locations of select investigations referenced below are shown on Figure 5. Initial trenching investigations were associated with research studies of the Mad River fault by Carver (1987) on a property east of U.S. Highway 101 and north of School Road. At that site, the Mad River fault is present as a tight, overturned fault-propagation fold that deforms the once-horizontal terrace abrasion surface. The fold and associated colluvial wedges suggest repeated, episodic movement of an underlying "blind" thrust fault. Latest Pleistocene age dates from radiocarbon dating of charcoal from two of the three shallowest (youngest) colluvial wedges at the site suggest only minimal Holocene activity (one, possibly two rupture events). At other nearby sites, the thrust fault has propagated to the ground surface, and juxtaposes Franciscan basement rock against colluvium or marine terrace deposits.

A study by Busch Geotechnical Consultants (BGC, 1990), a few hundred yards northwest of the Carver research site, documents the Mad River fault as Franciscan bedrock thrust over colluvium derived from marine terrace sediments. No colluvial wedges were apparent in the BGC trench, and the fault was a discrete rupture to the ground surface (as opposed to the overhanging fault propagation fold observed in Carver's trench). Bedrock in the upper plate at the BGC study site displays distributed shear that extends nearly 70 feet northeast of the fault. The age of these bedrock shears cannot be constrained due to the absence of marine terrace sediments overlying the Cretaceous age bedrock.

A study by SHN (1999) identified the Mad River fault at a site southwest of Betty Court, south of School Road. A set of closely spaced, primary thrust faults were identified in the western portion of the property. However, it was determined the fault terminates on the eastern portion of the property.

A study by SHN (2002) identified the Mad River fault at a site east-southeast of Bugenig Avenue, as three closely spaced, low angle, northeast-dipping thrust faults with an estimated strike of N30W.

A study by SHN (2006) identified the Mad River fault, north of School Road, as Franciscan bedrock over late-Pleistocene age marine terrace deposits. The fault strike was measured as N60W to N70W, roughly parallel to the topographic scarp.

The property immediately north of this project (at APN 510-371-044 prior to its subdivision) was evaluated in a fault trenching investigation and cleared for the presence of active faulting (SHN, 2020).

Field Investigation and Site Description

Site Description

The project site is located south of Eucalyptus Road, between Bolier Avenue and the Hammond Trail (Figure 1). The existing parcel is nearly rectangular and contains two single family residences, a detached garage, detached art studio, and sheds. The site is approximately 200 feet west of the mapped trace of the Mad River fault. SHN visited the site on June 6, 2025, to conduct a reconnaissance of geomorphic and surficial conditions and to determine the planned layout of the fault trenches. Topography indicates that the fault scarp lies on the east side of Bolier Avenue, with its base just east of the subject parcel. The scarp crosses Bolier Avenue obliquely near Eucalyptus Road. The subject parcel itself is essentially flat, with minimal evidence of past grading. Figure 6 presents a digital elevation model (DEM) of the site and surrounding area relative to the mapped active trace of the Mad River fault, expressed as a distinct scarp.

Site Investigation

Two trenches were excavated across the parcel from the west edge of the A-P zone boundary to just east of the eastern fence line. The locations of the two trenches were determined based on practical accessibility, the locations of existing structures and large trees, and to provide sufficient overlap between the two, such that any fault passing between them would be exposed in the trench walls. Trench 1 was excavated in the northwestern portion of the property from the western boundary of the Earthquake Fault zone extending approximately 112 feet east. Trench 2 was excavated approximately 30 feet to the north of Trench 1, with roughly 15 feet of overlap. Beginning at the gravel driveway, Trench 2 extended approximately 123 feet east across the property. Figure 2 shows the locations of the trenches.

The trenches were specifically oriented to ensure full coverage of the fenced area within the Earthquake Fault Zone and be as close to perpendicular to the mapped fault trend as feasible. Accordingly, Trench 1 (N87°E) and Trench 2 (N74°W) were excavated at orientations that are roughly perpendicular to the expected north-northwest-trending strike of the Mad River fault and the mapped Earthquake Fault Zone boundary (Figure 2). This orientation was designed to maximize the probability of intersecting active fault traces, including those that might trend slightly oblique to the primary fault strike. The trenches were excavated to depths ranging from 8 to 9 feet below the ground surface (BGS).

Both trenches were excavated, studied, and backfilled from August 25–29, 2025. The trenches were excavated by Bigfoot Construction using a mini-excavator with a 24-inch bucket and hydraulically shored to support the trench walls. The entire southern wall of each trench was scraped clean to provide fresh exposures of the subsurface stratigraphy. SHN's geologists logged the exposed stratigraphy in the trenches at a scale of 1 inch = 2 feet. Descriptions of the stratigraphic units as delineated and described in the field are included in Appendix 2.

Humboldt County's third-party reviewer conducted a field review of each trench on August 26 (Trench 1) and August 28 (Trench 2), after logging of stratigraphy was complete. Upon completion of third-party review, each trench was backfilled with the excavated soils. The backfill was not placed as structural fill, nor compacted to California Building Code (CBC) standards; thus, consideration should be given to the construction of any planned structures relative to the backfilled trenches.

Both trenches exposed laterally continuous Holocene and late Pleistocene deposits along the entire lengths explored. These units provided clear, mappable marker horizons appropriate for evaluating potential deformation associated with past fault rupture events.

Results

Site Stratigraphy

The stratigraphy exposed in the trenches consisted of up to eight distinct, mappable units. The stratigraphy in each trench generally consisted of a dark brown native eolian (wind-blown) deposit, locally disturbed and reworked in places, and underlain by marine terrace deposits along the entire length of both trenches. The units are described below and shown on the trench logs in Appendix 2.

Unit 1

The uppermost unit consists of dark brown silty sand and silt that is locally bioturbated and stirred by root development. The unit is also locally disturbed where minor historic grading has occurred across the property and where root throw craters were observed. The undisturbed portions of Unit 1 are consistent with eolian deposits seen in subsurface exposures in north coastal Humboldt from Table Bluff to McKinleyville. This material is interpreted to have been carried in by wind and deposited on an exposed continental shelf surface during the last glacial maximum (ice age) approximately 15,000 to 20,000 years ago. The basal contact of this unit is irregular and wavy, and disrupted by bioturbation and roots. Unit 1 extends the lengths of both trenches.

Unit 2

Unit 2, the uppermost unit of the exposed stratigraphic sequence, consists of light yellowish brown, poorly graded, fine sand. Dark brown krotovina is present throughout the unit, as well as occasional root development and trace rounded cobbles. The base of the unit is marked by a mostly well-defined contact that is occasionally somewhat indistinct. The lower contact is sharp along the entire length of Trench 1, extending east to Trench 2 where it fades/dies out toward the east, between Trench 2 Station 110 and 112 feet (horizontal distance).

Unit 3

Unit 3 consists of light yellowish-brown, silty to clayey sand with iron oxide stains and mottling. Slightly more cohesive and plastic lenses containing a higher clay content are present occasionally throughout the unit. Root disturbance and krotovina were commonly observed. The lower contact is irregular/wavy and mostly sharp to slightly gradational. The unit is locally disturbed by Unit 4, which is somewhat mixed into Unit 3 at two locations between stations 68 and 83 in Trench 2. Between stations 0 and 108 (in Trench 2), Unit 3 is overlain by Unit 1. Unit 3 extends the entire length of both trenches.

Unit 4

Unit 4 consists of pale olive, fine sand with trace silt and iron staining. An approximately 4-inch-thick lens of sandy silt was observed in Trench 1 extending from Station 25 to station 42. The lower contact is slightly gradational but clear and was a key marker horizon for our evaluation of the presence/absence of faulting.

Unit 5

Unit 5 consists of pale olive fine sand with silt, characterized by the consistent prevalence of approximately 15% manganese-oxide flecks and fine concretions along the lengths of both trenches. The manganese oxide sands occur mostly in a chaotic orientation, with occasional laminated sections at the upper contact of the unit. The basal contact of Unit 5 is mostly sharp and continuous throughout both trenches. It served as a key marker horizon.

Unit 6

Unit 6 is comprised of alternating beds of pale olive, very fine sand with silt and strong brown (oxidized), silty fine sand. The upper portion of the unit includes an approximately 2-inch-thick bed of strong brown silty to clayey fine sand (observed extending the entire length of Trench 1 to station 38 in Trench 2). Trace manganese-oxide flecks and small nodules are present throughout the unit. The base of the unit is in sharp contact with Unit 7 (where Unit 7 is exposed).

Unit 7

Unit 7 consists of light olive-gray, fine sand with silt, and weak, discontinuous laminations of oxidized sands. At the eastern end of Trench 2, the upper portion of Unit 7 is marked by a ¼–½-inch-thick bed of silty, low-medium plasticity clay, pinching out to the west. Unit 7 is exposed where the trench sidewall is deeper than about 8 feet BGS in both trenches, which in Trench 2 is continuous from station 0 to 63, and intermittent (due to trench depth) along the entirety of Trench 1.

