SR 85 Express Lanes Project
Santa Clara County, California

Location Hydraulic Study Report

Prepared for:
Prepared by:

March 2013
SR 85 Express Lanes Project
Santa Clara County, California

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Submitted to:
Santa Clara Valley Transportation Authority and California Department of Transportation, District 4

This report has been prepared by or under the supervision of the following Registered Engineer. The Registered Civil Engineer attests to the technical information contained herein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

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March 2013
Executive Summary
State Route (SR) 85 is a 24.1-mile-long freeway through Santa Clara County that connects Mountain View to southern San Jose. SR 85 passes through Cupertino, Saratoga, Campbell, Los Gatos, Sunnyvale, Los Altos, Mountain View, and San Jose. The purpose of the SR 85 Express Lanes Project (project) is to utilize excess capacity in the SR 85 High-Occupancy Vehicle (HOV) lanes, manage traffic congestion in the most congested HOV segments of the freeway between SR 87 and Interstate 280 (I-280), and maintain consistency with provisions defined in Assembly Bill 2032 (2004) and Assembly Bill 574 (2007) to implement express lanes in the SR 85 corridor. The project proposes to convert the existing HOV lanes on northbound and southbound SR 85 into express lane facilities that 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 ft, pavement widening would be conducted in the median to accommodate the second express lane. In addition, an auxiliary lane would be added to a 1.1-mile segment of northbound SR 85 between South De Anza Boulevard and Stevens Creek Boulevard. The project would also install new signage, striping, vehicle detection sensor units, and dynamic message signs.

The purpose of this Location Hydraulic Study is to examine and analyze the existing floodplains within the project limits and to document any potential impacts to or encroachments upon these floodplains and any mitigation that may be required. As defined by the Federal Highway Administration (FHWA), a significant encroachment is a highway encroachment and any action to promote base floodplain development that would involve one or more of the following construction or flood related impacts: 1) a significant potential for the interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation route; 2) a significant risk; or 3) a significant adverse impact on the natural and beneficial floodplain values (FHWA, 1994).

The project encompasses 21 creek crossings, of which 13 are bridges and 8 are cross culverts. Within the project limits, 20 areas are within delineated floodplains defined by the Federal Emergency Management Agency (FEMA). Of these floodplains, seven are identified as flood hazard Zone AE, which represents the 1 percent annual chance of flooding to specified flood elevations. One floodplain is within flood hazard Zone AO, which represents the 1 percent annual chance flood with specified flood depths of 1 to 3 ft. The remaining 12 floodplains are identified as flood hazard Zone A, which represents the 1 percent annual chance flood with undetermined base flood elevations.

Of the 20 floodplains, 12 are not within areas of roadway widening or re-grading and would therefore not have impacts: a tidal floodplain at Matadero and Adobe creeks; the crossings of Permanente Creek, Stevens Creek (four locations), Permanente Diversion, Canoa Creek, and Coyote Creek; and three other floodplain areas along Coyote Creek. Of the remaining eight floodplains, three are at bridges that would not be widened as part of this project. These floodplains include the crossings of Calabazas Creek, Los Gatos
Creek and Guadalupe River. The Saratoga Creek and San Tomas Aquino Creek floodplains are at bridges that would be widened as part of this project. The remaining three floodplains exist at cross culverts where all widening would take place within the median. These culverts are at the crossings of Rodeo, Vasona, and Ross creeks. Rodeo and Ross creeks are known to be contained within the culvert at their respective crossings, while water surface elevations at the Vasona Creek crossing are not known. There would be minimal grading at areas of these culvert crossings.

Impervious areas would increase along SR 85 between I-280 and SR 87 as a result of median widening. The increase in roadway surface runoff, however, would be minimal in comparison to the overall watersheds for the creeks, with the average increase of approximately 0.01 percent. Thus, there would be insignificant increases in water surface elevations.

The project does not constitute a longitudinal encroachment of the base floodplain. Stevens Creek runs parallel to SR 85, and Coyote Creek runs parallel to US 101 within the project limits. No widening is proposed, however, within the vicinity of either of these creeks.

This project would not support probable incompatible floodplain development. The project is the widening and reconfiguration of an existing highway and would not create new access to developed or undeveloped land.

Various areas within the project limits have natural and beneficial floodplain values. These areas include waters of the U.S., potential wetlands, and varying types of riparian forest. None of the work is anticipated to take place in these areas, and the contractor would be required to protect them when work is conducted in adjacent areas.

The project would improve traffic conditions along SR 85 by creating express lanes and, in some locations, widening the median. Several areas within the project limits that are currently overtopped by the 1 percent annual chance flood are along US 101 at the northwest end of the project. These areas are outside of widening and grading areas and would not be significantly modified as a result of this project. There are also several locations along SR 85 where floodplains have been studied by FEMA and may overtop SR 85. The work for the proposed widening of the SR 85 bridges would occur along the banks and riparian corridors of Saratoga Creek and San Tomas Aquino Creek, and the project would not require in-water work. The small areas of potential wetland that exist apart from creek crossings are also outside of widening areas. The project does not constitute a significant floodplain encroachment as defined in 23 Code of Federal Regulations (CFR), Section 650.105(q).
Acronyms

BSA  Biological Study Area
FEMA  Federal Emergency Management Agency
FIRM  Flood Insurance Rate Map
FIS  Flood Insurance Study
HOT  High Occupancy Toll
HOV  High Occupancy Vehicle
LOMR  Letter of Map Revision
NAVD 88  North American Vertical Datum of 1988
NES  Natural Environment Study
PM  Post Mile
RCB  Reinforced Concrete Box
SCBWMI  Santa Clara Basin Watershed Management Initiative
SCVWD  Santa Clara Valley Water District
SOV  Single Occupant Vehicle
SR  State Route
US  United States Highway
VTA  Valley Transportation Authority
1 GENERAL DESCRIPTION

The California Department of Transportation (Caltrans), in cooperation with the Santa Clara Valley Transportation Authority (VTA), proposes to convert the existing High-Occupancy Vehicle (HOV) lanes on State Route (SR) 85 to High-Occupancy Toll (HOT) lanes (hereafter known as 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 (Figures 1 and 2). The express lanes would continue for 3.3 miles of a 5.5-mile segment on US 101 in southern San Jose. Express lane advance notification signage would also be added in a 4.1-mile segment of US 101 in Mountain View, for a total project length of 33.7 miles. 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.

The purpose of the SR 85 Express Lanes Project (project) is to utilize excess capacity in the SR 85 HOV lanes, manage traffic congestion in the most congested HOV segments of the freeway between SR 87 and Interstate 280 (I-280), and maintain consistency with provisions defined in Assembly Bill 2032 (2004) and Assembly Bill 574 (2007) to implement express lanes in the SR 85 corridor.

1.1 Project History

SR 85 is a 24.1-mile-long freeway that connects Mountain View to southern San Jose. SR 85 passes through Cupertino, Saratoga, Campbell, Los Gatos, Sunnyvale, Los Altos, Mountain View, and San Jose. SR 85 also intersects with SR 237, I-280, SR 17, and SR 87. SR 85 has three lanes in each direction, which consist of two mixed-flow lanes and one HOV lane.

The proposed project was originally conceived in 2003 as part of a VTA Adhoc Financial Stability Committee recommendation. In 2004 the California Legislature passed Assembly Bill 2032 authorizing the VTA, as part of a demonstration project to conduct, administer, and operate a value pricing and transit development program under which SOVs may use designated HOV lanes at certain times of the day for a fee. A Feasibility Study was completed in 2005. In 2007, Assembly Bill 574 was passed, removing the “demonstration” category from the law and allowing the VTA to implement a value pricing program within any two corridors in the Santa Clara County HOV system.

VTA began preliminary engineering and public outreach in 2007, and the VTA Board approved a Silicon Valley Express Lane Program in December 2008. Work on the development of SR 85 express lanes has been on-going since 2007. As part of the preliminary engineering work, over 19 express lanes access configurations were reviewed, public outreach was conducted, and a technical memorandum was prepared that was used as input for the approval of the Silicon Valley Express Lanes Program by VTA Board of Directors. Approval of the project’s project Study Report (PSR) advanced
work into the preliminary engineering and environmental approval phase. Net revenue generated from the use of the SR 85 express lanes would be used in the SR 85 corridor for highway improvements including transit service and operations.

1.2 Project Description
The project would convert existing HOV lanes to express lanes along SR 85 and a portion of US 101. Two alternatives are proposed: Build and No Build.

1.2.1 Build Alternative
The Build Alternative would convert the existing HOV lanes on northbound and southbound SR 85 into express lane facilities that 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. The project would include multiple intermediate access points between the express lanes and the adjacent mixed-flow lanes. The access points would consist of entrance and exit openings in a striped 2-foot-wide buffer zone where traffic can enter and exit the express lane facility. All work would be done in the existing right-of-way on both sides of the road and in the median. No work would be done in waterways in or adjacent to the project area.

In the section between SR 87 and I-280, where the median width is approximately 46 ft, 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, striping, vehicle detection sensor units, and dynamic message signs.

SR 85 bridge decks would be widened at Almaden Expressway (northbound side only), Camden Avenue, Oka Road, Pollard Road, and Saratoga Avenue, as well as at the San Tomas Aquino Creek and Saratoga Creek crossings. The existing gaps between the northbound and southbound bridges at these locations would be closed except at Almaden Expressway, where the northbound bridge would be widened on the inside (toward the median).

An auxiliary lane would be added to a 1.1-mile segment of northbound SR 85 between South De Anza Boulevard and Stevens Creek Boulevard. The existing pavement would be widened by up to 14 feet to the outside (northeast). To accommodate the auxiliary lane, the existing embankments at the abutments of the South Stelling Road and McClellan Road overcrossings adjacent to northbound SR 85 would be replaced with retaining walls. No culvert extensions, sound wall modifications, or additional right-of-way would be required.

1.2.2 No Build Alternative
The No Build Alternative assumes no modifications would be made to the current SR 85 corridor, including the continuous access HOV lane, other than routine maintenance and rehabilitation of the facility and any currently planned and programmed projects within the area.
Figure 1. Location Map

Source: United States Geological Survey
Figure 2. Vicinity Map and Waterway Crossings

Source: United States Geological Survey
1.3 **Geographical References**

Project maps were based on the following quadrangles from the United States Geological Survey: Mountain View, Cupertino, San Jose West, Los Gatos, San Jose East, and Santa Teresa Hills.

All elevations listed in the Flood Insurance Rate Maps (FIRMs) and the Flood Insurance Study (FIS) are based on the North American Vertical Datum of 1988 (NAVD 88). The project survey data is also based on NAVD 88, so no datum shift is necessary.

1.4 **Creek, Stream, and River Crossings**

Eighteen waterways cross SR 85 within the project limits, with Stevens Creek crossing the highway alignment 4 times for a total of 21 crossings (see Figure 2). Creek crossing drainage systems were located from FEMA maps, as-built record drawings, Caltrans Structure Maintenance Logs, aerial photographs and site visits by WRECO staff on August 3 and September 2, 2011. The sizes and types of these crossings are discussed in the following sections and listed in Table 1. All creeks that pass through the project limits are maintained by the Santa Clara Valley Water District (SCVWD).
1.4.1 Matadero Creek (US 101 PM 51.37)

Matadero Creek crosses US 101 approximately 3,200 ft southeast of the Oregon Expressway interchange. The creek originates in the Town of Los Altos Hills and the upper portion of Palo Alto, flowing northeast through unincorporated areas of Santa Clara County and the City of Palo Alto. According to the Watershed Stewardship Plan, the overall watershed area of Matadero Creek is approximately 14 sq mi, of which 13.6 sq mi are upstream of the US 101 crossing according to the FIS. Of the total watershed, 11 sq mi are within mountainous areas, and 3 sq mi are in gently sloping terrain. Within the City of Palo Alto, the watershed is almost fully urbanized. Overall, 76 percent of the watershed area is urbanized for residential, commercial, industrial, and institutional use. There is open space in the foothills, which covers approximately 24 percent of the watershed area. About 40 to 60 percent of the fully urbanized area near the project site is impervious. The impervious area is expected to increase in the future from probable developments (Tetra Tech, 2006).

Matadero Creek flows in a natural channel with steep slopes through the unincorporated areas of Santa Clara County. In the City of Palo Alto, Matadero Creek travels in a U-shaped concrete channel with relatively flat slopes. The creek is conveyed under US 101 in a concrete lined channel under a 81 ft long by 133 ft wide double span concrete bridge. At the downstream end of the project site, Matadero Creek discharges into the Palo Alto Flood Basin, which eventually outfalls to the San Francisco Bay. This area is a straightened, earthen bed channel with a channel longitudinal slope of less than 0.1 percent.

The existing median barrier of US 101 at the vicinity of the Matadero Creek crossing is a mixture of thrie-beam barrier and concrete barrier. The US 101 travel way and frontage road are separated by narrow open space and a chain-link fence. The existing US 101 barriers in the vicinity of Matadero Creek crossing do not obstruct the lateral movement of the storm runoff.

Photo 1. Matadero Creek entering bridge under US 101 (looking downstream)
1.4.2 Adobe Creek (US 101 PM 50.66)

Adobe Creek crosses US 101 between the Matadero Creek crossing (approximately 3,700 ft northwest of the creek crossing) and the San Antonio Road Interchange (approximately 1,800 ft southeast of the creek crossing). Adobe Creek has its confluence with Barron Creek at the upstream face of the US 101 crossing. Adobe Creek originates in the highlands of the unincorporated areas of Santa Clara County and Palo Alto Hills. The total watershed area of Adobe Creek is approximately 13.5 sq mi. Land use within the City of Palo Alto and City of Los Altos is fully urbanized. Open space is limited to the area in the foothills of the upstream watershed. Approximately 70 percent of the watershed area is urbanized and 30 percent is open space. Currently, the area surrounding the project site is 40 to 60 percent impervious, but future residential or commercial developments could increase impervious area (Tetra Tech, 2006).

Adobe Creek flows in a natural channel with moderate to steep slopes within the City of Los Altos and Town of Los Altos Hills. In the City of Palo Alto, Adobe Creek travels in a wide rectangular concrete channel with very flat slopes. Adobe Creek is conveyed under US 101 in a 65 ft long by 33 ft wide single span concrete bridge. The slope of the channel within the project area is less than 0.1 percent. At the downstream end of its US 101 crossing, Adobe Creek discharges to Charleston Slough, which eventually outfalls to the San Francisco Bay.

The existing median barrier of US 101 in the vicinity of the Adobe Creek crossing comprises three-beam barrier and concrete barrier. The US 101 travel way and the frontage road are separated by a narrow strip of open space and a chain-link fence. The US 101 Auxiliary Lanes project was required to maintain the three-beam barrier locations to allow the lateral movement to continue to cross the freeway.

Photo 2. Adobe Creek at bridge under US 101 (looking upstream)
1.4.3 Permanente Creek

Permanente Creek crosses US 101 between the North Rengstorff Avenue interchange (approximately 2,200 ft northwest of the creek crossing) and the Shoreline Boulevard interchange (approximately 3,100 ft southeast of the creek crossing). The creek originates in the Santa Cruz Mountains, travels 19 mi north to the San Francisco Bay, and passes through unincorporated areas of Santa Clara County as well as the City of Cupertino, Town of Los Altos Hills, City of Los Altos, and City of Mountain View. At the downstream end of the project site, Permanente Creek passes through a twin reinforced concrete box (RCB) culvert at Charleston Road and a bridge at Amphitheatre Parkway to discharge to Mountain View Slough; the creek eventually outfalls to the San Francisco Bay.

The watershed area of Permanente Creek is approximately 15.8 sq mi at the US 101 crossing. The cities of Mountain View and Los Altos are fully developed and cover approximately 55 percent of the watershed area. In addition to the urbanized area, approximately 8 percent of the area is used as non-urbanized development, such as a golf course and a mine. The remaining 37 percent is open space, predominantly located in the ridge foothills.

Permanente Creek crosses US 101 in a 216 ft long single 12 ft by 12 ft RCB culvert. Existing rectangular concrete lined channels upstream and downstream of the RCB culvert crossing have very flat slopes of 0.1 percent. The channel upstream of the US 101 cross culvert is a 12 ft wide by 9 ft deep concrete lined channel. There is a 3 ft drop immediately upstream of the US 101 cross culvert. The end of the transition from the concrete lined channel to the earthen channel takes place approximately 200 ft downstream from the cross culvert (Tetra Tech, 2006).

US 101 has a concrete median barrier in the vicinity of the Permanente Creek crossing. There is no frontage road of US 101 in the vicinity of the Permanente Creek crossing. A chain-link fence is used as a barrier between US 101 and the adjacent area in the vicinity of the US 101 crossing of Permanente Creek.

Photo 3. Permanente Creek at box culvert under US 101 (looking upstream)
1.4.4 Stevens Creek

Stevens Creek drains a 29 sq mile watershed originating in the low elevation Santa Cruz Mountains of the Santa Clara Valley. The creek originates at an elevation of 2,500 ft and flows southeast along the San Andreas Fault for approximately 5 mi, then bends northeast and flows for an additional 3 mi before reaching Stevens Creek Reservoir. From the reservoir, the creek flows 12.5 mi before terminating in the southern San Francisco Bay. Approximately 6.3 mi from Stevens Creek reservoir, peak flows of Permanente Creek (up to 1,400 cfs) are diverted into Stevens Creek via the Permanente Diversion, bringing the total watershed area for Stevens Creek to 38 sq mi (of which 36.4 sq mi are upstream of the US 101 crossing according to the FIS). Historic evidence suggests that Permanente Creek was originally a tributary of Stevens Creek. North of I-280, it runs generally parallel to SR 85. Stevens Creek crosses US 101 just east of the US 101/SR 85 interchange in a small stretch of concrete lined trapezoidal channel. North of US 101 it flows through a straightened earth channel and eventually outfalls into San Francisco Bay.

Approximately 34 percent of the watershed consists of urbanized portions of Cupertino, Sunnyvale and Mountain View. In addition to the urbanized area, approximately 2 percent of the area is used as non-urbanized development, such as agriculture, golf courses and mines. The remaining 64 percent is open space, located primarily in the Santa Cruz Mountains (Tetra Tech, 2006).

Stevens Creek crosses the project in four different locations: One crossing at US 101 once and three at SR 85. These crossings are documented below.

1.4.4.1 Stevens Creek (US 101 PM 48.04)

Stevens Creek crosses US 101 just east of the US 101/SR 85 interchange under a 50 foot long, 201 foot wide dual-span concrete bridge in a concrete lined trapezoidal channel. The Stevens Creek trail follows the western bank at this location.

Photo 4. Stevens Creek at bridge under US 101 (looking upstream)
1.4.4.2 Stevens Creek (SR 85 PM R22.95)
Stevens Creek crosses SR 85 0.3 mi north of the Central Expressway interchange under a 122 ft long, 151 ft wide triple-span bridge in a trapezoidal channel with an earthen bottom and concrete-lined side-slopes. At the upstream end of the bridge are v-shaped energy dissipaters. Downstream of the bridge and upstream of the energy dissipaters, Stevens Creek flows in a natural channel. The Stevens Creek trail follows the creek along the west bank.

Photo 5. Stevens Creek at bridge under SR 85 north of Central Expressway (looking upstream)

1.4.4.3 Stevens Creek (SR 85 PM R20.96)
Stevens Creek crosses SR 85 roughly halfway between the El Camino Real and Fremont Avenue interchanges under a 35 ft long, 125 ft wide single span bridge in a natural channel.

