PALEONTOLOGICAL IDENTIFICATION REPORT

STATE ROUTE 85 EXPRESS LANES PROJECT, SANTA CLARA COUNTY, CALIFORNIA

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US 101 PM 25.3–28.6
SR 85 PM 0.0–24.1
US 101 PM 47.9–52.0

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This Paleontological Identification Report (PIR) has been prepared to support the State Route (SR) 85 Express Lanes Project in Santa Clara County, California (EA 04-4A7900). The California Department of Transportation (Caltrans) is the lead agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The project is proposed in cooperation with the Santa Clara Valley Transportation Authority (VTA).

This PIR was prepared in accordance with the Caltrans Environmental Handbook, Volume 1, Chapter 8, *Paleontology*. The PIR serves as an initial screening to assess whether project-related ground disturbance would take place in geologic units that have a high potential to contain sensitive paleontological resources.

PIR preparation included reviews of literature and maps to identify geologic units in the project area, the potential for those geologic units to contain fossils, and the types of fossils that may be in or adjacent to the project area.

1.1 PROJECT SUMMARY

The project would convert the existing High-Occupancy Vehicle (HOV) lanes on SR 85 to express lanes. The express lanes would allow HOVs to continue to use the lanes without cost and eligible single-occupant vehicles (SOVs) to pay a toll. The express lanes would be implemented on northbound and southbound SR 85 from US 101 in southern San Jose to US 101 in Mountain View in Santa Clara County (see Figures 1 and 2). The project would also include the continuation of the express lanes for 3.3 miles on US 101 in southern San Jose and 4.1 miles in Mountain View, for a total of 30.8 miles.

The proposed express lane facility would have one lane between US 101 in southern San Jose and SR 87, two lanes between SR 87 and I-280, and one lane between I-280 and US 101 in Mountain View. In the section between SR 87 and I-280, where the median width is approximately 46 feet, pavement widening would be conducted in the median to accommodate the second express lane. The median would be paved, and the existing thrie-beam barrier would be replaced with a Type 60 concrete barrier. The project would also install new signage (including dynamic message signs [DMS]), tolling equipment, striping, and vehicle detection sensor units.

Work on the US 101 segments will mainly consist of striping and signing and will not include widening or any changes in system or HOV lane access. The project does not require any right-of-way acquisition.

Project construction would include the following ground-disturbing activities:

- Overhead DMS and fixed-message signs would be mounted on cantilever structures supported on cast-in-drilled-hole (CIDH) or driven piles of 3 to 6 feet in diameter that would extend 25 to 30 feet below ground surface.
- Overhead tolling equipment would be mounted on cantilever structures supported on CIDH or driven piles of 1 to 2.5 feet in diameter that would extend to approximately 10 feet below ground surface.
- Trenching to a maximum depth of 3 feet would be conducted along the outside edge of pavement for installation of conduits. Conduit would be jacked across the freeway to

median where needed to provide power and communication feeds to the new overhead signage and tolling equipment.

1.2 RESOURCE SETTING

The project area is situated on relatively level terrain along the western and southern margins of the Santa Clara Valley within the San Francisco Bay block (URS 2011). Geologically, the project area is underlain by alluvial deposits consisting of sand, gravel, silt and clay deposited by Adobe, Coyote, Los Gatos, Saratoga, and Stevens creeks and the Guadalupe River (Brabb and Dibblee 1974). These deposits range in age from Holocene Alluvium and Pleistocene Older Alluvium to the Pliocene–Pleistocene Santa Clara Formation. These alluvial deposits are largely derived from the Mesozoic Franciscan Complex mélange, which is the basement formation of the San Francisco Bay block and the principle bedrock unit exposed in the nearby Santa Cruz Mountains (Brabb and Dibblee 1974; URS 2011).

Paleontological resources are the fossilized remains of plants and animals and associated deposits. Marine sediments may contain invertebrate fossils such as snail, clam and oyster shells, sponges, and protozoa; and vertebrate fossils such as fish, whale, and sea lion bones. Vertebrate land animal fossils may include bones of bison, mammoth, horse, rodent, bird, reptile, and amphibian. Paleontological resources also include such trace fossils as plant imprints, petrified wood, and animal tracks.

2.1 REGULATORY CONTEXT

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized or funded projects, including the Antiquities Act of 1906 (16 United States Code [USC] 431-433), the Federal-Aid Highway Act of 1960 (23 USC 305), and the Omnibus Public Land Management Act of 2009 (16 USC 470aaa). This project may involve federal funding.

California Public Resources Code Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site…or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands." Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

Under California law, paleontological resources are protected by CEQA. CEQA requires that a determination be made as to whether a project would directly or indirectly destroy a unique paleontological resource or site or unique geological feature (CEQA Appendix G(v)(c)). If an impact is significant, CEQA requires feasible measures to minimize the impact (Section 21002.1(b)).

2.2 SOCIETY OF VERTEBRATE PALEONTOLOGY GUIDELINES

According to the Society of Vertebrate Paleontology (SVP) Conformable Impact Mitigation Guidelines (1995), a vertebrate fossil is considered sensitive unless otherwise demonstrated. Environmental statutes regard them in a like manner. This position is because of the relative rarity of vertebrate fossils. Vertebrate fossils are so uncommon that, in many cases, each recovered specimen will provide additional important information about the morphological variation or the geographic distribution of its species. The SVP recommendations (1995) also mention that some invertebrate or botanical fossils are considered sensitive paleontological resources.

A geologic unit is considered "sensitive" to adverse impacts if there is a high probability that grading, excavation, or other earth-moving will jeopardize significant fossil remains. Using criteria published by the SVP (1995), the paleontological importance or sensitivity (high, low, or undetermined) of each geologic unit exposed in a project site or surrounding area is the measure most amenable to assessing the sensitivity of paleontological resources because the areal distribution of each geologic unit can be delineated on a topographic or geologic map. The paleontological sensitivity of a stratigraphic unit reflects its potential paleontological

productivity and sensitivity as well as the scientific significance of the fossils it has produced. This method of paleontological resource assessment is the most appropriate because discrete levels of paleontological importance can be delineated on a geologic map.

