FOR CONTRACT NO.: 10-264444

INFORMATION HANDOUT

MATERIALS INFORMATION

1. Revised Foundation / Seismic Report -For Jackson Creek Bridge (Widen) (Br No 26-0019)
2. Revised Foundation / Seismic Report -For Jackson Creek Overflow Bridge (Replacement)
3. Foundation Review for Jackson Creek Bridge (Widen) (Br No 26-0019)
4. Foundation Review for Jackson Creek Overflow Bridge (Replace) (Br No 26-0051)
5. Geotechnical Design Report (Retaining Wall)
6. United State Fish and Wildlife Biological Opinion
7. California Department of Fish and Game Streambed Alteration Agreement (1600-2011-0084-R2)
8. Regional Water Quality Control Board 401 Certification (5B03CR00061)
9. United States Army Corps of Engineers Nationwide Permit Number 14 (SPK-2010-00269)

ROUTE: 10-Ama-88-0.0/5.5

Jackson Creek Bridge (26-0019)

Revised Final Foundation Report

State of California
Department of Transportation

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: GARY BLAKESLEY
Branch Chief
Bridge Design Branch 5
Office of Bridge Design North
Division of Engineering Services
Structures Design

Date: April 2, 2010

File: 10-AMA-88 –2.94PM
Jackson Creek Bridge
(Widen)
Bridge: 26-0019
EA: 10-264441

Attention: Mario Guadamuz

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Revised Foundation / Seismic Report – Supersede all previous reports

The Office of Geotechnical Design North has prepared this Revised Foundation / Seismic report for the Jackson Creek Bridge. The bridge is located approximately 4 miles southwest of the town of Ione on State Route 88 in Amador County. This bridge is scheduled to be widened with the widen sections supported on CIDH pile extensions.

The original field investigation was performed in 2006. One additional boring was performed in 2009 to quantify geotechnical conditions, in order to perform a design check and revise the initial foundation recommendations as needed. On October 20 through Oct 21, 2009 the supplemental subsurface investigation took place and foundation recommendations have been revised to reflect the new findings.

Field Investigation

The 2009 investigation consisted of one mud rotary boring (R-09-001) drilled adjacent Pier 3 (Right) of the existing bridge. Core samples were taken continuously from top to bottom of the boring (depth 69.5 ft (Elev 128 ft)). A Standard Penetration Test (SPT) was taken at 5-foot intervals, selected core and SPT samples were sent to the Transportation Laboratory for further tests.

Geology

Regional Geology and Faulting

The project site is located at the Sierra Nevada western foothill margin; adjacent the Carabas Paleo-Ridge, a set of northwest trending low hills that are composed of highly deformed low-grade metavolcanic and metasedimentary basement rocks including plutonic intrusions. At the bridge site these basement rocks are buried by at least 500 to 1000 feet of interbedded Tertiary Age sedimentary and volcanics rocks.

Major faults within the vicinity of the project site include Bear Mountains Fault Zone located approximately 5.5 miles east of the site and the Melones Fault zone located approximately 12 miles northeast of the site. See Seismic Study section below for discussion of the seismic controlling fault(s) and site seismic design criteria.

Site Geology

The lithology at the site consists of Middle Pleistocene age Riverbank formation (Arkosic old alluvium) exposed in the road cut south of the bridge. At the bridge site boring (R-09-001) the underlying Eocene age Valley springs Formation was encountered. The formation consisted of volcanics that include intensely weathered to decomposed RHYOLITIC TUFF /ASH with interbedded stream channel GRAVELS which intern are underlain by sedimentary rocks that include interbedded SANDSTONE, SILTSONE and CLAYSTONE. In general, the formation material is very weak to extremely weak (strength ranges between 42 to 139 psi) based on laboratory testing although weaker and stronger rock maybe encountered at some pile locations. The over all rock quality (Rock Quality Designation, RQD index) measured from the core samples averaged 18%, indicating on average the rock quality is very poor). Further more, the core samples in all cases very weak (lacked soundness) as noted above. Therefore, the (RQD) values above 0% were given an asterisk (RQD*) to indicate the rock quality should be down graded further in those cases. Also, the strength ranges encountered indicate the formation material generally is transitional in nature that is, the formation material classifies between soil and rock, i.e., Intermediate Geomaterial (IGM). The literature describes the Valley Springs Formation materials as rock therefore a rock classification was used here. However, since the formation materials falls into a transitional category the previous investigations soil classifications are appropriate. To clarify the different classifications used by the previous and present investigations a simple soil to rock cross-referencing is presented in Table 1 below.

Table 1– Soil classification and rock equivalents for the Bridge 26-0019 site.

Soil Classification based on the 2006 Investigation (Borings 06-4, 06-5 & 06-6)	Rock equivalents based on 2009 Investigation (Boring R-09-001)
SAND, SILT and CLAY (or mixed)	RHYOLITIC ASH (*)
GRAVEL	COMGLOMERATE
SILTY SAND, SAND	SILTY SANDSTONE, SANSTONE
SANDY SILT, SILT	SANDY SILTSTONE, SILTSTONE
CLAY	CLAYSTONE

Note: (*) Volcanics (RHYOLITIC ASH) typically occurs above elevation 178 +/- feet.

See the attachment LOTB(s) for detailed of subsurface conditions at the bridge site.

Groundwater

Groundwater was not encountered in the boring during the present investigation. However, during the investigation there was water flowing in Jackson Creek and standing water under the overflow bridge that would indicate groundwater should also be present. For design purposes the groundwater elevation shall be the same as the creek channel elevation, with the later ranging from about 197 to 202 feet.

Seismicity

Based on Caltrans California Seismic Hazard Map 1996, the controlling fault for the site is Prairie Creek-Spenceville-Dentman with a maximum credible earthquake of M_w=6.5 and is located about 6.5 miles northeast of the site. The peak horizontal bedrock acceleration at this site, based on the above map is estimated to be 0.3g. The potential for surface rupture at the site due to fault movement is considered insignificant since there are no known faults projecting towards or passing directly through the project site.

Liquefaction analysis indicates the presence of potentially liquefiable layers in the vicinity of Piers 7, 9 and 10 (See Table 1 below).

Table 1- Liquefaction Data

Support Location	Estimated Original Ground Elevation (ft)	Estimated Elevation Liquefiable Layers (ft)
Pier 7	200	200 to 189
Pier 9	209	197 to 189
Pier 10	209	197 to 189

Based on the LOTBs dated January 2006 and October 2009, a final Caltrans Seismic Design Criteria (CSDS) Acceleration Response Spectrum (ARS) curve corresponding to soil profile Type D is recommended for design. Please note that due to the close proximity of this structure to the fault, we have performed a second modification to the CSDC ARS curve (see Figure 1). The modification is such that there is no increase in spectral accelerations (SA) for periods less than 0.5 second, and a 20% increase in SA for periods greater than 1 second. Between the periods of 0.5 and 1 second, a linear interpolation was used to estimate the SA.

Corrosivity

Two corrosion tests were performed from samples taken during the drilling process at depths of 1.2 meters and 2.4 meters below the ground surface. Both tests indicate that the soil is non-corrosive to foundation elements.

Scour Potential

According to the final Hydraulic Report (Sharon Ropp, January 27, 2009) the pier pile extensions chosen should be designed for the channel scour elevations as presented in Table 1 below.

Table 2- Pier Scour Data

Pier Scour Elevation w/ 2 ft Diameter Columns	
Pier 2	No Scour Anticipated
Pier 3	191.0 feet
Pier 4,5,6 & 7	178.0 feet
Pier 8	189.0 feet
Pier 9	192.0 feet

Foundations Recommendation

The foundation recommendations are based on the present (2009) field investigation, geologic literature and analysis in conjunction with the General Plan dated October 30, 2008. Foundation Design Recommendations and Pile Data are presented in Tables 2 below.

Table 2- Pile Data

Location	Pile Type	Design Loading (kips)	Nominal Resistance		Cut-Off Elev. ft)	(1) (2) Design Tip Elev. (ft)	Specified Tip Elev. (ft)
			Compression (kips)	Tension (kips)			
Pier 1: Left Right	24-inch CIDH	N/A	240	N/A	208.8 203.4	170.4 (c) 165.2 (c)	170.4 165.2
Pier 2: Left Right	24-inch CIDH	N/A	240	N/A	202.9 201.2	162.6 (c) 162.4 (c)	162.6 162.4
Pier 3: Left Right	24-inch CIDH	N/A	240	N/A	197.0 197.3	159.5 (a) 159.4 (a)	159.5 159.4
Pier 4: Left Right	24-inch CIDH	N/A	240	N/A	193.0 193.3	152.7 (a) 151.7 (a)	152.7 151.7
Pier 5: Left Right	24-inch CIDH	N/A	240	N/A	192.9 193.3	150.8 (a) 151.8 (a)	150.8 151.8
Pier 6: Left Right	24-inch CIDH	N/A	240	N/A	192.8 193.4	151.7 (a) 150.1 (a)	151.7 150.1
Pier 7: Left Right	24-inch CIDH	N/A	240	N/A	192.6 198.0	150.0 (a) 155.1(b) 149.7 (a) 154.5(b)	150.0 155.1 149.7 154.5
Pier 8: Left Right	24-inch CIDH	N/A	240	N/A	195.5 197.0	154.4 (a) 154.0 (a)	154.4 154.0
Pier 9: Left Right	24-inch CIDH	N/A	240	N/A	202.9 199.5	155.2 (a) 153.2 (b) 155.3 (a) 154.1 (b)	155.2 153.2 155.3 154.1
Pier 10: Left Right	24-inch CIDH	N/A	240	N/A	205.5 206.2	153.6 (b) 152.8 (b)	153.6 152.8

Notes: 1) Pile tip elevations are controlled by Compression; (a) Scour (b) Liquefaction (c) Compression only.

2) Load Factor Design (LFD).

Construction Considerations

1. Groundwater may be encountered at all pile locations. Much of the geomaterials are sufficiently cohesive to make dewatering of the drilled shafts feasible. However, depending on the amount of water, there is a potential for the caving of granular geomaterials such as sands and gravels (SANDSTONE AND CONGLOMERATE) where present. If the contractor proposes to place concrete in a dry hole, the drilled holes are to be dewatered by pumping methods prior to placement of concrete. Also, the holes may require isolation by casing if surface or creek water is present. At locations where pumping methods are not sufficient to dewater the shafts, the Contractor should be allowed to place concrete using a slurry displacement method following the "Guidelines for CIDH Piles in Wet Conditions".

2. Prior to placement of concrete, the interior surface of the shaft including the bottom should be cleaned of residue from drilling operations.

3. The contractor has the option of using full-length temporary casing. The use of temporary casing will require that it be removed while the concrete is being placed in order to develop the expected pile capacity and to facilitate the casing removal.

4. The drilling of the CIDH piles, the placement of the rebar cage, and concrete pour shall be completed in a continuous operation.

5. Excavated materials and drilling fluids shall be handled and disposed of in accordance with the contract plans.

Disclaimer and Contract Information

The recommendations contained in this report are based on specific project information regarding design loads and structure location provided by the OGDN. If any conceptual changes are made during final project design, the Office of Geotechnical Design – North should review those changes to determine if these foundation recommendations are still applicable.

Project Information

Standard Special Provision (SSP) S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt form SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plan are:

A. *Log of Test Borings for Jackson Creek Bridge Widen, Bridge No. 26-0019 (2009 investigation).*

B. *Log of Test Borings for the Jackson Creek Bridge, Bridge No. 26-0019 (2006 investigation).*

Data and information included in the Information Handout provided to the bidders and contractors are:

A. *This report.*

If you have any questions, please call William Bertucci at (916) 227-1045 or John Huang at (916) 227-1037.

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ARS curve Attachment

cc: Jim Bane (District PM), Peggy Lim (PCE), Mark Willian, Trais Norris (District Env Manager), Ted Morradian (District Materials)

Jackson Creek Bridge
Br. No. 26-0019
10-264441

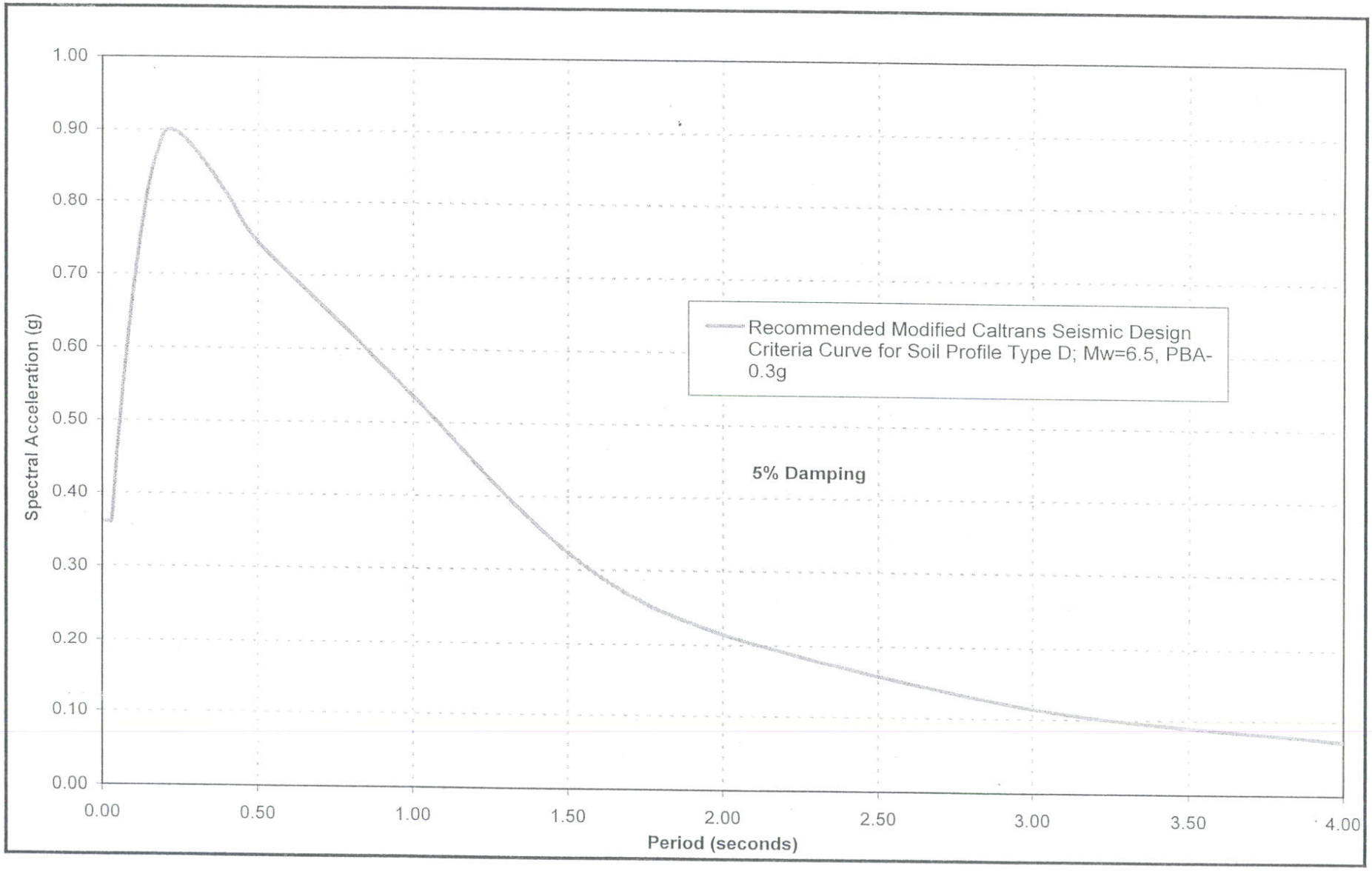

Figure 1. Acceleration Response Spectrum Recommended for Design

Jackson Creek Overflow Bridge (26-0051)

Revised Final Foundation Report

State of California
Department of Transportation

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: GARY BLAKESLEY

Date: April 2, 2010

Branch Chief
Bridge Design Branch 5
Office of Bridge Design North
Division of Engineering Services
Structures Design

File: 10-AMA-88 –2.94PM
Jackson Creek Overflow
Bridge (Replacement)
Bridge: 26-0051
EA: 10-264441

Attention: Mario Guadamuz

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Revised Foundation / Seismic Report – Supercedes all previous reports.

The Office of Geotechnical Design North has prepared this revised Foundation / Seismic Recommendations Report for the Jackson Creek Overflow Bridge. The bridge is located approximately 4 miles southwest of the town of Ione on State Route 88 in Amador County. This bridge is scheduled to be replaced and will require staged construction to maintain continuous traffic flow. The existing bridge is founded on relatively shallow isolated reinforced concrete spread footings. As such, piers 2 through 5 of the existing bridge have been classified scour critical.

The original field investigation was performed in 2006. One additional boring was drilled in 2009 to quantify geotechnical conditions. On October 20 through Oct 21, 2009 the supplemental subsurface investigation took place and foundation recommendations have been revised to reflect the new findings. This bridge is being replaced therefore the foundation design is based on Load Resistance Factor Design (LRFD).

Field Investigation

The 2009 investigation consisted of one mud rotary boring (R-09-002) drilled adjacent Pier 6 (Left) of the existing bridge (between Piers 4 and 5 of the replacement bridge). Core samples were taken continuously from top to bottom of the boring (depth 69.5 ft (Elev 128 ft)). One Standard Penetration Test (SPT) sample was taken (depth 4 ft); the N_{60} blow count was 91 (blows/last12-in.). As a consequence of the high blow count, SPTs were suspended in order to get more mechanically undisturbed core for laboratory testing and easier classification.

Geology

Regional Geology and Faulting

The project site is located at the Sierra Nevada western foothill margin; adjacent the Carabas Paleo-Ridge, a set of northwest trending low hills that are composed of highly deformed low-grade metavolcanic and metasedimentary basement rocks including plutonic intrusions. At the bridge site these basement rocks are buried by at least 500 to 1000 feet of interbedded Tertiary Age sedimentary and volcanics rocks.

Major faults within the vicinity of the project site include Bear Mountains Fault Zone located approximately 5.5 miles east of the site and the Melones Fault zone located approximately 12 miles northeast of the site. See Seismic Study section below for discussion of the seismic controlling fault(s) and site seismic design criteria.

Site Geology

The lithology at the site consists of Middle Pleistocene age Riverbank formation (Arkosic old alluvium) exposed in the road cut north of the bridge. At the bridge site boring (R-09-002) the underlying Eocene age Valley springs Formation was encountered. The formation consisted of volcanics that include RHYOLITIC TUFF /ASH with interbedded stream channel GRAVELS which intern are underlain by sedimentary rocks that include interbedded SANDSTONE, SILTSONE and CLAYSTONE. At Pier 3 and Pier 4 based on Boring 06-3 data dense to very dense GRAVEL with SAND may be encountered between about elevations 189 and 174 feet during pile drilling. In general, the formation material is very weak to extremely weak (strength ranges between 33 to 317 psi) based on laboratory testing although weaker and stronger rock maybe encountered at some pile locations. The over all rock quality (Rock Quality Designation, RQD index) measured from the core samples averaged 68%, indicating on average the rock quality is fair). Further more, the core samples in all cases very weak (lacked soundness) as noted above. Therefore, the (RQD) values above 0% were given an asterisk (RQD*) to indicate the

rock quality should be down graded further in those cases. Also, the strength ranges encountered indicate the formation material generally is transitional in nature that is, the formation material classifies between soil and rock, i.e., Intermediate Geomaterial (IGM). The literature describes the Valley Springs Formation materials as rock therefore a rock classification was used here. However, since the formation materials falls into a transitional category the previous investigations soil classifications are appropriate. To clarify the different classifications used by the previous and present investigations a simple soil to rock cross-referencing is presented in Table 1 below.

Table 1– Soil classification and rock equivalents for the Bridge 26-0051 site.

Soil Classification based on the 2006 Investigation (Borings 06-1, 06-2 & 06-3)	Rock equivalents based on Present Investigation (Boring R-09-002)
SAND, SILT and CLAY (or mixed)	RHYOLITIC ASH (*)
GRAVEL	COMGLOMERATE
SILTY SAND, SAND	SILTY SANDSTONE, SANSTONE
SANDY SILT, SILT	SANDY SILTSTONE, SILTSTONE
CLAY	CLAYSTONE

Note: (*) Volcanics (RHYOLITIC ASH) typically occurs above elevation 185 +/- feet.

See the attachment LOTB(s) for detailed of subsurface conditions at the bridge site.

Groundwater

Groundwater was not encountered in the boring during the present investigation. However, during the investigation there was water flowing in Jackson Creek and standing water under the overflow bridge that would indicate groundwater should also be present. For design purposes the groundwater elevation shall be the same as the creek channel elevation, with the later ranging from about 197 to 202 feet.

Seismicity

Based on Caltrans California Seismic Hazard Map 1996, the controlling fault for the site is Prairie Creek-Spenceville-Dentman with a maximum credible earthquake of M_w=6.5 and is located about 6.5 miles northeast of the site. The peak horizontal bedrock acceleration at this site, based on the above map is estimated to be 0.3g. The potential for surface rupture at the site due to fault movement is considered insignificant since there are no known faults projecting towards or passing directly through the project site.

Based on the LOTBs dated January 2006 and October 2009 a, a final Caltrans Seismic Design Criteria (CSDS) Acceleration Response Spectrum (ARS) curve corresponding to soil profile Type D is recommended for design. Please note that due to the close proximity of this structure to the fault, we have performed a second modification to the CSDC ARS curve (see Figure 1). The modification is such that there is no increase in spectral accelerations (SA) for periods less than 0.5 second, and a 20% increase in SA for periods greater than 1 second. Between the periods of 0.5 and 1 second, a linear interpolation was used to estimate the SA.

Liquefaction Potential

The potential for liquefaction at this bridge site during a seismic event is considered negligible due to the earth material types and density of these materials.

Corrosivity

Two corrosion tests were performed from samples taken during the drilling process at depths of 1.2 meters and 2.4 meters below the ground surface. Both tests indicate that the soil is non-corrosive to foundation elements.

Scour Potential

According to the final Hydraulic Report (Sharon Ropp, January 27, 2009) the pier pile extensions chosen should be designed for the channel scour elevations as presented in Table 1 below.

Table 2 - Pier Scour Elevations

Pier Scour Elevation w/ 2 ft Diameter Columns	
Pier 2	199.1 feet
Pier 3	190.7 feet
Pier 4	191.2 feet
Pier 5	196.1 feet

Foundations Recommendation

The foundation recommendations are based on the present (2009) field investigation, geologic literature and analysis in conjunction with the General Plan dated October 30, 2008. Foundation Design Recommendations and Pile Data are presented in Tables 2 and 5 below.

Table 3. Abutment Foundations Design Recommendations for the proposed bridge replacement.

Support Location	Pile Type	Bottom of Footing Elevation (ft)	LRFD Service-I Limit State Load (kips) per Support		LRFD Service-I Limit State Total Load (kips) per Pile (Compression)	Nominal Resistance (kips)	(1) Design Tip Elevation (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
			Total	Permanent					
Abut. 1	24-inch CIDH	203.98	910	650	70	140	185.5 (a-I)	185.5	N/A
Abut. 6	24-inch CIDH	203.54	910	650	70	140	185.5 (a-I)	185.5	N/A

Notes:

1) *Design tip elevations are controlled by: (a-I) Compression (Service I Limit).*
2) *There is no design tip elevation for Settlement.*
3) *The CIDH specified Tip elevation shall not be raised.*
4) *Structure Design typically provides design tip elevations for lateral loads.*

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Table 4. Pier foundations Design Recommendations for the proposed Bridge Replacement.

Support Location	Pile Type	Cut-off Elevation (ft)	Service-I Limit State Load per Pile (kips)	Total Permissible Support Settlement (inches)	Required Factored Nominal Resistance (kips)				(1) Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
					Strength Limit		Extreme Event				
					Comp. (φ=0.5)	Tension (φ=0.5)	Comp. (φ=1)	Tension (φ=1)			
Pier 2	24-inch CIDH	200.5	190.0	1	280	100	200	N/A	153.4 (a-I) 172.7 (a-II)	153.4	N/A
Pier 3	24-inch CIDH	195.57	190.0	1	280	100	200	N/A	156.9 (a-I) 176.1 (a-II)	156.9	N/A
Pier 4	24-inch CIDH	195.72	190.0	1	280	100	200	N/A	152.9 (a-I) 172.1 (a-II)	152.9	N/A
Pier 5	24-inch CIDH	198.55	190.0	1	280	100	200	N/A	160.0 (a-I) 179.1 (a-II)	160.0	N/A

Notes:

1) *Design tip elevations are controlled by: (a-I) Compression (Strength Limit) Scour, (a-II) Tension (Extreme Event) Scour.*
2) *There is no design tip elevation for Settlement.*
3) *The CIDH specified Tip elevation shall not be raised.*
4) *Structure Design Typically provided Design tip elevations for Lateral Loads.*

Table 5. Pile Data Table for the proposed bridge replacement.

Pile Data Table						
Location	Pile Type	Nominal Resistance (kips)		Design Tip Elevation (Ft)	Specified Tip Elevation (Ft)	Nominal Driving Resistance (Kips)
		Compression	Tension			
Abutment 1	24-inch CIDH	140	0	185.5 (a)	185.5	N/A
Pier 2	24-inch CIDH	560	200	153.4 (a) 172.7 (b)	153.4	N/A
Pier 3	24-inch CIDH	560	200	156.9 (a) 176.1 (b)	156.9	N/A
Pier 4	24-inch CIDH	560	200	152.9 (a) 172.1 (b)	152.9	N/A
Pier 5	24-inch CIDH	560	200	160.0 (a) 179.1 (b)	160.0	N/A
Abutment 6	24-inch CIDH	140	0	185.5 (a)	185.5	N/A

Notes:

1) Design tip elevations for Abutments and Bents are controlled by: (a) Compression, (b) Tension.

Construction Considerations

1. Groundwater may be encountered at all pile locations. Much of the geomaterials are sufficiently cohesive to make dewatering of the drilled shafts feasible. However, depending on the amount of water, there is a potential for the caving of granular geomaterials such as sands and gravels (SANDSTONE AND CONGLOMERATE) where present. If the contractor proposes to place concrete in a dry hole, the drilled holes are to be dewatered by pumping methods prior to placement of concrete. Also, the holes may require isolation by casing if surface or creek water is present. At locations where pumping methods are not sufficient to dewater the shafts, the Contractor should be allowed to place concrete using either

water or slurry displacement methods following the "Guidelines for CIDH Piles in Wet Conditions".

2. Prior to placement of concrete, the interior surface of the shaft including the bottom should be cleaned of residue from drilling operations.

3. The contractor has the option of using full-length temporary casing. The use of temporary casing will require that it be removed while the concrete is being placed in order to develop the expected pile capacity and to facilitate the casing removal.

4. The drilling of the CIDH piles, the placement of the rebar cage, and concrete pour shall be completed in a continuous operation.

5. Man-made obstructions are present at the surface in the area surrounding approximately Piers 3, 4 and 5 of the existing bridge and would impact construction of Pier 3 and possibly Pier 4 of the replacement bridge if left in place. The obstruction is various sized rip-rap rock up to several feet in diameter. This rip-rap should be removed prior to drilling the CIDH piles.

6. Excavated materials and drilling fluids shall be handled and disposed of in accordance with the contract plans.

Disclaimer and Contract Information

The recommendations contained in this report are based on specific project information regarding design loads and structure location provided by the OBDN. If any conceptual changes are made during final project design, the Office of Geotechnical Design – North should review those changes to determine if these foundation recommendations are still applicable.

Project Information

Standard Special Provision (SSP) S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt form SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plan are:

A. *Log of Test Borings for Jackson Creek Overflow Bridge Widen, Bridge No. 26-0051 (2009 investigation).*

B. *Log of Test Borings for the Jackson Creek Overflow Bridge, Bridge No. 26-0031 (2006 investigation).*

Data and information included in the Information Handout provided to the bidders and contractors are:

A. *Foundation report for Jackson Creek Overflow Bridge, this report.*

If you have any questions, please call William Bertucci at (916) 227-1045 or John Huang at (916) 227-1037.

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REGISTERED PROFESSIONAL ENGINEER
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Exp. 12/31/10
CIVIL
STATE OF CALIFORNIA

ARS curve Attachment

cc: Jim Bane (District PM), Peggy Lim (PCE), Mark Willian, Trais Norris (District Env Manager), Ted Morradian (District Materials)

FOUNDATION REVIEW

DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

To: Structure Design
1. Preliminary Report
2. R.E. Pending File
3. Specifications & Estimates
4. File

Geotechnical Services
1. GS (Sacramento)
2. GS

Date: 1/21/10

Jackson Ck. Br (Widen)
Structure Name

10 - Ama - 88 - 3.1
District County Route Post ~~Km~~ m.

District Project Development
District Project Engineer

18-264441 26-0019
E.A. Number Structure Number

Foundation Report By: B. Bertucci Dated: 12/23/09

Reviewed By: M. Guadamuz (OSD) R. Price (GS)

General Plan Dated: 10/7/09 Foundation Plan Dated: 4/2/09

☐ No changes. ☒ The following changes are necessary.

Please disregard item #5 in "construction considerations" in Foundation Report dated 12/23/09. Contractor is not required to submit drilling logs.

FOUNDATION CHECKLIST

✓ Pile Types and Design Loads	✓ Footing Elevations, Design Loads, and Locations	✓ LOTB's
✓ Pile Lengths	✓ Seismic Data	✓ Fill Surcharge
✓ Predrilling	✓ Location of Adjacent Structures and Utilities	✓ Approach Paving Slabs
✓ Pile Load Test	✓ Stability of Cuts or Fills	✓ Scour
✓ Substitution of H Piles For Concrete Piles ☐ Yes ☒ No	✓ Fill Time Delay	✓ Ground Water
	✓ Effect of Fills on Abutments and Bents	✓ Tremie Seals/Type D Excavation

Office of Structure Design Branch No. Geotechnical Services

Rev. 10/02

FOUNDATION REVIEW

DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

To: Structure Design
1. Preliminary Report
2. R.E. Pending File
3. Specifications & Estimates
4. File

Geotechnical Services
1. GS (Sacramento)
2. GS

District Project Development
District Project Engineer

Date: 1/21/10

Jackson Ck. Overflow Br.
Structure Name

10 - Ama - 88 - 2.94
District County Route Post ~~Km~~ mi

10-264441 26-0051
E.A. Number Structure Number

Foundation Report By: W. Bertran
Dated: 12/22/09

Reviewed By: M. Guadamuz (OSD) R. Price (GS)

General Plan Dated: 12/17/09
Foundation Plan Dated: 12/17/09

☐ No changes. ☒ The following changes are necessary.

(1) Please disregard item #5 in "Construction Considerations" section of Foundation Report dated 12/22/09.
Contractor is not required to submit drilling logs.

(2) The existing footings obstructing new piles must be addressed.

FOUNDATION CHECKLIST

- ✓ Pile Types and Design Loads
- ✓ Pile Lengths
- ✓ Predrilling
- ✓ Pile Load Test
- ✓ Substitution of H Piles For Concrete Piles ☐ Yes ☒ No
- ✓ Footing Elevations, Design Loads, and Locations
- ✓ Seismic Data
- ✓ Location of Adjacent Structures and Utilities
- ✓ Stability of Cuts or Fills
- ✓ Fill Time Delay
- ✓ Effect of Fills on Abutments and Bents
- ✓ LOTB's
- ✓ Fill Surcharge
- ✓ Approach Paving Slabs
- ✓ Scour
- ✓ Ground Water
- ✓ Tremie Seals/Type D Excavation

Office of Structure Design — Branch No. — Geotechnical Services

Rev. 10/02

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: MR. PAUL ELLIOT
Design Manager
Office of Design IV, Branch I

Attention: Mr. Eric Chin

Date: March 14, 2011

File: 10-AMA-88
PM 0.1/5.1
EA 10-264441
ID 1000000378-1

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Geotechnical Design Report (GDR)

1. Introduction

This report has been prepared to provide geotechnical design recommendations for the Jackson Valley SR88 (Widening) Rehabilitation project. The project starts just east of the San Joaquin / Amador County line at PM 0.1 and ends at PM 5.1 in Amador County. The project proposes to widen State Route 88 and includes cut and fill sections, one retaining wall, and two bridges. Foundation recommendations for the bridges are presented in Foundation Reports delivered to Headquarters Structure Design. A vicinity map is presented as **Plate No. 1**.

This report is based on analysis of field and laboratory tests derived from the recently completed foundation drilling investigation, geophysical survey and Cone Penetrometer Testing (CPT), and a review of existing reports and plans.

2. Existing Facilities / Proposed Improvements

Within the project limits, SR 88 is a two lane undivided highway aligned in a general northeast / southwest direction. The highway has 12 foot lanes and variable shoulders.

This project proposes to widen SR 88. To facilitate the widening, the proposed improvements include cut slopes of 2:1 (H:V) or flatter from 5 to 37 feet in height and fill slopes of 2:1 or flatter from 1 to 6 feet in height. A Type 1 retaining wall of 11 to 12 feet in height is also proposed.

3. Pertinent Reports and Investigations

- Goose Creek / Ione, CA 7.5-Minute Quadrangles, USGS.
- Camp Pardee, Monthly Climate Summary, Western Regional Climate Center.
- Caltrans Standard Plans / Specifications, May 2006.
- Project Plans / Cross Sections, District 6 Design.
- Foundation Report, Jackson Creek Bridge, 2/10/2009.
- Foundation Report, Jackson Creek Overflow Bridge, 2/10/2009.

4. Physical Setting

Climate

According to the Western Regional Climate Center, the average annual precipitation in the project area is about 22 in. The majority of this precipitation falls between October and May. The average annual air temperature is around 62°F with the highest average daily maximum of around 96°F in July and the lowest average daily minimum of around 38°F in January. Freezing temperature conditions are usually brief and freeze / thaw conditions typically do not occur.

Topography

The Goose Creek and Ione, Ca. 7.5-Minute Quadrangles, were reviewed to determine the topographic features of the project region. The general terrain within the project limits consists of level ground to rolling hills with ground elevations varying from approximately 195 feet at the south end of the project to approximately 280 feet at the north end. Within the project limits, the highway is constructed both at grade, and through cut and fill sections.

Geomorphology and Geology

The proposed rehabilitation project is located within the Great Valley Geomorphic Province (GP) located to the west and the Sierra Nevada (GP) located to the east, the later includes the Sierra Foothills. The west segment of the project (Station 106+00 to Station 304+00) passes over the relatively flat lying to gently rolling Jackson valley drainage. The valley marine and nonmarine sediments underlying the portion of the roadway extend to depths of few hundred to a few thousand feet. The road cut slopes with in this

segment expose Gravel, Sand and Clay of the River Bank Formation overlying interbedded Rhyolitic volcanic-clastic rock of the Valley Spring Formation. Within the east part of the project beyond Station 304+00 to the end of the project the valley sediments thin out and / or occur as isolated hill top remnants. The topography rises and falls, forming the beginning of the north trending narrow ridge and valley Sierra Foothills. These hills consist mainly of weakly metamorphosed basement rocks which are partially capped by a relatively thin veneer of Recent to Tertiary Age sedimentary and volcanic formations as noted above. The first prominent series of hills called the Carabas Paleo-Ridge crosses the project roadway alignment between approximately Station 304+00 and Station 325+00. Within the project this ridge exposes mainly hard highly deformed low-grade metavolcanic rock referred to as the Carboniferous and Jurassic Age Gopher Ridge Volcanics. Beyond this Ridge to the east, the roadway passes through the generally flat to gently rolling Ione Valley. The underlying soil and rock is mainly the Eocene Age Ione Formation that is capped by a thin layer (several feet) of resistant Plio-Pleistocene North Merced Gravel. These formations exposed in the project road cuts and retaining wall borings are composed mainly of dense oxidized gravel and cobbles with some fines overlaying soft interbedded, Sandy Claystone and Clayey Sandstone.

Seismicity

Refer to the Foundation Reports for Jackson Creek Bridge and Jackson Creek Overflow Bridge dated 2/10/2009 for seismic details.

5. Geotechnical Conditions

To determine the geotechnical conditions within the project limits, a subsurface investigation was performed. The subsurface investigation included drilling, Cone Penetrometer Testing (CPT) and a geophysical survey (seismic refraction lines).

Drilling

Drilling was performed at the northeastern end of the project in September 2010 for the proposed retaining wall. Drilling consisted of two rotary wash borings drilled to depths of 31.5 to 37.5 feet. The boring locations are presented on **Plates 2 through 5**. The boring logs are presented in **Appendix A**.

Table 1 below, summarizes the boring locations and general soil type.

Table 1. Boring Locations / Soil Type

Boring No.	STA (ft)	Line	Offset / Direction	Depth (ft)	Soil Type
R-10-001	367+60	CL SR 88	7 ft Left	36	Sandy Claystone, Clayey Sandstone
R-10-002	361+15	CL SR 88	7 ft Left	33	Sandy Claystone, Clayey Sandstone, Silty Sandstone

Cone Penetrometer Testing (CPT)

Eleven CPT borings were performed within the project limits in August 2010 at locations where fill is to be placed. The CPT soundings, converted to soil consistency data, was used to determine the extent of soil removal and/or reworking that might be required before fill soil can be placed. The CPT locations are presented on **Plates 2 through 5**. The CPT logs are presented in **Appendix B**.

Table 2 below, summarizes the CPT locations and general soil type.

Table 2. CPT Locations / Soil Type

CPT No.	Approx. STA (ft)	Line	Offset / Direction	Approx. Depth (ft)	Soil Type
1	222+00	CL SR 88	17 ft R	3	Silty Sand, Gravel
2	234+00	CL SR 88	18 ft R	9	Sand, Silt, Gravel
3	243+50	CL SR 88	16 ft R	6	Sand, Silt, Clay
4	250+00	CL SR 88	20 ft R	11	Sand, Silt, Gravel
5	278+00	CL SR 88	20 ft R	34	Sand, Silt, Clay, Gravel

Table 2. CPT Locations / Soil Type (continued)

CPT No.	Approx. STA (ft)	Line	Offset / Direction	Approx. Depth (ft)	Soil Type
6	297+00	CL SR 88	16 ft R	30	Sand, Silt, Clay, Gravel
7	318+00	CL SR 88	18 ft R	8	Sand, Silt, Clay
8	330+00	CL SR 88	17 ft R	35	Sand, Silt, Clay, Gravel
9	344+00	CL SR 88	18 ft R	10	Sand, Silt
10	355+00	CL SR 88	22 ft L	19	Sand, Silt, Clay, Gravel
11	372+00	CL SR 88	16 ft L	32	Sand, Silt, Gravel

The CPT depths shown are the maximum depth that could be obtained with the CPT rig. The CPT logs indicate that the subsurface soil predominantly consists of medium dense to very dense sands, silts and gravels. For complete descriptions, see the CPT logs attached in **Appendix B**.

Geophysical Survey

A Geophysical Survey consisting of seismic refraction lines was performed and provides a record of rippability (relative difficulty to excavate) at selected cut slope location. As the geologic layers generally lie near horizontal, it was not necessary to conduct the survey over the entire length of most of the slope areas. The Seismic Refraction Survey Report is attached in **Appendix C**.

Table 3 below, summarizes the cut slope geophysical soil and rock properties.