1.4.4.4 Stevens Creek (SR 85 PM R20.02)
Stevens Creek crosses SR 85 0.2 mi north of the Fremont Avenue interchange under a 121 ft long, 163 ft wide triple-span bridge in a natural channel.
1.4.5 Permanente Diversion

Permanente Diversion is an overflow channel for Permanente Creek that is re-routed toward Stevens Creek. Just upstream of the confluence with Stevens Creek, it crosses SR 85, approximately halfway between the El Camino Real and Fremont Avenue interchanges. It is conveyed through a 10 ft by 10 ft concrete box culvert. Upstream of the crossing, it flows through a concrete lined trapezoidal channel. Downstream of the crossing it enters the natural channel of Stevens Creek.

Photo 6. Permanente Diversion upstream of bridge under SR 85 (looking downstream)
1.4.6 Regnart Creek (SR 85 PM 16.65)

Regnart Creek crosses SR 85 adjacent to the Stelling Road undercrossing, 0.8 mi northwest of the De Anza Road interchange. The creek originates in the foothills of the Santa Cruz Mountains and flows to the northeast through the City of Cupertino. Except for its uppermost 2/3 mi, Regnart Creek is primarily contained in a concrete channel. In northeastern Cupertino, approximately 2 mi downstream of the SR 85 crossing, Regnart Creek outfalls into Calabazas Creek.

Upstream of the freeway crossing, the channel has a concrete-lined invert and steep side slopes of terraced rock mesh. At Festival Drive, just upstream of SR 85, Regnart Creek enters a 12 ft wide by 7 ft tall concrete box culvert. Downstream of the freeway, Regnart Creek remains in a box culvert as it passes under Stelling Road and Jollyman Park, eventually daylighting approximately 0.4 mi downstream.
1.4.7  Calabazas Creek (SR 85 PM R15.40)

Calabazas Creek crosses SR 85 approximately 0.3 mi southeast of the De Anza Boulevard interchange. The creek originates in the foothills of the Santa Cruz Mountains and flows 13.3 mi to the northeast through the Cities of Saratoga, Cupertino, Sunnyvale, San Jose and Santa Clara through sections of both natural and lined channel. Approximately 9 mi downstream of the site, Calabazas Creek outfalls into Guadalupe Slough and ultimately the San Francisco Bay.

The watershed of Calabazas Creek is approximately 4.4 sq mi at the SR 85 crossing. Overall, the Calabazas Creek watershed is 81 percent urbanized. In addition to the urbanized area, approximately 1 percent of the area is used as non-urbanized development, such as agriculture and golf courses. The remaining 18 percent is open space, predominantly located in the foothills of the Santa Cruz Mountains (Tetra Tech, 2006). Most of the open space is upstream of the SR 85 crossing, so this area is less developed than the watershed as a whole.

At SR 85, Calabazas Creek is conveyed under three separate dual-span concrete bridges, ranging from 149 ft to 156 ft in length and 26 ft to 70 ft in width. Both upstream and downstream of the bridge, the Calabazas Creek is conveyed in a natural channel, but under the bridge, the channel is lined with concrete tiles. Portions of this lining have been covered in up to 3 ft of sediment.
1.4.8 Rodeo Creek (SR 85 PM 15.06)

Rodeo Creek crosses SR 85 between the South De Anza interchange and the Saratoga Avenue interchange. The creek begins in western Saratoga and flows to the northeast through the cities of Saratoga and San Jose. Rodeo Creek has been realigned from its natural channel and consists of a combination of earth and concrete lined channels as well as sections of underground culvert.

Upstream of SR 85, Rodeo Creek is confined within a box culvert. The crossing of SR 85 consists of an 11 ft wide by 7 ft tall concrete box culvert. Downstream of SR 85 it consists of a trapezoidal channel with a concrete lined 8 ft bottom and steep side slopes of terraced rock mesh.

Photo 9. Rodeo Creek at downstream end of culvert under SR 85 (looking upstream)
1.4.9 Saratoga Creek (SR 85 PM R13.91)

Saratoga Creek crosses SR 85 just northwest of Saratoga Avenue. The creek begins in the Santa Cruz Mountains and flows to the northeast through unincorporated Santa Clara County as well as the cities of Saratoga, San Jose and Santa Clara. Much of the southern portion of the creek consists of natural channel, while downstream portions of the channel have been straightened and/or hardened.

The watershed of Saratoga Creek is approximately 11.1 sq mi at the SR 85 crossing. Overall, the Saratoga Creek watershed is 41 percent urbanized. The remaining 59 percent consists primarily of open space, but also includes small areas of vacant land and agriculture (Tetra Tech, 2006). Most of the open space is upstream of the SR 85 crossing, so this area is less developed than the watershed as a whole.

At the SR 85 crossing, Saratoga Creek is conveyed through a natural channel under four separate single-span concrete bridges, ranging from 97 ft to 102 ft in length and 28 ft to 59 ft in width. Under the bridge, the side slopes have been lined with rock slope protection.

Photo 10. Saratoga Creek under SR 85
1.4.10 Vasona Creek (SR 85 PM 12.72)

Vasona Creek crosses SR 85 roughly halfway between the Winchester Boulevard and Saratoga Road interchanges. The creek flows through portions of unincorporated Santa Clara County and the City of Saratoga, primarily in a natural channel. Approximately 0.2 mi upstream of the SR 85 crossing is the confluence with Wildcat Creek.

Vasona Creek flows within a natural channel both upstream and downstream of the crossing. It is conveyed under SR 85 through a double 12 ft by 12 ft concrete box culvert. Immediately downstream of the crossing is the confluence with San Tomas Aquino Creek.

Photo 11. Downstream end of Vasona Creek double box culvert under SR 85 (looking upstream)
1.4.11 San Tomas Aquino Creek (SR 85 PM R12.68)

San Tomas Aquino Creek crosses SR 85 roughly halfway between the Winchester Boulevard and Saratoga Road interchanges, just southeast of the Vasona Creek crossing. The creek originates in the foothills of the Santa Cruz Mountains and flows to the northeast through the cities of Saratoga, San Jose, Campbell and Santa Clara. Approximately 8 mi downstream of the SR 85 crossing, Saratoga Creek enters San Tomas Aquino Creek. San Tomas Aquino Creek flows downstream through Santa Clara to the Guadalupe Slough and finally into the southern San Francisco Bay. A majority of the stream channel from the Smith Creek confluence to US 101 has been hardened (lined with concrete) and/or realigned (SCVURPP).

Overall, the San Tomas Aquino Creek watershed is 85 percent urbanized. The remaining 15 percent consists primarily of open space, but also includes small areas of vacant land (Tetra Tech, 2006). Most of the open space is upstream of the SR 85 crossing, so this area is less developed than the watershed as a whole.

San Tomas Aquino Creek is conveyed under SR 85 under a pair of single-span 105 ft long by 59 ft wide concrete bridges. Under the bridge and downstream of the crossing, the channel has a gravel invert with 1:1 (H:V) side slopes lined with sacked concrete. Just downstream of the crossing is the confluence with Vasona Creek.

Photo 12. San Tomas Aquino Creek downstream of SR 85 bridge (looking upstream)
1.4.12  Smith Creek (SR 85 PM 11.82)
Smith Creek crosses SR 85 approximately 0.8 mi northwest of Winchester Boulevard. It flows through the cities of Monte Sereno and Cupertino as well as the Town of Los Gatos. Much of the channel has been engineered, and some portions of the creek consist of underground culverts.

The watershed area for Smith Creek is 0.8 sq mi at the SR 85 crossing. This area consists almost entirely of developed land, primarily the residential areas of Monte Sereno and Los Gatos, as well as the La Rinconada Country Club golf course.

Adjacent to SR 85 on the south side, Smith Creek is conveyed in a rectangular concrete channel as it passes under the railroad tracks. Under SR 85, Smith Creek is conveyed through a circular reinforced concrete pipe culvert. The size could not be confirmed, but the size of the pipe culvert appears to be approximately 60 inches. Downstream of the crossing, it remains underground in a concrete box culvert until it daylights at West Hacienda Avenue approximately 0.09 miles from the SR 85 crossing. Approximately 1.0 mi downstream of Hacienda Avenue, Smith Creek enters San Tomas Aquino Creek.
1.4.13   Los Gatos Creek (SR 85 PM R10.80)

Los Gatos Creek crosses SR 85 at the western end of the SR 17 interchange. The creek originates in the Santa Cruz Mountains at an elevation of up to 3,483 ft and follows SR 17 as it winds through the mountains. The lower portions of the creek pass through Los Gatos, Campbell and San Jose. Upstream of the crossing, it flows primarily in a natural channel, though downstream some portions have been straightened. Downstream of SR 85, it continues to parallel SR 17 until it outfalls into Guadalupe River in downtown San Jose.

The watershed area of Los Gatos Creek is approximately 44.1 sq mi at the SR 85 crossing. Overall, the Los Gatos Creek watershed is 26 percent urbanized. The remaining 74 percent consists primarily of open space, but also includes small areas of vacant land golf courses and mines (Tetra Tech, 2006). Most of the open space is upstream of the SR 85 crossing, so this area is less developed than the watershed as a whole. There are many water bodies in the Los Gatos Creek watershed including Lake Elsman, Lexington Reservoir and Vasona Reservoir, all of which are upstream of the SR 85 crossing.

At the SR 85 crossing, Los Gatos Creek flows through a natural channel alongside the paved Los Gatos Creek trail. It is conveyed under three separate dual-span bridges, all 178 ft long and ranging from 59 ft to 94 ft wide. Under the bridges the banks are lined with rock slope protection. Vasona Reservoir is located approximately 0.8 mi upstream of the SR 85 crossing of Los Gatos Creek.
1.4.14 Ross Creek (SR 85 PM 8.15)

Ross Creek crosses SR 85 at the western end of the Camden Avenue interchange. It flows to the northeast through eastern Los Gatos and portions of southern San Jose. With the exception of the farthest upstream portion, nearly the entire creek channel has been straightened. Approximately 2.2 mi downstream of the SR 85 crossing, Ross Creek enters Guadalupe River.

The watershed drains primarily urban areas of Los Gatos and San Jose. Some undeveloped areas exist in the southern portion of the watershed.

Upstream of the freeway, the creek is conveyed in an 8 ft wide trapezoidal channel with 1:1 (H:V) side slopes. It is conveyed under SR 85 through a double 10 ft wide by 12 ft tall box culvert. Downstream of the freeway, the culvert continues under Camden Avenue and outfalls into an 8 ft wide trapezoidal channel with 1:1 (H:V) side slopes. According to as-builts from Caltrans, a significant portion of Ross Creek surrounding SR 85 was lowered to accommodate SR 85 and the realigned Camden Avenue in the 1990s.

Photo 15. Ross Creek entering box culvert under SR 85 (looking downstream)
1.4.15 Guadalupe River (SR 85 PM 5.59)
Guadalupe River crosses SR 85 between the SR 87 interchange and the Almaden Expressway interchange. The river originates in the Santa Cruz Mountains and flows to the north through unincorporated Santa Clara County and the City of San Jose. Upstream of the SR 85 crossing, most of Guadalupe River flows in a natural channel.

The watershed area of Guadalupe River at the SR 85 crossing is approximately 53.2 sq mi. The watershed area consists of both urbanized portions of southern San Jose as well as undeveloped areas in unincorporated Santa Clara County. Upstream of the crossing, there are several reservoirs including Almaden Reservoir, Calero Reservoir, Guadalupe Reservoir, and Almaden Lake.

Under SR 85, Guadalupe River is conveyed in a straightened natural channel with moderate to heavy riparian vegetation directly adjacent to the channel under two separate 81 ft wide bridges that are approximately 1,600 ft long. These bridges also cross recharge ponds operated by SCVWD. The confluence of Guadalupe River and Canoas Creek is located approximately 2.7 mi downstream of the SR 85 crossing at Guadalupe River.

Photo 16. SR 85 bridge over Guadalupe River and SCVWD percolation ponds (looking downstream)
1.4.16 Canoas Creek (SR 85 PM 4.28)

Canoas Creek crosses SR 85 between the SR 87 interchange and the Blossom Hill Road interchange. The creek flows to the northwest through the City of San Jose in a straightened channel. Approximately 3.6 mi downstream of the crossing, Canoas Creek enters Guadalupe River.

At the SR 85 crossing, the watershed area of Canoas Creek is approximately 12.5 sq mi. The watershed area almost entirely consists of urbanized areas of southern San Jose, though it also drains the north-facing slopes of the Santa Teresa hills.

Canoas Creek is conveyed under a pair of 124 ft long, 81 ft wide concrete bridges in a concrete-lined trapezoidal concrete channel with a 10 ft bottom width and a 15 ft high side slopes at a 1:1 (H:V) slope lined with sacked concrete. The confluence of Guadalupe River and Canoas Creek is located approximately 3.9 mi downstream of the SR 85 crossing of Canoas Creek.
1.4.17  Coyote Creek (US 101 PM R26.47, R26.60)

Coyote Creek crosses US 101 and the northbound on-ramp from US 101 to SR 85 within the southern US 101/SR 85 interchange. The creek flows to the northeast through the cities of Morgan Hill and San Jose and portions of unincorporated Santa Clara County. While some of the stream channel in the upland areas is still natural, most areas in the valley floor have been partially reconstructed to optimize flood conveyance capacity. Approximately 17 mi downstream of the US 101 crossing, Coyote Creek outfalls into the San Francisco Bay.

The watershed area of Coyote Creek is approximately 229 sq mi at the SR 85 crossing. Overall, 27 percent of the Coyote Creek watershed is within the Urban Service Areas of either San Jose or Morgan Hill, while the remaining 73 percent is within unincorporated areas of Santa Clara County (SCVWD, 2002). Upstream of the US 101 crossing, there are several reservoirs, most notably Anderson Lake. There are also the Parkway Lakes, which are just upstream of the US 101 crossing.

Coyote Creek is conveyed under US 101 via four separate bridges (US 101 southbound lanes, Interchange for express lanes, US 101 northbound lanes, and connector from US 101 northbound to SR 85 northbound) ranging from 474 ft to 773 ft in length and from 47 to 95 ft in width. The creek is in a partially straightened gravel and earth channel with riparian vegetation surrounding, but not under, the bridges.
### Table 1. Drainage Facilities at Major Crossings

<table>
<thead>
<tr>
<th>Waterway</th>
<th>Route</th>
<th>Post Mile at Crossing</th>
<th>Drainage Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matadero Creek</td>
<td>US 101</td>
<td>51.37</td>
<td>81 ft long by 133 ft wide single span concrete bridge</td>
</tr>
<tr>
<td>Adobe Creek</td>
<td>US 101</td>
<td>50.66</td>
<td>65 ft long by 133 ft wide single span concrete bridge</td>
</tr>
<tr>
<td>Permanente Creek</td>
<td>US 101</td>
<td>-</td>
<td>12 ft by 12 ft reinforced concrete box culvert</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>US 101</td>
<td>48.04</td>
<td>50 ft long by 201 ft wide dual span concrete bridge</td>
</tr>
<tr>
<td></td>
<td>SR 85</td>
<td>R(1)22.95</td>
<td>122 ft long by 151 ft wide triple span concrete bridge</td>
</tr>
<tr>
<td></td>
<td>SR 85</td>
<td>R20.96</td>
<td>35 ft long by 125 ft wide single span concrete bridge</td>
</tr>
<tr>
<td></td>
<td>SR 85</td>
<td>R20.02</td>
<td>121 ft long by 163 ft wide triple span concrete bridge</td>
</tr>
<tr>
<td>Permanente Diversion</td>
<td>SR 85</td>
<td>-</td>
<td>10 ft by 10 ft reinforced concrete box culvert</td>
</tr>
<tr>
<td>Regnart Creek</td>
<td>SR 85</td>
<td>16.65</td>
<td>12 ft by 7 ft reinforced concrete box culvert</td>
</tr>
<tr>
<td>Calabazas Creek</td>
<td>SR 85</td>
<td>R15.40</td>
<td>156 ft long dual span concrete bridges</td>
</tr>
<tr>
<td>Rodeo Creek</td>
<td>SR 85</td>
<td>15.06</td>
<td>11 ft by 7 ft reinforced concrete box culvert</td>
</tr>
<tr>
<td>Saratoga Creek</td>
<td>SR 85</td>
<td>R13.91</td>
<td>100 ft long single span concrete bridge</td>
</tr>
<tr>
<td>Vasona Creek</td>
<td>SR 85</td>
<td>12.72</td>
<td>Double 12 ft by 12 ft reinforced concrete box culvert</td>
</tr>
<tr>
<td>San Tomas Aquino Creek</td>
<td>SR 85</td>
<td>R12.68</td>
<td>105 ft long single span concrete bridges</td>
</tr>
<tr>
<td>Smith Creek</td>
<td>SR 85</td>
<td>11.82</td>
<td>60” reinforced concrete pipe culvert</td>
</tr>
<tr>
<td>Smith Creek East Channel</td>
<td>SR 85</td>
<td>11.34</td>
<td>Unknown culvert size</td>
</tr>
<tr>
<td>Los Gatos Creek</td>
<td>SR 85</td>
<td>R10.80</td>
<td>178 ft long dual span concrete bridges</td>
</tr>
<tr>
<td>Ross Creek</td>
<td>SR 85</td>
<td>8.15</td>
<td>Double 10 ft by 12 ft reinforced concrete box culvert</td>
</tr>
<tr>
<td>Guadalupe River</td>
<td>SR 85</td>
<td>5.59</td>
<td>1,620 ft long 10-span concrete bridges</td>
</tr>
<tr>
<td>Canoas Creek</td>
<td>SR 85</td>
<td>4.28</td>
<td>124 ft long single span concrete bridges</td>
</tr>
<tr>
<td>Coyote Creek</td>
<td>US 101</td>
<td>R26.47, R26.60</td>
<td>475 ft long triple span concrete bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>474 ft long triple span concrete bridge</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>474 ft long triple span concrete bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>773 ft long four span concrete bridge</td>
</tr>
</tbody>
</table>

Note:
(1). “R” in post mile refers to realigned routes.
1.5 Bridge Numbers

Eight of the 21 creek crossings are cross culverts. The other 13 are bridges with assigned bridge numbers. Though Ross Creek is a culvert, it also has a bridge number. These bridges are listed below:

<table>
<thead>
<tr>
<th>Waterway</th>
<th>Route</th>
<th>Station</th>
<th>Post mile</th>
<th>Bridge Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matadero Creek</td>
<td>US 101</td>
<td>1947+30</td>
<td>51.37</td>
<td>37-0040</td>
</tr>
<tr>
<td>Adobe Creek</td>
<td>US 101</td>
<td>1909+80</td>
<td>50.66</td>
<td>37-0174</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>US 101</td>
<td>1771+50</td>
<td>48.04</td>
<td>37-0034</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>SR 85</td>
<td>1850+67</td>
<td>R22.95</td>
<td>37-0197</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>SR 85</td>
<td>1743+50</td>
<td>R20.96</td>
<td>37-0189</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>SR 85</td>
<td>1695+73</td>
<td>R20.02</td>
<td>37-0185</td>
</tr>
<tr>
<td>Calabazas Creek</td>
<td>SR 85</td>
<td>1459+50</td>
<td>R15.40</td>
<td>37-0527L, 37-0527R, 37-0527S</td>
</tr>
<tr>
<td>San Tomas Aquino Creek</td>
<td>SR 85</td>
<td>1305+50</td>
<td>R12.68</td>
<td>37-0524L, 37-0524R</td>
</tr>
<tr>
<td>Los Gatos Creek</td>
<td>SR 85</td>
<td>1210+25</td>
<td>R10.80</td>
<td>37-0491L, 37-0491R</td>
</tr>
<tr>
<td>Ross Creek</td>
<td>SR 85</td>
<td>1061+54</td>
<td>8.15</td>
<td>37-0469</td>
</tr>
<tr>
<td>Guadalupe River</td>
<td>SR 85</td>
<td>935+15</td>
<td>5.59</td>
<td>37-0467L, 37-0467R</td>
</tr>
<tr>
<td>Canoas Creek</td>
<td>SR 85</td>
<td>855+29</td>
<td>4.28</td>
<td>37-0412L, 37-0412R</td>
</tr>
</tbody>
</table>

1.6 Traffic

SR 85 and US 101 are major highways used by emergency supply or evacuation, emergency vehicle access, school buses and mail delivery. However, practical detour routes are available and can be made available during construction. Please see below for the summary of the assessment. The current and future traffic volumes for representative segments within each of the four major system interchanges in the project corridor (between US 101 at the southern project limit and SR 87, between SR 87 and I-880/SR-17, between I-880/SR-17 and I-280, and between I-280 and US 101 at the northern project limit) are summarized in Table 3.