Unit 8

Unit 8 consists of an organic layer (paleosol) interbedded with sands. We interpret Unit 8 to represent deposition in a marsh-like or back-dune environment, where organic-rich horizons and rooted vegetation were buried by successive packages of fine sand, producing the discrete paleosol horizons observed in the trench exposures (described below).

The uppermost paleosol is a soft, dark reddish gray to black, sandy elastic/organic silt (shown in solid black on trench logs T2-1, T2-2, and T2-3). The layer is about 2 to 4 inches thick and contains approximately 30% very fine plant/grass fibers. The layer appears to be continuous in Trench 2 from station 0 to station 56, though it is only exposed where the trench is deep enough.

The uppermost paleosol/organic-rich silt layer, where present, grades downward into dark bluish gray fine sand with trace silt. This fine sand contains roughly 5% upright, fine plant stems (~3–5 millimeters wide), suggesting preservation in growth position. Below the plant-bearing bed, the fine sand further grades into a light olive gray sand exhibiting iron-oxide Liesegang banding and thin laminations.

A deeper, compositionally similar plant-bearing elastic/organic silt was encountered in hand-auger boring HB-1 (Trench 2; station 14), approximately 2.5 feet beneath the upper paleosol layer (at approximately 11 feet BGS).

Unit 8 was not exposed in Trench 1.

Conclusions

1. The trenching investigation exposed geologic materials that provide sufficient control for evaluating the late Pleistocene and Holocene faulting history at the site. The marine terrace sediments exposed in the trenches offer excellent stratigraphic continuity for interpreting deformation associated with the past fault rupture events. Contacts between Units 4, 5, and 6 served as the primary marker horizons for this assessment.
2. No evidence of Holocene faulting was observed in the exposed subsurface stratigraphy on the subject property. The stratigraphic contacts between Units 4, 5, and 6 were observed to be undisturbed, laterally continuous, and planar, confirming the absence of fault rupture and secondary deformation (tilting, warping, folding) across the site. Additionally, there is no evidence of secondary deformation or faulting in any of the other logged units.
3. The potential for future surface fault rupture to affect this site is considered low, based on the absence of subsurface or geomorphic indicators at the site.
4. In the absence of any fault-related deformation in the trenches and based on the mapped location of the active fault trace east of the project site, a structural setback is not recommended at the east end of Trench 2. The zone cleared for the proposed development is shown on Figure 2.

Recommendations

The proposed subdivision is considered suitable for development based on the evidence for the absence of faulting or surface rupture on the site. This includes existing and proposed structures within the "area cleared of active faulting" on Figure 2. There are no required setbacks defined by the Alquist-Priolo Earthquake Fault Zoning Act or the guidelines of the California Geological Survey for structures on the subject property, as the site has been demonstrated through this investigation to be free of Holocene surface fault rupture hazard. The trench layout investigated the width of the property within the Earthquake Fault Zone (to just beyond the eastern fence line); thus, no additional fault-rupture hazard investigation is warranted for the proposed subdivided parcels.

This report addresses surface fault rupture hazard only. It is not an evaluation of the geotechnical conditions at the site and should not be construed as a geotechnical (soils) report. It should be noted that any foundation designs for new structures should account for the uncompacted trench backfill to mitigate the potential for differential settlement. Where feasible, linear foundations elements that run parallel to trench alignments should be located at least 15 feet away from the nearest trench wall. Where foundation elements are planned to cross a trench, the trench section should be excavated and replaced with structural fill or the foundation element designed to span the trench. Additional geotechnical reporting may be required by the County of Humboldt prior to approval or permitting of any new buildings.

Closure and Limitations

The conclusions and recommendations presented herein are the results of a study of inherently limited scope. Specifically, the scope of our services consisted solely of an evaluation of surface fault rupture potential at the site where investigated. Our conclusions and recommendations are professional opinions derived in accordance with current standards of professional practice. No warranty is expressed or implied.

The data and conclusions we have presented are based on our professional interpretations of available geologic data. Existing site conditions have evolved according to the geologic processes of the past. It is conceivable that tectonic processes may change or accelerate in an unpredictable manner in the future. Because this portion of Humboldt County is an area of dynamic tectonism, we cannot preclude the possibility of propagation of new faults or the lengthening of existing faults. Therefore, all future risks from surface fault rupture cannot be precisely determined nor avoided when developing in a zone of active and potentially active faults.

This report applies only to the proposed development plans. If significant changes in the development plans should occur, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed by SHN, and the conclusions and recommendations of this report are verified in writing.

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1 Figures

Celine Pele
Fault Evaluation Report for Proposed Subdivision
Bolier Ave, McKinleyville, Humboldt County, California

Project Location
December 2025 - 025090

Figure
1

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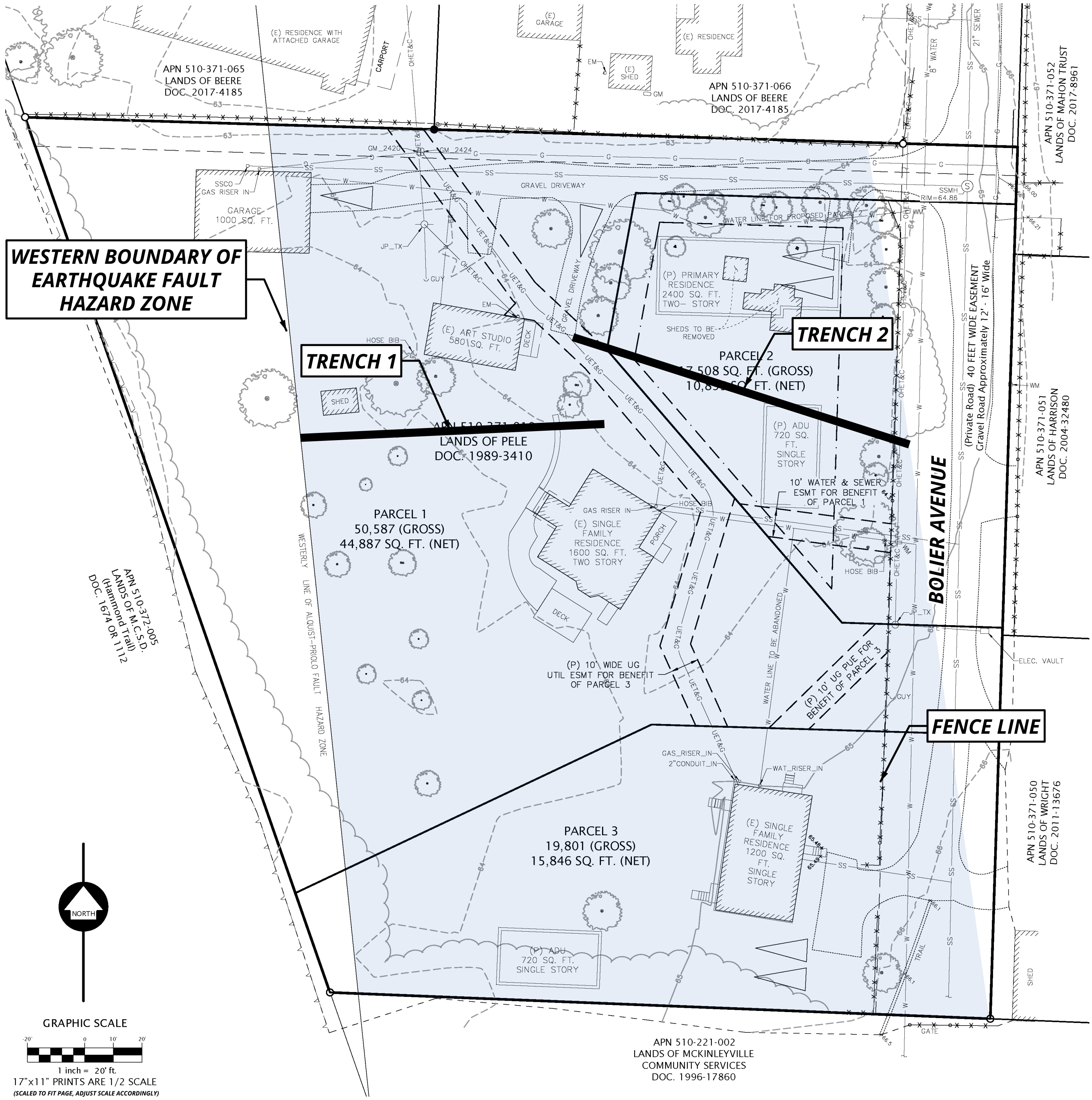

EXPLANATION

- *EARTHQUAKE FAULT TRENCH*
- *AREA CLEARED OF ACTIVE FAULTING*

MODIFIED FROM:
PRELIMINARY MAP FOR CELINE PELE,
POINTS WEST SURVEYING CO., NOVEMBER 2025

SHN

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Fault Evaluation Report for Proposed Subdivision
Bolier Ave, McKinleyville, Humboldt County, California

Geologic Map
Kelley (1984)
December 2025 - 025090

Figure
3

EXPLANATION

QUAD/STUDY AREA BOUNDARY

APPROXIMATE LOCATION

COASTLINE

KNOWN LOCATION

DIPBED

MARSH

ACTIVE SLIDE: TOO SMALL TO DELINEATE AT THIS SCALE.

