GEOTECHNICAL FEASIBILITY REPORT
BIOMARIN OFFICE BUILDINGS
999 3RD STREET
SAN RAFAEL, CALIFORNIA

August 24, 2018

Job No. 595.137

Prepared For:
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CERTIFICATION

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1.0 INTRODUCTION

This report presents the results of our geotechnical feasibility evaluation for the proposed new office buildings for BioMarin Pharmaceutical. As shown on Figure 1, the project site is located within an approximately three-acre parcel (APN 011-265-01) at 999 3rd Street in San Rafael. The purpose of our report is to identify and address potential geotechnical and geologic issues at the project site, offer our opinion on project feasibility, prepare preliminary geotechnical design recommendations and summarize our findings in this report for use in planning, permitting, and preliminary design of the project.

Our feasibility evaluation was performed in accordance with Task Order No. 206838 of our Master Service Agreement dated May 4, 2018. Our scope of services includes several phases to match project development. This report completes the first phase of our services and includes the following:

- Review of readily available geologic reference information to describe geologic setting and local geologic conditions.
- A site reconnaissance to observe and document surface conditions.
- An evaluation of geologic hazards that could affect the site and preliminary recommendations to mitigate identified hazards.
- Description of other geotechnical constraints that should be addressed during project design and preliminary recommendations for probable foundation types.
- Preparation of this report which summarizes our evaluation of geologic hazards and preliminary geotechnical recommendations for design and construction.

Issuance of this report completes our initial phase of services. Future phases of work are expected to include a design-level geotechnical report with subsurface exploration, supplemental geotechnical consultation and plan review, and observation and testing of geotechnical-related items during construction.

2.0 PROJECT DESCRIPTION

While planning and preliminary design are still underway, we understand the project is expected to include developing the site with two new buildings which will provide office and laboratory space. As shown on Figure 2, Building “A” will occupy an approximately 21,000-square-foot building footprint on the north side of the property, while Building “B” will occupy an approximately 22,500-square-foot footprint on the south side of the property. The new buildings will be four

stories in height with the ground floor constructed near existing grades. While structural details are not yet available, we anticipate the new buildings will induce moderate to heavy foundation loads. An additional building is planned near the northwest corner of the site and will provide about 15,000 square feet of space for a senior center and housing facility. However, we understand this additional building will be completed by others as part of a separate, future project.

Preliminary Drawings (Johnson Fain 2018) indicate new parking areas will be constructed along the southern portion of the site, just east and west of Building B. An exterior patio is also shown east of Building A and will serve as an outdoor dining/lounge area. Site grading is expected to include minor cuts and fills to create level building pads and appropriate surface drainage patterns. Other improvements may include new driveways, exterior hardscape, underground utilities, site drainage, landscaping and other improvements typical of such developments.

3.0 SITE CONDITIONS

3.1 Regional Geology

The project site lies within the Coast Ranges geomorphic province of California. Regional topography within the Coast Ranges province is characterized by northwest-southeast trending mountain ridges and intervening valleys that parallel the major geologic structures, including the San Andreas Fault System. The province is also generally characterized by abundant landsliding and erosion, owing in part to its typically high levels of precipitation and seismic activity.

The oldest rocks in the region are the sedimentary, igneous, and metamorphic rocks of the Jurassic-Cretaceous age (190- to 65-million years old) Franciscan Complex. Within Marin County, a variety of sedimentary and volcanic rocks of Tertiary (1.8- to 65-million years old) and Quaternary (less than 1.8-million years old) age locally overlie the basement rocks of the Franciscan Complex. Tectonic deformation and erosion during late Tertiary and Quaternary time (the last several million years) formed the prominent coastal ridges and intervening valleys typical of the Coast Ranges province. The youngest geologic units in the region are Quaternary age (last 1.8 million years) sedimentary deposits, including alluvial deposits which partially fill most of the valleys and colluvial deposits which typically blanket the lower portions of surrounding slopes.

The site is located on relatively level terrain just west of Highway 101 and near the northwest margin of the former marshland area west of San Rafael Creek. Regional geologic mapping indicates the majority of the site is underlain by artificial fill over Bay Mud (California Division of Mines and Geology, 1976). The mapping further indicates the northwest portion of the site and the adjacent areas are underlain by Quaternary-age alluvial deposits. A Regional Geologic Map and descriptions of the mapped geologic units are shown on Figure 3.

3.2 Seismicity

The project site is located within the seismically active San Francisco Bay Area and will therefore experience the effects of future earthquakes. Earthquakes are the product of the build-up and sudden release of strain along a “fault” or zone of weakness in the earth's crust. Stored energy may be released as soon as it is generated or it may be accumulated and stored for long periods

of time. Individual releases may be so small that they are detected only by sensitive instruments, or they may be violent enough to cause destruction over vast areas.

Faults are seldom single cracks in the earth's crust but are typically comprised of localized shear zones which link together to form larger fault zones. Within the Bay Area, faults are concentrated along the San Andreas Fault zone. The movement between rock formations along either side of a fault may be horizontal, vertical, or a combination and is radiated outward in the form of energy waves. The amplitude and frequency of earthquake ground motions partially depends on the material through which it is moving. The earthquake force is transmitted through hard rock in short, rapid vibrations, while this energy becomes a long, high-amplitude motion when moving through soft ground materials, such as Bay Mud.

3.2.1 Regional Active Faults

The California Geological Survey (previously known as the California Division of Mines and Geology) defines a “Holocene-active fault” as one that had surface displacement within Holocene time (the last 11,700 years). CGS further defines a “pre-Holocene fault” as a fault whose recency of past movement is older than 11,700 years. Similarly, an “age-undetermined fault” is defined as a fault whose age of most recent movement is not known or is unconstrained by dating methods or limitations in stratigraphic resolution. CGS has mapped various faults in the region as part of their Fault Activity Map of California (CGS, 2010). Many of these faults are shown in relation to the project site on the attached Active Fault Map, Figure 4.

The nearest known Holocene-active faults are the San Andreas, Hayward, and San Gregorio Faults. The San Andreas and San Gregorio faults are located approximately 14.7 kilometers (9.1 miles) and 15.6 kilometers (9.7 miles) southwest of the site. The Hayward Fault is located approximately 13.5 kilometers (8.4 miles) to the northeast.

3.2.2 Historic Fault Activity

Numerous earthquakes have occurred in the region within historic times. The results of our computer database search indicate that at least twelve earthquakes with Richter Magnitude 5.0 or larger have occurred within 100 kilometers (62 miles) of the site between 1900 and 2018. The approximate locations of these earthquakes are shown on the Historic Earthquake Map, Figure 5.

3.2.3 Probability of Future Earthquakes

The site will likely experience moderate to strong ground shaking from future earthquakes originating on any of several active faults in the San Francisco Bay region. The historical records do not directly indicate either the maximum credible earthquake or the probability of such a future event. To evaluate earthquake probabilities in California, the USGS has assembled a group of researchers into the “Working Group on California Earthquake Probabilities” (USGS 2003, 2008, 2013) to estimate the probabilities of earthquakes on active faults. These studies have been published cooperatively by the USGS, CGS, and Southern California Earthquake Center (SCEC) as the Uniform California Earthquake Rupture Forecast, Versions 1, 2, and 3. In these studies, potential seismic sources were

analyzed considering fault geometry, geologic slip rates, geodetic strain rates, historic activity, micro-seismicity, and other factors to arrive at estimates of earthquakes of various magnitudes on a variety of faults in California.

Conclusions from the most recent UCERF3 and USGS indicate the highest probability of an earthquake with a magnitude greater than 6.7 originating on any of the active faults in the San Francisco Bay region by 2043 is assigned to the Hayward/Rodgers Creek Fault system. The Hayward Fault is located approximately 13.4 kilometers (8.4 miles) northeast of the site and is assigned a probability of 33 percent. The San Andreas Fault, located approximately 14.7 kilometers (9.1 miles) southwest of the site, is assigned a 22 percent probability of an earthquake with a magnitude greater than 6.7 by 2043. Additional studies by the USGS regarding the probability of large earthquakes in the Bay Area are ongoing. These current evaluations include data from additional active faults and updated geological data.

3.3 Surface Conditions

We performed a site reconnaissance on August 21, 2018 to observe and document surface conditions throughout the proposed project area. The project site encompasses an approximately three-acre, rectangular-shaped parcel (APN 011-265-01) in downtown San Rafael. The property is bordered to the north by 3rd Street, to the east by Lindaro Street, to the south by 2nd Street, and to the west by Brooks Street. While no structures currently exist at the site, the concrete floor slabs for the former buildings at the northwest and southwest corners of the site remain.

The ground surface is level to gently sloping with surface elevations ranging from about eight to ten feet[1]. The ground surface is paved with asphalt with the exception of a few planter areas that are located around the perimeter of the property. The area is secured by chain link fencing and access is provided by driveways located on the west and east side of the property. Several storm drain inlets exist at various locations and were presumably installed as part of the recent remediation work.

3.4 Reference Geotechnical and Environmental Data

Several subsurface explorations have been conducted by Miller Pacific and other Consultants as part of other nearby projects. Prior to completing our subsurface exploration, we reviewed the following reports which were obtained from our files:

Donald Herzog & Associates, Inc., *Geotechnical Investigation, 931 Second Street, San Rafael, California*, November 29, 1985.

Harding Lawson Associates, *Geotechnical Investigation, Second and Lindaro Streets, Central Parcel, San Rafael, California,* November 4, 1997.

Harding Lawson Associates, *Geotechnical Investigation, Parking Structures 1 and 2, Fair, Isaac Office Park, San Rafael, California,* June 25, 1998.

[1] Surface elevations based on those presented on the Marin County GIS Viewer (www.marinmap.org).

Miller Pacific Engineering Group, *Geotechnical Investigation, San Rafael Lofts, 931 Second Street, San Rafael, California*, October 7, 1999.

Miller Pacific Engineering Group, *Geotechnical Investigation, San Rafael Youth Center, 1115 Third Street, San Rafael, California*, April 7, 2004.

Miller Pacific Engineering Group, *Geotechnical & Environmental Test Results*, *Parking Lot at 3rd Street & Cijos Street, San Rafael, California*, March 20, 2013.

Miller Pacific Engineering Group, *Geotechnical Investigation Report, BioMarin Laboratory Building, San Rafael Corporate Center, Parcel 7, APN 018-021-51, San Rafael, California"*, May 23, 2014.

Miller Pacific Engineering Group, *Geotechnical Investigation, Lincoln Parking Garage, San Rafael Corporate Center, Parcel 8, San Rafael, California,* August 26, 2014.

Miller Pacific Engineering Group, *Geotechnical Investigation Report, CCA, LLC – NLB2, San Rafael Corporate Center, Parcel 1, APN-018-021-39, San Rafael, California*, October 29, 2014.

Miller Pacific Engineering Group, *Geotechnical Investigation, 1001 4th Street Development, San Rafael, California,* July 18, 2017.

Treadwell & Rollo, *Geotechnical Consultation, Lincoln Garage (Parcel 8), San Rafael Corporate Center, San Rafael, California*, May 17, 2007.

Treadwell & Rollo, *Geotechnical Consultation, Office Buildings D, E and F, San Rafael Corporate Center, San Rafael, California*, May 8, 2007.

The approximate locations of the nearby reference borings and cone penetration tests (CPTs) from these previous investigations are shown on the Previous Exploration Plan, Figure 6. The reference CPT and boring logs from the previous investigations are included under Appendix A.

In addition to the previous geotechnical investigations, a number of borings and monitoring well installations were completed as part of previous environmental studies for the site and several nearby properties (Hurvitz Environmental, 2008; Gettler-Ryan, 1998; Cambria, 2006; PES, 1990; Terra Pacific, 2017). The locations of previous environmental studies within the vicinity of the site are shown on Figure 6. Boring and monitoring well logs from these environmental investigations were obtained from the State Water Resources Control Board's Geotracker website and are presented in Appendix B. We note that a comprehensive overview of the previous environmental studies within and around the site is beyond the scope of this geotechnical feasibility evaluation. A detailed overview of the previous environmental studies is presented in the Draft Remedial Action Completion Report (RACR) prepared by Terra Pacific Group on behalf of PG&E (Terra Pacific, 2017).

3.5 Site History

The following paragraphs provide a brief, general overview of historic site development and use. Subsurface conditions at the site have been largely impacted by various development and environmental remediation activities which have been completed over several decades. A more detailed description of site history is presented in the Draft RACR report (Terra Pacific, 2017).

Based on our review of historic shoreline maps, the majority of the project area is located within former marshlands. The site encompasses the northwest parcel of the former 17-acre PG&E San Rafael Service Center. Adjacent portions of the Service Center were previously redeveloped as part of the BioMarin business park. A manufactured gas plant was originally constructed at the site in 1875 and, following several expansions, remained in operation until about 1930. After 1930, plant operations were essentially discontinued and the plant remained largely inactive until it was removed in the early 1960's. The site housed the PG&E North Bay Division offices until it was closed in the late 1990's. The site was purchased by BioMarin in 2015 to facilitate expansion of its business park.

While the disposal practices for byproducts from the manufactured gas plant are not known, disposal of waste residues in the adjacent marsh areas resulted in contamination of on-site soil and groundwater. A slurry wall and groundwater extraction and treatment system were constructed in the 1980's around the southern and eastern portions of the former PG&E Service Center, as shown in Figure 1-3 of the Draft RACR. More recent remedial actions also included focused excavation and off-site disposal of impacted soil in select areas, with excavation and backfilling completed between October 2015 through April 2017. Excavations up to about 28-feet-deep were completed to remove approximately 47,000 tons of soil. The approximate location and depth of the excavated areas are shown on Figure 7.

The excavations were predominantly backfilled with Class 2 aggregate base. Lesser amounts of drain rock and sand-cement slurry were reportedly used for backfill in soft/wet and confined areas. Compaction testing was performed by Hushmand Associates, Inc. during backfilling operations and the results are provided in Appendix C of the RACR report. The report indicates that the aggregate base was compacted to at least 95 percent relative compaction within two feet of the ground surface, and to at least 90 percent relative compaction at greater depths. The test method used to determine the laboratory compaction characteristics of the backfill material was ASTM D1557. Backfilling was followed by restoration of the surface cover largely to its pre-existing condition with asphalt concrete paving and localized landscaped planters.

3.6 Anticipated Subsurface Conditions

The reference borings and CPTs completed prior to the recent excavation and backfilling for environmental remediation indicate subsurface conditions in areas surrounding the site are generally consistent with regional geological mapping. Reference borings RB-1, RB-7 and RB-15, located closest to the southern side of the site, encountered five to seven feet of fill over five to 14 feet of Bay Mud over shale bedrock. Reference Borings 29 and 30, located along the northern side of the site, encountered about ten feet of alluvium over shale bedrock.

As noted previously, subsurface conditions at the site have been significantly altered by the previous environmental remediation activities. As shown on Figure 7, the previous targeted excavation and backfilling of contaminated soils has resulted in variable fill thicknesses beneath the proposed buildings. The RACR report indicates the majority of the fill consists of compacted aggregate base with lesser amounts of drain rock and cement-sand slurry in localized areas. A mixture of fill, alluvium and Franciscan bedrock likely underlay the backfill materials.

Groundwater monitoring during previous environmental investigations indicates the water levels in nearby monitoring wells are at approximate depths ranging from one to four feet below ground surface (Terra Pacific, 2009). Groundwater elevations are expected to fluctuate seasonally and higher groundwater levels will likely be present during periods of intense rainfall and/or fluctuations in tidal elevation.

4.0 GEOLOGIC HAZARDS

This section summarizes our review of commonly considered geologic hazards, discusses their potential impacts on the proposed improvements, and identifies preliminary mitigation options. The primary geologic hazards which could affect the proposed development are settlement under new static loads, liquefaction and strong ground shaking during future seismic events. Other geologic hazards are judged relatively insignificant with regard to the proposed project. Each geologic hazard considered is discussed in further detail in the following paragraph.

4.1 Fault Surface Rupture

Under the Alquist-Priolo Earthquake Fault Zoning Act, the California Division of Mines and Geology (now known as the California Geological Survey) produced 1:24,000 scale maps showing known active and potentially active faults and defining zones within which special fault studies are required. The nearest known Holocene-active faults are the San Andreas, Hayward, and San Gregorio Faults. The San Andreas and San Gregorio faults are located approximately 14.7 kilometers (9.1 miles) and 15.6 kilometers (9.7 miles) southwest of the site. The Hayward Fault is located approximately 13.5 kilometers (8.4 miles) to the northeast. The site is not located within an Alquist-Priolo Special Studies Zone. We therefore judge the potential for fault surface rupture in the development area to be low.

Evaluation: *Less than significant.*
Mitigation: *No mitigation measures are required.*

4.2 Seismic Shaking

The site will likely experience seismic ground shaking similar to other areas in the seismically active Bay Area. The intensity of ground shaking will depend on the characteristics of the causative fault, distance from the fault, the earthquake magnitude and duration, and site specific geologic conditions. Estimates of peak ground accelerations are based on either deterministic or probabilistic methods.

Deterministic methods use empirical attenuation relations that provide approximate estimates of median peak ground accelerations. A summary of the active faults that could most significantly affect the planning area, their maximum credible magnitude, closest distance to the center of the planning area, and probable peak ground accelerations are summarized in Table 1. The calculated accelerations should only be considered as reasonable estimates. Many factors (e.g., soil conditions, orientation to the fault, etc.) can influence the actual ground surface accelerations.

Table 1 – Deterministic Peak Ground Accelerations for Active Faults

Fault	Moment Magnitude for Characteristic Earthquake	Closest Estimated Distance (km)	Median Peak Ground Acceleration (g)	Median PGA +1 Std Dev (g)
San Andreas	8.0	14.7	0.29	0.48
Hayward	7.3	13.5	0.26	0.42
San Gregorio	7.4	15.6	0.24	0.40
Rodgers Creek	7.3	23.0	0.19	0.31
West Napa	6.6	32.1	0.11	0.19

Reference: Abrahamson & Silva, Boore & Atkinson, Campbell & Bozorgnia, and Chiou & Youngs 2008 NGA models using V_{s30} = 270 m/s.

Probabilistic Seismic Hazard Analysis analyzes all possible earthquake scenarios while incorporating the probability of each individual event to occur. The probability is determined in the form of the recurrence interval, which is the average time for a specific earthquake acceleration to be exceeded. The design earthquake is not solely dependent on the fault with the closest distance to the site and/or the largest magnitude, but rather the probability of given seismic events occurring on both known and unknown faults.

We calculated the peak ground acceleration for two separate probabilistic conditions, including the two percent chance of exceedance in 50 years (2,475-year statistical return period) and the ten percent chance of exceedance in 50 years (475-year statistical return period). The peak ground acceleration values were calculated utilizing the USGS Unified Hazard Tool. The results of the probabilistic analyses are presented below in Table 2.

Table 2 – Probabilistic Peak Ground Accelerations for Active Faults

Probability of Exceedance	Statistical Return Period	Magnitude	Peak Ground Acceleration (g)
2% in 50 years	2,475 years	7.2	0.73
10% in 50 years	475 years	7.1	0.48

Reference: USGS Unified Hazard Tool accessed on August 22, 2018.

Ground shaking can result in structural failure and collapse of structures or cause non-structural building elements (such as light fixtures, shelves, cornices, etc.) to fall, presenting a hazard to building occupants and contents. Compliance with provisions of the most recent version of the California Building Code (2016 CBC) should result in structures that do not collapse in an earthquake. Damage may still occur and hazards associated with falling objects or non-structural building elements will remain.

The potential for strong seismic shaking at the project site is high. Due to their proximity and historic rates of activity, the San Andreas, San Gregorio and Hayward Faults present the highest potential for severe ground shaking. The significant adverse impact associated with strong seismic shaking is potential damage to structures and improvements.

Evaluation: *Less than significant with mitigation.*
Mitigation: *Minimum mitigation includes design of new structures in accordance with the provisions of the 2016 California Building Code or subsequent codes in effect when final design occurs. Recommended preliminary seismic design coefficients and spectral accelerations are presented in Section 5.1 of this report.*

4.3 Liquefaction and Related Effects

Liquefaction refers to the sudden, temporary loss of soil strength during strong ground shaking. The strength loss occurs as a result of the build-up of excess pore water pressures and subsequent reduction of effective stress. While liquefaction most commonly occurs in saturated, loose, granular deposits, recent studies indicate that it can also occur in materials with relatively high fines content provided the fines exhibit lower plasticity. The effects of liquefaction can vary from cyclic softening resulting in limited strain potential to flow failure which cause large settlements and lateral ground movements. Lateral spreading refers to a specific type of liquefaction-induced ground failure characterized primarily by horizontal displacement of surficial soil layers as a consequence of liquefaction of a subsurface granular layer (Youd, 1995). Lateral spreads generally move down gentle slopes or slip toward a free face such as an incised river channel.

As shown on Figure 8, regional liquefaction hazard maps indicate the site is mapped within a zone of “high” to “very high” susceptibility to liquefaction (Association of Bay Area Governments, 2018). The available subsurface data collected from nearby sites shows the alluvial soils are predominantly clayey. However, several borings encountered lenses of loose to medium dense sand and gravel which may be susceptible to liquefaction. Previous studies for nearby sites identified some of these sandy soils as potentially liquefiable with estimated post-liquefaction settlements of up to 1.5 inches (Treadwell & Rollo, 2007). Therefore, based on our review of available data, we judge there is generally a moderate risk of liquefaction during future seismic events. We note that the compacted backfill that was placed during the previous remediation work is likely relatively dense and not susceptible to liquefaction.

Evaluation: *Less than significant with mitigation.*
Mitigation: *Mitigation measures are anticipated to include supporting new structures on deep foundations that extend through any potentially liquefiable materials and bear on*

firm bedrock. Additionally, flexible utility connections may be required to allow for movement without rupturing if liquefaction does occur. Liquefaction potential should be reevaluated based upon subsurface exploration and laboratory testing performed as part of a future design-level investigation.

4.4 Seismic Densification

Seismic ground shaking can induce settlement of unsaturated, loose, granular soils. Settlement occurs as the loose soil particles rearrange into a denser configuration when subjected to seismic ground shaking. Varying degrees of settlement can occur throughout a deposit, resulting in differential settlement of structures founded on such deposits. The available subsurface data suggests near-surface soils do not include loose, granular materials. Additionally, the backfill materials placed during the remediation work are compacted and are anticipated to be relatively dense. Therefore, we judge the likelihood of seismically-induced settlement is low.

Evaluation: *Less than significant.*
Mitigation: *No mitigation measures are anticipated based on available data. Seismic densification potential should be reevaluated based upon subsurface exploration and laboratory testing performed as part of a future design-level investigation.*

4.5 Expansive Soil

Expansive soils will shrink and swell with fluctuations in moisture content and are capable of exerting significant expansion pressures on building foundations, interior floor slabs and exterior flatwork. Distress from expansive soil movement can include cracking of brittle wall coverings (stucco, plaster, drywall, etc.), racked door and/or window frames, uneven floors, and cracked slabs. Flatwork, pavements, and concrete slabs-on-grade are particularly vulnerable to distress due to their low bearing pressures. The available subsurface data suggests near-surface soils are generally of low plasticity suggesting a low to moderate expansion potential.

Evaluation: *Less than significant with mitigation.*
Mitigation: *As a minimum, soils should be moisture conditioned to slightly above the optimum moisture content during site grading and maintained at this moisture content until imported aggregate base and/or surface flatwork is completed. Additional laboratory testing should be performed as part of the future design-level investigation to further characterize the expansion potential of near-surface soils.*

4.6 Settlement

Significant settlement can occur when new loads are placed over soft, compressible silt and clay, loose soils, or across cut-to-fill transitions. Bay Mud was encountered in reference borings RB-1, RB-7 and RB-15, located closest to the south side of the site. The thickness of the Bay Mud at these locations varies from about five to 14 feet. Additionally, the remediation work resulted in new fill being placed beneath the proposed buildings with fill thicknesses varying from less than a foot to up to about 28 feet. Some settlement of the fill should be expected with larger settlements occurring where fill thicknesses are greatest. We note that the fill was reportedly compacted to 90 percent relative compaction at depths greater than two feet below ground surface. In general,

fill thicknesses greater than ten feet are typically compacted to 95 percent to reduce the risk of settlement associated with thicker fills.

The reference data suggests that subsurface conditions are likely highly variable throughout the site. Considering the variable support conditions, the lower compaction requirements for the relatively thick fills (i.e. 90 percent relative compaction instead of 95 percent) and the moderate to heavy foundation loads that are anticipated for the new four-story structures, the risk of differential settlement due to variations in the composition, stiffness and thickness of the nonuniform subsurface soils is considered moderate to high.

Evaluation: *Less than significant with mitigation.*
Mitigation: *Mitigation measures are anticipated to include supporting new structures on deep foundations that bear on firm bedrock. Additionally, flexible utility connections may be required to allow for movement without rupturing if settlement does occur. Potential foundation alternatives are discussed in Section 5.3. A more detailed analysis of building settlements should be performed as part of the future design-level geotechnical investigation.*

4.7 Erosion

Sandy soils on most slopes or clayey soils on steep slopes are susceptible to erosion when exposed to concentrated surface water flow. The potential for erosion is increased when established vegetation is disturbed or removed during normal construction activity.

The work area is relatively level and it is anticipated that much of the site will be covered with new buildings, pavements, or concrete flatwork. Therefore, erosion is not considered to be a significant long-term geologic hazard. However, care should be taken during construction to prevent excess erosion when the soils are exposed.

Evaluation: *Less than significant with mitigation.*
Mitigation: *Mitigation measures include designing a site drainage system to collect surface water and discharging it into an established storm drainage system. The project Civil Engineer or Architect is responsible for designing the site drainage system and an erosion control plan may need to be developed prior to construction.*

4.8 Soil Corrosivity

Corrosive soil can damage buried metallic structures, cause concrete spalling and deteriorate rebar reinforcement. While laboratory testing for corrosion potential of near-surface soils was not performed under this current phase or work, we judge that site conditions are potentially corrosive based upon the proximity to brackish water within the nearby San Rafael Creek.

Evaluation: *Less than significant with mitigation.*
Mitigation: *Minimum mitigation measures are anticipated to include designing the concrete structures in accordance with applicable durability requirements outlined in Table 4.3.1 of ACI 318. Reinforcing steel in the concrete should have a minimum coverage of three inches. Metallic components should incorporate protective*

coatings or other measures aimed at improving corrosion resistance. A more detailed analysis of corrosion potential should be performed as part of the future design-level geotechnical investigation.

4.9 Flooding

As shown on Figure 9, Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (FEMA, 2016) indicate the majority of the site is mapped within a Special Flood Hazard Area characterized as "Zone AH". This designation corresponds to a shallow flooding Special Flood Hazard Area with a base flood elevation of 11 feet[2]. Based on the FEMA mapping, the risk of damage to future improvements due to flooding is considered moderate to high. The project Civil Engineer or Architect is responsible for site drainage and should evaluate localized flooding potential and provide appropriate mitigation.

Evaluation: *Less than significant with mitigation.*
Mitigation: *Mitigation measures should include designing finished floors elevations above flood level in accordance with the City of San Rafael's requirements. The project Civil Engineer is responsible for site drainage and should evaluate localized flooding potential and provide appropriate mitigation.*

4.10 Tsunami/Seiche

Seiche and tsunamis are short duration, earthquake-generated water waves in large enclosed bodies of water and the open ocean, respectively. The extent and severity of a seiche would be dependent upon ground motions and fault offset from nearby active faults. The project site is roughly 1,000 feet west of the tidally-influenced San Rafael Creek, it is not mapped within a designated Tsunami Inundation Area (California Geological Survey, 2009). Therefore, the risk of tsunami inundation following a future seismic event is low.

Evaluation: *Less than significant.*
Mitigation: *No mitigation measures are required.*

5.0 CONCLUSIONS AND PRELIMINARY RECOMMENDATIONS

Based on our review of available geologic and geotechnical data and experience with similar projects, we conclude that the proposed project is feasible from a geotechnical standpoint. Primary geotechnical considerations relative to site development include providing suitable foundation design for the new structure, designing the structure to resist strong seismic ground shaking, and the presence of potentially corrosive soil and groundwater conditions.

Recommendations are provided below to aid in planning and preliminary design for the project. As project planning advances, we must perform a design-level Geotechnical Investigation which includes subsurface exploration and laboratory testing. The results of our design-level investigation will be used to provide site-specific recommendations for the project.

[2] FEMA base flood elevations are based on the National Geodetic Vertical Datum of 1929.

5.1 Preliminary Seismic Design

Minimum mitigation of ground shaking includes seismic design of new structures in conformance with the provisions of the most recent edition (2016) of the California Building Code. The magnitude and character of these ground motions will depend on the particular earthquake and the site response characteristics. Based on the anticipated subsurface conditions and close proximity of several nearby faults, we recommend the preliminary CBC coefficients and site values shown in Table 3 be used to calculate the design base shear of the new construction. The preliminary CBC coefficients should be confirmed based upon the results of future subsurface exploration.

Table 3 – Preliminary 2016 California Building Code Seismic Design Criteria

Parameter	Design Value
Site Class	D
Site Latitude	37.972°N
Site Longitude	-122.528°W
Spectral Response (short), S_S	1.500 g
Spectral Response (1-sec), S_1	0.600 g
Site Coefficient, F_a	1.0
Site Coefficient, F_V	1.5

Reference: USGS US Seismic Design Maps accessed on August 21, 2018.

5.2 Potential Foundation Alternatives

While the building structural types are unknown at this time, we anticipate the new four-story structures will induce moderate to heavy foundation loads. Given the potential for settlements due to liquefaction or static building loads, appropriate foundation systems for the new structures are expected to include various deep foundation alternatives that extend through potentially compressible and liquefiable soils and are supported on firm bedrock.

Since some of the subsurface soils are characterized as contaminated, we anticipate minimizing the amount of spoils that will be generated during foundation construction will be a key consideration in selecting a preferred foundation alternative. With this constraint, potential deep foundation alternatives may include torque down piles, driven piles or auger displacement piles. We note that auger displacement piles were successfully used for the nearby parking structure at 788 Lincoln Avenue and laboratory building at 791 Lincoln Avenue. Regardless of which alternative is selected, the variable fill materials which were placed during the remediation work may make installation of the deep foundations difficult. The drain rock material is likely highly permeable and noncohesive which can lead to potential raveling/collapse of foundations for the excavations. Additionally, the sand-cement slurry used in the slot trench backfill could lead to difficult excavation conditions depending upon the compressive strength of the hardened slurry.

Additional, subsurface exploration and laboratory testing along with further evaluation of proposed building layouts, structural loads, and load-induced building settlements will be necessary prior to selecting a preferred foundation system. Foundation design criteria will be provided as part of a future design-level geotechnical investigation.

6.0 SUPPLEMENTAL GEOTECHNICAL SERVICES

This report provides preliminary geotechnical and geological information, and is therefore suitable for planning purposes only. Further detailed geotechnical exploration, testing and engineering analysis will be required to develop final design criteria for project design. We should consult with the project professionals during design. When the project improvement plans have been prepared, we must review the documents to confirm that the intent of our recommendations has been understood and incorporated. Supplemental recommendations can be prepared during the design phase as needed.

During construction, we must inspect geotechnical items relating to site grading and construction of new building foundations. We should observe foundation excavations and installations, subgrade preparation and compaction and other geotechnical-related work items.

7.0 LIMITATIONS

We believe this report has been prepared in accordance with generally accepted geotechnical engineering practices in the northern San Francisco Bay Area at the time the report was prepared. This report has been prepared for the exclusive use of the project Owner and/or their assignees specifically for this project. No other warranty, expressed or implied, is made. Our evaluations and recommendations are based on available geologic and geotechnical data and our experience with soils in this geographic area.

8.0 LIST OF REFERENCES

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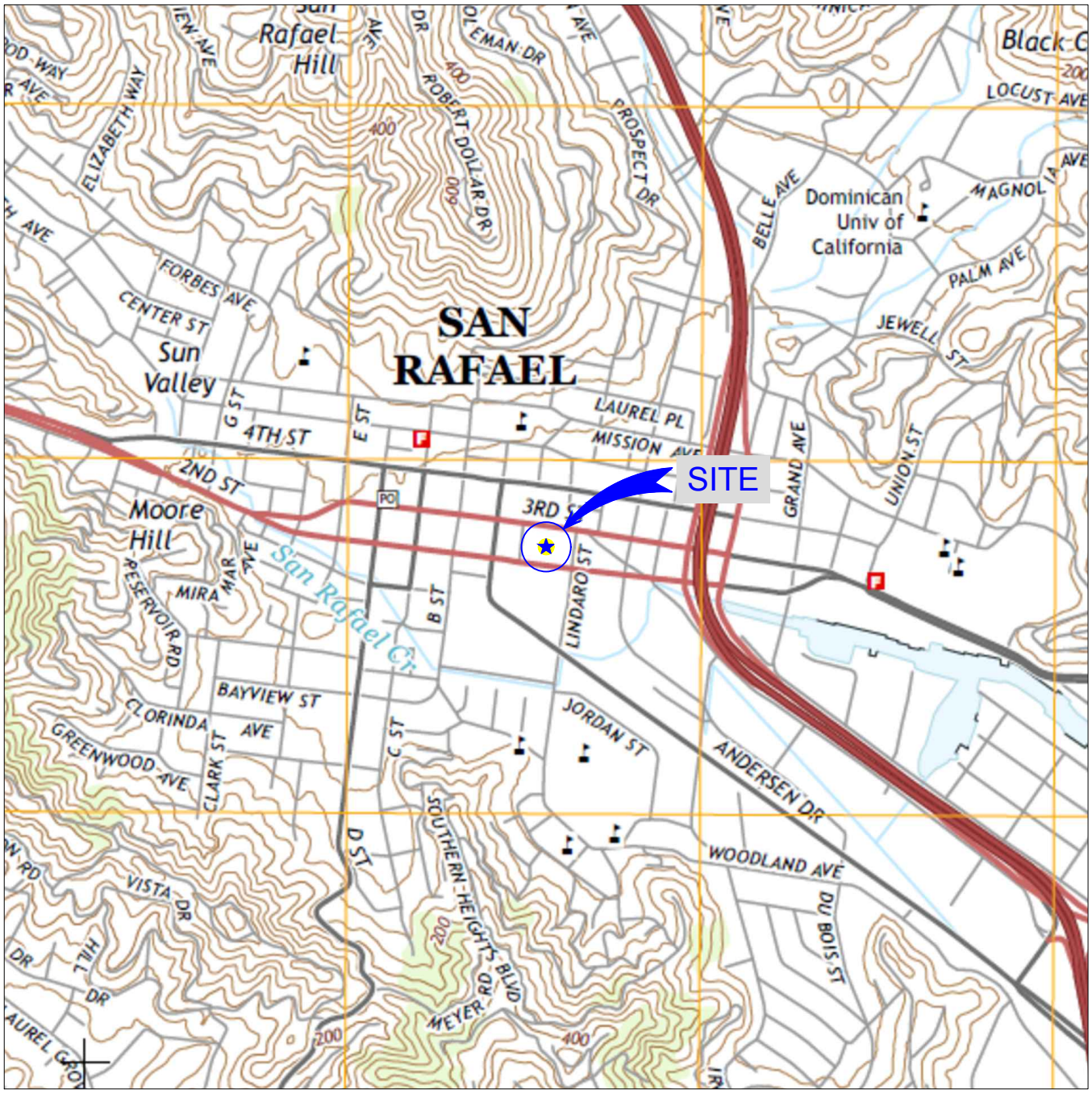

SITE LOCATION

(NO SCALE)

NORTH

REFERENCE: United States Geological Survey, "San Rafael,7.5-Minute Topographic Quadrangle", 2015

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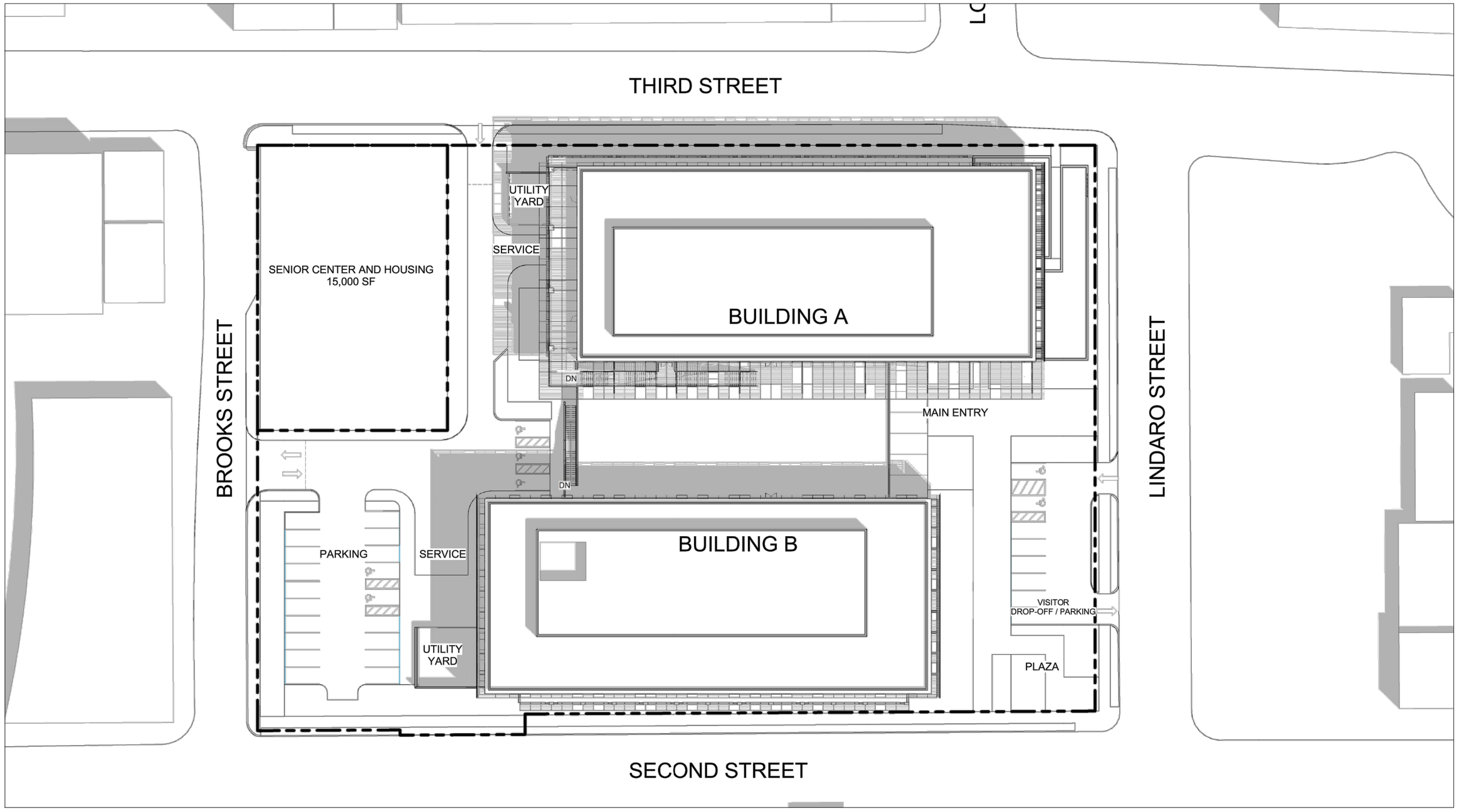
SITE LOCATION MAP

BioMarin Office Buildings
999 3rd Street
San Rafael, California

Project No. 595.137 Date: 8/22/2018

Drawn RCA
Checked

1
FIGURE



NORTH

SCALE

0 25 50 100 FEET

REFERENCE: Johnson Fain, "999 3rd Street, Site Plan (Sheet A0.03)", June 22, 2018.

