

**California Regional Water Quality Control Board
North Coast Region**

Monitoring and Reporting Program No. R1-2010-0066

For

**California Department of Transportation
Highway 101 – Willits Bypass Project
WDID No. 1B10019WNME**

Mendocino County

1.0. INTRODUCTION and OBJECTIVE

This Monitoring and Reporting Program (MRP) is issued as a condition of the Clean Water Act Section 401 Water Quality Certification and requires the monitoring and assessment of waters of the State (wetlands, streams, and riparian areas) and the submission of technical reports. The objective of monitoring conducted under this MRP is to provide the California Department of Transportation (Caltrans) and the North Coast Regional Water Quality Control Board (Regional Water Board) with information concerning the conditions and quality of waters of the State and concentration trends within and adjacent to the proposed Highway 101 Willits Bypass Project (project) alignment and the associated off-site mitigation lands. The requirement for technical reports associated with this MRP is related to Caltrans March 1, 2010, application for a Clean Water Act Section 401 Water Quality Certification/Waste Discharge Requirements.

The technical reports required within this MRP are necessary for the Regional Water Board to appropriately determine whether or not the project will adequately comply with the Basin Plan and all applicable Water Quality Standards and provide the mitigation necessary to compensate impacts to jurisdictional resources. To compensate for the impacts to wetlands Caltrans proposes a watershed approach to achieve an increase in functions and values within the selected mitigation area. This MRP is intended to provide the data necessary to validate that proposal. This MRP is designed to collect data and provide reports that assess the biological, chemical, physical characteristics and conditions of resources within the jurisdiction of the Regional Water Board for both the bypass alignment and the associated mitigation lands. It is necessary to establish baseline conditions of surface waters to verify the establishment and enhancement of wetlands, riparian areas, and waters of the U.S. and State within the mitigation lands.

Documenting pre-project baseline conditions of surface waters for the bypass alignment and the mitigation lands are required as part of this MRP. Baseline data will be used to demonstrate that the bypass, both during and after construction, is in compliance with the Basin Plan, California's antidegradation policy in State Water Board Resolution No. 68-16, and the United States Environmental Protection Agency (U.S. EPA) established

sediment and temperature total maximum daily loads (TMDLs) for the Upper Main Eel River and tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury). Pursuant to Regional Water Board Resolution R1-2004-0087, *Total Maximum Daily Load Implementation Policy Statement for Sediment-Impaired Receiving Waters within the North Coast Region* (Sediment TMDL Implementation Policy), the Executive Officer is directed to “rely on the use of all available authorities, including existing regulatory standards, and permitting and enforcement tools to more effectively and efficaciously pursue compliance with sediment-related standards by all dischargers of sediment waste.”

The primary objectives of the MRP include, but are not limited to:

- A. Assessing the biological, chemical, and physical environmental characteristics within the bypass alignment, and within the mitigation lands;
- B. Assessing the overall health and evaluating trends in receiving water quality;
- C. Assessing the potential biological, chemical, physical impacts, both during and after construction, of the bypass alignment;
- D. Determining and revising site specific performance standards and success criteria for the biological, chemical, and physical environmental characteristics within the bypass alignment, and within the mitigation lands;
- E. Evaluating the effectiveness of BMPs, mitigation measures, and avoidance measures;
- F. Evaluating activities that results in or may result in violations of MRP and the Water Quality Certification that may warrant additional BMPs or stop work orders;
- G. Identifying sources of pollutants;
- H. Assessing compliance with water quality objectives and TMDLs;
- I. Measuring and assessing the reductions or prevention in pollutant loads; and
- J. Verifying and successful repair within the bypass alignment and enhancement of the mitigation lands.

The data collection and evaluation will be broken down into four separate phases for the bypass alignment and mitigation lands (with multiple tasks per phase). Data collection and evaluation may necessitate revisions to the MRP as trends and comparisons are established. This MRP requires the collection and evaluation of data to supplement the Caltrans prepared Final Mitigation and Monitoring Proposal (Final MMP), dated June 2010, for the performance standards and success criteria, short term, and long term mitigation plans. Also see MRP Appendix 1 – Willits Bypass Flow Chart.

The requirements outlined in this MRP are not subject to an expiration date, and remain in full effect and are enforceable. The Executive Officer of the Regional Water Board may add to or modify this MRP, as appropriate.

The four phases and associated tasks of this MRP will be:

Phase I - Baseline Evaluation and Reporting (Bypass Alignment)

Baseline Tasks

- a) Collect baseline water quality data for stream reaches along the bypass alignment
- b) Collect baseline bioassessment data for bypass alignment
- c) Collect baseline wetland data for bypass alignment
- d) Prepare and submit reports that evaluate data sets to assess the baseline biological, physical, and chemical properties
- e) Incorporate data evaluation, revised success criteria, and revised management plans into MMP

Phase I - Baseline Evaluation and Reporting (Mitigation Lands)

Baseline Tasks

- f) Collect baseline water quality data for mitigation lands
- g) Collect baseline bioassessment data for mitigation lands
- h) Collect baseline wetland data for off-site mitigation lands
- i) Prepare and submit reports that evaluate data sets to assess the biological, physical, and chemical properties
- j) Incorporate data evaluation, revised success criteria, and revised management plans into MMP

Phase II - Construction Compliance Monitoring and Reporting (Bypass Alignment)

Construction Compliance Tasks

- a) Conduct water quality monitoring within the stream reaches along the bypass alignment
- b) Submit monthly reports on construction compliance
- c) Annual Report summary on construction compliance

Phase II - Construction Compliance Monitoring and Reporting (Mitigation Lands)

Construction Compliance Tasks

- d) Conduct water quality monitoring within the mitigation lands
- e) Annual qualitative status reports on progress of plantings, and mitigation construction compliance, and mitigation trends and progress

Phase III - Repair Success (Bypass Alignment) – Evaluating and Measuring Success

Repair Monitoring Tasks

- a) Conduct water quality monitoring within the stream reaches along the bypass alignment to verify repair success
- b) Collect bioassessment data within the stream reaches along the bypass alignment to verify repair success
- c) Collect wetland data for bypass to verify repair success
- d) Annual reporting on compliance and mitigation progress

- e) Final Mitigation Report verifying success.