FAULT (APPROXIMATE)

LINEAMENT

THRUST FAULT (APPROXIMATE)

LS ARROWS & ARCS

DISTURBED GROUND

TRANSLATIONAL/ROTATIONAL DORMANT

DEBRIS SLIDE AMPHITHEATER/ SLOPE

Q - ALLUVIUM (Holocene): unconsolidated sand, silt, gravel, and clay deposited by streams in canyon bottoms.

Qbs - BEACH DEPOSITS (Holocene): sands and gravels along the coast line.

Qmts - MARINE TERRACE DEPOSITS undifferentiated, progressively older with increased elevation (Pleistocene): deposits generally consist of well-sorted quartz sand with minor gravel and have coarser textures near major drainages; may include some dune sands.

Qods - OLDER DUNES (Pleistocene): well-sorted, semi-consolidated, fine- to medium-grained quartz sand overlying wave-cut platforms and terraces.

Qrt - ALLUVIAL TERRACE DEPOSITS (Holocene-Pleistocene): sand and gravel located above present-day streams and creeks forming flat benches adjacent to those streams and creeks.

Qsc - STREAM/RIVER CHANNEL DEPOSITS (Holocene): stream channel deposits of sand and gravel.

QTfa - ALLUVIAL FAN DEPOSITS (Pliocene-Pleistocene): coarse, poorly sorted sand and gravel derived from nearby highlands; fan-shaped accumulations at canyon mouths; locally cemented.

KJfs - CENTRAL BELT FRANCISCAN SEDIMENTARY ROCKS (Cretaceous-Jurrasic): well consolidated sandstone, siltstone, and shale with minor amoutns of conglomerate; structurally deformed and usually highly sheared; includes areas mapped as Franciscan Broken Formation by Carver and others (1984).

fm - FRANCISCAN MELANGE (Cretaceous-Jurassic): individual blocks of graywacke, sandstone, mudstone, conglomerate, greenstone, chert, and serpentinite in a sheared argillaceous matrix.

DATA SOURCE:
CGS (NCWMP) (2010)

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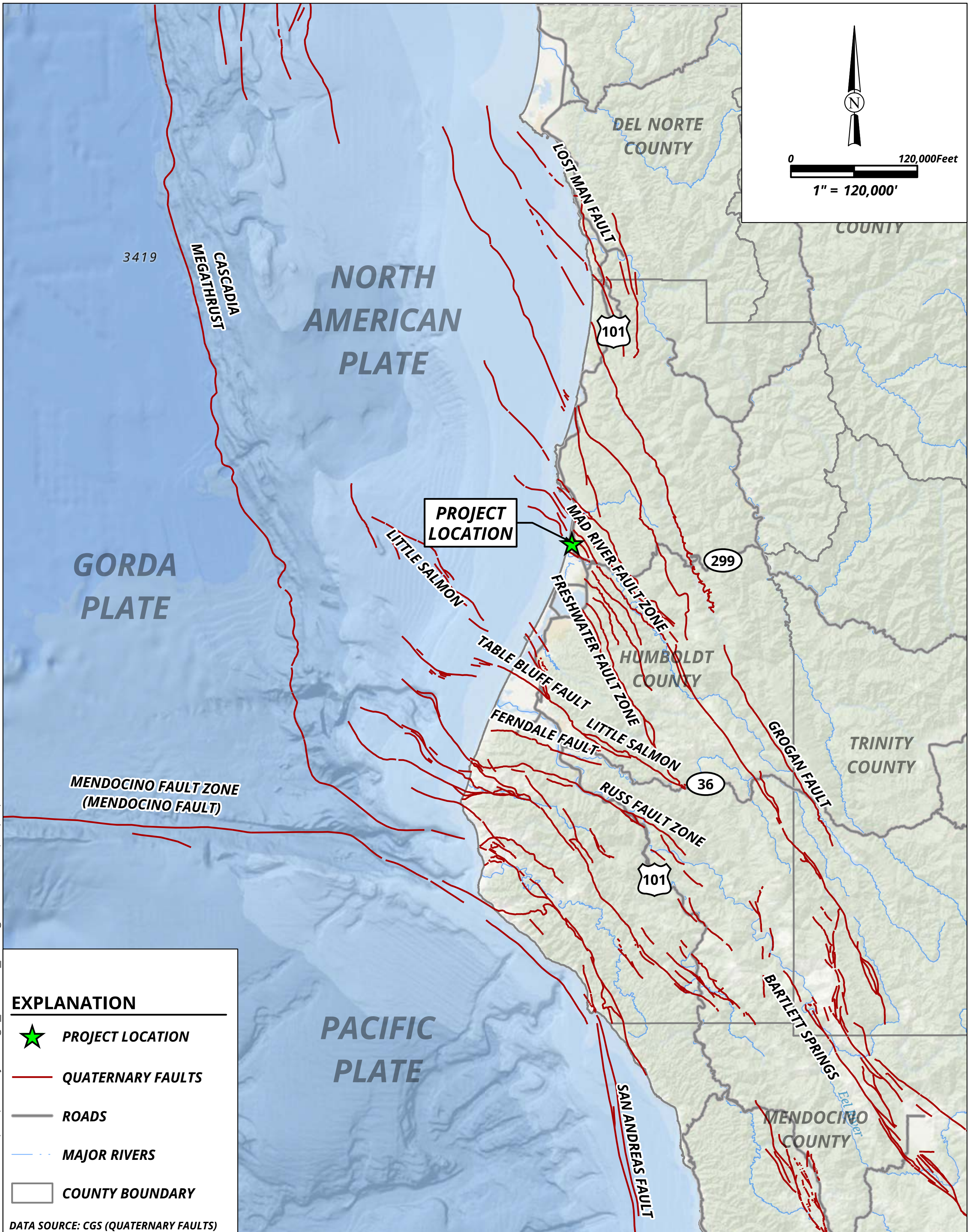
Fault Evaluation Report for Proposed Subdivision
Bolier Ave, McKinleyville, Humboldt County, California

Geologic Map Explanation
Kelley (1984)
December 2025 - 025090

Figure
3A



P:\Eureka\2025\025090-Pele-FER\GIS\ProProjectsFig4_Tectonic_Setting -- tmcbroom, 12/16/25

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Bolier Ave, McKinleyville, Humboldt County, California