MPEG MILLER PACIFIC ENGINEERING GROUP
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SITE PLAN

BioMarin Office Buildings
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San Rafael, California

Project No. 595.137 Date: 8/3/2016

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Drawn RCA
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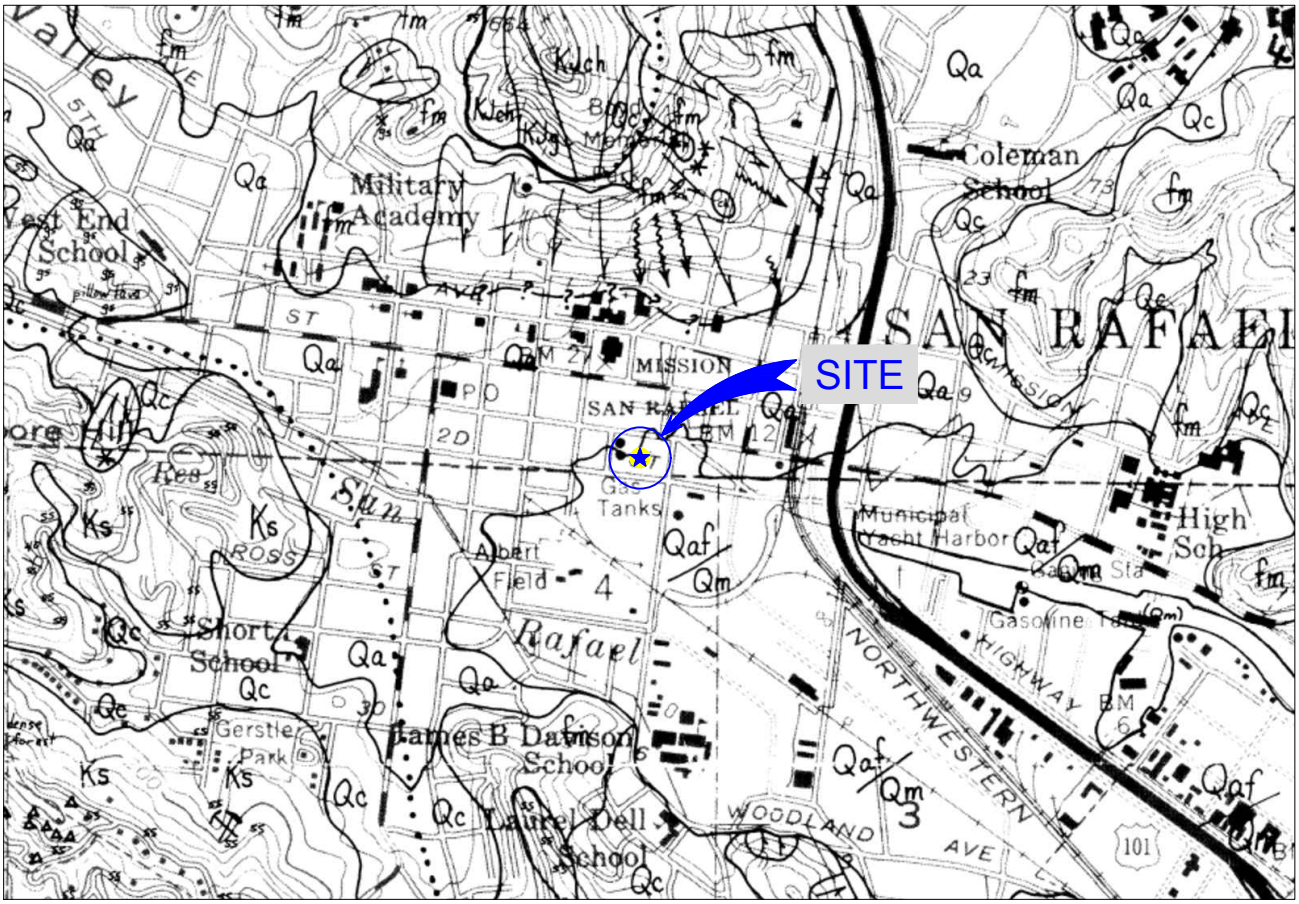
2
FIGURE



REGIONAL GEOLOGIC MAP

(NO SCALE)

NORTH

LEGEND

Qaf **ARTIFICIAL FILL (Quaternary)**
Deposits of rock, soil, garbage and trash, or Bay Mud placed by man upon natural surfaces, mostly for engineering purposes. Highly variable from place to place as to composition, degree of compaction, etc.

Qm **BAY MUD (Quaternary)**
Marshlands, former marshlands, and mudflats bordering San Francisco and San Pablo Bays. Mostly at or below mean sea level; these are thick deposits of unconolidated, low-denisty, semi-fluid, highly compressible, highly impermeable silty clay. They are rick in disseminated peaty material, contain lenses of peat, and are likely to contain lenses of sand in many areas.

Qa **ALLUVIUM (Quaternary)**
Unconsolidated deposits of clay, silt, sand and gravel underlying the bottom lands of the main stream valleys, consisting of materials transported and deposited by streams.

Reference: California Division of Mines and Geology, "Geology for Planning in Central and Southeastern Marin County, California (OFR 76-2 S.F. Plate 1C), 1976.

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GEOLOGIC MAP

BioMarin Office Buildings
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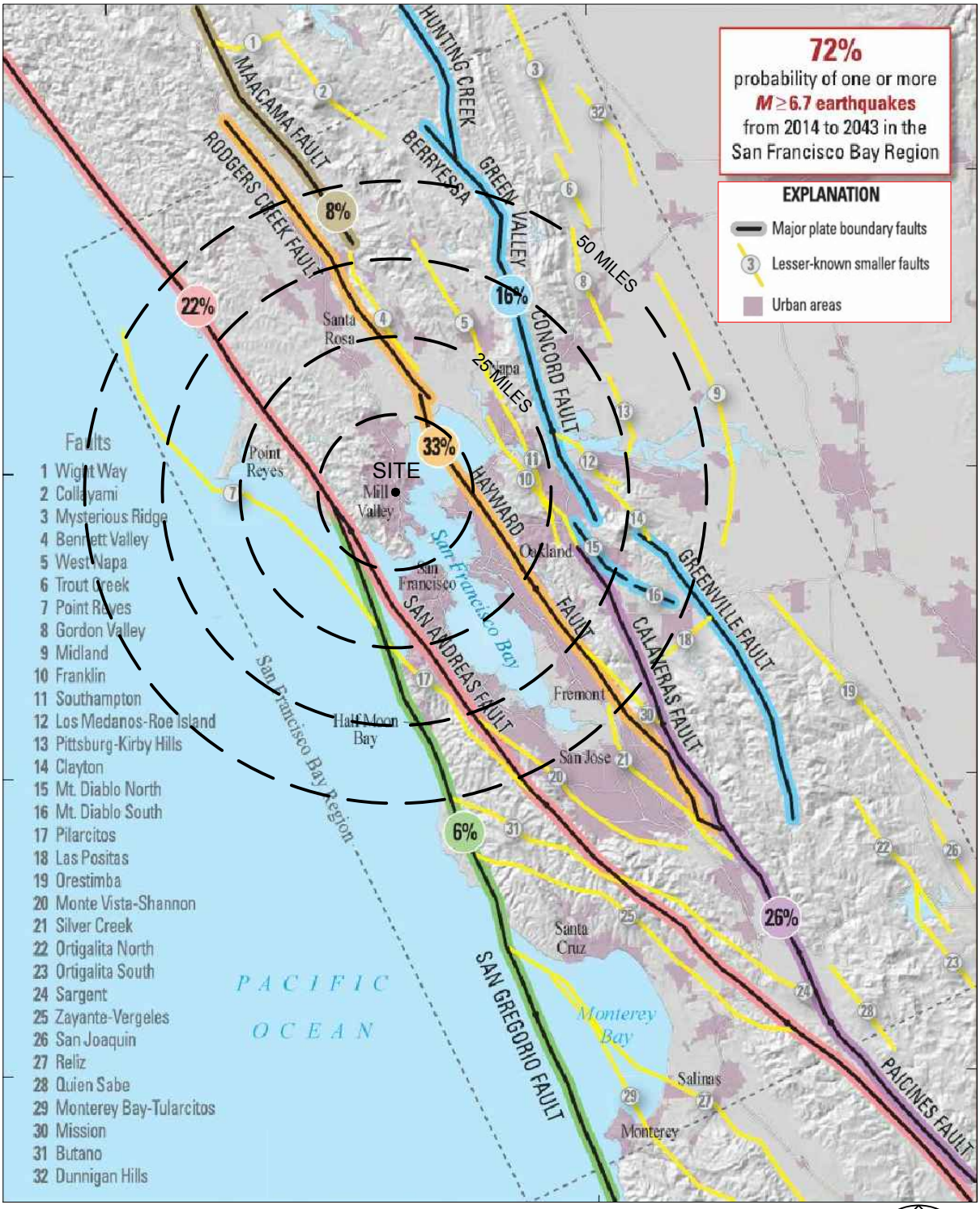
3
FIGURE



SCALE

0 12.5 25 50 MILES

NORTH

DATA SOURCE:

1) U.S. Geological Survey, U.S. Department of the Interior, "Earthquake Outlook for the San Francisco Bay Region 2014-2043", Map of Known Active Faults in the San Francisco Bay Region, Fact Sheet 2016-3020, Revised August 2016 (ver. 1.1).

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ACTIVE FAULT MAP

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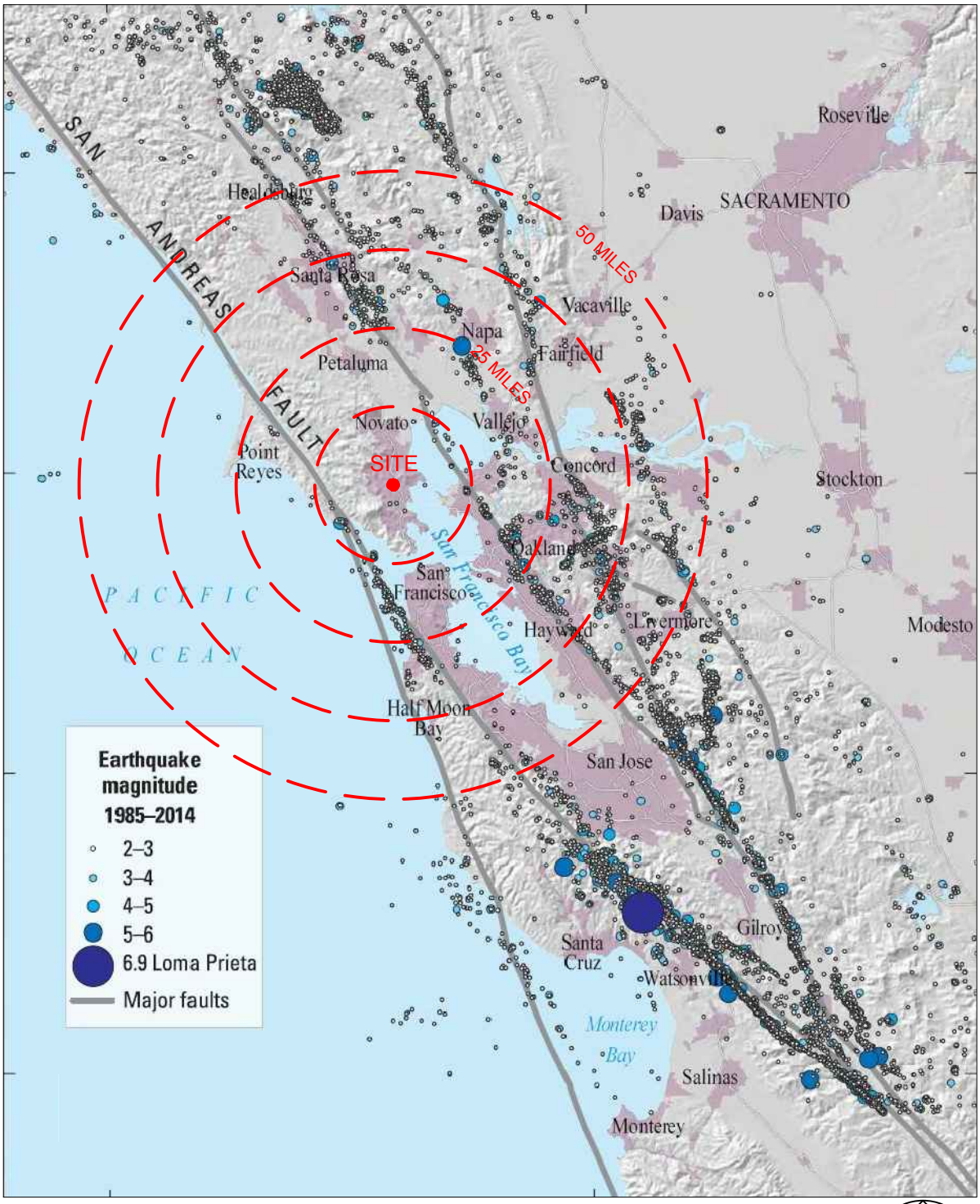
4
FIGURE



SCALE

0 12.5 25 50 MILES

NORTH

DATA SOURCE:

1) U.S. Geological Survey, U.S. Department of the Interior, "Earthquake Outlook for the San Francisco Bay Region 2014-2043", Map of Earthquakes Greater Than Magnitude 2.0 in the San Francisco Bay Region from 1985-2014, Fact Sheet 2016-3020, Revised August 2016 (ver. 1.1).

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HISTORIC EARTHQUAKE MAP

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5
FIGURE

LEGEND:

- APPROXIMATE LOCATION OF REFERENCE BORING FROM PREVIOUS INVESTIGATION
- APPROXIMATE LOCATION OF REFERENCE CONE PENETRATION TEST FROM PREVIOUS INVESTIGATION
- LOCATION OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

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PREVIOUS EXPLORATION PLAN

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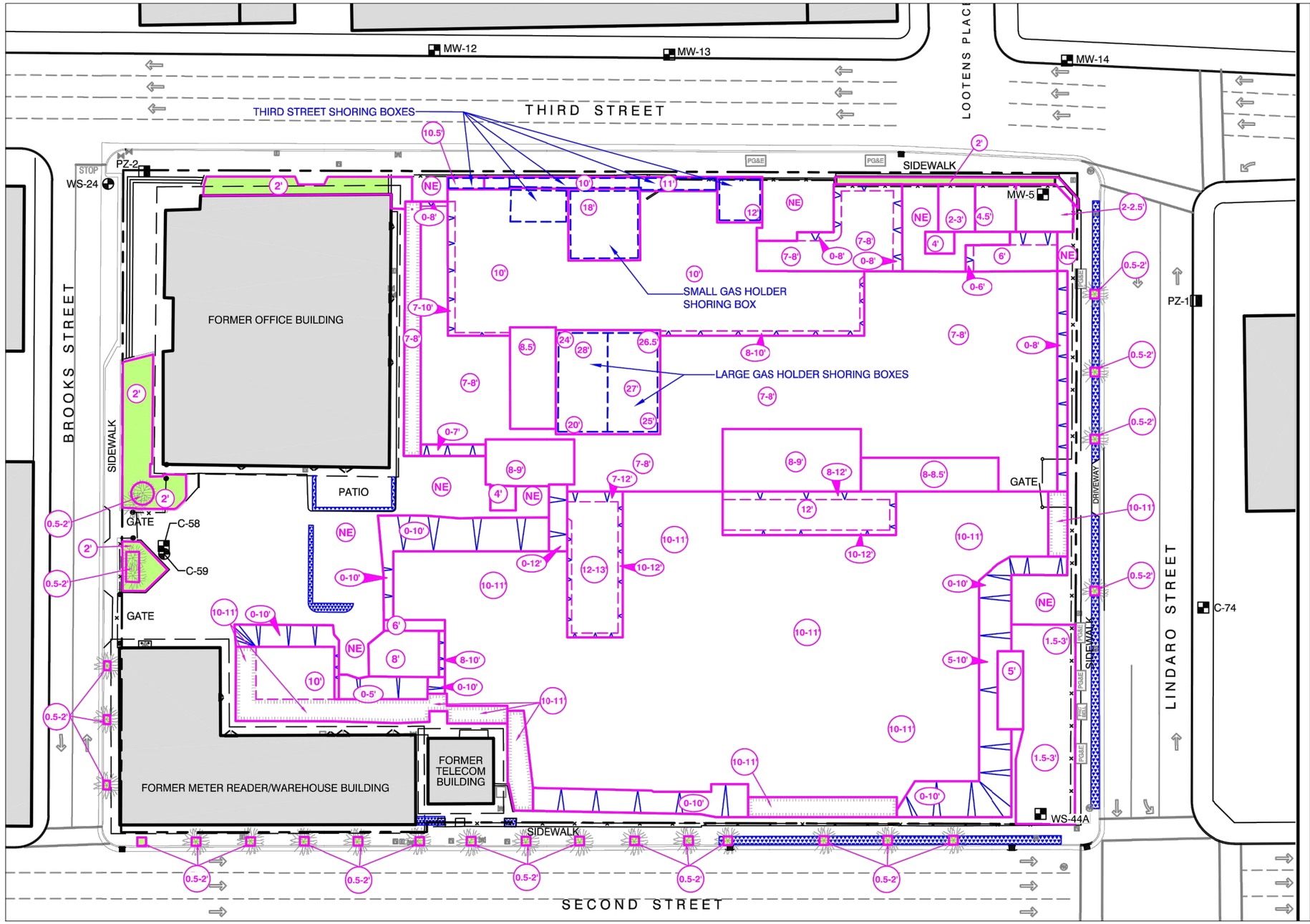
6
FIGURE



0 50 100 FEET
APPROXIMATE SCALE

EXPLANATION

- PZ-2 — SHALLOW-ZONE PIEZOMETER
- WS-41 — SHALLOW-ZONE MONITORING WELL
- C-59 — DEEP-ZONE MONITORING WELL
- FENCE
- BUILDING CANOPY/AWNING
- PROPERTY LINE
- LANDSCAPED AREA
- EXISTING BUILDING FOOTPRINT
- PREVIOUS PLANTER/EXPOSED SOIL - CONCRETE/ASPHALT CAPPED
- EXTENT OF EXCAVATION
- SLOT TRENCH EXCAVATION AREA
- SHORING BOX LOCATIONS
- EXCAVATION SLOPE
- NE 10-11' — EXCAVATION DEPTH OR DEPTH RANGES IN FEET, NE INDICATES NOT EXCAVATED
- 0-10' — SLOPE DEPTH RANGE IN FEET
- EXISTING TREE

FIGURE 3-1

SITE PLAN SHOWING

REFERENCE: Terra Pacific Group, "Draft Remedial Action Completion Report (Figure 3-1)", August 18, 2017.

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REMEDIATION EXCAVATION PLAN

BioMarin Office Buildings
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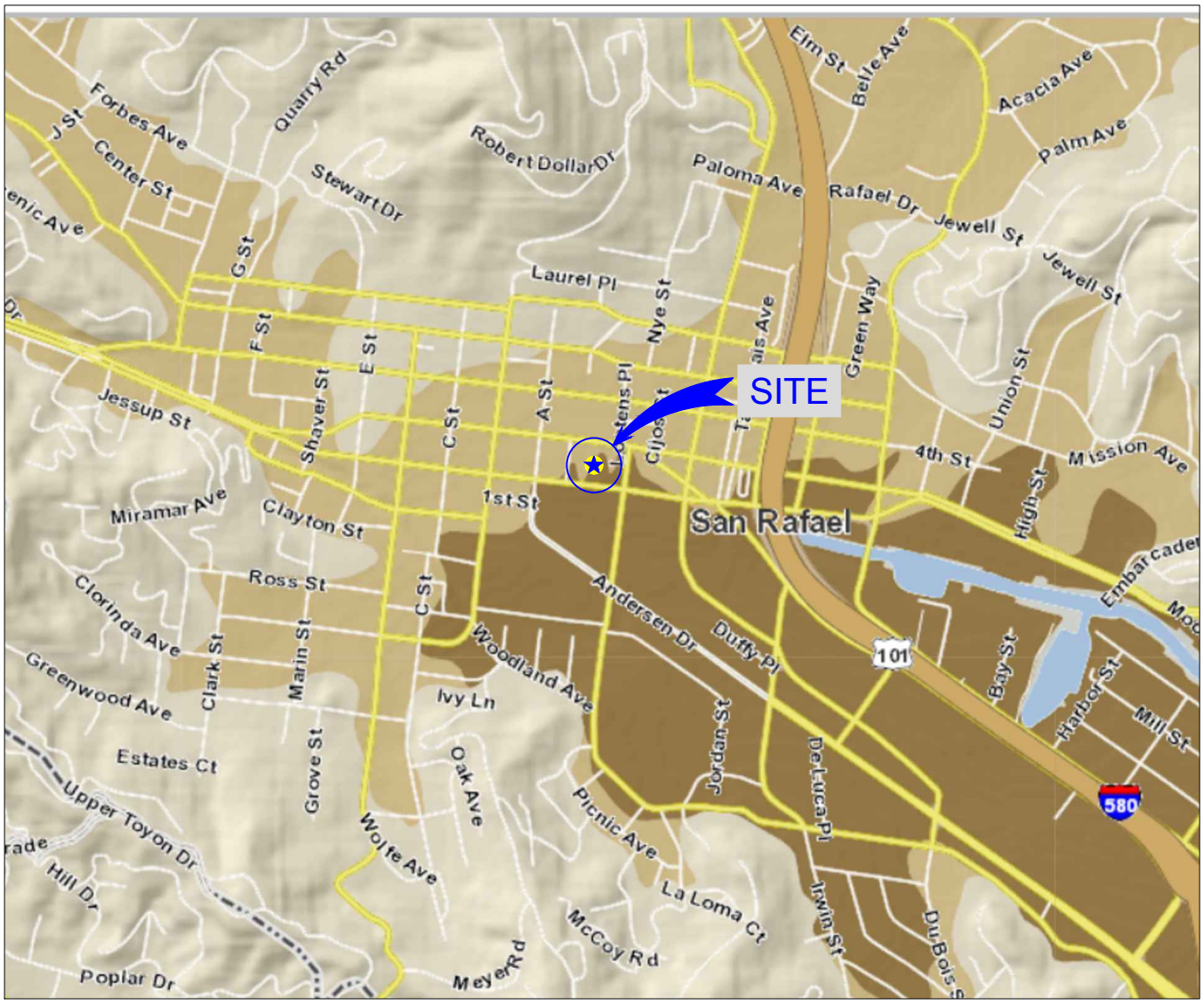
7 FIGURE



LIQUEFACTION SUSCEPTIBILITY

(NO SCALE)

Liquefaction Susceptibility

Liquefaction Susceptibility Hazard

- Very High Susceptibility
- High Susceptibility
- Moderate Susceptibility
- Low Susceptibility
- Very Low Susceptibility

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LIQUEFACTION SUSCEPTIBILITY MAP

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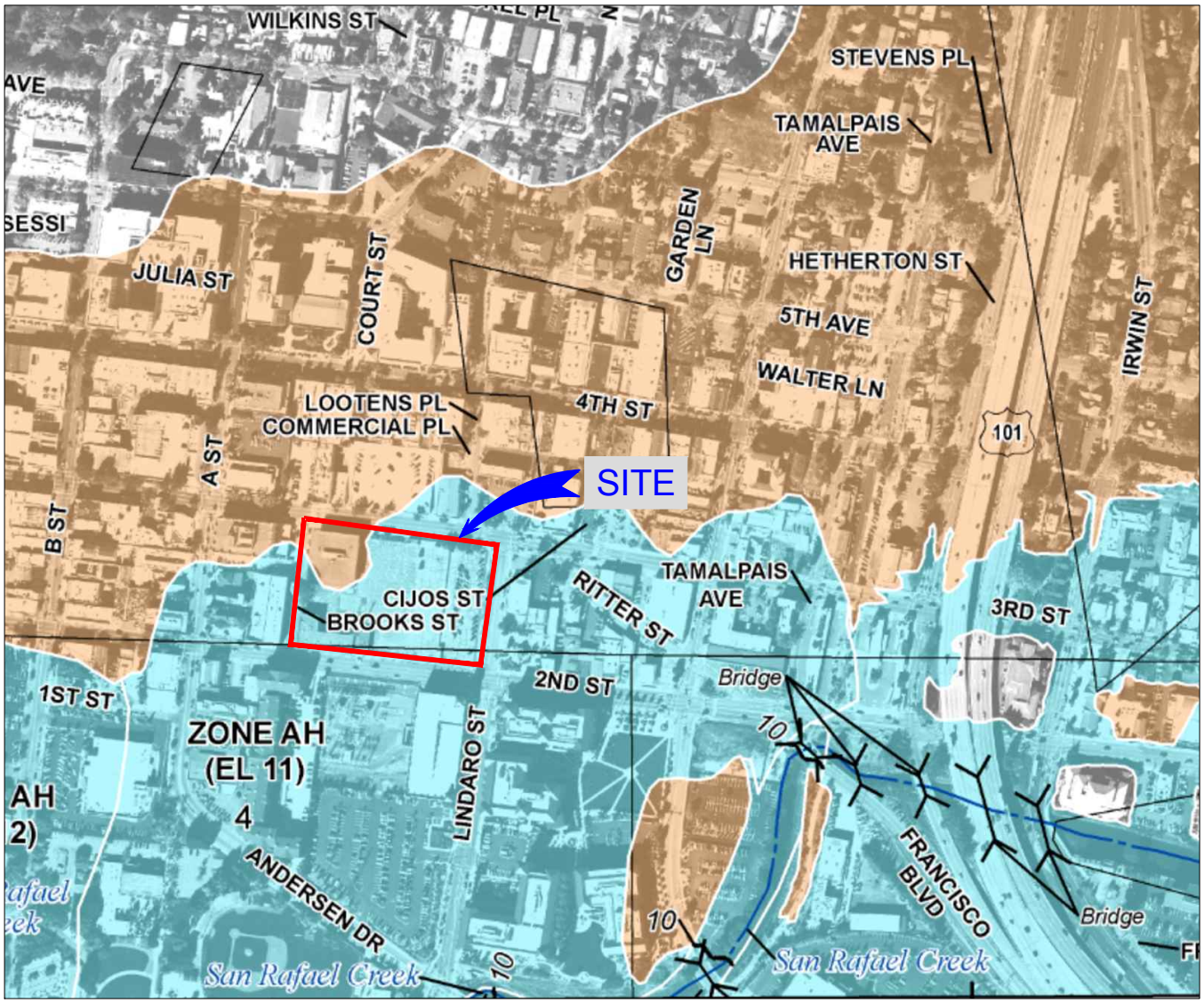
8
FIGURE



FEMA FLOOD INSURANCE RATE MAP

(NO SCALE)

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) — Zone A, V, A99
- With BFE or Depth — Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile — Zone X
- Future Conditions 1% Annual Chance Flood Hazard — Zone X
- Area with Reduced Flood Risk due to Levee See Notes — Zone X

OTHER AREAS
- NO SCREEN — Areas of Minimal Flood Hazard — Zone X
- Area of Undetermined Flood Hazard — Zone D

GENERAL STRUCTURES
- Channel, Culvert or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike or Floodwall
- Non-accredited Levee, Dike or Floodwall
- (E) 18.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation (BFE)
- (8) Coastal Transect
- Coastal Transect Baseline

OTHER FEATURES
- Profile Baseline
- Hydrographic Feature
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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FEMA FLOOD INSURANCE RATE MAP

BioMarin Office Buildings
999 3rd Street
San Rafael, California

Project No. 595.137 Date: 8/22/2018

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9
FIGURE

APPENDIX A

SUBSURFACE EXPLORATION FROM PREVIOUS INVESTIGATIONS

REFERENCE BORING RB-1

Equipment 8" HOLLOW FLIGHT AUGER

Elevation 5/9/88 Date -0.7'

Laboratory Tests	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Core Recov. % /RQD	Drilling Rate (min/ft)	Depth (ft)	Sample
						0	
							LIGHT BROWN SAND AND GRAVEL gravel up to 1"
						5	
							RED BROWN CLAYEY SAND (SC) stiff, moist
						10	
							GRAY SILT (MH) soft, saturated (bay mud)
							water level on 5/9/88
	10					15	
							MOTTLED-ORANGE-BROWN GRAY CLAYEY SAND (SC) med stiff, saturated
						20	
						25	
							becoming firmer at 27'
	32					30	
							BROWNISH GRAY SHALE moderately fractured, highly weathered
	23					35	
							bottom of boring at 36.5'
						40	

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Log of Boring A
San Rafael Retail Center
San Rafael, California

PLATE 2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
IAG	18,229,008.01		5/88		

REFERENCE BORING RB-2

Equipment CME-55
8-inch Hollow Stem Auger
Elevation 8.5 ft. MSL Date 7/09/97

Laboratory Tests	PID Reading (ppm)	Pocket Pen** (psf)	Moisture Content (%)	Dry Density (pcf)	Blows/ft.	Depth (ft.)	Sample
	ND		6.3	111.4	28*	0	
	0.6	2,000			7		
		750			PUSH 400 psi	5	
Torvane 2,500	0.4	2,500 2,500	22.9	103.7	8*	10	
-200=33%	ND	>4,500	19.5	109.8	14*	15	
	ND	>4,500			25*	20	
	ND	>4,500			32*	25	
TxUU 5,500 (5,200) (FM) See Plate 18	ND	>4,500	49.1	123.1	38*	30	
					32*	35	
	ND	>4,500			50/6"*	40	
	0.6				50/3"*	45	
						50	

GRAY POORLY GRADED GRAVEL WITH CLAY (GP): Medium dense, dry, (Fill).

LIGHT BROWN SANDY LEAN CLAY WITH GRAVEL (CL): Hard, dry, (Fill).

Changes to mottled brown and gray: Stiff, moist.

DARK GRAY FAT CLAY (CH): Soft, moist, (Bay Mud).

MOTTLED GRAY AND BROWN LEAN CLAY (CL): Stiff, moist.

Groundwater encountered at 14.5 feet during drilling.

MOTTLED RED BROWN SILTY SAND WITH GRAVEL (SM): Medium dense, wet.

Gravel content increases, becomes dense.

RED BROWN CLAYEY GRAVEL WITH SAND (GC): Very dense, wet, (colluvium).

Color changes to dark brown, sand content increases, large shale intrusions apparent in soil.

DARK BLACK SHALE: Moderately hard, weak, deep weathering, intensely fractured.

Bottom of boring at 45.5 feet.
Groundwater was encountered at 14.5 feet below ground surface during drilling.
Boring backfilled with cement grout.

GTECF12

* Blow counts are S&H sampler blow counts converted to standard penetration test N-values by multiplying the field values by 0.6. Blow counts without an asterisk are standard penetration test N-values.

** Actual reading divided by 2.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring B-1
Fair Isaac Office Park
Second and Lindaro Streets
San Rafael, California

PLATE 4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
TAC	35575.004	NFS	7/97	

REFERENCE BORING RB-3

Equipment CME-55
8-inch Hollow Stem Auger
Elevation 7.0 ft. MSL Date 7/09/97

Laboratory Tests	PID Reading (ppm)	Pocket Pen** (psf)	Moisture Content (%)	Dry Density (pcf)	Blows/ft.	Depth (ft.)	Sample
	ND					0	
	ND	750	19.3	110.4	4*	5	
					PUSH 100 psi	10	
-200=24%	0.2		21.4	101.5	11*	15	
	ND	4,000			23*	20	
LL=56, PI=38 See Plate 21 TxUU 5,200 (3,200) (FM) See Plate 18	ND	>4,500	11.0	132.6	42*	25	
		>4,500			40*	30	
	ND	>4,500			50/6"*	35	
	ND				50/5"*	40	
	ND				50/6"*	45	
						50	

GRAY POORLY GRADED GRAVEL (GP): Loose to medium dense, dry. (Fill).

DARK BROWN SANDY LEAN CLAY (CL): Soft to stiff, moist, occasional gravel. (Fill).

Gravel content increases.

DARK GRAY FAT CLAY (CH): Soft, moist, occasional gravel (Bay Mud).

LIGHT GRAY TO LIGHT BROWN SANDY LEAN CLAY WITH GRAVEL (CL): Soft to stiff, moist.

Groundwater encountered at 15 feet during drilling.

MOTTLED BROWN CLAYEY SAND WITH GRAVEL (SC): Medium dense, wet, sandstone gravels.

LIGHT BROWN LEAN CLAY WITH SAND (CL): Hard to very hard, wet, occasional gravel.

DARK GRAY SHALE: Low hardness, weak, deeply weathered, crushed.

Bottom of boring at 43.5 feet.
Groundwater was encountered at 15 feet below ground surface during drilling
Boring backfilled with cement grout.

* Blow counts are S&H sampler blow counts converted to standard penetration test N-values by multiplying the field values by 0.6. Blow counts without an asterisk are standard penetration test N-values.

** Actual reading divided by 2.

GTECFI2

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring B-2
Fair Isaac Office Park
Second and Lindaro Streets
San Rafael, California

PLATE 5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
TAC	35575.004	NFS	7/97	

REFERENCE BORING RB-4

Equipment CME-55
12-inch Hollow Stem Auger
Elevation 6.61 ft. MSL Date 7/10/97

Laboratory Tests	PID Reading (ppm)	Pocket Pen** (psf)	Moisture Content (%)	Dry Density (pcf)	Blows/ft.	Depth (ft.)	Sample
	ND					0	
	ND				14		
Consol See Plate 14			31.1	47.0	2 100 psi PUSH 250 psi	5	
	ND						
LL=86,PI=54 See Plate 21 Torvane 1,000 UC 210 See Plate 20	ND	500	95	47.1	PUSH	10	
		3,500			PUSH 100 psi	15	
-200=18%		2,500	12.6	124.2	13*	20	
		4,000			17*	25	
		3,500			33*	30	
TxUU 2,550 (4,300) (FM) See Plate 18		2,750	17.3	116.3	26*	35	
		>4,500			51* 50/2"*	40	
						45	
						50	

2 INCH ASPHALTIC CONCRETE

6 INCH AGGREGATE BASE

BROWN CLAYEY GRAVEL WITH SAND (GC): Medium dense, dry. (Fill)

DARK GRAY SANDY CLAY WITH GRAVEL (CL): Stiff, moist. (Fill).