- Emergency Supply or Evacuation Route: Yes
- Emergency Vehicle Access: Yes
- Practical Detour Route: Yes
- School Bus or Mail Route: Yes
Table 3. Traffic Volumes

<table>
<thead>
<tr>
<th>Route</th>
<th>Location</th>
<th>2009 Volume (AADT)</th>
<th>2015 No Build Volume (AADT)</th>
<th>2035 No Build Volume (AADT)</th>
<th>2015 Build Volume (AADT)</th>
<th>2035 Build Volume (AADT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 85</td>
<td>Blossom Hill to SR 87</td>
<td>141,000</td>
<td>148,900</td>
<td>184,900</td>
<td>153,400</td>
<td>187,300</td>
</tr>
<tr>
<td>SR 85</td>
<td>Union to Bascom</td>
<td>129,000</td>
<td>139,100</td>
<td>164,700</td>
<td>149,300</td>
<td>175,800</td>
</tr>
<tr>
<td>SR 85</td>
<td>Saratoga to Sunnyvale/DeAnza</td>
<td>100,000</td>
<td>113,400</td>
<td>138,900</td>
<td>122,200</td>
<td>150,800</td>
</tr>
<tr>
<td>SR 85</td>
<td>Fremont to El Camino</td>
<td>115,000</td>
<td>125,100</td>
<td>146,200</td>
<td>125,800</td>
<td>143,600</td>
</tr>
</tbody>
</table>

1.7 Traffic Interruptions for Base Flood (Q₁₀₀)

FEMA defines the base flood as the flood event having a one percent chance of being equaled or exceeded in any given year. This is often referred to as the “100-year flood” or the 1-percent annual chance flood. For the purposes of this report, such a flood is referred to as the 1-percent annual chance flood.

There are several areas of potential flooding along SR 85 within the project limits. Most of the cities of Mountain View and Saratoga are defined by FEMA as being within Flood Hazard Zone X, which typically represents shallow flooding of less than a foot. These areas include significant portions of SR 85 and may be a source of traffic interruption. There are also floodplains at several creek crossings for which information is not available to determine whether freeway traffic would be interrupted. These locations include San Tomas Creek, Vasona Creek, and two of the Stevens Creek crossings.

Portions of US 101 at the north end of the project fall within the 1-percent annual chance floodplain. Zone AE, a 100-year floodplain caused by high-tide, covers northbound and southbound US 101 from the Embarcadero Road Interchange to the Rengstorff Avenue Interchange. Traffic interruption may also occur at the following five interchanges as these streets would also be inundated during the 1-percent annual chance flood event: Embarcadero Road, Oregon Expressway, San Antonio Road, Rengstorff Avenue, and Old Middlefield Way.

Overall, the project does not have significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles. The project would maintain routes currently used by emergency vehicles and would improve traffic flow. There are also various streets running parallel to SR 85 that would be available for detour and
emergency vehicle use. There is generally no change in grade, and there would be no significant increase in interruptions caused by flooding issues due to the project.
2 HYDROLOGIC AND HYDRAULIC DATA

Within the project limits, 20 areas are within the delineated floodplains defined by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). The maps indicate there is an additional creek crossing (Smith Creek, discussed further below) that does not contain a defined floodplain at the project site but has a floodplain directly adjacent to the site. Of these floodplains, seven are identified as flood hazard zone designation Zone AE, which represents areas with a 1 percent annual chance of flooding, where base flood elevations have been determined in the Flood Insurance Study (FIS) by detailed methods of analysis. One floodplain is within Zone AO, which represents a 1 percent or greater chance of shallow flooding each year, with an average depth ranging from 1 ft to 3 ft. The remaining 12 floodplains are identified as Zone A, which represents areas with a 1 percent annual chance of flooding, where the floodplain has been analyzed by approximate methods and base flood elevations have not been determined.

There are also various areas that are delineated on the FIRMs as being within Zone X (shaded), which may represent the area between the 1-percent and 0.2-percent annual chance floodplains, areas protected from the 1-percent annual chance flood by levees, or shallow flooding with average depths of less than one foot. These areas do not support the typical beneficial uses associated with floodplains, nor do they require the purchase of flood insurance.

The FIS for Santa Clara County, CA and Incorporated Areas (2009) was used to obtain existing floodplain information within the project area to supplement the data provided by the FIRMs. The FIS provides hydrologic information and explains the methods of analysis used to generate the floodplains shown on the FIRMs. The FIS also includes profiles of the floodplain elevations. In the cases of Stevens Creek, Ross Creek and Guadalupe River, the FIS profiles include water surface elevations not shown on the FIRMs. These water surface elevations were used in the analysis and are documented below. Where neither the FIS nor the FIRM provided water surface elevations, HEC-RAS models provided by SCVWD were used to determine water surface elevations.

It should be noted that much of the information available in the FEMA studies was determined before the construction of SR 85. Therefore, much of the hydrologic information presented in the following sections reflects the nearest or most applicable data available.

An overview of the floodplain maps is shown in Figure 3, Figure 4, and Figure 5. FIRMs can be found in Appendix C.
Figure 3. Floodplain Map, Part 1

Source: FEMA, Google Earth
Figure 4. Floodplain Map, Part 2

Source: FEMA, Google Earth
Figure 5. Floodplain Map, Part 3

Source: FEMA, Google Earth
2.1 Matadero and Adobe Creeks

Northwest of the US 101/SR 85 interchange, Matadero and Adobe creeks each cross US 101 together generate large floodplains that cover much of US 101 and the surrounding areas within the project limits.

The floodplain that covers much of US 101 consists of Zone AE, which represents the 1-percent annual chance floodplain determined by detailed hydraulic analyses. According to the City of Palo Alto, this area is due to the potential overtopping of bayfront levees in the event of an extremely high tide, particularly one that might be associated with an extreme storm event (City of Palo Alto, Department of Public Works). A high tide event during a 1-percent annual chance flood event in the Project location is approximately 11 ft NAVD. Zone AE floodplain in the vicinity of US 101 bridges over Matadero and Adobe creeks represents areas with an elevation of less than 11 ft NAVD, which is subject to the tidal flooding. The floodplain covers northbound and southbound US 101 from the Embarcadero Road interchange to the North Rengstorff Avenue interchange.

As noted above, the water surface elevation throughout this area is approximately 11 ft NAVD. This elevation is higher than the existing US 101 in some locations through this stretch.

2.2 Permanente Creek

Permanente Creek crosses US 101 between the North Rengstorff Avenue and Old Middlefield Way interchanges. According to FIRM 06085C0037H, there is no floodplain directly at the US 101 crossing, but there are adjacent areas that do fall within the 1-percent annual chance floodplain. These areas are designated as being within Zone AO, which represents the floodplain caused by the shallow sheet overtopped flow from Permanente Creek during a 1-percent annual chance flood event. This overtopping is due to the insufficient capacity of the concrete lined channel upstream of US 101 (FEMA 2009). The Zone AO floodplain area, at the upstream side of the US 101 cross culvert, is approximately 150 acres. In the vicinity of the project site, floodplain areas adjacent to the US 101 southbound lanes are at the North Rengstorff Avenue interchange and the Old Middlefield Road interchange. A small portion of the North Rengstorff Avenue on-ramp to US 101 is shown as being within Zone AO with a 2 foot depth.

2.3 Stevens Creek

North of I-280, Stevens Creek runs parallel to SR 85, crossing it in several places as well as crossing US 101 near the northern limit of the project. According to FIRMs 06085C0037H, 06085C0039H, 06085C0202H and 06085C0206H, this stretch of the creek is within flood hazard zone designation Zone A, which designates a floodplain during a 1-percent annual chance flood event determined by approximate methods. In several locations, the FIRMs state that the 1 percent annual discharge is contained within the culvert, but they do not specify whether this applies to the entire segment of Stevens Creek within the project limits. The FEMA layers in Google Earth, however, confirm
that the entirety of Stevens Creek between US 101 and the Central Expressway is contained within the channel. With the exception of the locations where Stevens Creek crosses SR 85, there are no instances where the floodplain encroaches into the Department’s right-of-way.

Nearly the entire cities of Mountain View and Sunnyvale are defined as being within Zone X (shaded). Downstream of the US 101 crossing, the FIRM states that Zone X (shaded) areas are protected from the 1-percent annual-chance flood hazard by a levee system that has been provisionally accredited. In November 2010, FEMA issued a Letter of Map Revision (LOMR) confirming the accreditation of these levees, but notes that the overtopping of levees is possible. Throughout the remainder of the project limits, FEMA does not specify why the areas surrounding SR 85 are within Zone X.

South of I-280, a detailed study was performed on Stevens Creek and shows some areas of floodplain outside of the creek channel. These areas are over half of a mile outside of the project limits, but appear to contribute to additional areas of Zone X surrounding SR 85 south of I-280 within the City of Cupertino. FEMA does not specify why these areas are being listed within Zone X (shaded), but profiles in the FIS show the creek overtopping several bridges, most notably at Stevens Creek Boulevard.

2.3.1 Stevens Creek at US 101 (PM 48.04)
According to FIRM number 06085C0037H, a floodplain exists at the Stevens Creek crossing of US 101. This floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. The FIS lists the 1-percent annual chance peak discharge as 5,750 cfs and the drainage area as 36.4 sq mi at the US 101 crossing. Though the FIRM does not list water surface elevations, the profiles in the FIS show the 1-percent annual chance water surface elevation to be 35.9 ft NAVD upstream of the crossing and 35.7 ft NAVD just downstream of the crossing. The existing roadway elevation is approximately 40.0 ft NAVD, and is not inundated by the 1-percent annual chance flood. The FEMA layer in Google Earth also shows that the waterway is contained within the channel at this crossing.

2.3.2 Stevens Creek at PM 22.95
According to FIRM number 06085C0039H, a floodplain exists at the Stevens Creek crossing of SR 85 between Middlefield Road and Central Expressway (approximate station 1291+00). This floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. The closest available hydrologic data in the FIS is for the railroad crossing 0.3 mi upstream of the SR 85 crossing. At the railroad crossing, the FIS lists the 1-percent annual chance peak discharge as 5,350 cfs and the drainage area as 34.3 sq mi. Though the FIRM does not list water surface elevations, the profiles in the FIS show the 1-percent annual chance water surface elevation to be 64.6 ft NAVD upstream of the SR 85 crossing and 64.0 ft NAVD downstream of the crossing. The roadway elevation is at approximately 78.0 ft NAVD, and would not be inundated by the
1-percent annual chance flood. The FEMA layer in Google Earth also shows that the waterway is contained within the channel at this crossing.

2.3.3 Stevens Creek at PM 20.96
According to FIRM number 06085C0202H, a floodplain exists at the Stevens Creek crossing of SR 85 approximately 0.8 mi south of El Camino Real (approximate station 1397+00). This floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. Direct information from the FIS for this location is not available. This location, however, is 0.3 mi downstream of the confluence with Permanente Diversion and the FIS lists hydrologic values for both Permanente Diversion and Stevens Creek just upstream of the confluence. Adding the values together gives a 1-percent annual chance peak discharge of 7,390 cfs and a drainage area of 33.1 sq mi.

2.3.4 Stevens Creek at PM 20.02
According to FIRM number 06085C0206H, a floodplain exists at the Stevens Creek crossing of SR 85 just north of Fremont Avenue (approximate station 1446+50). This floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. Direct information from the FIS for this location is not available. This location, however, is 0.7 mi upstream of the confluence with Permanente Diversion. At the confluence, the FIS lists a 1-percent annual chance discharge of 6,000 cfs and a drainage area of 24.2 sq mi.

2.4 Permanente Diversion
According to FIRM number 06085C0202H, a floodplain exists at the Permanente Diversion crossing of SR 85. The FIRM identifies the floodplain as being in flood hazard Zone A and does not list a water surface elevation, but states that the 1 percent annual discharge is contained within the channel at this location. SCVWD provided HEC-RAS models that provide 1-percent annual chance water surface elevations at the crossing, listing it as 167.1 ft NAVD upstream of the crossing and 164.2 ft NAVD downstream of the crossing. Where Permanente Diversion enters Stevens Creek, adjacent to the SR 85 crossing, the FIS lists the 1-percent annual chance peak discharge as 1,390 cfs and the drainage area as 8.9 sq mi.

Nearly the entire cities of Mountain View and Sunnyvale are defined as being within flood hazard Zone X (shaded), which represents the area between the 1-percent annual chance and 0.2-percent annual chance floodplains, areas protected from the 1-percent annual chance flood by levees, or shallow flooding with average depths of less than one foot. Within the vicinity of Permanente Diversion, FEMA does not specify why the areas surrounding SR 85 are within Zone X (shaded).

2.5 Regnart Creek
FIRM number 06085C0216H shows a floodplain at the Regnart Creek crossing of SR 85. In September 2010, however, FEMA issued Letter of Map Revision (LOMR) number 10-09-2408P-060339, which shows the 1-percent annual chance flood as being contained
within the culvert under SR 85. There is thus no applicable floodplain for Regnart Creek. The FIS does not include hydrologic parameters for Regnart Creek.

### 2.6 Calabazas Creek

According to FIRM number 06085C0217H, a floodplain exists at the Calabazas Creek crossing of SR 85. This floodplain is identified as being in flood hazard Zone AE. The water surface elevation is 284.1 ft NAVD upstream of the crossing and 280.2 ft NAVD downstream of the crossing. The roadway elevation is at approximately 296.5 ft NAVD and is not inundated by the 1-percent annual chance flood.

The FIS lists hydrologic data for both 0.3 mi upstream (at Prospect Road) and 0.3 mi downstream (at Rainbow Drive). The data from just above Prospect Road were used, which list the 1-percent annual chance peak discharge as 1,800 cfs and a drainage area of 4.4 sq mi.

The FIRM does not show any Zone X (shaded) areas adjacent to the Calabazas Creek crossing of SR 85 in the City of San Jose. Nearly all of the City of Saratoga, however, southeast of the Calabazas Creek crossing, is listed as being in Zone X (shaded), which represents the area between the 1-percent annual chance and 0.2 percent annual chance floodplains, areas protected from the 1-percent annual chance flood by levees, or shallow flooding with average depths of less than 1 foot. The FIS does not specify which condition applies in particular areas of Saratoga, but does acknowledge that at a minimum some portions of Saratoga contain areas where the 1-percent annual chance flood produced depths of greater than 1 foot and were subsequently designated as Zone X (shaded). The FIS also indicates that there is overtopping of Calabazas Creek at the railroad tracks approximately 0.7 mi upstream of SR 85. Likewise, it was noted that some overflow areas are adjacent to SR 85 and will enter the freeway depressed section.

According to the watershed characteristic report prepared by Santa Clara Basin Watershed Management Initiative (SCBWMI, 2000), Calabazas Creek has a history of chronic flooding. On December 22, 1955, over 160 homes were flooded to a depth of up to 3 ft in Sunnyvale alone. More recent flooding has occurred in 1978, 1980, 1983, 1986, 1995, and 1998. The 1998 storms resulted in the overtopping of the following bridges: Southern Pacific Railroad, Saratoga-Sunnyvale Road, Bollinger Road, Miller Avenue, Tantau Avenue, Pruneridge Avenue and Monroe Street.

### 2.7 Rodeo Creek

According to FIRM number 06085C0217H, a floodplain exists at the Rodeo Creek crossing of SR 85. This floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. SCVWD, however, provided the project team with a HEC-RAS model of Rodeo Creek. This model begins at the downstream end of the creek, and lists the water surface elevation as 280.8 ft NAVD. The roadway elevation is at approximately 288.0 ft NAVD and is not inundated by the 1-percent annual chance
flood. The SCVWD HEC-RAS models also provide a 1-percent annual chance flow of 300 cfs.

The Rodeo Creek crossing is within the limits of the City of Saratoga, which is almost entirely within flood hazard Zone X (shaded). According to the FIS, the 1-percent annual chance flood will subject nearly the entire City of Saratoga to shallow flooding due to the limited capacity of its storm drain system.

2.8 Saratoga Creek

According to FIRM number 06085C0219H, a floodplain exists at the Saratoga Creek crossing of SR 85. At the crossing itself, the floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. Just upstream of the project site, however, is listed as Zone AE with a 1-percent annual chance water surface elevation of 315 ft NAVD. The roadway elevation at Saratoga Creek is approximately 319.5 ft NAVD, and is not inundated by the 1-percent annual chance flood. The FIS lists the 1-percent annual chance peak discharge as 3,950 cfs and the drainage area as 11.1 sq mi at the railroad tracks just upstream of the SR 85 crossing.

The Saratoga Creek crossing is within the limits of the City of Saratoga, which is almost entirely within flood hazard Zone X (shaded). According to the FIS, the 1 percent annual chance flood will subject nearly the entire City of Saratoga to shallow flooding due to the limited capacity of its storm drain system.

The earliest flood of record on Saratoga Creek occurred in 1861. Other floods occurred in 1892, 1910, 1940, 1943, 1955 and 1958. The highest ever recorded flow on Saratoga Creek occurred in 1955, when flows reached 2,730 cfs (SCBWMI, 2000). According to the FIS, this is estimated to have been a 40 to 50-year event, and it washed out numerous private bridges. The storms of 1958 caused similar levels of damage.

2.9 Vasona Creek

According to FIRM number 06085C0238H, a floodplain exists at the Vasona Creek crossing of SR 85. This floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. The floodplain shown on the FIRM suggests that Vasona Creek is contained within its banks, but information is not available to confirm this assumption. This report therefore considers the possibility that Vasona Creek overtops SR 85 at this location.

2.10 San Tomas Aquino Creek

According to FIRM number 06085C0238H, a floodplain exists at the San Tomas Aquino Creek crossing of SR 85. This floodplain is identified as being in flood hazard Zone A, and does not list a water surface elevation. The floodplain shown on the FIRM suggests that San Tomas Aquino Creek is contained within its banks, but information is not available to confirm this assumption. This report therefore considers the possibility that San Tomas Aquino Creek overtops SR 85 at this location. Portions of San Tomas
Aquino Creek received a detailed study in the FIS, but this portion of the creek did not. The nearest available data are from near Old Adobe and Quito roads, approximately 0.7 mi upstream of the project. At this location, the 1-percent annual chance peak discharge is given as 1,350 cfs and the drainage area is given as 3.1 sq mi.

