Memorandum

Date: September 13, 2011

To: Gordon Sweet, Project Engineer, BKF Engineers
    Christophe Schneider, Assistant Public Works Director, City Engineer,
    City of Santa Cruz
    Yvonne Hoffman, Environmental Manager, Caltrans District 5

Cc:

From: Nate Martin, Water Quality Specialist, ICF International
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Subject: City of Santa Cruz Route 1/Route 9 Intersection Improvement Project,
         Water Quality Technical Memorandum

Project Location

The California Department of Transportation (Caltrans) proposes to implement improvements to
the intersection at Route 1 and Route 9/River Street (Route 1/9 intersection) in the City of Santa
Cruz, Santa Cruz County, California. These roadways are under Caltrans’ jurisdiction. Figure 1
shows the location in the City of Santa Cruz.

Proposed Project

The purposes of the project are to:

- Alleviate congestion at the Route 1/9 intersection
- Better accommodate existing and projected traffic volumes at the Route 1/9 intersection
- Improve safety

The following improvements are proposed at the Route 1/9 intersection (listed below by segment).
The project design plan is shown in Figure 2.
Figure 1
Regional and Project Location
Figure 2
Plan View

ROUTE 1/9 INTERSECTION IMPROVEMENTS PROJECT
EA#: 05-465800
SCR 1-17.5/17.7
SCR 9-0.0/0.2

Source: BKF Engineers
Route 9 (North of the Route 1/9 Intersection)

Northbound Route 9

- Add a second northbound lane and an 8-foot shoulder on northbound Route 9, from Route 1 to Fern Street, to receive vehicular and bicycle traffic from both the new left-turn lane on Route 1 and the converted shared left/through lane from northbound River Street.

- Add a 4-foot through bike lane, 12-foot right turn lane, and 4-foot shoulder on northbound Route 9, between Fern Street and Encinal Street, to accommodate bicycle through traffic, and vehicular traffic turning into the Tannery Arts Center.

- Replace channelizers with a 2-foot raised concrete median along Route 9 from Route 1 to Fern Street.

These improvements, all of which are standard lane and shoulder width dimensions, would require widening the existing roadway. Curb and gutter (at locations noted above) would be constructed along Route 9 from the Route 1/9 intersection to the south side of the Route 9/Encinal Street intersection.

An earthen embankment would be constructed to support the roadway widening over the drainage culvert (known as Arroyo de San Pedro Regaldo) located at the northeast corner of the Route 1/9 intersection. The embankment would have a 2:1 slope with the toe of the embankment extending approximately 20–40 feet beyond the existing roadway. The existing culvert would be extended approximately 10 feet. The existing concrete apron and cutoff wall that extend approximately 25 feet from the existing culvert would remain in place or reconstructed “in-kind”. All construction activities would be conducted during the dry season. Dewatering would be accomplished by using small check dams and bypass pipes.

The road widening would result in the displacement of a private residence (744 River Street, Assessor’s Parcel Number [APN] 008-172-08-000) on the east side of Route 9 located between the drainage culvert and the Central Home Supply (808 River Street, APN 008-163-06-000), a landscape and building supply business, both owned by the same property owner. The road widening would also result in loss of unofficial parking in front of Central Home Supply and would displace a portion of the Central Home Supply’s showroom; the entire Central Home Supply parcel is not needed to accommodate the additional right-of-way needed for the project. Although full acquisition of APN 008-163-06-000 is not required to accommodate the proposed right-of-way, full acquisition of this parcel is assumed for the purposes of the environmental analysis conducted for this project as a worst-case assumption.

Since full acquisition of the parcel that houses the Central Home Supply buildings may be required, full acquisition of APN 008-172-16-000, also owned by the property owner of APN 008-172-08-000 and 008-163-06-000, is also assumed. This parcel is used by Central Home Supply for materials storage.

Road widening may require construction of a retaining wall on the east side of Route 9 between Encinal Street and the Central Home Supply’s driveway located south of Fern Street. The
area along Central Home Supply is currently within Caltrans right-of-way and is being leased by Central Home Supply. The proposed improvements would also result in the removal of a number of street trees near the Route 9/Fern Street intersection.