The SVP (1995) established three categories of sensitivity for paleontological resources in its standard guidelines for assessment and mitigation of adverse impacts to paleontological resources. The three categories are low, high, and undetermined.

- Low sensitivity paleontological resources are categorized as geologic units that are not sedimentary or volcanic in origin. Likewise, geologic units made up of sedimentary rock that have been well examined and have not produced paleontological resources are considered to have low sensitivity.
- High sensitivity paleontological resources are categorized as geologic units older than Holocene (recent) for which vertebrate or significant invertebrate fossils or a significant suite of plant fossils have been recovered.
- Paleontological resources with undetermined sensitivity are categorized as geologic units made up of sedimentary rock for which little information is available.

Reasons for considering an individual fossil specimen scientifically important include:

- If it is well preserved,
- If it can be identified,
- If it is more complete than most specimens for that species,
- If it preserves one or more elements not known in most specimens of that species,
- If it is indicative of a particular time period,
- If it has not been recorded from that sedimentary unit,
- If it provides information concerning the environment in which it lived,
- If it could be the basis for description of a new species or comes from a site that produced the type (definitive) specimen of its species, or
- If it belongs to a species rarely encountered.

2.3 CALIFORNIA DEPARTMENT OF TRANSPORTATION GUIDELINES

Caltrans has established guidelines for the evaluation of paleontological resources in the Standard Environmental Reference (SER) Volume 1, Chapter 8. The approach involves identification of the presence, or potential for presence, of paleontological resources within the project area, evaluation of the significance of the resource, and assessment of project impacts and mitigation. The results of these steps can be documented in one or more of the following reports, as appropriate: 1) a Paleontological Identification Report (PIR), 2) a Paleontological Evaluation Report (PER), and if necessary, 3) a Paleontological Mitigation Plan (PMP). A PIR was prepared for this project as an initial screening assessment of the potential for the presence of, and impacts to, paleontological resources within the project area.

URS researched whether paleontological resources (fossils) and geologic formations known to contain fossils are in or adjacent to the project area. This research consisted of a review of geological literature and maps to identify fossils and fossiliferous geological formations that may occur in the project area. A field survey or museum archival review was not completed as part of this PIR.

Three main surficial geologic units underlay the project area. Approximately 70 percent of the project area is mapped by Helley et al. (1994) as Holocene Quaternary Alluvium, and 30 percent is mapped as Pleistocene Older Alluvium. In addition, Brabb and Dibblee (1974) and Helley et al. (1994) have identified limited outcrops of the Santa Clara Formation in the vicinity of SR 85/US 101 interchange in southern San Jose and elsewhere to the west and south of the SR 85 corridor (Figures 3.1 through 3.7). The lithology and paleontological sensitivity of each major unit and subunit are described below. Abbreviations for the major units and subunits correspond to those used in Figures 3.1 through 3.7.

3.1 QUATERNARY ALLUVIUM

Quaternary Alluvium deposits are recognized by Helley et al. (1994) as Holocene (recent – less than 10,000 years B.P.) and consist of unconsolidated and semi-consolidated, mostly nonmarine alluvium, lake, playa and terrace deposits. The Holocene units found along the project corridor are as follows:

- Floodplain Deposits (Qhfp)
- Estuary Deposits (Bay mud) (Qhbm)
- Salt Affected Floodbasin Deposits (Qhbs)
- Floodbasin Deposits (Qhb)
- Stream Channel Deposits (Qhsc)
- Natural Levee Deposits (Qhl)
- Alluvial Fan Deposits (Qhaf)

Recent sedimentary deposits are generally considered too young geologically to contain significant paleontological resources.

3.2 OLDER ALLUVIUM

Older Alluvium deposits are recognized as Pleistocene in age (Helley et al. 1994) and consist of older alluvium, lake, playa, and terrace deposits. The Pleistocene units found along the project area are as follows:

- Alluvial Fan Deposits (Qpaf)
- Younger Alluvial Fan Deposits (Qpaf1)

Fossils found in Pleistocene deposits may include bison, mammoths, rodents, birds, reptiles, amphibians, and plants (Bell et al. 2004; Helley et al., 1979; Savage 1951; Stirton 1951) and are considered paleontologically significant.

3.3 SANTA CLARA FORMATION

Santa Clara Formation deposits (QTsc) are recognized as Pliocene to Pleistocene in age and generally consist of claystone, siltstone, conglomerate, and tuff (Brabb and Dibblee 1974). Fossils found in the Santa Clara Formation may include birds, reptiles, fish, amphibians, plants, and terrestrial mammals representative of a range of North American land mammal ages (Bell et al. 2004; Helley et al., 1979; Savage 1951; Stirton 1951). These resources are considered paleontologically significant.

The results of the literature and map review with regard to project-related ground disturbance are described below.

4.1 PALEONTOLOGICAL SETTING

Sensitive paleontological resources may be encountered as a result of ground disturbance activities in portions of the project area that are underlain by Older Alluvium or the Santa Clara Formation. Although portions of the project area that are underlain by Quaternary Alluvium (Holocene) are not considered to be sensitive for paleontological resources, these recent sediments are likely underlain by Older Alluvium or the Santa Clara Formation, which are considered sensitive for such resources. The assessment of the specific depths of the Older Alluvium or the Santa Clara Formation underneath the Quaternary Alluvium (Holocene) is beyond the scope of this PIR, but depths likely range from a few feet to more than 20 feet in the study area. Thus, portions of the study area that are mapped as Quaternary Alluvium (Holocene) are also considered sensitive for paleontological resources until further assessment can be completed to determine the depths of the underlying Older Alluvium or the Santa Clara Formation.

