Water Quality Assessment Report

for

Richardson Grove Operational Improvement Project

Humboldt County, California
US Route 101, PM 1.1/2.2
EA: 01-46480

December 2015

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Prepared by:
STATE OF CALIFORNIA
Department of Transportation

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Water Quality Assessment Report for
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EA: 01-46480 (100000266)

County/Route/Post Mile: 01-HUM-101-PM 1.1/2.2

Project Description

This proposed project includes minor roadway realignments and widening of US Route (Route) 101 from post mile (PM) 1.1 to PM 2.2 to correct the current alignment that restricts Surface Transportation Assistance Act (STAA) access. The project is just over one mile in length and the majority passes through Richardson Grove State Park (state park). Within the limits of the proposed project, Route 101 is a conventional two lane highway with two 12-foot lanes and 0- to 4-foot shoulders. The proposed project would be separated into three sections: segment 1 from PM 1.11 to PM 1.70; segment 2 from PM 1.70 to PM 2.04; and segment 3 from PM 2.04 to PM 2.20. The curves restricting STAA access are located in segments 1 and 3. Project activities in segments 1 and 3 would include cuts (excavations) and fills (embankment) to accommodate realignments and widening, drainage improvements, repaving, and restriping; segment 2 activities would include pavement overlay, restriping, and one minor drainage improvement.

Project Setting

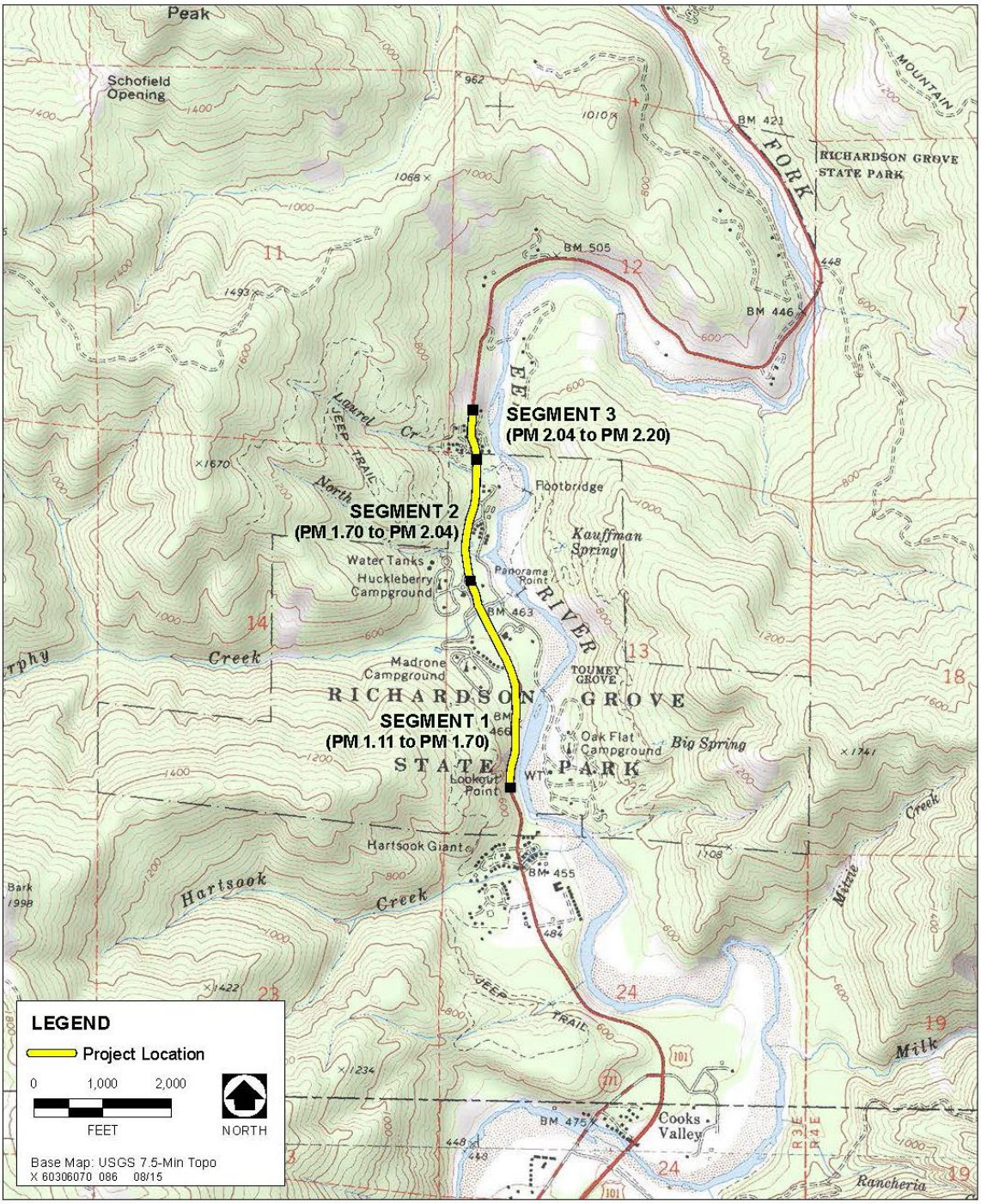
The project is located along Route 101 approximately one mile north of the Mendocino/Humboldt County line, in Humboldt County, California (Figure 1). Figure 2 shows the project segments and surface features in the project area. The project is within the North Coast Region of California, which encompasses a total area of approximately 19,390 square miles including scenic coastline and remote wilderness areas, as well as urbanized and agricultural areas. The North Coast Region reaches from the California-Oregon state border south to Marin and Sonoma Counties and covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou and Sonoma Counties, and small portions of Glenn, Lake, and Marin Counties.