Phase III - Mitigation Land Enhancement (Mitigation Lands) – Evaluating and Measuring Success

Enhancement Monitoring Tasks

- f) Conduct water quality monitoring within the mitigation lands to verify repair and enhancement success
- g) Collect bioassessment data for the mitigation lands to verify repair and enhancement success
- h) Collect wetland data for the mitigation lands to verify repair and enhancement success
- i) Annual reporting on compliance and mitigation progress
- j) Final Mitigation Report verifying success.

Phase IV - Long Term Total Maximum Daily Load (TMDL) compliance for the Bypass.

TMDL and Long Term Management Tasks

- a) Once success has been achieved for the on-site repair areas, Caltrans shall develop TMDL Compliance Plan and Long Term Management Plan.

Phase IV - Long Term Total Maximum Daily Load (TMDL) compliance for the Mitigation Lands.

TMDL and Long Term Management Tasks

- b) Once success has been achieved for the repair areas and the off-site mitigation lands, Caltrans shall develop TMDL Compliance Plan and Long Term Management Plan.

This MRP will detail Phases 1 and 2 to ensure the proper development and implementation of Phase 3 and 4, which are structured within this order similarly to the baseline monitoring program. However, monitoring requirements throughout Phases 3 and 4 will vary, depending on the results of the baseline evaluation and construction compliance monitoring programs. In addition, all phases of this MRP are subject to site specific conditions, climatic variability, and ultimate need for information and therefore may warrant appropriate changes to best reflect the primary objectives stated above.

2.0. SURFACE WATER MONITORING and REPORTING PROGRAM DEVELOPMENT

Prior to implementing a monitoring and sampling program Caltrans shall develop the proper Quality Assurance Project Plan (QAPP) to ensure the data gathered will be reliable for statistical evaluation. The validity of the data collected for the MRP hinges on the proper methods and procedures used.

2.1. Quality Assurance Project Plan

Caltrans shall develop a QAPP for the bypass footprint (including onsite repair areas) and the offsite mitigation lands. The QAPP shall be submitted to the Executive Officer of the Regional Water Board for review, consideration, and concurrence.

2.2. Bioassessment Protocols

Pre-project bioassessments must be conducted prior to initiating any ground-disturbing activities or vegetation removal. Post-project bioassessments shall be performed the following season after completion of the bypass. In addition, for the mitigation lands, post-project bioassessments shall be performed the season after the completion of the mitigation actions at years five and ten of the mitigation monitoring period. The stream bioassessments must be performed in accordance with the State Water Resources Control Board (SWRCB) Surface Water Ambient Monitoring Program (SWAMP) *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*, dated February 2007, and associated standard operating procedure memo, dated 21 May 2007, and guidance on quality assurance, dated 17 September 2008. In addition, the *Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California*, dated June 2009, shall be used for the algae portion of the bioassessment.

The bioassessment must be conducted in accordance with the stream algae samples and the “full” suite of physical habitat characterization measurements, using the “reachwide benthos (Multi-Habitat) procedure”. The SWRCB SWAMP standard operating procedures, memos, and guidance documents can be found online at: <http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/standard-operating-procedures>

3.0. PHASE I - BASELINE MONITORING AND REPORTING

The results of the monitoring requirements outlined below shall be used to develop performance standards and success criteria for the on-site repair areas (bypass alignment) and the off-site mitigation lands. Additionally, the data will be used to demonstrate the enhancement and protection of beneficial uses and long term TMDL implementation for the receiving waters with the Outlet Creek Hydrologic Sub-Area (HSA).

3.1. Baseline Bypass Monitoring

The following water quality constituents will be measured as part of the baseline monitoring within the bypass alignment. This baseline data shall be collected from

August 20th, 2010 to at least May 15th, 2011, if baseline conditions are not changed, baseline monitoring shall continue. Baseline data collection will continue until construction activities have a measureable effect on receiving water monitoring data.

Constituent(s)	Frequency
Stream flow (cubic feet per second)	Continuous ¹
pH	Continuous
Temperature (Air and Water)	Continuous
Total Dissolved Solids	Continuous
Turbidity	Continuous
Specific Conductance	Continuous
Dissolved Oxygen	Continuous
Total Settleable Solids	Event based*
Hardness	Event based*
Total and Dissolved Metals (Cam 17)	Event based*
Oil and Grease	Event based*
Bioassessment – BMI, Phab, & Algae	One Baseline Survey in Summer 2010. (Reaches that are dry in 2010 shall be conducted in Spring 2011)
California Rapid Assessment Method (CRAM) Score	One survey to be determined per CRAM methodology (Spring 2011)
* Additional precipitation event sampling to be conducted in conjunction with the “first flush ² ” event and the seven subsequent storm events > 0.25 inches of precipitation in 24 hours. Precipitation events are separated by 48 hours of dry weather. Precipitation monitoring shall be conducted daily from Phase I through Phase III of this program at a weather station within Little Lake Valley and a method approved by Regional Water Board staff.	

In addition, precipitation event-based monitoring will include visual observations of the appearance of the stream, including color, presence of floating or suspended matter or debris; appearance of the receiving water at the station location (e.g., occurrence of erosion and scouring, solids deposition, unusual aquatic growth, algae); and observations about the receiving water, such as the presence of aquatic life.

Wetland baseline assessments throughout the bypass alignment shall include:

- Hydrology [i.e., ground water level fluctuation (discharge and recharge), inundation (depth, duration and frequency), soil saturation, drainage patterns, erosion and deposition] - Hydrology frequency at two week intervals from **November 1st - May 30th, 2010**
- Absolute percent coverage of wetland plants
- Absolute percent cover of native plant species

¹ Continuous monitoring shall occur at all sampling sites at 15 minute intervals.