Tectonic Setting

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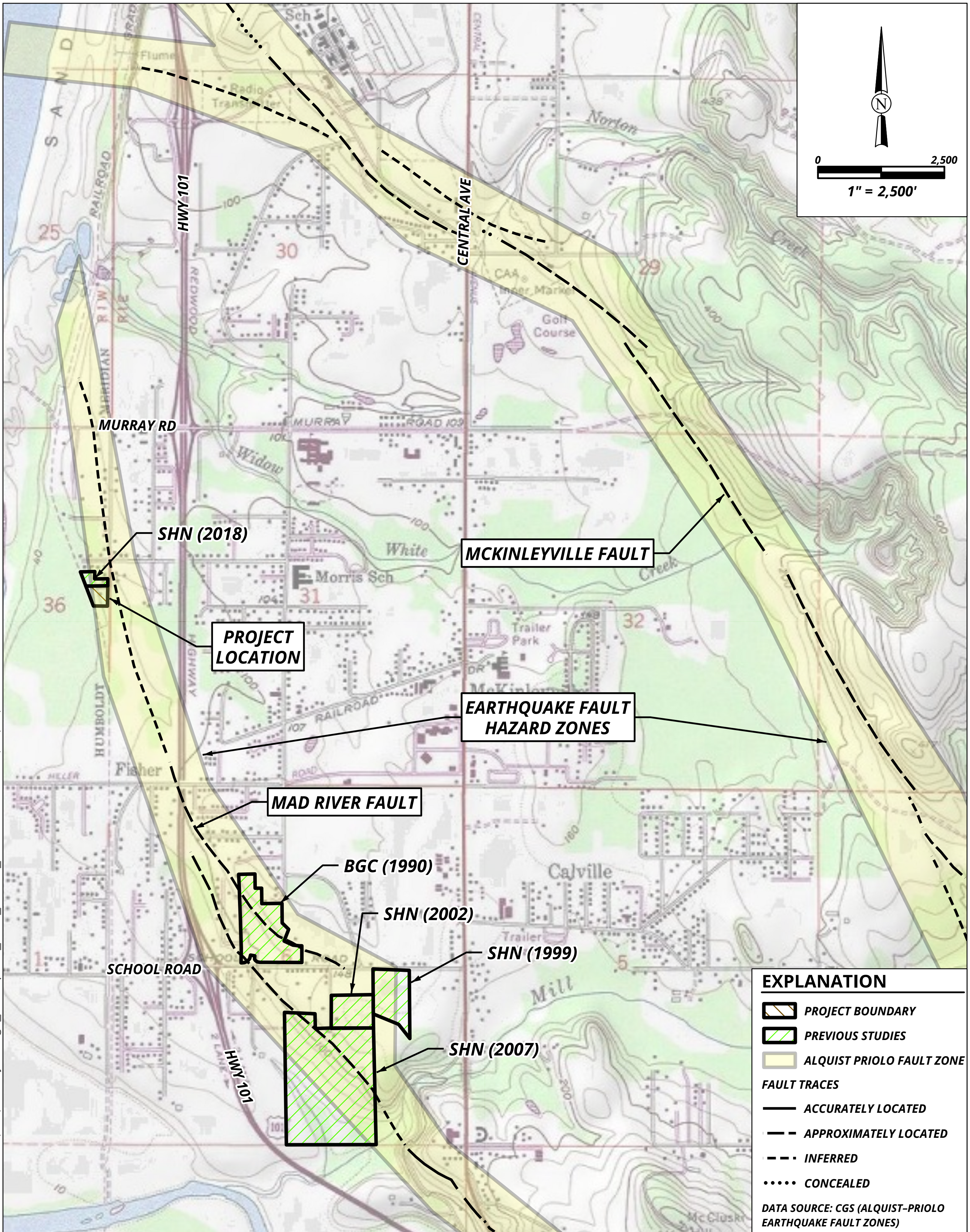
Figure
4



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Earthquake Fault Hazard Zones

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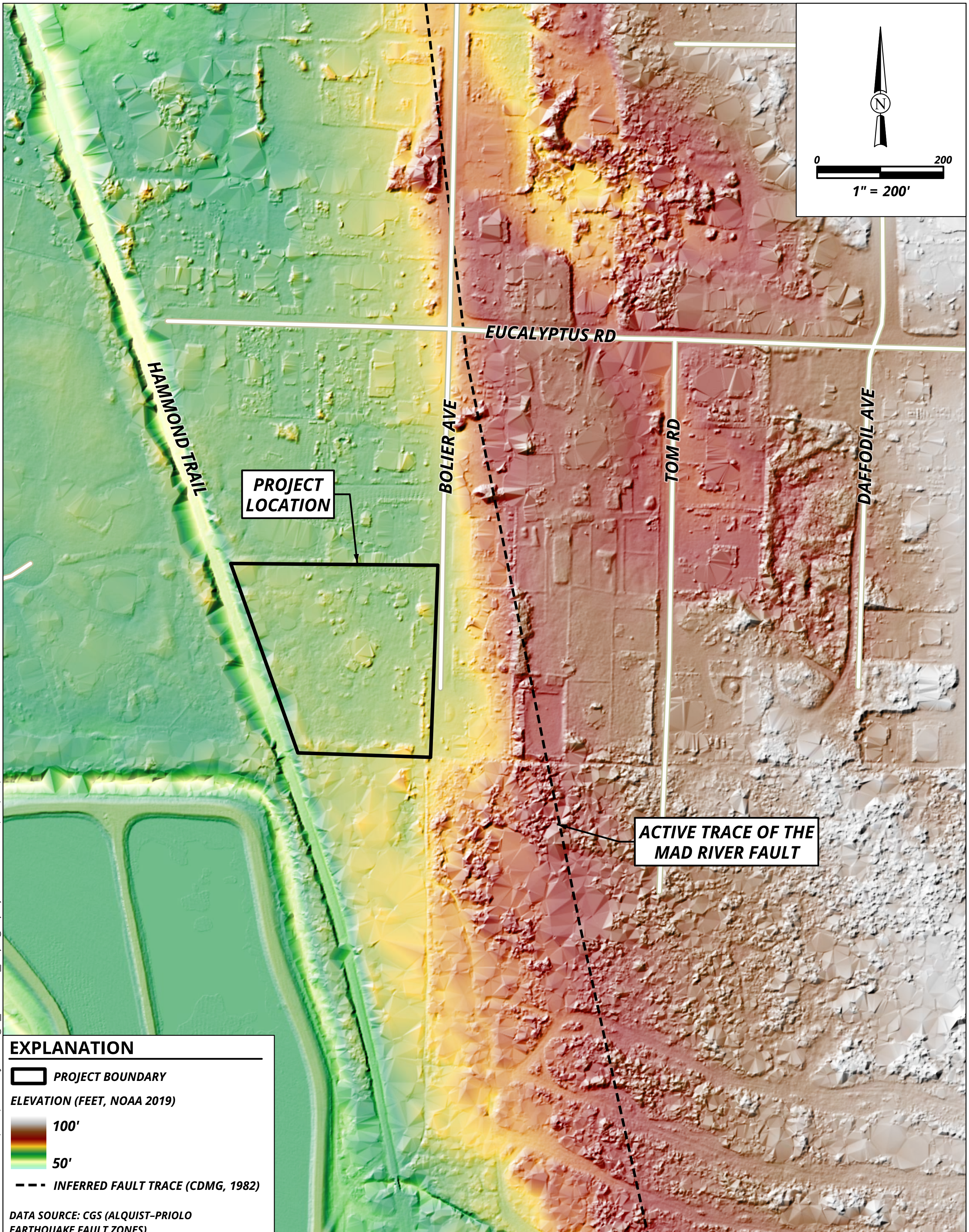
Figure 5

P:\Eureka\2025\025090-Pele-FER\GIS\ProProjectsFig5_Earthquake_Fault_Hazard_Zones -- tmcbroom, 12/17/25



P:\Eureka\2025\025090-Pele-FER\GIS\ProProjectsFig6_Surface_Topography -- tmcbroom, 12/16/25

SHN	Celine Pele Fault Evaluation Report for Proposed Subdivision Bolier Ave, McKinleyville, Humboldt County, California	**Surface Topography** December 2025 - 025090	**Figure** **6**

Trench Log and Explanation

2

LEGEND

UNIT DESCRIPTIONS

Topsoil and Aeolian Deposits

(1) Very dark brown (10YR 2/2) organic-rich silt with sand (ML) to silty fine sand (SM), loose, non-cemented and unconsolidated with an irregular (bioturbated) lower contact.

Late Pleistocene Marine Terrace Deposits

(2) Light yellowish brown fine sand (SP), krotovina and root development throughout, trace cobbles. Mostly distinct, sharp lower contact that fades out toward the east at Trench 2 Station 110-112 feet (horizontal distance).

(3) Light yellowish-brown silty to clayey sand (SM to SC), fine sand with iron oxide stains and mottling and localized, clayey lenses. Root development and krotovina in upper portion.

(4) Pale olive fine sand (SP) with trace silt and iron staining and occasional sandy silt lenses. Slightly gradational basal contact to Unit 5.

(5) Pale olive fine sand (SP) with silt with manganese-oxide flecks and fine concretions. Mostly sharp basal contact of Unit 5.