The terrain of the project area is mountainous with rounded ridges, steep and moderately steep slopes and narrow canyons. Elevations through the project area range from 500 feet to 1700 feet above sea level, with slopes ranging from 0 to 9 percent.

The climate of the project area is characterized by cool, wet winters and warm, dry summers. The average rainfall in and around the project limits is approximately 59 inches, mostly falling during the rainy season (October 1 through May 1). Average annual temperatures range from 43 to 70 degrees Fahrenheit.

The North Coast Region, including the project area, is prone to erosion due to steep topography (Coastal Watersheds Program Portal 2014). The heavy seasonal precipitation, steep slopes, and fractured rocks, combined with landslides and unstable geology have contributed to high levels of fine sediment in receiving waters within the North Coast Region watersheds.

Figure 1: Regional Map
Richardson Grove Operational Improvement Water Quality Assessment Report



Source: Caltrans 2014 (Adapted by AECOM)

Figure 2: Vicinity Map
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Hydrology

The project is located adjacent to South Fork Eel River and crosses three tributaries to South Fork Eel River: Laurel Creek, North Creek, and Durphy Creek. It is situated in the South Fork Eel River Hydrologic Area (HA) in the Benbow Hydrologic Sub-Area (HSA) 111.32 within Eel River Hydrologic Unit. The project is located in the Middle South Fork Eel River watershed (Figure 3). The hydrologic information of the project is summarized in Table 1.

Runoff from the project location discharges to South Fork Eel River and tributaries to South Fork Eel River. South Fork Eel River discharges to Eel River near Humboldt Redwoods State Park and the town of Weott. Eel River discharges into the Pacific Ocean via an estuary just south of Humboldt Bay approximately 15 miles south of Eureka.

Table 1. Hydrologic Information

Route	Post Mile	Hydrologic Unit	Hydrologic Sub-Area	Hydrologic Sub-Area Name	Watershed	Average Annual Precipitation (Inches)
101	1.2-2.2	Eel River	111.32	Benbow	Middle South Fork Eel River	59

Proposed Scope of Work

Segment 1

Proposed activities in segment 1 (PM 1.1 to PM 1.7) include minor realignments and widening of the existing roadway to minimize off-tracking conflicts between large vehicles and fixed objects (trees). This segment is completely within the state park.