In 1931, San Tomas Aquino Creek overtopped Latimer Avenue in Los Gatos. In 1998, it overbanked downstream of SR 237.

2.11 Smith Creek
According to FIRM number 06085C0238H, a floodplain exists just upstream of the Smith Creek crossing of SR 85. Just upstream of the project site, the floodplain is listed as Zone AE with a 1-percent annual chance water surface elevation of 251 ft NAVD. The roadway elevation at this crossing is approximately 255.5 ft NAVD, and is not inundated by the 1-percent annual chance flood. The FIS lists the 1-percent annual chance peak discharge at the railroad tracks just upstream of SR 85 as 440 cfs and the drainage area as 0.8 sq mi.

Within the vicinity of Smith Creek, portions of SR 85 are within Zone X (shaded), which represents the area between the 1-percent annual chance and 0.2-percent annual chance floodplains, areas protected from the 1-percent annual chance flood by levees, or shallow flooding with average depths of less than 1 foot. Neither the FIRM nor the FIS state which condition is true within the vicinity of SR 85 at the Smith Creek crossing, but the FIS states that some areas of Los Gatos are subject to shallow overland flow of less than 3 ft deep.

2.12 Los Gatos Creek
According to FIRM number 06085C0239H, a floodplain exists at the Los Gatos Creek crossing of SR 85. This floodplain is identified as being in flood hazard Zone AE. The water surface elevation is 263.6 ft NAVD upstream of the crossing and 263.1 ft NAVD downstream of the crossing. The roadway elevation at the crossing is approximately 269.5 ft NAVD and is not inundated by the 1-percent annual chance flood. The closest available hydrologic data in the FIS come from 0.8 mi upstream, below Vasona Dam. Below Vasona Dam, the FIS lists the 1-percent annual chance peak discharge as 6,950 cfs and the drainage area as 44.1 sq mi.

Within the vicinity of Los Gatos Creek, portions of SR 85 are within Zone X (shaded), which represents the area between the 1-percent annual chance and 500-year floodplains, areas protected from the 1-percent annual chance flood by levees, or shallow flooding with average depths of less than 1 foot. Neither the FIRM nor the FIS state which condition is true within the vicinity of SR 85 at the Los Gatos Creek crossing, but the FIS states that some areas in the Town of Los Gatos are subject to shallow overland flow of less than 3 ft deep.
Floods on Los Gatos Creek in 1952 damaged the Main Street bridge and caused the Chemeketa Park bridge to collapse. Vasona Park flooded in 1962.

### 2.13 Ross Creek

According to FIRM number 06085C0243H, a floodplain exists at the Ross Creek crossing of SR 85. This floodplain is identified as being in flood hazard Zone A, and the FIRM does not list a water surface elevation. Where Ross Creek crosses SR 85 is just upstream of the upper limit of a profile in the FIS. The FIS shows the water surface elevation as 213.5 ft NAVD at the intersection of Branham Lane and Camden Avenue, which is adjacent to SR 85. The FIS lists no hydrologic information for Ross Creek. In July 2010, FEMA issued LOMR number 10-09-2973P-060349, which shows the 1-percent annual chance flood as being contained within the channel from downstream of Camden Avenue to the confluence with Guadalupe River. The LOMR does not document any changes to the SR 85 crossing, however.

As-builts of the construction of the SR 85/Camden Avenue interchange show the realignment and profile of Ross Creek, constructed in 1992. This project shows Ross Creek being lowered by approximately 7 ft at the SR 85 crossing. They also show that the 1-percent annual chance water surface elevation is contained within the box culvert, with a water surface elevation of approximately 199 ft NAVD at the downstream end of SR 85 and approximately 204 ft NAVD as it enters the box culvert. SCVWD HEC-RAS models confirm that the water surface elevations are significantly lower than those listed by FEMA, showing elevations of approximately 203 ft NAVD upstream of the crossing and 202 ft NAVD downstream of the crossing. The remainder of this report assumes that the SCVWD HEC-RAS data are the most current and accurate.

The roadway elevation at this crossing is approximately 224.5 ft NAVD, and will not be inundated by the 1-percent annual chance flood.

### 2.14 Guadalupe River

According to FIRM number 06085C0263H, a floodplain exists at the Guadalupe River crossing of SR 85. This floodplain includes the surrounding percolation ponds operated by SCVWD and is identified as being in flood hazard Zone A; a water surface elevation is not listed. The closest available hydrologic data in the FIS come from Blossom Hill Road, 0.4 mi upstream of the SR 85 crossing. At the Blossom Hill Road crossing of Guadalupe River, the FIS lists the 1-percent annual chance peak discharge as 11,500 cfs and the drainage area as 53.2 sq mi. Though the FIRM does not list water surface elevations, the FIS profile show the 1-percent annual chance water surface elevation as 178.9 ft NAVD upstream of the SR 85 crossing and 178.5 ft NAVD downstream of the crossing. The roadway elevation is approximately 217 ft NAVD at the crossing and is not inundated by the 1-percent annual chance flood.

The written history of flooding in the Guadalupe River area dates to the founding of Mission Santa Clara and Pueblo San Jose de Guadalupe in 1777. Accounts of flooding
were recorded in 1779, 1862, 1867, 1869, and 1911. The storm of December 1955 caused widespread flooding throughout the Basin, the Guadalupe River alone inundating some 5,200 acres. Flooding would have been even more severe if the upstream storage reservoirs had not been nearly empty prior to the storm. Major flooding also occurred in April 1958, when flood waters covered portions of downtown San Jose to a depth of up to 4 ft. In recent years, the Guadalupe River has flooded San Jose communities during the winters of 1980, 1982, 1983, and 1995 (SCBWMI, 2000).

2.15 Canoas Creek

According to FIRM number 06085C0264H, a floodplain exists at the Canoas Creek crossing of SR 85. This floodplain is identified as being in flood hazard Zone A, and the FIRM does not list a water surface elevation. SCVWD, however, provided the project team with a HEC-RAS model of Canoas Creek, which shows the water surface elevation to be 159.1 ft NAVD at both the upstream and downstream ends of the crossing. The roadway elevation at Canoas Creek is approximately 180.5 ft NAVD, and is not inundated by the 1-percent annual chance flood. The closest available hydrologic data in the FIS come from the crossing at Blossom Hill Road 0.2 mi upstream of the SR 85 crossing. At the Blossom Hill Road crossing, the FIS lists the 1-percent annual chance peak discharge as 1,400 cfs and the drainage area as 12.5 sq mi.

2.16 Coyote Creek

According to FIRM number 06085C0407H, a floodplain exists at the Coyote Creek crossing of US 101 and the northbound on-ramp to SR 85. This floodplain is identified as being in flood hazard Zone AE. The FIRM lists the 1-percent annual chance water surface elevations as 228.0 ft NAVD upstream of the US 101 crossing and 226.2 ft NAVD downstream of the US 101 crossing. The FIRM shows the roadway is inundated by a 100-year flood. However, per the survey information, the roadway elevation at the crossing is approximately 241.5 ft NAVD, which is above the 100-year water surface elevation shown on the FIRM.

The FIS does not list hydrologic information at this exact location. Downstream of the site, the closest available hydrologic data in the FIS come from the USGS survey gage near Edenvale, approximately 3.4 mi downstream of the project. Upstream of the site, the closest available hydrologic data come from upstream of the confluence with Fischer Creek, approximately 1.6 mi upstream of the project site. The Fischer Creek data, however, are upstream of the Parkway Lakes. Due to the hydrologic effect these lakes may have on Coyote Creek, the Edenvale location was considered more accurate and is used in this report. At the Edenvale survey gage, the FIS lists the 1-percent annual chance peak discharge as 13,760 cfs and the drainage area as 229.0 sq mi.

Approximately 1.2 mi northwest of the US 101/SR 85 interchange, FIRM number 06085C0268H shows the floodplain of Coyote Creek encroaching onto US 101. The FIRM lists the floodplain over US 101 as Zone AO floodplain, which represents the floodplain caused by the shallow sheet overtopped flow from Coyote Creek during a 1-
percent annual chance flood event. The FIRM lists the floodplain elevation adjacent to the Zone AO floodplain as 210 ft NAVD (see Figure 6). The current topography shows the highway elevation to be approximately 210 ft NAVD, which is equivalent to the 100-year floodplain elevation.

Figure 6. FIRM Overlay, Coyote Creek Floodplain along US 101, Location 1
Source: FEMA and Google Earth

Approximately 0.5 mi southeast of the US 101/SR 85 interchange, FIRM number 06085C0407H shows the floodplain of Coyote Creek encroaching onto US 101. The FIRM lists the floodplain elevation as approximately 235 ft NAVD in this location (see Figure 7). The current topography, however, shows the highway elevation to be approximately 245 ft NAVD, well above the floodplain. USGS Topo maps from 1980, however, show that US 101 used to be the roadway that is currently Monterey Road, on the west side of Coyote Creek. In addition, Coyote Creek flood profile from the FEMA FIS does not show the US 101 bridge over Coyote Creek at the US 101/SR 85 interchange. This is most likely because the FIS was completed in 1979 and has not been updated to reflect the effect of the US 101 roadway project (Contract No. 04-117384), which was completed in 1980.
Figure 7. FIRM Overlay, Coyote Creek Floodplain along US 101, Location 2
Source: FEMA and Google Earth

Just southeast of the US 101/Metcalf Road interchange, FIRM number 06085C0426H shows the floodplain of Coyote Creek, designated as Zone AE, encroaching onto US 101. The FIRM lists the floodplain elevation as approximately 248 ft NAVD in this location (see Figure 8). The current topography, however, shows the highway elevation to be approximately 256 ft NAVD, well above the 100-year floodplain. The FIS was completed in 1979 and has not been updated to reflect the effect of the US 101 roadway project (Contract No. 04-117384), which was completed in 1980. USGS Topo maps from 1980 show that US 101 used to be the roadway that is currently Monterey Road, on the west side of Coyote Creek.
Approximately 0.5 mi northwest of the US 101/Bailey Road interchange, FIRM number 06085C0428H shows the floodplain of Coyote Creek encroaching onto US 101. The FIRM lists the floodplain elevation as approximately 264 ft NAVD in this location (see Figure 9). According to the contour data available from the SCVWD’s GIS data library, elevation of US 101 at this location is approximately 270 ft, NAVD, well above the 100-year floodplain. USGS Topo maps from 1980 show that US 101 used to be the roadway that is currently Monterey Road, on the west side of Coyote Creek. The FIS was completed in 1979 and has not been updated to reflect the effect of the US 101 roadway project (Contract No. 04-117384), which was completed in 1980.
The largest recorded flow on Coyote Creek was 25,000 cfs in 1911, 1.2 mi downstream of the future Anderson Dam, and caused a large lake at the junction with the overflow of Guadalupe River. Since the construction of Anderson Dam, the largest recorded flow on Coyote Creek was 5,750 cfs, recorded in April 1958. The floods of 1983, however, caused extensive damage.

2.17 Summary Tables of Hydrologic and Hydraulic Data

Table 4 summarizes the available hydrologic and hydraulic information for each creek crossing within the project limits. Table 5 summarizes floodplain information from FEMA.
Table 4. Hydrologic and Hydraulic Information

<table>
<thead>
<tr>
<th>Creek</th>
<th>1-percent annual chance Peak Discharge (cfs)</th>
<th>Drainage Area (mi²)</th>
<th>Water Surface Elevation (ft, NAVD)</th>
<th>Roadway Elevation (ft)</th>
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<tr>
<td></td>
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<td>Upstream</td>
<td>Downstream</td>
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<td>Matadero Creek</td>
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<td>228¹⁰</td>
<td>226.2¹⁰</td>
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¹ Crossing is below confluence with Permanente Diversion. Values shown represent the flows upstream of the crossing at Stevens Creek plus the flows in the Permanente Diversion.
² Information is from SCVWD HEC-RAS models
³ Values are for confluence with Permanente Diversion, 0.7 mi downstream.
⁴ Several values are listed for Calabazas Creek close to the SR 85 crossing. This value is the most conservative listed, reflecting flows upstream of the Prospect Road bridge that overtops and diverts some flows.
⁵ Values are for Old Adobe and Quito Roads, 0.7 mi upstream of crossing.
⁶ Values are for Vasona Dam, 0.8 mi upstream of crossing.
⁷ Values are for Blossom Hill Road, 0.3 mi upstream of crossing.
⁸ Values are for Blossom Hill Road, 0.2 mi upstream of crossing.
⁹ Values are for Edenvale USGS gage, 3.4 mi downstream of crossing.
¹⁰ Values are at upstream and downstream of the US 101/SR 85 Interchange bridges over Coyote Creek.
### Table 5. Floodplain Information

<table>
<thead>
<tr>
<th>Route</th>
<th>Begin Post Mile</th>
<th>End Post Mile</th>
<th>Creek(s)</th>
<th>FIRM #</th>
<th>Flood Hazard Zone</th>
<th>Inundates Freeway?</th>
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<td>52.18</td>
<td>49.61</td>
<td>Matadero Creek, Adobe Creek,</td>
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<td>14.03</td>
<td>Saratoga Creek</td>
<td>06085C0219H</td>
<td>A</td>
<td>No</td>
</tr>
<tr>
<td>SR 85</td>
<td>12.92</td>
<td>12.90</td>
<td>Vasona Creek</td>
<td>06085C0238H</td>
<td>A</td>
<td>Unknown</td>
</tr>
<tr>
<td>SR 85</td>
<td>12.84</td>
<td>12.80</td>
<td>San Tomas Aquino Creek</td>
<td>06085C0238H</td>
<td>A</td>
<td>Unknown</td>
</tr>
<tr>
<td>SR 85</td>
<td>--</td>
<td>--</td>
<td>Smith Creek</td>
<td>06085C0238H</td>
<td>A</td>
<td>Unknown</td>
</tr>
<tr>
<td>SR 85</td>
<td>11.02</td>
<td>10.99</td>
<td>Los Gatos Creek</td>
<td>06085C0239H</td>
<td>AE</td>
<td>No</td>
</tr>
<tr>
<td>SR 85</td>
<td>8.20</td>
<td>8.17</td>
<td>Ross Creek</td>
<td>06085C0243H</td>
<td>A</td>
<td>No</td>
</tr>
<tr>
<td>SR 85</td>
<td>5.87</td>
<td>5.64</td>
<td>Guadalupe River</td>
<td>06085C0263H</td>
<td>A</td>
<td>No</td>
</tr>
<tr>
<td>SR 85</td>
<td>4.32</td>
<td>4.26</td>
<td>Canoas Creek</td>
<td>06085C0263H</td>
<td>A</td>
<td>No</td>
</tr>
<tr>
<td>US 101</td>
<td>27.24</td>
<td>27.83</td>
<td>Coyote Creek</td>
<td>06085C0268H</td>
<td>AO</td>
<td>Yes</td>
</tr>
<tr>
<td>US 101</td>
<td>26.12</td>
<td>25.82</td>
<td>Coyote Creek</td>
<td>06085C0407H</td>
<td>AE</td>
<td>No</td>
</tr>
<tr>
<td>US 101</td>
<td>25.50</td>
<td>25.21</td>
<td>Coyote Creek</td>
<td>06085C0407H</td>
<td>AE</td>
<td>No</td>
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<td>US 101</td>
<td>24.73</td>
<td>24.55</td>
<td>Coyote Creek</td>
<td>06085C0426H</td>
<td>AE</td>
<td>No</td>
</tr>
<tr>
<td>US 101</td>
<td>23.16</td>
<td>22.92</td>
<td>Coyote Creek</td>
<td>06085C0428H</td>
<td>AE</td>
<td>No</td>
</tr>
</tbody>
</table>
3 PROJECT EVALUATION

Executive Order 11988 requires federal agencies to avoid to the maximum extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. This section analyzes the impacts associated with this project.

3.1 Risk Associated with the Proposed Action

As defined by the Code of Federal Regulations (CFR) Title 23 Part 650, risk shall mean the consequences associated with the probability of flooding attributable to an encroachment. It shall include the potential for property loss and hazard to life during the service life of the proposed bridges and station structures.

The potential risk associated with the implementation of the proposed Project include: 1) change in land use; 2) fill inside floodplain; and 3) changes in the 100-year WSE.

The project is not proposing any change in land use, therefore there will be no land use risk associated with the Project. The risks associated with fill inside floodplains and changes in the 100-year WSE are discussed in the following sections.

3.1.1 Areas North of I-280 (PM 52.16 to PM 18.62)

North of the I-280/SR 85 interchange, the project would primarily consist of re-striping and new signs. This work would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect any floodplains. Floodplains within this area would include the floodplains along US 101 in Mountain View and Palo Alto surrounding Matadero, Adobe and Permanente creeks. This area would also include all crossings of Stevens Creek as well as the crossing of Permanente Diversion.

3.1.2 Regnart Creek

As noted in Section 2, Regnart Creek is contained within the channel at the SR 85 crossing and does not have a floodplain within the Project limits.

3.1.3 Calabazas Creek

Impacts to the floodplain at the Calabazas Creek crossing would be minimal. The existing bridge across Calabazas Creek does not get overtopped in the 1-percent annual chance flood and would not be modified as part of this project. The floodplain does not extend beyond the limits of the bridge. There would be some increase in impervious area draining to Calabazas Creek, but this area would represent only 0.09 percent of the total watershed area and would not have a significant impact on the floodplain (see Table 6).
3.1.4 Rodeo Creek
Impacts to the floodplain at the Rodeo Creek crossing would be minimal. Work within the FEMA-defined floodplain area would include median widening. This widening, however, would take place well above the 1-percent annual chance flood water surface elevation, would not significantly change the roadway profile, and would involve minimal grading. There would be a small addition of impervious area draining to Rodeo Creek, but these areas would be insignificant compared to the overall Rodeo Creek watershed (see Table 6).

3.1.5 Saratoga Creek
Impacts to the floodplain at the Saratoga Creek crossing would be minimal. Bridge widening is proposed to close the gap between the northbound and southbound bridges. The proposed bridge will remain single-span and will not change the existing hydraulic opening. The bridge widening would not significantly modify the 1-percent annual flood profile in the project vicinity. The existing and proposed SR 85 bridges across Saratoga Creek would not overtopped by the 1-percent annual chance flood. The floodplain does not extend beyond the limits of the bridge. Outside of the floodplain, there would be some increase in impervious area draining to Saratoga Creek, but this area would represent only 0.03 percent of the total watershed area and would not have a significant impact on the floodplain (see Table 6).

3.1.6 Vasona Creek
Impacts to the floodplain at the Vasona Creek crossing would be minimal. Available information does not confirm whether or not the floodplain elevation overtops SR 85 at this location. Work within the FEMA-defined floodplain area would include median widening. This widening, however, would not significantly change the profile and would involve minimal grading. There would be a small addition of impervious area draining to Vasona Creek, but these areas would be insignificant compared to the overall Vasona Creek watershed (see Table 6).