**Southbound Route 9**

- Add a new shared through/left turn lane on southbound Route 9 to permit a triple left onto eastbound Route 1 and two through (receiving) lanes to southbound River Street.
- Add a 4-foot through bike lane to accommodate bicycle through traffic.

These improvements, all which are standard lane and shoulder width dimensions, would require widening of the existing roadway and removal of the existing landscaping immediately adjacent to the Rebele Family Shelter that is part of the City-owned Homeless Services Center (115 Coral Street) located at the corner of Route 9 and Coral Street. The Rebele Family Shelter structure would not be directly affected, but the southeast corner of the structure would be moved closer to the travel lanes. The nearest lane is currently about 28 feet from the shelter and the new turn pocket would be about 19 feet from the shelter. Due to the standardization of the lane widths, the upstream lane that contributes to this right-turn pocket would actually be seven feet further away from the structure. The road widening may also require the reconstruction of a masonry block wall located at the corner immediately south of the Homeless Services Center and result in the removal of ornamental trees and shrubs adjacent to the masonry wall. Curb, gutter and sidewalk would be reconstructed from the Route 1/9 intersection to Coral Street. Road widening could also require the relocation of various road signs; an ornamental metal picket fence; electrical power poles; light poles along the sidewalk between Route 1 and Coral Street; an existing storm drain inlet; and an electrical box near the northwest quadrant of the Route 1/9 intersection.

**River Street (South of the Route 1/9 Intersection)**

**Northbound River Street**

- Revise the left turn lane to provide a shared through/left turn lane, so two lanes turn onto westbound Route 1.
- Extend the queuing length for the two right turn lanes onto eastbound Route 1.

These improvements, all of which are standard lane and shoulder width dimensions, would require widening of the existing roadway. Curb, gutter, and sidewalk would be reconstructed from the Route 1/9 intersection to a point approximately 300 feet south of the intersection. Due to the elevation difference between the roadway and the existing grade immediately southeast of the intersection, a retaining wall may be necessary to minimize impacts to the adjacent properties. Where there is sufficient room to grade, the slope would be graded to a 2:1 (horizontal: vertical) maximum slope. The existing street frontage landscaping would be removed, and the sidewalk would be narrowed from eight feet to five feet. Road widening would also result in the removal of approximately five street trees; relocation of a utility joint trench located beneath the existing sidewalk, including utility boxes, vaults, backflow preventers, roadside signs, and street lights; and reconstruction of the pedestrian and bicycle access to the Gateway Plaza shopping center. Road widening would also
impact the driveway to the commercial office building located at 700/720 River Street which could require reconstruction of the driveway and the retaining wall (including hand railing) immediately adjacent to the commercial office, necessitate the removal of two redwood trees (including one of heritage size), and result in the loss of one to two onsite parking spaces along the driveway.

Additionally, the narrow concrete raised median in the middle of River Street, between Madrone Street and Cottonwood Street, would be removed and replaced with a double-yellow median stripe. The median surrounding the existing River Street gateway sign would be reconstructed to accommodate the new alignment, and the gateway sign would need to be removed and/or relocated.

Southbound River Street

- Realign the two lanes to receive traffic from the two through lanes on southbound Route 9.

These improvements all of which are standard lane and shoulder width dimensions would require widening of southbound River Street from the Route 1/9 intersection to the River Street/ Cottonwood Street intersection. To accommodate curb, gutter, and sidewalk (including curb returns), the street frontage landscaping, including two street trees, would be removed, and the existing sidewalk would be narrowed from eight feet to five feet. The existing street light poles and other utility facilities would be relocated due to the widening.