Table 3. Cut Slope Soil and Rock Properties

Cut Slope No. / Structure ID	Approx STA Limits SR 88 C/L	Approx Height (ft.)	Rock Velocity Layer (decreasing depth)	Ave Velocity Layer Thickness (ft) (2)	Layer Average Velocity (ft/sec)	Ripping Difficulty (1)	Geologic Deposits
Cut Slope 1 Left (Seismic Line 1)	226+40 to 227+65	5	1 2 3	0-1.0 14 undefined	500 5000 6600	ER DR NR	Volcanic-clastic (Valley Sp. Fm.)
Cut Slope 2 Left (Seismic Line 2A)	237+30 to 240+60	16	1	2	500	ER	Weathered Volcanics (Valley Sp. Fm.)
Cut Slope 2 Right (Seismic Line 2B	Same as above	14	2 3	20 undefined	4000 5000	DR DR	Weathered Volcanics (Valley Sp. Fm.)
Cut Slope 3 Right (Seismic Line 3)	247+40 249+95	16	1 2	11 undefined	500-700 7900	ER NR	Volcanic-clastic? (Valley Sp. Fm) Metavol? (GRV)
Cut Slope 4 Left (Seismic Line 4)	305+20	37	1	Undefined (expect to involve entire cut)	17,000	NR	Metavolcanics (Gopher Ridge Volcanics-GRV)
Cut Slope 5 Left (Seismic Line 5)	313+00 to 314+30	7	1 2 3	4.5 7.5 undefined	500 600 6400	ER ER NR	Weathered Metavolcanics - Weathered Metavolcanics? S/A (G RV)
Cut Slope 6 Left (Seismic Line 6)	318+50 to 320+90	8	1 2 3	3 36 undefined	400 4000 11,000	ER DR NR	Weathered Metavol. Metavolcanics S/A (GRV)
Cut Slope 7 Left (Seismic Line 7)	334+00 to 338+70	13	1 2	3 undefined	2000 4300	ER DR	Gravel & Cobbles Gravels & Cobbles? North Merced Gravel)

Table 3. Cut Slope Soil and Rock Properties (continued)

Cut Slope No. / Structure ID	Approx STA Limits SR 88 C/L	Approx Height (ft.)	Rock Velocity Layer (decreasing depth)	Ave Velocity Layer Thickness (ft) (2)	Layer Average Velocity (ft/sec)	Ripping Difficulty (1)	Geologic Deposits
Cut Slope 8A1 right (Seismic Line 8A1)	360+00 to 361+25	23	1 2	2.5 undefined	1516 5858	ER DR	Weathered Sandy Sandy Claystone Ione Fm?
Cut Slope 8A2 Right (Seismic Line 8A2)	366+30 to 367+50	23	1 2	5 undefined	1447 6272	ER DR	Weathered Sandy Claystone (I. Fm) Ione Fm?
Cut Slope C8B) Left (Seismic Line 8B)	365+70 to 368+15	13	1 2 3	1300 2688 7237	6 12-20 undefined	ER ER NR	Gravel & Sand (North Merced Gravels) Sandy Claystone? (Ione Fm?)

Notes:

1. ER = Easily Ripped, MD = Moderately Difficult to Rip, DR = Difficult to rip, NR = Not Rippable (Taken from the Attached Seismic Investigation)
2. Depth to a particular velocity layer is dependent on the inclination (dip, undermined) of that layer, therefore the layer may be encountered at depths or elevations different than what was indicated at the seismic line location.

Ground Water

Groundwater seepage within the more clayey bedrock formations are primarily controlled by fracturing and to a lesser degree by its permeability and vice versa for the more sandy formation. White mineral precipitate streaks seen emanating from cracks in the roadway fronting some of the cut slopes indicates the presents of groundwater seepage. Groundwater at these locations was not seen during our field work but most likely was occurring during the winter months.

It is anticipated that groundwater levels will vary with the passage of time due to seasonal groundwater fluctuations, irrigation, surface and subsurface flow, run-off and other factors. Perched ground water conditions may exist within the project limits.

Corrosion

Laboratory testing of samples collected at the project site indicate the soils and rock are corrosive.

6. Geotechnical Recommendations

The following geotechnical recommendations are based primarily on analysis of the Project Layout Sheets provided by District 10 Design, and geologic investigation data. The recommendations presented in this report are limited to the cut slopes, areas to receive fill and the retaining wall located at the east end of the project.

Cut and Fill

Based upon the subsurface investigation and analysis, the proposed cut and fill slopes may be constructed as proposed. A settlement waiting period is not needed for fill placement, as the estimated immediate settlement for a 6 ft high fill is about 1 inch. No long term settlement is expected. As shown in **Table 3**, material within the proposed cut slopes consists predominantly of easily rippable (ER) to moderately difficult (MD) with some areas of difficult to rip (DR) to non-rippable (NR).

Retaining Walls

Due to right of way constraints, a standard plan retaining wall is proposed at the northeast end of the project (eastbound side of highway). The retaining wall type including stationing and general locations are shown in **Table 4** below.

Table 4. Standard Retaining Wall

Structure	Station & Line (approximate)	Location	Wall Type	Wall Height (ft)
Retaining Wall	361+60 to 368+25, CL SR 88	Southeast side of RTE 88, end of wall approx. 380 feet southwest of Martin Lane C/L	Type 1 Retaining Wall	11-12

A Standard Plan Type 1 wall with a spread footing foundation is adequate from a geotechnical view. The allowable bearing capacity of the on-site rock/soil meets the toe pressure requirement specified in the Caltrans Standard Plans dated May 2006. The wall footing edge shall be kept at least 4 feet back of edge of slope measured horizontally from top of footing as shown on the plans. For descriptions of subsurface conditions at the retaining wall site refer to **Table 3** (Cut Slope Soil and Rock Properties).

Due to the dense nature of the subsurface materials at the retaining wall location, settlement should be mainly elastic. Therefore, the settlement should be completed before construction is finished.

7. Construction Considerations

1. Groundwater is not expected during construction in the summer or fall seasons. Minor groundwater seepage may be encountered if construction occurs during the winter or spring season. The greatest potential source of water that could affect the footing excavations is from surface run off during periods of rain. Therefore, it is important to divert and contain surface drainage during construction.

2. Rock quality, strength and ripping ability vary greatly (reference **Table 3**). Drilling and/or excavating may be very difficult and may require specialized equipment and methods such as rock breaking tools and/or blasting.

3. The retaining wall footing shall be constructed below existing ground on competent material. The footing shall be embedded at a sufficient depth (minimum 5 feet to the bottom of the footing). A representative from our office should observe the finished excavations. If non-suitable material is encountered at the bottom of footing grade, the footing excavation should be lowered and poured back with lean concrete.

4. Embankment fill and backfill behind the retaining wall should meet the structure backfill requirements set forth in the standard specifications and standard plans. Backfill and compaction of depressions and pits created from clearing and grubbing at the base of the footing shall also conform to requirements of the standard specifications.

5. Concrete in the footing excavation shall be placed neat against trimmed undisturbed competent material.

6. Bidders are encouraged to view the rock cores at the Transportation Laboratory located in Sacramento before submitting bids.

8. Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

A. None

Data and Information included in the Information Handout provided to the bidders and Contractors are:

A. Geotechnical Design Report for EA 10-264441, dated 3/14/2011.

Data and Information available for inspection at the District Office:

A. None

Data and Information available for inspection at the Transportation Laboratory are:

A. Borehole Core Samples

The recommendations contained in this report are based upon site conditions that we observed at the time of our investigation, data from our field investigation (borings, CPT and geophysical survey) and our current understanding of proposed project. If the scope of the proposed project changes from that described in this report, the Office of Geotechnical Design North should be afforded the opportunity to review those changes to determine if our geotechnical recommendations are still applicable.

If there are any questions or more information is needed please contact Bill Bertucci at 916-227-1045 or Ben Barnes at 916-227-1039.

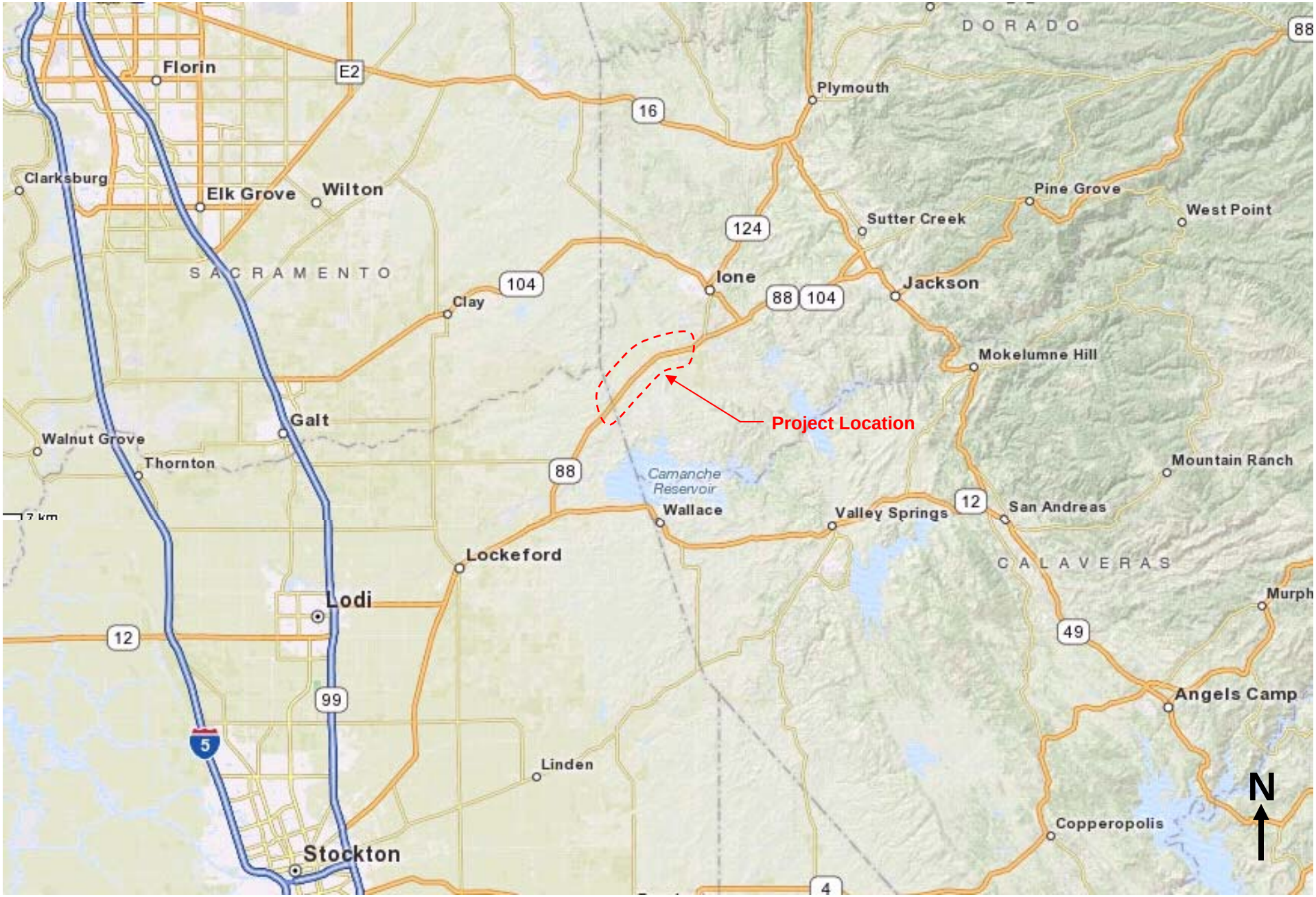
WILLIAM BERTUCCI
Associate Engineering Geologist
Office of Geotechnical Design – North
Branch E

BENJAMIN M. BARNES
Transportation Engineer
Office of Geotechnical Design – North
Branch E

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN M. BARNES
No. 66090
Exp. 6/30/2012
CIVIL
STATE OF CALIFORNIA

Attachments:
Plate No. 1: Vicinity Map
Plates No. 2-5: Site Plans
Appendix A: Boring Logs
Appendix B: CPT Logs
Appendix C: Seismic Refraction Survey Report

c: John Huang (GS, OGDN-E)
Jim Hammer (D10 Project Manager)
Mark Willian (GS, Corporate Unit)
District Construction RE Pending File
Dave Dhillon (D10 District Materials Engineer)

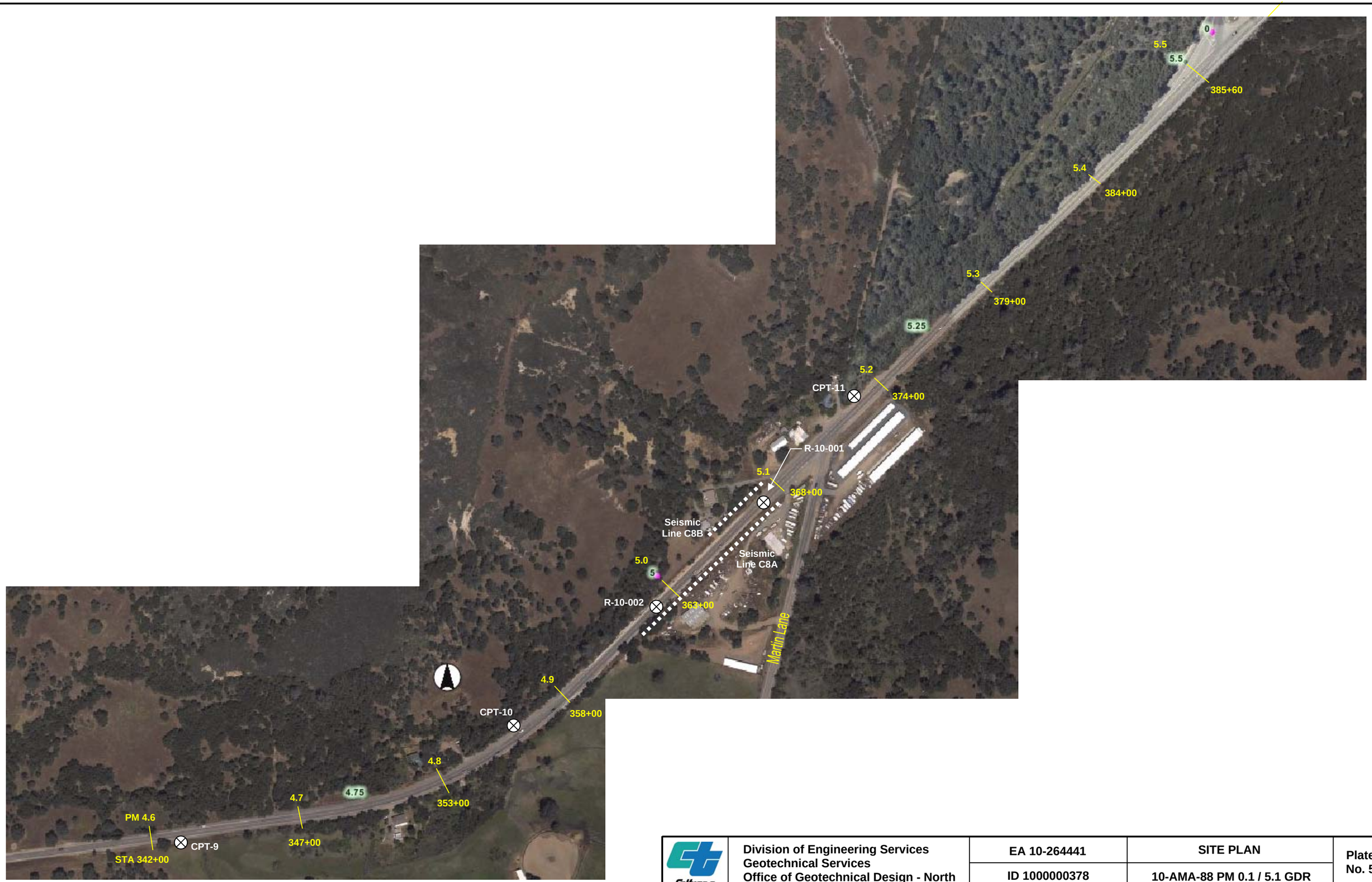


Caltrans	Division of Engineering Services Geotechnical Services Office of Geotechnical Design - North	EA 10-264441	VICINITY MAP	Plate No. 1
		ID 1000000378	10-AMA-88 PM 0.1/5.1 GDR	

Caltrans	Division of Engineering Services Geotechnical Services Office of Geotechnical Design - North	EA 10-264441	SITE PLAN	Plate No. 2
		ID 1000000378	10-AMA-88 PM 0.1 / 5.1 GDR	

Caltrans	Division of Engineering Services Geotechnical Services Office of Geotechnical Design - North	EA 10-264441	SITE PLAN	Plate No. 3
		ID 1000000378	10-AMA-88 PM 0.1 / 5.1 GDR	

Caltrans	Division of Engineering Services Geotechnical Services Office of Geotechnical Design - North	EA 10-264441	SITE PLAN	Plate No. 4
		ID 1000000378	10-AMA-88 PM 0.1 / 5.1 GDR	



Caltrans	Division of Engineering Services Geotechnical Services Office of Geotechnical Design - North	EA 10-264441	SITE PLAN	Plate No. 5
		ID 1000000378	10-AMA-88 PM 0.1 / 5.1 GDR	

APPENDIX A

Boring Logs

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic / Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435-04)
CL	Collapse Potential (ASTM D 5333-03)
CP	Compaction Curve (CTM 216 - 06)
CR	Corrosion, Sulfates, Chlorides (CTM 643 - 99; CTM 417 - 06; CTM 422 - 06)
CU	Consolidated Undrained Triaxial (ASTM D 4767-02)
DS	Direct Shear (ASTM D 3080-04)
EI	Expansion Index (ASTM D 4829-03)
M	Moisture Content (ASTM D 2216-05)
OC	Organic Content (ASTM D 2974-07)
P	Permeability (CTM 220 - 05)
PA	Particle Size Analysis (ASTM D 422-63 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89-02, AASHTO T 90-00)
PL	Point Load Index (ASTM D 5731-05)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301 - 00)
SE	Sand Equivalent (CTM 217 - 99)
SG	Specific Gravity (AASHTO T 100-06)
SL	Shrinkage Limit (ASTM D 427-04)
SW	Swell Potential (ASTM D 4546-03)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166-06) Unconfined Compression - Rock (ASTM D 2938-95)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850-03)
UW	Unit Weight (ASTM D 4767-04)
VS	Vane Shear (AASHTO T 223-96 [2004])

SAMPLER GRAPHIC SYMBOLS

- Standard Penetration Test (SPT)
- Standard California Sampler
- Modified California Sampler
- Shelby Tube
- Piston Sampler
- NX Rock Core
- HQ Rock Core
- Bulk Sample
- Other (see remarks)

DRILLING METHOD SYMBOLS

- Auger Drilling
- Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

WATER LEVEL SYMBOLS

- First Water Level Reading (during drilling)
- Static Water Level Reading (short-term)
- Static Water Level Reading (long-term)

Department of Transportation
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - North

REPORT TITLE
BORING RECORD LEGEND

DIST.	COUNTY	ROUTE	POSTMILE	EA
10	Amador	88	D0.1/D5.1	10-264441

PROJECT OR BRIDGE NAME
Jackson Valley Rehabilitation

BRIDGE NUMBER	PREPARED BY	DATE	SHEET
NA			1 of 3

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	Pocket Penetrometer (tsf)	Torvane (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	0.25 - 0.50	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	0.50 - 1.0	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	1.0 - 2.0	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	2.0 - 4.0	1.0 - 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60} - Value (blows / foot)
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Descriptor	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptors and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (July 2007), Section 2, for tables of additional soil description components and discussion of soil description and identification.

ROCK GRAPHIC SYMBOLS

IGNEOUS ROCK

SEDIMENTARY ROCK

METAMORPHIC ROCK

BEDDING SPACING

Descriptor	Thickness or Spacing
Massive	> 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8 inches to 1 ft
Thinly bedded	1-1/4 to 3-5/8 inches
Very thinly bedded	3/8 inch to 1-1/4 inches
Laminated	< 3/8 inch

WEATHERING DESCRIPTORS FOR INTACT ROCK

	Diagnostic Features					
	Chemical Weathering-Discoloration-Oxidation		Mechanical Weathering and Grain Boundary Conditions	Texture and Solutioning		
Descriptor	Body of Rock	Fracture Surfaces		Texture	Solutioning	General Characteristics
Fresh	No discoloration, not oxidized	No discoloration or oxidation	No separation, intact (tight)	No change	No solutioning	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull	Minor to complete discoloration or oxidation of most surfaces	No visible separation, intact (tight)	Preserved	Minor leaching of some soluble minerals may be noted	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty"; feldspar crystals are "cloudy"	All fracture surfaces are discolored or oxidized	Partial separation of boundaries visible	Generally preserved	Soluble minerals may be mostly leached	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation (refer to grain boundary conditions)	All fracture surfaces are discolored or oxidized; surfaces are friable	Partial separation, rock is friable; in semi-arid conditions, granitics are disaggregated	Altered by chemical disintegration such as via hydration or argillation	Leaching of soluble minerals may be complete	Dull sound when struck with hammer; usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures or veinlets. Rock is significantly weakened.
Decomposed	Discolored of oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay		Complete separation of grain boundaries (disaggregated)	Resembles a soil; partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes".

Note: Combination descriptors (such as "slightly weathered to fresh") are used where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant identifiable zones can be delineated. Only two adjacent descriptors shall be combined. "Very intensely weathered" is the combination descriptor for "decomposed to intensely weathered".

RELATIVE STRENGTH OF INTACT ROCK

Descriptor	Uniaxial Compressive Strength (psi)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

ROCK HARDNESS

Descriptor	Criteria
Extremely Hard	Specimen cannot be scratched with pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows
Very hard	Specimen cannot be scratched with pocket knife or sharp pick; breaks with repeated heavy hammer blows
Hard	Specimen can be scratched with pocket knife or sharp pick with heavy pressure; heavy hammer blows required to break specimen
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure; breaks with moderate hammer blows
Moderately Soft	Specimen can be grooved 1/6 in. with pocket knife or sharp pick with moderate or heavy pressure; breaks with light hammer blow or heavy hand pressure
Soft	Specimen can be grooved or gouged with pocket knife or sharp pick with light pressure, breaks with light to moderate hand pressure
Very Soft	Specimen can be readily indented, grooved, or gouged with fingernail, or carved with pocket knife; breaks with light hand pressure

CORE RECOVERY CALCULATION (%)

$$\frac{\Sigma \text{ Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100$$

RQD CALCULATION (%)

$$\frac{\Sigma \text{ Length of intact core pieces > 4 in.}}{\text{Total length of core run (in.)}} \times 100$$

FRACTURE DENSITY

Descriptor	Criteria
Unfractured	No fractures
Very Slightly Fractured	Lengths greater 3 ft
Slightly Fractured	Lengths from 1 to 3 ft, few lengths outside that range
Moderately Fractured	Lengths mostly in range of 4 in. to 1 ft, with most lengths about 8 in.
Intensely Fractured	Lengths average from 1 in. to 4 in. with scattered fragmented intervals with lengths less than 4 in.
Very Intensely Fractured	Mostly chips and fragments with few scattered short core lengths

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
B. Bertucci	9-7-10	9-7-10	NAD83	R-10-001
DRILLING CONTRACTOR: Caltrans			BOREHOLE LOCATION (Offset, Station, Line): 7.00' Rt Sta 367+60CL	SURFACE ELEVATION: 274.0 ft MLLW
DRILLING METHOD: Rotary Wash			DRILL RIG: Mobile B47	BOREHOLE DIAMETER: 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4 in)			SPT HAMMER TYPE: Safety	HAMMER EFFICIENCY, ERi: 82%
BOREHOLE BACKFILL AND COMPLETION: Bentonite chip seal			GROUNDWATER READINGS: DURING DRILLING: Not encountered; AFTER DRILLING (DATE):	TOTAL DEPTH OF BORING: 37.5 ft

ELEVATION (ft)	DEPTH (ft)	Material Graphics	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0		ASPHALT.												
			AGGREGATE BASE.												
			CLAYSTONE intensely weathered to decomposed; dusky red; very soft; single thin clay filled fracture (Fat CLAY (CH); stiff to very stiff; high plasticity, 100% fines); PP = 1 to 3 tsf; UU = 4.7 tsf.												
269.00	5		SANDY CLAYSTONE massive; mottled light gray and dark yellowish orange; intensely weathered; very soft; unfractured; (Lean CLAY with SAND (CL); hard; slightly plastic; 25% SAND; 75% fines; PP = 4.5 tsf..	X	1	10 10 27	37	100							
264.00	10		25% SAND, 75% FINES.	X	2			100							
259.00	15		PP = 2.5 to >4.5 tsf.												
			38% SAND, 62% FINES.	X	3	10 12 18	30	100							
254.00	20		45% SAND, 55% FINES. UU = 1.5 tsf, PP = 2 to 4.5 tsf.	X	4	10 14 18	32	100							
249.00	25		SANDY CLAYSTONE / CLAYEY SANDSTONE very thickly beded; fine to medium grained; intensely weathered; slightly mottled light gray and yellowish orange; very soft; unfractured; (Sandy Lean CLAY (CL); very stiff; slightly plastic); 66% SAND, 34% FINES; PP = 3.5 to 4.5 tsf..	X	5	10 16 20	36	100							
244.00	30		SILTY SANDSTONE slightly mottled light gray and yellowish orange; intensely weathered to decomposed; very soft; (SILTY SAND (SM); medium dense; fine grained; non-plastic); UU = 0.6 to 1.2 tsf..	X	6	10 9 14	23	100							
239.00	35			X	7			100							
			Bottom of borehole at 37.5 ft bgs												
	40														

Department of Transportation
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - North

REPORT TITLE				HOLE ID
BORING RECORD				R-10-001
DIST. 10	COUNTY AMA	ROUTE 88	POSTMILE D0.1/D5.1	EA 10-264441
PROJECT OR BRIDGE NAME: Jackson Valley Rehabilitation				
BRIDGE NUMBER NA	PREPARED BY B. Barnes	DATE 1-10-11	SHEET 1 of 1	

5 BR - STANDARD JACKSONVALLEY.GPJ CALTRANS_LIBRARY_DEC09.GLB 1/27/11

LOGGED BY	BEGIN DATE	COMPLETION DATE	BOREHOLE LOCATION (Lat/Long or North/East and Datum)	HOLE ID
B. Bertucci	9-8-10	9-8-10	NAD83	R-10-002
DRILLING CONTRACTOR: Caltrans			BOREHOLE LOCATION (Offset, Station, Line): 7.00' Rt Sta 361+15CL	SURFACE ELEVATION: 269.4 ft MLLW
DRILLING METHOD: Rotary Wash			DRILL RIG: Mobile B47	BOREHOLE DIAMETER: 4 in
SAMPLER TYPE(S) AND SIZE(S) (ID): SPT (1.4 in)			SPT HAMMER TYPE: Safety	HAMMER EFFICIENCY, ERi: 82%
BOREHOLE BACKFILL AND COMPLETION: Bentonite chip seal			GROUNDWATER READINGS: DURING DRILLING: Not encountered; AFTER DRILLING (DATE):	TOTAL DEPTH OF BORING: 32.5 ft

ELEVATION (ft)	DEPTH (ft)	DESCRIPTION	Sample Location	Sample Number	Blows per 6 in.	Blows per foot	Recovery (%)	RQD (%)	Moisture Content (%)	Dry Unit Weight (pcf)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks
	0	ASPHALT.												
		AGGREGATE BASE.												
		SANDY CLAYSTONE intensely weathered; mottled bluish gray and yellwoish orange; very soft; unfractured; (SANDY Lean CLAY (CL); very stiff to hard; moderate plasticity; 28% SAND, 72% FINES; PP = 2.5 to 4.5 tsf..												
264.40	5													
		From approx. 6 to 8 ft, becomes dusky red, hard; PP > 4.5 tsf..	X	1	10 26 32	58	100							
259.40	10													
		30% SAND, 70% FINES.	X	2	10 34 46	80	100							
254.40	15													
		From 16 to 25 ft, slightly mottled medium gray and yellowish orange..												
		25% SAND, 75% FINES.	X	3	10 7 13	20	100							
249.40	20													
		43% SAND, 57% FINES.	X	4	10 17 22	39	100							
244.40	25													
		CLAYEY SANDSTONE fine to medium grained; very thickly bedded; intensely weathered; light gray; very soft; unfractured; (SANDY Lean CLAY (CL); very stiff; slight plasticity; 62% SAND, 38% FINES)..	X	5	10 9 10	19	100							
239.40	30													
			X	6	10 12 13	25	100							
		Bottom of borehole at 32.5 ft bgs												
234.40	35													
	40													

Department of Transportation
Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - North

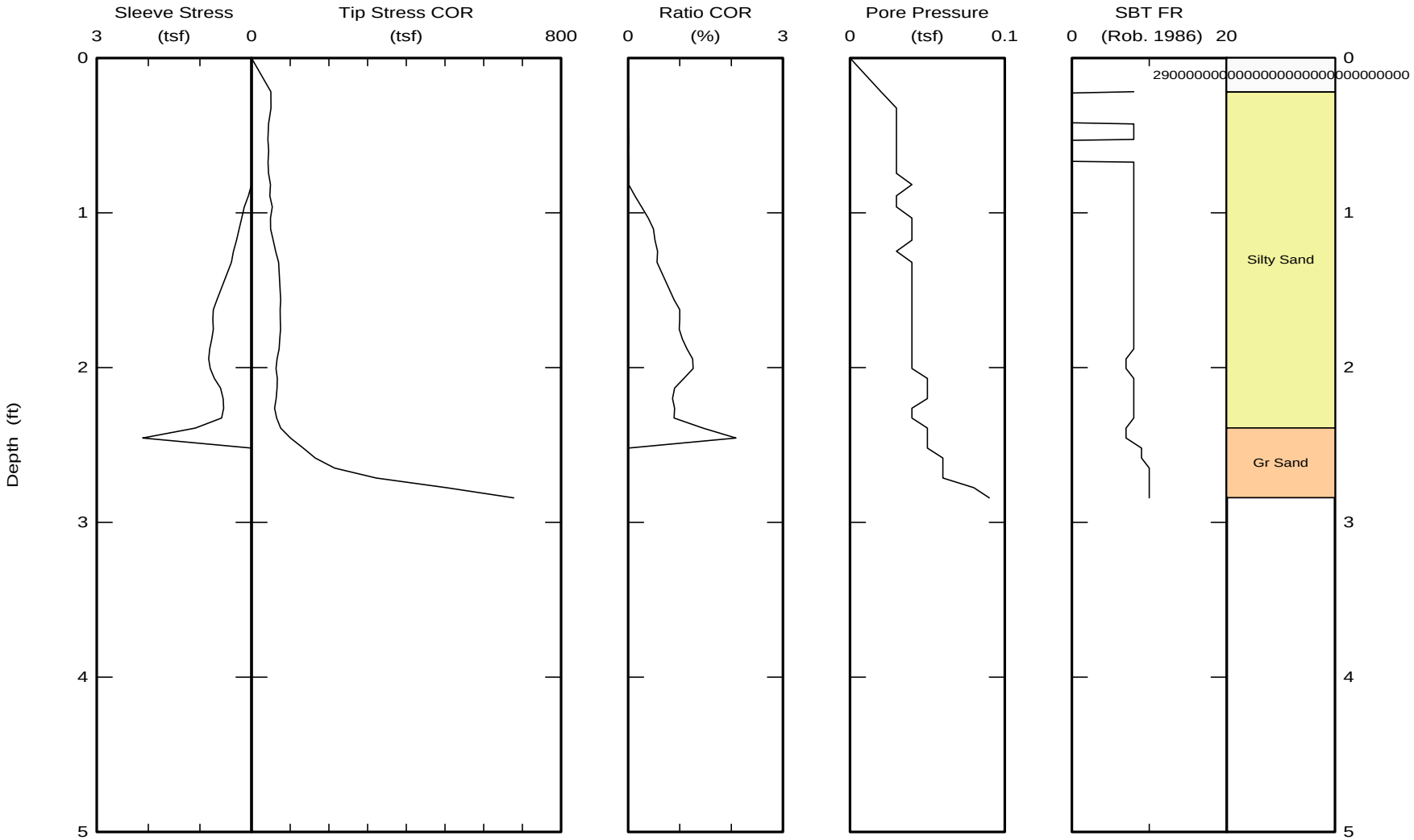
REPORT TITLE				HOLE ID
BORING RECORD				R-10-002
DIST. 10	COUNTY AMA	ROUTE 88	POSTMILE D0.1/D5.1	EA 10-264441
PROJECT OR BRIDGE NAME: Jackson Valley Rehabilitation				
BRIDGE NUMBER NA	PREPARED BY B. Barnes	DATE 1-10-11	SHEET 1 of 1	

5 BR - STANDARD JACKSONVALLEY.GPJ CALTRANS_LIBRARY_DEC09.GLB 1/27/11

APPENDIX B

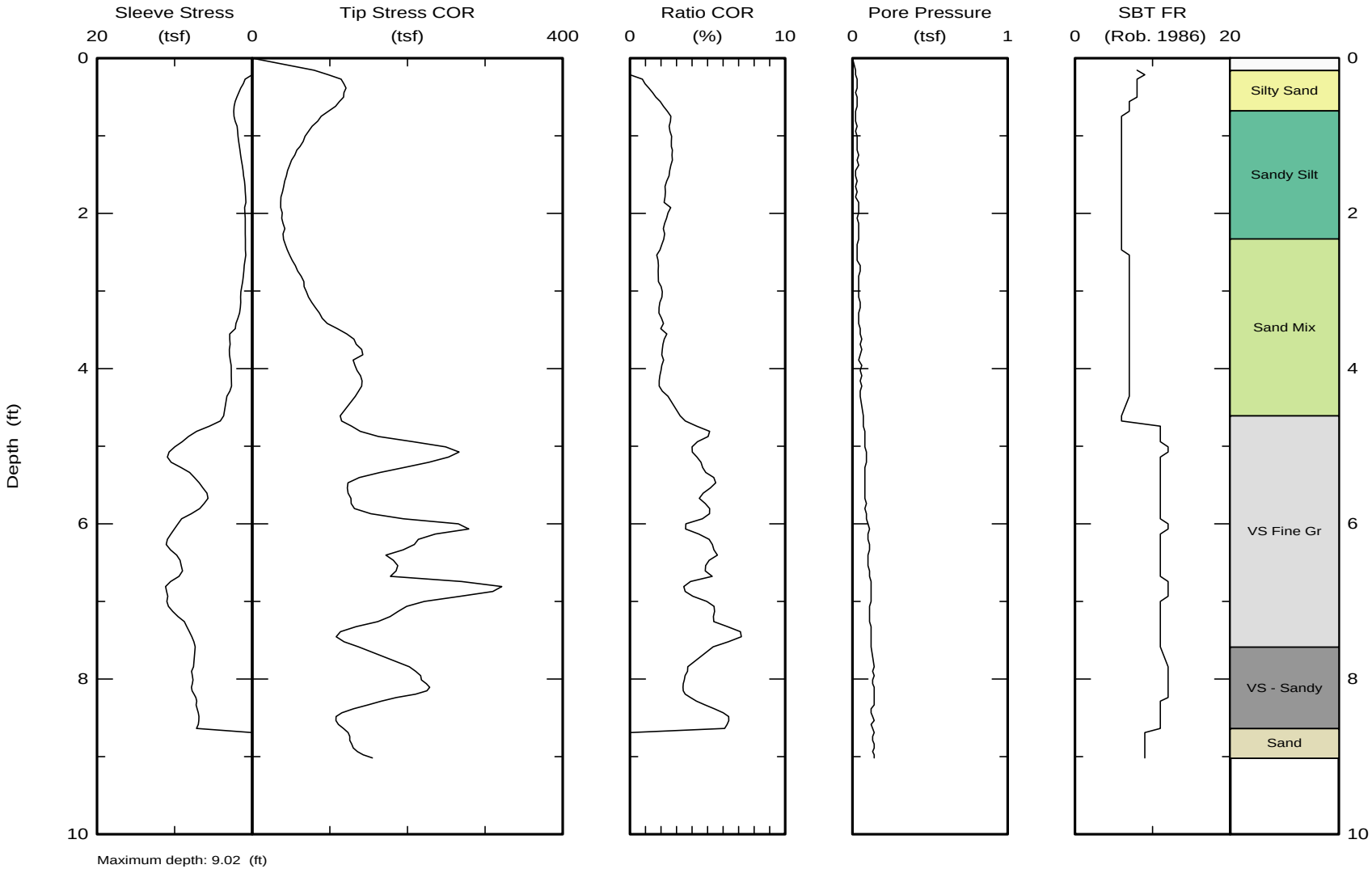
CPT Logs

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 07/Oct/2010 Test ID: 07O04-CPT01C Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



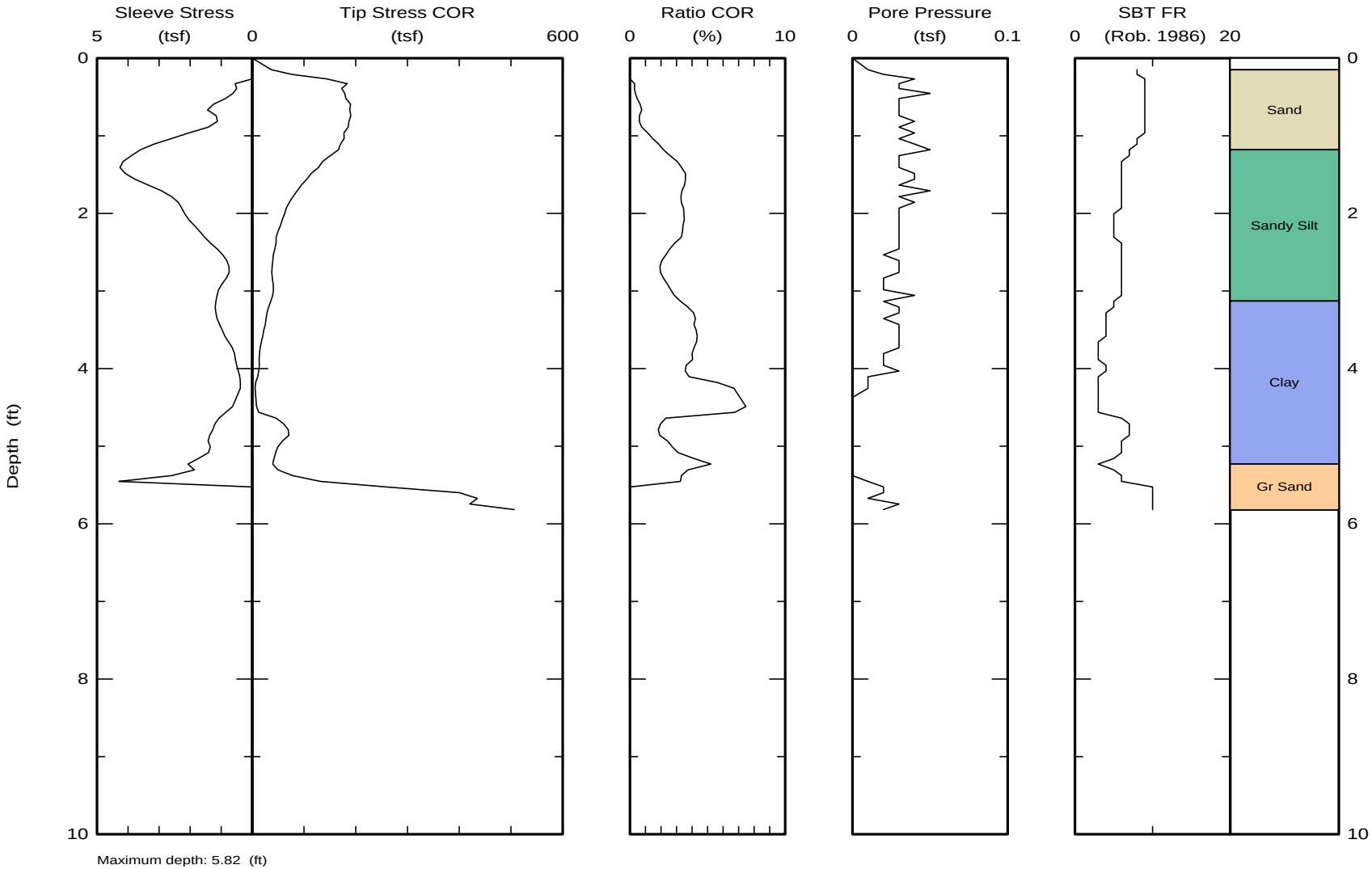
Maximum depth: 2.84 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 06/Oct/2010 Test ID: 06O03-CPT02 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