4.2 PROJECT EXCAVATION PARAMETERS

The proposed project would be constructed entirely within the existing rights-of-way of SR 85 and US 101 in the limits shown in Figures 1 and 2. The project would include trenching and conduit installation at shallow depths (approximately 3 feet) in sediments that have been previously disturbed by the construction of SR 85 and US 101. Since these activities are in previously disturbed sediments, they are not expected to affect sensitive paleontological resources.

Overhead DMS and fixed-message signs would be mounted on cantilever structures supported on CIDH or driven piles of 3 to 6 feet in diameter that would extend 25 to 30 feet below ground surface. Overhead tolling equipment would be mounted on cantilever structures supported on CIDH or driven piles of 1 to 2.5 feet in diameter that would extend to approximately 10 feet below ground surface. This review indicates a potential for paleontological resources to be encountered during pile installation for these structures.

The pile installations for the proposed overhead sign and tolling structures have the potential to disturb the Older Alluvium and Santa Clara Formation, which are considered to have high paleontological sensitivity. Therefore, a Paleontological Evaluation Report (PER) may be prepared. A key component of the PER is to assess the number, locations, and drilling depths of the proposed structures. The locations of these structures have only been preliminarily identified and have not received conceptual approval from Caltrans and VTA.

Once the placement of the structures has received conceptual approval, a qualified paleontologist, as part of the PER, will compare the pile locations with available information on the paleontological sensitivity of the geologic units, the depth of pile installation and the geotechnical profile at each location based on the *Preliminary Geotechnical Report* (URS 2011) and other available information. If pile installation has the potential to encounter sediments of paleontological significance, and the pile(s) cannot be relocated to avoid the sensitive area(s), a Paleontological Mitigation Plan (PMP) could be recommended. The PMP will address the following, as appropriate: timing, type and location of monitoring, if needed; recordation standards for fossil locality, data recovery and analysis, and reporting; and instructions for accessioning the fossil material and technical report to a paleontological repository.

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Helley, E.J., R.W. Graymer, G.A. Phelps, P.K. Showalter, and C.M. Wentworth. 1994. Preliminary Quaternary Geologic Maps of Santa Clara Valley, Santa Clara, Alameda, and San Mateo Counties, California: A Digital Database. Geological Survey Open – File Report 94-231, scale 1:50,000.

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Stirton, R.A. 1951. “Prehistoric Land Animals of the San Francisco Bay Region.” California Division of Mines Bulletin. 154, pp. 177-186.