Route 1 (West of the Route 1/9 Intersection)

Eastbound Route 1

- Add a left turn lane on eastbound Route 1 so that two lanes turn onto northbound Route 9.
- Remove the existing traffic signal mast arm and “pork chop” island between the right turn lane and through lane. A new signal mast arm will be installed at the curb return at the southwest corner of the intersection of Route 1/River Street, just south of the handicap ramps.
- Reconstruct the median, from the Route 1/9 intersection to the SCBT&P railroad tracks, to accommodate the additional left turn lane.

Road widening would be minor and within the Caltrans right-of-way. The crosswalk would be restriped to align with the reconstructed median.

Westbound Route 1

- Minor widening and striping realignment of westbound Route 1 due to widening associated with the second left turn lane along eastbound Route 1.

Road widening would be minor and within the Caltrans right-of-way. There would be no impacts to existing land uses or resources.
Route 1 (East of the Route 1/9 Intersection)

**Eastbound Route 1**
- Minor modification to the median nose to accommodate Route 1/9 intersection improvements, including receiving the triple left-turn movement from southbound Route 9.

These improvements would not require road widening.

**Westbound Route 1**

There are no improvements proposed on westbound Route 1 east of the Route 1/9 intersection.

**Regulatory Setting**

**Federal Regulations**

**Clean Water Act**

There are several sections of the federal Clean Water Act (CWA) that pertain to regulating impacts on waters of the United States. The discharge of dredged or fill material into waters of the United States is subject to permitting specified under Title IV (Permits and Licenses) of the CWA and specifically under Section 404 (Discharges of Dredge or Fill Material) of the act. Section 401 specifies additional requirements for permit review at the state level of federal permits and actions. The state also adopts water quality standards to protect beneficial uses of state waters under Section 303 of the CWA. Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources.

The permit program for placement of clean fill materials into the waters of the United States, regulated by CWA Section 404, is administered by the U.S. Army Corps of Engineers. CWA Section 401 requires that an applicant pursuing a federal permit to conduct any activity that may result in a discharge of a pollutant obtain a water quality certification (WQC). In California, WQCs are issued by one of nine Regional Water Quality Control Boards (RWQCBs) with jurisdiction over the permitting area, in this case the Central Coast RWQCB (Region 3). Under the CWA, the RWQCB must issue a WQC for the proposed activity to be permitted under Section 404. A WQC requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States. The proposed project would require a Nationwide Section 404 permit and a WQC. These approval will be obtained during the final design phase.

The NPDES program is intended to control discharges of pollutants from both point and nonpoint sources, such as stormwater. The U.S. Environmental Protection Agency has delegated NPDES permitting authority to the State Water Resources Control Board (SWRCB), as described in more detail below.
State Regulations

The Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 (PCWQCA) established the SWRCB and divided the state into nine regional basins, each with a RWQCB. The SWRCB is the primary state agency responsible for protecting the quality of the state’s surface and groundwater supplies.

PCWQCA authorizes the SWRCB to draft state policies regarding water quality. It also authorizes the SWRCB to issue waste discharge requirements for discharges to state waters. PCWQCA requires that SWRCB or an RWQCB adopt water quality control plans (Basin Plans) for the protection of water quality. A Basin Plan must:

- identify beneficial uses of water to be protected,
- establish water quality objectives for the reasonable protection of the beneficial uses, and
- establish a program of implementation for achieving the water quality objectives.

These plans also provide the technical basis for determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. Basin Plans are updated and reviewed every 3 years.

NPDES permits issued to control pollution must implement requirements of the Central Coast RWQCB Basin Plan. The Central Coast RWQCB is charged with enforcing NPDES permits.

Caltrans NPDES Permit Program

Construction activities are regulated under the NPDES Construction General Permit for Discharges of Storm Water Runoff associated with Construction Activity (Construction General Permit), provided that the total amount of ground disturbance during construction exceeds 1 acre. Caltrans activities are regulated by the NPDES Construction General Permit and the General Statewide NPDES Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans General Permit). The Caltrans Construction General Permit (2009-0009-DWQ) would not apply to the proposed project since the project is less than one acre.