3.1.7 San Tomas Aquino Creek
Impacts to the floodplain at the San Tomas Aquino Creek crossing would be minimal. Available information does not confirm whether or not the floodplain elevation overtops SR 85 at this location. Bridge widening is proposed to close the gap between the northbound and southbound bridges. The proposed bridge will remain single-span and will not change the existing hydraulic opening. Within some areas that drain to San Tomas Aquino Creek, impervious area would be added, but these areas would be outside of the floodplain and would be insignificant compared to the overall Saratoga Creek watershed (see Table 6).

3.1.8 Smith Creek
As noted in Section 2, Smith Creek does not have a 100-year floodplain where it crosses SR 85.
3.1.9 Los Gatos Creek
Impacts to the floodplain at the Los Gatos Creek crossing would be minimal. The existing bridge across Los Gatos Creek is not overtopped by the 1-percent annual chance flood and would not be modified as part of this project. The floodplain does not extend beyond the limits of the bridge. Within some areas that drain to Los Gatos Creek, impervious area would be added, but these areas would be outside of the floodplain and would be insignificant compared to the overall Los Gatos Creek watershed (see Table 6).

3.1.10 Ross Creek
Impacts to the floodplain at the Ross Creek crossing would be minimal. Work within the FEMA-defined floodplain area would include median widening. This widening, however, would take place well above the 1-percent annual chance water surface elevation, would not significantly change the roadway profile, and would involve minimal grading. There would be a small addition of impervious area draining to Ross Creek, but these areas would be insignificant compared to the overall Ross Creek watershed (see Table 6).

3.1.11 Guadalupe River
Impacts to the floodplain at the Guadalupe River crossing would be minimal. The existing bridge across Guadalupe River is not overtopped by the 1-percent annual chance flood, and would not be modified as part of this project. The floodplain does not extend beyond the limits of the bridge. Within some areas that drain to Guadalupe River, impervious area would be added, but these areas would be outside of the floodplain and would be insignificant compared to the overall Guadalupe River watershed (see Table 6).

3.1.12 Areas Southeast of SR 87 (PM 5.23 to PM 22.92)
Southeast of the SR 87/SR 85 interchange, the project would primarily consist of restriping and new signs. This work would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect any floodplains. Floodplains within this area would include the floodplain at the Canoas Creek and Coyote Creek crossings as well as several other locations where FEMA maps show the Coyote Creek watershed encroaching onto US 101 south of the US 101/SR 85 interchange.

3.2 Increase in Impervious Surfaces
SR 85 bridge decks would be widened at Almaden Expressway (northbound side only), Camden Avenue, Oka Road, Pollard Road, and Saratoga Avenue, as well as at the San Tomas Aquino Creek and Saratoga Creek crossings. The existing gaps between the northbound and southbound bridges at these locations would be closed except at Almaden Expressway, where the northbound bridge would be widened on the inside (toward the median). Between I-280 and SR 87, there would be an increase in impervious area due to widening in the median and addition of an auxiliary lane between South De Anza Boulevard and Stevens Creek Boulevard. The widening would result in
increases to peak stormwater runoff and a reduction in the amount of pervious surfaces available for infiltration of stormwater runoff.

Table 6 summarizes the increase in impervious area contributing to the creeks and the associated floodplains. These increases in area are compared to the overall watershed drainage areas at each crossing. Where available, overall drainage areas were taken from FEMA. Where watershed areas were not available in the FEMA studies, watersheds were delineated using USGS topographic maps.

<table>
<thead>
<tr>
<th>Location</th>
<th>Added Impervious Area (ac)</th>
<th>Watershed Area (ac)</th>
<th>Percent of Total Watershed Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matadero Creek</td>
<td>0.00</td>
<td>8,704</td>
<td>0.00%</td>
</tr>
<tr>
<td>Adobe Creek</td>
<td>0.00</td>
<td>8,640</td>
<td>0.00%</td>
</tr>
<tr>
<td>Permanente Creek</td>
<td>0.00</td>
<td>10,112</td>
<td>0.00%</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>0.00</td>
<td>23,296</td>
<td>0.00%</td>
</tr>
<tr>
<td>Regnart Creek</td>
<td>3.33</td>
<td>799</td>
<td>0.42%</td>
</tr>
<tr>
<td>Calabazas Creek</td>
<td>5.26</td>
<td>2,816</td>
<td>0.19%</td>
</tr>
<tr>
<td>Rodeo Creek</td>
<td>1.50</td>
<td>654</td>
<td>0.23%</td>
</tr>
<tr>
<td>Saratoga Creek</td>
<td>1.97</td>
<td>7,104</td>
<td>0.03%</td>
</tr>
<tr>
<td>Vasona Creek</td>
<td>3.27</td>
<td>2,793</td>
<td>0.12%</td>
</tr>
<tr>
<td>San Tomas Aquino Creek</td>
<td>0.14</td>
<td>2,337</td>
<td>0.01%</td>
</tr>
<tr>
<td>Smith Creek</td>
<td>1.16</td>
<td>512</td>
<td>0.23%</td>
</tr>
<tr>
<td>Smith Creek East Channel</td>
<td>2.11</td>
<td>148</td>
<td>1.43%</td>
</tr>
<tr>
<td>Los Gatos Creek</td>
<td>8.60</td>
<td>28,224</td>
<td>0.03%</td>
</tr>
<tr>
<td>Ross Creek</td>
<td>10.16</td>
<td>4,240</td>
<td>0.24%</td>
</tr>
<tr>
<td>Guadalupe River</td>
<td>2.64</td>
<td>34,048</td>
<td>0.01%</td>
</tr>
<tr>
<td>Canoas Creek</td>
<td>0.00</td>
<td>8,000</td>
<td>0.00%</td>
</tr>
<tr>
<td>Coyote Creek</td>
<td>0.00</td>
<td>146,560</td>
<td>0.00%</td>
</tr>
<tr>
<td>Total</td>
<td>40.14</td>
<td>288,987</td>
<td>0.01%</td>
</tr>
</tbody>
</table>

Source: URS

The project will not pose a significant risk by widening SR 85. As Table 6 shows, the increase in roadway runoff will be minimal in comparison to the overall watersheds of the creeks (less than 1.43 percent at each crossing). Therefore, there will be an insignificant change in the water surface elevation to the identified floodplain areas due to increases in impervious areas.

### 3.3 Impacts on Natural and Beneficial Floodplain Values

Natural and beneficial floodplain values include, but are not limited to: fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and ground water recharge.
The Natural Environment Study (NES) for this project identified approximately 7.67 acres of potentially jurisdictional waters that exist within the biological study area (BSA). These jurisdictional features include perennial and intermittent streams, some of which may be considered waters of the U.S. Some of these streams also contain potential wetland areas within their channels. Potential wetland areas were identified within the channels of Calabazas Creek, Los Gatos Creek, Guadalupe River, and Coyote Creek, as well as a perennial freshwater wetland along the south side of US 101 at the southern end of the project. A summary of these areas can be found in Table 7.

### Table 7. Potential Waters of the U.S. and Wetland Areas within Project BSA

<table>
<thead>
<tr>
<th>Location</th>
<th>Route</th>
<th>Approximate Post Mile</th>
<th>Waters of the US Areas (acres)</th>
<th>Wetland Area (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matadero Creek</td>
<td>US 101</td>
<td>--</td>
<td>0.15</td>
<td>0</td>
</tr>
<tr>
<td>Adobe Creek</td>
<td>US 101</td>
<td>50.66</td>
<td>0.15</td>
<td>0</td>
</tr>
<tr>
<td>Permanente Creek-Culverted water</td>
<td>US 101</td>
<td>--</td>
<td>0.06</td>
<td>0</td>
</tr>
<tr>
<td>Permanente Creek</td>
<td>US 101</td>
<td>--</td>
<td>0.01</td>
<td>0</td>
</tr>
<tr>
<td>Permanente Creek</td>
<td>US 101</td>
<td>--</td>
<td>0.01</td>
<td>0</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>US 101</td>
<td>48.04</td>
<td>0.14</td>
<td>0</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>SR 85</td>
<td>22.95</td>
<td>0.16</td>
<td>0</td>
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<tr>
<td>Stevens Creek</td>
<td>SR 85</td>
<td>20.96</td>
<td>0.07</td>
<td>0</td>
</tr>
<tr>
<td>Stevens Creek</td>
<td>SR 85</td>
<td>20.02</td>
<td>0.23</td>
<td>0</td>
</tr>
<tr>
<td>Calabazas Creek and stormwater drain</td>
<td>SR 85</td>
<td>15.40</td>
<td>0.24</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Saratoga Creek</td>
<td>SR 85</td>
<td>13.91</td>
<td>0.20</td>
<td>0</td>
</tr>
<tr>
<td>Vasona Creek*</td>
<td>SR 85</td>
<td>12.72</td>
<td>0.13</td>
<td>0</td>
</tr>
<tr>
<td>San Tomas Aquino Creek</td>
<td>SR 85</td>
<td>12.68</td>
<td>0.11</td>
<td>0</td>
</tr>
<tr>
<td>Los Gatos Creek</td>
<td>SR 85</td>
<td>10.80</td>
<td>0.41</td>
<td>0.03</td>
</tr>
<tr>
<td>Ross Creek</td>
<td>SR 85</td>
<td>8.15</td>
<td>0.15</td>
<td>0</td>
</tr>
<tr>
<td>Guadalupe River</td>
<td>SR 85</td>
<td>5.59</td>
<td>4.23b</td>
<td>0.08</td>
</tr>
<tr>
<td>Canoas Creek</td>
<td>SR 85</td>
<td>4.28</td>
<td>0.13</td>
<td>0</td>
</tr>
<tr>
<td>Coyote Creek</td>
<td>US 101</td>
<td>26.47, 26.60</td>
<td>0.40</td>
<td>0.43, &lt;0.01</td>
</tr>
<tr>
<td>South Side US 101</td>
<td>US 101</td>
<td>595+00</td>
<td>0</td>
<td>0.14</td>
</tr>
<tr>
<td>North Side US 101</td>
<td>US 101</td>
<td>592+00</td>
<td>0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>6.98</strong></td>
<td><strong>0.69</strong></td>
</tr>
</tbody>
</table>

Source: URS 2013a, b  
* Labeled as “WUS-8 Wildcat Creek” in Natural Environment Study (URS 2013a) and Jurisdictional Delineation (URS 2013b).  
* Includes 3.86 acres of recharge pond area.

The NES also defines different vegetation communities within the BSA, some of which are riparian in nature. The total areas within the project limits are shown in Table 8.
Table 8. Areas of Riparian Vegetation

<table>
<thead>
<tr>
<th>Vegetation Type</th>
<th>Area within BSA (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arroyo willow forest</td>
<td>25.86</td>
</tr>
<tr>
<td>Black cottonwood forest</td>
<td>0.63</td>
</tr>
<tr>
<td>California bay riparian forest</td>
<td>0.54</td>
</tr>
<tr>
<td>California sycamore woodland</td>
<td>0.34</td>
</tr>
<tr>
<td>Cattail marsh</td>
<td>0.07</td>
</tr>
<tr>
<td>Coast live oak woodland</td>
<td>2.57</td>
</tr>
<tr>
<td>Fremont cottonwood forest</td>
<td>1.76</td>
</tr>
<tr>
<td>Red willow forest</td>
<td>0.19</td>
</tr>
<tr>
<td>Sandbar willow thicket</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Serpentine grassland</td>
<td>0.83</td>
</tr>
<tr>
<td>White alder forest</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Source: URS 2013a

None of the areas listed as being potential waters of the U.S. or wetlands would be disturbed by this project. Although in-water work is not proposed, work would occur along the banks and riparian corridors of San Tomas Aquino and Saratoga creeks.

No work would take place at other creeks that pass under bridges or within any stream channels or riparian areas. The small areas of potential wetland that exist apart from creek crossings are also outside of widening areas.

### 3.4 Support of Probable Incompatible Floodplain Development

As defined by the FHWA, the support of incompatible base floodplain development will encourage, allow, serve, or otherwise facilitate incompatible base floodplain development, such as commercial development or urban growth.

Because this project includes minimal median widening of an existing highway, it would not support incompatible floodplain development. It would not create new access to developed or undeveloped land.

### 3.5 Measures to Minimize Floodplain Impacts Associated with the Action

There would be minimal floodplain impacts associated with the project. The project would cause increases in impervious area, but these areas are small compared to the existing creek watersheds and would not significantly increase flows or affect floodplain
areas. No work is planned at bridges within floodplains, and there would be no significant changes in profile within floodplains. No potential impacts to jurisdictional wetlands, waters of the U.S. or floodplains are expected from the proposed project. Mitigation measures are therefore not required.

All proposed construction would be limited to the existing and proposed right-of-way, and environmentally sensitive areas (ESAs) would be identified on the contract documents. ESAs would include wetlands, waters, and habitats that support sensitive species. Contractor encroachment into ESAs would be prohibited.

3.6 Measures to Restore and Preserve the Natural and Beneficial Floodplain Values Impacted by this Action

As noted above, there are no anticipated impacts to locations with natural and beneficial floodplain values. Where necessary, any environmental impacts resulting from construction can be mitigated with standard measures, re-vegetation, best management practices (BMPs), and other activities.

The contractor would also be required to submit a Storm Water Pollution Control Plan to protect water quality. The contractor would install erosion control BMPs, avoid allowing asphalt concrete to enter live streams, and keep all staging areas away from waters of the U.S. or wetlands.

3.7 Practicability of Alternatives to any Significant Encroachments

As defined by the FHWA, risk shall mean the consequences associated with the probability of flooding attributable to an encroachment. It shall include the potential for property loss and hazard to life during the service life of the bridge and roadway.

The project would maintain the existing roadway profile. The effects to the floodplain would be minimal due to the relatively minor increases in impervious area compared to the total watershed areas. Encroachments would not be significant. The project would take place within the existing right-of-way of SR 85, and it would be impractical to relocate the project to avoid impacts.

3.8 Practicability of Alternatives to any Longitudinal Encroachments

As defined by the FHWA, a longitudinal encroachment is an action within the limits of the base floodplain that is longitudinal to the normal direction of the floodplain.

A longitudinal encroachment is “[a]n encroachment that is parallel to the direction of flow. Example: A highway that runs along the edge of a river is, usually considered a longitudinal encroachment.” The requirement for consideration of avoidance alternatives must be included in a Location Hydraulic Study by including an evaluation and a
discussion of the practicability of alternatives to any significant encroachment or any support of incompatible floodplain development.

No widening work would take place within areas of longitudinal encroachment. With the exception of portions of Stevens Creek and Coyote Creek, the project would be perpendicular to all creek crossings. Stevens Creek runs parallel to the existing SR 85 between US 101 and I-280, crossing SR 85 several times. This portion of the project, however, does not include freeway widening. Coyote Creek runs parallel to US 101 in some locations within the project limits, but work in these areas would be limited to the installation of signs, tolling equipment, and Traffic Operations Systems equipment.
4 REFERENCES
City of Palo Alto, California, Department of Public Works. *Flood Zone Descriptions: Zone AE*.
Federal Emergency Management Agency. (2009). Flood Insurance Rate Map, Santa Clara County and Incorporated Areas, California, Panel 238 of 830, (Map Number 06085C0238H)

Federal Emergency Management Agency. (2009). Flood Insurance Rate Map, Santa Clara County and Incorporated Areas, California, Panel 244 of 830, (Map Number 06085C0244H)


Federal Emergency Management Agency. (2010). Letter of Map Revision Determination Document, City of San Jose and Santa Clara County, California, Community no 060349, (Case Number 10-09-2973P)


Santa Clara Valley Water District (February 2002). *Coyote Watershed Stream Stewardship Plan*.


URS Corporation. (2013a). *Natural Environment Study: State Route 85 Express Lanes Project*.

Appendix A  Summaries of Floodplain Encroachment
FLOODPLAIN EVALUATION REPORT SUMMARY
MATADERO CREEK

District: 04  County: Santa Clara
Route: US 101  PM: 51.37
EA 4A7900  Bridge No.: 37-0040

Limits:
Northern Limit of project (PM 52.0) to Rengstorff Avenue Interchange (PM 49.61)

Floodplain Description:
According to FEMA FIRMs 06085C0030H, 06085C0036H and 06085C0037H, the floodplain that covers much of US 101 in the vicinity of Matadero Creek crossing is designated as Zone AE. According to the City of Palo Alto, this area is due to the potential overtopping of bayfront levees in the event of an extremely high tide, particularly one that might be associated with an extreme storm event.

1. Is the proposed action a longitudinal encroachment of the base floodplain? [ ] No  [ ] Yes
2. Are the risks associated with the implementation of the proposed action significant? [ ] No  [ ] Yes
3. Will the proposed action support probable incompatible floodplain development? [ ] No  [ ] Yes
4. Are there any significant impacts on natural and beneficial floodplain values? [ ] No  [ ] Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). [ ] No  [ ] Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. [ ] No  [ ] Yes
FLOODPLAIN EVALUATION REPORT SUMMARY
MATADERO CREEK

<table>
<thead>
<tr>
<th>District:</th>
<th>04</th>
<th>County:</th>
<th>Santa Clara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route:</td>
<td>US 101</td>
<td>PM:</td>
<td>51.37</td>
</tr>
<tr>
<td>EA</td>
<td>4A7900</td>
<td>Bridge No.:</td>
<td>37-0040</td>
</tr>
</tbody>
</table>

PREPARED BY:

__________________________________________
Signature - Hydraulic Engineer    Date

CONCURRENCE FROM:

__________________________________________
Signature - Dist. Hydraulic Engineer    Date

__________________________________________
Signature - Dist. Environmental Branch Chief    Date

__________________________________________
Signature - Dist. Project Engineer    Date
FLOODPLAIN EVALUATION REPORT SUMMARY
ADOBE CREEK

District: 04  County: Santa Clara
Route: US 101  PM: 50.66
EA 4A7900  Bridge No.: 37-0174

Limits:
Northern Limit of project (PM 52.0) to Rengstorff Avenue Interchange (PM 49.61)

Floodplain Description:
According to FEMA FIRMs 06085C0030H, 06085C0036H and 06085C0037H, the floodplain that covers much of US 101 in the vicinity of Adobe Creek crossing is designated as Zone AE. According to the City of Palo Alto, this area is due to the potential overtopping of bayfront levees in the event of an extremely high tide, particularly one that might be associated with an extreme storm event.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No  Yes
2. Are the risks associated with the implementation of the proposed action significant? Yes  No
3. Will the proposed action support probable incompatible floodplain development? Yes  No
4. Are there any significant impacts on natural and beneficial floodplain values? Yes  No
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. Yes  No
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). Yes  No
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. No  Yes
**FLOODPLAIN EVALUATION REPORT SUMMARY**

**ADOBE CREEK**

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## FLOODPLAIN EVALUATION REPORT SUMMARY
### PERMANENTE CREEK

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<tr>
<td>EA</td>
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### Limits:
From Rengstorff Avenue Interchange (PM 49.61) to US 101 Southbound on-ramp (PM 48.3).