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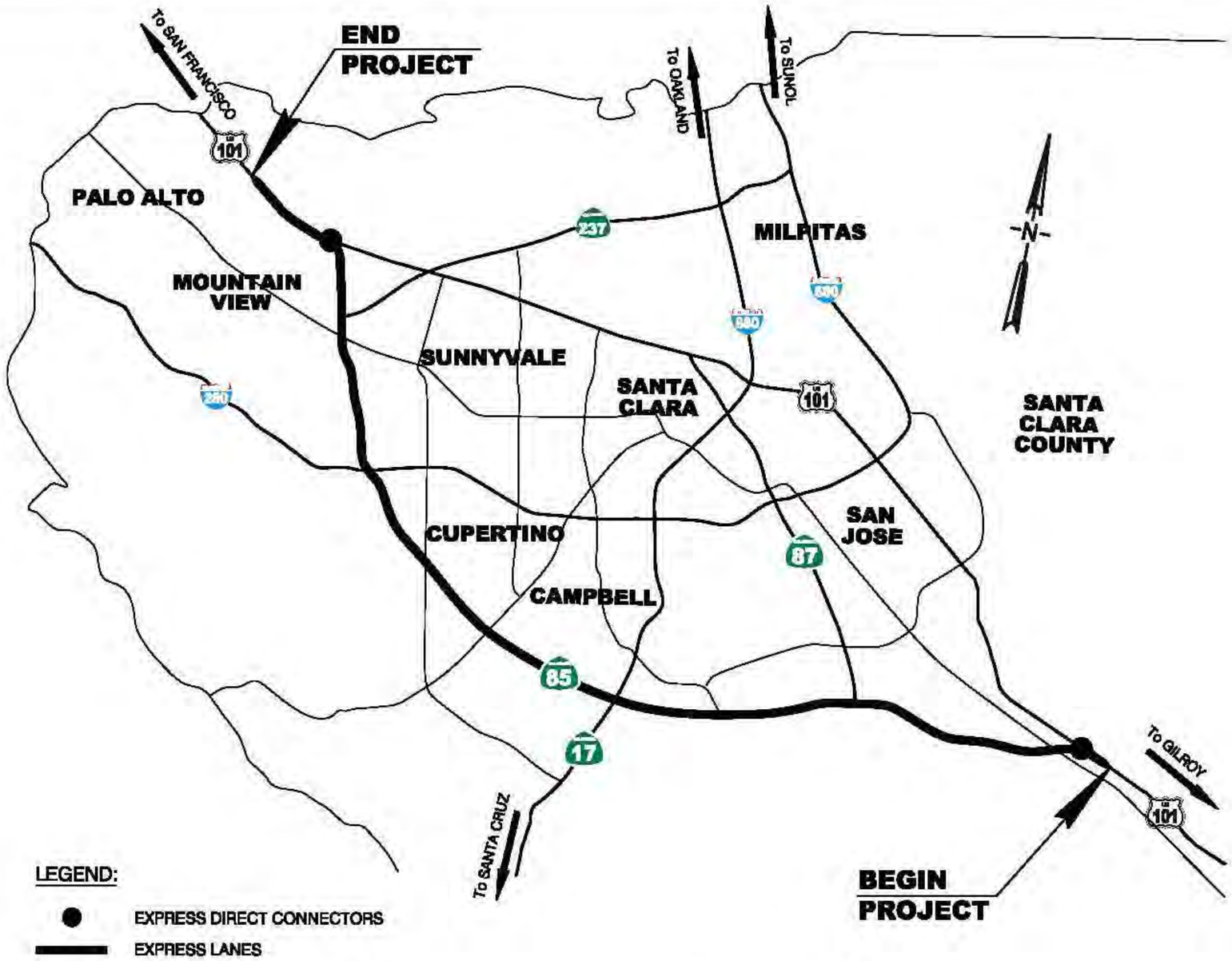
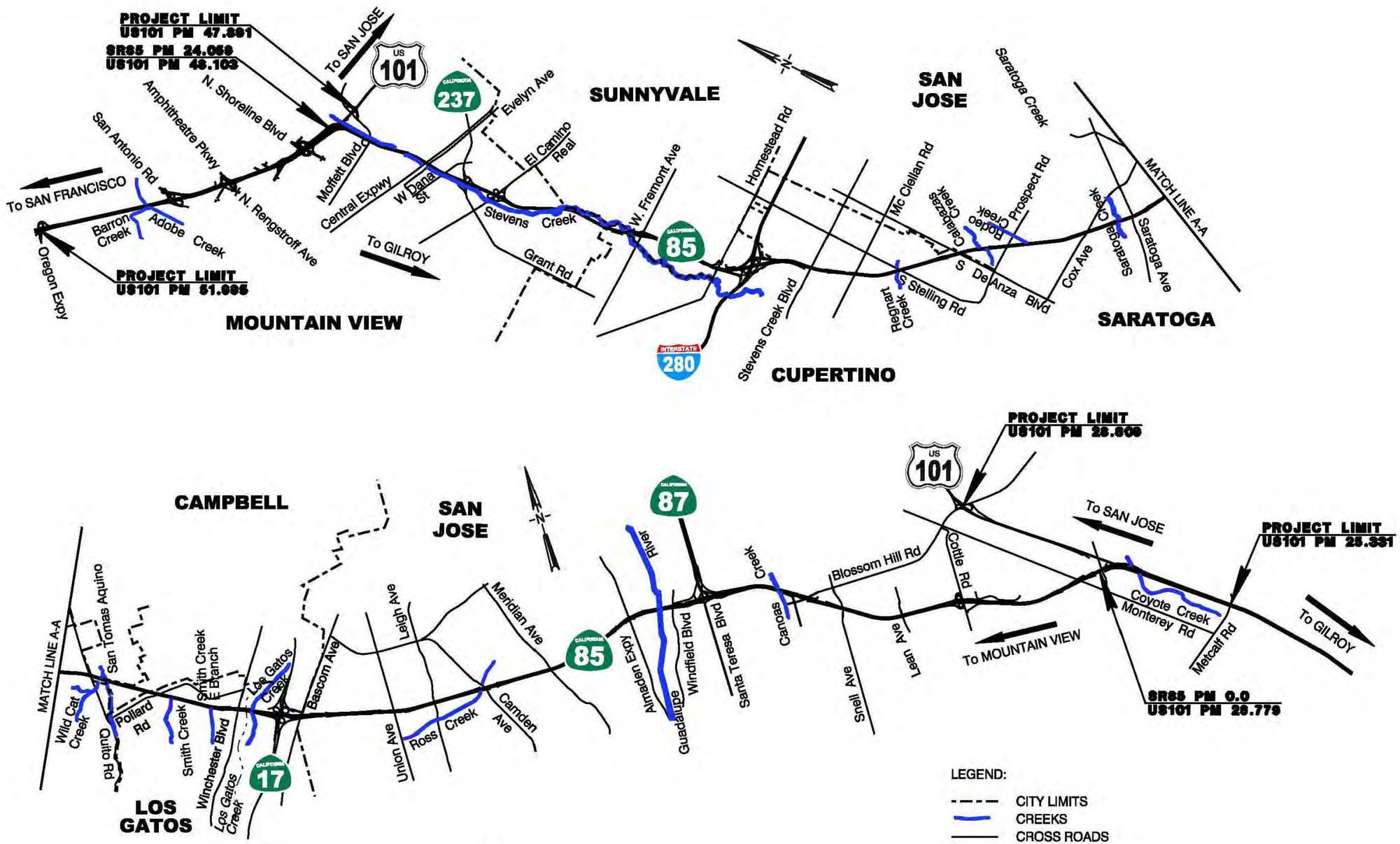
URS Corporation. 2011. Preliminary Geotechnical Report for the State Route 85 Express Lane Project. Prepared for the Santa Clara Valley Transportation Authority by URS Corporation, San Jose, California.