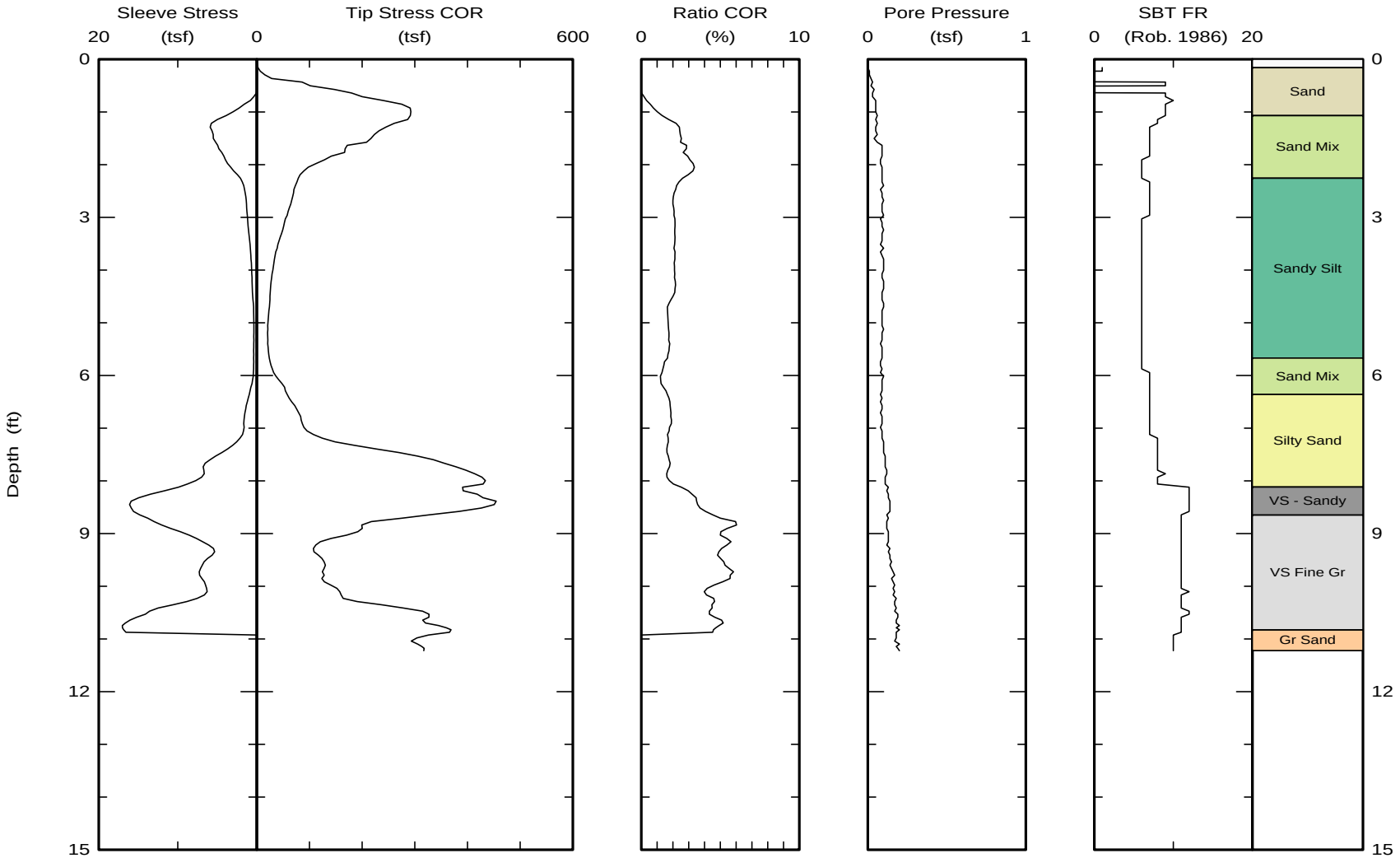
Maximum depth: 9.02 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 06/Oct/2010 Test ID: 06O06-CPT03B Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



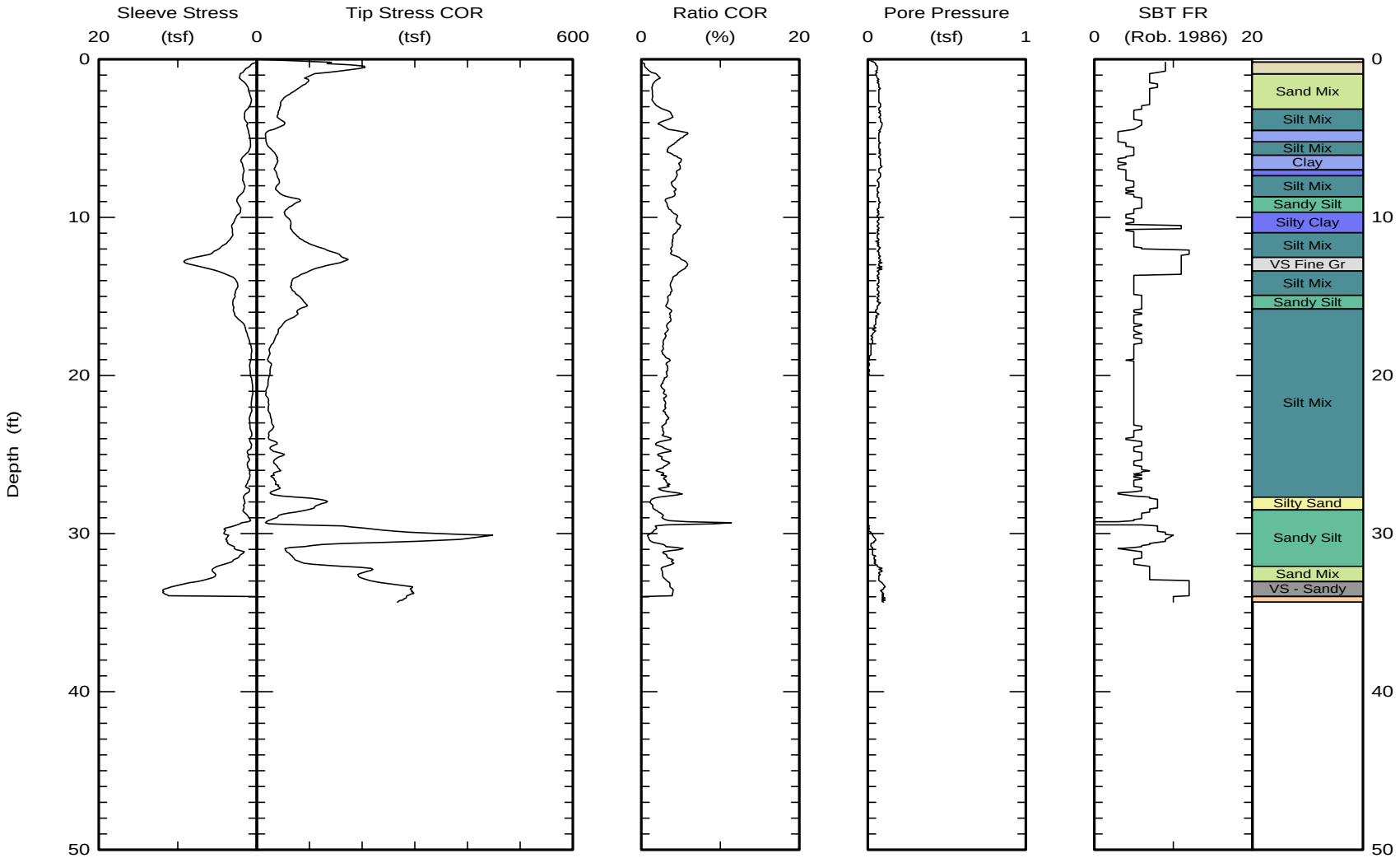
Maximum depth: 5.82 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 06/Oct/2010 Test ID: 06O07-CPT04 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



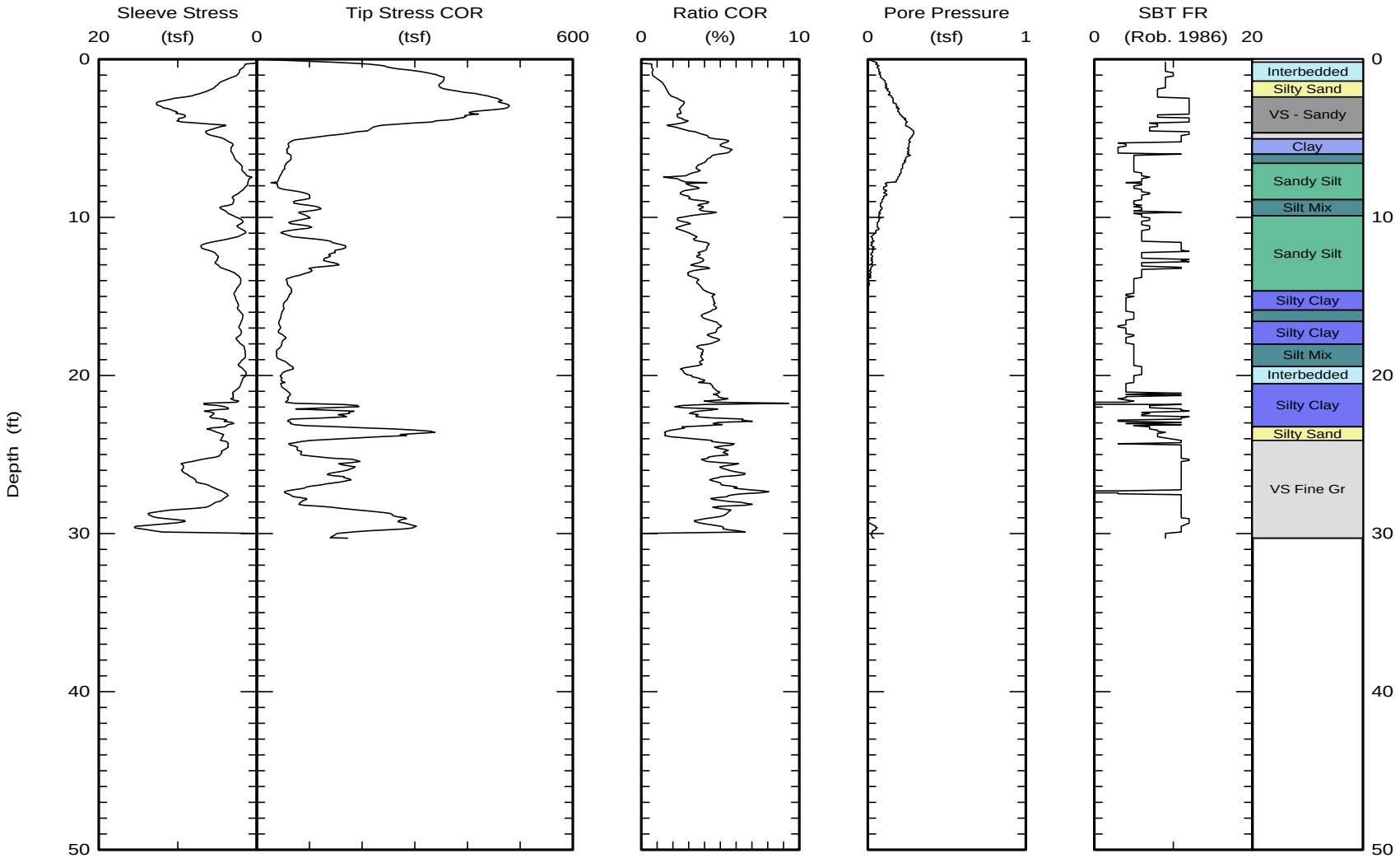
Maximum depth: 11.22 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 05/Oct/2010 Test ID: 05O046-CPT05 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



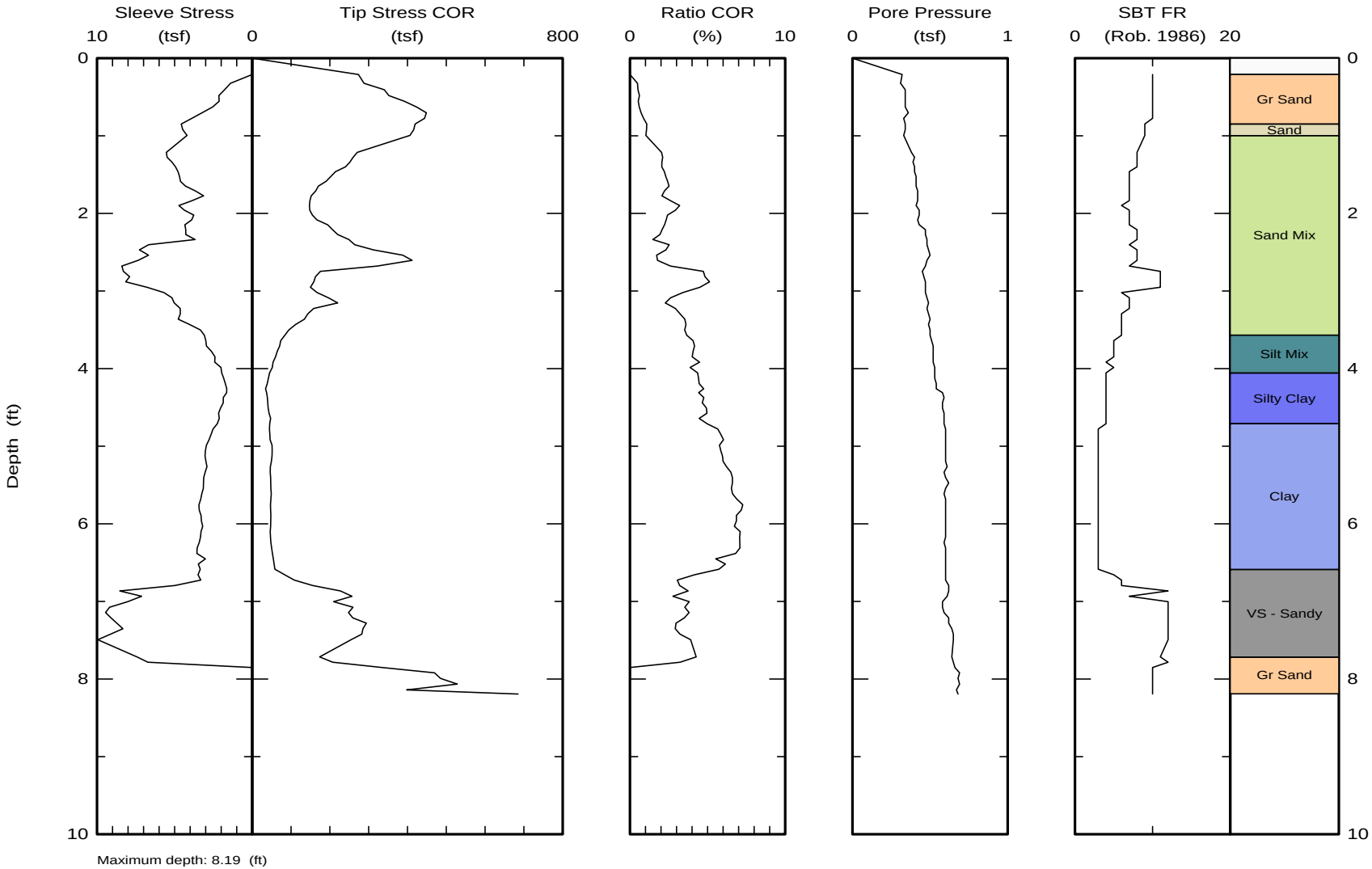
Maximum depth: 34.33 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 05/Oct/2010 Test ID: 05O045-CPT06 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



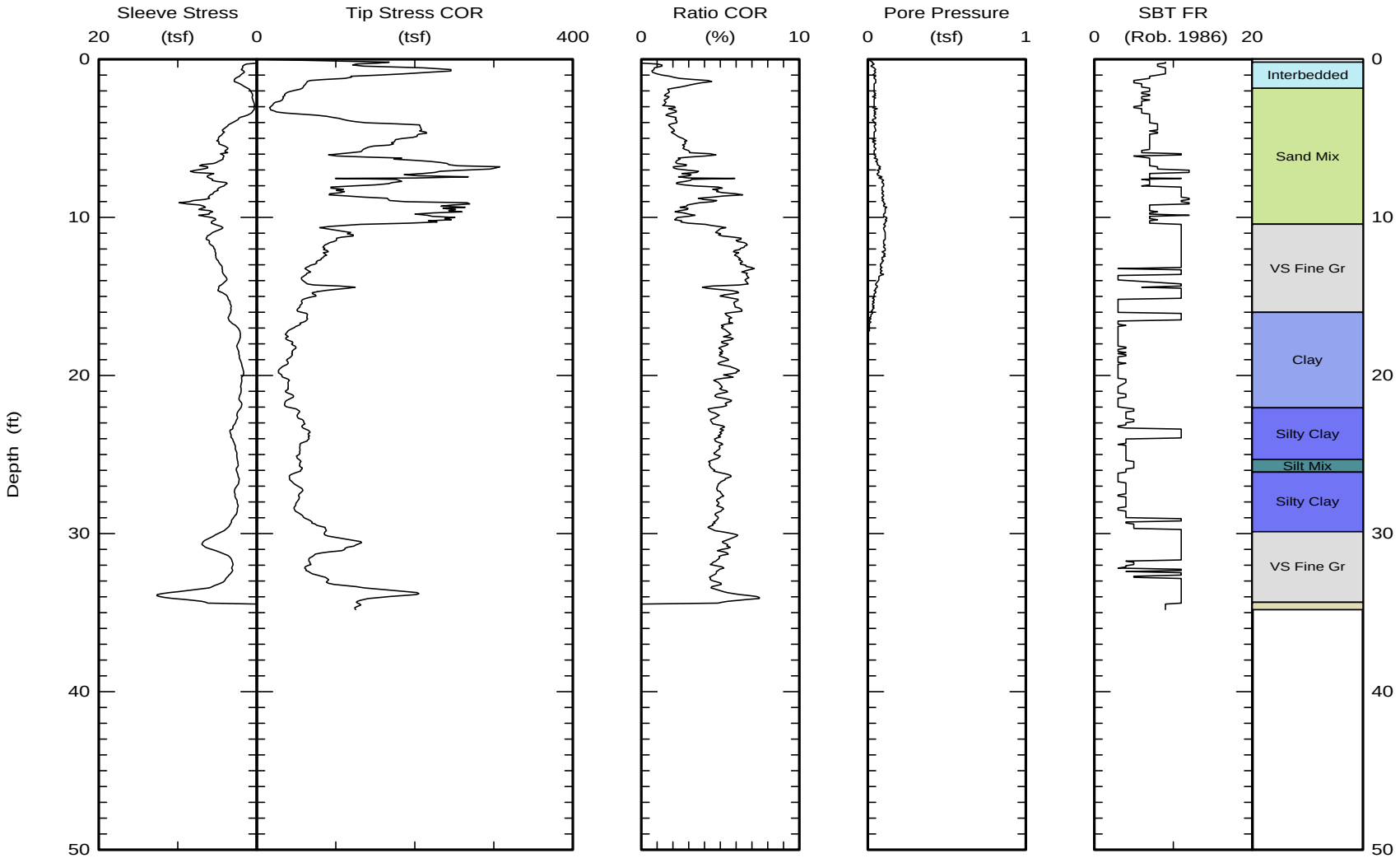
Maximum depth: 30.29 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 05/Oct/2010 Test ID: 05O03-CPT07 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



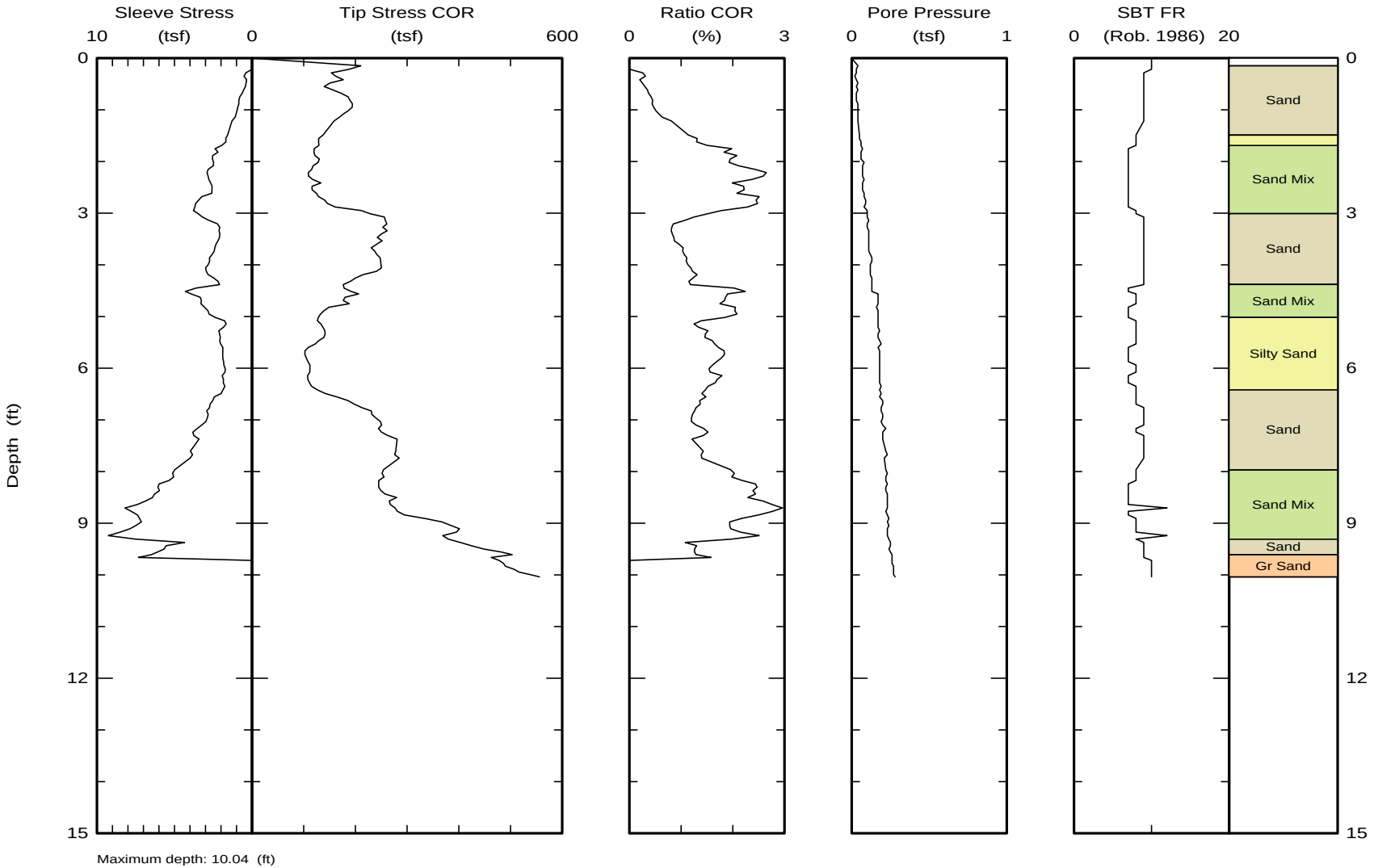
Maximum depth: 8.19 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 07/Oct/2010 Test ID: 07O03-CPT08 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	

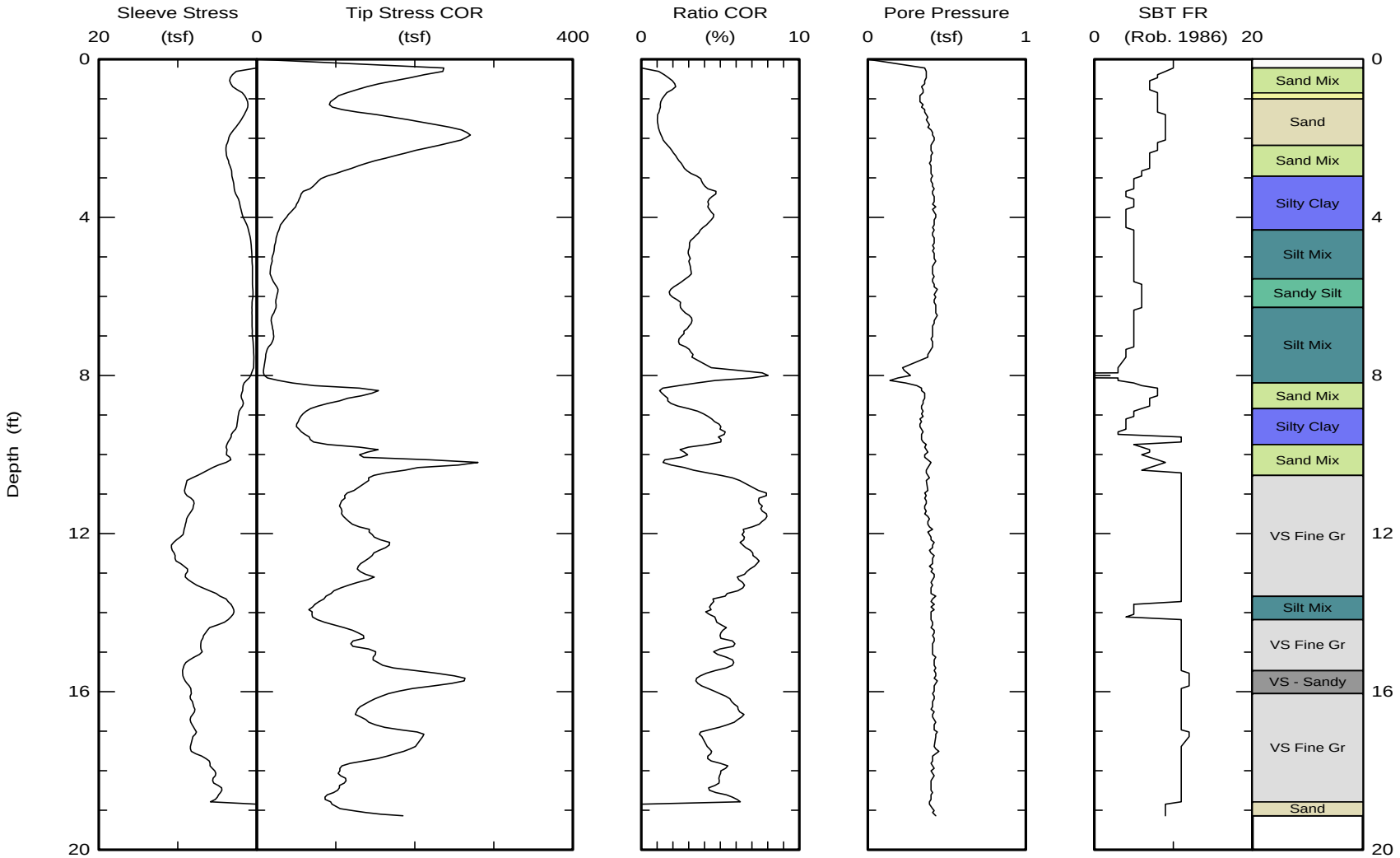


Maximum depth: 34.81 (ft)

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 07/Oct/2010 Test ID: 07O01-CPT09 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



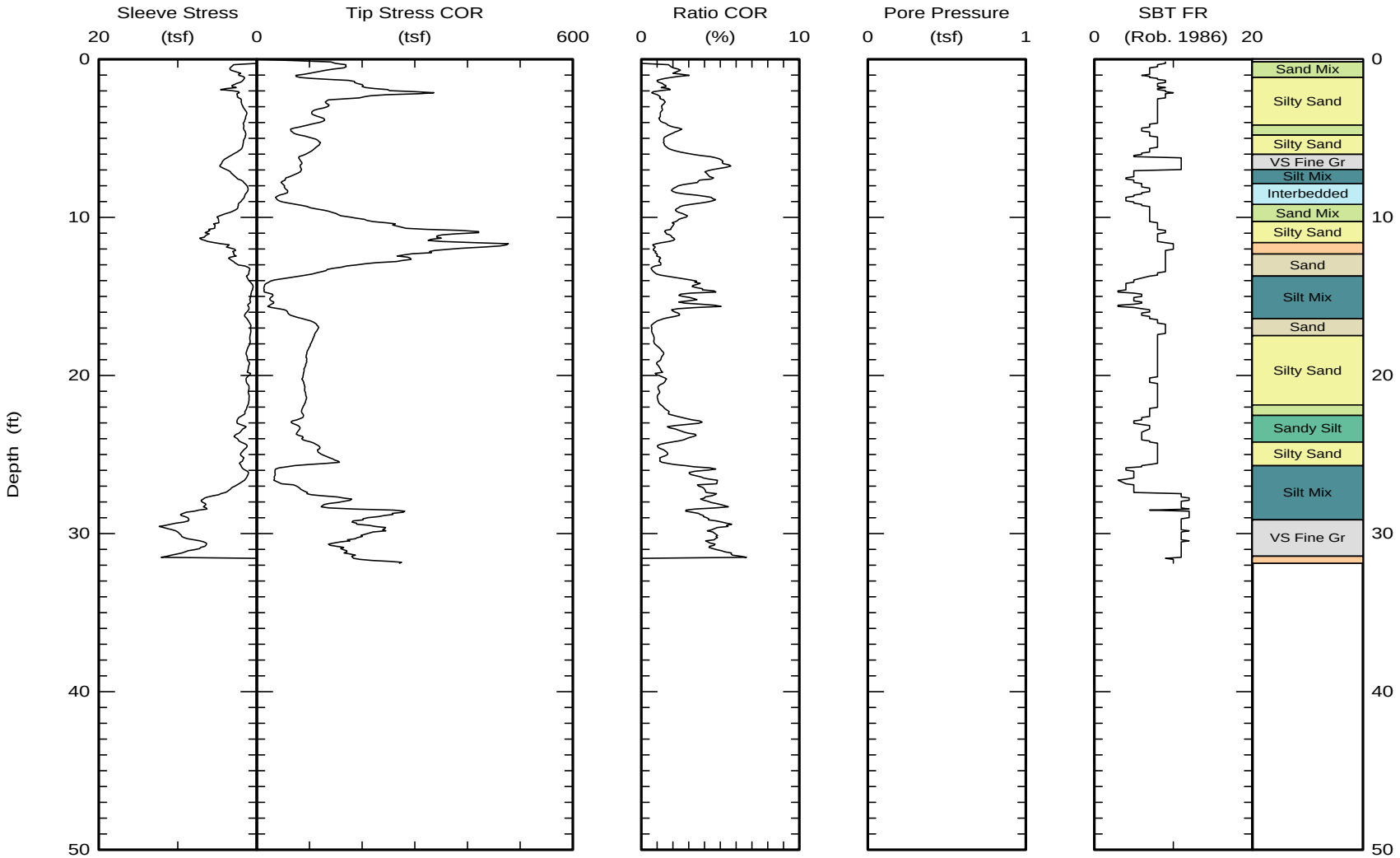
Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 05/Oct/2010 Test ID: 05O02-CPT10 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



Maximum depth: 19.14 (ft)

Test ID: 05O02-CPT10
File: CPT05O1002C.ecp

Division of Engineer Service Geotechnical Service 5900 Folsom Blvd. Sac., CA 95819 www.dot.ca.gov	Lat: Lon: Elevation:	Date: 05/Oct/2010 Test ID: 05O01-CPT11 Project: 1000000378
	Customer: WILLIAM BERTUCCI Job Site: RTE88JacksonValleyRehab	



Maximum depth: 31.88 (ft)

APPENDIX C

Seismic Refraction Survey Report

State of California | Business, Transportation and Housing Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: **QIANG HUANG**
Senior M&R Engineer
Geotechnical Design West
Division of Engineering Services

Date January12, 2011

File: 10_AMA_88_0.0_5.5
Project: 10-264441

Attention: William Bertucci

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES-MS#5

Subject: Jackson Valley Rehabilitation- Rte. 88

Introduction

This memo documents the results of a refraction seismic survey to assist in the design of roadway improvements for Highway 88 in Amador County. The seismic refraction survey was employed determine the rippability of material proposed for removal to accommodate the new design. A total of ten seismic profiles were surveyed (Figures 1-10). Figures 11-14 show where the seismic lines were positioned. Project stationing and elevation data has been estimated based on project plans, DHIPP areal photos and topographic maps of the area.

Interpretation of the survey results used the Generalized Reciprocal Method of refraction Interpretation (GRM; Palmer, 1980). This method can accommodate variation in refractor velocity and depth along the seismic line, is relatively insensitive to refractor dip (up to 20 degrees) and can accommodate hidden layer conditions (where supporting borehole data exist). Data interpretation used Viewseis, a commercially available computer program.

Jackson Valley (Ione) Geology

Roadside geology encountered during the Jackson Valley seismic refraction study consists mostly of apparent channel deposits of coarse-grained gravel (Plio-Pleistocene North Merced Gravel (10 KA-1.8 MA), incised into and emplaced over relatively horizontal rhyolitic flows and volcanic sediments of the Late Oligocene-Early Miocene Valley Springs Formation, (19.9-25 MA), which in turn is deposited over horizontal non-marine fine-grained sediments of the Eocene Ione FM (39-53.5 MA). Seismic line C4, C5 and C6 encountered Jurassic (144-208 MA) Gopher Ridge Volcanics (originally basalt, subsequently metamorphosed to greenstone, and quarried for use as aggregate). The local basement is composed of Foothill Metamorphic rock (undifferentiated), noted in outcrops at the base of roadcut at C6 and C7. Geology is summarized in Table 1 below.

TABLE 1

Seismic line	Observed Geology	Comments
C1	Valley Springs Formation	Horizontal volcanic sediments
C2	Valley Springs Formation	Horizontal volcanic sediments,
C3	Valley Springs Formation?	More gravelly than above
C4	Gopher Ridge Formation	Resistant to erosion, forms ridges, near quarry
C5	Gopher Ridge Formation	Lower strand of Gopher Ridge
C6	Gopher Ridge/ Foothill Formation	Boulders of Gopher Ridge Volcanics in soil matrix on foothill metamorphic basement. Weathered surface on metamorphics
C7	North Merced Gravel	Gravel over Foothill Metamorphic basement
C8	N. Merced Gravel/Valley Springs/Ione	Volcanic Sediments. Apparently overlays Ione Formation below road grade (results obtained from CT drilling

Results and Discussion

Seismic lines were positioned to provide representative sampling of the embankments proposed for excavation. Measured velocities are listed in Table 2.

.TABLE 2

Line	La yer	Average Thickness ft.)	Average Velocity (ft/sec)	Line Length (ft)	Approximate Project Stationing	Inferred Material	Rippability
C1	1	0.0-1.0	500	125	226+40 to 227+65	soil	ER
C1	2	14.0	5000			volcanic sediments	DR
C1	3	N/A	6600			Volcanic sediments	NR
C2	1	2.0	500	330	237+30 to 240+60	soil	ER
C2	2	20.0	4000			Weathered volcanics	DR
C2	3	N/A	5000			Saturated volcanics?	DR
C3	1	11.0	500-700	245	247+40 to 249+95	Weathered volcanics	ER
C3	2	N/A	7900			Gravelly volcanics	NR
C4	*	*	17000		305+20?	Greenstone Bldr	NR
C5	1	4.5	500	130	313+00 to 314+30	soil	ER
C5	2	7.5	600			Gravelly soil	ER
C5	3	N/A	6400			Broken blocks of metemorphics	NR
C6	1	3.0	400	240	318+50 to 320+90	soil	ER
C6	2	36.0	4000			Weathered metamorphics	DR
C6	3	N/A	11000			Metamorphics?	NR
C7	1	3.0	2000	470	334+00 to 338+70	Rocky soil	ER
	2	N/A	4300			Rocky metamorphics	DR
C8A1	1	2.5	1516	130	360+00 to 361+25	Soil	ER

	2	N/A	5858			Sandy Claystone	DR
C8A2	1	5.0	1447	130	366+30 to 367+50	Soil	ER
	2	N/A	6272			Sandy Claystone	DR
C8B	1	6.0	1300	250	365+70 to 368+15	Soil	ER
	2	12.0-20.0	2688			Channel deposits	ER
	3	N/A	7237			Ione Fm?	NR

[1] ER = Easily Ripped, MD = Moderately Difficult, DR = Difficult Ripping, NR = Not Rippable,

Data Acquisition and Processing

Seismic refraction data were recorded using an EG&G Smartseis 24-channel seismograph with 14 Hz geophones. The profile used 1.5 meter (4.92 feet) geophone spacing. The energy source employed was a hammer and striker plate. Refraction data from each shot were stored in the seismograph's memory. Both profile geometry and refraction data were backed-up to paper and floppy disk upon completion of the survey.

Profiles in this report are presented in terms of velocity units. A velocity unit is a three-dimensional unit which, due to its elastic properties and density, propagates seismic waves at a characteristic velocity or within a characteristic velocity range. At least one velocity is present within a geological rock unit. In addition, each zone of weathering or fracturing within that geological unit can constitute its own velocity unit. Conversely, when two rock units, such as water saturated gravel and moderately weathered rock, propagate seismic waves at the same velocity and are adjacent to each other, both units would be part of the same velocity unit. Lastly, discontinuous velocities might result from variation in the degree of alteration in the form of physical and chemical weathering and should be considered in the interpretation of the data.

Ripping ability is based on unpublished Caltrans data for a Caterpillar D9 series bulldozer with a single-tooth ripper. These values are as follows:

Velocity (ft/s.)	**Rippability**
<3440	Easily Ripped
3440-4920	Moderately Difficult
4920-6560	Difficult Ripping
>6560	Not Rippable

Different excavation equipment may experience different results. Penetrating efficacy of the ripping tooth is often more important in predicting ripping success than seismic velocity alone. Undetected blocks or lenses of high-velocity material may also be present within rippable zones, requiring blasting or other means of mechanical breakage for excavation.

Thank you for the opportunity to work on this project. If you have any questions or need additional assistance, please contact me at (916) 227-1307 or Mr. Bill Owen at (916) 227-0227.

Report by:

Dennison Leeds
Engineering Geologist
Geophysics and Geology Branch

Reviewed By:

William Owen, CEG 1735
Chief, Geophysics and Geology Branch

Project File.

DL/WO

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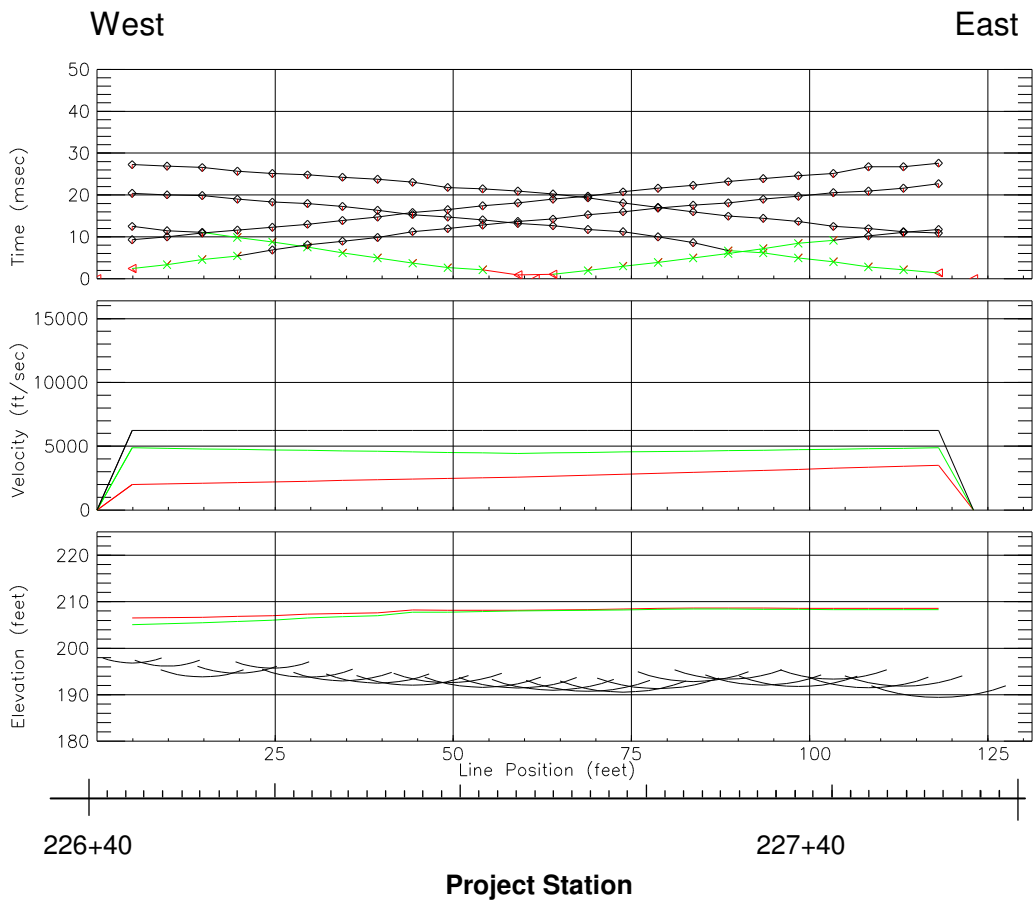
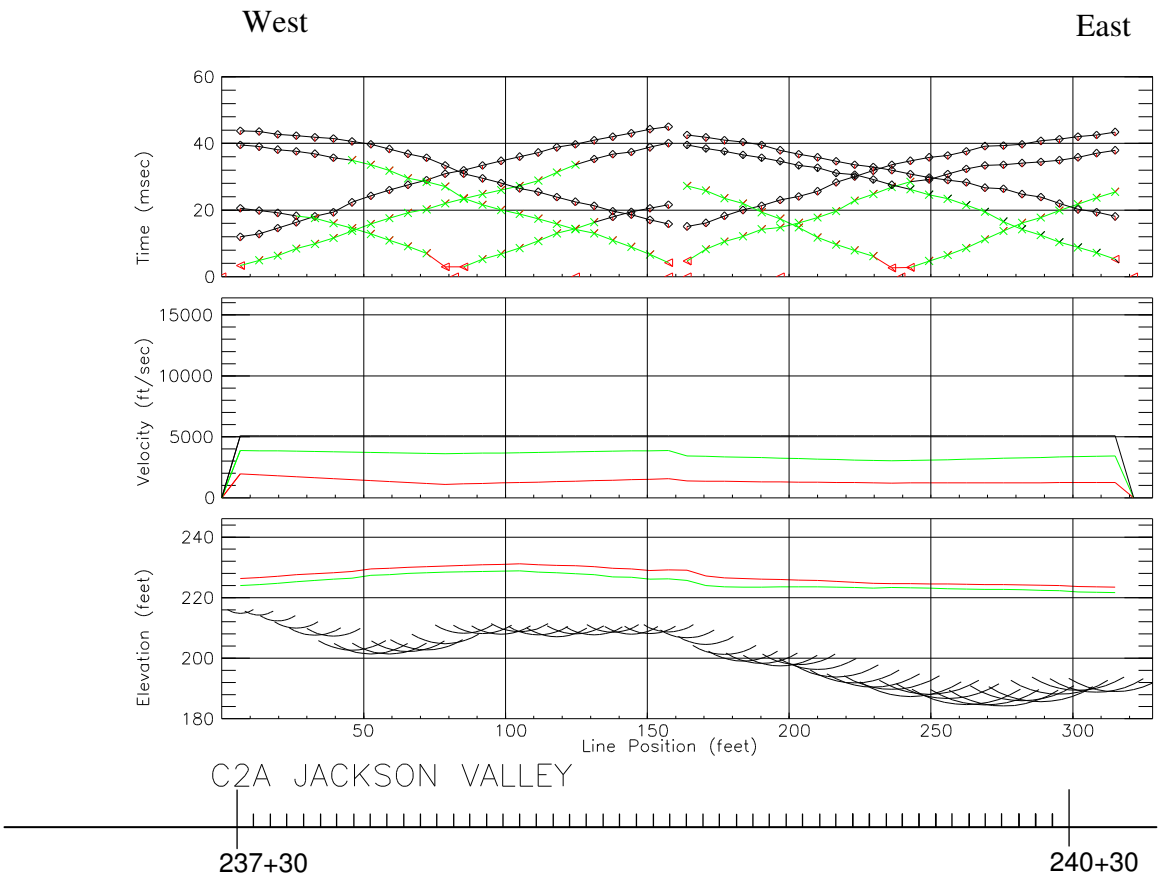


Figure 1. Travel-time curve, velocity model, and depth section for seismic line C1. Geologic interpretation is a very thin layer of soil over weathered volcanic sediments about 14.0 feet thick lying over unknown geologic below road grade that is not rippable. The roadway elevation at station 226+40. is 203.0ft.



