WATER POLLUTION CONTROL PROGRAM (WPCP)
for

MAD RIVER BRIDGE - BRUSHING ONLY

Caltrans Contract Number:
01-296101

Prepared for:
Department of Fish & Game

Tom Fitzgerald - Resident Engineer
707-496-6614

Submitted by:
Department of Transportation
5601 South Broadway
Eureka, CA 95503

Project Site Address
HUM -101-KP 143.6/145.5

WPCP Prepared by:
Department of Transportation
5601 South Broadway
Eureka, CA 95503
707-496-6614
Tom Fitzgerald

WPCP Preparation Date
October 10, 2007

Contents

WPCP Attachments

Section 10
WPCP Certification and Approval

10.1 Contractor's Certification and Approval by the Resident Engineer

CONTRACTOR'S CERTIFICATION OF WPCP

"I certify under a penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate 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, to the best of my knowledge and belief is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature	Date
N/A Name and Title	Telephone Number

Is a Local Agency administering the project?

☐ Yes ☐ No

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CALTRANS RESIDENT ENGINEER'S APPROVAL OF WPCP

I, and/or personnel acting under my direction and supervision, have reviewed this WPCP and find that it meets the requirements set forth in the Special Provisions, the Caltrans Construction Site Best Management Practices Manual, the Caltrans SWPPP and WPCP Preparation Manual (March 2003), and the Standard Specifications Section 7-1.01G - Water Pollution.

Caltrans Resident Engineer's Signature	Date of WPCP Approval
Tom Fitzgerald Caltrans Resident Engineer's Name (printed)	707-496-6614 Caltrans Resident Engineer's Phone Number

For Use by Local Agency Only

RESIDENT ENGINEER'S APPROVAL OF WPCP

I, and/or personnel acting under my direction and supervision, have reviewed this WPCP and find that it meets the requirements set forth in the Special Provisions, the Caltrans Construction Site Best Management Practices Manual, the Caltrans SWPPP and WPCP Preparation Manual (March 2003), and the Standard Specifications Section 7-1.01G - Water Pollution.

Resident Engineer's Signature	Date of WPCP Approval
Resident Engineer's Name (printed)	Resident Engineer's Phone Number

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CALTRANS OVERSIGHT ENGINEER'S CONCURENCE OF WPCP

I, and/or personnel acting under my direction and supervision, have reviewed this WPCP and concur with the Resident Engineer's findings that it meets the requirements set forth in the Special Provisions, the Caltrans Construction Site Best Management Practices Manual, the Caltrans SWPPP and WPCP Preparation Manual (March 2003), and the Standard Specifications Section 7-1.01G - Water Pollution.

Caltrans Oversight Engineer's Signature	Date of WPCP Concurrence
Walt Dragoloski	707-445-6697
Caltrans Oversight Engineer's Name	Caltrans Oversight Engineer's Phone Number

Section 20
Project Information

1. Introduction and Project Description:

The construction contract for the Mad River Bridge Replacement Project is expected to be awarded in the summer of 2008. The contract will not be approved in time to address the concern of migratory birds nesting in critical work areas. The first order of work to construct the new south bound bridge will be to access and construct Pier 2 foundation and perform load testing of the Pier 2 foundation piles. The purpose of this WPCP is to cover the removal of vegetation necessary for this first season work to occur.

The work included in this storm water plan is limited to tree removal and brushing potential nesting sites from 1) Staging Area 1 shown on the plans. 2) Staging Area 2 Shown on the Plans. 3) the area adjacent to Pier 2 Pile foundation. 4) the Access road on the southeast river bank.

The brushing work will be performed by the Department of Transportation and should not be confused with the subsequent work to be performed by the bridge contractor. This storm water plan will be superceded by the bridge contractor prior to the start of bridge construction.

2. Unique Site Features:

The work will be accessed and completed outside the bed bank and channel of the Mad River. The environmental features of the area to be brushed have been described, analyzed and mitigated in permits currently issued to the Department of Transportation. Work will be consistent with these permits and will be concluded prior to the start of bridge construction work. Barriers to protect environmentally sensitive areas (ESA's) are an integral part of the bridge construction. ESA's are not to be constructed during the high water season so brushing will be confined to cleared areas with surveyed reference points, continuous inspection and consultation with biological specialists.

3. Project Schedule (written and graphical):

December 2007, January 2008

4. Potential Pollutant Sources:

Workers' vehicles and power tools; portable toilet facilities

Prejob meeting
Plan contingency measures
Schedule work for non rainy days only
Perform brushing activity
Remove any litter or foreign objects from site

Section 30
Pollution Sources and Control Measures

30.1 Soil Stabilization (Erosion Control) and Sediment Control

30.1.1 Soil Stabilization BMPs

The selected temporary soil stabilization BMPs will be implemented to control erosion on the construction site. Implementation and locations of temporary soil stabilization BMPs are shown on the WPCDs and/or described in this section. The BMP working details that will be adhered to are found in the onsite Construction Site BMPs Manual. The following list of BMPs and narrative explains how the selected BMPs will be incorporated into the project.

TEMPORARY SOIL STABILIZATION BMPs						
BMP No.	BMP	BMP MANUAL MINIMUM REQUIREMENT	PROJECT SPECIFIC MINIMUM REQUIREMENT	USED	NOT USED	IF NOT USED, STATE REASON
SS-1	Scheduling	✓	☐	☒	☐	
SS-2	Preservation of Existing Vegetation	✓	☐	☒	☐	
SS-3	Hydraulic Mulch	✓ (1)	☐	☐	☒	no disturbed area
SS-4	Hydroseeding	✓ (1)	☐	☐	☒	no disturbed area
SS-5	Soil Binder	✓ (1)	☐	☐	☒	no disturbed area
SS-6	Straw Mulch	✓ (1)	☐	☒	☐	used if there's bare ground
SS-7	Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats	✓ (1)	☐	☒	☐	used if there's bare ground
SS-8	Wood Mulching		☐	☐	☒	no disturbed area
SS-9	Earth Dikes/Drainage Swales & Lined Ditches		☐	☐	☒	no disturbed area
SS-10	Outlet Protection/ Velocity Dissipation Devices		☐	☐	☒	no disturbed area
SS-11	Slope Drains		☐	☐	☒	no disturbed area
SS-12	Streambank Stabilization		☐	☐	☒	no disturbed area

1) The Contractor shall select one of the five measures listed or a combination thereof to achieve and maintain the contract's disturbed soil area (DSA) protection requirements.

Would chips, geotextiles or any other materials would not placed within the 100 year flood plain.

30.1.2 Sediment Control BMPs

The selected temporary sediment control BMPs will be implemented to control erosion on the construction site. Implementation and locations of temporary sediment control BMPs are shown on the WPCD and/or described in this section. The BMP working details that will be adhered to are found in the onsite Construction Site BMPs Manual. The following list of BMPs and narrative explains how the selected BMPs will be incorporated into the project.

TEMPORARY SEDIMENT CONTROL BMPs						
BMP No.	BMP	BMP MANUAL MINIMUM REQUIREMENT	PROJECT SPECIFIC MINIMUM REQUIREMENT	USED	NOT USED	IF NOT USED, STATE REASON
SC-1	Silt Fence [1]	✓	☐	☒	☐	used if erosion occurs
SC-2	Desilting Basin		☐	☐	☒	no disturbed area
SC-3	Sediment Trap		☐	☐	☒	no disturbed area
SC-4	Check Dam		☐	☐	☒	no disturbed area
SC-5	Fiber Rolls [1]	✓	☐	☒	☐	used if erosion occurs
SC-6	Gravel Bag Berm		☐	☐	☒	no disturbed area
SC-7	Street Sweeping and Vacuuming	✓	☐	☐	☒	no disturbed area
SC-8	Sandbag Barrier		☐	☐	☒	no disturbed area
SC-9	Straw Bale Barrier		☐	☐	☒	no disturbed area
SC-10	Storm Drain Inlet Protection	✓	☐	☐	☒	no disturbed area

[1] The Contractor shall select either sediment control measure or a combination thereof to achieve and maintain the contract's disturbed soil area (DSA) protection requirements.

N/A No disturbed area.

30.1.3 Tracking Control BMPs

The selected tracking control BMPs will be implemented to control erosion on the construction site. Implementation and locations of tracking control BMPs are shown on the WPCDs and/or described in this section. The BMP working details that will be adhered to are found in the onsite Construction Site BMPs Manual. The following list of BMPs and narrative explains how the selected BMPs will be incorporated into the project.

TRACKING CONTROL BMPs

Complete the following table. The Contractor shall consider using all BMPs listed hereon.						
BMP No.	BMP	BMP MANUAL MINIMUM REQUIREMENT	PROJECT SPECIFIC MINIMUM REQUIREMENT	USED	NOT USED	IF NOT USED, STATE REASON
TC-1	Stabilized Construction Entrance/Exit		☐	☐	☒	no disturbed area
TC-2	Stabilized Construction Roadway		☐	☐	☒	no disturbed area
TC-3	Entrance/Outlet Tire Wash		☐	☐	☒	no disturbed area
SC-7	Street Sweeping and Vacuuming	✓	☐	☐	☒	no disturbed area

N/A No disturbed area

30.1.4 Wind Erosion Control BMPs

Wind erosion controls will be applied as necessary to prevent nuisance dust as required by the Standard Specifications, the Special Provisions, BMP WE-1, Wind Erosion Control, and as directed by the Resident Engineer. The soil stabilization BMPs selected for the project will also provide wind erosion control benefits.

30.2 Non-Storm Water Management BMPs

The selected non-storm water management BMPs will be implemented to control erosion on the construction site. Implementation and locations of non-storm water management BMPs are shown on the WPCDs and/or described in this section. The BMP working details that will be adhered to are found in the onsite Construction Site BMPs Manual. The following list of BMPs and narrative explains how the selected BMPs will be incorporated into the project.