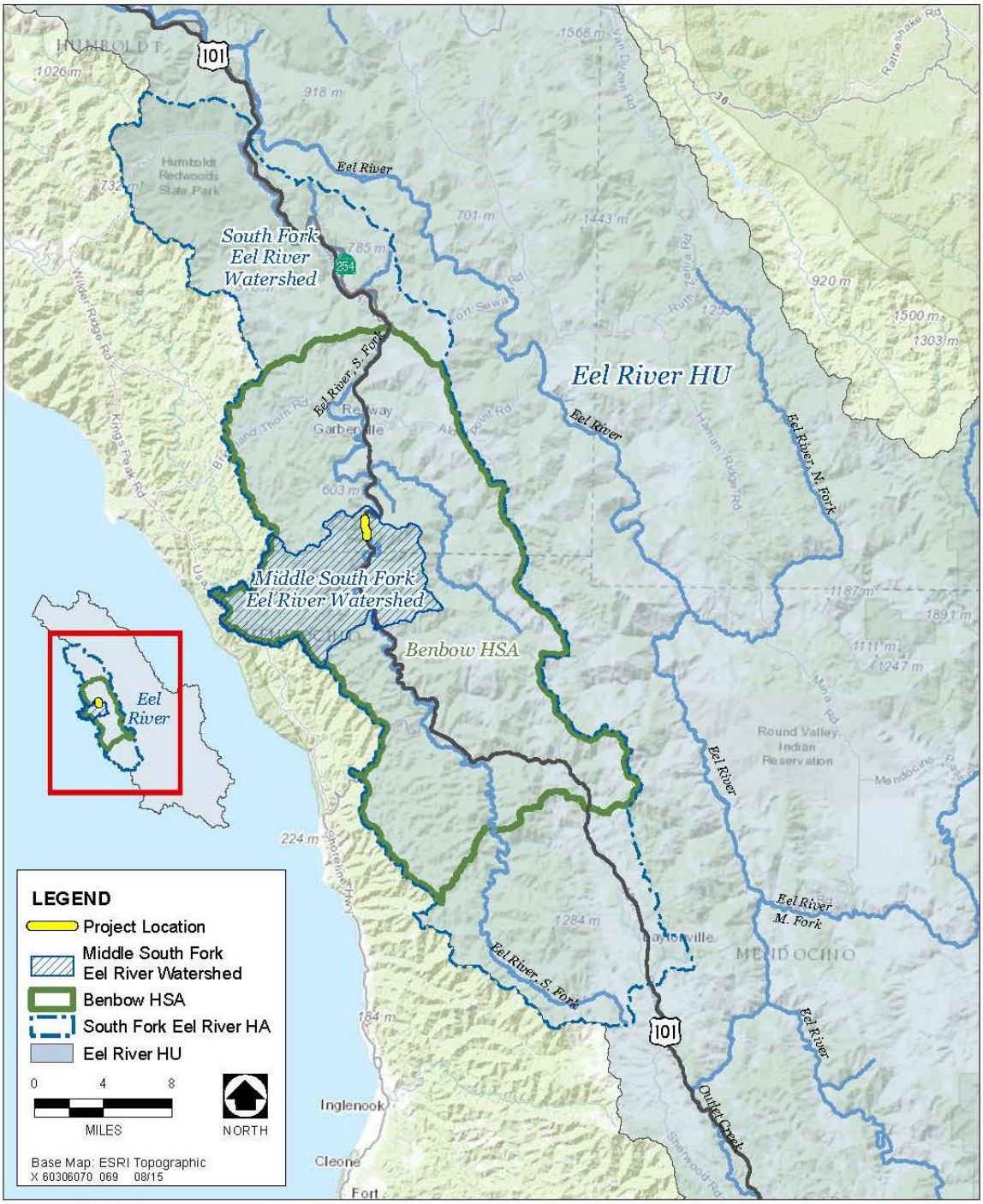
Two lanes with a width of 12 feet are proposed where possible. Proposed shoulders would be tapered where existing trees are located adjacent to the edge of pavement. This work would require minor earthwork, sliver widening of the roadway and adjustments to the super-elevation (to “bank the curves”). The maximum lateral change in the alignment would be 17 feet, but the average alignment shift from the existing centerline would be approximately 2 to 6 feet.

The depth of excavation for the new road section in segment 1 would be 12 inches.

The 18-inch diameter culverts at PMs 1.18, 1.28, 1.34 and 1.35 in segment 1 would be extended to accommodate the realignment and new inlet structures would be constructed. The open-graded asphalt would be ground off and new open-graded paving would be installed and pavement striping would be replaced.

Segment 2

Proposed activities within segment 2 (PM 1.7 to PM 2.04) includes removing and replacing the existing open-graded pavement and striping, and extending a berm to divert water into a downdrain to connect to the culvert at PM 1.78. There are no STAA restrictions in this segment, so no realignment or widening is proposed.