² First flush is the initial surface runoff from a rainstorm after the dry season that causes a measurable increase of flow in surface waters.

- Species richness
- Absolute percent coverage of invasive species
- CRAM score.

3.2. Baseline Bypass Monitoring Locations

The number of monitoring locations will vary according to the status of bypass construction. Baseline water quality data will be collected at the following 10 locations along the bypass alignment, as shown in Figure 1:

- Upper Haehl Creek downstream of the Haehl Creek interchange construction footprint (WQ-3);
- Middle Haehl Creek downstream of the Haehl Creek bridge construction footprint (WQ-5);
- Lower Haehl Creek downstream of the viaduct construction footprint, but upstream of the Baechtel Creek confluence (WQ-9);
- Baechtel Creek upstream of the Baechtel Creek retaining wall construction footprint (WQ-6), upstream of the Haehl Creek confluence (WQ-7), and upstream of the viaduct construction footprint (WQ-10);
- Broaddus Creek upstream of the viaduct construction footprint (WQ-12);
- Outlet Creek downstream of the viaduct construction footprint (WQ-11);
- Mill Creek downstream of the viaduct construction footprint (WQ-14); and
- Upp Creek downstream of the Quail Meadows interchange construction footprint (WQ-17).

Bioassessment monitoring will occur at the following 13 locations along the bypass alignment, as shown in Figure 2:

- Upper Haehl Creek upstream of the Haehl Creek interchange (BA-1), within the Haehl Creek interchange creek repair (BA-2), and downstream of the Haehl Creek interchange (BA-3);
- Baechtel Creek below its confluence with Haehl Creek (BA-4), along the Category I riparian enhancement area parcels (BA-5), and below the riparian enhancement area (BA-6);
- Outlet Creek downstream of the Baechtel-Broaddus Creek confluence but upstream of the Category I riparian enhancement area (BA-7);
- Mill Creek upstream of the bypass footprint (BA-8), below the bypass footprint (BA-9), and downstream of the Category I riparian enhancement parcel (BA-10); and
- Upp Creek upstream of the Quail Meadows interchange (BA-11), within the Quail Meadows interchange creek repair (BA-12), and downstream of the Quail Meadows interchange (BA-13).

Wetland baseline assessments throughout the bypass alignment shall be conducted in accordance with the following:

- Plants surveys conducted in spring 2011 for 10-20% of total wetland acreage
- A minimum of 10-20% of the wetland surface area will be surveyed. Following this data collection, a percent cover-area curve will be developed to determine if 10-20% is an adequate sample size to accurately monitor vegetation. If not, additional quadrats will be sampled until the curve reaches the appropriate number of samples needed to minimize error and maximize accuracy (by capturing the inherent variability in the vegetation across the wetland). Once the cover-area curve has stabilized, an additional 3 quadrats will be sampled to confirm that the curve's plateau does not shift.

Following baseline data collection, a statistical analysis will be conducted to determine if the number of quadrats sampled was appropriate to accurately assess the vegetation. The data will be combined and averaged by habitat type and the analysis will include the following parameters:

- Power analysis at 80%;
- Test of significance at 10% (i.e., the probability of mistakenly rejecting accurate data is no more than the stated probability);
- Minimum detectable change at 20%; and
- Standard error by habitat type.

The result of this analysis will determine the number of quadrats to be sampled in subsequent years (this number could be greater than or less than 10-20% of the wetland surface area). While the complete statistical analysis described above will not be required in subsequent years, the standard error will be reported for each monitoring year.

3.3. Baseline Mitigation Monitoring

The following water quality constituents will be measured as part of baseline monitoring in the mitigation lands. This baseline data shall be collected from **August 20th, 2010 to at least October 15th, 2011**, if baseline conditions are not changed by construction activities or mitigation actions then baseline monitoring shall continue until conditions are altered. Baseline data collection will continue until implemented mitigation activities have a measureable effect on receiving water monitoring data.

Constituent(s)	Frequency
Stream flow	Continuous
pH	Continuous
Temperature (air and water)	Continuous
Total Dissolved Solids	Continuous

Constituent(s)	Frequency
Turbidity	Continuous
Specific Conductance	Continuous
Dissolved Oxygen	Continuous
Total Settleable Solids	Monthly*
Total and Dissolved Metals (Cam 17)	Monthly*
Total Nitrogen	Monthly*
Ammonia	Monthly*
Nitrate and Nitrite	Monthly*
Total Kjeldahl Nitrogen	Monthly*
Biochemical Oxygen Demand	Monthly*
Total and Dissolved Phosphorus	Monthly*
Hardness	Monthly*
Fecal Coliform	Monthly*
Enterococcus	Monthly*
Total Organic Carbon	Monthly*
Bioassessment – BMI, Phab, & Algae	Two Baseline Surveys Summer 2010 and Spring 2011 (April/May).
CRAM Score	One survey to be determined per CRAM methodology (Spring 2011)
* Additional precipitation event sampling to be conducted in conjunction with the “first flush” event and the seven subsequent storm events > 0.25 inches of precipitation in 24 hours. Precipitation events are separated by 48 hours of dry weather. Precipitation monitoring shall be conducted from Phase I through Phase III of this program at a weather station within Little Lake Valley and a method approved by Regional Water Board staff.	

In addition, monthly and precipitation event-based monitoring will include visual observations of the appearance of the stream including color, presence of floating or suspended matter or debris; appearance of the receiving water at the station location (e.g., occurrence of erosion and scouring, solids deposition, unusual aquatic growth, algae); and observations about the receiving water, such as the presence of aquatic life.