NON-STORM WATER MANAGEMENT BMPs						
BMP No.	BMP	BMP MANUAL MINIMUM REQUIREMENT	PROJECT SPECIFIC MINIMUM REQUIREMENT	USED	NOT USED	IF NOT USED, STATE REASON
NS-1	Water Conservation Practices		☐	☐	☒	N/A
NS-2	Dewatering Operations		☐	☐	☒	N/A
NS-3	Paving and Grinding Operations		☐	☐	☒	N/A
NS-4	Temporary Stream Crossing		☐	☐	☒	N/A
NS-5	Clear Water Diversion		☐	☐	☒	N/A
NS-6	Illicit Discharge/Illegal Dumping Reporting	✓	☐	☐	☒	N/A

NON-STORM WATER MANAGEMENT BMPs						
BMP No.	BMP	BMP MANUAL MINIMUM REQUIREMENT	PROJECT SPECIFIC MINIMUM REQUIREMENT	USED	NOT USED	IF NOT USED, STATE REASON
NS-7	Potable Water/Irrigation		☐	☐	☒	N/A
NS-8	Vehicle and Equipment Cleaning	✓	☐	☐	☒	offsite only
NS-9	Vehicle and Equipment Fueling	✓	☐	☒	☐	
NS-10	Vehicle and Equipment Maintenance	✓	☐	☐	☒	offsite only
NS-11	Pile Driving Operations		☐	☐	☒	N/A
NS-12	Concrete Curing		☐	☐	☒	N/A
NS-13	Material and Equipment Use Over Water		☐	☐	☒	N/A
NS-14	Concrete Finishing		☐	☐	☒	N/A
NS-15	Structure Demolition/Removal		☐	☐	☒	N/A

Hand operated power tools (e.g. chain saws), vehicles and wood chippers to be fueled and maintained as needed in cleared areas only.

30.3 Waste Management and Materials Pollution Control BMPs

The selected waste management and materials pollution control BMPs will be implemented to prevent the release of waste materials into storm water discharges on the construction site. Implementation and locations of waste management and materials pollution control BMPs are shown on the WPCDs and/or described in this section. The BMP working details that will be adhered to are found in the onsite Construction Site BMPs Manual. The following list of BMPs and narrative explains how the selected BMPs will be incorporated into the project.

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs						
BMP No.	BMP	BMP MANUAL MINIMUM REQUIREMENT	PROJECT SPECIFIC MINIMUM REQUIREMENT	USED	NOT USED	IF NOT USED, STATE REASON
WM-1	Material Delivery and Storage	✓	☐	☐	☒	N/A
WM-2	Material Use	✓	☐	☐	☒	N/A
WM-3	Stockpile Management	✓	☐	☐	☒	N/A
WM-4	Spill Prevention and Control	✓	☐	☒	☐	

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL BMPs						
BMP No.	BMP	BMP MANUAL MINIMUM REQUIREMENT	PROJECT SPECIFIC MINIMUM REQUIREMENT	USED	NOT USED	IF NOT USED, STATE REASON
WM-5	Solid Waste Management	✓	☐	☒	☐	
WM-6	Hazardous Waste Management		☐	☐	☒	N/A
WM-7	Contaminated Soil Management		☐	☐	☒	N/A
WM-8	Concrete Waste Management		☐	☐	☒	N/A
WM-9	Sanitary/Septic Waste Management	✓	☐	☒	☐	
WM-10	Liquid Waste Management		☐	☐	☒	N/A

Absorptive materials to contain fuel spill from equipment to be kept onsite.

Work area will be kept free of litter and debris.

Location of portable toilet to be secure

30.4 Water Pollution Control Drawings (WPCDs)

The WPCDs are included as Attachment A to this Water Pollution Control Program.

30.5 Cost Breakdown for Water Pollution Control

A cost breakdown itemizing the contract lump sum for water pollution control has been developed for this project and is included in Attachment B. The cost breakdown reflects the items of work, quantities and costs for BMPs shown in the WPCP, except for those construction site BMPs and permanent BMPs that are shown on the project plans and for which there is a contract item of work.

A cost breakdown itemizing the contract lump sum for water pollution control has been developed for this project and is included in Attachment B. The cost breakdown reflects the items of work, quantities and costs for BMPs shown in the WPCP, except for those construction site BMPs and permanent BMPs that are shown on the project plans and for which there is a contract item of work.

30.6 Construction BMP Maintenance, Inspection, and Repair

Inspections will be conducted as follows:

- Prior to a forecast storm
- After a rain event that causes runoff from the construction site
- At 24-hour intervals during extended rain events

- Weekly during the rainy season
- Every 2 weeks during the non-rainy season
- At any other time(s) or intervals of time specified in the project Special Provisions
- Daily inspection at the end of each day within the Lake Tahoe Hydrologic Unit

Completed inspection checklists (Attachment C) will be submitted to the Resident Engineer within 24 hours of inspection. Copies of the completed checklists will be kept with the WPCP. A tracking or follow-up procedure shall follow any inspection that identifies deficiencies in BMPs. The inspection, maintenance and repair program is shown below.

WPCP ***Inspection, Maintenance, and Repair Program***			
BMP	***Inspection Frequency***		***Maintenance/Repair Measures***
	Rainy	***Non-Rainy***	
NS-9	Weekly		Monitor equipment for leaks, repair-cleanup-dispose properly
WM-4	Weekly		Spill protection equipment to be inventoried and available
WM-5	Weekly		Waste disposal to focus on cleanup and removal from site
WM-9	Weekly		Septic to be secured and moved on forecast of major storms

WPCP *Inspection, Maintenance, and Repair Program*			
BMP	*Inspection Frequency*		*Maintenance/Repair Measures*
	Rainy	*Non-Rainy*	

Section 40
Amendments

Construction Contractor's Certification of the WPCP Amendment

"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 gather and evaluate 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, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature	Date
Name and Title	Phone Number

Is a Local Agency administering the project?

☐ Yes ☐ No

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CALTRANS RESIDENT ENGINEER'S APPROVAL OF WPCP

I, and/or personnel acting under my direction and supervision, have reviewed this WPCP and find that it meets the requirements set forth in the Special Provisions, the Caltrans Construction Site Best Management Practices Manual, the Caltrans SWPPP and WPCP Preparation Manual (March 2003), and the Standard Specifications Section 7-1.01G - Water Pollution.

Caltrans Resident Engineer's Signature	Date of WPCP Approval
Tom Fitzgerald	707-496-6614
Caltrans Resident Engineer's Name (printed)	Caltrans Resident Engineer's Phone Number

For Use by Local Agency Only

RESIDENT ENGINEER'S APPROVAL OF WPCP

I, and/or personnel acting under my direction and supervision, have reviewed this WPCP and find that it meets the requirements set forth in the Special Provisions, the Caltrans Construction Site Best Management Practices Manual, the Caltrans SWPPP and WPCP Preparation Manual (March 2003), and the Standard Specifications Section 7-1.01G - Water Pollution.

Resident Engineer's Signature	Date of WPCP Approval
Resident Engineer's Name (printed)	Resident Engineer's Phone Number

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CALTRANS OVERSIGHT ENGINEER'S CONCURENCE OF WPCP

I, and/or personnel acting under my direction and supervision, have reviewed this WPCP and concur with the Resident Engineer's findings that it meets the requirements set forth in the Special Provisions, the Caltrans Construction Site Best Management Practices Manual, the Caltrans SWPPP and WPCP Preparation Manual (March 2003), and the Standard Specifications Section 7-1.01G - Water Pollution.

Caltrans Oversight Engineer's Signature	Date of WPCP Concurrence
Caltrans Oversight Engineer's Name	Caltrans Oversight Engineer's Phone Number

Section 50
Reporting

50.1 Discharge Reporting

If a discharge occurs or if the project receives a written notice or order from any regulatory agency, the contractor will immediately notify the Engineer and will file a written report to the Resident Engineer within 7 days of the discharge event, notice, or order. Corrective measures will be implemented immediately following the discharge, notice or order. A Notice of Discharge form is provided in Attachment D. All discharges shall be documented on a Discharge Reporting Log in Attachment E.

The report to the Resident Engineer will contain the following items:

- The date, time, location, nature of operation, and type of discharge, including the cause or nature of the notice or order;
- The BMPs deployed before the discharge event, or prior to receiving notice or order;
- The date of deployment and type of BMPs deployed after the discharge event, or after receiving the notice or order, including additional BMPs installed or planned to reduce or prevent re-occurrence; and
- An implementation and maintenance schedule for any affected BMPs.