Free Water encountered at 3.0 feet during drilling.

DARK GRAY FAT CLAY (CH): Very soft, wet (Bay Mud).

MOTTLED BROWN CLAYEY SAND WITH GRAVEL (SC): Medium dense, wet.

MOTTLED GRAY AND BROWN LEAN CLAY WITH SAND (CL): Stiff, wet.

Sand content decreases at 25 feet.

Sand lenses apparent at 26 feet.

Sand and gravel contents increase.

GRAY SHALE: Moderately hard to hard, friable, moderately to deeply weathered, intensely fractured.

Bottom of boring at 42.5 feet.
Free Water was encountered at 3.0 feet below ground surface during drilling.
Boring backfilled with cement grout.

GTECF12

* Blow counts are S&H sampler blow counts converted to standard penetration test N-values by multiplying the field values by 0.6. Blow counts without an asterisk are standard penetration test N-values.

** Actual reading divided by 2.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring B-3
Fair Isaac Office Park
Second and Lindaro Streets
San Rafael, California

PLATE 6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
TAC	35575.004	NPS	7/97	

REFERENCE BORING RB-5

Equipment CME-55
12-inch Hollow Stem Auger
Elevation 8.0 ft. MSL Date 7/09/97

Laboratory Tests	PID Reading (ppm)	Pocket Pen** (psf)	Moisture Content (%)	Dry Density (pcf)	Blows/ft.	Depth (ft.)	Sample
	0.7					0	
	ND	3,000			PUSH 200 psi	5	
	ND					10	
Torvane 1,000 Torvane 2,000		750 2,000			2* PUSH		
	ND		18.5	112.3	14*	15	
	ND				50/3"*	20	
	ND				50/3"*	25	
						30	
						35	
						40	
						45	
						50	

GRAY POORLY GRADED GRAVEL (GP): Loose to medium dense, dry. (Fill).

RED BROWN LEAN CLAY (CL): Stiff, moist, occasional gravel. (Fill).

DARK GRAY FAT CLAY (CH): Stiff, moist (Bay Mud).

Color changes to black.

Becomes soft.

BLUE GRAY LEAN CLAY (CL): stiff, moist.

LIGHT GRAY AND BROWN CLAYEY SAND WITH GRAVEL (SC): Medium dense, moist. Fragments of shale and sandstone apparent throughout sample.

Color changes to red brown.

RED-BROWN SANDSTONE: Moderately hard to moderately strong, deep to moderate weathering, intensely fractured to completely crushed.

Bottom of boring at 25.75 feet.
Groundwater was not encountered during drilling
Boring backfilled with cement grout.

* Blow counts are S&H sampler blow counts converted to standard penetration test N-values by multiplying the field values by 0.6. Blow counts without an asterisk are standard penetration test N-values.

** Actual reading divided by 2.

GTEC F12

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Log of Boring B-4
Fair Isaac Office Park
Second and Lindaro Streets
San Rafael, California

PLATE 7

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
TAC	35575.004	NFS	7/97	

REFERENCE BORING RB-6

Equipment CME-55
12-inch Hollow Stem Auger

Elevation 6.5 ft. MSL Date 7/10/97

Laboratory Tests	PID Reading (ppm)	Pocket Pen** (psf)	Moisture Content (%)	Dry Density (pcf)	Blows/ft.	Depth (ft.)	Sample
	ND					0	
	ND				4		
Consol See Plate 15 Torvane 1,750	ND	750	79.7	52.4	PUSH 100 psi	5	
UC 310 See Plate 20		750	96	46.4	2*	10	
TxUU 1,300 (1,900) (FM) See Plate 18		1,500	20.4	109.7	4*	15	
					14*	20	
		4,000			20*		
						25	
		>4,500			50/3"*	30	
					50/3"*	35	
						40	
						45	
						50	

2" ASPHALTIC CONCRETE, 4" AGGREGATE BASE.

DARK BROWN GRAVELLY CLAY WITH SAND (CL): Stiff, moist (Fill).

DARK GRAY FAT CLAY (CH): Soft, wet (Bay Mud).

Becomes stiff.

Groundwater encountered at 14.5 feet during drilling.

MOTTLED LIGHT BROWN LEAN CLAYEY SAND (SC): Loose, wet.

GRAY BROWN SANDY CLAY (CL/CH): Stiff to hard, moist, trace fine gravel and coarse sand, (Deeply Weathered Shale Franciscan Melange).

GRAY SHALE: Moderately hard to hard, friable, moderately to deeply weathered, intensely fractured, quartz intrusions apparent at bottom of 2 inches.

Bottom of boring at 38.0 feet.
Groundwater was encountered at 14.5 feet during drilling
Boring backfilled with cement grout.

GTECFI2

* Blow counts are S&H sampler blow counts converted to standard penetration test N-values by multiplying the field values by 0.6. Blow counts without an asterisk are standard penetration test N-values.

** Actual reading divided by 2.

Harding Lawson Associates
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Log of Boring B-5
Fair Isaac Office Park
Second and Lindaro Streets
San Rafael, California

PLATE 8

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
TAC	35575.004	NPS	7/97	

REFERENCE BORING RB-7

Equipment 12-inch Hollow Stem Auger

Elevation 6.0 ft. MSL Date 2/20/98

Laboratory Tests	PID Reading (ppm)	Pocket Pen (psf)**	Blows/foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft.)	Sample	
	ND					0		3" CONCRETE RED-BROWN LEAN CLAY WITH SAND (CL) stiff to hard, moist, occasional gravel (Fill) @2'-3" AC - hard drilling
	0.6		9					
	75							DARK GRAY LEAN CLAY (CL) stiff to hard, wet, high organic content, pieces of black coal up to 1" visible (Bay Mud Crust) Groundwater observed at 4' during drilling
	50					5		
	Draeger=7***		15*					
								DARK GRAY FAT CLAY (CH) very soft, wet (Bay Mud)
	ND	0				10		
UC=124		0	0*	85.9	50			
LL=88, PI=50 CONSOL			Push	99.0	46			
						15		
						20		
TxUU=1080(1500)		1000 750	13*	19.5	111			MOTTLED GRAY AND BROWN SANDY LEAN CLAY (CL) stiff, moist, occasional gravel
								Gravel content increases
						25		
			50*					GRAY SHALE low to moderate hardness, friable to moderately strong, intensely fractured, deep to moderate weathering, dry, quartz intrusions
								Bottom of boring at 26.5 feet Groundwater was encountered at 4 feet below ground surface during drilling Boring backfilled with cement-bentonite grout
						30		
						35		
						40		

*Blow counts are S&H sampler blow counts converted to Standard Penetration Test (SPT) N-values by multiplying the field values by 0.57. Blow counts without an asterisk are SPT N-values.

**Actual reading divided by 2.

***Draeger Tube measures benzene concentrations in ppm.

HLA

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Log of Boring EB-1
Fair, Isaac Parking Structures 1 and 2
San Rafael, California

PLATE

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
JMV	40335	NES	5/98	

40335 PS

REFERENCE BORING RB-8

Equipment 12-inch Hollow Stem Auger

Elevation 6.0 ft MSL Date 2/20/98

Laboratory Tests	PID Reading (ppm)	Pocket Pen (psf)**	Blows/foot*	Moisture Content (%)	Dry Density (pcf)
	ND		19	20.2	98
TxUU=580(500)	8.3	0	1*	107.5	38
UC=175	12.9		0	58.8	65
-200=20.3%	25		Push		
TxUU=2530(1500)		1750	13*	14.4	121
		3750	22*	17.8	113
TxUU=1835(2000)			21*	21.3	105

Depth (ft.) Sample

0 — 3" CONCRETE

RED-BROWN GRAVELLY LEAN CLAY WITH SAND (CL)
stiff, moist, gravel up to 2" (Fill)

BLACK SANDY LEAN CLAY (CL)
very soft, wet, high organic content, pieces of coal up to 1" (Bay Mud Crust)

Groundwater observed at 3' during drilling

5 — DARK GRAY FAT CLAY (CH)
very soft, wet, occasional gravel (Bay Mud)

10

15 — MOTTLED GRAY AND RED-BROWN CLAYEY GRAVEL, WITH SAND (GC)
medium dense, wet

20 — MOTTLED GRAY AND RED BROWN SANDY LEAN CLAY (CL)
hard, moist, occasional gravel

25

30 — RED-BROWN SANDSTONE
low to moderate hardness, deep to moderate weathering, intensely fractured, occasional red gravel up to 2"

Bottom of boring at 31.5 feet
Groundwater was encountered at 3 feet below ground surface during drilling
Boring backfilled with cement-bentonite grout

35

40

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring EB-2
Fair, Isaac Parking Structures 1 and 2
San Rafael, California

PLATE

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
JMV	40335	NTS	5/98	

REFERENCE BORING RB-9

Equipment 12-inch Hollow Stem Auger

Elevation 6.0 ft MSL Date 2/23/98

Laboratory Tests	PID Reading (ppm)	Pocket Pen (psf)**	Blows/foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft.)	Sample	
	ND					0		2" ASPHALTIC CONCRETE
	1.4		9	16.5	120			RED-BROWN POORLY GRADED GRAVEL WITH CLAY (GP-GC) loose, moist, occasional gravel up to 3" (Fill) Groundwater level observed at 2' during drilling
		2750				5		Red brick debris, fragments apparent
TxUU=1097(500)	28.6 Draeger= 1.5***		6*	103.6	38			BLACK LEAN CLAY (CL) soft, moist, high organic and coal content (Bay Mud Crust)
								Becomes very soft and wet, gravel and sand content increases at 6.5 feet
LL=85, PI=47 CONSOL		250	Push	75.0	53			DARK GRAY FAT CLAY (CH) very soft, wet (Bay Mud)
UC=189		0	1*	92.4	47	10		
						15		
TxUU=437(801)	3.8	750	3*	30.5	92			BLUE-GRAY LEAN CLAY WITH SAND (CL) soft, wet, occasional gravel
	2.1		2*			20		
-200=17.2%			36*					LIGHT BROWN CLAYEY GRAVEL WITH SAND (GC) medium dense, wet
								RED-BROWN POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC) medium dense, moist
		1750	9*	39.4	83	25		MOTTLED BROWN AND GRAY LEAN CLAY WITH SAND (CL) stiff, moist
								Gravel content increases, becomes hard
		3500 1750	21*	15.1	122	30		Sandstone intrusions apparent
						35		@ 35' Gravel fragments up to 1", becomes very hard
			36*					GRAY SHALE low to moderate hardness, friable, intensely fractured, deep weathering
						40		Bottom of boring at 36.5 feet Groundwater was encountered at 2 feet below ground surface during drilling Boring backfilled with cement-bentonite grout

HLA

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Log of Boring EB-3
Fair, Isaac Parking Structures 1 and 2
San Rafael, California

PLATE

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
JMV	40335	MFS	5/98	

REFERENCE BORING RB-10

Equipment 12-inch Hollow Stem Auger

Elevation 8.0 ft MSL Date 2/24/98

Laboratory Tests	PID Reading (ppm)	Pocket Pen (psf)**	Blows/foot*	Moisture Content (%)	Dry Density (pcf)
	1.3		16	10.6	135
-200=65.9%	4.1		7*	19.8	100
UC=1080 LL=37,PI=18	3.2	500	5*	12.5	116
TxUU=1880(1300)	1.3	2000	29*	23.6	103
TxUU=1505(1650)	1.3	>4500	29*	21.2	105

Depth (ft.) / Sample

0 — 2" ASPHALTIC CONCRETE
GRAY-BROWN CLAYEY GRAVEL WITH SAND (GC)
medium dense, moist, gravel up to 1" (Fill)

5 — GRAY GRAVELLY CLAY WITH SAND (CL)
firm, moist (Fill)

DARK GRAY SANDY CLAY (CL)
soft to stiff, wet, occasional gravel and wood content, shiny
Groundwater observed at 7' during drilling

10 — DARK BROWN FAT CLAY WITH SAND (CH)
soft, wet, shiny
GRAY GRAVELLY SAND (SP)
loose, wet
MOTTLED GRAY-BROWN LEAN CLAY WITH SAND (CL)
hard, moist

15 — GRAY-BROWN CLAYEY GRAVEL (GC)
medium dense, moist

20 — LIGHT GRAY LEAN CLAY WITH GRAVEL (CL)
hard, moist

Bottom of boring at 21.5 feet
Groundwater was encountered at 7 feet below ground surface during drilling
Boring backfilled with cement-bentonite grout

25

30

35

40

Harding Lawson Associates
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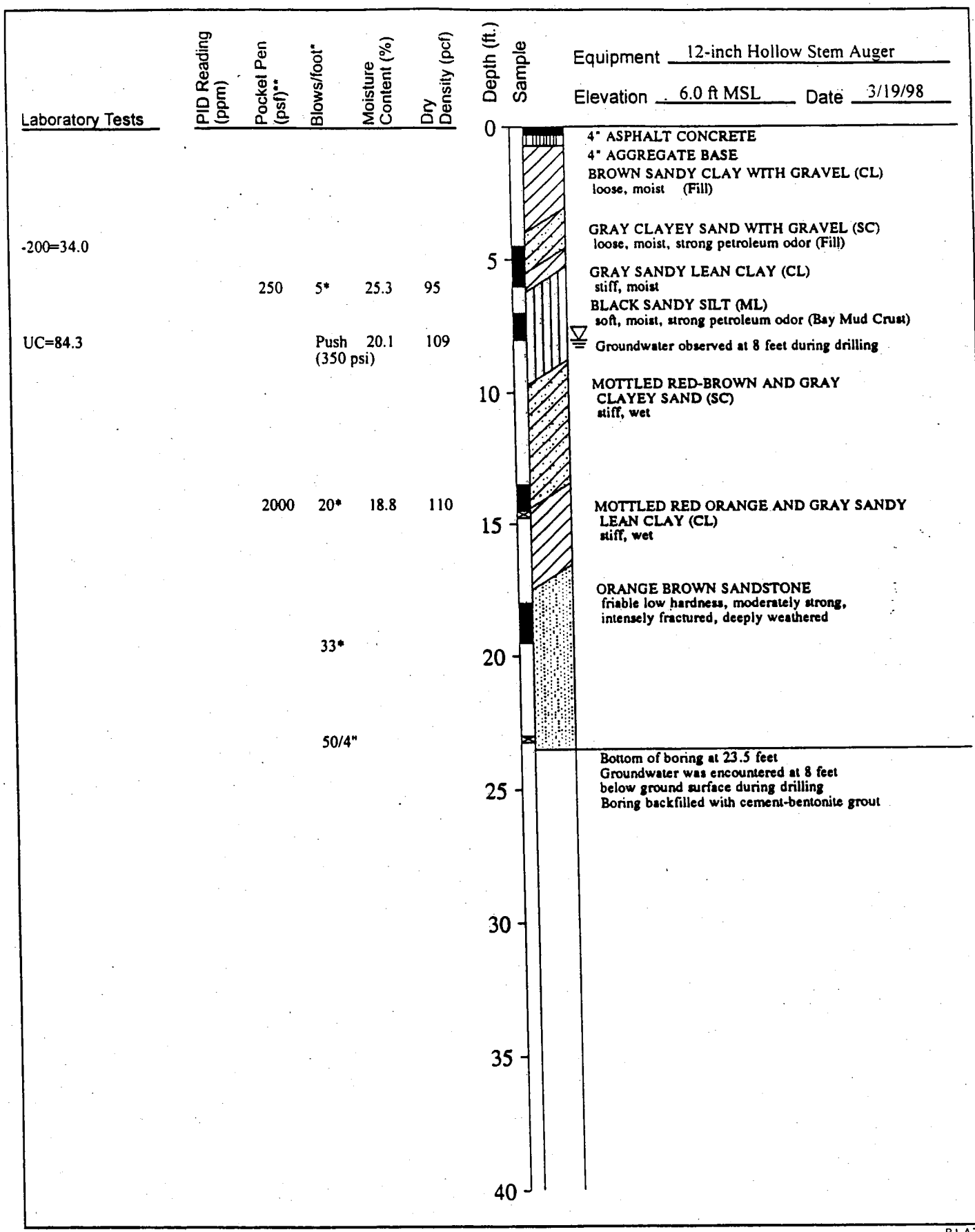
Log of Boring EB-4
Fair, Isaac Parking Structures 1 and 2
San Rafael, California

PLATE

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
JMV	40335	NFS	5/98	

REFERENCE BORING RB-11



PLATE

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Log of Boring EB-5
Fair, Isaac Parking Structures 1 and 2
San Rafael, California

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
JMV	40335	NFS	5/98	

REFERENCE BORING RB-12

LOG OF BORING #1

Equipment Hollow Stem Auger

Elevation ** 7 feet ± Date 9-23-85

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample	
			33	22	103			GREENISH-GRAY GRAVELLY SAND (SP) medium dense, moist (Fill) BROWN SANDY CLAY (CL) medium stiff, moist to wet (Fill)
			27	18	115	4		BROWN CLAYEY SAND (SC) medium dense to dense, moist (Fill)
			10	22	96			GRAY CLAYEY SILT (MH) soft to medium stiff, wet, with minor organics (Bay Mud)
				28	92	8		Water level 10-1-85
CONSOL LL = 108 PL = 47 PI = 61			75 psi	105	43			
						12		BROWN GRAVELLY SAND (SP) dense, wet, with gravel
			25	16		16		
						20		BROWN CLAYEY SAND (SC) medium dense, wet
			17	17	116			
						24		YELLOW-BROWN GRAVELLY SAND (SP) dense, wet
			72	19	115			Bottom of hole.

Hydraulic pressure required to advance Shelby tube.

Blows/foot for Modified California Sampler driven by 140 lb hammer falling 30 inches.

* N.G.V.D. 1929 ADJ.

REFERENCE: Donald Herzog and Associates, 1985

FILE: DHA Boring Title Block.dwg

Miller Pacific ENGINEERING GROUP

PREVIOUS EXPLORATION
San Rafael Lofts
San Rafael, California

A-11

Project No. 621.01 Date 10/04/99 Approved By: RV

Figure

REFERENCE BORING RB-13

LOG OF BORING #2

Equipment Hollow Stem Auger

Elevation ** 7 feet ± Date 9-23-85

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/Foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample	
			21	7				BROWN SANDY GRAVEL (GP) dense, moist (Fill)
			40	26	76	4		GRAY CLAYEY SAND (SC) dense, moist to wet (Fill)
			17	22	106			BLACK SILTY SAND (SM) medium dense, wet with abundant decaying wood (Fill)
TV 150			75 psi	95	49	8		BROWN SANDY GRAVEL (GP) medium dense, moist to wet (Fill)
								GRAY SANDY SILT (ML) very soft to medium stiff, wet, (Bay Mud) with clay
						12		BROWN CLAYEY SAND (SC) medium dense to dense, wet
			22	18	113	16		
								BROWN SANDY CLAY (CL) stiff to very stiff, moist to wet with occasional gravel
			48	22	108	20		Bottom of hole.

Blows/foot for Modified California Sampler driven by 140 lb hammer falling 30 inches.

N.G.V.D. 1929 ADJ.

REFERENCE: Donald Herzog and Associates, 1985

FILE: DHA Boring Title Block.dwg

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PREVIOUS EXPLORATION
San Rafael Lofts
San Rafael, California

A-12

Project No. 621.01 Date 10/04/99 Approved By:

Figure

REFERENCE BORING RB-14

LOG OF BORING #3

Equipment Hollow Stem Auger

Elevation ** 7½ feet± Date 9-23-85

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample	
			31	10	124			REDDISH-BROWN CLAYEY SAND (SC) dense, moist with minor gravels (Fill)
			50	11	131	4		GREY GRAVELLY SAND (GP) dense, wet (Fill)
			20	15	111			GRAY CLAYEY SILT (MH) medium stiff (Bay Mud)
						8		GRAY SILTY SAND (SM) medium dense, wet
								GRAY CLAYEY SILT (MH) soft, very wet (Bay Mud)
V 1600			150 psi	34	88	12		GREEN-BROWN SANDY CLAY (CL) medium stiff, very wet
						16		
			88	12	122			GRAY-BROWN SHEARED SHALE highly weathered, friable, weak to firm
						20		Bottom of hole.

Blows/foot for Modified California Sampler driven by 140 lb hammer falling 30 inches

N.G.V.D. 1929 ADJ.

REFERENCE: Donald Herzog and Associates, 1985

FILE: DHA Boring Title Block.dwg

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PREVIOUS EXPLORATION
San Rafael Lofts
San Rafael, California

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Project No. 621.01 Date 10/04/99 Approved By:

Figure

REFERENCE BORING RB-15

LOG OF BORING #4

Equipment Hollow Stem Auger

Elevation ** 7 feet ± Date 9-23-85

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/Foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample	
			17					BROWN SANDY GRAVEL (GP) dense, moist (Fill)
			17					GREEN SILTY SAND (SM) medium dense, wet (Fill)
			14	12		4		GRAY CLAYEY SILT (MH) soft to medium stiff, wet (Bay Mud)
			12	26	97			
				93	45			
						8		
TV 1000			100 psi	30	94			BROWN CLAYEY SAND (SC) loose to medium dense, wet, with occasional ½ inch diameter gravel
						12		BROWN CLAYEY SAND (SC) very dense, moist
			50/6"	11	129			Bottom of hole
						16		

* Blows/foot for Modified California Sampler driven by 140 lb hammer falling 30 inches

** N.G.V.D. 1929 ADJ.

REFERENCE: Donald Herzog and Associates, 1985

FILE: DHA Boring Title Block.dwg

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PREVIOUS EXPLORATION
San Rafael Lofts
San Rafael, California

A-14

Project No. 621.01 Date 10/04/99 Approved By: RJ

Figure

REFERENCE BORING RB-16

LOG OF BORING #5

Equipment Hollow Stem Auger

Elevation **7 feet ± Date 10-1-85

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample
			88	10	100		
hemical Test			5			4	
v 580			200 psi	91	47	8	
						12	
			15	19	98		
						16	
						20	
						24	
			84/11"	11	108		
						28	

BROWN GRAVELLY SAND (SP) dense moist (Fill)

REDDISH-BROWN CLAYEY GRAVEL (GC) dense, moist (Fill)

GRAY SANDY GRAVEL (GP) medium dense, wet (Fill)

GRAY CLAYEY SILT (MH) soft, wet (Bay Mud)

GRAY GRAVELLY SAND (SP) medium dense to dense, moist, with minor silts

Harder drilling at 20 feet

BROWN SHALE highly weathered, friable, soft

Bottom of hole

Blows/foot for Modified California Sampler driven by 140 lb hammer falling 30 inches

N.G.V.D. 1929 ADJ.

REFERENCE: Donald Herzog and Associates, 1985

FILE: DHA Boring Title Block.dwg

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PREVIOUS EXPLORATION
San Rafael Lofts
San Rafael, California

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Project No. 621.01 Date 10/04/99 Approved By: RJO

Figure

REFERENCE BORING RB-17

LOG OF BORING #6

Equipment Hollow Stem Auger

Elevation ** 7 feet ± Date 10-1-85

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot*	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample	
			77	16	94			BROWN CLAYEY GRAVEL/GRAVELLY CLAY (GC/CL) dense/stiff, moist (Fill)
Chemical Test			7			4		GRAY GRAVELLY SAND (SM) medium dense, wet, slight chemical odor (Fill)
								GRAY CLAYEY SILT (MH) soft, wet (Bay Mud)
						8		
V 760			250 psi	27	96	12		GRAVELLY SANDY CLAY (SC)
						16		GRAY SHEARED SHALE highly weathered, friable, soft
			45	22	106	20		Bottom of hole.

Blows/foot for Modified California Sampler driven by 140 lb hammer falling 30 inches

N.G.V.D. 1929 ADJ.

REFERENCE: Donald Herzog and Associates, 1985

FILE: DHA Boring Title Block.dwg

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PREVIOUS EXPLORATION
San Rafael Lofts
San Rafael, California

A-16

Project No. 621.01 Date 10/04/99 Approved By: RD

Figure

REFERENCE BORING RB-18

LOG OF BORING #7

Equipment Hollow Stem Auger

Elevation ** 7 feet ± Date 10-1-85

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample	
								GRAY-BROWN GRAVELLY SAND (SP) dense, moist (Fill)
								GRAY SANDY GRAVEL (GP) medium dense, wet (Fill)
						4		BLACK SILTY GRAVEL (GM) loose, wet, with decayed wood (Fill)
emical Test			7					
								GRAY CLAYEY SILT (MH) soft, wet (Bay Mud)
360			3	42	74	8		
						12		
n 2300 1600 n 4000 1250				30	91			BROWN SANDY CLAY (CL) medium stiff, moist to wet
						16		GRAY-BROWN SHALE highly weathered, friable, firm to weak
			76/11"	27	91			Bottom of hole.
						20		

Blows/foot for Modified California Sampler driven by 140 lb hammer falling 30 inches

N.G.V.D. 1929 ADJ.

REFERENCE: Donald Herzog and Associates, 1985

FILE: DHA Boring Title Block.dwg

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PREVIOUS EXPLORATION
San Rafael Lofts
San Rafael, California

A-17

Project No. 621.01 Date 10/04/99 Approved By: RD

Figure

REFERENCE BORING RB-19

BORING 1

EQUIPMENT: 8-inch Hollow Stem Augers
DATE: September 2, 1999
ELEVATION: +7 Feet*
*REFERENCE: San Rafael Topographic Maps

OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (3)	
					0	0			SILTY SAND (SM) WITH GRAVEL (FILL) SANDY GRAVEL (GP) WITH SILT (FILL) gray, subrounded gravels to 1 inch
		21			1				SANDY SILT (ML) WITH GRAVEL (FILL) mottled gray and brown, wet, medium dense
									Groundwater observed at 4.0 feet
		52				5			brick fragments and concrete debris
		4			2				SILTY CLAY (CH, BAY MUD) mottled gray and brown, wet, soft, minor peat
			41.0	75	3	10			SANDY CLAY (CL) no recovery
					4				Bottom of boring at 11.5 feet Groundwater observed at 4.0 feet immediately after drilling
						15			
					5				
					6	20			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

FILE: Boring 1 621-01.dwg

Miller Pacific
ENGINEERING GROUP

BORING LOG
San Rafael Lofts
San Rafael, California

A-3

Project No. 621.01 Date 10/04/99 Approved By:

Figure

REFERENCE BORING RB-20

BORING: 1

EQUIPMENT: Simco - 3.5" Solid Stem Continuous Flight Auger
DATE: 03/02/04
ELEVATION: 11 feet*
*REFERENCE: City of San Rafael, Dept. of Public Works, 1988

OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (3)	
					0	0			3.0" AC over 6.0" AB
									SILTY CLAY (CL) brown-gray, moist, medium stiff, low plasticity, strong hydrocarbon odor
- #200 43.2%	275	7	13.4	110	1	5			CLAYEY SAND (SC) brown, moist, medium dense, low plasticity, some gravel
- #200 40.2%	2125	21	15.2	118	2				grades without gravel
		13	13.6		3	10			CLAYEY SAND (SC) mottled tan and orange-brown, moist, medium dense, low plasticity
					7				grades to hard
						15			SANDY CLAY (CL) mottled tan and orange-brown, moist, medium dense, low plasticity
		89	11.4	128	8				
		70/6"	14.7		9	20			SHALE dark gray to black, intensely fractured, weak, moderate to highly weathered (Bedrock) CONTINUED

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

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Project No. 1125.01 Date 03/23/04 Approved By:

Figure

REFERENCE BORING RB-20 (CONTINUED)

OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters / feet	SAMPLE	SYMBOL (3)	BORING: 1 (CONTINUED)
					20			SHALE dark gray to black, intensely fractured, weak, moderate to highly weathered
					7			Bottom of boring at 22.0 feet Groundwater observed at 7.0 feet
					25			
					8			
					9			
					30			
					10			
					35			
					11			
					12			
					40			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

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Figure

REFERENCE BORING RB-21

BORING: 2

EQUIPMENT: Truck - 4" Solid Stem Continuous Flight Auger
DATE: 05/25/94
ELEVATION: 11 feet*
*REFERENCE: City of San Rafael, Dept. of Public Works, 1988

OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters / feet	SAMPLE	SYMBOL (3)	
					0 / 0			SILTY CLAY (CL) (FILL) brown, moist, medium stiff, low plasticity
		8			1			SANDY SILT (ML) dark brown, wet, loose
		24			2 / 5			CLAYEY GRAVEL (GC) mottled orange-brown and white, medium dense, fine to medium grained sands
					3 / 10			Bottom of boring at 10.0 feet No Groundwater observed while drilling
					7			
					15			
					8			
					9 / 20			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

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Figure

REFERENCE BORING RB-22

OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters / feet	SAMPLE	SYMBOL (3)	BORING: 3 EQUIPMENT: Truck - 4" Solid Stem Continuous Flight Auger DATE: 07/01/94 ELEVATION: 11 feet* *REFERENCE: City of San Rafael, Dept. of Public Works, 1988
					0 / 0			GRAVELLY CLAYEY SILT (ML) (FILL) brown, moist to saturated, abundant gravel up to 1in.
		10			1			SILTY CLAY (CL) mottled olive green/gray, firm, strong hydrocarbon odor
		12			5			CLAYEY GRAVEL (GC) dark brown, wet to saturated, loose, slight hydrocarbon odor
					2			SILTY GRAVELLY CLAY (CL) dark olive gray w/ orange, very moist, firm to stiff, slight hydrocarbon odor
					3 / 10			CLAYEY GRAVEL (GC) olive green to gray, wet to saturated, loose, moderate to strong hydrocarbon odor
					7			Bottom of boring at 10.0 feet Groundwater observed at 7.5 feet while drilling
					15			
					8			
					9 / 20			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

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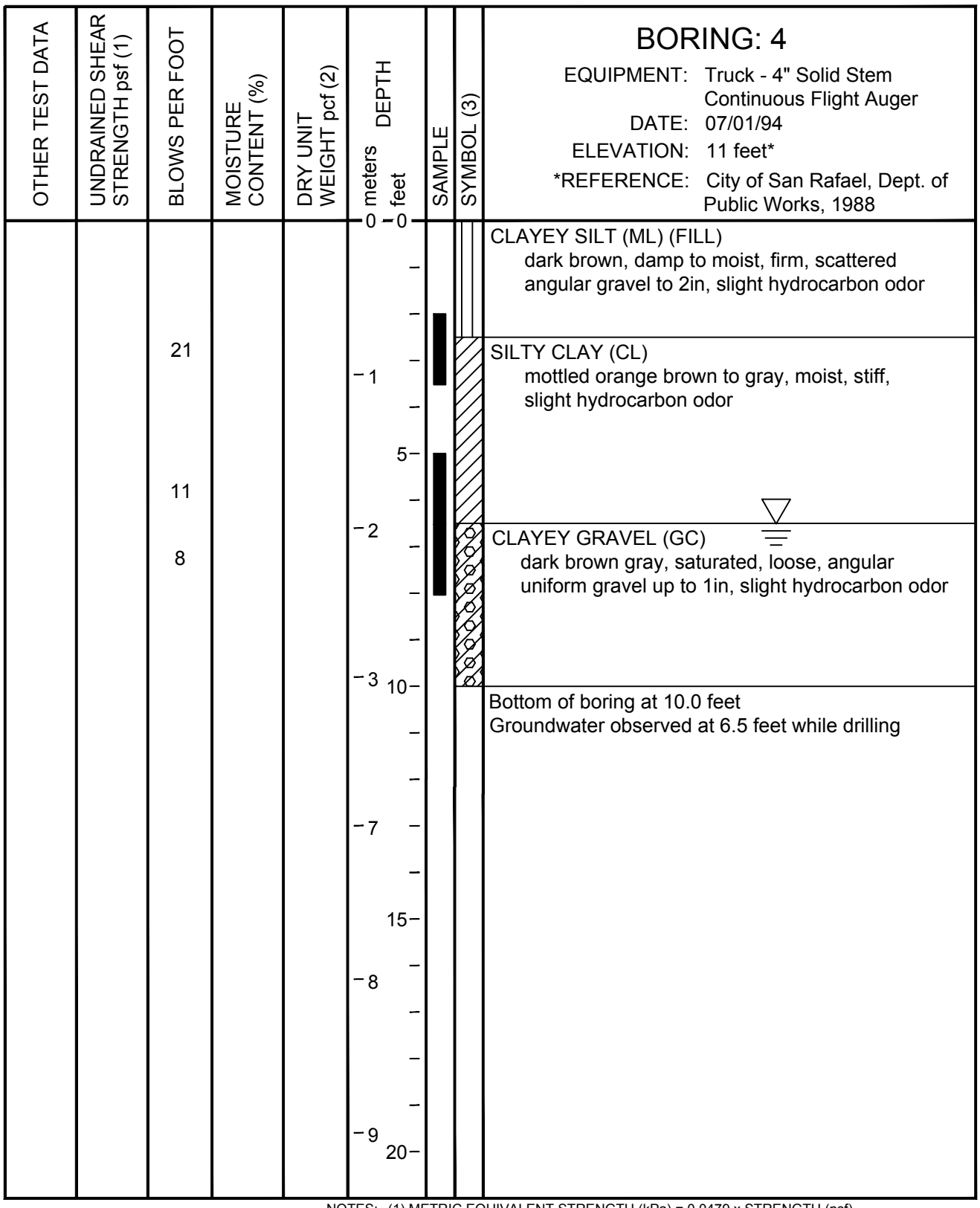
Figure

REFERENCE BORING RB-23



NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
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Figure

REFERENCE BORING RB-24

OTHER TEST DATA	OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters / feet	SAMPLE	SYMBOL (3)	BORING 1
						0 / 0			EQUIPMENT: Truck-Mounted Mobile B-53 Drill Rig with 6-Inch Solid Flight Augers DATE: 3/1/13 ELEVATION: 9-Feet* *REFERENCE: Google Earth
									3-Inch Asphalt Concrete 6-Inch Aggregate Baserock
			11			1			Clayey SAND with Gravel (SC) Medium brown with gray mottling, moist, medium dense, fine to medium sand, ~30% low to medium plasticity clay, ~10% fine gravel [ALLUVIUM / FILL]
			32			5			Grades to trace gravels at 2.0-feet Grades to ~15-20% low plasticity clay, ~20% fine to coarse sub-angular gravels at 4.0-feet
			21			2			
						3 / 10			Bottom of Boring at 7.0-feet No Groundwater Encountered During Exploration
						4			
						15			
						5			
						6 / 20			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) GRAPHIC SYMBOLS ARE ILLUSTRATIVE ONLY

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FILE: 2157.26 BL.dwg

BORING LOG

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4
FIGURE

REFERENCE BORING RB-25

OTHER TEST DATA	OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters / feet	SAMPLE	SYMBOL (3)	BORING 2
						0 / 0			EQUIPMENT: Truck-Mounted Mobile B-53 Drill Rig with 6-Inch Solid Flight Augers DATE: 3/1/13 ELEVATION: 11-Feet* *REFERENCE: Google Earth
									4.5-Inches Asphalt Concrete 10-Inches Aggregate Baserock
			5			1			Sandy CLAY (CL) Medium brown to gray, moist, soft, medium plasticity, ~20-30% fine sand [ALLUVIUM / FILL] Grades blue green, medium stiff at 3.5-feet
			15			5			Clayey SAND (SC) Medium brown to gray, moist, medium dense, fine sand, ~30% low plasticity clay [ALLUVIUM] Grades ~20% medium plasticity clay at 5.5-feet
			37			2			Bottom of Boring at 7.0-feet No Groundwater Encountered During Exploration
						3 / 10			
						4			
						15			
						5			
						6 / 20			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
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FIGURE

REFERENCE BORING RB-26

BORING 3

EQUIPMENT: Truck-Mounted Mobile B-53 Drill Rig with 6-Inch Solid Flight Augers

DATE: 3/1/13

ELEVATION: 10-Feet*

*REFERENCE: Google Earth

OTHER TEST DATA	OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters / feet	SAMPLE	SYMBOL (3)	
						0 / 0			4.0-Inches Asphalt Concrete 7-Inches Aggregate Baserock
			14			1			Clayey SAND (SC) Medium brown, moist, loose to medium dense, fine to coarse sub-rounded sand, ~20% low plasticity clay, trace fine gravels [ALLUVIUM / FILL]
			11			5			Sandy CLAY (CL) Blue-green, moist, medium stiff, medium plasticity, ~20 to 30% fine to coarse sub-angular sand [ALLUVIUM]
			42			2			SHALE MELANGE Medium brown to gray, crushed thinly bedded, low hardness, friable [BEDROCK]
						3 / 10			Bottom of Boring at 7.5-feet No Groundwater Encountered During Exploration
						4			
						15			
						5			
						6 / 20			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
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FIGURE