Source: CalWater 2004

Figure 3: Watershed Map
Richardson Grove Operational Improvement Water Quality Assessment Report

Segment 3

Proposed activities in segment 3 (PM 2.04 to PM 2.20), includes widening the roadway to provide for wider shoulders, and realigning the roadway to minimize off-tracking conflicts between large vehicles and fixed objects. The majority of this segment is located outside the state park boundary which ends at PM 2.05. From PM 2.04 to PM 2.06, there is a gradual increase in the existing road width, which begins with very little shoulder and extends to two 12-foot lanes with 4-foot shoulders. From PM 2.06 to PM 2.15 two 4-foot shoulders and a minimum of two 12-foot lanes are proposed. For the remainder of this segment the roadway would transition from the two 4-foot shoulders to the existing roadway width. From PM 2.04 to PM 2.10, the proposed alignment would be shifted approximately ten feet into an existing cut slope west of the highway. Between PM 2.10 and PM 2.15 the proposed alignment would be shifted slightly to the east. A 200-foot long soldier pile retaining wall would be constructed that would support the roadway from below the road.

The wall would begin at the Singing Trees facility about five feet from the existing pavement and extend 200 feet to a small through-cut to the north. The below-the-road wall will be 10 to 13 feet in height. At the northern end, the wall would be about ten feet east from the existing pavement. The wall would have a timber lagging face. At each end of the soldier pile wall, a short section of gabion wall (steel mesh box filled with rocks) would be constructed in order to protect the large trees located in each of these areas. Excavation for the gabion wall would not be deeper than the base of the tree. The work also includes excavating approximately three additional feet from an existing cut slope for a length of about 60 feet just north of the soldier pile and gabion walls. A concrete barrier with a metal bike railing would be installed on top of the soldier pile wall and on top of the gabion wall at PM 2.14. West of the highway across from the soldier pile wall, the base of the existing cut slope would be excavated to gain width for the shoulders. To construct the retaining wall, the northbound lane would be used as a construction work area. A temporary signal would be installed to facilitate the one-way traffic.

The main area of excavation in this segment would be on the left (west) side of the roadway from PM 2.04 to PM 2.10 to accommodate wider shoulders. This excavation would generate approximately 500 cubic yards of excess material, and would extend from the Singing Trees facility south to just past the state park boundary. The area of excavation is mostly outside of the park, on a slope below some private housing units.

A 24-inch diameter culvert at PM 2.10 would be replaced and extended, and two new inlet structures would be constructed. The culvert outlet would be embedded in the gabion wall and rock slope protection would be added at the outlet as an energy dissipater. A PVC pipe inside the existing culvert that conveys water to the Singing Trees facility would be relocated adjacent to the new culvert. A new 12-inch slotted drain would also be constructed. The existing open-graded asphalt would be ground off and new open-graded pavement would be placed. Finally, pavement striping would be replaced.

Construction of the retaining wall requires the installation of temporary signals to accommodate one-way traffic about 100 feet away from the location of the wall to the north and south. Three additional flashing warning beacons would be located at approximately 500-foot intervals in advance of the signals to warn motorists of the approaching signal. Each of the beacons would be connected to a power source via a buried cable that would be placed in a shallow 4-inch-wide trench within the roadway pavement.

Other Elements of the Preferred Alternative

Suitable excavated material would be reused within the project limits. Any excess material generated by the project would be disposed of at a site located just south of the project within Caltrans' right-of-way on Route 101 in Mendocino County at PM 106.50.

The proposed project would also improve the bridge railings at each of the four corners of the Richardson Grove Undercrossing (Post Mile 1.61) by replacing the metal beam guardrail (MBGR) with a shorter MBGR crash cushion. The MBGR crash cushions would be approximately 21 feet long and 30 inches wide. Concrete transition barriers approximately 20 feet in length would be constructed to provide a smooth transition between the old bridge barriers and the new crash cushions. The combined length of the new transition barrier and the new crash cushion would generally be less than the existing MBGR.

The proposed project would also add shoulder backing and update signs. The majority of disturbed areas would be replanted in kind. Night construction would likely be necessary for portions of the work to minimize traffic delays during peak traffic. The project would require additional right-of-way from both private property owners as well as the state park. In the state park the highway lies within an easement from the California Department of Parks and Recreation; the easement would need to be revised to both incorporate some new areas into the easement as well as remove some areas from the easement that are no longer needed for operating and maintaining the roadway. Areas that would be removed from the easement would be scarified and replanted.

Construction staging areas would be on the paved roadway and gravel shoulders. One staging area includes the large paved turnout just north of the project limits.