### Floodplain Description:
According to FEMA FIRM 06085C0037H, there is no floodplain directly at the US 101 crossing, but there are adjacent areas that do fall within the 1-percent annual chance floodplain. These areas are designated as being within Zone AO, which represents the floodplain caused by the shallow sheet overtopped flow from Permanente Creek during a 1-percent annual chance flood event. This overtopping is due to the insufficient capacity of the concrete lined channel upstream of US 101.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No ☒ Yes ☐
2. Are the risks associated with the implementation of the proposed action significant? No ☒ Yes ☐
3. Will the proposed action support probable incompatible floodplain development? No ☒ Yes ☐
4. Are there any significant impacts on natural and beneficial floodplain values? No ☒ Yes ☐
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. No ☒ Yes ☐
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)? No ☒ Yes ☐
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. No ☒ Yes ☒
FLOODPLAIN EVALUATION REPORT SUMMARY
PERMANENTE CREEK

District: 04  County: Santa Clara
Route: US 101  PM:
EA 4A7900  Bridge No.: None

PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY
STEVENS CREEK

District: 04  County: Santa Clara
Route: US 101  PM: 48.04
EA 4A7900  Bridge No.: 37-0034

Limits:
US 101 bridge over Stevens Creek

Floodplain Description:
According to FEMA FIRM 06085C0037H, a Zone A floodplain exists at the Stevens Creek crossing of US 101. The profiles in the FIS show the 1-percent annual chance water surface elevation to be 35.9 ft NAVD upstream of the crossing and 35.7 ft NAVD just downstream of the crossing. The existing roadway elevation is approximately 40.0 ft NAVD, and is not inundated by the 1-percent annual chance flood.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No  Yes
2. Are the risks associated with the implementation of the proposed action significant? Yes
3. Will the proposed action support probable incompatible floodplain development? No
4. Are there any significant impacts on natural and beneficial floodplain values? No
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. Yes
FLOODPLAIN EVALUATION REPORT SUMMARY
STEVENS CREEK

District: 04  County: Santa Clara
Route: US 101  PM: 48.04
EA 4A7900  Bridge No.: 37-0034

PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date

March 2013
FLOODPLAIN EVALUATION REPORT SUMMARY
STEVENS CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: R22.95
EA 4A7900  Bridge No.: 37-0197

Limits:
SR 85 Bridge over Stevens Creek north of Central Expressway Interchange (PM 22.63)

Floodplain Description:
According to FIRM number 06085C0039H, a Zone A floodplain exists at the Stevens Creek crossing of SR 85 at PM 22.95. The profiles in the FIS show the 1-percent annual chance water surface elevation to be 64.6 ft NAVD upstream of the SR 85 crossing and 64.0 ft NAVD downstream of the crossing. The roadway elevation is at approximately 78.0 ft NAVD, and would not be inundated by the 1-percent annual chance flood.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No Yes
2. Are the risks associated with the implementation of the proposed action significant? No Yes
3. Will the proposed action support probable incompatible floodplain development? No Yes
4. Are there any significant impacts on natural and beneficial floodplain values? No Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. No Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). No Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. No Yes
FLOODPLAIN EVALUATION REPORT SUMMARY
STEVENS CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: R22.95
EA 4A7900  Bridge No.: 37-0197

PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY
STEVENS CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: R20.96
EA 4A7900  Bridge No.: 37-0189

Limits:
SR 85 Bridge over Stevens Creek between El Camino Real Interchange (PM 21.75/21.76) and Fremont Avenue Interchange (PM 19.86)

Floodplain Description:
According to FEMA FIRM 06085C0202H, Zone A floodplain exists at the SR 85 Bridge over Stevens Creek at PM 20.96. The FIRM does not show a sign of overbank flow inundating SR 85 or backwater at the bridge crossing.

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<tr>
<th>Question</th>
<th>Yes</th>
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<tr>
<td>1. Is the proposed action a longitudinal encroachment of the base floodplain?</td>
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<tr>
<td>3. Will the proposed action support probable incompatible floodplain development?</td>
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<tr>
<td>4. Are there any significant impacts on natural and beneficial floodplain values?</td>
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<tr>
<td>5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.</td>
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<td>6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).</td>
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<td>7. Are Location Hydraulic Studies that document the above answers on file? If not explain.</td>
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## FLOODPLAIN EVALUATION REPORT SUMMARY

**STEVENS CREEK**

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### PREPARED BY:

- Signature - Hydraulic Engineer
- Date

### CONCURRENCE FROM:

- Signature - Dist. Hydraulic Engineer
- Date

- Signature - Dist. Environmental Branch Chief
- Date

- Signature - Dist. Project Engineer
- Date
FLOODPLAIN EVALUATION REPORT SUMMARY
STEVENS CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: R20.02
EA 4A7900  Bridge No.: 37-0185

Limits:
SR 85 Bridge over Stevens Creek approximately 0.15 mi north of Fremont Avenue Interchange (PM 19.86)

Floodplain Description:
According to FIRM number 06085C0206H, Zone A floodplain exists at the Stevens Creek crossing of SR 85 just north of Fremont Avenue. The FIRM does not show a sign of overbank flow inundating SR 85 or backwater at the bridge crossing.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No Yes
2. Are the risks associated with the implementation of the proposed action significant? No Yes
3. Will the proposed action support probable incompatible floodplain development? No Yes
4. Are there any significant impacts on natural and beneficial floodplain values? No Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. No Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)? No Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. No Yes
# FLOODPLAIN EVALUATION REPORT SUMMARY

**STEVENS CREEK**

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</table>
FLOODPLAIN EVALUATION REPORT SUMMARY
PERMANENTE CREEK DIVERSION

District: 04         County: Santa Clara
Route: SR 85        PM:
EA 4A7900          Bridge No.:  

Limits:
SR 85 RCB culvert across Permanente Diversion

Floodplain Description:
According to FIRM number 06085C0202H, Zone A floodplain exists at the Permanente Diversion crossing of SR 85. The FIRM does not show a sign of overbank flow inundating SR 85 or backwater at the bridge crossing.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
2. Are the risks associated with the implementation of the proposed action significant?  
3. Will the proposed action support probable incompatible floodplain development?  
4. Are there any significant impacts on natural and beneficial floodplain values?  
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.
# Floodplain Evaluation Report Summary

**Permanent Creek Diversion**

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<td>4A7900</td>
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**Prepared By:**

- Signature - Hydraulic Engineer
- Date

**Concurrence From:**

- Signature - Dist. Hydraulic Engineer
- Date

- Signature - Dist. Environmental Branch Chief
- Date

- Signature - Dist. Project Engineer
- Date

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March 2013
FLOODPLAIN EVALUATION REPORT SUMMARY
REGNART CREEK

District: 04    County: Santa Clara
Route: SR 85    PM: 16.65
EA 4A7900
Bridge No.: 

Limits:
SR 85 RCB cross culvert across Regnart Creek

Floodplain Description:
There is no applicable floodplain for Regnart Creek. In September 2010, FEMA issued Letter of Map Revision (LOMR) number 10-09-2408P-060339, which shows the 1-percent annual chance flood as being contained within the cross culvert under SR 85.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
   No ☒ Yes ☐
2. Are the risks associated with the implementation of the proposed action significant?  
   No ☒ Yes ☐
3. Will the proposed action support probable incompatible floodplain development?  
   No ☒ Yes ☐
4. Are there any significant impacts on natural and beneficial floodplain values?  
   No ☒ Yes ☐
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
   No ☒ Yes ☐
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
   No ☒ Yes ☐
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  
   No ☒ Yes ☒
# FLOODPLAIN EVALUATION REPORT SUMMARY
## REGNART CREEK

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## PREPARED BY:

- Signature - Hydraulic Engineer: 
  - Date

## CONCURRENCE FROM:

- Signature - Dist. Hydraulic Engineer: 
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- Signature - Dist. Environmental Branch Chief: 
  - Date
- Signature - Dist. Project Engineer: 
  - Date

March 2013
FLOODPLAIN EVALUATION REPORT SUMMARY  
CALABAZAS CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: R15.40
EA 4A7900  Bridge No.: 37-0527L, 37-0527R, 37-0527S

Limits:
SR 85 bridges across Calabazas Creek

Floodplain Description:
According to FIRM number 06085C0217H, Zone AE floodplain exists at the Calabazas Creek crossing of SR 85. The 100-year water surface elevation is 284.1 ft NAVD upstream of the crossing and 280.2 ft NAVD downstream of the crossing. The roadway elevation is at approximately 296.5 ft NAVD and is not inundated by the 1-percent annual chance flood.

1. Is the proposed action a longitudinal encroachment of the base floodplain? ☒ ☐
2. Are the risks associated with the implementation of the proposed action significant? ☒ ☐
3. Will the proposed action support probable incompatible floodplain development? ☒ ☐
4. Are there any significant impacts on natural and beneficial floodplain values? ☒ ☐
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. ☒ ☐
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)? ☒ ☐
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. ☒ ☐
FLOODPLAIN EVALUATION REPORT SUMMARY
CALABAZAS CREEK

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FLOODPLAIN EVALUATION REPORT SUMMARY
RODEO CREEK

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Limits:
SR 85 RCB cross culvert across Rodeo Creek

Floodplain Description:
According to FIRM number 06085C0217H, Zone A floodplain exists at the Rodeo Creek crossing of SR 85. The roadway elevation is at approximately 288.0 ft NAVD and is not inundated by the 1-percent annual chance flood.

| 1. Is the proposed action a longitudinal encroachment of the base floodplain? | No | Yes |
| 2. Are the risks associated with the implementation of the proposed action significant? | No | Yes |
| 3. Will the proposed action support probable incompatible floodplain development? | No | Yes |
| 4. Are there any significant impacts on natural and beneficial floodplain values? | No | Yes |
| 5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. | No | Yes |
| 6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). | No | Yes |
| 7. Are Location Hydraulic Studies that document the above answers on file? If not explain. | No | Yes |
# Floodplain Evaluation Report Summary

**Rodeo Creek**

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March 2013
FLOODPLAIN EVALUATION REPORT SUMMARY
SARATOGA CREEK

District: 04
County: Santa Clara
Route: SR 85
PM: R13.91
EA 4A7900
Bridge No.: 37-0500K, 37-0500L, 37-0500R, 37-0500S

Limits:
SR 85 bridges across Saratoga Creek

Floodplain Description:
According to FIRM number 06085C0219H, Zone A floodplain exists at the Saratoga Creek crossing of SR 85. The roadway elevation at Saratoga Creek is approximately 319.5 ft NAVD, and is not inundated by the 1-percent annual chance flood.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No Yes
2. Are the risks associated with the implementation of the proposed action significant?
3. Will the proposed action support probable incompatible floodplain development?
4. Are there any significant impacts on natural and beneficial floodplain values?
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.
# Floodplain Evaluation Report Summary

**Saratoga Creek**

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**FLOODPLAIN EVALUATION REPORT SUMMARY**

**VASONA CREEK**

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**Limits:**
SR 85 RCB cross culvert for Vasona Creek

**Floodplain Description:**
According to FIRM number 06085C0238H, Zone A floodplain exists at the Vasona Creek crossing of SR 85. The floodplain shown on the FIRM suggests that Vasona Creek is contained within its banks. However, available information does not confirm whether or not the floodplain elevation overtops SR 85 at this location.

| 1. Is the proposed action a longitudinal encroachment of the base floodplain? | No | Yes |
| 2. Are the risks associated with the implementation of the proposed action significant? | Yes | No |
| 3. Will the proposed action support probable incompatible floodplain development? | Yes | No |
| 4. Are there any significant impacts on natural and beneficial floodplain values? | Yes | No |
| 5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. | Yes | No |
| 6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). | Yes | No |
| 7. Are Location Hydraulic Studies that document the above answers on file? If not explain. | No | Yes |
FLOODPLAIN EVALUATION REPORT SUMMARY
VASONA CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: 12.72
EA 4A7900  Bridge No.: 

PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY  
SAN TOMAS AQUINO CREEK

District: 04    County: Santa Clara
Route: SR 85    PM: R12.68
EA 4A7900    Bridge No.: 37-0524L, 37-0524R

Limits:
SR 85 bridges across San Tomas Aquino Creek

Floodplain Description:
According to FIRM number 06085C0238H, Zone A floodplain exists at the San Tomas Aquino Creek crossing of SR 85. The floodplain shown on the FIRM suggests that San Tomas Aquino Creek is contained within its banks. However, available information does not confirm whether or not the floodplain elevation overtops SR 85 at this location.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
   No ☒ Yes ☐  
2. Are the risks associated with the implementation of the proposed action significant?  
   No ☒ Yes ☐  
3. Will the proposed action support probable incompatible floodplain development?  
   No ☒ Yes ☐  
4. Are there any significant impacts on natural and beneficial floodplain values?  
   No ☒ Yes ☐  
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
   No ☒ Yes ☐  
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
   No ☒ Yes ☐  
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  
   No ☒ Yes ☐
FLOODPLAIN EVALUATION REPORT SUMMARY
SAN TOMAS AQUINO CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: R12.68
EA 4A7900  Bridge No.: 37-0524L, 37-0524R

PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
# FLOODPLAIN EVALUATION REPORT SUMMARY

**SMITH CREEK**

<table>
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<tr>
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**Limits:**
SR 85 RCP cross culvert at Smith Creek

**Floodplain Description:**
Smith Creek does not have a 100-year floodplain where it crosses SR 85. The floodplain assigned at the Smith Creek RCP cross culvert crossing SR 85 is Zone X (shaded).

<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
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<tr>
<td>1. Is the proposed action a longitudinal encroachment of the base floodplain?</td>
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<td>2. Are the risks associated with the implementation of the proposed action significant?</td>
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<td>3. Will the proposed action support probable incompatible floodplain development?</td>
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<td>4. Are there any significant impacts on natural and beneficial floodplain values?</td>
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<tr>
<td>5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.</td>
<td>☒</td>
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<td>6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).</td>
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<td>7. Are Location Hydraulic Studies that document the above answers on file? If not explain.</td>
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FLOODPLAIN EVALUATION REPORT SUMMARY
SMITH CREEK

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PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY  
LOS GATOS CREEK

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Limits:
SR 85 bridges across Los Gatos Creek

Floodplain Description:
According to FEMA FIRM 06085C0239H, Zone AE floodplain exists at the Los Gatos Creek crossing of SR 85. The water surface elevation is 263.6 ft NAVD upstream of the crossing and 263.1 ft NAVD downstream of the crossing. The roadway elevation at the crossing is approximately 269.5 ft NAVD and is not inundated by the 1-percent annual chance flood.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No Yes
2. Are the risks associated with the implementation of the proposed action significant? No Yes
3. Will the proposed action support probable incompatible floodplain development? No Yes
4. Are there any significant impacts on natural and beneficial floodplain values? No Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. No Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). No Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. No Yes

March 2013
A-32
# Floodplain Evaluation Report Summary

**Los Gatos Creek**

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**Prepared By:**

---

Signature - Hydraulic Engineer  
Date

**Concurrence From:**

---

Signature - Dist. Hydraulic Engineer  
Date

Signature - Dist. Environmental Branch Chief  
Date

Signature - Dist. Project Engineer  
Date

---

March 2013  
A-33
FLOODPLAIN EVALUATION REPORT SUMMARY
ROSS CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: 8.15
EA 4A7900  Bridge No.: 37-0469

Limits:
SR 85 RCB cross culvert at Ross Creek

Floodplain Description:
According to FIRM number 06085C0243H, Zone A floodplain exists at the Ross Creek crossing of SR 85. Based on the available information, 100-year WSE at the upstream and downstream of the crossing was estimated to be 203 ft NAVD and 202 ft NAVD, respectively. The roadway elevation at this crossing is approximately 224.5 ft NAVD, and will not be inundated by the 1-percent annual chance flood.

No  Yes

1. Is the proposed action a longitudinal encroachment of the base floodplain?
2. Are the risks associated with the implementation of the proposed action significant?
3. Will the proposed action support probable incompatible floodplain development?
4. Are there any significant impacts on natural and beneficial floodplain values?
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.
# Floodplain Evaluation Report Summary

**Ross Creek**

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**Prepared By:**

| Signature - Hydraulic Engineer | Date |

**Concurrence From:**

| Signature - Dist. Hydraulic Engineer | Date |
| Signature - Dist. Environmental Branch Chief | Date |
| Signature - Dist. Project Engineer | Date |

March 2013
FLOODPLAIN EVALUATION REPORT SUMMARY
GUADALUPE RIVER

District: 04  County: Santa Clara
Route: SR 85  PM: 5.59
EA 4A7900  Bridge No.: 37-0467L, 37-0467R

Limits:
SR 85 bridges across Guadalupe River

Floodplain Description:
According to FIRM number 06085C0263H, Zone A floodplain exists at the Guadalupe River crossing of SR 85. According to the stream profiles in FEMA FIS, 1-percent annual chance water surface elevation as 178.9 ft NAVD upstream of the SR 85 crossing and 178.5 ft NAVD downstream of the crossing. The roadway elevation is approximately 217 ft NAVD at the crossing and is not inundated by the 1-percent annual chance flood.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
   No  Yes
2. Are the risks associated with the implementation of the proposed action significant?  
   No  Yes
3. Will the proposed action support probable incompatible floodplain development?  
   No  Yes
4. Are there any significant impacts on natural and beneficial floodplain values?  
   No  Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
   No  Yes
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
   No  Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  
   No  Yes
FLOODPLAIN EVALUATION REPORT SUMMARY
GUADALUPE RIVER

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PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY
CANOAS CREEK

District: 04  County: Santa Clara
Route: SR 85  PM: 4.28
EA 4A7900  Bridge No.: 37-0412L, 37-0412R

Limits:
SR 85 bridges across Canoas Creek

Floodplain Description:
According to FIRM number 06085C0264H, Zone A floodplain exists at the Canoas Creek crossing of SR 85. The 100-year WSE of Canoas Creek is 159.1 ft NAVD at both the upstream and downstream ends of the crossing. The roadway elevation at Canoas Creek is approximately 180.5 ft NAVD, and is not inundated by the 1-percent annual chance flood.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  ☒  ☐
2. Are the risks associated with the implementation of the proposed action significant?  ☒  ☐
3. Will the proposed action support probable incompatible floodplain development?  ☒  ☐
4. Are there any significant impacts on natural and beneficial floodplain values?  ☒  ☐
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  ☒  ☐
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  ☒  ☐
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.  ☐  ☒
### FLOODPLAIN EVALUATION REPORT SUMMARY
#### CANOAS CREEK

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<td>Bridge No.:</td>
<td>37-0412L, 37-0412R</td>
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</tbody>
</table>

**PREPARED BY:**

| Signature - Hydraulic Engineer | Date |

**CONCURRENCE FROM:**

| Signature - Dist. Hydraulic Engineer | Date |
| Signature - Dist. Environmental Branch Chief | Date |
| Signature - Dist. Project Engineer | Date |
FLOODPLAIN EVALUATION REPORT SUMMARY
COYOTE CREEK

District: 04  County: Santa Clara
Route: US 101  PM:
EA 4A7900  Bridge No.

Limits:
Between Project limit (US 101 PM 28.6) and US 101/SR 85 Interchange (US 101 PM 26.70)

Floodplain Description:
Approximately 1.2 mi northwest of the US 101/SR 85 interchange, FIRM number 06085C0268H shows the overtopping flow from Coyote Creek encroaching onto US 101, which is classified as Zone AO floodplain. The FIRM lists the floodplain elevation adjacent to the Zone AO floodplain as 210 ft NAVD. The current topography shows the highway elevation to be approximately 210 ft NAVD, which is equivalent to the 100-year floodplain elevation.