REFERENCE BORING RB-27

BORING 4

EQUIPMENT: Truck-Mounted Mobile B-53 Drill Rig with 6-Inch Solid Flight Augers

DATE: 3/1/13

ELEVATION: 8-Feet*

*REFERENCE: Google Earth

OTHER TEST DATA	OTHER TEST DATA	UNDRAINED SHEAR STRENGTH psf (1)	BLOWS PER FOOT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT pcf (2)	DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (3)	
						0	0			4.5-Inches Asphalt Concrete 11-Inches Aggregate Baserock
			18							SAND with Clay and Gravel (SP-SC) Dark brown, moist, medium dense, fine sand, ~15% low plasticity clay, ~15% fine gravel [FILL]
						1				Grades medium brown, trace gravels at 2.5-feet
			15				5			Grades fine to coarse sand, ~15% fine sub-rounded gravel at 4.0-feet
										Grades ~20% fine to coarse gravel to 1-inch diameter at 6.0-feet
			34			2				
										Bottom of Boring at 7.0-feet No Groundwater Encountered During Exploration
						3	10			
						4				
							15			
						5				
						6	20			

NOTES: (1) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
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FIGURE

REFERENCE BORING RB-28

BORING 1

EQUIPMENT: Portable Hydraulic Drill Rig with 4.0-inch Solid Flight Auger
DATE: 6/08/17
ELEVATION: 20 - feet*
*REFERENCE: Google Earth, 2017

DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (4)		BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	DRILLING RATE	OTHER TEST DATA
0	0			6" Concrete over 4" Aggregate Base						
				Sandy CLAY (CL) Medium brown, moist, soft to medium stiff, 30-35% fine to medium grained sand, trace gravel, low plasticity lean clay, some lenses of debris (brick, dark gray gravel) Fill						
1	5									
				Sandy CLAY (CL) Medium yellow brown, moist, medium stiff to stiff, few large gravels present in rock sampler, thinly bedded, some rock structure preserved Residual Soil Hard drilling at 8.0-feet	41	109	18.9	3800		
2				Sandstone and Shale Medium brown to dark gray, friable, moderately hard, highly weathered, locally weathered completely to clay Bedrock						
3	10				78/10"	113	8.4			
				Hard drilling increases at 13.0-feet					0.20 ft/min	
4	15			Very poor recovery, one small piece of sandstone recovered	50/1"		1.8		0.10 ft/min	
5										
6	20									

▽ Water level encountered during drilling
▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
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A-3
FIGURE

REFERENCE BORING RB-28 (CONTINUED)

DEPTH meters / feet	SAMPLE	SYMBOL (4)	BORING 1 (CONTINUED)	BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	DRILLING RATE	OTHER TEST DATA
20			Shale Dark gray, friable when sampled, moderately hard, laminated bedded, pervasively sheared Bedrock	50/2"				0.25 ft/min	
7									
25			Grades to hard, moderately strong Bedrock						
8				83/11"		8.0			
			End of boring at 26.0 Groundwater enountered at 14.0-feet						
9 30									
10									
35									
11									
12 40									

▽ Water level encountered during drilling
▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
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A-4
FIGURE

REFERENCE BORING RB-29

BORING 2

EQUIPMENT: Portable Hydraulic Drill Rig with 4.0-inch Solid Flight Auger
DATE: 6/09/17
ELEVATION: 12 - feet*
*REFERENCE: Google Earth, 2017

DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (4)		BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	OTHER TEST DATA	OTHER TEST DATA
0	0			4" Aggregate Base						
				Sandy Clayey GRAVEL (GC) Gray brown, moist, loose to medium dense (Fill)						
1				Clayey SAND (SC) Medium yellow brown with minor gray mottling, moist, medium dense, (30-35% medium to high plasticity clay, fine to coarse grained sand (Alluvium)						
	5				24	111	16.6	1350		
2				Stiffer drilling at 8.0-feet						
3	10			Shale Yellow brown, low hardness, weak, moderately to highly weathered, laminated to thinly bedded (Bedrock)	74	138	7.6	1050		
4										
	15			Color varies from dark gray to yellow brown, weak, low hardness, some clay and sand lenses present, pervasively sheared (Bedrock)	38		14.7		1.25 ft/min	
5										
6	20									

▽ Water level encountered during drilling
▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
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A-5
FIGURE

REFERENCE BORING RB-29 (CONTINUED)

DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (4)	BORING 2 (CONTINUED)	BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	DRILLING RATE	OTHER TEST DATA
	20			Shale Grades to dark gray, weak, low hardness, slightly weathered, laminated bedding Bedrock	50/5"		12.1			
7										
	25			Grades to moderately hard Bedrock	50/1"				0.35 ft/min	
8										
9	30			Grades to very hard, auger chewing, no recovery	50/.5"					
				End of boring at 30-feet Groundwater encountered at 14-feet during drilling Groundwater measured at 4.5-feet on 6/16/17						
10										
	35									
11										
12										
	40									

▽ Water level encountered during drilling

▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
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A-6
FIGURE

REFERENCE BORING RB-30

BORING 3

EQUIPMENT: Track-Mounted Drill Rig with 4.0-inch Solid Flight Auger
DATE: 6/09/17
ELEVATION: 12 - feet*
*REFERENCE: Google Earth, 2017

DEPTH meters	DEPTH feet	SAMPLE	SYMBOL (4)		BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	DRILLING RATE	OTHER TEST DATA
0	0			4" Asphalt Concrete over 2" Aggregate Base						
				Gravelly Clayey SAND (SC) Yellow brown, moist to wet, medium dense, 35% angular to sub-angular gravel, 30% fine to coarse grained sand Alluvium	24	126	11.7			
1	5									
2										
3	10			Sandy CLAY (CL) Yellow brown and gray mottled, moist, medium stiff, 40% fine to medium grained sand, some rock structure present Residual Soil	30	108	18.8	1400		
				Shale Yellow brown to gray where fresh, low hardness, weak, thinly bedded to laminated, locally weathered almost to clay Bedrock						
4										
	15			Grades to dark gray, weak, low hardness Bedrock	80/11"	126	9.0	900	0.25 ft/min	
5										
6	20									

▽ Water level encountered during drilling
▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
(3) METRIC EQUIVALENT STRENGTH (kPa) = 0.0479 x STRENGTH (psf)
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A-7
FIGURE

REFERENCE BORING RB-30 (CONTINUED)

DEPTH meters / feet	SAMPLE	SYMBOL (4)	BORING 3 (CONTINUED)	BLOWS / FOOT (1)	DRY UNIT WEIGHT pcf (2)	MOISTURE CONTENT (%)	SHEAR STRENGTH psf (3)	DRILLING RATE	OTHER TEST DATA
20			Shale Dark gray, weak to locally moderately strong, low hardness, laminated bedding, pervasively sheared Bedrock	74		13.5		0.50 ft/min	
7 25 8			Poor recovery, grades to strong Bedrock	50/1"		6.7			
			End of boring at 27.0-feet 1.0-inches Groundwater encountered at 21.0-feet						
9 30 10 35 11									
12 40									

▽ Water level encountered during drilling
▼ Water level measured after drilling

NOTES: (1) UNCORRECTED FIELD BLOW COUNTS
(2) METRIC EQUIVALENT DRY UNIT WEIGHT kN/m^3 = 0.1571 x DRY UNIT WEIGHT (pcf)
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A-8
FIGURE

REFERENCE CPT RC-1

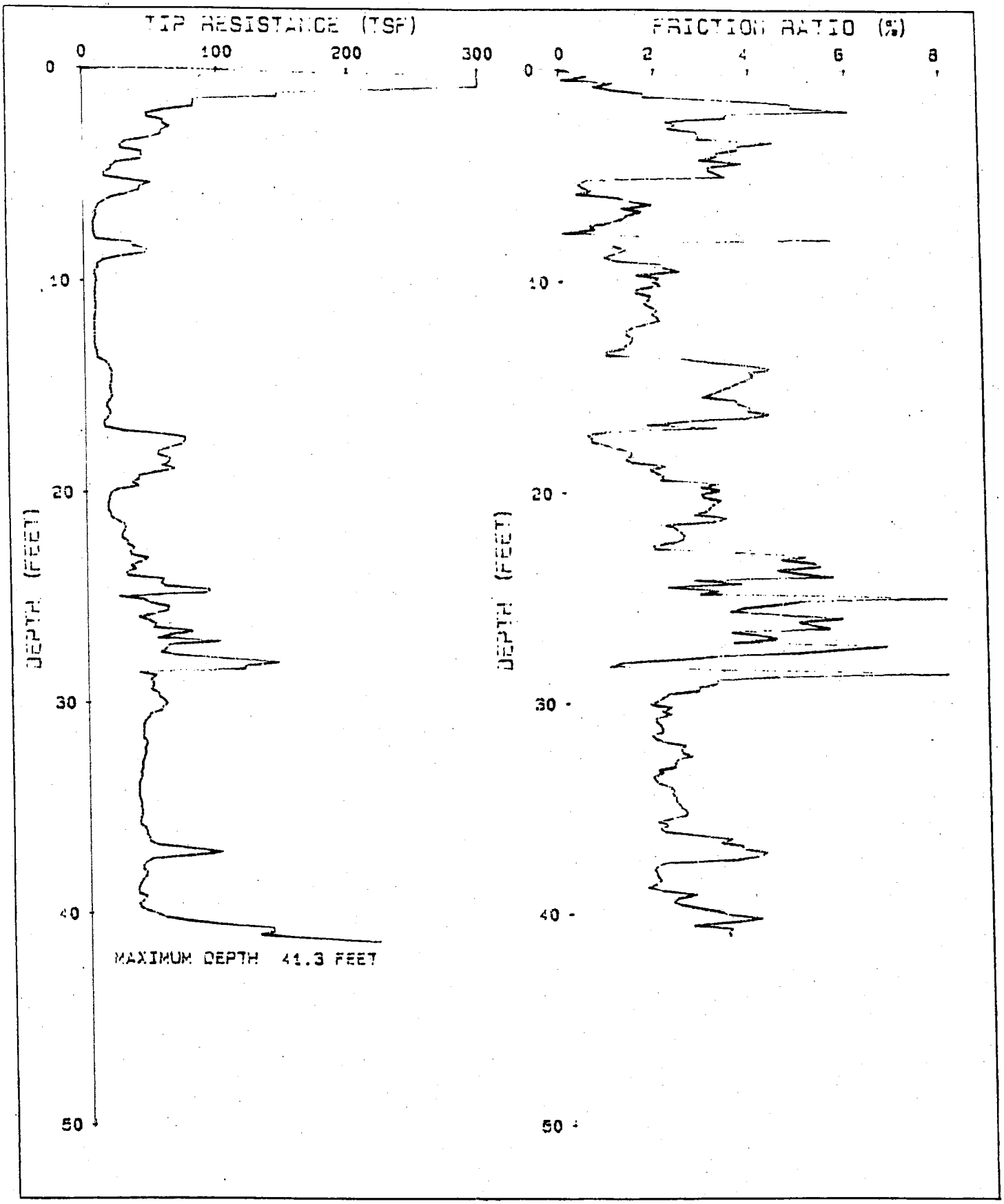

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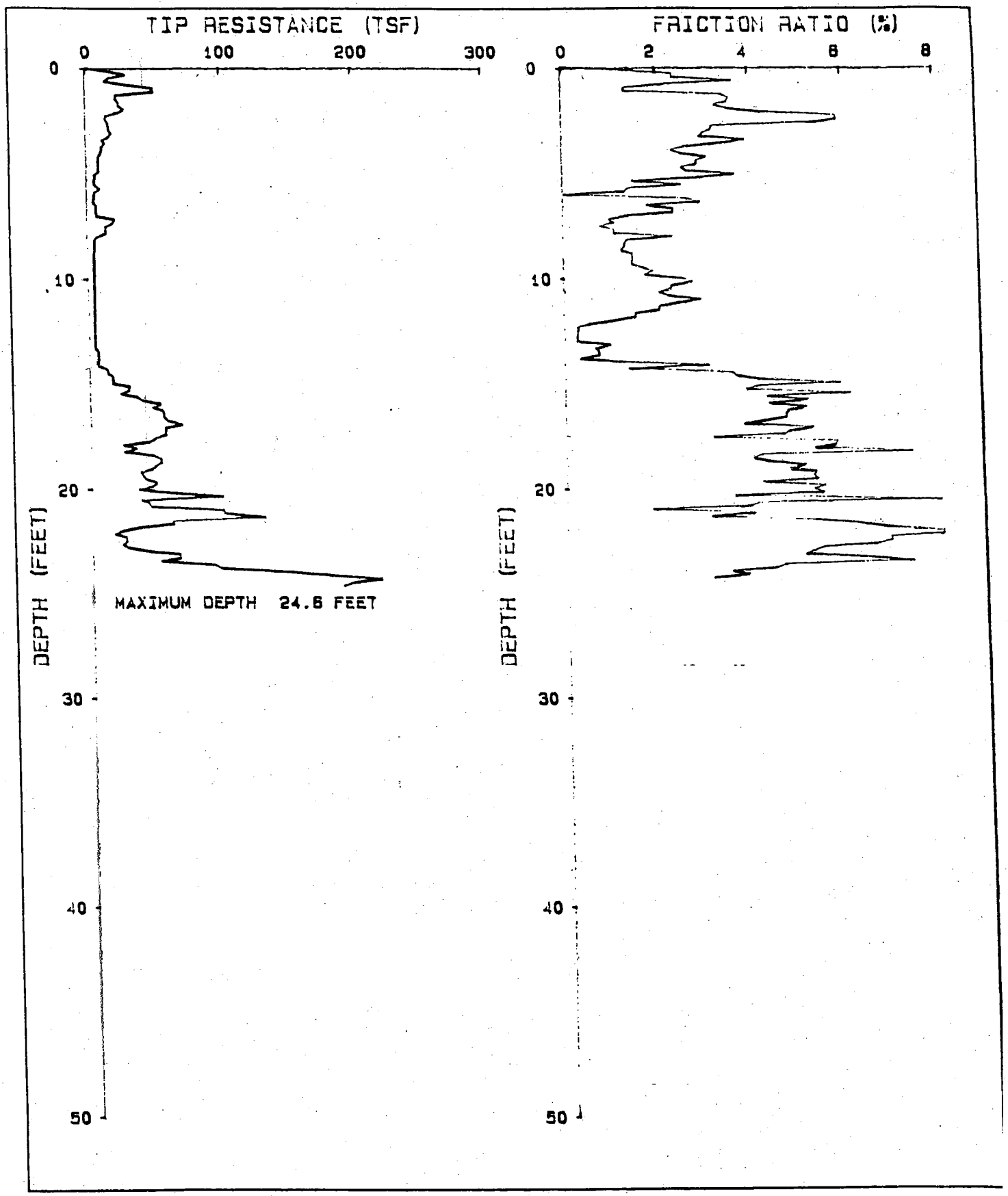
PLATE
4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
MAG	18,229,008.01		5/88		

REFERENCE CPT RC-2



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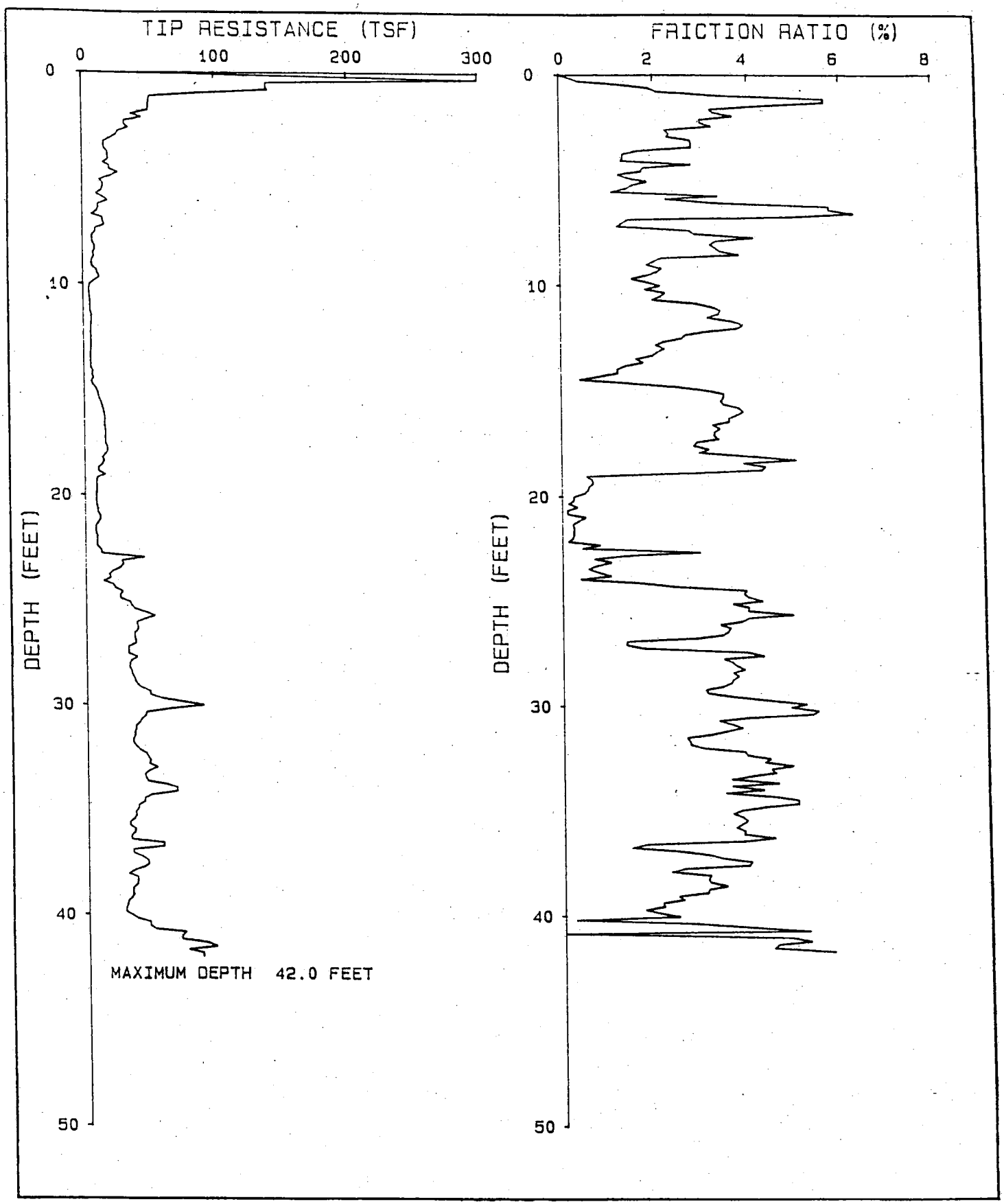
5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
MAG	18,229,008.01		5/88		

REFERENCE CPT RC-3



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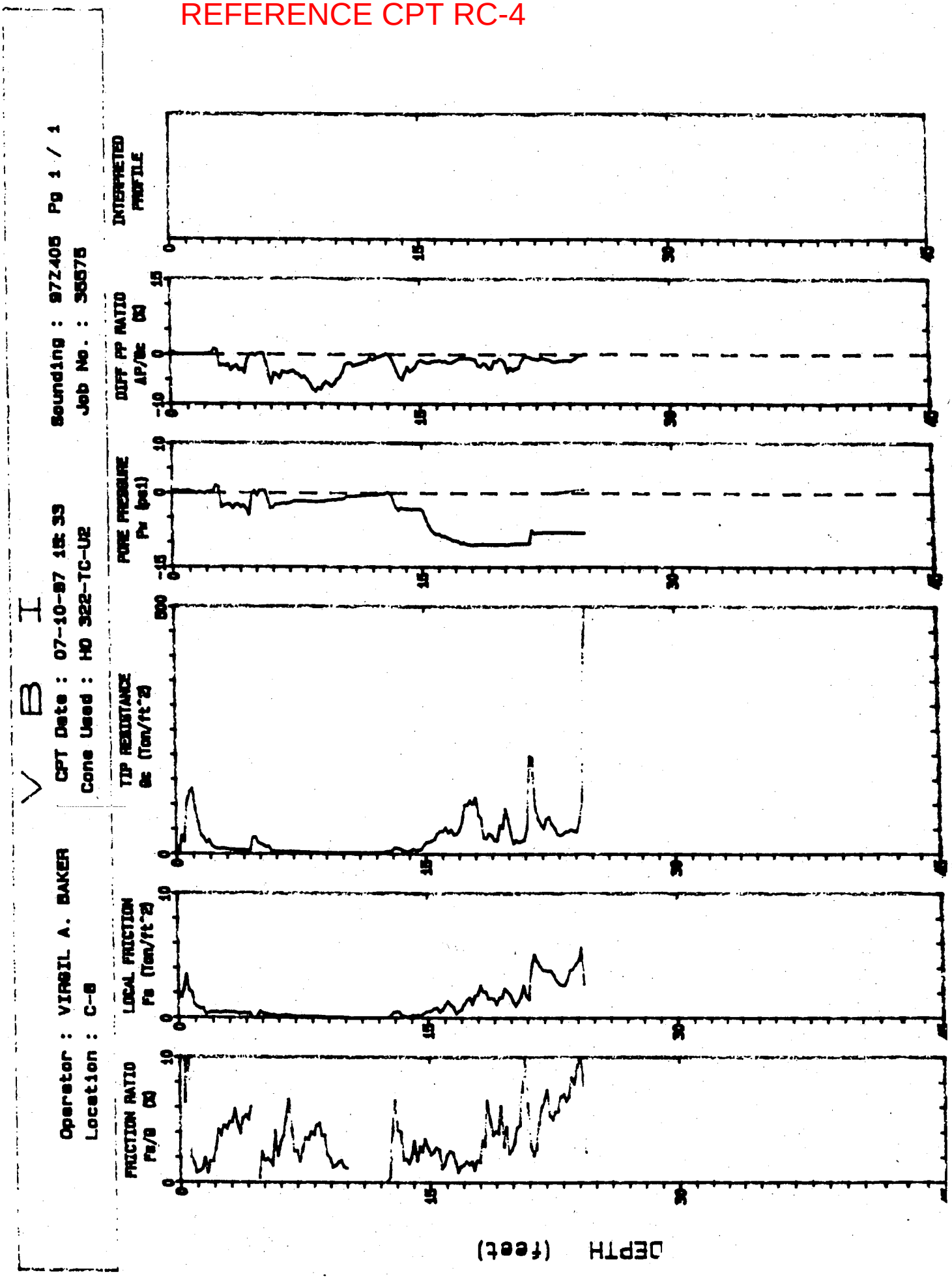
Engineers and Geoscientists

Log of CPT Probe 4
San Rafael Retail Center
San Rafael, California

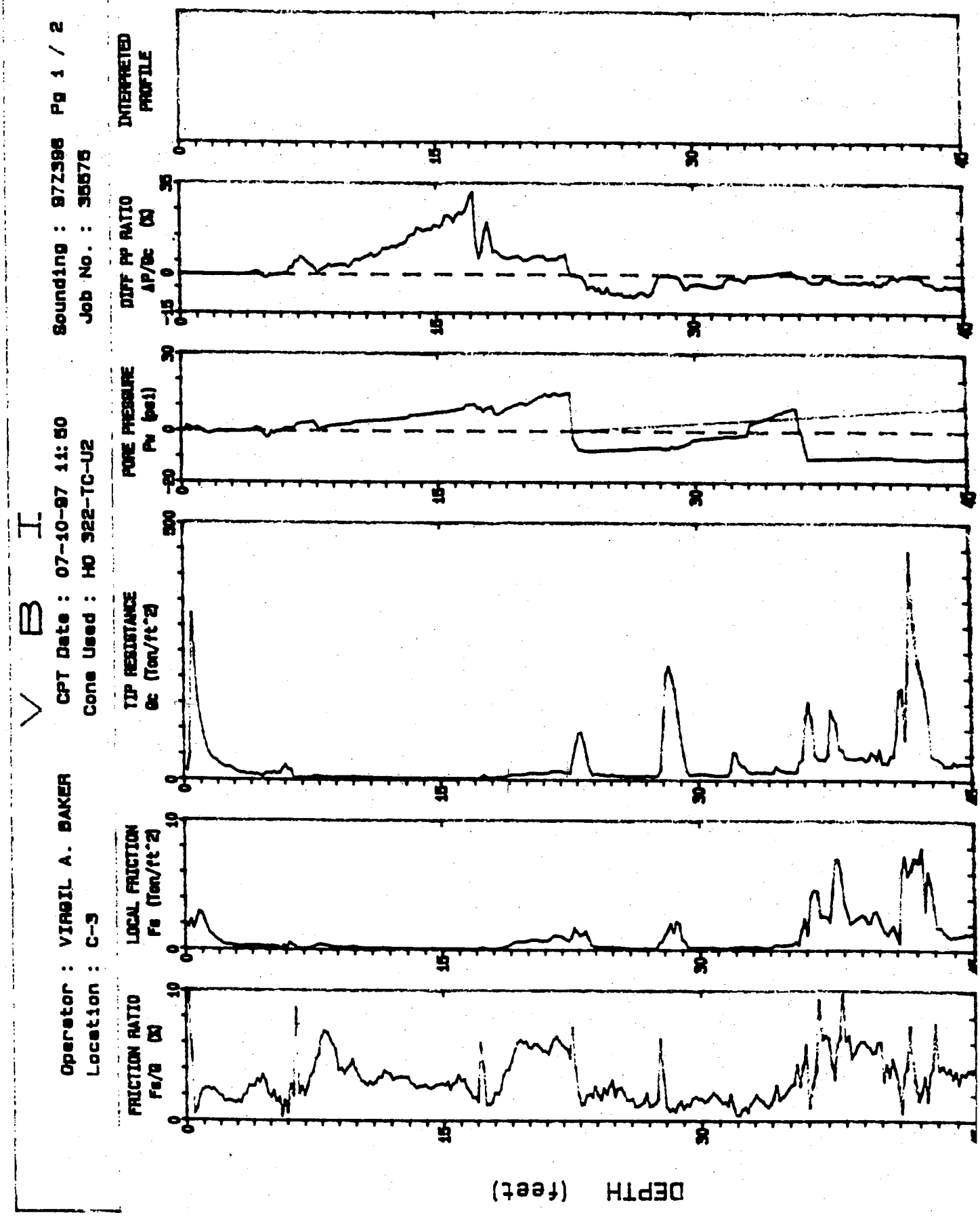
PLATE **7**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
MAG	18,229,008.01		5/88		

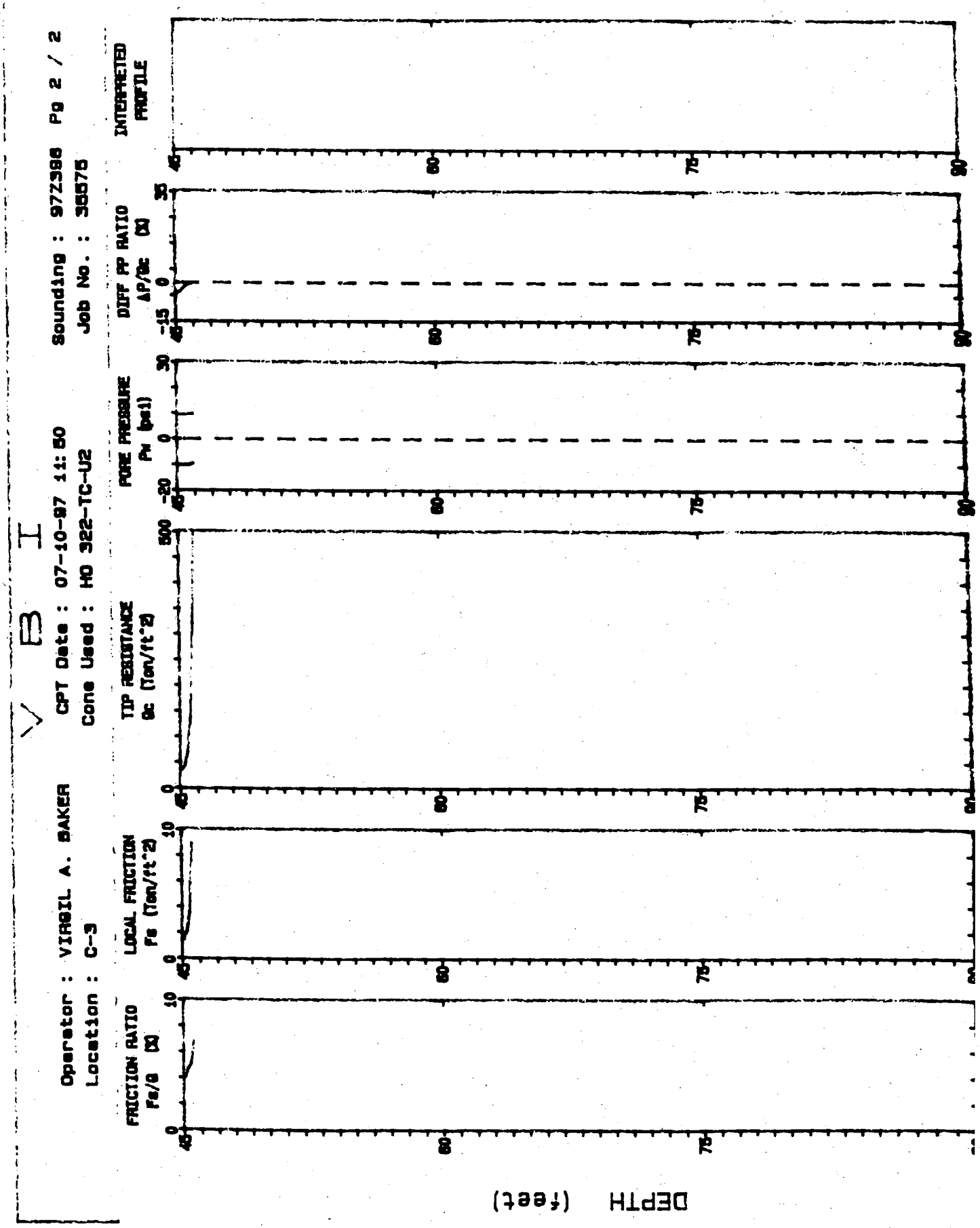
REFERENCE CPT RC-4



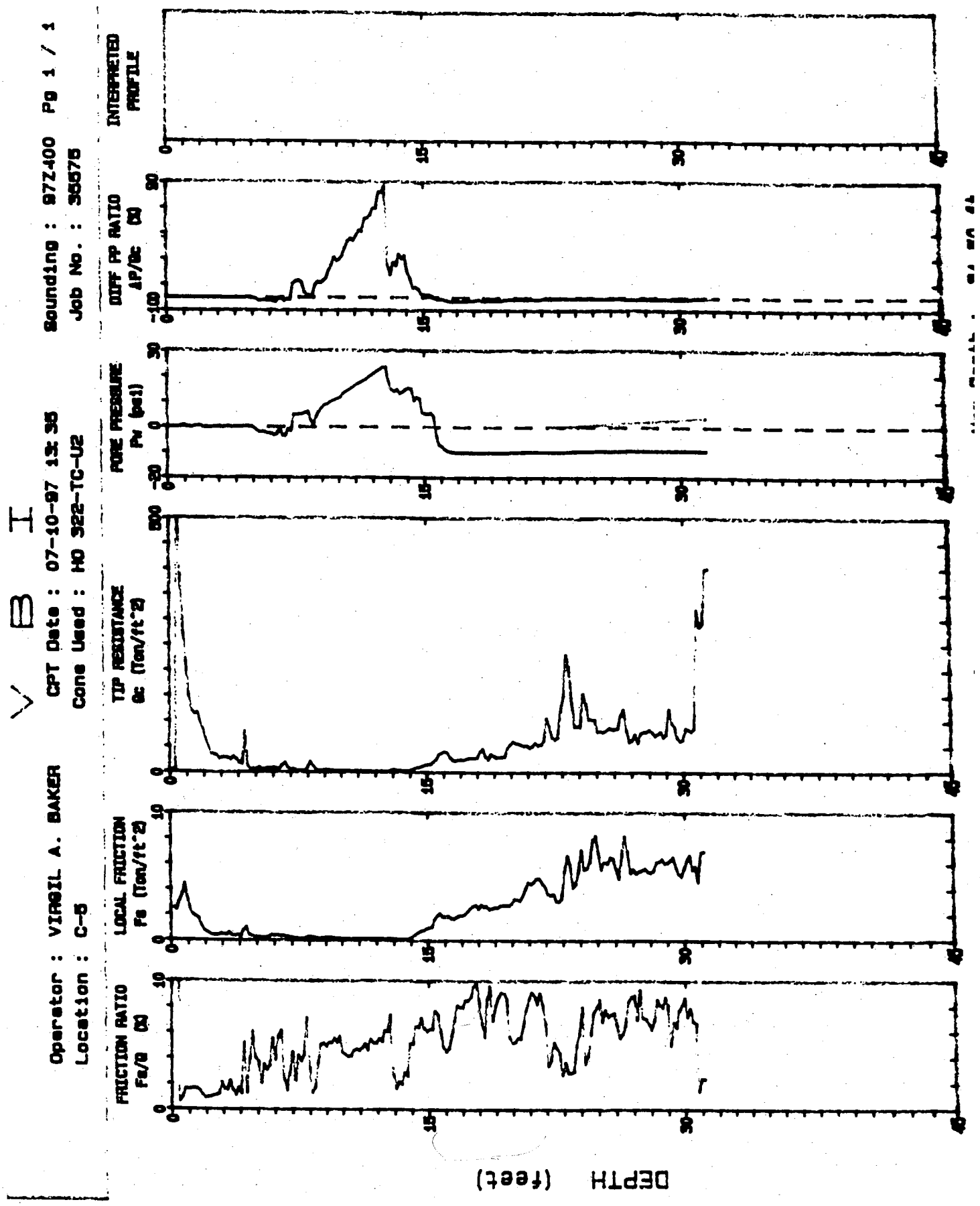
REFERENCE CPT RC-5



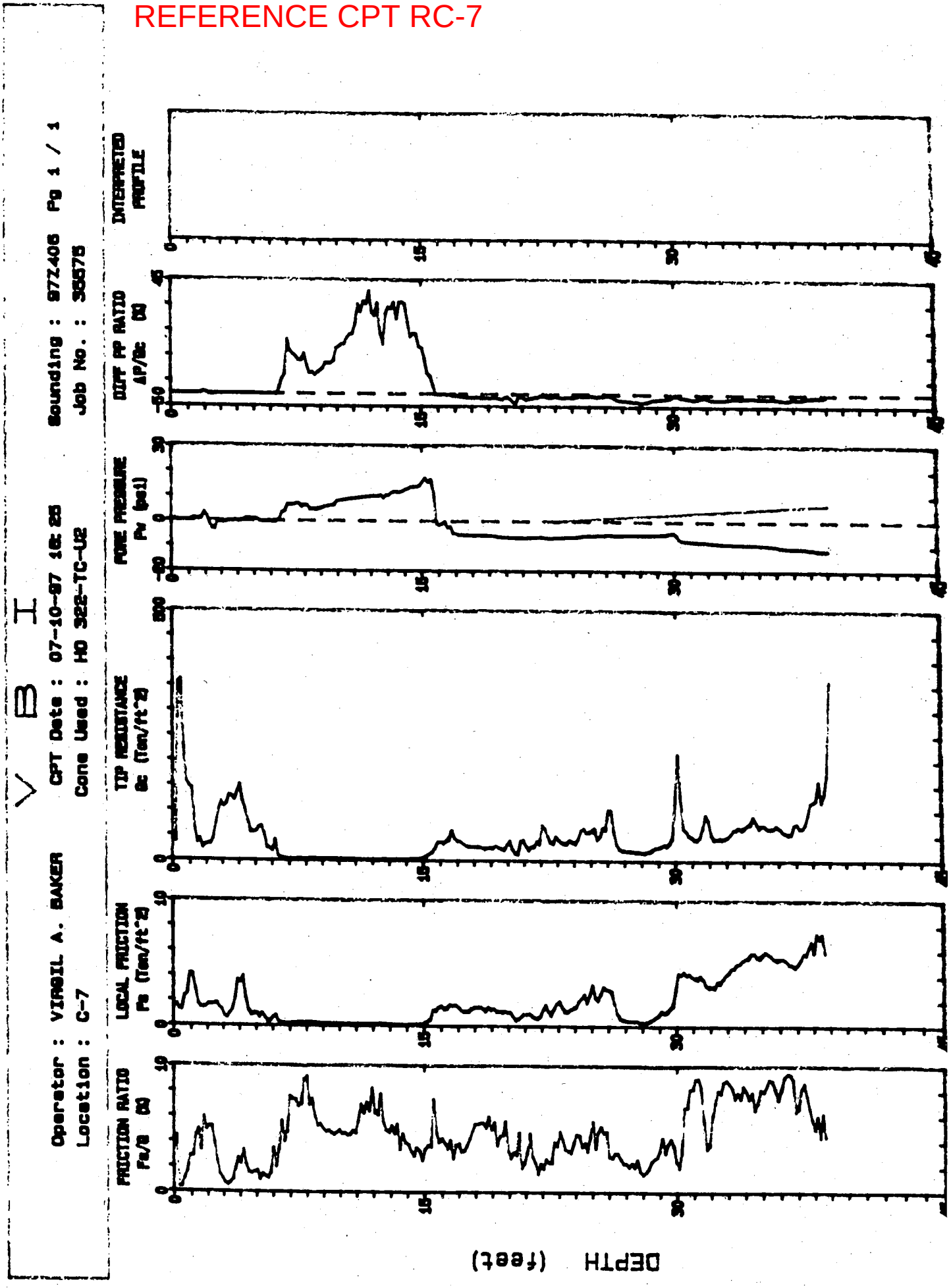
REFERENCE CPT RC-5 (CONTINUED)