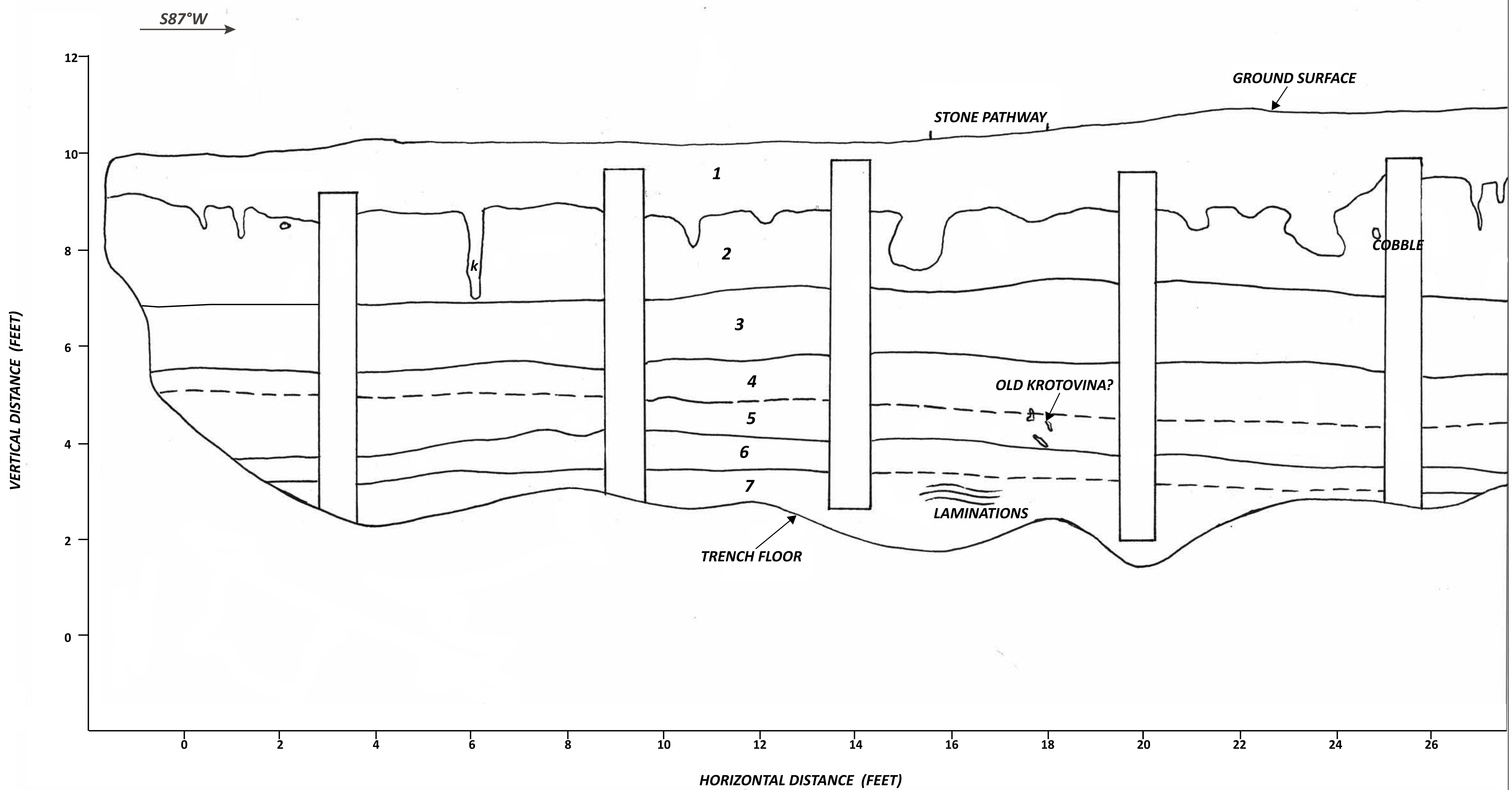
(6) Alternating beds of pale olive very fine sand with silt (SP-SM) and strong brown (oxidized) silty fine sand (SM). Thin clayey/silty interbeds.

(7) Light olive-gray fine sand with silt (SP-SM), and weak, discontinuous laminations of oxidized sands.

(8) Dark reddish-gray to black sandy elastic/organic silt (MH; paleosol) interbedded with pale olive to light olive-gray fine sand (SP) with trace silt. Paleosol horizons are typically 2–4 in. thick with abundant very fine plant fibers and locally preserved upright plant stems; intervening sands are fine-grained and laminated. Interpreted as marsh-like or back-dune deposition with episodic burial of rooted surfaces by sand.

KEY TO SYMBOLS

———— – – ‐ ‐	Unit Contact - Dashed where approximate
K	Krotovina



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Log of Trench 1

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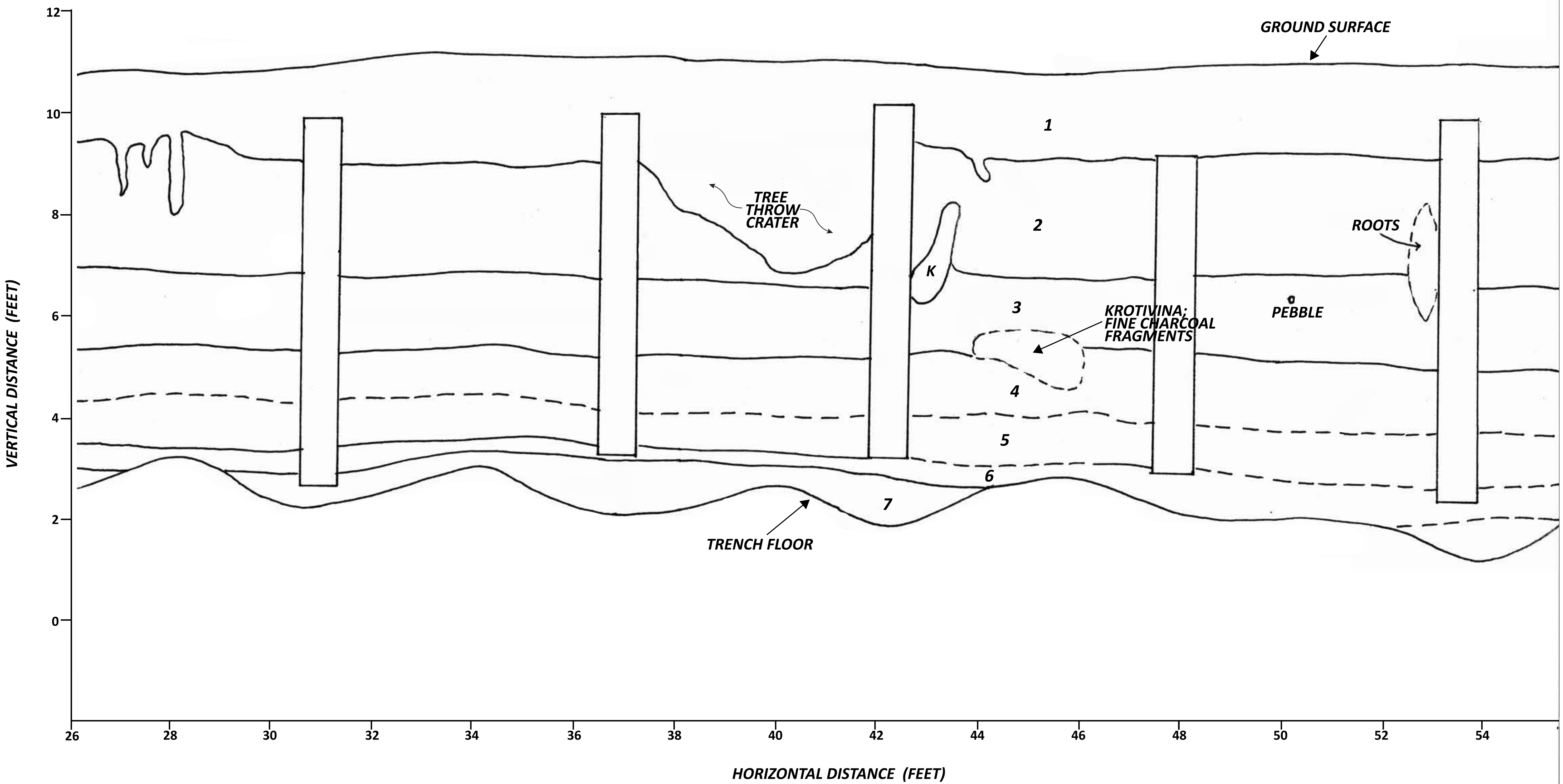
T1-1