Discharges requiring reporting include:

- Storm water from a DSA discharged to a waterway without treatment by a temporary construction BMP;
- Non-storm water, except conditionally exempted discharges, discharged to a waterway or a storm drain system, without treatment by an approved control measure (BMP);
- Storm water discharged to a waterway or a storm drain system where the control measures (BMPs) have been overwhelmed or not properly maintained or installed;
- Discharge of hazardous substances above the reportable quantities in 40 CFR 117.3 or 302.4.
- Storm water runoff containing hazardous substances from spills discharged to a waterway or storm drain system;
- Discharges that may endanger health or the environment; and
- Other discharge reporting as directed by the Resident Engineer.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	101,200	KP143.8/145.0 KP 0.4/0.9	43	125

REGISTERED CIVIL ENGINEER 00-00-00

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER ERIC Y. WONG No. C62040 Exp. 9/30/07 CIVIL STATE OF CALIFORNIA

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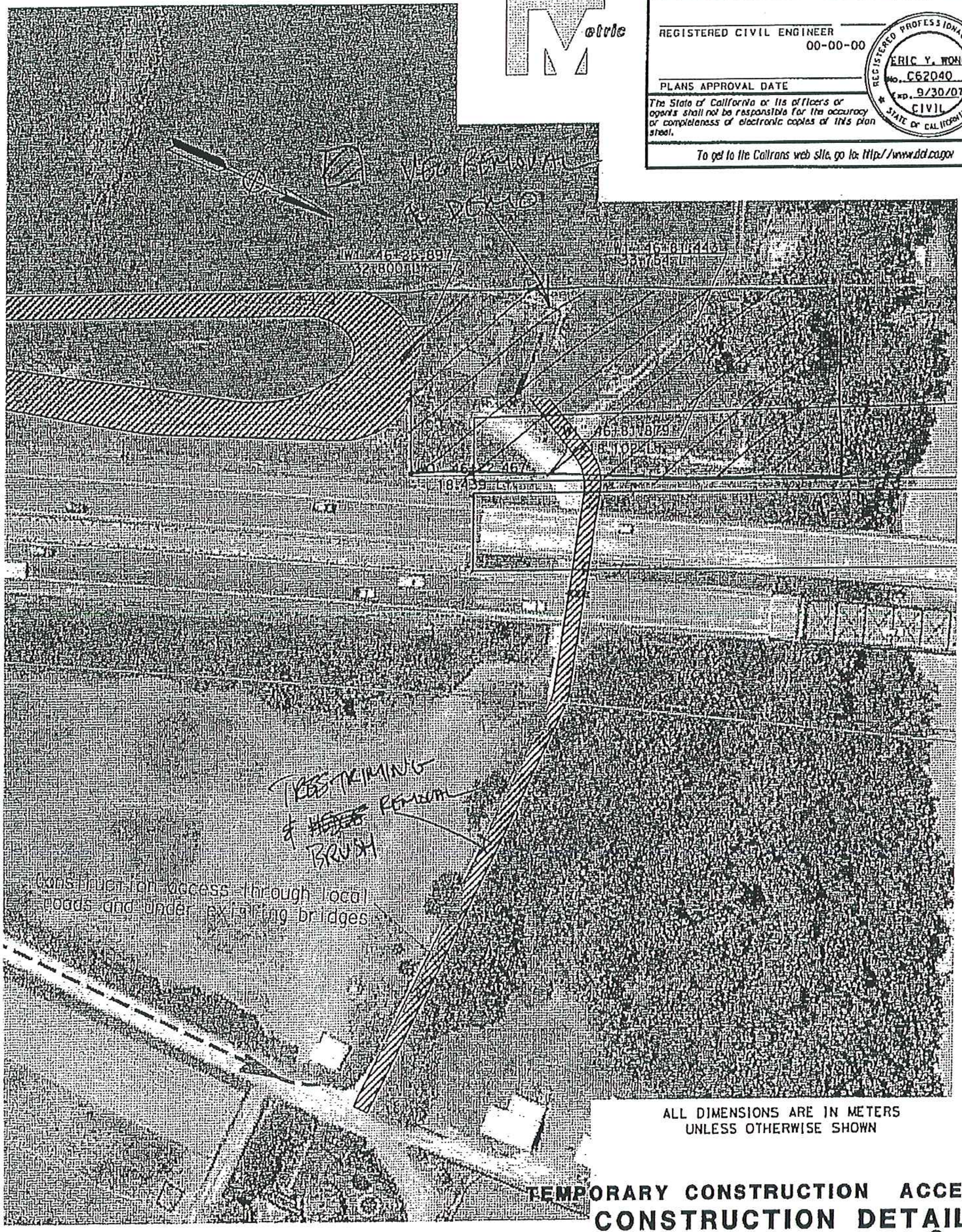

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EA 296101

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	101,200	KP143.8/145.0 KP 0.4/0.9	44	125

REGISTERED CIVIL ENGINEER
00-00-00

REGISTERED PROFESSIONAL ENGINEER
ERIC Y. WONG
No. C62040
Exp. 9/30/07
CIVIL
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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EA 296101

CALTRANS DISTRICT 1 RESPONSE TO CALIFORNIA COASTAL COMMISSION STAFF REQUEST FOR MORE INFORMATION ON MAD RIVER BRIDGES – CONSTRUCTIBILITY/ALTERNATIVES ANALYSIS

1. *Are Mad River Bridges still vulnerable to scour and, if not, why is Caltrans designing to scour standards?*

The design of the new Mad River Bridges is controlled by local pier scour induced by the 100-year flood, not by degradation induced by upstream mining operations. In 2004, as part of their biennial inspection of the Mad River Bridge and after investigating and inspecting the bridge while taking measurements of the channel, Caltrans Structure Maintenance and Investigations engineers prepared their latest channel cross-section of the Mad River at the bridge crossing location. The cross sections, which Caltrans has been preparing since 1957, indicate that local bridge scour is still occurring due to the characteristics of the river and the underlying geology at the crossing location regardless of gravel extraction.

The bridge inspection report (the document used to scope and program the replacement project) rated the existing Mad River Bridges as a "3" on a scour scale from 9 to 0. "9" is a bridge on dry land and "0" is a bridge that has collapsed from scour. As defined by Caltrans using Federal Highway Administration (FHWA) criteria, a "3" is described as "bridge is scour critical; bridge foundations determined to be unstable for assessed or calculated scour conditions:
-Scour within limits of footing or piles
-Scour below spread-footing base or pile tips"

Following FHWA methods for calculating future anticipated scour at bridges, which is controlled by the anticipated 100-year flood, the local pier scour elevation was determined to occur in the order of 15 feet below the thalwag (low spot) of the river. The local pier scour elevation defines the elevation as to what depth scour can be anticipated to occur from the 100-year flood. If a pile cap were used, as would be required with the use of 30-inch diameter piles, additional excavation of material would be required within the cofferdam to construct the pile cap below the scour elevation. Approximately 47 feet of excavation would be required at Pier 2, approximately 36 feet at Pier 3 and approximately 41 feet at Pier 4 since the original ground where each of the piers is to be constructed is at a higher elevation than the low spot of the river. The depths of excavation take into account the thickness of the footing and seal course (see below for a more detailed explanation), which are placed below the scour elevation line. With a 7-foot diameter pile alternative, approximately 30 feet of excavation at Pier 2, 10 feet at Pier 3 and 20 feet at Pier 4 will still occur below original ground but only to a depth to what is termed the pile cut-off elevation. The bridge design engineer through detailed analysis establishes the pile cut-off elevation. The pile cut-off elevation establishes the location where the support shaft transitions from a pile to a pier with this monolithic

Items 1b; 8

Exhibit M

piling to pier design. Also, since a footing is not required with the 7-foot diameter pile option, the cofferdam size will be much smaller resulting in less volume of excavation.

A pile cap, also known as a bridge footing, would encroach significantly into the wetted channel of the river with a portion (approximately 40) of the piles being required to be driven in the wetted channel. As the bridge spans are already designed at their maximum lengths for a cast-in-place prestressed box girder bridge, it would not be possible to lengthen the spans to avoid the footing from intruding into the wetted channel. A footing would be approximately 25-feet in length, or 12.5 feet either side of the piers, which would cause the concrete footing at Pier 3 to intrude into the wetted channel by approximately 5 feet at the northerly side of the footing.

For comparison, the Southbound Route 101 Van Duzen River Bridge in Humboldt County was designed using 30-inch diameter piles for the piers. Approximately 36 piles were designed to be used at each pier on the Southbound Van Duzen River Bridge that was recently constructed. The pile cap, or reinforced concrete footing, for each of the piers was approximately 6 feet thick with an additional 4-foot thick concrete seal course, used to deter water from intruding into the cofferdam during construction of the footing. A footing is required to transfer load from the piers into the pilings. Each of these reinforced concrete footings were 30 feet by 30 feet in size. In order for the footings to be below the calculated scour elevation, the following approximate depths of excavation were required at the Southbound Route 101 Van Duzen River Bridge:

Pier 2 39 feet
Pier 3 39 feet
Pier 4 51 feet

Caltrans Bridge Design Engineers and Geotechnical Engineers designed the Mad River Bridges using 7-foot diameter pilings instead of 30-inch diameter pilings for the following reasons:

- Monolithic piling-to-pier construction for scour and seismic demands for the site; specifically, for structural design superiority related to the analysis and design of the foundation
- 7-foot diameter pilings are located out of the wetted channel, where they would not be exposed to continued scour potential from lower intensity storms and flows; if a footing were used as required for the 30-inch diameter piling, the pilings in the wetted channel would be exposed to this lower intensity scour potential
- Has a smaller footprint to construct as 30-inch diameter piling requires a reinforced concrete footing that would have to be excavated to at approximately 36 feet below the current riverbed elevation at Piers 3 and 4
- Would avoid having cofferdam located in the wetted channel
- Would require less time to construct as there are approximately 20 times less piles and no footing would have to be constructed

2. *How did Caltrans assume a 20:1 pile ratio at Mad River Bridges (40 30-inch diameter piles for every 2 7-foot diameter pile as an in lieu of number) when Ten Mile River Bridge had an in lieu of ratio of 16:1?*

Every bridge location throughout the state is different and is analyzed on a site-specific basis. Such items as peak-rock acceleration, maximum credible earthquake, geomorphology, length of spans, updates in design criteria, depth of scour, depth of bridge, type of bridge, length of pier(s), size of pier(s), number of piers, etc...are analyzed on a site-specific basis. One cannot take the "cookie-cutter" approach that because one bridge has one type of foundation that another bridge should have the exact same number of pilings or type. Take the Southbound Van Duzen River Bridge on Route 101, for example. The bridge has 36 piles supporting every column compared to 20 that would be required for at Mad River Bridge or 16 that would be required for at Ten Mile River Bridge.