Approximate volumes of excavation and embankment by area are as follows:

- PM 1.35 to PM 1.36, western shoulder – 60 cubic yards excavation;
- PM 1.37 to PM 1.39, eastern shoulder – 200 cubic yards embankment;
- PM 1.56 to PM 1.61, western shoulder – 30 cubic yards embankment;
- PM 1.65 to PM 1.75, eastern shoulder – 10 cubic yards excavation, 15 cubic yards embankment;
- PM 2.05 to PM 2.10, western shoulder – 500 cubic yards excavation; and
- PM 2.10 to PM 2.15, eastern shoulder – 150 cubic yards embankment.

Approach to Water Quality Assessment

The purpose of this Water Quality Assessment Report (WQAR) is to provide information to ensure National Pollutant Discharge Elimination System (NPDES) permit compliance. In addition to the discussion of the proposed project and the physical setting described above, this WQAR presents a regulatory framework with respect to achieving water quality regulatory compliance. It also provides information on surface water and groundwater resources and the quality of these waters, describes receiving water impairments and beneficial uses, identifies potential water quality

impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts associated with the project.

Regulatory Setting

The proposed project would be subject to policies, laws, regulations, and guidance documents that are currently in place to protect surface water quality through the establishment of compliance standards and/or waste discharge requirements. These regulations and policies require implementation of design, construction, and operational standards for the management and treatment of storm water runoff. The project would be required to comply with the following federal and state water quality regulations and Total Maximum Daily Load (TMDL) policies:

- Clean Water Act sections 303, 401, 402, and 404;
- Water Quality Control Plan for the North Coast Region (Basin Plan) (North Coast Regional Water Quality Control Board [RWQCB] 2011);
- California Department of Transportation (Caltrans) Statewide NPDES Storm Water Permit (Caltrans NPDES Permit) Order 2012-0011-DWQ (State Water Resources Control Board [SWRCB 2012];
- General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) Order 2009-0009-DWQ (as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ) (SWRCB 2009), if 1 or more acres of soil is disturbed;
- Caltrans Standard Specifications for Water Pollution Control (Caltrans 2010);
- TMDL Implementation Policy Statement for Sediment-Impaired Receiving Waters in the North Coast Region (Sediment TMDL Implementation Policy), Resolution No. R1-2004-0087 (North Coast RWQCB 2004);
- South Fork Eel River TMDLs for Sediment and Temperature (United States Environmental Protection Agency [USEPA] 1999);
- Policy Statement for Implementation of the Water Quality Objective for Temperature in the North Coast Region, Resolution No. R1-2012-0013 (North Coast RWQCB 2012a); and
- Action Plans to Address Temperature Impairments in the Mattole, Navarro, and Eel River Watershed (North Coast RWQCB 2013).

Sections 401 and 303(d) of the CWA allow the Executive Officer of the RWQCBs wide discretion in implementing Basin Plan requirements and water quality objectives (WQOs). Given the number and extent of sediment impaired water bodies, the North Coast RWQCB has chosen to regulate point source storm water discharges through the 401 Certification program. The North Coast RWQCB requires that all projects, which require a 401 Certification, evaluate the potential to include treatment best management practices (BMPs) and consider the incorporation of Low Impact Development (LID) BMPs. These policy goals are incorporated into the North Coast RWQCB's 401 Certification Application (North Coast RWQCB 2012b; Section 5, A and B). The

project would need to incorporate these requirements, to the extent practicable, in order to obtain North Coast RWQCB 401 Certification coverage.

The SWRCB issued a statewide storm water permit to Caltrans (Caltrans NPDES Permit; Order 2012-0011-DWQ) to regulate storm water and some non-storm water discharges from the Caltrans MS4 and associated facilities. Order 2012-0011-DWQ replaces the original Caltrans statewide permit issued in 1999 and has substantial new requirements for controlling storm water runoff and non-storm water discharges to protect water quality.

TMDL Compliance

The Caltrans NPDES Permit, Order 2012-0011-DWQ, was amended in May 2014 to include TMDL requirements. TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards. Caltrans is currently subject to 84 TMDLs in various watersheds throughout the state.

As a result of the Middle Fork Eel River Temperature TMDL policy, any removal of riparian vegetation has the potential to result in an exceedance of a water quality temperature objective established by the North Coast RWQCB. Vegetation clearing and/or removal within riparian areas adjacent to tributaries of the South Fork Eel River should be avoided, minimized, and restored.