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Log of Trench 1

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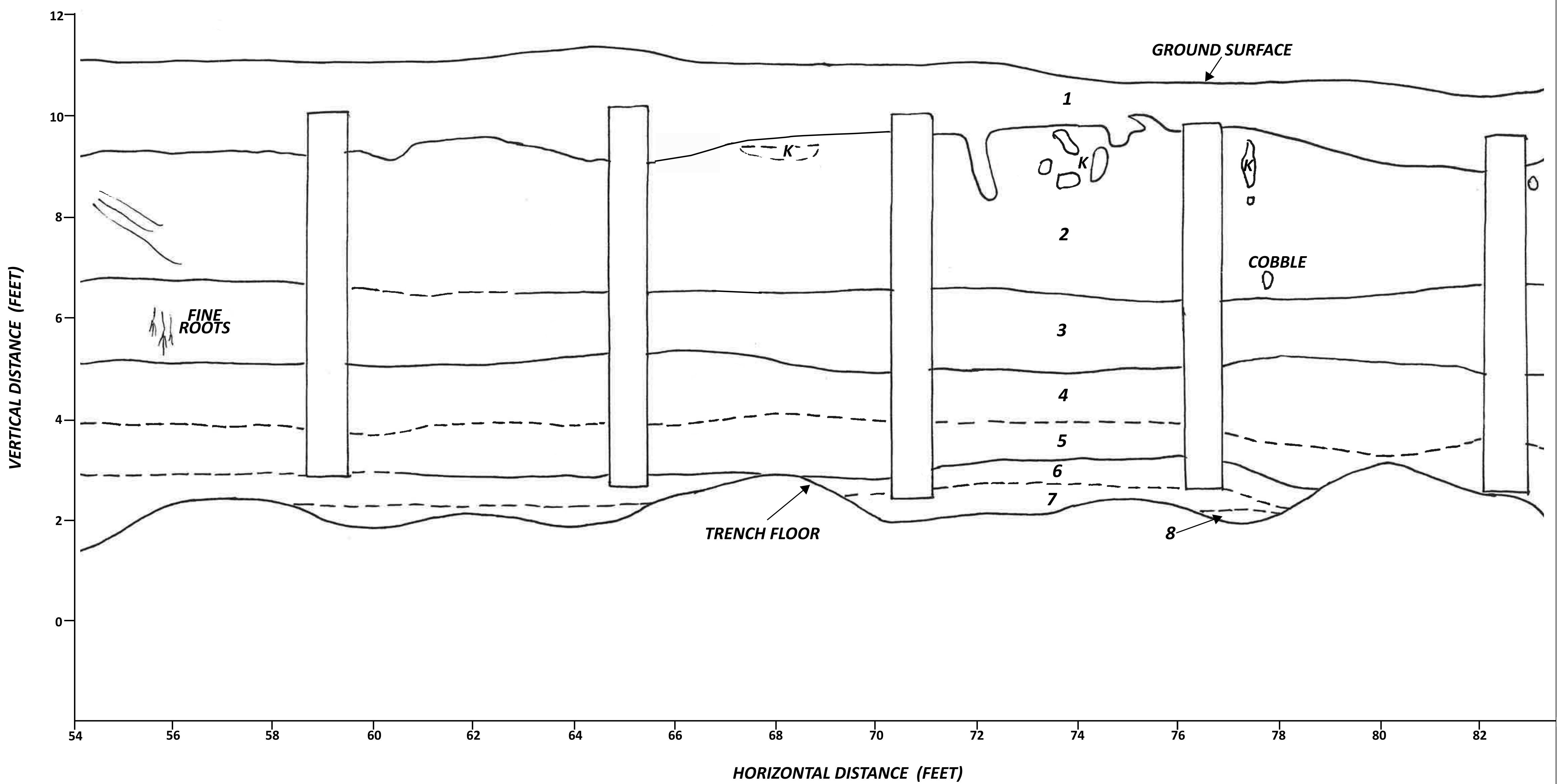
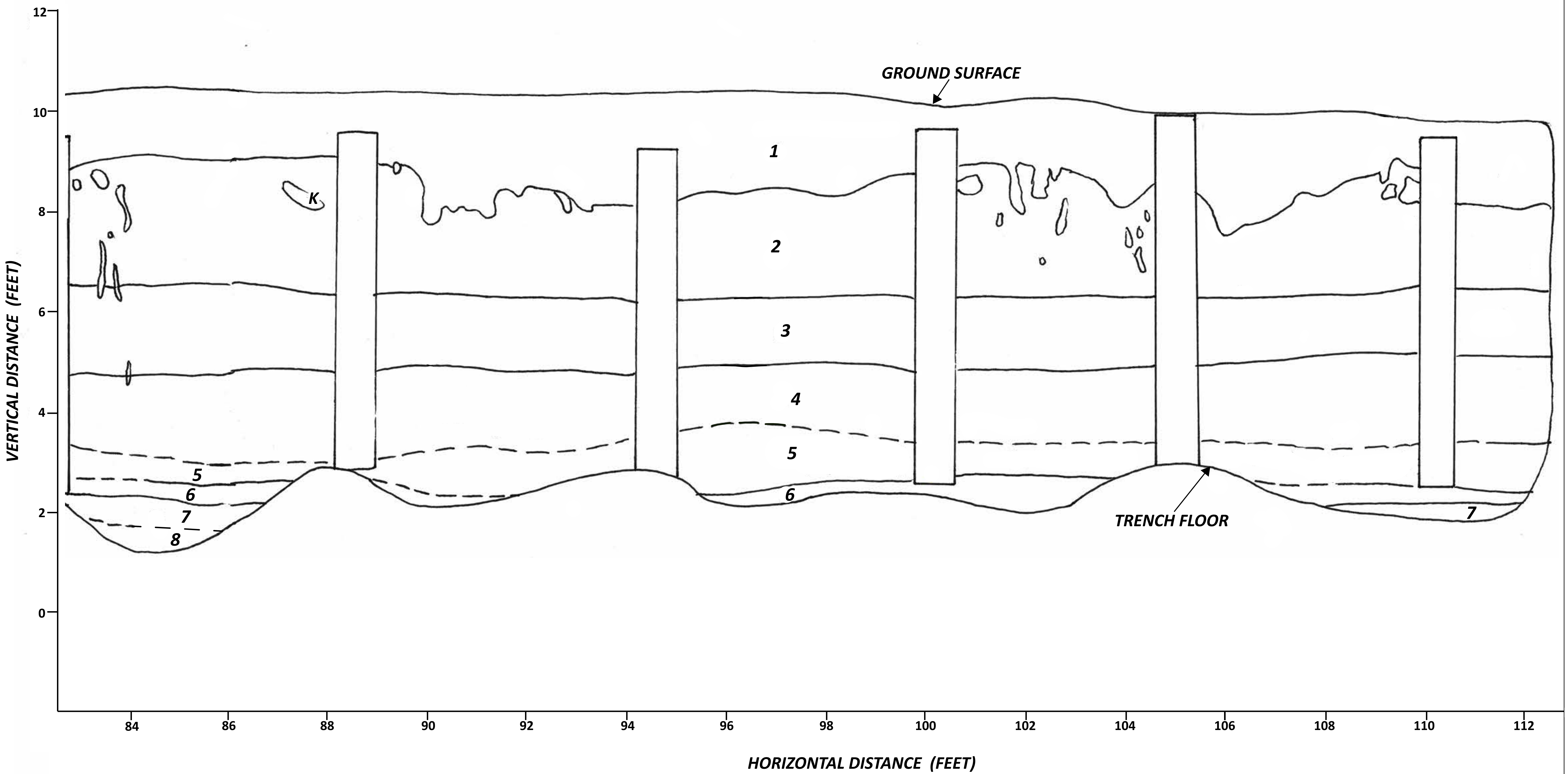
T1-2


GROUND SURFACE
1
K
K
K
2
COBBLE
FINE ROOTS
3
4
5
6
7
TRENCH FLOOR
8
12
10
8
6
4
2
0
VERTICAL DISTANCE (FEET)
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
HORIZONTAL DISTANCE (FEET)



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Log of Trench 1

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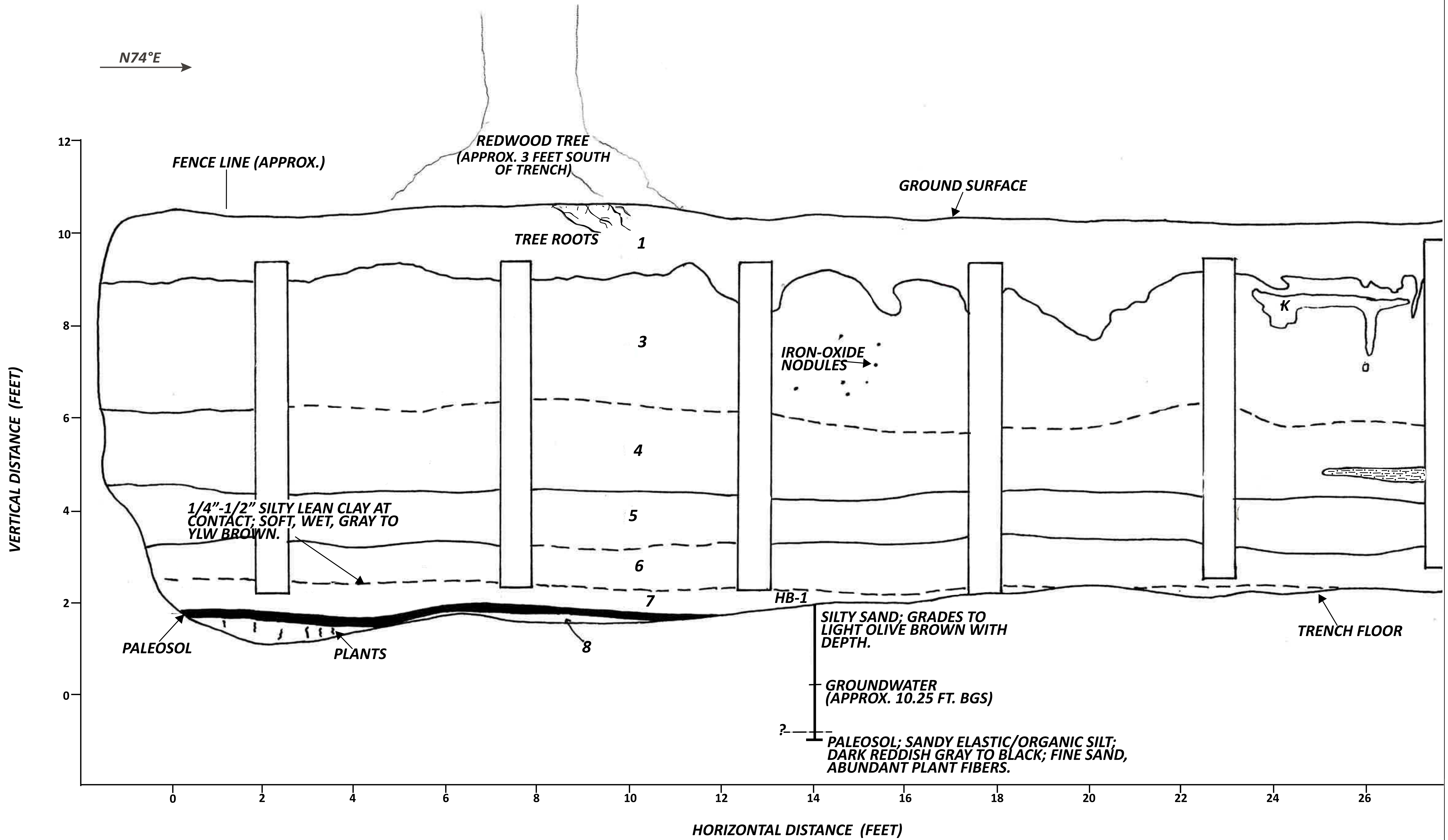
T1-4