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3. *Why does Caltrans have two plus acres of impacts with use of 7-foot diameter CISS piling?*

The 2+ acres is the sum total of all the area in the channel where Caltrans anticipates performing temporary re-grading work on the gravel bar for the whole project. Caltrans does not anticipate 2+ acres every year or any single year for that matter. Caltrans is proposing to submit an annual "River Access Plan" for CA Coastal Commission (CCC) review and approval. Access road areas, volumes, etc...can be designed much better with the help of the contractor on an annual basis once the river conditions can be surveyed each season. Tom Fitzgerald of Caltrans Construction staff has already discussed this with Melanie Faust of Coastal staff.

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4. *Can Caltrans use a trestle bridge to minimize impacts and not reroute the channel?*

It is possible but does not represent the most feasible or practicable alternative. A trestle is used by Caltrans (and its contractors) only in environments where the piers can only be accessed (due to the existence of an estuary, bay, river channel, etc...) by spanning a waterway or other appurtenance. A good example is Ten Mile River Bridge where a trestle bridge was needed to access the pier locations in the wetted channel and to cross over wetland areas. Mad River Bridges does not require such a trestle bridge since both Pier 3 and Pier 4 are located out of the wetted channel and work, such as pile driving, can be performed from either the banks or on the dry gravel bar as proposed. Also, a trestle bridge would require that pipe piles be driven to support the superstructure of the trestle bridge and would require open water pile driving. By using water bladders and gravel to increase the area of dry gravel bar around the footings Caltrans can keep the pile driving out of the wetted channel. Also, by creating this dry gravel bar under the new structures, the falsework, which supports the formwork from which the new bridge will be constructed, can be built on bearing pads and avoid temporary support piles being driven

in the wetted channel. The temporary support piles would be required because the span over the channel would otherwise be too long to support the falsework loads.

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5. *Was a trestle bridge not given consideration due to the heavy loads induced by designing the bridge for "heavy" 7-foot diameter piles that will likely require a bigger crane and hammer?*

No. It is possible to design a trestle bridge to withstand the loads required for the construction of this project. As stated above, a trestle bridge was not proposed because it does not represent a practicable or feasible alternative. It should also be made clear that the bigger the size of a crane does not mean more impacts to the environment. A bigger crane can span longer distances, thus sometimes reducing the impacts by increasing the distance that materials can be "flown in." A larger crane can place larger falsework girders, which can span a wider river channel for falsework or temporary bridges. Also, there are numerous other activities on the project that will require the use of a crane in addition to pile driving. Operations such as falsework construction and bridge demolition could very well dictate the size of the crane that is used on site. It also depends on the contractor and the availability of cranes. One cannot necessarily make the connection between the size of piles used for the projects and the size of crane that will ultimately be used by the contractor.

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6. *Is there a larger pile that could be used, such as an 8' diameter screw-in-the-ground type of pile?*

Screwed in piles, better known as "oscillated piles," such as Fundex Piles, were given consideration for the pier piles at Mad River Bridges. However, these types of piles do not have the capacity to withstand the bridge loads that will exist on the new Mad River Bridges. Each of the new bridges is designed to be supported on two piers that bear huge loads at all but one support location. The bridges were designed this way to better resist the maximum credible earthquake for this area and to better pass the 100-year flood. Caltrans has only utilized this type of piling to date for casings, not for load bearing. According to Caltrans Geotechnical Engineers, the torque required for the top drive rig would also need to be well beyond what is currently available to reach design capacities.

---

7. *What size piling was used at the Southbound Van Duzen River Bridge and Humboldt Bay Bridges?*

As stated above, the Soundbound Van Duzen River Bridge was designed and constructed using 36 30-inch diameter piles for each of the 3 piers. Based on lessons learned from the Van Duzen River Bridge and other projects throughout the state as well as discussions with resource agencies, the project team for Mad River Bridges proposed to use 7-foot diameter piles to avoid the kind of major excavations that were used at Van Duzen River

believing that this represented the least environmentally damaging practicable alternative (in addition to less pile driving).

The Humboldt Bay Bridges (HBB) project was a seismic retrofit project only, whereas the Mad River Bridges project also addresses scour. The HBB project was designed by a consultant engineering firm who initially designed the additional retrofit piles using 8-foot diameter piling. Upon plan review by in-house Caltrans engineers, Caltrans discovered that the consultant design team had designed the bridge for 1-hour serviceability after the maximum credible earthquake was experienced. It was supposed to have been designed for no catastrophic failure (big difference). Caltrans engineers, using 3-foot and 5-foot diameter piles so that the bridge could withstand the maximum credible earthquake without having catastrophic failure, redesigned the foundations.

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8. *Can Caltrans use a smaller crane and smaller hammer if Caltrans used the 30-inch diameter piles?*

As stated in #5 above, there is not necessarily a direct relationship on a project between crane size and pile size due to a number of factors. As far as the use of a smaller hammer goes, the best comparison the District has is at Ten Mile River Bridge and using the analysis titled, "Evaluation of the Use of Smaller Piles for the Replacement of the Mad River Bridges." From information received at Ten Mile River Bridge, a test pile at Pier 7 was driven to refusal (where resistance was such that it would no longer move in the direction to which it was driven without damaging the pile), which was 120 blows/foot, using a D46-32 hammer on August 24, 2007. The peak noise level was 184.9 dB. With the larger D62-16, the same pile was driven to refusal (200 blows/foot) on September 24, 2007. The peak noise level was 190 dB. However, looking at the data closely, the noise started out at 190 dB for the first few blows until the pile started moving, then dropped down to 185 dB for awhile and slowly increased back up to 190 dB at the point of refusal. Based on this information, the consultant to Caltrans from Illingworth and Rodkin believed that both hammers were generating similar sound levels.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	101,200	KP143.8/145.0 KP 0.4/0.9		125

REGISTERED CIVIL ENGINEER
00-00-00
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
ERIC Y. WONG
No. C62040
Exp. 9/30/07
CIVIL
STATE OF CALIFORNIA

To get to the Caltrans web site, go to: http://www.dot.ca.gov

Caltrans Metric

DRAFT

SEE SHEET G-1

SEE SHEET G-3

R/W

ESA

MAD RIVER BRIDGE 04-0025L

MAD RIVER BRIDGE 04-0025R

"W1" LINE

"W2" LINE

"W3" LINE

"W5" LINE

"PED11" LINE

"PED12" LINE

AERIALLY DEPOSITED LEAD TO BE REMOVED

DIRT

ALL DIMENSIONS ARE IN METERS
UNLESS OTHERWISE SHOWN

CONTOUR GRADING

SCALE 1:500

G-2

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CALCULATED/ DESIGNED BY		DATE	REVISED BY
CHECKED BY			DATE REVISED

PROJECT ENGINEER
ERIC Y. WONG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
NORTH REGION
OFFICE OF DESIGN, WEST
DESIGN BRANCH 81

Caltrans

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	101,200	KP143.8/145.0 KP 0.4/0.9		125

REGISTERED CIVIL ENGINEER

00-00-00

PLANS APPROVAL DATE

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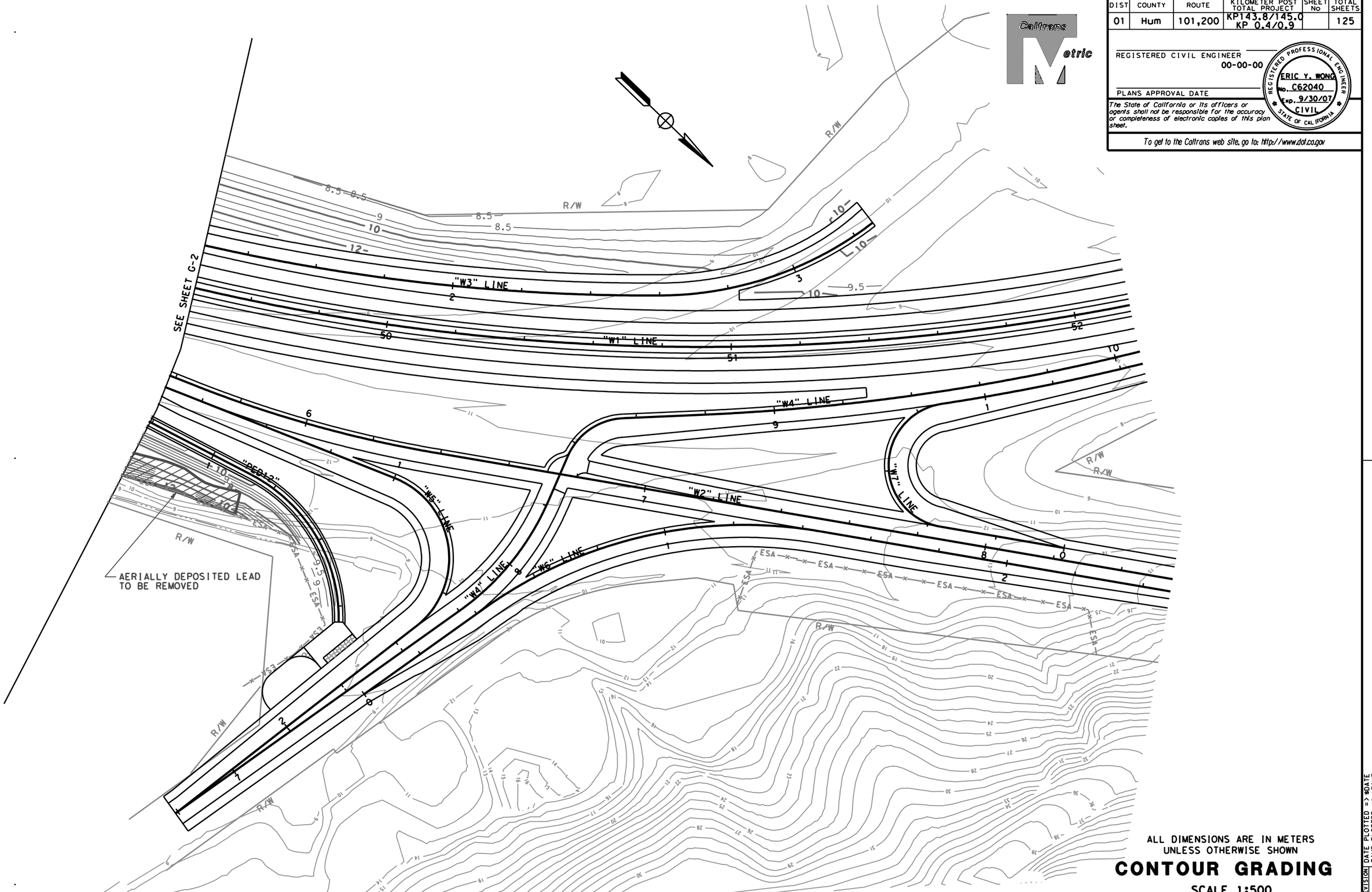
Caltrans Metric