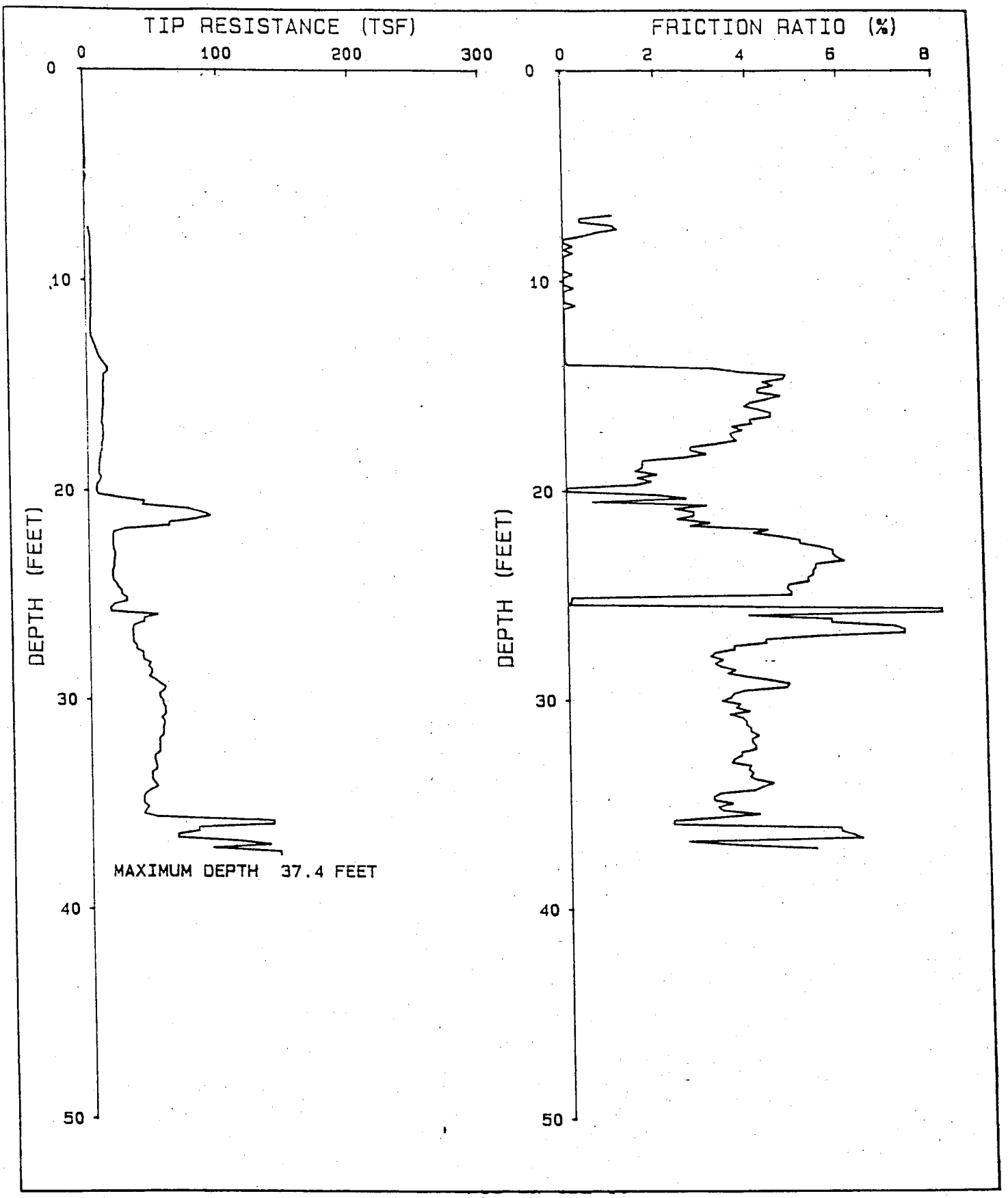
REFERENCE CPT RC-6



REFERENCE CPT RC-7



REFERENCE CPT RC-8



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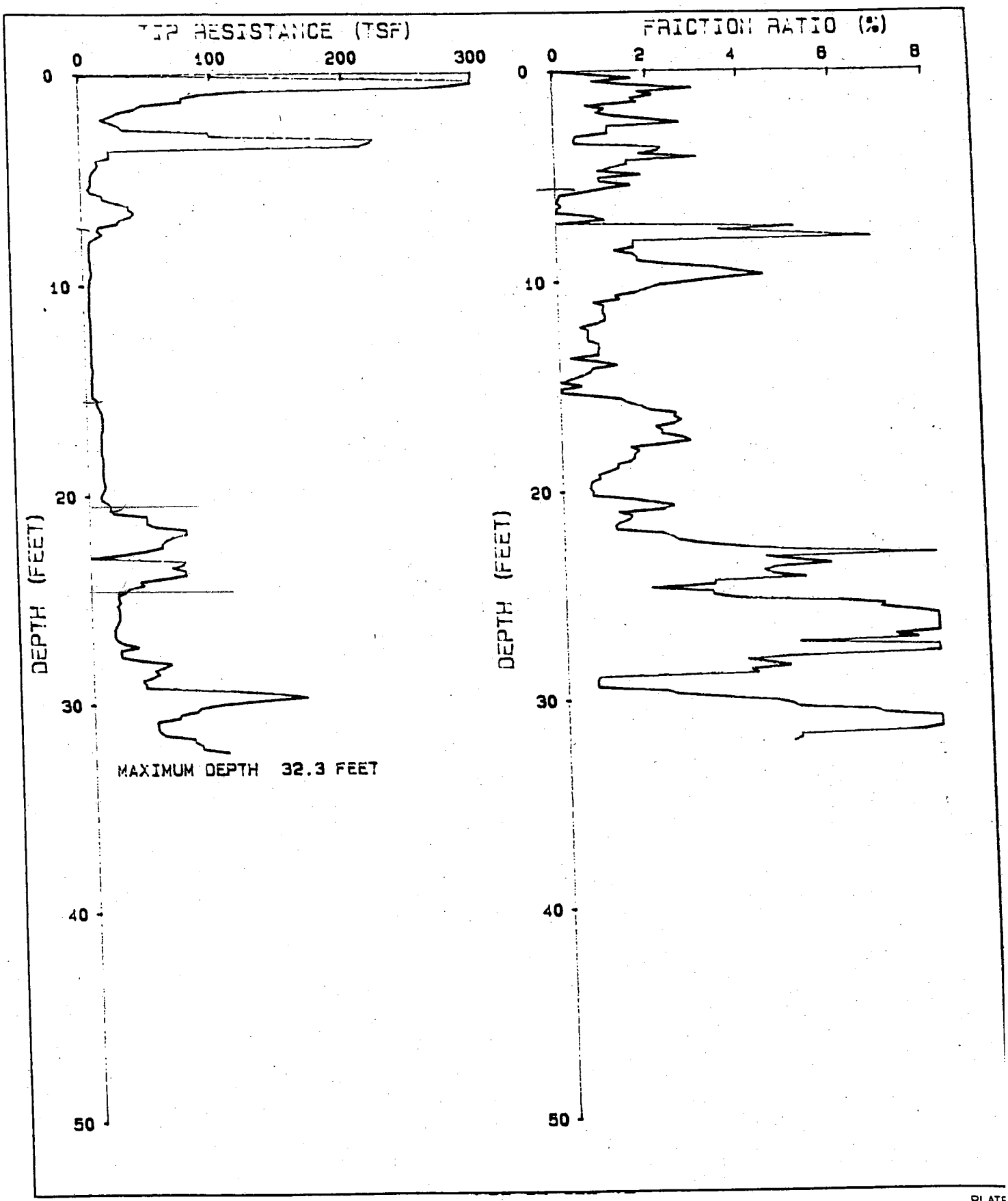
Log of CPT Probe 7
San Rafael Retail Center
San Rafael, California

PLATE
10

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
MAG	18,229,008.01		5/88	-	

REFERENCE CPT RC-9



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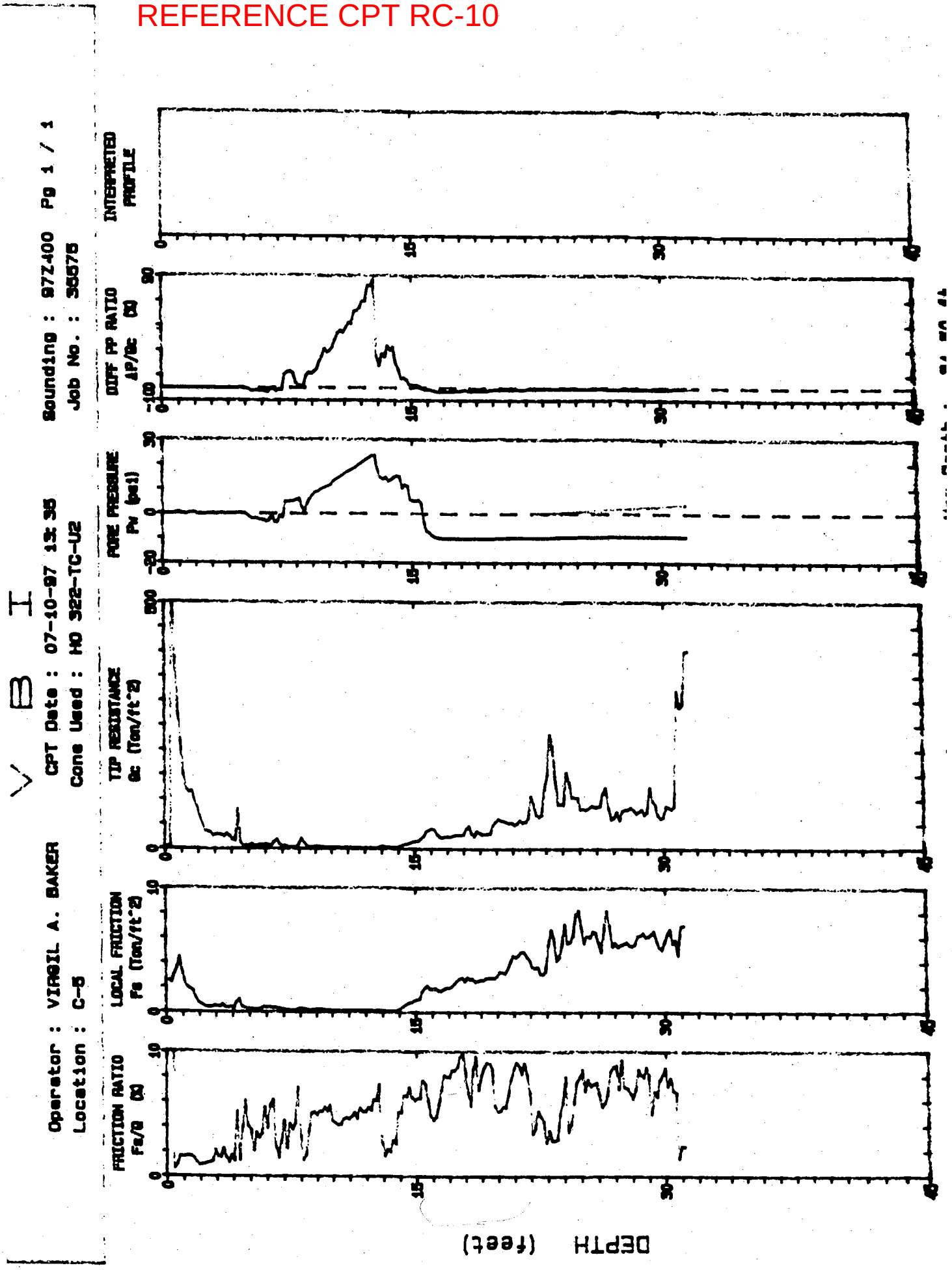
Log of CPT Probe 6
San Rafael Retail Center
San Rafael, California

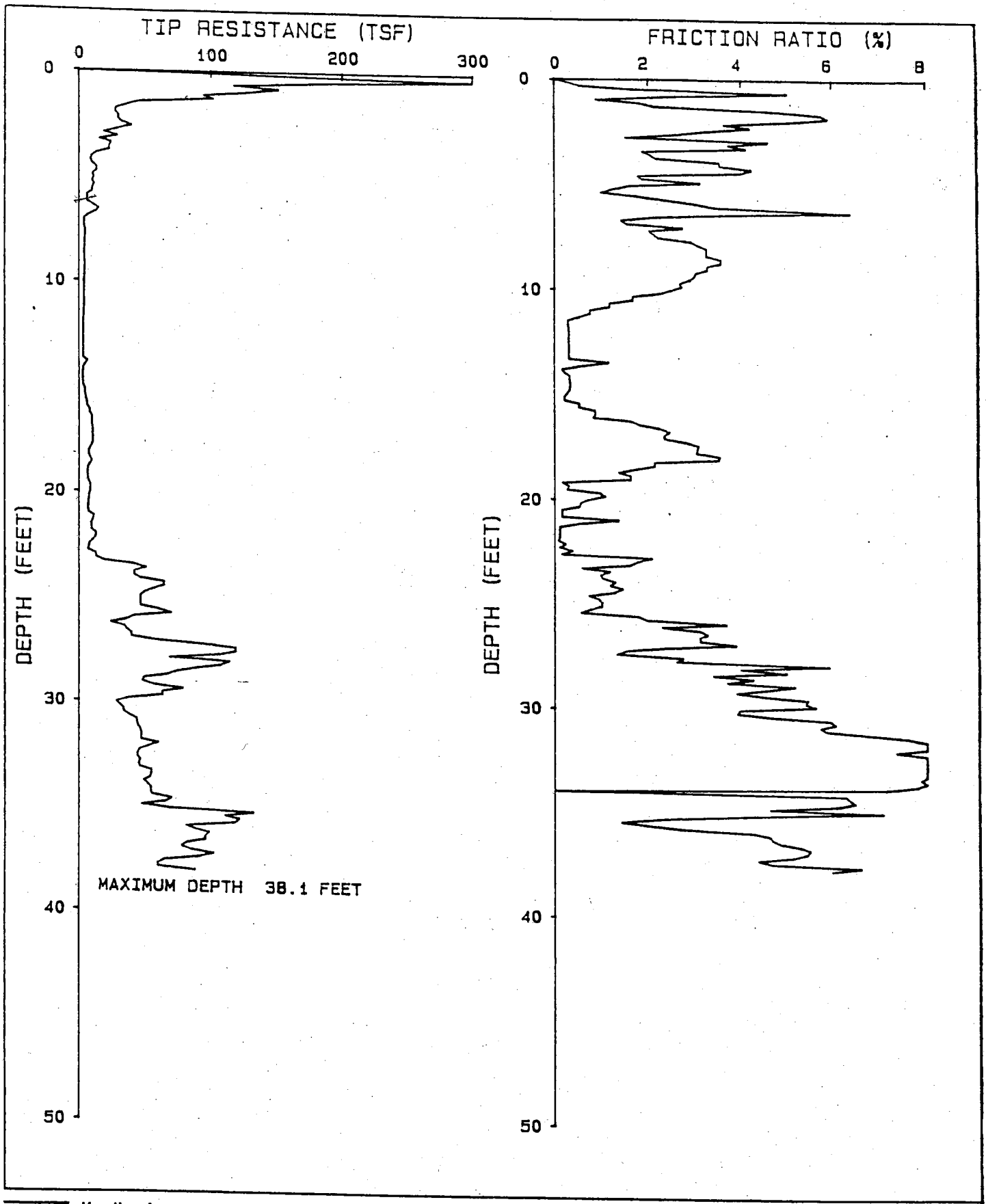
PLATE
9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
MAG	18,229,008:01		5/88		

REFERENCE CPT RC-10



REFERENCE CPT RC-11



Harding Lawson Associates
Engineers and Geoscientists

Log of CPT Probe 8
San Rafael Retail Center
San Rafael, California

PLATE
11

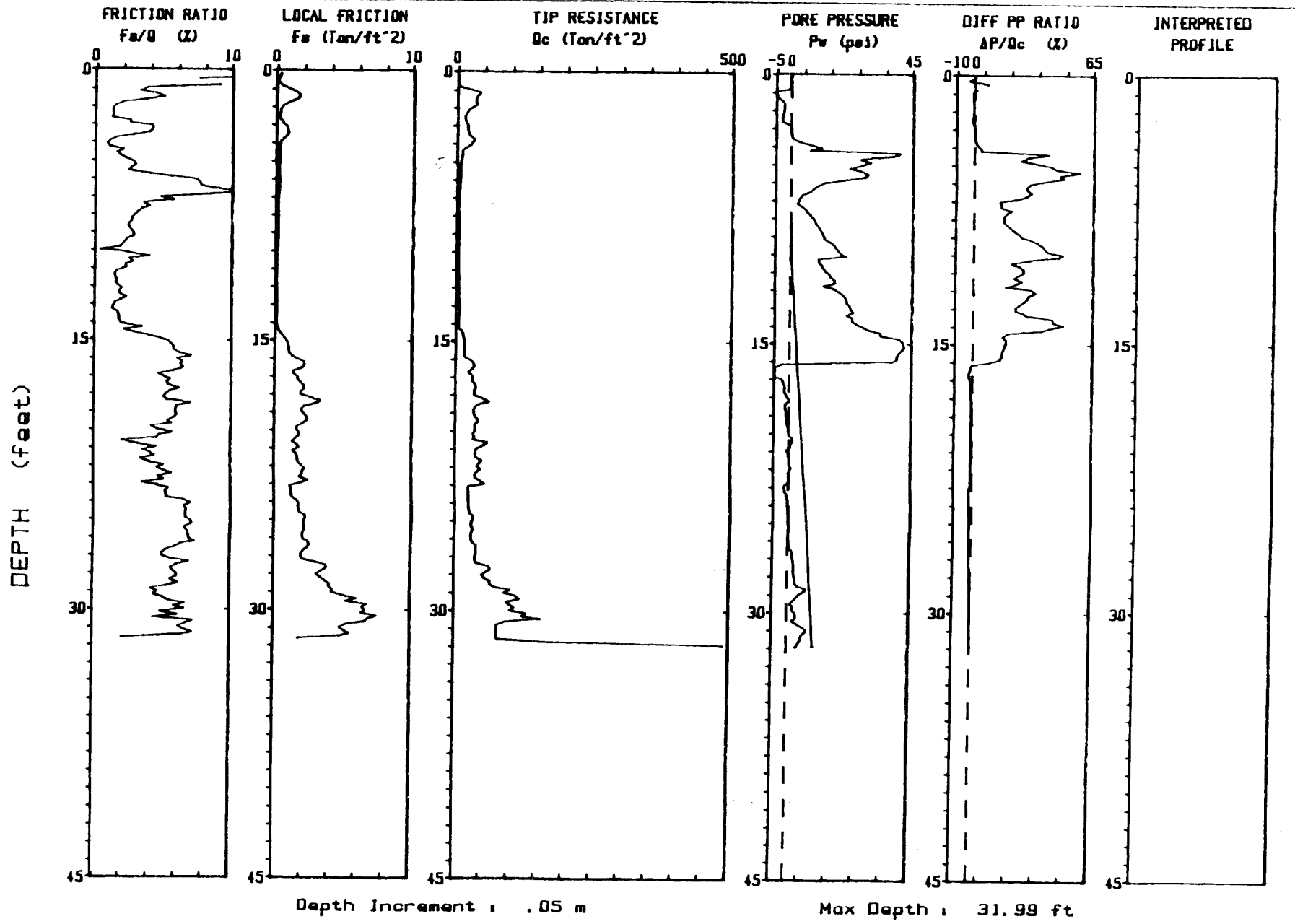
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
MAG	18,229,008.01.		5/88		

V B I

Operator : VIRGIL A. BAKER
Location : CPT-1

CPT Date : 02-19-98 10:16
Cone Used : HO 347 TC

Sounding : 98Z034 Pg 1 / 1
Job No. : 40335.11



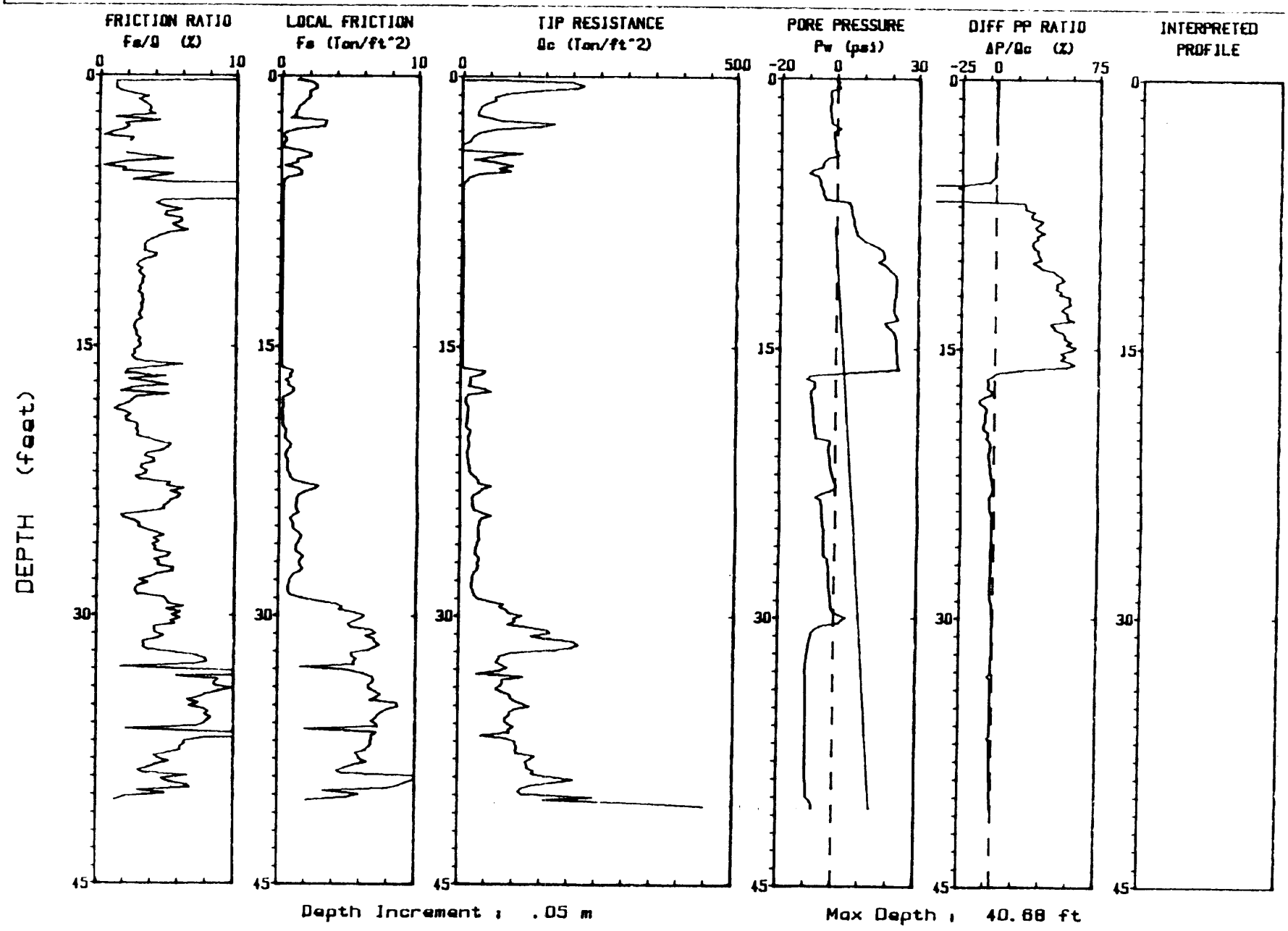
REFERENCE CPT RC-12

V B I

Operator : VIRGIL A. BAKER
Location : CPT-2

CPT Date : 02-18-98 18:03
Cone Used : HO 349 TC

Sounding : 98Z033 Pg 1 / 1
Job No. : 40335.11



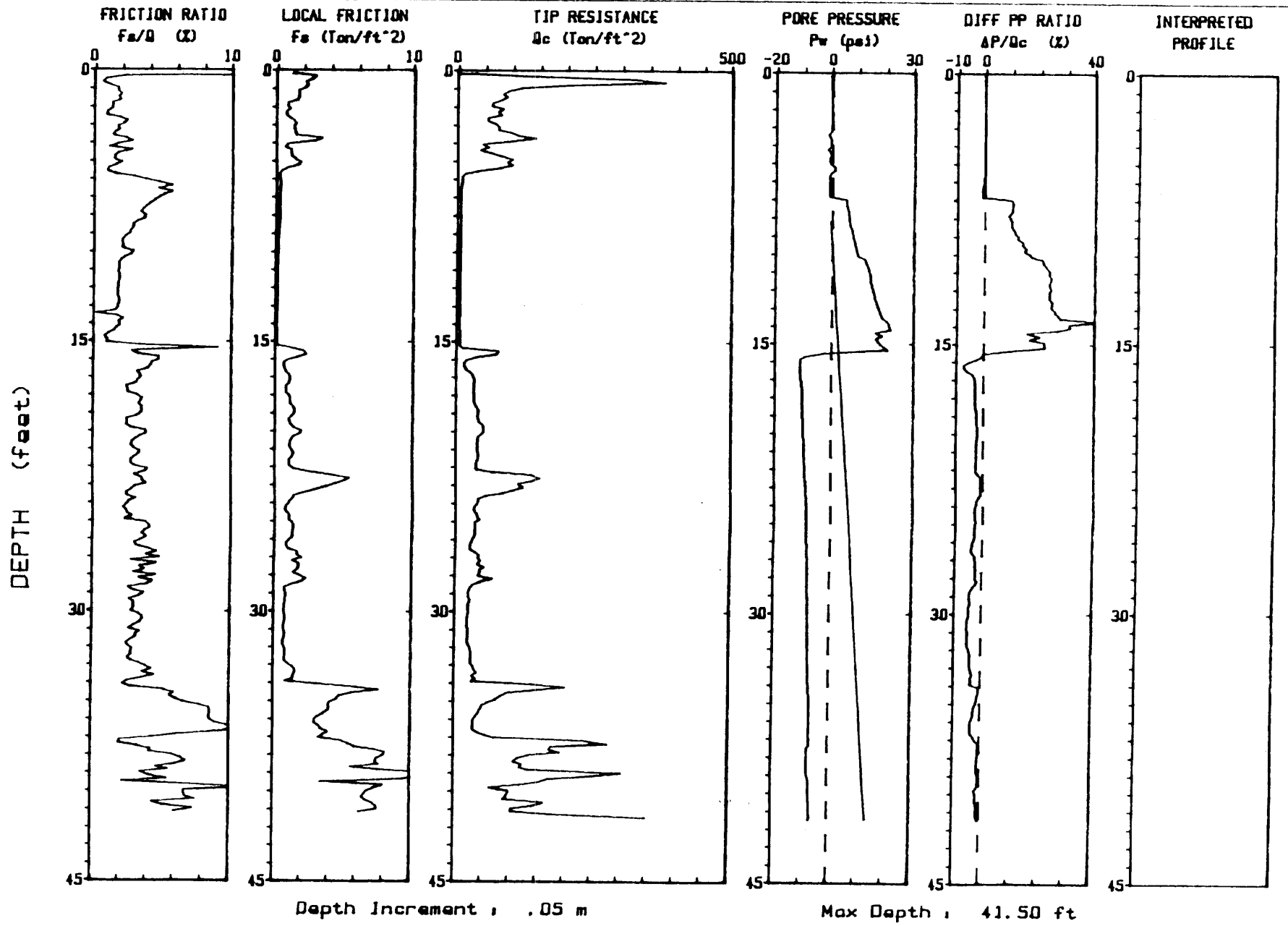
REFERENCE CPT RC-13

V B I

Operator : VIRGIL A. BAKER
Location : CPT-3

CPT Date : 02-18-98 16:57
Cone Used : HD 349 TC

Sounding : 98Z032 Pg 1 / 1
Job No. : 40335.11



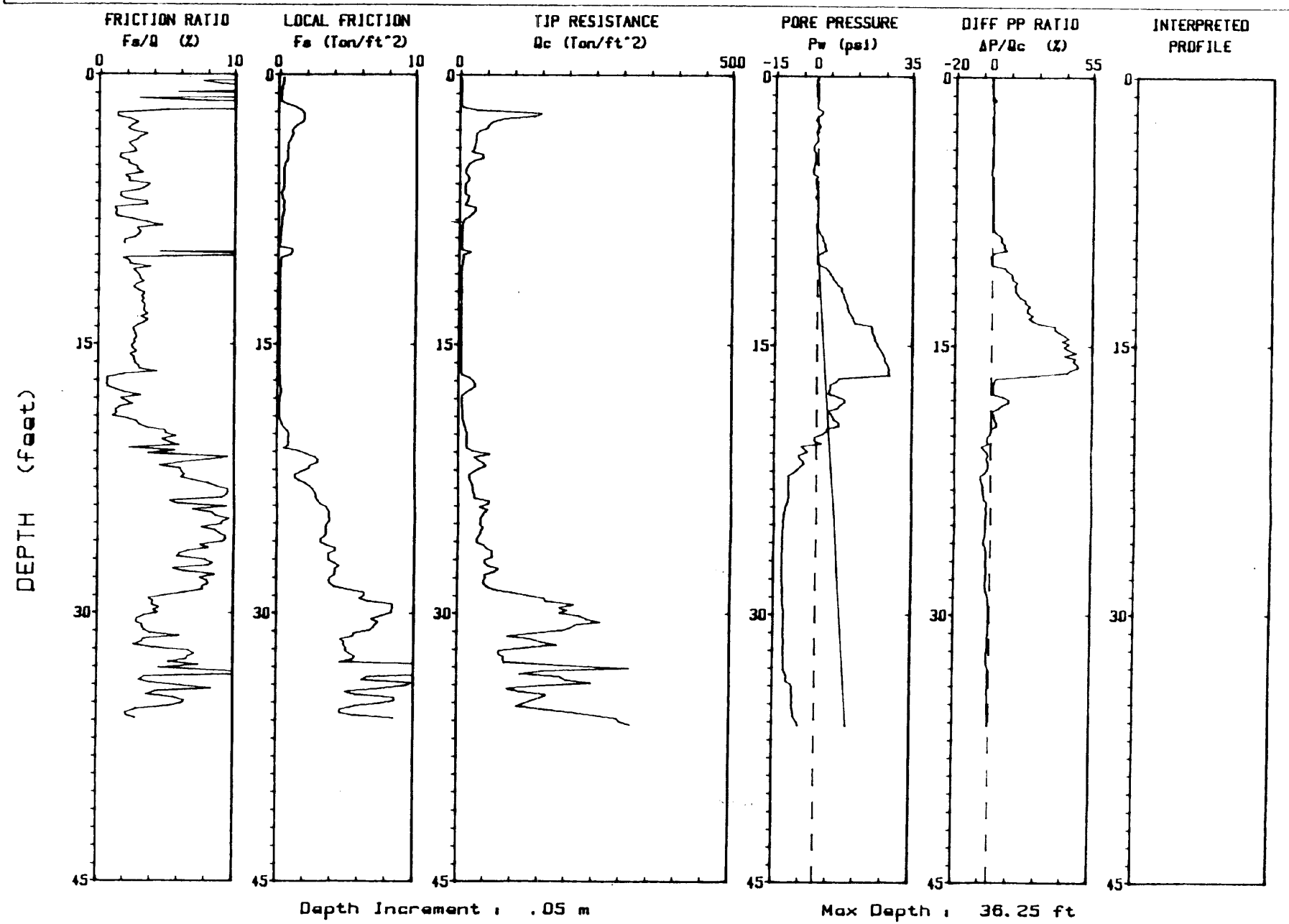
REFERENCE CPT RC-14

V B I

Operator : VIRGIL A. BAKER
Location : CPT-4

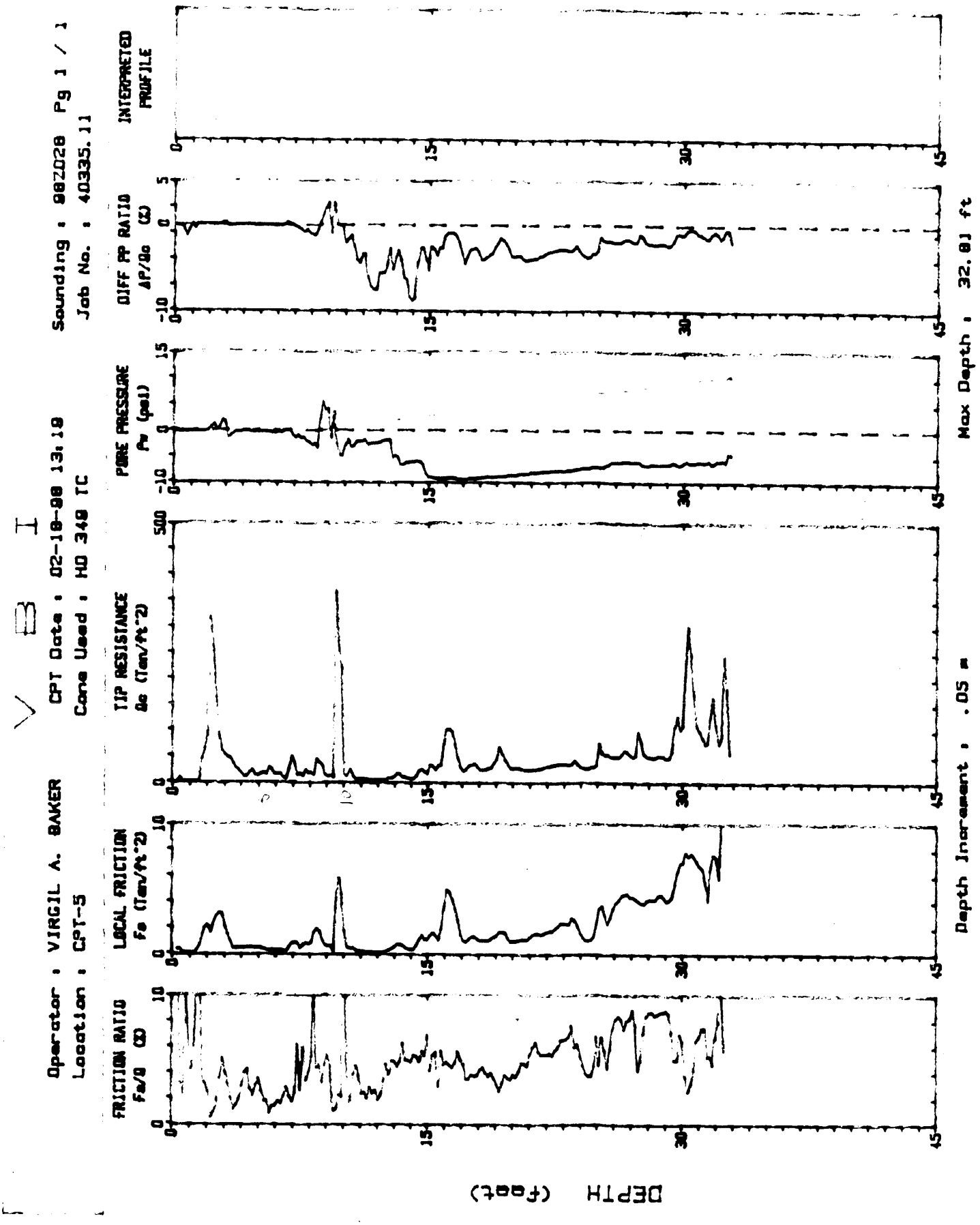
CPT Date : 02-18-98 14:37
Cone Used : HO 349 TC