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Log of Trench 2

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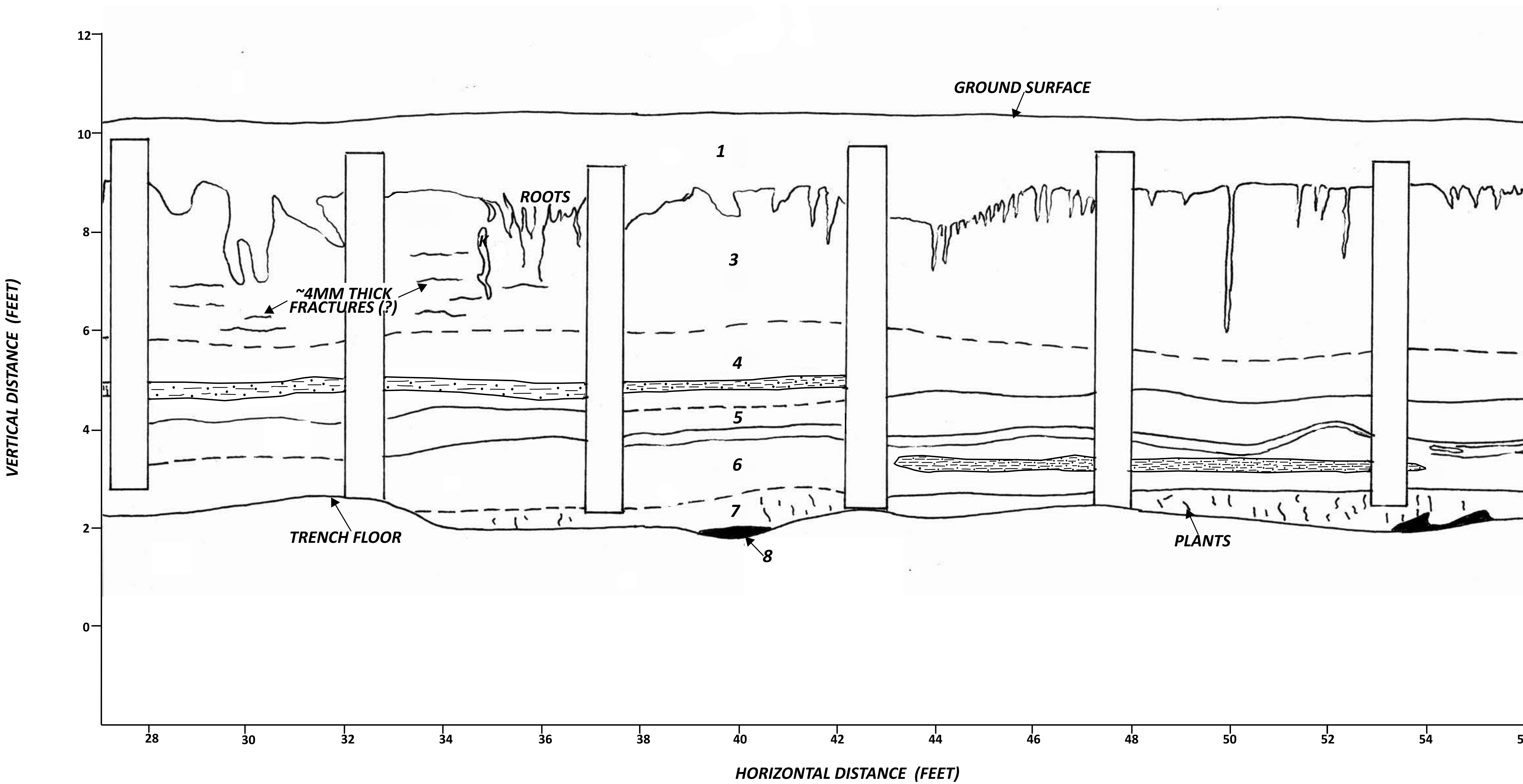
T2-1

025090 -- atrola



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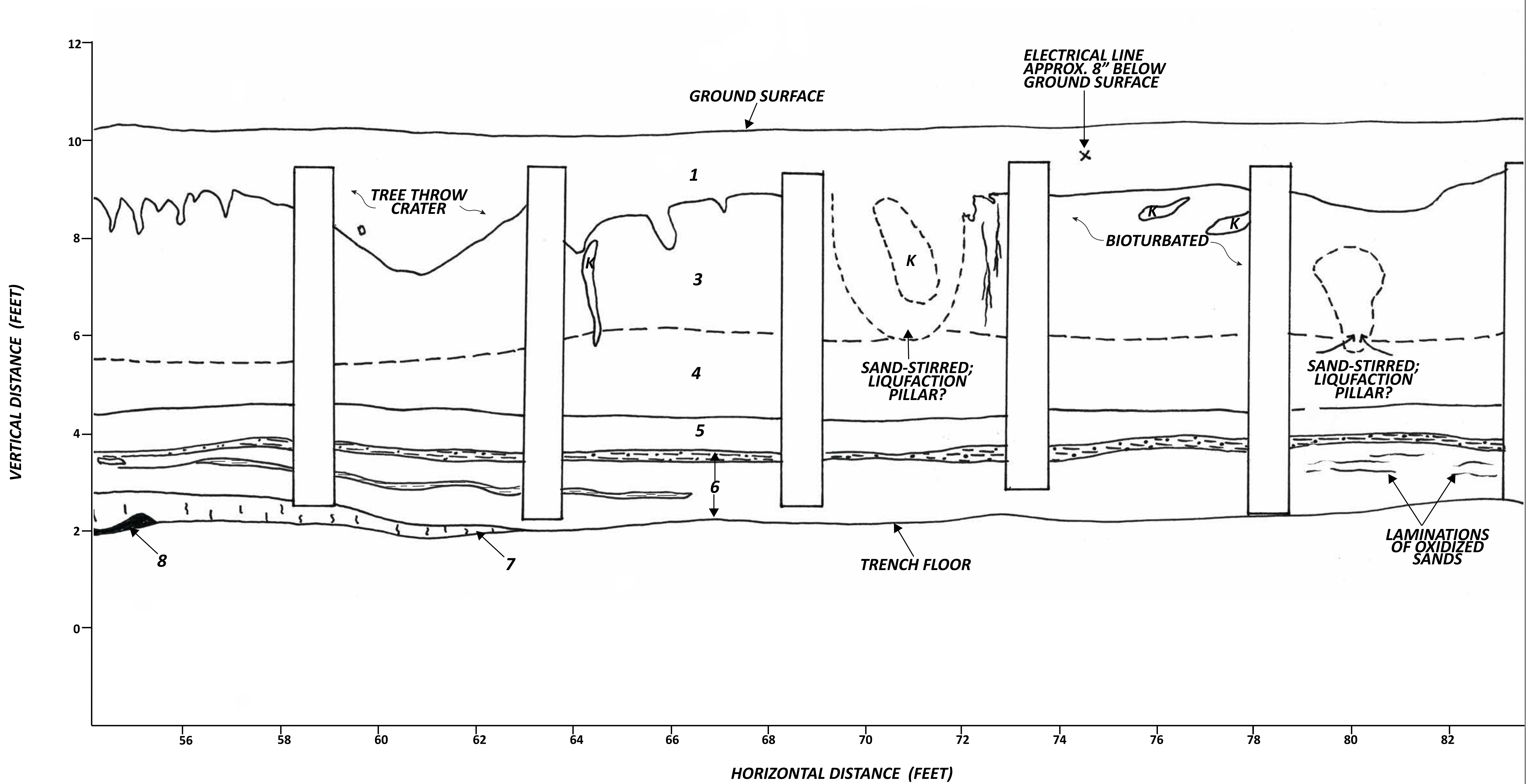
Log of Trench 2