Non-Storm Water Discharges

The Caltrans NPDES Permit Section B (Non-Storm Water Discharge Prohibitions) provision B.1 prohibits non-storm water discharges unless the following conditions are met:

1. Discharges are authorized by a separate NPDES permit ; or

2. Discharges are conditionally exempt in accordance with provision B.2 of the Caltrans NPDES Permit.

Provision B.2 describes conditionally exempt non-storm water discharges, including but not limited to diverted stream flows, rising groundwater, uncontaminated groundwater infiltration to MS4s, springs, and flows from riparian habitats and wetlands. However, Section B.3 acknowledges that some RWQCB's (e.g., the North Coast RWQCB) may have separate dewatering and/or *de minimis* NPDES discharge permits or Basin Plan requirements for conditionally exempt non-storm water discharges. Therefore, any temporary diversion of surface water or dewatering during pile drilling or excavation operations that could potentially result in a discharge to State Waters (e.g., wetlands, perennial and ephemeral channels) during construction would likely require authorization by the North Coast RWQCB.

Low threat discharges are defined as planned discharges that are short term and/or of minimized volume from a definable project that results in a point source discharge to surface waters. These discharges can be permitted by the North Coast RWQCB if it is determined that they do not pose a threat to water quality by ensuring that the following conditions are met:

1. The discharge shall not adversely affect the beneficial uses of the receiving water or cause a condition of nuisance.
2. The discharge shall comply with all applicable water quality objectives.

3. Best practicable treatment or control of the discharge shall be implemented to assure that pollution and nuisance will not occur, and the highest water quality consistent with maximum benefit to the people of the State will be maintained.
4. The discharge is necessary because no feasible alternative to the discharge (reclamation, evaporation, infiltration, discharge to a sanitary sewer system, etc.) is available.
5. The discharge is limited to that increment of wastewater that remains after implementation of all reasonable alternatives for reclamation or disposal.
6. The discharge is regulated by NPDES Permit/Waste Discharge Requirements.

Surface Water Beneficial Uses and Water Quality Objectives/Standards

The beneficial uses designated for surface waters within the Benbow HSA are as follows (RWQCB 2011):

- MUN: Municipal and Domestic Supply
- AGR: Agricultural Supply
- IND: Industrial Service Supply
- GWR: Groundwater Recharge
- FRSH: Freshwater Replenishment
- NAV: Navigation
- REC-1: Water Contact Recreation
- REC-2: Noncontact Water Recreation
- COMM: Commercial and Sportfishing
- WARM: Warm Freshwater Habitat
- COLD: Cold Freshwater Habitat
- WILD: Wildlife Habitat
- RARE: Preservation of Rare and Endangered Species
- MIGR: Migration of Aquatic Organisms
- SPWN: Spawning, Reproduction, and Development

The following discharge prohibitions to waters designated with a beneficial use are listed in the North Coast Region Basin Plan (RWQCB 2011):

- The discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.

- The placing or disposal of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature at locations where such material could pass into any stream or watercourse in the basin in quantities which could be deleterious to fish, wildlife, or other beneficial uses is prohibited.

Water quality objectives of particular importance in protecting beneficial uses from unreasonable effect due to discharges from construction or associated activities are stated in the North Coast Region Basin Plan (RWQCB 2011) and include the following:

- Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

- Turbidity shall not be increased more than 20 percent above naturally occurring background levels.
- Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin,that cause nuisance or adversely affect the beneficial uses.
- The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Narrative and numeric WQOs for all surface waters within the North Coast Region are established for a variety of constituents. WQOs for the South Fork Eel River are established for specific conductance, total dissolved solids, dissolved oxygen, and pH. Refer to Table 3-1 in the North Coast Region Basin Plan (RWQCB 2011) for the specific WQOs.

The South Fork Eel River within the South Fork Eel River HA is listed as impaired for sedimentation/siltation, temperature, and aluminum pursuant to Section 303(d) of the Clean Water Act (SWRCB 2015). Potential sources of these impairments include erosion/siltation, removal of riparian vegetation, logging/construction, range grazing, silviculture, flow regulation, hydromodification, and nonpoint and natural sources. TMDLs for sediment and temperature have been developed and approved by the USEPA for the South Fork Eel River (USEPA 1999).