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CONTOUR GRADING

SCALE 1:500

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G-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION NORTH REGION OFFICE OF DESIGN, WEST DESIGN BRANCH 81	PROJECT ENGINEER ERIC Y. WONG	CALCULATED/ DESIGNED BY	DATE REVISED
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CU 03251

EA 296101

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Hum	101,200	KP143.8/145.0 KP 0.4/0.9		125

Caltrans Metric

REGISTERED CIVIL ENGINEER 00-00-00

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER ERIC Y. WONG No. C62040 Exp. 9/30/07 CIVIL STATE OF CALIFORNIA

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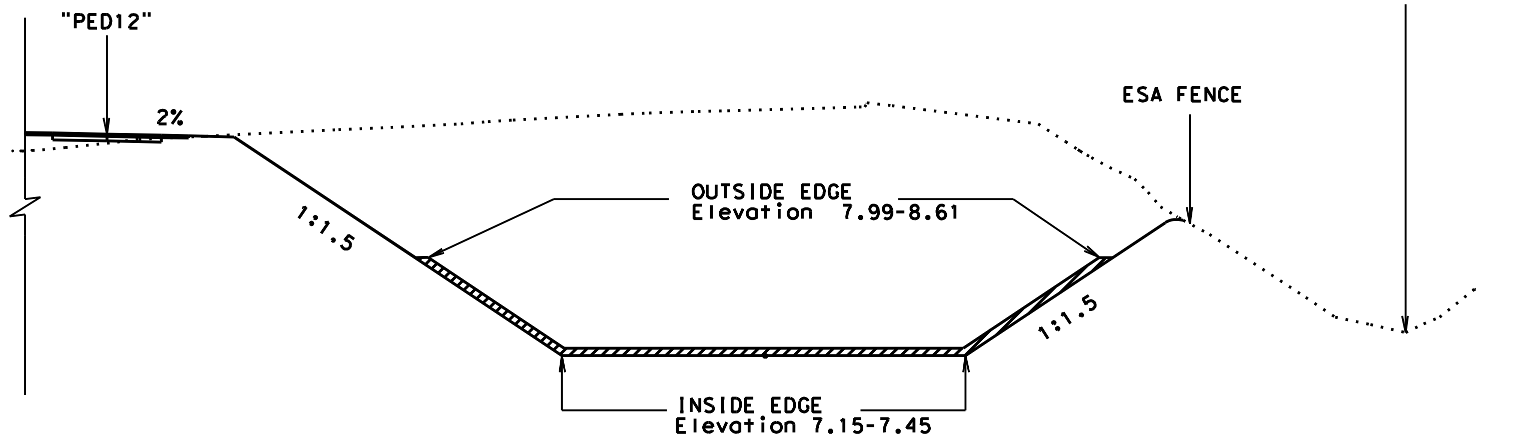
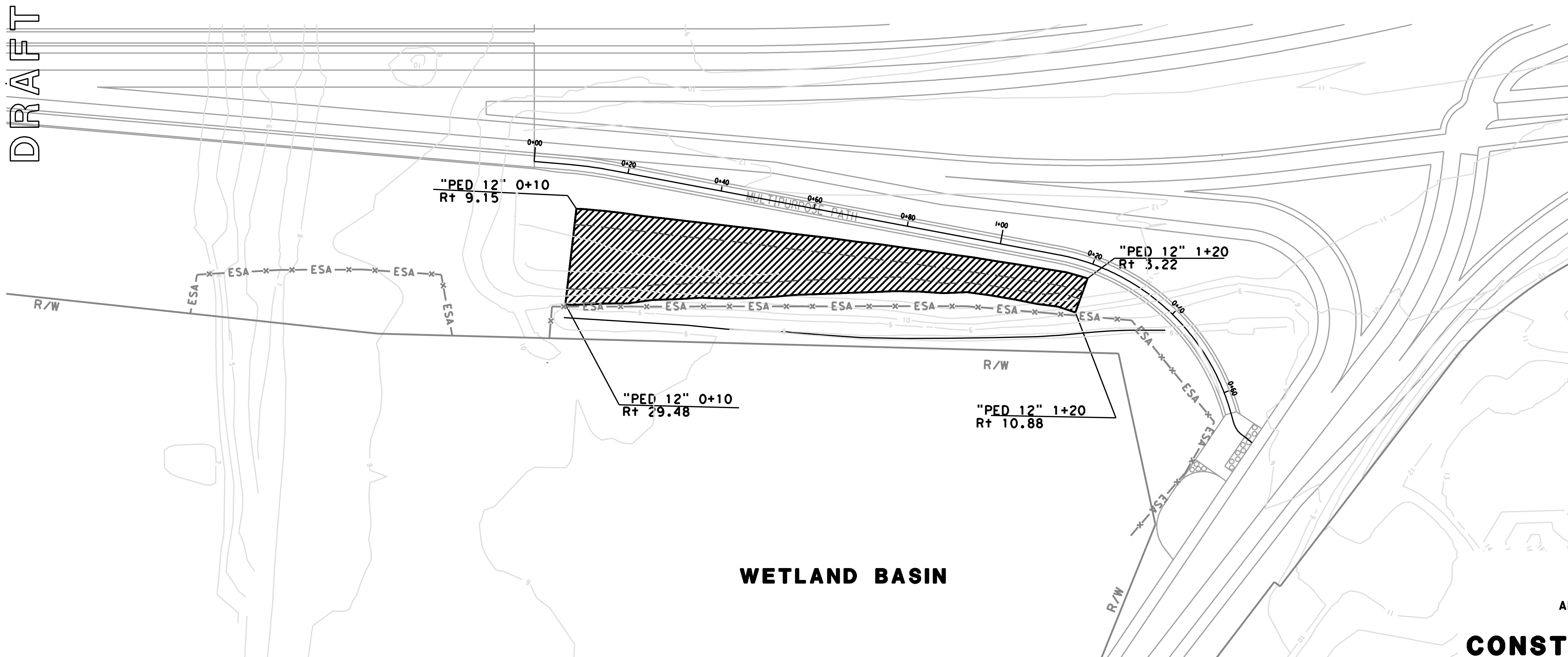
LEGEND:

WETLAND BASIN AREA TO BE RE-VEGETATED



WETLAND BASIN TYPICAL X- SECTION
"PED 12" 0+10 TO 1+20



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CONSTRUCTION DETAILS

NO SCALE

C-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
NORTH REGION
OFFICE OF DESIGN, WEST
DESIGN BRANCH 81

PROJECT ENGINEER ERIC Y. WONG

CALCULATED/ DESIGNED BY | CHECKED BY

DATE | REVISED BY | DATE REVISED

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State of California
Department of Transportation

Business, Transportation and Housing Agency

Memorandum

To: California Coastal Commission

Date: December 07, 2007

File No.: HUM 101/EA # 296101

From: Samantha Hadden, Fisheries Biologist, Jones & Stokes
North Region Environmental Services, Branch E2

Subject: Mad River Bridges Replacement Project Potential Fisheries Mitigation Sites

Fisheries mitigation is being proposed by Caltrans to mitigate for the potential take of listed salmonids during pile driving activities during the replacement of the Mad River Bridges on Highway 101 in Humboldt County. Worst case planning estimates for potential bioacoustic impacts to listed salmonids due to pile driving have been developed. However, the extent of potential take will not actually be known until after the project has been completed. Caltrans has proposed a number of measures to avoid and minimize potential take of listed salmonids during piles driving (i.e., fish exclusion). Caltrans estimates that with the implementation of exclusionary devices at the site during project construction take of listed species can be reduced by 88-92%.

The following is a list and summary of potential fish passage mitigation sites within the Mad River watershed that is proposed and developed in coordination with Humboldt County Public Works and the California Department of Fish and Game (CDFG). The type of fisheries mitigation proposed is adult fish passage. However, in many cases juvenile salmonid passage also will be improved. The quantity of mitigation that will be required has not been yet determined as it will be a function of the number of listed salmonids estimated to be impacted during pile driving activities. This estimate will be made from fisheries monitoring associated with pile driving construction activities. The number of adult equivalents potentially impacted during pile driving will be estimated from fisheries monitoring (i.e., snorkel counts) pre- and post- project. This list is meant to provide permitting agencies with preliminary information regarding potential mitigation sites that could be within the Mad River watershed.