Sounding : 98Z029 Pg 1 / 1
Job No. : 40335.11



REFERENCE CPT RC-15

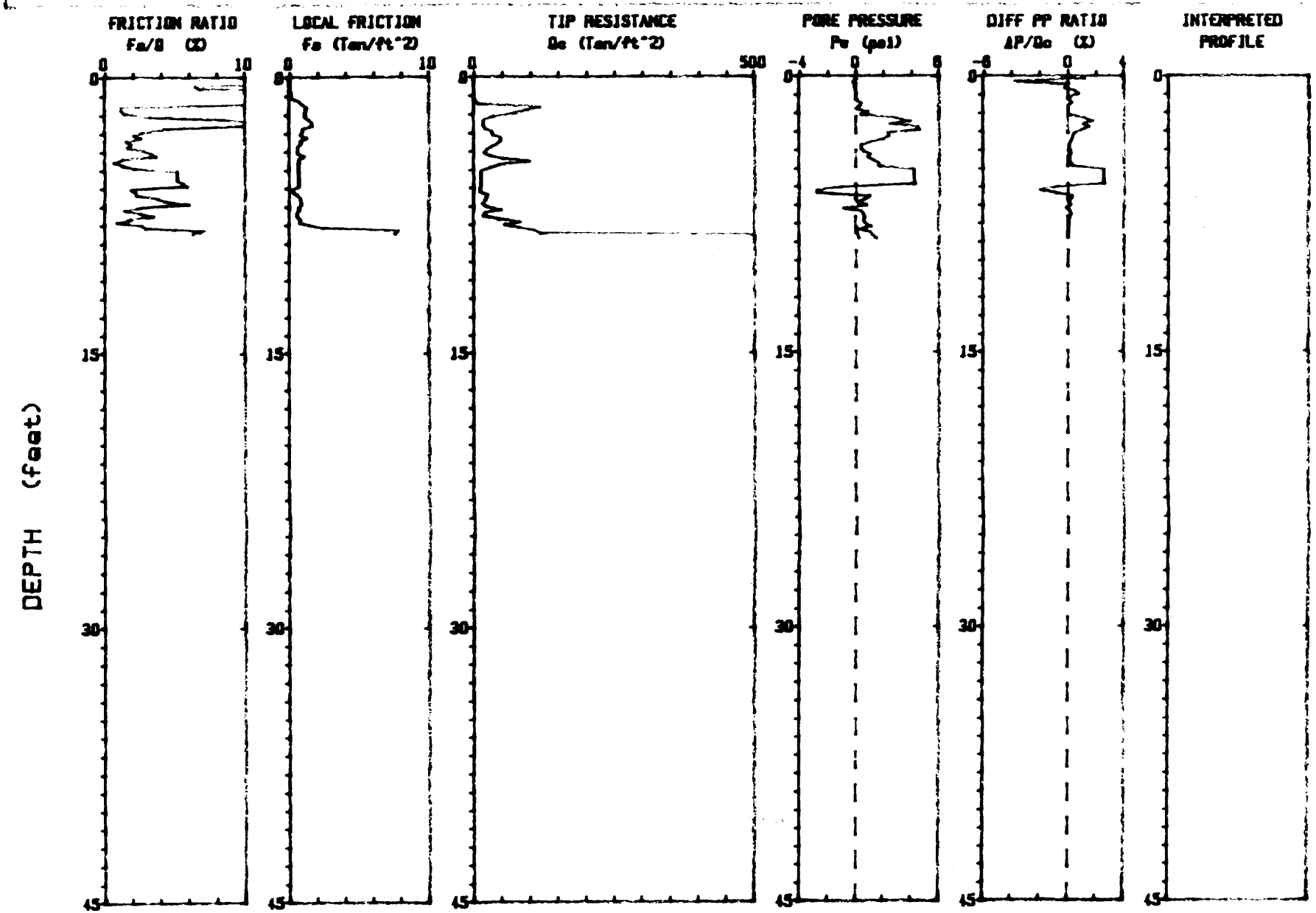
REFERENCE CPT RC-16



V B I

Operator : VIRGIL A. BAKER CPT Date : 02-18-98 10:10 Sounding : 980206 Pg 1 / 1

Location : CPT-6 Cone Used : HO 348 TC Job No. : 40335.11



Depth Increment : .05 m Max Depth : 8.86 ft

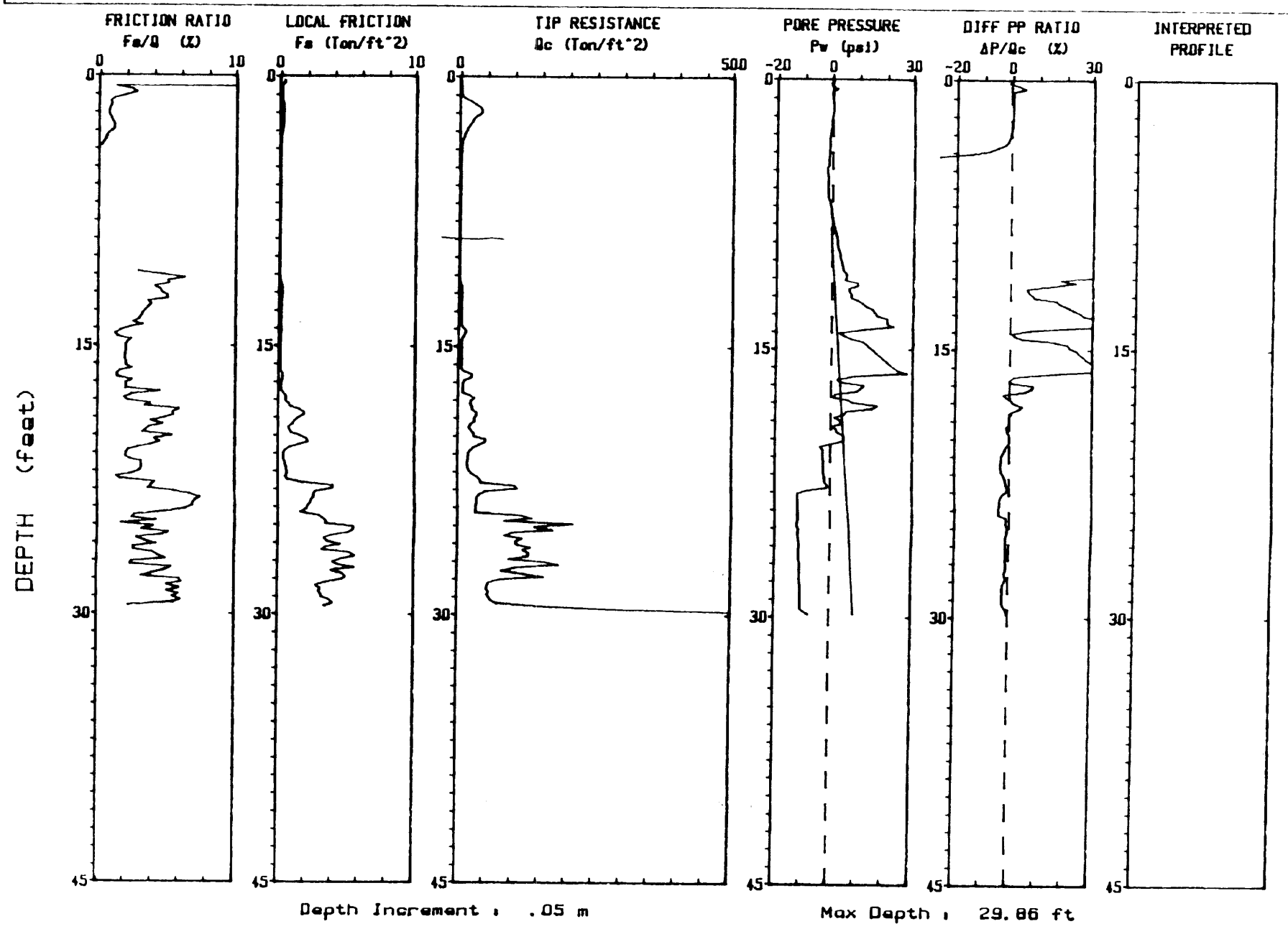
REFERENCE CPT RC-17

V B I

Operator : VIRGIL A. BAKER
Location : CPT-68

CPT Date : 02-18-98 15:27
Cone Used : HO 349 TC

Sounding : 98Z030 Pg 1 / 1
Job No. : 40335.11

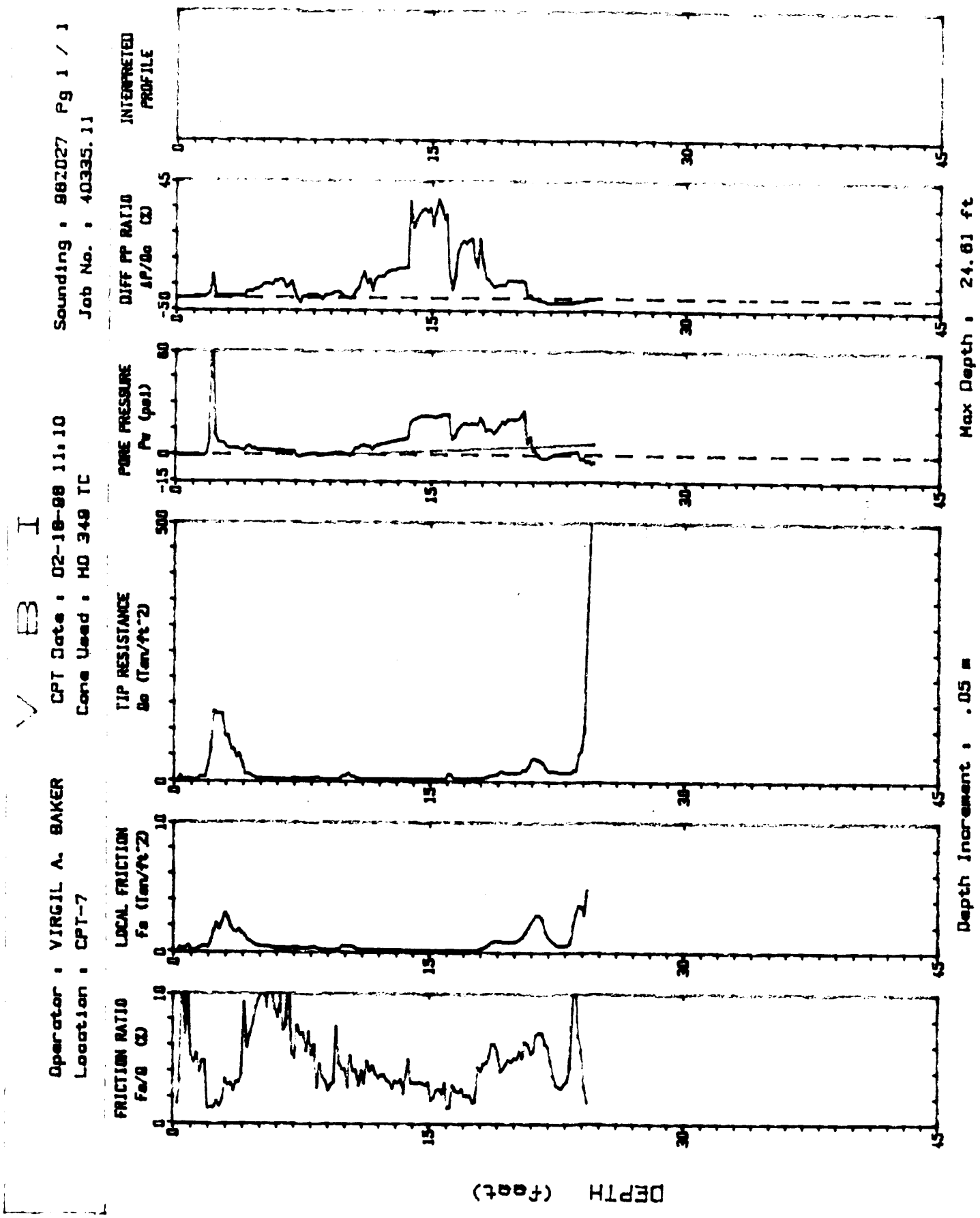


Depth Increment : .05 m

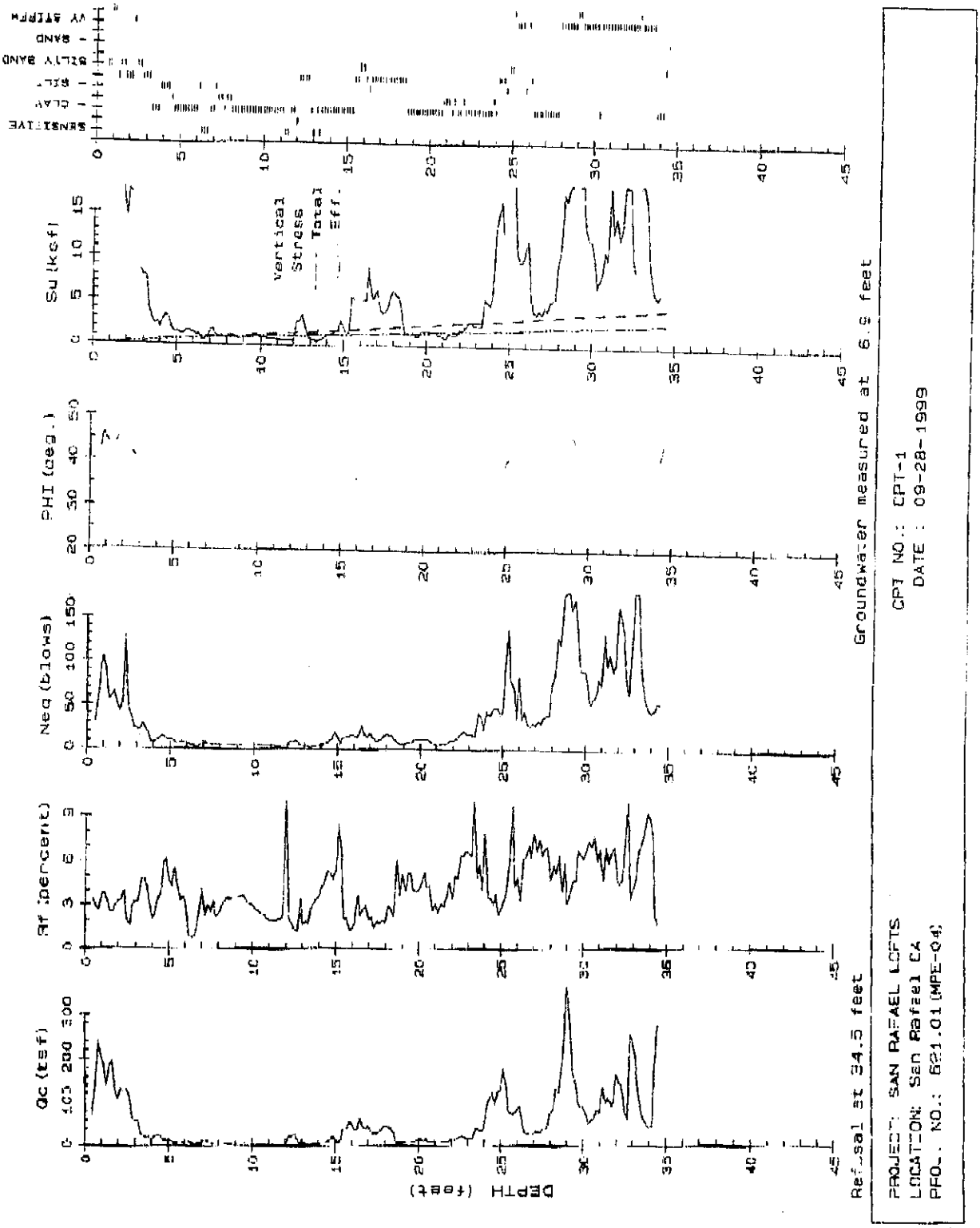
Max Depth : 29.86 ft

REFERENCE CPT RC-17B

REFERENCE CPT RC-18



REFERENCE CPT RC-19



FILE: CPT Title Block.dwg

Miller Pacific ENGINEERING GROUP

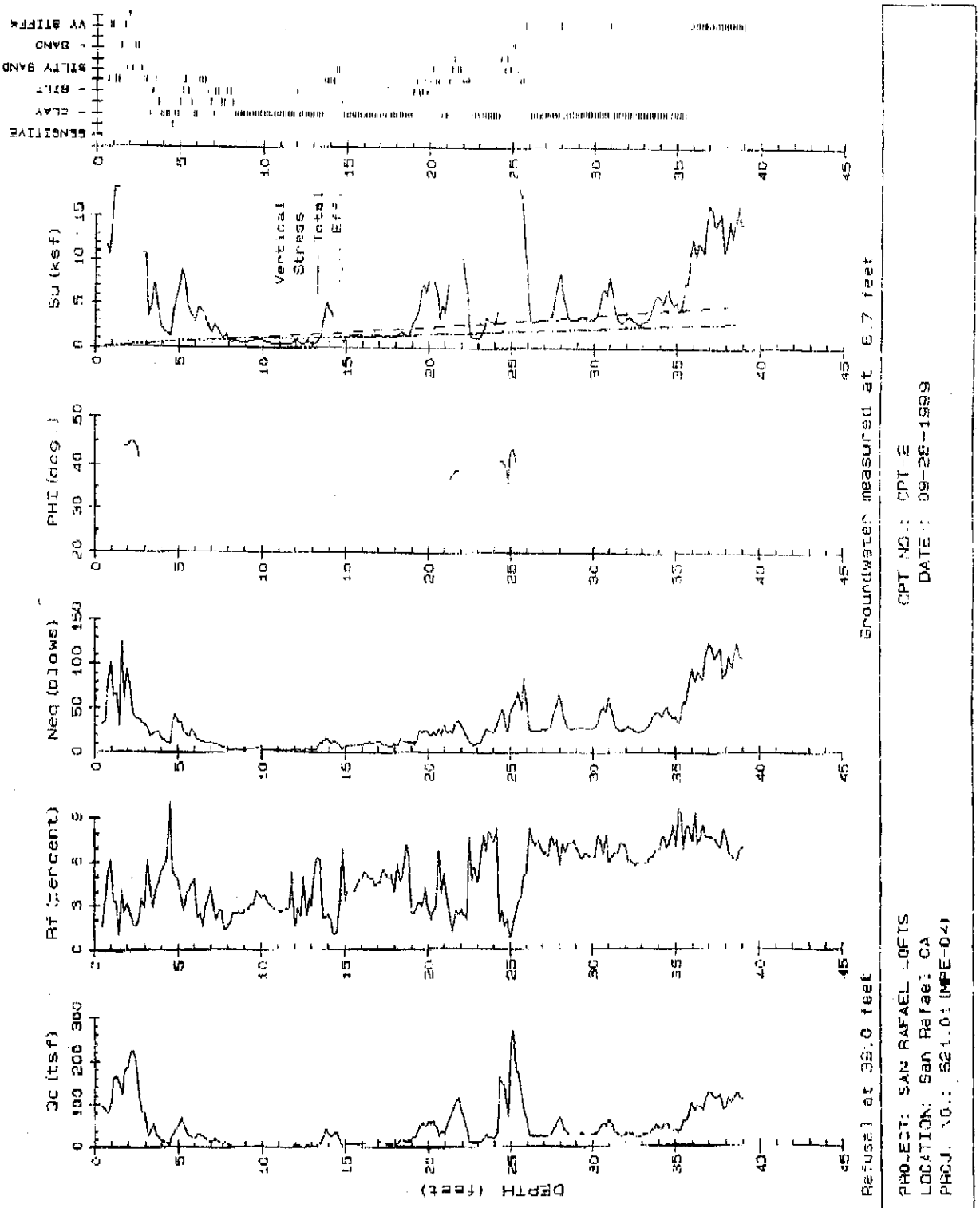
CONE PENETRATION TEST
San Rafael Lofts
San Rafael, California

A-8

Project No. 621.01 | Date 10/04/99 | Approved By:

Figure

REFERENCE CPT RC-20



FILE: CPT Title Block.dwg

Miller Pacific ENGINEERING GROUP

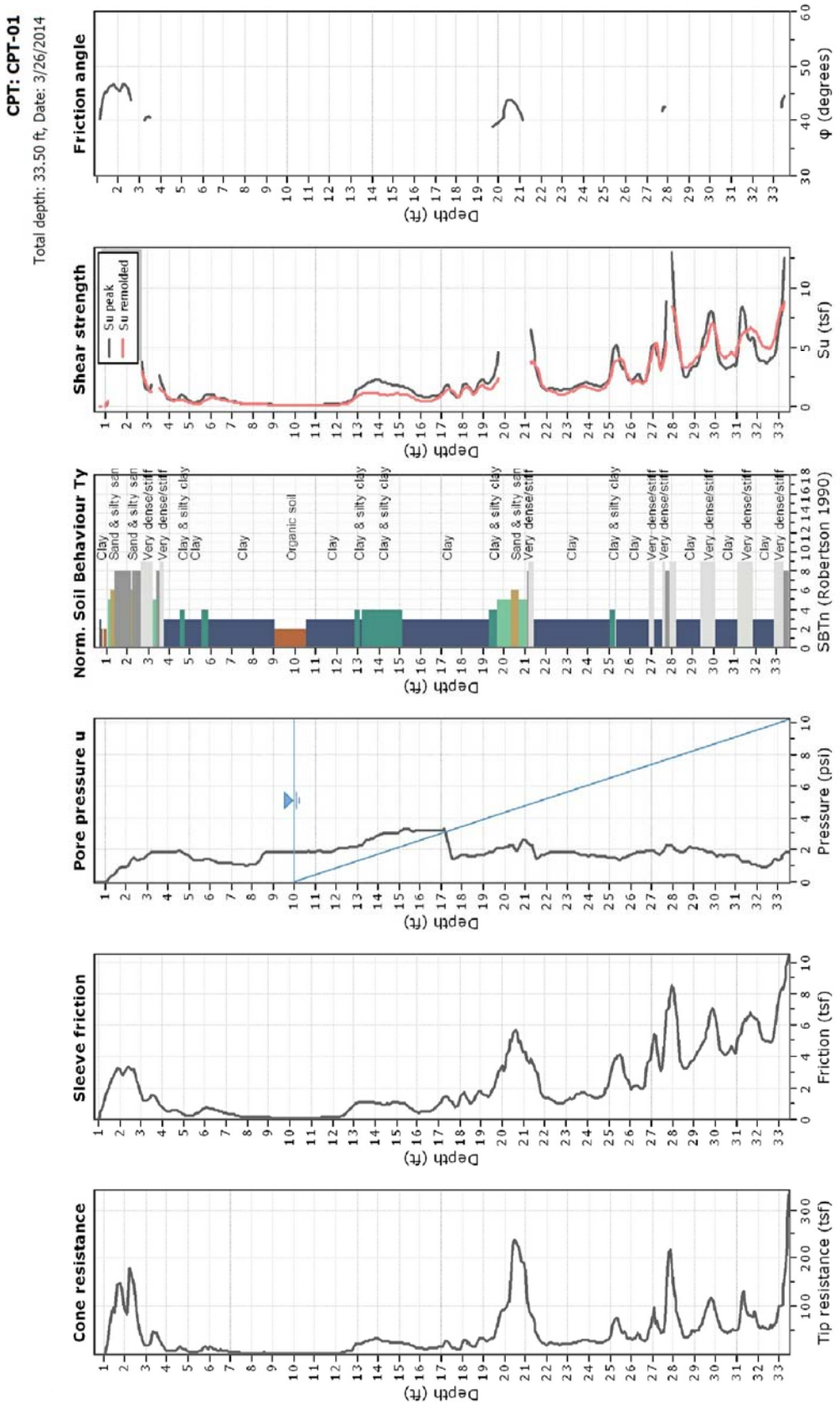
CONE PENETRATION TEST
San Rafael Lofts
San Rafael, California

A-9

Project No. 621.01 Date 10/04/99 Approved By: RED

Figure

REFERENCE CPT RC-21



Miller Pacific
ENGINEERING GROUP

FILE: 595.131 CPT.dwg

504 Redwood Blvd.
Suite 220
Novato, CA 94947
T 415 / 382-3444
F 415 / 382-3450
www.millerpac.com

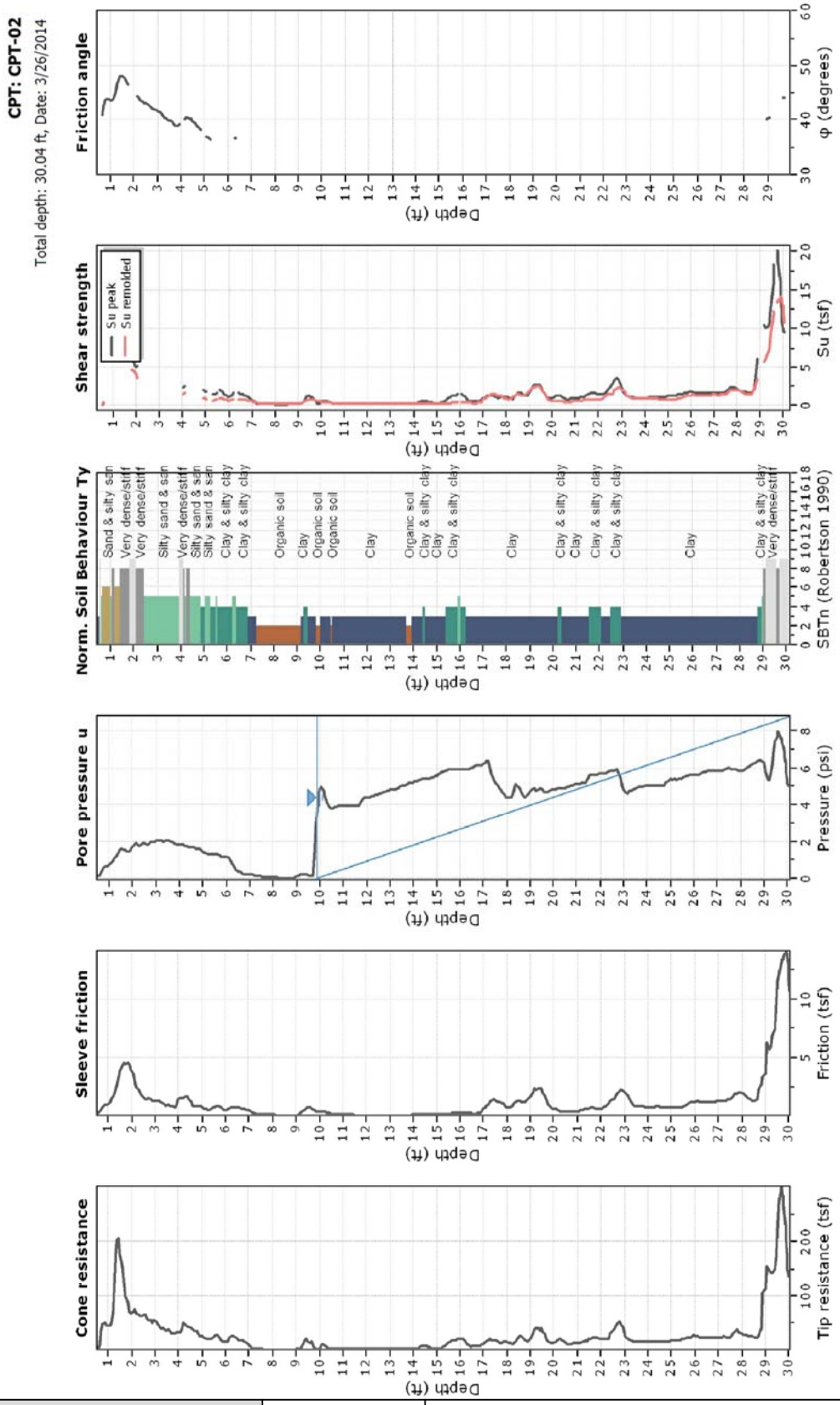
CONE PENETROMETER LOG

BioMarin Parking Structure
Lincoln Avenue
San Rafael, California
Project No. 595.131 Date: 5/30/14

Drawn JTO
Checked

3
FIGURE

REFERENCE CPT RC-22



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CONE PENETROMETER LOG

BioMarin Parking Structure
Lincoln Avenue
San Rafael, California

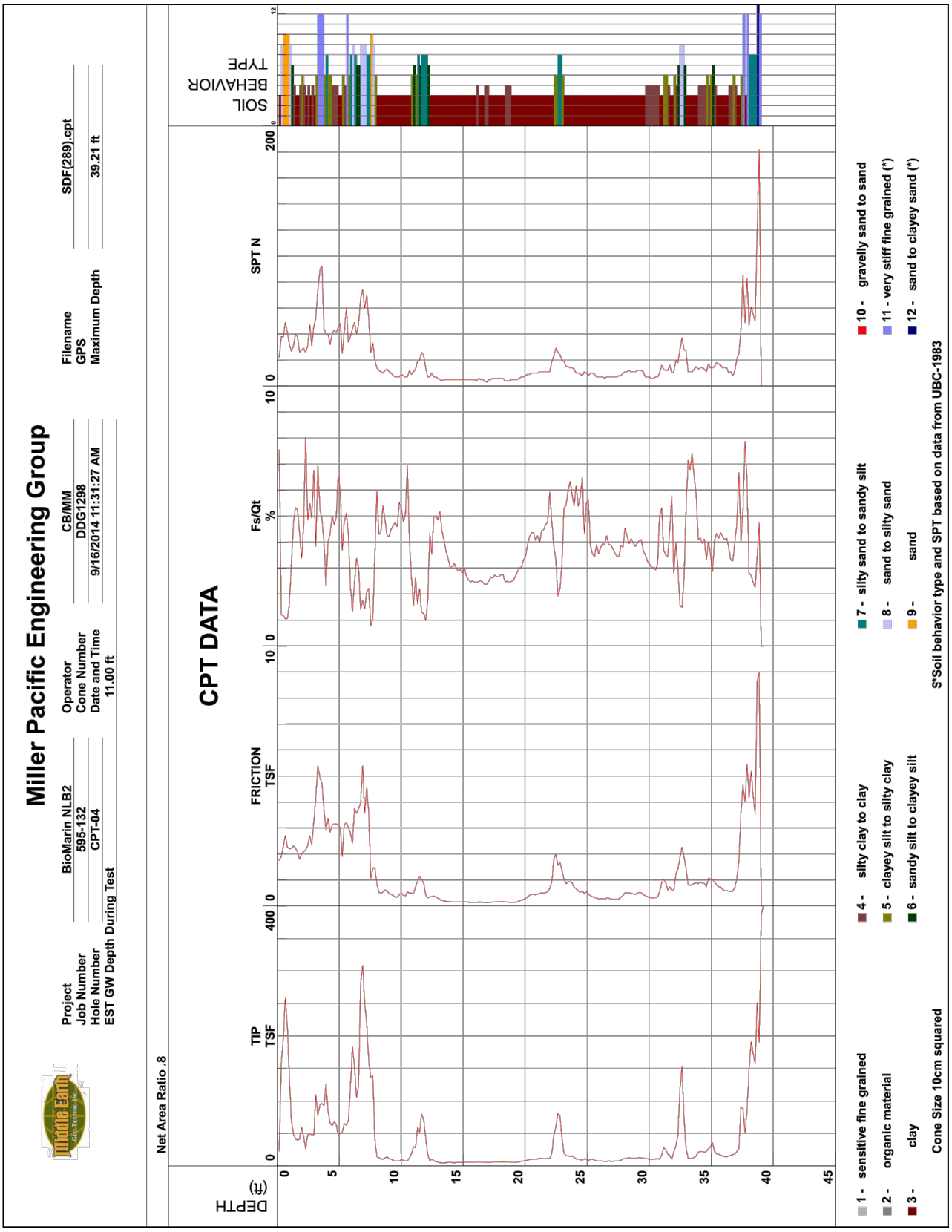
Project No. 595.131 Date: 5/30/14

Drawn JTO
Checked

4
FIGURE

FILE: 595.131 CPT.dwg

REFERENCE CPT RC-23



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FILE: 595.132 CPT.dwg

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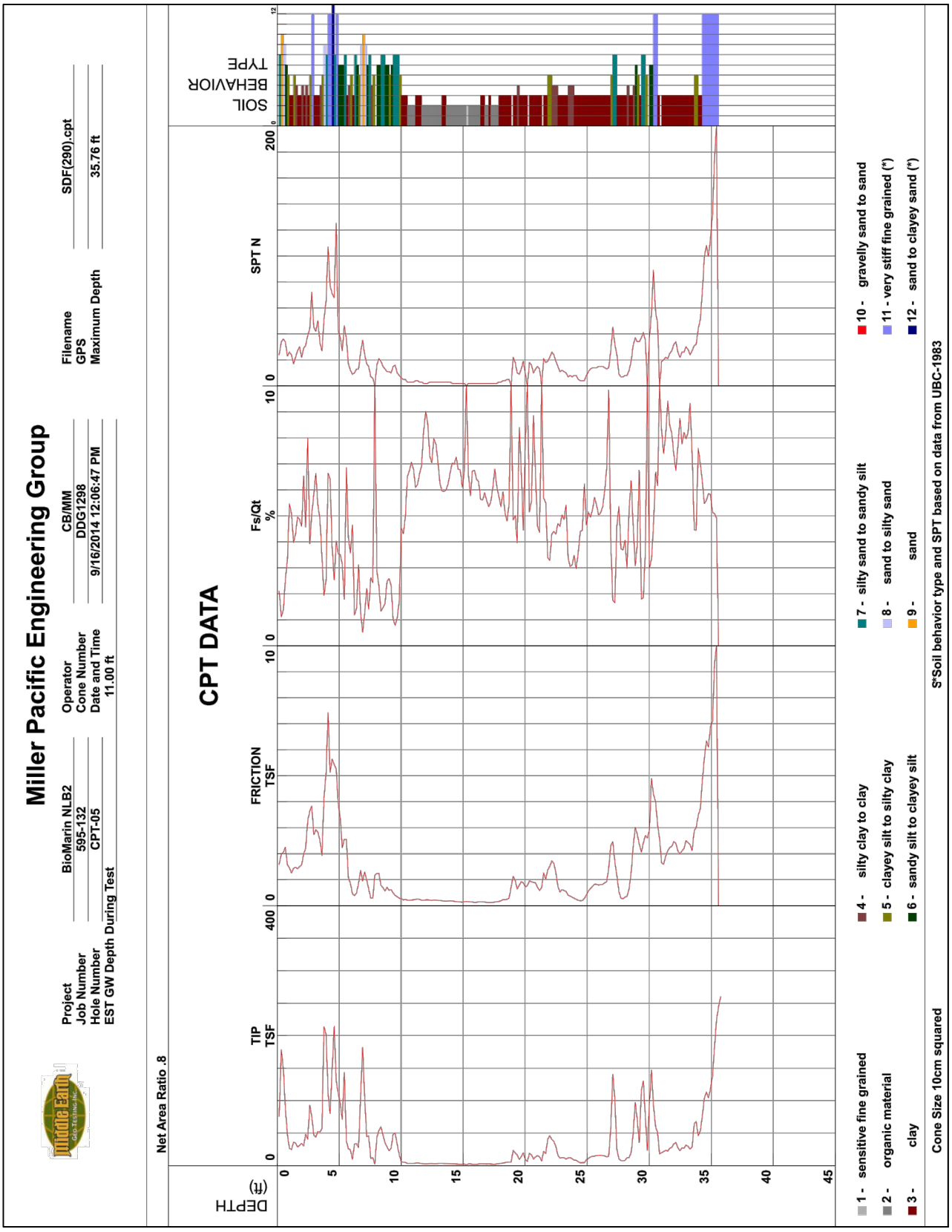
CONE PENETRATION TEST 4

CCCA, LLC - NLB2
APN 013-012-39 ("Parcel 1")
San Rafael, California
Project No. 595.132 Date: 10/28/14

Drawn EDT
Checked

A-6
FIGURE

REFERENCE CPT RC-24



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Novato, CA 94947
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F 415 / 382-3450
www.millerpac.com