Wetland baseline assessments throughout the mitigation lands shall include:

- Hydrology [i.e., ground water level fluctuation (discharge and recharge), inundation (depth, duration and frequency), soil saturation, drainage patterns, erosion and deposition] - Hydrology frequency **every two weeks from November 1st - May 30th, 2010**
- Nutrient removal/transformation
- Sediment/toxicant retention
- Absolute percent coverage of wetland plants
- Relative percent cover of native plant species
- Species richness

- Absolute percent coverage of invasive species
- CRAM score

3.4. Baseline Mitigation Land Monitoring Locations

The number of monitoring locations may vary according to the status of bypass construction. Baseline water quality data will be collected at the following 11 locations at the offsite mitigation parcels (Figure 1):

- Old Outlet Creek downstream of parcel 108-030-04 (WQ-20), west of parcel 108-010-06 along the Category I riparian creation area (WQ-21), and west of parcel 108-010-06 downstream of the Category II riparian creation site on lower Wild Oat Canyon Creek (WQ-22);
- Outlet Creek downstream of parcels 108-030-05 (WQ-18) and 108-020-04 (WQ-19);
- Davis Creek upstream of parcel 108-070-08 (WQ-23), downstream of parcel 108-060-01 (WQ-24), and downstream of parcel 108-010-05 (WQ-25);
- Berry Creek upstream of Category I riparian creation on parcel 108-070-09 (WQ-26), and downstream of parcel 108-060-02 (WQ-28); and
- Outlet Creek (WQ-27) downstream of the confluence with Davis Creek and Caltrans existing Highway 101 Outlet Creek Bridge post mile (PM) 50.66.

Bioassessment monitoring will occur at the following 10 locations at the offsite mitigation lands (Figure 2):

- Outlet Creek downstream of parcels 108-030-05 (BA-14) and 108-020-04 (BA-15);
- Old Outlet Creek downstream of parcel 108-030-04 (BA-16), west of parcel 108-010-06 along the Category I riparian creation area (BA-17), and west of parcel 108-010-06 downstream of the Category II riparian creation site on lower Wild Oat Canyon Creek (BA-18);
- Davis Creek upstream of parcel 108-070-08 (BA-19), downstream of parcel 108-060-01 (BA-20), and downstream of parcel 108-010-05 (BA-21); and
- Berry Creek upstream of Category I riparian creation on parcel 108-070-09 (BA-22), and downstream of parcel 108-060-02 (BA-24).

Wetland baseline assessments throughout the mitigation lands shall be conducted in accordance with the following:

- Plants surveys conducted in spring 2011 for 10-20% of total wetland acreage
- A minimum of 10-20% of the wetland surface area will be surveyed. Following this data collection, a percent cover-area curve will be developed to determine if 10-20% is an adequate sample size to accurately monitor vegetation. If not, additional quadrats will be sampled until the curve reaches the appropriate

number of samples needed to minimize error and maximize accuracy (by capturing the inherent variability in the vegetation across the wetland). Once the cover-area curve has stabilized, an additional 3 quadrats will be sampled to confirm that the curve's plateau does not shift.

Following baseline data collection, a statistical analysis will be conducted to determine if the number of quadrats sampled was appropriate to accurately assess the vegetation. The data will be combined and averaged by habitat type and the analysis will include the following parameters:

- Power analysis at 80%;
- Test of significance at 10% (i.e., the probability of mistakenly rejecting accurate data is no more than the stated probability);
- Minimum detectable change at 20%; and
- Standard error by habitat type.

The result of this analysis will determine the number of quadrats to be sampled in subsequent years (this number could be greater than or less than 10-20% of the wetland surface area). While the complete statistical analysis described above will not be required in subsequent years, the standard error will be reported for each monitoring year.

3.4.1. Baseline Evaluation Reports and Revised MMP

Caltrans shall submit reports documenting the results of the baseline water quality surveys required by this MRP: A report for the bypass alignment and a report for the mitigation lands. The report for the bypass alignment shall evaluate the data gathered and revise the performance standards and success criteria for proposed repair and restoration actions. In addition, the bypass alignment report shall present how the revised performance standards and success criteria will be used to implement the sediment and temperature TMDLs. The report for the off-site mitigation lands shall evaluate the data gathered and revise the performance standards and success criteria for the enhancement of the off-site mitigation lands. Additionally, the mitigation land report shall present how the revised performance standards and success criteria will be used to implement the sediment and temperature TMDLs.

The CRAM scores shall be entered into the CRAM database. In addition, the data collected shall be SWAMP compatible and submitted electronically to the Regional Water Board. The baseline evaluation reports will be used to amend the final MMP. The reports shall include, at a minimum, the following information:

- Data collection procedures protocols
- QA/QC for sample collection, handling and analysis
- Data in narrative summaries and data analysis
- Summaries and conclusions
- Data tables

- Data concentration graphs
- Site maps
- Site photographs
- Laboratory analytical reports
- Field logs and data sheets
- Filed instrument calibration logs

The reports shall correlate site observations, historical data, and local site specific baseline data to establish the local baseline conditions along the bypass alignment and mitigation lands to establish the proper functioning conditions (PFC). The PFC or ideal natural conditions shall be defined in the future reports subsequent to the completion of the baseline assessments. The data gathered from the baseline assessment shall be used to assess the characteristics of the PFC and shall be correlated to the performance standards and success criteria for wetlands, streams, and riparian/buffer areas for the off-site mitigation lands. The baseline reports are due to the Regional Water Board by **January 31, 2012**.

3.4.2. Revised Performance Standards / Success Criteria

The performance standards listed below shall be cumulatively assessed within each category to determine the success of the mitigation and repair actions. In other words successful mitigation shall take into consideration an overall weight of evidence. Those performance standards and success criteria shall be incorporated in the MMP, which shall be submitted to the Regional Water Board by **April 30, 2012**.

3.4.3. Riparian (Buffer) Establishment/Creation, Repair, and Enhancement Success Criteria

Based on the baseline data gathered Caltrans shall include the following performance standards and success criteria:

- Plant survival
- Plant vigor
- Percent vegetation cover (canopy)
- Maximum site potential shade
- Baseline percent canopy cover
- Percent effective shade (shade on water)
- Baseline and target temperature objectives
- Physical Habitat Criteria per SWAMP protocols
- Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California.