Central Coast Regional Water Quality Control Board

The Central Coast RWQCB is responsible for implementing the Basin Plans in the region to protect water quality. The Basin Plan identifies beneficial uses of surface and groundwater as well as water quality objectives to protect those uses. Numerical and narrative criteria are contained in the Basin Plan for several key water quality constituents, including dissolved oxygen, water temperature, trace metals, turbidity, suspended material, pesticides, salinity, radioactivity, and other related constituents.

The methods the Central Coast RWQCB uses to implement the Basin Plan criteria include issuing waste discharge requirements (WDRs). WDRs may be issued to any entity that discharges waste that may affect the quality of any surface or groundwater. For discharges to waters protected under the
CWA, WDRs could also serve as a federally required NPDES permit (under the CWA) and incorporate the requirements of other applicable regulations.

The Beneficial Uses of the San Lorenzo River include municipal (MUN), agricultural (AGR), industrial (IND), groundwater recharge (GWR), recreation (REC1, REC2), wildlife habitat (WILD), cold fresh water habitat (COLD), migration of aquatic organisms (MIGR), spawning habitat (SPWN), biological habitats of special significance (BIOL), rare or endangered species (RARE), fresh water replenishment (FRESH), and commercial fishing (COMM).

Physical Setting

Geology and Soils

General geologic features of the project site are identified in Figure 3. Figure 3 indicates that the project site is generally underlain by undifferentiated alluvial deposits (Qal).

Surface Waters

The project is located in the San Lorenzo Hydrologic Unit (Unit 4.12). The drainage channel located on the north side of Route 1, east of Route 9, is historically known as the Arroyo de San Pedro Regaldo (Figure 2). The drainage channel extends from a 72-inch reinforced concrete pipe storm drain beneath Route 9 east to the San Lorenzo River. The channel drains an industrial area of approximately 200 acres on the west side of Route 9. A residence and building supply company are on the north side of the channel, and Route 1 is on the south side. The size of the drainage channel ranges from 6- to 9-feet wide and 2- to 3-feet deep, and the channel is approximately 500 feet long (between the culvert opening and the San Lorenzo River).

The San Lorenzo River is located just east of the Route 1/9 intersection (Figure 2). The Clean Water Act Section 303(d) List states that the San Lorenzo River is impaired only for pathogens (SWRCB 2006, p.22). The potential sources of the pathogen impairment is considered to be urban runoff and septage disposal. The estimated completion date for the Pathogen Total Maximum Daily Load (TMDL) is 2019.

Total Suspended Solids (TSS) data was downloaded from the U.S. Geological Survey website to determine the in-situ conditions of the sediment in the San Lorenzo River. Other 303(d)-listed constituents (nutrients and pathogens) are not discussed because of the small potential for the proposed project to introduce these contaminants to surface waters. The sampling location for TSS on the San Lorenzo River was at Big Trees, which is approximately 10 miles upstream of the City of Santa Cruz. The San Lorenzo River near the project could have different concentrations of sediment due to settling of sediment or possibly additional contaminated runoff entering the river between the locations. In addition, the data is relatively old, and conditions could have changed since 1993 due to increasing development in the area.
There were a total of 142 TSS samples over a period from 1972 to 1993. The minimum concentration over the time period was 1 mg/L, the average concentration was 759 mg/L, and the maximum concentration was 11,300 mg/L (see Table 1 below). The Central Coast Basin Plan states that suspended sediment load and suspended sediment concentration shall not be altered in such a way as to cause a nuisance or adversely affect beneficial uses. Because the San Lorenzo River is CWA section 303(d)-listed as impaired for sedimentation and siltation, any incremental increase in sedimentation regardless of the concentration would considered a significant impact to water quality.

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Source: USGS Website.

**Groundwater**

The proposed project is located in the West Santa Cruz Terrace Groundwater Basin (Basin Number 3-26), which is approximately 7,867 acres or 12 square miles and includes nearly the entire City of Santa Cruz (DWR, page 1, 2004). Groundwater level data in the basin are based on two wells. One well was drilled in 1967 and was flowing; the other was a domestic well drilled in 1999 with a depth to groundwater of approximately 400 feet. Due to variations in well construction and aquifer geology, depth to water across the basin is highly variable (DWR, p. 2, 2004). However, a Geotechnical Engineering Investigation (2008) prepared by Parikh Consultants for the San Lorenzo River Bike Path Project found the depth to groundwater in the area to be five feet, nine feet and 14 feet on three separate borings in the area (Parikh Consultants, p. 7, 2008).