Figures



SR 85 EXPRESS LANES PROJECT
SANTA CLARA COUNTY, CA
EA 04-4A7900

FIGURE 1
PROJECT VICINITY MAP



SR 85 EXPRESS LANES PROJECT
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FIGURE 2
PROJECT LOCATION MAP

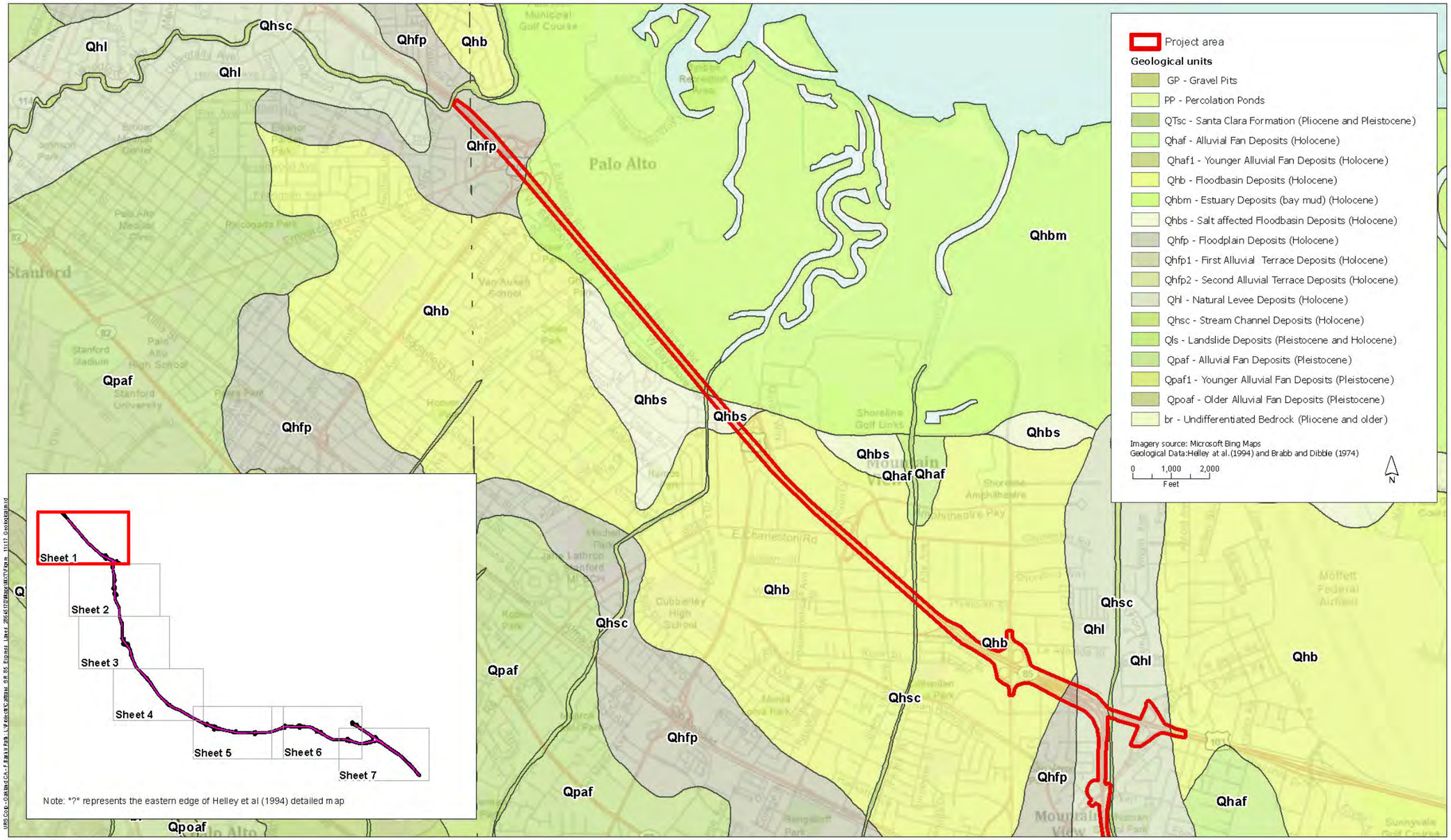

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Figure 3,1
Project Area Geological Map,Santa Clara County,California