3.4.4. Wetland Establishment/Creation, Repair and Enhancement Success Criteria

Based on the baseline data gathered, Caltrans shall include the following performance standards and success criteria:

- Hydrology [i.e., ground water level fluctuation (discharge and recharge), inundation (depth, duration and frequency), soil saturation, drainage patterns, erosion and deposition]
- Nutrient removal/transformation
- Sediment/toxicant retention
- Absolute percent coverage of wetland plants
- Absolute percent cover of native plant species
- Species richness
- Absolute percent coverage of invasive species
- CRAM score.

3.4.5. Other Waters (streams) Enhancement Success Criteria

Based on the baseline data gathered, Caltrans shall include the following performance standards and success criteria:

- Geomorphic conditions (e.g., cross sectional water depth, wetted channel width, bankfull width, full channel width, cross sectional channel width, substrate characteristics, canopy cover, gradient, sinuosity, large woody debris, fish habitat characteristics and rating)
- Physical Habitat Criteria per SWAMP protocols
- IBI for BMI assessment including but not limited to (taxa richness, taxa composition, percent tolerant/intolerant organisms, functional feeding group analysis, and abundance)
- B-IBI for Wadeable Streams in Northern Coastal California
- CRAM Score.

3.4.6. Work Plan / Short Term Management Plan

Subsequent to evaluating the baseline data collected and revising the performance standards, Caltrans shall revise the work plan / short term mitigation plan for the bypass alignment and mitigation lands to include:

- Mitigation Specific Design Plans (e.g., riparian/buffer planting plans, erosion site restoration plans, exclusionary fence locations)
- Repair Action Specific Design Plans (e.g., riparian/buffer planting plans)
- Design and Construction Specifications
- Implementation Schedule

The revised work plan / short term management plan shall be incorporated in the MMP and submitted to the Regional Water Board by **April 30, 2012**.

3.4.7. Grazing Management Plan

Subsequent to evaluating the data collected from Phase I of the MRP, Caltrans shall revise the grazing management plan (parcel or zone specific) to include monitoring for the performance standards listed above that apply to streams, riparian areas, and wetlands. The goal is to monitor and manage the PFC of the wetlands, riparian areas, and streams.

The grazing management plan shall include the following goals and objectives:

- The components (functioning conditions of the ecosystem and cattle)
- What is to be accomplished (enhancement of the baseline conditions)
- The amount of change (success criteria increase from baseline)
- The locations (parcel or zone specific)
- A timeframe (schedule for success and reevaluation of management practices)

It is recommended that the grazing management plan include the following best management practices (BMPs):

- Parcel or zone specific grazing prescription;
- Parcel or quadrant specific grazing schedule that is developed with the enhancement and protection of natural resources (e.g., wetlands, streams and riparian areas) as the primary focus of the management plan;
- A setback plan (e.g. exclusionary fencing) to prevent cattle from entering streams or degrading the functions of the riparian areas;
- A schedule and plan that provides for plant development prior to, or plant recovery following, the grazing period each year; and
- An inspection schedule to assess the conditions of wetland and riparian areas at a frequency adequate to enable, if necessary, prompt corrective management action to protect the health of the riparian area. The schedule should be at least monthly during grazing within the short term mitigation implementation period.

The revised grazing management plan shall be incorporated in the MMP and submitted to the Regional Water Board by **April 30, 2012**.

4.0. PHASE II - CONSTRUCTION COMPLIANCE MONITORING and REPORTING

In order to demonstrate whether the bypass is in compliance with the applicable water quality objectives, Caltrans shall conduct monitoring in accordance with this MRP and the Water Quality Certification. This MRP requires monitoring at static locations throughout the bypass alignment during the construction phase.

4.1. Water Quality Monitoring for the Bypass Footprint.

Constituent(s)	Frequency
Stream flow	Continuous
pH	Continuous
Temperature (Air and Water)	Continuous
Total Dissolved Solids	Continuous
Turbidity	Continuous
Specific Conductance	Continuous
Dissolved Oxygen	Continuous
Total Settleable Solids	Event based*
Total and Dissolved Metals (Cam 17)	Event based*
Hardness	Event based*
Oil and Grease	Event based*
Methylene Blue Activated Substances	Event based*
* Additional precipitation event sampling to be conducted in conjunction with the “first flush” event and the seven subsequent storm events > 0.25 inches of precipitation in 24 hours. Precipitation events are separated by 48 hours of dry weather. Precipitation monitoring shall be conducted from Phase I through Phase III of this program at a weather station within Little Lake Valley and a method approved by Regional Water Board staff.	

In addition, precipitation event-based monitoring will include visual observations of the appearance of the stream including color, presence of floating or suspended matter or debris; appearance of the receiving water at the station location (e.g., occurrence of erosion and scouring, solids deposition, unusual aquatic growth, algae); and observations about the receiving water, such as the presence of aquatic life.

Water quality data will be collected at the following 17 locations along the bypass alignment for construction compliance monitoring (Figure 1):

- Upper Haehl Creek upstream of the interchange construction footprint (WQ-1), within the construction foot print (WQ-2) and downstream of the Haehl Creek interchange (WQ-3);
- Middle Haehl Creek bridge construction upstream of the project footprint (WQ-4) and downstream of the project footprint (WQ-5);
- Baechtel Creek upstream of the Baechtel Creek retaining wall construction footprint (WQ-6), upstream of the Haehl Creek confluence (WQ-7), Lower Haehl Creek upstream of the bypass footprint (WQ-8);
- Lower Haehl Creek downstream of the viaduct construction footprint, but upstream of the Baechtel Creek confluence (WQ-9); and upstream of the viaduct construction footprint (WQ-10);

- Outlet Creek downstream of the viaduct construction footprint (WQ-11) and Broaddus Creek upstream of the viaduct construction footprint (WQ-12);
- Mill Creek upstream of the viaduct construction footprint.(WQ-13) downstream of the viaduct construction footprint (WQ-14); and
- Upp Creek upstream (WQ-15) and within (WQ-16) the Quail Meadows interchange construction footprint and downstream of the interchange construction footprint (WQ-17).