Project Station

Figure 2. Travel-time curve, velocity model and depth section for seismic line C2.

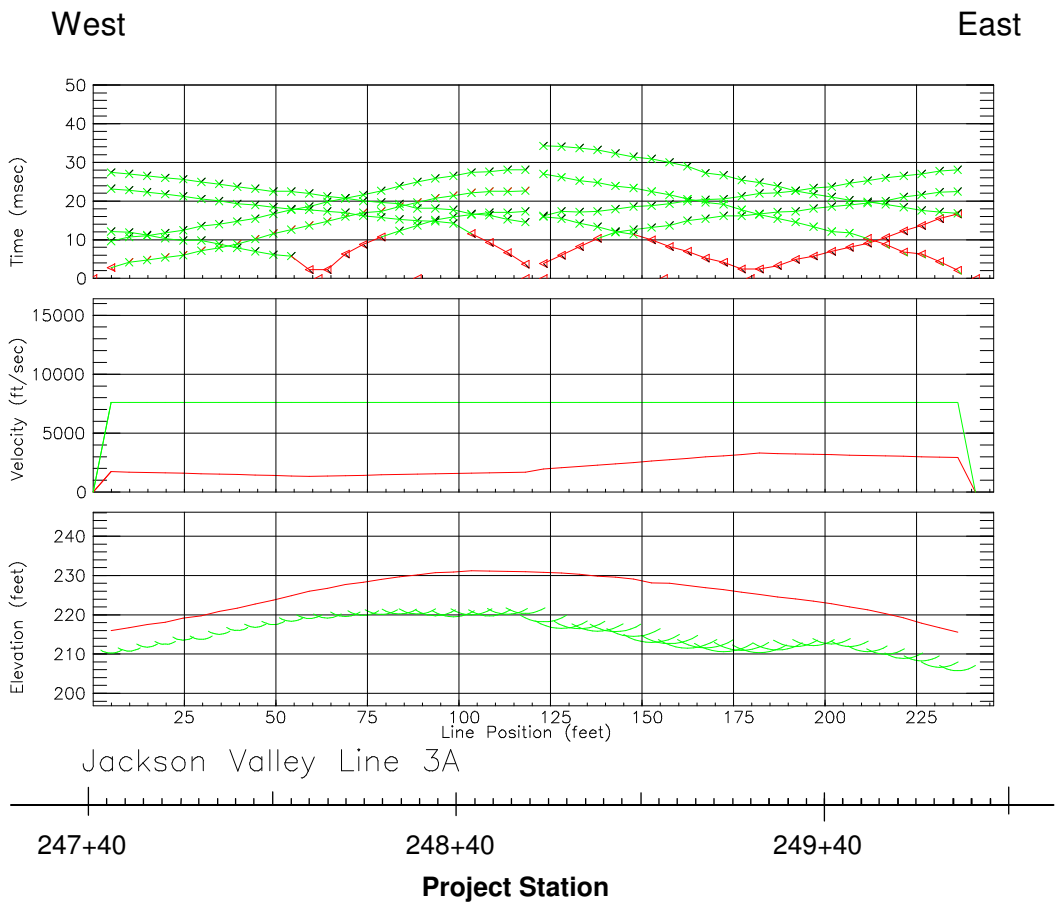


Figure 3. Travel-time curve, velocity model and depth section for seismic lines C3A and C3B Road grade elevation at station 247+40 = 215.0ft.

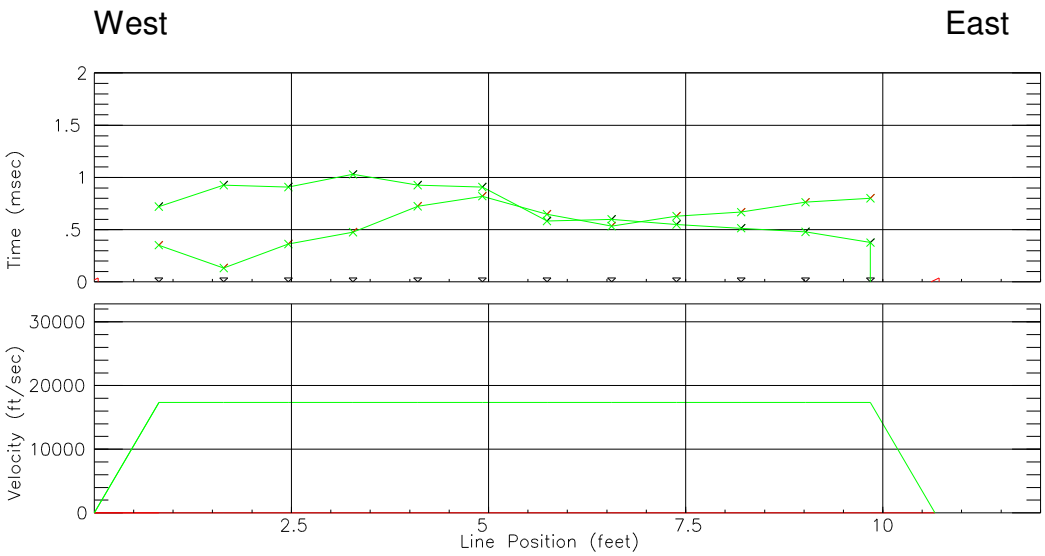


Figure 4. Travel-time curve and velocity model of a Greenstone boulder. larger than 9ft. diameter. Sample taken at Station 305+20

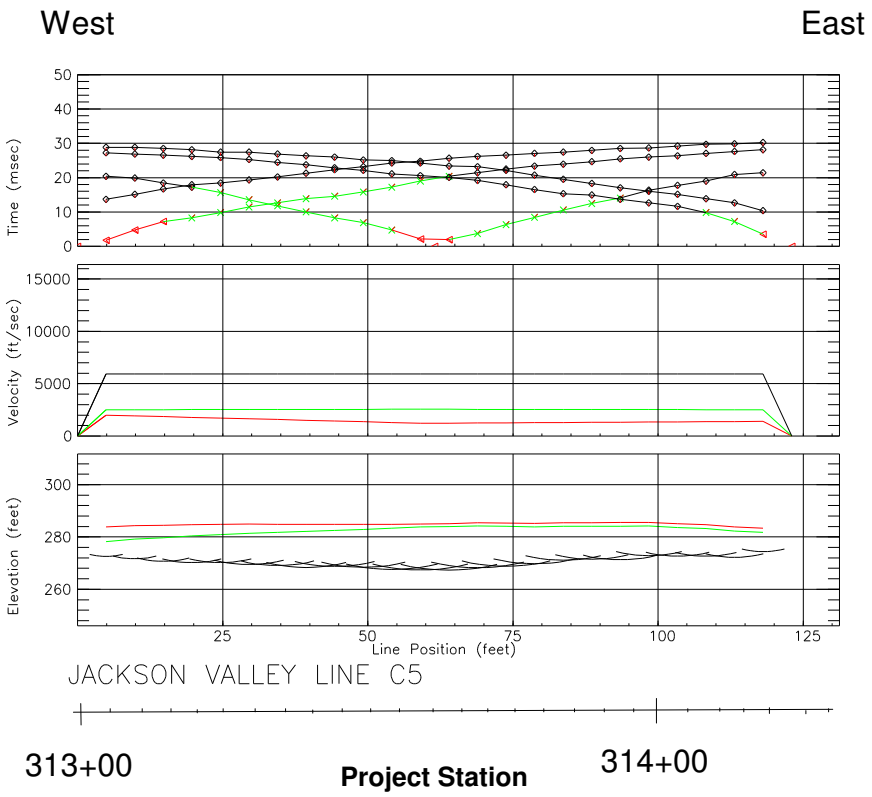


Figure 5. Travel time curve, velocity model and depth section for seismic line C5. The roadway elevation at Station 313+00 = 283.0ft.

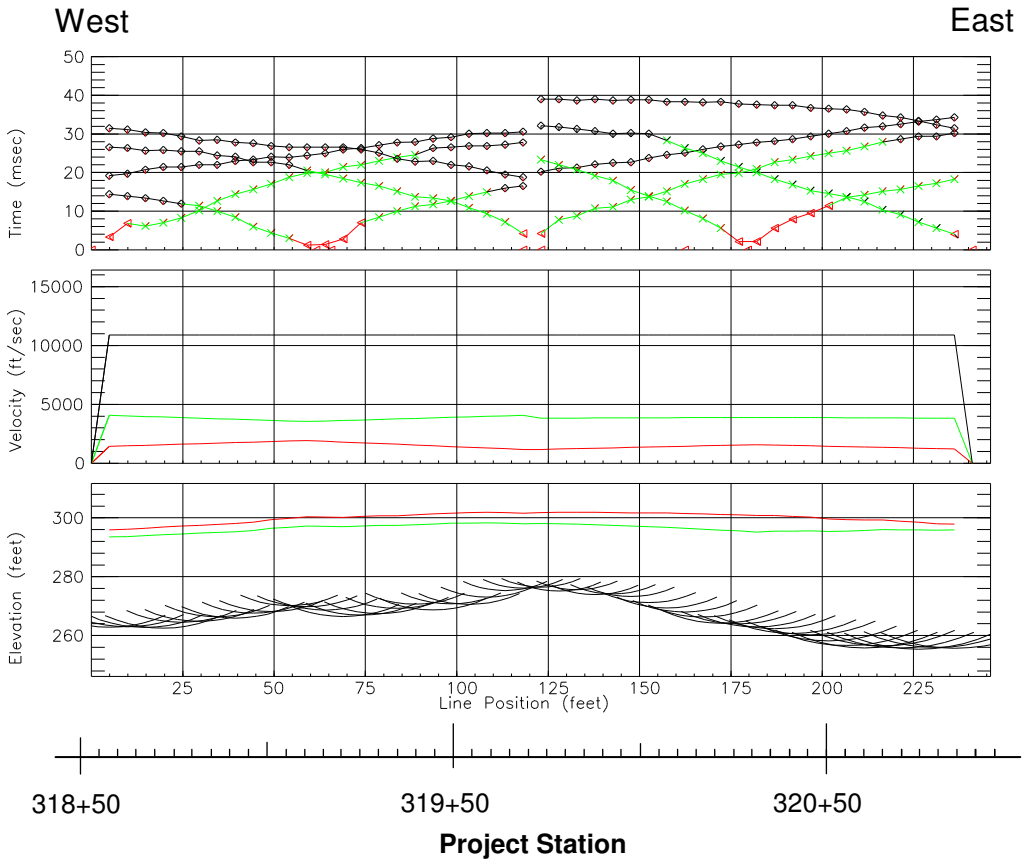


Figure 6. Travel-time curve, velocity model and depth section for seismic line C6. DI elevation at edge of pavement = 290 ft.@ station 318+50

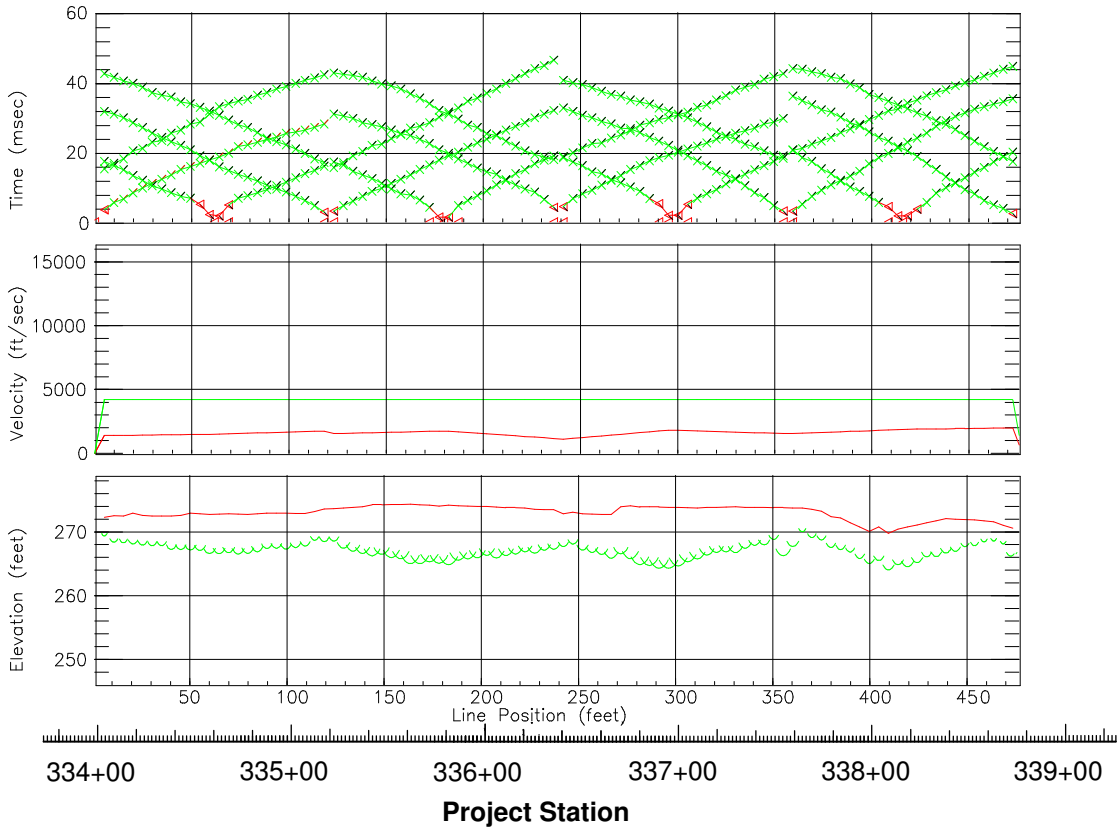


Figure 7.. Travel-time curve, velocity model and depth section for seismic line C7. Road grade is within layer V1 at Station 334+70

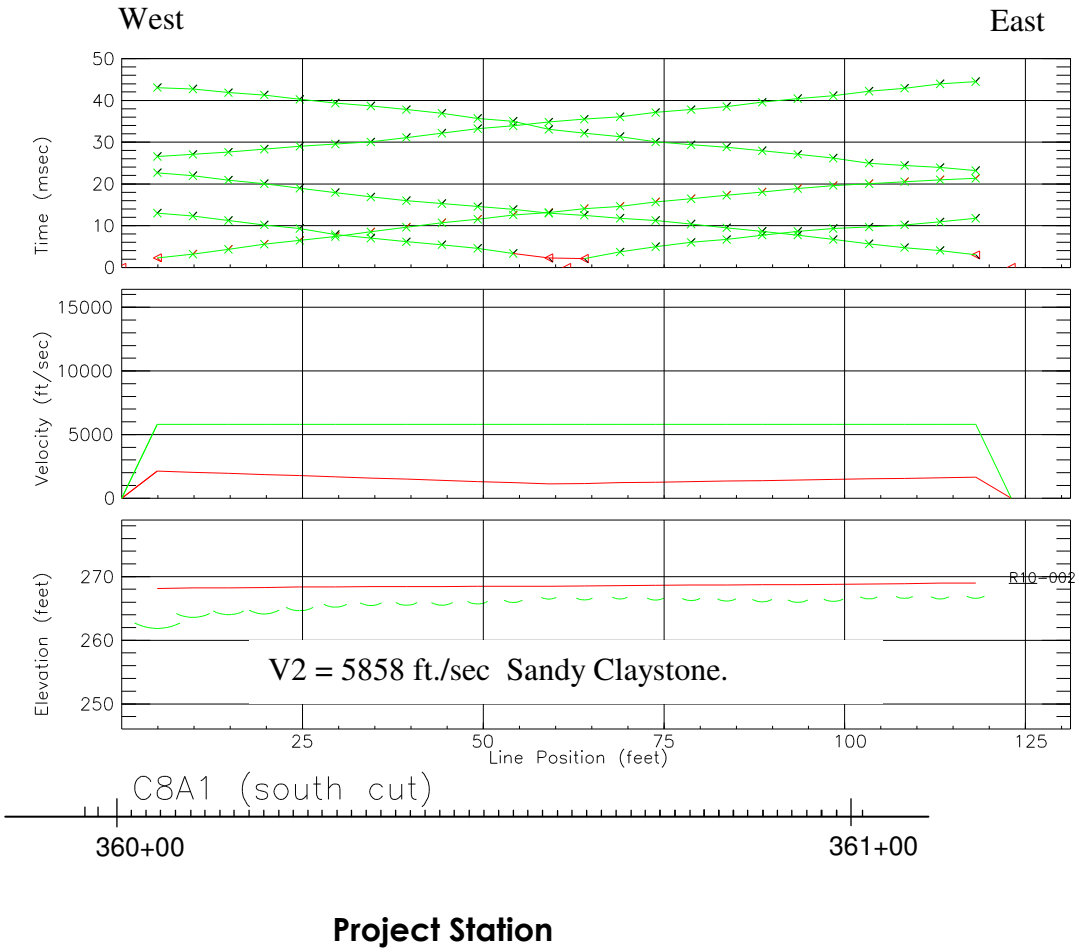


Figure 8. Travel-time curve, velocity model and depth section for seismic line C8A1 on the south side of roadway. Model presents as a two layer case. Layer one seismic velocity is 1447 ft./sec., layer 2 = 5858 ft./sec. LOTB for boring R-010-002 describes sandy claystone below 5 feet.

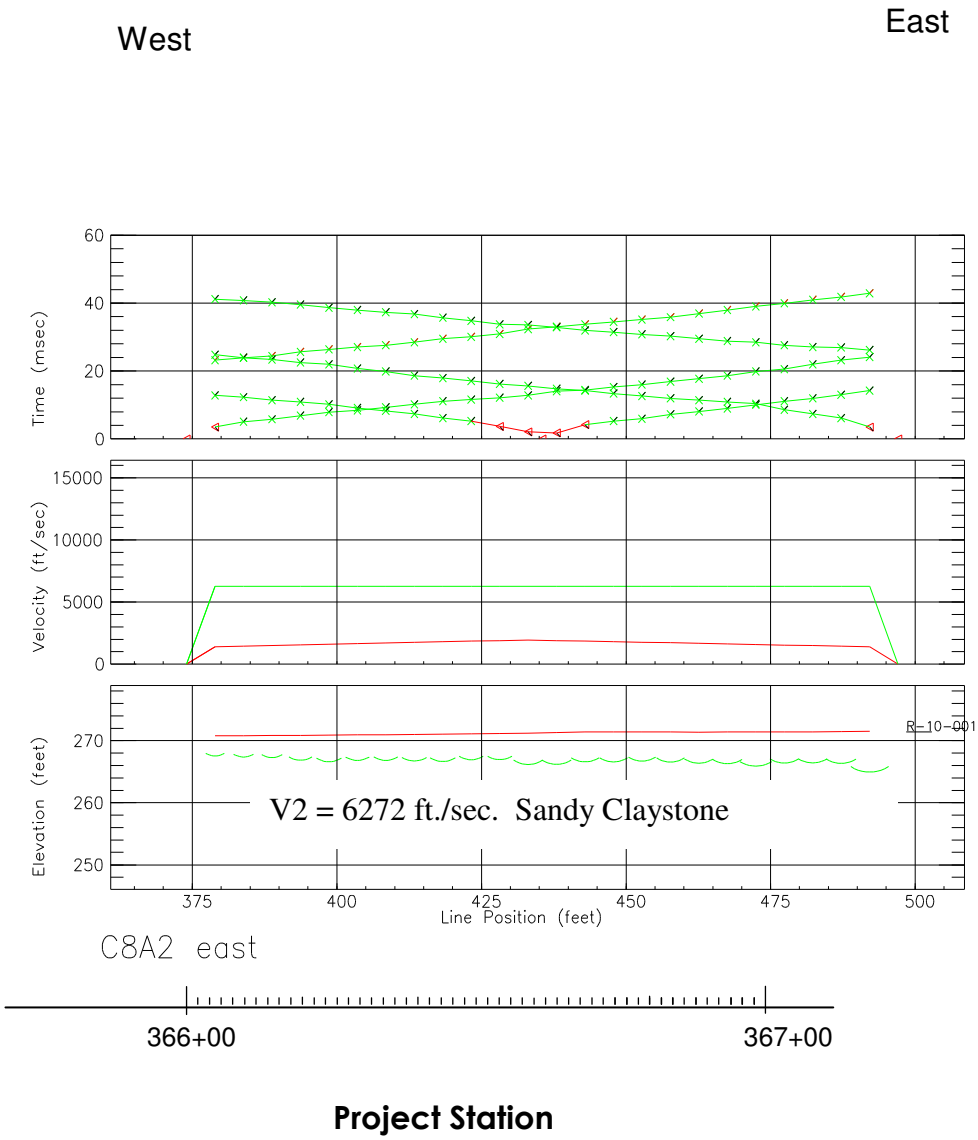


Figure 9. Travel-time curve, velocity model and depth section for seismic line C8A2 Model presents as a two layer case, V1 = 1516 ft./sec., V2 = 6272 ft./sec. LOTB for boring R-010-001 describes sandy claystone below 5.0 feet.

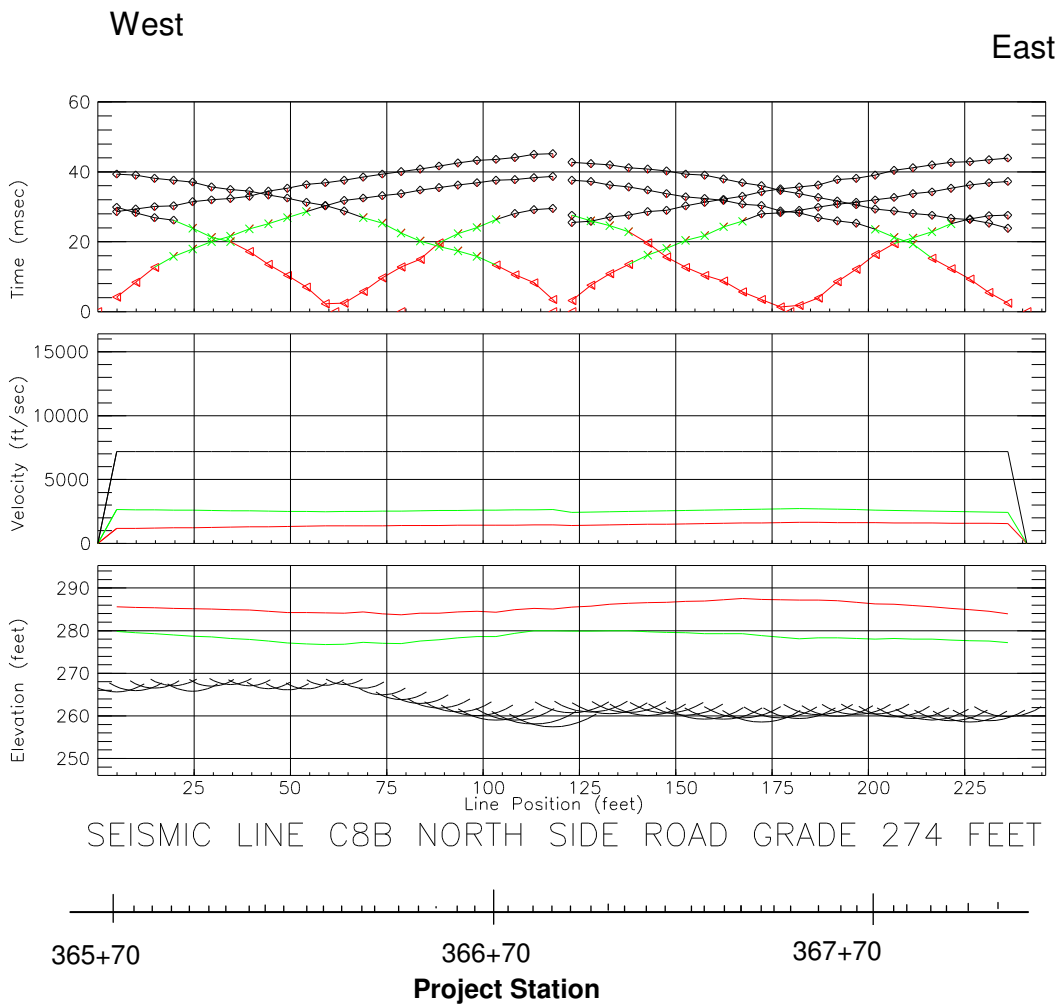


Figure 10. Travel-time curve, velocity model and depth section for seismic line C8B. Roadway elevation @ 367+70 is 274.0 feet.

Figure 11. Approximate location of seismic lines C1,C2a,C2b

Figure 12. Approximate location of seismic lines C3A and C3B

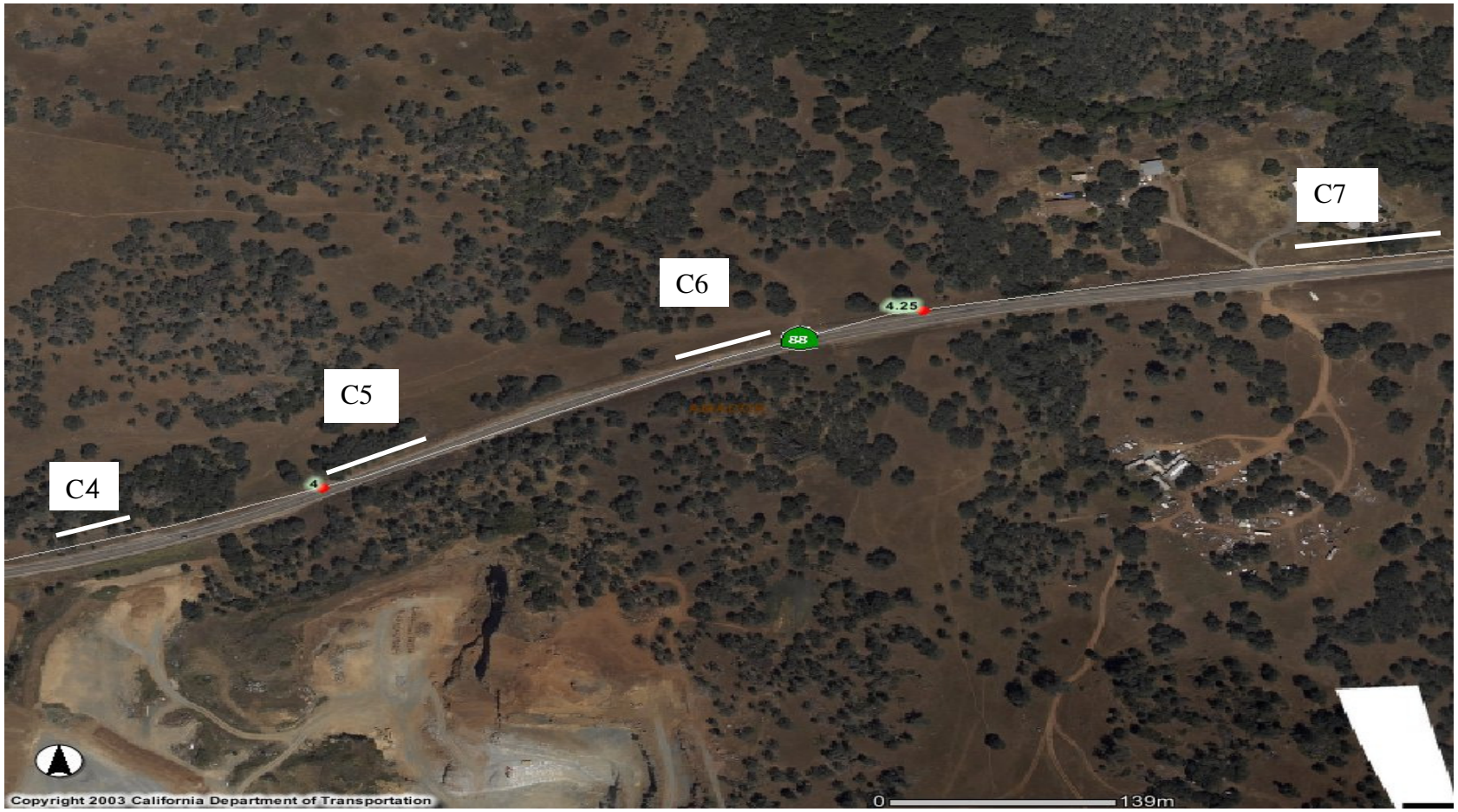


Figure 13. Approximate locations of seismic lines 4,5,6 and 7. Seismic line 4 was a direct measurement of a basalt boulder

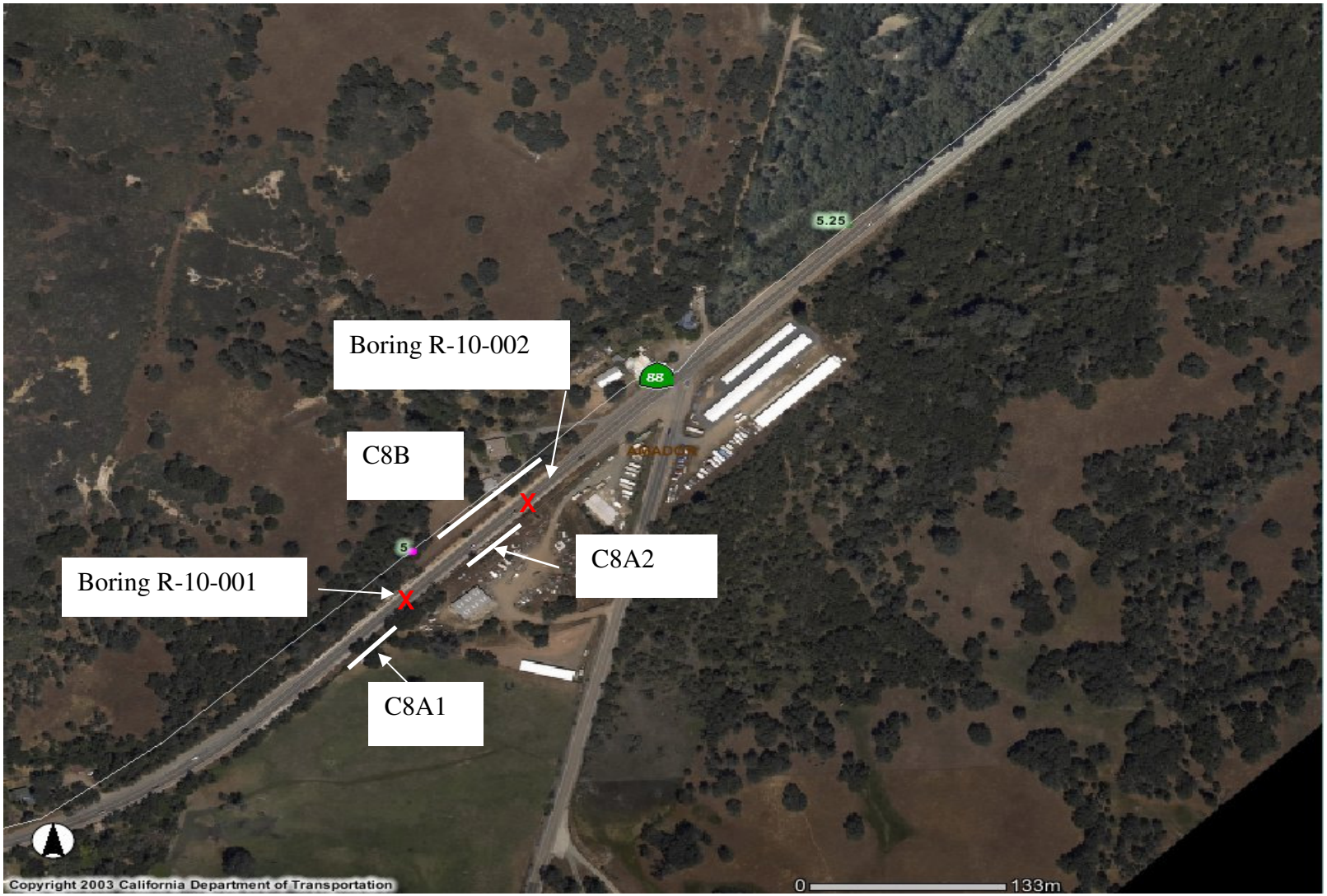


Figure 14. Approximate location of seismic lines C8B, (north cut), C8A1, and C8A2 (south cut)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In reply refer to:
1-1-07-F-0283

AUG 2 7 2007

Zachary K. Parker
Biology Branch Chief
California Department of Transportation, District 6
2015 East Shields Avenue, Suite A-100
Fresno, California 93726

Subject: Biological Opinion for the State Route 88 Jackson Valley Rehabilitation Project, Amador County, California 10-AMA-88-PM 0.0/5.5 EA 10-26444

Dear Mr. Parker:

This is the U.S. Fish and Wildlife Service's (Service) biological opinion on the State Route (SR) 88 Jackson Valley Rehabilitation Project (Project), Amador County, California. The California Department of Transportation's (Caltrans) July 23, 2007, request for formal consultation was received in this office on July 26, 2007. At issue are the effects of this proposed project on the following Federally-listed species: vernal pool fairy shrimp (*Branchinecta lynchi*)(VPFS), the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB), vernal pool tadpole shrimp (*Lepidurus packardi*) (VPTS), Central Valley steelhead (*Oncorhynchus mykiss*), Central Valley fall/late fall-run Chinook salmon (*Oncorhynchus tshawytscha*), the California red-legged frog (*Rana draytonii*) (CRLF), the California tiger salamander (*Ambystoma californiense*)(CTS), and portions of CTS Critical Habitat (CH) (Unit 4, Northeastern San Joaquin Unit). This biological opinion was prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

This biological opinion (BO) is based on: (1) *Biological Assessment for Jackson Valley Rehabilitation Project*, dated July 2007 (BA), (2) a site visit by Rocky Montgomery (Parsons/Service) and Reagen O'Leary (Caltrans), and (3) other information available to the Service.

TAKE PRIDE IN AMERICA

Caltrans has determined that the Project will have no effect on the VELB or the CRLF, and after reviewing the BA and other information the Service concurs with that determination. In addition, Caltrans has made a determination of *May Affect, Not Likely to Adversely Affect* for the VPTS, the Central Valley steelhead, and Central Valley fall/late fall-run Chinook salmon. After review of the above information and the concurrence with the determination by the National Marine Fisheries Service (NMFS) on the salmonid species, the Service concurs with that determination. This concludes the consideration of the Project's impacts on the VELB, VPTS, CRLF, Central Valley steelhead, and Central Valley fall/late fall-run Chinook salmon by the Service. If there is a significant change in the Project or new information becomes available to the Service, then this finding maybe reconsidered by the Service and consultation reinitiated.

Consultation History

July 26, 2007 The Service received the *Biological Assessment for Jackson Valley Rehabilitation Located on State Route 88 From Amador County Line to State Route 124 Junction*, Amador County, California, dated July 2007. Section 7 consultation was initiated by the California Department of Transportation.

August 22, 2007 Site visit by Rocky Montgomery representing the Service and Reagen O'Leary from Caltrans.

BIOLOGICAL OPINION

Description of the Proposed Action

Caltrans in cooperation with the Federal Highway Administration (FHWA), proposes to rehabilitate and widen a section of 5.5 miles (mi) of SR 88 from the San Joaquin county line north-eastward toward Highway (Hwy) 124 in Amador County, California. The purpose of the Project is to replace and/or repair damaged pavement and width and shoulder of roadway to current safety standards.

The proposed project will entail the following actions:

- Rehabilitate pavement with dig-outs of localized pavement failure, crack sealing, and application of asphalt concrete overlay.
- SR 88 will receive a shoulder upgrade to 8 feet (ft) to meet current federal standards for 3.2 mi of roadway between Bamert Road to the intersection of SR 124 (post mile [PM] 2.25 to 5.50).
- Jackson Creek Bridge and Jackson Creek Overflow Bridge will be widened to include standard 8 ft shoulder upgrades. A portion of the deck on each structure will be repaired with polyester concrete.

- A portion of highway will be realigned to the westbound side between Jackson Valley Road and Martin Road by acquiring right of way (ROW).

- Relocation of utilities (gas line, telephone, and fiber optic lines) will be necessary through the shoulder-widening portion if the project. It may be necessary to negotiate restoration of Pacific Gas and Electric Company (PG & E) easement, and require additional ROW.

- The replacement and/or extension of culverts throughout the project as needed in order to upgrade existing drainage systems to conform to hydraulic recommendations.

- Construct turnouts in both eastbound (PM 1.5 to 1.65) and westbound (1.95 to 2.10) directions.

- Overlay local roads and private driveways with new asphalt at their connections with SR 88 with in the ROW.

- Construct a new driveway to the Applegate property, located at approximately PM 3.0.

Total cut and fill areas are proposed to accommodate 4:1 slopes from PM 2.25 to 5.50. The fill material will be obtained on-site from cut areas.

Proposed Avoidance, Minimization, and Compensation Measures for Listed Species

According to the biological assessment, Caltrans has proposed to implement the following avoidance, minimization and compensation actions:

1. Best management practices (BMP) during construction will be implemented. Equipment maintenance, project access, supply logistics, equipment maintenance, and other project-related activities will occur at a designated staging area.

2. Prior to construction, orange mesh fencing will be installed within Caltrans ROW to avoid accidental construction related impacts to vernal pool habitats. Such habitats will be designated as environmentally sensitive areas (ESA).

3. An employee education program will be conducted, consisting of a brief presentation by persons knowledgeable in vernal pools, VPFS and CTS biology, and legislative protection to explain endangered species concerns to contractors, their employees, and any other personnel involved in the project. The program will include the following: a description of the species and their habitat needs; a report of the occurrence of these species in the project area; an explanation of the status of these species and their protection under the ESA; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the workers and anyone else who may enter the project site. Upon completion of training, employees will sign a form stating

that they attended the training and understand all the conservation and protection measures.

4. To the extent possible, nighttime construction will be minimized. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads. Construction within 0.6 mile (1 kilometer) of potential California tiger salamander breeding habitat will be timed to occur during the dry season (June to October) when larvae and breeding adult salamanders are not present.