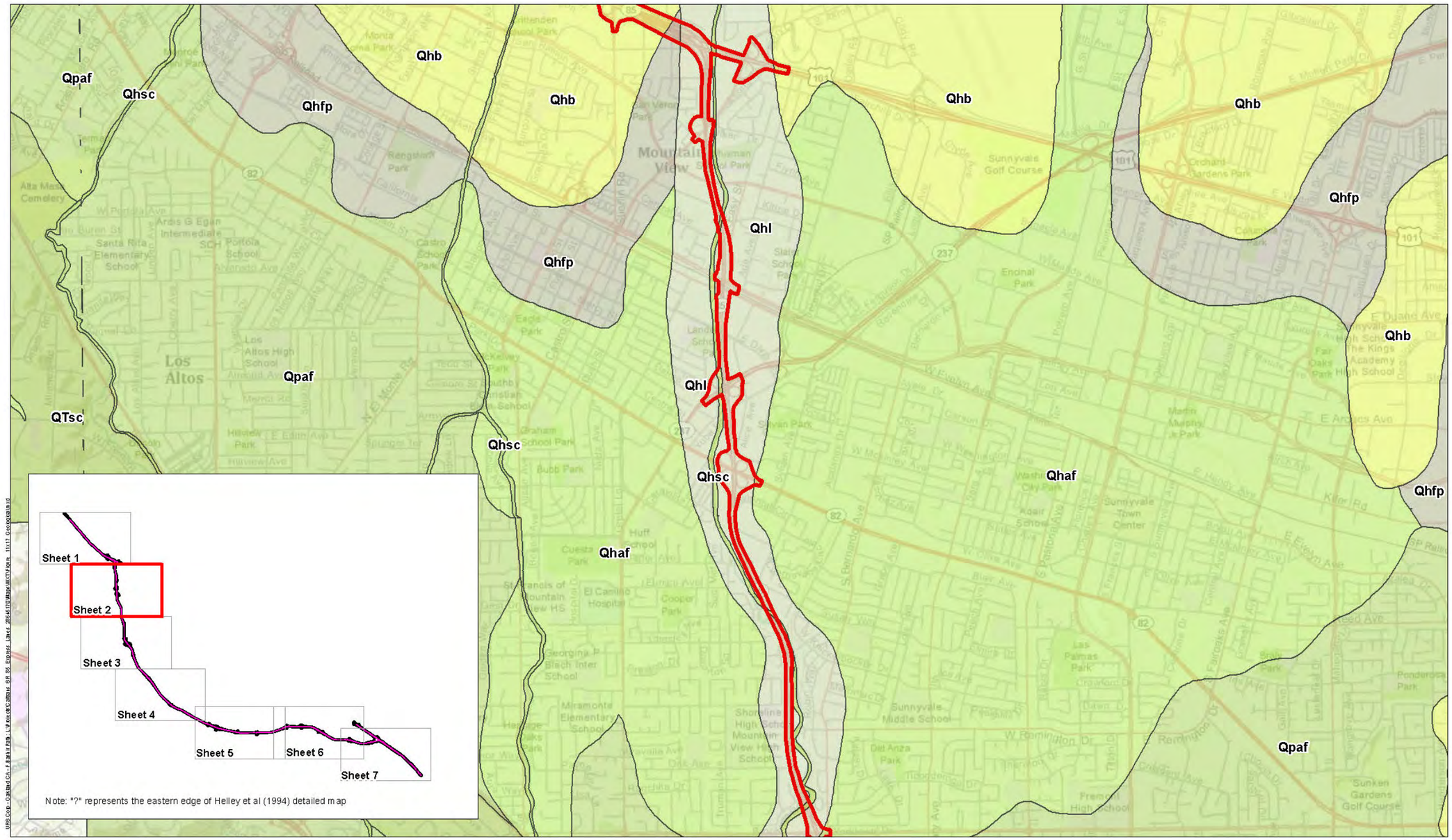

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Figure 3.2
Project Area Geological Map,Santa Clara County,California

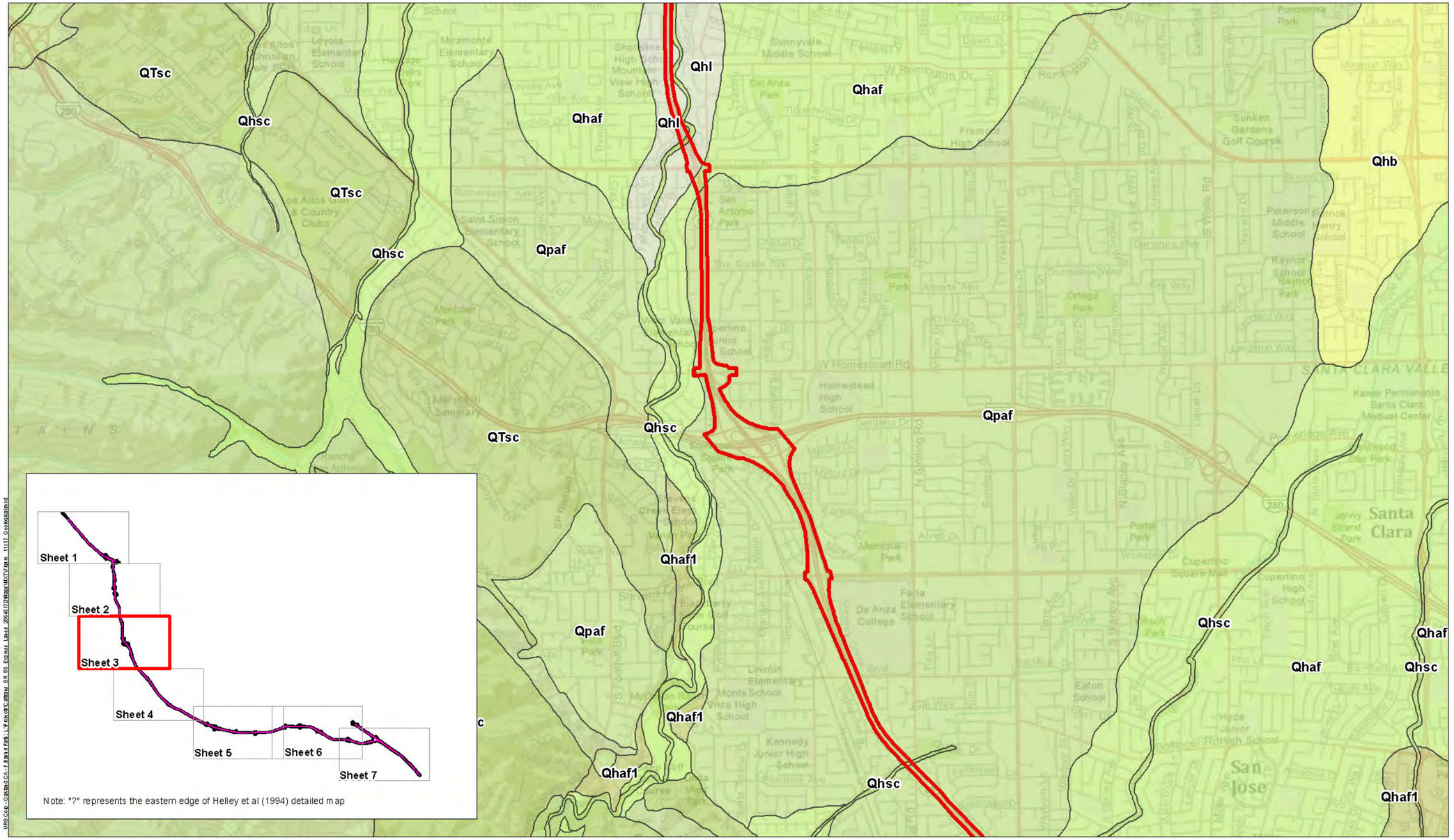

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Figure 3,3
Project Area Geological Map,Santa Clara County,California

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State Route 85 Express Lanes