Existing groundwater quality is characterized as being predominately calcium-sodium bicarbonate with Total Dissolved Solids (TDS) ranging from 378 to 684 mg/L, with an average value of 478 mg/L (based on 6 wells and 7 analyses) (DWR, p.2, 2004).

**Impacts**

The proposed project would require work within the drainage channel in the northeast quadrant of the intersection by extending the channel's outfall. In-water construction would occur during the dry season (July 1 through October 15); since the creek appears to be perennial, water may still be present. Although in-water construction activities would occur during the dry season, there is
potential for dewatering to occur. This will be accomplished through small check dams and bypass pipes to stop sedimentation.

With implementation of the project, an approximately 0.5-acre increase in impervious surface is expected. Potential effects of the proposed project are limited to construction-related impacts such as erosion, sedimentation, and the potential release of hazardous construction-related materials. Grading activities could result in sedimentation of nearby surface waters, and trenching and excavation may expose the groundwater table and provide a direct path for contamination of groundwater. In addition, improper use of fuels, oils, and other construction-related hazardous materials may also pose a threat to surface or groundwater quality. The City is not required to obtain an NPDES permit and subsequent SWPPP. The City, however, would adhere to erosion control standards that will ensure that sedimentation from construction does not impact the water quality of the Arroyo.

Mitigation

To minimize the mobilization of sediment and construction-related contaminants to the adjacent water body, Caltrans/City will require that erosion and sediment control measures be specified in the construction specifications and project performance specifications based on standard Caltrans/City requirements. These may include but are not be limited to the following:

- To prevent fertilizers used on landscaped areas from contributing nutrients to the impaired San Lorenzo River, contain runoff from landscaped on-site. This containment can be achieved by irrigating at an agronomic rate so as to prevent runoff.

- Develop a hazardous material spill prevention control and countermeasure plan before construction begins that will minimize the potential for and the effects of hazardous or toxic substances spills during construction. The plan will include storage and containment procedures to prevent and respond to spills, and will identify the parties responsible for monitoring the spill response. During construction, any spills will be cleaned up immediately according to the spill prevention and countermeasure plan. The City/Caltrans will review and approve the contractors’ toxic materials spill prevention control and countermeasure plan before allowing construction to begin. The City/Caltrans will routinely inspect the construction site to verify that BMPs specified in the plan are properly implemented and maintained. The City/Caltrans will notify the contractor immediately if there is a noncompliance issue and will require compliance.

- Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.

- Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways.

- Contain soil and filter runoff from disturbed areas by berms, vegetated filters, silt fencing, straw wattle, plastic sheeting, catch basins, or other means necessary to prevent the escape of sediment from the disturbed area.
Use other temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary re-vegetation or other ground cover) to control erosion from disturbed areas as necessary.

Avoid earth or organic material from being deposited or placed where it may be directly carried into the channel.

Prohibit the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete; solvents and adhesives; thinners; paints; fuels; sawdust; dirt; gasoline; asphalt and concrete saw slurry; heavily chlorinated water.

Measure baseline turbidity, pH, specific conductance, and temperature in the channel when flow is present, and sample water from dewatering activities. As required by the RWQCB, avoid exceeding water quality standards specified in the Basin Plan standards over the natural in-situ conditions.

BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. Final selection of BMPs will be subject to review by City/Caltrans. The City/Caltrans shall perform routine inspections of the construction area to verify that the BMPs are properly implemented and maintained. The City/Caltrans will notify contractors immediately if there is a noncompliance issue and will require compliance.

References

California Regional Water Quality Control Board, Central Coast Region. Central Coast Basin Plan.