4.2. Water Quality Objectives

The relevant water quality requirements, parameters, and objectives applicable to the project are summarized below. However, the list below is not all inclusive of all relevant water quality requirements; water quality objectives, and the authority and jurisdiction of the Regional Water Board are not limited to the list below.

Constituent	Concentrations
pH ³	>6.5 or <8.5
Temperature ⁴	<0.5 degrees F
Dissolved Oxygen ⁵	>7.0 mg/L or (>9.0 mg/L)
Total Dissolved Solids	<230 ⁶ or <125 ⁷
Turbidity	<20% above background
Specific Conductance ⁸	<400 ⁵ or <200 ⁶
Hardness	Used to correlate metals concentrations
Total and Dissolved Metals	Various aquatic criteria within the Basin Plan and California Toxics Rule ⁹ for Inland Surface Waters
Total Suspended Solids	Waters shall not contain substances in concentrations that causes nuisance or adversely affect beneficial uses.
Oil and Grease	

³ Changes in normal ambient pH levels shall not change 0.5 units within the range specified in fresh waters with designated COLD or WARM beneficial uses.

⁴ The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature. mg/L – milligrams per liter

⁵ Waters designated SPWN during critical spawning and egg incubation periods is >9.0 mg/l

⁶ 90% or more of the yearly values must be less than or equal this limit.

⁷ 50% or more of the monthly means must be less than this limit.

⁸ micromhos @ 77°F

⁹ California Toxics Rule (CTR) objectives are not used as effluent limitations or Basin Plan Water Quality Objectives. CTR values will be utilized to assess the effectiveness of BMPs associated with the project construction as well as post-construction treatment BMPs.

4.3. Reporting

Monthly Monitoring Reports: shall be submitted to the Executive Officer of the Regional Water Board. The monthly monitoring reports shall include, at a minimum;

- 1) A summary of discharges;
- 2) A summary of corrective actions taken (if necessary);
- 3) Photographs;
- 4) All field sampling measurements and/or results;
- 5) Project status (i.e. upcoming construction schedule and disturbed soil area updates);
- 6) Monitoring reports and field logs;
- 7) Water quality monitor reports and field logs;
- 8) All field monitoring equipment calibration logs;
- 9) Caltrans shall develop, and Regional Water Board shall approve, a data management and reporting system to efficiently and effectively report sampling and monitoring data. Monthly monitoring reports are due to the Regional Water Board **by the 15th of each month** once work on the project has been initiated.

Rainy Day Reports: Caltrans shall take photos of all areas disturbed by project activities, including all excess materials disposal areas, after rainfall events that generate visible runoff from these areas in order to demonstrate that erosion control and revegetation measures are present and have been installed appropriately and successfully. A brief report containing these photos shall be submitted **within 30 days of the rainfall event that generated runoff from the disturbed areas**.

Annual Monitoring Reports: Caltrans shall provide the Regional Water Board with an Annual Monitoring Report no later than **January 31** of every year beginning with issuance of this Order and continuing until the Regional Water Board accepts the Final Mitigation Report. The annual reports (i.e. report for the bypass alignment and a report for the mitigation lands) shall include, at a minimum:

- 1) A summary of all monitoring reports identified in this Order;
- 2) A general description of the status of the project site and project activities, including actual or projected completion dates, if known;

- 3) A summary of the annual mitigation monitoring reports and the current implementation status of each mitigation measure;
- 4) An assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and mitigating project impacts (e.g., adaptive management summary for mitigation and environmental sensitive area fencing for bypass construction);
- 5) Results and an evaluation of the data collected from this MRP;
- 6) Monthly Monitoring and Rainy Day Reports; and
- 7) A compliance table (spreadsheet) that presents each condition of the Water Quality Certification and the MRP, time frame (yearly calendar), project milestones and achievements, all reported discharges, and all violations of this MRP and each condition of the Water Quality Certification.

5.0. PHASE III – EVALUATING SUCCESS FOR THE MITIGATION LAND ESTABLISHMENT/CREATION AND ENHACEMENT (MITIGATION LANDS) AND ON-SITE REPAIR (BYPASS)

As stated in Section 1.0., the purpose of the baseline monitoring is to establish the conditions of surface waters to verify the establishment, enhancement and repair of wetlands, riparian areas (buffers), and streams within the mitigation lands and bypass footprint, respectively. Prior to Phase III the proper functioning conditions of the establishment, enhancement, and repair sites has been determined, and the data gathered during the baseline has been correlated with the performance standards and ultimate success criteria. The following post construction monitoring will be implemented to track performance and determine success.

5.1. Post-Construction Bypass Water Quality

The following water quality monitoring program will be conducted for **one calendar year at years one, five, and ten** as part of compliance monitoring in the bypass alignment subsequent to the completion bypass. Monitoring may be extended or reduced depending on the results.

Constituent(s)	Frequency
Stream flow	Continuous
pH	Continuous
Temperature (Air and Water)	Continuous
Total Dissolved Solids	Continuous
Turbidity	Continuous

Constituent(s)	Frequency
Specific Conductance	Continuous
Dissolved Oxygen	Continuous
Total Settleable Solids	Event based*
Total and Dissolved Metals (Cam 17)	Event based*
Hardness	Event based*
Oil and Grease	Event based*
Methylene Blue Activated Substances	Event based*
Bioassessment – BMI, Phab, & Algae	Summer and Spring Surveys twice per year (July/August and April/May) at years one, five and ten
CRAM Score	To be determined per CRAM methodology (Spring) at years one, five and ten
* Additional precipitation event sampling to be conducted in conjunction with the “first flush” event and the seven subsequent storm events > 0.25 inches of precipitation in 24 hours and which generate visible runoff. Precipitation events are separated by 48 hours of dry weather. Precipitation monitoring shall be conducted from Phase I through Phase III of this program at a weather station within Little Lake Valley and a method approved by Regional Water Board staff.	