Figure 3,4
Project Area Geological Map,Santa Clara County,California

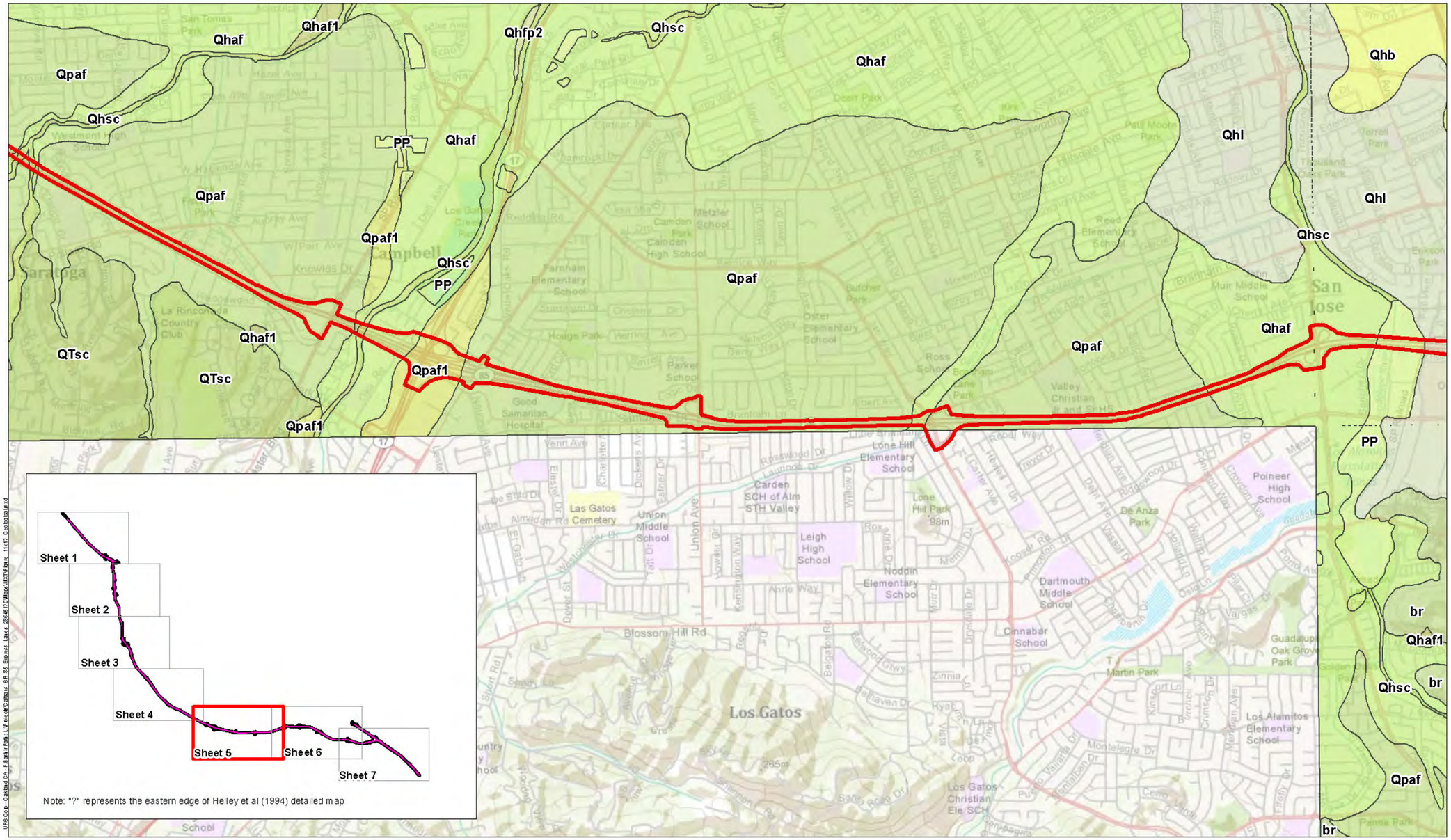

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Figure 3,5
Project Area Geological Map,Santa Clara County,California