December 2025 - 025090

T2-2



025090 -- atrola

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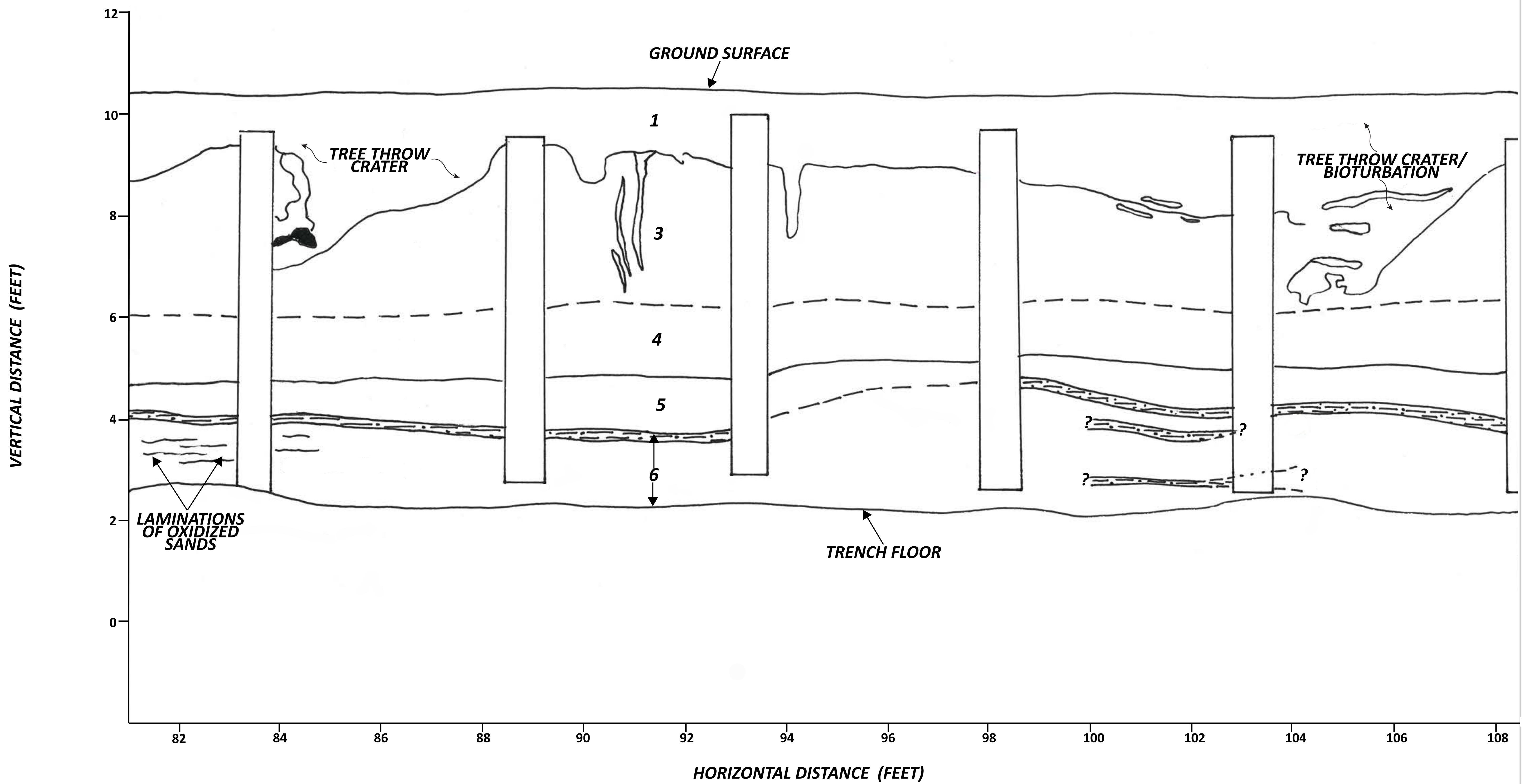
Log of Trench 2

December 2025 - 025090

T2-3



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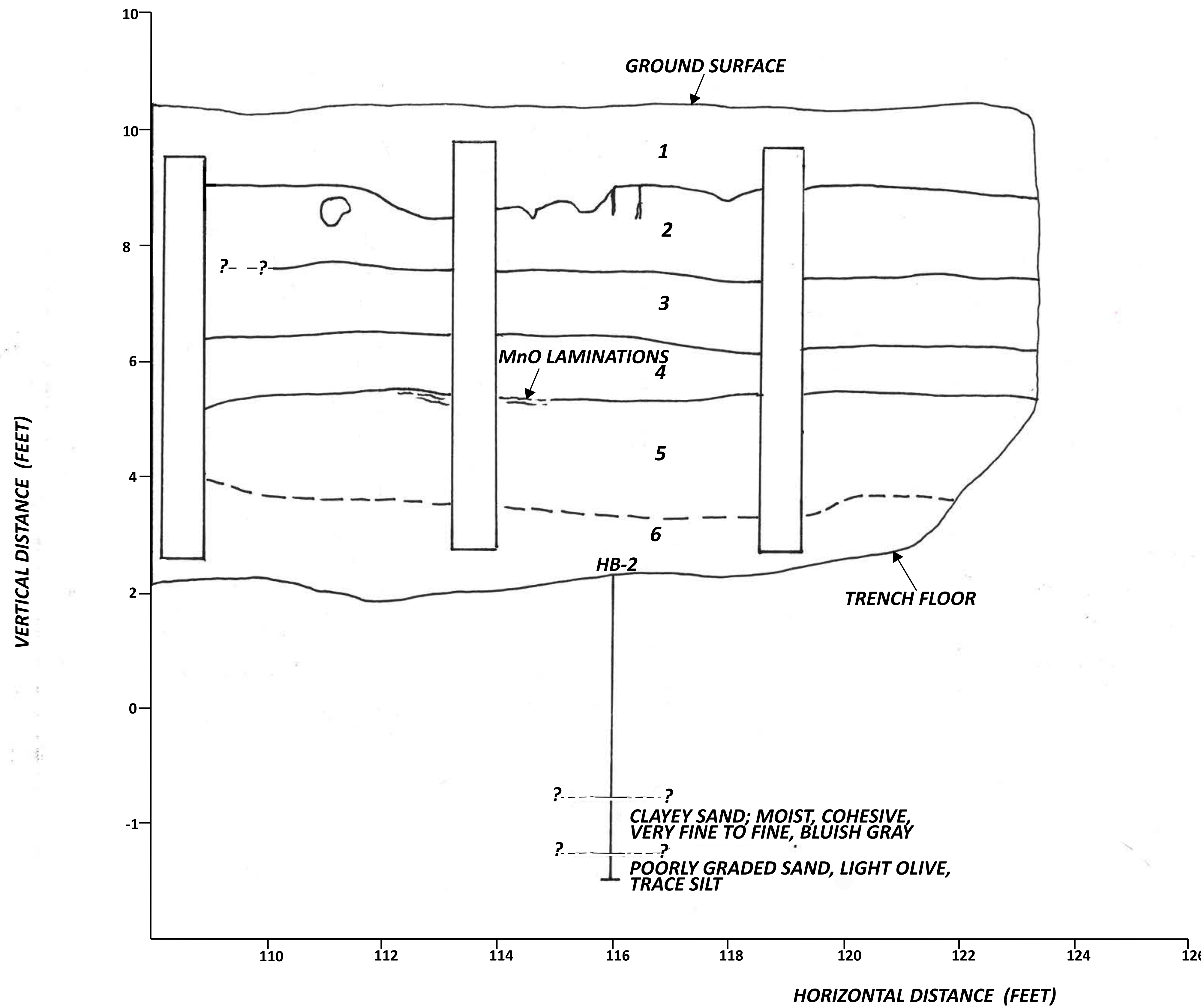
Log of Trench 2

December 2025 - 025090

T2-4



GROUND SURFACE
1
2
?- -?
3
MnO LAMINATIONS
4
5
6
HB-2
TRENCH FLOOR
?-------?
CLAYEY SAND; MOIST, COHESIVE, VERY FINE TO FINE, BLUISH GRAY
?-------?
POORLY GRADED SAND, LIGHT OLIVE, TRACE SILT
VERTICAL DISTANCE (FEET)
HORIZONTAL DISTANCE (FEET)
10
10
8
6
4
2
0
-1
110
112
114
116
118
120
122
124
126