5. Caltrans will compensate for the impacts to VPFS and CTS aquatic habitat through the use of a Service approved conservation bank. Caltrans has proposed purchasing credits at either Fitzgerald Ranch Conservation Bank or the pending Florence Lake Conservation Bank of Wildlands, Inc., both in San Joaquin County. Caltrans has proposed to compensate for direct impacts to VPFS and CTS wetland habitat using a 3:1 compensation ratio. Caltrans has proposed that impacts to CTS upland habitat will be compensated for using a 3:1 compensation ratio for permanent impacts, and 1.1:1 for temporary impacts.

6. The total acreage of vernal pool habitat that will be lost as a result of direct effects is 0.63 acres (ac). At the above compensation ratios, the quantity of vernal pool acreage to be purchased from a conservation bank will be equal to 1.89 ac, which includes compensation credits for impacts to VPFS and CTS aquatic breeding habitat. The acreage of CTS upland habitat permanently affected is 2.37 ac, using the proposed compensation ratio of 3:1, 7.11 ac of compensation will be purchased to offset this impact. In addition to the permanent impact, there will be temporary impacts of 8.16 ac, using the proposed compensation ratio of 1.1:1; a total of 8.98 ac will be purchased to offset this impact. Caltrans will purchase a minimum of 16.09 ac of CTS upland habitat credits form a of the Service-approved conservation bank to offset both direct and indirect impacts by the Project to CTS upland habitat.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed action, the Service considers the action area to be the existing and proposed new roadway and right-of-way (ROW), up to 0.6 miles (1 kilometer) from the edge of the new ROW to account for possible effects to upland CTS habitat, and all areas used to access the project sites or store equipment to be used for the projects.

The action area is located within the Goose Creek and Ione United States Geological Survey (USGS) 7.5-minute quadrangles. Complete public lands survey including Township, Range and Section information is not available throughout the majority of the project area. Historically this area was a Spanish Land Grant Claim that predated the public lands survey, whereas USGS did

not include Spanish Land Grant properties within the public lands survey. The UTM coordinates for the action area are 676609.054331 E, 4241648.91434 N, NAD 83.

Status of the Species and Environmental Baseline

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)
Vernal pool fairy shrimp were federally listed as threatened under the Act, throughout their range in 1994 (59 **FR** 48153). Vernal pool fairy shrimp are members of the aquatic crustacean order Anostraca. Vernal pool fairy shrimp are found only in ephemeral freshwater habitats in California and Southern Oregon and the other two species are found only in ephemeral freshwater habitats in California. These species have all evolved similar adaptations to the unique habitat conditions of their vernal pool habitats. The general appearance and life history characteristics of these three species will be described in combination below. Following this description, information pertinent to each species' biology is provided.

Vernal pool fairy shrimp (fairy shrimp) have delicate elongate bodies, large stalked compound eyes, and 11 pairs of phyllopods, or gill-like structures that also serve as legs. They swim or glide gracefully upside down by means of complex beating movements that pass in a wave-like anterior to posterior direction. Fairy shrimp are filter feeders, and consume algae, bacteria, protozoa, rotifers, and bits of detritus as they move through the water. The second pair of antennae in fairy shrimp adult males are greatly enlarged and specialized for clasping the females during copulation. The females carry eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. After fertilization, the eggs are coated with a protective protein layer that allows them to withstand heat, cold, and prolonged dehydration. These dormant eggs are also known as cysts, and they can remain viable in the soil for decades after deposition. When the pools refill in the same or subsequent seasons, some, but not all, of the cysts may hatch. The cyst bank in the soil may consist of cysts from several years of breeding. The cysts that hatch may do so within days after the vernal pools fill, and rapidly develop into adults. In pools that persist for several weeks to a few months, fairy shrimp may have multiple hatches during a single season (59 **FR** 48136).

Vernal pool crustaceans breathe primarily through their phyllopods. When dissolved oxygen concentrations are low, fairy shrimp can be seen at the water's surface, circulating oxygen. In addition to phyllopods, fairy shrimp exchange oxygen through other surfaces of their body, particularly the thorax and abdomen (Ericksen and Belk 1999). Oxygen is more readily available in cooler water, below 68 degrees Fahrenheit (° F), and oxygen requirements may explain why most species endemic to the Central Valley hatch in the winter and live in cooler water habitats.

The hydrology that maintains the pattern of inundation and drying characteristic of vernal pool habitats is complex. Vernal pool habitats form in depressions above an impervious soil layer (duripan) or rock substrate. After winter rains begin, this impervious layer prevents the downward percolation of water and creates a perched water table causing the depression (or pool) to fill. Due to local topography and geology, the depressions are generally part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages (Nikiforoff 1941, Holland and Jain 1978). These features form an interconnected hydrological unit known

as a vernal pool complex. Although vernal pool hydrology is driven by the input of precipitation, water input to vernal pool basins also occurs from surface and subsurface flow from the swale and upland portions of the complex (Zedler 1987, Hanes *et al.* 1990, Hanes and Stromberg 1998). Surface flow through the swale portion of the complex allows vernal pool species to move directly from one vernal pool to another. Upland areas are a critical component of vernal pool hydrology because they directly influence the rate of vernal pool filling, the length of the inundation period, and the rate of vernal pool drying (Zedler 1987, Hanes and Stromberg 1998).

The Service has used vernal pool complexes as the basis for determining populations of vernal pool crustaceans since the species were first proposed for listing. The final rule to list the four vernal pool crustaceans states that "The genetic characteristics of the three fairy shrimp and vernal pool tadpole shrimp, as well as ecological conditions, such as watershed contiguity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools" (Fugate 1992, Fugate 1998, King 1996). Therefore, the most accurate indication of the distribution and abundance of the three vernal pool crustaceans is the number of inhabited vernal pool complexes. Individual vernal pools occupied by the three species listed herein are most appropriately referred to as "subpopulations" (**FR** 59:48137).

All of the vernal pool crustacean species addressed in this biological opinion have evolved unique physical adaptations to survive in vernal pools. Vernal pool environments are characterized by a short inundation phase during the winter, a drying phase during the spring, and a dry phase during the summer (Holland and Jain 1978). The timing and duration of these phases can vary significantly from year to year, and in some years vernal pools may not inundate at all. In order to take advantage of the short inundation phase, vernal pool crustaceans have evolved short reproduction times and high reproductive rates. The listed crustaceans generally hatch within a few days after their habitats fill with water, and can start reproducing within a few weeks (Eng *et al.* 1990, Helm 1998, Eriksen and Belk 1999). Vernal pool crustaceans can complete their entire life cycle in a single season, and some species may complete several life cycles. Vernal pool crustaceans can also produce numerous offspring when environmental conditions are favorable. Some species may produce thousands of cysts during their life spans.

To survive the prolonged heat and desiccation of the vernal pool dry phase, vernal pool crustaceans have developed a dormant stage. After vernal pool crustacean eggs are fertilized in the female's brood sac, the embryos develop a thick, usually multi-layered shell. When embryonic development reaches a late stage, further maturation stops, metabolism is drastically slowed, and the egg, now referred to as a cyst, enters a dormant state called diapause. The cyst is then either dropped to the pool bottom or remains in the brood sac until the female dies and sinks. Once the cyst is desiccated, it can withstand temperatures near boiling (Carlisle 1968), fire (Wells *et al.* 1997), freezing, and anoxic conditions without damage to the embryo. The cyst wall cannot be affected by digestive enzymes, and can be transported in the digestive tracts of animals without harm (Horne 1967). Most fairy shrimp cysts can remain viable in the soil for a decade or longer (Belk 1998).

Although the exact signals that cause crustacean cysts to hatch are unknown, factors such as soil moisture, temperature, light, oxygen, and osmotic pressure may trigger the embryo's emergence from the cyst (Brendonck 1996). Because the cyst contains a well developed embryo, the animal can quickly develop into a fully mature adult. This allows vernal pool crustaceans to reproduce before the vernal pool enters the dry phase, sometimes within only a few weeks (Helm 1998, Eriksen and Belk 1999). In some species, cysts may hatch immediately without going through a dormant stage, if they are deposited while the vernal pool still contains water. These cysts are referred to as quiescent, and allow the vernal pool crustacean to produce multiple generations in a single wet season as long as their habitat remains inundated.

Another important adaptation of vernal pool crustaceans to the unpredictable conditions of vernal pools is the fact that not all of the dormant cysts hatch in every season. Hathaway and Simovich (1996) found that only 6 percent of San Diego fairy shrimp cysts hatched after initial hydration, and only 0.18 percent of Riverside fairy shrimp cysts hatched. The cysts that don't hatch remain dormant and viable in the soil. These cysts may hatch in a subsequent year, and form a cyst bank much like the seed bank of annual plants. The cyst bank may be comprised of cysts from several years of breeding, and large cyst banks of viable resting eggs in the soil of vernal pools containing fairy shrimp have been well documented (Belk 1998). Based on a review of other studies (e.g. Belk 1977, Gallagher 1996, Brendonck 1996), Hathaway and Simovich (1996) concluded that species inhabiting more unpredictable environments, such as smaller or shorter lived pools, are more likely to have a smaller percent of their cysts hatch after their vernal pool habitats fill with water. This strategy reduces the probability of complete reproductive failure if a vernal pool dries up prematurely. This kind of "bet-hedging strategy" has been suggested as a mechanism by which rare species may persist in unpredictable environments (Chesson and Huntly 1989, Ellner and Hairston 1994).

Although the vernal pool crustaceans, and particularly the fairy shrimp, addressed in this biological opinion are not often found in the same vernal pool at the same time, when coexistence does occur, it is generally in deeper, longer lived pools (Eng *et al.* 1990, Thiery 1991, Gallagher 1996, Simovich 1998). In larger pools, closely related species of fairy shrimp may coexist by hatching at different temperatures, and by developing at different rates (Thiery 1991, Hathaway and Simovich 1996). Vernal pool crustacean species may also be able to coexist by utilizing different physical portions of the vernal pool or by eating different food sources (Daborn 1978, Mura 1991, Hamer and Appleton 1991, Thiery1991). Maeda-Martinez (1997) reviewed much of the literature on large branchiopod coexistence and concluded that species distribution patterns likely result from differences in the physical environment of the ephemeral habitat, differences in the life history and habitat requirements of different species, and factors such as colonization, extirpation, and random events. The role of competition in structuring vernal pool crustacean communities is not well understood.

Upland areas associated with vernal pools are also an important source of nutrients to vernal pool organisms (Wetzel 1975). Vernal pool habitats derive most of their nutrients from detritus which is washed into the pool from adjacent uplands, and these nutrients provide the foundation for vernal pool aquatic community's' food chain. Detritus is a primary food source for the vernal pool crustaceans (Eriksen and Belk 1999).

Vernal pool crustaceans are an important food source for a number of aquatic and terrestrial species. Aquatic predators include insects such as backswimmers (Family Notonectidae) (Woodward and Kiesecker 1994), predaceous diving beetles and their larvae (Family Dystictidae), and dragonflies and damselfly larvae (Order Odonate). Vernal pool tadpole shrimp are another significant predator of fairy shrimp. Vernal pools provide important habitat for resident and migratory birds, particularly waterfowl and shorebirds. Birds are particularly attracted to the pools because they offer foraging habitat at a time of year when resources are limited (Silveira 1998), and vernal pools help link aquatic resources in the California portion of the Pacific Flyway. Vernal pool crustaceans provide important proteins and calcium vital to the energetic needs of migratory bird migration and reproduction (Proctor *et al.* 1967, Silveira 1998). Vernal pool crustaceans are a major food source for a number of terrestrial vertebrate predators including water fowl, wading birds, toads, frogs, and salamanders (Proctor *et al.* 1967, Krapu 1974, Swanson 1974, Morin 1987, Simovich *et al.* 1991, Silveira 1998). Vernal pool crustaceans depend on the absence of water during the summer months to discourage aquatic predator species such as bullfrogs, garter snakes, and fish (Eriksen and Belk 1999). There is evidence that vernal pool crustaceans were used as a food source for Native Americans in California's Central Valley. The primary historic dispersal mechanisms for the vernal pool crustaceans probably consisted of large scale flooding resulting from winter and spring rains, and dispersal by migratory birds. As a result of widespread flood control and agricultural water diversion projects developed during the twentieth century, large scale flooding is no longer a major form of dispersal for the vernal pool crustaceans. When being dispersed by migratory birds, the eggs of these crustaceans are either ingested (Krapu 1974, Swanson 1974, Driver 1981, Ahl 1991) and/or adhere to the bird's legs and feathers where they are transported to new habitats. Cysts may also be dispersed by a number of other species, such as salamanders, toads, cattle, and humans (Eriksen and Belk 1999).

Vernal pool crustaceans are often dispersed from one pool to another through surface swales that connect one vernal pool to another. These dispersal events allow for genetic exchange between pools and create a population of animals that extends beyond the boundaries of a single pool. Instead, populations of vernal pool crustaceans are defined by the entire vernal pool complex in which they occur (Simovich *et al.* 1992, King 1996). These dispersal events also allow vernal pool crustaceans to move into pools with a range of sizes and depths. In dry years, animals may only emerge in the largest and deepest pools. In wet years, animals may be present in all pools, or in only the smallest pools. The movement of vernal pool crustaceans into vernal pools of different sizes and depths allows these species to survive the environmental variability that is characteristic of their habitats.

The vernal pool crustaceans addressed in this biological opinion are generally confined to habitats that are low to moderate in alkalinity and dissolved salts, when compared with other aquatic systems (Ericksen and Belk 1999). Although potentially moderated by soil type, vernal pools are generally unbuffered and exhibit wide fluctuations in pH and dissolved oxygen. Vernal pools may change 3 to 4 pH units within a few hours (Keeley and Zedler 1998). Vernal pool water ion concentrations, such as sodium, potassium, calcium, chlorine, and magnesium, also experience large daily and seasonal variations. These variations are due to the concentration of ions as a result of evaporation, and the dilution of ions with additional rainfall throughout the wet season (Barclay and Knight 1981). How vernal pool crustacean species adapt to these

fluctuations in water chemistry is unknown. Gonzalez *et al.* (1996) studied ion regulation in several fairy shrimp species in Southern California and found that some species are hyperosmotic regulators, and use active transport to maintain internal ion concentrations above that in the external environment. These species typically inhabit pools with low ion concentrations. Other species can tolerate higher ion concentrations in the external environment by hyporegulating, or maintaining internal levels below that of the water around them. Some species are also able to osmoconform, and allow their internal chemistry to match external ion concentrations. These differences in ion regulation may explain why some species are limited to certain habitats. Although there are numerous observations of the water chemistry of vernal pools where vernal pool crustaceans have been collected, wide variations in vernal pool water chemistry and the anecdotal nature of these observations preclude definitive conclusions about water chemistry habitat preferences.

Although most species of fairy shrimp look generally similar, vernal pool fairy shrimp are characterized by the presence and size of several bulges on the male's antenna, and by the female's short, pyriform or pear shaped, brood pouch. They vary in size, ranging from 0.4 to 1.0 inch in length (Eng *et al.* 1990).

Vernal pool fairy shrimp generally will not hatch until water temperatures drop to below 50°F (Gallagher 1996, Helm 1998). This species is capable of hatching multiple times within a single wet season if conditions are appropriate. Helm (1998) observed 6 separate hatches of vernal pool fairy shrimp within a single wet season, and Gallagher (1996) observed 3 separate hatches in vernal pools in Butte County.

Helm (1998) observed vernal pool fairy shrimp living for as long as 147 days. The species can reproduce in as few as 18 days at optimal conditions of 68°F and can complete its life cycle in as little as 9 weeks (Gallagher 1996, Helm 1998). However, maturation and reproduction rates of vernal pool crustaceans are controlled by water temperature and can vary greatly (Eriksen and Brown 1980, Helm 1998). Helm (1998) observed that vernal pool fairy shrimp did not reach maturity until 41 days at water temperatures of 59F. Vernal pool fairy shrimp has been collected at water temperatures as low as 40F (Eriksen and Belk 1999), however, the species has not been found in water temperatures above about 73°F (Helm 1998, Eriksen and Belk 1999).

Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools (Eng *et al.* 1990, Helm 1998, CNDDB 2001). The pool types where the species has been found include Northern Hardpan, Northern Claypan, Northern Volcanic Mud Flow, and Northern Basalt Flow vernal pools formed on a variety of geologic formations and soil types. Although vernal pool fairy shrimp have been collected from large vernal pools, including one exceeding 25 acres in area (Eriksen and Belk 1999), it is most frequently found in pools measuring fewer than 0.05 acre in area (Helm 1998, Gallagher 1996). The species occurs at elevations from 33 feet to 4,003 feet (Eng *et al.* 1990), and is typically found in pools with low to moderate amounts of salinity or total dissolved solids (Keeley 1984, Syrdahl 1993). Vernal pools are mostly rain fed, resulting in low nutrient levels and dramatic daily fluctuations in pH, dissolved oxygen, and carbon dioxide (Keeley and Zedler 1998). Although there are many observations of the environmental

conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species.

The vernal pool fairy shrimp is known from 32 populations extending from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles in San Benito County (Eng et al. 1990, Fugate 1992, Sugnet 1993) and a disjunct population on the Agate Desert in Oregon. Five additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County; one in the mountain grasslands of northern Santa Barbara County; one on the Santa Rosa Plateau in Riverside County, one near Rancho California in Riverside County and one on the Agate Desert near Medford, Oregon. Three of these isolated populations each contain only a single pool known to be occupied by the vernal pool fairy shrimp.

Vernal Pool Fairy Shrimp Critical Habitat

Critical habitat for the vernal pool fairy shrimp was designated on August 6, 2003 (68 **FR** 46684) and then revised on February 10, 2006 (71 **FR** 7141). This proposed project is not located within any designated critical habitat for the vernal pool fairy shrimp.

California Tiger Salamander

On August 4, 2004, the Service listed the California tiger salamander as threatened throughout its range (69 **FR** 47211). On August 19, 2005, U.S. District Judge William Alsup vacated the Service's down-listing of the Sonoma and Santa Barbara Distinct Population Segments (DPSs) from endangered to threatened. Therefore, the Sonoma and Santa Barbara DPSs are now listed as endangered. The Central Valley DPS remains listed as threatened. On August 23, 2005, the Service designated 199,109 acres (80,576 hectares) of critical habitat for the Central Valley DPS in 19 counties (70 **FR** 49380).

The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (20.8 centimeters) (Petranka 1998). California tiger salamanders exhibit sexual dimorphism with males tending to be larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. As adults, California tiger salamanders tend to have creamy yellow to white spotting on the sides with much less on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the top of the animals. Historically, the California tiger salamander inhabited low elevation grassland and oak savanna plant communities of the Central Valley, and adjacent foothills, and the inner Coast Ranges in California (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County south to the vicinity of Buellton in Santa Barbara County. In the Central Valley and surrounding foothills, the species occurred from northern Yolo County southward to northwestern Kern County and northern Tulare County. The species has been recorded from near sea level to approximately 3,900 (1,189 meters) in the Coast Ranges and to approximately 1,600 feet (488 meters) in the Sierra Nevada foothills (Shaffer *et al.* 2004).

California tiger salamanders require both wetland and adjacent upland habitat to complete their life cycle (Shaffer *et al.* 1993). The tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae develop in the vernal pools and ponds in which they were born, tiger salamanders are otherwise terrestrial and spend most of their post-metamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Subadult and adult California tiger salamanders spend the dry summer and fall months of the year in small mammal burrows, such as those of Beechey ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Initially, it was believed that during this period, California tiger salamanders ate very little (Shaffer *et al.* 1993), but new evidence is indicating that the salamanders may be very active during this time and feed regularly.

Once fall or winter rains begin, the salamanders emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985, 1989; Shaffer *et al.* 1993). Adult salamanders mate in the breeding ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Historically, the California tiger salamander utilized vernal pools, but the animals also currently breed in livestock stock ponds. Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925, Twitty 1941). In ponds with no or limited vegetation, they may be attached to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). After breeding, adults leave the pool and return to the small mammal burrows (Loredo *et al.* 1996; Trenham 1998a), although they may continue to come out nightly for approximately the next two weeks to feed (Shaffer *et al.* 1993). In drought years, the seasonal pools may not form and the adults cannot breed (Barry and Shaffer 1994).

Egg laying typically reaches a peak in January (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Salamander eggs hatch in 10 to 14 days with newly hatched salamanders (larvae) ranging from 0.45 to 0.56 inch (1.14 to 1.42 centimeters) in total length (Petranka 1998). The larvae are aquatic. They are yellowish gray in color and have broad fat heads, possess large, feathery external gills, and broad dorsal fins that extend well onto their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. D. Anderson 1968). Larger larvae have been known to consume smaller tadpoles of Pacific treefrogs (*Pseudacris regilla*) and California red-legged frogs (*Rana draytonii*) (J. D. Anderson 1968; P. R. Anderson 1968). The larvae are among the top aquatic predators in the seasonal pool ecosystems. They often rest on the bottom in shallow water, but also may be found at different layers in the water column in deeper water. The young salamanders are wary and, when approached by potential predators, will dart into vegetation on the bottom of the pool (Storer 1925).

The larval stage of the California tiger salamander usually lasts three to six months, as most seasonal ponds and pools dry up during the summer (Petranka 1998). Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches (4.78 to 5.89 centimeters) in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left

the breeding pools 60 to 94 days after the eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. The longer the ponding duration, the larger the larvae and metamorphosed juveniles are able to grow, and the more likely they are to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). The larvae will perish if a site dries before metamorphosis is complete (P. R. Anderson 1968; Feaver 1971). Pechmann *et al.* (1989) found a strong positive correlation with ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 pools sampled supported larval California tiger salamanders, and five of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only six (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998).

In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave them and enter upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Unlike their winter migration, the wet conditions that California tiger salamanders prefer do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find temporary upland sites for the dry summer months, waiting until the next winter's rains to move further into suitable upland refugia. Once juvenile California tiger salamanders leave their birth ponds for upland refugia, they typically do not return to ponds to breed for an average of 4 to 5 years. However, they remain active in the uplands, coming to the surface during rainfall events to disperse or forage.

The upland component of California tiger salamander habitat typically consists of grassland savannah. Within these upland habitats, adult California tiger salamanders spend the greater part of their lives in the underground burrows of Beechey ground squirrels and Botta's pocket gophers (Barry and Shaffer 1994; Loredo *et al.* 1996; Trenham 1998a). Although, recent study has shown that an apparent absence of rodent burrows does not directly result in an absence of California tiger salamanders. Significant numbers of salamanders were found to be inhabiting upland habitat that appeared to be without rodent burrows (Orloff 2007). Camel crickets (*Ceuthophilus* spp.) and other invertebrates within these burrows provide food for California tiger salamanders, as well as protection from the sun and wind associated with the dry California climate that can cause desiccation (drying out) of amphibian skin. Although California tiger salamanders are members of a family of "burrowing" salamanders, California tiger salamanders are not known to create their own burrows in the wild, likely due to the hardness of soils in the California ecosystems in which they are found. Because they live underground in the burrows of mammals, they are rarely encountered even where abundant. The burrows may be active or inactive, but because they collapse within 18 months if not maintained, an active population of burrowing mammals is necessary to sustain sufficient underground refugia for the species (Loredo *et al.* 1996). California tiger salamanders also may utilize leaf litter or desiccation cracks in the soil.

Upland burrows inhabited by tiger salamanders have often been referred to as "aestivation" sites. However, "aestivation" implies a state of inactivity, while most evidence suggests that tiger salamanders remain active in their underground dwellings. A recent study has found that tiger salamanders move, feed, and remain active in their burrows (Van Hattem 2004). Because tiger salamanders arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving, researchers have long inferred that tiger salamanders are feeding while underground. Recent direct observations have confirmed this (Trenham 2001; van Hattem 2004). Thus, "upland habitat" is a more accurate description of the terrestrial areas used by CTS. Dispersal and migration movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. At a study site in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). Following breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before breeding again (Trenham *et al.* 2000).

California tiger salamanders are known to travel large distances from breeding ponds into upland habitats. Maximum distances moved are generally difficult to establish for any species, but California tiger salamanders in Santa Barbara County have been recorded to disperse 1.3 miles from breeding ponds (Sweet 1998). California tiger salamanders are known to travel between breeding ponds; one study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at ponds approximately 1,900 and 2,200 feet (597 and 671 meters) away (Trenham *et al.* 2000). In addition to traveling long distances during migration to or dispersal from ponds, California tiger salamanders may reside in burrows that are far from ponds. At one site in Contra Costa County, hundreds of California tiger salamanders have been captured three years in a row in upland habitat approximately 0.75 mile (1.14 kilometers) from the nearest breeding pond (Orloff 2003), and these numbers did not begin to decline until the fourth year of a relocation program (Orloff 2007).

Although previously cited information indicates that tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002-2003 suggested that juveniles dispersed and used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile salamanders were captured at traps placed at 328, 656, and 1,312 feet (100, 200, and 400 meters) from a breeding pond than at 164 feet (50 meters). Approximately 20 percent of the captured juveniles were found at least 1,312 feet (400 meters) from the nearest breeding pond. The associated distribution curve suggested that 95 percent of juvenile salamanders were within 2,099 feet (640 meters) of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from a 2003-04 trapping effort at the same study site detected juvenile tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet (700 meters) from the breeding pond (Shaffer and McCoy 2006). During post-breeding emigration from aquatic habitat, radio-equipped adult tiger salamanders were tracked to burrows between 62 to 813 feet (19 to 248 meters) from their breeding ponds (Trenham 2001).

These reduced movements may be due to adult California tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period. A five-year study in Contra Costa County found that, under certain environmental conditions, an adult salamander population may use upland habitat significantly farther (>800 m), and at a much greater percentage (> 5%) of the population then previously believed (Orloff 2007).

Lifetime reproductive success for California and other tiger salamanders is low. Trenham *et al.* (2000) found the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in roughly 11 metamorphic offspring over the lifetime of a female. While individuals may survive for more than ten years, many breed only once, and in some populations, less than 5 percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as human-caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

California tiger salamanders are imperiled by a variety of human activities. Current factors associated with declining populations of the salamander include continued degradation and loss of habitat due to agriculture and urbanization, non-native plants, hybridization with the non-native eastern tiger salamander (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003), and predation by introduced species. Fragmentation of existing habitat and the continued colonization of existing habitat by non-native tiger salamanders may represent the most significant current threats to California tiger salamanders, although populations are likely threatened by more than one factor. Isolation and fragmentation of habitats within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). California tiger salamanders are also prone to chance environmental or demographic events, to which small populations are particularly vulnerable.

Documented or potential tiger salamanders predators include coyotes (*Canis latrans*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), Virginia opossums (*Didelphis virginiana*), egrets (*Egretta* species), Great Blue Herons (*Ardea herodias*), American Crows (*Corvus brachyrhynchos*), Common Ravens (*Corvus corax*), garter snakes (*Thamnophis* species), bullfrogs (*Rana catesbeiana*), California red-legged frogs, western mosquito fish (*Gambusia affinis*), and crayfish (*Procrambus* species). Due to predation, permanent ponds occupied by bullfrogs and exotic fishes are often considered unsuitable as viable breeding habitat (Fisher and Shaffer 1996).

The specific effects of disease on the California tiger salamander are not known. Pathogens, fungi, water mold, bacteria, and viruses have been known to adversely affect other tiger salamander species or other amphibians. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Nonnative species, such as bullfrogs, are located within the range of the Central Valley DPS and have been identified as potential carriers of

Chytridiomycosis (a fungal infection) and ranaviruses, which can adversely affect amphibians. Human activities can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e., contaminated boots or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in tiger salamanders being more susceptible to the effects of disease.

Disease will likely become a growing threat because of the relatively small, fragmented remaining California tiger salamander breeding sites, the many stresses on these sites due to habitat losses and alterations, and the many other potential disease-enhancing anthropogenic changes which have occurred both inside and outside the species' range. California tiger salamanders could be threatened by collecting for the pet trade. The listing of the species in 2004 may have raised the value of the species within wildlife trade markets, and increase the threat of unauthorized collections above current levels (K. McCloud, Special Agent, Service, personal communication, 2002). Even limited interest in the species could pose a serious threat to the Central Valley DPS.

The Service determined that conserving the California tiger salamander over the long-term requires a five-pronged approach: (1) Maintaining the current genetic structure across the species range; (2) maintaining the current geographical, elevational, and ecological distribution; (3) protecting the hydrology and water quality of breeding pools and ponds; (4) retaining or providing for connectivity between locations for genetic exchange and recolonizaiton; (5) protecting sufficient barrier-free upland habitat around each breeding location to allow for sufficient survival and recruitment to maintain a breeding population over the long-term (Service 2004).

California Tiger Salamander Critical Habitat

Critical habitat for the California tiger salamander was proposed on August 10, 2004 (69 **FR** 48569), totaling 382,666 acres (154,860 hectares), divided into 47 units, and spanning 20 counties, and was designated on August 23, 2005 (U.S. Fish and Wildlife Service 2004b). The proposed project will occur within the Central Valley Region: Unit 4 Northeastern San Joaquin; California tiger salamander Critical Habitat (70 **FR** 49428).

Effects of the Proposed Action

Vernal Pool Fairy Shrimp

Direct impacts to VPFS habitat will occur as a result if partial excavation or filling of vernal pools during construction from PM 0.00 to PM 2.95 along SR 88. Temporary ground disturbance will occur due to culvert repairs and upgrades from PM 0.00 to PM 2.25. From PM 2.25 to 2.95, excavation and filling of vernal pools will occur do to shoulder widening and utility relocation. These project activities will result in loss of habitat and destruction of vernal pool fairy shrimp cysts lying dormant in the vernal pool substrate. A total of 0.63 acres of vernal pool habitat will be directly affected as a result of excavation or filling for the Project. Caltrans proposes to compensate for impacts to VPFS via the use of Service approved credits at either the Fitzgerald Ranch Conservation Bank or the pending Florence Lake Conservation Bank, or another Service-approved conservation bank.

At this time, Caltrans anticipates no indirect impacts to any vernal pool habitat as a result of the project.

California Tiger Salamander

Construction activities would directly affect potential CTS breeding habitat of 0.63 ac as a result of excavating or filling of the vernal pool habitat. An additional 2.37 ac of CTS upland habitat will be permanently impacted, and 8.16 ac will be temporarily impacted by the Project.

The largest source of mortality to the CTS will likely come from either crushing or entombment in underground burrows due to construction activities. CTS that are exposed during grading or earthmoving likely will be subject to predation. CTS may, also, be crushed and killed or injured by construction-related vehicles above the ground.

Individual CTS disturbed by construction activities onsite could attempt overland movements in an effort to find alternative upland habitat. These individuals could be harassed, injured and killed by pedestrians, vehicles, and urban-adapted predators during overland movements at the project site, or during attempts to find more suitable habitats on adjacent lands. Construction related activities are likely to cause disruption of surface movement, disruption or complete loss of reproduction, harassment from increased human activity, and permanent and temporary loss of shelter. Tiger salamanders are primarily nocturnal; therefore, the above effects would be further exacerbated should construction be performed at night. Artificial lighting used during night time construction may increase predation of the tiger salamanders during periods of fall, winter, or spring rains, because they lose the protective cover of darkness during critical opportunities for upland movement (Wise and Buchanan 2002). Terrestrial salamanders are known to emerge soon after sunset and artificial lighting may delay emergence, resulting in reduced foraging time (Wise and Buchanan 2002). Tiger salamanders use visual cues to locate their prey and may be aided by artificial lighting. However, for the same reason, lighting may make them more vulnerable to capture by their predators. Many salamanders, such as the tiger salamander, are terrestrial as adults but migrate to ponds to breed and lay eggs. The orientation of some of these terrestrial species to and from these ponds is influenced by the spectral characteristics of light (Wise and Buchanan 2002). Artificial lights that emit unusual spectra may disrupt these migration patterns.

Various other work activities associated with the proposed project also may adversely affect CTS. Trash left during or after project activities could attract predators to work sites, which could subsequently harass or prey on the animals. For example, raccoons, crows, and ravens are attracted to trash and also prey opportunistically on amphibians. Accidental spills of hazardous materials or careless fueling or oiling of vehicles or equipment could degrade water quality or habitat to a degree where salamanders are adversely affected. Some potential also exists for disturbance of habitat which could result in the spread or establishment on non-native invasive plant species. There is also a possibility that people working on the site, particularly the onsite biologists, could introduce amphibian disease to habitat used by CTS.

To minimize adverse effects to CTS, construction should be excluded from November 1 to May 1 to avoid disruption of CTS breeding activities. Caltrans proposes to compensate for impacts to CTS through the use of Service approved credits at either the Fitzgerald Ranch Conservation Bank or Florence Lake Conservation Bank, or by purchasing credits at another approved conservation bank. A 3:1 compensation ratio has been proposed for permanent impacts to 0.63 acres of potential CTS aquatic breeding habitat. This compensation may be included in the 1.89 ac of vernal pool acreage to be purchased in available bank credits for impacts to VPFS. Caltrans has proposed a 3:1 compensation ratio for permanent impacts to 2.37 ac of upland habitat and 1.1:1 for temporary impacts to 8.16 ac.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

As the human population of central California increases and land continues to be converted to municipal and industrial uses, the amount and quality of habitat suitable for the species considered in this biological opinion will decrease. Between 1970 and 2000, California's total population increased by approximately 71% while the Central Valley's population increased 200%. Of the Sacramento and San Joaquin Valleys within the Central Valley, the San Joaquin Valley had the greater population growth. Among counties in the San Joaquin Valley, Tulare experienced the least increase percentage in population at 226% from 1940 to 1995, while Stanislaus experienced the greatest increase at 453% during the same period. Also during the period from 1940 to 1995, the increase in population for Fresno was 322%; 356% each for Kern and Madera; 227% for Kings: and 322% for Merced. During the period 1988 to 1998, 82,756 acres in the San Joaquin Valley were converted to urban and built-up land uses (California Department of Conservation 2000). Although not all of the converted acres can be considered habitat, this trend indicates that habitat loss and the fragmenting of metapopulations continues to threaten the survival and recovery of listed species.

Road construction and improvement are usually a result of development, and, likewise, development is usually fueled by the construction or improvement of roads (Forman, *et.al.*, 2004). Improved access to a region will encourage development of that region, and roads are that access. Roads and development are both the chicken and the egg, both the dog and the tail, and it is naïve to believe that anywhere in California that road construction or road improvement occurs will not have a cumulative effect on the current baseline of wildlife habitat.

The cumulative effects of all future State, Tribal, local, and private actions that are reasonably certain to occur in the action area and will continue to have a deleterious effect on the reproduction, numbers, and distribution of the species considered herein. The project as described, will not alter the present habitat in such away as to degrade it or make it uninhabitable for the species concerned with in this opinion. The permanent loss or impacts will be compensated for by the project proponent. Although, the adverse cumulative effects described in

this section serve to magnify the adverse effects of the proposed action and diminish any beneficial effects.

Conclusion

After reviewing the current status of the California tiger salamander and the vernal pool fairy shrimp, the environmental baseline for the action area, the effects of the proposed Project, and the cumulative effects, it is the Service's biological opinion that the project and the amount of compensatory preservation, as agreed upon, is not likely to jeopardize the continued existence of the California tiger salamander or the vernal pool fairy shrimp, or to destroy or adversely modify designated critical habitat for the California tiger salamander or the vernal pool fairy shrimp.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The California Department of Transportation has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans (1) fails to require the contractor to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of the vernal pool fairy shrimp will be difficult to detect because when this crustacean is not in its active adult stage, the cysts or napulai are difficult to locate in the vernal pools and seasonal wetlands; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers, random environmental

events, changes in water regime at their breeding ponds, or additional environmental disturbances. Therefore, the Service is estimating that all vernal pool fairy shrimp inhabiting 0.63 acres of direct impact, as described in the BA will be subject to incidental take. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Project in the form of harm, harassment, injury, and death of the vernal pool fairy shrimp caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect or quantify for the following reasons: the activity patterns of tiger salamanders makes the finding of a dead specimen unlikely, losses may be masked by annual fluctuations in numbers, and the species occurs in habitat that makes it difficult to detect. Due to the difficulty in quantifying the number of the California tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the Project as all California tiger salamanders inhabiting or utilizing the 0.63 acres of breeding habitat and 10.53 acres (including permanent and temporary impact) of salamander upland habitat identified in the action area, as described in the biological assessment. Upon implementation of the Reasonable and Prudent Measures, incidental take associated with the Project in the form of harm, harassment, capture, injury, and death of the California tiger salamander caused by habitat loss and construction activities will become exempt from the prohibitions described under section 9 of the Act.

Effect of Take

In the accompanying biological opinion, the Service determined that these levels of anticipated take for CTS and VPFS are not likely to result in jeopardy to either of the listed wildlife species or to destroy or adversely modify designated CTS critical habitat.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the Jackson Valley Rehabilitation Project on the California tiger salamander and the vernal pool fairy shrimp.

1. Caltrans will implement conservation measures for CTS and VPFS to minimize: (1) the effects of the loss of habitat that will occur as a result of the project; (2) the potential for harassment, harm, injury, and mortality to these two listed species; and (3) the potential for inadvertent capture or inadvertent capture or entrapment of federally-listed wildlife species during construction activities.

2. Caltrans will ensure its compliance, and any contractor acting in their behalf, with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans will ensure that they, and any contractor acting on their behalf, complies with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure One (1):

   A. Caltrans shall minimize the potential for harm or harassment of CTS and VPFS resulting from the project related activities by implementation of the conservation measures as described in the BA and the Project Description of this BO.

   B. Caltrans shall include Special Provisions that include the avoidance and minimization measures of this BO in the solicitation for bid information. Caltrans shall educate and inform contractors involved in the project as to the requirements of the BO.

   C A qualified, Service-approved biologist shall be on-site or on-call during all activities that could result in the take of listed species. The qualifications of the biologist(s) shall be presented to the Service for review and approval at least 60 calendar days prior to any groundbreaking at the project site. The biologist shall have oversight over implementation of all the measures described in the *Terms and Conditions* of this biological opinion, and he/she shall have the authority to stop project activities, through communication with the Resident Engineer, if any of the requirements associated with these measures are not being fulfilled. If the biologist(s) exercises this authority, the Service and the California Department of Fish and Game (CDFG) shall be notified by telephone and electronic mail within one (1) working day. The Service contact is Mr. Peter A. Cross, Deputy Assistant Field Supervisor, Endangered Species Program, Sacramento Fish and Wildlife Office, Sacramento (telephone 916/414-6600). The CDFG contact is Mr. Ron Schlorff at (916) 654-4262.

   D. Prior to initiation of any site preparation/construction activities, the Service-approved biologist shall conduct an education and training session for all construction personnel. All available individuals who will be involved in the site preparation or construction will be present, including the project representative(s) responsible for reporting take to the Service and the CDFG. Training sessions will be repeated for all new employees before they are allowed to access the project site. Sign up sheets identifying attendees and the contractor/company they represent will be provided to the Service with the post-construction compliance report. At a minimum, the training will include a description of the California tiger salamander, vernal pool fairy shrimp, their life histories, and vernal pool habitats. Training will include the general measures that are being implemented to conserve these species as they relate to the project, the penalties for non-compliance, and the boundaries (work area) within which the project must be accomplished. To ensure that employees and contractors

understand their roles and responsibilities, training may have to be conducted in languages other than English.

E. A Service approved biologists will conduct pre-construction surveys for potential CTS aestivation sites and vernal pools within designated construction areas that will not be subject to excavation or filling. Any such areas will be enclosed with environmentally sensitive area (ESA) fencing to prevent construction-related impacts to the extent to which project goals may still be achieved.

F. As described in BA, and the *Project Description* of this BO, 1.89 acres of vernal pool habitat compensation credits shall be purchased by Caltrans for the vernal pool fairy shrimp and all of which will be aquatic breeding habitat for the California tiger salamander, otherwise additional credits may be required to offset any short fall. Credits for 16.09 acres of CTS upland habitat will also be obtained. These credits will be obtained through the purchase of credits at the Fitzgerald Ranch Conservation Bank, or the pending Florence Lake Conservation Bank, or another Service-approved conservation bank.

G. The limits of the construction area will be flagged, if not already marked by right of way or other fencing, and all activity will be confined within the marked area. All access to and from the project area will be clearly marked in the field with appropriate flagging and signs. Prior to commencing construction activities, the contractor will determine construction vehicle parking sites and all access routes.

H. Construction will be prohibited from November 1 to May 1 to avoid impacts to potential breeding habitat during CTS breeding season and to avoid impacts to any VPFS life stage other than dormant cysts.

I. To the extent possible, nighttime construction shall be minimized. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved, as well as, improved roads.

J. Permanent and temporary disturbances and other types of project-related disturbance to habitats of CTS shall be minimized to the maximum extent practicable. To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads and other designated areas. These areas also shall be included in pre-construction surveys and, to the maximum extent possible, shall be established in locations disturbed by previous activities to prevent further adverse effects.