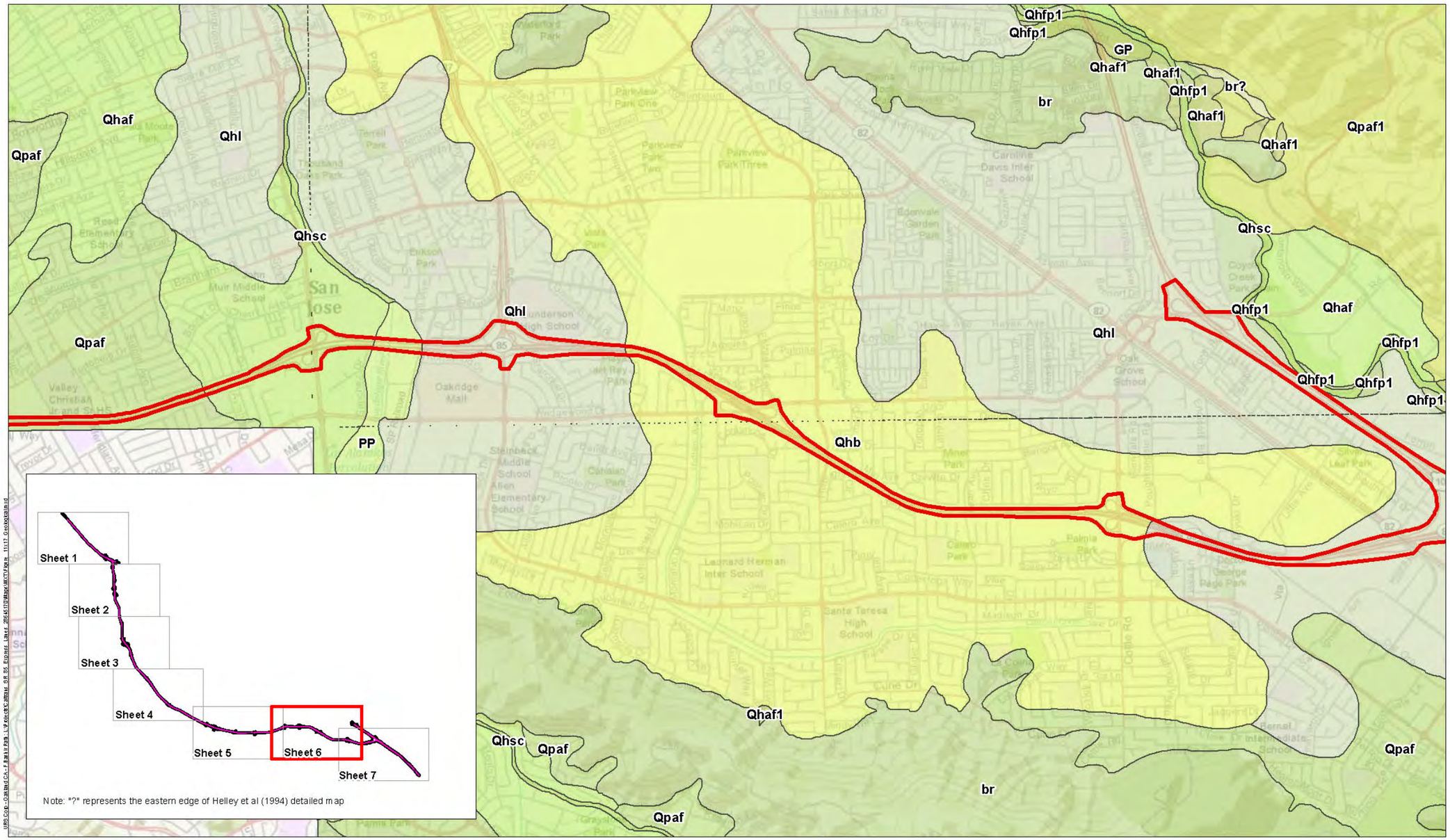

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Figure 3.6
Project Area Geological Map,Santa Clara County,California

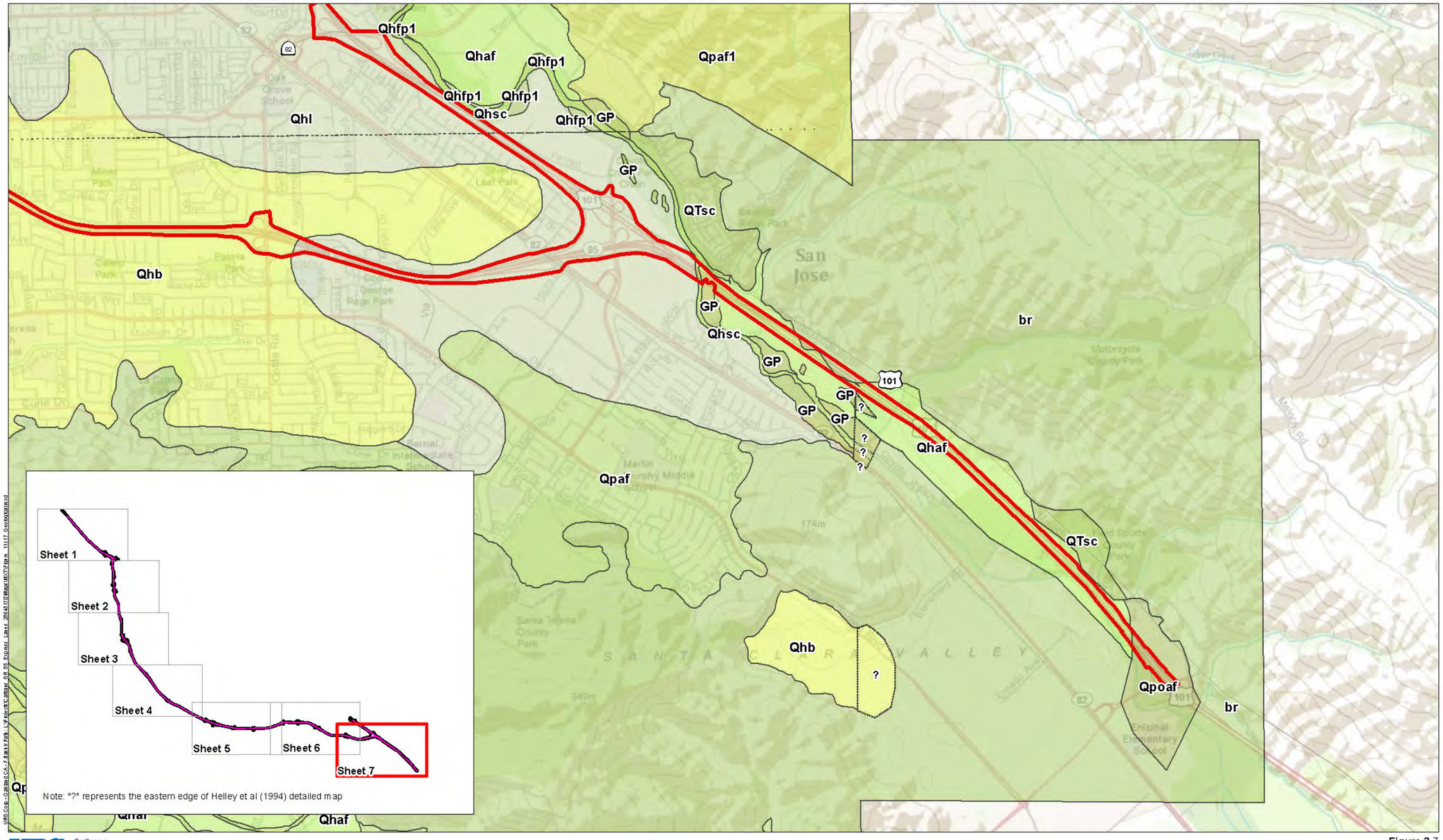

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Figure 3,7
Project Area Geological Map,Santa Clara County,California