Wetland Assessment for On-site Repair shall include:

- Hydrology [i.e., ground water level fluctuation (discharge and recharge), inundation (depth, duration and frequency), soil saturation, drainage patterns, erosion and deposition] - Hydrology frequency conducted at two week intervals from November 1st - May 30th
- Absolute percent coverage of wetland plants
- Relative percent cover of native plant species
- Species richness
- Absolute percent coverage of invasive species
- CRAM score.

5.2. Bypass Monitoring Locations

Water quality data will be collected at the following 17 locations along the bypass alignment (Figure 1):

- Upper Haehl Creek upstream of the interchange construction footprint (WQ-1), within the construction foot print (WQ-2) and downstream of the Haehl Creek interchange (WQ-3);
- Middle Haehl Creek bridge construction upstream of the project footprint (WQ-4) and downstream of the project footprint (WQ-5);

- Baechtel Creek upstream of the Baechtel Creek retaining wall construction footprint (WQ-6), upstream of the Haehl Creek confluence (WQ-7), Lower Haehl Creek upstream of the bypass footprint (WQ-8);
- Lower Haehl Creek downstream of the viaduct construction footprint, but upstream of the Baechtel Creek confluence (WQ-9); and upstream of the viaduct construction footprint (WQ-10);
- Outlet Creek downstream of the viaduct construction footprint (WQ-11) and Broaddus Creek upstream of the viaduct construction footprint (WQ-12);
- Mill Creek upstream of the viaduct construction footprint.(WQ-13) downstream of the viaduct construction footprint (WQ-14); and
- Upp Creek upstream (WQ-15) and within (WQ-16) the Quail Meadows interchange construction footprint and downstream of the interchange construction footprint (WQ-17).

Bioassessment monitoring will occur at the following 13 locations along the bypass alignment twice per year at years one, five and ten subsequent to the completion of the bypass (Figure 2):

- Upper Haehl Creek upstream of the Haehl Creek interchange (BA-1), within the Haehl Creek interchange creek repair (BA-2), and downstream of the Haehl Creek interchange (BA-3);
- Baechtel Creek below its confluence with Haehl Creek (BA-4), along the Category I riparian enhancement area parcels (BA-5), and below the riparian enhancement area (BA-6);
- Outlet Creek downstream of the Baechtel-Broaddus Creek confluence but upstream of the Category I riparian enhancement area (BA-7);
- Mill Creek upstream of the bypass footprint (BA-8), below the bypass footprint (BA-9), and downstream of the Category I riparian enhancement parcel (BA-10); and
- Upp Creek upstream of the Quail Meadows interchange (BA-11), within the Quail Meadows interchange creek repair (BA-12), and downstream of the Quail Meadows interchange (BA-13).

Wetland assessments for the baypass alignment shall be conducted in accordance with the following:

- Plants surveys conducted in spring for the location and area determined by the baseline surveys and associated statistical power analysis.

5.3. Mitigation Monitoring

The following water quality monitoring program will be conducted for **one calendar year at years one, five and ten** as part of establishment and enhancement monitoring in the mitigation lands subsequent to the completion of the mitigation actions. The mitigation

actions are defined as construction events (e.g., wetland creation, riparian creation, bank erosion stabilization), not management activities (e.g., grazing management).

Constituent(s)	Frequency
Stream flow	Continuous
pH	Continuous
Temperature (air and water)	Continuous
Total Dissolved Solids	Continuous
Turbidity	Continuous
Specific Conductance	Continuous
Dissolved Oxygen	Continuous
Total Settleable Solids	Monthly*
Total and Dissolved Metals (Cam 17)	Monthly*
Total Nitrogen	Monthly*
Ammonia	Monthly*
Nitrate and Nitrite	Monthly*
Total Kjeldahl Nitrogen	Monthly*
Biochemical Oxygen Demand	Monthly*
Total and Dissolved Phosphorus	Monthly*
Hardness	Monthly*
Fecal Coliform	Monthly*
Enterococcus	Monthly*
Total Organic Carbon	Monthly*
Bioassessment – BMI, Phab, & Algae	Twice per year (July/August and April/May) at years one, five and ten
CRAM Score	To be determined per CRAM methodology (Spring) at years one, five and ten
* Additional precipitation event sampling to be conducted in conjunction with the “first flush” event and the seven subsequent storm events > 0.25 inches of precipitation in 24 hours and which generate visible runoff. Precipitation events are separated by 48 hours of dry weather. Precipitation monitoring shall be conducted from Phase I through Phase III of this program at a weather station within Little Lake Valley and a method approved by Regional Water Board staff.	

In addition, monthly and precipitation event-based monitoring will include visual observations of the appearance of the stream, including color, presence of floating or suspended matter or debris; appearance of the receiving water at the station location (e.g., occurrence of erosion and scouring, solids deposition, unusual aquatic growth, algae); and observations about the receiving water, such as the presence of aquatic life.

Wetland Assessment for Mitigation Monitoring:

- Hydrology [i.e., ground water level fluctuation (discharge and recharge), inundation (depth, duration and frequency), soil saturation, drainage patterns, erosion and deposition] - Hydrology frequency conducted at two week intervals from November 1st - May 30th
- Plants surveys conducted in spring
- Nutrient removal/transformation
- Sediment/toxicant retention
- Absolute percent coverage of wetland plants
- Relative percent cover of native plant species
- Species richness
- Absolute percent coverage of invasive species
- CRAM score

5.4. Mitigation Land Monitoring Locations

The number of monitoring locations may vary according to the status of bypass construction. Water quality data will be collected at the following 11 locations throughout the offsite mitigation parcels (Figure 1):

- Old Outlet Creek downstream of parcel 108-030-04 (WQ-20), west of parcel 108-010-06 along the Category I riparian creation area (WQ-21), and west of parcel 108-010-06 downstream of the Category II riparian creation site on lower Wild Oat Canyon Creek (WQ-22);
- Outlet Creek downstream of parcels 108-030-05 (WQ-18) and 108-020-04 (WQ-19);
- Davis Creek upstream of parcel 108-070-08 (WQ-23), downstream of parcel 108-060-01 (WQ-24), and downstream of parcel 108-010-05 (WQ-25);
- Berry Creek upstream of Category I riparian creation on parcel 108-070-09 (WQ-26), and downstream of parcel 108-060-02 (WQ-28); and
- Outlet Creek (WQ-27) downstream of the confluence with Davis Creek and Caltrans existing Highway 101 Outlet Creek Bridge.