FILE: 595.132 CPT.dwg

CONE PENETRATION TEST 5

CCCA, LLC - NLB2
APN 013-012-39 ("Parcel 1")
San Rafael, California

Project No. 595.132 Date: 10/28/14

Drawn EDT
Checked

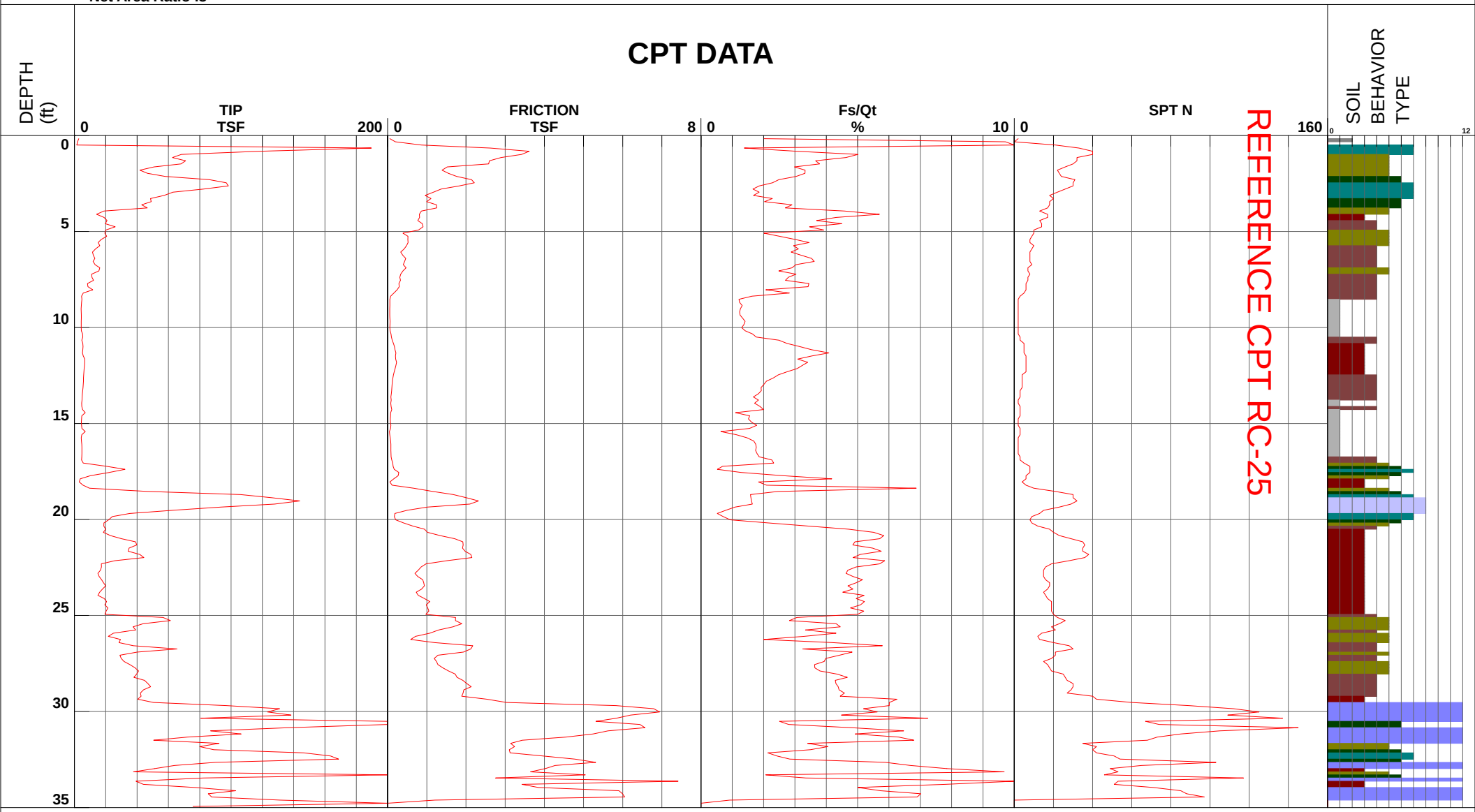
A-7
FIGURE

Miller Pacific Engineering Group

Project	BioMarin Parking Garage	Operator	BH-RC	Filename	SDF(123).cpt
Job Number	595-131	Cone Number	DDG1333	GPS	
Hole Number	CPT-02	Date and Time	9/2/2015 9:19:47 AM	Maximum Depth	34.94 ft
EST GW Depth During Test		9.00 ft			

Net Area Ratio .8

CPT DATA



1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Cone Size 10cm squared

S*Soil behavior type and SPT based on data from UBC-1983

APPENDIX B

PREVIOUS ENVIRONMENTAL INVESTIGATIONS

MILLER PACIFIC ENGINEERING GROUP

CAMBRIA

755 SECOND STREET

07-June-06

EXPLANATION

- Monitoring Well
- Soil Vapor Sample Location
- Soil Boring
- Geoprobe boring (May 2006)
- Destroyed well
- Proposed Building Location

<1.0/<0.0050/**0.0056**/12.5' TPHg/benzene/MTBE concentrations in soil in mg/Kg/sample depth

SECOND STREET

LINCOLN AVENUE

MW-5
MW-6
MW-5R
MW-A
MW-B
MW-4
MW-3
MW-2
MW-1
MW-7
C72
C73
HSB1
HSB3
MB-4
HSG79
HSB39
GP-10
HSG78
HSB40
MSB-10
HSB57
HSB58
HB-7
Former Fuel USTs
Former Station Building
Former Dispenser Island
Former Generator
Former Gasoline AST
Former Waste Oil Tank
Underground High Voltage Power Line

SB-10
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/15.0'

SB-11
<1.0/<0.0050/**0.022**/5.0'
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/14.0'

SB-12
<1.0/<0.0050/<0.0050/5.0'
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/12.0'

SB-13
<1.0/<0.0050/<0.0050/2.0'
<1.0/<0.0050/<0.0050/9.5'
<1.0/<0.0050/<0.0050/15.0'

SB-14
<1.0/<0.0050/<0.0050/2.0'
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/14.0'

SB-15
<1.0/<0.0050/**0.013**/2.0'
<1.0/<0.0050/<0.0050/9.5'
<1.0/<0.0050/<0.0050/15.0'

SB-17
<1.0/<0.0050/**0.044**/5.0'
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/15.0'

SB-18
<1.0/<0.0050/<0.0050/2.0'
<1.0/<0.0050/<0.0050/5.0'
<1.0/<0.0050/<0.0050/10.0'

SB-19
<1.0/<0.0050/<0.0050/9.0'
<1.0/<0.0050/<0.0050/13.5'

SB-20
<1.0/<0.0050/<0.0050/4.5'
<1.0/<0.0050/<0.0050/8.0'
<1.0/<0.0050/**0.0056**/12.5'

SB-21
<1.0/<0.0050/<0.0050/5.0'
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/15.0'

SB-22
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/15.5'

SB-23
<1.0/<0.0050/<0.0050/5.0'
<1.0/<0.0050/<0.0050/10.0'
<1.0/<0.0050/<0.0050/15.0'

SB-24
<1.0/<0.0050/<0.0050/2.0'
<1.0/<0.0050/<0.0050/8.5'
<1.0/<0.0050/<0.0050/15.0'

12"W

Scale (ft)
0 10 20 40

Base Map from Erler & Kalinowski, Inc

FIGURE
2

1196

Former Shell Sevice Station
755 Second Street
San Rafael, California

CAMBRIA

Soil Chemical Concentration Map

May 15, 16 &17, 2006

Boring/Well Log Legend

KEY TO SYMBOLS/ABBREVIATIONS

- First encountered groundwater
- Static groundwater
- Soils logged by hand-auger or air-knife cuttings
- Soils logged by drill cuttings or disturbed sample
- Undisturbed soil sample interval
- Soil sample retained for submittal to analytical laboratory
- No recovery within interval
- Hydropunch or vapor sample screen interval

PID = Photo-ionization detector or organic vapor meter reading in parts per million (ppm)

fbg = Feet below grade

Blow Counts = Number of blows required to drive a California-modified split-spoon sampler using a 140-pound hammer falling freely 30 inches, recorded per 6-inch interval of a total 18-inch sample interval

(10YR 4/4) = Soil color according to Munsell Soil Color Charts

msl = Mean sea level

Soils logged according to the USCS.

UNIFIED SOILS CLASSIFICATION SYSTEM (USCS) SUMMARY

Major Divisions			Graphic	Group Symbol	Typical Description
Coarse-Grained Soils (>50% Sands and/or Gravels)	Gravel and Gravelly Soils	Clean Gravels (≤5% fines)		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
		Gravels with Fines (≥15% fines)		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and Sandy Soils	Clean Sands (≤5% fines)		SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sand, little or no fines
		Sands with Fines (≥15% fines)		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
Fine-Grained Soils (>50% Silts and/or Clays)	Silts and Clays			ML	Inorganic silts, very fine sands, silty or clayey fine sands, clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays			MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils
				CH	Inorganic clays of high plasticity
				OH	Organic clays of medium to high plasticity, organic silts
Highly Organic Soils				PT	Peat, humus, swamp soils with high organic contents

M:\Templates & Forms\Boring Logs\Boring Log Legend

CAMBRIA

Cambria Environmental Technology, Inc.
270 Perkins Street
Sonoma, CA 95476
Telephone: 707-935-4850
Fax: 707-935-6649

BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-10
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	8.0 ft (17-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
				5			**SILT with Sand (ML)**; olive brown (2.5Y 4/4); moist; 10% clay, 65% silt, 15% fine to coarse sand, 10% fine gravel.		
							@ 2.0' - dark greenish gray (5G 4/1); 15% clay, 65% silt, 20% fine to coarse sand.		
							@ 3.0' - **SILT (ML)** ; 20% clay, 70% silt, 10% fine to coarse sand.		
							@ 4.0' - black (N 2.5/); 20% clay, 75% silt, 5% fine sand.		
					ML		@ 8.0' - **Sandy SILT with Gravel (ML)**; dark olive gray (5Y 3/2); wet; 15% clay, 35% silt, 30% fine to coarse sand, 20% fine gravel. ▽		◄ Portland Type I/II
0.0		SB-10-10'		10			@ 9.0' - **SILT with Sand (ML)**; light olive brown (2.5Y 5/4); moist; 15% clay, 60% silt, 15% fine to coarse sand, 10 % fine gravel.		
							@ 12.0' - **Sandy SILT with Gravel (ML)**; dark olive gray (5Y 3/2); wet; 15% clay, 35% silt, 30% fine to coarse sand, 20% fine gravel.		
0.0		SB-10-15'		15			@ 14.0' - **SILT with Sand (ML)**; light olive brown (2.5Y 5/4); moist; 15% clay, 60% silt, 15% fine to coarse sand. 10% fine gravel.		
								16.0	Bottom of Boring @ 16 ft
				20					

WELL LOG (PID) I:\SANRAF~1\GINT\755SEC~1.GPJ DEFAULT.GDT 6/29/06

Cambria Environmental Technology, Inc.
270 Perkins Street
Sonoma, CA 95476
Telephone: 707-935-4850
Fax: 707-935-6649

BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-11
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	12.0 ft (16-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
0.2		SB-11-5'		5	ML		**SILT with Sand (ML)**; olive brown (2.5Y 4/4); moist; 10% clay, 65% silt, 15% fine to coarse sand, 10% fine gravel.		
							@ 2.0' - dark greenish gray (5G 4/1); 15% clay, 65% silt, 20% fine to coarse sand.		
							@ 4.0' - **SILT (ML)** ; black (N 2.5/); 20% clay, 75% silt, 5% fine sand.		
							@ 6.0' - **Sandy SILT (ML)**; olive (5Y 4/3); 10% clay, 55% silt, 35% fine to coarse sand.		
							@ 8.0' - **SILT with Sand (ML)**; 5% clay, 70% silt, 25% fine to medium sand.		◄ Portland Type I/II
0.0		SB-11-10'		10					
							@ 12.0' - black (5Y 2.5/1); wet; 10% clay, 70 % silt, 20% fine to medium sand. ▽		
							@ 13.0' - olive (5Y 4/3); moist; 15% clay, 60% silt, 25% fine to medium sand.		
0.0		SB-11-14'		15				14.5	Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-12
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	17-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	12.0 ft (17-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					GM		**Silty GRAVEL (GM)**; dark olive gray (5Y 3/2); dry; 5% clay, 10% silt, 5% fine to coarse sand, 80% fine to medium gravel.	3.0	
					ML		**SILT with Sand (ML)**; black (5Y 2.5/1); moist; 15% clay, 65% silt, 15% fine to medium sand, 5% fine gravel.		
							@ 4.0' - **SILT (ML)** ; 15% clay, 80% silt, 5% fine sand.		
1.4		SB-12-5'		5					
							@ 9.0' - **Sandy SILT (ML)**; olive gray (5Y 4/2); 10% clay, 40% silt, 40% fine to medium sand, 10% fine gravel.		
1.7		SB-12-10'		10					
							@ 11.0' - light olive brown (2.5Y 5/4); 15% clay, 50% silt, 30% fine to medium sand, 5% fine gravel.		
NA		SB-12-12'					@ 12.0' - very dark grayish brown (2.5Y 3/2); wet; 15% clay, 45% silt, 35% fine to medium sand, 5% fine gravel. ▽	12.5	
				15					Portland Type I/II
				20					Bottom of Boring @ 16 ft

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-13
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	NA
REVIEWED BY		**DEPTH TO WATER (Static)**	NA
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					GM		**GRAVEL with Silt (GM)**; very dark grayish brown (10YR 3/2); moist; 5% clay, 5% silt, 10% fine to coarse sand, 80% fine to coarse gravel.	1.0	
1.0		SB-13-2'		5			**Gravelly SILT with Sand (ML)**; dark gray (5Y 4/1); moist; 10% clay, 40% silt, 20% fine to medium sand, 30% fine gravel. @ 2.0' - **SILT with Sand (ML)**; dark greenish gray (5G 4/1); 15% clay, 70% silt, 10% fine to medium sand, 5% fine gravel. @ 3.0' - **Sandy SILT (ML)**; dark gray (5Y 4/1) mottled with olive brown (2.5Y 4/4); 10% clay, 60% silt, 30% fine sand. @ 4.0' - **SILT (ML)**; dark olive gray (5Y 3/2); 20% clay, 75% silt, 5% fine sand.		Portland Type I/II
0.0		SB-13-9.5'		10	ML		@ 8.0' - **SILT with Sand (ML)**; light olive brown (2.5Y 5/6); 15% clay, 65% silt, 15% fine to coarse sand, 5% fine gravel. @ 11.0' - 15% clay, 65% silt, 20% fine sand.		
0.0		SB-13-15'		15				16.0	Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-14
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	NA
REVIEWED BY		**DEPTH TO WATER (Static)**	NA
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					GM		**Silty GRAVEL with Sand (GM)**; dark gray (5Y 4/1); moist; 5% clay, 10% silt, 15% fine to coarse sand, 70% fine to medium gravel.	1.0	
0.0		SB-14-2'			SM		**Silty SAND with Gravel (SM)**; dark olive gray (5Y 3/2); moist; 15% clay, 15% silt, 40% fine to coarse sand, 30% fine gravel. @ 2.0' - olive gray (5Y 4/2); 5% clay, 15% silt, 50% fine to coarse sand, 30% fine gravel.		
				5			@ 5.0' - very dark grayish brown (10YR 3/2); 5% clay, 25% silt, 50% fine coarse sand, 20% fine gravel.	6.5	
					ML		**Sandy SILT (ML)**; dark olive gray (5Y 3/2) mottled with olive (5Y 4/4); moist; 5% clay, 55% silt, 35% fine coarse sand, 5% fine gravel.		Portland Type I/II
0.7		SB-14-10'		10			@ 9.0' - **SILT (ML)** ; yellowish brown (10YR 5/6) mottled with light greenish gray (5G 7/1); 15% clay, 75% silt, 10% fine sand.		
0.3		SB-14-14'					@ 12.0' - **SILT with Sand (ML)**; light olive brown (2.5Y 5/6) mottled with light greenish gray (5G 7/1); 10% clay, 65% silt, 20% fine coarse sand, 5% fine gravel. @ 13.0' - **SILT (ML)** ; 15% clay, 75% silt, 10% fine sand.	14.5	
				15					Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-15
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	8.0 ft (17-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
5.0		SB-15-2'		0	GM		**GRAVEL with Silt and Sand (GM)**; dark greenish gray (5GY 4/1); moist; 5% clay, 5% silt, 30% fine to medium sand, 60% fine to medium gravel. @ 1.0' - 10% clay, 30% silt, 20% fine to medium sand, 40% fine gravel.	2.5	Portland Type I/II
				5			**SILT (ML)** ; very dark greenish gray (10Y 3/1); moist; 15% clay, 75% silt, 5% fine sand, 5% fine gravel. @ 3.0' - **Sandy SILT (ML)** ; dark greenish gray (10Y 4/1); 15% clay, 50% silt, 30% fine to medium sand, 5% fine gravel. @ 4.0' - very dark gray (5Y 3/1); 10% clay, 45% silt, 40% fine to medium sand, 5% fine gravel.		
0.2		SB-15-9.5'		10	ML		@ 8.0' - light olive brown (2.5Y 5/6) mottled with greenish gray (5G 6/1); wet; 10% clay, 40% silt, 50% fine sand. @ 9.0' - 15% clay, 45% silt, 35% fine to coarse sand, 5% fine gravel.		
							@ 12.0' - **SILT (ML)** ; light olive brown (2.5Y 5/6) mottled with greenish gray (5G 6/1); moist; 15% clay, 75% silt, 10% fine sand.		
0.5		SB-15-15'		15			@ 15.0' - light olive brown (2.5Y 5/6) mottled with black (2.5Y 2.5/1) and greenish gray (5G 6/1); 15% clay, 75% silt, 10% fine sand.	16.0	Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-17
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K.Taylor	**DEPTH TO WATER (First Encountered)**	3.5 ft (16-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					GM		**Silty GRAVEL with Sand (GM)**; gray (5Y 5/1); moist; 5% clay, 25% silt, 30% fine to coarse sand, 40% fine gravel.		
							@ 3.0' - **GRAVEL with Silt (GM)**; gray (5Y 5/1); wet; 5% clay, 5% silt, 10% fine to coarse sand, 80% fine to medium gravel. ▽	4.0	
2.0		SB-17-5'		5			**SILT (ML)** ; black (5Y 2.5/1); wet; 20% clay, 75% silt, 5% fine sand. @ 5.0' - dark olive gray (5Y 3/2); moist; 15% clay, 80% silt, 5% fine sand.		
					ML		@ 8.0' - **Sandy SILT with Gravel (ML)**; dark olive gray (5Y 3/2); wet; 15% clay, 35% silt, 30% fine to coarse sand, 20% fine gravel. @ 9.0' - **SILT with Sand (ML)**; light olive brown (2.5Y 5/4); moist; 15% clay, 60% silt, 15% fine to coarse sand, 10% fine gravel. @ 10.0' - light olive brown (2.5Y 5/4) mottled with greenish gray (5G 6/1); 15% clay, 60% silt, 15% fine coarse sand, 10% fine gravel.		◄ Portland Type I/II
0.0		SB-17-10'		10					
							@ 13.0' - **Sandy SILT (ML)** ; dark olive gray (5Y 3/2); wet; 15% clay, 45% silt, 30% fine to coarse sand, 10% fine gravel.		
0.0		SB-17-15'		15			@ 15.0' - **SILT with Sand (ML)**; light olive brown (2.5Y 5/4); moist; 15% clay, 60% silt, 15% fine to coarse sand, 10% fine gravel.	16.0	Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-18
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	4.0 ft (16-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
0.0		SB-18-2'			GM		**GRAVEL with Silt and Sand (GM)**; dark gray (5Y 4/1); moist; 5% clay, 5% silt, 40% fine to coarse sand, 50% fine gravel.		
							@ 4.0' - wet ▽		
0.5		SB-18-5'		5				6.5	
					ML		**SILT (ML)** ; dark olive gray (5Y 3/2); wet; 15% clay, 80% silt, 5% fine sand.		Portland Type I/II
0.2		SB-18-10'		10			**Sandy SILT (ML)**; olive (2.5Y 5/6); moist; 10% clay, 60% silt, 30% fine sand.	11.0	
				15					Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-19
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	NA ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					GM		**Silty GRAVEL with Sand (GM)**; gray (5Y 5/1); moist; 5% clay, 25% silt, 30% fine to coarse sand, 40% fine gravel.	3.0	
				5	ML		**Sandy SILT with Gravel (ML)**; olive brown (2.5Y 4/4); moist; 15% clay, 40% silt, 25% fine to coarse sand, 20% fine gravel. @ 4.0' - **SILT (ML)** ; very dark greenish gray (10Y 3/1); moist; 20% clay, 75% silt, 5% fine sand.	6.5	
					GM		@ 8.0' - **Silty GRAVEL with Sand (GM)**; gray (5Y 5/1); dry; 5% clay, 25% silt, 30% fine to coarse sand, 40% fine gravel.	9.0	Portland Type I/II
0.2		SB-19-9'		10	ML		**Sandy SILT (ML)** ; light olive brown (2.5Y 5/6); moist; 10% clay, 60% silt, 30% fine to medium sand.		
0.0		SB-19-13.5'		15			@ 12.0' - light olive brown (2.5Y 5/6) mottled with brown (7.5YR 4/4); 10% clay, 45% silt, 40% fine to coarse sand, 5% fine gravel. @ 13.0' - light olive brown (2.5Y 5/6); 10% clay, 60% silt, 30% fine to medium sand.	14.0	Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-20
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	8.0 ft (16-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					GM		**GRAVEL with Silt (GM)**; dark gray (5Y 4/1); dry; 5% clay, 5% silt, 10% fine to coarse sand, 80% fine gravel. @ 1.0' - **Silty GRAVEL with Sand (GM)**; moist; 5% clay, 25% silt, 30% fine to coarse sand, 40% fine gravel.	2.0	
					SM		**Silty SAND with Gravel (SM)**; dark gray (5Y 4/1); moist; 5% clay, 30% silt, 35% fine to coarse sand, 30% fine gravel.	3.0	
		SB-20-4.5'		5	GM		**Silty GRAVEL with Sand (GM)**; dark gray (5Y 4/1); moist; 5% clay, 40% silt, 25% fine to coarse sand, 30% fine gravel.		Portland Type I/II
		SB-20-8'					@ 8.0' - wet; 5% clay, 20% silt, 35% fine to coarse sand, 40% fine gravel. ▽		
				10				10.3	
					ML		**SILT (ML)** ; light olive brown (2.5Y 5/6); wet; 15% clay, 75% silt, 10% fine sand.	12.5	
1.0		SB-20-12.5'			SM		**SAND with Silt (SM)**; gray (5Y 5/1); wet; 10% silt, 90% fine to medium sand.	13.0	
				15					Bottom of Boring @ 15 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-21
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	17-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	9.0 ft (17-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					ML		**SILT with Sand (ML)**; olive (5Y 4/4); dry; 5% clay, 75% silt, 15% fine to medium sand, 5% fine gravel.	1.0	
					SM		**Silty SAND (SM)**; olive gray (5Y 4/2); moist; 5% clay, 20% silt, 60% fine to coarse sand, 15% fine gravel.	3.0	
0.7		SB-21-5'		5	ML		**Sandy SILT (ML)**; olive gray (5Y 4/2); moist; 15% clay, 35% silt, 50% fine sand. @ 5.0' - dark greenish gray (5G 4/1); 5% clay, 45% silt, 50% fine sand. @ 6.0' - **SILT (ML)** ; black (5Y 2.5/1); moist; 15% clay, 80% silt, 5% fine sand. @ 7.0' - dark gray (5Y 4/1) @ 9.0' - wet ▽		Portland Type I/II
1.9		SB-21-10'		10	SM		**Silty SAND (SM)**; olive (5Y 5/4) mottled with greenish gray (5G 6/1); wet; 5% clay, 40% silt, 50% fine to medium sand, 5% fine gravel.	11.0 12.0	
					ML		**SILT (ML)** ; light olive brown (2.5Y 5/6) mottled with greenish gray (5G 6/1); moist; 15% clay, 75% silt, 10% fine sand. @ 13.0' - dark gray (5Y 4/1); wet; 15% clay, 80% silt, 5% fine sand.	14.0	
					SM		**Silty SAND (SM)**; olive (5Y 5/4); wet; 5% clay, 40% silt, 50% fine to medium sand, 5% fine gravel.	15.0	
2.0		SB-21-15'		15	ML		**Sandy SILT (ML)**; light olive brown (2.5y 5/6); moist; 5% clay, 55% silt, 40% fine to medium sand.	16.0	Bottom of Boring @ 16 ft
				20					

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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-22
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	12.0 ft (17-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
				0	GM		**GRAVEL with Silt (GM)**; olive gray (5Y 5/2); dry; 5% clay, 5% silt , 10% fine to coarse sand, 80% fine gravel.		
							@ 2.0' - **Silty GRAVEL with Sand (GM)**; gray (5Y 5/1); moist; 5% clay, 25% silt, 30% fine to coarse sand, 40% fine gravel.	3.0	
							SILT (ML) ; dark grayish brown (2.5Y 4/2); moist; 20% clay, 75% silt, 5% fine sand.		
							@ 4.0' - very dark greenish gray (5G 3/1)		
				5					
									Portland Type I/II
					ML		@ 8.0' - **Sandy SILT (ML)** ; dark grayish brown (2.5Y 4/2); 15% clay, 40% silt, 40% fine to coarse sand, 5% fine gravel.		
							@ 9.0' - light olive brown (2.5Y 5/6); 10% clay, 60% silt, 30% fine to medium sand.		
1.0		SB-22-10'		10					
							@ 12.0' - olive gray (5Y 4/2); wet; 15% clay, 45% silt, 30% fine to coarse sand, 10% fine gravel. ▽		
							@ 13.0' - **SILT (ML)** ; light olive brown (2.5Y 5/6); moist; 15% clay, 75% silt, 10% fine sand.		
1.0		SB-22-15'		15				16.0	
									Bottom of Boring @ 16 ft
				20					

WELL LOG (PID) I:\SANRAF~1\GINT\755SEC~1.GPJ DEFAULT.GDT 6/29/06

Cambria Environmental Technology, Inc.
270 Perkins Street
Sonoma, CA 95476
Telephone: 707-935-4850
Fax: 707-935-6649

BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-23
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	17-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	10.0 ft (17-May-06) ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					SM		**Silty SAND with Gravel (SM)**; light olive brown (2.5Y 5/4); dry; 15% silt, 60% fine to coarse sand, 25% fine gravel.		
							@ 2.0' - olive gray (5Y 4/2); 5% clay, 20% silt, 60% fine to coarse sand, 15% fine gravel.		
							@ 3.0' - 10% clay, 25% silt, 50% fine to coarse sand, 15% fine gravel.	4.0	
							SILT with Sand (ML); black (5Y 2.5/2); moist; 20% clay, 40% silt, 25% fine to coarse sand, 15% fine gravel.		
1.6		SB-23-5'		5			@ 5.0' - dark gray (5Y 4/1); 10% clay, 70% silt, 20% fine sand.		
					ML		@ 6.5' - black (5Y 2.5/1); 5% clay, 80% silt, 10% fine sand, 5% fine gravel.		Portland Type I/II
							@ 9.0' - **Sandy SILT (ML)**; greenish gray (5G 5/1); 5% clay, 55% silt, 40% fine to medium sand. ▽	10.0	
0.2		SB-23-10'		10	SM		**Silty SAND (SM)**; olive (5Y 5/4); wet; 5% clay, 35% silt, 60% fine to medium sand.	11.0	
							SILT with Sand (ML); dark yellowish brown (10YR 4/6); moist; 15% clay, 65% silt, 20% fine to medium sand.		
					ML		@ 13.0' - **Sandy SILT (ML)**; greenish gray (5G 5/1); 5% clay, 55% silt, 40% fine to medium sand.		
							@ 14.0' - **SILT with Sand (ML)**; black (5Y 2.5/1); 5% clay, 80% silt, 10% fine sand, 5% fine gravel.		
0.8		SB-23-15'		15			@ 15.0' - light olive brown (2.5Y 5/6) mottled with greenish gray (5G 6/1); 10% clay, 70% silt, 20% fine sand.	16.0	Bottom of Boring @ 16 ft
				20					

WELL LOG (PID) I:\SANRAF~1\GINT\755SEC~1.GPJ DEFAULT.GDT 6/29/06

Cambria Environmental Technology, Inc.
270 Perkins Street
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Telephone: 707-935-4850
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BORING/WELL LOG

CLIENT NAME	Shell Oil Products US	**BORING/WELL NAME**	SB-24
JOB/SITE NAME	Former Shell Service Station	**DRILLING STARTED**	15-May-06
LOCATION	755 Second St, San Rafael	**DRILLING COMPLETED**	17-May-06
PROJECT NUMBER	248-1196	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER		**SCREENED INTERVAL**	NA
LOGGED BY	K. Taylor	**DEPTH TO WATER (First Encountered)**	NA ▽
REVIEWED BY		**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

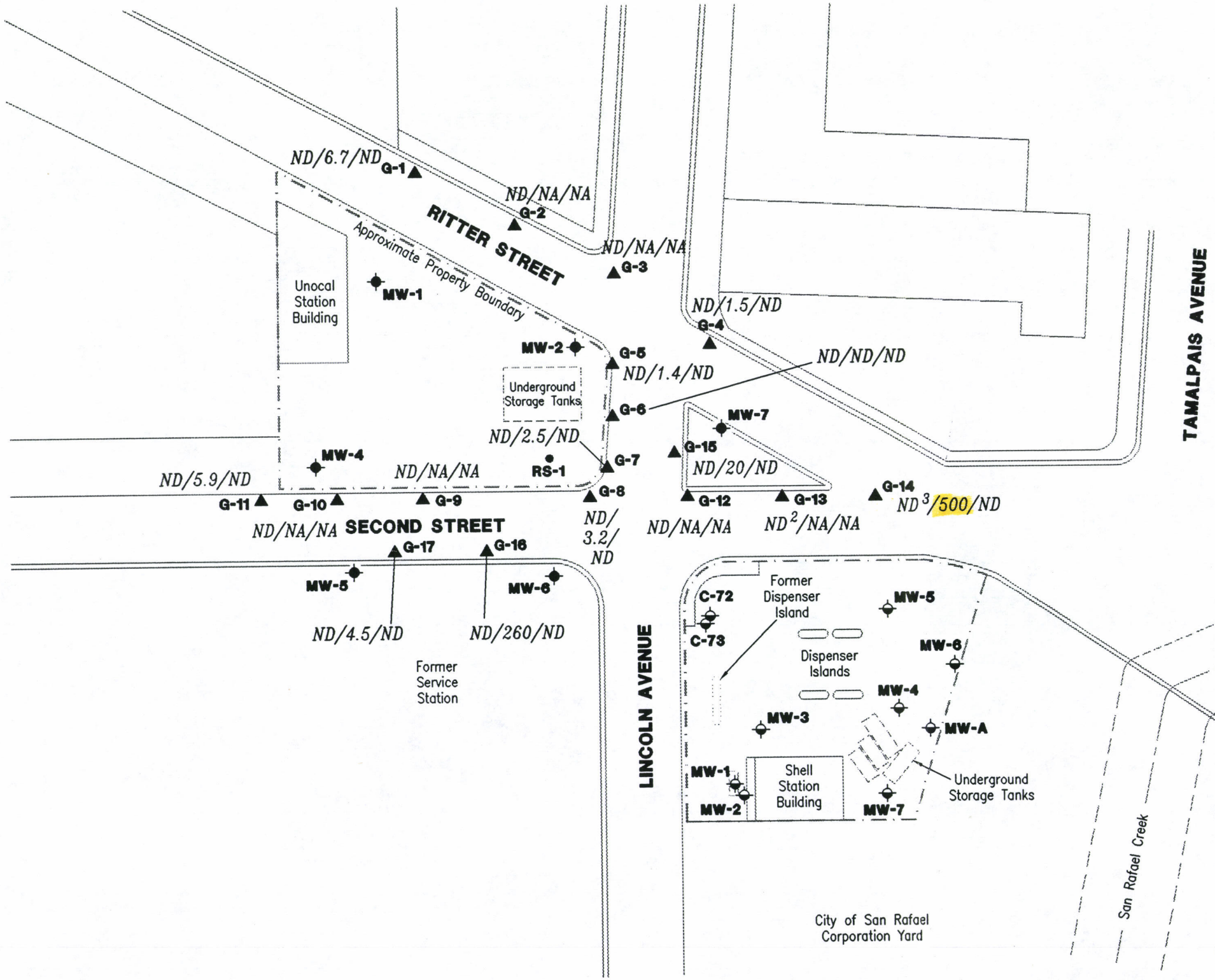
PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	SOIL DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
					GM		**Silty GRAVEL with Sand (GM)**; olive brown (2.5Y 4/4); moist; 15% clay, 15% silt, 20% fine to coarse sand, 50% fine to medium gravel.	1.0	
					SM		**Silty SAND (SM)**; olive gray (5Y 4/2); moist; 5% clay, 10% silt, 80% fine to coarse sand, 5% fine to medium gravel.		
0.0		SB-24-2'						2.5	
					ML		**SILT with Sand (ML)**; olive gray (5Y 4/2); moist; 15% clay, 60% silt, 20% fine to coarse sand, 5% fine to medium gravel.	3.0	
					SM		**Silty SAND (SM)**; dark olive gray (5Y 3/2); moist; 5% clay, 30% silt, 60% fine to coarse sand, 5% fine to medium gravel.	3.5	
				5			**SILT with Sand (ML)**; black (5Y 2.5/1); moist; 15% clay, 70% silt, 10% fine to coarse sand, 5% fine to medium gravel. @ 4.0' - black (5Y 2.5/1); 20% clay, 65% silt, 10% fine to coarse sand, 5% fine to medium sand.		
0.8		SB-24-8.5'					@ 8.0' - **Sandy SILT (ML)**; light olive brown (2.5Y 5/6) mottled with olive (5Y 4/3); 10% clay, 55% silt, 30% fine to coarse sand, 5% fine gravel.		◄ Portland Type I/II
				10	ML				
							@ 12.0' - olive (5Y 5/6) mottled with olive brown (2.5Y 4/4); 10% clay, 50% silt, 40% fine sand.		
							@ 13.0' - **SILT (ML)**; yellowish brown (10YR 5/6) mottled with light greenish gray (5G 7/1); 15% clay, 75% silt, 10% fine sand.		
0.7		SB-28-15'		15			@ 15.0' - **SILT with Sand (ML)**; 15% clay, 70% silt, 10% fine to coarse sand, 5% fine gravel.		
								16.0	Bottom of Boring @ 16 ft
				20					

WELL LOG (PID) I:\SANRAF~1\GINT\755SEC~1.GPJ DEFAULT.GDT 6/29/06

MILLER PACIFIC ENGINEERING GROUP

GETTLER-RYAN INC.

34 RITTER STREET



EXPLANATION

- Groundwater monitoring well (Unocal)
- Groundwater monitoring well (Shell)
- Recovery sump
- Geoprobe boring
- *A/B/C* — Concentrations of TPHg, benzene and MTBE/TPHd/PNA_s in soil in ppm
- *ND* — Not Detected
- *NA* — Not Analyzed

NOTES

1. PNA_s were not detected except benzo(a)pyrene (0.300 ppm), benzo(b)fluoranthene (0.250 ppm), fluoranthene (0.420 ppm), and pyrene (0.420 ppm)
2. Benzene detected at 0.0060 ppm
3. Benzene detected at 0.0083 ppm

FIGURE 2

SOIL CONCENTRATION MAP
Tosco (Unocal) Service Station #2441
34 Ritter Street
San Rafael, California

DATE September, 1998

REVISED DATE

Gettler - Ryan Inc.
6747 Sierra Ct., Suite J (925) 551-7555
Dublin, CA 94568

JOB NUMBER 140008.02

REVIEWED BY

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

LL - Liquid Limit (%)

PI - Plastic Index (%)

PID - Volatile Vapors in ppm

MA - Particle Size Analysis

2.5 YR 6/2 - Soil Color according to Munsell Soil Color Charts (1975 Edition)

5 GY 5/2 - GSA Rock Color Chart

 - No Soil Sample Recovered

 - "Undisturbed" Sample

 - Bulk or Classification Sample

 - First Encountered Ground Water Level

 - Piezometric Ground Water Level

Penetration - Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs

Unified Soil Classification - ASTM D 2488-85 and Key to Test Data

Gettler-Ryan, Inc.