The sites presented here represent a range of mitigation opportunities within the watershed. However, not all sites have been completely evaluated and fish passage mitigation opportunities have not been completely quantified (i.e., quantity of potentially spawning habitat available at each potential site). Caltrans will continue to consult with the fisheries resource agencies to determine the benefits of providing fish passage at each of the sites below. In addition, it may be necessary for Caltrans to consult with their water resources engineers in order to provide cost estimates of providing passage at each site (i.e., state culvert repairs).

Potential fisheries mitigation sites are as follows:

1. Hall Creek (near Mad River confluence)

   Hall Creek is a second order tributary to the Mad River. It flows into the Mad River south of the town of Blue Lake. Passage through a State culvert under HWY 299 provides anadromous salmonids with access to spawning and rearing habitat within Hall, Noisy, and Mill creeks. Hall and Noisy creeks have been identified as key coho salmon habitats to improve and maintain within California (CDFG 2004). The presence of coho salmon has not been confirmed in Mill Creek, however the creek has only been surveyed for juvenile presence during the summer months when the creek is dry. It may provide spring or winter rearing, or adult spawning habitat for salmonids.

   State highway 299 crosses Hall Creek below its confluence with Noisy Creek (note: the creek which HWY 299 passes over is mislabeled on USGS maps as Noisy Creek). Juvenile coho salmon were documented utilizing Hall Creek in a California Department of Fish and Game 2001 coho salmon presence/absence survey of the Mad River watershed (Michelle Gilroy, CDFG, Personal Communication 2007).

   Since coho salmon are present within Noisy and Hall creeks it is likely that the culvert near the confluence with the Mad River is a complete barrier to adult fish passage. However, it is not passable over a wide enough range of flows to facilitate complete utilization throughout the spawning season, and may be a complete barrier to juvenile salmonids attempting to move upstream to seek refuge from winter flows in the mainstem of the Mad River.

2. Mill Creek (at the Turner Road crossing in McKinleyville)

   Mill Creek near McKinleyville is a first order tributary to the Mad River.
   The status of salmonid populations in Mill Creek near McKinleyville is not known at this time. However, it is believed to be an adult salmonid passage impediment. Potential repairs could include the installation of weirs but, may require a complete culvert replacement. No cost estimates are available at this time. Further consultation with Humboldt County Public Works, CDFG, and the National Marine Fisheries Service (NMFS) will be necessary to determine what benefit passage mitigation at this site would provide to Mad River salmonids.

3. Essex Gulch (Highway 299 crossing)

   Essex Gulch, is a perennial stream that should support coho, steelhead and coastal cutthroat trout. However, it was not listed in the *Recover Strategy for California Coho Salmon* (CDFG 2004). The Caltrans facility in a 2001 survey was estimated

to be in good condition (and is therefore unlikely to be funded as a facilities maintenance or replacement project anytime in the near future).

The Caltrans structure is 605' long and has a slope of 2.1%. It reportedly meets adult fish passage guidelines for 44% of fish passage design flows (Lange 2001). The culvert is likely an upstream passage barrier to juveniles for most, if not all flows. There is approximately 6,000 feet of usable, albeit somewhat degraded, habitat available upstream.

A shorter, and less deeply buried, county culvert is located approx 100 feet downstream of the state culvert; the county culvert appears to be a complete barrier due to an excessive outlet perch (greater than 6 feet). Chris Whitworth (Humboldt County Public Works) has stated that the Caltrans facility mentioned above is viewed as a barrier to fish passage and therefore the County has not actively sought funding to repair its culvert, which is located just downstream of the State culvert. A proposed fix of fish passage of the Caltrans Essex Gulch facility would require that the County culvert also be fixed. It may be necessary to re-evaluate adult fish passage criteria at both of these culverts to determine potential approaches to mitigation.

4. Mill Creek (NF Mad River)

Mill Creek is a tributary to the NF of the Mad River. CDFG surveys in 2005 documented the presence of juvenile rainbow trout (potentially steelhead, or coastal cutthroat trout). There are two high flow culvert barriers located approximately 250 ft and 500 ft from the Mill Creek and Mad River confluence. No cost estimates are available at this time. Further consultation with Humboldt County Public Works, CDFG, and NMFS will be necessary to determine what benefit passage mitigation at this site would provide to Mad River salmonids. Note: the location of this potential mitigation site is not on the enclosed map. Its exact location needs to be verified in the field.

5. Powers Creek (HWY 299 Crossing)

Powers Creek is listed as a historic coho salmon stream. The state culvert, located at the HWY 299 crossing, may be a passage barrier. Channel slopes above the culvert are believed to be too steep for anadromy. If the habitat above the culvert is suitable for anadromous salmonids (i.e., not too steep) then the culvert would need to be completely replaced (Lang 2001). Dan Free (NMFS, personal communication to Kelley Garrett, 2007) believes this facility to be a good candidate for a fish passage improvement.

6. Mad River Hatchery Dam Weir (below the Mad River Hatchery)

There has been some discussion with CDFG and NMFS about repairing the weir to facilitate adult and juvenile passage. Improving fish passage at the weir may benefit the Mad River summer steelhead population in particular. No cost estimates are available at this time. Further consultation with CDFG, and NMFS will be necessary to determine what benefit passage mitigation at this site would provide to Mad River salmonids.

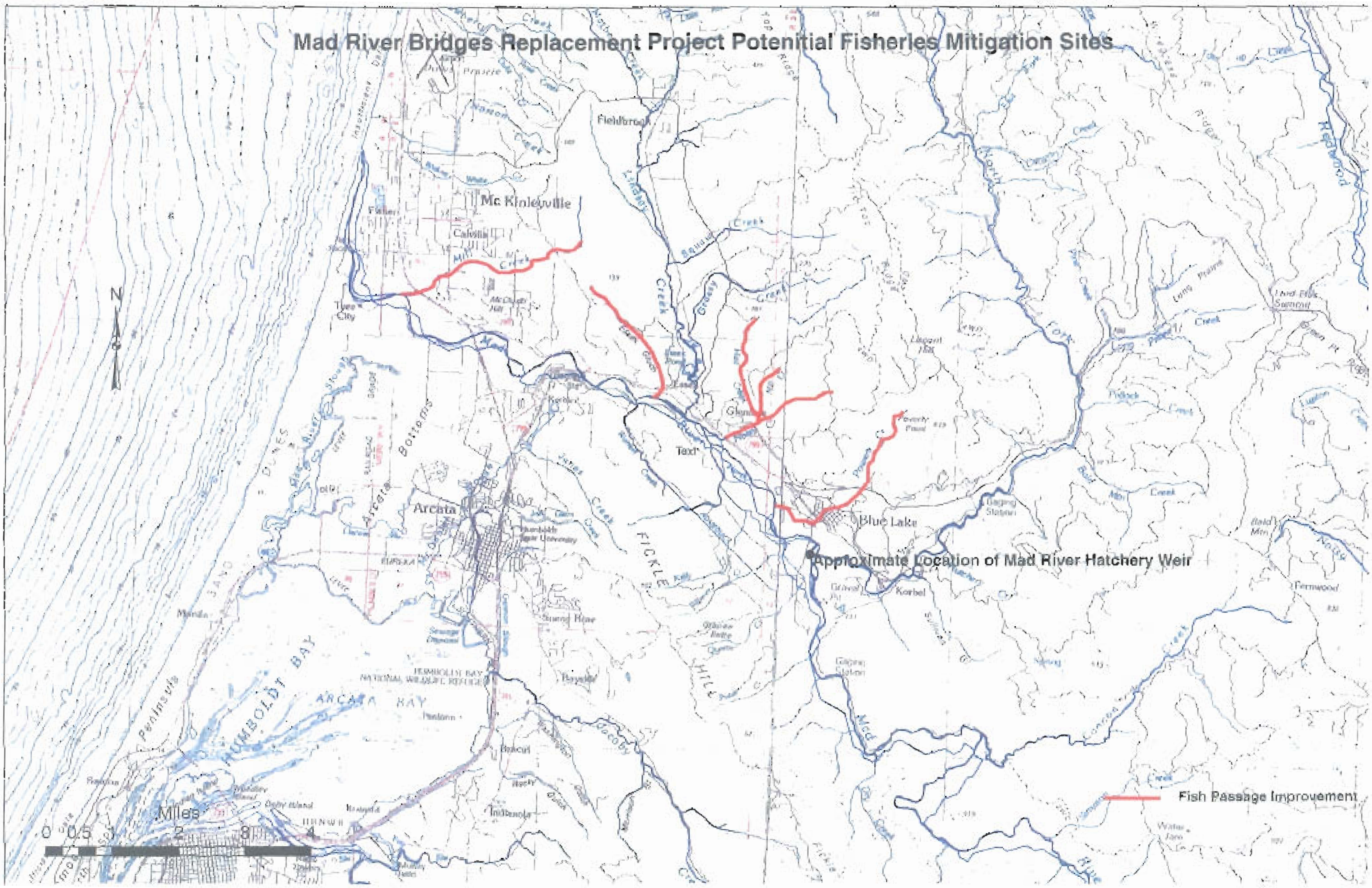
References

CDFG 2004. Recovery Strategy for California Coho Salmon, A Report to the California Fish and Game Commission.

Lange, M. 2001. California Department of Transportation (Caltrans) District 1 Pilot Fish Passage Assessment Study: Humboldt County Fish Passage Studies.