Bioassessment monitoring will occur at the following 10 locations at the offsite mitigation lands subsequent to the completion of the mitigation actions (Figure 2):

- Outlet Creek downstream of parcels 108-030-05 (BA-14) and 108-020-04 (BA-15);
- Old Outlet Creek downstream of parcel 108-030-04 (BA-16), west of parcel 108-010-06 along the Category I riparian creation area (BA-17), and west of parcel 108-010-06 downstream of the Category II riparian creation site on lower Wild Oat Canyon Creek (BA-18);

- Davis Creek upstream of parcel 108-070-08 (BA-19), downstream of parcel 108-060-01 (BA-20), and downstream of parcel 108-010-05 (BA-21); and
- Berry Creek upstream of Category I riparian creation on parcel 108-070-09 (BA-22) and downstream of parcel 108-060-02 (BA-24).

Wetland assessments throughout the mitigation lands shall be conducted in accordance with the following:

- Plants surveys conducted in spring for the location and area determined by the baseline surveys and associated statistical power analysis.

5.5. Reporting

Annual Monitoring Reports: Caltrans shall provide the Regional Water Board with an Annual Monitoring Report no later than **January 31** of every year beginning with issuance of this MRP and continuing until the Regional Water Board accepts the verified success of the mitigation and signs off on the Final Mitigation Report. Each annual report shall include, at a minimum:

- 1) A summary of all monitoring reports identified in this Order;
- 2) A general description of the status of the project site and project activities, including actual or projected completion dates, if known;
- 3) A summary of the annual mitigation monitoring reports and the current implementation status of each mitigation measure;
- 4) An assessment of the effectiveness of each completed or partially completed mitigation measure in avoiding, minimizing, and mitigating project impacts;
- 5) Results and an evaluation of the data collected from this MRP;
- 6) Monthly Monitoring and Rainy Day Reports; and
- 7) A compliance table (spreadsheet) that presents each condition of the Water Quality Certification and the MRP, time frame (yearly calendar), project milestones and achievements, all reported discharges, and all violations of this MRP and each condition of the Water Quality Certification.

Slope Stability Reports: Caltrans shall provide yearly slope evaluation and erosion control monitoring reports for up to 10 years subsequent to the completion of the bypass project. Caltrans shall provide at least 80 percent coverage of established erosion control of all exposed areas along the bypass. To ensure the reduction of sediment transport into the Outlet Creek HSA, Caltrans shall conduct inspections prior to and

subsequent to each rainy season up to 10 years after completion of the bypass. Reports shall include, at a minimum:

- 1) Name and title of personnel conducting monitoring and/or maintenance;
- 2) Observation dates;
- 3) Site photographs;
- 4) Maps including percent coverage of established erosion control and revegetation efforts; and
- 5) An erosion evaluation.

If the new bypass project has slope failures, excessive erosion, or causes other water quality degradation corrective actions will be required to mitigate the impacts. Established erosion control is vegetation growth, not applied erosion control product.

Final Mitigation Report: No later than 120 days after achieving success criteria for the on-site repair and the off-site mitigation lands, Caltrans shall provide the Regional Water Board with a Final Mitigation Report. The Final Mitigation Report shall include, at a minimum:

- 1) A summary of all monthly monitoring reports and annual status reports;
- 2) Copies of all mitigation monitoring reports documenting when success criteria for each of the mitigation measures were achieved;
- 3) All available information about mitigation measures, data collection for the MRP, and projects taken to implement the sediment and temperature TMDLs;
- 4) Each yearly compliance calendar;
- 5) An assessment of the effectiveness of the required measures in avoiding, minimizing, and mitigating project impacts;
- 6) Any recommendations on how mitigation measures might be changed to more effectively minimize impacts to water quality and mitigate the impacts of future projects;
- 7) A final long term management plan;
- 8) Revised PAR and endowment calculation approved by the long term manager; and

- 9) Any other pertinent information.

The long term management plan shall include the following actions:

- a) Water Quality Monitoring plans to verify habitat enhancement, compliance with the basin plan, and TMDL;
- b) Inspections of the erosion sites shall be conducted annually to assess the stability and condition of the repair actions and for all the sites identified in Appendix J of the Final MMP;
- c) All adaptive management plans and actions (e.g. stream channel or bank stabilization, vegetation management, and erosion control) for waters of the State (i.e., streams, riparian areas, and wetlands) shall be submitted to the Executive Officer of the Regional Water Board for prior review and concurrence.

6.0. PHASE IV – TMDL COMPLIANCE BYPASS AND MITIGATION LANDS

Once success has been achieved for the on-site repair areas and the off-site mitigation lands, Caltrans shall develop individual TMDL Compliance Plans for the bypass and mitigation lands. The TMDL compliance plan for the bypass shall be incorporated into the Annual Storm Water Work Plans and Reports, while the TMDL compliance plan shall be incorporated into the Mitigation Lands Long Term Management Plan and enrolled under the appropriate regulatory permit as determined by the Executive Officer of the Regional Water Board.

All previously gathered data shall be evaluated to determine the minimum amount of monitoring necessary to regularly evaluate whether the bypass alignment and mitigation lands are continuing to remain in compliance with the Basin Plan and applicable TMDLs or if there are contributing factors to degradation and impairments of water quality and beneficial uses.

Ordered by _____

Catherine Kuhlman
Executive Officer

August 6, 2010