1. Is the proposed action a longitudinal encroachment of the base floodplain? ☒
2. Are the risks associated with the implementation of the proposed action significant? ☒
3. Will the proposed action support probable incompatible floodplain development? ☒
4. Are there any significant impacts on natural and beneficial floodplain values? ☒
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. ☒
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)? ☒
7. Are Location Hydraulic Studies that document the above answers on file? If not explain. ☒
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PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY
COYOTE CREEK

District: 04  County: Santa Clara  
Route: US 101  PM: R26.47, R26.60  
EA 4A7900  Bridge No.: 37-0346L, 37-0346R  
___________________________  
37-0346E, 37-0346G

Limits:
US 101/SR85 Interchange bridges over Coyote Creek

Floodplain Description:
According to FIRM number 06085C0407H, existing Coyote Creek floodplain below the US 101 and the US 101/SR 85 interchange bridges is classified as Zone AE floodplain with elevation of 228.0 ft NAVD upstream of the US 101 crossing and 226.2 ft NAVD downstream of the US 101 crossing. Per the survey information, the roadway elevation at the crossing is approximately 241.5 ft NAVD, which is above the FEMA 100-year floodplain elevation.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
2. Are the risks associated with the implementation of the proposed action significant?  
3. Will the proposed action support probable incompatible floodplain development?  
4. Are there any significant impacts on natural and beneficial floodplain values?  
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.

March 2013  A-42
FLOODPLAIN EVALUATION REPORT SUMMARY
COYOTE CREEK

District: 04  County: Santa Clara
Route: US 101  PM: R26.47, R26.60
EA 4A7900  Bridge No.: 37-0346L, 37-0346R

PREPARED BY:

Signature - Hydraulic Engineer  Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer  Date

Signature - Dist. Environmental Branch Chief  Date

Signature - Dist. Project Engineer  Date
FLOODPLAIN EVALUATION REPORT SUMMARY
COYOTE CREEK

District: 04    County: Santa Clara
Route: US 101    PM:
EA 4A7900    Bridge No.:

Limits:
Between US 101/SR85 Interchange (PM 26.60) and US 101/Metcalf Road interchange (PM 25.31)

Floodplain Description:
Approximately 0.5 mi southeast of the US 101/SR 85 interchange, FIRM number 06085C0407H shows the floodplain of Coyote Creek, designated as Zone AE, encroaching onto US 101. The current topography, however, shows the highway elevation to be approximately 245 ft NAVD, well above the floodplain elevation of 235 ft NAVD.

1. Is the proposed action a longitudinal encroachment of the base floodplain? No Yes
2. Are the risks associated with the implementation of the proposed action significant? No Yes
3. Will the proposed action support probable incompatible floodplain development? No Yes
4. Are there any significant impacts on natural and beneficial floodplain values? No Yes
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)? No Yes
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.
FLOODPLAIN EVALUATION REPORT SUMMARY
COYOTE CREEK

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PREPARED BY:

Signature - Hydraulic Engineer    Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer    Date

Signature - Dist. Environmental Branch Chief    Date

Signature - Dist. Project Engineer    Date
FLOODPLAIN EVALUATION REPORT SUMMARY
COYOTE CREEK

District: 04    County: Santa Clara
Route: US 101    PM:
EA 4A7900    Bridge No.: 

Limits:
Between US 101/Metcalf Road interchange (PM 25.31) and Project limit (PM 23.1)

Floodplain Description:
Just southeast of the US 101/Metcalf Road interchange (PM 25.31), FIRM number 06085C0426H shows the floodplain of Coyote Creek, designated as Zone AE with elevation of 248 ft NAVD, encroaching onto US 101. The current topography, however, shows the highway elevation to be approximately 256 ft NAVD, well above the floodplain elevation.

1. Is the proposed action a longitudinal encroachment of the base floodplain?  
2. Are the risks associated with the implementation of the proposed action significant?  
3. Will the proposed action support probable incompatible floodplain development?  
4. Are there any significant impacts on natural and beneficial floodplain values?  
5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.  
6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).  
7. Are Location Hydraulic Studies that document the above answers on file? If not explain.
# Floodplain Evaluation Report Summary

**Coyote Creek**

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**Prepared By:**

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<td>Signature - Dist. Project Engineer</td>
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March 2013
**FLOODPLAIN EVALUATION REPORT SUMMARY**

**COYOTE CREEK**

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<td>EA</td>
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Limits:
Between US 101/Metcalf Road interchange (PM 25.31) and Project limit (PM 23.1)

Floodplain Description:
Approximately 0.5 mi northwest of the US 101/Bailey Road interchange (Project limit, PM 23.1), FIRM number 06085C0428H shows the floodplain of Coyote Creek, designated as Zone AE with elevation of 264 ft NAVD, encroaching onto US 101. The current topography, however, shows the pavement elevation of the US 101 to be approximately 270 ft NAVD, well above the floodplain elevation.

<p>| 1. Is the proposed action a longitudinal encroachment of the base floodplain? | No | Yes |
| 2. Are the risks associated with the implementation of the proposed action significant? | No | Yes |
| 3. Will the proposed action support probable incompatible floodplain development? | No | Yes |
| 4. Are there any significant impacts on natural and beneficial floodplain values? | No | Yes |
| 5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? | No | Yes |
| If yes, explain. | | |
| 6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). | No | Yes |
| 7. Are Location Hydraulic Studies that document the above answers on file? If not explain. | No | Yes |</p>
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PREPARED BY:

Signature - Hydraulic Engineer

Date

CONCURRENCE FROM:

Signature - Dist. Hydraulic Engineer

Date

Signature - Dist. Environmental Branch Chief

Date

Signature - Dist. Project Engineer

Date
Appendix B    Location Hydraulic Study Forms
LOCATION HYDRAULIC STUDY FORM
Matadero Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 51.37 EA: 4A7900
Federal-Aid Project Number: _________________________________

Floodplain Description:
According to FEMA FIRM 06085C0030H, 06085C0036H and 06085C0037H, the floodplain that covers much of US 101 in the vicinity of Matadero Creek crossing is designated as Zone AE. According to the City of Palo Alto, this area is due to the potential overtopping of bayfront levees in the event of an extremely high tide, particularly one that might be associated with an extreme storm event.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

The work at this floodplain consists of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= 1775 cfs
   WSE100= 11 ft
   The flood of record, if greater than Q100:
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO_____YES ____ X
B. Emergency vehicle access? NO_____YES ____ X
C. Practicable detour available? NO_____YES ____ X
D. School bus or mail route? NO_____YES ____ X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X
   Moderate_____
   High_______

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Matadero Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 51.37
Federal-Aid Project Number: ____________________________
EA 4A7900 Bridge No. 37-0040

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES
If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

___________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

___________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
Floodplain Description:
According to FEMA FIRMs 06085C0030H, 06085C0036H and 06085C0037H, the floodplain that covers much of US 101 in the vicinity of Adobe Creek crossing is designated as Zone AE. According to the City of Palo Alto, this area is due to the potential overtopping of bayfront levees in the event of an extremely high tide, particularly one that might be associated with an extreme storm event.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consists of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

3. Hydraulic Data: Base Flood Q100= 1780 cfs
   WSE100= 11 ft
   The flood of record, if greater than Q100:
   Q= N/A cfs   WSE= N/A
   Overtopping flood Q= N/A cfs   WSE= N/A

Are NFIP maps and studies available?     YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences?     NO  X  YES
B. Other Bldgs?    NO  X  YES
C. Crops?         NO  X  YES
D. Natural and beneficial Floodplain values? NO  X  YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route?   NO______YES   X
   B. Emergency vehicle access?            NO______YES   X
   C. Practicable detour available?        NO______YES   X
   D. School bus or mail route?            NO______YES   X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk     Low____  X
    Moderate____
    High________

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Adobe Creek

Dist. 04   Co. Santa Clara   Rte. US 101   P.M. 50.66
Federal-Aid Project Number: ________________________________
EA 4A7900   Bridge No. 37-0174

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________   Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)
___________________________________________   Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES
If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.
I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________   Date __________________
District Project Engineer (capital and ‘on’ system projects)
___________________________________________   Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:
I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

___________________________________________   Date __________________
District Project Manager (capital and ‘on’ system projects)
___________________________________________   Date __________________
Local Agency Project Manager (Local Assistance projects)
___________________________________________   Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.
__________________________________________   Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Permanente Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M. EA: 4A7900

Federal-Aid Project Number:__________________________________________________

Floodplain Description:
According to FIRM 06085C0037H, there is no floodplain directly at the US 101 crossing, but there are adjacent areas that
do fall within the 1-percent annual chance floodplain. These areas are designated as being within Zone AO, which
represents the floodplain caused by the shallow sheet overtopped flow from Permanente Creek during a 1-percent annual
chance flood event. This overtopping is due to the insufficient capacity of the concrete lined channel upstream of US 101.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consists of re-striping and new signs. This project would not widen the freeway, add any
impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location.
Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= 4,000 cfs
WSE100= 16 ft  The flood of record, if greater than Q100:
Q= N/A cfs  WSE= N/A
Overtopping flood Q= N/A cfs  WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design
alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Permanente Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M._____

Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No._____________________

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.
__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
Floodplain Description:
According to FEMA FIRM 06085C0037H, a Zone A floodplain exists at the Stevens Creek crossing of US 101. The profiles in the FIS show the 1-percent annual chance water surface elevation to be 35.9 ft NAVD upstream of the crossing and 35.7 ft NAVD just downstream of the crossing. The existing roadway elevation is approximately 40.0 ft NAVD, and is not inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consists of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A  Projected N/A

3. Hydraulic Data:
   | Base Flood Q100= | WSE100= 35.9 ft The flood of record, if greater than Q100: N/A |
   | Q= N/A cfs      | WSE= N/A            |
   | Overtopping flood Q= N/A cfs | WSE= N/A            |

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO  YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
- A. Residences? NO  X  YES
- B. Other Bldgs? NO  X  YES
- C. Crops? NO  X  YES
- D. Natural and beneficial Floodplain values? NO  X  YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
- A. Emergency supply or evacuation route? NO  YES  X
- B. Emergency vehicle access? NO  YES  X
- C. Practicable detour available? NO  YES  X
- D. School bus or mail route? NO  YES  X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   - A. Roadway $ N/A
   - B. Property $ N/A
   - Total $ N/A

9. Assessment of Level of Risk
   - Low  X
   - Moderate
   - High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Stevens Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M. 48.04
Federal-Aid Project Number: ______________________________________________
EA 4A7900 Bridge No. 37-0034

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)
___________________________________________ Date
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)
___________________________________________ Date
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

___________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)
___________________________________________ Date
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Stevens Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R22.95 EA: 4A7900

Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
According to FIRM number 06085C0039H, a Zone A floodplain exists at the Stevens Creek crossing of SR 85 at PM 22.95. The profiles in the FIS show the 1-percent annual chance water surface elevation to be 64.6 ft NAVD upstream of the SR 85 crossing and 64.0 ft NAVD downstream of the crossing. The roadway elevation is at approximately 78.0 ft NAVD, and would not be inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consists of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= 5,350 cfs
   WSE100= 64.6 ft The flood of record, if greater than Q100:
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO _____ YES X
   B. Emergency vehicle access? NO _____ YES X
   C. Practicable detour available? NO _____ YES X
   D. School bus or mail route? NO _____ YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X
    Moderate
    High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Stevens Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R22.95
Federal-Aid Project Number: ____________________________
EA 4A7900 Bridge No. 37-0197

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.  
___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO ___ X ___ YES __________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:  
___________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

___________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

___________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Stevens Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R20.96 EA: 4A7900

Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
According to FEMA FIRM 06085C0202H, Zone A floodplain exists at the SR 85 Bridge over Stevens Creek at PM 20.96. The FIRM does not show a sign of overbank flow inundating SR 85 or backwater at the bridge crossing.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consists of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current (2009) 115,000 Projected (2035, Build) 143,600

3. Hydraulic Data: Base Flood Q100= 7,390 cfs
   WSE100= N/A The flood of record, if greater than Q100:
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Stevens Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R20.96
Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No. 37-0189

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate. ___________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO ___ X ___ YES __________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report: ___________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

_____________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided.)

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM

Stevens Creek

Dist. 04 Co. Santa Clara Rte. SR85 P.M. R20.02 EA: 4A7900

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM number 06085C0206H, Zone A floodplain exists at the Stevens Creek crossing of SR 85 just north of Fremont Avenue. The FIRM does not show a sign of overbank flow inundating SR 85 or backwater at the bridge crossing.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
No bridge widening is proposed as part of the Project. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current (2009) 115,000 Projected (2035, Build) 143,600

3. Hydraulic Data:
   Base Flood Q100 = 6,000 cfs
   WSE100 = N/A
   Q = N/A cfs
   Overtopping flood Q = N/A cfs

   The flood of record, if greater than Q100: N/A
   WSE = N/A

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO YES X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X
    Moderate
    High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Stevens Creek

Dist.  04  Co.  Santa Clara  Rte.  SR 85  P.M.  R20.02
Federal-Aid Project Number: ____________________________________________________
EA  4A7900  Bridge No.  37-0185

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________   Date __________________
District Hydraulic Engineer  (capital and ‘on’ system projects)
___________________________________________   Date __________________
Local Agency/Consulting Hydraulic Engineer  (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?    NO  X  YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.
I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________   Date __________________
District Project Engineer  (capital and ‘on’ system projects)
___________________________________________   Date __________________
Local Agency Project Engineer  (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.
___________________________________________   Date __________________
District Project Manager  (capital and ‘on’ system projects)
___________________________________________   Date __________________
Local Agency Project Manager  (Local Assistance projects)
___________________________________________   Date __________________
District Local Assistance Engineer  (or District Hydraulic Branch for very complex projects or when required expertise is unavailable.  Note:  District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).
I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.
___________________________________________   Date __________________
District Senior Environmental Planner  (or Designee)

Note:  If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
Floodplain Description:
According to FIRM number 06085C0202H, Zone A floodplain exists at the Permanente Diversion crossing of SR 85. The FIRM does not show a sign of overbank flow inundating SR 85 or backwater at the bridge crossing.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
No bridge widening is proposed as part of the Project. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT:
   - Current (2009) 115,000
   - Projected (2035, Build) 143,600

3. Hydraulic Data:
   - Base Flood Q100= 1,390 cfs
   - WSE100= N/A
   - The flood of record, if greater than Q100: N/A
   - Q= N/A cfs
   - WSE= N/A
   - Overtopping flood Q= N/A cfs
   - WSE= N/A

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   - Residences? NO X YES
   - Other Bldgs? NO X YES
   - Crops? NO X YES
   - Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   - Emergency supply or evacuation route? NO X YES
   - Emergency vehicle access? NO X YES
   - Practicable detour available? NO X YES
   - School bus or mail route? NO X YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   - Roadway $ N/A
   - Property $ N/A
   - Total $ N/A

9. Assessment of Level of Risk
   - Low X
   - Moderate
   - High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Permanente Creek Diversion

Dist. 04 Co. Santa Clara Rte. SR 85 P.M.  
Federal-Aid Project Number: ________________________________
EA 4A7900 Bridge No. ________________________________

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

_________________________  Date __________________
District Hydraulic Engineer  (capital and ‘on’ system projects)

_________________________  Date __________________
Local Agency/Consulting Hydraulic Engineer  (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

_________________________  Date __________________
District Project Engineer  (capital and ‘on’ system projects)

_________________________  Date __________________
Local Agency Project Engineer  (local assistance projects)

CONCURRED BY:
I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

_________________________  Date __________________
District Project Manager  (capital and ‘on’ system projects)

_________________________  Date __________________
Local Agency Project Manager  (Local Assistance projects)

_________________________  Date __________________
District Local Assistance Engineer  (or District Hydraulic Branch for very complex projects or when required expertise is unavailable.  Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

_________________________  Date __________________
District Senior Environmental Planner  (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Regnart Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 16.65 EA: 4A7900

Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
There is no applicable floodplain for Regnart Creek. In September 2010, FEMA issued Letter of Map Revision (LOMR) number 10-09-2408P-060339, which shows the 1-percent annual chance flood as being contained within the cross culvert under SR 85.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
Regnart Creek is contained within the channel at the SR 85 crossing and does not have a floodplain. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:

   Base Flood Q100= N/A cfs
   WSE100= N/A
   Q= N/A cfs
   Overtopping flood Q= N/A cfs

   The flood of record, if greater than Q100: N/A
   WSE= N/A
   WSE= N/A

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Regnart Creek

Dist.  04  Co.  Santa Clara  Rte. SR 85  P.M.  16.65
Federal-Aid Project Number: ____________________________________________________
EA      4A7900  Bridge No.________________________

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________   Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________   Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?    NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________   Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________   Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.
_________________________________________   Date _________________
District Project Manager (capital and ‘on’ system projects)

_________________________________________   Date _________________
Local Agency Project Manager (Local Assistance projects)

_________________________________________   Date _________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable.  Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.
_________________________________________   Date _________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Calabazas Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R15.40 EA: 4A7900

Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
According to FIRM number 06085C0217H, Zone AE floodplain exists at the Calabazas Creek crossing of SR 85. The 100-year water surface elevation is 284.1 ft NAVD upstream of the crossing and 280.2 ft NAVD downstream of the crossing. The roadway elevation is at approximately 296.5 ft NAVD and is not inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The existing bridge across Calabazas Creek does not get overtopped in the 1-percent annual chance flood and would not be modified as part of this project. The floodplain does not extend beyond the limits of the bridge. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current (2009) 100,000 Projected (2035, Build) 150,800

3. Hydraulic Data: Base Flood Q100= 1,800 cfs
   WSE100= 284.1 ft The flood of record, if greater than Q100: N/A
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
   A. Residences? NO YES
   B. Other Bldgs? NO YES
   C. Crops? NO YES
   D. Natural and beneficial Floodplain values? NO YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES
   B. Emergency vehicle access? NO YES
   C. Practicable detour available? NO YES
   D. School bus or mail route? NO YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Calabazas Creek

Dist.  04  Co.  Santa Clara  Rte.  SR 85  P.M.  R15.40
Federal-Aid Project Number: ________________________________
EA  4A7900  Bridge No.  37-0527L, 37-0527R, 37-0527S

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________  Date __________________
District Hydraulic Engineer  (capital and ‘on’ system projects)

___________________________________________  Date __________________
Local Agency/Consulting Hydraulic Engineer  (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________  Date __________________
District Project Engineer  (capital and ‘on’ system projects)

___________________________________________  Date __________________
Local Agency Project Engineer  (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

District Project Manager  (capital and ‘on’ system projects)

___________________________________________  Date __________________
Local Agency Project Manager  (Local Assistance projects)

___________________________________________  Date __________________
District Local Assistance Engineer  (or District Hydraulic Branch for very complex projects or when required expertise is unavailable.  Note:  District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

District Senior Environmental Planner  (or Designee)

Note:  If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Rodeo Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 15.06 EA: 4A7900

Federal-Aid Project Number: ____________________________________________

Floodplain Description:
According to FIRM number 06085C0217H, Zone A floodplain exists at the Rodeo Creek crossing of SR 85. The roadway elevation is at approximately 288.0 ft NAVD and is not inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
Work within the FEMA-defined floodplain area would include median widening. This widening, however, would take place well above the 1-percent annual chance flood water surface elevation, would not significantly change the roadway profile, and would involve minimal grading. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT:
   Current (2009) 100,000
   Projected (2035, Build) 150,800

3. Hydraulic Data:
   Base Flood Q100= N/A cfs
   WSE100= 280.8 ft The flood of record, if greater than Q100:
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO_____ YES____ X
   B. Emergency vehicle access? NO_____ YES____ X
   C. Practicable detour available? NO_____ YES____ X
   D. School bus or mail route? NO_____ YES____ X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low____ X
   Moderate____
   High_____

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Rodeo Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 15.06
Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No.____________________________

PREPARED BY:

Signature:________________________________________________________________________
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO  X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

____________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

____________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

____________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

____________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Saratoga Creek

Dist. 04  Co. Santa Clara  Rte. SR 85  P.M. R13.91  EA: 4A7900
Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM number 06085C0219H, Zone A floodplain exists at the Saratoga Creek crossing of SR 85. The roadway elevation at Saratoga Creek is approximately 319.5 ft NAVD, and is not inundated by the 1-percent annual chance flood.