K. Project employees shall be directed to exercise caution when commuting within the habitats of CTS and VPFS. A 20-mile per hour speed limit will be strongly encouraged on unpaved roads within listed species habitats.

L. To prevent harassment, injury or mortality of CTS or destruction of their refugia or burrows by dogs or cats, no pets shall be permitted on construction sites.

M. All construction activity shall be confined within the project site, which may include temporary access roads, haul roads, and staging areas specifically designated and marked for these purposes. At no time shall equipment or personnel be allowed to adversely affect habitat areas outside the project site without authorization from the Service.

N. The Resident Engineer or his designee shall be responsible for implementing these conservation measures and will be the point of contact.

O. The onsite biological monitor will check for animals under any equipment such as vehicles and stored pipes before the start of work each morning. The biological monitor will check all excavated steep-walled holes or trenches greater than 6 inches (0.15 meters) deep for CTS. CTS will be removed by the biological monitor and translocated. Only Service-approved biologists who are familiar with the biology and ecology of the CTS are authorized to capture or handle listed species.

P. To prevent inadvertent entrapment of CTS during construction, all excavated, steep-walled holes or trenches shall be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist shall immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service and/or California Department of Fish and Game will be contacted by telephone for guidance. The Service will be notified of the incident by telephone and electronic mail within one working day.

Q. All equipment shall be maintained such that there will be no leaks of fluids such as gasoline, oils, or solvents.

R. To eliminate an attraction to predators of the California tiger salamander, all food-related trash items such as wrappers, cans, bottles, and food scraps must be disposed of in closed containers and removed at least once every day from the entire project site.

S. If borrow material is going to be used for the project, Caltrans shall follow the procedures outlined below:

1. Caltrans shall require as part of the construction contract that all contractors comply with the Act in the performance of the work necessary for project completion performed inside and outside the project right-of-way.

2. Caltrans shall require documentation from the contractor that aggregate, fill, or borrow material provided for the project will be obtained in compliance with the Act. Evidence of compliance with the Act shall be demonstrated by providing the Resident Engineer any one of the following:

   a. a letter from the Service stating use of the borrow pit area will not result in the incidental take of listed species;
   b. an incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;
   c. a biological opinion or a letter concurring with a "not likely to adversely affect" determination issued by the Service to the Federal agency having jurisdiction over contractor-related activities;
   d. a letter from the Service concurring with the "no effect" determination for contractor-related activities; or
   e. contractor submittal of information to Caltrans Resident Engineer indicating compliance with the State Mining and Reclamation Act (SMARA) and provide the County land use permits and CEQA clearance;
   f. if a borrow site that is in compliance with the Act is not available, Caltrans will either:
      i. identify/select a site that the Service has concurred with the "no effect" determination, or
      ii. request re-initiation of formal consultation on the action considered herein based on new information.

2. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

   A. If requested, before, during, or upon completion of ground breaking and construction activities, Caltrans shall allow access by Service and/or California Department of Fish and Game personnel to the project site to inspect project effects to the vernal pool fairy shrimp and California tiger salamander and their habitat.

   B. Caltrans shall comply with the *Reporting Requirements* of this biological opinion.

Reporting Requirements

1. Before construction starts on this project, the Service shall be provided with the final documents, including but not limited to, recorded conservation easements, PAR analyses, management plans, or proof of purchase of credits. Please see draft guidance from the Service, *Selected Review Criteria for Conservation Banks and Section 7 Off Site Compensation* dated August 4, 2004, or Service guidance that supersedes this document.

2. A post-construction report detailing compliance with the project design criteria described under the *Description of the Proposed Action* section of this biological opinion shall be provided to the Service within 30 calendar days of completion of the project.

3. Caltrans shall notify the Service via electronic mail and telephone within one (1) working day of the death or injury to a California Tiger Salamander and/or other listed species that occurs due to project related activities or is observed at the project site. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. In the case of an injured animal, the animal shall be cared for by a licensed veterinarian or other qualified person. In the case of a dead animal, the individual animal should be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are Mr. Peter A. Cross, Deputy Assistant Field Supervisor, Endangered Species Program, Sacramento at (916) 414-6600, and Scott Heard, Resident Agent-in-Charge, Office of Law Enforcement, Sacramento at (916) 414-6660). The California Department of Fish and Game contact is Mr. Ron Schlorff at (916) 654-4262.

4. Any contractor or employee who, during routine operations and maintenance activities inadvertently kills or injures a State listed wildlife species shall immediately report the incident to his or her supervisor or representative. The supervisor or representative must contact the California Department of Fish and Game immediately in the case of a dead or injured State listed wildlife species. The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Sightings of any sensitive animal species should be reported to the California Natural Diversity Database of the California Department of Fish and Game. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

2. Caltrans should encourage the establishment of functioning preservation and creation conservation banking systems to further the conservation of the California tiger salamander, listed crustacean species, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate.

3. Caltrans should initiate an institutional program of the routine installation of wildlife crossing structures where appropriate, and where the effects of such structures will enhance the genetic viability and the dispersal capabilities of listed wildlife populations. Such crossing structures would facilitate the maintenance of viable metapopulations and

create safe dispersal corridors for wildlife reducing road mortalities and enhancing public safety.

In order for the Service to be kept informed of conservation actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any of the above conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the State Route 41 Culvert Installation and Drainage Rehabilitation Project. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions concerning this biological opinion on the Jackson Valley SR 88 Rehabilitation Project, please contact Richard Montgomery or Susan P. Jones at the letterhead address or at telephone 916/414-6630.

Sincerely,

Susan P. Jones

for Peter A. Cross
Deputy Assistant Field Supervisor

Enclosure:
Selected Review Criteria for Conservation Banks and Section 7 Off-Site Compensation

cc:
Gene K. Fong, Federal Highway Administration, Sacramento, California
Julie Vance, California Department of Fish and Game, Fresno, California

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Selected Review Criteria for
Conservation Banks and Section 7 Off Site Compensation
Rev. April 11, 2006

This list is not a comprehensive list, but gives a substantial number of the basic considerations and requirements necessary to establish protection for properties designated as compensation for project impacts.

In many instances, 'Service-approval,' as stated below, may be replaced with 'Agency-approval,' where other government agencies are involved, such as in Conservation Banking (eg. USACE, CDFG, EPA).

Property Assurances and Conservation Easement

Title Report (Preliminary at proposal, and Final Title Insurance at recordation)

1. Who holds fee title to property? Should be Bank Owner/Project Applicant. If not, there may be liability and contracting issues.
2. Are there any liens or encumbrances (existing debts or easements) on the property?
    a. Review necessary supporting instruments to evaluate liens and encumbrances. Property owner should submit a "Property Assessment and Warranty" which discusses each and every exception listed on the Preliminary and Final Title Insurance Policies, evaluating any potential impacts to the conservation values that could result from the exceptions (see below).
3. Could any of these liens or encumbrances potentially interfere with either biological/habitat values or ownership? If existing easements can potentially interfere with the conservation values/habitat of the property, those portions of the land should be removed from the Conservation Easement (CE), and deducted from the total number of credits or acres attributed to the site.
4. A Subordination Agreement is necessary if there is any outstanding debt on the property. Review Subordination Agreement for adequacy – the lending bank or other lien holder must agree to fully subordinate to each lien or encumbrance.

Legal Description and Parcel Map

1. Ensure accuracy of map, location and acreage protected under CE.
2. Both the map and the legal description should explain the boundaries of the Bank and/or boundaries of each individual Bank phase or individual project compensation sites. Individual project compensation sites should *not* have "leftover" areas for later use.

Conservation Easement

1. Should use current USFWS CE template;
2. Who will hold the easement?
    a. Must have third-party oversight by a qualified non-profit or government agency. Qualifications include:
        i. Organized under IRC 501(c)(3),

ii. Qualified under CA Civil Code § 815
iii. Bylaws, Articles of Incorporation, and biographies of Board of Directors on file at, and approved by, USFWS
1. Must meet requirements of USFWS, including 51% disinterested parties on the Board of Directors

3. If not using the USFWS template, applicant should specify objections they have to the template as provided, and may substantially delay processing as they will require Solicitor review. Alternate CE's must be approved by the USFWS prior to recording.
4. Other (non-template) CE's should include, at a minimum, language to:
   a. **USFWS *must* be third-party beneficiary** or add language throughout the document in all appropriate places that will assure USFWS the right to enforce, inspect, and approve any and all uses and/or changes under the CE prior to occurrence (including land use, biological management or ownership). The alternative of adding language is difficult because we are not signatories to the CE, so you should make sure it is done through the Solicitor's Office.
   b. Reserve all mineral, air and water rights under CE as necessary to maintain and operate the Bank in perpetuity [USFWS § 2(D)]
   c. Ensure all future development rights are forfeited.
   d. Ensure all prohibited uses contained in USFWS CE template are addressed.
   e. Link the CE, the Management Plan, and the Endowment Trust fund within the document (e.g. note that each exists to support the others, and where each of the documents can be located if a copy is required).
5. There are probably many more specific concerns – should compare the content of each of the sections of the current USFWS CE to see where discrepancies lie, and to insert necessary language, particularly, but not exclusively, per:
   a. Rights of Grantee
   b. Remedies
   c. Injunctive Relief
   d. Enforcement Discretion
   e. Costs and Liabilities
   f. Taxes
   g. Hold Harmless
   h. No Hazardous Materials Liability
   i. Assignment and Transfer
   j. Amendment
   k. Funding
   l. Warranty
   m. Additional Interests

<u>Property Assessment and Warranty</u>

1. A summary and full explanation of all exceptions remaining on the title must be included, with a statement that the owner/Grantor accepts responsibility for all lands being placed under this CE as available for the primary purposes of

the easement, as stated in the easement, and assures that these lands have a free and clear title and are available to be placed under the CE.

Environmental Site Assessment – Phase I

1. Check for clear report
2. If there are issues – a proposal to address the issues should be included; remediation may be necessary

Service Area

1. Service Area for a Conservation Bank is based upon biological criteria, and must be approved by USFWS.
2. Documents should then include a map designating the proposed/approved Service Area, and a text description of the same area.

Restoration or Development Plan

1. Full plans for any habitat construction *must* be USFWS-*approved*, and all permits in place, ***prior*** to the start of construction of the habitat

Management Plan

1. Must be reviewed and approved by the USFWS for each individual Bank, or individual mitigation project, for target species baseline, adequacy of management and monitoring, and reporting requirements and schedules in perpetuity, etc.
2. Management Plan should also describe funding mechanisms, schedule, and reporting for the long term funding of the property
3. Appendices should include biological surveys, wetland delineation and USACE verification letter, and any required permitting information
4. A copy of the final Management Plan must be either recorded with the CE, or the CE must state in its body that the current management plan can be obtained upon request from any signatory wildlife agency.

Economic Analysis

1. Must be based upon the *final, approved* management plan.
2. Must include provision to adjust for CPI annually.
3. Must be based on appropriate, attainable, long-term interest rate.
4. Must address/account for all of the required funds (as below).

Performance Security, Contingency Security and Endowment Fund

All funds must be held, managed, accessed, expended and released according to agency-approved methods and procedures. There are a variety of requirements for each fund. Following is a general overview:

1. All funds must be held by qualified, Service-approved, non-profit organization or government agency [see requirements under CE, §2(a), above]
2. A full description of the trust account and investment methods must be agency-approved. All funds must be held according to minimum standards for assuring

maximum success in earning potential, and with assurances for no loss of principal

3. Disbursements or releases from each of the funds must be for documented expenditures, as they occur
4. A full economic analysis must be included to demonstrate how each of the required funding amounts was determined. This analysis must be approved by the agencies as being full, complete and adequate
5. A schedule and plan (including target date and full amount on that date) for funding each of the accounts must be submitted for approval

Agreement Contract

This would include a "Conservation Bank Agreement," "Bank Enabling Instrument," or other consolidating agreement that ties all of the associated documents together. Some general, basic (certainly not all-inclusive) concerns to include are:

1. Conservation Easement must be approved by any agencies involved prior to recording, and a recorded copy must be submitted to the agencies prior to the compensation taking effect in any way.
2. For an individual site, each of the primary documents – the CE, management plan and endowment trust – must reference the other two documents to link them together to fully address the compensation.
3. If not a Conservation Bank, individual project compensation should be addressed fully (within or by each document) as individual projects.
4. Responsible party (property owner) must be identified (and a valid party to the contract) as responsible for all funding, management, monitoring, and reporting of Bank or Compensation Site, in perpetuity.
5. Transfer and Assignment of property should be according to §9.0 of USFWS Bank Agreement template, or approved by USFWS
6. Any agreement must include remedies for any disputes per §10.0 of the USFWS Conservation Bank Agreement.
7. Applications for individual compensation sites must not include any "leftover" pre-approved acreages for future projects. Any future projects must be addressed individually.

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND GAME
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4599
916-358-2900
www.dfg.ca.gov

EDMUND G. BROWN, *Governor*
JOHN McCAMMAN, *Director*

July 11, 2011

Zachary Parker
California Department of Transportation
2015 E. Shields Ave. Suite 100
Fresno, CA 93726

Subject: Draft Lake or Streambed Alteration Agreement
Notification No. 1600-2011-0084-R2
Jackson Valley Rehabilitation Project SR 88

Dear Mr. Parker:

Enclosed is the final Streambed Alteration Agreement (Agreement) for the Jackson Valley Rehabilitation Project SR 88 (Project). Before the Department of Fish and Game (Department) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, the Department, acting as a responsible agency, filed a notice of determination (NOD) on the same date it signed the Agreement. The NOD was based on information contained in the "Jackson Valley Rehabilitation: Initial Study with Mitigated Negative Declaration" the lead agency prepared for the Project.

Under CEQA, filing a NOD starts a 30-day period within which a party may challenge the filing agency's approval of the project. You may begin your project before the 30-day period expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this letter, please contact Tim Nosal, Environmental Scientist at (916) 358-2853 or tnosal@dfg.ca.gov.

Sincerely,

Jeff Burgess

Kent Smith
Regional Manager

ec: Tim Nosal
tnosal@dfg.ca.gov

CALIFORNIA DEPARTMENT OF FISH AND GAME
NORTH CENTRAL REGION
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CA 95670

Streambed Alteration Agreement Notification No. 1600-2011-0084 -R2
Jackson Creek, Jackson Creek Overflow, unnamed streams and wetlands
California Department of Transportation
Jackson Valley Rehabilitation Project, SR88

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and the California Department of Transportation (Caltrans) (Permittee) as represented by Zachary Parker.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on May 5, 2011 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, DFG has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

PROJECT LOCATION

The project is located at Jackson Creek, Jackson Creek Overflow, unnamed streams and wetlands, in the County of Amador, State of California; Latitude (start/end) 38.2756/38.3180 N, Longitude (start/end) -121.0150/-120.9400 W, or Section 20, Township 5 N, Range 9 E, U.S. Geological Survey (USGS) maps Goose Creek and Ione, Mount Diablo baseline and meridian.

PROJECT DESCRIPTION

The California Department of Transportation (Caltrans), in cooperation with the Federal Highway Administration (FHWA), proposes to rehabilitate and widen a section of 5.5 miles (mi) of State Route (SR) 88 from the San Joaquin County line north-eastward toward Highway 124 in Amador County, California.
SR 88 would receive a shoulder upgrade to 8 feet (ft) for 3.25 mi of highway between Bamert Road to the intersection of SR 124 (post mile [PM] 2.25 to 5.50). Jackson Creek Bridge and Jackson Creek Overflow Bridge would be widened to include shoulder upgrades. A portion of highway would be realigned to the westbound side between Jackson Valley Road and Martin Road. Relocation of utilities would be necessary

through the shoulder-widening portion of the project. Other minor upgrades would also be included.

A detailed project description is provided in the notification materials submitted to DFG. The notification, together with all supporting documents submitted with the notification, *Categorical Exemption/Categorical Exclusion Determination Form* (EA 26444), *Jackson Valley Rehabilitation Project – Clean Water Act Permit Applications: 401 & 404* (Feb 23, 2011), *Jackson Valley Rehabilitation – Biological Assessment* (July 2007), *Jackson Valley Rehabilitation – Initial Study with Mitigated Negative Declaration* (March 2008), *Biological Opinion for the State Route 88 Jackson Valley Rehabilitation Project, Amador County, California 10-AMA-88-PM 0.0/5.5 EA 10-26444* (August 24, 2007), and *Natural Environment Study – Jackson Valley Rehabilitation Project* (Jan 2007) are hereby incorporated into this agreement to describe the location, features, avoidance measures and mitigation measures of the proposed project.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, Central Valley steelhead, Central Valley fall/late fall run chinook salmon, western spadefoot toad, great egret, bats, cold water fish species, amphibians, and other aquatic and terrestrial plant and wildlife species.

The adverse effects the project could have on the fish or wildlife resources identified above include: disturbance from project activity; direct take of terrestrial species; loss of riparian habitat and oak woodland; loss of upland habitat; direct take of fish and other aquatic species; direct take of terrestrial species; removal of bat roosting habitat; diversion of creek around project site; and temporary de-watering of the watercourse.

STREAM ZONE DEFINED

The Stream Zone comprises all components of a stream, including the channel, bed, banks, and floodplains. The Stream Zone is the land, including vegetation, that bounds a lake or the channel of a stream and that defines the lateral extent of their waters.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to DFG personnel, or personnel from another state, federal, or local agency upon request.

1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

1.3 Notification of Conflicting Provisions. Permittee shall notify DFG if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, DFG shall contact Permittee to resolve any conflict.

1.4 Project Site Entry. Permittee agrees that DFG personnel may enter the project site to verify compliance with the Agreement. DFG personnel may only enter the project site when it is safe to do so. When appropriate, DFG personnel shall contact the Permittee prior to entering the construction area.

1.5 Authorized Work. The notification, together with all supporting documents submitted with the notification, is hereby incorporated into this agreement to describe the location and features of the proposed project. The Permittee agrees that all work shall be done as described in the notification and supporting documents, incorporating all project modifications, wildlife resource protection features, mitigation measures, and provisions as described in this agreement. Where apparent conflicts exist between the notification and the provisions listed in this agreement, the Permittee shall comply with the provisions listed in this agreement. The Permittee further agrees to notify DFG of any modifications made to the project plans submitted to DFG. At the discretion of DFG, this agreement will be amended to accommodate modifications to the project plans submitted to DFG and/or new project activities.

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

2.1 Work Period. The time period for completing the work within the stream zone shall be restricted to periods of low stream flow and dry weather and shall be confined to the period of April 15 – October 15. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities within the stream zone shall cease until all reasonable erosion control measures, inside and outside of the stream zone, have been implemented prior to all storm events. Revegetation, restoration and erosion control work is not confined to this time period.

2.2 Work Period Extensions. At DFG's discretion, the work period may be extended based on the extent of the work remaining, on site conditions and reasonably anticipated future conditions. If the Permittee finds more time is needed to complete the authorized activity, the Permittee shall submit a written request for a

work period time extension to DFG. The work period extension request shall provide the following information: 1) Describe the extent of work already completed; 2) Provide specific detail of the activities that remain to be completed within the stream zone; and 3) Detail the actual time required to complete each of the remaining activities within the stream zone. The work period extension request should consider the effects of increased stream conditions, rain delays, increased erosion control measures, limited access due to saturated soil conditions, and limited growth of erosion control grasses due to cool weather. Photographs of the work completed and the proposed work areas are helpful in assisting DFG in its evaluation. Time extensions are issued at the discretion of DFG. DFG will have ten calendar days to approve the proposed work period extension. DFG reserves the right to require additional measures designed to protect natural resources.

2.3 Stream Diversions / Dewatering. If work in the flowing portion of the stream is unavoidable, the entire stream flow shall be diverted around or through the work area during the excavation and/or construction operations. Stream flow shall be diverted using gravity flow through temporary culverts/pipe's or pumped around the work site with the use of hoses. When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain aquatic life below the dam pursuant to Fish and Game Code section 5937. Any temporary dam or other artificial obstruction constructed shall only be built from clean materials such as sandbags, gravel bags, water dams, or clean/washed gravel which will cause little or no siltation.

2.4 Bird Nests. It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by the Fish and Game Code. No trees that contain active nests of birds shall be disturbed until all eggs have hatched and young birds have fledged without prior consultation and approval of a Department representative.

2.5 Vegetation Removal. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Except for the trees specifically identified for removal in the notification, no native trees with a trunk diameter at breast height (DBH) in excess of four (4) inches shall be removed or damaged without prior consultation and approval of a Department representative. Using hand tools (clippers, chain saw, etc.), trees may be trimmed to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the riparian/stream zone.

2.6 Sediment Control. Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures shall be taken. The sediment barrier(s) shall be maintained in good operating condition throughout the construction period and the following rainy season.

Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. The Permittee is responsible for the removal of non-biodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season). Upon Department determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation shall be halted until effective Department approved control devices are installed or abatement procedures are initiated.

2.7 Pollution Control. Utilize Best Management Practices (BMPs) to prevent spills and leaks into water bodies. If maintenance or refueling of vehicles or equipment must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses to prevent the runoff of storm water and the runoff of spills. Ensure that all vehicles and equipment are in good working order (no leaks). Place drip pans or absorbent materials under vehicles and equipment when not in use. Ensure that all construction areas have proper spill clean up materials (absorbent pads, sealed containers, booms, etc.) to contain the movement of any spilled substances. Any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake by the Applicant or any party working under contract or with the permission of the Permittee, shall be removed immediately. DFG shall be notified immediately by the Permittee of any spills and shall be consulted regarding clean-up procedures.

3. Compensatory Measures

To compensate for adverse impacts to fish and wildlife resources identified above that cannot be avoided or minimized, Permittee shall implement each measure listed below.

3.1 Site Restoration. All exposed/disturbed areas and access points within the stream zone left barren of vegetation as a result of the construction activities shall be restored using locally native grass seeds, locally native grass plugs and/or a mix of quick growing sterile non-native grass with locally native grass seeds. Seeded areas shall be covered with broadcast straw and/or jute netted (monofilament erosion blankets are not authorized).

4. Reporting Measures

Permittee shall meet each reporting requirement described below.

4.1 The Permittee shall notify DFG within two working days of beginning work within the stream zone of Jackson Creek, Jackson Creek overflow, unnamed streams and wetlands. Notification shall be submitted as instructed in Contact Information section below. Email notification is preferred.

4.2 Upon completion of the project activities described in this agreement, the work area within the stream zone shall be digitally photographed. Photographs shall be submitted to DFG within two days of completion. Photographs and project commencement notification shall be submitted as instructed in Contact Information section below. Email submittal is preferred.

CONTACT INFORMATION

Any communication that Permittee or DFG submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or DFG specifies by written notice to the other. Refer to the project's Notification Number when submitting documents to DFG.

To Permittee:

California Department of Transportation
Zachary Parker
2015 E. Shields Ave. Suite 100
Fresno, CA 93726
(559) 243-8215
zachary_parker@dot.ca.gov

To DFG:

Department of Fish and Game
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
Attn: Lake and Streambed Alteration Program – Tim Nosal
Notification #1600-2010-0084-R2

Fax: 916-358-2912
Email: tnosal@dfg.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute DFG's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

DFG may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before DFG suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before DFG suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused DFG to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes DFG from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects DFG's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

The Permittee shall notify DFG where conflicts exist between the provisions of this agreement and those imposed by other regulatory agencies. Unless otherwise notified, the Permittee shall comply with the provision that offers the greatest protection to water quality, species of special concern and/or critical habitat.

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

DFG may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by Permittee and DFG.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by DFG and Permittee. To request an amendment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter DFG approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to DFG a completed DFG "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). DFG shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)). .

EFFECTIVE DATE

The Agreement becomes effective on the date of DFG's signature, which shall be: 1) after Permittee's signature; 2) after DFG complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire 5 years from the date of the final signature on this Agreement unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify DFG in accordance with FGC section 1602.

CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

FOR CALIFORNIA DEPARTMENT OF TRANSPORTATION

Zachary Parker
Branch Chief, Central Region Biology

7/1/11
Date

FOR DEPARTMENT OF FISH AND GAME

for Kent Smith
Regional Manager

7/11/11
Date

Prepared by: Tim Nosal
Environmental Scientist

California Regional Water Quality Control Board
Central Valley Region
Katherine Hart, Chair

11020 Sun Center Drive, #200, Rancho Cordova, California 95670-6114
(916) 464-3291 • FAX (916) 464-4645
http://www.waterboards.ca.gov/centralvalley

Matthew Rodriquez
Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

27 September 2011

Zachary Parker
California Department of Transportation
2015 East Shields Avenue, Suite 100
Fresno, CA 93726

CERTIFIED MAIL
7010 3090 0000 5044 5622

CLEAN WATER ACT §401 TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS FOR THE CALIFORNIA DEPARTMENT OF TRANSPORTATION, STATE ROUTE 88 JACKSON VALLEY REHABILITATION PROJECT (WDID#5B03CR00061), AMADOR COUNTY

This Order responds to your 10 March 2011 application submittal, and supplemental information submitted on 21 September 2011, for the Water Quality Certification of a road rehabilitation and bridge modification and replacement project permanently impacting approximately 0.40 acres and temporarily impacting 1.03 acres of waters of the United States.

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This Order serves as a Water Quality Certification (Certification) action that is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3. The validity of any non-denial Certification action shall be conditioned upon total payment of the full fee required under 23 CCR §3833, unless otherwise stated in writing by the certifying agency.

4. This Certification is valid for the duration of the described project. This Certification is no longer valid if the project (as currently described) is modified, or coverage under Section 404 of the Clean Water Act has expired.

5. All reports, notices, or other documents required by this Certification or requested by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) shall be signed by a person described below or by a duly authorized representative of that person.

(a) For a corporation: by a responsible corporate officer such as (1) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; (2) any other person who performs similar policy or decision-making functions for the corporation; or (3) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
(b) For a partnership or sole proprietorship: by a general partner or the proprietor.
(c) For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official.

6. Any person signing a document under Standard Condition number 5 shall make the following certification, whether written or implied:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

ADDITIONAL TECHNICAL CERTIFICATION CONDITIONS:

In addition to the above standard conditions, the California Department of Transportation shall satisfy the following:

1. The California Department of Transportation shall notify the Central Valley Water Board in writing 7 days in advance of the start of any work within waters of the United States or State. The notification should include the name of the project and the WDID number, and should be sent to the Central Valley Water Board Contact indicated in this Certification.

2. Except for activities permitted by the United States Army Corps of Engineers under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.

3. All areas disturbed by project activities shall be protected from washout or erosion.

4. The California Department of Transportation shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the Project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed project shall be adequately informed and trained regarding the conditions of this Certification.

5. All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.

6. The California Department of Transportation shall perform surface water sampling: 1) when performing any in-water work; 2) in the event that project activities result in any materials reaching surface waters; or 3) when any activities result in the creation of a visible plume in surface waters. The monitoring requirements in Table 1 shall be conducted immediately upstream out of the influence of the project and within 300 feet downstream of the active work area. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board staff.

Table 1

Parameter	Unit	Type of Sample	Minimum Sampling Frequency	Required Analytical Test Method
Turbidity	NTU	Grab(1)	Every 4 hours during in-water work	(2)
Settleable Material	ml/L	Grab(1)	Every 4 hours during in-water work	(2)
Visible construction related pollutants	Observations	Visual Inspections	Continuous throughout the construction period	—
pH	Standard Units	Grab(1)	Every 4 hours during in-water work	(2)

(1) Grab shall not be collected at the same time each day to get a complete representation of variations in the receiving water.

(2) Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; where no methods are specified for a given pollutant, method shall be approved by Central Valley Water Board staff.

A surface water monitoring report shall be submitted to the Central Valley Water Board Contact indicated in this Certification within two weeks of initiation of sampling and every two weeks thereafter. In reporting the monitoring data, the California Department of Transportation shall arrange the data in tabular form so that the sampling locations, date, constituents, and concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the project complies with Certification requirements. The report shall include surface water sampling results and visual observations, and calculations of the turbidity increase in the receiving water applicable to the natural turbidity conditions specified in Condition 9.

7. The Central Valley Water Board adopted a *Water Quality Control Plan for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009 (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. Turbidity, settleable matter, and pH are based on water quality objectives contained in the Basin Plan and required as part of this Certification.

8. Activities shall not cause turbidity increases in surface water to exceed:

   (a) where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTUs;
   (b) where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
   (c) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
   (d) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs; and
   (e) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

   Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTUs over background turbidity as measured in surface waters immediately upstream out of the influence of the project and within 300 feet downstream of the active work area. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be assessed by prior permission of the Central Valley Water Board staff.

9. Activities shall not cause settleable matter to exceed 0.1 ml/L in surface waters as measured in surface waters within 300 feet downstream of the project.

10. Activities shall not cause pH to be depressed below 6.5 nor raised above 8.5 in surface water.

11. Activities shall not cause degradation of waters of the State.

12. The discharge of petroleum products or other excavated materials to surface water is prohibited. Activities shall not cause oil, grease, or foam in the work area or downstream. The California Department of Transportation shall notify the Central Valley Water Board immediately of any spill of petroleum products or other organic or earthen materials.

13. The California Department of Transportation shall notify the Central Valley Water Board immediately if the above criteria for turbidity, settleable matter, or pH are exceeded.

14. The California Department of Transportation shall comply with all California Department of Fish and Game requirements and recommendation for the project, including, but not limited to, Streambed Alteration Agreement Notification No. 1600-2011-0084-R2.

15. The California Department of Transportation shall comply with all United States Fish and Wildlife Service requirements for the project, including those requirements contained in Biological Opinion (1-1-07-F-0283) provided to the California Department of Transportation, dated 27 August 2007.

16. The California Department of Transportation shall comply with all National Marine Fisheries Service (NMFS) requirements, and implement corresponding Avoidance and Minimization measures for the project, including those requirements addressing the potential to affect listed salmonid habitat contained in the amended Letter of Concurrence (SWR-02-SA-8324:MTM), dated 8 August 2002, and any further modifications to the NMFS requirements.

17. The use of netting material (e.g., monofilament-based erosion blankets) that could trap aquatic dependent wildlife is prohibited within the Project Area.

18. Hydroseeding shall be performed with California native seed mix.

19. If surface water diversions and/or dewatering are anticipated, the California Department of Transportation shall develop and submit a Surface Water Diversion and/or Dewatering Plan to the Central Valley Water Board Contact indicated in this Certification at least thirty (30) days prior to commencement of in-water construction. The plan shall include the proposed method and duration of diversion activities, structure configuration, construction materials, equipment, erosion and sediment controls, and a map or drawing indicating the location(s) of diversion and/or dewatering, and discharge points. The Surface Water Diversion and/or Dewatering Plan must be consistent with this Certification.

20. Except when working in a flowing stream is unavoidable, this Certification does not allow water diversion or removal of flow from the receiving water. This Certification is invalid if any water is diverted or removed as a part of the project.

21. When work in a flowing stream is unavoidable and any dam or other artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream, to maintain beneficial uses of waters of the State below the dam. Construction, dewatering, and removal of temporary cofferdams shall not violate Conditions 7 through 12 of this Certification. If water quality criteria are exceeded, the California Department of Transportation shall notify the Central Valley Water Board immediately.

22. Any temporary dam or other artificial obstruction constructed shall only be built from clean materials such as sandbags, gravel bags, water dams, or clean/washed gravel which will cause little or no siltation. Stream flow shall be diverted using gravity flow through temporary culverts/pipes or pumped around the work site with the use of hoses.

23. Refueling of equipment within the floodplain or within 300 feet of the waterway is prohibited. If some critical equipment must be refueled within 300 feet of the waterway, strict spill prevention and countermeasures must be implemented to avoid spills. Refueling areas shall be provided with secondary containment including drip pans and/or placement or absorbent material. No hazardous materials, pesticides, fuels, lubricants, oils, hydraulic fluids, or other construction-related potentially hazardous substances should be stored within a floodplain or within 300 feet of a water body. The California Department of Transportation must perform frequent inspections of construction equipment prior to utilizing it near surface waters to ensure leaks from the equipment are not occurring and are not a threat to water quality.

24. Raw cement, concrete or washing thereof, asphalt, drilling fluids or lubricants, paint of other coating material, oil or other petroleum products, or any other substances which could be hazardous to fish and wildlife resulting from or disturbed by project-related activities, shall be prevented from contaminating the soil and/or entering waters of the United States or waters of the State.

25. Concrete must completely cured before coming into contact with waters of the United States and/or waters of the State. Waters of the United States and/or waters of the State that contacts wet concrete must be pumped out and disposed of at an appropriate off-site commercial facility which is authorized to accept concrete wastes.

26. During construction, silt fencing, straw wattles, or other effective management practices must be used along the construction zone to minimize soil or sediment along the embankments from migrating into the waters of the United States and/or waters of the State.

27. In-stream work for Jackson Creek and the Jackson Creek Overflow Bridges will occur during no flows or precipitation.

28. During removal of the existing Jackson Creek Overflow Bridge, a tarp or equivalent method must be used below the bridge to prevent debris from falling into the creek. The tarp must remain in place until the bridge is removed. After bridge removal is complete, the tarp and all bridge debris must be removed from the project site and disposed of properly.

29. All areas temporarily disturbed during the Jackson Creek Bridge widening and the Jackson Creek Overflow Bridge demolishing and replacement shall be restored to pre-project conditions.

30. All materials resulting from replacement, extension, modification, removal, repair, or installation of the Jackson Creek Bridge and the Jackson Creek Overflow Bridge must be removed from the site and disposed of properly.

31. All materials resulting from replacement, extension, modification, removal, repair, or installation of new culverts must be removed from the site and disposed of properly.

32. Dry and wet utility work, including, but not limited to, relocating gas line and electric pole lines, water lines and fiber optic lines are not covered by this Certification.

33. The California Department of Transportation must obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2009-0009-DWQ for discharges to surface waters comprised of storm water associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities of one or more acres.

34. The Conditions in this Certification are based on the information in the attached "Project Information." If the information in the attached Project Information Sheet is modified or the project changes, this Certification is no longer valid until amended by the Central Valley Water Board.

35. The mitigation measures specified in the approved Mitigated Negative Declaration for the project, as they pertain to biology, hydrology and water quality impacts, are included in this Certification, as required by California Public Resource Code Section 21081.6 and CEQA Guidelines, California Code of Regulations Section 15097.

36. In the event of any violation or threatened violation of the conditions of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under State and Federal law. The applicability of any State law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with this Certification.

    (a) If the California Department of Transportation or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Certification, or falsifies any information provided in the monitoring reports, the applicant is subject to civil liability, for each day of violation, or criminal liability.
    (b) In response to a suspected violation of any condition of this Certification, the Central Valley Water Board may require the California Department of Transportation to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
    (c) The California Department of Transportation shall allow the staff(s) of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this Certification and determining the ecological success of the project.

37. The California Department of Transportation shall provide a Notice of Completion (NOC) no later than 30 days after the project completion. The NOC shall demonstrate that the project has been carried out in accordance with the project's description (and any amendments approved). The NOC shall include a map of the project location(s), including final boundaries of any in situ restoration area(s), if appropriate, and representative pre and post construction photographs. Each photograph shall include a descriptive title, date taken, photographic site, and photographic orientation.

38. The California Department of Transportation has provided evidence of mitigation credits purchased in association with the compensatory mitigation requirements of this project by the United States Army Corps of Engineers and the United States Fish and Wildlife Service to the Central Valley Water Board prior to proceeding with the activity authorized by this Certification.

39. The California Department of Transportation shall provide payment of the remaining outstanding fee of $2,834.00 for temporary impacts of 1.03 acres to waters of the United States and/or waters of the State to the Central Valley Water Board within 30 calendar days of the date of issuance of this Certification. The Central Valley Water Board received payment for 0.40 acre of permanent impacts to waters of the United States and/or waters of the State on 10 March 2011.

    A payment of $2,834.00 must be made payable to the State Water Resources Control Board and submitted to the Central Valley Water Board Contact indicated in this Certification.

If the remaining outstanding fees are not received within 30 calendar days of the date of issuance of this Certification, the Certification will become invalid.

ADDITIONAL STORM WATER QUALITY CONDITIONS:

The California Department of Transportation shall also satisfy the following additional storm water quality conditions:

1. During the construction phase, the California Department of Transportation must employ strategies to minimize erosion and the introduction of pollutants into storm water runoff. These strategies must include:
   (a) preparing the Storm Water Pollution Prevention Plan prior to any land disturbance or construction work;
   (b) implementing appropriate erosion and sediment control Best Management Practices (BMPs) during all phases of land disturbance and construction work throughout the year; and
   (c) ensuring that site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges from construction activity to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standard.

2. The California Department of Transportation must minimize the short and long-term impacts on receiving water quality from the State Route 88 Jackson Valley Rehabilitation Project by implementing the following post-construction storm water management practices and as required by the local agency permitting the project, as appropriate:
   (a) minimize the amount of impervious surface;
   (b) reduce peak runoff flows;
   (c) provide treatment BMPs to reduce pollutants in runoff;
   (d) ensure existing waters of the State (e.g., wetlands, vernal pools, or creeks) are not used as pollutant source controls and/or treatment controls;
   (e) preserve and, where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones;
   (f) limit disturbances of natural water bodies and natural drainage systems caused by development (including development of roads, highways, and bridges); and
   (g) use existing drainage master plans or studies to estimate increases in pollutant loads and flows resulting from projected future development and require incorporation of structural and non-structural BMPs to mitigate the projected pollutant load increases in surface water runoff.

CENTRAL VALLEY WATER BOARD CONTACT:

Genevieve Sparks, Environmental Scientist
11020 Sun Center Drive, Suite 200
Rancho Cordova, California 95670-6114
gsparks@waterboards.ca.gov
(916) 464-4745

WATER QUALITY CERTIFICATION:

I hereby issue an Order certifying that any discharge from the California Department of Transportation, State Route 88 Jackson Valley Rehabilitation Project (WDID#5B03CR00061) will comply with the applicable provisions of §301 ("Effluent Limitations"), §302 ("Water Quality Related Effluent Limitations"), §303 ("Water Quality Standards and Implementation Plans"), §306 ("National Standards of Performance"), and §307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017 DWQ "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)".

Except insofar as may be modified by any preceding conditions, all Certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with California Department of Transportation's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the *Water Quality Control Plan for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009.

for Pamela C. Creedon
Executive Officer

Enclosure: Project Information

Attachment: Figure 1, Project Location Map

cc: See enclosure, page 15

PROJECT INFORMATION

Application Date: 10 March 2011

Supplemental Information Submittal Date: 21 September 2011

Applicant: Zachary Parker
California Department of Transportation
2015 East Shields Avenue, Suite 100
Fresno, CA 93726

Project Name: State Route 88 Jackson Valley Rehabilitation Project

Application Number: WDID#5B03CR00061

Type of Project: Road Rehabilitation, Shoulder Widening, and Bridge Modification/Replacement Project

Timeframe of Project Implementation: In accordance with the National Marine Fisheries Service requirements for the project contained in the Letter of Concurrence (SWR-02-SA-8324:MTM) dated 8 August 2002, in-water work for the Jackson Creek and the Jackson Creek Overflow Bridges will be restricted to 1 June and 15 September, during no flows or precipitation.

In accordance with the United States Fish and Wildlife Service requirements contained in Biological Opinion (1-1-07-F-0283), construction activities will be prohibited from 1 November to 1 May to avoid impacts to potential breeding habitat during California tiger salamander breeding season and to avoid impacts to any Vernal pool fairy shrimp life stage other than dormant cysts.

Revegetation, restoration and erosion control work is not confined to this time period.

Work outside of these work windows must receive written approval by the Central Valley Water Board staff.

Project Location: Section 20, Township 5 North, Range 9 East, MDB&M.
Latitude: 38.297945° and Longitude: -120.984544°

County: Amador

Receiving Water(s) (hydrologic unit): Jackson Creek, Jackson Creek Overflow, two unnamed perennial streams, 26 unnamed perennial drainages and 35 wetlands, including vernal pools connect to Dry Creek, which drains to Mokelumne River into the San Joaquin River, discharging into the Sacramento-San Joaquin Delta, San Joaquin Hydrologic Basin, Middle Sierra Hydrologic Unit #532.40, Sutter Creek HA

Water Body Type: Wetlands, Streambed, Riparian, Vernal Pools

Designated Beneficial Uses: The *Water Quality Control Plan for the Sacramento River and San Joaquin River*, Fourth Edition, revised September 2009 (Basin Plan) has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include, but are not limited to: Municipal and Domestic Water Supply (MUN); Agricultural Supply (AGR); Industrial Supply (IND), Hydropower Generation (POW); Groundwater Recharge (GWR), Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); and Wildlife Habitat (WILD). A comprehensive and specific list of the Beneficial Uses applicable for the project area can be found at http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

303(d) List of Water Quality Limited Segments: Jackson Creek, Jackson Creek Overflow, two un-named streams, wetlands, vernal pools, and ephemeral streams, the receiving waters for this project, drain into Dry Creek. The project does not impact an already impaired water body. The most recent list of approved water quality limited segments can be found at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

Project Description: The State Route 88 Jackson Valley Rehabilitation Project consists of rehabilitating and widening a 5.5-mile section of State Route 88 from the San Joaquin County line to State Route 124 in Amador County, Post Miles 0.0 to 5.5.