Enclosures

Mad River Bridges Replacement Project Potential Fisheries Mitigation Sites (Map)



Mad River Bridges Replacement Project Potential Fisheries Mitigation Sites
Approximate Location of Mad River Hatchery Weir
Fish Passage Improvement
Miles
0 0.5 1 2 3 4
N
Mc Kinleyville
Arcata
Blue Lake
Fieldbrook
Korbel
FICKLE HILL
HUMBOLDT BAY
ARCATA BAY

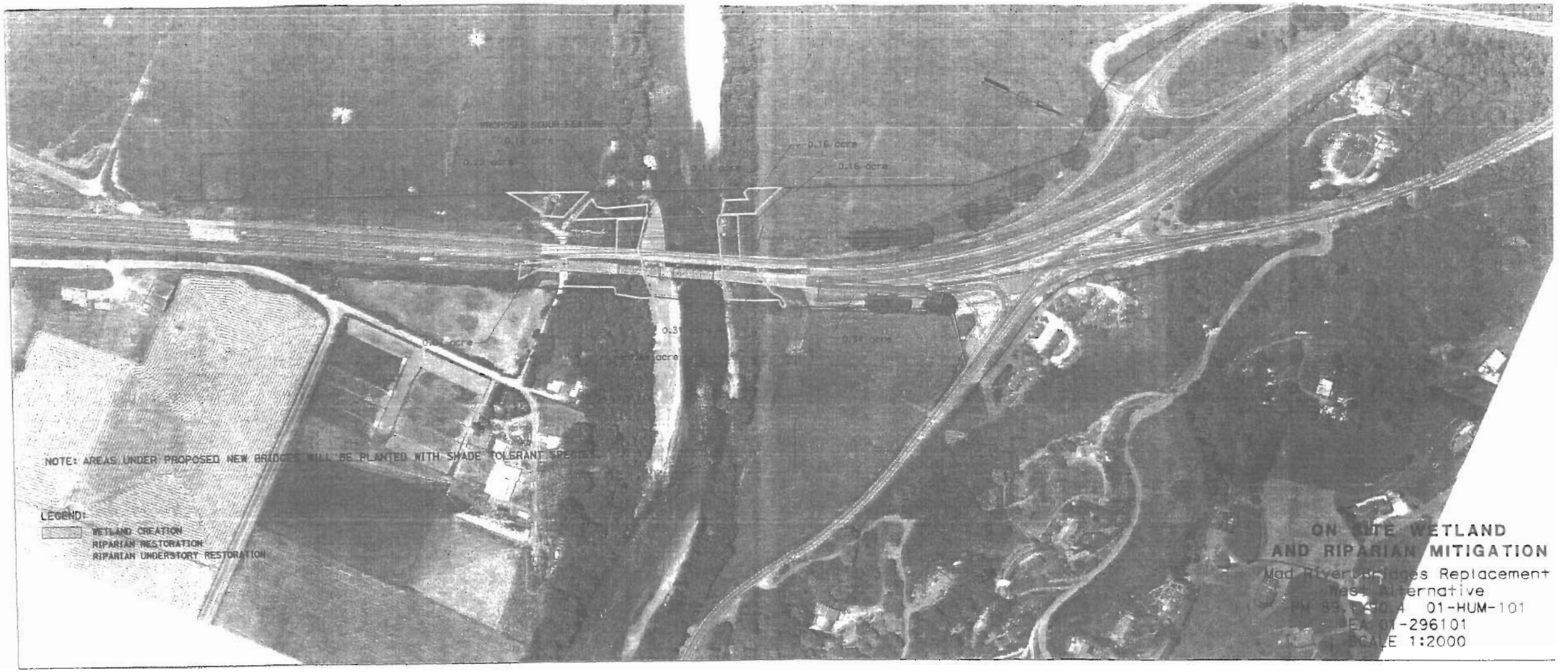
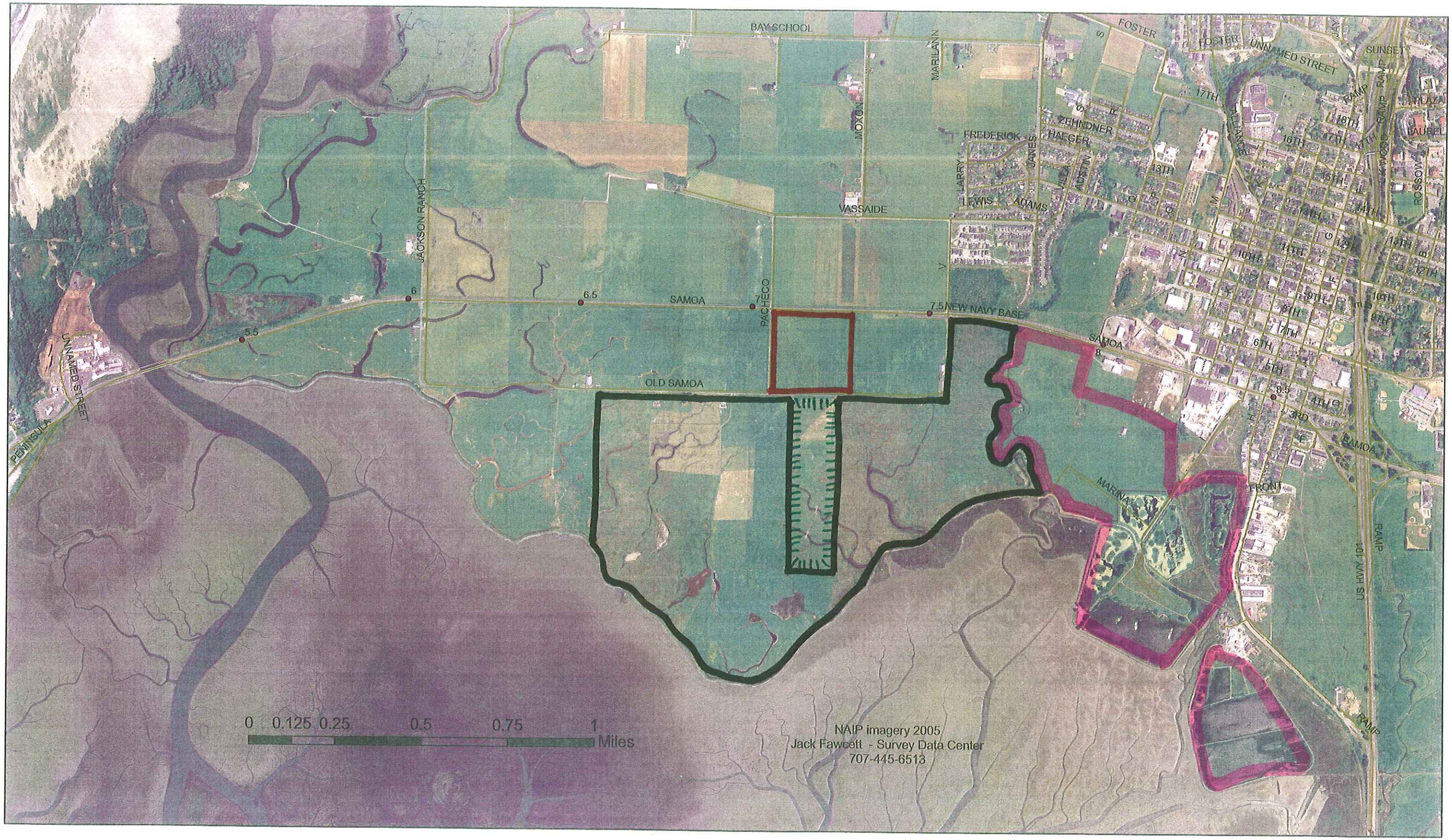

PROPOSED SCOUR FEATURE
0.16 acre
0.16 acre
0.34 acre
NOTE: AREAS UNDER PROPOSED NEW BRIDGES WILL BE PLANTED WITH SHADE TOLERANT SPECIES
LEGEND:
WETLAND CREATION
RIPARIAN RESTORATION
RIPARIAN UNDERSTORY RESTORATION
ON SITE WETLAND
AND RIPARIAN MITIGATION
Mad River Bridges Replacement
Alternative
01-HUM-101
296101
SCALE 1:2000

Exhibit D



CDFG Mad River Slough Wildlife Area

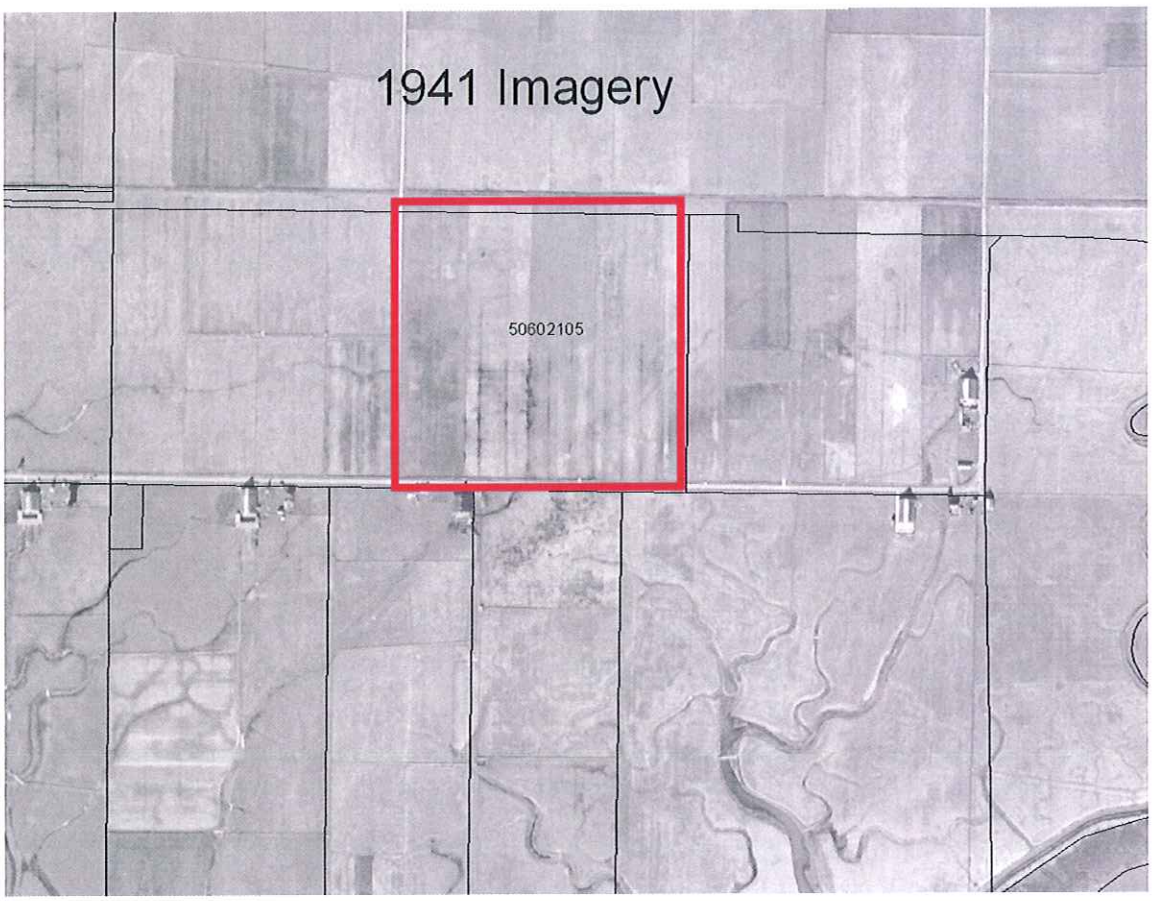
CDFG New Parcel (Moranda)