Groundwater Beneficial Uses and Water Quality Objectives/Standards

There is no defined alluvial groundwater basin underlying the proposed project site. However, existing beneficial uses of all groundwater resources within the North Coast Region are specified in the Basin Plan (RWQCB 2011) and include municipal supply, agricultural supply, industrial service supply, and Native American culture. All groundwater within the North Coast Region is subject to narrative and quantitative WQOs for bacteria, chemical constituents, radioactivity, and tastes and odors, as described in the North Coast Basin Plan. There are no specific WQOs for groundwater within the Eel River HU (RWQCB 2011).

Disturbed Soil Area and Net Impervious Area

The total disturbed soil area is currently estimated to be 0.669 acres. The net increase in impervious surface area due to drainage improvements, barrier rail modifications, and roadway widening/retaining wall is 0.23 acres.

Potential Water Quality and Hydromodification Impacts

There is the potential for temporary and permanent water quality impacts to occur during the roadway and drainage improvement activities due to work adjacent to South Fork Eel River and tributaries to South Fork Eel River. However, implementing design, construction and operational standards as described below will avoid and minimize these potential impacts.

Temporary and Permanent Water Quality Control Measures

To prevent potential impacts to receiving waters as a result of construction activities and/or operations related to this project, both temporary and permanent measures would be implemented in accordance with applicable storm water regulations and Caltrans' standards. Short-term temporary measures would be designed to reduce erosion and subsequent sediment

transport, while long-term permanent measures would be designed to stabilize disturbed soil and bare areas and dissipate the energy of runoff flowing through the site.

It is anticipated that implementing the following measures will control both storm water runoff and non-storm water discharges sufficiently to protect water quality:

1. Sediment and erosion-control BMPs would be implemented in compliance with the Caltrans NPDES Permit. Temporary storm water and non-storm water construction site BMPs would likely include:

    - Silt fence
    - Fiber rolls
    - Street sweeping
    - Temporary concrete washout/Concrete waste management
    - Rolled erosion-control product (e.g., netting)
    - Re-establishment of vegetation or other stabilization measures (hydroseeding, mulch) on disturbed soil areas and newly constructed slopes

2. All construction site BMPs would follow the latest edition of the Storm Water Quality Handbook: Construction Site Best Management Practices Manual (Caltrans 2003) to control and minimize the impacts of construction-related activities, materials, and pollutants on the watershed.

3. The project would incorporate pollution prevention and design measures, such as energy dissipation (rock slope protection) and slope revegetation, consistent with the program set forth in the Caltrans Storm Water Management Plan to meet specific water quality objectives related to sediment treatment control.

4. The project would comply with Caltrans Standard Specifications for Water Pollution Control (Caltrans 2010). The project would implement storm water and water pollution control training, routine BMP inspections, spill prevention and control, materials and waste management, and non-storm water management.

5. Currently, the total disturbed soil area is estimated to be 0.67 acre and therefore the contractor would be required to develop and implement a Water Pollution Control Plan (WPCP) identifying site-specific best management practices and emergency spill controls. If one or more acres of soil is disturbed, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented in accordance with the Construction General Permit to address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP identifies the sources of pollutants that may affect the quality of storm water; includes construction site BMPs to control sedimentation, erosion, and potential chemical pollutants; provides for construction materials management, non-storm-water BMPs, and includes routine inspections and a monitoring and reporting plan.

6. Subject to 401 Certification, the project may be required to implement a North Coast RWQCB-approved Permanent BMP Plan or equivalent for the discharge of storm water

to surface water or groundwater. The permanent treatment BMP Plan would document and describe existing and proposed discharges and the types of BMPs (e.g., infiltration and design pollution prevention BMPs, such as rock slope protection at culvert outlets to prevent erosion) that will be implemented to eliminate or minimize impacts from storm water discharges into surface waters. The project-specific BMP Plan should be sufficient to prevent erosion, protect beneficial uses, and support the requirements (i.e., inspection, monitoring, reporting and enforcement) of the general management plan (or equivalent), when submitted and approved by the North Coast RWQCB.

7. This WQAR is based on information provided in the proposed scope of work. This WQAR should be re-evaluated during subsequent phases of the project as design and construction details become available.

Conclusions

Due to its proximity to the South Fork of the Eel River and work within its tributaries, the project has the potential for non-storm water and storm water discharges to Waters of the State both during construction and post-construction. However, it is anticipated that by implementation of the BMPs described here in consultation with North Coast RWQCB staff, the Richardson Grove Operational Improvement Project will be in compliance with all federal and state water quality protection regulations and policies.

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