1. Description of Proposal
   (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

   Bridge widening is proposed to close the gap between the northbound and southbound bridges. The proposed bridge will remain single-span and will not change the existing hydraulic opening. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT:  Current (2009) 100,000  Projected (2035, Build) 150,800

3. Hydraulic Data:
   Base Flood Q100 = 3,950 cfs
   WSE100 = 315 ft
   The flood of record, if greater than Q100:
   Q = N/A cfs  WSE = N/A
   Overtopping flood Q = N/A cfs  WSE = N/A

   Are NFIP maps and studies available?  YES

4. Is the highway location alternative within a regulatory floodway?  NO  YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences?  NO  X  YES
   B. Other Bldgs?  NO  X  YES
   C. Crops?  NO  X  YES
   D. Natural and beneficial Floodplain values?  NO  X  YES

   "Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route?  NO  YES  X
   B. Emergency vehicle access?  NO  YES  X
   C. Practicable detour available?  NO  YES  X
   D. School bus or mail route?  NO  YES  X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low  X
   Moderate
   High

   For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Saratoga Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R13.91

Federal-Aid Project Number: ____________________________________________________

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

__________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

__________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

__________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Vasona Creek

Dist. 04  Co. Santa Clara  Rte. SR 85  P.M. 12.72  EA: 4A7900
Federal-Aid Project Number: ______________________________

Floodplain Description:
According to FIRM number 06085C0238H, Zone A floodplain exists at the Vasona Creek crossing of SR 85. The floodplain shown on the FIRM suggests that Vasona Creek is contained within its banks. However, available information does not confirm whether or not the floodplain elevation overtops SR 85 at this location.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
Work within the FEMA-defined floodplain area would include median widening. This widening, however, would not significantly change the profile and would involve minimal grading. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A  Projected N/A

3. Hydraulic Data: Base Flood Q100= N/A cfs
   WSE100= N/A The flood of record, if greater than Q100: N/A
   Q= N/A cfs  WSE= N/A
   Overtopping flood Q= N/A cfs  WSE= N/A

Are NFIP maps and studies available?  YES

4. Is the highway location alternative within a regulatory floodway?  NO  YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences?  NO  YES
B. Other Bldgs?  NO  YES
C. Crops?  NO  YES
D. Natural and beneficial Floodplain values?  NO  YES

“Natural and beneficial flood-plain values” shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route?  NO YES
B. Emergency vehicle access?  NO YES
C. Practicable detour available?  NO YES
D. School bus or mail route?  NO YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk  Low
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Vasona Creek

Dist. 04  Co. Santa Clara  Rte. SR 85  P.M. 12.72
Federal-Aid Project Number: ____________________________________________________
EA 4A7900  Bridge No. ________________

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.  
___________________________________________  Date __________________
District Hydraulic Engineer  (capital and 'on' system projects)

___________________________________________  Date __________________
Local Agency/Consulting Hydraulic Engineer  (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  
NO____ X____ YES________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:  
__________________________________________  Date __________________
District Project Engineer  (capital and ‘on’ system projects)

___________________________________________  Date __________________
Local Agency Project Engineer  (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

_____________________________________  Date ________________
District Project Manager  (capital and ‘on’ system projects)

______________________________________  Date ________________
Local Agency Project Manager  (Local Assistance projects)

______________________________________  Date ________________
District Local Assistance Engineer  (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

______________________________________  Date ________________
District Senior Environmental Planner  (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
San Tomas Aquino Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R12.68 EA: 4A7900
Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FIRM number 06085C0238H, Zone A floodplain exists at the San Tomas Aquino Creek crossing of SR 85. The floodplain shown on the FIRM suggests that San Tomas Aquino Creek is contained within its banks. However, available information does not confirm whether or not the floodplain elevation overtops SR 85 at this location.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
Bridge widening is proposed to close the gap between the northbound and southbound bridges. The proposed bridge will remain single-span and will not change the existing hydraulic opening. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= 1,350 cfs
   WSE100= N/A
   The flood of record, if greater than Q100: N/A
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO X YES
B. Emergency vehicle access? NO X YES
C. Practicable detour available? NO X YES
D. School bus or mail route? NO X YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
San Tomas Aquino Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R12.68
Federal-Aid Project Number: ________________________________
EA 4A7900 Bridge No. 37-0524L, 37-0524R

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate. ___________________________ Date ___________________________
District Hydraulic Engineer (capital and ‘on’ system projects)

_________________________ Date ___________________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report: ___________________________ Date ___________________________
District Project Engineer (capital and ‘on’ system projects)

_________________________ Date ___________________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

_________________________ Date ___________________________
District Project Manager (capital and ‘on’ system projects)

_________________________ Date ___________________________
Local Agency Project Manager (Local Assistance projects)

_________________________ Date ___________________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis. ___________________________ Date ___________________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Smith Creek

Dist.  04     Co. Santa Clara    Rte. SR 85    P.M. 11.82    EA:  4A7900

Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
Smith Creek does not have a 100-year floodplain where it crosses SR 85. The floodplain assigned at the Smith Creek RCP cross culvert crossing SR 85 is Zone X (shaded).

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The Project is performed outside of the existing 100-year floodplain. Elements to minimize floodplain impacts are not proposed at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A  Projected N/A

3. Hydraulic Data: Base Flood Q100 = 440 cfs
   WSE100 = N/A
   Q = N/A cfs
   WSE = N/A
   Overtopping flood Q = N/A cfs
   WSE = N/A

   Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate____
   High______

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Smith Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 11.82
Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No. __________________________

PREPARED BY:

Signature: 
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate. 
___________________________________________ Date __________________
District Hydraulic Engineer (capital and 'on' system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report: 
__________________________________________ Date __________________
District Project Engineer (capital and 'on' system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________ Date __________________
District Project Manager (capital and 'on' system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Los Gatos Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R10.80 EA: 4A7900

Federal-Aid Project Number: ________________________________

Floodplain Description:
According to FEMA FIRM 06085C0239H, Zone AE floodplain exists at the Los Gatos Creek crossing of SR 85. The water surface elevation is 263.6 ft NAVD upstream of the crossing and 263.1 ft NAVD downstream of the crossing. The roadway elevation at the crossing is approximately 269.5 ft NAVD and is not inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The existing bridge across Los Gatos Creek is not overtopped by the 1-percent annual chance flood and would not be modified as part of this project. The floodplain does not extend beyond the limits of the bridge. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100 = 6,950 cfs
   WSE100 = 263.6 The flood of record, if greater than Q100: N/A
   Q = N/A cfs WSE = N/A
   Overtopping flood Q = N/A cfs WSE = N/A

4. Are NFIP maps and studies available? YES

5. Attachment map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X
Moderate
High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Los Gatos Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. R10.80
Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No. 37-0491L, 37-0491 R

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.
___________________________________________ Date __________________
District Hydraulic Engineer (capital and 'on' system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________ Date __________________
District Project Engineer (capital and 'on' system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

__________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.
__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Ross Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 8.15 EA: 4A7900

Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
According to FIRM number 06085C0243H, Zone A floodplain exists at the Ross Creek crossing of SR 85. Based on the available information, 100-year WSE at the upstream and downstream of the crossing was estimated to be 203 ft NAVD and 202 ft NAVD, respectively. The roadway elevation at this crossing is approximately 224.5 ft NAVD, and will not be inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
Work within the FEMA-defined floodplain area would include median widening. This widening, however, would take place well above the 1-percent annual chance water surface elevation, would not significantly change the roadway profile, and would involve minimal grading. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= 1,300 cfs
WSE100= 203 The flood of record, if greater than Q100: N/A
Q= N/A cfs WSE= N/A
Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.

A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X Moderate High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Ross Creek

Dist.  04      Co.  Santa Clara       Rte.  SR 85       P.M.  8.15
Federal-Aid Project Number: ____________________________________________________  
EA    4A7900       Bridge No.      37-0469

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.  
___________________________________________   Date __________________
District Hydraulic Engineer  (capital and ‘on’ system projects)

___________________________________________   Date __________________
Local Agency/Consulting Hydraulic Engineer  (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?    NO    X    YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:  
__________________________________________   Date __________________
District Project Engineer  (capital and ‘on’ system projects)

___________________________________________   Date __________________
Local Agency Project Engineer  (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

___________________________________________   Date __________________
District Project Manager  (capital and ‘on’ system projects)

___________________________________________   Date __________________
Local Agency Project Manager  (Local Assistance projects)

___________________________________________   Date __________________
District Local Assistance Engineer  (or District Hydraulic Branch for very complex projects or when required expertise is unavailable.  Note:  District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.  
___________________________________________   Date __________________
District Senior Environmental Planner  (or Designee)

Note:  If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Guadalupe River

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 5.59 EA: 4A7900

Federal-Aid Project Number: ____________________________

Floodplain Description:
According to FIRM number 06085C0263H, Zone A floodplain exists at the Guadalupe River crossing of SR 85. According to the stream profiles in FEMA FIS, 1-percent annual chance water surface elevation as 178.9 ft NAVD upstream of the SR 85 crossing and 178.5 ft NAVD downstream of the crossing. The roadway elevation is approximately 217 ft NAVD at the crossing and is not inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The existing bridge across Guadalupe River is not overtopped by the 1-percent annual chance flood, and would not be modified as part of this project. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= 11,500 cfs
   WSE100= 178.9 The flood of record, if greater than Q100: N/A
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO_____ YES X
B. Emergency vehicle access? NO______ YES X
C. Practicable detour available? NO________ YES X
D. School bus or mail route? NO_________ YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk Low X
Moderate
High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Guadalupe River

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 5.59
Federal-Aid Project Number: ________________________________
EA 4A7900 Bridge No. 37-0467L, 37-0467R

**PREPARED BY:**

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.  
___________________________________________ Date ________________  
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date ________________  
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:  
___________________________________________ Date ________________  
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date ________________  
Local Agency Project Engineer (local assistance projects)

**CONCURRED BY:**

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

____________________________________________________________________________  
District Project Manager (capital and ‘on’ system projects)

____________________________________________________________________________  
Local Agency Project Manager (Local Assistance projects)

____________________________________________________________________________  
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.  
___________________________________________ Date ________________  
District Senior Environmental Planner (or Designee)

**Note:** If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Canoas Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 4.28 EA: 4A7900

Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
According to FIRM number 06085C0264H, Zone A floodplain exists at the Canoas Creek crossing of SR 85. The 100-year WSE of Canoas Creek is 159.1 ft NAVD at both the upstream and downstream ends of the crossing. The roadway elevation at Canoas Creek is approximately 180.5 ft NAVD, and is not inundated by the 1-percent annual chance flood.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
   The work at this floodplain consist of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current (2009) 141,000 Projected (2035, Build) 187,300

3. Hydraulic Data: Base Flood Q100= 1,400 cfs
   WSE100= 159.1
   The flood of record, if greater than Q100: N/A
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

   "Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Canoas Creek

Dist. 04 Co. Santa Clara Rte. SR 85 P.M. 4.28

Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No. 37-0412L, 37-0412R

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

__________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

__________________________________________ Date
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

__________________________________________ Date
Local Agency Project Manager (Local Assistance projects)

__________________________________________ Date
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding
LOCATION HYDRAULIC STUDY FORM
Coyote Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M. EA: 4A7900
Federal-Aid Project Number: ____________________________________________________

Floodplain Description:
Approximately 1.2 mi northwest of the US 101/SR 85 interchange, FIRM number 06085C0268H shows the overtopping flow from Coyote Creek encroaching onto US 101, which is classified as Zone AO floodplain. The FIRM lists the floodplain elevation adjacent to the Zone AO floodplain as 210 ft NAVD. The current topography shows the highway elevation to be approximately 210 ft NAVD, which is equivalent to the 100-year floodplain elevation.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The Project at the floodplain would primarily consist of re-striping and placing new signs, which would not widen the freeway, add impervious areas, increase flows, or grade any new slopes, and thus would not affect any floodplains. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= _______ cfs
   WSE100= 210 The flood of record, if greater than Q100: N/A
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Coyote Creek

Dist.  04     Co. Santa Clara    Rte. US 101     P.M.  EA:  4A7900
Federal-Aid Project Number: __________________________________________
EA  4A7900                     Bridge No.____________________________________

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.  
___________________________________________   Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________   Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?    NO X YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:
__________________________________________   Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________   Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________   Date __________________
District Project Manager (capital and ‘on’ system projects)

__________________________________________   Date __________________
Local Agency Project Manager (Local Assistance projects)

__________________________________________   Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

__________________________________________   Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Coyote Creek

EA: 4A7900 Federal-Aid Project Number: ______________________________

Floodplain Description:
According to FIRM number 06085C0407H, existing Coyote Creek floodplain below the US 101 and the US 101/SR 85 interchange bridges is classified as Zone AE floodplain with elevation of 228.0 ft NAVD upstream of the US 101 crossing and 226.2 ft NAVD downstream of the US 101 crossing. Per the survey information, the roadway elevation at the crossing is approximately 241.5 ft NAVD, which is above the FEMA 100-year floodplain elevation.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consist of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100= 13,670 cfs
   WSE100= 228
   The flood of record, if greater than Q100: N/A
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO YES X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

   Potential Q100 backwater damages:
   A. Residences? NO X YES
   B. Other Bldgs? NO X YES
   C. Crops? NO X YES
   D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
   A. Emergency supply or evacuation route? NO YES X
   B. Emergency vehicle access? NO YES X
   C. Practicable detour available? NO YES X
   D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk
   Low X
   Moderate
   High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Coyote Creek

Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No. 37-0346L, 37-0346R, 37-0346E, 37-0346G

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate. ___________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO ______ YES __ X __

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report: ___________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

Date __________________
District Project Manager (capital and ‘on’ system projects)

Date __________________
Local Agency Project Manager (Local Assistance projects)

Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.
LOCATION HYDRAULIC STUDY FORM
Coyote Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M. ______________________________
EA: 4A7900 Federal-Aid Project Number: ______________________________

Floodplain Description:
Approximately 0.5 mi southeast of the US 101/SR 85 interchange, FIRM number 06085C0407H shows the Zone AE floodplain of Coyote Creek with the elevation of 235 ft encroaching onto US 101. The current topography, however, shows the highway elevation to be approximately 245 ft NAVD, well above the floodplain elevation of 235 ft, NAVD.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consist of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data: Base Flood Q100= ____ cfs
   WSE100= 235 ft The flood of record, if greater than Q100: N/A
   Q = N/A cfs WSE= N/A
   Overtopping flood Q = N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO YES X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X
    Moderate
    High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
Coyote Creek

Federal-Aid Project Number: ____________________________

EA 4A7900  Bridge No. __________________________________________

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?  NO_______YES__X____

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

___________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

___________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

___________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding
Location Hydraulic Study Form
Coyote Creek

EA: 4A7900

Floodplain Description:
Just southeast of the US 101/Metcalf Road interchange (PM 25.31), FIRM number 06085C0426H shows the floodplain of Coyote Creek, designated as Zone AE with elevation of 248 ft NAVD, encroaching onto US 101. The current topography, however, shows the highway elevation to be approximately 256 ft NAVD, well above the floodplain elevation.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consist of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A

3. Hydraulic Data:
   Base Flood Q100=_________ cfs
   WSE100= 248
   Q= N/A cfs
   WSE= N/A
   Overtopping flood Q= N/A cfs
   WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO X YES

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO X YES
B. Emergency vehicle access? NO X YES
C. Practicable detour available? NO X YES
D. School bus or mail route? NO X YES

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
A. Roadway $ N/A
B. Property $ N/A
Total $ N/A

9. Assessment of Level of Risk
Low X
Moderate
High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Coyote Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M.  
Federal-Aid Project Number: ____________________________
EA  4A7900 Bridge No. ____________________________

PREPARED BY:

Signature:  
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.  
___________________________________________ Date __________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development?   NO_____YES____X____

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

__________________________________________ Date __________________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

__________________________________________ Date __________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date __________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date __________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

__________________________________________ Date __________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding
LOCATION HYDRAULIC STUDY FORM
Coyote Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M. ________________
EA: 4A7900 Federal-Aid Project Number: ______________________________

Floodplain Description:
Approximately 0.5 mi northwest of the US 101/Bailey Road interchange (Project limit, PM 23.1), FIRM number 06085C0428H shows the floodplain of Coyote Creek, designated as Zone AE with elevation of 264 ft NAVD, encroaching onto US 101. The current topography, however, shows the pavement elevation of the US 101 to be approximately 270 ft NAVD, well above the floodplain elevation.

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)
The work at this floodplain consist of re-striping and new signs. This project would not widen the freeway, add any impervious areas, increase flows, or grade any new slopes, and thus would not affect the floodplain at this location. Therefore, minimization and/or mitigation measures are not proposed.

2. ADT: Current N/A Projected N/A________

3. Hydraulic Data: Base Flood Q100= 13,670 cfs
   WSE100= 264
   The flood of record, if greater than Q100: N/A
   Q= N/A cfs WSE= N/A
   Overtopping flood Q= N/A cfs WSE= N/A

Are NFIP maps and studies available? YES

4. Is the highway location alternative within a regulatory floodway? NO YES X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:
A. Residences? NO X YES
B. Other Bldgs? NO X YES
C. Crops? NO X YES
D. Natural and beneficial Floodplain values? NO X YES

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:
A. Emergency supply or evacuation route? NO YES X
B. Emergency vehicle access? NO YES X
C. Practicable detour available? NO YES X
D. School bus or mail route? NO YES X

7. Estimated duration of traffic interruption for 100-year event hours: N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.
   A. Roadway $ N/A
   B. Property $ N/A
   Total $ N/A

9. Assessment of Level of Risk Low X
    Moderate
    High

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.
LOCATION HYDRAULIC STUDY FORM cont.
Coyote Creek

Dist. 04 Co. Santa Clara Rte. US 101 P.M.__________
Federal-Aid Project Number: ____________________________________________________
EA 4A7900 Bridge No.__________________________________________________________

PREPARED BY:

Signature: I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate. __________________________________________ Date __________________________
District Hydraulic Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________________
Local Agency/Consulting Hydraulic Engineer (local assistance projects)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO________YES__X____
If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report: ______________ Date ______________
District Project Engineer (capital and ‘on’ system projects)

___________________________________________ Date __________________________
Local Agency Project Engineer (local assistance projects)

CONCURRED BY:

I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

___________________________________________ Date _________________
District Project Manager (capital and ‘on’ system projects)

___________________________________________ Date _________________
Local Agency Project Manager (Local Assistance projects)

___________________________________________ Date _________________
District Local Assistance Engineer (or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

___________________________________________ Date _________________
District Senior Environmental Planner (or Designee)

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding
Appendix C  Federal Emergency Management Agency
Flood Insurance Rate Maps
Location Hydraulic Study Report
SR 85 Express Lanes Project
Santa Clara County, California

March 2013