Old Samoa Parcel

City of Arcata Marsh and Wildlife Sanctuary

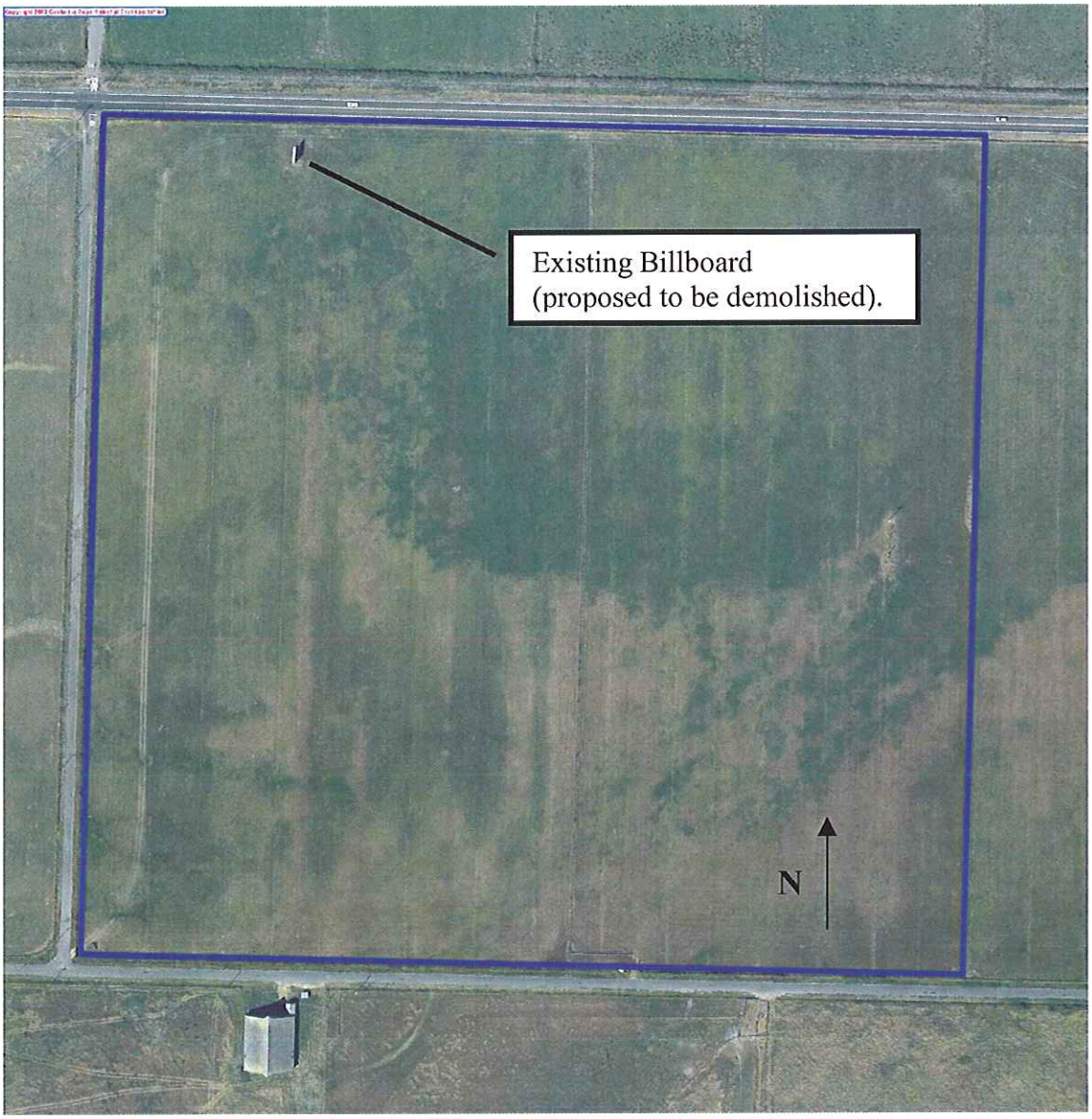
FIGURE 2. – Resource Properties Map

Exhibit 3 – 1941 AERIAL PHOTO OF PARCEL

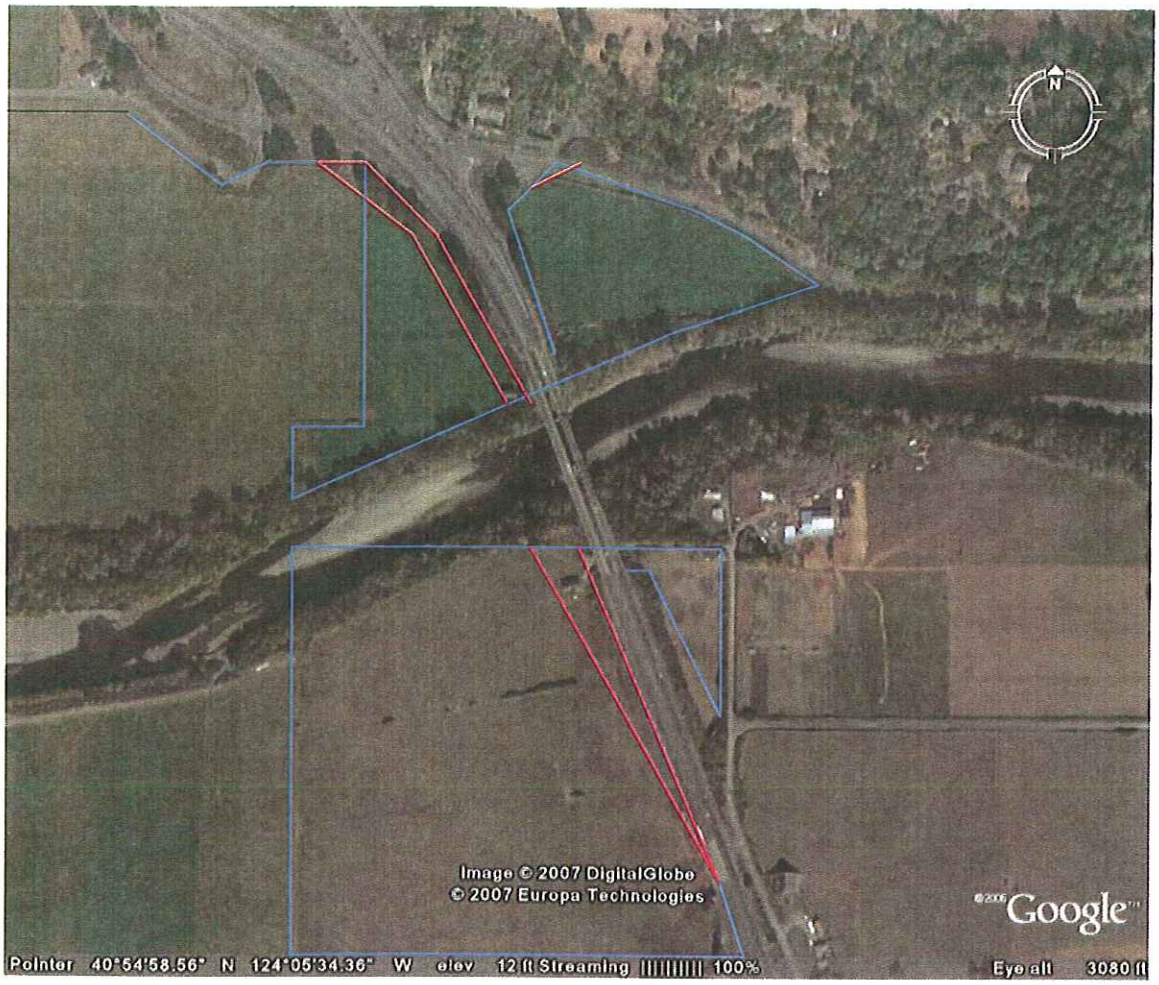


Old Samoa Parcel (50602105). On State Route 255, at Pacheco and Old Samoa Roads, Humboldt County.

Exhibit 4 – AERIAL PHOTO PLAN VIEW (2005)



Old Samoa Parcel boundary, and existing fenceline (approximate).



---- Existing Agricultural Parcel Boundary
---- Agricultural Parcel Acquisition Boundary