The State Route 88 Jackson Valley Rehabilitation Project includes:

(a) rehabilitation of pavement with dig-outs of localized pavement failure, crack sealing, and application of asphalt concrete overlay;

(b) upgrade shoulders to 8-feet to meet current federal standards for 3.25 miles of highway between Bamert Road to the intersection of State Route 124, Post Miles 2.25 to 5.50;

(c) widen Jackson Creek Bridge to include standard 8-foot shoulders requiring additional concrete piles in the streambed;

(d) demolish and rebuild Jackson Creek Overflow Bridge with roadside shoulders, including removing an existing 28 foot, 10-inch wide bridge supported by spread footings and installation of a 50 foot, 10-inch wide bridge supported on 24-inch cast-in-drilled-hole concrete piles embedded 46 feet below the ground surface;

(e) replace and/or extend 26 corrugated steel or reinforced concrete pipe culverts ranging from 12 to 108-inches in diameter and 14 to 182-feet long throughout the project area;

(f) realign a portion of State Route 88 between Jackson Valley Road and Martin Road;

(g) pave turnouts in both directions between Post Miles 1.3 to 1.4 (eastbound) and Post Miles 1.8 to 1.9 (westbound);

(h) overlay local roads and private driveways with new asphalt at their connections with State Route 88 within the right-of-way;

(i) construct a new driveway at the Applegate property, located at approximately Post Mile 3.0; and

(j) cut and fill areas to accommodate 2:1 slopes from Post Miles 2.25 to 5.50.

Dry and wet utility work, including, but not limited to, relocating gas line and electric pole lines, water lines and fiber optic lines are not covered by this Certification.

In-stream work for the Jackson Creek and Jackson Creek Overflow Bridges will occur during no flows or precipitation.

Construction staging areas will be located in upland areas, not in or adjacent to any water body and/or wetland feature.

The State Route 88 Jackson Valley Rehabilitation Project will create approximately 6 acres of new impervious surface area that will increase the volume of storm water runoff.

Temporary impacts to waters of the United States will result from in-stream work replacing, extending, modifying, removing, repairing, or installing new culverts, or implementation of other project components as described in this Certification. Permanent impacts to waters of the United States will result from excavation of 800 cubic yards of native soil and placing 2,158 cubic yards of asphalt concrete, rock slope protection and native soil, and two concrete piles into the waters of the United States.

The State Route 88 Jackson Valley Rehabilitation Project will result in approximately 0.40 acre of permanent impacts and approximately 1.03 acre of temporary impacts to waters the United States.

Preliminary Water Quality Concerns: Construction activities may impact surface waters with increased turbidity, settleable matter and pH.

Proposed Mitigation to Address Concerns: The California Department of Transportation will implement Best Management Practices to control sedimentation and erosion. All temporary affected areas will be restored to pre-construction contours and conditions upon completion of construction activities. The California Department of Transportation will conduct turbidity, settleable matter and pH testing during in-water work, stopping work if the Basin Plan criteria are exceeded or are observed.

Fill/Excavation Area: Approximately 800 cubic yards of native soil will be excavated from 0.40 acres of waters of the United States, including ephemeral streams, vernal pools, and ephemeral and perennial wetlands.

Approximately 2,158 cubic yards of asphalt concrete, rock slope protection, and native soil will be placed into 0.40 acres waters of the United States, including ephemeral streams, vernal pools, and ephemeral and perennial wetlands.

Two concrete piles totaling 473 cubic yards will be placed in waters of the United States, including perennial wetlands.

Dredge Volume: None

United States Army Corps of Engineers File Number: SPK#2010-00269

United States Army Corps of Engineers Permit Number: Nationwide Permit #14

California Department of Fish and Game Streambed Alteration Agreement: 1600-2011-0084-R2

Possible Listed Species: Vernal pool fairy shrimp, Vernal pool tadpole shrimp, Midvalley fairy shrimp, California fairy shrimp, Valley elderberry longhorn beetle, Central Valley steelhead, Central Valley fall/late fall-run Chinook salmon, California red-legged frog, California tiger salamander, Swainson's hawk, Western spadefoot toad, Western pond turtle, Great egret, Golden eagle, Great blue heron, Burrowing owl, Ferruginous hawk, Yellow warbler, White-tailed kite, Prairie falcon, Bald eagle, Yellow-breasted chat, Loggerhead shrike, Bank swallow (nesting), Western small-footed myotis bat, Long-eared myotis bat, Fringed myotis bat, Yuma myotis bat, Henderson's bent grass, Succulent owl's clover, Dwarf downingia, Tuolumne button-celery, Boggs Lake hedge-hyssop, Legenere, Pincushion navarretia, Sacramento orcutt grass

Status of CEQA Compliance: The California Department of Transportation approved the Mitigated Negative Declaration and filed a Notice of Determination on 7 May 2008 (State Clearinghouse Number SCH2007062087).

As a Responsible Agency under California Environmental Quality Act, the Central Valley Water Board reviewed the Mitigated Negative Declaration and found that impacts to water quality were addressed. Mitigation for impacts to water quality is discussed in the "Proposed Mitigation to Address Concerns" section above, and the "Compensatory Mitigation" section below.

With regard to the remaining impacts identified in the Mitigated Negative Declaration, the corresponding mitigation measures proposed are within the responsibility and jurisdiction of another public agency, and not within the jurisdiction of the Central Valley Water Board.

Compensatory Mitigation: As required by the United States Army Corps of Engineers, the California Department of Transportation will purchase 0.26 credits of seasonal wetland habitat, 0.14 credits of palustrine emergent marsh habitat, and 0.5 credits of riparian habitat at Beach Lake Mitigation Bank to mitigate for the permanent loss of 0.26 acre of wetlands, including 0.045 acre of vernal pools, 0.14 acre of waters of the United States, and temporary impacts to 1.03 acre of waters of the United States.

As required by the United States Fish and Wildlife Service, the California Department of Transportation will purchase 1.89 acre of vernal pool preservation credits at Fitzgerald Ranch Conservation Bank, a United States Fish and Wildlife Service approved bank, to mitigate for the permanent impacts to vernal pool species.

As required by the United States Fish and Wildlife Service, the California Department of Transportation has purchased a minimum of 16.09 acres for temporary impacts to California tiger salamander upland credits. Compensatory mitigation credits were purchased at Fitzgerald Ranch Conservation Bank, a United States Fish and Wildlife approved bank, to mitigate for impacts to California tiger salamander aquatic habitat.

The Central Valley Water Board is not requesting compensatory mitigation for the State Route 88 Jackson Valley Rehabilitation Project.

Evidence of these purchases has been provided to the Central Valley Water Board prior to proceeding with the activity authorized by this Certification.

Application Fee Provided: Total fees of $1,741.00 have been submitted to the Central Valley Water Board as required by 23 CCR §3833b(3)(A) and by 23 CCR §2200(e). The remaining outstanding fee for temporary impacts of 1.03 acres to waters of the United States and/or waters of the State is $2,834.00.

DISTRIBUTION LIST

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(Electronic copy only) Bill Orme
State Water Resources Control Board
401 Certification and Wetlands Unit Chief

(Electronic copy only) Dave Smith
Wetlands Section Chief (W-3)
United States Environmental Protection Agency

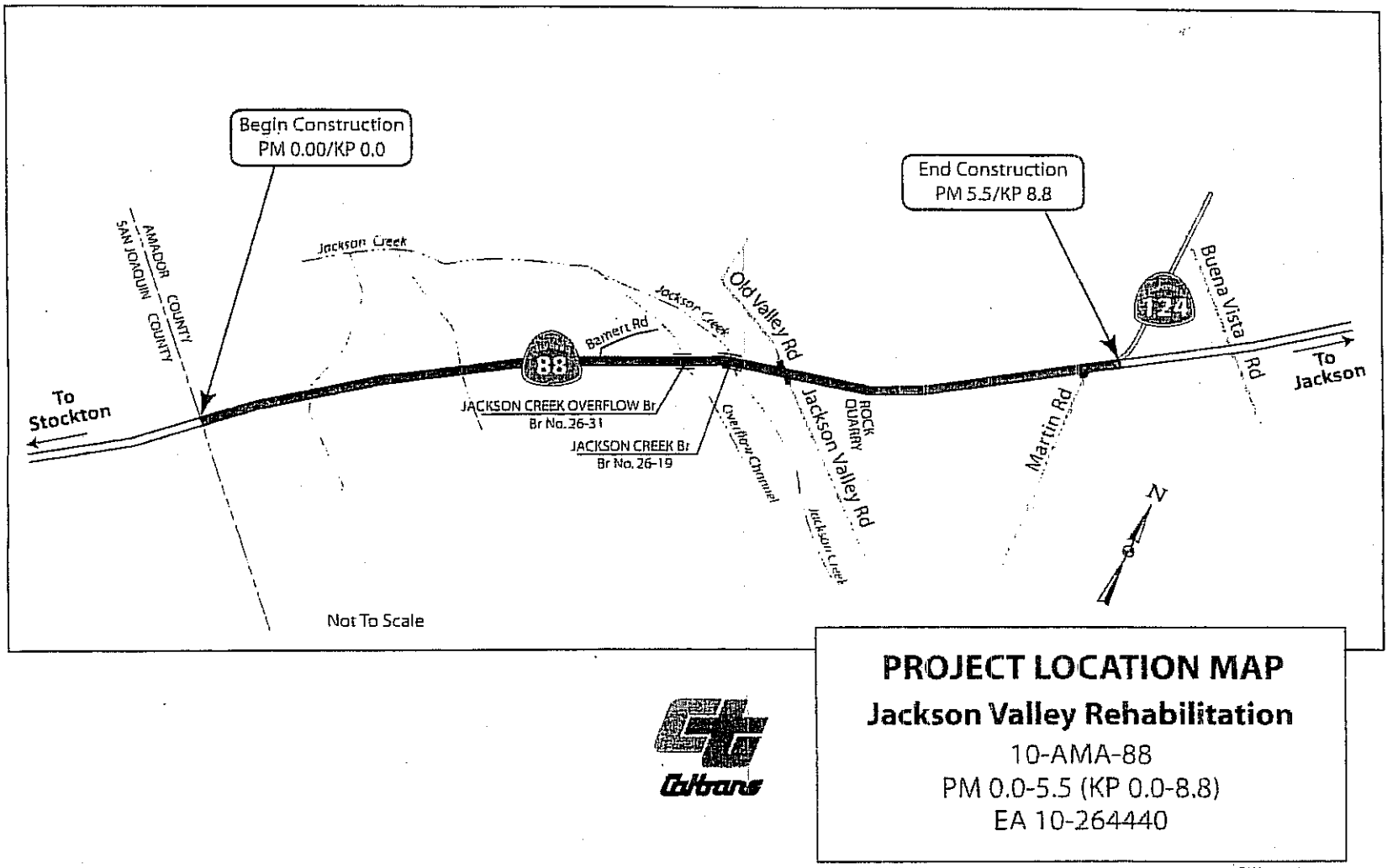


Figure 1, Project Location Map

Source: Figure 1-2, Project Location Map, modified. *Initial Study with Mitigated Negative Declaration, Jackson Valley Rehabilitation, on State Route 88 in Amador County from the San Joaquin/Amador County Line to State Route 124, 10-AMA-88-PM 0.0/5.5, EA 10-264440*, prepared by the State of California Department of Transportation, dated March 2008.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

June 6, 2011

Regulatory Division (SPK-2010-00269)

State of California
Department of Transportation, District 6
Attn: Mr. Zachary Parker
2015 East Shields Avenue, Suite A-100
Fresno, California 93726-5428

Dear Mr. Parker:

We are responding to your February 22, 2011 request for a Department of the Army permit for the SR 88 Jackson Valley Rehabilitation project. This approximately 107-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to construct a Rehabilitate 5.5 miles of State Route 88 and upgrade shoulders for 3.25 miles of the project area. The project is located on or near Jackson Creek, Section 20, Township 5 North, Range 9 East, Mount Diablo Meridian, Latitude 38.297945°, Longitude -120.984544°, Amador County, California.

Based on the information you provided, the proposed activity, resulting in the permanent loss of approximately 0.26 acre of wetlands, 0.14 acre of other waters of the United States and temporary impacts to approximately 1.03 acres of waters of the United States including wetlands, is authorized by Nationwide Permit Number 14. However, until Section 401 Water Quality Certification for the activity has been issued or waived, our authorization is denied without prejudice. Once you have provided us evidence of water quality certification, the activity is authorized and the work may proceed subject to the conditions of certification and the Nationwide Permit. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets and the following special conditions:

Special Conditions:

1. We understand the State of California, Department of Transportation (Caltrans) is the National Environmental Policy Act (NEPA) lead federal agency for this project, and as such, will ensure the authorized work complies with the National Environmental Policy Act, the Endangered Species Act, the National Historical Preservation Act and any other applicable federal laws. This authorization is contingent upon the permittee implementing all actions necessary to comply with these requirements.

2. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify the appropriate Caltrans and U.S. Army Corps of Engineers Regulatory offices of what you have found. Caltrans acting as the lead Federal agency for this project may consult as appropriate to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register, pursuant to 36 CFR Part 800, as amended 8/05/2004.

3. The attached Memorandum of Agreement (MOA), dated March 2008, entitled *Memorandum of Agreement Between the California Department of Transportation and the California State Historic Preservation Officer Regarding the Rehabilitation Project on State Route 88 in Jackson Valley, Amador County, California,* and signed by these entities, will be implemented in its entirety. Caltrans has been designated the lead Federal agency responsible for implementing and enforcing the Memorandum of Agreement as signed. If you fail to comply with the implementation and associated enforcement of the MOA, the Corps may determine that you are out of compliance with the conditions of the Department of the Army verification and suspend the authorization. Suspension may result in modification or revocation of the authorized work.

4. This Corps permit does not authorize you to take an endangered species, in particular the federally threatened California tiger salamander (*Ambystoma californiense*) (CTS), and vernal pool fairy shrimp (*Branchinecta lynchi*) (VPFS), or their designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed Fish and Wildlife Service Biological Opinion (Service File Number 1-1-07-F-0283, dated August 27, 2007), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached Biological Opinion, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological Opinion, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its Biological Opinion, and with the Endangered Species Act. If you are unable to implement any of these measures, you must immediately notify the appropriate Caltrans office, the U.S. Army Corps of Engineers Regulatory office, and the appropriate USFWS office so that Caltrans acting as the lead Federal agency for this project may consult as appropriate, prior to initiating the work, in accordance with Federal law.

5. To ensure your project complies with the Federal Endangered Species Act and the Magnuson-Stevens Fishery and Consultation Act, you must implement all of the mitigating measures identified in the enclosed National Marine Fisheries Service letter of concurrence (NMFS # SWR-02-SA-8234:MTM, dated August 8, 2002), including those ascribed to the Corps therein. If you are unable to implement any of these measures, you must immediately notify this office, the U.S. Fish and Wildlife Office, and the National Marine Fisheries Service so we may consult as appropriate, prior to initiating the work, in accordance with Federal law.

6. To mitigate for the loss of 0.26 acre of wetlands (including 0.045 acre of vernal pools) and 0.14 acre of other waters of the United States, and temporary impacts to 1.03 acres of waters of the United States, you shall purchase 0.26 credits of seasonal wetland habitat, 0.14 credits of palustrine emergent marsh habitat, and 0.5 credits of riparian habitat at Beach Lake Mitigation Bank. Since there are no vernal pool credits available at Beach Lake Mitigation Bank, you shall mitigate for the loss of vernal pool species by purchasing 1.89 credits of vernal pool preservation at a U.S. Fish and Wildlife Service approved bank.

7. Within 30 days prior to initiation of construction activities within waters of the United States, you shall submit to this office, pre-construction photographs of the proposed permanent and temporary discharge areas in waters of the U.S., landscape view photographs of major project features, which have been taken no more than 1 year prior to initiation of construction activities. Within 30 days following construction activities, you shall submit post-construction photographs of the same locations, showing the placement and/or removal of fill, landscape view photographs of all major project features. The pre & post camera positions and view angles of the photographs shall be identical and identified on a map, aerial photo, or project drawing.

8. All equipment staging, including Temporary Construction Areas (TCA's), shall take place within Corps of Engineers approved areas within the project boundary. Prior to construction implementation, you shall ensure all equipment staging, TCA's, demolition and excavation, off pavement detours, borrow and fill areas, and upland disposal areas have been evaluated under National Environmental Policy Act, Section 401 and 404 of the Clean Water Act, Section 7 of the Endangered Species Act and Section 106 of the National Historical Preservation Act and all required permits have been obtained.

9. Excavated materials shall only be placed in upland locations. The upland disposal site(s) shall be delineated for waters of the U.S. and must be approved by the Corps of Engineers prior to disposal.

10. Prior to proceeding with any activity otherwise authorized by this permit, you shall install Environmentally Sensitive Area (ESA) fencing and employ appropriate water quality protection measures and/or Best Management Practices (BMP's), to ensure unauthorized fills and unforeseen impacts to waters of the U.S. are avoided. All fencing surrounding avoidance areas shall allow unrestricted visibility of these areas to discourage vandalism, destruction or disturbance. An example of fencing includes; high-visibility orange plastic or similar type.

11. You shall follow specifications and standards described in the Storm Water Pollution Prevention Plan (SWPPP) and/or Water Pollution Control Plan (WPCP), to prevent erosion and sedimentation during and after construction. Construction work within waters of the U. S. shall be performed when the flows are at their seasonal low or when they have ceased and the areas are dry, typically late summer through early fall.

12. Between construction seasons all equipment and materials, with the exception of ESA fencing, temporary falsework, and trestles, shall be removed from waters of the U.S. and all disturbed areas shall be stabilized to prevent erosion and sedimentation.

13. Temporary fills, access roads, dams and/or water structures shall be removed in their entirety and the affected areas returned to pre-construction elevations, contours and conditions within 30 days of completion of authorized work in waters of the U.S.

14. Within 60 days following completion of the authorized work or at the expiration of the construction window of this permit, whichever occurs first, you shall submit as-built drawings and a description of the work conducted on the project site to this office for review. The drawings shall be signed and sealed by a registered professional engineer and include the following:

a. The Department of the Army Permit number.

b. A plan view drawing of the location of the authorized work footprint (as shown on the permit drawings) with an overlay of the work as constructed in the same scale as the attached permit drawings. The drawing should show all "earth disturbance," wetland impacts, structures, and the boundaries of any on-site mitigation and/or avoidance areas. The drawings shall contain, at a minimum, 2-foot topographic contours of the entire site.

c. Ground photographs of the completed work. The cameral positions and view-angles of the ground photographs shall be identified on a map, aerial photograph, or project drawing.

d. A description and list of all deviations between the work as authorized by this permit and the work as constructed. Clearly indicate on the as-built drawings the location of any deviations that have been listed.

15. All temporary impacts to waters of the U.S. and adjacent upland areas within 20 feet of waters of the U.S. shall be restored to their original contour and condition within 60 days following completion of construction activities. In order to ensure compliance with this condition, you shall:

a. Prior to initiation of any construction activities within waters of the U.S., submit to the Corps, for review and approval, a plan for the restoration of temporary impact areas prior to initiation of any construction activities. This plan shall include the following information:

1. A description of and drawings showing the existing contours (elevation) and existing vegetation of the temporary impact areas. This information shall include site photographs taken of the temporary impact area. For linear projects, these photographs shall be taken from the alignment, in both directions and taken every XX-feet for the length of the temporary impact area.

2. The methods used to restore the site to the original contour and conditions, as well as a plan for the revegetation of the site following construction activities;

3. The proposed schedule for the restoration activities, and;

4. A mitigation and monitoring plan, to be approved by the Corps, for the temporary impact area to ensure success of the restoration. Monitoring shall be conducted for a minimum of three growing seasons after completion of restoration activities. The plan shall be presented in the format of the Sacramento District's *Habitat Mitigation and Monitoring Proposal Guidelines*, dated December 30, 2004.

b. Within 30 days following completion of restoration activities, submit to the Corps a report describing the restoration activities and including photographs of the restored area. The camera positions and view angles of post-construction photographs shall be identical to pre-construction photographs.

c. Submit to the Corps a Monitoring Report by October 1 of each year of required monitoring. This report shall be submitted in the format shown on the enclosed Regulatory Guidance Letter 08-03, dated 10 October 2008, or subsequent guidance as appropriate. Reports may be submitted in hard copy or electronically.

16. If any of the above conditions are violated or unauthorized activities occur, you shall stop work immediately and notify the Sacramento District, Regulatory Division Office. You shall provide us with a detailed description of the unauthorized activity(s), photo documentation, and any measures taken to remedy the violation.

17. The Permittee (Caltrans) is responsible for all work authorized herein and ensuring that all contractors and workers are made aware and adhere to the terms and conditions of this permit authorization. You shall ensure that a copy of the permit authorization and associated drawings are available for quick reference at the project site until all construction activities are completed.

18. You and your authorized contractor shall allow representatives from this office to inspect the authorized activity and all mitigation areas at any time deemed necessary to ensure that work is being or has been accomplished in accordance with the terms and conditions of this verification.

19. You shall notify this office of the start and completion dates for each phase of the authorized work within 30 calendar days prior to initiation of construction activities within waters of the U.S. and 30 calendar days following completion of construction activities. Along with this notification, you shall submit a copy of the project construction/work schedule or similar report.

20. You shall notify this office of any proposed modifications to the project, including revisions to any of the work plans or documents cited in this authorization, for review and approval prior to construction work associated with the proposed modification(s).

21. Within 30 days after completion of the authorized work, you must sign the enclosed *Compliance Certification* form and return it to this office, along with the items required in special condition #7.

This verification is valid until March 18, 2012, when the existing Nationwide Permits are scheduled to be modified, reissued, or revoked. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit. Failure to comply with the General Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2010-00269 in any correspondence concerning this project. If you have any questions, please contact Mr. Jason Deters at our California South Branch Office, 650 Capitol Mall, Suite 5-200, Sacramento, California 95814, email *Jason.Deters@usace.army.mil*, or telephone 916-557-7152. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

Paul M. Maniccia
Chief, California South Branch

Enclosure(s)

Copies Furnished without enclosure(s)
Ms. Susan Moore, Field supervisor, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Room W-2605, Sacramento, California 95825-1846
Mr. Rodney McInnis, National Marine Fisheries Service, Southwest Region, 501 West Ocean Boulevard, Suite 4200, Long Beach, California 90802-4213
State of California, Department of Fish and Game, North Central Region, 1701 Nimbus Road, Rancho Cordova, California 95670
California Regional Water Quality Control Board, Central Valley Region, 11020 Sun Center Drive, Suite 200, Rancho Cordova, California 95670

COMPLIANCE CERTIFICATION

Permit File Number: SPK-2010-00269

Nationwide Permit Number: 14

Permittee: Mr. Zachary Parker
California Department of Transportation, District 6
2015 East Shields Avenue, Suite A-100
Fresno, California 93726-5428

County: Amador

Date of Verification: June 6, 2011

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Sacramento District
Regulatory Division
650 Capitol Mall, Suite 5-200
Sacramento, California 95814
DLLS-CESPK-RD-Compliance@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the Corps of Engineers.

* * * * * * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

_____ _____
Signature of Permittee Date

Nationwide Permit Summary

U S Army Corps of Engineers
Sacramento District

33 CFR Part 330; Issuance of Nationwide Permits - March 19, 2007 includes corrections of May 8, 2007 and addition of regional conditions December 2007

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10 acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4)

A. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

☐ **1. Navigation.**

☐ (a) No activity may cause more than a minimal adverse effect on navigation.

☐ (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

☐ (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

☐ **2. Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

☐ **3 Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

☐ **4. Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

☐ **5. Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.

☐ **6. Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

☐ **7. Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

☐ **8. Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or

restricting its flow must be minimized to the maximum extent practicable.

☐ 9. **Management of Water Flows**. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

☐ 10. **Fills Within 100-Year Floodplains**. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

☐ 11. **Equipment**. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

☐ 12. **Soil Erosion and Sediment Controls**. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

☐ 13. **Removal of Temporary Fills**. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

☐ 14. **Proper Maintenance**. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

☐ 15. **Wild and Scenic Rivers**. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

☐ 16. **Tribal Rights**. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

☐ 17. **Endangered Species**.

☐ (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

☐ (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

☐ (c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed.

☐ (d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

☐ (e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at http://www.fws.gov/ and http://www.noaa.gov/fisheries.html respectively.

☐ 18. **Historic Properties**.

☐ (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

☐ (b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

☐ (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

☐ (d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

☐ (e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

☐ **19. Designated Critical Resource Waters.** Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

☐ (a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

☐ (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

☐ **20 Mitigation.** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

☐ (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

☐ (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

☐ (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the

aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

☐ (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

☐ (e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

☐ (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

☐ (g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

☐ (h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

☐ **21. Water Quality.** Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

☐ **22. Coastal Zone Management.** In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

☐ **23. Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

☐ **24. Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

☐ **25. Transfer of Nationwide Permit Verifications.** If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

> "When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)

(Date)

☐ **26. Compliance Certification.** Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:

☐ (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;

☐ (b) A statement that any required mitigation was completed in accordance with the permit conditions; and

☐ (c) The signature of the permittee certifying the completion of the work and mitigation.

☐ **27. Pre-Construction Notification.**

☐ (a) **Timing**.. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

☐ (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

☐ (2) Forty-five calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

☐ (b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

☐ (1) Name, address and telephone numbers of the prospective permittee;

☐ (2) Location of the proposed project;

☐ (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);

☐ (4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;

☐ (5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

☐ (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

☐ (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic

property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

☐ (c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

☐ (d) Agency Coordination:

☐ (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

☐ (2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

☐ (3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

☐ (4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.

☐ (5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

☐ (e) In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant

submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

☐ **(a) 28. Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

B. Regional Conditions:

I. Sacramento District (All States, except Colorado)

1. When pre-construction notification (PCN) is required, the prospective permittee shall notify the Sacramento District in accordance with General Condition 27 using either the South Pacific Division Preconstruction Notification (PCN) Checklist or a completed application form (ENG Form 4345). In addition, the PCN shall include:

a. A written statement explaining how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;

b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and size (in acreage) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the high tide line should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation; and

c. Pre-project color photographs of the project site taken from designatedlocations documented on the plan drawing.

2. The permittee shall complete compensatory mitigation required by special conditions of the NWP verification before or concurrent with construction of the authorized activity, except when specifically determined to be impracticable by the Sacramento District. When project mitigation involves use of a mitigation bank or in-lieu fee program, payment shall be made before commencing construction.

3. The permittee shall record the NWP verification with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title to or interest in real property against areas (1) designated to be preserved as part of mitigation for authorized impacts, including any associated covenants or restrictions, or (2) where structures such as boat ramps or docks, marinas, piers, and permanently moored vessels will be constructed in or adjacent to navigable waters (Section 10 and Section 404). The recordation shall also include a map showing the surveyed location of the authorized structure and any associated areas preserved to minimize or compensate for project impacts.

4. The permittee shall place wetlands, other aquatic areas, and any vegetative buffers preserved as part of mitigation for impacts into a separate "preserve" parcel prior to discharging dredged or fill material into waters of the United States, except where specifically determined to be impracticable by the Sacramento District. Permanent legal protection shall be established for all preserve parcels, following Sacramento District approval of the legal instrument.

5. The permittee shall allow Corps representatives to inspect the authorized activity and any mitigation areas at any time deemed necessary to determine compliance with the terms and conditions of the NWP verification. The permittee will be notified in advance of an inspection.

6. For NWPs 29, 39, 40, 42, 43, 44, and 46, requests to waive the 300 linear foot limitation for intermittent or ephemeral waters of the U.S. shall include an evaluation of functions and services provided by the waterbody taking into account the watershed, measures to be implemented to avoid and minimize impacts, other measures to avoid and minimize that were found to be impracticable, and a mitigation plan for offsetting impacts.

7. Road crossings shall be designed to ensure fish passage, especially for anadromous fisheries. Permittees shall employ bridge designs that span the stream or river, utilize pier or pile supported structures, or involve large bottomless culverts with a natural streambed, where the substrate and streamflow conditions approximate existing channel conditions. Approach fills in waters of the United States below the ordinary high water mark are not authorized under the NWPs, except where avoidance has specifically been determined to be impracticable by the Sacramento District.

8. For NWP 12, clay blocks, bentonite, or other suitable material shall be used to seal the trench to prevent the utility line from draining waters of the United States, including wetlands.

9. For NWP 13, bank stabilization shall include the use of vegetation or other biotechnical design to the maximum extent practicable. Activities involving hard-armoring of the bank toe or slope requires submission of a PCN per General Condition 27.

10. For NWP 23, the PCN shall include a copy of the signed Categorical Exclusion document and final agency determinations regarding compliance with Section 7 of the Endangered Species Act, Essential Fish Habitat under the Magnussen-Stevens Act, and Section 106 of the National Historic Preservation Act.

11. For NWP 44, the discharge shall not cause the loss of more than 300 linear feet of streambed. For intermittent and ephemeral streams, the 300 linear foot limit may be waived in writing by the Sacramento District. This NWP does not authorize discharges in waters of the United States supporting anadromous fisheries.

12. For NWPs 29 and 39, channelization or relocation of intermittent or perennial drainage, is not authorized, except when, as determined by the Sacramento District, the relocation would result in a net increase in functions of the aquatic ecosystem within the watershed.

13. For NWP 33, temporary fills for construction access in waters of the United States supporting fisheries shall be accomplished with clean, washed spawning quality gravels where practicable as determined by the Sacramento District, in consultation with appropriate federal and state wildlife agencies.

14. For NWP 46, the discharge shall not cause the loss of greater than 0.5 acres of waters of the United States or the loss of more than 300 linear feet of ditch, unless this 300 foot linear foot limit is waived in writing by the Sacramento District.

15. For NWPs 29, 39, 40, 42, and 43, upland vegetated buffers shall be established and maintained in perpetuity, to the maximum extent practicable, next to all preserved open waters, streams and wetlands including created, restored, enhanced or preserved waters of the U.S., consistent with General Condition 20. Except in unusual circumstances, vegetated buffers shall be at least 50 feet in width.

16. All NWPs except 3, 6, 20, 27, 32, 38, and 47, are revoked for activities in histosols and fens and in wetlands contiguous with fens. Fens are defined as slope wetlands with a histic epipedon that are hydrologically supported by groundwater. Fens are normally saturated throughout the growing season, although they may not be during drought conditions. For NWPs 3, 6, 20, 27, 32, and 38, prospective permittees shall submit a PCN to the Sacramento District in accordance with General Condition 27.

17. For all NWPs, when activities are proposed within 100 feet of the point of groundwater discharge of a natural spring, prospective permittees shall submit a PCN to the Sacramento District in accordance with General Condition 27. A spring source is defined as any location where ground water emanates from a point in the ground. For purposes of this condition, springs do not include seeps or other discharges which lack a defined channel.

II. California Only

1. In the Lake Tahoe Basin, all NWPs are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

2. In the Primary and Secondary Zones of the Legal Delta, NWPs 29 and 39 are revoked. New development activities in the Legal Delta will be reviewed through the Corps' standard permit process.

III. Nevada Only

1. In the Lake Tahoe Basin, all NWPs are revoked. Activities in this area shall be authorized under Regional General Permit 16 or through an individual permit.

IV. Utah Only

1. For all NWPs, except NWP 47, prospective permittees shall submit a PCN in accordance with General Condition 27 for any activity, in waters of the United States, below 4217 feet mean sea level (msl) adjacent to the Great Salt Lake and below 4500 feet msl adjacent to Utah Lake.

2. A PCN is required for all bank stabilization activities in a perennial stream that would affect more than 100 linear feet of stream

3. For NWP 27, facilities for controlling stormwater runoff, construction of water parks such as kayak courses, and use of grout or concrete to construct in-stream structures are not authorized. A PCN is required for all projects exceeding 1500 linear feet as measured on the stream thalweg, using in stream structures exceeding 50 cubic yards per structure and/or incorporating grade control structures exceeding 1 foot vertical drop. For any stream restoration project, the post project stream sinuosity shall be appropriate to the geomorphology of the surrounding area and shall be equal to, or greater than, pre project sinuosity. Sinuosity is defined as the ratio of stream length to project reach length. Structures shall allow the passage of aquatic organisms, recreational water craft or other navigational activities unless specifically waived in writing by the District Engineer.

V. Colorado Only

1. Final Regional Conditions Applicable to Specific Nationwide Permits within Colorado.

a. Nationwide Permit Nos. 12 and 14, Utility Line Activities and Linear Transportation Projects. In the Colorado River Basin, utility line and road activities crossing perennial water or special aquatic sites require notification to the District Engineer in accordance with General Condition 27 (Pre-Construction Notification).

b. Nationwide Permit No. 13 Bank Stabilization. In Colorado, bank stabilization activities necessary for erosion prevention in streams that average less than 20 feet in width (measured between the ordinary high water marks) are limited to the placement of no more than 1/4 cubic yard of suitable fill* material per running foot below the plane of the ordinary high water mark. Activities greater than 1/4 cubic yard may be authorized if the permittee notifies the District Engineer in accordance with General Condition 27 (Pre-Construction Notification) and the Corps determines the adverse environmental effects are minimal. [* See (g) for definition of Suitable Fill]

c. Nationwide Permit No. 27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities.

(1) For activities that include a fishery enhancement component, the Corps will send the Pre-Construction Notification to the Colorado Division of Wildlife (CDOW) for review. In accordance with General Condition 27 (Pre-Construction Notification), CDOW will have 10 days from the receipt of Corps notification to indicate that they will be commenting on the proposed project. CDOW will then have an additional 15 days after the initial 10-day period to provide those comments. If CDOW raises concerns, the applicant may either modify their plan, in coordination with CDOW, or apply for a standard individual permit.

(2) For activities involving the length of a stream, the post-project stream sinuosity will not be significantly reduced, unless it is demonstrated that the reduction in sinuosity is consistent with the natural morphological evolution of the stream (sinuosity is the ratio of stream length to project reach length).

(3) Structures will allow the upstream and downstream passage of aquatic organisms, including fish native to the reach, as well as recreational water craft or other navigational activities, unless specifically waived in writing by the District Engineer. The use of grout and/or concrete in

building structures is not authorized by this nationwide permit.

(4) The construction of water parks (i.e., kayak courses) and flood control projects are not authorized by this nationwide permit.

d. Nationwide Permits Nos. 29 and 39; Residential Developments and Commercial and Institutional Developments. A copy of the existing FEMA/locally-approved floodplain map must be submitted with the Pre-Construction Notification. When reviewing proposed developments, the Corps will utilize the most accurate and reliable FEMA/locally-approved pre-project floodplain mapping, not post-project floodplain mapping based on a CLOMR or LOMR. However, the Corps will accept revisions to existing floodplain mapping if the revisions resolve inaccuracies in the original floodplain mapping and if the revisions accurately reflect pre-project conditions.

2. Final Regional Conditions Applicable to All Nationwide Permits within Colorado

e. Removal of Temporary Fills. General Condition 13 (Removal of Temporary Fills) is amended by adding the following: When temporary fills are placed in wetlands in Colorado, a horizontal marker (i.e. fabric, certified weed-free straw, etc.) must be used to delineate the existing ground elevation of wetlands that will be temporarily filled during construction.

f. Spawning Areas. General Condition 3 (Spawning Areas) is amended by adding the following: In Colorado, all Designated Critical Resource Waters (see enclosure 1) are considered important spawning areas. Therefore, In accordance with General Condition 19 (Designated Critical Resource Waters), the discharge of dredged or fill material in not authorized by the following nationwide permits in these waters: NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50. In addition, in accordance with General Condition 27 (Pre-Construction Notification), notification to the District Engineer is required for use of the following nationwide permits in these waters: NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37 and 38".

g. Suitable Fill. In Colorado, use of broken concrete as fill material requires notification to the District Engineer in accordance with General Condition 27 (Pre-Construction Notification). Permittees must demonstrate that soft engineering methods utilizing native or non-manmade materials are not practicable (with respect to cost, existing technology, and logistics), before broken concrete is allowed as suitable fill. Use of broken concrete with exposed rebar is prohibited in perennial waters and special aquatic sites.

h. Invasive Aquatic Species. General Condition 11 is amended by adding the following condition for work in perennial or intermittent waters of the United States: If heavy equipment is used for the subject project that was previously working in another stream, river, lake, pond, or wetland within 10 days of initiating work, one the following procedures is necessary to prevent the spread of New Zealand Mud Snails and other aquatic hitchhikers:

(1) Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and keep the equipment dry for 10 days. OR

(2) Remove all mud and debris from Equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with either a 1:1 solution of Formula 409 Household Cleaner and water, or a solution of Sparquat 256 (5 ounces Sparquat per gallon of water). Treated equipment must be kept moist for at least 10 minutes. OR

(3) Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with water greater than 120 degrees F for at least 10 minutes.

3. Final Regional Conditions for Revocation/Special Notification Specific to Certain Geographic Areas

i. Fens: All Nationwide permits, except permit Nos. 3, 6, 20, 27, 32, 38 and 47, are revoked in fens and wetlands adjacent to fens. Use of nationwide permit Nos. 3, 20, 27 and 38, requires notification to the District Engineer, in accordance with General Condition 27 (Pre-Construction Notification), and the permittee may not begin the activity until the Corps determines the adverse environmental effects are minimal. The following defines a fen:

> Fen soils (histosols) are normally saturated throughout the growing season, although they may not be during drought conditions. The primary source of hydrology for fens is groundwater. Histosols are defined in accordance with the U.S. Department of Agriculture, Natural Resources Conservation Service publications on Keys to Soil Taxonomy and Field Indicators of Hydric Soils in the United States (http://soils.usda.gov/technical/classification/taxonomy).

j. Springs: Within the state of Colorado, all NWPs, except permit 47 (original 'C'), require preconstruction notification pursuant to General Condition 27 for discharges of dredged or fill material within 100 feet of the point of groundwater discharge of natural springs. A spring source is defined as any location where groundwater emanates from a point in the ground. For purposes of this regional condition, springs do not include seeps or other discharges which do not have a defined channel.

4. Additional Information

The following provides additional information regarding minimization of impacts and compliance with existing general Conditions:

a. Permittees are reminded of the existing General Condition No. 6 which prohibits the use of unsuitable material. Organic debris, building waste, asphalt, car bodies, and trash are not suitable material. Also, General Condition 12 requires appropriate erosion and sediment controls (i.e. all fills must be permanently stabilized to

prevent erosion and siltation into waters and wetlands at the earliest practicable date). Streambed material or other small aggregate material placed along a bank as stabilization will not meet General Condition 12. Also, use of erosion control mates that contain plastic netting may not meet General Condition 12 if deemed harmful to wildlife.

b. Designated Critical Resource Waters in Colorado. In Colorado, a list of designated Critical Resource Waters has been published in accordance with General Condition 19 (Designated Critical Resource Waters). This list will be published on the Albuquerque District Regulatory home page (http://www.spa.usace.army.mil/reg/)

c. Federally-Listed Threatened and Endangered Species. General condition 17 requires that nod-federal permittees notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project. Information on such species, to include occurrence by county in Colorado, may be found at the following U.S. Fish and Wildlife Service website: http://www.fws.gov/mountain%2Dprairie/endspp/name_county_search.htm

C. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project.

D. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration, establishment (creation), enhancement, or preservation of aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Discharge: The term "discharge" means any discharge of dredged or fill material.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands

contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects waterbodies with their adjacent uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 20.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete project: The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete project must have independent utility (see definition). For linear projects, a "single and complete project" is all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal

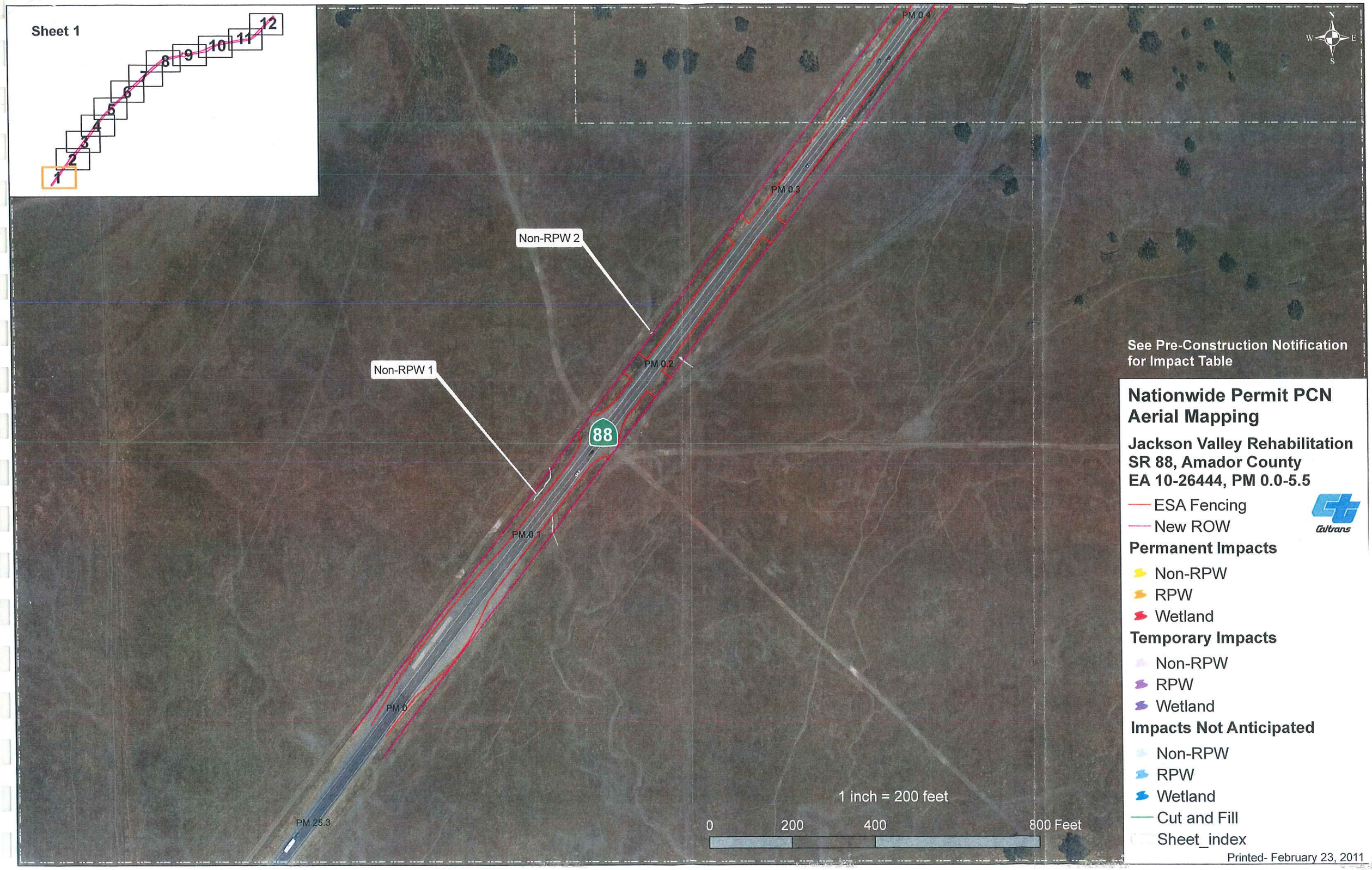
interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States that, during a year with normal patterns of precipitation, has water flowing or standing above ground to the extent that an ordinary high water mark (OHWM) or other indicators of jurisdiction can be determined, as well as any wetland area (see 33 CFR 328.3(b)). If a jurisdictional wetland is adjacent--meaning bordering, contiguous, or neighboring--to a jurisdictional waterbody displaying an OHWM or other indicators of jurisdiction, that waterbody and its adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of "waterbodies" include streams, rivers, lakes, ponds, and wetlands.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See Pre-Construction Notification for Impact Table
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Jackson Valley Rehabilitation
SR 88, Amador County
EA 10-26444, PM 0.0-5.5
ESA Fencing
New ROW
Caltrans
Permanent Impacts
Non-RPW
RPW
Wetland
Temporary Impacts
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Wetland
Impacts Not Anticipated
Non-RPW
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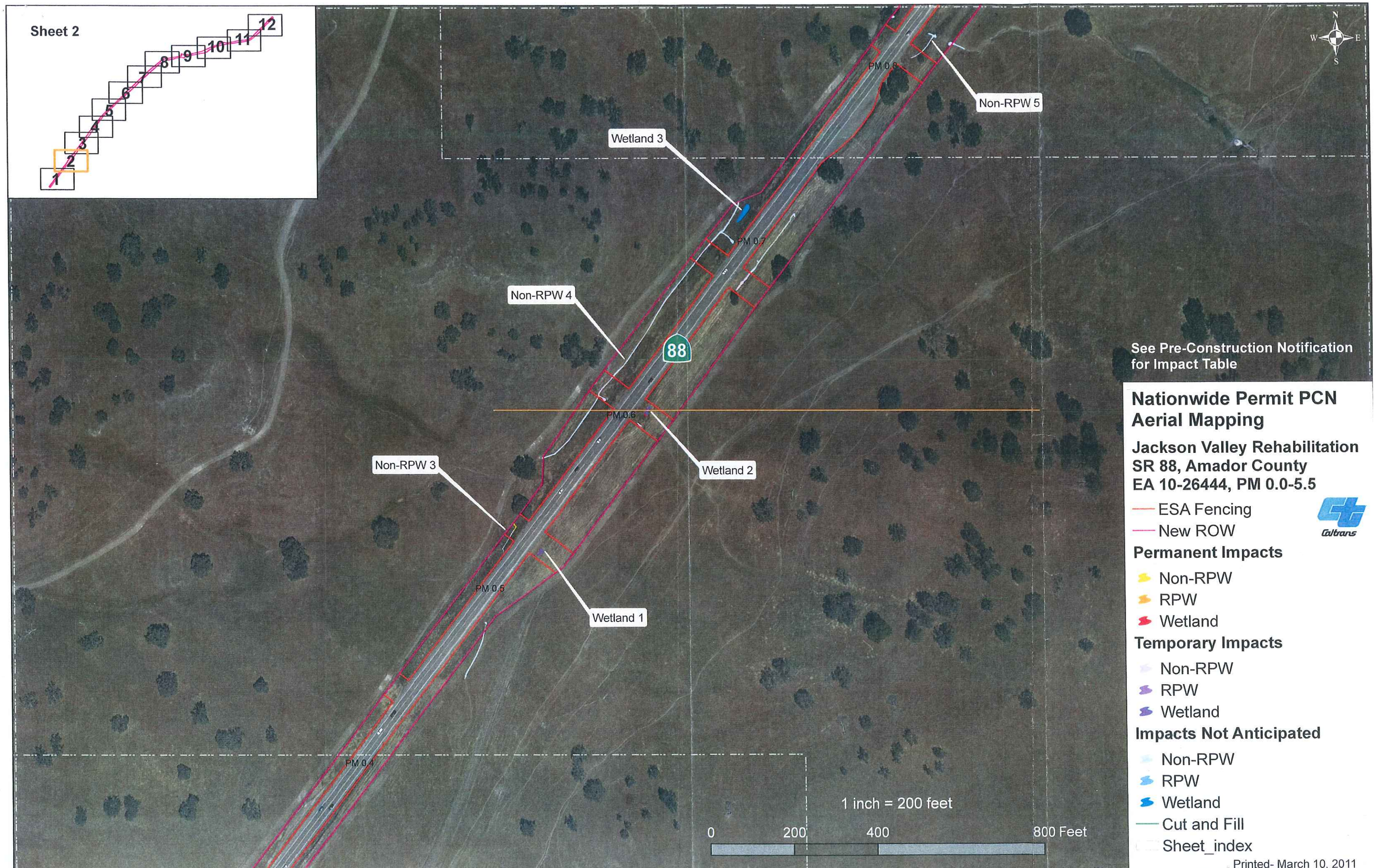

Nationwide Permit PCN Aerial Mapping

Jackson Valley Rehabilitation
SR 88, Amador County
EA 10-26444, PM 0.0-5.5

- ESA Fencing
- New ROW

Permanent Impacts

- Non-RPW
- RPW
- Wetland

Temporary Impacts

- Non-RPW
- RPW
- Wetland

Impacts Not Anticipated

- Non-RPW
- RPW
- Wetland
- Cut and Fill
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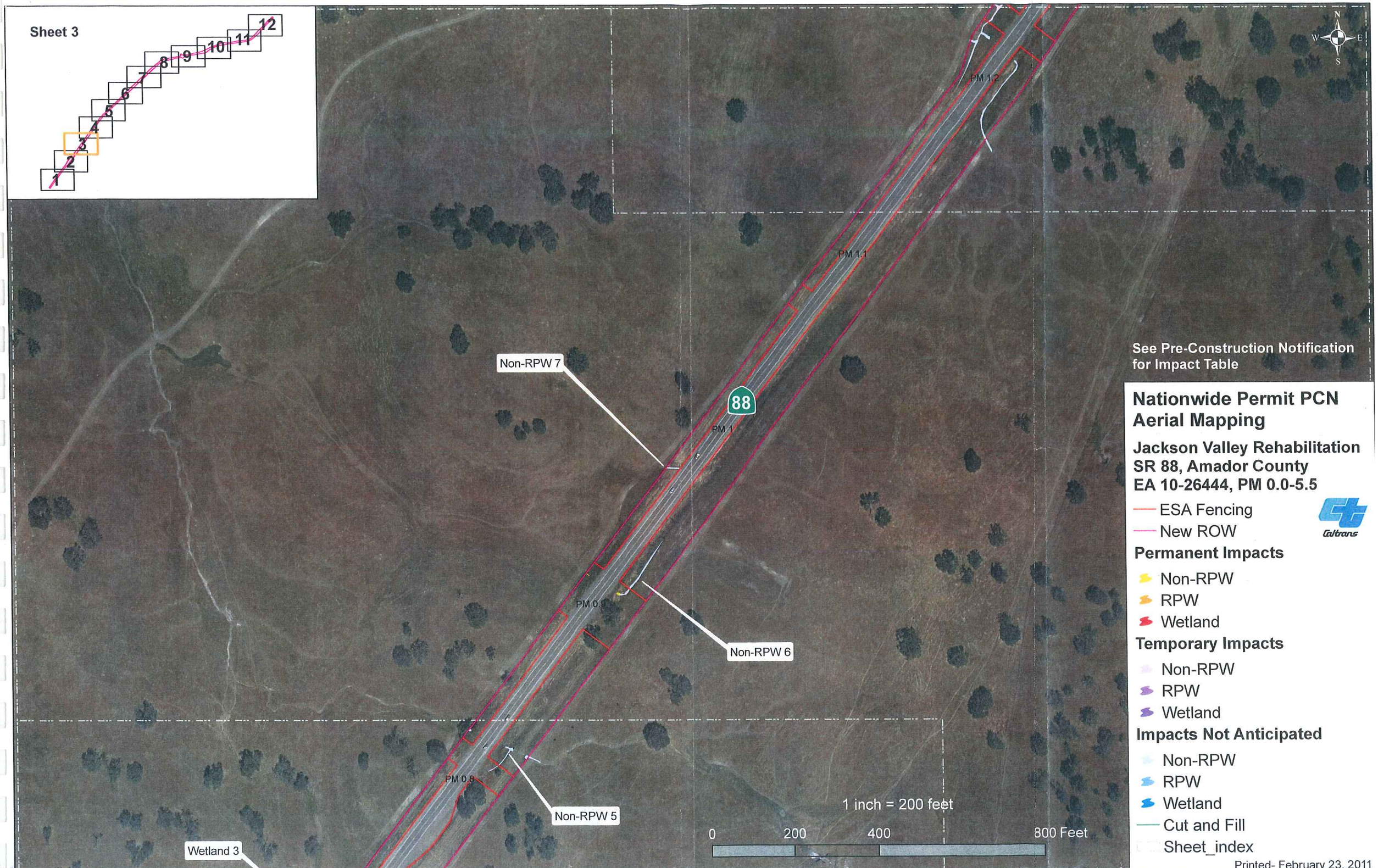
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Non-RPW 7
Non-RPW 6
Non-RPW 5
Wetland 3
1 inch = 200 feet
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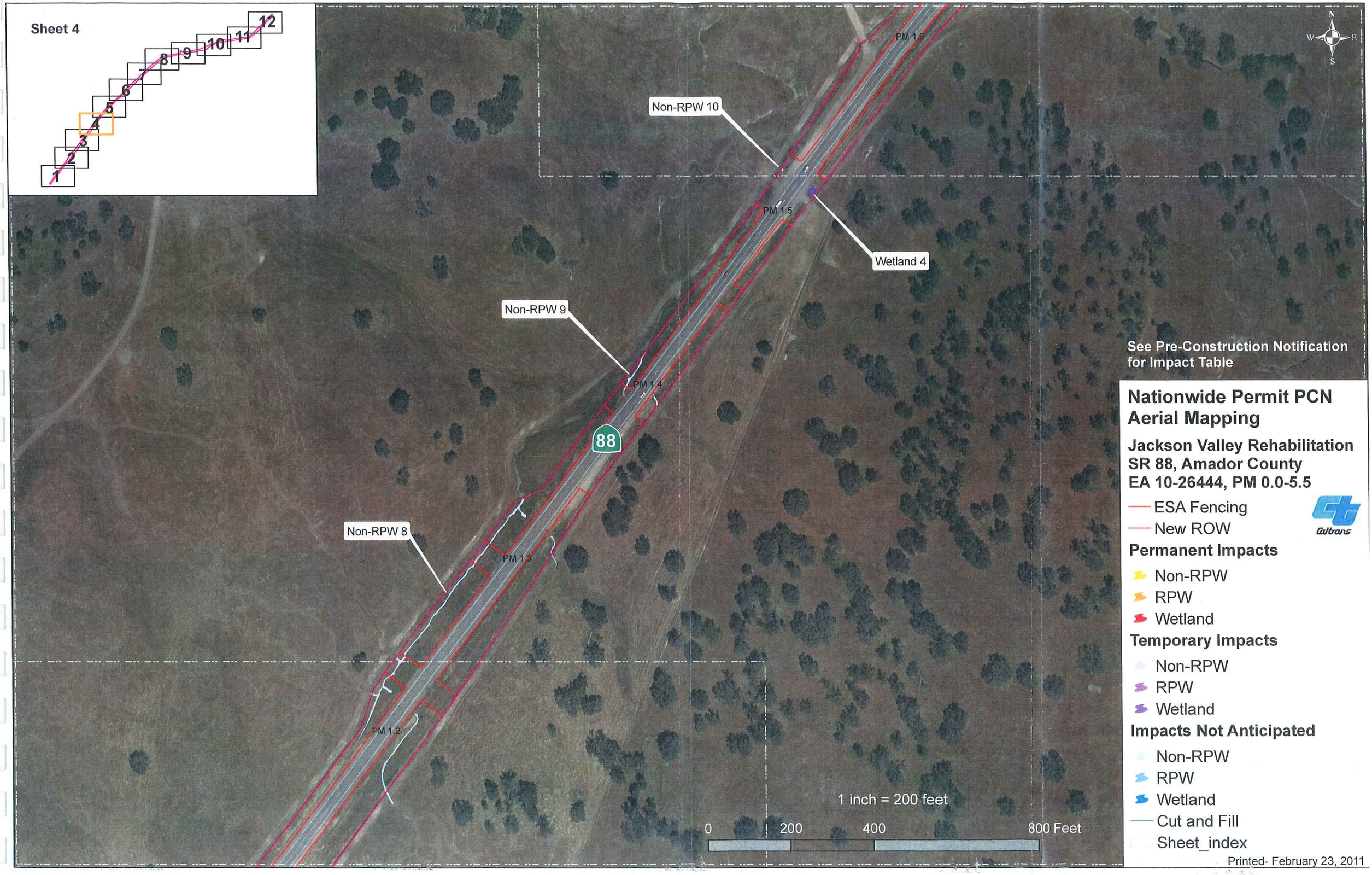

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Nationwide Permit PCN Aerial Mapping

Jackson Valley Rehabilitation
SR 88, Amador County
EA 10-26444, PM 0.0-5.5

- ESA Fencing
- New ROW

Permanent Impacts

- Non-RPW
- RPW
- Wetland

Temporary Impacts

- Non-RPW
- RPW
- Wetland

Impacts Not Anticipated

- Non-RPW
- RPW
- Wetland
- Cut and Fill
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Jackson Valley Rehabilitation SR 88, Amador County EA 10-26444, PM 0.0-5.5

ESA Fencing
New ROW

Permanent Impacts

- Non-RPW
- RPW
- Wetland

Temporary Impacts

- Non-RPW
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- Wetland

Impacts Not Anticipated

- Non-RPW
- RPW
- Wetland
- Cut and Fill
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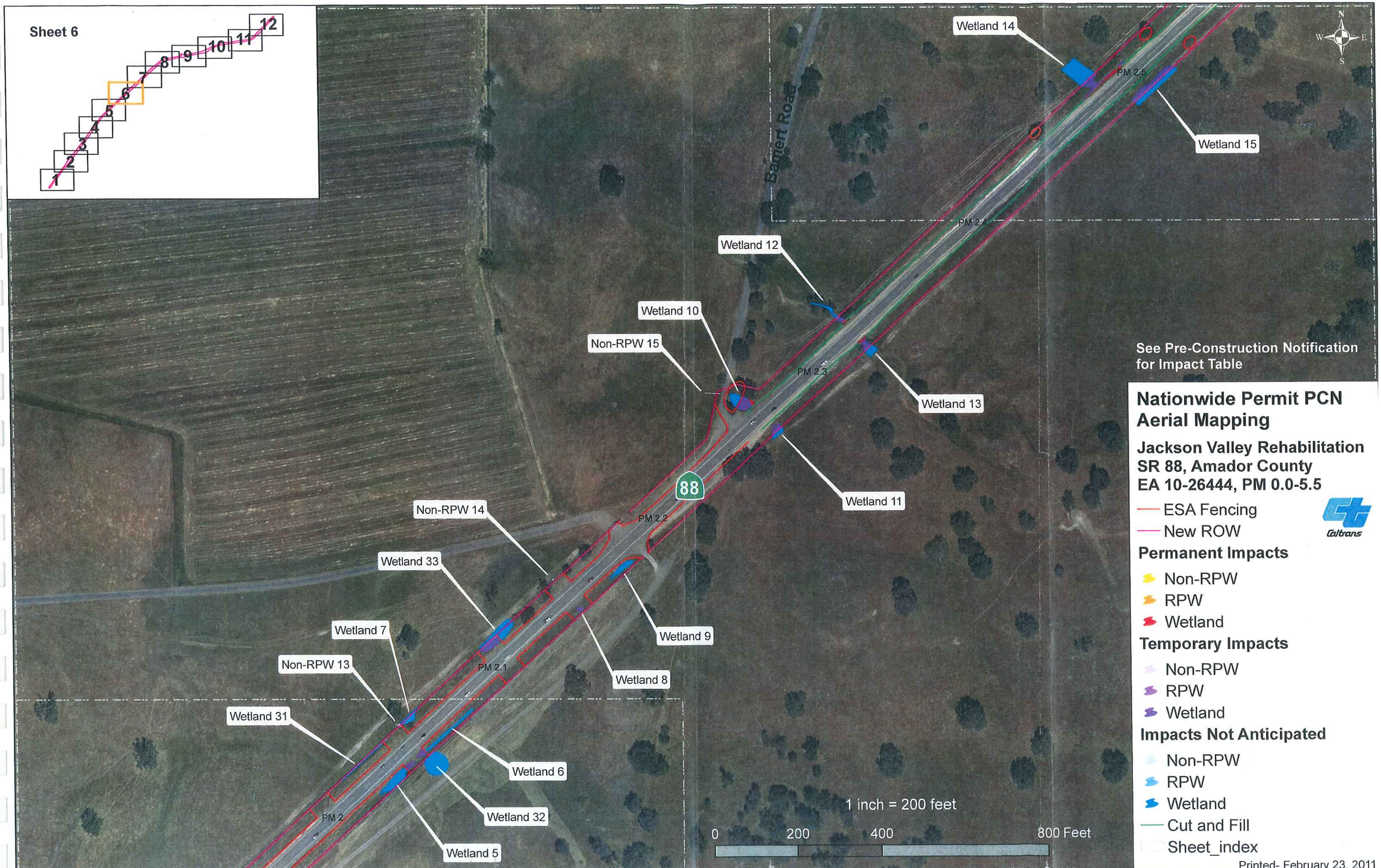
Printed- February 23, 2011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Wetland 10
Non-RPW 15
PM 2.3
Wetland 13
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Wetland 11
Non-RPW 14
PM 2.2
Wetland 33
Wetland 9
Wetland 7
Non-RPW 13
PM 2.1
Wetland 8
Wetland 31
Wetland 6
Wetland 32
PM 2
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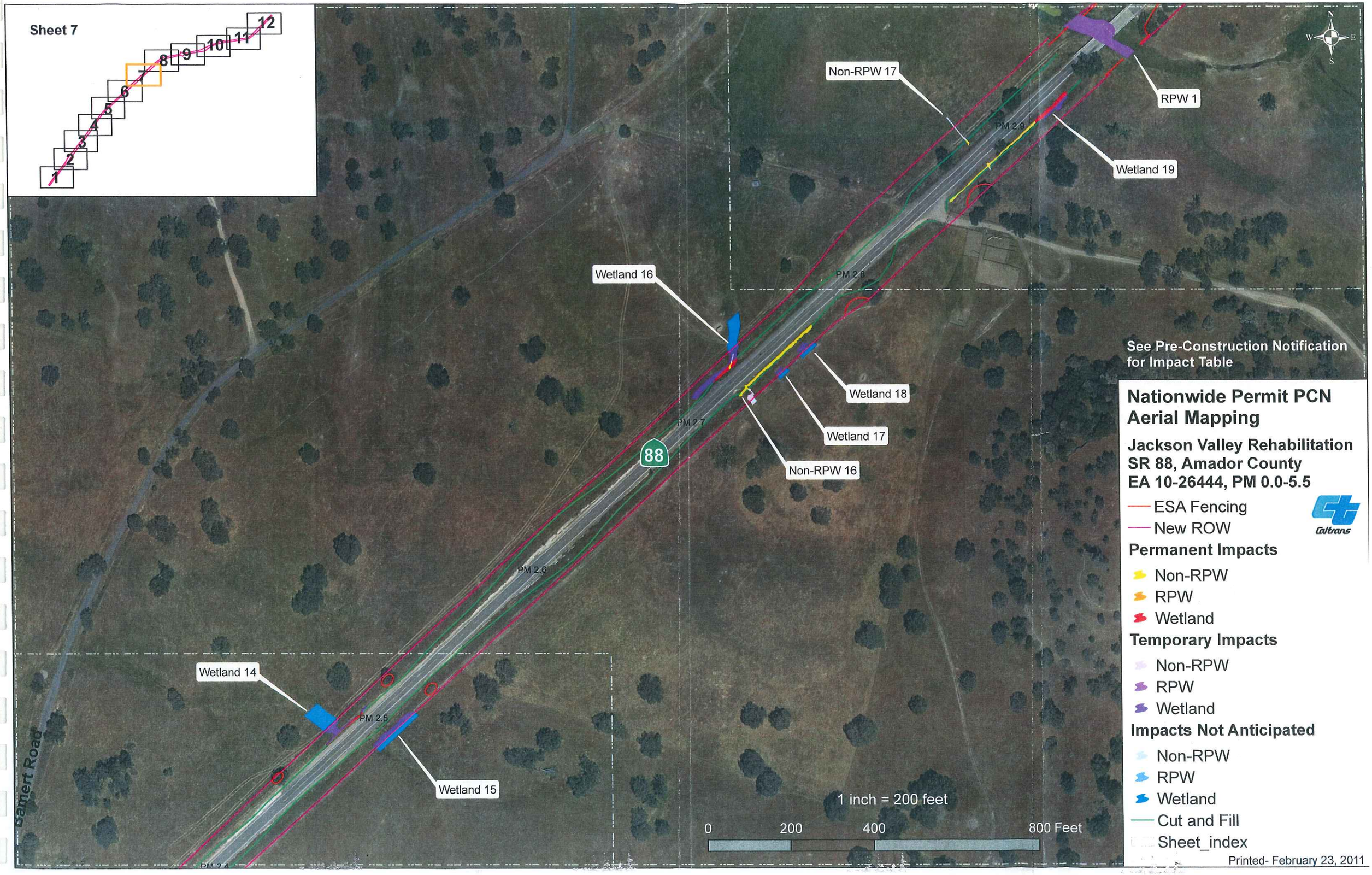
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Wetland 18
Wetland 17
Non-RPW 16
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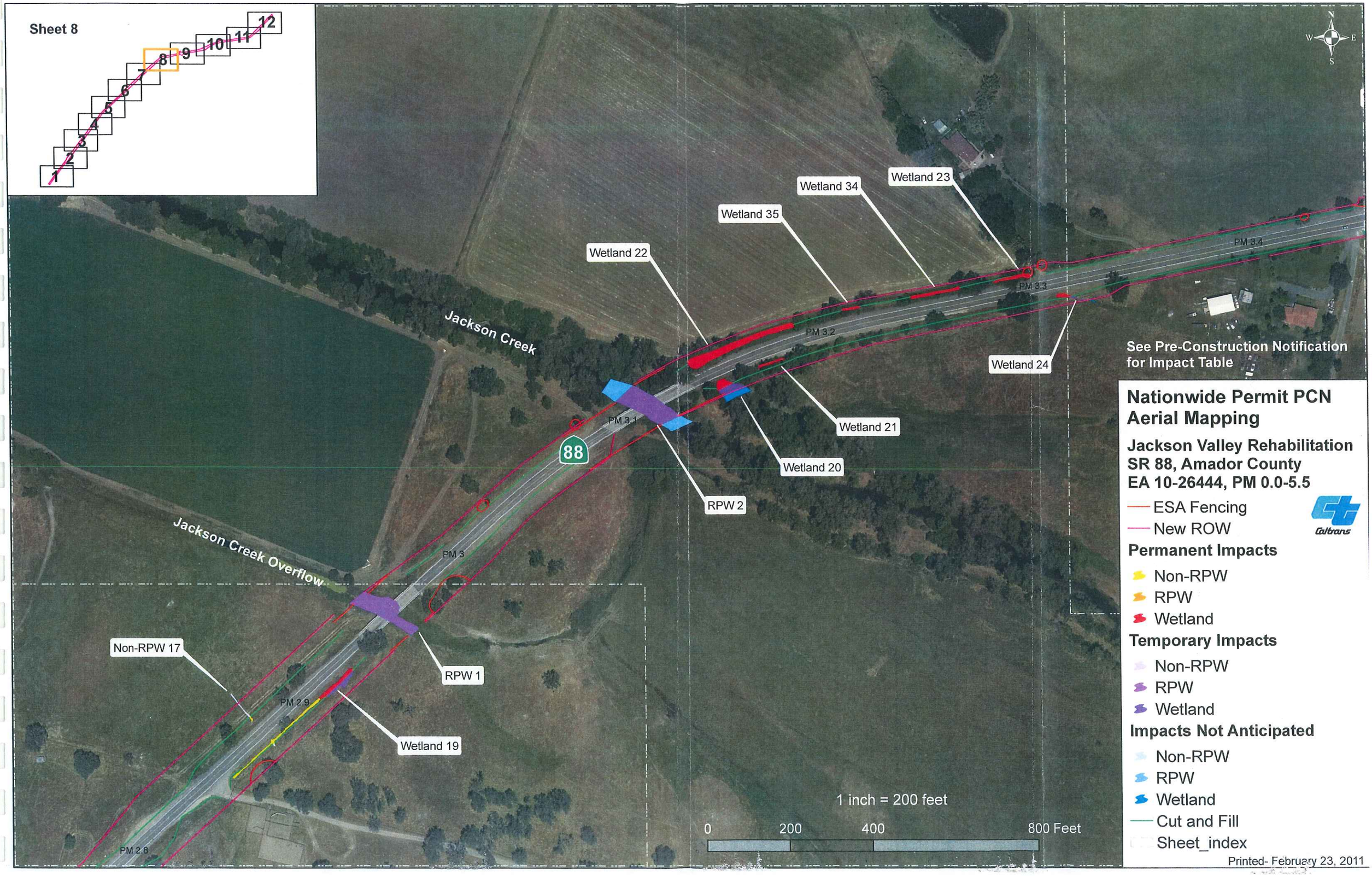
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Wetland 35
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PM 3.1
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PM 2.9
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Jackson Creek
Jackson Creek Overflow
88
Wetland 24
Wetland 21
Wetland 20
RPW 2
RPW 1
Non-RPW 17
Wetland 19
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Jackson Valley Rehabilitation
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- ESA Fencing
- New ROW

Permanent Impacts

- Non-RPW
- RPW
- Wetland

Temporary Impacts

- Non-RPW
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Impacts Not Anticipated

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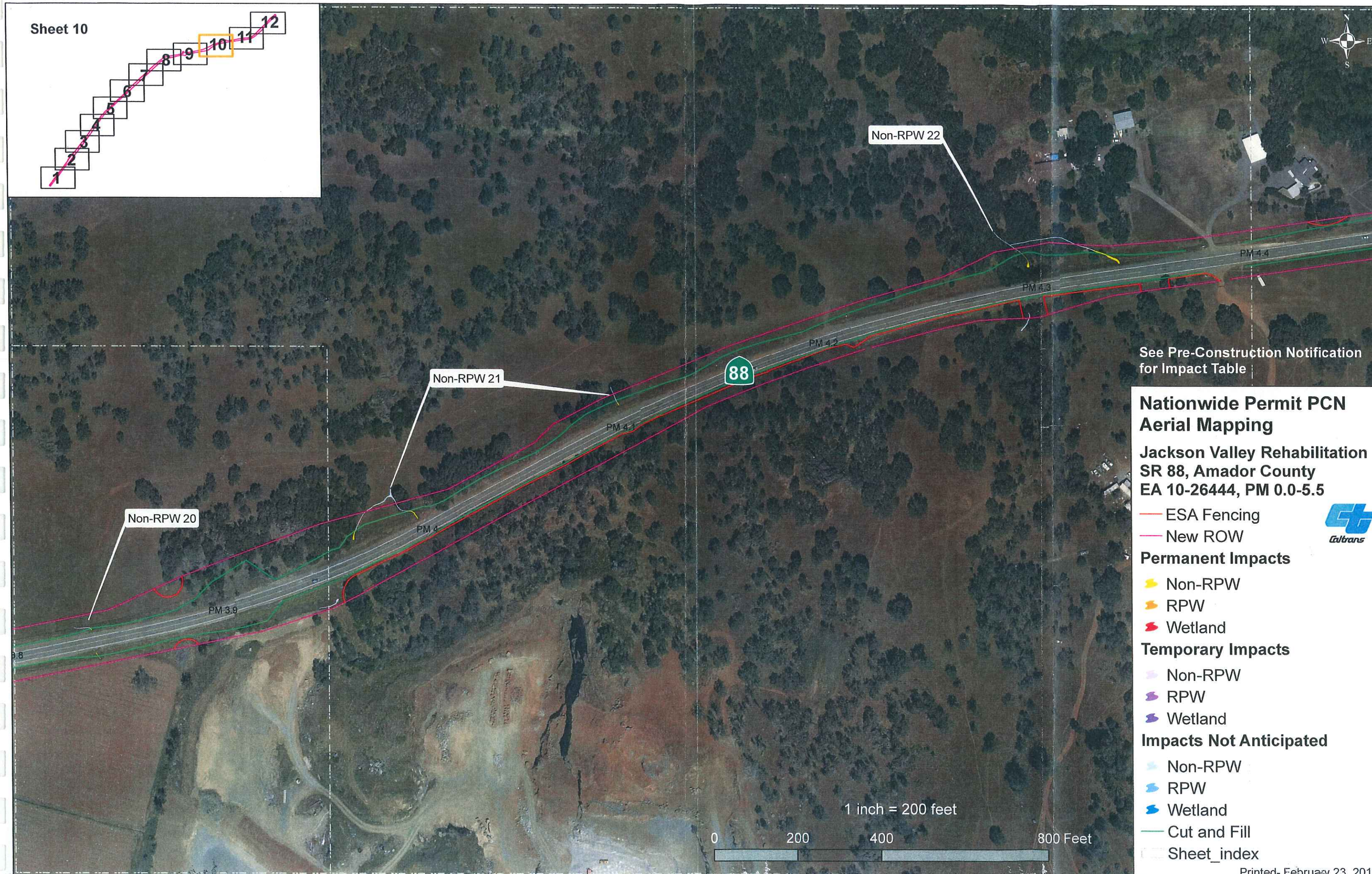
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PM 4.4
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Permanent Impacts
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Impacts Not Anticipated
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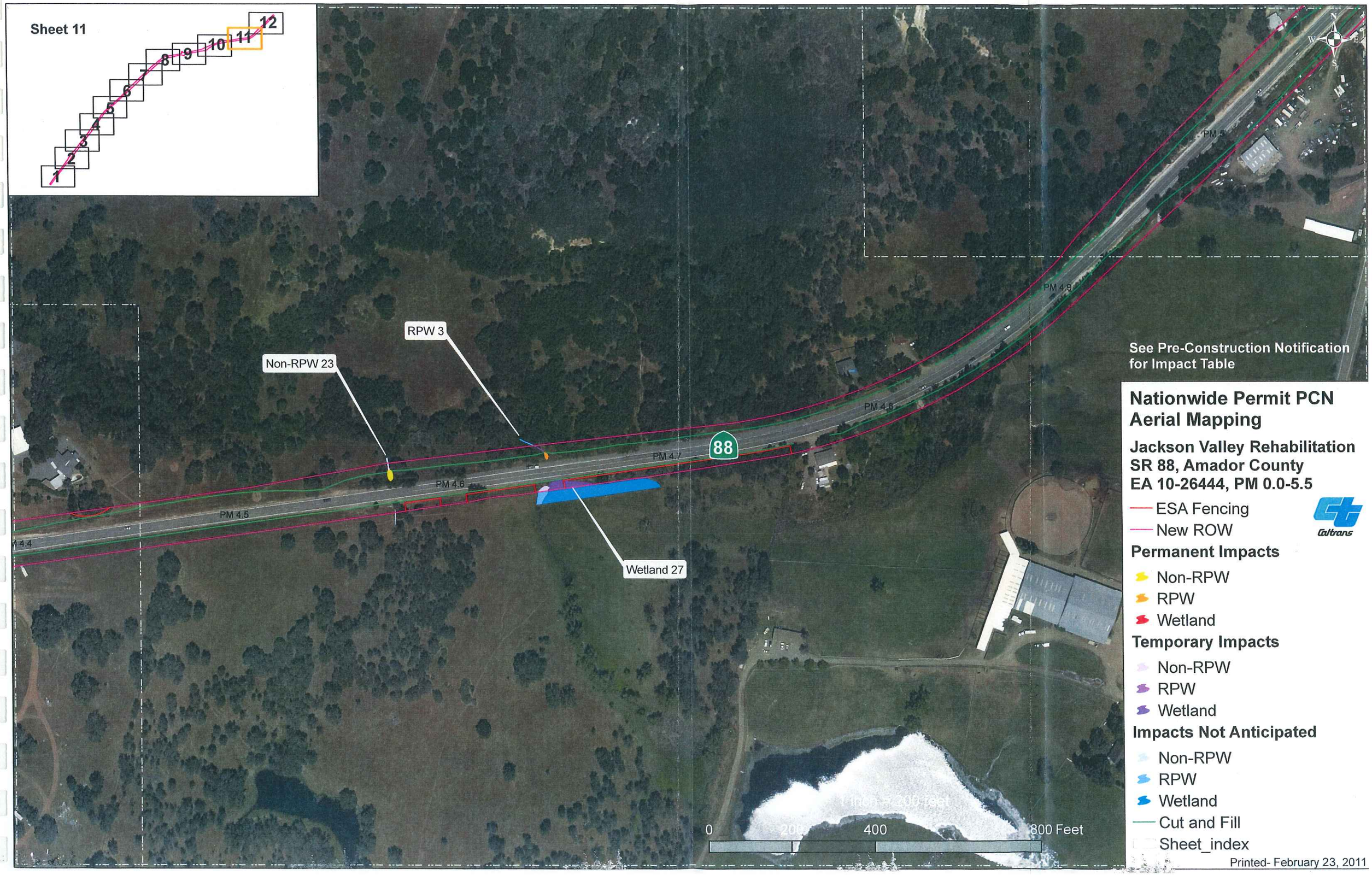
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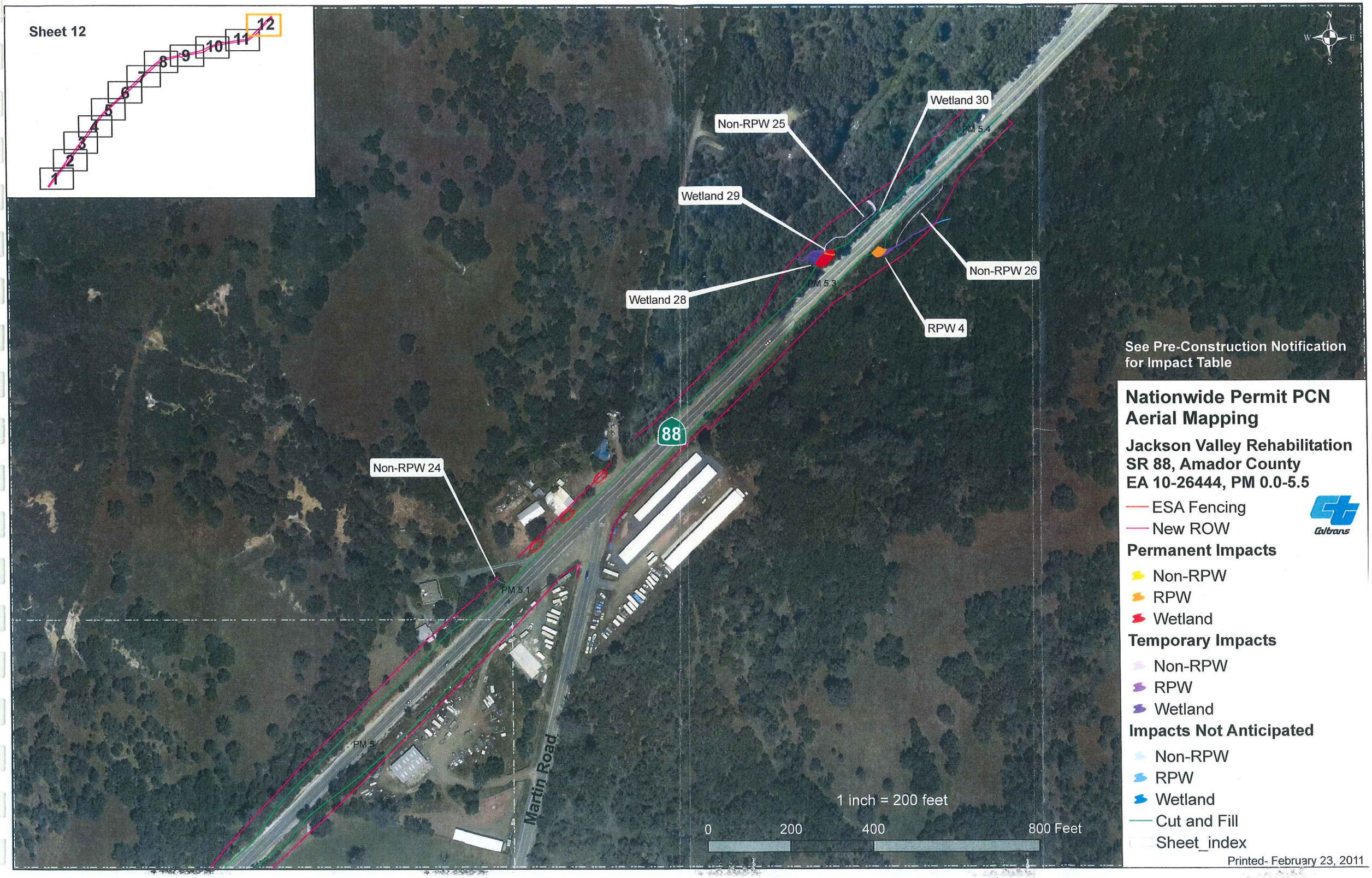
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PM 5.4
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PM 5.3
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Non-RPW 24
PM 5.1
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Martin Road
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800 Feet
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