Log of Boring G-1

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *4.30* DATE: *07/27/98* TIME: *15:55*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *Hand Auger*	TOTAL DEPTH: *5.5 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt over concrete.	Boring backfilled with soil cuttings to 3 inches below ground surface (bgs) and capped with asphalt.
						CL	CLAY (CL) – black (7.5YR 2/0), moist, low plasticity; 80% clay, 10% fine to coarse sand, 10% gravel.	
							Color changes to dark greenish gray (5GY 4/1) at 3 feet.	
	23		G1-4.0				▽ Becomes saturated at 4.3 feet.	
5								
10							(* = not applicable – boring advanced using hand auger)	
15								
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-2

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO. : *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *5.0* DATE: *07/27/98* TIME: *16:30*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *Hand Auger*	TOTAL DEPTH: *7.0 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt over concrete.	Boring backfilled with soil cuttings to 3 inches below ground surface (bgs) and capped with asphalt.
						CL	CLAY (CL) – black (7.5YR 2/0), moist, medium plasticity; 100% clay.	
						CL	SANDY CLAY WITH GRAVEL (CL) – olive gray (5Y 4/2), moist, low plasticity; 60% clay, 30% fine to coarse sand, 10% fine gravel.	
	0		G2-4.5					
5							▽ Becomes saturated at 5.0 feet.	
							(* = not applicable – boring advanced using hand auger)	
10								
15								
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-3

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *dry* DATE: *07/27/98* TIME: *17:00*
DATE FINISHED: *07/27/98*	WL (ft. bgs): *dry* DATE: *07/28/98* TIME: *10:10*
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *11.5 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					PAVEMENT – asphalt over concrete.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
				CL	CLAY WITH SAND (CL) – dark gray (2.5Y 4/0), moist, low plasticity; 80% clay, 20% fine to coarse sand.	
5	0		G3-4.0		Color changes to brown (10YR 5/3), 30% fine sand at 4 feet.	
	0		G3-6.0			
	0		G3-8.0	CL	GRAVELLY CLAY (CL) – black (10YR 2/1), moist, low plasticity; 60% clay, 30% fine gravel, 10% fine to coarse sand.	
10	0		G3-10.5		Color changes to dark grayish brown (2.5Y 4/2) at 9 feet and to brown (10YR 5/3) at 10 feet.	
				GC	CLAYEY GRAVEL (GC) – yellowish brown (10YR 5/6), damp; 60% fine to coarse gravel, 30% clay, 10% fine to coarse sand.	
					Refusal at 11.5 feet. Temporary screen installed. No water in boring after waiting 17 hours.	
15						
					(* = not applicable – boring advanced using direct-push technology)	
20						

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-4

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *6.75* DATE: *07/27/98* TIME: *9:30*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *14 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
				CL	PAVEMENT – asphalt.	
					CLAY (CL) – very dark gray (10YR 3/1), moist, medium plasticity; 95% clay, 5% fine sand.	
	0		G4-2.5			Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
	0		G4-4.0		Color changes to dark brown (10YR 4/3) mottled gray (10YR 5/1), sand increases to 10% at 4 feet.	
5						
	0		G4-6.0		▽ Becomes saturated at 6.75 feet.	
	0		G4-9.5			
10				CL/SC	SANDY CLAY (CL/SC) – yellowish brown (10YR 5/4), saturated, low plasticity; 50% clay, 50% fine sand.	
				CL/GC	GRAVELLY CLAY (CL/GC) – yellowish brown (10YR 5/4) mottled gray (10YR 5/1) and yellowish red (5YR 5/8), saturated, low plasticity; 50% clay , 35% fine gravel, 15% fine to coarse sand.	
15						
					(* = not applicable – boring advanced using direct-push technology)	
20						

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-5

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/28/98*	WL (ft. bgs): *dry* DATE: *07/28/98* TIME: *14:00*
DATE FINISHED: *07/28/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12.0 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt over concrete.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
	0		G5-4.0			SM	SILTY SAND WITH GRAVEL (SM) – dark brown (7.5YR 3/4), damp; 50% fine to coarse sand, 30% fine to coarse gravel, 20% silt.	
5	0		G5-6.0			CL	GRAVELLY CLAY (CL) – yellowish brown (10YR 5/6), moist, low plasticity ; 60% clay, 30% fine to coarse gravel, 10% fine to coarse sand.	
	0		G5-8.0			CL	CLAY (CL) – black (10YR 2/1), moist, medium plasticity; 90% clay, 10% fine sand.	
10						SC	CLAYEY SAND (SC) – brown (10YR 5/3), moist; 70% fine to coarse sand, 30% clay. Temporary screen installed. No water in boring after waiting 4 hours.	
15							(* = not applicable – boring advanced using direct-push technology)	
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-6

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/28/98*	WL (ft. bgs): *dry* DATE: *07/28/98* TIME: *14:00*
DATE FINISHED: *07/28/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12.0 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt over concrete.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						SC/GC	CLAYEY SAND WITH GRAVEL (SC/GC) – dark brown (7.5YR 3/4), moist, 35% fine to coarse sand, 35% fine to coarse gravel, 30% clay.	
5	0		G6-4.0					
	0		G6-6.0				With dark grayish brown (2.5Y 4/2) mottling at 6 feet.	
	0		G6-8.0			CL	SANDY CLAY (CL) – black (7.5YR 2/0) mottled dark brown (7.5YR 4/4), moist, low plasticity; 70% clay, 30% fine to coarse sand, trace fine gravel.	
							No dark brown mottling at 9 feet.	
10						ML	SANDY SILT (ML) – brown (10YR 5/3), moist, low plasticity; 60% silt, 30% fine sand, 10% clay.	
							Temporary screen installed. No water in boring after waiting 4.5 hours.	
15							(* = not applicable – boring advanced using direct-push technology)	
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.	Log of Boring G-7
PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/28/98*	WL (ft. bgs): *7.0* DATE: *07/28/98* TIME: *8:50*
DATE FINISHED: *07/28/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt over concrete.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						GC	CLAYEY GRAVEL (GC) – dark brown (7.5YR 3/4), moist; 50% fine to coarse gravel, 30% clay, 20% fine to coarse sand.	
5	0		G7-4.0					
	0		G7-6.0				Color changes to very dark grayish brown (2.5YR 3/2) at 6 feet.	
							▽ Becomes saturated at 7.0 feet.	
	0		G7-7.5			CL	CLAY (CL) – dark grayish brown (2.5YR 4/2), saturated, low plasticity; 90% clay, 10% fine sand.	
10								
15							(* = not applicable – boring advanced using direct-push technology)	
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-8

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *7.0* DATE: *07/27/98* TIME: *11:45*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT - asphalt.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						CL/GC	GRAVELLY CLAY (CL/GC) - dark yellowish brown (10YR 3/4) mottled olive (2.5Y 4/4), moist, low plasticity; 50% clay, 40% fine to coarse gravel , 10% fine to coarse sand.	
	0		G8-4.0					
5						SW-SM	SAND WITH GRAVEL AND SILT (SW-SM) - dark brown (7.5YR 3/4), moist; 70% fine to coarse sand, 20% fine gravel, 10% silt.	
	0		G8-6.0					
	0		G8-7.5			CL	GRAVELLY CLAY (CL) - dark brown (7.5YR 3/4), saturated, low plasticity ; 60% clay, 30% fine to coarse gravel, 10% fine to coarse sand.	
						CL	CLAY (CL) - very dark gray (10YR 3/1), saturated, medium plasticity; 100% clay.	
10								
15							(* = not applicable - boring advanced using direct-push technology)	
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-9

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *5.4* DATE: *07/27/98* TIME: *13:15*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						CL/GC	GRAVELLY CLAY (CL/GC) – dark yellowish brown (10YR 4/4), moist, low plasticity; 45% clay, 40% fine to coarse gravel, 15% fine to coarse sand.	
5	0		G9-4.5				▽ Becomes saturated at 5.4 feet.	
10						CL	SANDY CLAY (CL) – dark greenish gray (5G 4/1), saturated, low plasticity: 65% clay, 35% fine to coarse sand.	
15							(* = not applicable – boring advanced using direct-push technology)	
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-10

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *8.2* DATE: *07/27/98* TIME: *12:10*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						CL/GC	GRAVELLY CLAY (CL/GC) – dark yellowish brown (10YR 3/4), moist, low plasticity; 50% clay, 40% fine to coarse gravel, 10% fine to coarse sand.	
	0		G11-4.0					
5			G11-6.0					
	0		G11-7.5				▽ Becomes saturated at 8.2 feet.	
10						CL	CLAY (CL) – very dark gray (10YR 3/1), saturated, medium plasticity; 100% clay.	
							(* = not applicable – boring advanced using direct-push technology)	
15								
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-11

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *5.60* DATE: *07/27/98* TIME: *12:40*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						CL/GC	GRAVELLY CLAY (CL/GC) – dark yellowish brown (10YR 3/4), moist, low plasticity; 50% clay, 40% fine to coarse gravel, 10% fine to coarse sand.	
	0		G11-4.0					
5	0		G11-5.0				▽ Saturated at 5.8 feet.	
						CL	CLAY (CL) – very dark gray (10YR 3/1), saturated, medium plasticity; 100% clay.	
						CL	SANDY CLAY (CL) – light olive brown (2.5Y 5/4) mottled gray (2.5Y 5/4), saturated, low plasticity; 70% clay, 30% fine sand.	
10								
15							(* = not applicable – boring advanced using direct-push technology)	
20								

Gettler-Ryan, Inc.

Log of Boring G-12

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *dry* DATE: *07/27/98* TIME: *13:10*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						CL/GC	GRAVELLY CLAY (CL/GC) – dark brown (7.5YR 3/4), moist, low plasticity; 45% clay, 40% fine to coarse gravel, 15% fine to coarse sand.	
5	0		G12-5.0					
	0		G12-7.5				Color changes to light olive brown (2.5Y 5/4) at 7 feet.	
						CL/SC	SANDY CLAY (CL/SC) – black (2.5YR 2/0), moist, low plasticity; 50% clay, 40% fine to coarse sand, 10% fine gravel.	
10							Color changes to light olive brown (2.5Y 5/4) at 10 feet.	
							Clay increasing to 70% at 11 feet. Temporary screen installed. No water in boring after waiting 1.5 hour.	
15							(* = not applicable – boring advanced using direct-push technology)	
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-13

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *dry* DATE: *07/27/98* TIME: *13:40*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *10 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt.	
						CL/GC	GRAVELLY CLAY (CL/GC) – very dark grayish brown (2.5YR 3/2), moist, low plasticity; 45% clay, 40% fine to coarse gravel, 15% fine to coarse sand.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
5	0		G13-6.0					
	14.8		G13-9.0			CL	SANDY CLAY (CL) – very dark gray (2.5YR 3/0), moist, low plasticity; 65% clay, 35% fine to medium sand.	
10							Refusal at 10 feet. Temporary screen installed. No water in boring after waiting 1 hour.	
							(* = not applicable – boring advanced using direct-push technology)	
15								
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-14

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/27/98*	WL (ft. bgs): *10.5* DATE: *07/27/98* TIME: *15:10*
DATE FINISHED: *07/27/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12.0 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT - asphalt.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						SW	SAND WITH GRAVEL (SW) - light olive brown (2.5Y 5/4), damp; 60% fine to coarse sand, 40% fine to coarse gravel; fill.	
5	0		G14-8.0					
	0		G14-8.0			CL/GC	GRAVELLY CLAY (CL) - brownish yellow (10YR 6/8), moist, low plasticity ; 40% clay, 40% fine to coarse gravel, 20% fine to coarse sand.	
10	14.5		G14-10.0				▽ Color changes to olive (5Y 5/30, becomes saturated at 10.5 feet.	
							(* = not applicable - boring advanced using direct-push technology)	
15								
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-15

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/28/98*	WL (ft. bgs): *dry* DATE: *07/28/98* TIME: *14:00*
DATE FINISHED: *07/28/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *14 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT – asphalt over concrete.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						CL/GC	GRAVELLY CLAY (CL/GC) – dark brown (7.5YR 3/4), moist, low plasticity; 50% clay, 40% fine to coarse gravel, 10% fine to coarse sand.	
	0		G15-4.0					
5						SC/CL	CLAYEY SAND (SC/CL) – dark brown (7.5YR 3/2), moist; 50% fine to coarse sand, 50% clay.	
	0		G15-6.0					
						CL	SANDY CLAY (CL) – dark brown (7.5YR 3/2), moist, low plasticity; 70% clay, 30% fine to medium sand.	
	0		G15-8.0					
10	0		G15-10.0					
						CL	CLAY (CL) – olive (5Y 4/3), very moist, medium plasticity; 90% clay, 10% fine sand.	
	0		G15-13.5				Temporary screen installed. No water in boring after waiting 1.5 hour	
15								
							(* = not applicable – boring advanced using direct-push technology)	
20								

JOB NUMBER: *140008.02*

Gettler-Ryan, Inc.

Log of Boring G-16

PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/28/98*	WL (ft. bgs): *5.2* DATE: *07/28/98* TIME: *12:05*
DATE FINISHED: *07/28/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *8.0 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT - asphalt.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
						SW-SM	SAND WITH GRAVEL AND SILT (SW-SM) - brown (10YR 5/3), damp; 60% fine to coarse sand, 30% fine gravel, 10% silt.	
						CL		
	0		G16-3.0			GC	GRAVELLY CLAY (CL) - black (10YR 2/10, moist, low plasticity; 60% clay , 30% fine gravel, 10% fine to coarse sand.	
	0		G16-4.0				CLAYEY GRAVEL (GC) - dark brown (7.5YR 3/4), moist; 70% fine to coarse gravel, 20% clay, 10% fine to coarse sand.	
5						CL	Color changes to very dark gray (10YR 3/1) at 3.5 feet.	
							CLAY (CL) - dark gray (10YR 4/1), saturated, medium plasticity; 85% clay, 15% peat.	
10							(* = not applicable - boring advanced using direct-push technology)	
15								
20								

JOB NUMBER: *140008.02*

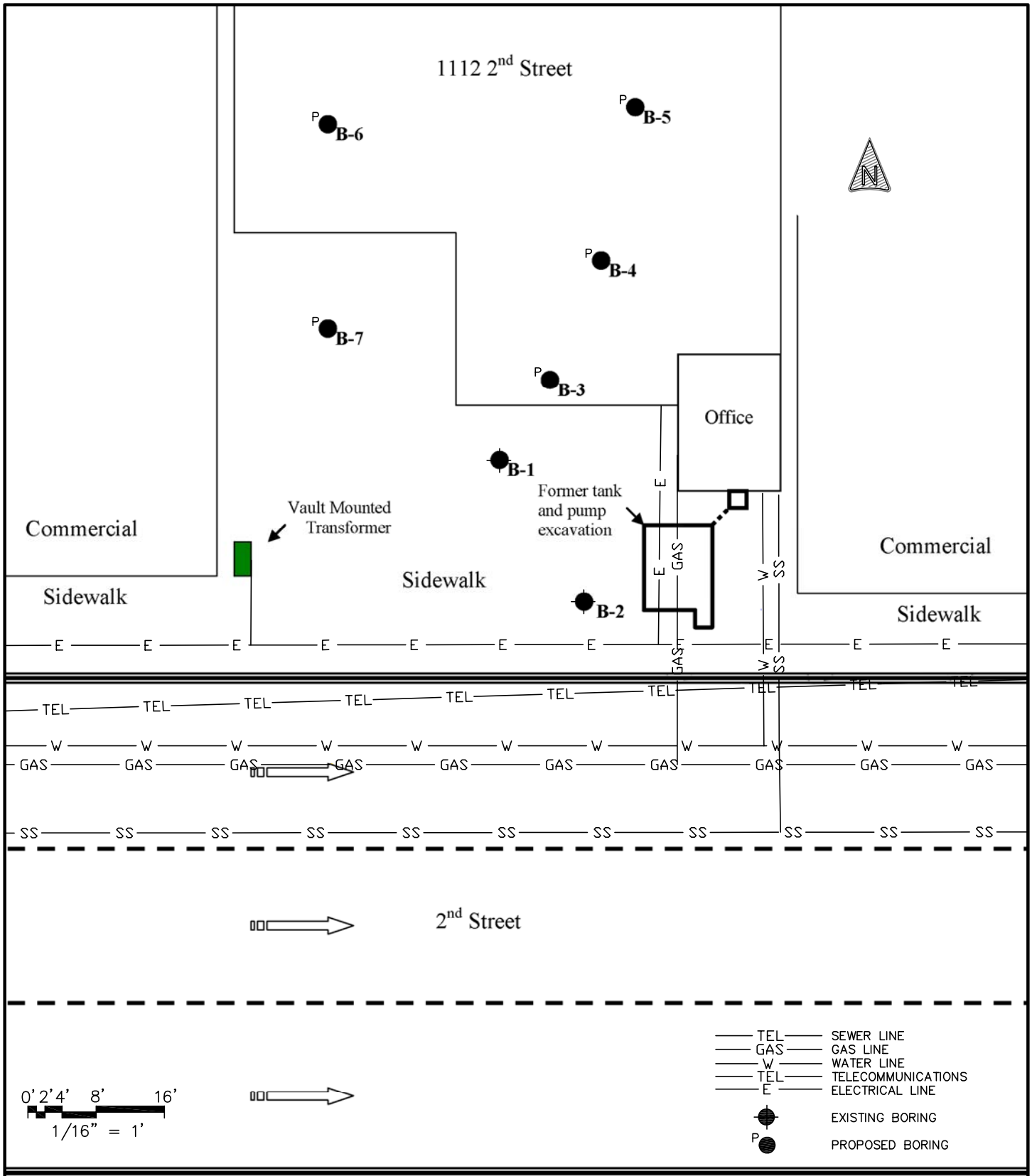
Gettler-Ryan, Inc.	Log of Boring G-17
PROJECT: *Tosco (Unocal) Service Station #2441*	LOCATION: *34 Ritter Street, San Rafael, CA*
GR PROJECT NO.: *140008.02*	SURFACE ELEVATION:
DATE STARTED: *07/28/98*	WL (ft. bgs): *5.2* DATE: *07/28/98* TIME: *13:30*
DATE FINISHED: *07/28/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *2 in. GeoProbe*	TOTAL DEPTH: *12.0 Feet*
DRILLING COMPANY: *Gregg Drilling & Testing, Inc.*	GEOLOGIST: *Barbara Sieminski*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
							PAVEMENT - asphalt.	
						SW-SM	SAND WITH GRAVEL AND SILT (SW-SM) - brown (10YR 5/3), damp; 60% fine to coarse sand, 30% fine gravel, 10% silt.	
						GC	CLAYEY GRAVEL (GC) - dark brown (7.5YR 3/4), moist; 70% fine to coarse gravel, 20% clay, 10% fine to coarse sand.	Boring backfilled with neat cement from the bottom to 4 feet below ground surface (bgs), soil cuttings to 3 inches bgs, and capped with asphalt.
	0		G17-4.0					
5						CL	CLAY (CL) - dark gray (10YR 4/1), saturated, medium plasticity; 80% clay, 20% peat.	
10						CL	SANDY CLAY (CL) - light olive brown (2.5Y 5/4) mottled gray (2.5Y 5/0), saturated, low plasticity; 70% clay, 30% fine sand.	
							(* = not applicable - boring advanced using direct-push technology)	
15								
20								

JOB NUMBER: *140008.02*

HURVITZ ENVIRONMENTAL

1112 2ND STREET



Sidewalk Sidewalk

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CA PG# 7573

SITE PLAN

ZAPPETINI
1112 2ND STREET
SAN RAFAEL, CALIFORNIA

JOB NUMBER: 3025.01
DATE: 04-16-08
PLATE: 2

Date: 4–3–08
Logged By: LEE HURVITZ
Drill Start Time: 10:00AM
Drill End Time: 11:40AM

Boring No.

B–1

Boring Location – See Site Plan

See Unified Soil Classification System (USCS) for Legend and information not noted.

Drilling Contractor: OFIARO DRILLING
Driller's Name: CESAR
Drilling Method: HOLLOW STEM AUGERS
Sampling Method: CAMSSS
Hammer Weight, lbs. 140

MW Installed: Y ☐ N ☐ if no, boring filled with:
Cement ☒ Bentonite: Cement ☐ Grout ☒ Chips ☐
Auger Depth, ft: 14 Total Depth, ft: 14
Hydropunch Int., ft: NA Temp Screen, ft: NA

Notes: USE HILTI TO BREAK CONCRETE/ HAND AUGER TO 4 FT. BELOW GRADE.

Sample	Sample Condition	Feet Recovered	C = CMSSS SP = Std. Pin	Blows / 6 in.	Initial Free Water	Static Water	PID (ppm) maximum, not stabilized	Odor	Discolored	USCS Soil Class.	Depth in Feet	Graphic Log	Estimated Gravel, %	Estimate Sand, %	Estimated Silt, %	Estimated Clay, %	**Description:** Soil Type (USCS); Color; Moisture Condition (dry, moist, wet); Relative Density – sand & gravel (v. loose, loose, m. dense, dense, v. dense); Consistency – silt & clay (v. soft, soft, m. stiff, stiff, v. stiff, hard)
								NO	NO	C							CONCRETE
										B	1						SAND/GRAVEL/BASEROCK
											2						
											3			5	25	70	GREENISH, MOTTLED, SILTY CLAY, MOIST
							0.6		YES	CL	4						
											5						
☒		6		8					NO					30	60	10	GREYISH, BROWN, SANDY SILT WITH SHALE
☒	G	6	C	20							6			30	60	10	VERY DENSE
◣		6		46			0.2			ML/BR	7			30	60	10	
											8						
☒	P	1	C	50							9						AUGER REFUSAL, NO SAMPLES RECOVERED
																	SWITCH TO SOILD AUGERS
											10						
											11						
										BR	12						
											13						
	P	0	C	50							14						REFUSAL WITH SOLID AUGERS
																	NO SAMPLE RECOVERY
											15						
											16						

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CA PG# 7573

B–1

ZAPPETINI
1112 2ND STREET
SAN RAFAEL, CALIFORNIA

JOB NUMBER: 3025.01
DATE: 04–16–08
PLATE: A

Date: 4–3–08
Logged By: LEE HURVITZ
Drill Start Time: 12:10PM
Drill End Time: 1:40PM

Boring No.

B–2

Boring Location – See Site Plan

See Unified Soil Classification System (USCS) for Legend and information not noted.

Drilling Contractor: OFIARO DRILLING
Driller's Name: CESAR
Drilling Method: SOLID STEM AUGERS
Sampling Method: CAMSSS
Hammer Weight, lbs. 140

MW Installed: Y ☐ N ☐ if no, boring filled with:
Cement ☒ Bentonite: Cement ☐ Grout ☒ Chips ☐
Auger Depth, ft: 17 Total Depth, ft: 17
Hydropunch Int., ft: NA Temp Screen, ft: NA

Notes:

Sample	Sample Condition	Feet Recovered	C = CMSSS SP = Std. Pin	Blows / 6 in.	Initial Free Water	Static Water	PID (ppm) maximum, not stabilized	Odor	Discolored	USCS Soil Class.	Depth in Feet	Graphic Log	Estimated Gravel, %	Estimate Sand, %	Estimated Silt, %	Estimated Clay, %	**Description:** Soil Type (USCS); Color; Moisture Condition (dry, moist, wet); Relative Density – sand & gravel (v. loose, loose, m. dense, dense, v. dense); Consistency – silt & clay (v. soft, soft, m. stiff, stiff, v. stiff, hard)
								NO	NO	C	1						CONCRETE
										B							BASEROCK
											2						DARKBROWN CLAY, SLIGHTLY GREENISH
										CL	3						
											4						
☒		6		15							5		25		50	25	BROWNISH SILT WITH SHALE
■	C	6	C	20									25		50	25	HARD, MOIST
☒		6		19			0.2				6		25		50	25	
										ML	7						
											8						
											9						
☒		6		21							10		60		15	25	BROWNISH BLACK CLAYEY SILT,
☒	G	6	C	35			0.2						65		15	20	SHALE/GRAVEL, MOIST, DENSE
		6		50							11		65		15	20	
											12						
										BR	13						
											14						
☒		4		50			0.1				15		65		20	15	DARK GREY BEDROCK WITH SILT/CLAY
	P		C														VERY DENSE, DRY
											16						

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B–2

ZAPPETINI
1112 2ND STREET
SAN RAFAEL, CALIFORNIA

JOB NUMBER: 3025.01
DATE: 04–16–08
PLATE: B–1

Boring No.

B–2

Sample	Sample Condition	Feet Recovered	C = CMSSS SP = Std. Pin	Blows / 6 in.	Initial Free Water	Static Water	PID (ppm) maximum, not stabilized	Odor	Discolored	USCS Soil Class.	Depth in Feet	Graphic Log	Estimated Gravel, %	Estimate Sand, %	Estimated Silt, %	Estimated Clay, %	Description: Soil Type (USCS); Color; Moisture Condition (dry, moist, wet); Relative Density – sand & gravel (v. loose, loose, m. dense, dense, v. dense); Consistency – silt & clay (v. soft, soft, m. stiff, stiff, v. stiff, hard)
								NO	NO	BR	17						
X		0	C	50													AUGER REFUSAL, NO SAMPLE RECOVERY
											18						
											19						
											20						
											21						
											22						
											23						
											24						
											25						
											26						
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											34						
											35						
											36						

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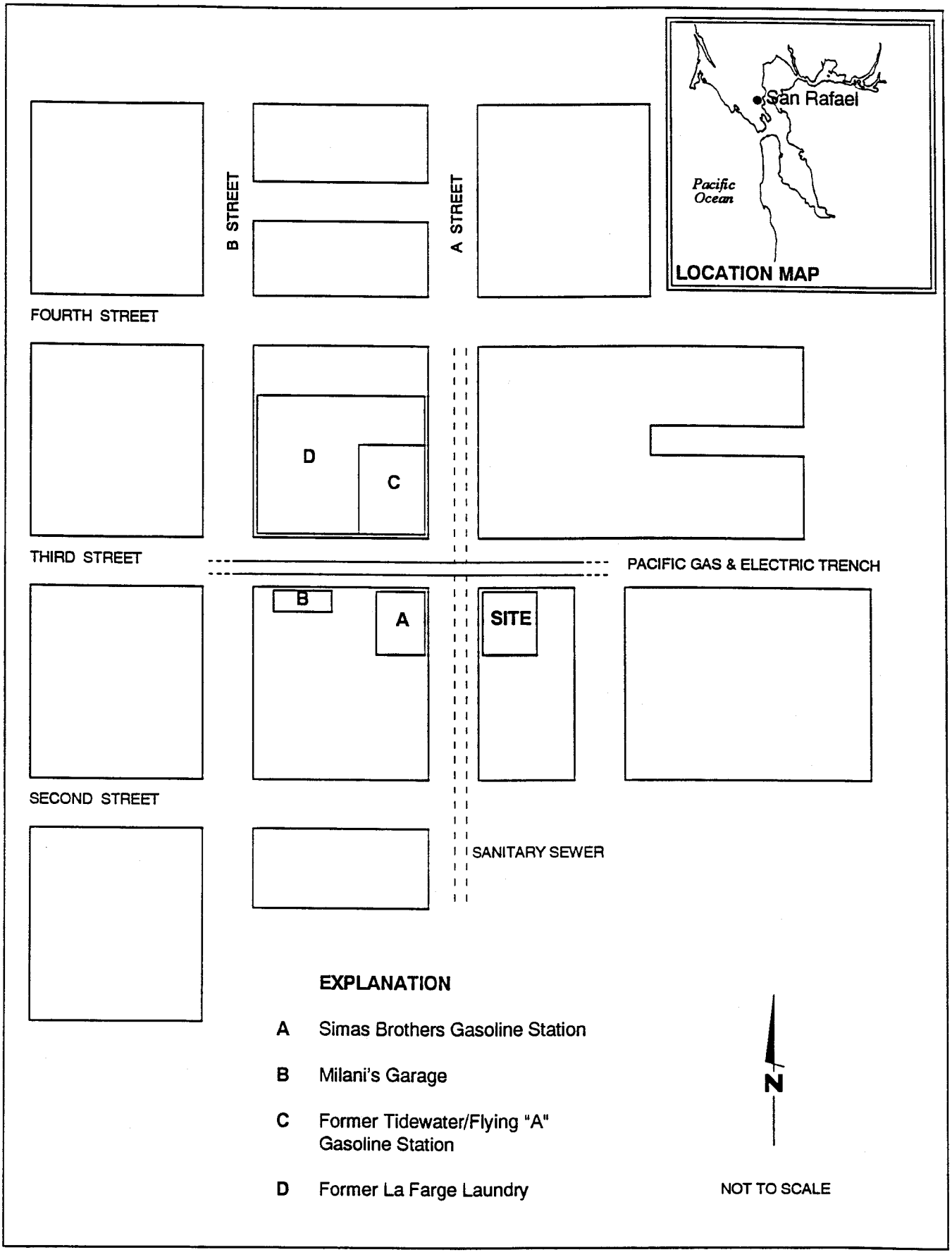
CA PG# 7573

B–2

ZAPPETINI
1112 2ND STREET
SAN RAFAEL, CALIFORNIA

JOB NUMBER: 3025.01
DATE: 04–16–08
PLATE: B–2



PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
Third and A Streets
San Rafael, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
PF001A		3/90		

Log of Test Boring 1

Equipment Penn Truck-Mounted Drill

Elevation _____ Date 6/1/88

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	* Blows/foot	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	
						0	A.C.
			6	13.0	115	3	DARK GRAY SANDY CLAY (CL), wet, medium stiff, w/wood debris, gravel, & petroleum odor (FILL)
							MOTTLED GRAY-YELLOW SANDY CLAY (CL), wet, stiff, w/trace of gravel & petroleum odor (ALLUVIUM)
			16	19.2 14.8	106 116	6	MOTTLED GRAY-ORANGE CLAYEY SAND (SC), wet, medium dense, w/some gravel (ALLUVIUM)
						9	MOTTLED GRAY-YELLOW-ORANGE CLAYEY GRAVEL (GC), wet, medium dense (ALLUVIUM)
			23	7.5	115	12	
UC = 1504 psf			23	16.3	112	15	MOTTLED GRAY-ORANGE CLAYEY SAND (SC), wet, medium dense, w/some gravel (ALLUVIUM)
						18	
							▼ Water Level, 6/1/88, @ 4:47 p.m.
			32	10.2	125	21	MOTTLED RED-GRAY-ORANGE CLAYEY GRAVEL (GC), wet, dense (ALLUVIUM)
							Boring Terminated @ 22.5'
						24	

* Values converted to Standard Penetration Resistance

JCH
JOHN C. HOM
& ASSOCIATES, INC.
Geotechnical Consultants

Job No: 350.2
Appr: JCH
Date: 6/88

LOG OF TEST BORING 1

Third & "A" Streets
San Rafael, California

PLATE 2

Log of Test Boring 2

Equipment Penn Truck-Mounted Drill

Elevation _____ Date 6/1/88

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	
						0	A.C.
			11	10.4			MOTTLED WHITE-BROWN SILTY SAND (SM), moist, loose (FILL)
						3	MOTTLED ORANGE-YELLOW-BROWN CLAYEY SAND (SC), moist, medium dense, w/some gravel (FILL)
			4	14.3	116		DARK GRAY SANDY CLAY (CL), wet, soft, w/ trace of gravel & petroleum odor (FILL)
						6	OLIVE-BROWN CLAYEY SAND (SC), wet, loose, w/trace of gravel (ALLUVIUM)
			15	15.8	115	9	MOTTLED ORANGE-GRAY CLAYEY SAND (SC), wet, medium dense, w/trace of gravel & petroleum odor (ALLUVIUM)
						12	
			26	11.0	118		MOTTLED GRAY-GREEN-BROWN SHALE, slightly hard, friable, highly weathered (BEDROCK)
						15	Boring Terminated @ 15.0'
							No ground water encountered
						18	
						21	
						24	

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Appr:
Date: 6/88

LOG OF TEST BORING 2
Third & "A" Streets
San Rafael, California

PLATE 3

Log of Test Boring 3

Equipment Penn Truck-Mounted Drill

Elevation _____ Date 6/1/88

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	
						0	A.C.
							DARK BROWN to YELLOW-BROWN CLAYEY SAND (SC), wet, loose, w/trace of gravel (FILL)
			5	29.6	80	3	
							▼ Water Level, 6/1/88, @ 4:51 p.m.
						6	grades to saturated
			4				
UC = 762 psf			19	15.5	115	9	MOTTLED GRAY & YELLOW-ORANGE SANDY CLAY (CL), saturated, very stiff (ALLUVIUM)
						12	
			31	9.6		15	YELLOW-ORANGE SANDY CLAYEY GRAVEL (GC), saturated, dense (ALLUVIUM)
						18	
			16/6"	12.7	123		Boring Terminated @ 19.5'
						21	
						24	

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LOG OF TEST BORING 3

Third & "A" Streets
San Rafael, California

PLATE 4

Log of Test Boring 4

Equipment Penn Truck-Mounted Drill

Elevation _____ Date 6/1/88

Laboratory Tests	Drill Rate (min/ft)	Drill Pressure (psi)	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Depth (ft)	Sample
						0	
			5	15.2	111		
						3	
			4	15.0	112		
						6	
						9	
UC = 912 psf			18	16.2	113		
						12	
			45	9.8	127	15	
						18	
						21	
						24	

A.C.

DARK GRAY GRAVELLY CLAYEY SAND (SC), wet, loose, w/brick fragments & petroleum odor (FILL)

▼ Water Level, 6/1/88, @ 4:53 p.m.

MOTTLED GRAY-YELLOW-ORANGE CLAYEY SAND (SC), saturated, medium dense (ALLUVIUM)

OLIVE CLAYEY GRAVEL (GC), saturated, very dense (ALLUVIUM)

Boring Terminated @ 15.0'

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LOG OF TEST BORING 4
Third & "A" Streets
San Rafael, California

PLATE 5

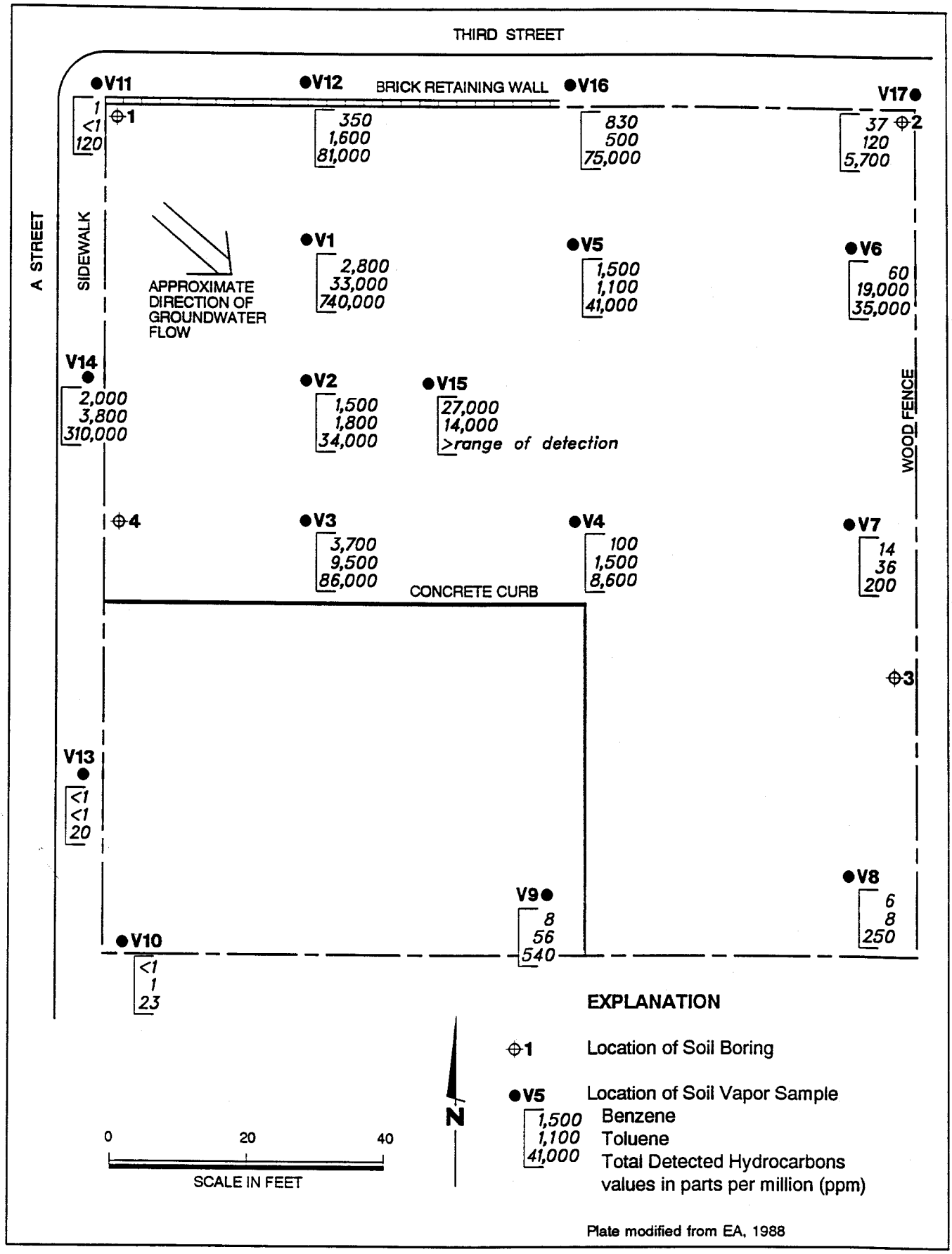

Plate modified from EA, 1988

PES Environmental, Inc.
Engineering & Environmental Services

Petroleum Hydrocarbon Constituents in Soil Vapor
Third and A Streets
San Rafael, California

PLATE **6**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
PF001A		3/90		